

# PAKISTAN AIRPORTS AUTHORITY

## **Construction of New Air Traffic Control Tower (ATCT), Fire Station and Allied Facilities at Skardu International Airport, Skardu**

### ***Consolidated Responses to Prospective Bidders' Pre-Bid Queries***

*(Pre-Bid Meeting held on 13 August 2026 — Bidding Document published on EPADS on 27 July 2026)*

With reference to the Bidding Document for the Procurement of Works for Construction of New Air Traffic Control Tower (ATCT), Fire Station and Allied Facilities at Skardu International Airport, published on EPADS on 27th July 2026, all concerned are requested to find below, in a single consolidated and continuously numbered list, the queries raised by prospective bidders at, and in written submissions associated with, the pre-bid meeting held on 13 August 2026, together with PAA's responses thereto. Consistent with the requirement of non-disclosure of the identity of the bidder raising each query, the queries are reproduced without attribution to any particular bidder and are grouped below into three parts — General Queries, Contractual Queries and Technical Queries. The same shall form an integral part of the Bidding Document and shall be read and construed accordingly. Responses that commit to the issuance of a drawing, report or corrective addendum are to be treated as an undertaking to issue the same prior to the bid submission deadline, which shall be extended commensurately as noted at Sr. No. 13 below.

## A. General Queries

| S. No. | Query                                                                                                                                                                                                                                                                                                           | Reply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| 1      | In the qualification criteria, experience of existing (ongoing) projects is not considered, whereas general practice counts works-in-hand. It is requested that the qualification criteria be amended to consider works in hand.                                                                                | The Experience Capability criterion under Section V is, and shall remain, referable to Substantially Completed contracts for which a certified completion value and satisfactory-performance certificate from the employer of the cited project can be furnished, so that the Employer is able to verify, on an equal and objective basis, the value and quality of the experience claimed by every bidder at the time of bid evaluation. Works-in-hand cannot, by definition, be verified to the same standard at the bid-evaluation stage. No amendment is proposed. |
| 2      | The severe winter/sub-zero temperature conditions at Skardu may be mentioned in the bidding documents so that they are reflected in the Construction schedule.                                                                                                                                                  | Bidders' attention is drawn to Volume II, Section 0010 (General Requirements) and to the Consolidated Design Parameters at Annex 1, which record the site's climatic design basis, including the winter design dry-bulb temperature. Bidders are required to account for seasonal climatic constraints in their own construction programme and method of working; this is a matter for each bidder's programming and pricing judgement and does not, of itself, warrant an amendment of the Bidding Documents.                                                         |
| 3      | The bid submission date may be extended by 15 days, as several systems require rates from foreign principals which require adequate response time.                                                                                                                                                              | Bid Submission deadline has been extended by 17 <sup>th</sup> September 2026.<br>Please refer Corrigendum/Addendum No. 1                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4      | Section V, Experience Capability requires "Construction of Similar Nature Projects including Piling Works for High-Rise Buildings", minimum PKR 1,000 million. Request to amend to "Construction of Piling Works as part of major Infrastructure/Building Projects", retaining the PKR 1,000 million threshold. | The criterion is intended to establish that the bidder has executed works of a technical complexity comparable to the foundation system of this Project, which comprises approximately 1 m diameter piles of 15–20 m depth (Volume IV, Sheets S-02 to S-04). The ATC tower is approximately 80 meter high and can be categorized as                                                                                                                                                                                                                                    |

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|   |                                                                                                                                                                                                                                                           | high-rise building. The evaluation criteria shall therefore remain unchanged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5 | Volume II, Employer's Requirements – Construction Camp and Housing Facilities: clarify whether the Contractor will be permitted to establish and operate a batching plant within the airport premises.                                                    | Skardu International Airport is a joint-user airfield and PAF base; security considerations preclude residential accommodation for Contractor's personnel within the airport premises. Subject to availability of space and Employer/security-authority approval, temporary site offices and ancillary facilities may be permitted in the vicinity of the Project Site; accommodation shall be arranged by the Contractor outside the airport premises. A designated construction access route, separate from passenger circulation, will be provided.                                                                                                                                                                                                                                                                                                                   |
| 6 | Section V, Evaluation and Qualification Criteria: bidders holding parent PEC Codes CE-02 and BC-01 should, per PEC guidelines, be considered compliant with the specialised sub-codes CE-02(ii) and BC-01(ii), without separate specialised registration. | The possession of the parent Code (CE-02, BC-01) is sufficient, without separate specialised-code registration, to undertake the piling (CE-02(ii)) and steel-framed building (BC-01(ii)) components of the Works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 7 | BOQ Items G-4, G-6, G-8 and G-9 (Site Office Complex; Staff Accommodation & Mess; Temporary Access Roads; Temporary Fencing): request detailed drawings, dimensions, areas and quantities.                                                                | As to Item G-4 (Combined Employer's/Engineer's Site Office Complex), bidders are directed to the drawing titled "Proposed Site Office for ATC Tower Project Staff at Skardu Airport", which sets out the layout and area requirements; the Technical Specifications and that Drawing are to be read conjointly. As to Item G-6 (Staff Accommodation & Mess), accommodation is to be arranged by the Contractor outside the airport compound on a rental/hiring basis in accordance with the personnel numbers and standards specified at Volume II, Section 0010, Clauses 4.04 and 4.08; a drawing is accordingly not deemed appropriate for this item. As to Item G-8 (Temporary Access Road) and Item G-9 (Temporary Fencing), the extent and alignment shall be as reasonably required to serve the Site Office Complex and to secure the working areas respectively. |
| 8 | BOQ Item G-5: clarify whether the Site Office Complex, furniture, equipment and other facilities provided under Items G-4/G-5 are to be handed over to the Employer upon completion/DLC, or remain the Contractor's property and be removed.              | The Combined Employer's/Engineer's Site Office Complex, together with the furniture, fixtures, equipment and other facilities provided under Item G-4 and maintained under Item G-5, shall remain the property of the Contractor throughout the Contract and shall become property of the Employer, following issuance of the Defects Liability Certificate (DLC).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9 | Request for a site visit, and clarification during the visit of site boundaries, Engineer's/Client's office distances, Contractor's camp/storage-yard location, batch-plant location, electricity/water source arrangements.                              | All prospective bidders are encouraged to undertake a site visit prior to bid submission. The pre-bid meeting held at Skardu International Airport on 13 August 2026 afforded this opportunity; bidders are requested to coordinate with the Office of the Project Director, Skardu International Airport, for Airport Entry Pass security clearance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| 10 | Request to establish the Contractor's camp (site offices, staff/labour accommodation) within the airport compound.                                  | <p>The Project Site is located within the access-controlled premises of Skardu International Airport, and access thereto is strictly subject to the issuance of valid Airport Entry Passes and compliance with all applicable airport security procedures.</p> <p>It is further clarified that Skardu International Airport is a joint-user airfield and also serves as a Pakistan Air Force (PAF) base. Consequently, security considerations preclude the establishment of residential accommodation for the Contractor's personnel within the airport premises.</p> <p>Subject to the availability of suitable space and the prior approval of the Employer and the relevant airport and security authorities, the Contractor may be permitted to establish temporary site offices and ancillary facilities in the vicinity of the Project Site. However, the Contractor shall be responsible for arranging accommodation for its personnel outside the airport premises.</p> <p>To facilitate the execution of the Works, access to the Project Site shall be provided through a designated construction access route, separate from passenger circulation areas, to the extent practicable. This arrangement is intended to facilitate the efficient movement of the Contractor's personnel, materials, and construction equipment while maintaining airport operational efficiency and security.</p> |
| 11 | The Contractor shall be allowed to establish the batching plant inside the airport compound.                                                        | Please refer to Sr. No. 10 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 12 | Qualification criteria are more stringent than those previously applied by PAA in certain other tenders; request rationalisation of the thresholds. | <p>The qualification thresholds prescribed in Section V have been calibrated to the scale (Engineer's Estimate approximately PKR 5.02 billion), technical complexity and safety-critical, aviation-specific nature of this particular Project, which is not directly comparable to PAA works of a more conventional building or civil-works character.</p> <p>Please refer to Corrigendum / Addendum-I</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 13 | Request to extend the bid submission date to 20 September 2026.                                                                                     | Please refer to response at S.N. 3 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 14 | Two versions of the BOQ have been received (landscape and portrait format); clarify which is to be followed, and request issuance in Excel format.  | <p>The presence of two versions of the BOQ is necessitated by a technical limitation inherent to the EPADS 2.0 software application, which automatically generates the primary BOQ. To resolve any system-generated anomalies and to ensure a clear understanding of the scope of work, an additional BOQ has been appended as an "Annexure" to the tender documents. For the avoidance of doubt and to maintain uniform interpretation, the BOQ provided in the Annexure shall</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|  |  | <p>govern and supersede the system-generated BOQ in the event of any conflict, discrepancy, or ambiguity.</p> <p>Excel file of BOQ will be shared separately on request basis through email. However, it shall only be treated for the ease of the Bidder's calculation and shall have no liability what so ever it is in any form on the Employer.</p> |
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## B. Contractual Queries

| S. No. | Query                                                                                                                                                                                                                            | Reply                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 15     | Performance Security in bidding documents is 10% of the contract value. We request that performance security may be 5% of the contract value, in line with PAA's general practice, to ease the initial burden on the Contractor. | The Performance Security for this Contract is fixed at 10% of the Accepted Contract Amount, consistent with the value, criticality and risk profile of an essential aviation facility, and measured against the Engineer's Estimate and is in compliance with PP rules 2004. No amendment is proposed. Bidders' attention is drawn to the clarification issued at Sr. No. 27 below regarding the permissible form of the Performance Security. |
| 16     | Bidding Data, ITB 1.1, Time for Completion: request to extend from 24 to not less than 36 months on account of severe winter conditions restricting effective working to approximately eight months per year.                    | The time for completion for works shall remain unchanged. The contractor is requested to prepare the programme of works accordingly for compliance with the requirement.                                                                                                                                                                                                                                                                       |
| 17     | Clause 4.01 – Engineer's Site Office: clarify whether the tea bar is within the Contractor's scope.                                                                                                                              | The provision, operation and maintenance of the tea bar for both the Employer's Office and the Engineer's Site Office are included in the Contractor's scope, each equipped with a microwave, coffee machine, electric kettle, hot plate, crockery, cutlery and ancillary items for the Contract period.                                                                                                                                       |
| 18     | Clause 4.03 – Engineer's Transport: monthly fuel allowance/limit not defined.                                                                                                                                                    | Please refer to Clause 4.03(B) of Section 0010 – General Requirements, Volume II – Technical Specifications, which specifies the fuel provision for the Engineer's transport.                                                                                                                                                                                                                                                                  |
| 19     | Clause – Engineer's Accommodation: request personnel numbers and meal allowance; request a prefabricated accommodation site within the airport compound.                                                                         | Please refer to Clause 4.04 of Section 0010, Volume II – Technical Specifications. Kitchen facilities for the Engineer's Accommodation are within the Contractor's scope; provision of meals/meal allowance is not included in the scope. The request for a prefabricated accommodation/mess facility within the airport premises cannot be accommodated owing to land availability constraints.                                               |
| 20     | Clause 4.05 – Employer's Site Office: request covered area and accommodation requirements.                                                                                                                                       | Please refer to Clause 4.05 of Section 0010, Volume II – Technical Specifications, and the drawing titled                                                                                                                                                                                                                                                                                                                                      |

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|    |                                                                                                                                                                                                              | “Proposed Site Office for ATC Tower Project Staff at Skardu Airport,” to be read conjointly with the Technical Specifications.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 21 | Clause 4.07 – Employer's Transport: monthly fuel allowance/limit not defined.                                                                                                                                | Please refer to Clause 4.07 of Section 0010, Volume II – Technical Specifications, which specifies the fuel provision for the Employer's transport.                                                                                                                                                                                                                                                                                                                                                                                                  |
| 22 | Clause 4.08 – Employer's Accommodation: request area, occupancy, room requirements and messing details; request a prefabricated accommodation site within the airport compound.                              | Please refer to Clause 4.08 of Section 0010, Volume II – Technical Specifications. As to kitchen provision, exclusion of meals, and the prefabricated-accommodation request, the response at Sr. No. 5 above applies mutatis mutandis.                                                                                                                                                                                                                                                                                                               |
| 23 | Bidding Data, ITB 1.1: request extension of the 24-month Time for Completion to not less than 36 months.                                                                                                     | Please refer to Sr. No. 16 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 24 | Request to extend the Time for Completion from 24 to not less than 36 months, given approximately four months' loss of effective working time each winter at Skardu.                                         | Please refer to Sr. No. 16 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 25 | SCC, Part A, Contract Data, Sub-Clause 14.2.3 (Mobilization Advance Deduction): 17.5% is stated at Page 430 of 1708, while 20% is stated at Page 678 of 1708. Which is correct?                              | This is a technical limitation of the current version of EPADS 2.0. The disclaimers provided at pages 462 to 471 under the heading “Annexures” have been incorporated to address and overcome the technical limitations and system-related constraints of EPADS 2.0. In the event of any inconsistency or discrepancy between the information generated by the EPADS 2.0 system and the information contained in the said “Annexures”, the information provided in the “Annexures” shall prevail to the extent of such inconsistency or discrepancy. |
| 26 | SCC/PCC, Sub-Clause 14.3(iii) (Retention Money): Page 430 states 7% (limit 5%), while Page 679 states 10% (limit 5%). Which is correct?                                                                      | Please refer to Sr. No. 25 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 27 | PCC, Part B, Special Provision, Sub-Clause 4.2 (Performance Security): Page 435 permits an insurance guarantee, while SCC Part B, Sub-Clause 4.2, Page 689, permits a bank guarantee only. Which is correct? | Please refer to Sr. No. 25 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 28 | SCC/PCC, Sub-Clause 12.3: Page 429 states 10%, while Page 677 states 15%. Which is correct?                                                                                                                  | Please refer to Sr. No. 25 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 29 | SCC/PCC, Sub-Clause 13.4(b)(ii) (percentage applied to Provisional Sums for overhead charges and profit): Page 430 states 25%, while Page 677 states 15%. Which is correct?                                  | Please refer to Sr. No. 25 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| 30 | SCC/PCC, Sub-Clause 14.8 (Financial Charges for delayed payment): Page 431 states 3%, while Page 684 states 5%. Which is correct? | Please refer to Sr. No. 25 above. |
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## C. Technical Queries

| S. No. | Query                                                                                                                                                                                                                                                                                        | Reply                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| 31     | BOQ Item CP-1 (Reinforced Concrete Piles): the reference to “SR and OP Cement” is ambiguous; clarify whether Sulphate Resistant or Ordinary Portland cement is required, and specify the required concrete grade. Request a separate BOQ item for the Test Pile with the required test load. | <p>The BOQ item description for CP-1 already specifies a nominal cylindrical strength of 3,000 psi (dia. as mentioned on drawing); no further clarification of grade is required. As to cement type, for all the RCC Piles, Sulphate Resistant (SR) Cement is to be used.</p> <p>A separate BOQ item for the Test Pile (Preliminary/Working Pile, load-tested to the working/proof load required by Section 0190) has been introduced vide addendum/corrigendum No.1.</p>                                                                                                                                                                                                                                                                          |
| 32     | BOQ Item CB-23 (Reinforced Concrete), measured in “Job”: the location and extent of the work are not defined. Request the structural members, grade and reinforcement details, and revision of the unit of measurement to a measurable quantity.                                             | BOQ Item CB-23 is a single, defined-scope composite item for <b>vehicle service pit</b> (raft, walls and stair, together with associated waterproofing, water-stops, plaster and floor/wall finishes) relating to a specific below-grade structure shown on the Architectural drawings (Drawings No. AW-29a ) & Structural Drawing (S-40) are attached herewith.                                                                                                                                                                                                                                                                                                                                                                                   |
| 33     | BOQ Item AF-3 (3/4-inch thick Granite Flooring): type, grade, colour, finish and quality not specified. Request specification or a base rate.                                                                                                                                                | <p>The following granite types have been considered as the basis of the BOQ:</p> <p><b>Emerald Pearl Granite, Blue Pearl, Black Granite, Skardu White, Ziarat White, Jabrana, Coffee Brown, tan Brown, Blatic Brown, Galaxy Black</b></p> <p>Either of the above granite types may be used in the designated areas of the building like Entrance Lobby floor, staircases, bathroom vanities, Window sills etc, as appropriate, in accordance with the directions of the <b>Employer or Consultant</b>.</p> <p>The final selection of granite type, colour, finish, and location of application shall be subject to approval by the Employer/Consultant and shall be made in accordance with the BOQ rates and the requirements of the project.</p> |
| 34     | BOQ Item CU-6 (Reinforced Cement Concrete): cement type (OP/SR) not clearly indicated.                                                                                                                                                                                                       | The BOQ item header for CU-6 (and its sub-items CU-6-1 to CU-6-3) specifies a concrete cylinder strength of 3,000 psi at 28 days and as regards to cement type, Sulphate Resistant (SR) Cement is required to be used.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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| 35 | BOQ Item AF-7 (Raised Panels): request the list of approved manufacturers/vendors.                                                                                                                                                    | Please refer to List of approved manufacturer and Supplier placed at Volume-II (Technical Specification), S.N. 13 & 14 (Copy attached again herewith)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 36 | BOQ Item AF-11 (Facade System): detailed drawings (elevations, sections, fixing details) have not been provided.                                                                                                                      | Relevant Drawing (AW-20) are issued under Addendum/Corrigendum No. 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 37 | BOQ Item AF-12 (Gypsum Board False Ceiling): the 3D drawings show a more complex arrangement with suspended hanging fins not reflected in the BOQ nomenclature. Clarify whether the hanging fins are included or separately measured. | Please follow the drawings for pricing (with inclusion of everything mentioned in drawings) and execution will be done with approval of Employer/Engineer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 38 | BOQ Item AF-39 (ACP Cladding): request detailed working drawings (panel sizes, layout, joint details) and details of the supporting back-frame/substructure.                                                                          | The ACP cladding is intended to be used to cover the space frame structure between standing seam lock roofing and wall to seal the building and provide architectural aesthetic treatment.<br><br>Please refer the response at S.No.36 above as well.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 39 | Request for the Soil Investigation/Geotechnical Investigation Report for the project site, including soil strata, groundwater level, bearing capacity and geotechnical parameters.                                                    | <p>The Geotechnical Investigation Report has been provided and incorporated as an integral part of the Bidding Documents.</p> <p>The structural design of the building has been prepared based on the findings of the <b>Geotechnical Investigation Survey (GIS)</b> conducted for the project site.</p> <p>However, prior to commencement of construction works, the Contractor shall carry out a <b>re-confirmatory soil investigation</b> at the site to verify the existing geotechnical conditions and confirm the parameters used for the structural and foundation design.</p> <p>The Contractor shall submit the findings and recommendations of the re-confirmatory soil investigation to the Consultant for review and approval. Any discrepancy between the re-confirmatory investigation results and the previously established soil parameters shall be brought to the immediate attention of the Consultant for necessary review and, where required, modification of the design.</p> <p><b>This requirement shall form an integral and mandatory part of the Contract and Bidding Documents</b>, and the Contractor shall make adequate provisions for the associated costs, resources, testing, and investigations in its bid.</p> |
| 40 | HVAC Heating & Cooling Systems: request the list of approved manufacturers/vendors.                                                                                                                                                   | Please refer to Volume II – Technical Specifications, Section 0710/0720 and the associated Annex (HVAC Equipment Schedules), which identify the approved manufacturers for the principal HVAC plant items. Where a specific piece of equipment is                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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|    |                                                                                                                                                                       | <p>not named in that Annex, the material-submittal and Engineer-approval procedure described at Sr. No. 35 above shall apply.</p> <p>Already Given.</p> <p>Please refer to List of approved manufacturers and Suppliers.</p>                                                                                                                                                                                           |
| 41 | BOQ Item CP-1: ambiguity as to SR/OP cement and pile concrete grade; request a separate BOQ item for the Test Pile and the required test load.                        | See the response at Sr. No. 31 above, which applies equally to this query.                                                                                                                                                                                                                                                                                                                                             |
| 42 | BOQ Items CB-01/CU-1 (Excavation): request the Soil Investigation/Geotechnical Investigation Report, and the location and haul distance of the dumping/disposal area. | <p>As to the Geotechnical Investigation Report, see the response at Sr. No. 39 above.</p> <p>As to the disposal-area location and haul distance, see the response at Sr. No. 64 below (BOQ Item R-18).</p>                                                                                                                                                                                                             |
| 43 | BOQ Item CB-11 (Torch-Applied Membrane): required membrane thickness not specified.                                                                                   | The torch-applied bituminous waterproofing membrane specified at Volume II – Technical Specifications, Section 0150 shall be of 3 mm minimum thickness (elastomeric bitumen, glass-fibre or polyester reinforced, as detailed in Section 0150), which is confirmed to bidders by this response and shall be treated as forming part of BOQ Item CB-11.                                                                 |
| 44 | BOQ Item CB-14/CU-11 (1/2" thick 1:4 Cement Sand Plaster): required gauge and mesh size of the galvanized wire mesh not specified.                                    | Volume II – Technical Specifications, Section 0260 specifies galvanized expanded metal lath/corner-reinforcement mesh conforming to ASTM C847, fabricated from 1.2 mm diameter galvanized wire (minimum weight 1.85 kg/m <sup>2</sup> ), to be provided at abutments of concrete and brick faces and at corners as called for in BOQ Items CB-14/CB-15 and CU-11. This is confirmed to bidders by this response.       |
| 45 | BOQ Item CB-23 (Reinforced Concrete, "Job" unit): structural member and extent not defined.                                                                           | See the response at Sr. No. 32 above.                                                                                                                                                                                                                                                                                                                                                                                  |
| 46 | BOQ Item CB-25 (Diesel Fuel Storage Tank): drawings and detailed specifications not available.                                                                        | <p>The technical requirements for the underground diesel fuel storage and supply system (tank design per DIN 6608/6616, corrosion allowance, coating, dyking/bunding, instrumentation, piping and controls) are set out in full at Volume II – Technical Specifications, Section 0680, to which bidders are directed.</p> <p>A dedicated layout/capacity drawing for the underground storage is attached herewith.</p> |
| 47 | BOQ Item AF-1 (24"x24" Terrazzo Tiles): clarify grey or white cement, and whether the subfloor is included.                                                           | BOQ Item AF-1 specifies bedding in 1-inch (25 mm) thick cement mortar (1:2) with the tiles set in grey cement slurry; the bedding/setting course is                                                                                                                                                                                                                                                                    |

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|    |                                                                                                                                                                    | <p>accordingly included within this item, and grey cement is the specified cement for the setting slurry. Tile type/finish shall be as approved under Volume II – Technical Specifications, Section 0300.</p> <p>The Consultant has specified terrazzo finish tiles of size <b>24” × 24”</b> for the designated areas of the building.</p> <p>The Contractor shall procure the terrazzo tiles exclusively from the supplier/manufacturer included in the <b>List of Approved Manufacturers and Suppliers</b>. The Contractor shall not manufacture, fabricate, or produce the terrazzo tiles on site under any circumstances.</p> <p>Prior to procurement and installation, the Contractor shall submit samples of terrazzo tiles in different aggregate-to-cement/resin ratios and colour combinations, as applicable, for review and approval by the Consultant. The Contractor shall proceed with procurement and installation only after obtaining the Consultant’s approval of the submitted samples.</p> <p>The approved tile shall conform to the specified size, finish, colour, pattern, quality, and performance requirements of the project specifications.</p> |
| 48 | BOQ Item AF-2 (Epoxy Resin Flooring): required thickness (microns), number of coats and system (self-levelling/coating) not specified; subfloor inclusion unclear. | <p>BOQ Item AF-2 comprises a primer coat plus a two-component protective epoxy topcoat over the prepared concrete substrate; the item does not include a separately measured subfloor/screed, the flooring being applied directly to the structural concrete surface. The specific dry-film thickness, number of coats and system type (self-levelling or coating) shall be as set out in the manufacturer's data sheet approved by the Engineer under Volume II – Technical Specifications, Section 0330.</p> <p>The thickness of the Epoxy Resin Flooring is minimum 3mm.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 49 | BOQ Item AF-3 (3/4” Granite Flooring): type, grade, colour, finish not specified.                                                                                  | See the response at Sr. No. 33 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 50 | BOQ Item CS-3 (Standing Seam Lock Roofing System): clarify whether FM-Approved or non-FM-Approved hardware/accessories are required.                               | <p>Volume II – Technical Specifications, Section 0160 and BOQ Item CS-3 specify the roofing system by material and performance criteria (0.70 mm PPGL Aluzinc, AZ150 coating, seam-lock clips with thermal-movement provision, and a water test) without a fixed FM-Approval requirement. FM Approval is accordingly not mandated for the roofing attachment hardware; the Contractor's proposed system shall nonetheless demonstrate equivalent wind-uplift and water-tightness performance to the Engineer's satisfaction, supported by manufacturer's test data, as a condition of material approval.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|    |                                                                                                                       | Please refer to drawings # S-24                                                                                                                                                                                                                                                                                                                                                                     |
| 51 | BOQ Item AF-4 (Porcelain Tiles – Rooms/Offices): make, grade, size, finish not specified; subfloor inclusion unclear. | The porcelain tile size is 3'x6' in offices and rooms. Please refer to the List of Approved manufactures and Suppliers.                                                                                                                                                                                                                                                                             |
| 52 | BOQ Item AF-5 (Porcelain Tiles – Toilets): as above.                                                                  | The porcelain tile size is 2'x4' in Toilets. Please refer to the List of Approved manufactures and Suppliers. The tiles color and finish will be provided at the time of approval of the tile in consultation with the Employer.                                                                                                                                                                    |
| 53 | BOQ Item CU-6 (Reinforced Cement Concrete): OP/SR cement not specified.                                               | See the response at Sr. No. 34 above.                                                                                                                                                                                                                                                                                                                                                               |
| 54 | BOQ Item AF-7 (Raised Panels): request list of approved manufacturers/vendors.                                        | See the response at Sr. No. 35 above.                                                                                                                                                                                                                                                                                                                                                               |
| 55 | BOQ Items AF-15, AF-16, AF-17 and AF-18 (Expansion Joints): request list of approved manufacturers/vendors.           | Please refer to List of approved manufacturers and Suppliers.                                                                                                                                                                                                                                                                                                                                       |
| 56 | BOQ Item AF-11 (Facade System): detailed drawings not included.                                                       | See the response at Sr. No. 36 above.                                                                                                                                                                                                                                                                                                                                                               |
| 57 | Aluminium windows are shown on the drawings but not included in the BOQ; request review and inclusion if required.    | Please refer to BOQ item AF-27 & AF-28                                                                                                                                                                                                                                                                                                                                                              |
| 58 | BOQ Item AF-19 (PIR Panels): required thickness, density, fire rating not specified.                                  | Volume II – Technical Specifications, Section 0335 specifies PIR insulated panels of 100 mm minimum thickness, nominal core density 38–40 kg/m <sup>3</sup> , with a Class O / Class 1 (BS 476 Parts 6 and 7) fire-performance rating for the coated steel-faced panel system; bidders shall price BOQ Item AF-19 on this basis, subject to the manufacturer's data sheet approved by the Engineer. |
| 59 | BOQ Item AF-12 (Gypsum Board False Ceiling): 3D drawings show hanging fins not reflected in BOQ nomenclature.         | See the response at Sr. No. 37 above.                                                                                                                                                                                                                                                                                                                                                               |
| 60 | BOQ Item AF-39 (ACP Cladding): detailed working drawings and substructure/back-frame details not provided.            | See the response at Sr. No. 38 above.                                                                                                                                                                                                                                                                                                                                                               |
| 61 | BOQ Item AF-40 (Roller Blinds): request a base rate given the wide cost variation by fabric/mechanism/manufacture.    | <p>Following manufacturer are mentioned for purpose of costing. The Operating mechanism shall be manual.</p> <ul style="list-style-type: none"> <li>• XIOMOO (China)</li> </ul>                                                                                                                                                                                                                     |

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|    |                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• Bandalux (Spain)</li> <li>• Coulissee (Netherlands)</li> <li>• Markisol Group (Global/Europe)</li> <li>• Unitec Textile Decoration (China)</li> <li>• Forbo (Europe)</li> <li>• or any other equivalent</li> </ul>                                                                                                                                                                                                                                                                                                              |
| 62 | BOQ Item R-2 (Subgrade in Earth Cut, m <sup>2</sup> ): required thickness not specified.                                                                                                                                                                       | BOQ Item R-2 is a subgrade-preparation item (scarifying, moisture conditioning, re-compaction of the existing in-situ material to the specified degree of compaction) rather than a placed granular layer of defined thickness; the treatment depth is governed by Volume II – Technical Specifications, Section 0340, which specifies a minimum scarification/re-compaction depth of 150 mm (6 inches) for subgrade preparation in cut sections, to which bidders are directed.                                                                                         |
| 63 | BOQ Item R-15 (Reinforced Cement Concrete): structural member/location not specified; clarify whether building paper is placed beneath the concrete.                                                                                                           | <p>BOQ Item R-15 is the specific road-related concrete structure (e.g catch-pit or road side drain) shown on the relevant Road drawings (Volume IV); bidders are directed to those drawings for the applicable structural member, dimensions and grade.</p> <p>As to “building paper”, this is a formwork-lining material (as also referenced in the parallel item CU-6, Bill 2D) used to achieve a smooth, dent-free concrete finish where laminated wooden-ply formwork is used, and is not a sub-slab waterproofing layer; it is not placed beneath the concrete.</p> |
| 64 | BOQ Item R-18 (Removal of Sand Dunes): clarify whether excavation, transportation, disposal and spreading are included, and request the disposal location and maximum lead/haul distance.                                                                      | <p>BOQ item R-18 is spreading of the Sand dunes within the vicinity as per required grade/levels.</p> <p>Disposal is covered under BOQ Item No. R-19 separately.</p>                                                                                                                                                                                                                                                                                                                                                                                                     |
| 65 | BOQ Item R-23 (Sign Boards): request detailed drawings, quantities and material specifications for all sign-board types.                                                                                                                                       | Please refer to Drawing No. R-36 & R-37 in attached herewith for ready reference.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 66 | Concrete Production: total concrete quantity is approximately 8,000 m <sup>3</sup> over a 40-day batching period, for which a fixed batching plant is not technically or economically justified; request permission to use a gear-type concrete mixer instead. | The requirement for a batching plant is not mandatory. If the selected bidder satisfied the Engineer for production of the required quantity of concrete as per specification and work requirement at time of the execution, the requirement can be curtailed, based on the level of satisfaction of the engineer supported by the Contractor’s justification and arrangements.                                                                                                                                                                                          |
| 67 | Section 0490, Cl. 1.3 (Ambient Conditions): maximum indoor ambient temperature specified as                                                                                                                                                                    | Please refer to Addendum / Corrigendum No. 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|    | 50°C; request revision to 40°C as more realistic; also review the maximum relative humidity.                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                           |
| 68 | Confirm whether Factory Acceptance Testing (FAT) is required for imported equipment/items; if so, provide the list of items requiring international FAT and the number of officials who will attend.                                 | The requirement for Factory Acceptance Testing (FAT) has been specified in the relevant sections of Volume-II – Technical Specifications. The said requirement shall be read and construed in conjunction with Clause 3.12 of Section 0010 of Volume-II – Technical Specifications.                                                                                                                       |
| 69 | Provide the Class of UPVC Conduits.                                                                                                                                                                                                  | UPVC conduits shall be Class ‘B’ (medium duty, per BS 3506/BS EN 61386 or equivalent) for general concealed/embedded electrical wiring, and Class ‘C’ (heavy duty) where installed below ground, under roadways/pavement, or otherwise subject to vehicular or mechanical loading, consistent with Section 0490/Section 0610 of Volume-II – Technical Specifications.                                     |
| 70 | Drawings E-10 to E-28: circuit numbering/identification is not shown; request updated drawings with circuit numbering.                                                                                                               | Circuit numbering already provided on the relevant drawings. Please refer drawings No. (E-10 to E-30)                                                                                                                                                                                                                                                                                                     |
| 71 | Transformer (E-0.1): the List of Approved Manufacturers names PEL (local) and Siemens (imported); request that another local manufacturer (e.g., Transpower) be added; note that Siemens does not deal in oil-immersed transformers. | Please refer to Addendum / Corrigendum No. 1                                                                                                                                                                                                                                                                                                                                                              |
| 72 | Confirm whether the derating factor has already been considered in the specified transformer capacity.                                                                                                                               | Yes. The transformer capacity specified (630 kVA, per Drawing E-65) has been derated for the Project's site altitude (approximately 2,230 m AMSL) and the +40°C ambient-qualification basis referred to at Sr. No. 67 above, in accordance with the manufacturer's standard altitude/temperature de-rating curves. Bidders are not required to apply a further derating allowance to the stated capacity. |
| 73 | Section 0490, Cl. 3.2.3/3.3.2: generator manufacturers do not permit operation below 40% or above 100% of rated capacity; request the testing/commissioning load and duration be revised accordingly.                                | Please refer to Specification no. 0500 1.2. Standard is already given.                                                                                                                                                                                                                                                                                                                                    |
| 74 | Confirm whether the genset FAT will be conducted abroad or at the local factory.                                                                                                                                                     | See the response at Sr. No. 68 above.                                                                                                                                                                                                                                                                                                                                                                     |
| 75 | Confirm whether local coupling is acceptable, or only imported coupling.                                                                                                                                                             | A locally-fabricated coupling/coupling guard is acceptable, provided it is designed and certified by the genset manufacturer or its authorised representative as suitable for the specific engine/alternator combination, and is submitted for                                                                                                                                                            |

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|    |                                                                                                                                                                                                                                                                              | the Engineer's approval as a standard equipment submittal.                                                                                                                                                                                                                                                                                                                                                                                           |
| 76 | Confirm whether the derating factor has already been considered in the specified D.G. Set capacity.                                                                                                                                                                          | Yes, on the same basis as the response at Sr. No. 72 above (site altitude and ambient-qualification derating already applied to the stated 300 kVA/150 kVA prime ratings).                                                                                                                                                                                                                                                                           |
| 77 | Electrical LOAM lists Power Zone as an approved vendor for the DG Set, supplying engines from Cummins, Perkins, FPT and Yuchai; confirm whether these engine brands are acceptable if supplied through other authorised dealers; note that Siemens does not deal in DG Sets. | The engine brand (Cummins) is acceptable where supplied and warranted by that engine manufacturer's officially authorised dealer/distributor in Pakistan, and is not restricted to supply through Power Zone specifically, provided the complete genset (engine, alternator, control panel and enclosure) is assembled and certified by a single, genset assembler taking full system responsibility.                                                |
| 78 | Confirm whether a Fuel Storage System is required; if so, provide drawings, BOQ item(s) and specifications.                                                                                                                                                                  | Yes, a Fuel Storage System is required; see BOQ Item CB-25 and the response at Sr. No. 46 above.                                                                                                                                                                                                                                                                                                                                                     |
| 79 | Confirm whether Chinese-manufactured gensets are acceptable, or only European-manufactured.                                                                                                                                                                                  | Only European manufacturers are acceptable.                                                                                                                                                                                                                                                                                                                                                                                                          |
| 80 | UPS (E-0.3): confirm the ambient temperature design basis.                                                                                                                                                                                                                   | The UPS ambient-temperature design basis is as stated generally at Section 0490, Clause 1.3 (see Sr. No. 67 above), where the UPS is installed within an air-conditioned equipment/UPS room, the room's designed indoor condition (per the HVAC Basis of Design, Section 0710) shall govern the equipment's normal continuous-operating environment, and the wider figure remains a qualification/robustness margin, not the design operating point. |
| 81 | Confirm whether the derating factor has already been considered in the specified UPS capacity.                                                                                                                                                                               | Yes, on the same basis as Sr. No. 72 and Sr. No. 76 above.                                                                                                                                                                                                                                                                                                                                                                                           |
| 82 | Provide the approved vendors and brands for the UPS system.                                                                                                                                                                                                                  | Please refer to the List of Approved Manufacturers annexed to Volume II – Technical Specifications; Section 740, Division 03 Uninterruptible Power Supplies (UPS), Clause No. 2.7.<br><br>Please refer to Electrical List of Approved manufacturer & Suppliers                                                                                                                                                                                       |
| 83 | Provide the SLD referenced in the BOQ for the UPS/IPS system.                                                                                                                                                                                                                | Please refer Drawings No. E-67 to E-70 issued with Addendum / Corrigendum No. 1                                                                                                                                                                                                                                                                                                                                                                      |
| 84 | Main Panel Board & AHFs (E-1, E-1-1): clarify whether Electrical Panels and Distribution Boards are type-tested or non-type-tested.                                                                                                                                          | All Low-Voltage Switchboards, Main Panel Boards and Distribution Boards shall be fully type-tested assemblies (TTA) in accordance with IEC 61439-1/-2, with type-test certificates from an independent accredited laboratory to be submitted as part of the                                                                                                                                                                                          |

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|    |                                                                                                                                                                                                                                                       | equipment approval submittal; non-type-tested (PTTA) assemblies are not acceptable for this Project.                                                                                                                                                                                                                                             |
| 85 | Identify which Distribution Boards are floor-mounted and which are wall-mounted (surface/concealed).                                                                                                                                                  | All the DB's are Wall mounted and concealed.                                                                                                                                                                                                                                                                                                     |
| 86 | Specify which DBs are indoor and which are outdoor.                                                                                                                                                                                                   | All the DB's are indoor type.                                                                                                                                                                                                                                                                                                                    |
| 87 | Specify the required Form of Separation for each Electrical Panel and DB (Form 1, 2B or 3B).                                                                                                                                                          | As a minimum: the Main Panel Board and the Automatic Synchronising/Load-Sharing Generator Panel Board shall be Form 4 Type 7 (per IEC 61439/BS EN 60439-1 Annex);<br>Sub-distribution boards feeding life-safety and CNS/ATM loads shall be not less than Form 3B;<br>General power/lighting Distribution Boards shall be not less than Form 2B. |
| 88 | Confirm whether any withdrawable breakers are required.                                                                                                                                                                                               | Withdrawable (draw-out type) breakers are required for the incoming and bus-coupler breakers of the Main Panel Board and the Generator Panel Board only; fixed (non-withdrawable) moulded-case breakers are acceptable for all downstream sub-distribution boards.                                                                               |
| 89 | Provide the LOAM for components of LT Panels and DBs.                                                                                                                                                                                                 | Please refer to Electrical List of Approved manufacturer & Suppliers<br>Also refer corrigendum / addendum No. 1                                                                                                                                                                                                                                  |
| 90 | Drawing E-65 shows DB-Airside, SMPB-GF, DB-EXT-GF, HVAC, DB-Lift, Public Health and Fire Fighting Distribution Boards without corresponding detailed SLDs or BOQ items; request these, together with the clarifications sought above, for each board. | Drawings already given. Drawing is attached again for your ready reference.<br>(Refer Drawing No. E-67 to E-70)<br>For HVAC refer drawing No. IEST/310/AAA/TD/12                                                                                                                                                                                 |
| 91 | Light Fixtures (E-4.01): request the complete Lighting Schedule (type, material, wattage, lumens, efficacy, mounting, life, IP rating, CCT, CRI, etc.).                                                                                               | Lights types and wattage already mentioned in the drawing no. E-01 & Technical Specification Section 0560-lights fixtures, may please be referred.                                                                                                                                                                                               |
| 92 | Drawing E-01 light-fixture details do not match the BOQ; request reconciliation.                                                                                                                                                                      | Please follow BOQ details for this particular item.                                                                                                                                                                                                                                                                                              |
| 93 | SFPs/ODF/Networking Switches/Racks/Telephone Exchange: request the list of approved vendors/brands for active and passive telecom equipment and the Telephone Exchange.                                                                               | Please refer to Volume II – Technical Specifications, Section 0650 (Structured Cabling Network) and its associated Annex, which lists the approved manufacturers for the principal structured-cabling and active-networking components; where a specific                                                                                         |

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|    |                                                                                                                                                                                                                                 | <p>item is not separately listed, the material-submittal procedure applies.</p> <p>Please also refer to Electrical List of Approved manufacturer &amp; Suppliers</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 94 | Drawing E-58 shows a 16-Port Layer 2 switch not mentioned in the BOQ; confirm requirement, quantity and scope.                                                                                                                  | Please refer to Addendum/Corrigendum No.1 (Revise Riser Diagram no. E-55 to E-58)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 95 | Technical Specifications require a chassis-based Layer 3 switch with 32 x 10G ports, while the SLD shows an 8-port Layer 3 core switch, and no core switch appears in the BOQ; confirm the required configuration and BOQ item. | <p>The chassis-based Layer 3 core switch, 32 × 10G ports, as required under the Technical Specifications, shall govern over the 8-port configuration shown on the SLD. The SLD shall be read as illustrative of connectivity/topology only, and shall be revised at detailed engineering/shop drawing stage to reflect the specified 32 × 10G chassis-based core switch.</p> <p>Bidders shall include the full supply, installation, testing, and commissioning cost of the chassis-based Layer 3 core switch (32 × 10G ports, and all associated line cards, power supplies, licenses, and accessories required to meet the Technical Specifications) within BOQ Item E-12.01, without change to the stated quantity (1.00 Job) or unit rate structure. This item shall be read as inclusive of the core switch and all its interconnections with the data, CCTV, access control, fire alarm, and BMS networks described elsewhere in this Bill.</p> |
| 96 | BOQ Item E-5.07 (Single-Mode SFPs): confirm whether 1G or 10G SFPs are required.                                                                                                                                                | 10G single-mode SFP+ transceivers (LC duplex, OS2 9/125 μm fibre, per Section 0650) are required for the inter-building backbone links; 1G SFPs are acceptable only for intra-building/access-layer links where expressly shown as such on the riser diagrams.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 97 | IP PABX is specified together with Multipair Cables and MDF; clarify whether a hybrid PABX (Analog/Digital split of the 100 extensions) is required, and whether a Digital Operator Console is required.                        | A hybrid IP/Analog PABX is required, to accommodate legacy analog extensions (e.g., existing airport operational lines) alongside IP extensions; of the 100 extensions, 20 shall be Analog and 80 shall be IP/Digital extensions, and one Digital Operator Console (with busy-lamp field for not fewer than 30 stations) is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 98 | FACP (E-6.06_1): request the list of approved vendors/brands for the Fire Alarm System.                                                                                                                                         | <p>Please refer to Electrical List of Approved manufacturer &amp; Suppliers</p> <p>(Addendum / Corrigendum No. 1)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 99 | Drawing E-55 shows a 2-loop Fire Alarm Control Panel while the BOQ specifies a 4-loop panel; clarify the required capacity and reconcile device quantities.                                                                     | Please follow BOQ nomenclature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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| 100 | Provide details of any existing fire alarm system requiring integration.                                                                                                                        | There is no existing Fire Alarm System at the Project Site requiring integration; the FAS for the new facilities is a standalone, new installation. Bidders are not required to price for integration with any existing FAS.                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 101 | Bill No. 8 – ATC & CNS Equipment: request SLDs, layout and installation drawings for the complete Bill.                                                                                         | Reference is made to Volume-II – Technical Specifications, Section 0740 – CNS Equipment, Division 01 – General Requirements, Clause 1.1. The Contractor shall be responsible for the complete planning, design, testing, installation, integration, and commissioning of the CNS system on an EPC/Turnkey basis. Accordingly, the Contractor shall develop and submit all necessary layouts, shop drawings, installation drawings, and other relevant design documentation as required for the proper execution and commissioning of the works. Therefore, no separate layout or installation drawings are required to be provided as part of the Bidding Documents. |
| 102 | All items are lump-sum/job; request itemised BOQ with quantities.                                                                                                                               | See the response at Sr. No. 101 immediately above. The BOQ has been worked out accordingly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 103 | Provide the approved vendors and brands for Bill No. 8.                                                                                                                                         | Reference is made to Volume-II – Technical Specifications, Section 0740 and its associated Divisions, wherein recommended equipment manufacturers for the respective equipment have been specified. The Contractor shall comply with the requirements stipulated therein.                                                                                                                                                                                                                                                                                                                                                                                            |
| 104 | Item T-24 (UPS): provide the complete specification, capacity and load.                                                                                                                         | Please refer to Volume II – Technical Specifications; Section 740, Division 03 Uninterruptible Power Supplies (UPS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 105 | Item T-30 (Fibre Cable): provide core count and SM/MM, indoor/outdoor specification.                                                                                                            | Volume II – Technical Specifications, Section 0650 (and the associated Consolidated Design Parameters annex) specifies OS2 single-mode 9/125 $\mu\text{m}$ fibre for inter-building backbone runs and OM4 multimode 50/125 $\mu\text{m}$ fibre for intra-building backbone runs, terminated with LC duplex (OM4) and LC duplex APC (OS2) connectors; core count shall be 24 core cable. Item T-30 (1,200 m) is the fibre cable between AFL vault station to ATC tower for relocation of ALCM so the same is an outdoor installation and may be read in conjunction with T-31 and T-32.                                                                               |
| 106 | Item T-33 (ALCMS relocation): request complete details of the existing system (manufacturer, architecture, controller, software, field equipment, interfaces), layout, quantities, power supply | The existing Airfield Lighting Control and Monitoring System (ALCMS) is an operational PAA asset external to this Contract's design scope. The scope is limited to shifting of ALCMS panel from existing ATC Tower to New ATC tower with                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|     | arrangement, integration, transition methodology, permissible downtime and as-built documentation.                                                                                                                 | new fibre connection reconfiguration through local representative of OEM. For the sake of clarity the ALCMS panel make is ADB Safegate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 107 | MCCs and ACPs (M.29 & M.29-1): request the quantity of MCCs and ACPs.                                                                                                                                              | Please refer to drawing No. IEST/310/AAA/TD/12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 108 | Provide the SLD for MCCs/ACPs, including breakers, equipment and ratings.                                                                                                                                          | refer response against S.N. 107 above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 109 | Bill 7 – Solar System: confirm whether the specified 250 kW capacity is stated before or after altitude/temperature derating.                                                                                      | <p>It is clarified, in the first instance, that the Solar PV system is priced under BOQ Item E-13.01, Bill 5 – Electrical (not Bill 7), which specifies “Monocrystalline PV modules 250 kW.” This 250 kW figure is the array's nameplate (STC, standard test condition) DC capacity, before altitude, temperature and other site-condition derating.</p> <p>The Contractor's design shall apply the applicable altitude/temperature/soiling derating factors when sizing the inverter(s) and confirming expected net AC output, consistent with the drawing note on Sheet E-66 referring to an approximately 75% average system efficiency.</p> <p>Please refer to Drawing No. E-66 (Rev.) is attached herewith.</p> |
| 110 | BOQ Item E-9.01: 2x(5.7x8mm) electrolytic copper strip specified as down conductor; standard practice is 25x3mm; request review.                                                                                   | BOQ Item E-9.01 already permits the specified copper strip “or as approved by Consultant”; a 25 x 3 mm electrolytic copper strip of equivalent or greater cross-sectional area is confirmed as an acceptable alternative, subject to submission of the manufacturer's data sheet for the Engineer's approval as a standard material submittal. The BOQ item description is not otherwise amended.                                                                                                                                                                                                                                                                                                                    |
| 111 | BOQ Item E-9.02: 2¾" dia. copper rod specified; Drawing E-54 shows 1" dia. copper rod for the lightning system and a 5x50mm steel rod for general earthing; request the correct rod diameter and updated drawings. | Please follow BOQ item descriptions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 112 | BOQ Item E-9.03: request the “LAS Emission Streamer” earth pit drawing.                                                                                                                                            | <p>The BOQ item description refers to the earth pit for the “ESE” (Early Streamer Emission) lightning air terminal system (“LAS” being a transcription variant of “ESE” in the Bill of Quantities).</p> <p>Please refer to Addendum / Corrigendum No.1 ,drawings no. E-53 &amp; E-54. The number of bores is already mentioned in the drawings and BOQ.</p>                                                                                                                                                                                                                                                                                                                                                          |
| 113 | BOQ Item E-9.04-2 specifies a conventional Franklin-rod air terminal, while Drawing E-54 shows an ESE lightning arrester; confirm the                                                                              | It is clarified that both technologies form part of the specified lightning-protection system, and are not mutually exclusive alternatives:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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|     | required system type, down-conductor material, and provide updated drawings.                                                    | <p>BOQ Items E-9.04-1 to E-9.04-4 specify a Controlled Early Streamer Emission (CESE) air terminal system (Prevectron 3rd Generation or approved equivalent, autonomous type, 45 m protection radius, Level of Protection I, designed to NFC 17-102/UNE 21186), serving as the primary lightning-protection terminal for the ATCT/tower structure;</p> <p>BOQ Item E-9.04-2, correctly read, is the supporting GI elevation pole/mast assembly for the CESE air terminal, not itself a Franklin rod;</p> <p>and BOQ Item E-9.04-5 separately specifies a conventional Franklin-rod air terminal, which serves as the secondary/backup terminal and protects rooftop equipment and building areas outside the CESE terminal's protection radius, consistent with Drawing E-54, which shows both terminal types on the same structure for this reason.</p> <p>The governing design standard is NFC 17-102/UNE 21186 (Level of Protection I) for the primary CESE terminal, and BS EN 62305 (rolling-sphere method, Level of Protection I) for the conventional Franklin-rod terminal and the general down-conductor/earthing network.</p> |
| 114 | BOQ Item E-9.04-2: confirm the height of the mast.                                                                              | It should not be less than 3 meters from the highest point of the structure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 115 | BOQ Item E-9.04-5: confirm whether the down conductor for the Franklin rod base is copper cable or copper strip.                | A copper strip (of the same specification as Item E-9.01, or as approved) shall be used as the down conductor for the conventional Franklin-rod terminal, for consistency with the down-conductor system used for the CESE terminal and the general earthing network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 116 | BOQ Items E-9.02, E-10.01 and E-10.02: confirm the proposed chemical soil-enhancement material (Bentonite or Marconite/LowRes). | Marconite (or an approved low-resistance carbon-based backfill compound of equivalent performance) is the specified chemical soil-enhancement material for earth-pit backfill, in preference to Bentonite, given its lower and more stable resistivity performance and reduced maintenance requirement; an approved equivalent product may be submitted for the Engineer's consideration under the standard material-submittal procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**LIST OF APPROVED MANUFACTURERS  
OF AIR TRAFFIC CONTROL TOWER AT SKARDU INTERNATIONAL AIRPORT.**

(To be signed by the Bidder)

The Contractor should note that only material from those manufacturers specified in the list of approved manufacturers shall be allowed to be used on this Project. The Contractor shall submit literature/catalogue/samples etc. of all the items from each of the specified manufacturer to the Engineer who shall then decide and approve the sample and the manufacturer. Where the item involves any finishes such as paints, external coatings, etc. the Contractor shall erect mock-up samples of the specified manufacturers for the selection and approval of the Engineer.

The responsibility lies with the Contractor for establishing the genuineness of any materials/products/items for its make and origin as specified below.

| <b>CIVIL WORKS</b> |                                            |                                                                                                           |
|--------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>Sr. No.</b>     | <b>Materials / Items</b>                   | <b>Name of Manufacturer/ Suppliers</b>                                                                    |
| 1                  | Cement                                     | 1. DG Cement<br>2. Maple Leaf Cement<br>3. Pioneer Cement<br>4. Best way Cement<br>5. Lucky Cement.       |
| 2                  | Steel (60 Grade & 40 Grade)                | 1. Sheikho Steel<br>2. FF Steel<br>3. Moiz Steel<br>4. Ittefaq Steel<br>5. Nomee Steel<br>6. Amreli Steel |
| 3                  | Aluminum Works (Aluminum Doors & Windows ) | 1. Chawala Aluminum<br>2. Prime Aluminum                                                                  |
| 4                  | Glass                                      | 1. Guardian Glass<br>2. Emirates Glass<br>3. Saint Gobain Glass<br>4. AGC Glass                           |
| 5                  | U.P.V.C Windows                            | 1. Wintech,<br>2. Veka<br>3. Yagmur Pen                                                                   |
| 6                  | Paints                                     | 1. ICI Paints<br>2. Happilac Paints<br>3. Nippon Paints<br>4. Jotun Paints                                |
| 7                  | Wall Coatings                              | 1. Rock Shield<br>2. Fanaan by Brighto<br>3. Happilac<br>4. Nova Color                                    |
| 8                  | Thermal Insulation                         | 1. Diamond Jumbolon                                                                                       |

|    |                                               |                                                                                                                                                                                                           |
|----|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | Glass Mosaic Tile                             | 1. AMC Art Design<br>2. MEC Mosaic.                                                                                                                                                                       |
| 10 | Concrete Floor Tiles. Pavers &. Paving Blocks | 1. Concrete Concept<br>2. ENVICRETE<br>3. Fine Concrete                                                                                                                                                   |
| 11 | Porcelain Tiles on Floor & Toilets            | 1. Fifi Ceramic by S. Abdullah<br>2. Porcelanosa by AW<br>3. Atlas Concorde by AW<br>4. Novus by H-Verse<br>5. Monalisa by H-Verse<br>6. Aura by Hadayat Sons<br>7. Aive by H-verse<br>8. Orient Ceramics |
| 12 | Ceramic Tiles in Toilets                      | 1. Fifi Ceramic<br>2. Porcelanosa by AW<br>3. Atlas Concorde by AW<br>4. Novus by H-Verse<br>5. Monalisa by H-Verse                                                                                       |
| 13 | PVC Tiles (Static)                            | 1. Marflex<br>2. Sarina Flooring                                                                                                                                                                          |
| 14 | PVC Tiles (Non-Static)                        | 1. Marflex<br>2. Sarina Flooring                                                                                                                                                                          |
| 15 | Water Stopper                                 | 3. Marflex                                                                                                                                                                                                |
| 16 | Epoxy Coating / Flooring                      | 1. Aqua Seal<br>2. Sika<br>3. Vertex<br>4. Happilac                                                                                                                                                       |
| 17 | Facade Tile / System                          | 1. Novus by H-verse<br>2. Kuthaya by S-Abdullah<br>3. Sinterflex Turkish                                                                                                                                  |
| 18 | Termite Proofing (For Soil)                   | 1. Agenda by Jaffer Brothers<br>2. BruckMann<br>3. Safe Posion by Mass Brown                                                                                                                              |
| 19 | Termite Proofing (For Wood)                   | 1. Bio-Wood<br>2. Kanzo (Urban Pest)<br>3. Power-Max<br>4. Dow Agro Sciences<br>5. Solegnium<br>6. Jaffer Brothers                                                                                        |
| 20 | Water Proofing                                | 1. Aqua Seal<br>2. Sika                                                                                                                                                                                   |
| 21 | Aluminum Lineal False Ceilings                | 1. Daiken (Japan)<br>2. Dampa (Denmark)<br>3. Owa (Germany)                                                                                                                                               |
| 22 | Doors, Kitchen Cabinets                       | 1. Interwood<br>2. Naeem Trading Company<br>3. Buro Kitchen                                                                                                                                               |
| 23 | WPC Doors                                     | 1. Esta Doors                                                                                                                                                                                             |

| 24                                          | EPC Panels                             | 2. Banu Mukhtar<br>3. EPC Solution Pakistan                                              |
|---------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------|
| 25                                          | Door Locks & Door Closer               | 1. Yale<br>2. Abloy                                                                      |
| 26                                          | Tile Grout                             | 1. Happilac<br>2. Sika                                                                   |
| 27                                          | Tile Bond                              | 1. Happilac<br>2. Sika                                                                   |
| 28                                          | Gypsum Board Ceiling and Panel         | 1. United Gypsum<br>2. Elephant<br>3. Lodhiya Gypsum                                     |
| 29                                          | Fire Doors                             | 1. Haseen Habib<br>2. Khokhar Group                                                      |
| 30                                          | Terrozzo Tiles                         | 1. Punjab Tiles                                                                          |
| 31                                          | Expansion Joints                       | 4. ARFEN<br>5. Asteknik<br>6. Mesihuo                                                    |
| 32                                          | Expanded Polystyrene (EPS) / PIR Panel | 1. Banu Mukhtar<br>2. EPS Pakistan<br>3. Izhar Foster                                    |
| 33                                          | Space Frame Structure                  | 1. OHC Construction China<br>2. ABC Engineering Company China<br>3. Jazari Steel Pvt Ltd |
| <b>WATER SUPPLY &amp; SANITARY FITTINGS</b> |                                        |                                                                                          |
| Sr. No.                                     | Materials / Items                      | Name of Manufacturer/ Suppliers                                                          |
| 1                                           | G.I. Pipes                             | 1. M/S International Industries Limited (IIL)                                            |
| 2                                           | G.I. Pipe Fittings                     | 1. M/S HE China, M/S TG China.                                                           |
| 3                                           | CPVC Pipes                             | 1. Prestige Plastic Pipes<br>2. Labrasol<br>3. Steelex Pipes                             |
| 4                                           | Sanitary Fixtures                      | 1. TOTO by AW<br>2. Verona by H2O<br>3. Bleen by H-Verse<br>4. Sera by S-Abdullah        |
| 5                                           | Kitchen Sinks                          | 1. RAK<br>2. Fotile<br>3. Franke                                                         |
| 6                                           | Sanitary Fittings                      | 1. TOTO by AW<br>2. Hans Grohe by H-Verse<br>3. SERA by S- Abdullah                      |
| 7                                           | Valves                                 | 1. Kitz-Japan                                                                            |
| 8                                           | Geyser                                 | 1. Ekotherm<br>2. CANNON<br>3. Veissman                                                  |

|    |                                                       |                                                                                                                                 |
|----|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 9  | Water Cooler                                          | 1. Deluxe,<br>2. Ambassador,<br>3. CANON                                                                                        |
| 10 | C.I. Covers With Frame Floor Drains & Floor Cleanouts | 1. Alpine Steel (Pvt.) Ltd.<br>2. Sandal Engineering (Pvt.) Ltd.<br>3. Central Mechanical Engineering (CME) Company (Pvt.) Ltd. |
| 11 | Fire Hose Cabinet And Extinguishers + Fire Doors      | 1. M/S Haseen Habib (Pvt.) Ltd.<br>2. MESI GROUP                                                                                |
| 12 | UPVC , HDPE & PPRC Pipes and Fittings                 | 1. M/S Shafisons Engineering (Pvt.) Ltd. (Beta Pipes).<br>2. IIL<br>3. Master Pipes (Faisalabad),<br>4. Popular Pipes           |
| 13 | Electric Water Heaters.                               | 1. CANON<br>2. Nas Gas                                                                                                          |
| 14 | Water Filters                                         | 1. M/S So-Safe<br>2. M./S Aqua Safe<br>3. Culligan<br>4. Teka                                                                   |

| ELECTRIC MATERIAL |                                                   |                                                                                           |
|-------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------|
| Sr. No.           | Materials / Items                                 | Name of Manufacturer/ Suppliers                                                           |
| 1                 | Light Fixture                                     | 1. Impulse<br>2. Watts and Luxes<br>3. Fast Lighting<br>4. Matrix Led                     |
| 2                 | Distribution Boards, Main & Sub-Main Panel Boards | 1. Bilal Switch Change<br>2. Electrech<br>3. Volamp Engineering<br>4. Capital Switch gear |
| 3                 | Cables And Wires                                  | 1. Pakistan Cables<br>2. Newage Cables<br>3. Fast Cables<br>4. CopperGat Cables           |
| 4                 | PVC Conduit & Accessories                         | 1. Beta<br>2. Master Pipes (Faisalabad)                                                   |
| 5                 | Steel Conduit & Accessories                       | 1. M/S International Industries Limited (IIL)                                             |
| 6                 | Switches. Sockets Etc.                            | 1. ORANGE<br>2. Legrand<br>3. Schneider                                                   |
| 7                 | Back Boxes, Pull Boxes, Etc.                      | 1. Bosch<br>2. Milano<br>3. Legrand<br>4. ORANGE                                          |
| 8                 | Telephone Cables Dish Antenna Cables              | 1. Siemens Germany<br>2. Comscope USA & 3 M                                               |

|    |                                     |                                                                                                                          |
|----|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|    |                                     | 3. Ventilex                                                                                                              |
| 9  | Telephone Junction Boxes            | 1. Panasonic<br>2. Huawei                                                                                                |
| 10 | Fans                                | 1. GFC Fans<br>2. Lahore Fans<br>3. Royal Fans                                                                           |
| 11 | MCCBS And MCBS                      | 1. Marlin Gerlin (MG) (France)<br>2. Siemens (Germany)<br>3. ABB (Italy)<br>4. Schneider Electric (Germany)<br>5. ORANGE |
| 12 | ACBS                                | 1. Siemens (Germany)<br>2. ABB (Italy)                                                                                   |
| 13 | Generator Set                       | 1. Caterpillar<br>2. Siemens<br>3. Power zone by Mecatech                                                                |
| 14 | Transformer                         | 1. Siemens<br>2. PEL                                                                                                     |
| 15 | CCTV System & Public Address System | 1. Hik Vision<br>2. Samsung<br>3. Sony<br>4. Dahua                                                                       |
| 16 | DC Inverter and Air Conditioner     | 1. Trane<br>2. TCL<br>3. Hitachi<br>4. Daikin                                                                            |
| 17 | Solar System Panels                 | 1. Longi Solar<br>2. Jinko Solar<br>3. Canadian Solar                                                                    |
| 18 | Solar System Inverter               | 1. Solis<br>2. Huawei                                                                                                    |
| 19 | Net Working Cables                  | 1. ORANGE<br>2. 3M                                                                                                       |

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

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

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

| <b>LIST OF APPROVED MANUFACTURERS (M)</b> |                                                                          |                                |               |                 | <b>(Annexure-A)</b>  |
|-------------------------------------------|--------------------------------------------------------------------------|--------------------------------|---------------|-----------------|----------------------|
| <b>Sr #</b>                               | <b>Particulars</b>                                                       | <b>Manufacturers / Vendors</b> | <b>Origin</b> | <b>Landline</b> | <b>Mobile / Cell</b> |
| <b>1</b>                                  | <b><u>LT / HT PANELS &amp; DB's / STREET LIGHT POLES</u></b>             |                                |               |                 |                      |
| i                                         | Quality Switchgear Pvt Ltd.                                              | Quality Switchgear             | Pakistan      |                 | 0300-8404301         |
| ii                                        | Bilal Engineering                                                        | Bilal Engineering              | Pakistan      |                 | 0313-4444029         |
| iii                                       | Ghafoor Engineering                                                      | Ghafoor Engineering            | Pakistan      |                 | 0320-7780309         |
| iv                                        | PEMPAK                                                                   | PEMPAK                         | Pakistan      |                 |                      |
| v                                         | South Asian Electric (SAEC)                                              | South Asian Electric           | Pakistan      |                 | 0300-8477067         |
| <b>2</b>                                  | <b><u>CIRCUIT BREAKERS</u></b>                                           |                                |               |                 |                      |
|                                           | <b><u>MCB/MCCB/ACB/ELCB/RCBO</u></b>                                     |                                |               |                 |                      |
| i)                                        | Schneider                                                                | Oliver General Trading         | France        |                 | 0324-4475372         |
| ii)                                       | ABB                                                                      | Trade Ventures                 | EU            |                 | 0303-4443327         |
| iii)                                      | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| <b>3</b>                                  | <b><u>MAGNETIC CONTACTORS</u></b>                                        |                                |               |                 |                      |
| i)                                        | Schneider                                                                | Oliver General Trading         | France        |                 | 0324-4475372         |
| ii)                                       | ABB                                                                      | Trade Ventures                 | EU            |                 | 0303-4443327         |
| iii)                                      | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| <b>4</b>                                  | <b><u>SELECTOR SWITCHES</u></b>                                          |                                |               |                 |                      |
| i)                                        | Sinusoid                                                                 | Eyelogy                        | CAD/CHN       |                 | 0336-4452231         |
| ii)                                       | KRAUS & NAIMER                                                           | E-Links                        | EU            |                 | 0321-4404025         |
| iii)                                      | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| <b>5</b>                                  | <b><u>ENERGY &amp; NETWORK ANALYZERS / VOLTMETERS / AMPEREMETERS</u></b> |                                |               |                 |                      |
| i)                                        | Smart Controller                                                         | Index Technology               | UK            |                 | 0300-8184203         |
| ii)                                       | Lovato                                                                   | Jubilee Corporation            | Italy         |                 | 0300-8548550         |
| iii)                                      | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| <b>5a</b>                                 | <b><u>DUAL SOURCE ENERGY METERS</u></b>                                  |                                |               |                 |                      |
| i)                                        | Lovato                                                                   | Jubilee Corporation            | Italy         |                 | 0300-8548550         |
| ii)                                       | ABB                                                                      | ABB                            | EU            |                 | 0303-4443327         |
| iii)                                      | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| iv)                                       | Schneider                                                                | Oliver General Trading         | France        |                 | 0324-4475372         |
| <b>6</b>                                  | <b><u>PFI RELAYS</u></b>                                                 |                                |               |                 |                      |
| i)                                        | Shizuki                                                                  | Sheikh Waliyat & Sons          | Thailand      |                 | 0307-5553960         |
| ii)                                       | BTB                                                                      | Eyelogy                        | Turkey        |                 | 0336-4452231         |
| iii)                                      | Nokian                                                                   | Jubilee Corporation            | Finland       |                 | 0300-8548550         |
| iv)                                       | Sigma                                                                    | Jawad Electric                 | Turkey        |                 | 0322-8061111         |
| <b>7</b>                                  | <b><u>TERMINAL BLOCKS</u></b>                                            |                                |               |                 |                      |

|      |         |                |        |              |
|------|---------|----------------|--------|--------------|
| i)   | Klemsan | E-Links        | Turkey | 0321-4404025 |
| ii)  | Onka    | Pyramid        | Turkey |              |
| iii) | Sigma   | Jawad Electric | Turkey | 0322-8061111 |

## **8 PFI CAPACITORS**

|      |         |                       |          |              |
|------|---------|-----------------------|----------|--------------|
| i)   | BTB     | Eyelogy               | Turkey   | 0336-4452231 |
| ii)  | Nokian  | Jubilee Corporation   | Finland  | 0300-8548550 |
| iii) | Shizuki | Sheikh Waliyat & Sons | Thailand | 0307-5553960 |

## **9 CURRENT TRANSFORMERS**

|      |              |                      |            |              |
|------|--------------|----------------------|------------|--------------|
| i)   | Revalco/Saci | Jubilee Corporation  | Italy / EU | 0300-8548550 |
| ii)  | Hubit        | E-Links              | UK         | 0321 4404025 |
| iii) | Lovato       | Jubilee Corporation  | EU         | 0300-8548550 |
| iv)  | Entes        | Shahid International | Turkey     | 0321-8472264 |
| v)   | Sigma        | Jawad Electric       | Turkey     | 0322-8061111 |

## **10 VOLTAGE MONITORING RELAYS**

|      |          |                      |         |              |
|------|----------|----------------------|---------|--------------|
| i)   | Entes    | Shahid International | Turkey  | 0321-8472264 |
| ii)  | Emirel   | Jubilee Corporation  | Italy   | 0300-8548550 |
| iii) | ABB      | ABB                  | EU      | 0303-4443327 |
| iv)  | Sinusoid | Eyelogy              | CAD/CHN | 0336-4452231 |
| v)   | Sigma    | Jawad Electric       | Turkey  | 0322-8061111 |

## **11 LOAD BREAK SWITCHES / CHANGE OVER SWITCHES**

|      |           |                        |        |              |
|------|-----------|------------------------|--------|--------------|
| i)   | Socomec   | Jubilee Corporation    | France | 0300-8548550 |
| ii)  | ABB       | ABB                    | EU     | 0303-4443327 |
| iii) | Schneider | Oliver General Trading | France | 0324-4475372 |
| iv)  | Sigma     | Jawad Electric         | Turkey | 0322-8061111 |

## **12 INDICATION LIGHTS**

|      |                |                    |        |              |
|------|----------------|--------------------|--------|--------------|
| i)   | Telemechanique | Schneider Pakistan | EU     |              |
| ii)  | GGT            | E-Links            | EU     | 0321 4404025 |
| iii) | Sigma          | Jawad Electric     | Turkey | 0322-8061111 |

## **13 SWITCHES & SOCKETS**

|      |                       |                      |         |              |
|------|-----------------------|----------------------|---------|--------------|
| i)   | Clipsal Vivace Series | Clipsal Pakistan     | Vietnam | 0322-2880057 |
| ii)  | Legrand               | Shahid International | EU      | 0321-8472264 |
| iii) | Orange Switches       | Orange Electric      |         | 0322-4834937 |
| iv)  | Riva                  | Eyelogy              |         | 0336-4452231 |

## **14 LT/HT CABLES**

|      |                 |                 |          |              |
|------|-----------------|-----------------|----------|--------------|
| i)   | Fast Cables     | Fast Cables     | Pakistan | 0320-8080046 |
| ii)  | Newage Cables   | Newage Cables   | Pakistan | 0333-478210  |
| iii) | Pakistan Cables | Pakistan Cables | Pakistan | 0321-2304494 |

## **15 EARTHING CONDUCTORS**

|      |                 |                 |          |              |
|------|-----------------|-----------------|----------|--------------|
| i)   | Fast Cables     | Fast Cables     | Pakistan | 0320-8080046 |
| ii)  | Newage Cables   | Newage Cables   | Pakistan | 0333-4748210 |
| iii) | Pakistan Cables | Pakistan Cables | Pakistan | 0321-2304494 |

#### **16 PVC CONDUIT & ACCESSORIES**

|      |             |             |          |              |
|------|-------------|-------------|----------|--------------|
| i)   | PLASCO PIPE | PLASCO PIPE | Pakistan | 0321 4113938 |
| ii)  | BETA PIPES  | BETA PIPES  | Pakistan |              |
| iii) | Dadex Pipes | Dadex Pipes | Pakistan |              |

#### **17 LIGHTING FIXTURES**

|      |             |                         |  |              |
|------|-------------|-------------------------|--|--------------|
| i)   | Vlux        | Index Technologies      |  | 0300-8184203 |
| ii)  | Osram       | Osram                   |  | 0312-4732209 |
| iii) | Oppl Lights | Oppl Lighting           |  | 0301-8440368 |
| iv)  | Avada       | Avada                   |  | 0300-0840008 |
| v)   | Coarts      | Coarts Lighting Pvt.Ltd |  | 0331-2273277 |

#### **18 FANS**

|     |            |            |          |                |
|-----|------------|------------|----------|----------------|
| i)  | Lahore Fan | Lahore Fan | Pakistan | 042-35113741   |
| ii) | Royal Fans | Royal Fans | Pakistan | 042 - 35761308 |

#### **19 TELEPHONE CABLES**

|      |             |                    |           |              |
|------|-------------|--------------------|-----------|--------------|
| i)   | Ventilux    | Index Technologies | UK        | 0300-8184203 |
| ii)  | ELAN Cabels | Index Technologies | USA       | 0300-8184203 |
| iii) | Clipsal     | Clipsal Pakistan   | Australia | 0322-2880041 |
| iv)  | Comscope    | Netsoft            | USA       | 0321-8480227 |

#### **20 DATA CABLES (CAT-6 UTP/STP/FTP)**

|      |             |                    |       |              |
|------|-------------|--------------------|-------|--------------|
| i)   | Ventilux    | Index Technologies | UK    | 0300-8184203 |
| ii)  | ELAN Cabels | Index Technologies | EU    | 0300-8184203 |
| iii) | Clipsal     | Clipsal Pakistan   | China | 0322-2880057 |
| iv)  | Molex       | Netsoft            | USA   | 0321-8480227 |
| v)   | Corning     | ESP Solutions      | USA   | 0333-4666946 |

#### **21 CO-AXIAL CABLES (RG-6/7)**

|      |             |                    |       |              |
|------|-------------|--------------------|-------|--------------|
| i)   | Ventilux    | Index Technologies | UK    | 0300-8184203 |
| ii)  | ELAN Cabels | Index Technologies | EU    | 0300-8184203 |
| iii) | Clipsal     | Clipsal Pakistan   | China | 0322-2880057 |

#### **22 TELEPHONE,JUNCTION BOXES & PATCH PANELS**

|     |       |                  |     |              |
|-----|-------|------------------|-----|--------------|
| i)  | TESCO | Index Technology | USA | 0300-8184203 |
| ii) | 3M    | ESP Solutions    |     | 0333-4666946 |

#### **23 TELEPHONE OUTLETS**

|      |                       |                      |       |              |
|------|-----------------------|----------------------|-------|--------------|
| i)   | CLIPSAL-Vivace Series | Clipsal Pakistan     | China | 0322-2880041 |
| ii)  | Legrand               | Shahid International | EU    | 0321-8472264 |
| iii) | Orange Switches       | Orange Electric      |       | 0322-4834937 |

**24 FIRE ALARM SYSTEM**

|      |                        |                  |         |              |
|------|------------------------|------------------|---------|--------------|
| i)   | DETNOV                 | Index Technology | Spain   | 0300-8184203 |
| ii)  | ALCO (fire & security) | Index Technology | USA     | 0300-8184203 |
| iii) | Honeywell              | Notifier         | UK      |              |
| iv)  | Bosch                  | ESP Solutions    | Germany | 0333-4666946 |

**24 a FIRE ALARM SYSTEM CABLING**

|      |          |                    |       |              |
|------|----------|--------------------|-------|--------------|
| i)   | Ventilux | Index Technologies | UK    | 0300-8184203 |
| ii)  | Elan     | Index Technologies | Italy | 0300-8184203 |
| iii) | Cavicell | C-XOR Engineering  | Italy | 0300-8477751 |

**25 CCTV SYSTEM**

|      |           |                     |         |              |
|------|-----------|---------------------|---------|--------------|
| i)   | SAMSUNG   | Vital International | Korea   | 0306-6831111 |
| ii)  | ALCO      | Index Technology    | USA     | 0300-8184203 |
| iii) | Bosh      | ESP Solutions       | Germany | 0333-4666946 |
| iii) | Honeywell |                     | USA     |              |

**25 a CCTV SYSTEM CABLING**

|      |          |                    |       |              |
|------|----------|--------------------|-------|--------------|
| i)   | Ventilux | Index Technologies | UK    | 0300-8184203 |
| ii)  | ELAN     | Index Technologies | EU    | 0300-8184203 |
| iii) | Clipsal  | Clipsal Pakistan   | China | 0322-2880057 |
| iv)  | Molex    | Netsoft            | USA   | 0321-8480227 |
| v)   | Corning  | ESP Solution       | USA   | 0333-4666986 |

**26 PUBLIC ADDRESS SYSTEM**

|      |       |                  |         |              |
|------|-------|------------------|---------|--------------|
| i)   | TOA   | Index Technology | Japan   | 0300-8184203 |
| ii)  | ITC   | Index Technology | China   | 0300-8184203 |
| iii) | Bosch | Bosch Invented   | Germany | 0321-6447170 |

**26 a PUBLIC ADDRESS SYSTEM CABLING**

|      |          |                  |     |              |
|------|----------|------------------|-----|--------------|
| i)   | Ventilux | Index Technology | UK  | 0300-8184203 |
| ii)  | ELAN     | Index Technology | EU  | 0300-8184203 |
| iii) | Corning  | ESP Solution     | USA | 0333-4666986 |

**27 CABLE TRUNKING / LADDERS**

|      |                             |                     |          |              |
|------|-----------------------------|---------------------|----------|--------------|
| i    | Quality Switchgear Pvt Ltd. | Quality Switchgear  | Pakistan | 0300-8404301 |
| ii   | Bilal Engineering           | Bilal Engineering   | Pakistan | 0331-4999119 |
| v    | Ghafoor Engineering         | Ghafoor Engineering | Pakistan | 0320-7780309 |
| vii  | Power-EM                    | Power-EM            | Pakistan | 0300-9430832 |
| viii | M-Tech                      | M-Tech              | Pakistan | 0301-8472264 |
| ix   | Power Tech                  | Power Tech          | Pakistan | 0321-5234202 |
| x    | PEMPAK                      | PEMPAK              | Pakistan |              |

**28 BUS TIE DUCT (BTD)**

|     |           |                     |    |              |
|-----|-----------|---------------------|----|--------------|
| i)  | Pogillano | Jubilee Corporation | EU | 0300-8548550 |
| ii) | Legrand   | C-XOR Engineering   | EU | 0300 8477751 |

|      |            |                   |          |              |
|------|------------|-------------------|----------|--------------|
| iii) | Power Plug | C-XOR Engineering | Malaysia | 0300 8477751 |
| iv)  | Megaduct   | ERCON             | Malaysia | 0300-0406941 |
| v)   | EAE        | Libra Engineering | Turkey   | 0318-2070520 |

## 29 LIGHTNING PROTECTION SYSTEMS

### Early Streamer Emission With Accessories (Active)

|      |                  |                   |        |              |
|------|------------------|-------------------|--------|--------------|
| i)   | Application Tech | C-Xor Engineering | Spain  | 0300-8477751 |
| ii)  | Jeflash          | Eyelogy           | Turkey | 0322-8092588 |
| iii) | INGESCO          | Electrokraft      | Italy  |              |

### Conventional System With Accessories (Passive)

|     |      |                     |    |              |
|-----|------|---------------------|----|--------------|
| i)  | ABB  | ABB                 | EU | 0303-4443327 |
| ii) | Dehn | Jubilee Corporation | EU | 0300-8548550 |

## 30 MV SWITCHGEAR / 11KV RMU / LBS

|     |         |         |       |              |
|-----|---------|---------|-------|--------------|
| i)  | Hyundai | PEL     | Korea |              |
| ii) | ABB     | ABB     | EU    | 0303-4443327 |
| iv) | Siemens | Siemens | EU    |              |

## 31 TRANSFORMERS (DRY TYPE)

|      |               |                     |    |              |
|------|---------------|---------------------|----|--------------|
| i)   | Trafo Elettro | C-Xor Engineering   | EU | 0300 8477751 |
| ii)  | Legrand       | C-Xor Engineering   | EU | 0300 8477751 |
| iii) | ABB           | ABB                 | EU | 0303-4443327 |
| iv)  | TMC           | Jubilee Corporation | EU | 0300-8548550 |
| v)   | Power Go      | Rachena Corp        | EU | 0321-840078  |
| vi)  | Fedral        | Eyelogy             | EU | 0336-4452231 |

## 32 TRANSFORMERS (OIL TYPE)

|      |                            |                            |          |              |
|------|----------------------------|----------------------------|----------|--------------|
| i)   | Pak Electron Limited (PEL) | Pak Electron Limited (PEL) | Pakistan | 0300-8406508 |
| ii)  | ELMETEC                    | ELMETEC                    | Pakistan | 0302-4712772 |
| iii) | Hammad Engineering         | Hammad Engineering         | Pakistan | 0302-4712772 |
| iv)  | Transfo Power              | Transfo Power              | Pakistan | 0320-7889283 |

## 33 GENERATORS

|       |                   |                        |           |              |
|-------|-------------------|------------------------|-----------|--------------|
| i)    | Cummins           | Orient Energy          | EU/US/CN  | 0300-8440430 |
| ii)   | Starkat           | Innovative Engergy Sol | EU        | 0333-0525552 |
| iii)  | Scania            | KAN Engineering        | Sweden/EU | 0301-8402312 |
| iv)   | Onis Visa / Volvo | VPL                    | EU        | 0301-8445026 |
| v)    | Aksa              | Aksa Generators        | Turkey    | 0302-8282690 |
| vi)   | Perkins           | Power Zone             |           | 0321-4462651 |
| vii)  | Perkins           | Multiline              |           | 0301-8665069 |
| viii) | Kohler SDMO       | Greaves                |           | 0345-4014588 |
| ix)   | Cummins           | Power Vision           | EU/US/CN  | 0300-9439310 |

## 34 GENERATOR CONTROL MODULES

|      |          |                    |        |              |
|------|----------|--------------------|--------|--------------|
| i)   | SICES    | HUB ENGINEERING    | EU     | 0301-6020372 |
| ii)  | DEEP SEA | PYRAMID AUTOMATION | UK     | 0333-4561619 |
| iii) | EURO GEN | EURO GEN           | FRANCE | 0333-4561619 |

**35 OCCUPANCY SENSOR**

|     |                            |                  |    |              |
|-----|----------------------------|------------------|----|--------------|
| i)  | Ventilux                   | Index Technology | UK | 0300-8184203 |
| ii) | Clipsal/Schneider Electric | Clipsal Pakistan |    | 0322-2880057 |

**36 WIFI ROUTER**

|      |                |               |           |              |
|------|----------------|---------------|-----------|--------------|
| i)   | Ruckus         | Netsoft       | Australia | 0321-8480227 |
| ii)  | Huawei         | CMC           | China     | 0330-7470125 |
| iii) | Allied Telesis | ESP SOLUTIONS |           | 0333-4666946 |

**37 GPON ACTIVE EQUIPMENT**

|     |         |               |       |              |
|-----|---------|---------------|-------|--------------|
| i)  | CORNING | ESP SOLUTIONS | USA   | 0333-4666986 |
| ii) | HUAWEI  | OCTO          | CHINA | 0330-7470125 |

**38 GPON PASSIVE EQUIPMENT**

|      |          |               |     |              |
|------|----------|---------------|-----|--------------|
| i)   | Molex    | Netsoft       | Aus | 0321-8480227 |
| ii)  | Corning  | ESP Solutions | USA | 0333-4666946 |
| iii) | Comscope | Netsoft       | USA | 0321-8480227 |

**39 LIFTS / ESCALATORS / DUMP WAITERS**

|      |            |                        |        |              |
|------|------------|------------------------|--------|--------------|
| i)   | Fuji       | Innovative Energy Sol. | Japan  | 0300-8504838 |
| ii)  | Sanyo      | DWP Technologies       | Japan  | 0302-8445225 |
| iii) | OTIS       | Royal Systems          |        | 0300-8548002 |
| iv)  | Euksali    | Mesi Group             | Turkey | 0300-8446992 |
| v)   | Mitsubishi |                        |        |              |

**40 ACCESS CONTROL / DOOR LOCKS**

|     |       |                 |         |              |
|-----|-------|-----------------|---------|--------------|
| i)  | Salto | ESP Solutions   | UK      | 0333-4666946 |
| ii) | ANVIZ | INEX Technology | USA/CHN | 0300-8184203 |

**41 INVERTER**

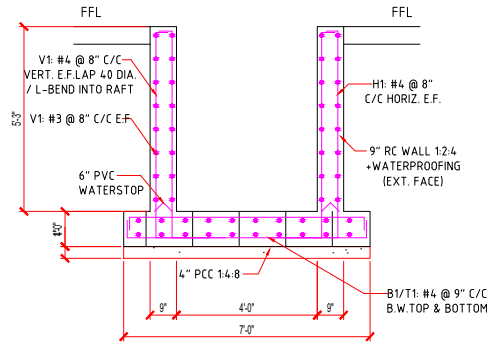
|     |                  |           |          |              |
|-----|------------------|-----------|----------|--------------|
| i)  | APC by Schneider | Octo      | EU/CHINA | 0330-7470125 |
| ii) | ABB              | SM JAFFER | EU       | 0333-0321284 |

**42 INDUSTRIAL POWER SOCKETS (IPS)**

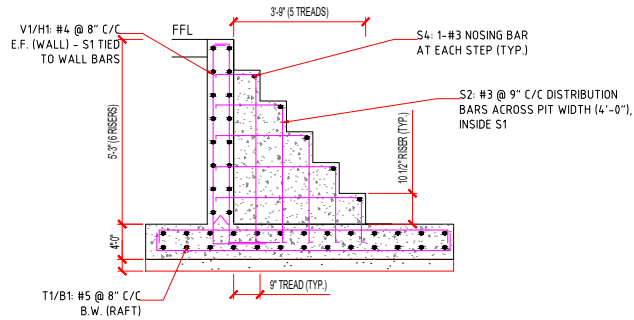
|     |         |                     |       |              |
|-----|---------|---------------------|-------|--------------|
| i)  | Clipsal | Clipsal Pakisan     | China | 0322-2880057 |
| ii) | FAMATEL | JUBLIEE CORPORATION | SPAIN | 0300-8548550 |

**43 SURGE PROTECTION DEVICES**

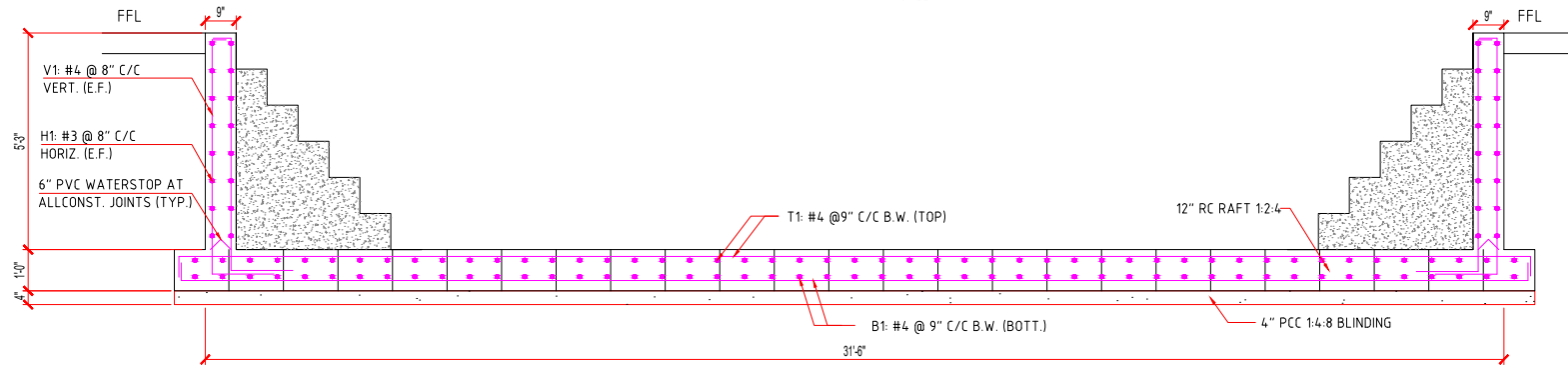
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|------|-------|---------------------|--------|--------------|
| i)   | ABB   | ABB                 | EU     | 0303-4443327 |
| ii)  | Dehn  | Jubilee Corporation | EU     | 0300-8548550 |
| iii) | Sigma | Jawad Electric      | Turkey | 0322-8061111 |



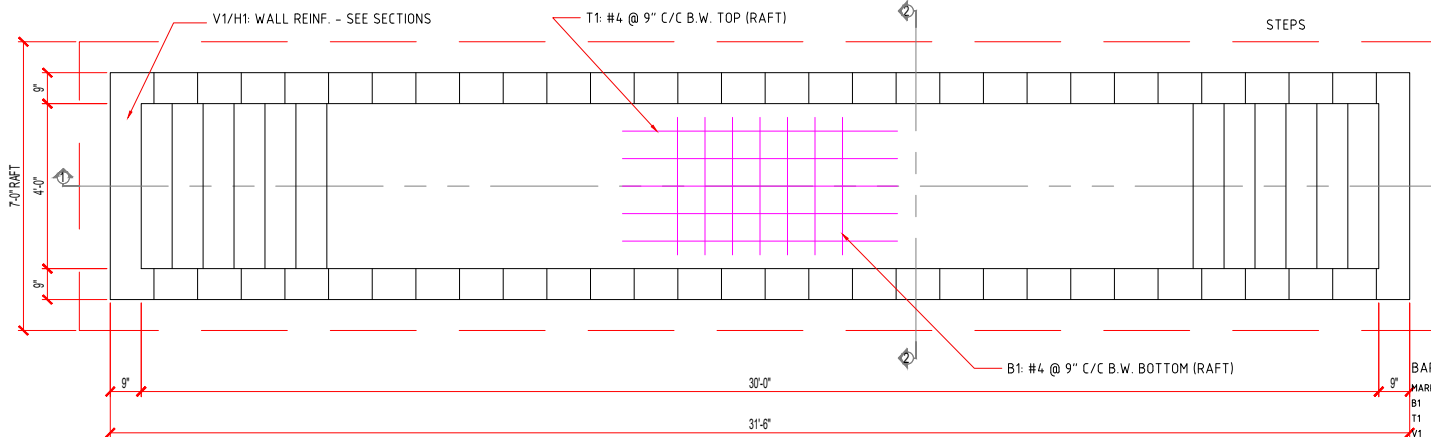
**PIT SECTION 2-2 (STRUCTURAL)**  
SCALE: N.T.S.



**STAIR REINFORCEMENT DETAIL (TYP. BOTH ENDS)**  
SCALE: N.T.S.



**PIT SECTION 1-1 (STRUCTURAL)**  
SCALE: N.T.S.



**VEHICLE PIT - RAFT & WALL REINFORCEMENT PLAN**  
SCALE: N.T.S.  
STEPS: R=10 1/2", T=9" (6 NOS. EACH END) REINF. #4 @ 8" C/C E.W.

#### GENERAL NOTES - STRUCTURAL:

- ALL DIMENSIONS ARE IN FEET & INCHES U.N.O. DO NOT SCALE DRAWING.
- CONCRETE: RC WALLS & RAFT 1:2.4 (MIN.  $f_c = 3000$  PSI @ 28 DAYS).  
PCC BLINDING 1:4-8, 4" THICK UNDER RAFT.
- REINFORCEMENT: DEFORMED BARS, GRADE 60 ( $f_y = 60,000$  PSI), ASTM A615.
- CLEAR COVER: RAFT BOTTOM 3", RAFT TOP 2", WALLS (EARTH FACE) 2", WALLS (INNER FACE) 1-1/2".
- LAP LENGTH 40 x BAR DIA. (MIN.). STAGGER LAPS, HOOKS & BENDS PER ACI 318.
- WALLS & RAFT DESIGNED AS WATER-RETAINING / EARTH-RETAINING ELEMENTS, PROVIDE 6" PVC WATERSTOP AT ALL CONSTRUCTION JOINTS.
- EXTERNAL WATERPROOFING TREATMENT ON ALL EARTH-FACING SURFACES, AS PER PROJECT SPECIFICATIONS.
- BACKFILL IN 6" LAYERS COMPACTED TO 95% MDD AFTER 14 DAYS CURING; BACKFILL BOTH SIDES SIMULTANEOUSLY.
- ALLOWABLE BEARING PRESSURE ASSUMED 1.0 TSF - TO BE VERIFIED ON SITE BY GEOTECHNICAL INVESTIGATION BEFORE CONSTRUCTION.
- PROVIDE 1% FLOOR SLOPE TO FLOOR DRAIN; 6" DIA. SEWER PIPE SLEEVE THROUGH WALL WITH PUDDLE FLANGE / WATERSTOP COLLAR.
- CURING MIN. 14 DAYS, NO CONSTRUCTION JOINTS OTHER THAN SHOWN WITHOUT ENGINEER'S APPROVAL.
- THIS DRAWING TO BE READ WITH ARCH. DWG. AW-29a. ALL LEVELS & SETTING-OUT TO BE VERIFIED WITH ARCHITECTURAL DRAWINGS.

#### BAR SCHEDULE (TYPICAL):

| MARK | LOCATION               | BAR | SPACING | REMARKS              |
|------|------------------------|-----|---------|----------------------|
| B1   | RAFT BOTTOM (B.W.)     | #4  | 9" C/C  | 3" COVER             |
| T1   | RAFT TOP (B.W.)        | #4  | 9" C/C  | 2" COVER             |
| V1   | WALL VERTICAL (E.F.)   | #4  | 8" C/C  | L-BEND 18" INTO RAFT |
| H1   | WALL HORIZONTAL (E.F.) | #3  | 8" C/C  | OUTSIDE V1           |
| S1   | STEPS MESH (E.W.)      | #4  | 8" C/C  | TIE TO WALL BARS     |

ABBREVIATIONS: B.W. = BOTH WAYS, E.F. = EACH FACE, E.W. = EACH WAY,  
C/C = CENTER TO CENTER, U.N.O. = UNLESS NOTED OTHERWISE

#### General Notes

ALL LEVELS AND DIMENSIONS  
ARE IN INCHES UNLESS  
INDICATED OTHERWISE.  
CONTOURS INTERVAL @ 1 FEET



#### CLIENT:



#### CONSULTANTS



#### PROJECT:

NEW ATCT, FIRE STATION & ALLIED  
FACILITIES, SKARDU INTL. AIRPORT

#### DRAWING TITLE:

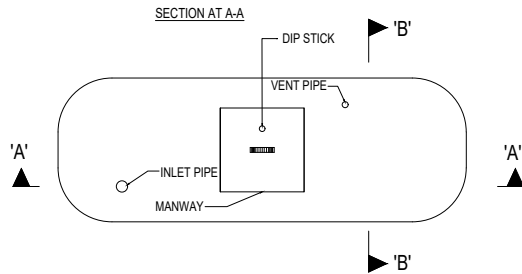
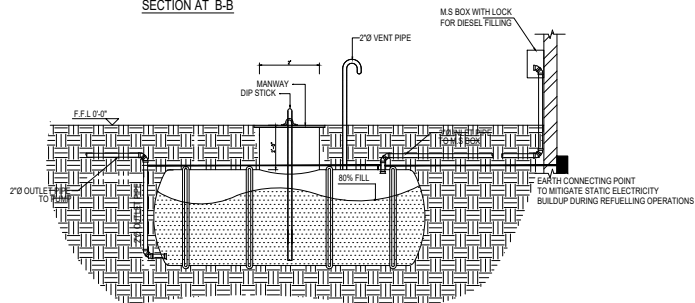
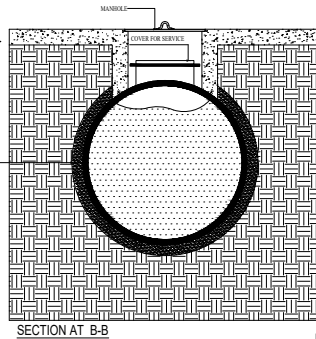
VEHICLE SERVICE PIT - STRUCTURAL  
DETAILS

|              |                     |          |            |
|--------------|---------------------|----------|------------|
| DESIGNED BY: | ENG. MUHAMMAD HANIF | SCALE:   |            |
| CHECKED BY:  | ENG. MURTAZA        | DATE:    | 03/08/2024 |
| FILE PATH:   | D:\NA               | PROJECT: | 03-02      |

ISSUED FOR TENDER

NOTE:-  
1. All drawings to be coordinated with relevant structural mechanical and other services before execution.  
2. Any discrepancy is to be brought to the attention of the Architect /Engineer prior to execution.

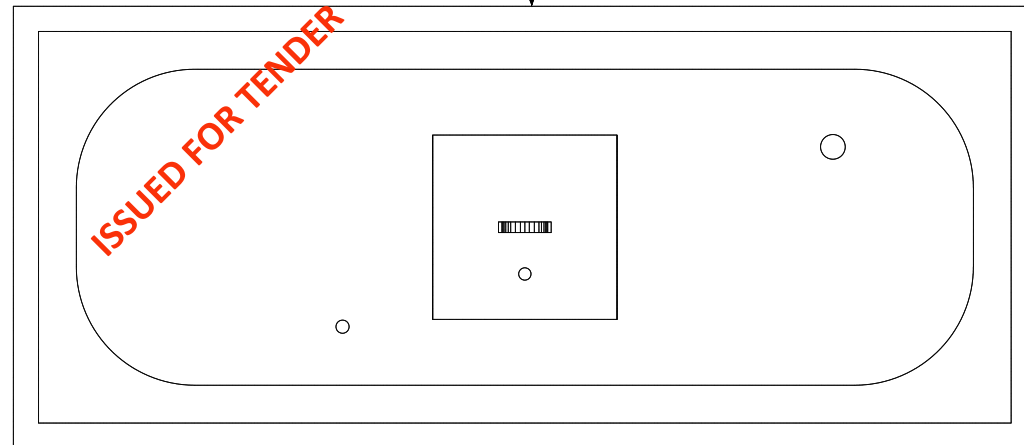
BUILDUP DURING REFUELLING OPERATIONS



PLAN VIEW

DIESEL TANK:-

5506 UK GALLON CAPACITY



#### NOTES:

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06 HIFIC BLOCK A FASAL TOWN LAHORE

#### JV MEMBERS

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#### Project Name

Consultancy Services for  
New Air Traffic Control Tower  
(ATCT), Fire Station and Allied  
Facilities at Skardu  
International Airport

#### DETAILED ELECTRICAL Design Drawings

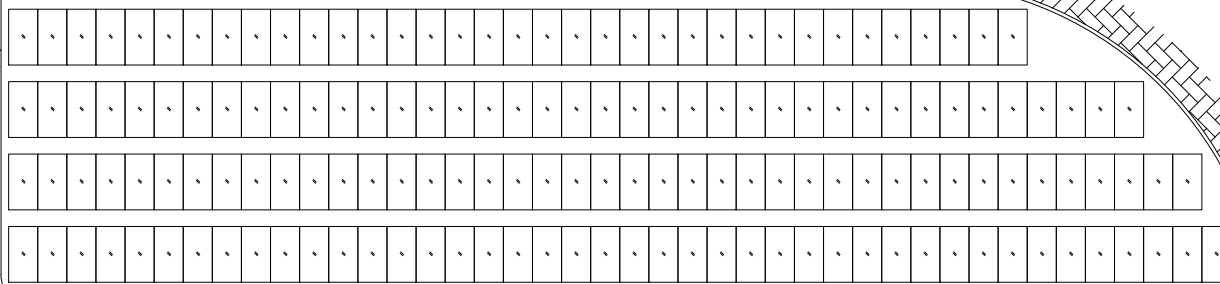
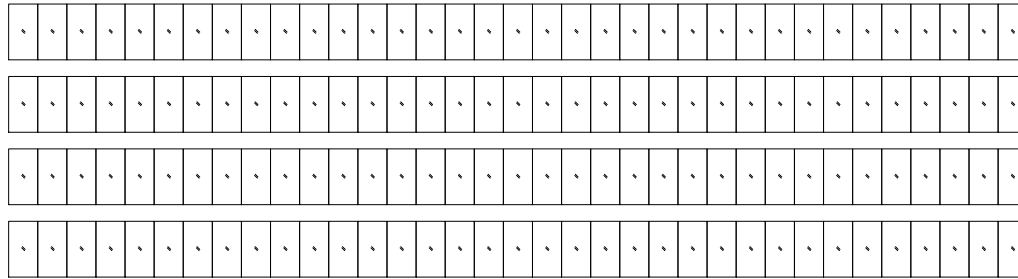
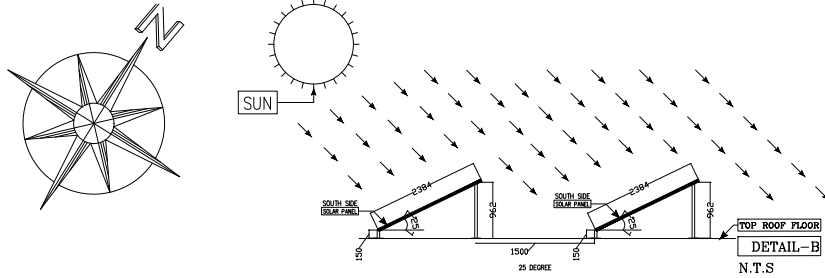
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#### DIESEL TANK SECTION DETAIL

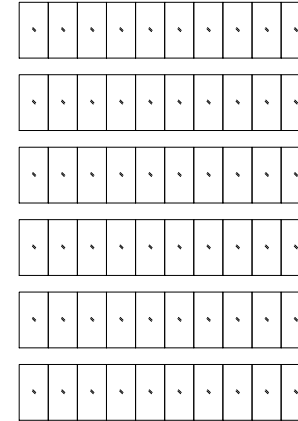
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| Scale       | NTS         |
| Drawn by    | A.S.B       |
| Checked by  | M.K         |
| Approved by | M.F         |
| Drawing No. | E-71        |

# SOLAR SYSTEM

| S.NO | NO OF PV PLATES | PER PV PLATE WATTAGE | TOTAL PRODUCTION IN WATTS | KW  | AVERAGE EFFICIENCY AT 75% |
|------|-----------------|----------------------|---------------------------|-----|---------------------------|
| 1    | 357             | 700W                 | 700 x 357 = 250,000W      | 250 | 250 x 0.75 = 187.5KW      |
|      |                 |                      |                           |     |                           |



FOOT PATH 5'-0" WIDE



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## JV MEMBERS

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Cell no: 0322-3924199  
E-mail: abstractorseng@gmail.com

## Project Name

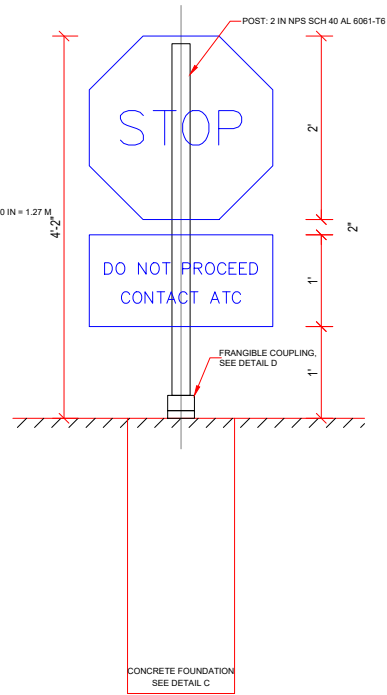
Consultancy Services for  
New Air Traffic Control Tower  
(ATCT), Fire Station and Allied  
Facilities at Skardu  
International Airport

## DETAILED ELECTRICAL Design Drawings

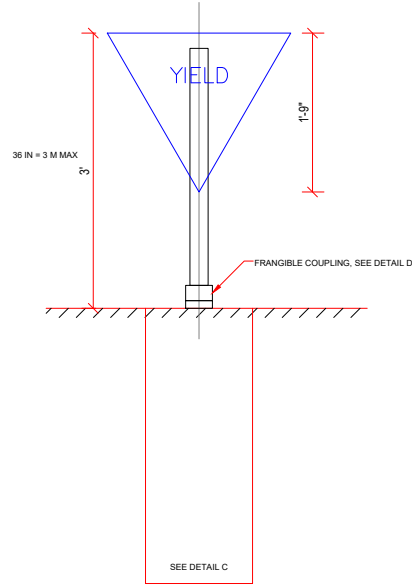
## Sheet Name

## SOLAR SYSTEM LAYOUT

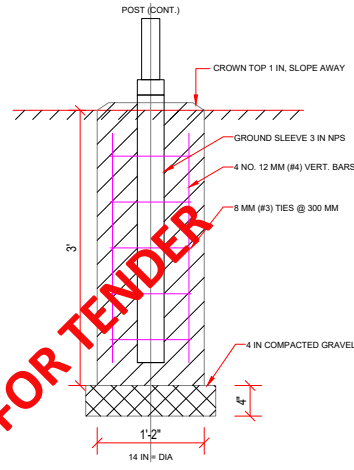
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|-------------|-------------|
| Date        | April, 2026 |
| Scale       | NTS         |
| Drawn by    | A.S.B       |
| Checked by  | M.K         |
| Approved by | M.F         |
| Drawing No. | E-66        |



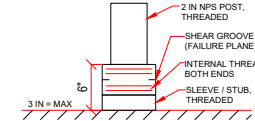
**DETAIL A**  
VERTICAL CONFIGURATION - SIGNS 1+2 (OR 1+3) ON COMMON POST  
TOTAL HEIGHT 1.27 M > 0.91 M: FRANGIBLE SUPPORT MANDATORY  
(AC 150/5340-18H FIG. 1-16 NOTE 3 / ICAO DOC 9157 PART 6)



**DETAIL B**  
SINGLE SIGN POST - SIGN 4 (YIELD) OR LONE STOP SIGN  
TOP OF SIGN 0.91 M (36 IN) MAX ABOVE GRADE / TOFA ELEVATION  
(AC 150/5340-18H FIG. 1-17 NOTE 3; KEEPS ASSEMBLY BELOW OLS)



**DETAIL C**  
TYPICAL FOUNDATION SECTION - ALL 4 SIGN POSTS  
CONCRETE C20/25 (3000 PSI MIN); INCREASE DEPTH TO LOCAL FROST LINE IF DEEPER

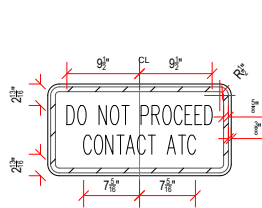


**DETAIL D (SCALE 2:1)**  
FRANGIBLE COUPLING AT EACH POST  
FAILURE PLANE 3 INCHES MAX ABOVE GRADE  
PER ICAO DOC 9157 PART 6 / FAA AC 150/5220-23

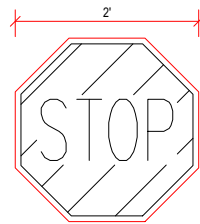
- OLS / HEIGHT COMPLIANCE NOTES (ICAO ANNEX 14 VOL. I, CHAP. 4; DOC 9157 PART 4):**
- SIGN ASSEMBLIES ARE HELD TO MINIMUM PRACTICAL HEIGHT: SINGLE SIGNS 36 INCHES MAX TO TOP OF PANEL; STACKED VERTICAL ASSEMBLY 50 INCHES MAX TO TOP OF STOP SIGN.
  - THE INNER EDGE OF THE TRANSITIONAL SURFACE (SLOPE 1:7, 14.3%) RISES FROM THE RUNWAY STRIP EDGE. AT THE 6-12 FT SERVICE ROAD OFFSETS OF AC FIGS. 1-16/1-17 THESE HEIGHTS REMAIN BELOW THE OLS FOR STANDARD STRIP WIDTHS. CONFIRM BY SITE-SPECIFIC OLS SURVEY BEFORE INSTALLATION; IF ANY PENETRATION IS FOUND, LOWER THE ASSEMBLY (HORIZONTAL CONFIG. AC FIG. 1-16/1-17, 36 INCHES MAX) OR RELOCATE.
  - ALL OBJECTS SITED WITHIN THE RUNWAY STRIP / TSA SHALL BE FRANGIBLE AND OF MINIMUM MASS (ANNEX 14 PARA. 9.9; DOC 9157 PART 6). FRANGIBLE COUPLINGS PROVIDED AT EVERY POST REGARDLESS OF HEIGHT.
  - FAILURE PLANE OF FRANGIBLE COUPLING 76 IN MAX ABOVE FINISHED GRADE. NO RIGID PROJECTION OF THE FOUNDATION MORE THAN 25 MM (1 IN) ABOVE GRADE (CROWN FOR DRAINAGE ONLY).

- GENERAL NOTES:**
- POSTS: 2 IN NPS SCH 40 ALUMINUM 6061-T6 (OD 60.3 MM, WALL 3.9 MM), OR HOT-DIP GALVANIZED STEEL WITH APPROVED FRANGIBLE COUPLING. ONE POST PER SIGN ASSEMBLY (PANELS 24 IN WIDE MAX).
  - FOUNDATION: 350 MM (14 IN) DIA X 900 MM (36 IN) DEEP CAST-IN-PLACE CONCRETE, C20/25 (3000 PSI MIN), OR 100 MM COMPACTED GRAVEL, EXTEND BELOW LOCAL FROST LINE WHERE DEEPER THAN 900 MM.
  - REINFORCEMENT: 4 NO. 12 MM (#4) VERTICAL BARS WITH 8 MM (#3) TIES @ 300 MM O.C., 75 MM COVER.
  - GROUND SLEEVE: 3 IN NPS GALVANIZED STEEL, EMBEDDED 840 MM, WITH BOTTOM DRAIN GAP, SET PLUMB.
  - DESIGN WIND SPEED 150 KMH (94 MPH) 3-SEC GUST ON FULL SIGN AREA, VERIFY LOCALLY IF HIGHER.
  - PANEL ATTACHMENT: 2 NO. M6 (5/16 IN) SS BOLTS PER PANEL, WITH NYLON WASHERS AT SIGN FACE, ANTI-ROTATION BRACKET OR DOUBLE-BOLT PATTERN AT EACH PANEL.
  - SIGN FACE MAY BE CANTED UP TO 30 DEG TOWARD VEHICLE OPERATOR (AC FIG. 1-16 NOTE 2).
  - ALL BURIED STEEL HOT-DIP GALVANIZED PER ASTM A123; ISOLATE AL/STEEL CONTACT WITH GASKETS.
  - LOCATE ASSEMBLIES PER SIGN LAYOUT PLAN. 6-12 FT OFFSET FROM SERVICE ROAD EDGE, 24 IN MIN CLEAR TO ADJACENT RUNWAY/TAXIWAY SIGNS. 2-10 FT FROM ROAD EDGE LINE PER AC FIGS. 1-16 / 1-17.
  - 1 IN = 25.4 MM; 1 FT = 0.305 M. DETAILS A-C FULL SCALE, DETAIL D AT 2:1.

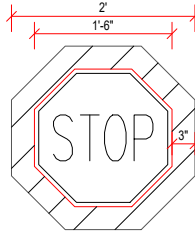
- GENERAL NOTES:**
- ALL DIMENSIONS ARE IN INCHES UNLESS NOTED. 1 INCH = 25.4 MM. DRAWN FULL SCALE (1:1).
  - TOTAL QUANTITY OF SIGN BOARDS: 6 (SIGNS 1 THROUGH 4). CONFIRM FINAL MIX WITH SIGN PLAN.
  - REFERENCES: FAA AC 150/5340-18H (9/30/2024), FIGURES 1-16 THROUGH 1-19; MUTCD STANDARD HIGHWAY SIGNS 2009 (REV. 1 & 2); FHWA STANDARD ALPHABETS; ICAO DOC 9157 AERODROME DESIGN MANUAL PART 4 (VISUAL AIDS); ICAO ANNEX 14 VOL. I.
  - ALL SIGN FACES SHALL BE RETROREFLECTIVE SHEETING PER ASTM D4956, TYPE IV OR HIGHER, ON 0.080 IN MIN. ALUMINUM BLANKS PER ASTM B209, ALLOY 5052-H38 OR 6061-T6.
  - STOP SIGN LEGEND/BORDER WHITE ON RED; DO NOT PROCEED SIGN LEGEND BLACK ON WHITE.
  - YIELD SIGN LEGEND RED, INNER WHITE, OUTER RED. COLORS PER MUTCD / FHWA COLOR TOLERANCE CHARTS.
  - DO NOT PROCEED LEGEND FONT: MUTCD SERIES B 2000, LETTER HEIGHT 2-1/2 IN, STROKE 5/16 IN. IF NO ATC AT AIRPORT, REPLACE 'CONTACT ATC' WITH 'ANNOUNCE TO CTAF' OR 'ANNOUNCE TO UNICOM'; THE APPLICABLE FREQUENCY MAY REPLACE 'CTAF/UNICOM' (AC FIG. 1-19, NOTE 5).
  - INSTALLATION: STOP SIGN AT 6-12 FT OFFSET FROM SERVICE ROAD EDGE. INSTRUCTION SIGN MOUNTED BELOW STOP SIGN (VERTICAL CONFIG.) OR AT 6 IN MAX GAP (HORIZONTAL CONFIG.); 24 IN MIN CLEAR TO ADJACENT RUNWAY/TAXIWAY SIGNS; SIGN FACE MAY BE CANTED UP TO 30 DEG (AC FIGS. 1-16 / 1-17).
  - SIGN SUPPORTS SHALL BE FRANGIBLE WHERE SIGN HEIGHT EXCEEDS 36 IN (91 CM) - AC FIG. 1-16 NOTE 3.
  - FRANGIBILITY PER ICAO DOC 9157 PART 6 AND AC 150/5220-23.
  - IT IS ACCEPTABLE TO COMBINE THE INSTRUCTION LEGEND AND STOP LEGEND ONTO ONE PANEL PER AC FIG. 1-18(C) FOR THE HORIZONTAL CONFIGURATION.
  - FASTENERS: STAINLESS STEEL, OR ALUMINUM, WITH NYLON WASHERS AT SIGN FACE.



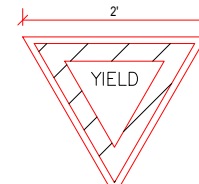
**SIGN 1 - DO NOT PROCEED SIGN (INSTRUCTION SIGN)**  
FAA AC 150/5340-18H FIG. 1-19 | MUTCD 24" x 48" BLANK | QTY: SEE SCHEDULE  
LEGEND: BLACK | BACKGROUND: WHITE RETROREFLECTIVE | FONT: MUTCD SERIES B 2000, HT 2-1/2", STROKE 5/16"



**SIGN 2 - STOP SIGN (MUTCD R1-1)**  
FAA AC 150/5340-18H FIG. 1-18(A) | 24" ACROSS FLATS  
LEGEND & BORDER: WHITE RETROREFLECTIVE | BACKGROUND: RED RETROREFLECTIVE



**SIGN 3 - STOP SIGN WITH ENHANCED BORDER**  
FAA AC 150/5340-18H FIG. 1-18(B) | 18" R1-1 + 3" BLACK BORDER (NOTE 3)  
LEGEND: RED | INNER BACKGROUND: WHITE | OUTER BACKGROUND: RED (ALL RETROREFLECTIVE)



**SIGN 4 - YIELD SIGN (MUTCD R1-2)**  
FAA AC 150/5340-18H FIG. 1-18(D) | 24" EQUILATERAL, POINT DOWN (AC PARA. 1.11.2.3)  
LEGEND: RED | INNER BACKGROUND: WHITE | OUTER BACKGROUND: RED (ALL RETROREFLECTIVE)

General Notes

ALL LEVELS AND DIMENSIONS  
ARE IN INCHES UNLESS  
INDICATED OTHERWISE.  
CONTOURS INTERVAL @ 1 FEET

CLIENT:



CONSULTANTS



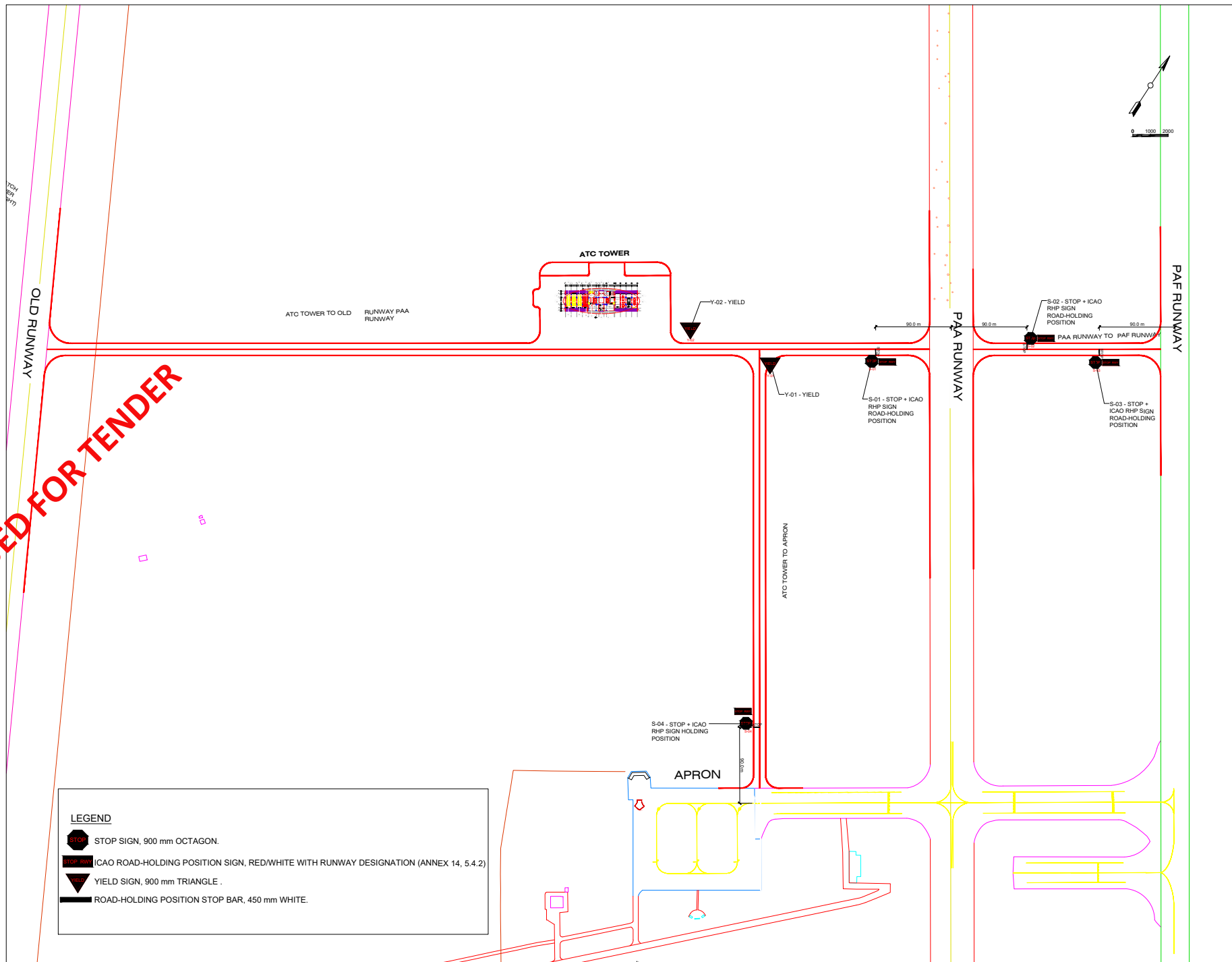
PROJECT:

NEW ATCT, FIRE STATION & ALLIED  
FACILITIES, SKARDU INTL. AIRPORT

DRAWING TITLE:  
AIRSIDE SERVICE ROAD DIRECTIONAL  
AND RESTRICTION SIGNBOARDS

|                    |                  |
|--------------------|------------------|
| DRAWN BY:          | SCALE:           |
| CHECKED BY:        | DATE: 01/08/2024 |
| FILE PATH:         | SHEET: 8/34      |
| QUANTITY NO. & IN: |                  |

ISSUED FOR TENDER



LEGEND

- STOP SIGN, 900 mm OCTAGON.
- ICAO ROAD-HOLDING POSITION SIGN, RED/WHITE WITH RUNWAY DESIGNATION (ANNEX 14, 5.4.2)
- YIELD SIGN, 900 mm TRIANGLE.
- ROAD-HOLDING POSITION STOP BAR, 450 mm WHITE.

General Notes

ALL LEVELS AND DIMENSIONS  
ARE IN METER UNLESS  
INDICATED OTHERWISE.  
CONTOURS INTERVAL @  
300mm

CLIENT:



CONSULTANTS



PROJECT:  
CONSULTANCY SERVICES FOR THE  
PREPARATION OF DETAILED  
DESIGN, PROCUREMENT SUPPORT  
AND CONSTRUCTION SUPERVISION  
OF NEW AIRTRAFFIC CONTROL  
TOWER (ATCT), FIRE STATION AND  
ALLIED FACILITIES ATSKARDU  
INTERNATIONAL AIRPORT, SKARDU

DRAWING TITLE:  
PLAN

|                             |                  |
|-----------------------------|------------------|
| DRAWN BY: ENUSULZAR MANDOUR | SCALE:           |
| CHECKED BY: ENUS MURTAZA    | DATE: 01-04-2023 |
| FILE PATH: 01-04            | DATE: 01-04-2023 |
| DRAWING NO: 01-01           | DATE: 01-04-2023 |