

|       |                        |
|-------|------------------------|
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| M-104 | ROOF FLOOR HVAC LAYOUT           |
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|                                                                                                    |  |                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|----------------------------------------------------------------------------------------------------|--|-------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <div>Project Name</div> <div>UNESCO</div> <div>Owner</div> <div>Lebanese Ministry of Culture</div> |  | <div>Location</div> <div>Beirut - Lebanon</div> |  | <div><div><div><input type="checkbox"/> Architecture</div><div><input type="checkbox"/> Structural Eng.</div><div><input checked="" type="checkbox"/> Mechanical Eng.</div><div><input type="checkbox"/> Electrical Eng.</div></div><div><div><input type="checkbox"/> Project Mgmt.</div><div><input type="checkbox"/> Medical Planner</div><div><input type="checkbox"/> Technical Controller</div><div><input type="checkbox"/> Security Eng.</div></div></div> |  |
|----------------------------------------------------------------------------------------------------|--|-------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

ROOF TYPE  
SINGLE PACKAGE AC UNIT

|                                                                                                                                                                                                                                                                                                                                                                                                                      |    |                                                                                                                                               |                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| UNIT NO.                                                                                                                                                                                                                                                                                                                                                                                                             |    | RT-01 A/B/C/E                                                                                                                                 | RT-01 D/F                                                                                                                                     |
| QUANTITY                                                                                                                                                                                                                                                                                                                                                                                                             |    | 4                                                                                                                                             | 2                                                                                                                                             |
| HEATING SYSTEM                                                                                                                                                                                                                                                                                                                                                                                                       |    | HEAT PUMP                                                                                                                                     | HEAT PUMP                                                                                                                                     |
| MINIMUM OUTSIDE AIR FLOW L/S                                                                                                                                                                                                                                                                                                                                                                                         |    | 760                                                                                                                                           | 580                                                                                                                                           |
| TOTAL COOLING LOAD KW THERMAL                                                                                                                                                                                                                                                                                                                                                                                        |    | 101.2                                                                                                                                         | 110.5                                                                                                                                         |
| SENSIBLE LOAD KW THERMAL                                                                                                                                                                                                                                                                                                                                                                                             |    | 61.8                                                                                                                                          | 80.6                                                                                                                                          |
| OUTDOOR AMBIENT AIR CONDITIONS °C                                                                                                                                                                                                                                                                                                                                                                                    | DB | 36.0                                                                                                                                          | 36.0                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                      | WB | 27.0                                                                                                                                          | 27.0                                                                                                                                          |
| ENTERING AIR TEMPERATURE °C                                                                                                                                                                                                                                                                                                                                                                                          | DB | 25.9                                                                                                                                          | 25.6                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                      | WB | 19.9                                                                                                                                          | 18.5                                                                                                                                          |
| SUPPLY FAN EXTERNAL STATIC PRESSURE PA                                                                                                                                                                                                                                                                                                                                                                               |    | 250                                                                                                                                           | 250                                                                                                                                           |
| RETURN FAN EXTERNAL STATIC PRESSURE PA                                                                                                                                                                                                                                                                                                                                                                               |    | 200                                                                                                                                           | 200                                                                                                                                           |
| APPROXIMATE POWER CONSUMPTION (KW)                                                                                                                                                                                                                                                                                                                                                                                   |    | 45                                                                                                                                            | 45                                                                                                                                            |
| POWER RATING                                                                                                                                                                                                                                                                                                                                                                                                         |    | 380V/3Ph/50Hz                                                                                                                                 | 380V/3Ph/50Hz                                                                                                                                 |
| REFRIGERANT TYPE                                                                                                                                                                                                                                                                                                                                                                                                     |    | R-32                                                                                                                                          | R-32                                                                                                                                          |
| MINIMUM NO. & TYPE OF COMPRESSORS                                                                                                                                                                                                                                                                                                                                                                                    |    | 2 - SCROLL                                                                                                                                    | 2 - SCROLL                                                                                                                                    |
| LOCATION                                                                                                                                                                                                                                                                                                                                                                                                             |    | Roof                                                                                                                                          | Roof                                                                                                                                          |
| REMARKS                                                                                                                                                                                                                                                                                                                                                                                                              |    | UNIT SHALL HAVE:<br>-Two fans (one for supply, second for return)<br>-Economizer for fresh air intake<br>-Motorized hood 0-50%<br>-CO2 sensor | UNIT SHALL HAVE:<br>-Two fans (one for supply, second for return)<br>-Economizer for fresh air intake<br>-Motorized hood 0-50%<br>-CO2 sensor |
| NOTE:<br><br>1- THE CONTRACTOR SHALL RECALCULATE THE TOTAL HEAD BASED ON THE FINAL APPROVED SHOP DRAWINGS.<br>2- THE VALUE OF EXTERNAL STATIC PRESSURE MENTIONED IN THE EQUIPMENT SCHEDULE IS ONLY INDICATIVE. CONTRACTOR IS RESPONSIBLE TO PROVIDE THE ESP CALCULATION FOR PRICING AND SELECTION PURPOSES.<br>3-SOUND ATTENUATORS MAY BE REQUIRED ON THE SUPPLY AND RETURN AIR DUCTS, DEPENDING ON THE SOUND LEVELS |    |                                                                                                                                               |                                                                                                                                               |

| DX SPLIT UNIT SCHEDULE                                          |          |                      |          |     |                   |             |              |                   |               |         |
|-----------------------------------------------------------------|----------|----------------------|----------|-----|-------------------|-------------|--------------|-------------------|---------------|---------|
| MARK<br>IU / OU                                                 | QUANTITY | INDOOR UNIT          |          |     |                   |             | OUTDOOR UNIT |                   | NOMINAL POWER | REMARKS |
|                                                                 |          | TYPE                 | SELECTED | ESP | PHASE / VOLT / Hz | REFRIGERANT | TYPE         | PHASE / VOLT / Hz | kW            |         |
|                                                                 |          |                      | BTU/HR   | Pa  |                   |             |              |                   |               |         |
| AC-01 / CU-01                                                   | 2        | CONCEALED HORIZONTAL | 144000   | 220 | 3 / 380 / 50      | R410        | AIR COOLED   | 3 / 380 / 50      | 16.8          | -       |
| AC-02 / CU-02                                                   | 2        | CONCEALED HORIZONTAL | 180000   | 220 | 3 / 380 / 50      | R410        | AIR COOLED   | 3 / 380 / 50      | 21.0          | -       |
| AC-03 / CU-03                                                   | 1        | CONCEALED HORIZONTAL | 96000    | 220 | 3 / 380 / 50      | R410        | AIR COOLED   | 3 / 380 / 50      | 11.2          | -       |
| NOTE<br>1- OUTDOOR TEMPERATURE 36 °C, INDOOR TEMPERATURE 23 °C. |          |                      |          |     |                   |             |              |                   |               |         |

Note: The contractor should verify all dimensions and discuss with the architect all suggestions and remarks for the proper execution of the works. No modifications to execution drawings are allowed without the architect's written consent. All dimensions have to be checked on site, all errors and omissions to be reported to the architect. All rights reserved for Engineered Systems International S.A.R.L

Project Name

UNESCO

Owner

Lebanese Ministry of Culture

Location

Beirut - Lebanon

☐ Architecture

☐ Structural Eng.

☒ Mechanical Eng.

☐ Electrical Eng.

☐ Project Mgmt.

☐ Medical Planner

☐ Technical Controller

☐ Security Eng.

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Initial Issue: May 6, 2026

Revision 1:

Revision 2:

Revision 3:

Revision 4:

Revision 5:

Drawing Title

SCHEDULE OF EQUIPMENT

Project Phase

Tender

Drawn By

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Verified By

---

Approved By

---

Drawing Number

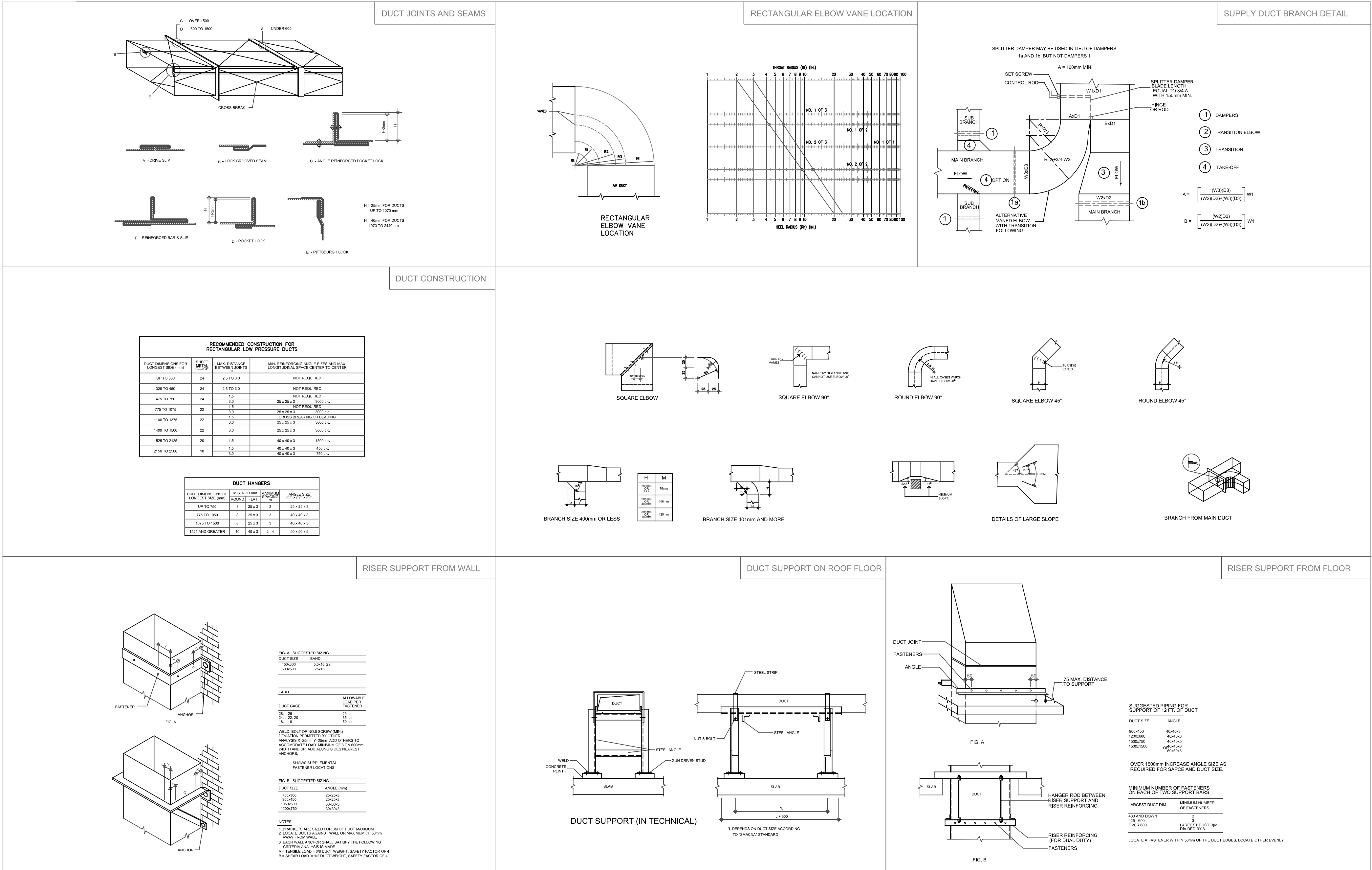
M-002

Job Number

MA2601

Scale

NTS



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UNESCO

Owner

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Location

Beirut - Lebanon

☐ Architecture

☐ Structural Eng.

☒ Mechanical Eng.

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Revision 4:

Revision 5:

Drawing Title

MECHANICAL DETAILS 1/2

Project Phase

Tender

Drawn By

Verified By

Approved By

Drawing Number

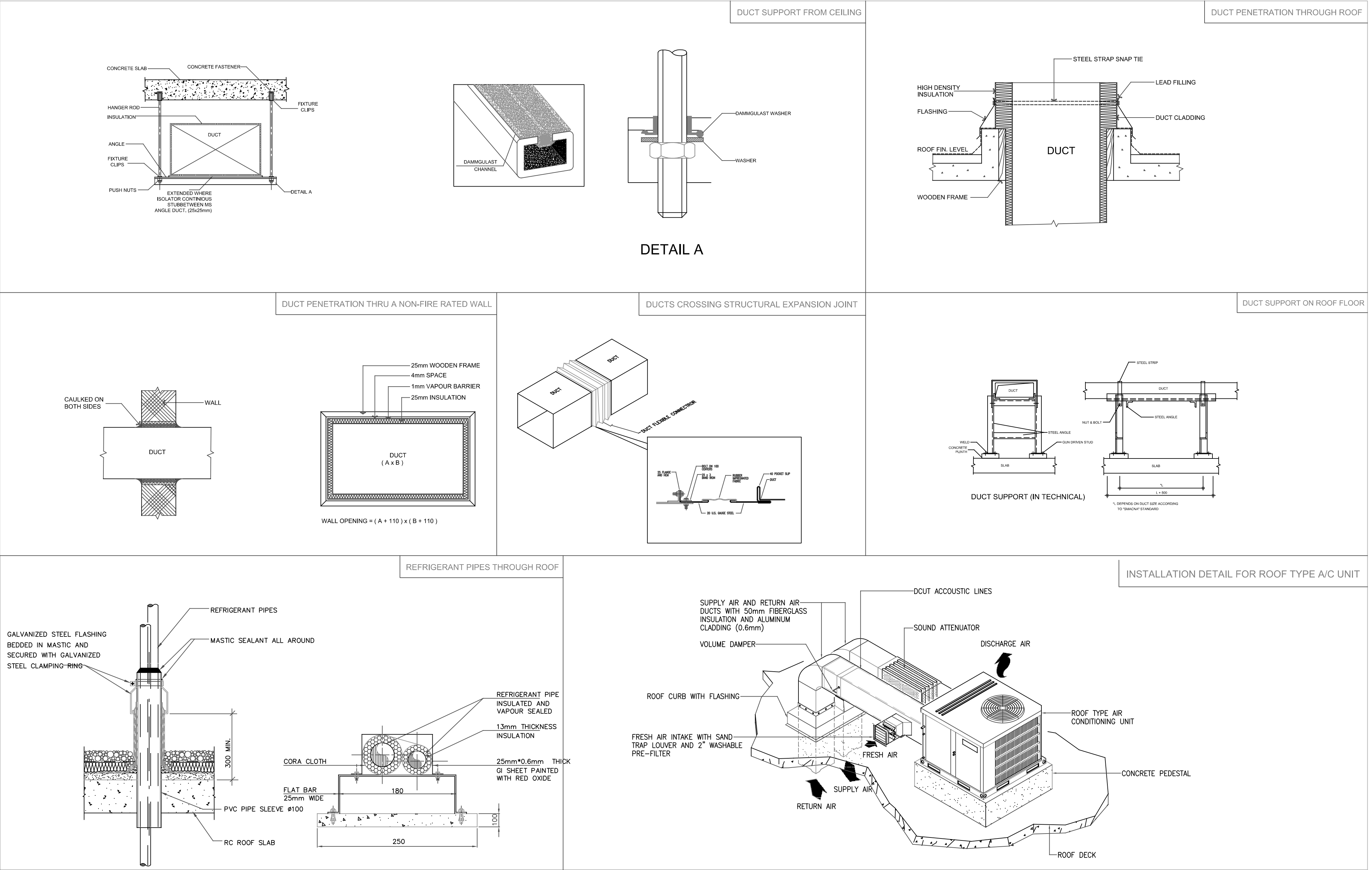
M-003

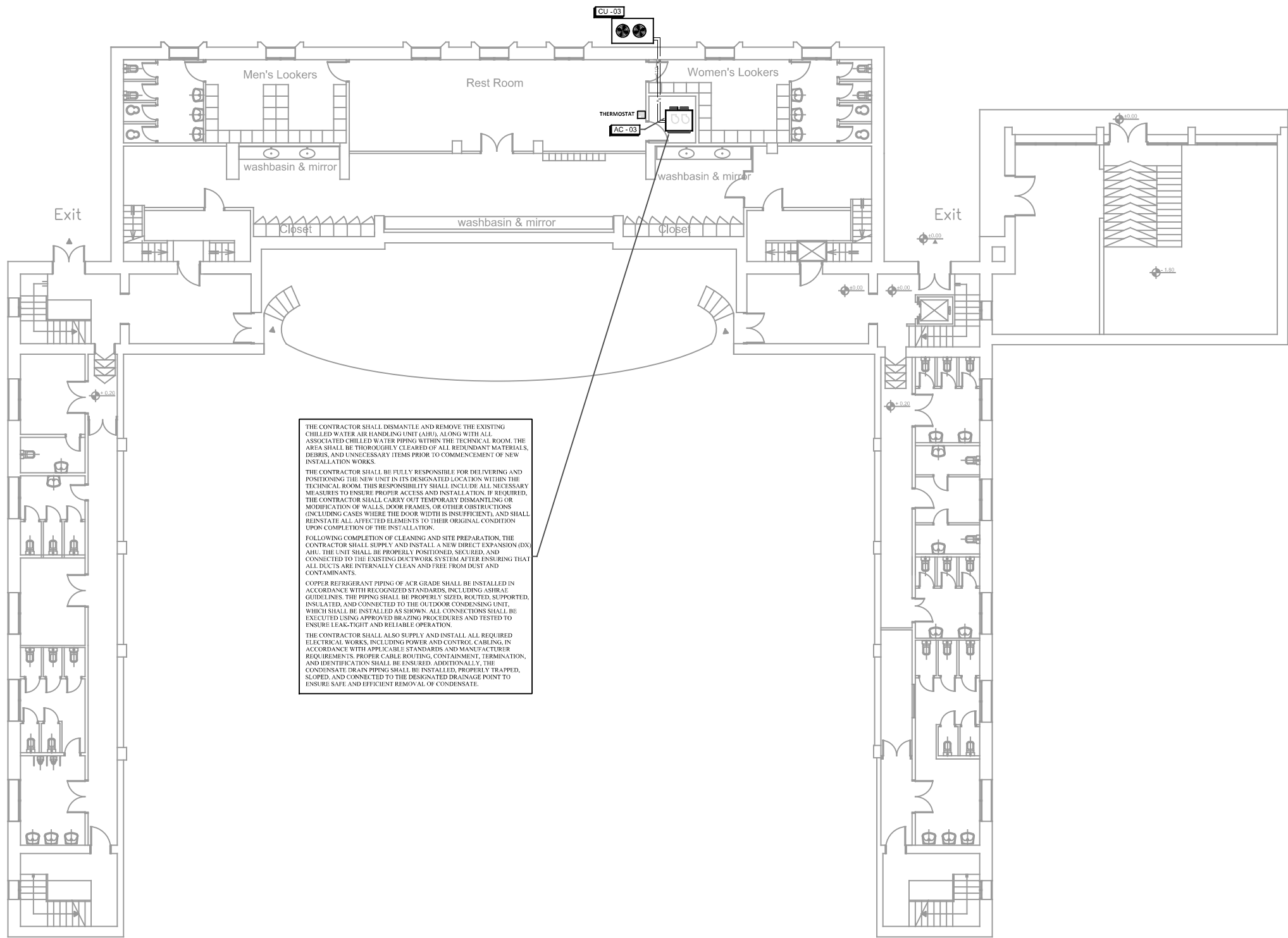
Job Number

MA2601

Scale

NTS





THE CONTRACTOR SHALL DISMANTLE AND REMOVE THE EXISTING CHILLED WATER AIR HANDLING UNIT (CAHU), ALONG WITH ALL ASSOCIATED CHILLED WATER PIPING WITHIN THE TECHNICAL ROOM. THE AREA SHALL BE THOROUGHLY CLEARED OF ALL RESIDUOUS MATERIALS, DEBRIS, AND UNNECESSARY ITEMS PRIOR TO COMMENCEMENT OF NEW INSTALLATION WORKS.

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR DELIVERING AND POSITIONING THE NEW UNIT PERSONALLY LOCATED WITHIN THE TECHNICAL ROOM. THIS RESPONSIBILITY SHALL INCLUDE ALL NECESSARY MEASURES TO INSURE PROPER ACCESS AND INSTALLATION. REQUIRED, THE CONTRACTOR SHALL CARRY OUT TEMPORARY DISMANTLING OR MODIFICATION OF WALLS, DOOR FRAMES, OR OTHER OBSTRUCTIONS, INCLUDING CASES WHERE THE DOOR WIDTH IS INSUFFICIENT, AND SHALL RESTORE ALL AFFECTED ELEMENTS TO THEIR ORIGINAL CONDITION UPON COMPLETION OF THE INSTALLATION.

FOLLOWING COMPLETION OF CLEANING AND SITE PREPARATION, THE CONTRACTOR SHALL SUPPLY AND INSTALL A NEW DIRECT EXPANSION (DX) AIR. THE UNIT SHALL BE PROPERLY POSITIONED, SECURED, AND CONNECTED TO THE EXISTING DUCTWORK SYSTEM AFTER INSURING THAT ALL DUCTS ARE INTERNALLY CLEAN AND FREE FROM DEBRIS AND CONTAMINANTS.

COOPER REFRIGERANT PIPING OF A/C GRADE SHALL BE INSTALLED IN ACCORDANCE WITH RECOMMENDED STANDARDS, INCLUDING ASHRAE GUIDELINES. THE PIPING SHALL BE PROPERLY SIZED, ROUTED, SUPPORTED, INSULATED, AND CONNECTED TO THE OUTDOOR CONDENSING UNIT. WORK SHALL BE INSTALLED AS SHOWN. ALL CONNECTIONS SHALL BE EXECUTED USING APPROVED BRAZING PROCEDURES AND TESTED TO ENSURE LEAK-TIGHT AND RELIABLE OPERATION.

THE CONTRACTOR SHALL ALSO SUPPLY AND INSTALL ALL REQUIRED ELECTRICAL WORKS, INCLUDING POWER AND CONTROL CABLEING, IN ACCORDANCE WITH APPLICABLE STANDARDS AND MANUFACTURER REQUIREMENTS. PROPER CABLE ROUTING, CONTAMINANT, TERMINATION, AND IDENTIFICATION SHALL BE ENSURED. ADDITIONALLY, THE CONDENSATE DRAIN PIPING SHALL BE INSTALLED, PROPERLY TRAPPED, SLOPED, AND CONNECTED TO THE DESIGNATED DRAINAGE POINT TO ENSURE SAFE AND EFFICIENT REMOVAL OF CONDENSATE.

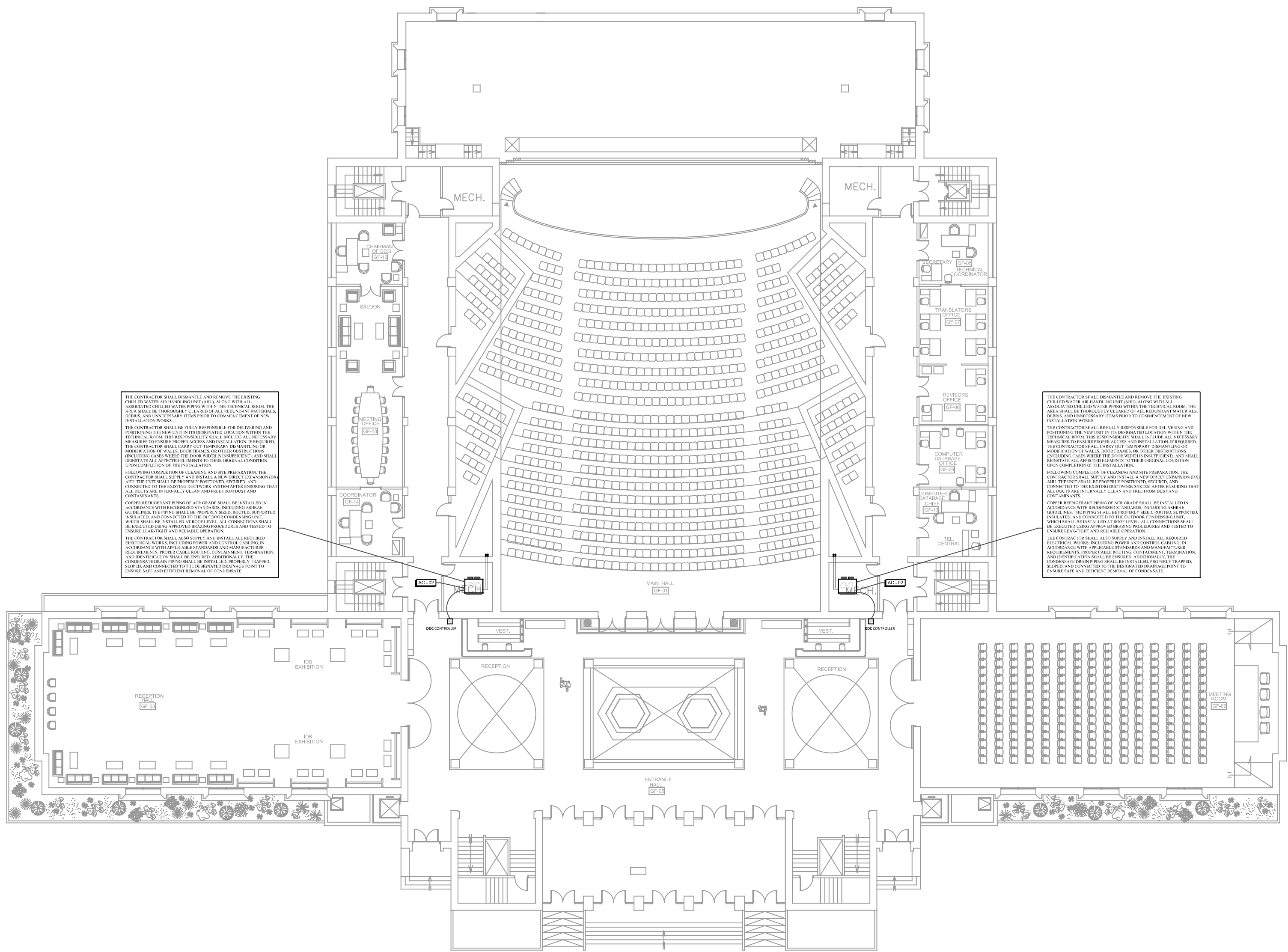
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|----------------------------------------------|--|-----------------------------------------------------|--|-----------------------------------------------|--|
| Project Name<br><b>UNESCO</b>                |  | <input type="checkbox"/> Architecture               |  | <input type="checkbox"/> Project Mgmt.        |  |
| Owner<br><b>Lebanese Ministry of Culture</b> |  | <input type="checkbox"/> Structural Eng.            |  | <input type="checkbox"/> Medical Planner      |  |
| Location<br><b>Beirut - Lebanon</b>          |  | <input checked="" type="checkbox"/> Mechanical Eng. |  | <input type="checkbox"/> Technical Controller |  |
|                                              |  | <input type="checkbox"/> Electrical Eng.            |  | <input type="checkbox"/> Security Eng.        |  |

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| Initial Issue: May 6, 2026 |  |
| Revision 1: _____          |  |
| Revision 2: _____          |  |
| Revision 3: _____          |  |
| Revision 4: _____          |  |
| Revision 5: _____          |  |

|                                                    |                    |                    |                                |                             |
|----------------------------------------------------|--------------------|--------------------|--------------------------------|-----------------------------|
| Drawing Title<br><b>FIRST BASEMENT HVAC LAYOUT</b> |                    |                    | Drawing Number<br><b>M-101</b> |                             |
| Project Phase<br><b>Tender</b>                     |                    |                    |                                |                             |
| Drawn By<br>---                                    | Verified By<br>--- | Approved By<br>--- |                                | Job Number<br><b>MA2601</b> |
|                                                    |                    |                    |                                | Scale<br><b>1:100</b>       |



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|                                              |  |                                                     |  |                                               |  |
|----------------------------------------------|--|-----------------------------------------------------|--|-----------------------------------------------|--|
| Project Name<br><b>UNESCO</b>                |  | <input type="checkbox"/> Architecture               |  | <input type="checkbox"/> Project Mgmt.        |  |
| Owner<br><b>Lebanese Ministry of Culture</b> |  | <input type="checkbox"/> Structural Eng.            |  | <input type="checkbox"/> Medical Planner      |  |
| Location<br><b>Beirut - Lebanon</b>          |  | <input checked="" type="checkbox"/> Mechanical Eng. |  | <input type="checkbox"/> Technical Controller |  |
|                                              |  | <input type="checkbox"/> Electrical Eng.            |  | <input type="checkbox"/> Security Eng.        |  |

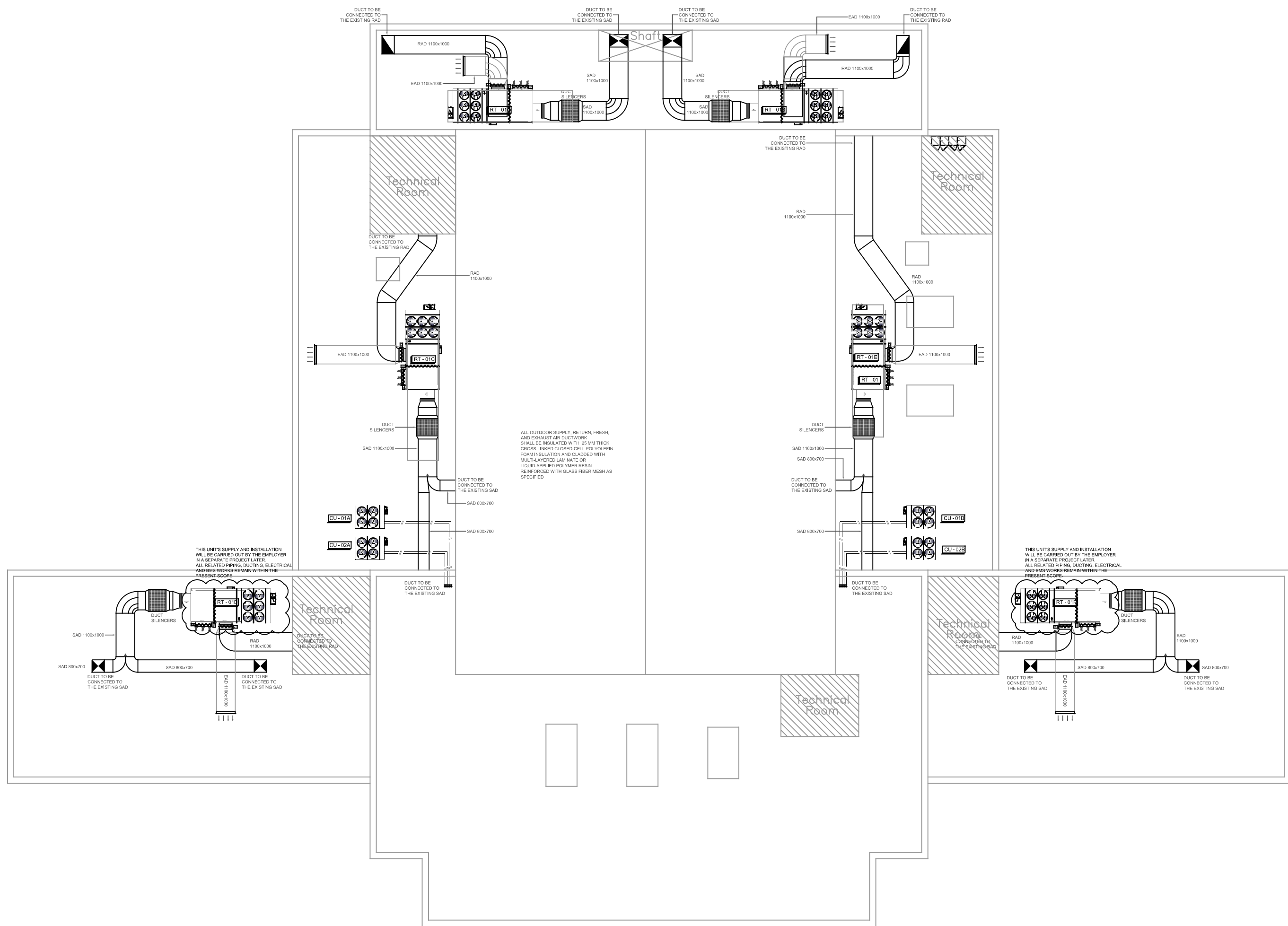
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| Revision 5:                |  |

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|--------------------------------------------------|--------------------|--------------------|--------------------------------|--|
| Drawing Title<br><b>GROUND FLOOR HVAC LAYOUT</b> |                    |                    | Drawing Number<br><b>M-102</b> |  |
| Project Phase<br><b>Tender</b>                   |                    |                    |                                |  |
| Drawn By<br>---                                  | Verified By<br>--- | Approved By<br>--- |                                |  |

|                             |                       |
|-----------------------------|-----------------------|
| Job Number<br><b>MA2601</b> | Scale<br><b>1:100</b> |
|-----------------------------|-----------------------|





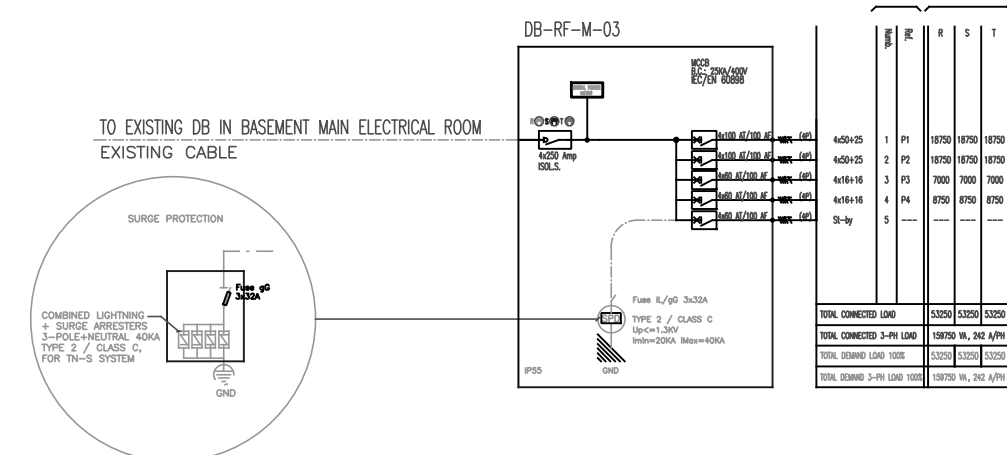
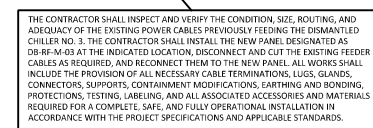
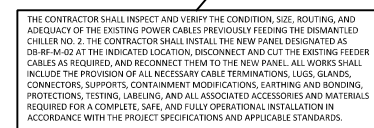
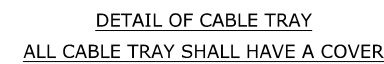
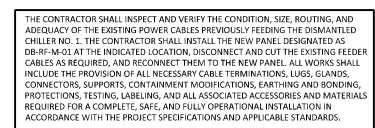
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|                                              |  |                                          |  |                                               |  |
|----------------------------------------------|--|------------------------------------------|--|-----------------------------------------------|--|
| Project Name<br><b>UNESCO</b>                |  | <input type="checkbox"/> Architecture    |  | <input type="checkbox"/> Project Mgmt.        |  |
| Owner<br><b>Lebanese Ministry of Culture</b> |  | <input type="checkbox"/> Structural Eng. |  | <input type="checkbox"/> Medical Planner      |  |
| Location<br><b>Beirut - Lebanon</b>          |  | <input type="checkbox"/> Mechanical Eng. |  | <input type="checkbox"/> Technical Controller |  |
|                                              |  | <input type="checkbox"/> Electrical Eng. |  | <input type="checkbox"/> Security Eng.        |  |

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|                                                |                    |                    |                                |                             |
|------------------------------------------------|--------------------|--------------------|--------------------------------|-----------------------------|
| Drawing Title<br><b>ROOF FLOOR HVAC LAYOUT</b> |                    |                    | Drawing Number<br><b>M-104</b> |                             |
| Project Phase<br><b>Tender</b>                 |                    |                    |                                |                             |
| Drawn By<br>---                                | Verified By<br>--- | Approved By<br>--- |                                | Job Number<br><b>MA2601</b> |
|                                                |                    |                    |                                | Scale<br><b>1:100</b>       |



|                              |                  |                                                     |  |                                               |  |
|------------------------------|------------------|-----------------------------------------------------|--|-----------------------------------------------|--|
| Project Name                 |                  | <input type="checkbox"/> Architecture               |  | <input type="checkbox"/> Project Mgmt.        |  |
| UNESCO                       |                  | <input type="checkbox"/> Structural Eng.            |  | <input type="checkbox"/> Medical Planner      |  |
| Owner                        | Location         | <input checked="" type="checkbox"/> Mechanical Eng. |  | <input type="checkbox"/> Technical Controller |  |
| Lebanese Ministry of Culture | Beirut - Lebanon | <input type="checkbox"/> Electrical Eng.            |  | <input type="checkbox"/> Security Eng.        |  |



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|                        |             |                |  |
|------------------------|-------------|----------------|--|
| Drawing Title          |             | Drawing Number |  |
| Roof Electrical Layout |             | E-101          |  |
| Project Phase          |             | Job Number     |  |
| Tender                 |             | MA2601         |  |
| Drawn By               | Verified By | Approved By    |  |
| ---                    | ---         | ---            |  |