

Section VI. Terms of Reference

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PROJECT TITLE:

CONSULTING SERVICES FOR DETAILED ARCHITECTURAL AND ENGINEERING DESIGN (DAED) OF THE HORIZONTAL INFRASTRUCTURE DEVELOPMENT AT THE CLARK CIVIL AVIATION COMPLEX

1. INTRODUCTION

Clark International Airport Corporation (CIAC) outlines the priority flagship projects at the Civil Aviation Complex designed to promote entertainment and sports development, boost tourism, sustainability, and regional growth. Initially, the projects have been strategically identified and integrated into the CIAC Master Development Plan: (a) Construction of CRK Direct Access Link from SCTEx to Airport Road New Terminal Building, (b) Construction of CIAC Entertainment and Events Hub Connector Road along Gil Puyat Avenue, (c) Upgrading of Clark National Food Hub Gateway, and Construction of Connecting Access Road from C.M. Recto Avenue to Airport Road New Terminal Building, (d) Construction, Expansion, and Upgrading of the Remaining Road Network and Utilities (Districts 1, 2, 3, & 4 of CIAC-MDP), (e) Development of CIAC Aviation Park (minimum approximate area: ~ 6.0 Ha.) and (f) Development of CIAC Picnic Ground (minimum approximate area: ~ 7.0 Ha.) further solidifying their significance as integral parts of the flagship projects of CIAC.

Before the aforementioned developments can be implemented consistent with the CIAC Master Development Plan (CIAC-MDP), CIAC needs the services of a Consultant who shall conduct the Detailed Architectural and Engineering Design of the horizontal infrastructures in Clark Civil Aviation Complex (CCAC) based on the latest CIAC-MDP.

2. DESCRIPTION OF CONSULTING SERVICES

The consulting services required under this Terms of Reference (TOR) shall be the Detailed Architectural and Engineering Design (DAED) for the Horizontal Infrastructures of CIAC-MDP herein referred to as the "Project".

The project shall consist of, but not be limited to the following:

Alignment study, detailed design of the road and mass transport alignment, road right of way, bridges/interchanges, toll plazas, picnic grounds parks, aviation parks and open spaces, pavements, sidewalks, walking alleys, bike lanes, motorcycle lanes, slope protection, road lighting, drainage, utility corridor, landscapes, hardscapes, ancillary, and

other items that will complete all the requirements for horizontal development.

The utility corridor shall be composed of power, water, sewer, and ICT for both ways. The utility corridor design shall be in accordance with the utility requirements of the parcels, future locators, and establishments, and should be based on the land use and GFA described in the CIAC-MDP.

The CIAC is therefore seeking an experienced company to design and prepare tender documents for actual construction and implementation of the horizontal infrastructure developments.

3. OBJECTIVES

The overall objective of the consulting services is to provide CIAC with detailed architectural and engineering design for the actual construction of interchanges, elevated highways, toll plazas, bridges, picnic ground, aviation park and open spaces, road networks (major and minor), walking alleys, bike lanes, motorcycle lanes, drainages, slope protections, landscapes, hardscapes, and other horizontal infrastructure development based from the CIAC Master Development Plan (CIAC-MDP) and as required in this TOR.

4. SCOPE OF SERVICES

To attain the above objective, the Consultant shall render services to include but not limited to the following:

- 4.1. Provide and guarantee the highest quality of detailed architectural and engineering consulting services required to do the architectural and engineering design following the DPWH Design Standards and Guidelines, Criteria, and Traffic Standards; traffic, topographic, parcellary, geohazard, road-right-of-way, drainage, hydrologic/hydrogeological study, rivers/waterways, and geotechnical surveys/studies; detailed engineering and architectural design works; architectural drawings and perspectives, site development plan, sections, elevations, 3D models, walkthroughs, landscape, hardscape, technical specifications, detailed unit price analysis, and cost estimates, program of works, construction drawings and bidding documents; Engineering Geological and Geohazard Assessment Report (EGGAR).
- 4.2. Include disaster resilience components in the design and green concept for the above-mentioned primary roads and must be in line with the Key Performance Indicators (KPIs) of CIAC Infrastructures and the Concept of the latest approved Master Development Plan and Design Standards and Guidelines of CIAC.

- 4.3. The latest Master Development Plan and Design Standard and Guidelines of the CIAC shall take precedence over the DPWH Guidelines (whichever is more stringent). The Consultant shall also take into consideration the existing design for the parks and open spaces, picnic grounds, roads and utilities.
- 4.4. Integrate the Master Development Plan of the CIAC for existing locators in the overall utility network of the project. All available information will be provided by the CIAC.
- 4.5. The Consultant shall study the CIAC project phasing plan for the construction and development of the CIAC main and internal road networks. The Consultant should advise CIAC on the practicality of the phasing plan and ensure that the For-Construction drawings of each phase will properly connect to existing infrastructure, roads, road right-of-way, and utilities and are usable when each phase is completed.
- 4.6. The Consultant will review the conditions of existing terrains and roads, right-of-way, hydrogeologic requirements, and CIAC's latest MDP, and will design the picnic ground, aviation park and open spaces, horizontal/road network to allow the construction of utility corridors where needed. This includes quantification and scope definition of the demolition/removal and restoration methodology.
- 4.7. Consolidate constructed plans of parks and open spaces, picnic grounds, existing roads, structures, and utilities into the whole design of the project. The consolidated file shall consist of, but not be limited to, the details of the plan and profile, bridges, elevated highways, interchanges, picnic grounds, aviation parks, utility plan, drainage, rivers/waterways, canals, slope protection structures plan, sidewalk, bike lanes, streetlights, landscapes, hardscapes, area lighting and New CIAC Headquarters. CIAC will only provide available copies of all existing conditions of all infrastructure within Clark Civil Aviation Complex (CCAC). The Winning consultant will include all these into a consolidated design, and will review conflicts using BIM.
- 4.8. The Winning Consultant shall upload all the plans of the project and existing structures in the Two (2) laptops with BIM software and shall turn over the same to CIAC. Each of the two (2) laptops shall have one (1) year licensed Building Information Modeling Software (BIM).
- 4.9. The Consultant Shall also conduct knowledge-transfer activities to CIAC personnel on the design process and operation of the BIM

- 4.10. The Consultant shall identify and include all areas that will require UXO survey within the project scope and reflect the corresponding cost on the Bill of Quantities.
- 4.11. The Consultant shall provide Five (5) units of laptop computers equipped with the system specifications that shall effectively facilitate the optimum delivery of the required outputs, with the following features and specifications but not limited to:

Particulars	Minimum Requirements
Processor	No. of Core: 14 No. of Thread: 20 Hybrid Cores Performance Core: 6 Efficient Core: 8
Memory	32GB DDR5 4800MHz RAM
Disk Storage	2 (units) 2TB PCIe SSD RAID 1
Video Card	8GB GDDR6 Graphics Card
Display	15.6-inch FHD
OS:	<ul style="list-style-type: none"> • Latest Operating System • Should be installed in SSD • Should be licensed • Should be in professional edition (64-bit) • Should have integrated antivirus of the same brand as operating system • Should have official compatibility with office productivity tools
Network and Communication	WIFI 6, ethernet port, Dual band 2*2 + Bluetooth 5.2 wireless card
Ports	2 USB 3.0 Ports, 1 USB C Port
Battery	60Whrs, 45W, 4-cell Li-Ion
Warranty:	<ul style="list-style-type: none"> • 3 years standard warranty on site service, parts, and labor for the laptop; and • 1year standard warranty on site service, parts, and labor for battery and AC adapter
Software/Application:	
MS Office (>= V2021)	Five (5) Lic. - perpetual license
AutoCAD (>= V2020)	Two (2) Lic. - One (1) year license
BIM Software (which can read, create and processed BIM file formats such as but not limited to; DWG, DXF,	Two (2) Lic. - One (1) year license

IFC, NWD, NWC, NWF, RVT, RTE, and RFA)	One (1) Lic. - One (1) year license (latest version)
Trimble Aerial Photogrammetry Solutions (LIDAR output processing software)	
All subscriptions should be licensed. All subscription(s) based software or application shall be addressed to "Lic.Admin@ciac.gov.ph"	

4.12. The Consultant shall issue a rental of 3-unit Ink Tank Printer with supply of ink for CIAC ED use during project implementation. Specs: A3 size capable, copy/print/scan/, WIFI wireless printing capability, and with supply of ink.

4.13. The Consultant shall undertake the following activities for the CCAC Area of 1,398.55 Hectares, but not limited to:

- 4.13.1. Complete Set of Drawings with Cover Sheet
- 4.13.2. Key Plan, Project and Vicinity Map, and Perspectives
- 4.13.3. Location Map
- 4.13.4. Collection and Review of Existing Data and Documents
- 4.13.5. Alignment and road-right-of-way Study
- 4.13.6. Hydrologic Study including the entire CCAC area (2,367ha)
- 4.13.7. Traffic Study, including daytime and night time population projection.
- 4.13.8. Conduct of Aerial LiDAR Survey of the CCAC Area of 1,398.55 Hectares.

4.13.8.1 For areas within the CCAC where existing site conditions or elements (e.g., overgrown tree canopies, signal interference) may obstruct or compromise LiDAR data accuracy, the winning bidder must conduct a survey of affected parcels/ areas to generate the necessary technical data.

- 4.13.9. Provide seven (7) sets-survey control points, copper plate plaque on reinforced concrete foundation and pedestal monument, NAMRIA certified and registered.
- 4.13.10. Parcelation Survey of approximately/minimum of **157** hectare-portion of the **CCAC** area (see attached annexes for the conceptual subdivision scheme/**parcel cuts**)

4.13.10.1 Integrate the following existing CIAC survey data (Boundary Stake-out and Topographic Survey) of approximately 200 selected CCAC Parcels, and the parcels bisected by existing roads into the database of technical results and outputs from this project survey:

- a) **Location Plan with Vicinity Map,**
- b) **Survey/Sketch Plan,**
- c) **Lot Information Plan,**
- d) **AutoCAD file of staked-out survey parcels plotted in PRS 92 PTM Zone III Reference system, Geotagged Photos of installed corner markings, and**
- e) **Topographic Survey of 3.7 km Road, West Kamikaze Airfield, and Clark Picnic Grounds**
- f) **NAMRIA Certifications of established geodetic control points (GCPs): CIAC-1, CIAC-2, CIAC-3**

- 4.13.11. **Topographic Survey (including the threshold of the three-runway system at 3.2km and 4.0km).**
- 4.13.12. **Removal, Demolition, and Re-location Survey of all affected vertical and horizontal structures, trees, and utilities**
- 4.13.13. **Structural/Facilities/Utilities Survey**
- 4.13.14. **One (1) complete set each Geotechnical Survey/Soil Investigation Analysis of the CCAC Area: District 1, District 2, District 3, and District 4. (For vertical structures, interchanges, elevated highways, and road sections with excavation depth requiring geotechnical study should be conducted to determine the presence of soft and/or hard rock within the alignment of the project)**
- 4.13.15. **Conduct Engineering Geological and Geohazard Assessment (EGGA) of the CCAC Area of 1,398.55 Hectares**
- 4.13.16. **Hydrogeological Investigation with Resistivity Survey of CCAC area of 1,398.55 Hectares.**
- 4.13.17. **Conduct an Environmental Compliance Study and Environmental Impact Assessment for the Environmental Compliance Certificate (ECC) acquisition from the Department of Environment and Natural Resources (DENR) for the CCAC Area of 1,398.55 Hectares.**
- 4.13.18. **Construction Materials Investigation/Survey**
- 4.13.19. **Detailed Architectural and Engineering Design**
 - **Road/Highway Design**

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- Structural/Bridge Design
- Drainage Design
- Slope Protection Design, Water & waste waterways Design
- Road Lighting Design
- Landscape Design (Planting Strip Design Details based on the approved DSG of CIAC MDP)
- CIAC Picnic Ground Park
- CIAC Aviation Park and Open Space
- Utility Corridor Design for the Power, Water, Sewer, and Telco/Fiber Network
- Security command center
- Toll plazas including all facilities.

4.14. As a result of the survey works, the Consultant shall provide, but not be limited to, the following information:

- 4.14.1 Traffic Analysis Report including daytime and night time population projection.
- 4.14.2 LIDAR Survey Outputs/Deliverables (signed)

Output	Format	Quality
Classified Point Cloud Data	LAZ	Georeferenced Minimum 20 points per sqm Classified for Vegetation, Bare Earth, Structures, and Water Maximum 5 cm vertical accuracy
Digital Surface Model (DSM)	TIFF; PDF	Maximum 15 cm GSD
Digital Terrain Model (DTM)	TIFF; PDF	Maximum 15 cm GSD
Images	TIFF	Single Image Orthophoto Mosaic
Topographic Map	DWG; PDF	In proper scale 1 meter contour interval
Contours	SHP; DXF; DWG	Major contour interval: 5 m Minor contour interval: 1 m
Features i.e. Structures, Roads, Utilities, etc.	SHP; DWG	Maximum 10 cm horizontal accuracy
Project Report	DOCX; PDF	Comprehensive

- 4.14.3 Parcellation Survey Outputs/Deliverables (signed and sealed)
- a) Location Plan with Vicinity Map of individual parcels **(Signed and Sealed hard copies and soft copies in DWG, RVT, KMZ formats),**
 - b) Lot Information Plan of individual parcels **(Signed and Sealed Hard copies and Soft Copies in DWG, RVT, KMZ formats)**

- c) **Sketch Plan (Signed and Sealed Hard copies and Soft Copies in DWG, RVT, KMZ formats),**
- d) **Installation of concrete markings/Stakeout of parcel boundary corners.**
- e) **Threshold coordinates and elevations of the second (at 3.2km and 4.0km) and third (at 3.2km) runways**
- f) **Geotagged photos of all concrete corner markings taken from the North, East, West, and South directions showing the actual concrete marker and its nearby surroundings**
- g) **File directory and tabulation of all technical details, area and coordinates.**

- 4.14.4 Geotechnical Investigation Report
- 4.14.5 Engineering Geological and Geohazard Assessment Report (EGGAR)
- 4.14.6 Hydrogeological Report and Resistivity Survey
- 4.14.7 Structural Analysis Report of the Interchange (CRK Direct Access Link) and other structures that may be required.
- 4.14.8 Markings of road boundary corners
- 4.14.9 Survey control points certified and registered by NAMRIA
- 4.14.10 Vertical Control/Profile Leveling
- 4.14.11 20-meter interval cross-sections
- 4.14.12 Structural/Facilities/Utilities Plan
- 4.14.13 Removal, Demolition, and Re-location Survey Plans of all affected vertical and horizontal structures, trees, and utilities
- 4.14.14 Utility Corridor Report (Power, Water, Sewer, ICT) incorporating results of the actual on-the-ground comprehensive survey of utility systems within the CCAC and the reference files from the utility companies within the Clark Freeport Zone.

4.14.14.1 Provide the DWG, RVT, KMZ and SHP files of the Comprehensive survey of the utility systems within the CCAC including the overhead posts, accessories, auxiliary systems and all other incidental and support fixture, materials and devices.

4.14.14.2 Generate comprehensive maps (in DWG, RVT, KMZ and SHP formats) for each of the utility systems, that contains both the data from the actual on-the-ground utility survey and the contents of the reference files acquired from the utility companies

within the Clark Freeport Zone (e.g., Clark Water Corporation, Clark Electric Distribution Corporation, PLDT, Converge).

4.14.15 Location and sources of construction materials

4.15. Provide complete architectural and engineering detailed plans and drawings which shall include, but not be limited to, the following:

- 4.15.1 Complete Set of Drawings with Cover Sheet
- 4.15.2 Key Plan, Project and Vicinity Map and Perspective
- 4.15.3 Location Map
- 4.15.4 Plan and Profile Sheets with all topographic information within the survey corridor
- 4.15.5 Soils and Materials Investigation Maps (Boring logs and Soil stratigraphy)
- 4.15.6 Architectural Plans, Perspectives, Schematic Design and Walkthroughs (CIAC Picnic Ground, Aviation Park and Open Spaces, Walking Alleys, Toll Plazas, Interchange, and other required facilities)
- 4.15.7 Typical Cross Sections
- 4.15.8 Construction Details
- 4.15.9 Removal and Demolition plan of all structures affected by the horizontal construction and development
- 4.15.10 Toll Plaza, Bridge/Interchange Structural Details, Cross-Sectional and Elevation Views
- 4.15.11 Drainage Plan and Profile and Cross-Section Details
- 4.15.12 Sewer Plan and Profile and Cross-Section Details
- 4.15.13 Utility Corridor Plan (Power, Water, Sewer, ICT), Cross-Section and
- 4.15.14 Invert Elevation of Tapping Points
- 4.15.15 Water and Sewer Service Connection Details
- 4.15.16 Materials Sources Location Maps
- 4.15.17 Intersection Maps
- 4.15.18 Minor Drainage Structure Drawings
- 4.15.19 Major Structure Drawings
- 4.15.20 Slope Protection Drawings
- 4.15.21 Road Signs and Pavement Markings
- 4.15.22 Pedestrian lane, walking alley, motorcycle lane, bike lane
- 4.15.23 Power Supply and Street Lighting Design and Details
- 4.15.24 Utility Relocation Maps
- 4.15.25 Subdivision Plan for Relocation
- 4.15.26 Ancillary Works / Miscellaneous Details
- 4.15.27 Detailed Cross-Sections
- 4.15.28 Right-of-Way Plans
- 4.15.29 Landscaping, Hardscaping Plan
- 4.15.30 Traffic Management Plan

- 4.15.31 Security/CCTV system
 - 4.15.32 Traffic Signalization Plan
 - 4.15.33 Drawing Index
 - 4.15.34 Summary of Quantities, Costs, Detailed Unit Price Analysis (DUPA), and Detailed Quantity Calculations
- 4.16. Coordinate with the utility partners (Clark Water, Clark Electric, PLDT, and others) for the design of the utility corridor. The design should be in conformance with the standards of the utility partners and the detailed standards and guidelines of CIAC MDP.
- 4.17. Conduct a detailed relocation plan of the existing utilities that should be outside the leasable areas of CIAC.
- 4.18. Conduct detailed study and recommendations among the existing and new integrated bike lanes, sidewalks, walking alley, hardscape, landscape, and pedestrian crossings along bridge/overpass sections, Toll Plaza and interchange (complete design), CIAC Picnic Grounds, CIAC Aviation Parks and Open Spaces, and road intersections inside the CCAC.
- 4.19. Conduct detailed study and recommendations on the streetlights and lamp posts to be used inside the CCAC (conventional, solar/hybrid, or combination).
- 4.20. Conduct detailed surveys, estimates, quantifications, and studies on the existing vertical and horizontal structures (buildings, interchanges, roads, parks, picnic grounds, sidewalks, drainages, etc.) that are to be demolished, restored, or reconstructed.
- 4.21. Conduct of inventory and quantification for the trees affected which are to be removed and/or relocated during the construction of the roads.
- 4.22. Provide detailed quantity calculations, detailed cost estimates, and detailed unit price analysis (DUPA).
- 4.23. Provide Sex Disaggregated Data of Personnel assigned in the execution of this DAED contract and demographics of Project Affected Persons during construction.
- 4.24. Provide Technical Specifications that shall comply with the latest DPWH Design Standards and have to include the descriptions of the work items, material requirements, construction requirements, methods, methods of measurements, and basis of payments. The sampling, testing, and inspection requirements shall be included in the specifications of applicable work items.

4.25. Provide Program of Works (Bill of Quantities, Plans, Detailed Cost Estimates, DUPA, Technical Specifications), Terms of Reference, and Bidding Documents (using CIAC format) for each proposed construction of horizontal and vertical structures (Roads, Interchanges with Toll Plazas, Drainages, Slope protections, walking alleys, pedestrian lanes, bike lanes, motorcycle lanes, medians, street lights, CCTV/Security camera, landscapes, hardscapes, traffic signal system, signages, pavement markings, underground utilities, and all other items to complete the project requirements) to be prioritized for construction based on the latest edition of Implementing Rules and Regulations of RA 9184:

- 4.25.1 Construction of CRK Direct Access Link from SCTEx to Airport Road at the New Terminal Building.
- 4.25.2 Construction of CIAC Entertainment & Events Hub Connector Road along Gil Puyat Ave.
- 4.25.3 Upgrading of Clark National Food Hub Gateway, and Construction of Connecting Access Road from C.M. Recto Avenue to Airport Road New Terminal Building

4.26. The Consultant shall provide the DAED including all related bidding documents (BOQ, DUJA, TOR, DQC, POW, Drawings, etc.) of the following projects, to include the development phasing plan of every project item:

- 4.26.1 Construction of CRK Direct Access Link from SCTEx to Airport Road at the New Terminal Building.
 - 4.26.1.1 Phase 1 – 2 lanes
 - 4.26.1.2 Phase 2 – additional 2 lanes, 3 lanes
- 4.26.2 Construction of CIAC Entertainment & Events Hub Connector Road along Gil Puyat Ave.
 - 4.26.2.1 Phase 1 – 2 lanes
 - 4.26.2.2 Phase 2 – additional 2 lanes, 3 lanes
- 4.26.3 4.24.3 Upgrading of Clark National Food Hub Gateway, and Construction of Connecting Access Road from C.M. Recto Avenue to Airport Road New Terminal Building
 - 4.26.3.1 Phase 1 – 2 lanes
 - 4.26.3.2 Phase 2 – additional 2 lanes, 3 lanes
- 4.26.4 4.24.4 Construction, Expansion, and Upgrading of the Remaining Road Network and Utilities (Districts 1, 2, 3, & 4 of CIAC-MDP)
 - 4.26.4.1 Phase 1 – 2 lanes
 - 4.26.4.2 Phase 2 – additional 2 lanes, 3 lanes
- 4.26.5 Development of CIAC Picnic Ground
- 4.26.6 Development of CIAC Aviation Park and Open Spaces
- 4.26.7 Additionally, The DAED Consultant shall also submit all related bidding documents (BOQ, DUPA, TOR, DQC, POW, etc.) of the Construction, Management, and Supervision

(CMS) project for the aforementioned projects that are required during the implementation.

A complete developmental phasing (design and construction) shall be issued by CIAC during the implementation of the project.

4.27. Conduct a study and recommendations on the CIAC phasing plan for the construction and development of the other remaining Road networks and utilities of CIAC-CCAC based on the latest CIAC-MDP. The Consultant must ensure that every study and recommended construction phasing plan shall be usable upon every completion. The Consultant shall also submit separate Bidding Documents, Technical Specifications, Bill of Quantities, Plans, Detailed Cost Estimates, DUPA, and all other tender documents for each of the approved phases.

4.27.1 Construction, Expansion, and Upgrading of the Remaining Road Network and Utilities (Districts 1, 2, 3, & 4 of CIAC-MDP)

4.28. Provide material, personnel, and equipment utilization program, construction schedule, and S-Curve.

4.29. Provide Engineering Geological and Geohazard Assessment Report (EGGAR) of the CIAC-CCAC with a total area of 1,398.55 Hectares.

4.30. Provide a Geotechnical Study Report on Districts 1, 2, 3, & 4.

4.31. Provide LIDAR Survey Outputs/Deliverables, signed hard copies, electronic files (in .kmz, .dwg, .pdf, LAS files, images), and all other product generation files.

4.32. Prepare and accomplish all necessary CAAP documents, forms, and plans signed and sealed by the winning bidder's Registered and Licensed Geodetic Engineer (and any other required professionals) for the Height Limit (HL) evaluation within the Boundary Stake-out survey area (approximately 200 parcels) and the 157-hectare portion (see attached annexes for the conceptual subdivision scheme/parcel cuts). The above documents will be used and submitted by CIAC for the Height Limit Evaluation to CAAP.

4.33. Facilitate the approval of all the plans from concerned utility providers, other private entities, and/or government agencies.

4.34. Conduct of Gender and Development (GAD) Seminar at least one (1) seminar to its project personnel, in coordination with CIAC-GAD

TWG, within sixty (60) calendar days of the contract implementation, and provide completion report covering the summary of activities conducted with photo documentation.

- 4.35. Coordinate with the concerned government agencies or local government units, locators, NGO's, utility companies, and all other affected parties relative to the Project; and
- 4.36. Provide on-call services, and technical assistance during the bidding process, pre-construction, and construction stages, and provide technical assistance in the modification of the plans that may arise during the implementation stage at no additional cost to CIAC within 10 years after project completion.
- 4.37. Provide all other reports that CIAC may require.

5. OBLIGATIONS OF THE CONSULTANT

- 5.1. Responsibilities of the CONSULTANT. Generally, but without limiting the Consultant's responsibilities elsewhere stated under this TOR which shall form part of the Contract, the Consultant shall:
 - 5.1.1. Carry out the preparation of the DAED with sound theories and practices and in accordance with the standards, specifications, timetable, guidelines, and provisions of the TOR.
 - 5.1.2. Accept full responsibility for the consulting services to be performed under this TOR including applicable warranties on the integrity and soundness of the design.
 - 5.1.3. Perform the work in an efficient and diligent manner.
 - 5.1.4. Provide on-call services, and technical assistance during the bidding process and construction phase to answer inquiries or make clarification regarding the design as CIAC may require at no additional cost to CIAC within 10 years after project completion.
- 5.2. **Records.** The Consultant shall keep accurate and systematic records and accounts with respect to the consulting services in such form and with such details as is customary and sufficient to establish accurately that the costs and expenditures have been duly incurred.
- 5.3. **Information and Progress Reports.** In addition to the reports required in the TOR, the Consultant shall furnish CIAC periodic progress reports and any such information relative to the consulting

services as CIAC may from time-to-time reasonably request and as the Commission on Audit (COA) may require on post audit.

- 5.4. Assignment and/or Sub-Contract. Except with prior written approval of CIAC, the Consultant shall neither assign nor sub-contract any part of the professional consulting services to any other person or firm.
- 5.5. Prohibition on Association. The Consultant agrees that during or after the conclusion or termination of the Contract, limit its role to providing the consulting services herein defined and hereby disqualifies itself and any other contractor, consulting engineer, or manufacturing firm with which it is associated or affiliated from providing goods, works and services during the implementation of the primary access roads.
- 5.6. Prohibition on Professional Engagement. No full-time Staff of the Consultant during his assignment under the Contract shall, without the written consent of CIAC, engage directly or indirectly, either in his name or through the Consultant, in any activity in the Philippines which will conflict with the performance of his duties or assignment under the Contract.
- 5.7. Confidentiality. Except with the prior written consent of CIAC, the Consultant or its Principals and Staff shall not at any time communicate to any person or entity any information disclosed thereto for the consulting services, nor shall the Consultant or its Principals and Staff make public any information as to the recommendations formulated in the course of or as a result of the consulting services.

During the effectivity of the Contract, the Consultant shall not render its services directly to any person or entity who is or has been an adverse party in any litigation or issue against CIAC or whose business or interest is in conflict with or against the interest of CIAC. This prohibition shall subsist for two (2) years after the expiration of the Contract.

In all cases, the Consultant who may be indirectly associated with any entity that may have a conflict of interest in or bias against CIAC Group shall be required to disclose the extent of such relationship, so CIAC may act upon the same accordingly.

- 5.8. Independent Contractor. Nothing contained herein shall be construed as establishing or creating between CIAC and the Consultant the relationship of employer and employee or principal and agent, it is understood that the position of the Consultant and

anyone else performing the consulting services is that of an independent contractor.

6. OBLIGATIONS OF CIAC

- 6.1. Project Data. CIAC shall make available to the Consultant for reference all existing documents about the Project, the latest Master Development Plan including the available files of the Existing and Projected Road Network, Picnic Grounds, Parks, and Open Spaces, **conceptual subdivision scheme/parcel cuts of the 157-hectare area identified by CIAC, Topographic and the Boundary Stake-out survey selected CCAC Parcels.** However, it is the Consultant's responsibility to validate the information and data provided. Whenever practicable, CIAC shall assist the Consultant in securing data from concerned government agencies/offices.
- 6.2. Access to Land and Property. CIAC shall arrange with the agencies concerned with the primary access roads for free and unimpeded access by the Consultant's Personnel to all lands and properties in respect of which access is required for the performance of the consulting services.
- 6.3. Evaluation of Consultant's Outputs. CIAC shall review and evaluate the documents submitted by the Consultant as required herein.

7. DELIVERABLES

The Consultant is expected to deliver the following to CIAC:

- 7.1. Detailed architectural and engineering plans and drawings on one original A-1 size (594mm x 841mm) Mylar Sheet, five (5) other copies in a blueprint, and three (3) copies in A-3 size quality paper including the electronic files (ACAD, PDF, and other corresponding output files). The drawings shall be prepared using AutoCAD format not lower than its 2019 version. (Refer to item 4.11)
- 7.2. One (1) original and five (5) other copies of the detailed cost estimates, unit price analysis, technical specifications, and tender documents in A-4 size quality paper and prepared using MS Office latest version including electronic files;
- 7.3. Draft drawings for CIAC's review or in support of progress payments shall be submitted in three (3) sets of A-3 size quality paper. All other documents for submission to CIAC for review or in support of progress payments shall be submitted in three (3) sets of A-4 size quality paper including electronic files;

- 7.4. Monthly Progress Reports indicating, but not limited to, the updates and accomplishments of the activities the Consultant undertook for a particular month in three (3) sets of A-4 size quality paper including electronic files. The monthly reports shall also include the problems encountered by the Consultant in conducting its activities, its recommendations and solutions provided; coordination meetings attended and their outcomes; and a log of correspondences;
- 7.5. Final Report, Bidding Documents in three (3) sets of A-4 size quality paper including electronic files and Detailed Engineering Design; and
- 7.6. Reports on the activities as enumerated above and all other reports that may be required for this consulting services by CIAC
- 7.7. Clash Analysis Report of the overall utilities design that shall include: a) 3- sets of Narrative of the Underground Utilities b) 2 sets Printed Mylar in A-1 size, 1 set in A-3 size paper.
- 7.8. Electronics copy/soft copy shall be in applicable/appropriate format: .DWG, .PDF, .JPEG, .PNG, .DOCX, .XLS, .PPT, .KMZ, LAS files, and other LIDAR Survey output files. These files shall also be compiled in three (3) SSD external hard drives, 2TB capacity/each, and be submitted to CIAC.
- 7.9. All related bidding documents (BOQ, DUPA, TOR, DQC, POW, Drawings, etc.):
- 7.9.1 Construction of CRK Direct Access Link from SCTEx to Airport Road at the New Terminal Building.
- 7.9.1.1 Phase 1 – 2 lanes
- 7.9.1.2 Phase 2 – additional 2 lanes, 3 lanes
- 7.9.2 Construction of CIAC Entertainment & Events Hub Connector Road along Gil Puyat Ave.
- 7.9.2.1 Phase 1 – 2 lanes
- 7.9.2.2 Phase 2 – additional 2 lanes, 3 lanes
- 7.9.3 Upgrading of Clark National Food Hub Gateway, and Construction of Connecting Access Road from C.M. Recto Avenue to Airport Road New Terminal Building
- 7.9.3.1 Phase 1 – 2 lanes
- 7.9.3.2 Phase 2 – additional 2 lanes, 3 lanes
- 7.9.4 Construction, Expansion, and Upgrading of the Remaining Road Network and Utilities (Districts 1, 2, 3, & 4 of CIAC-MDP)
- 7.9.4.1 Phase 1 – 2 lanes
- 7.9.4.2 Phase 2 – additional 2 lanes, 3 lanes
- 7.9.5 Development of CIAC Picnic Ground
- 7.9.6 Development of CIAC Aviation Park and Open Spaces

7.9.7 All bidding documents (BOQ, DUPA, TOR, DQC, POW, etc.) of the Construction, Management, and Supervision (CMS) project for the aforementioned projects that are required during the implementation.

7.10. The Consultant shall commence work as indicated in the Notice to Proceed.

7.11. The Consultant shall submit the following report and documents for each of the approved phases:

- a) Inception Report (3 copies)
- b) Draft Design (3 copies)
- c) Detailed Engineering Design (6 copies)
- d) Monthly Report (3 copies)
- e) Final Report (3 copies)

8. CONTRACT DURATION

The contract shall be effective for Two Hundred Forty (240) calendar days from receipt of the NTP. Except for the on-call services stipulated in this TOR that have to be rendered on a later date, the consulting services required for the DAED must be completed within the following schedules:

DAED for the Construction Phase	Duration
1. Construction of CRK Direct Access Link from SCTEx to Airport Road at the New Terminal Building. (approximate length: ~3.0 KM) 2. Construction of CIAC Entertainment & Events Hub Connector Road along Gil Puyat Ave. (approximate length: ~5.0 KM) 3. Upgrading of Clark National Food Hub Gateway, and Construction of Connecting Access Road from C.M. Recto Avenue to Airport Road New Terminal Building (approximate length: ~3.0 KM) 4. Construction, Expansion, and Upgrading of the Remaining Road Network and Utilities (Districts 1, 2, 3, & 4 of CIAC-MDP) (approximate length: ~32 KM) 5. Development of CIAC Picnic Grounds (approximate area: ~ 6.73 Ha.) 6. Development of CIAC Aviation Parks (approximate area: ~ 5.10 Ha.) Based on the latest CIAC-MDP (For-Construction Phasing Plan, Sub-phases) that are usable when each phase is completed	8 months upon issuance of the NTP

The Consultant should advise CIAC on the practicality of the phasing plan and ensure that the For-Construction drawings of each phase will properly connect to existing infrastructure and that roads and utilities are usable when each phase is completed.

9. APPROVED BUDGET FOR THE CONSULTING SERVICES

The proposed DAED Study has an Approved Budget for the Contract (ABC) of **Ninety-Four Million Three Hundred Twenty-Six Thousand Four Hundred Pesos (Php94,326,400.00)**, inclusive of VAT and all other applicable government taxes.

10. TERMS OF PAYMENT

In consideration of the consulting services required under this TOR, payment to the Consultant shall be made in the following manner:

DESCRIPTION	PERCENTAGE OF TOTAL CONSULTANCY FEE	DELIVERABLES
1 st Payment	10%	Upon submission of an approved Inception Report including the approved phasing plan of the project
2 nd Payment	20%	Upon submission of the LIDAR Survey Output and Reports, Topographic Survey reports, Geotechnical Investigation/Survey Reports, Engineering Geological and Geohazard Assessment Reports, Environmental Impact Assessment Reports, Hydrogeological Reports and Resistivity Reports.
3 rd Payment	25%	Upon submission of the draft architectural and engineering design drawings, survey data and reports, technical specifications, cost estimates, unit price analysis, tender documents, terms of reference, technical reports, personnel and equipment utilization program, construction schedule, S-Curve, Traffic analysis, and other tender bid documents.
4 th Payment	35%	Upon submission of the complete set of approved architectural and engineering design plans/drawings, technical specifications, cost estimates, unit price analysis, terms of reference, tender documents, survey data and reports, technical reports, construction schedule, S-Curve, Traffic analysis, and other tender bid documents that will complete the requirements of the TOR.
Final Payment	10%	The remaining ten percent (10%) of the Contract Price shall be released under the following conditions: 1. Upon Issuance of Certificate of Completion by CIAC; 2. Submission of the approved Final Report; and

		3. Submission of the Design Consultant of a Sworn Statement that it shall provide on-call services during the bidding, pre-construction, construction and post-construction of the horizontal structures (roads, drainage, interchange, etc.), picnic ground, aviation park and open spaces subject to the conditions under this TOR and at no additional cost to CIAC.
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Consistent with the provisions of R.A. 9184, all consultancy contracts shall be fixed price contracts. Any extension of contract time shall not involve any additional cost.

11. MINIMUM QUALIFICATIONS OF THE CONSULTANT

The Consultant must possess the following minimum qualifications:

- 11.1. Should be a reputable firm with at least ten (10) years of business operation involving Detailed Architectural and Engineering Design. In case of a Joint Venture (JV), at least one (1) member of the firm should have at least ten (10) years of business operation involving Detailed Architectural and Engineering Design and shall be designated as the lead partner;
- 11.2. Should have undertaken at least one (1) detailed architectural and engineering design of road/highway project for the last ten (10) years whose value must be at least fifty percent (50%) of the ABC. In the case of JV, at least one (1) of the JV partners should have undertaken at least one (1) detailed architectural and engineering design of a road/highway project for the last ten (10) years whose value must be at least fifty percent (50%) of the ABC.

The key personnel who shall work for the Project must meet the minimum qualifications under the section of the Terms of Reference.

It is encouraged that the Consultant promotes gender and development to its Key Personnel and staff.

12. SHORTLISTING OF PROSPECTIVE BIDDERS

The shortlist shall consist of at most five (5) prospective bidders who will be entitled to submit bids. The criteria and rating system for shortlisting are as follows:

Criteria	Rating	Min. Passing Rate
1. Relevant Experience of the Consultant	40%	28%
2. Qualification of the key personnel to be assigned full time to the Project	40%	28%

3. Current workload of the Consultant relative to its capacity	20%	14%
Total	100%	70%

The Consultant (s) must pass the required minimum score of seventy percent (70%) for each criterion to be shortlisted. Failure to meet the specified requirements in the shortlisting would result in a zero (0) rating for the specific criterion.

13. DETERMINATION OF THE HIGHEST RATED BID

The shortlisted bidders shall be subjected to evaluation to determine the bidder with HRB, wherein the criteria and rating are as follows:

Criteria	Rating	% Passing Rate
1. Relevant Experience of the Consultant	40%	28%
2. Qualification of the key personnel to be assigned full time to the Project	40%	28%
3. Plan of Approach and Methodology	20%	14%
Total	100%	70%

To be declared as HRB, the bidder shall pass the required minimum technical score of seventy percent (70%) for each criterion. Failure of the Consultant to meet the specified requirements would result in a zero (0) rating for the specific criterion.

14. EVALUATION PROCEDURE

To determine the Consultant with the Highest Rated Bid, CIAC shall evaluate bids using the Quality Cost-Based Evaluation (QCBE) Procedure, wherein the technical and financial proposals shall be given a corresponding weight equivalent to 80% and 20%, respectively.

15. STAFF REQUIREMENT

The Consultant shall provide a team comprising qualified specialists (not necessarily limited to those listed below) with duties and responsibilities described in this TOR and with satisfactory experience in implementing projects of similar nature and size. The Consultant shall provide the resources to fulfill the general requirements described in these Terms of Reference.

Each proposed professional staff shall only be nominated by one (1) firm and to a single position. The Consultant shall not nominate any key personnel and support staff deployed in the ongoing projects of CIAC. Failure to meet this requirement shall be grounds for disqualification.

The Consultant is required to have previous experience in the design of roads, as well as having the following minimum qualifications and experience amongst its team members:

Key Staff

Personnel/Minimum Qualifications	Responsibilities
<p>a. Team Leader/Project Manager [should be a licensed Civil Engineer for ten (10) years with at least ten (10) years of experience as a Team Leader/Project Manager in the design of highway/road projects]</p>	<p>The Team Leader/Project Manager shall be responsible for the following:</p> <ul style="list-style-type: none"> • Overall supervision of the project team, and in the management and organization of the project. • Leading the team in the preparation of all project deliveries; • Ensuring all reporting required by CIAC is fully and punctually delivered; and • Any other task required to complete the consulting services.
<p>b. Senior Highway/Interchange Engineer [should be a licensed Civil Engineer for ten (10) years with at least ten (10) years' experience as a Road/Highway Engineer in the design of highway/road projects]</p>	<p>The Senior Highway Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Oversee the progress of design works, the project status; • In constant coordination with the Team Leader and other members of the team • Preparation of the design of the highway/road and interchange; • Analyzing traffic data and survey reports. • Preparation of specifications and quantity calculations; • Periodic monitoring of the interchange, highway/road design works during the project; and • Any other task required to complete the consulting services.
<p>c. Senior Transport Engineer [should be a licensed Civil Engineer for ten (10) years with at least ten (10) years' experience as a Transport Engineer in the design of highway/road projects.]</p>	<p>The Senior Transport Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Finalize the Traffic Study to determine the effect of the traffic system; • Conducting field studies and analyzing traffic conditions and issues; • Making sure that the traffic flow at major roads and intersections can move smoothly; • Coordinates with the Sr. Highway Engineer about the design, details, and maintenance of the roads and other structures; and • Any other task required to complete the consulting services.
<p>d. Senior Toll Facility/Systems Engineer</p>	<p>The Senior Toll Facility/ Systems Engineer shall be responsible for the following:</p>

<p>[should be a licensed Civil Engineer for ten (10) years with at least five (5) years' experience as a Toll Facility/Systems Engineer in the design of highway/road projects.]</p>	<ul style="list-style-type: none"> • Undertaking the detailed toll facility modeling/analyses along the corridor to confirm the appropriate toll facility analysis to ensure that the civil works are appropriately designed for current and anticipated future toll volumes; • Prepare a design for the systems and toll facilities; and • Any other task required to complete the consulting services.
<p>e. Senior Sanitary/Drainage Engineer [should be a licensed Civil Engineer for ten (10) years with at least five (5) years' experience as a Drainage Engineer in the design of highway/road projects.]</p>	<p>The Senior Sanitary/Drainage Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Prepare a design for the utility corridor for water and sewer ensuring the efficient drainage design capacity • Ensuring that all side drains, culverts, and other drainage structures are appropriately designed; • Providing recommendations on bio-engineering and other solutions to help reduce the impact of rainfall on the road infrastructure; and • Any other task required to complete the consulting services.
<p>f. Senior Hydrologist [should be a licensed Civil Engineer for ten (10) years with at least five (5) years' experience as a Hydrologist in the design of highway/road projects.]</p>	<p>The Senior Hydrologist shall be responsible for the following:</p> <ul style="list-style-type: none"> • Undertaking the detailed hydrological modeling/analyses along the corridor to confirm the appropriate hydrological analyses to ensure that the civil works are appropriately designed for current and anticipated future rainfall volumes and intensities; • Ensuring that all side drains, culverts, and other drainage structures are appropriately designed; • Providing recommendations on bio-engineering and other solutions to help reduce the impact of rainfall on the road infrastructure; and • Any other task required to complete the consulting services.
<p>g. Senior Structural/Bridge Engineer [should be a licensed Civil Engineer for ten (10) years with at least five (5) years' experience as Structural Engineer in the design of highway/road projects knowledgeable in using latest design software/tools.]</p>	<p>The Senior Structural Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Establishing parameters for bridge/interchange design, and toll plaza structures, taking into account climate change forecasts over the design life of the structures and component parts; • Preparing full designs for all bridge/interchange structures and large drainage structures; • Designing all erosion protection measures associated with the major structures; and • Any other task required to complete the consulting services.

<p>h. Senior Geotechnical/ Foundation Engineer [should be a licensed Civil Engineer for ten (10) years with at least five (5) years' experience as a Geotechnical Engineer in the design of highway/road projects.]</p>	<p>The Senior Geotechnical/Foundation Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Identifying potential geotechnical constraints on the proposed road, bridges/interchanges, particularly identifying specific locations where mitigation measures will be required; • Guiding site-specific surveys as required for preliminary assessment and design of mitigation measures for geotechnical instabilities. Prepare preliminary designs in sufficient detail for assessment of cost; • Assessing bio-engineering as a means of mitigating slope instability and recommend incorporation of measures in the project design as appropriate; • Assessing potential sources of materials, particularly pavement materials required for the works, along with processing requirements and oversee preliminary laboratory testing; • Interpreting the results of geotechnical investigations and prepare appropriate soil parameters both for road/pavement and structural designs, allowable bearing capacity, pile capacities, etc. in conjunction with the structural and drainage engineers; and • Any other task required to complete the consulting services.
<p>i. Senior Geodetic Engineer [should be a licensed Geodetic Engineer for ten (10) years as Geodetic Engineer in the design of highway/road projects.]</p>	<p>The Lead Geodetic Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • All survey fieldwork and data processing; • Preparation of field reports; • Ensuring that the survey activities are within survey standards; • Periodic monitoring of the surveying works during the project; and • Any other task required to complete the consulting services.
<p>j. Senior Electrical Engineer [should be a licensed Professional Electrical Engineer for ten (10) years with at least five (5) years' experience as an Electrical Engineer in the design of highway/road projects.]</p>	<p>The Senior Electrical Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • All the electrical engineering aspects of the project; • The detailed electrical design of the utility corridor for power to include the formulation and layout of optimum lighting, power systems, analysis of different load cases, and the determination of the most practical and economical designs of the component parts such as wiring, conduits, panel boxes, fixtures, and other electrical details.

	<ul style="list-style-type: none"> • Periodic monitoring of the electrical works during the design/study period. • Any other task required to complete the consulting services.
<p>k. Senior Electronics Engineer [should be a licensed Professional Electronics Engineer for ten (10) years with at least five (5) years' experience as an Electronics Engineer in the design of highway/road projects.]</p>	<p>The Senior Electronics Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Preparation of the Traffic Control System of all Road Network Intersections; • Preparation of design of the underground utilities to support Telco requirements, public wifi system, IoT devices and other solutions aligned with the latest design standards and guidelines. • Periodic monitoring of the electronic system during the study; • Any other task required to complete the consulting services.
<p>l. Senior Quantity/Cost Engineer [should be licensed Engineer for ten (10) years with at least five (5) years' experience as a Quantity/Cost Engineer in the design of highway/road projects.]</p>	<p>The Senior Quantity/Cost Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Preparation of cost and quantity estimates of all work items; • Preparation of bidding documents; • Assisting in the preparation of reports; and • Any other task required to complete the consulting services.
<p>m. Senior Materials Engineer [should be a licensed Civil Engineer for ten (10) years and a TSWH Accredited Materials Engineer II with at least five (5) years' experience as a Materials Engineer in the design of highway/road projects.]</p>	<p>The Senior Materials Engineer shall be responsible for the following:</p> <ul style="list-style-type: none"> • Undertaking detailed investigations of material sources for the construction of embankments, pavement layers, interchange, and other structures required in the study; • Conducting an assessment of the pavement subgrade for the whole length of the road; • Preparation of factual report on all materials testing carried out for the purpose of designing the works; • Preparation of the specifications for materials quality and construction quality; and • Any other task required to complete the consulting services.
<p>n. Senior Architect [Should be a licensed Architect for ten (10) years with at least five (5) years' experience in projects of similar nature.]</p>	<p>The Senior Architect shall be responsible for the following:</p> <ul style="list-style-type: none"> • All the outdoor design of public areas, toll plazas, interchanges, landmarks, and structures to achieve environmental, social-behavioral, or aesthetic outcomes. • Hardscapes, parks, recreational, and green infrastructure design. • Periodic monitoring of the architectural works during the study.

	<ul style="list-style-type: none"> Any other task required to complete the consulting services.
<p>o. Senior Environmental Planner [Should be a licensed Environmental Planner for five (5) years with at least five (5) years' experience in projects of similar nature.]</p>	<p>The Senior Environmental Planner shall be responsible for the following:</p> <ul style="list-style-type: none"> Collection and review of existing data and documents, Site investigation/field reconnaissance Prepares environmental report Prepares environmental impact assessment of the project study area Any other task required to complete the consulting services.
<p>p. Senior Building Information Modelling Specialist [Should be a licensed Civil Engineer or Architect for ten (10) years with at least five (5) years' experience in projects of similar nature.]</p>	<p>The Senior BIM Specialist shall be responsible for the following:</p> <ul style="list-style-type: none"> Lead the team in BIM execution plan and project workflow Develop digital designs for the whole project Integrate all CAD and BIM data for submission and acceptance to CIAC Any other task required to complete the Consulting Services

Support Staff

Personnel	Quantity
Road/Highway Engineer	4
Toll Facility Engineer	1
Toll System Engineer	1
Transport Engineer	4
Sanitary/Drainage Engineer	4
Hydrologist	1
Structural Engineer	4
Geotechnical/Foundation Engineer	4
Geodetic Engineer	4
Electrical Engineer	3
Electronic and Communication Engineer	2
Environmentalist	2
Quantity/Cost Engineer	5
Architect	2
Landscape Architect	2
Document Specialist	2
BIM Specialist	2
Environmental Planner	2
Cad Operator	6
Survey Aide	6
Administrative Officer	2
Secretary/Encoder	2
Messenger/Utility Man	2

16. STANDARD OF SERVICES

- 16.1 The Consultant shall fulfill its obligations under the agreement by using its technical expertise and according to the best-accepted professional and industry standards. The Consultant shall exercise all reasonable skill, care, diligence, and prudence in the discharge of the duties agreed to be performed and shall always work in the best interest of CIAC. To attain these, the Consultant shall provide personnel with sufficient qualifications and experience to ensure the full and satisfactory accomplishment of the required consulting services/undertakings.
- 16.2 The consulting services shall be conducted by the Consultant in accordance with the instructions or directions made or to be made by the CIAC at any time before its completion. The Consultant shall conduct regular consultation with CIAC in relation to the undertaking of its responsibilities.

17. GENERAL TERMS AND CONDITIONS

17.1 Alteration and Additional Works

Revisions or additional works that become necessary due to the errors or faults of the Consultant or those which are necessary to comply with the requirements of the AGREEMENT shall be done by the Consultant at no additional cost to CIAC. Nevertheless, any variation of additional work items not included in the foregoing but which are proximate, appropriate, and necessary shall be subject to and covered by a separate agreement pursuant to RA 9184 and its IRR.

CIAC may, at any time, by written notice to the Consultant, issue additional instructions, make changes or alterations in the Scope of Consulting Services or direct the omission of works included in the Scope of Consulting Services. If such instructions/changes/alterations require extra or services on the part of the Consultant, then both parties shall mutually agree upon the corresponding compensation for the same, subject to RA 9184 and its IRR.

17.2 Delay: Extension of time: Force Majeure

Any delay on the agreed completion date from failure of performance by either of the party shall not constitute a default hereunder nor shall give rise to any claim if such delay or failure is wholly attributable to acts of Nature, any act of sabotage, war, armed invasion, revolution insurrection blockade, riot, declaration of national emergency, industry-wide strike, or any other cause beyond the reasonable control of either Party, or which cannot be

avoided by the Consultant or CIAC despite the exercise of due diligence.

Within ten (10) days from the occurrence of such event, the Party affected shall notify in writing the other Party of such event of force majeure and of the obligations or part of the works the performance of which is affected by such force majeure. Immediately after such notification, the parties shall meet to discuss and agree on the appropriate steps/measures to be taken to minimize the effect(s) of the force majeure: provided that the party affected shall be entitled to an extension of the contract time for the number of days of the delay incurred by reason of the causes above mentioned.

17.3 Ownership of Reports and Documents

The reports, drawings, documents and materials compiled or prepared in the course of the performance of the consulting services are and shall remain the property of CIAC and shall not be used by the Consultant for purposes unrelated to the consulting services without the prior written approval of CIAC. Any equipment supplied by the CIAC, or for which payments are made or reimbursed shall become and remain the property of CIAC.

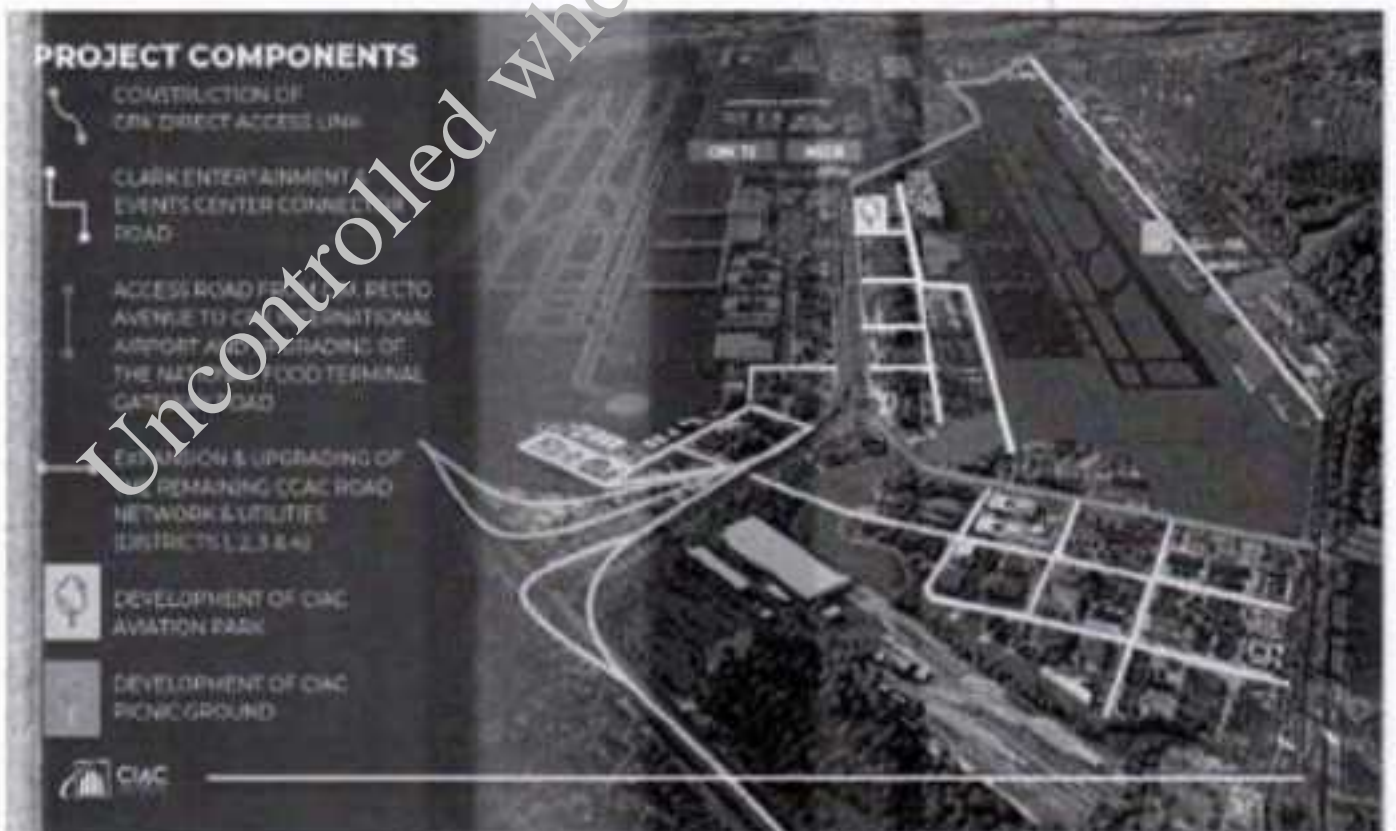
17.4 Representation and Warranties

The Parties hereby represent and warrant that no government official has benefited directly or indirectly from this consulting services. The Parties warrant that they have not offered or given, and will not offer or give to any employee, agent or representative or either Party, any gratuity, with a view toward securing any business from one another, or influencing such persons with respect to terms, conditions or performance of any contract with each other.

18. ILLUSTRATIONS AND CONCEPTUAL LAYOUT:



CIAC LATEST MASTER DEVELOPMENT PLAN BY PALAFOX & ASSOCIATES (PA)

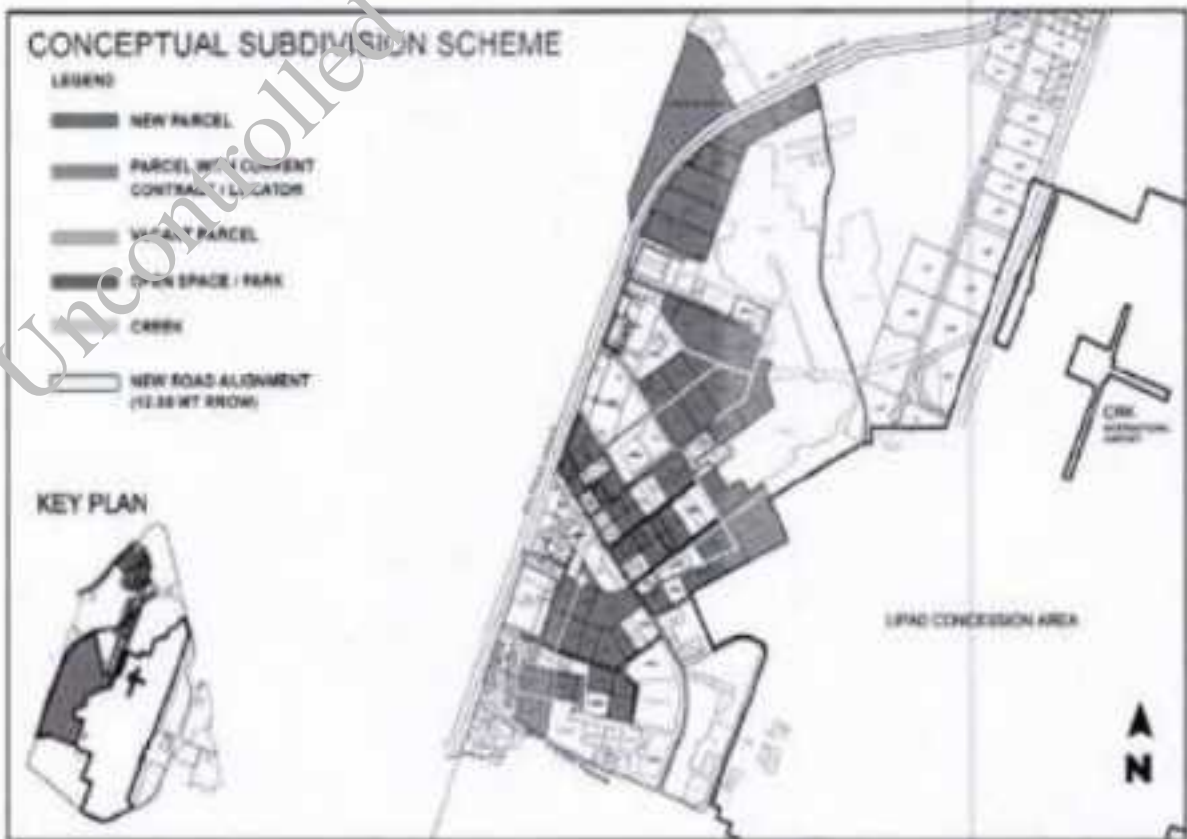


PROJECT COMPONENTS OF THE DAED

CIAC LATEST MASTER DEVELOPMENT PLAN by PALAFOX & ASSOCIATES (PA)



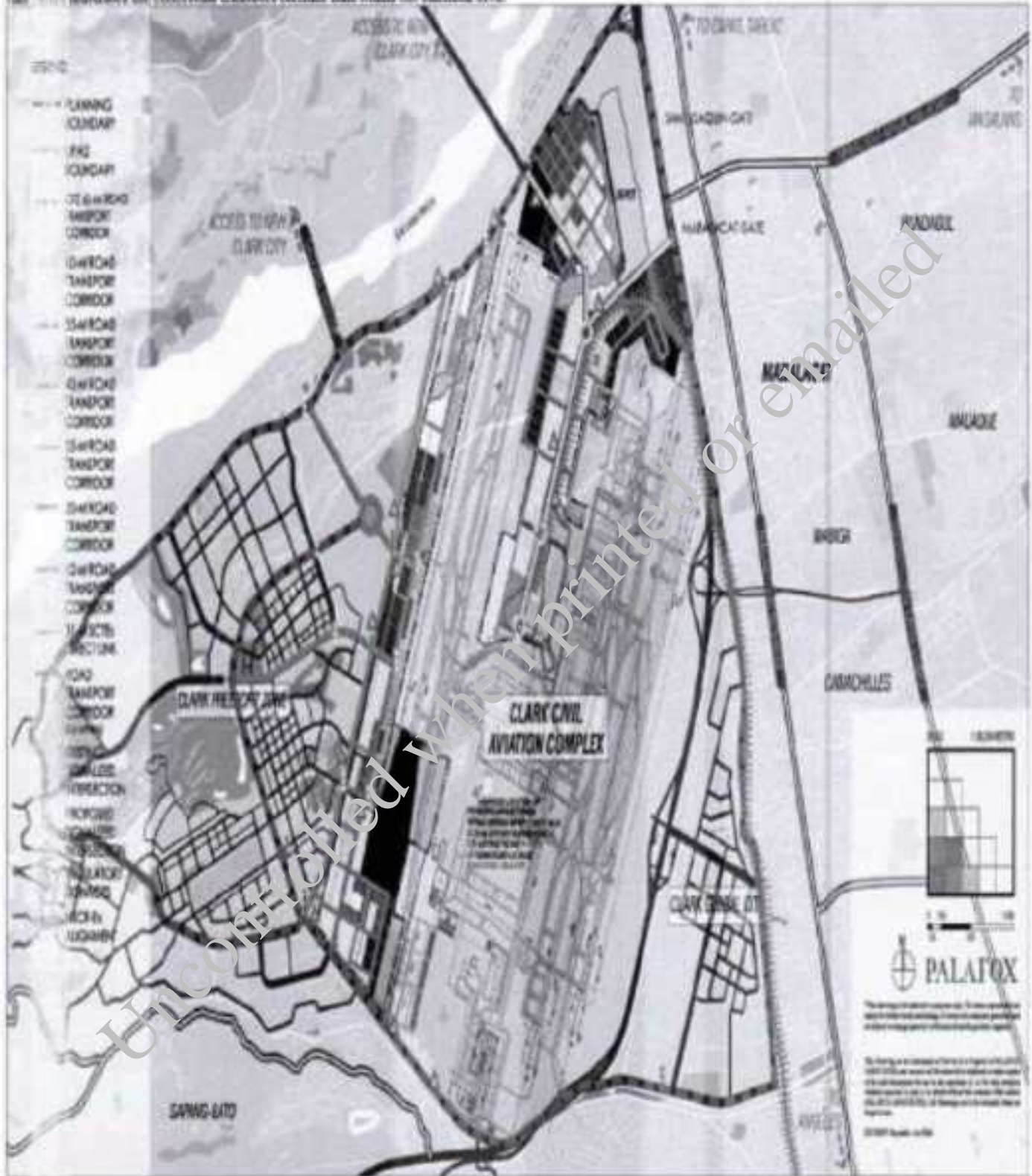
CONCEPTUAL SUBDIVISION PLAN



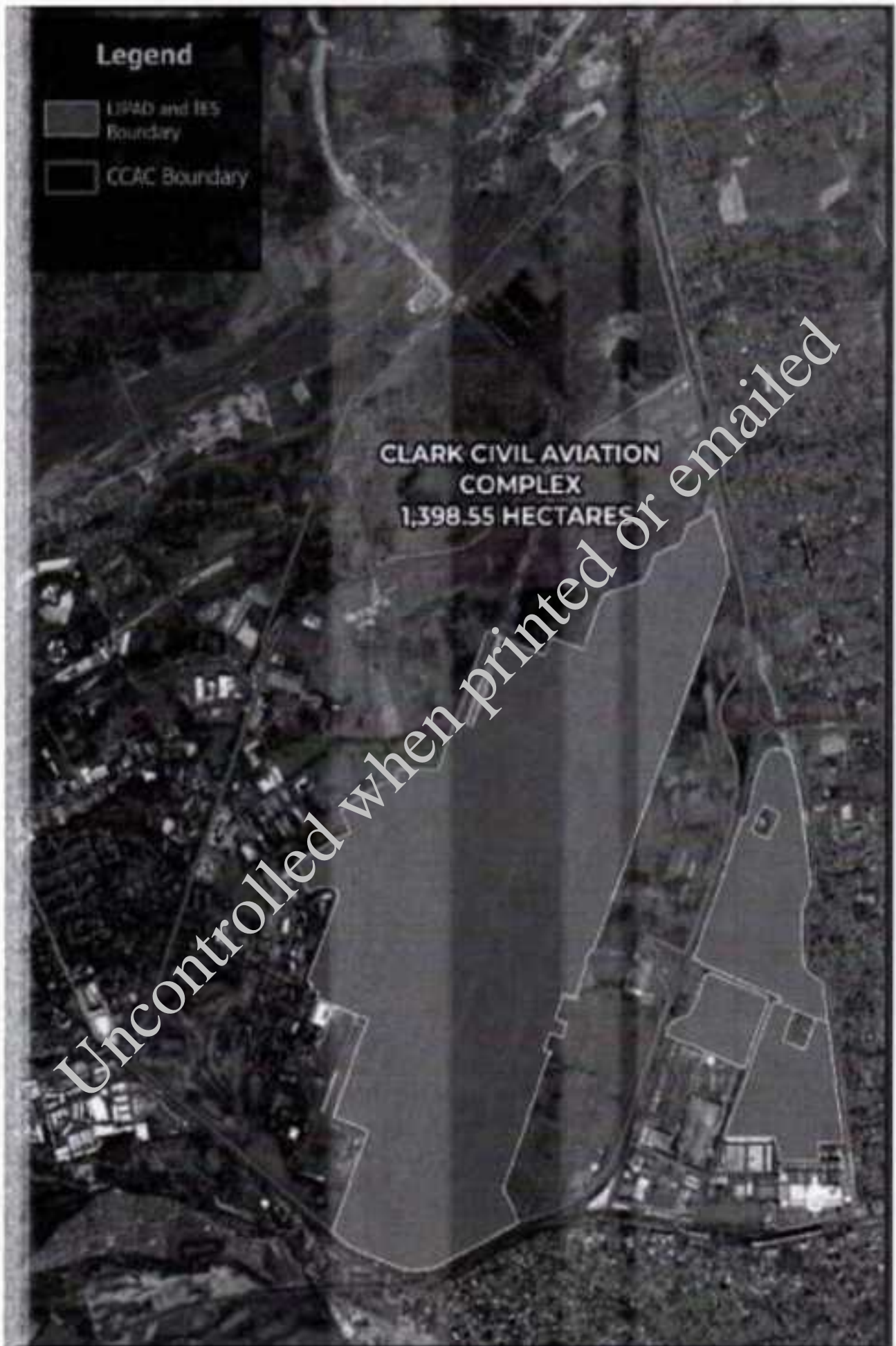
CIAC-MDP CONCEPTUAL TRANSPORT CORRIDOR PLAN

Conceptual Transport Corridor Plan (Second Runway at 12km Length)

This figure illustrates the conceptual transport corridor plan within the planning area.



CCAC and LIPAD BOUNDARY



MINIMUM REQUIREMENTS – PARKS DESIGN STANDARDS and SPECIFICATIONS

A. Architectural Design Character.

The specifications for the buildings and other structures shall adhere to the following codes and standards:

1. Codes:

- National Building Code of the Philippines and its Revised Implementing Rules and Regulations
- Batas Pambansa 344 – Accessibility Law
- Fire Code of the Philippines and Its Revised Implementing Rules and Regulations
- IRR RA 9266 or Architectural and its Latest and Amended IRR
- Other Laws that apply to the Project

Site Specific Guidelines:

- CIAC Comprehensive Master Development Plan
- CIAC Design Standards and Guidelines (Final)
- CIAC Master Development Plan ("CIAC MDP")

2. Standards:

CIAC basis of design standards and guidelines establishing MPSS for Aviation facilities. Updating of the Master Development Plan and Preparation of a Detailed Site Development Planning of CCAC Selected Areas – Final Design Standard and Guidelines.

Precinct 1

Aviation Facilities	Public Infrastructure	Utilities	Other Services
<ul style="list-style-type: none"> • Catering Facilities • Warehousing • Hangers • Airline Support Facilities • Parking Buildings 	<ul style="list-style-type: none"> • Temporary Retail Spans • Multipurpose Facilities/Events Venue • Dinner Parks • Active Parks • Information Centers • Public Restrooms • Surface Parking Areas • Electric Charging Stations • Water Dispensers 	<ul style="list-style-type: none"> • Material Recovery Facility • Power House • Sewage Treatment Plant • Electric Charging Station • Water Tank • Pump House • Generator • Storage Facilities • Toler Farm 	<ul style="list-style-type: none"> • Englewood • Bike Studio • FUR Retail Store & Convenience Store • Visitor's Center with Retail • Bike Rentals • Entertainment Park • Outdoor Mirrors • Seating Areas • Bike Lanes • Jogging Paths • Urban Farming • Active Parks

PRECINCT 1			
PARKS AND RECREATION			
Background Open Space	Traditional Zone	Urban	Urban Edge
<ul style="list-style-type: none"> Temporary Amenity Spaces Children's Gyms Water Parks Water Amusement Children's Parks Outdoor Museums Information Centers Public Restrooms Surface Parking Areas Electric Charging Stations Linear Parks 	<ul style="list-style-type: none"> Age-Up Amusement Rides Electric Charging Stations Surface Parking Areas Urban Farming 	<ul style="list-style-type: none"> Historic Laundry Facilities Power Lines Sewage Treatment Plants Electric Charging Stations Water Tanks Pump Rooms Gasometer Storage Facilities Solar Panels 	<ul style="list-style-type: none"> Esplanade Linear Parks Public Retail Streets Community Details Visitor's Center with Retail Urban Exercise Community Parks Outdoor Museums Seating Areas Urban Farms Jogging Paths Urban Farming Active Parks
PRECINCT 2			
PARKS AND RECREATION			
Light Industrial	RA	NA	NA

Open spaces, parks recreational facilities as specified in the Terms of Reference must also conform with the Precincts 1 & 3 of the CIAC DSG.

3. Site Development Plan

- 1. Consistent with codes.** The proposed Site Development Plan (SDP) for the redevelopment of picnic grounds encourages variance in the architectural design of parks, recreational facilities, amenities within a zone to evoke an identity that shall be consistent with the CIAC MDP and the CIAC DSG.
- 2. Branding features.** The proposed SDP along Claro M. Recto Avenue includes elements that not only provide forms and function, but also establish attractive, creative, cohesive urban setting within a zone to evoke an identity that shall be consistent with the branding features of the flagship projects.
- 4. Integration with Nature:** The proposed design of the Public Park and open spaces involves integrating natural elements such as trees, plants, and water bodies harmoniously into the environment; this not only enhances the aesthetic appeal but also promotes biodiversity and sustainability.
- 5. Accessibility and Circulation:** Landscape Architect shall prioritize accessible pathways and circulation routes that cater to pedestrians, cyclists, and people with disabilities. Provision of clear signages and intuitive layouts are essential to guide visitors through the park.
- 6. Flexible Use Areas:** Open spaces shall be carefully designed to accommodate a variety of activities such as picnicking, sports, cultural events, and relaxation. The flexibility of the proposed design allows the different groups of people to use the space simultaneously without disagreements.

7. **Amenities and Facilities:** The Designer shall provide essential amenities such as seating, restrooms, drinking fountains, and waste bins are crucial for visitor comfort and convenience. Designer shall also provide and consider recreational facilities like playgrounds, sports courts, and exercise stations may also be incorporated based on the park's purpose.
 8. **Sustainability:** The adoption of sustainable design shall be considered including water conservation, energy-efficient lighting, use of recycled materials, and green infrastructure solutions like rain gardens or permeable paving.

Sustainable priorities shall include compliance with park security (highly visible and lighted), longevity and durability (vandal resistant), ease of maintenance, drought tolerant vegetation, and water saving methods intended to use the least possible amount of water.
 9. **Safety and Security:** Landscape Architect shall consider the design visibility and lighting to ensure that the park is safe for visitors during day and night. Design features such as open sightlines, well-lit paths, and strategic placement of amenities contribute to a secure environment.
 10. **Cultural and Historical Context:** The designer shall also consider incorporating elements that reflect the local culture, history, or natural heritage of the area adds depth and meaning to the park design. Art installations, interpretive signage, or themed gardens can enhance the visitor experience.
 11. **Community Engagement:** The objective is to involve major concerned stakeholders in the design process ensuring that the park meets the needs and preferences of CIA, PMO. Public consultations and feedback sessions help designer tailor the design to suit the community's desires.
 12. **Maintenance and Longevity:** Design considerations relative to the durable materials and low-maintenance landscaping reduce ongoing operational costs and ensure the longevity of the park infrastructure. Sustainable landscaping best practices shall also consider minimizing the need for intensive maintenance.
 13. **Environmental Considerations:** Design shall strive to minimize the environmental impact of park development by preserving existing ecosystems, reducing stormwater runoff, and promoting biodiversity through native plantings.
 14. **Project Phasing Implementation.** The proposed design and build scheme of the project is intended for the phasing of developments for Phase 1, Phase 2 and Phase 3. Designer shall prepare the complete design of the Site Development Plan with corresponding program of works and phasing of developments until the completion of the project.
- B. Urban Design Requirements.** The Redevelopment of Site Development Plan covers a wide array of development criteria and standards as reflected in Annex 'A'- Lot Information Plan. (Geodetic Engineer data).

Key features and landscape materials to be adopted in the design considerations:

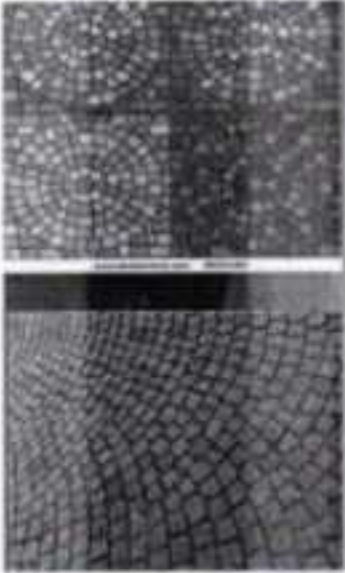
B.1 Features:



	FEATURES	DESCRIPTION
B.1	Public Plazas and Squares:	Design of open spaces for gatherings, events, and social interactions. Key features of paved surfaces, seating areas, and open type areas shall be adopted.
B.2	Streetscapes:	The proposed design of the picnic ground area includes sidewalks, street furniture (such as benches, trash bins, and bus/taxiway/jeepney stops), lighting fixtures, and trees or plantings along the sidewalks.
B.3	Pedestrian Walkways:	Parks and open space areas shall provide dedicated pedestrian walkways or promenades that are pedestrian-friendly lined with shops, cafes, or outdoor seating.
B.4	Outdoor Dining Areas:	Design shall provide areas designated spaces for outdoor dining, either along sidewalks or in courtyards, often equipped with tables, chairs, umbrellas, and sometimes heating elements.
B.5	Green Spaces:	The Proposed Clark Aviation landscapes shall integrate green spaces for the parks, gardens and these spaces provide relief from the built environment and encourage outdoor recreation and relaxation.
B.6	Water Features	The design of fountains, ponds, and small water features are frequent in urban landscapes, adding aesthetic value and providing a calming effect.
B.7	Art and Sculpture Installations:	Proposed landscapes shall incorporate public art installations, sculptures, murals, and other artistic elements that contribute to the cultural and aesthetic vibrancy of the area.




C. Architectural Characteristics

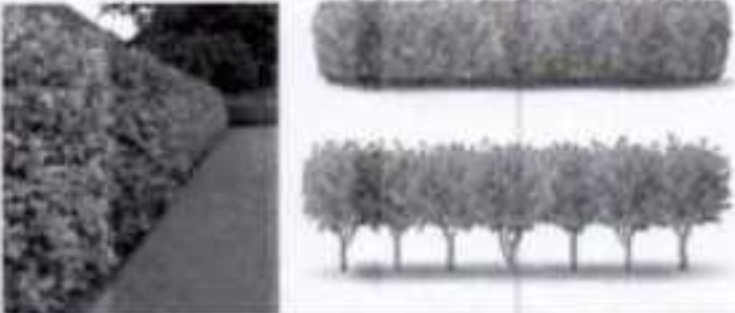
The architectural characteristics for public parks, recreation areas, amenities, and open spaces typically focus on creating environments that are welcoming, functional, and conducive to various activities.




C.1	Landscaping	Features and landscape materials shall complement the branding requirement of the urban renewal character and architecture. Materials used must be safe, durable, easily maintained and aesthetically pleasing.
	Hardscape	Interlocking blocks, natural stones, decorative stones, pebbles, stepping stones and others. Hardscape materials for CIAC PMO Senior Architects approval.





		
	<p>Grasscrete</p>	<ol style="list-style-type: none"> 1) Decorative paving blocks that incorporate vegetation into the paving structure. The blocks are concrete or a similar durable material with specifications below: 2) The design with voids or apertures that allow grass or other vegetation to grow through. 3) Dimensions can vary, but common sizes for individual blocks are around 12 inches by 12-16 inches (30 cm by 30-40 cm) or larger. Thickness varies 10-15cm. 4) Load-bearing capacity to support applicable loads for pedestrians and vehicles. 5) Installation on a well-prepared base of compacted aggregate and sand. 6) Requires proper alignment and leveling to ensure a smooth and even surface. 7) Specifications and design according to the manufacturer and specific design requirements of the project.



		
	<p>Softscape</p>	<p>Encompasses trees, shrubs, ground covers, flowers, and grasses. Plants are highly encouraged in the proposed design in aesthetic appeal, community interest, and functionality in the landscape.</p> <p>Landform. Natural features of the land grade will be used together with the original terrain given arrangement through topography.</p>
	<p>Plants</p>	<p>Softscape features refer to the living, horticultural elements of a landscape design. These elements primarily includes the following: Bougainvillea, Adelfa, Calachuchi, Yellow bignonia, Green African Hallsay, Hedge plant for perimeter fences.</p> <div data-bbox="853 1286 1357 1838" data-label="Image">  </div>
	<p>Jogging/walking track design</p>	<p>1) The proposed design of jogging and walkway shall be adequately planned with architectural decorative plan in the design consideration and be subject for approval by CIAC PMO representatives.</p>

		
		<p>2) Utilization of paving blocks and or other architectural concrete finish materials are highly encouraged.</p> 
	<p>Existing Trees</p>	<p>Beautification of existing centennial trees are essential in softscape design, providing shade, habitat for wildlife, and visual interest with their foliage, flowers, and edible foods.</p> 
	<p>Shrubs and Hedges</p>	<p>Shall be used for structure and as borders, providing a framework for the landscape and defining spaces.</p> <p>Perimeter fences. The perimeter fences of the minipark were green flowering plants fences. The specification of such measures is subject to review and approval of the Architect.</p>

		
		<p>Street furniture Benches. Park benches provide a place for people to rest, relax and socialize. Benches encourage people to spend more time outdoors, which can have a number of benefits for physical and mental health.</p> 
	<p>Vines and Climbers</p>	<p>Provide plants adding vertical interest by growing on structures such as trellises, fences, or walls.</p>
	<p>Flower Beds</p>	<p>Designated areas for planting flowering plants shall be arranged in beds or borders to add color and visual interest to the landscape.</p>
	<p>Water Features:</p>	<p>While typically considered hardscape, water features like ponds, waterfalls, and streams can also involve softscape elements such as aquatic plants like water lilies and lotuses.</p> <p>Waterscapes. The essence of environmental beauty by principle of appreciation through nature base approach. Design shall be made in accordance with the present site conditions allowing the environmental slope through water scape design. The design of water is included in the Phase 1 of the proposed projects; however, the approval and cost estimate will be for Phase 2 development of the Project.</p> 
	<p>Grasses:</p>	<p>Ornamental grasses are used for their texture, movement, and ability to provide a naturalistic look to the landscape.</p>

		<p>Grass. Bermuda grass, Frog grass, blue grass, carabao grass, subject for cost benefit analysis of grass utilization in the project.</p> 
	<p>Rainwater harvesting/water pond.</p>	<p>Designer shall consider sustainable water management for irrigation of picnic ground green areas. The occurring wetlands, groves, and other existing natural resources and terrains should be maintained to the fullest extent possible. Specifications and limitations of impervious surfaces, stormwater retention, and percent green areas shall take into account for better planning undertaking. Design shall consider the cost effective analysis and impact of the proposed rainwater harvesting for Phase 2 developments.</p>
	<p>Landscape Lighting</p>	<p>For pathways bollard lights, well lights, flood lights, tree lighting up and down lighting, spotlight, and hardscape lights. For Architects approval.</p> 
	<p>Park Landings.</p>	
	<p>Mobile carts</p>	<p>Consideration into a gateway and green heart of the airport city featuring central lawn area surrounded by retail spaces for mobile food carts, food kiosks and a mini restaurant makes the space a destination even without a major event. The seasonal shade structure and trees along major circulation routes provide shade for those who want to escape the sunny areas.</p>

<p>Signages</p>	<p>CIAC Branding and or CIAC specifications for approval</p> 
<p>Information guides.</p>	<p>Signage systems provide effective information and direction for people to find locations around parks and around public spaces. CIAC Branding and or CIAC specifications for approval.</p> 
<p>Directional signs.</p>	<p>Customize directional signage's CIAC Branding and or CIAC specifications for approval.</p> 
<p>Park parking signs for vehicles</p>	<p>Parking signages in ensuring the safety of both drivers and pedestrians within the parking facility. Clearly marking designated parking spaces, pedestrian crossings, speed limits, and the direction of traffic flow. CIAC Branding and or CIAC specifications for approval.</p> 
<p>Pedestrian crossing</p>	<p>Setting up of pedestrian crossings, functions being both to assist pedestrians to cross roads and to do so in greater safety. All crossings must have certain facilities to assist disabled pedestrians who wish to cross, such as tactile</p>

		<p>paving and barriers, CIAC Branding and or CIAC specifications for approval.</p> 
<p>Pick up and Drop Off.</p>	<p>The pick up and drop offs are located within the interior of parcels, not to disrupt the flow of traffic.</p>	
<p>Park Lights</p>		<p>Lights to be provided within the pathwalks, perimeter, parking areas, and among others.</p> <p>b. Lights to be provided in the Field event area (Phase 1).</p> <p>External lights (solar powered and/or conventional lightings)</p> <ul style="list-style-type: none"> • Halogen lamps. Conventional lamps and tubes. Halogen lamps. • Fluorescent lamps and starters. • Compact fluorescent integrated. • Compact fluorescent non integrated. • Compact high intensity discharge. • High intensity discharge lamps. • Special lamp
<p>Park Lamps.</p>		<p>Interactive lighting features such as LED decorative lights safety. CIAC Branding and or CIAC specifications for approval.</p> <p>Bollards. Parking bollards must be sturdy posts placed in parking lots or spaces to manage and control vehicle access, protect areas, and enhance safety. The specification provides various purposes, including security and protection, traffic control and reserving designated spaces. CIAC Branding and or CIAC specifications for approval.</p>

		
	<p>Waste receptacles/trashbins.</p>	<p>Trash Bins with attractive designs desire for rolling use. For CIAC Branding and or CIAC specifications for approval.</p>  <p>Well-distributed bins throughout the park to encourage recycling and waste separation. Features include: clearly marked bins, separate bins for recyclables, compostables, and general waste, with clear labeling to guide proper disposal and Signage and educational materials near the bins to inform visitors about recycling practices and the importance of waste reduction.</p> 
	<p>Multipurpose Pavillion/Events Venue.</p>	<p>Special events such as musical, mini theater integrate the park with its neighboring public spaces. The presence of smaller courtyards and formal gardens along the main street helps the transition from busy traffic to an inviting green lawn and provides a buffer during events.</p>

		
	<p>Walking/Jogging/walk way paths</p>	<p>Walk Paths (sheltered)/Bike Paths/Walk-Jog Lanes (Sand-wash Finish Texture or other/similar)</p> <p>Nature Trails: Forest Walk: A serene trail meandering through the densest part of the existing tree area within the Clark picnic grounds, featuring informative signs about the local flora and fauna. This trail will reflect the CIAC rebranding theme while showcasing the natural beauty of the park.</p> <p>Educational Stations: Interactive stops along the trail offering educational insights into the local environment, including information on native plants, wildlife, and the ecological significance of the existing trees. These stations are designed to align with the CIAC rebranding effort and enhance the visitor's understanding of the Clark picnic grounds' unique natural features.</p>
	<p>Parking</p>	<p>Design consideration of parking intended for the client must be carefully studied upon actual site investigation and expediency criteria of the project.</p> <p>The parking area shall be designed to efficiently handle large tourist volumes with clearly marked parking spaces and accessible entry/exit points. Accessibility will be ensured with ADA-compliant spaces near entrances and safe, well-lit pedestrian pathways. Safety and security will be enhanced through adequate lighting, security cameras, and clearly marked emergency stations and fire lanes. Amenities will include drop-off zones for buses and ride-sharing, provision for EV charging stations, and green spaces for shade and aesthetics.</p> <p>If possible integrate, sustainability features such as permeable paving materials and solar panels on covered parking areas. Clear signage and digital displays will guide visitors to parking zones and attractions, ensuring convenience, safety, and a pleasant experience for all.</p>
	<p>Themed Playground</p>	<p>An engaging and expansive play area featuring CIAC branding-themed colors and equipment, designed to stand out from existing playgrounds in Clark. The playground will include:</p>

		<p>Integration with Existing Trees: Play structures strategically placed to incorporate and highlight the existing large trees, providing natural shade and enhancing the overall aesthetic.</p> <p>Safety Features: Soft, impact-absorbing ground surfaces, secure play structures, and clearly marked safety zones to ensure the well-being of children.</p> <p>Inclusive Design: Equipment accessible to children of all abilities, including ramps and sensory play elements.</p> <p>Large Play Structures: Spacious, multi-level play structures with various climbing, sliding, and interactive features to accommodate a large number of children and encourage imaginative play.</p> 
	<p>Souvenir Shops/ Restrooms/ Rental Shop</p>	<p>A central facility offering restrooms, a snack bar with commercial stalls, and a rental shop providing equipment for picnics, biking, rollerblading, skating, and scooters, including helmets—all reflecting the CIAC rebranding.</p>
	<p>Entrance Area/Welcome Plaza</p>	<p>A welcoming entry point featuring clear signage, a map of the rebranded CIAC picnic grounds, and information about nearby attractions.</p>
	<p>Recreational Facilities</p>	<p>Sports Field: The sports field is a versatile, multi-purpose area designed for activities such as soccer, frisbee, and other sports. It will feature high-quality playing surfaces, including well-maintained turf or synthetic options, ensuring a safe and enjoyable experience. Modern amenities such as sports lighting for evening use, spectator seating, and shaded areas will enhance comfort and accessibility. The field will be seamlessly integrated into the rebranded CIAC picnic grounds with landscaping that complements the overall park aesthetic.</p> <p>Fitness Stations: Outdoor fitness equipment will be placed along the main pathways, featuring durable, non-electrical machines and stations for strength training, cardio, and stretching. These fitness areas will be strategically positioned with</p>

clear signage and shaded rest spots, complemented by interactive features such as instructional signage and fitness challenge boards to engage users and promote an active lifestyle, all in alignment with the CIAC rebranding.



D. Structural Requirements

1. **Codes.** The specifications for the buildings and other structures shall adhere to the following codes and standards:

Codes:

- ✓ National Structural Code of the Philippines, NSCP 2017 7th Edition
- ✓ National Building Code of the Philippines
- ✓ Accessibility Law

E. Civil Works Design Parameters

1. **Codes .** The Civil Works Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

2. **Codes:**

- ✓ NSCP 2015: National Structural Code of the Philippines
- ✓ ACI 318-2005: American Concrete Institute

- ✓ PD1067- The Water Code of the Philippines
- ✓ National Plumbing Code of the Philippines
- ✓ PD856 - The Code on Sanitation of the Philippines
- ✓ RA9514 - Fire Code of the Philippines
- ✓ Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) for Rainfall Intensity Duration Frequency Data
- ✓ National Mapping and Resources Information Authority (NAMRIA)
- ✓ Department of Natural Resources and Environment
- ✓ Ordinances of Concerned City or Municipality

F. Sanitary / Plumbing Design Parameters

1. Codes. The Plumbing Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

- ✓ National Building Code of the Philippines
- ✓ Fire Code of the Philippines
- ✓ National Plumbing Code of the Philippines (NPCP)
- ✓ Revised Plumbing Code of the Philippines
- ✓ International Plumbing Code
- ✓ PD 856 Code of Sanitation of the Philippines Standards:
- ✓ National Water Resources Board (NWRB)
- ✓ National Plumbers Association of the Philippines (NAMPAP)
- ✓ Philippine Society of Sanitary Engineers, Inc. (PSSE)

2. Sanitary / Plumbing System

- a. **Waterline System.** Provide a complete water system. A potable and non-potable supply shall be provided. Non potable water shall be used for flushing and irrigation. Complete with pipes and fittings and necessary accessories. The toilet areas, cleaners sink, and among others at the minimum.
- b. **Sanitary, Waste and Vent System.** All toilet areas, cleaners sink, etc. shall discharge to the nearest septic tank or sewer line system.
- c. **Storm and Drainage System.** A complete storm water drainage system will be provided for all roofs, setbacks, and area drains.

The storm drainage system must be sized in consideration of the rainfall intensities, slope, and roof areas of the school buildings.

3. Summary of Materials

- a. Cold Waterline pipes; PPR Pn16/Pn20 Fusion Pipes including Trims and Fittings (BPS Certified)
- b. Cold Waterline pipes
 - i. For main water riser inside building:
 - ✓ ASTM A53
 - ✓ ASTM A167

- ✓ ASTM A240
- ✓ ASTM A666
- ii. For horizontal suspended piping and connection
 - ✓ ASTM F2389
 - ✓ DIN 8074/ 8075
 - ✓ DIN 1988
- c. All pipes, fittings, puddle flanges and ladder rungs installed inside the domestic water tank, rainwater tank, and fire tank shall be stainless steel.
 - For buried soil and waste piping inside building:
 - ✓ ASTM A74, Service and Extra Heavy class
 - For above ground vent piping inside building:
 - ✓ ASTM D 2665
 - ✓ ASTM D-2729
 - ✓ ASTM F891
 - a. Plumbing Fixtures including Trims, Fittings and accessories: (BPS Certified)
 - b. Water Closet: Tank Button-Type flush
 - c. Lavatory: (Pedestal/Counter Type) /semi-pedestal with faucet.
 - d. Urinal: Wall hung Flush valve/lever/push button.

G. Electrical Design Parameters

1. **Codes and Standards.** The Electrical Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

Codes:

- ✓ Philippine Electrical Code
- ✓ National Electrical Code of the Philippines
- ✓ New Fire Code of the Philippines
- ✓ National Building Code and its New IRR

Standards:

- ✓ National Fire Protection Association
- ✓ National Electrical Manufacturers Association (NEMA)

2. **Site Works.** Based on the proposed project plan, complete Electrical Layout shall be provided with the following:

- a. Lighting Layout
- b. Power Layout, Grounding and Lightning Protection Layout
- c. Single Line Diagram and Load Schedule
- d. Miscellaneous Details
- e. Main Electrical Room Layout
- f. Electrical Site Development Plan

3. Electrical System

- a. Transformer
 - i. Transformer shall be Oil-filled Transformer

- ii. Transformer capacity shall be sufficient to serve the Electrical Load Demand of the proposed building.
- iii. The primary side of the Transformer shall be compatible with the incoming electrical utility supply. While the secondary side of the transformer shall be V/230V, 3Φ, 4-Wire + Ground, 60Hz.(Designer to verify)

b. Main Distribution Panel board

- i. Nominal System Voltage shall be V/230V, 3Φ, 4-Wire + Ground, 60Hz.(Designer to verify)
- ii. The Main Distribution Panelboard shall utilize Circuit Breaker (Designer to verify)A and above Circuit Branches and Moulded Case Circuit Breaker for (Designer to verify)A and below.

c. Lighting System

- i. Lighting Luminaires shall be LED.
- ii. Lighting Design shall generally follow the illumination level recommendations by the Illuminating Engineering Society (IES).
- iii. Lighting Design shall follow the Codes and standards, specifically the recommended Lighting Power Densities indicated in the code.

c. Wiring Devices

- i. Switches shall be of ___V 250V or ___V (Designer to verify) except as otherwise noted and approved. Terminals shall be screw-type or quick-connected type.
- ii. Wiring devices must be of modern type and approved for both location and purpose. General use receptacle shall be 15A, 250V grounding type unless otherwise indicated on the drawings.

d. Panel boards and Circuit Breakers

Designer submission and CIAC PMO for approval.

e. Electrical Conduits, Boxes and Fittings

All conduits, boxes and fittings shall be standard rigid steel, zinc coated or galvanized

- ✓ Rigid Steel Conduits (RSC)
- ✓ Rigid Metal Conduits (RMC)
- ✓ Intermediate Metal Conduits (IMC)
- ✓ Electrical Metallic Tubing (EMT)
- ✓ Unplasticized Polyvinyl Chloride (uPVC) if required shall be schedule 40

Conductors

- i. Wires shall be properly designed in accordance with Article 3.10 and the grounding system shall conform to Article 2.50 of the PEC.

- ii. The conductors used in the wiring system shall be of soft-annealed copper having a conductivity of not less than 98% of that of pure copper.
- iii. Low Voltage Conductors shall be generally THHN-THWN unless otherwise specified.
- iv. All conduits of convenience outlets and wire ways for lighting branch circuit home runs shall be wired with a minimum of 3.5 mm square in size.
- v. Fire-rated cable shall be rated for 3 hours low acid, low corrosive gas emission and low or zero halogen (low smoke emission and non-toxic)
- vi. Medium Voltage Conductor shall be copper, compact round stranding and uses crosslinked polyethylene as insulation (XLPE)

H. Electronics Design Parameters (Design within the scope)

1. **Codes and Standards.** The Electronics Supply System of all buildings and structures shall comply with the following codes and standards:

Codes:

- ✓ Philippine Electronics Code
- ✓ International Life Safety Code (NFPA 101)
- ✓ New Fire Code of the Philippines
- ✓ National Electrical Code (NFPA 70)
- ✓ National Building Code and its New IRR
- ✓ Other laws that apply to the Project Standards:
- ✓ Institute of Electrical and Electronics Engineers (IEEE)
- ✓ Other standards that apply to the Project

2. Wirings

All wirings and accessories must be properly sized suited for the operation of this Project. The following Auxillary Services shall be provided for this Project are: (1) Fire Detection and Alarm System, (2) Public Address System and (3) Closed Circuit Television System (CCTV), including all wiring and wiring devices and other accessories necessary for its function and operation.

3. Service Entrance (Roughing – ins)

- a. The main communication supply to the area shall be taken from the Telco and CATV utility company available in the area. The incoming supply shall be in underground concrete encasement.
- b. Unless specified/applicable, service entrance conduit shall be made of standard rigid steel, zinc coated, or galvanized.

Intermediate Metallic Conduit (IMC) may be used. Underground runs shall be encased in concrete envelope or reinforced concrete envelope when crossing a roadway. Ends of conduits shall be provided with a sealing compound.

4. Public Address System (PAS)

- a. PAS shall be provided with applicable mounted speakers based on NFPA 72, Evacuation System
- b. PAS shall be used only for evacuation systems interfaced to FDAS.

5. Security Monitoring System

- a. Access control system– Shall provide the necessary devices including wiring, accessories and equipment.
- b. Door contacts – shall be provided in all fire exit doors.
- c. SMS Workstation/Monitor – Shall provide at least 32-inch television provision ground floor.

6. Closed Circuit Television System

- a. CCTV system– Shall provide the necessary devices including wiring, accessories and equipment.
- b. Camera – Shall be provided and strategically located at all public areas.
- c. CCTV Workstation/Monitor – Shall provide at least 32-inch television provision to be located at the Central Operations Center (TBD)

I. Mechanical Works Design Parameters

Codes and Standards. The Mechanical and Fire protection Design Requirements and specifications for all buildings and structures shall comply with the following codes and standards:

Codes

- ✓ Philippine Society of Ventilating, Air Conditioning, and Refrigerating Engineers
- ✓ American Society of Ventilating, Refrigerating and Air-Conditioning Engineers
- ✓ New Fire Code of the Philippines
- ✓ National Fire Protection Association
- ✓ Philippine Mechanical Engineering Code Standards:
- ✓ Philippine National Standards (PNS)
- ✓ Underwriters Laboratory (UL) and Factory Mutual (FM)
- ✓ International Electro-technical Commission (IEC) 1988
- ✓ National Fire Protection Association (NFPA)
- ✓ American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

J. **Utility Services and Distribution.** The entirety of CCAC will be serviced with water supply, sewage, electricity, ICT, drainage, and solid waste management systems. For various phases of development, the various utility service companies (power, water, wastewater treatment, solid waste disposal, ICT) will be responsible for distributing utilities at the designated tapping points.

- a. The DBC shall design and construct the underground utilities corridor and be integrated in the site development area following the Terms of Reference and MPSS (this document) and the relevant guidelines and updated requirements for CCAC. The DBC is responsible for connecting to the tapping points provided by the utility providers on the project site premises.

K. Stormwater Management

- a. Picnic ground area and each facility should be designed and developed such to retain or absorb 80% of rainfall on-site. This can be accomplished through a combination of green infrastructure (bioswales), absorptive surfaces (permeable paving and water-retaining landscapes), and retention basins or tanks.
- b. Best management practices will be provided in all areas for treatment and management of excess stormwater prior to leaving parcels. The DBC will be responsible for collection of district-wide stormwater discharge from the entire project area to discharge points along the nearest natural waterways.

L. **Sustainability Requirements.** As far as practicable, the design of the picnic ground and facilities should endeavor to follow general principles for Green Building, such as:

- a. Design "public parks and open space" that strive for optimum energy management and sustainable systems.
- b. Maximized use of existing trees, vegetation, contour, and overall landscape.
- c. Use of shading of trees for heat absorption and plant strips to minimize scorching heat concerns.
- d. Rainwater harvesting system for irrigation and industrial use
- e. Use of solar panels to supplement electric supply in the daytime
- f. Specify water efficient fixtures and fittings to reduce water consumption
- g. Use of buffer zones to block solar heat bounce
- h. Maximize green areas to soften the ground surface and reduce heat index.
- i. Optimize the use of locally sourced materials that are low maintenance and environmentally friendly.

M. Disaster Resiliency

The design of the required facilities with the needs to have a level of resilience to ensure the on-going operations of the CCAC, particularly in post-disaster situations. Key aspects of this include:

- a. Base isolation, ground improvements and seismic engineering design commensurate with a building capable to withstand magnitude 8.0 earthquakes;
- b. Disaster-resilience requirements.

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