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PHILIPPINE BIDDING DOCUMENTS

SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF PRIMARY SURVEILLANCE RADAR AND MONOPULSE SECONDARY SURVEILLANCE RADAR FOR CLARK INTERNATIONAL AIRPORT

Government of the Republic of the Philippines

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Glossary of Terms, Abbreviations, and Acronyms

ABC – Approved Budget for the Contract.

ARCC – Allowable Range of Contract Cost.

BAC – Bids and Awards Committee.

Bid – A signed offer or proposal to undertake a contract submitted by a bidder in response to and in consonance with the requirements of the bidding documents. Also referred to as *Proposal* and *Tender*. (2016 revised IRR, Section 5[c])

Bidder – Refers to a contractor, manufacturer, supplier, distributor and/or consultant who submits a bid in response to the requirements of the Bidding Documents. (2016 revised IRR, Section 5[d])

Bidding Documents – The documents issued by the Procuring Entity as the bases for bids, furnishing all information necessary for a prospective bidder to prepare a bid for the Goods, Infrastructure Projects, and/or Consulting Services required by the Procuring Entity. (2016 revised IRR, Section 5[e])

BIR – Bureau of Internal Revenue.

BSP – Bangko Sentral ng Pilipinas.

CDA – Cooperative Development Authority.

Consulting Services – Refer to services for Infrastructure Projects and other types of projects or activities of the GOP requiring adequate external technical and professional expertise that are beyond the capability and/or capacity of the GOP to undertake such as, but not limited to: (i) advisory and review services; (ii) pre-investment or feasibility studies; (iii) design; (iv) construction supervision; (v) management and related services; and (vi) other technical services or special studies. (2016 revised IRR, Section 5[i])

Contract – Refers to the agreement entered into between the Procuring Entity and the Supplier or Manufacturer or Distributor or Service Provider for procurement of Goods and Services; Contractor for Procurement of Infrastructure Projects; or Consultant or Consulting Firm for Procurement of Consulting Services; as the case may be, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

Contractor – is a natural or juridical entity whose proposal was accepted by the Procuring Entity and to whom the Contract to execute the Work was awarded. Contractor as used in these Bidding Documents may likewise refer to a supplier, distributor, manufacturer, or consultant.

CPI – Consumer Price Index.

DOLE – Department of Labor and Employment.

DTI – Department of Trade and Industry.

Foreign-funded Procurement or Foreign-Assisted Project – Refers to procurement whose funding source is from a foreign government, foreign or international financing institution as specified in the Treaty or International or Executive Agreement. (2016 revised IRR, Section 5[b]).

GFI – Government Financial Institution.

GOCC – Government-owned and/or –controlled corporation.

Goods – Refer to all items, supplies, materials and general support services, except Consulting Services and Infrastructure Projects, which may be needed in the transaction of public businesses or in the pursuit of any government undertaking, project or activity, whether in the nature of equipment, furniture, stationery, materials for construction, or personal property of any kind, including non-personal or contractual services such as the repair and maintenance of equipment and furniture, as well as trucking, hauling, janitorial, security, and related or analogous services, as well as procurement of materials and supplies provided by the Procuring Entity for such services. The term "related" or "analogous services" shall include, but is not limited to, lease or purchase of office space, media advertisements, health maintenance services, and other services essential to the operation of the Procuring Entity. (2016 revised IRR, Section 5[r])

GOP – Government of the Philippines.

Infrastructure Projects – Include the construction, improvement, rehabilitation, demolition, repair, restoration or maintenance of roads and bridges, railways, airports, seaports, communication facilities, civil works components of information technology projects, irrigation, flood control and drainage, water supply, sanitation, sewerage and solid waste management systems, shore protection, energy/power and electrification facilities, national buildings, school buildings, hospital buildings, and other related construction projects of the government. Also referred to as *civil works or works*. (2016 revised IRR, Section 5[u])

LGUs – Local Government Units.

NFCC – Net Financial Contracting Capacity.

NGA – National Government Agency.

PCAB – Philippine Contractors Accreditation Board.

PhilGEPS - Philippine Government Electronic Procurement System.

Procurement Project – refers to a specific or identified procurement covering goods, infrastructure project or consulting services. A Procurement Project shall be described, detailed, and scheduled in the Project Procurement Management Plan prepared by the agency which shall be consolidated in the procuring entity's Annual Procurement Plan. (GPPB Circular No. 06-2019 dated 17 July 2019)

PSA – Philippine Statistics Authority.

SEC – Securities and Exchange Commission.

SLCC – Single Largest Completed Contract.

UN – United Nations.

Section I. Invitation to Bid

Invitation to Bid
for the
Supply, Installation, Testing and Commissioning of Primary Surveillance Radar and Monopulse Secondary Surveillance Radar for Clark International Airport

1. The **Bases Conversion and Development Authority (BCDA)**, through the General Appropriations Act (GAA) of 2020 and 2021 to be undertaken by **Clark International Airport Corporation (CIAC)** – Special Bids and Awards Committee (SBAC), intends to apply the sum of **Six Hundred Three Million Nine Hundred Eighty Thousand Pesos (PHP603,980,000.00)** being the Approved Budget for the Contract (ABC) to payments under the contract for the Supply, Installation, Testing and Commissioning of Primary Surveillance Radar and Monopulse Secondary Surveillance Radar for Clark International Airport. Bids received in excess of the ABC shall be automatically rejected at bid opening.

2. The CIAC now invites bids for the **Supply, Installation, Testing and Commissioning of Primary Surveillance Radar and Monopulse Secondary Surveillance Radar for Clark International Airport**. Completion of the Works is **within Five Hundred Ten (510) Calendar Days** from receipt of the Notice to Proceed (NTP).

   Bidders should have completed a contract similar to the Project. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. Instructions to Bidders. Interested bidder should possess a minimum PCAB License with Size **Range License Category "AAA" General Engineering, with Registration Particulars for Navigational Facilities – "Large B"**. The PCAB license must be valid and effective at the date of submission of the bid.

3. Bidding will be conducted through open competitive bidding procedures using non-discretionary "pass/fail" criterion as specified in the 2016 Revised Implementing Rules and Regulations (IRR) of Republic Act 9184 (RA 9184), otherwise known as the "Government Procurement Reform Act."

4. Interested bidders may obtain further information from CIAC and inspect the Bidding Documents at the address given below from **4 March 2021 until the deadline for the Submission of Bids from 8:00 a.m. to 6:30 p.m., Monday to Thursday.**

5. A complete set of Bidding Documents may be acquired by interested bidders starting **4 March 2021** from the address below upon payment of a nonrefundable fee in the amount of **Seventy Five Thousand Pesos (PHP75,000.00)**.

   It may also be downloaded free of charge from the website of the Philippine Government Electronic Procurement System (www.philgeps.gov.ph) and the website of CIAC (www.ciac.com.ph), provided that bidders shall pay the applicable fee for the Bidding Documents not later than the submission of their bids.

6. The CIAC – SBAC will hold a Pre-Bid Conference **on 15 March 2021 (Monday), 2:00 p.m. at Clark International Airport Corporation Board Room, Corporate Office Building, Civil Aviation Complex, Clark Freeport Zone, Pampanga, Philippines 2023**,

which shall be open to prospective bidders through videoconferencing via Zoom Application.

7. Bids must be duly received by the BAC Secretariat through manual submission at the Records Management Office, CIAC Corporate Office Building, Civil Aviation Complex, Clark Freeport Zone, Pampanga, Philippines 2023 **on or before 29 March 2021 (Monday), 9:00 a.m.** Late bids shall not be accepted.

8. All bids must be accompanied by a bid security in any of the acceptable forms and in the amount stated in **ITB** Clause 15.

9. Bid opening shall be on **29 March 2021 (Monday), 9:15 a.m. at Clark International Airport Corporation Board Room, Corporate Office Building, Civil Aviation Complex, Clark Freeport Zone, Pampanga, Philippines 2023**. Bids will be opened in the presence of the bidders' representatives who choose to attend the activity.

10. The CIAC reserves the right to reject any and all bids, declare a failure of bidding, or not award the contract at any time prior to contract award in accordance with Sections 35 and 41 of the 2016 revised Implementing Rules and Regulations (IRR) of RA No. 9184, without thereby incurring any liability to the affected bidder or bidders.

11. For further information, please refer to:

    MS. SHARON C. LINGAD
    Office of the BAC Secretariat, Clark International Airport Corporation
    CIAC Corporate Office Building, Clark Civil Aviation Complex, Clark Freeport Zone, Philippines 2023
    Telephone Nos.: [+6345] 599-2888 local 183 |
    Fax Nos.: [+6345] 599-2888 local 181
    E-mail Address: ciac_bacsecretariat@yahoo.com |
    Web Address: http://www.ciac.com.ph

12. You may visit the following websites:
    For downloading of Bidding Documents:
    PhilGEPS: www.philgeps.gov.ph
    CIAC: www.ciac.com.ph

Date of Issue: _____

IRISH C. CALAGUAS
SBAC Chairperson

Section II. Instruction to Bidders

A. General

1. Scope of Bid

The Bases Conversion and Development Authority (BCDA) through the General Appropriations Act (GAA) of 2020 and 2021, to be undertaken by Clark International Airport Corporation (CIAC) Special Bids and Awards Committee (SBAC), invites Bids for the **Supply, Installation, Testing and Commissioning of Primary Surveillance Radar and Monopulse Secondary Surveillance Radar for Clark International Airport**.

The Procurement Project (referred to herein as "Project") is for the Supply, Installation, Testing and Commissioning of Primary Surveillance Radar and Monopulse Secondary Surveillance Radar for Clark International Airport as described in Section VI (Specifications).

2. Funding Information

2.1. The GOP through the source of funding as indicated below for GAA of 2020 and 2021 in the sum of **Six Hundred Three Million Nine Hundred Eighty Thousand Pesos and 00/100 (PhP603,980,000.00)** being the Approved Budget for the Contract (ABC).

2.2. The source of funding is:

The Bases Conversion and Development Authority (BCDA) through the General Appropriations Act (GAA) of 2020 and 2021.

3. Bidding Requirements

The Bidding for the Project shall be governed by all the provisions of RA No. 9184 and its 2016 revised IRR, including its Generic Procurement Manual and associated policies, rules and regulations as the primary source thereof, while the herein clauses shall serve as the secondary source thereof.

Any amendments made to the IRR and other GPPB issuances shall be applicable only to the ongoing posting, advertisement, or invitation to bid by the BAC through the issuance of a supplemental or bid bulletin.

The Bidder, by the act of submitting its Bid, shall be deemed to have inspected the site, determined the general characteristics of the contracted Works and the conditions for this Project, such as the location and the nature of the work; (b) climatic conditions; (c) transportation facilities; (c) nature and condition of the terrain, geological conditions at the site communication facilities, requirements, location and availability of construction aggregates and other materials, labor, water, electric power and access roads; and (d) other factors that may affect the cost, duration and execution or implementation of the contract, project, or work and examine all instructions, forms, terms, and project requirements in the Bidding Documents.

4. Corrupt, Fraudulent, Collusive, Coercive, and Obstructive Practices

The Procuring Entity, as well as the Bidders and Contractors, shall observe the highest standard of ethics during the procurement and execution of the contract. They or through an agent shall not engage in corrupt, fraudulent, collusive, coercive, and obstructive practices defined under Annex "I" of the 2016 revised IRR of RA No. 9184 or other integrity violations in competing for the Project.

5. Eligible Bidders

5.1. Only Bids of Bidders found to be legally, technically, and financially capable will be evaluated.

5.2. The Bidder must have an experience of having completed a Single Largest Completed Contract (SLCC) that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC adjusted, if necessary, by the Bidder to current prices using the PSA's CPI, except under conditions provided for in Section 23.4.2.4 of the 2016 revised IRR of RA No. 9184.

A contract is considered to be "similar" to the contract to be bid if it has the major categories of work stated in the **BDS**.

5.3. For Foreign-funded Procurement, the Procuring Entity and the foreign government/foreign or international financing institution may agree on another track record requirement, as specified in the Bidding Document prepared for this purpose.

5.4. The Bidders shall comply with the eligibility criteria under Section 23.4.2 of the 2016 IRR of RA No. 9184.

6. Origin of Associated Goods

There is no restriction on the origin of Goods other than those prohibited by a decision of the UN Security Council taken under Chapter VII of the Charter of the UN.

7. Subcontracts

7.1 Subcontracting is allowed provided that the sub-contractor has the appropriate PCAB license classification required by the scope of work to be subcontracted. The portions of Project and the maximum percentage allowed to be subcontracted are indicated in the BDS, which shall not exceed fifty percent (50%) of the contracted Works.

7.2 The Supplier may identify its subcontractor during the contract implementation stage. Subcontractors identified during the bidding may be changed during the implementation of this Contract. Subcontractors must submit the documentary requirements under Section 23.1 of the 2016 revised

IRR of RA No. 9184 and comply with the eligibility criteria specified in **ITB** Clause 5 to the implementing or end-user unit.

7.3 Subcontracting of any portion of the Project does not relieve the Contractor of any liability or obligation under the Contract. The Supplier will be responsible for the acts, defaults, and negligence of any subcontractor, its agents, servants, or workmen as fully as if these were the Contractor's own acts, defaults, or negligence, or those of its agents, servants, or workmen.

8. Pre-Bid Conference

The Procuring Entity will hold a pre-bid conference for this Project on the specified date and time and either at its physical address at Clark International Airport Corporation Board Room, Corporate Office Building, Civil Aviation Complex, Clark Freeport Zone, Pampanga and/or through videoconferencing/webcasting} as indicated in paragraph 6 of the **IB.**

9. Clarification and Amendment of Bidding Documents

Prospective bidders may request for clarification on and/or interpretation of any part of the Bidding Documents. Such requests must be in writing and received by the Procuring Entity, either at its given address or through electronic mail indicated in the **IB**, at least ten (10) calendar days before the deadline set for the submission and receipt of Bids.

10. Documents Comprising the Bid: Eligibility and Technical Components

10.1. The first envelope shall contain the eligibility and technical documents of the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

10.2. If the eligibility requirements or statements, the bids, and all other documents for submission to the BAC are in foreign language other than English, it must be accompanied by a translation in English, which shall be authenticated by the appropriate Philippine foreign service establishment, post, or the equivalent office having jurisdiction over the foreign bidder's affairs in the Philippines. For Contracting Parties to the Apostille Convention, only the translated documents shall be authenticated through an apostille pursuant to GPPB Resolution No. 13-2019 dated 23 May 2019. The English translation shall govern, for purposes of interpretation of the bid.

10.3. A valid PCAB License is required, and in case of joint ventures, a valid special PCAB License, and registration for the type and cost of the contract for this Project. Any additional type of Contractor license or permit shall be indicated in the **BDS**.

10.4. A List of Contractor's key personnel (e.g., Project Manager, Project Engineers, Materials Engineers, and Foremen) assigned to the contract to be bid, with their complete qualification and experience data shall be provided.

These key personnel must meet the required minimum years of experience set in the **BDS**.

10.5. A List of Contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership, certification of availability of equipment from the equipment lessor/vendor for the duration of the project, as the case may be, must meet the minimum requirements for the contract set in the **BDS**.

11. Documents Comprising the Bid: Financial Component

11.1. The second bid envelope shall contain the financial documents for the Bid as specified in **Section IX. Checklist of Technical and Financial Documents**.

11.2. Any bid exceeding the ABC indicated in paragraph 1 of the **IB** shall not be accepted.

11.3. For Foreign-funded procurement, a ceiling may be applied to bid prices provided the conditions are met under Section 31.2 of the 2016 revised IRR of RA No. 9184.

12. Alternative Bids

Bidders shall submit offers that comply with the requirements of the Bidding Documents, including the basic technical design as indicated in the drawings and specifications. Unless there is a value engineering clause in the **BDS**, alternative Bids shall not be accepted.

13. Bid Prices

All bid prices for the given scope of work in the Project as awarded shall be considered as fixed prices, and therefore not subject to price escalation during contract implementation, except under extraordinary circumstances as determined by the NEDA and approved by the GPPB pursuant to the revised Guidelines for Contract Price Escalation guidelines.

14. Bid and Payment Currencies

14.1. Bid prices may be quoted in the local currency or tradeable currency accepted by the BSP at the discretion of the Bidder. However, for purposes of bid evaluation, Bids denominated in foreign currencies shall be converted to Philippine currency based on the exchange rate as published in the BSP reference rate bulletin on the day of the bid opening.

14.2 Payment of the contract price shall be made in Philippine Pesos.

15. Bid Security

15.1. The Bidder shall submit a Bid Securing Declaration or any form of Bid Security in the amount indicated in the **BDS**, which shall be not less than the percentage of the ABC in accordance with the schedule in the **BDS**.

15.2. The Bid and bid security shall be valid for one hundred twenty (120) calendar days from the date of the opening of bids. Any bid not accompanied by an acceptable bid security shall be rejected by the Procuring Entity as non-responsive.

16. Sealing and Marking of Bids

Each Bidder shall submit one copy of the first and second components of its Bid.

The Procuring Entity may request additional hard copies and/or electronic copies of the Bid. However, failure of the Bidders to comply with the said request shall not be a ground for disqualification.

If the Procuring Entity allows the submission of bids through online submission to the given website or any other electronic means, the Bidder shall submit an electronic copy of its Bid, which must be digitally signed. An electronic copy that cannot be opened or is corrupted shall be considered non-responsive and, thus, automatically disqualified.

17. Deadline for Submission of Bids

The Bidders shall submit on the specified date and time and either at its physical address or through online submission as indicated in paragraph 7 of the **IB.**

18. Opening and Preliminary Examination of Bids

18.1. The BAC shall open the Bids in public at the time, on the date, and at the place specified in paragraph 9 of the **IB**. The Bidders' representatives who are present shall sign a register evidencing their attendance. In case videoconferencing, webcasting or other similar technologies will be used, attendance of participants shall likewise be recorded by the BAC Secretariat.

In case the Bids cannot be opened as scheduled due to justifiable reasons, the rescheduling requirements under Section 29 of the 2016 revised IRR of RA No. 9184 shall prevail.

18.2. The preliminary examination of Bids shall be governed by Section 30 of the 2016 revised IRR of RA No. 9184.

19. Detailed Evaluation and Comparison of Bids

19.1. The Procuring Entity's BAC shall immediately conduct a detailed evaluation of all Bids rated "*passed*" using non-discretionary pass/fail criteria. The BAC shall consider the conditions in the evaluation of Bids under Section 32.2 of 2016 revised IRR of RA No. 9184.

19.2. If the Project allows partial bids, all Bids and combinations of Bids as indicated in the **BDS** shall be received by the same deadline and opened and evaluated simultaneously so as to determine the Bid or combination of Bids offering the lowest calculated cost to the Procuring Entity. Bid Security as required by **ITB** Clause 16 shall be submitted for each contract (lot) separately.

19.3. In all cases, the NFCC computation pursuant to Section 23.4.2.6 of the 2016 revised IRR of RA No. 9184 must be sufficient for the total of the ABCs for all the lots participated in by the prospective Bidder.

20. Post Qualification

Within a non-extendible period of five (5) calendar days from receipt by the Bidder of the notice from the BAC that it submitted the Lowest Calculated Bid, the Bidder shall submit its latest income and business tax returns filed and paid through the BIR Electronic Filing and Payment System (eFPS), and other appropriate licenses and permits required by law and stated in the **BDS**.

21. Signing of the Contract

The documents required in Section 37.2 of the 2016 revised IRR of RA No. 9184 shall form part of the Contract. Additional Contract documents are indicated in the **BDS**.

Section III. Bid Data Sheet

Bid Data Sheet

ITB Clause	
5.2	The Bidder must have completed a single contract that is similar to this Project, equivalent to at least fifty percent (50%) of the ABC. For this purpose, similar contracts shall refer solely to completed Supply, Installation, Testing and Commissioning of Primary Surveillance Radar or Monopulse Secondary Surveillance Radar. The description of an eligible bidder is contained in the Bidding Documents, particularly, in Section II. The Bidder shall submit documented proof such as certified copy of Contract and certified copy of Certificate of Completion/Acceptance.
7.1	Subcontracting is allowed provided that the sub-contractor has the appropriate PCAB license classification required by the scope of work to be subcontracted. The portions of Project and the maximum percentage allowed to be subcontracted which shall not exceed fifty percent (50%) of the contracted Works.
10.3	Bidders must have at least a **License Category "AAA" General Engineering, with Registration Particulars Large B for Navigational Facilities** from the Philippine Contractors Accreditation Board (PCAB). The PCAB license must be valid and effective at the time of submission of the bid. In case of Joint Venture (JV), the Special PCAB License of the JV is required for submittal in the bidding. To secure the required Special PCAB License, it is required that: 1. Partnerships consisting of constructors must apply to PCAB as a Joint Venture, wherein all constructor partners are required to have or apply for a Regular PCAB License or in case of a foreign partner, a "Special PCAB License for Foreign Constructors". 2. Partnerships consisting of constructors and non-constructors (e.g. financier or equipment supplier) must apply as a Consortium, wherein a PCAB License of one (1) partner constitutes compliance. Under IRR of RA 4566, the following are defined: • Consortium – means a cooperative arrangement between licensed constructor(s) and non-constructor(s) to jointly perform a single specific undertaking/project with the licensed constructor(s) as managing and operating partner(s) and the others as financier(s) or any such other construction supportive role. • Joint Venture – means a cooperative arrangement of licensed constructors/contractors to jointly perform a single specific

<table>
<tr><td></td><td>undertaking/project with each of the partners contributing to the performance.

“Constructor” shall have the same meaning as “Contractor”.</td></tr>
<tr><td>10.4</td><td>The minimum work experience requirements for key personnel are the following:

<table>
<tr><th>No.</th><th>Key Personnel</th><th>Minimum Required</th></tr>
<tr><td>1.</td><td>Project Manager - with at least 5 years management experience in installation Primary Surveillance Radar or Monopulse Secondary Surveillance Radar System or 5 years management experience in CNS (Communications Navigational Surveillance). Minimum Bachelor’s Degree in Engineering, Science, or Mathematics area.</td><td>1</td></tr>
<tr><td>2.</td><td>Project Engineer (Licensed Professional ECE with at least 5 years work experience)</td><td>1</td></tr>
<tr><td>3.</td><td>Structural Engineer (Licensed Civil Engineer with at least 5 years work experience)</td><td>1</td></tr>
<tr><td>4.</td><td>Electrical Engineer (Licensed Electrical Engineer with at least 5 years work experience)</td><td>1</td></tr>
<tr><td>5.</td><td>Mechanical Engineer (Licensed Mechanical Engineer with at least 5 years work experience)</td><td>1</td></tr>
<tr><td>6.</td><td>Radar System/Software Specialist with at least 5 years work experience in installation or maintenance Primary Surveillance Radar or Monopulse Secondary Surveillance Radar System.</td><td>2</td></tr>
<tr><td>7.</td><td>Safety Officer (DOLE Accredited Safety Officer with at least 5 years work experience)</td><td>1</td></tr>
</table>

The bidder is not allowed to combine work experiences of two or more personnel in order to meet the required minimum years of experience.

The bidder is allowed to nominate only one (1) key personnel for every key position.</td></tr>
<tr><td>10.5</td><td>The bidder is required to have the following minimum tools and equipment available for the project and shall submit supporting proof of ownership,</td></tr>
</table>

	certification of availability of equipment from equipment lessor/vendor for the duration of the project. 1. One (1) unit Air Compressor with jack hammer 2. One (1) unit Backhoe with Pavement Breaker 3. Two (2) units Concrete Cutter 4. One (1) Boom Truck 5. One (1) unit Skid Loader 6. One (1) unit Diesel Welding Machine 7. Two (2) units Service Truck 8. Two (2) units Dump Truck 9. Eight (8) units VHF Radios 10. Two (2) units Megger Insulation Tester 11. One (1) unit Boring Machine 12. One (1) unit Earth Resistance Test 13. Two (2) units Concrete Mixers 14. Two (2) units Mortar Mixers 15. One (1) unit Plate Compactor 16. One (1) unit Concrete Vibrator 17. One (1) unit Bar Cutter 18. One (1) Hydraulic Crane 19. Two (2) units Generator Sets 20. One (1) Total Station Surveying Equipment **Must attach proof of ownership for Owned or Leased and Certificate of good running condition together with the bid.**
15	The bid security shall be in the form of a Bid Securing Declaration or any of the following forms and amounts: 1. The amount of not less than **Twelve Million Seventy Nine Thousand Six Hundred Pesos and 0/100 (PHP12,079,600.00)**, if bid security is in cash, cashier's/manager's check, bank draft/guarantee or irrevocable

	letter of credit; 2. The amount of not less than **Thirty Million One Hundred Ninety Nine Thousand Pesos and 0/100 (PHP30,199,000.00)**, if bid security is in Surety Bond.
16	Each Bidder shall submit one (1) original and two (2) certified true copies of its bid.
19.2	Partial bid is not allowed. The infrastructure project is packaged in a single lot and the lot shall not be divided into sub-lots for the purpose of bidding, evaluation, and contract award.
20	**Only tax returns filed and taxes paid through the BIR Electronic Filing and** **Payment System (EFPS) shall be accepted.** The Bidder shall submit Certified True Copy of the following documents filed using the Electronic Filing and Payment System (EFPS): a. **INCOME TAX RETURN**- refer to the latest ITR (BIR Form No. 1702 for Corporation and Partnership) and b. **BUSINESS TAX RETURNS**- refers to the: b.1 Value Added Tax Return (Monthly-BIR Form No. 2550-M; Quarterly-BIR Form No. 2550-Q); b.2 Percentage Tax Returns (BIR Form No.2551-M) covering the previous six (6) months immediately preceding the date of submission and opening of bids. NOTE: Per BIR Revenue Regulations No. 3-2005: For Income Tax Returns: For participants already with an Annual ITR, Latest ITR shall refer to the ITR for the preceding Tax Year be it on a calendar or fiscal year. For new establishments which, therefore, have no annual ITR yet, it shall refer to the most recent quarter's ITR.
21	List of additional contract documents relevant to the Project: 1. Construction Schedule and S-Curve; 2. Manpower Schedule; 3. Construction Methods; 4. Equipment Utilization Schedule; 5. Safety and Health Program approved by DOLE

Section IV. General Conditions of Contract

1. Scope of Contract

This Contract shall include all such items, although not specifically mentioned, that can be reasonably inferred as being required for its completion as if such items were expressly mentioned herein. All the provisions of RA No. 9184 and its 2016 revised IRR, including the Generic Procurement Manual, and associated issuances, constitute the primary source for the terms and conditions of the Contract, and thus, applicable in contract implementation. Herein clauses shall serve as the secondary source for the terms and conditions of the Contract.

This is without prejudice to Sections 74.1 and 74.2 of the 2016 revised IRR of RA No. 9184 allowing the GPPB to amend the IRR, which shall be applied to all procurement activities, the advertisement, posting, or invitation of which were issued after the effectivity of the said amendment.

2) Sectional Completion of Works

If sectional completion is specified in the **Special Conditions of Contract (SCC)**, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date shall apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).

3) Possession of Site

3.1 The Procuring Entity shall give possession of all or parts of the Site to the Contractor based on the schedule of delivery indicated in the **SCC,** which corresponds to the execution of the Works. If the Contractor suffers delay or incurs cost from failure on the part of the Procuring Entity to give possession in accordance with the terms of this clause, the Procuring Entity's Representative shall give the Contractor a Contract Time Extension and certify such sum as fair to cover the cost incurred, which sum shall be paid by Procuring Entity.

3.2 If possession of a portion is not given by the above date, the Procuring Entity will be deemed to have delayed the start of the relevant activities. The resulting adjustments in contract time to address such delay may be addressed through contract extension provided under Annex "E" of the 2016 revised IRR of RA No. 9184.

4) The Contractor's Obligations

The Contractor shall employ the key personnel named in the Schedule of Key Personnel indicating their designation, in accordance with **ITB** Clause 10.3 and specified in the **BDS**, to carry out the supervision of the Works.

The Procuring Entity will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are equal to or better than those of the personnel listed in the Schedule.

5) Performance Security

5.1. Within ten (10) calendar days from receipt of the Notice of Award from the Procuring Entity but in no case later than the signing of the contract by both parties, the successful Bidder shall furnish the performance security in any of the forms prescribed in Section 39 of the 2016 revised IRR.

5.2. The Contractor, by entering into the Contract with the Procuring Entity, acknowledges the right of the Procuring Entity to institute action pursuant to RA No. 3688 against any subcontractor be they an individual, firm, partnership, corporation, or association supplying the Contractor with labor, materials and/or equipment for the performance of this Contract.

6) Site Investigation Reports

The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **SCC** supplemented by any information obtained by the Contractor.

7) Warranty

7.1. In case the Contractor fails to undertake the repair works under Section 62.2.2 of the 2016 revised IRR, the Procuring Entity shall forfeit its performance security, subject its property(ies) to attachment or garnishment proceedings, and perpetually disqualify it from participating in any public bidding. All payables of the GOP in his favor shall be offset to recover the costs.

7.2. The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity. Specific duration of the warranty is found in the **SCC**.

8) Liability of the Contractor

Subject to additional provisions, if any, set forth in the **SCC**, the Contractor's liability under this Contract shall be as provided by the laws of the Republic of the Philippines.

If the Contractor is a joint venture, all partners to the joint venture shall be jointly and severally liable to the Procuring Entity.

9) Termination for Other Causes

Contract termination shall be initiated in case it is determined *prima facie* by the Procuring Entity that the Contractor has engaged, before, or during the implementation of the contract, in unlawful deeds and behaviors relative to contract acquisition and implementation, such as, but not limited to corrupt, fraudulent, collusive, coercive, and obstructive practices as stated in **ITB** Clause 4.

10) Dayworks

Subject to the guidelines on Variation Order in Annex "E" of the 2016 revised IRR of RA No. 9184, and if applicable as indicated in the **SCC**, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Procuring Entity's Representative has given written instructions in advance for additional work to be paid for in that way.

11) Program of Work

11.1. The Contractor shall submit to the Procuring Entity's Representative for approval the said Program of Work showing the general methods, arrangements, order, and timing for all the activities in the Works. The submissions of the Program of Work are indicated in the **SCC.**

11.2. The Contractor shall submit to the Procuring Entity's Representative for approval an updated Program of Work at intervals no longer than the period stated in the **SCC.** If the Contractor does not submit an updated Program of Work within this period, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program of Work has been submitted.

12) Instructions, Inspections and Audits

The Contractor shall permit the GOP or the Procuring Entity to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors of the GOP or the Procuring Entity, as may be required.

13) Advance Payment

The Procuring Entity shall, upon a written request of the Contractor which shall be submitted as a Contract document, make an advance payment to the Contractor in an amount not exceeding fifteen percent (15%) of the total contract price, to be made in lump sum, or at the most two installments according to a schedule specified in the **SCC**, subject to the requirements in Annex "E" of the 2016 revised IRR of RA No. 9184.

14) Progress Payments

The Contractor may submit a request for payment for Work accomplished. Such requests for payment shall be verified and certified by the Procuring Entity's Representative/Project Engineer. Except as otherwise stipulated in the **SCC**, materials and equipment delivered on the site but not completely put in place shall not be included for payment.

15) Operating and Maintenance Manuals

15.1. If required, the Contractor will provide "as built" Drawings and/or operating and maintenance manuals as specified in the **SCC.**

15.2. If the Contractor does not provide the Drawings and/or manuals by the dates stated above, or they do not receive the Procuring Entity's Representative's approval, the Procuring Entity's Representative may withhold the amount stated in the **SCC** from payments due to the Contractor.

Section V. Special Conditions of Contract

Special Conditions of Contract

GCC Clause	
2	There shall be no sectional completion of the Project.
6	None.
7.2	The warranty against Structural Defects/Failures, except that occasioned-on force majeure, shall cover the period from the date of issuance of the Certificate of Final Acceptance by the Procuring Entity shall be fifteen (15) years. In addition to the defects liability period, a Warranty Period of two (2) years for the hardware/software components is required.
10	Day works are applicable at the rate shown in the Contractor's original Bid.
11.1	The Contractor shall submit the Program of Work to the Procuring Entity's Representative within seven (7) calendar days of delivery of the Notice of Award.
11.2	The Program of Work shall be updated and shall be submitted to CIAC for approval: 1. On the first working day of the week following a Weekly Accomplishment Report indicating a negative slippage; and 2. Together with the request for Variation Orders, either in the form of a change order or extra work order, that shall cover any increase or decrease in the original quantities of the Contract.
13	No further instructions.
14	No further instructions.
15.1	The As-Built Drawings shall be required before the issuance of a Certificate of Completion.
15.2	The final payment shall be withheld for failing to submit the complete set of As-Built Drawings.

Section VI. Specifications

1.0 TECHNICAL SPECIFICATIONS

1.1 Products and Services Sought

1.1.1 Bidders are invited for the Supply, Delivery, Installation, Integration, Testing, Training, Commissioning and Other Related Services for the implementation of Primary Surveillance Radar System (PSR) and Secondary Surveillance Radar System (SSR) in co-mounted configuration for the Clark International Airport (CIA), to meet the requirements of this Specification.

1.1.2 A short range Primary Surveillance Radar (PSR) shall be provided for Clark Air Traffic Centre (ATC), Terminal Maneuvering Area (TMA), Surveillance and Approach Control Service (APP).

1.1.3 The Primary Surveillance Radar (PSR) and Secondary Surveillance Radar System (SSR) (or throughout this tender document referred to as "the system") shall have the facilities and capabilities to process, distribute, store data and to be used as basis for daily support for ATC requirements in maintaining tracking, movements of aircraft within Philippines airspace.

1.1.4 The Successful Bidder shall be the Contractor and single point of contact for all products and services offered and fully responsible for the overall project management and co-ordination of the design, supply, delivery, installation, integration, testing, training, and commissioning for the implementation of the System.

1.1.5 Contractor may quote a fixed price and shall commit resources for the Department Representative's consideration and agreement for the development, enhancement or acquisition of new PSR/SSR systems and facilities; design, build, document, test and implement solutions of the system. This may include provision of required interfaces between the new/enhanced systems and other/existing systems or otherwise.

1.1.6 Contractor shall conduct the preliminary site and environmental survey including possible health hazard prior to tender document submission.

1.1.7 The Contractor is required to secure from the concerned or appropriate government agency (such as Department of Health and/or Department of Science and Technology) for the safety evaluation report/certificate regarding Electromagnetic Radiation Exposure to ensure the safety of people living nearby the radar site.

1.1.8 The document defines the minimum required performances for the following Surveillance equipment:

a) S-Band Primary Surveillance Radar (PSR)

b) Monopulse Secondary Surveillance Radar (MSSR) with mode S Interrogations. This radar shall be co-mounted with the PSR.

c) Ancillary Equipment including interfaces, data system etc.

The system equipment to be supplied shall consist at least on the following:

a) PSR Antenna of reflector type.

b) MSSR antenna of LVA type (Large Vertical Aperture) co-mounted on top of the PSR antenna.

c) Turning Gear and Pedestal including related sub-units such as 7-channels Rotary Joint, dual motorization and optical encoders (shared between PSR and MSSR in the co-mounted configuration).

d) Fully solid-state S-Band Primary Transmitters with fail-soft capability and duplicated transmitter drivers.

e) Duplicated S-Band Primary Receiving Channels including advanced processing at target level.

f) Dual MSSR Interrogator and Receiver with Monopulse Processor equipment.

g) Duplicated Radar Data Processor for the output of plots and/or tracks (common to PSR and MSSR in the co-mounted configuration).

h) Necessary interfaces to the radar (common to PSR and MSSR in the co-mounted configuration). The following list is non-exhaustive:

i. Radar Maintenance monitor

ii. Control and Monitoring System (Local and Remote)

iii. Time Stamping

iv. External interface devices to ATC

i) Necessary ancillary equipment associated to the radar system.

1.1.9 Industrial capacity

a) The Radar Manufacturer shall have proven experience of more than 20 years in the design, manufacture, installation, implementation and commissioning of Air Traffic Management radars such as S-Band PSR and Mode S MSSR either in stand-alone or co-mounted configuration as described in the tender documents.

b) The Contractor shall be the designer and manufacturer of proposed radar solutions.

c) The Contractor shall present his industrial organization and his production capacity for the proposed radars.

d) The Contractor shall have technical staff qualified for carrying out the design, development, installation, testing, commissioning & training. The Contractor shall provide the name, qualifications, experience and the role of each of the technical persons to be involved in the Contract.

1.1.10 Experience

a) The Contractor shall have installed and commissioned identical radar configurations as per description in the tender documents. Newer version of radars, which is better in respect of operating parameters, system configuration or functionalities, shall be accepted.
b) The Contractor shall provide an exhaustive list of existing projects worldwide for the last 10 years.

2.0 Scope of the Project

2.1 Project scope includes *Supply, Delivery, Installation, Integration, Testing, Training, Commissioning and Other Related Services* for the Implementation of Primary Surveillance Radar System (PSR) and Secondary Surveillance System (SSR) for the Clark International Airport (CIA).

2.2 **Supply and Delivery**

The Contractor shall:

2.2.1 Submit an offer for the installation of the System (PSR and SSR) as specified in this document.

2.2.2 State the type, model number and the manufacturer's name for the System being offered.

2.2.3 Submit a detailed functional specification of the Scope of the Project

2.2.4 Provide a reliability block diagram which illustrates Dual Channel Redundancy and Main/Standby configurations incorporated in the System being offered.

2.2.5 Provide complete set of tools and test equipment required to maintain the System being offered, including but not limited to the following:

a. Oscilloscope

b. RF Power Meter with sensor

c. Set of Attenuators

d. Signal Generator

e. Multitester

f. Lifting Mechanism for Heavy Loads from Antenna Tower to Turn Table

g. Maintenance Laptops with USB Adapter for RF Measurements

h. Power Spray for Turn table cleaning

2.2.6 Provide all requirements specified in the Bidder Schedules and all associated tender documents shall be strictly adhered to.

2.2.7 MSSR

This section also specifies Monopulse Secondary Surveillance Radar with mode S Enhanced Surveillance, including:

a) MSSR mode S Large Vertical Aperture Antenna

b) MSSR mode S Interrogator, with redundant mode S Transmitter,

2.3 Installation

2.3.1 The principal requirements specified shall include, but not limited to the following:

a) Completion of system design and production of shop drawings.

b) Supply of all materials.

c) To provide the system engineering drawings, installation, implementation drawing and Works Management Plan.

d) Supply of all labor, board and lodging, supervision and transportation required for the installation of the equipment, where applicable.

e) Management of a Quality Assurance program.

f) Conduct of equipment tests i.e. Factory Acceptance Test and Site and Commissioning Acceptance Test.

g) Conduct post implementation plan

h) Training management plan

2.3.2 The Contractor shall perform the relevant works needed to ensure the secure radar data transmission from the Clark Radar to the Clark Tower Workstation. A fiber optic link and a backup microwave link shall be established.

The link should be optic fiber based with Microwave Backup Link which has the same covering area and the same efficient function. (Refer to Annex 2 for further details)

2.3.3 Contractor's responsibility is also to check, verify and integrate the new Radar system with the current Remote Control and Monitoring System (RCMS) via Remote Terminal Unit (RTU) deployed at radar sites. The RTU is to collect, process and display data on local CMS workstation display. The central RCMS workstations can provide remote changeover or monitoring status of the Radar system.

2.3.4 Provide description of RCMS and CMS console for the offered Radar system with their tender proposal.

2.3.5 The Contractor scope of work includes construction of the radar equipment building, radar antenna tower, radome, demolition of affected structures, clearing of obstacle/grading/excavation/earth filling and associated infrastructure, Mechanical and Electrical services and other for;

a) Lightning Protection installation;
b) Network infrastructure;
c) 3-Phase Redundant UPS setup and installation;
d) 3-Phase generator setup and installation;
e) Air-conditioning system installation.
f) Site security system including Intruder Detection System, CCTV setup and installation.

Within the radar station facility, it is planned to build antenna tower with radome and radar equipment building which accommodates radar system, power supply, telecommunication and IT equipment, system for fire protection, video surveillance system and other auxiliary systems, as well as associated infrastructure to connect the facility to local infrastructure systems.

In addition to the scope of work is the rehabilitation of the building previously owned by Liberty Broadcasting to become the Radar Facility Building.

2.3.5.1 Uninterruptible Power Supply

Contractor shall install a new redundant 3-phase UPS system at the Radar site. The UPS shall be able to supply the PSR and SSR system when no mains available to the building. The UPS data shall be available on CMS/RCMS for UPS on loads/normal conditions.

2.3.5.2 Secondary Power

Contractor shall install two new 3-phase generator sets for the Radar site. The Generator sets shall be able to supply the PSR and SSR system when no mains available to the building. The generator data shall be available on CMS/RCMS for on loads/normal conditions etc.

Refer to Section 19.11 for further details

2.3.5.3 Firefighting System

Contractor shall install a new Fire Protection system at Radar site. The Fire Protection system shall protect the building from fire. The system shall include smoke detectors to be installed on all Radar rooms and other reliable detector. The Fire Protection system shall be interface to the CMS/RCMS system for local/remote monitoring and indications.

Refer to Section 19.15 for further details

2.3.5.4 Air Conditioning Unit

Contractor shall install 2 new sets of 3 Horse-Power split air-conditioning unit for the Radar equipment room. The 3HP air-conditioning unit shall provide enough system air cooling and air circulation. The air-conditioning shall be strategically mounted at the Radar equipment room.

2.3.5.5Site Security

Contractor shall install and configure Radar site security with 6 CCTV color camera and IDS system. The IDS system together with CCTV shall be position strategically around the Radar site and equipment. The CCTV shall be wall mounted and shall be provide with CCTV control facilities for Fault Control Room, ATSC site monitoring of Radar site.

3.0 Scope of Works

3.1 Introduction

This chapter provides the necessary requirements and specifications that should be taken into account by the Contractor aiding them in their preparation for their comprehensive offer. Contractor must describe all of the items enumerated in this Specification in detail as possible.

The principal requirement include, but are not limited to the followings:

a. completion of system design and production of shop drawings, where applicable, all PSR+SSR design shall be provided with drawing size A0,
b. supply of all materials,
c. installation of all equipment
d. fiber optic / microwave communication link
e. routing of necessary cabling, ducting, cable tray from equipment site to the antenna system
f. construction of radar equipment Building (OEM recommendation), Antenna Tower, powerhouse and Radome
g. rehabilitation of the building previously owned by Liberty Broadcasting to become the Radar Facility Building.
h. implementation of a Works Management plan
i. supply of all labor, board and lodging, supervision and transportation required for the installation of the equipment, where applicable
j. management of a Quality Assurance program
k. conduct of equipment tests i.e Factory Acceptance Test , Site Acceptance Test and Flight Testing (Checks and Commissioning)
l. provision of Factory Maintenance & Operator Training for technical / operator personnel
m. provision of equipment operation and software training for engineers and technicians.
n. conduct testing and commissioning works
o. supply of all supporting documentation
p. supply of recommended maintenance spares

q. provision of post-commissioning maintenance support & services

3.2 Contractor shall ensure that all equipment shall be properly installed and shall be neatly arranged in such a way that servicing and maintenance of the equipment will be easily accessible. All cables hanging in or out of the equipment shall be neatly and systematically laid within the rack.

3.3 The Contractor shall be responsible for the all civil works involved in this project. Refer to Chapter 19

3.4 Contractor shall conduct site familiarization visit to be held on Information Day to make assessment on all site conditions. This shall enable Contractor to submit a comprehensive proposal on required civil works, proposed suitable equipment and antenna system, installation of cable length between all the relevant sites, etc

4.0 Hardware Facilities

4.1 General Requirements

4.1.1 Contractor shall provide the required PSR+SSR hardware facilities and services, including the software utilities to be installed at Radar site, ATSC centre, and Backup sites for the development, testing, operations and maintenance of the System. The related fees shall be included as part of the hardware facilities and services price.

4.1.2 The system shall be installed with hot and standby facilities and shall be mounted in the racks. Uninterrupted Power Supply shall be installed to minimized interruption.

4.1.3 The proposed hardware facilities shall be reliable and efficient.

4.1.4 All Hardware, any bundle Software and related hardware facilities should be delivered to the CIA Site.

4.2 Contractor shall ensure that all the equipment shall be properly installed and shall be neatly arranged in such a way that servicing and maintenance of the equipment will be easily accessible. All cables hanging in or out of the equipment shall be neatly and systematically laid within the rack.

4.3 Radar Site Location

4.3.1 Radar site geographical locations are approximately;

a. LAT - 15 11' 32.7189" N

b. LON - 120 31'55.26989" E

c. ELEVATION - 209m

5.0 Software Facilities

5.0 General

5.1.1 Contractor shall provide all necessary software requirements for the PSR+SSR system offered and the corresponding Additional system requirements.

5.1.2 The CIA shall require the license for the any application software, database software, and necessary software to be installed at the Radar workstations, maintenance facilities and the additional system requirements.

5.1.3 Contractor shall also be responsible to provide its own software to perform all Implementation and Related Services, as well as maintenance services. CIA's does not intend to procure such software

5.2 Application Software

5.2.1 The proposed software delivered shall support the Radar operations with appropriately designed together with security and access controls on backup and/or disaster recovery(s), testing and/or training(s).

5.2.2 The proposed software shall be industry proven software, easy customisable for CIA needs and other software to meet the Radar installation and requirements. The application software provided for the Radar System shall have been in use for at least 3 years after the first commercial version/ release.

5.2.3 Any applications software shall run on all proposed workstations and sites while the communications between the system and workstations shall be on an IP Network infrastructure.

5.3 Utilities and Other Software

5.3.1 Any proposed utilities and other software items shall be secure and robust, and where relevant, apply non-proprietary technologies.

5.3.2 The proposed operating system software shall support the concurrent operations with appropriately designed security and access controls.

6.0 Workload Specifications

6.1 General

6.1.1 Contractor is requested to meet the projected workload and performance of the System".

6.1.2 The proposed System shall be robust and shall have redundancy arrangements incorporated in the Radar equipment.

6.1.3 The System shall operate continuously and there shall be no data loss in the System under any circumstance.

6.1.4 The system environment shall have an availability of 99.98%.

7.0 Technical Specifications

GENERAL

7.1.1 Contractor shall provide a brief Radar system descriptions and System Technical Specifications".

7.1.2 Contractor shall provide a technical proposal describing the proposed architecture and system Technical Specifications

7.1.3 Contractor shall also provide a technical proposal describing the proposed architecture and system "Technical Specifications" for the additional system requirements in Bidder Technical Proposal.

7.1.4 Contractor shall provide "Statement of Compliance" providing clause-by-clause including sub-clause by sub-clause statement of compliance corresponding to this document.

7.1.5 The CIA will provide site services such as building and external main supplies to the building.

7.2 Lightning Protection

7.2.1 Contractor shall offer protections proposals to the sites and equipment where applicable, and submit detailed descriptions and specifications for the followings, but not limited to:

(a) Data line and cable protection;
(b) Surge protections and Power Conditions;
(c) Lightning protections.

7.2.2 The nature of the equipment, its operational use and its location all dictate that emphasis shall be placed on the protection of installed equipment from direct lightning strikes and induced surges and flashovers.

7.2.3 Contractor is urged to utilize the services of specialist suppliers of lightning protection systems for the Radar project implementation.

7.3 Lightning Protection and Earthing

7.3.1 The Contractor shall propose the requirement as specified in Chapter 19.10 - Earthing and Lightning Protection

8.0 Interface Specification

8.1 General

8.1.1 The CIA preliminary plan is to establishing system interfaces with the other system as follows:

(a) Interface to the Plot Assignor Combiner (PAC)
(b) Interface to the RCMS/CMS system (if applicable)

(c) Where appropriate, the interfaces shall be automated;
(d) As much as possible, a standard file format shall be adopted for each type of information transfer.

8.1.2 When installing the System and the associated System interfaces, the impact to other interfacing systems shall be kept to a minimum.
8.1.3 The Contractor shall be responsible for providing all equipment items and hardware facilities, at the Contractor's own cost when developing all necessary system interfaces.

9.0 Implementation Plan

9.1 Implementation Approach and Schedule

9.1.1 The Contractor shall, within ten (10) working days from the date of issuance of Award of Contract, produce and maintain an up-to-date Implementation Plan showing time schedule and sequence of events for the installation of the System including delivery schedule for documentation and the respective dates for Delivery, Installation, commissioning and acceptance of the system. The plan shall also include activities to be carried by the CIA.
9.1.2 The Implementation Plan shall be agreed by CIA.
9.1.3 The Implementation Plan shall be updated at intervals of two (2) calendar weeks to show the expected and actual events and completion dates. The Implementation Plan shall be made available for the CIA for review.
9.1.4 The Contractor shall deliver to the CIA written progress and status reports every two (2) weeks in format agreeable with the CIA.
9.1.5 The Contractor shall notify the CIA of the expected delay in the delivery of any part of the System and/or the services to be performed. The Contractor shall refer immediately to the CIA any matter likely to impede the progress of the supply and installation of the System.
9.1.6 The CIA may call progress meetings every one (1) month intervals during which the Project Manager will attend and report to the CIA on the progress on the supply and installation of the System. The progress meetings shall be held at the CIA site.
9.1.7 The Contractor is required to work very closely with the CIA representative during the project implementation schedule as the Contractor shall be responsible for resolving any system and procedural issues arising after each deployment.
9.1.8 Contractor shall submit a 'Gantt Chart' for the project implementation. The 'Gantt Chart shall indicate all the tasks to be carried out and their respective implementation period.

10.0 Implementation and Related Services

10.1 General Requirements

10.1.1 Implementation and related services refer to the services provided by the Contractor from commencement of the implementation project, until successful completion of System, rollout to end users, including:

a. Project management services
b. System implementation

c. Post-implementation review

10.1.2 The CIA shall furnish the Contractor with pertinent information, knowledge and assistance as the Bidder may reasonably and properly require to enable it to perform its obligations hereunder.

10.1.3 All the materials supplied to the Contractor by the CIA for the purpose of any Contract shall remain the property of the CIA and shall be returned in reasonable order after completion of the Implementation and Related Services.

10.1.4 Contractor shall, through the CIA Representative, keep the Department informed of all matters related to the project within the knowledge of the Bidder and shall answer all reasonable enquiries received from the Department Representative.

10.1.5 Upon request, the Contractor shall attend all meetings convened by the Department Representative to which he may be summoned and shall advise and assist the Department on all matters relating to the duties he has assumed under Contract.

10.1.6 Contractor shall provide a complete set of relevant system documents, training materials and other related documentation during Implementation and Related Services. The Contractor shall ensure that all deliverables are produced according to the prevailing CIA standards or equivalent. The project deliverables shall include, but not be limited to, the items listed in - Subsection 15 – "Documentation and Deliverables".

10.1.7 Contractor shall provide Temporary Facilities for the Engineers including the operational and maintenance requirements but not limited to;

- 1 lot Furniture/Fixtures, Equipment & Appliances for the Field Office for the Engineer (rental basis)
- 10 units laptop with minimum 4gb ram and 1tb storage (rental basis)
- 1 lot office supplies
- 10 cellular phone units (rental basis) capable to take high definition photos with a 500 pesos monthly load.

10.2 Project Management Services

10.2.1 Contractor shall propose a suitable methodology for the conduct of this project for the CIA's consideration and agreement.

10.2.2 Contractor is required to set up the project organization for the project implementation as follows:
a. Project Steering Committee (PSC), to provide overall guidance and direction to the project.
b. Under the project management framework, the CIA is the project owner and provides sponsorship for the project. Contractor is required to take up the roles of Project Director, Project Manager and the project teams under the project management framework.

10.2.3 Contractor shall provide Project Management Services and the responsibilities shall include, but not be limited to, the following:
a. Provide day-to-day planning, control and administration of the project;

b. Oversee, control and report the project progress, the expenditure and the use of resources; and monitor the performance of all services during the Implementation Period, including design, development, integration, training services;
c. Ensure the successful implementation of the System within the specified schedule and budget, and according to specification and performance criteria, and;
d. Attend regular and ad-hoc meetings, as well as end-stage evaluation reviews at the end of every milestone, which are chaired by the CIA's representatives.

10.3 Multi-Vendor Co-ordination

10.3.1 The Contractor shall be responsible for co-ordinating with other Vendor(s) for the provision of all services supplied. Should there be any problems that affect the proper functioning of the System during implementation, the Contractor shall act as a single co-ordinator to work with other Vendor(s) so as to identify causes of such problems and resolve them.

10.3.2 Contractor is required to oversee itself and to complete their tasks according to schedule. The Contractor shall report to the CIA representative any fails to perform any task that shall affect the implementation schedule of the System.

10.4 Training Plan and Development

10.4.1 Contractor shall provide training plan and development services, so that appropriate training programmes can be designed for training CIA Operators, users and Maintenance Teams. These include, but are not limited to:
a. Define training plan and curriculum, including accommodation and required equipment for training
b. Design and develop training manuals, course materials and handouts
c. Design and develop training presentation slides, or other delivery aids. Define training evaluation mechanism and associated forms

10.5 Factory Acceptance Test (FAT)

10.5.1 Contractor shall state the number of days (not lower than ten days), required to perform the FAT satisfactorily. Schedule for FAT shall include but, are not limited to the following:
a. preliminary meeting;
b. FAT Procedure
c. Briefing on the overview, functional description, maintenance, test procedures, spares, technical support on hardware and software, engineering technical support and installation plan
d. procedures on FAT and SAT;
e. Demonstrate the PSR and SSR capabilities, design and technical aspect.
f. Wrap-up FAT meeting.
g. Signing of FAT Documents, Certificate of FAT
h. Site visits.

10.5.2 Contractor shall submit to CIA the FAT procedure at least four (4) weeks before the start of scheduled date.

10.6 Post-Implementation Review

10.6.1 Contractor shall work closely with the Department to conduct a post-implementation review, which shall include, but not be limited to the following areas:

(a) To evaluate whether the system objectives have been fully achieved and the problems identified have been satisfactorily resolved.

(b) To evaluate the utilisation of system functionality, and ways to attain its full productivity if necessary.

11.0 Project Team

11.1 General Project Team Requirements

11.1.1 The project team shall consist of maintenance staff from CIA and the Contractor and shall form the following sub-teams:

a. Implementation Team: to provide Implementation and Related Services

b. Operations and Maintenance Team: to provide Operations and Maintenance Services

11.1.2 To ensure continuity and stability of the System, a sufficient number of installation teams and CIA staff from the Implementation Team shall be retained.

11.1.3 The CIA Department representative shall be notified of any proposed changes to and replacements of the key Bidder staff on the Project Team during the project. The Contractor shall seek the CIA representative's approval before effecting the changes and replacements.

11.2 Implementation Team Requirements

11.2.1 The key team personnel (i.e. Project Manager(s) and Team Leader(s)) of the Implementation Team shall be stationed in Philippines for the provision of their particular services during the Contract Period.

11.2.2 At least one project manager shall be assigned for the Implementation Team, and shall work full time for this project.

11.2.3 At least two System Engineer/Specialist shall be assigned for the Implementation Team. The system engineer(s) shall possess post-qualification management experience as at the Tender Closing Date, which covers at least the following skills:

a. Provide expert advice on the system installation;

b. Provide technical consultancy services in the relevant functional systems;

c. Provide expert advice on the design of relevant systems; and

d. Design and implement relevant procedures and processes.

12.0 Delivery and Installation

12.1 Contractor's Responsibilities

12.1.1 Contractor shall conduct the delivery and installation program following the dates set out in Bidder Schedule, "Implementation Plan".

12.1.2 Contractor shall provide the hardware facilities, supply the Radar hardware and others facilities required as specified.

12.1.3 The Contractor shall observe the following requirements during system installation:

(a) All ordinances or regulations enforced in Philippines shall be followed;
(b) Appropriate measures shall be taken to protect the installation site and the existing facilities from damage caused by installation works; and

12.1.4 Contractor shall take all necessary measures to prevent interruption to the CIA's operations.

12.1.5 The Contractor shall be responsible for completing the on-site commissioning of the System before performing the acceptance tests which shall be witnessed by the CIA Representative.

12.1.6 Contractor shall describe any specific delivery and installation requirements for the System.

12.1.7 Contractor shall provide and/or deliver all the proposed hardware and software items within the implementation schedule.

12.1.8 Contractor shall be fully responsible for the installation, testing and commissioning of the System, including the provision of all equipment and wiring/cabling for the interconnection to the System, and connections to other system(s).

12.1.9 Contractor shall be responsible for completing the on-site commissioning of the System before performing the acceptance tests which shall be witnessed by the CIA Representative.

13.0 Acceptance Testing

13.1 Testing Requirements

13.1.1 Contractor's shall propose, in Tender Schedules 13.0 – "Acceptance Tests", the testing approaches, and tools required for simulating the production environment for the testing purposes.

13.1.2 Contractor shall complete comply with the Acceptance Testing requirements check list provided in Annex 2.13; Acceptance Testing requirements.

13.1.3 Contractor shall submit, at least one month prior to the carrying out of the Contractor 's tests, the corresponding test plan for approval by the Department Representative

13.1.4 Contractor shall provide means (e.g. simulation software, testing facilities) for measuring the performance and reliability of the proposed System during the acceptance tests.

13.1.5 Contractor shall provide all labor, materials, simulation and other special tools, test equipment, transportation and documentation to complete all acceptance tests. The Contractor shall perform tests to ensure that the equipment and system delivered meet the established criteria of performance,

reliability and availability in every respect in accordance with the Tender Schedules of this Project Specification.

13.1.6 Contractor shall be responsible for:

(a) Developing and submitting test plan, test conditions, test cases and procedures;
(b) Performing test details in approved test plan;
(c) Evaluating test results;
(d) Performing corrective actions and re-testing as required; and
(e) Submitting test results to the Department Representative for approval.

13.1.7 Contractor shall prepare two copies of a Test Report as soon as possible after the completion of each test, regardless of whether the test was witnessed by the CIA Representative. If the CIA Representative has witnessed the test, he shall countersign the Test Report to indicate his agreement. If the CIA representative has not witnessed the test, but the results and readings are satisfactory, he shall return one copy of the Test Report to the Contractor with a notification in writing indicating his agreement with the tests and with the results and readings. Where the results of the test do not meet the requirements, the CIA Representative may call for a retest which shall be at the expense of the Contractor.

14.0 Training

14.1 Introduction

14.1.1 The main categories of training shall include, but not be limited to:

a. Manufacturer site training,

b. Maintenance training on site

c. Operators training

14.1.2 The Contractor shall be responsible for providing a suitable number of competent instructors fully capable of providing training to a standard acceptable to CIA. Instructors must be able to communicate effectively with all levels of CIA officers and should be able to attend to their different training needs.

Further, the CIA reserves the right to replace the instructors should they not meet the above mentioned requirements and/or, if they deem necessary.

14.1.3 All travel expenses (airfare with insurance, hotel accommodations, meals, accident/health insurance for the duration of stay and daily allowances including VISA application) shall be borne by the Contractor and as a minimum shall be in accordance with the UNDP Daily Subsistence Allowance (DSA) rates including Saturdays and Sundays. Costs shall be included in the Contractor’s Financial Bid Proposal.

14.1.4 At the end of the Training, the CIA Maintenance team shall be fully capable and competent to operate and maintain the System for a minimum of, but not limited to 15 years as intended by CIA.

14.2 System Training

14.2.1 Provision of training for the CIA Maintenance teams must be conducted before the installation phase so that they will be equipped with prior knowledge necessary for the Operation and Maintenance

of the System. This leads to a healthy collaboration among the CIA Maintenance teams and the Contractor during the project implementation.

14.2.2 During the installation period, at least two CIA Engineers and six CIA maintenance teams will join the installation phase, allowing CIA maintenance teams to familiarise themselves with the system, processes and procedures in installation and on live system environment.

14.2.3 The following courses shall be conducted at the Manufacturer's Factory or Training Facility:

<table>
<tr><th>Courses</th><th colspan="2">CNSS Officers/CIAC Engineers</th><th>ATM Officers</th><th>No. of Weeks</th><th colspan="2">FAT- Technical Inspectors</th><th colspan="2">FAT- Operational Inspectors</th></tr>
<tr><td rowspan="2">PSR/SSR Radar Head</td><td>6</td><td>CNSS Officers</td><td rowspan="2">0</td><td rowspan="2">4</td><td rowspan="5">2</td><td rowspan="4">CNSS Officers</td><td rowspan="5">2</td><td rowspan="4">ATM/CNSS Officers</td></tr>
<tr><td>4</td><td>CIAC</td></tr>
<tr><td>RDP and Display System (Hardware and Software), including strip printers, interfaces, etc.</td><td colspan="2" rowspan="2">6
CNSS Officers
4
CIAC</td><td>0</td><td>1</td></tr>
<tr><td>Data Systems Specialization Course (Software Training)</td><td>0</td><td>3</td><td>6</td><td>CIAC</td><td>6</td><td>CIAC</td></tr>
<tr><td rowspan="2">ATC Workstations</td><td>2</td><td>CNSS Officers</td><td rowspan="2">6</td><td rowspan="2">1</td><td colspan4></td></tr>
<tr><td>2</td><td>CIAC</td><td colspan="4"></td></tr>
</table>

The following courses shall be conducted at the Site (Local):

Courses	CNSS Officers/CIAC Engr's.	ATM Officers
System Overview	12	12
PSSR-MSSR System	12	
RDP and Display System (Hardware and Software), including strip printers, interfaces, etc.	12	
Data Systems Specialization Course (Software Training)	12	
ATC Workstations	12	12
Power System	12	

19.2.4 The training shall include, but not be limited to:

a) Overview of the system;
b) Block diagram and functional diagram description;
c) Maintenance & test procedures;
d) Reading and interpretation of all working documents;
e) System/equipment operation and maintenance;
f) Familiarization with any associated test equipment;
g) Procedures for equipment alignment and testing in particular phasing procedures;
h) Procedures for rapid fault finding and restoration of equipment performance to line-up figures;
i) Procedures to storage and handling of LRUs and;
j) Understanding of system installation for both Hardware and Software

14.3 Operators and Maintenance training

14.3.1 Contractor shall be responsible for conducting Operators, Maintenance operation training for system operators (ATC personnel) and Maintenance staff prior to the actual implementation of the project. The objective is to ensure the readiness of all the Operators and Maintenance staff in utilizing the system for daily management and operations when *the System* gets commissioned.

14.3.2 The mode of Operators and Maintenance training shall include computer hands-on training with the system, set up in a way that closely resembles the actual workflow and operational processes in the working environment. This allows the CIA maintenance teams and Operators to familiarize themselves with the processes and procedures in a simulated environment.

For parts of the Training requiring an interaction with a computer, each trainee shall be assigned a dedicated computer unit.

14.3.3 The types of Operators and Maintenance training shall include, but not be limited to:

a) Introduction and overview of the System, including highlights of the re-engineered processes and procedures and;
b) Computer hands-on exercises covering different maintenance, operation, enquiry and reporting functions, which shall include function-based training as well as scenario-based training.

14.3.4 The training sessions shall be conducted according to the implementation plan.

14.4 Training Plan and Development

14.4.1 Contractor shall prepare a Training Plan document, which shall indicate a program of courses to facilitate training for the Maintenance Teams. The Contractor shall work closely with the CIA representative during the project to finalize the training arrangements, and submit the Training Plan document for approval by the CIA representative.

14.4.2 The Training Plan submission shall include, but not be limited to the following information for each course:

a. Training objectives;
b. Sequence of learning activities;
c. Outline/ curriculum of the course;
d. Types of training: e.g. Maintenance operation training;
e. Training mode, e.g. classroom presentation, hands-on computer assisted training, paper and pencil exercise, video, etc.;
f. Training venue;
g. Resources required, such as equipment, workshop accommodation, etc.;
h. Program showing the training hours for each training course, including classroom training, together with a breakdown of the hours necessary for each main subject;
i. Proposed schedule/duration;
j. No. of participants for each class; and
k. Post course assessment method, if applicable.

14.4.3 Contractor shall revise the Training Plan in accordance with the updated training requirements from the Department representatives during the Implementation phase of the project. The Contractor shall submit the revised Training Plan to the Department representative for consideration and agreement

14.4.4 Contractor shall develop different types of training facilities to support each course in the training program, such as:

a) Trainer's guide, which shall include course agenda, course objectives, procedures for managing training sessions, resources and facilities required, guidelines for preparing training, detailed lesson plans including outlined presentations and discussion guides,

training aids and job aids, computer based learning facilities, and detailed instructions for managing any on-the-job training.

b) Training materials, including manuals, handouts, computer-based training software packages, self-study packages, etc.
c) Training materials shall closely integrate with actual workflow and operation in the CIA's business environment to provide a user-friendly and practical guide to the users.
d) Training presentation slides, or other appropriate delivery aids.
e) Training data, designed for the purpose of computer hands-on training.
f) Training evaluation mechanism, including associated forms and scorecards.

14.4.5 All training facilities developed by the Contractor shall become the property of the CIA. Master copies of training facilities shall be provided to allow for reproduction, as deemed appropriate and necessary.

14.4.6 Contractor shall make provisions to enhance the course design and all associated training facilities, following an evaluation of the first presentation of each training course.

14.4.7 Contractor shall recommend the training approach for new user's in the future after full rollout of the System. The Contractor shall be responsible for planning, designing and developing any additional training facilities necessary to support this.

14.5 Training Delivery

14.5.1 Contractor shall:

a. Set up the Training Environment for all training sessions, including the preparation, loading and re-loading of training data.
b. Deliver training to train CIA operators and Maintenance staff.

14.5.2 At the request of the CIA Representative, the Contractor shall deliver operators and Maintenance staff training at CIA premises. The Contractor shall closely coordinate with the Department Representative in making the detailed arrangements, and shall render all necessary support in setting up the Training Environment(s), including the training System, training data, required facilities, etc.

15.0 Documentation and Deliverables

15.1 General Requirements

15.1.1 Contractor shall assume the responsibility for producing all relevant materials and documentation, for the purpose of ensuring a successful delivery of the System and associated services, as specified in this tender. The Contractor shall, after discussion and agreement with the CIA, deliver any additional documentation which is deemed crucial to the project success at no additional cost.

15.1.2 Contractor shall provide technical manuals which shall include but are not limited to the following:

a. System overview/introduction,
b. Functional description
c. Functional block diagram
d. Equipment technical manual (shall include technical description, specifications and drawings)
e. System maintenance manuals and procedure.
f. List of test equipment or special-to-type test equipment
g. Others (if any)

15.1.3 Contractor shall ensure a proper handover of all materials and documentation developed during implementation, including related on-going Operations and Maintenance Services documentation, from the Implementation Team to the Operations and Maintenance Team.

15.2 Project Deliverables

15.2.1 Contractor is required to specify and agree with the CIA the target acceptance date for each documentation in the detailed work plan. The Contractor shall deliver the documentation to the Department according to this schedule.

15.2.2 Contractor shall be responsible for having the drafted documentation ready in advance of the target acceptance date, allowing sufficient time for review by CIA Representative and any subsequent revisions required.

15.3 Project Reference Materials

15.3.1 Contractor shall provide project reference materials to the Department for information and comments.

15.3.2 Contractor shall provide for the Department information on the target completion dates of different project reference materials during Project Mobilization Stage.

15.3.3 At least two printed copies and one soft copy of the required documentation in Microsoft Office document shall be provided.

15.4 Software Documentation

15.4.1 The Contractor shall produce documentation for the application software, database software, system software, and where appropriate, documentation for other necessary software as specified in Contractor. These shall include, but not be limited to documentation of the following areas:

a. Software Setup, Installation and Configuration
b. System Administration and Maintenance Manuals
c. Operation Procedures Manuals
d. User Manuals
e. Technical Reference and Programming Guides
f. Other (if any)

15.4.2 The software documentation shall reflect the design of the proposed System.

15.5 Hardware and Software Documentation

15.5.1 To ensure continuity, the Contractor shall produce documentation for all the hardware and software facilities and hand them over to the Operations and Maintenance Team to facilitate operations and support. This shall include, but not be limited to documentation on the following areas:

a. Hardware Setup, Installation and Configuration
b. Hardware Administration and Maintenance
c. Others (if any)

15.6 Implementation and Related Services Documentation

15.6.1 The Contractor shall be responsible for delivering all relevant materials and documentation for the provision of Implementation and Related Services as Project Deliverables.

15.6.2 Upon completion of implementation, the Contractor is required to consolidate all the Implementation and Related Services documentation such that a complete set of documentation is submitted to CIA representative for record.

15.7 Operations and Maintenance Services Documentation

15.7.1 The Contractor shall be responsible for delivering all relevant materials and documentation for the provision of Operations and Maintenance services as Project Deliverables.

15.7.2 The CIA shall be responsible for the on-going maintenance of all necessary documents related to Operations and Maintenance Services, including the documents developed by the Operations and Maintenance Team as well as those transferred from the Implementation Team. For example, service plans and procedures, hardware documentation, etc.

15.8 Test Equipment, tools Documentation and Spare Parts

15.8.1 Test Equipment

15.8.1.1 Contractor shall provide and deliver all relevant test equipment and tools documentation for the provision of Operations and Maintenance services as Project Deliverables.

15.8.1.2 All test and fault location facilities which are built in and form an integral part of the equipment shall be listed and described.

15.8.1.3 All standard and special instruments and test equipment which are needed for fault location, testing, maintenance and major overhaul and are not an integral part of the equipment, shall be specified to its use and necessity and provided by the Contractor.

15.8.1.4 The Contractor shall provide test instruments for general purpose such as data and logic analyzers, oscilloscope, computers (laptops), pulse generators, RF Power Sensor, etc. which are available as off the shelf items and are considered necessary for the maintenance of the radar system.

15.8.1.4.1 Aside from traditional RF Power Meter and Sensor, Pulse Profiling USB Power Sensor with complete accessories and laptop must be provided with the following capabilities:

a. Time Gated Measurements: Pulse, Peak and Average Power, Overshoot, Crest Factor; Rise and Fall Time, Pulse Width; Pulse Repetition Frequency, Duty Cycle
b. Pulse (Modulation) Power Measurements: Duty Cycle, Measured Pulse Power, Peak Envelope Power, Crest Factor
c. Statistical Measurements: CDF, CCDF, PDF
d. CW and Average Measurements: Average Power, Duty-Cycle Corrected Pulse Power, Data Logging

15.8.1.5 Aside from traditional oscilloscope, additional oscilloscope of USB Sampling Oscilloscope type with up to 25Ghz Bandwidth with complete accessories and laptop must be provided.

15.8.1.6 These test instruments shall be arranged in a push cart utility and tool service that can house all the necessary tools, test instruments, adapters, attenuators, sensors, etc. and shall be fitted with the suitable power outlet with extension cord for mobility during the performance of maintenance.

15.8.2 Tools

15.8.2.1 A list with prices of all the necessary tools for installation, maintenance and repair of the deliveries shall be provided, also their recommended purpose and quantities shall be furnished.

15.8.3 Spare Parts

15.8.3.1 Spare units defined as repairable items, which are kept in store to be exchanged for the same items in case of failure. This should be considered as Lowest Replaceable Unit (LRU).

15.8.3.2 Spare parts are defined as components and consumable spare items, kept in store to be exchanged for failing/consummated items in the equipment.

15.8.3.3 The Contractor shall supply a preliminary list of recommended spare units for each of the system

15.8.3.4 The list shall contain at least one unit/printed circuit board of each type in the quoted equipment. Each item/spare unit in the list shall be separately quoted.

15.8.3.5 The Contractor shall supply all needed spare parts covering the needs of one (1) year of operation not including defects liability period (DLP).

15.8.3.5.1 In case of equipment failure or breakdown within the one (1) year period after the defects liability period (DLP), all spare parts needed to restore the system to normal operations shall be provided by the Contractor at no cost to the Employer (CIA) if they were not included in the initially provided spare parts.

15.8.3.5.2 A separate detailed list of spare units shall also be provided for longer period of operation. Each item/spare part shall be separately quoted.

15.8.3.6 The Contractor shall indicate the turnaround time for different types of spares during the lifetime of supplies.

15.8.3.7 The quantity of parts and spare shall be balanced against the maintenance philosophy, cost and probability of situations of spare shortage. A brief description of the calculations associated with the proposed spares supply and probability value used in these calculations shall be included in the proposal.

15.8.3.8 The Contractor shall guarantee to supply the Employer (CIA) with spare parts, units and components for at least fifteen (15) years after the end of the warranty period.

15.8.3.9 A spare parts provision meeting shall be held in order to make the final selection of spares, if necessary.

15.8.3.10 Spares shall be of the same quality as the originally installed parts, and equipment, and shall be subject to the same parts selection criteria, quality control, testing and burn-in as the original equipment.

15.8.3.11 The Contractor is required to supply information regarding Logistic Delay Time (LDT).

15.8.3.12 Logistic Delay Time (LDT) to produce spare parts or Lowest Replacement Module (LRM) from the Contractor shall be specified.

15.8.3.13 Turnaround time if a unit is returned to the Contractor for repair shall be specified.

15.8.3.14 The Contractor shall perform warranty repairs or replacements within 4 weeks, including transport time, from receipt of faulty item.

15.8.3.15 Information on the format of the Spares List

15.8.3.15.1 For each of the initial spares proposed in the list, excluding piece parts, the following information is required;

15.8.3.15.1.1 Item number (i.e. commercial stock number, drawing number, etc.)

15.8.3.15.1.2 Descriptive title with indication of group e.g. analogue, digital etc.

15.8.3.15.1.3 Category (repairable, non-repairable, multi-layer, sub-contracted item etc.)

15.8.3.15.1.4 Quantity of per equipment for LRMs.

15.8.3.15.1.5 Failure rate MTBF for operation, stand-by, storage.

15.8.3.15.1.6 Unit cost, the purchase price of the item as spare (FOB prices).

15.8.3.15.1.7 Guaranteed life, operational hours, shelf life for life limited items only.

15.8.3.15.1.8 Long lead items (delivery in month)

15.8.3.15.1.9 Safety requirements (if any).

15.8.3.15.1.10 Size and weight.

15.8.3.15.2 All parts (except for low cost material) which wear out life is less than the required life of the equipment, are to be identified and the following data supplied:

15.8.3.15.2.1 Guaranteed life, operational hours;

15.8.3.15.2.2 Guaranteed shelf life;

15.8.3.15.2.3 Cost (FOB CIA)

15.8.3.15.2.4 Man-hours to remove and replace.

16.0 Operations And Maintenance Service

16.1 Initial Application Management

16.1.1 Following implementation, the CIA will operate the System. However, in order to provide a smooth transition following implementation period, Contractor is required to provide two Implementation Project team members for a period of 1 year to work with the CIA Operations and Maintenance team.

16.1.2 Contractor shall require to state the frequency of Maintenance for the Radar systems including all the necessary equipment supply under this contract.

16.1.3 The Contractor shall be required to prepare all the recommend Routine Maintenance Procedures.

16.2 Ongoing Application Management

16.2.1 CIA may require access to additional assistance from the Contractor in the provision of Operations and Maintenance Services following the handover period. Contractor will be requested to assist the CIA with personnel with appropriate skills and knowledge to undertake works associated with such requests. Ideally, these personnel will have been involved in the implementation of the system.

16.2.2 In other cases, the CIA may request the Contractor to quote a fixed price and commit resources for the Department Representative's consideration and agreement for the development, enhancement or acquisition of new or enhanced systems and facilities; design, build, document, test and implement solutions. This may include provision of required interfaces between the new/enhanced systems and other/existing systems of third party or otherwise. The Department shall accept or reject the proposal at its sole discretion.

16.2.3 If the Department agrees that the Contractor shall conduct such development work, the Contractor shall commit to the following requirements:

16.2.3.1 Monitor progress against agreed key milestones and report in a format agreed at the end of each agreed monitoring period.

16.3 Availability and Maintenance Requirements

16.3.1 General

16.3.1.1 The system shall include maintenance features which provide system operators and maintenance personnel with full information on system status at all times, Moreover, to satisfy availability requirements, outage times shall be minimized by functions and facilities, which enable rapid diagnosis of malfunction, identification and replacement of the failed unit.

16.3.1.2Total maintenance need shall be minimized.

16.3.1.3 The maintenance philosophy and planned operations herein after are the basis for the tender.

16.3.2 System Design Considerations

16.3.2.1 Design considerations shall include at least, but not be limited to:

Maximum reliability of equipment
Redundancy of equipment and/or modules

16.3.2.2 Features that will allow internal on-line diagnostics for isolating failed modules and effect system restoration by reconfiguring the system by using redundant modules.

16.3.2.3 Modular design that permits an easy access to and simple replacement of defective modules and subassemblies.

16.3.2.4 Standardization of modules or units, to the extent practicable, to reduce life cycle costs including training, spare parts inventory management, etc.

16.3.2.5 The maintenance design features shall include on-line and off-line diagnostics, which together with built-in test equipment, test points and fault indicators, shall quickly detect the existence of and pin-point the source of a failure.

16.3.2.6 Diagnostics, status information and control of system are required to be handled via terminals, Remote and Local.

16.3.2.7 Minimum use of parts requiring special tools to remove, repair, replace and adjust shall be considered,

16.3.2.8 For rack mounted equipment, adjustments and routine servicing such as lubrication, screwdriver adjustments, etc., shall be possible without removing the equipment from the rack in which it is installed.

16.3.3 Availability performance requirements

16.3.3.1 Reliability performance requirements are imposed in the form of the highest permitted MTBF on the system. The following definitions shall be valid:

16.3.3.2 A fault refers to the following definitions: causing any function of the system to be below an acceptable level, irrespective of the cause.

16.3.3.3 The function of the equipment in the relevant facility is: to provide, transfer and display, correctly, all radar information including controls and status indications to and from the operator, to and from the connected external objects.

16.3.3.4 The function of the equipment at each radar site is: To provide and transfer, correctly, all radar information including controls and status indications to and from the equipment in the approach facility.

16.3.3.5 Faults caused by software faults shall, besides hardware faults shall be included. Equipment provided by the Employer shall be excluded from the calculations.
Critical MTBF figures for the equipment on radar site shall be better or equal to:
Primary radar $\geq$ 25,000 h.
Monopulse SSR $\geq$ 25,000 h.
Antennas, PSR and MSSR, $\geq$ 100,000 h.
Turning Unit $\geq$100,000 h.
Rotary Joint $\geq$ 70,000 h
Remote Control $\geq$ 25,000 h.

16.3.3.6 Critical MTBF figures for the equipment at approach control facility shall be better or equal to:
Approach Control system $\geq$ 30,000 h.
Remote Control $\geq$25,000 h.

16.3.4 System Availability

16.3.4.1 The system shall be design to operate 24 hours/day and 365 days/year.

16.3.4.2 Any part of the system shall be designed to have a function availability of 99.55%.

16.3.4.3 To meet these requirements the systems have to be of full dual channel configuration. Service and maintenance is to be performed on the nonoperational channel. The availability figures above exclude stops for normal service and maintenance on common parts as the Turning Gear.

16.3.5 Mean Time To Repair (MTTR) Requirement

16.3.5.1For each unit at radar head site or Approach control Facility, the Mean Time To Repair (MTTR), shall not exceed 0.5 h. Excluded, is the antenna system, which shall have a MTTR better or equal to 6 h.

16.4 Maintenance Operations

16.4.5 General

16.4.5.1 The maintenance operation is based on the premise of a highly reliable hardware design with a reasonable amount of redundancy at the system level. Therefore necessary design features to keep maintenance requirements to a minimum shall be incorporated.

16.4.5.2 Maintenance activities are classified into four items:
System Management
Preventive Maintenance
Corrective Maintenance
Technical Support

16.4.6 System Management

16.4.6.1 Complete system status information shall always be available for operators and maintenance personnel, Remote and Local.

16.4.7 Preventive Maintenance

16.4.7.1 Preventive maintenance shalt be carried out in a method based on system performance. That is, preventive maintenance schedules shall be regularly reviewed and adjusted to reflect operational and technical requirements for optimum efficiency.

16.4.7.2 The Contractor shall propose a program and detailed instructions for preventive maintenance, taking into account this Chapter and operational, as well as reliability and availability requirements. The need for preventive maintenance shall be kept to a minimum.

16.4.7.3 The Contractor shall propose all necessary resources to be needed to carry out the proposed preventive maintenance.

16.4.8 Corrective Maintenance

16.4.8.1 This activity includes system diagnosis, fault determination, adjustments and replacement or repair of modules and units.

16.4.8.2 Corrective Maintenance Level 1

16.4.8.2.1 The redundancy of the equipment together with the on-line diagnostic capability shall permit automatic switch over reconfiguration of a defective unit to a redundant one.

16.4.8.2.2 Fault isolation shall be accomplished using BITE and/or off-line diagnostic programs from RMCS, which will be downloaded to the defective equipment.

16.4.8.2.3 The Contractor is requested to submit predicted MTTR on maintenance level 1 for all the units contained in the proposed system and to calculate on this basis and on the Contractor 's previous experience the MTTR for the whole systems.

16.4.8.3 Corrective Maintenance Level 2

16.4.8.3.1 The level 2 maintenance shall be included in the proposal as appropriate.

16.4.8.3.2 A Maintenance Support Facility (MSF) will be used for level 2 maintenance. It shall consist of test bench, test programs, measuring equipment and special tools recommended by the manufacturer.

16.4.8.3.3 A recommended list of general purpose test equipment and tools required shall be provided. The list shall include the functions and the purpose for each test equipment/tool offered.

16.4.9 Maintenance Support

16.4.9.1 Online Diagnostics

16.4.9.1.1 The purpose of the on-line diagnostic task is to check the system hardware for correct operation, and to initiate a malfunction report when an error occurs.

16.4.9.1.2 On-line diagnostics shall provide a very high level of confidence for operational use of the system, a sound basis for automatic and manual reconfiguration decisions, and an indication to maintenance personnel of the nature and location of the malfunction.

16.4.9.1.3 The On-line diagnostic shall form a part of the Remote Monitoring and Control System (RMCS)

16.4.9.1.4 Design emphasis shall be placed on fault detection primarily, and on fault location secondly. The design shall take advantage of all available supplementary and status information which is to be included in the malfunction report.

16.4.9.1.5 In addition, this information shall be easily accessible from different system blocks by maintenance personnel should the nature of the malfunction prevent normal malfunction reporting or communication.

16.4.9.1.6 Diagnostic routines shall be repeated within adjusted time depending upon the criticality of the individual equipment. Diagnostic routines shall be provided for software as well as for each hardware functional element, such as antenna, transmitter/receiver, processing elements, memory/storage elements, interfaces, communication links shall be properly tailored to the hardware architecture and interface configurations.

16.4.9.2 Hardware Error Detection

16.4.9.2.1 All features for hardware error detection shall be exercised by the on-line diagnostics to the extent that they do not degrade the operational system integrity.

16.4.9.3 Documentation

16.4.9.3.1 Explanatory documentation for on-line diagnostic programs shall be supplied.

16.4.10 Built-in test equipment (BITE)

16.4.10.1 BITE shall be designed for rapid assessment of test results and isolation of faults down to LRM or component level. The BITE-system shall at least be in compliance with this TOR.

16.4.10.2 BITE or diagnostic programs shall be utilized also in peripheral equipment to locate faults down to LRM level. Facilities for calibration, fault detection, fault location and performance monitoring functions shall be included where applicable.

16.4.10.3 BITE shall not cause system failures or false alarms, and shall be extensively self-tested to ensure the validity of the BITE output. There shall be a possibility to block off the BITE function.

16.4.10.4 A local summary signal for pass/fail shall be indicated, for instance by a LED on the front edge of each major unit or PCB.

16.4.10.5 A subset of the internal diagnostic routines shall be activated automatically on power up. In this case the execution time of diagnostics shall be stated for each major unit. The associated routines shall include a check of all LRMs in the chassis and present the results in a manner similar to that described in the previous paragraph.

16.4.10.6 The BITE shall be connected to the RMCS, for logging and printing remotely and locally.

16.4.11 Off-Line Diagnostics

16.4.11.1 Off-line diagnostic shall have the same main features and capability as for on-line diagnostic.

16.4.11.2 Off-line diagnostics shall be available for downloading to the defective equipment.

16.4.11.3 It shall be possible to run the diagnostics either in a chained mode with default parameter values or by individual selection to permit detailed fault analysis in specific areas. Parameter values shall be easily modified and diagnostic loops easily inserted.

16.4.11.4 Computer test routines shall be provided which shall be capable of exercising all internal memory, computer and input/output control equipment that are program-accessible. Included in this routine there shall be a test of computer instructions, address registers, and data registers for the computer under test.

16.5 Remote Monitoring and Control System (RMCS)

16.5.1 Remote control, monitoring and diagnostic will be carried out from remote site. The RMCS shall monitor the status of the radar system in total. It shall be possible to override the remote function and use the RMCS for maintenance purpose.

16.6 Maintenance Vehicles

16.6.1 The Contractor shall provide within fourteen (14) calendar day upon receipt of Notice to Proceed until Certificate of Completion, two (2) maintenance vehicles with the following specifications:

a. Brand new 4 x 2 Pick-up (one unit with camper shell)
b. Locally purchased
c. Automatic transmission
d. Diesel engine

e. With plastic bed liner at the back and appropriate safety markings/decals (to be coordinated with the PMO)
1. With appropriate safety markings (to be coordinated with the PMO)
g. Equipped with yellow beacon light
h. Equipped with mobile Base Transceiver
i. Equipped with all necessary tools and early warning device
j. Registration and Insurance

16.6.2 The above vehicles shall be used by CIA, CAAP or their duly authorized representatives for official/project-related purposes only.

16.6.3 The Contractor shall provide a full time qualified and competent driver who shall be under their direct supervision in coordination with CIA Engineers or CAAP CNSS Officers or their delegated representatives. The Contractor shall maintain the vehicles in good running condition and shall be supplied with appropriate fuel and lubricants during the contract period.

16.6.4 The Contractor must ensure the hundred percent availability of the driver and vehicle until the end of the contract. In cases where in the vehicle/s or driver is/are not available due to maintenance or emergency, the Contractor must provide an alternate driver or vehicle of the same type and capability.

16.6.5 The Contractor shall provide a maximum diesel allowance of 20 Liters daily for the whole duration of the project.

16.6.6 Upon the receipt of Certificate of Completion, the Contractor must turn over the vehicle/s in good running condition to CIA. This vehicle will be specifically detailed at Radar Site (Lilly Hill) to be utilized by maintenance personnel in their performance of Preventive and Corrective Maintenance.

17.0 Transitional Operations

17.1 General Requirements

17.1.1 The adoption of a phased by department implementation approach, as stipulated in implies the requirement to have the proposed System running for approximately one year under warranty.

17.1.2 Contractor shall be responsible for liaising with and giving all necessary assistance to all parties for the proper implementation of the system, for example:

i) The coordination with CIA staff of the effected systems for transitional and operations programs.

ii) The briefing and familiarization of the affected maintenance procedure and troubleshooting techniques.

18.0 Equipment Warranty

18.1 The Contractor shall forthwith make arrangements with the CIA, if during the period of warranty any defects in design, material or workmanship shall appear or if the proper working of the Articles shall in any way deteriorate under proper use, the Contractor shall forthwith make arrangements with the CIA.

18.2.1 To repair such defective Articles or to supply as soon as possible by the same means (sea or air) as the original Articles, and at his own cost, such replacement or additional material or parts as may be necessary to put the whole system in full and satisfactory operation. Any such defective materials or parts shall by mutual consent be delivered to the Contractor 's Works at the Contractor 's cost as soon as possible after such defect is found, and

18.2.2 To install, if considered necessary by the CIA, as soon as possible at Contractor 's cost such repaired Articles, replacement or additional material or parts.

18.2.3 Should a defect or repetitive fault of the Articles become apparent during the period of warranty, which may endanger the operation of any system as a whole, then the Contractor shall take special steps as deemed necessary, to arrange for the supply of services of Contractor 's staff/and/or replacement materials, at Contractor 's cost, to the site or sites without delay to remedy such fault or defect.

18.3 In the event of the Contractor failing to make good such defects or deterioration in the manner provided herein they shall be made good under other arrangements and the Contractor shall pay to the CIA the cost thereof. CIA will make the deduction by involving the Banker's Guarantee for Security Deposit.

18.4 The periods of warranty set out in this Clause shall be extended by a period equal to the period during which the system, or that portion thereof in which a defect to which this Clause applies has developed cannot be used by reason of that defect.

18.5 The Contractor r shall be required to guarantee the proper working of the Articles as detailed below (but not limited to the followings)

18.5.1 The successful Contractor warrants and undertakes:

18.5.1.1 that it is not aware as at the date of this Contract of anything within its reasonable control which might or shall adversely affect its ability to perform its obligations under this Contract;

18.5.1.2 that the import, supply and installation of the System shall not infringe any laws of any country;

18.5.1.3 that as at the date of signature of this Contract:

18.5.1.3.1 each individual element of the System shall be compatible with all other elements of the System and shall work properly in combination with each other as an integrated system;

18.5.1.3.2 the System shall be compatible with the Government Equipment and each shall operate properly in conjunction with each other;

18.5.1.3.3 the Hardware shall run the Software;

18.5.1.3.4 the design of the System shall be suitable to fulfil the CIA Requirements and the System shall perform and function in accordance with the Requirements and the performance standards;

18.5.1.3.5 the installation of the System shall be free from defects in workmanship;

18.5.1.4 that the Documentation and training provided pursuant to supply the Documentation and provide training and other related services in accordance with Section 2 – Specification in the Invitation To Tender and the training plan set out shall enable suitably qualified personnel of the Government to make proper use of the System.

18.6 All hardware and software components to be delivered, including the RCMS (Remote Control Monitoring System), Generator Sets, Workmanship, Ancillaries, shall have a Defects Liability Period (DLP) of 12 months. All components to be delivered shall be brand new and of latest model.

18.7 The DLP shall start after the date of issuance of the Certificate of Project Completion by the CIAC, wherein all of the works were executed, completed by the Contractor as per Contract.

18.8 A Facility Availability Report shall be submitted by the Contractor to CIAC after the end of the DLP to determine if the system installed is within the required availability requirements.

18.9 A Certificate of Final Acceptance shall be issued by CIAC after the end of the DLP period.

18.10 After the defects liability period, a Warranty Period of two (2) years for the hardware/software components is required.

19 CIVIL WORKS

19.1 General

19.1.1 This Chapter establishes the requirements for the construction of radar equipment Building (OEM recommendation), Antenna Tower, powerhouse and Radome installed in the tower platform and rehabilitation of the existing building for the Radar Facility. It also specifies the building works requirements for basic electric installations, air conditioning systems, alarms and protection system.

19.1.2 The Contract is a design and construction Contract. For the building in sheltering the radar, and the Radar Facility, the design task includes the production of all necessary documents for the purpose of approvals and necessary permits before start of construction, as well as documents for the construction. Further the design task includes all contacts with local authorities to obtain any necessary permits including costs for it. Additional requirement of the contractor during the construction not included in the design shall be charged to the contractor, at no cost to the Employer.

19.1.3 In addition to the requirements of this part of the specifications, the design shall meet and fulfil all laws, standards, regulations and other official documents issued by the relevant authorities of the Republic of the Philippines. Further, the design shall take into account all relevant functional

requirements, i.e. the building and the surrounding area shall allow for easy operation, maintenance and repair.

19.2 Submissions

19.2.1 Tender submission

Site Inspection is required. The Contractor shall submit a notarized Affidavit of Site Inspection.

19.2.2 The Contractor shall include in his Tender and where appropriate specify, at least, the following key elements of the design and construction task:

19.2.2.1A sketch drawing showing the layout of the building with room sizes and location of equipment;

19.2.2.2 A sketch drawing showing the build-up of the tower shaft, the area below the radar turn-table and the security arrangements at same level; sketch drawing showing the layout of the building with room sizes and location of equipment;

19.2.2.3 Material choice for external and internal walls;

19.2.2.4 Material choice for tower shaft and turntable area;

19.2.2.5 A preliminary calculation related to requirements on deflection and inclination of the shaft;

19.2.2.6 Material choice for roofing;

19.2.3 Submission before start of construction work.

19.2.3.1 All work drawings and specifications intended for the civil, buildings and electrical works.

19.2.3.2 All necessary soil investigation, testing and analysis required for the design Which shall be the sole responsibility of the Contractor.

19.2.3.3 Structural calculations to verify the requirements on deflection and inclination of the tower shaft. The Contractor shall be fully responsible for the structural integrity of the tower.

19.2.3.4 Additional requirements on submissions are given in the subsequent text.

19.2.3.5 Contractor shall conduct Load Simulation Tests of the stability of designed tower, and submit the results verified by a Civil Engineer with supportive Calculations, considering and clearly indicating dead loads, external loads, wind loads and other environmental conditions at the Site.

19.2.3.6 Contractor shall obtain necessary permits from the relevant agencies for the construction of the Radar Tower, Equipment Building and Radar Facility Building.

19.3 Design Requirements

19.3.1 Room size requirements

19.3.1.1 The radar station shall be equipped with a base building one storey high, comprising at least four rooms:

19.3.1.2 Entrance, Wind and sand trap; minimum 2,4 sq. m.;

19.3.1.3 Radar Equipment room - Size as required for equipment and maintenance purposes. The free height below ducts/pipes/etc. shall not be less than 2.2 m.

19.3.1.4 Multi-purpose room, Office, storage, toilet & bath – size as required for equipment service and exchange; in addition 5 sq. m. free floor area.

19.3.1.5 UPS and Battery room - Size as UPS equipment, service and exchange.

19.3.1.6 Restrooms. Provide a minimum of one unisex (GAD compliant) restroom.

19.3.1.7 Rooms 1 to 4 shall have a minimum room height of 2.7 m. The height shall determine the final height of the rooms and building.

19.3.1.8 The radar tower shall be a freestanding structure adjacent to and directly connected to the base of the building.

19.3.1.9 Radar tower shaft – Size governed by deflection/inclination requirements; shall allow for a spiral staircase with radium 1.1m. Other type of staircase can be proposed.

19.3.1.10 Turn-table room — Space requirement governed by access to and service for turn-table, possibility to install same and exchange parts; height requirement the same as for rooms 1 to 4.

19.3.1.11 Applicable rules, standards and design criteria

Unless otherwise stated herein or agreed upon, the design and the choice of material for the building works shall be in accordance with the applicable standards and regulations issued by the government of the Republic of the Philippines.

19.3.2 Radar Facility Building

19.3.2.1 Rehabilitation of the existing building at Lily Hill formerly owned by Liberty Broadcasting into Radar Facility Building. This building shall include but not limited to the following rooms:

a. CAAP ANS Office
b. Lobby
c. Pantry
d. Conference Room/Training Room with workbench
e. Storage or Spare Parts Room

f. Locker Room
g. Comfort Room and Bath Room
h. Guard House
i. Guard and Utility Quarters
j. Outdoor Comfort Room

19.3.2.1.1 The Works Consist of The Following:

A. Temporary Facilities
B. Civil Works
B.1 Radar Facility Building (Interior Works)
B.2 Radar Facility Building (Ceiling Works)
B.3 Radar Facility Building (Floor Works)
B.4 Radar Facility Building (Painting Works)
B.5 Radar Facility Building (Window Works)
B.6 Comfort Room
B.7 Outside Works

C. Electrical and Mechanical Works
C.1 Lighting Fixtures (Radar Facility Building)
C.2 Generator Set
C.3 Electrical Works (Radar Facility Building)
C3.1 Furnish and Installation of the following:

1 Lighting System 2 Power System 3 Wiring Devices 4 Roughing-In 5 Wires and Cables 6 Auxiliary System 7 Miscellaneous

C3.2 Furnish and install other supporting materials and equipment deem necessary to complete the project.
C.4 Mechanical Works (Radar Facility Building)
Ventilation and Air conditioning
a. Provide air conditioning units and exhaust fans.
b. Provide air conditioning ducts, air diffuser, hangers and brackets.
c. Provide complete electric power supply, instrumentation and control system.
d. Provide mild steel painted finish pedestal and/or hangers for all air conditioners, exhaust fans and air ducts.
e. Chip and restore all areas affected by the installation of the ventilation and air-conditioning system.
f. Conduct leak testing, test run and painting/color coding of the installed ventilation and air conditioning system.
g. Provide any item that might have been omitted in any part of the work or materials usually furnished, which are necessary for the completion of the works outlined.

D. Auxiliary Works
D.1 FDAS (Radar Facility Building)
D.3 Structured Cabling Components for Data Connections (Radar Facility Building)
D.4 Structured Cabling Components for Voice Connections (Radar Facility Building)

E. Furniture
E.1 Furniture (Radar Facility Building)

E.1.1 Furnishings

a) Provide and install new cabinets with shelves, doors, and all necessary accessories.

b) Provide pieces of furniture.

c) Check and verify measurement at site prior to fabrication to insure proper fit and installation.

F. SANITARY/PLUMBING WORKS

F.1 Scope of Work

1) All plumbing and sanitary works shall be done in accordance with the best practices of the industry and should be supervised by a licensed Sanitary Engineer.

F.2 Plumbing Fixtures

F.2.1 Provide new plumbing fixtures complete with trims, fittings and accessories.

a. Water closet – Wall hung & in wall tank with complete fittings and accessories. Provide seat cover.

b. Lavatory – Semi-Pedestal Type complete with complete fittings and accessories.

c. Wash/pantry Sink – stainless Steel; with drain board, ceramic disk type faucet, and accessories

d. Wash Sink – Stainless Steel; complete with ceramic disk type faucet, and accessories. Waterproof compartment/cabinet

e. Provision of stainless steel spray hose/bidet.

F.3 Waterline System

1) Provide complete water supply pipes to plumbing fixtures.

2) Provide air cap chamber for every supply pipe of fixture.

3) Provide control/isolation valves for every group of fixtures as indicated on plan.

4) Tap water supply pipes to the existing water main. Verify actual location.

5) Install complete waterline system.

F.4 Sewerline System

1) Provide complete sewer line and ventilation system to all plumbing fixtures including fittings and trims.

2) Provide vent cap to all vent stacks installed/recessed at walls or below ceiling eaves.

3) Provide grease trap.

4) Tap sewerline from plumbing fixtures to existing sewer line; verify exact location.

5) Provide pipe hangers and brackets as needed.

G Other Works

1) Cleaning and Hauling Debris

2) All demolished/removed materials that are still usable will not be allowed to be use and shall be properly stocked, inventoried and turned over to end-user.

3) The Contractor shall take due care to protect existing structures which will be affected and unaffected by the work to be implemented.

4) The Contractor shall at all times keep the premises free from the accumulation of waste or rubbish, cause by his subordinates or work. Upon completion of each item of work, they shall remove all rubbish materials from and within the site including all his tools, scaffoldings and surplus materials.

19.3.2.1.2 Conference and Training Room shall have but not limited to the following:

a. Overhead projector with pull down projection screen
b. Sound system

19.3.2.2 Covered walkway/garage from Radar Facility to the Radar Equipment Building.

19.3.2.3 Applicable rules, standards and design criteria

Unless otherwise stated herein or agreed upon, the design and the choice of material for the building works shall be in accordance with the applicable standards and regulations issued by the government of the Republic of the Philippines.

19.3.3 Specific design criteria

19.3.3.1 The tower shaft shall be designed to withstand wind loads and other static and dynamic loads(critical load factors)imposed including such of equipment/radar and within the limits set by the operational requirements. The Contractor shall verify the design by using a standard, three dimensional, computer calculation program. Unless otherwise agreed, the design wind speed at the top of the tower used in the calculations shall be 35m/s. Typical values for such a tower are a maximum inclination of 0.1 deg. and a maximum torsion of 0.01 deg. The final limit shall be based on the operational requirements. In addition to the above mentioned loads, the difference in temperature between a part exposed to sun and another part in shadow must be considered. Typical values for non-insulated parts may be 20 °C for concrete and 40 °C for steel.

19.3.3.2 The super-imposed load on surfaces shall take into account the maximum loads imposed on a structure during erection or at transport of equipment. The minimum load on floors shall be 2 kN/m2. For roofs a minimum load of 1 kN/m2 shall be applied.

19.3.3.3 A separate power house for the emergency back-up generator for the radar head equipment shall be constructed at the radar head site.

19.3.3.4 All necessary ancillaries of the power house such as main fuel tank, day tank, etc. shall be provided.

19.4 Maintenance and Workmanship, Builder's Work

19.4.1 Moisture, vermin and dust protection.

19.4.1.1 The building structure and all spaces within the building shall have the necessary protection against moisture, water leakages, vermin and dust. The effects of temperature, precipitation, soil moisture, surface water, relative humidity and dampness of building materials shall be taken into account.

19.4.1.2 Special consideration shall be given to the design of the facing components such as welts, seams, windows and door edge flashing and tightening of joints.

19.4.1.3 Rainwater shall be led away through external gutters and downpipes with a discharge point at least 2 m away from the building. At discharge point, the surface shall be erosion protected within an area of 2 sq. m covered by gravel/stone size 16-64 mm, depth 200 mm.

19.4.2 Heat insulation

19.4.2.1 The coefficient of thermal transmission (u-value, W / m 2, °C) should reflect the need for energy saving related to the required temperature and humidity limits. For rooms with specific temperature and humidity requirements, the u- value shall not exceed:

19.4.2.2 External walls = 0.45

19.4.2.3 Roof = 0.30

19.4.2.4 Windows = 3.0

19.4.2.5 Doors in external walls = 2.00

19.4.3 Noise protection

19.4.3.1 The walls of the stand-by diesel generator power house shall have a noise reduction capacity of 45 dBA.

19.4.3.2 Noise from fans and air-conditioning units shall be kept to a minimum. In the multi-purpose room, the level shall be no more than 45 dBA.

19.4.4 Fire protection

19.4.4.1 Measures shall be agreed upon with the local authorities and shall comply with the local regulations. In the absence of any specific local rules, the fire protection level shall be equal to the National Fire Protection Administration (NFPA) Standard. As a minimum rooms 2 to 4 shall separate fire compartments with 60 minutes fire resistance. Further, fire within these rooms shall not cause damage to the tower shaft and the radar installations within 60 minutes.

19.4.5 Ground Conditions and Foundations

19.4.5.1 For the purpose of tender, the Contractor shall visit the site, to visually and make himself adequately accustomed with the prevailing conditions. Unless otherwise agreed, the Contractor shall take the full responsibility for determining the actual soil conditions and their effect on sizes and depths of foundations.

19.4.5.2 The building foundation shall be made of concrete. Special attention shall be paid to the protection against termites in accordance with the standard specification for materials.

19.4.5.3 Pipes for electrical wiring shall be routed in the foundation walls and in the concrete slab and be sealed after laying of cables to prevent intrusion of -termites, and other vermin.

19.4.6 Walls

19.4.6.1 Exterior walls shall have outside and inside surfaces concrete, either in the form of cast in site or pre-cast concrete or in the form of concrete blocks, To fulfil the requirement on thermal insulation, a sandwich construction may be required.

19.4.6.2 Internal walls may be made of concrete blocks.

19.4.6.3 All block wall mortar joints shall be flush.

19.4.7 Windows, hatches

19.4.7.1 Double-glazed windows of aluminum. Windows are only required in the multi-purpose room, 2 Nos size 800x1000 (height x width). They shall not be open able.

19.4.8 Doors

19.4.8.1 External entrance doors shall be made of aluminum with sufficient insulation, be provided with door closers and have neoprene tightening bands between frame and door blade. They may be ordinary aluminum doors, size minimum 1000 by 2400 mm, with threshold, framework of anodizied tubular sections, door-leaf of same, panel infills of 2 mm extruded aluminum panels on 3,2 mm hardboard core, single glazed of clear sheet glass size 500 by 1000. They shall be equipped with an upright mortise cylinder lock provided with one cylinder operated dead bolt and one handle operated latch bolt.

19.4.8.2 Interior doors between the rooms shall be fire-rated doors, minimum 60 minutes, except for the door between the multi-purpose room and the entrance, which may be an ordinary aluminum door. All doors shall be prepared for, but not equipped with, cylinder locks.

19.4.9 Ceiling

19.4.9.1 All ceilings in rooms 1 to 4 shall be concrete.

19.4.10 Roof

19.4.10.1The roof shall have a minimum slope of 14 degrees. The quality of the roofing material shall guarantee a life length of minimum 15 years at prevailing conditions.

19.4.10.2 The canopy shall be of type troughed steel decking.

19.4.11 Tower construction

19.4.11.1 The tower shaft shall be built of steel. Steel shall be hot dip galvanized.

19.4.11.2 The radar antenna tower shall withstand a wind speed of 250 km/hr.

19.4.11.3 The tower shall be constructed to have a maximum torque at a 0.01^{o} and a maximum bending of $\pm 0.1^{o}$ at a wind speed of 35 m/sec.

19.4.11.4 The tower shall be equipped with stairs or ladder to allow entrance to the turning unit platform and access to the antenna.

19.4.11.5 The turning unit platform shall be equipped with an appropriate lifting device capable of carrying a weight of at least 250 kg and/or the weight of drive mechanism assembly including motors whichever is higher.

19.4.11.6 The radar antenna tower must have a minimum height of 15 meters.

19.4.12 Room finishes schedule

19.4.12.1 Abbreviations:

F = flooring
S = skirting
W = walls
C = ceiling
O = other

19.4.12.2 Entrance

19.4.12.2.1 F – Steel troweled single course concrete slab treated with dust binding and slip resistant substance Semiconductor carpet, anti-static treated.

19.4.12.2.2 S - To form skirting, 70 mm high

19.4.12.2.3 W - Painted concrete blocks

19.4.12.2.4 C – Painted concrete

19.4.12.3 Equipment room

19.4.12.3.1 F – Steel troweled single course concrete slab treated with dust binding and slip resistant substance Semiconductor carpet, anti-static treated.

19.4.12.3.2 S - Floor carpet to form skirting, 70 mm high

19.4.12.3.3 W - Painted concrete blocks

19.4.12.3.4 C – Painted concrete

19.4.12.4 Multi purpose room

19.4.12.4.1 F - Steel troweled single-course concrete slab treated with two-component epoxy paint, slip resistant substance Semiconductor carpet

19.4.12.4.2 S - Not Applicable (N/A)

19.4.12.4.3 W - Painted concrete blocks

19.4.12.4.4 C – Painted concrete

19.4.12.5 UPS, Battery Room and Generator Room

19.4.12.5.1 F - Steel troweled single-course concrete slab treated with oil and slip resistant substance. The floor shall slope towards a floor pit approximately 0.5x0.5 meters, depth 200 mm

19.4.12.5.2 S - Concrete fillet, treated with oil resistant substance

19.4.12.5.3 W - Painted concrete

19.4.12.5.4 C – Painted concrete

19.4.12.5.5 O - Foundation of concrete, same treatment as the concrete slab. Collecting fuel trough of concrete under the fuel tank; treatment as for the concrete slab

19.4.12.6 Tower Shaft

19.4.12.6.1 F - Steel trowelled single-course concrete slab treated with dust binding slip resistant substance

19.4.12.6.2 S - N/A

19.4.12.6.3 W - N/A

19.4.12.6.4 C - N/A

19.4.12.6.5 O - Staircase, hot dip galvanized, with railing Hatch of aluminum at ceiling for access to turn-table room. Hatch equipped with burglar bar and cylinder hang-lock

19.4.12.7 Turntable room

19.4.12.7.1 F - Steel: Hot dip galvanized plate cover or grating

19.4.12.7.2 S - N/A

19.4.12.7.3 W - Steel: Hot dip galvanized plate with exhaust fan.

19.4.12.7.4 C - N/A

19.4.12.7.5 O - Telfer and/or lifting hooks for transport of turntable

19.4.12.8 External Finishes

19.4.12.8.1 Foundations Concrete

19.4.12.8.2 Walls Painted concrete, painted block wall or external rendering

19.4.12.8.3 Doors, windows, Aluminum, natural anodized hatches

19.4.12.8.4 Canopy Protruding 1 m outside façade

19.4.12.8.5 Gutters, downpipes, Rust protection PVF2 steel sheeting

19.7.12.8.6 Intake platform at tower top Hot dip galvanized platform for intake of equipment balustrade all around; part of balustrade to be open able

19.5 Materials and Workmanship, Air-conditioning, Air Treatment, Control and Monitoring

19.5.1 General

19.5.1.1 The work comprises design, documents for building permit, delivery, installation, tests, starting up, balancing, rating, as-built drawings, operation and maintenance instructions and liability for the performance of the complete installation as covered by this specification.

19.5.2 Authorities

The Contractor is responsible for all contacts with the authorities and is responsible for all permits required for the execution of the works including costs for the same.

19.5.3 Air-conditioning

The Contractor shall provide for redundant air-conditioning .system at operations and equipment rooms. The method for cooling the building is to be proposed by the Contractor with due regard to the criteria set forth in the previous chapters.

19.5.4 Air treatment installation

19.5.4.1 The air inlet for outdoor air shall be provided at the radar head building. The air shall pass through a sand trap before entering through a grill with an intake filter. The air may then be cooled by an air conditioning unit to meet the temperature and humidity requirements. Air pressure shall be raised by a fan and distributed via supply air terminal devices.

19.5.4.2 The extract air shall be extracted through ducts provided filters to prevent sand intrusion at accidental back-flows in the system.

19.5.4.3 Filters shall be of exchangeable type.

19.5.5 Central control and monitoring equipment.

19.5.5.1 A central control system for the ventilation and air-conditioning plants as necessary for the proper functioning of the system shall be provided.

19.5.6 Rating

19.5.6.1 All installations shall be marked with rating conditions showing relevant data of the equipment. Before rating is started the Contractor shall make up a draft and deliver it to the client for approval. Pipes, conduits and ducts are to be rated. Automatic devices, circuit breakers, safety switches and other similar equipment shall be rated.

19.5.7 Balancing and testing

19.5.7.1 The documentation shall describe the procedures for common testing of installations for ventilation, electric and central control systems. Testing of pressure and air tightness shall be performed. The entire plant shall be tested with regard to performance and safety. The airflow rate shall be documented by the Contractor.

19.5.8 Training, of Employer's Maintenance Staff

19.5.8.1 The Contractor shall train the client's staff in the operation and necessary maintenance of the system. This is to take place when the building has been completed and together with the final taking over of the building by the Employer.

19.5.9 Technical documentation

19.5.9.1 The Contractor shall prepare all work drawings of the building works for the approval of the PMO and obtain all necessary permits from relevant authorities. Specification of materials shall be produced by the Contractor. As-built drawings shall be delivered together with the final taking-over of the building by the Employer and PMO.

19.5.10 Operational instructions for ventilation and air-conditioning systems.

19.5.10.1 Manuals shall be delivered in six copies in files A4 size with index and markings on the back.

19.5.10.2 An electronic copy of all manuals shall be provided.

19.6 Civil Works

19.6.1 Area around the radar head building

19.6.1.1 The external area around the building shall be leveled with an outward slope from the building of minimum 1:50. The area shall receive the same bearing capacity and surface finish as the access road.

19.6.1.2 The area shall be fenced in with a hot dip galvanized cyclone fence with a height of approximately 3 meters. On top of the fence three curled layers of barbed wire shall be applied. A drive-in gate. 3 meters free width, with adequate locking devices shall be provided.

19.6.1.3 The area surrounding the building shall be concreted or receive concrete tiles 2 meters out from the façade.

19.7 General Instructions for Installations

19.7.1 The radar head building and antenna tower shall be equipped with the following facilities:

1. Electric Power from the Power Plant;
2. Earthing and Lightning Protection;
3. 3-Phase Standby Electric Power System (diesel generator) installed at power house (OEM Recommendation);
4. 3-Phase Redundant Uninterruptible Power System (UPS); (OEM Recommendation);
5. Air-Conditioning System (OEM Recommendation);
6. Fire Alarm System;
7. Fire Extinguishing System; and
8. Burglar Alarm System.

19.8 Electric Power System

19.8.1 The building shall be connected to a 220 V 60 Hz, 3 phase external power supply network, fed by a separate and appropriate size and type of transformer with lightning protection (surge diverter), situated in a separate transformer building/substation outside the radar building site. The 220V 60Hz, 3 phase power supply system shall be established at the radar head site. All necessary equipment such as transformers, transformer protection and auxiliaries, power cables and other ancillaries shall be the provided by the Contractor.

19.8.2 All installations shall be surface mounted, "5-conductor TN-S-system". 3 phases, N and PE, with cables on cable trays, in trenches or clamped to walls.

19.8.3 All cables shall be shielded,

19.8.4 All rooms including the equipment room and the turn-table room shall be equipped with lighting and socket outlets, as required.

19.8.5 In the turntable room a 3-phase socket outlet for motor connection shall be installed to be used for lifting equipment for turntable parts, including drive motor-gear assembly.

19.8.6 Panel board, floor mounted, with automatic fuses, circuit, breakers, contactors etc., shall be split in two separate sections, one for local small power and one for radar power supply, each with its own circuit breakers and fuses.

19.8.7 The panel board shall be equipped with an earth fault breaker,

19.8.7.1 The panel board shall have 20% fuse reserve capacity and fuses shall be automatic type.

19.8.7.2 Fuses/Circuit Breakers for socket outlets, 220 V power outlets, air-conditioning and lighting shall be equipped with earth fault breakers.

19.8.8 All rooms shall be equipped with portable emergency lights (to Illuminate at power supply interruption).

19.8.9 Cables for local power and power for radar system shall be mounted on separate cable trays or trenches.

19.8.10 Cables for telecommunication shall be separated from cables for control/monitoring.

19.9 Electric Power for Radar System

19.9.1 All electric power for the radar system shall be supplied from the 3-phase UPS (see paragraph 19.7.1 item 4. Uninterruptible Power System - UPS).

19.10 Earthing and Lightning Protection

19.10.1 All Incoming/outgoing cables (power and telecom) shall terminate at over-voltage protectors (vacuum lightning protector) at the inner surface of the external wall of the multi-purpose room. The protectors shall be connected to an earthing wire outside the wall.

19.10.2 Incoming power supply cable shall be over-voltage protected. The protectors shall be connected to an earthing wire outside the wall._

19.10.3 Earthing wires shall be Cu, minimum 3.5 sq. mm. with insulated green color.

19.10.4 The reinforcement of the foundation and floor slab shall be connected by steel wire to steel structure or the reinforcement of the tower shaft. The wire shall be connected to the earthing system. The earthing system comprises a continuous Cu-wire (minimum 3.5 sq. mm.), placed around the base of the building, below ground at a depth of minimum 400 mm, connected to four diagonally placed Cu-wires, at each corner, 20 meters long and terminated at and connected to an earthing rod.

19.10.5 At the switchgear, surface mounted on the outside, an earthed bus-bar shall. be mounted, connected to the earthing Cu-wire. Incoming N and PE, cable tray earthing, earthing of electric cabinets and earthing of turntable shall be connected to the bus-bar. All earthing wires shall be labeled.

19.10.6 The cable tray earthing may be non-insulated type and shall be connected to both sides at cable tray splices.

19.10.7 All installed/relocated equipment shall be lightning protected by a lightning dissipation type array. The design of the lightning protection system shall be the responsibility of the Contractor. The design of the lightning protection system shall be submitted for review and approval of the PMO.

19.11 3-Phase Standby Electric Power System

19.11.1 Technical

19.11.1.1 The following technical data shall be included in the tender

19.11.1.1.1	Set	Type
19.11.1.1.2	Engine	Make
19.11.1.1.3	Engine	Type
19.11.1.1.4	Alternator	Make
19.11.1.1.5	Alternator	Type
19.11.1.1.6	Alternator Capacity	kVA

19.11.1.1.7	Gen Set Capacity ISO 3046 Prime power	kVA
19.11.1.1.8	Gen Set Capacity ISO 3046 Overload	kVA
19.11.1.1.9	Voltage	220V
19.11.1.1.10	Frequency	60 Hz
19.11.1.1.11	Stability of voltage	+%
19.11.1.1.12	Stability of frequency	-%-
19.11.1.1.13	Fuel consumption 100% load	l/h
19.11.1.1.14	Fuel consumption 75% load	l/h
19.11.1.1.15	Fuel consumption 50% load	1/h
19.11.1.1.16	Heat rejection totally at 100 % load SO Hz	kW
19.11.1.1.17	Air volume for combustion	m3/h
19.11.1.1.18	Air volume for cooling	m3/h
19.11.1.1,19	Lube oil consumption 100% load	g/h
19.1'1.1.1.20	Weight of complete set	kg
19.11.1.1.21	Derated for site altitude	m
19.11.1.1.22	Derated for site temperature	°C

19.11.1.1.23 Derated for site humidity

19.11.1.2 Technical brochures and drawings shall be provided.
19.11.1.2.1 Engine
19.11.1.2.2 Generator
19.11.1.2.3 Dimension drawing

19.11.2 Rules
19.11,2.1 The generator set must conform to the requirements of the following standards or its equivalents:

19.11.2.1.1	ISO 3046/1	Diesel engines
19.11.2.1.2	ISO 8528-1	Application, ratings and performance
19.11.2.1.3	ISO 8528-2	Diesel engines
19.11.2.1.4	ISO 8528-3	Alternators
19.11.2.1.5	ISO 8528-4	Control panels
19.11.2.1.6	ISO 8528-5	Gen set
19.11.2.1.7	ISO 8528-6	Testing methods

19.11.3 Testing
19.11.3.1 The set must be tested in test room as full load tests and fully automatic tests before delivery from factory. The set shall be delivered with fully certified test reports_

19.11.4 Construction of the set
19.11.4.1 The single bearing alternator shall be directly flanged to the diesel engine fly wheel. The common flanged unit shall be rubber mounted on a rigid base frame. It must be possible to

mount the complete unit directly on an ordinary concrete floor without any special foundation.

19.11.5 Diesel engine
19.11.5.1 Standard industrial 4-stroke type, direct injected, liquid-cooled type is required_
19.11.5.2 The engine shall be equipped with the following.
19.11.5.2.1 Injector pumps with electronic speed regulator
19.11.5.2.2 Electric starter 24 V DC
19.11.5.2.3 Electric start/stop solenoid 24 V DC
19.11.5.2.4 Engine temp gauge
19.11.5.2.5 Lube oil pressure gauge
19.11.5.2.6 Engine temp switch
19.11.5.2.7 Lube oil pressure switch
19.11.5.2.8 Radiator +50 C with direct driven fan
19.11.5.2.9 Low water level alarm switch
19.11.5.2.10 Preheater in air intake manifold
19.11.5.2.11 Thermostatic controlled heater
19.11.5.2.12 Exhaust Silencer of three-chamber type with 30-dBA reduction or equivalent
19.11.5.2.13 Starting Battery and trickle charger

19.11.6 Lube oil pump
19.11.6.1 For drainage of the engine lube oil a tube oil sump draining pump shall be included and directly connected to the engine oil sump via a flexible rubber hose with steel core reinforcement. The pump shall be mounted alongside the engine on a rigid support.

19.11.7 Drip oil pan
19.11,7.1 The set shall be delivered with one drip oil pan covering the engine and be placed in the base frame under the engine.

19.11.8 Pre-heater
19.11.8.1 A thermostatic pre-heater element of free mounted type shall be connected to the engine via oil resistant rubber hoses. The heater shall have three power steps 500, 1000 and 1500 W and be connected directly to the control panel for supply via a separate circuit breaker so that it can be disconnected during summer period.

19.11.9 Alternator
19.11.9.1 Brush less synchronous alternator with automatic electronic controlled voltage regulator. RFI suppressed according to VDE 0875 grade N. The alternator must be equipped with permanent greased maintenance free ball bearing.
19.11.9.2 The alternator must have an electronic voltage regulator with accuracy better than t1.5%. The regulation range shall be possible to adjust ±5% via potentiometer mounted in the front of the control panel.
19.11.9.3 The magnetization system of the alternator shall be designed with PMG or auxiliary winding to give permanent short circuit current 3 times rated current

19.11.9.4 For parallel operations with the mains during test run and for automatic synchronization with the mains during change-over back to mains feeding of the plant the alternator must be equipped with control system for parallel operations.

19.11.9.5 The THD must be less than 4 % at full load.

19.11.9.6 The following rule is valid for this delivery_
19.11.9.6.1 ISO 85283 Alternators or equivalent standards

19.11.10 Control panel
19.11.10.1 The control panel shall be designed for automatic operation of this stand by generating set.
19.11.10.2 With the control system it shall be possible to operate the gen set in the following codes.
19.11.10.2.1Normal standby operation during mains failure with synchronization with Mains before changeover to mains.
19.11.10.2.2 Test run without load.
19.11.10.2.3 Test run with load changeover to the set and back to mains without any break.
19.11.10.2.4 Remote start order and synchronization to the mains with disconnection of the mains without any power break to the plant.
19.11.10.2.5 Remote order for synchronization back to mains supply and stop of the set after cooling-down period of 4 minutes.
19.11.10.3 The capacity of the control panel shall be calculated for 220V 60 Hz rated voltage and the panel shall include at least the following:
19.11.10.3.1 Three (3)-Current transformer connected in the neutral point of the alternator
19.11.10.3.2 One (1)-Generator contactor rated for the continuous output power in kVA from the alternator
19_11.10.3.3 One (1)-Mains contactor with electrical Interlocking with the generator contactor
19.11.10.3.4 One (1)-Overload relay
19.11.10.3.5 One (1)-Operation relay
19.11.10.3.6 X-Terminals for control wire
19.11.10.3.7 One (1)-Control unit for the speed governor
19.11.10.3.8 One (1)-Synchronizer
19.11.10_3.9 One (1)-Reverse power relay 0-20 % with 0-15 sec delay
19.11:10.3.10 Three (3)-Three-pole circuit breaker
19.11.10.3,11 One (1)-Two-pole circuit breaker
19.11.10.3,12 This circuit breaker shalt protect both the positive and the negative pole of the control
19.11.10.3.13 Voltage feeding
19.11.10.3.14 One (1)-Running hour meter
19.11.10.3.15 One (1)-Engine temp instrument
19.11.10.3.16 One (1)-Engine lobe oil pressure instrument
19.11.10.3.17 One (1)-Push button "Start"
19.11.10.3.18 One (1)-Push button "Stop"
19.11.10.3.19 One (1)-Push button "Lamp test"
19.11.10.3.20 One (1)-Push button "Emergency stop"
19.11.10.3.21 One (1)-Push button "Synchronize"

19.11.10.3.22 One (1)-Selector switch "Gen. Breaker ON-OFF"
19.11.10.3.23 One (1)-Duty selector "0-Hand-Auto-Test"
19.11.10.3.24 One (1)-Electronic control system for manual and automatic start, stop and supervision of the set

19.11.10.4 The following facilities shall be included.
19.11.10.4.1 Alarm system with the following indications:

19.11.10.5 Shutdown alarms for the following:
19.11.10.5,1 High voltage + 10%
19.11,10.5.2 High generator frequency + 20%
19.11.10.5.3 Low voltage - 10%
19.11.10.5.4 Low generator frequency -15%
19.11.10.5.5 Over current
19.11.10.5.6 Low engine lube oil pressure
19.11.10.5.7 High engine temp
19.11.10.5.8 Start failure
19.11.10.5.9 Reverse power shut down
19.11.10.5.10 Emergency

19.11.10_6 Indicating alarm for following:
19.11.10.6.1 Low coolant level
19.11.10.6.2 Circuit breakers tripped
19.11.10.6.3 Low fuel level
19.11.10.5.4 Low battery voltage

19.11.10.7 Far indication Of the set's status the following must be available:
19.11.10.7.1 Set in operation
19.11.10.7.2 Set in "Auto" mode
19.11.10.7.3 Generator contactor on
19.11.10.7.4, Mains contactor on
19.11.10.7.5 Mains voltage approved

19.11.10.8 For presentation of the voltage, current and frequency the control system must have digital instruments with accuracy 1% of measured value or better. It must be possible to measure all three phases with the voltmeter and the ampere meter.

19.11.10.9 Function of the electronic control system must include the following
19.11.10.9 1 Three start attempts
19.11.10.9.2 Start delay adjustable 0-18 sec
19.11.10.9.3 Delay of mains return 0-36 min
19.11.10.9.4 Cool down period at least 4 minutes
19.11.10,9.5 Delay of low oil pressure and high temp in 16 sec after start.
19.11.10,9.6 Over voltage delay 2 sec
19.11.10,9.7 Under voltage delay 4 sec
19.11.10.9.8 Reverse power delay 0-15 sec

19.11.10.9.9 The electronic system shall also permit operation directly by use of the starting battery at prevailing voltage including voltage drop during the engine cranking period. If quoted system cannot guarantee operation between 6 and 32 Volt at the start battery a separate control power battery with charger must be installed.

19.11.11 Battery

19.11_11.1 Combined battery for start and control of sealed type maintenance free shall be included. The battery has to be mounted on a battery shelf on the long side of the base frame. The battery capacity must allow five start attempts of ten seconds with five seconds rest in between. Battery shall be designed for "10 years".

19.11.12 Fuel tank

19.11.12.1 A separate freestanding fuel tank with a volume for at least 48 hours full operation shall be delivered. The fuel tank shall be equipped at least with the following:

19.11.12.1,1 Fuel level instrument
19.11.12.1.2 Low-level switch
19.11.12.1.3 Connector for 2" filling pipe
19,11.12.1.4 Connector for breathing pipe 2"
19.11.12.1.5 Manhole for inspection
19.11.12.1.6 Feeder to engine with stop valve
19.11.12.1.7 Return connection from engine with back valve
19.11.12.1.8 Draining valve in the bottom of the tank with a plug mounted in the valve.

19.11.12.2 The fuel tank shall have at least 150 mm high legs for inspection.

19.11.12.3 The painting of the tank shall be of highest industrial standard for outside and without paint on inside.

19.11.12.4 The thickness of the steel plate in the tank shall be 4 mm for bottom and sidewalls and at least 3 mm for the top,

19.11.13 Ventilation equipment

19.11.13.1 With the generating set the following equipment shall be delivered.
19.11.13.1.1 Two (2)-Motor operated jalousies
19.11.13.1.2 Two (2)-Fixed outside wall grids
19.11.13.1.3 One (1)-Air filter cassette on the air intake with changeable filter inserts.

19.11.14 Manuals

19.11.14.1 Four maintenance and operation manuals are to be delivered with each generator set. The manuals shall contain at least the following information.

19.11.14.1.1 1 - Starting instructions
19.11.14.1.2 1 - Engine handbook
19.11.14.1.3 1 - Engine spare part book
19.11.14.1.4 1 - Generator handbook
19.11.14.1.5 1 - Circuit diagrams for the control panel and all other circuits of the set,
19.11.14,1.6 1 - Component list

19.11.14.1.7 1 - Service journals
19.11.14.1.8 1 - Trouble Shooting tables
19.11.14.1.9 1 - Test reports from factory tests of the set.

19.11.15 Installation
19.11.15.1 The supplier of the set shall also supply the following documentation,
19.11.15.1.1 1 - Complete installation documentation with all dimensions for *necessary holes in the building
19.11.15.1.2 1 - Connection diagrams for connection of the set to the switchboard

19.12 Uninterruptible Power Supply (UPS)
19.12.1 General
19.12.1.1 The 3-Phase UPS shall be designed for the Radar Facility Building and Radar Equipment with antenna turntable, Remote Control Monitor System and wall socket for PC. A separate UPS shall be installed for display and computer system.

19.12.1.2 The Contractor shall propose a 3-Phase UPS with existing local after sales service in the Philippines. The Contractor shall state the name of the local company and its address.
19.12.1.3 Battery shall be designed for 10 years and sealed type maintenance free.
19.12.1.4 The UPS unit shall be designed for 30 min. back-up time at full rated power and equipped with manual mechanical by-pass and static switch_ The UPS shall be on-line double conversion type.

19.12.2 Electrical design criteria
19.12.2.1 Input voltage nominal - to be specified by the Contractor
Input frequency nominal 60 Hz range ± 10 % cont.
19.12.2.2 Input power factor min. 0.90
Output voltage — to be specified by the Contractor. Static regulation + 1%
+ 2 % with 100 % unbalanced load
Dynamic response + 3%, 1 ms to steady state
Output frequency nominal 60 Hz + 0.05 Hz (free running) Synchronized + 0.5, 1, 2, 3 Hz (site selected)
Load peak (crest) factor 3 min.
Overload capacity 125 % 10 min. 150 % 30 sec. of rated loads Voltage distortion 2 % THD with linear loads
3 % THD with non-linear loads
Operating temperature + 0...+ 40°C
Storage temperature - 20...+70°C excluding battery Relative humidity 10-90 %, non-condensing
Noise level, 1 m 55 dB(A)
Safety EN 50091-1 (1EC 950)
RR input EN 50081-1 (VDE 0875N) Protection class FP 20
User interface status indication panel.
Remote interface floating relay contacts emergency stop_

19.13 Air-Conditioning System

19.13.1 The air conditioning plan shall be designed to meet the environmental requirements of the proposed system.
19.13.2 Temperature readings with alert system must be integrated at the monitoring system.

19.14 Fire Alarm System
19.14.1 Heat and smoke detectors shall be located at ceiling level in all rooms and alarms be connected to a central alarm panel. To this panel the fire extinguishing system in radar equipment cabinets shall also be connected.
19.14.2 The panel shall be connected to alarm-activate an indoor and outdoor acoustic alarm.
19.14.3 Further the panel shall be connected to alarm-activate a remote control system, RCMS.

19.15 Fire Extinguishing System
19.15.1 The radar equipment cabinets shall include automatic fire extinguishing systems.
19.15.2 The extinguishing media shall not cause harm or damage to personnel or installations.
19.15.3 Regarding alarm, see paragraph 19.14 in this chapter above.

19.16 Burglar Alarm System
19.16.1 Infrared detectors shall be located in all rooms and be placed to detect opening or closing of all doors..
19.16.2 All external doors shall be equipped with magnetic alarm contactors and the entrance door be equipped with an ID-code pass-by system.
19.16.3 The external doors shall be connected to the acoustic fire alarm.
19.16.4 Installation of any electronic equipment must not begin until the building has been finished and approved for start of installation.

20 COMPLIANCE TO STANDARDS

20.1 **Quality Certification**

20.1.1 The equipment and its manufacturer shall be ISO Certified or its internationally recognized equivalent. The Contractor shall include in their Technical Proposal certified true copy of ISO Certification of their proposed equipment and its manufacturer.

20.2 This project shall adhere to the minimum standard set by the following:

1. CAAP latest Manual of Standards latest edition
2. ICAO Annex 10 Volume IV for Surveillance Radar and Collision Avoidance Systems
3. Federal Aviation Administration
4. Government ordinances enforced in the locality.

20.3 **Test Standards**

20.3.1 The equipment shall be compliant to internationally recognized test standards when obtaining values given in the technical specifications. The Contractor shall include in their Technical Proposal copy of the certification of the equipment

20.4 **MOS for Aerodromes/Method of Working Plan (MOWP)**

20.4.1 The Contractor shall comply with the latest provisions of the Civil Aviation Authority of the Philippines (CAAP) Manual of Standards (MOS) for Aerodromes. A Method of Working Plan (MOWP) shall be submitted to CIAC prior to project implementation. The MOWP shall be in accordance with Section 10.11 of the CAAP MOS.

20.5 **ICAO (Annex 10, 14)**

20.5.1 The supplied equipment shall be compliant to ICAO. The Contractor shall include in their Technical Proposal a compliance statement relative to the ICAO Annex 10 Volume IV Standards and Recommended Practices (SARPs) for Surveillance Radar and Collision Avoidance Systems.

20.6 **Flight Inspection Standard**

20.6.1 Conduct of the Flight Test shall be in accordance with ICAO Manual Doc. 8071 and related Civil Aviation Authority of the Philippines (CAAP) Regulations.

20.7 **PERMITS**

20.7.1 The Contractor shall secure all permits (e.g. Permit to Import, NTC, CIA Security Pass, etc.) from respective offices that may be necessary for the installation of the equipment at Clark International Airport (CIA). The cost of acquiring the permits including its processing shall be borne by the Contractor.

20.8 **Airport Safety and Security**

20.8.1 The Contractor including its authorized personnel shall comply with the Safety and Security requirements of CIAC specially when entering the airport premises and near vital navigational aids systems. All works shall be in accordance with Section 10.10- Aerodrome Work Safety of the Manual of Standards (MOS) for Aerodromes.

20.8.2 Prior to implementation / installation, the Contractor shall meet with CIAC representatives to discuss the personnel and equipment safety and security at site and other concerns for the projects.

The Contractor shall be liable for the safety and security of its personnel during the installation/construction period.

ANNEX 1 Functional Specifications

A. Secondary Surveillance Radar System (SSR)

1. Technology Requirements

The MSSR Mode S radar shall be made of up to date technology with fully digital receiver and improved algorithms.

The Contractor shall propose a complete redundant solution with automatic changeover between channels; the details and architecture of the redundancy solution shall be detailed.

The Contractor shall include in its proposal a Far Field Monitoring system

- It shall be fully redundant with dual electronics each one being fitted with one real directional antenna.

- It shall act like a Mode S Level 3 aircraft transponder plus some additional feature allowing on-line testing and performance monitoring of the MSSR.

2. Performances Requirements

The performance requirements of the MSSR Mode S radar are summarized in the following table.

GENERAL REQUIREMENTS	
Fully compliant or exceeding ICAO Annex 10 Volume. IV recommendations and amendments.	
ANTENNA AND PEDESTAL	
Antenna Type	LVA typc (Large Vertical Aperture) Monopulse design with 3 channels (Σ , Δ and Ω patterns)
Antenna Technology	Made of at least 36 radiating columns Each column shall be toned with dipole distributed using solid state stripline technology
Antenna Rotation	Fixed rotation rate l2 rpm for Approach & En-Route ATC application
Antenna Tilt	the MSSR antenna tilt shall be independent from P5R adjustment
Azimuth heantwidth.(ij -3 dB)	2.4° ± 0.25°
Antenna Gain	≥27 dBi
Antenna and Pedestal Weight	Care shall be taken to minimize the overall weight in order to limit constraints on *the* tower
TRANSMITTER AND RECEIVER	
Transmitter Frequency	1 030 ± 0.01 MHz
Transmitter Peak Power	> 2.8 kW
Transmitter Output Power	Attenuation from 0 dB to 12 dB with 2 dB step Independent attenuation on SUM & CONTROL
Receiver Frequency	1090 MHz + 3 MHz
Receiver	Full digital monopulse processing from the two analog signals (SUMand

Technology	DELTA) in order to improve the accuracy of results of the monopulse function	
Receiver Noise Figure	< 4.0 dB	
INTERROGATION		
Modes of interrogation	Mode 1, 2, 3/A, C and S both Elementary Mode S (ELS) & Enhanced Mode S (EHS)	
Mode S	The MSSR shall be able to interrogate and process replies of up to Level5 Mode S transponders without any additional software or hardware	
Interlacing	Flexible interrogator pattern and mode interlacing capability (single, double, triple interlacing)	
Side Lobes	ISLS Capabilities and IISLS (Improved Interrogator Side Lobe Suppression) possibilities	
DETECTION PERFORMANCES		
Instrumented Range	0.2 to 256 NM	
Detection Range	Up to 256 NM in Mode 3/A, C and Mode S (ELS & EHS)	
Probability of detection of a target	> 99 % (Non-Mode S target) > 99 % (Mode S target)	
Probability of correct and valid code detection	> 99 % (in Mode 3/A and C) > 99 % (in Mode S)	
Positional Accuracy • Slant Range bias • Azimuth bias	Excluding ice and wind effects on the antenna • < 14 m • < 0.022° (for elevation between 0° and +6°) • < 0.033° (for elevation between 6° and +10°)	
Random errors (standard deviation)	• < 0.068° • < 30 m (in SSR Modes) • < 15 m (in Mode S)	
PROCESSING		
Tracking processing capacity	> 1 200 targets per 360° (uniform azimuth distribution) > 220 targets per 45° > 40 targets per 2.6°	
INTERFACE		
Air Traffic Control Centre Interface	The output format shall be user selectable: • ASTERIX Cat 001/21 • ASTERIX Cat 034/048	
Control & Monitoring System (CMS)	It shall be made of 2 Consoles with the same HMI and functionalities: • A Local Control & Monitoring in the radar equipment room(Lily Hill) • A Remote Control & Monitoring in the ATC maintenance room and directly connected to the LCM Each Console shall be able to monitor the functions of the radar and display the synopsis of the radar station by the mean of block diagram The CMS shall also monitor external discrete information from ancillaries included in the radar station (anti-intrusion system, fire alarm, A/C, UPS,	

	Power Generator...)	
Radar Maintenance Monitor	A Radar Maintenance Monitoring in the radar equipment room(Lily Hill) Plots/tracks shall be superimposed on the radar video, with a geographical map background It shall include a 3D internal processing in order to project radar image layers enabling perspective view representation It shall be able to Record and Replay as real time data It shall be a separated Console from the CMS	
Time Stamping	The radar shall be fitted with a redundant Time Stamping function made of two NTP (Network Time Protocol) servers, each including: • GPS receiver with antenna providing accurate UTC time source • Internal clock in case of missing GPS signal. Maximum drift shall be 20 ms per month • Ethernet interface to provide time information to external equipment	
ENVIRONMENT		
Operational indoor Temperature	+10°C to +40°C	
Operational outdoor Temperature	-40°C to +70°C (including solar radiation)	
RMA		
Mean Time Before Failure (MTBF)	> 2 700 h	
Mean Time Before Critical Failure (MTBCF)	> 54 000 h	
Mean Time To Repair (MTTR)	< 25 min	
Operational Availability	>99.99%	
BITE Coverage	> 90 %	

B. Primary Surveillance Radar System(PSR)

1. **Technology Requirements of PSR**

The PSR shall detect Aircraft & Weather within specified range and send related PSR tracks and weather data to Air Traffic Management (ATM) systems operated by the CAAP for Air Traffic controlling within Terminal area and Flight Information Region.

The PSR shall be made of up to date technology with fully digital receiver and improved algorithms.

The Contractor shall propose a complete redundant solution with automatic changeover between channels; the details and architecture of the redundancy solution shall be detailed.

The Transmitters shall be fitted with fail-soft capability and graceful degradation.

2. **Performances Requirements of PSR**

The PSR shall be fitted with high target detection capability, even in harsh environment.

The Contractor shall detail the design, performances and/or additional features that allow achieving this detection performance. Preference will be given to PSR providing more features or higher performance of detection in severe clutter.

The performance requirements of the PSR S-band radar are summarized in the following table.

GENERAL REQUIREMENTS		
ANTENNA AND PEDESTAL		
Antenna Type	Reflector type	
Antenna Technology	The antenna shall feature double coverage patterns LB (Low Beam) and HB (High Beam) for both aircraft and weather channels, leading to a total of 4 channels	
Antenna Rotation	Fixed rotation rate 12/15 rpm for Approach ATC application	
Antenna Tilt	Adjustable from -3° to +3° in order allow adaptation to site environment In case of co-mounted version with MSSR, the PSR and MSSR antenna tilt adjustment shall be independent	
Azimuth beamwidth (@ -3 dB)	≥1.4°	
Antenna Gain	> 34.3 dB (for Low Beam & High Beam)	
Polarization	Vertical and Circular	
Antenna and Pedestal Weight	Care shall be taken to minimize the overall weight in order to limit constraints on the tower	
TRANSMITTER, GENERATORAND RECEIVER		
Transmitter Frequency	2 fixed frequencies to be chosen between 2 700 MHz and 2 900 MHz User selectable using digital synthesizer with 1 MHz step without restriction between both frequencies In case the bandwidth is limited due to 4G/5G remediation solution, the Contractor shall detail these limitations	
Transmitter Configuration	The PSR shall have transmitter scalability capability with different configurations (4, 8 and 16 Transmitters Modules) to optimize configuration to the PSR performances described in this document Preferences will be given to PSR providing radar within specifications with	

	minimum peak power The Contractor shall describe and explain which configuration is proposed Power Budget and Blake charts of the proposed configuration shall be provided	
Transmitter Technology	The transmitters shall be solid state and air cooled	
Graceful degradation	Fail-soft capability shall be described. Preference will be given to solutions allowing the radar to operate with up to (N-1) faulty Transmitter modules Hot swap replacement of any failed Transmitter module without shutting down the complete transmitter or the antenna rotation	
Blanking Sectors	Up to 4 Blanking Sectors adjustable with 0.022° step	
Receiver Technology	Fully digital	
Analogue to Digital conversion	16 bits 80 MHz sampling frequency	
Sensitivity Time Control (STC)	60 dB with 0.5 dB step	
System Stability	65 dB	
Noise Figure	< 1.5 dB	
DETECTION PERFORMANCES		
Instrumented Range (IR)	0.2 to 80 NM	
Probability of Detection (Pd)	The Contractor shall provide a Coverage Diagram considering the followings: • Full power as well as 1 faulty Transmitter module on the same diagram • Pd = 80 % • RCS = 2 m2 • Pfa 10-6 • Clear Environment • At full power as well as 1 faulty Transmitter module on the same diagram Evidences and explanations shall be provided in order to detail how small targets detection is managed. In particular, Coverage Diagram considering followings constraints shall be provided: • 50 NM • Up to 10,000 \ft • Pd = 80 % • RCS = 0.25 m2 • Pfa 10-6 • Swerling Case 1 • Clear Environment • Targets trajectory & kinematics (speed and acceleration) as already defined in this document • Full power	
Target Accuracy		
• Range Accuracy	• ≤ 50 m	

• Azimuth Accuracy	• < 0.15°	
Target Resolution (10 NM to IR)	Considering Pd 80 %	
• Range Resolution	• < 90 m (if there are exceptions in sonic range domain, please specify)	
• Azimuth Resolution	• < 2.6°	
Video Resolution (10 NM to IR)	At -3dB	
• Range Resolution	• < 50 m	
• Azimuth Resolution	• < 1.4°	
Range Cell	< 30 m	
PROCESSING		
Full Concurrent Beam Processing	The PSR shall implement simultaneous use and processing of Low Beam and High Beam to improve detection in clutter environment	
Tracking processing capacity	> 1 200 targets per 360° (uniform azimuth distribution) > 220 targets per 45° > 40 targets per 2.6°	
Target Velocity Range	40 to 800 knots	
Target maneuver	0.3 g (longitudinal) 0.9 g (transversal)	
Pulse Compression Technology	Digital	
Pulse Compression Side Lobes	≤-50 dBc	
Ground Clutter		
• Improvement Factor (IF)	• ≥ 70 dB	
Sub-Clutter Visibility (SCV)	• 55 dB	
Number of Doppler Filters & Doppler Filters Banks	8 Filter Banks Automatic selection thanks to adaptive selection map Up to 48 Doppler filters	
INTERFACE		
Air Traffic Control	The radar shall provide up to 8 ATCC outputs simultaneously for target reports, each being independently user configurable in terms of data reported and	

Centre Integration	data format The output format shall be user selectable: • ASTERIX Cat 001/002 • ASTERIX Cat 034/048 • ASTERIX Cat 008 • AIRCAT 500 The radar shall be interconnected and interfaced to the existing ATM System supplied by Thales. The model of the current ATM System is a Thales Topsky-ATC (HE). The Contractor shall take full responsibility including any changes to the existing ATM system software to ensure that the output data from the radar are properly input and integrated into the existing ATM System and presented on Controller Working Positions HMI.	
Control & Monitoring System (CMS)	It shall be made of 2 Consoles with the same HMI and functionalities: • A Local Console in the radar room • A Remote Console in the ATCC maintenance room and directly connected to the Local Console, with token control Each Console shall be able to monitor the functions of the radar and display the synopsis of the radar station by the mean of block diagram The CMS shall also monitor external discrete information (via relays or opto-couplers) from ancillaries included in the radar station (anti-intrusion system, fire alarm, A/C, UPS, Power Generator...)	
Radar Maintenance Display	Plots/tracks shall be superimposed on the radar video, with a geographical map background It shall include a 3D internal processing in order to project radar image layers enabling perspective view representation It shall be able to Record and Replay as real time data. It shall be a separated Console from the CMS	
Time Stamping	The radar shall be fitted with a redundant Time Stamping function made of two NTP (Network Time Protocol) servers, each including: • GPS receiver with antenna providing accurate UTC time source • Internal clock in case of missing GPS signal. Maximum drift shall be 20 ms per month • Ethernet interface to provide time information to external equipment	
ENVIRONMENT		
Operational indoor Temperature	+10°C to +40°C	
Operational outdoor Temperature	-40°C to +70°C (including solar radiation)	
Wind	160 km/h in operation 220 km/h in survival mode	
RMA		
Mean Time Before Critical Failure (MTBCF)	> 60 000 h	
Mean Time To Repair	< 25 min	

(MTTR)		
Operational Availability	> 99.99 %	
BITE Coverage	> 90 %	

ANNEX 2 MICROWAVE LINK AND FIBER OPTIC LINK

Functional Requirement/description (Microwave link and Fiber Optic Link)		
No	Description	
2.1	**MICROWAVE LINK**	
2.1.1	General	
2.1.1.1	Contractor shall install a four-channel Microwave Link and shall serve as the Secondary Link providing PSR and MSSR data transfer simultaneously. Additional two channels shall also be installed to serve as spare link to ensure hundred percent availability of the microwave link between Radar Site and New Clark ATC Tower.	
2.1.1.2	As this is the Secondary link, it shall be capable to switch over to the redundant channel, once a problem occurs. The Secondary Link should also be capable to switch over to the Main link and vice versa.	
2.1.1.3	The microwave link shall be of high performance, point-to-point communication between either sites and is required for transmission of radar data in analogue or digital form.	
2.1.1.4	The microwave link shall be within the allocated frequency band as indicate by regulatory Authority in the Philippines	
2.1.1.5	Contractor shall obtain the necessary type approval and frequency clearance from Philippine authority. The initial setup license fee is covered by the contractor.	

2.1.1.6	The offered microwave link shall be able to cater to but not limited to the following data from Radar Site to New Clark ATC Tower: a. Radar Data b. Monitoring Data c. Control signal d. Other Relevant data (i.e., Fire alarm, Gen Set, Intruder alarm, Room Temperature, etc.) needed or essential for remote monitoring.	

2.1.1.7	The configuration of the supplied microwave link shall be in the hot standby mode, with automatic changeover on detection of equipment failure.	
2.1.2	Technical Specifications	
2.1.2.1	The equipment shall include base band interface circuitry, digital modulator/demodulator, transmit RF power amplifier, receiver preamplifier and channel filtering for two-way transmission.	
2.1.2.2	The transmitter shall comply with the following characteristic: a. Carrier frequency stability b. RF Output impedance c. RF Output return loss d. Spurious output at antenna port, below carrier.	
2.1.2.3	Contractor shall list the following transmitter characteristic; a. Output power at antenna (dBm) b. Output power stability (dB) c. Power consumption (W)	
2.1.2.4	The receiver shall comply with the following characteristic; a. RF input impedance b. RF return loss c. Image rejection below wanted carrier d. Spurious output at antenna port, below carrier.	

2.1.2.5	Contractor shall list the following receiver characteristic; a. Normal received signal level (dBm) b. Normal received signal level to BER = 10E-3 (dBm) c. Normal received signal level to BER = 10E-6 (dBm) d. Noise figure (dB) e. RF overload level (dB) f. Local Oscillator frequency (MHz) g. Local Oscillator stability (ppm) h. IF bandwidth (MHz) i. IF nominal output level and range of adjustment (dBm, +/-dB) j. RF threshold level and range of adjustment (dBm, +/-dB) k. Power consumption (W)	
2.1.2.6	The antenna for the microwave link shall have a sufficient gain to meet prescribed end to end system performance requirements.	
2.1.2.7	The antenna shall be fitted with mounting frame suitable for mounting antenna on radar tower and Clark Air Traffic Control Tower.	
2.1.2.8	If antenna radome is proposed, Contractor shall provide details including; a. Attenuation b. Construction c. Influence on the overall antenna VSWR.	
2.1.2.9	Contractor shall provide and list down the offered antenna characteristics and shall be able to withstand with any environmental condition.	
2.1.2.10	The distance between Radar site and New ATCT is approximately 2.2 Km apart.	
2.1.2.11	The signal path will cross the proposed second runway. Unusual landing/takeoffs or missed approaches may result in aircraft intercepting the beam.	
	Contractor shall consider the consequences of this in determining a suitable link configuration for the Radar Data. The following shall be taken into account; a. Whether the signal loss caused by intercepting is sufficient to cause link interruptions; b. The consequences of momentary loss of datato the radar data processing system.	
2.1.2.12	It is not acceptable to lose any radar position reports or to cause any disruption of tracking or other functions.	
2.1.2.13	Contractor shall provide the Path Profile, Link Budget and Fresnel Zones. Proposed optimum Antenna Height should also be stated.	
2.1.2.14	The New Clark ATC tower is approximately 18 stories high.	

2.1.2.15	The Microwave Indoor Unit at the New Clark ATCT shall be located at the 16th floor. At the Radar site, it shall be located at the Radar Room. The microwave equipment shall be arranged such that it will not cause any interference or obstruction to other equipment installed in the area.	
2.1.2.16	The Microwave System shall have an exclusive new cable conduits and trays and shall be properly spaced from the other cable trays and conduits installed at the area (Radar Site and New Clark ATC Tower).	
2.1.2.17	Each elements of the communication link shall contain an integral BITE facilities and shall automatically report operating status and accept remote control commands integrated at the RCMS.	
2.1.2.18	Spare and support for the Microwave system shall be provided and available locally.	
2.2	**FIBER OPTIC LINK**	
2.2.1	General	
2.2.1.1	Contractor shall install a redundant fiber optic link and shall serve as the Main Link providing PSR and MSSR data transfer simultaneously.	
2.2.1.2	As this is the Main Link, it shall be capable to switch over to the redundant link, once a problem occurs. The Main Link should also be capable to switch over to the secondary link and vice versa.	
2.2.1.3	Estimated cable length from the Radar Site to the New Clark Tower is 3.2km. The cables shall be laid on new cable ducts, new conduits and new cable trays as applicable. The proposed new manholes shall be erosion resistant while ducts and trays on the other hand, shall be rust resistant.	
2.2.1.4	If the Contractor opts to use existing manholes, they shall make sure that it is not eroded and shall bear the cost of any repairs.	
2.2.1.5	Contractor shall submit their detailed proposal for the fiber cable routing and the actual length required.	
2.2.1.6	Contractor shall familiarize himself with the site conditions which might affect the intended cable route. Any damages caused on the existing fiber optic shall be borne by the Contractor.	
2.2.1.7	All relevant information for the fiber link installation between Radar Site and New Clark ATC Tower including civil works requirements shall be included in their proposals.	

2.2.1.8	The offered fiber optic link shall be able to cater to but not limited to the following data from Radar Site to New Clark ATC Tower: a. Radar Data b. Monitoring Data c. Control signal Other Relevant data (i.e., Fire alarm, Gen Set, Intruder alarm, Room Temperature, etc.) needed or essential for remote site monitoring	
2.2.1.9	Contractor shall integrate at the RCMS located at New Clark ATC Tower the status of all the fiber optic links used for Radar Data transmission for link monitoring purposes.	
2.2.1.10	One pair of fiber should be allotted for one local telephone unit at the Radar Site to be connected at the PABX located at the New Clark Tower.	
2.2.2	Technical Specifications	
2.2.2.1	Contractor shall supply two (2) twenty-four (24) core single-mode fiber optic cable and shall all be properly terminated at the equipment racks on both Radar Site and New Clark ATC Tower.	
2.2.2.2	Contractor shall list the following characteristics: a. Optical crosstalk b. Loss (dB/km) c. Numerical aperture d. Transmission bandwidth (MHz/km)	
2.2.2.3	Fiber optic equipment shall be provided for transmission of digital data between base band transmit input port of a fiber optic transceiver and corresponding base band receiver output port of fiber optic transceiver.	
2.2.2.4	Contractor shall state the equipment transmission capacity in transmitting data.	
2.2.2.5	Contractor shall describe the fiber optic equipment used to process the data from terminating point to the other end of the fiber optic terminating point.	
2.2.2.6	Contractor shall conduct a site survey for better assessment of all equipment locations and estimation of cable length required between relevant sites.	
2.2.2.7	Spare and support for the Fiber Optic Cable Plant shall be provided, locally available and COTS.	
2.3	**MICROWAVE AND FIBER OPTIC TRAINING**	
2.3.1	If Contractor optioned to conduct the microwave and fiber optic training locally, they shall state the cost for at least ten (10) NCIA staff.	
2.3.2.	The training should be properly conducted in a classroom for theoretical training apart from the site training.	

2.3.3	The Contractor shall offer at least 3 weeks maintenance training at NCIA Site.	
2.3.4	The training syllabus shall include but not limited to; a. Introduction/system overview b. Functional description c. Functional block diagram d. Troubleshooting techniques which include technical description, specification and drawings. e. System maintenance procedure.	
2.3.5	The Contractor shall require to include the costing in the Bill of Quantity.	

Section VII. DRAWINGS

CONCEPT IMAGES AND PLANS

Fig. 1 Location Area: ADPI Master Plan

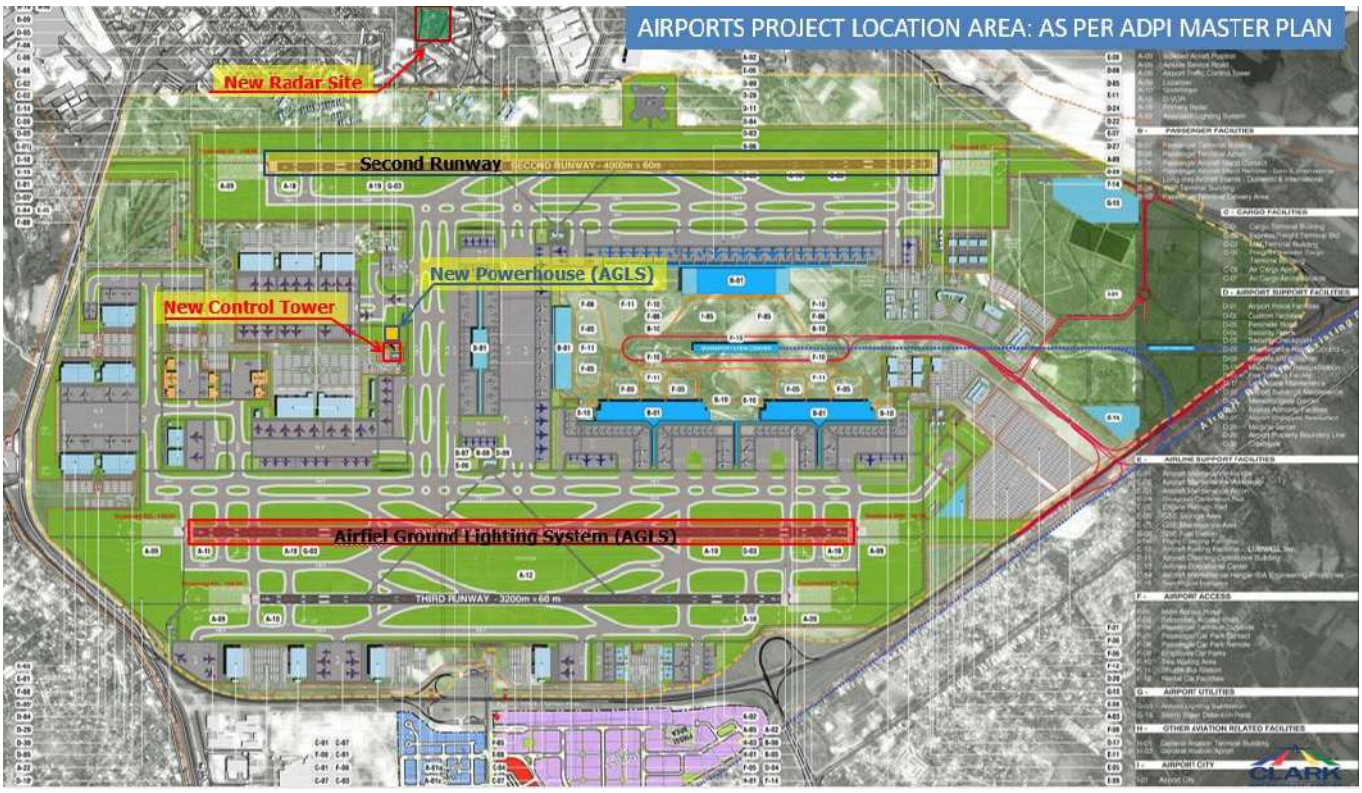
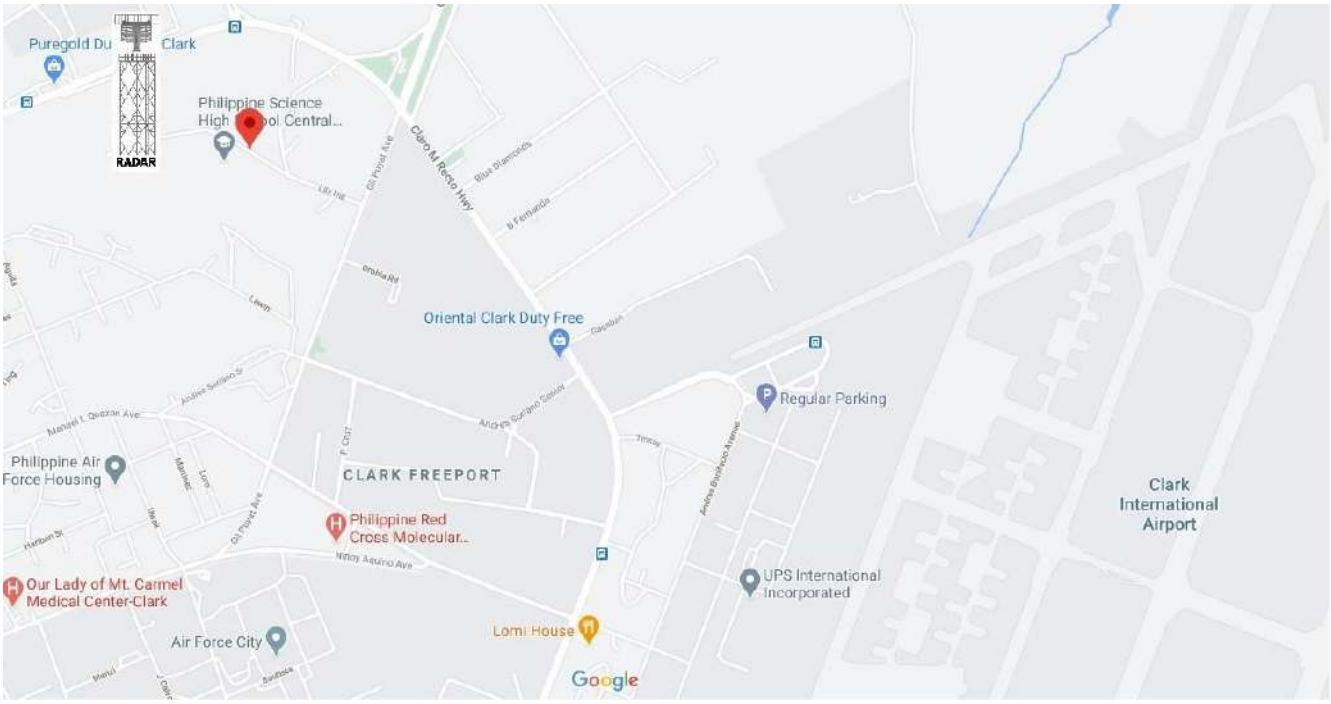


Fig. 2 Location Area:



Concept Drawing

Note: This Concept Drawing is only for illustration purposes. The Contractor may propose alternative schemes in its Bid Proposal subject to final verification and confirmation by the Procuring Entity.

Fig 3. Radar Layout

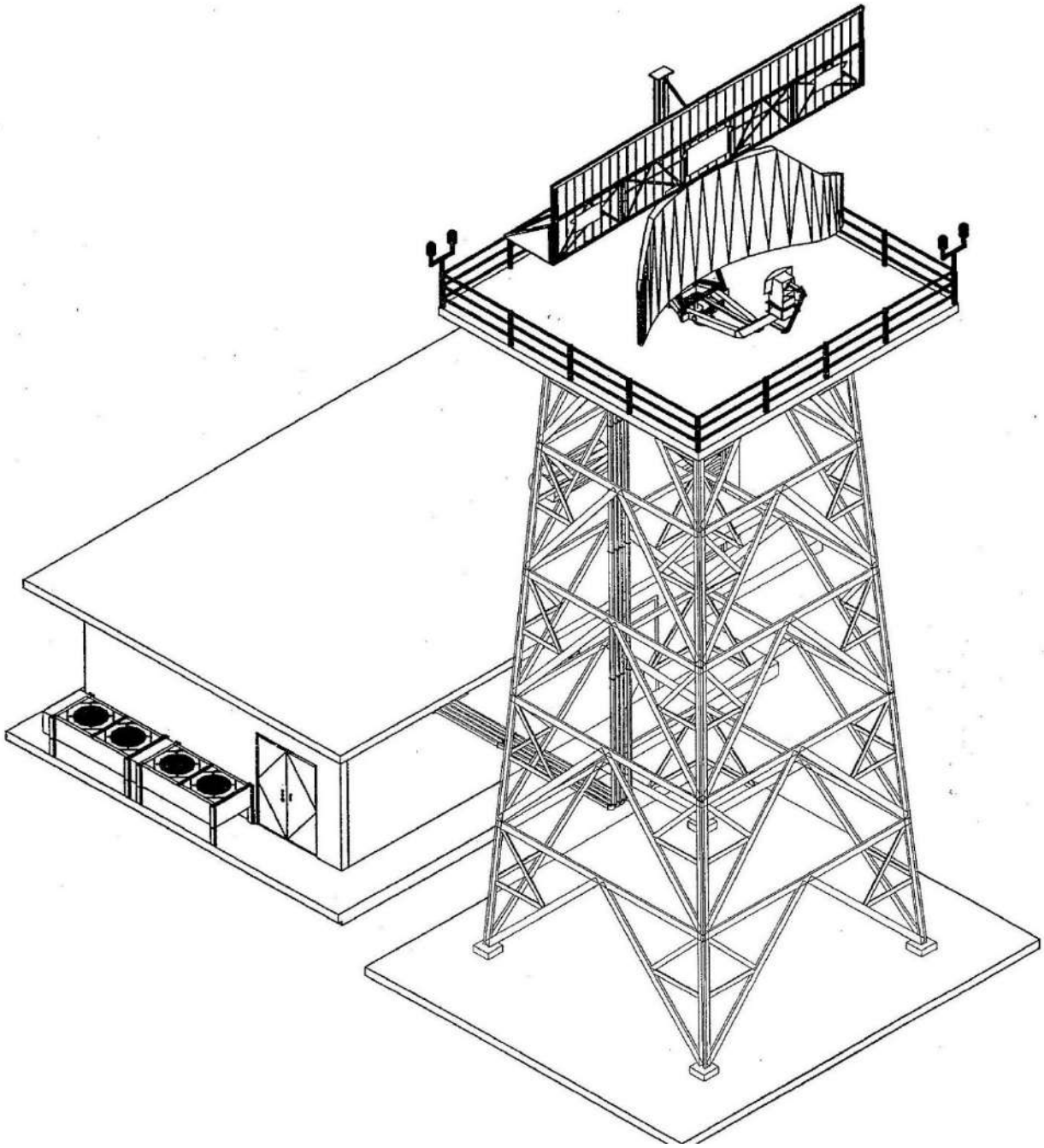


Fig. 4

LAYOUT OF PROPOSED RADAR SITE AT LILY HILL

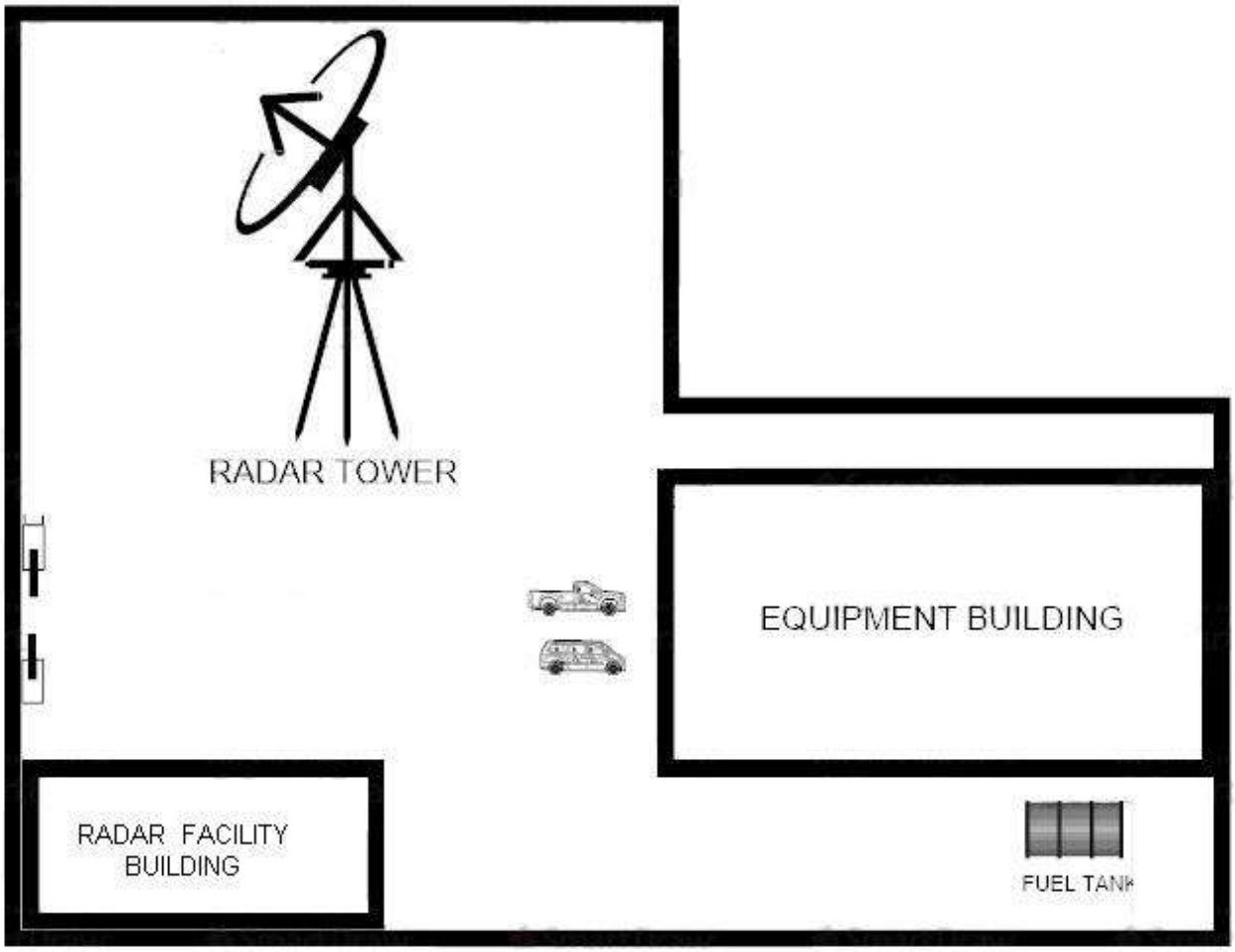


Fig. 5 Floor Plan Radar Equipment Building

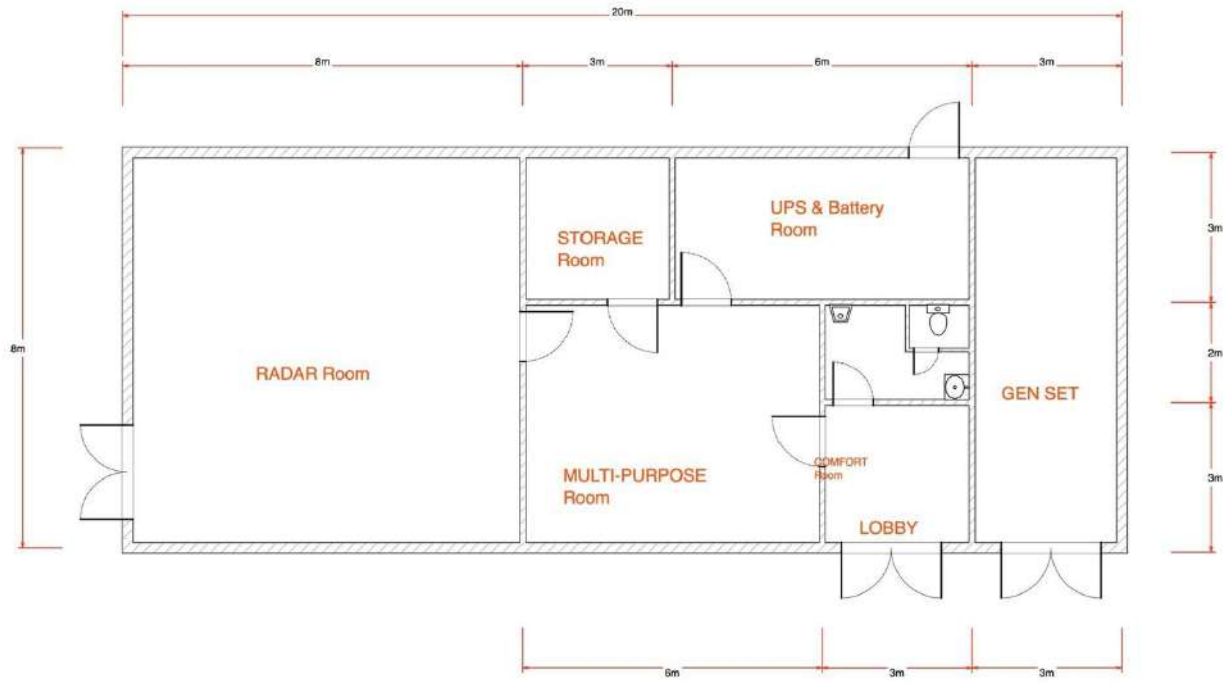


Fig. 6 Radar Facility Building Floor Plan

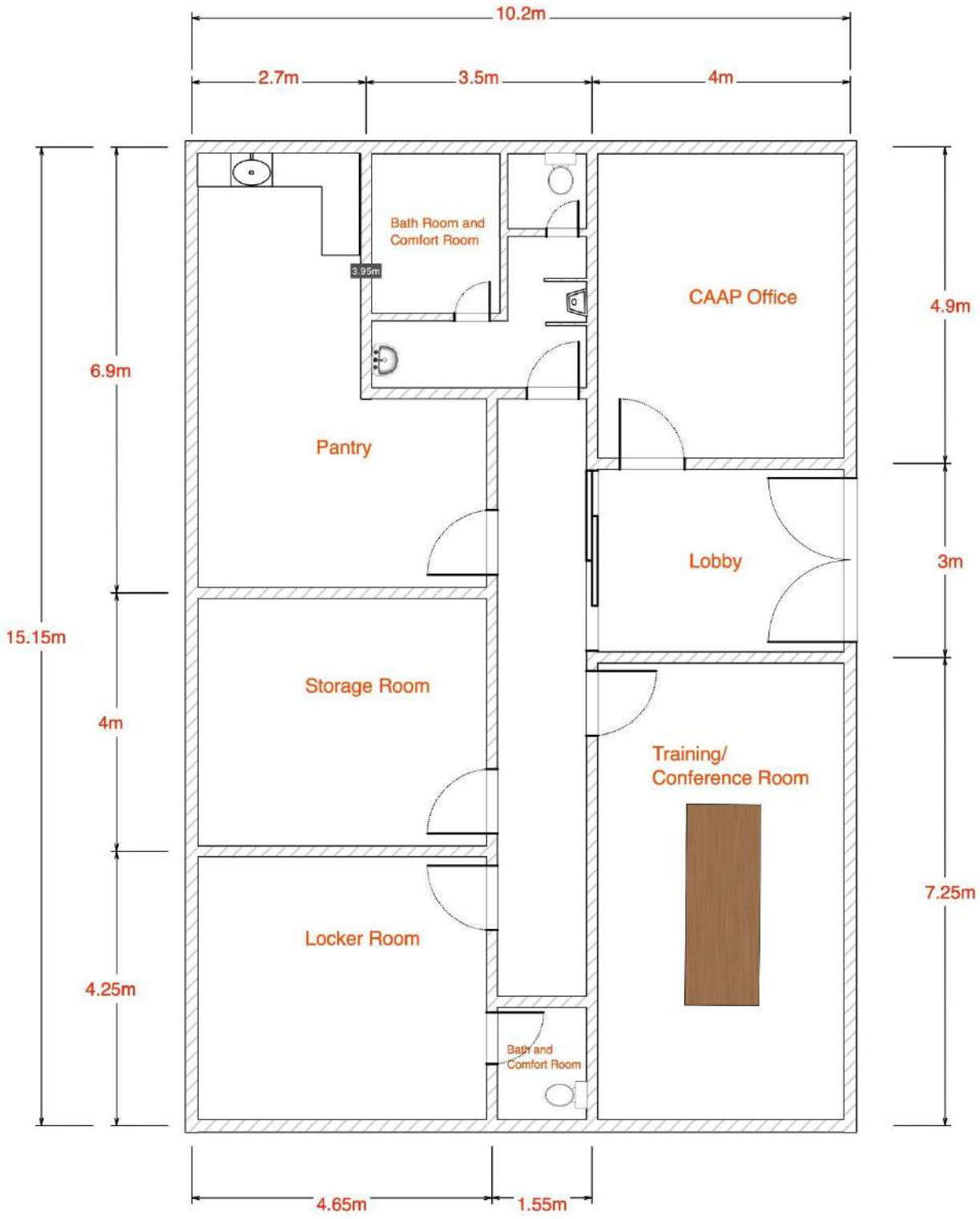
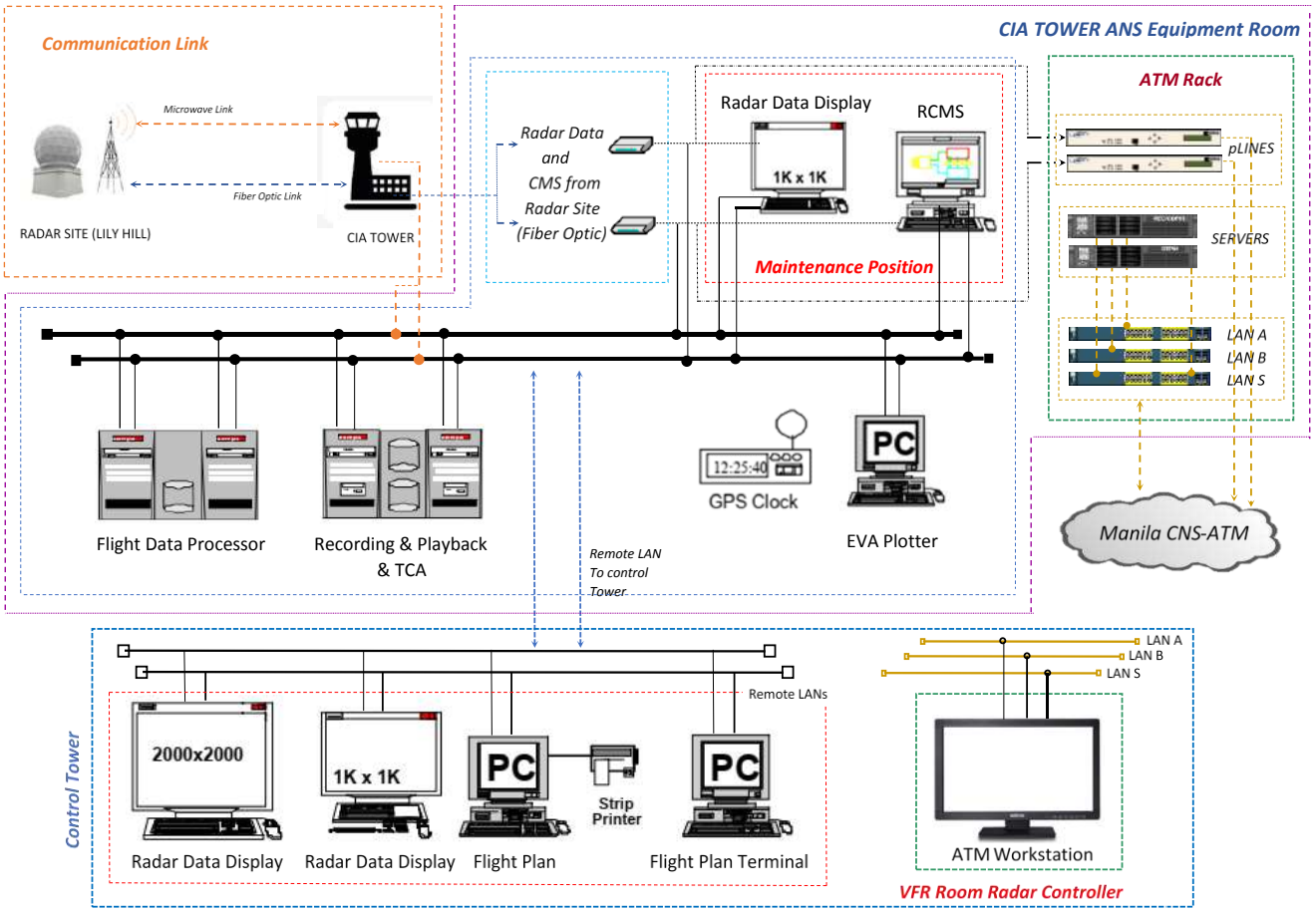


Fig. 7 System Overview



The above data are for reference only. The Procuring Entity does not guarantee that these data are fully correct, up to date, and applicable to the project at hand. The Contractor is responsible for the accuracy and applicability of all data, including the above, that it will use in its design and build proposal and services."

Section VIII. BILL OF QUANTITIES

BILL OF QUANTITIES

Project Title : SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF PRIMARY SURVEILLANCE RADAR AND MONOPULSE SECONDARY SURVEILLANCE RADAR

Item No.	Description	Quantity	Unit	Unit Cost (PhP)	Total Amount (PhP)
1.0	**General Requirements**				
1.1	Mobilization & Demobilization	1.00	lot		
1.2	Temporary Facilities including CIAC PMO Engineers	1.00	lot		
1.2.1	Furniture/Fixtures, Equipment & Appliances for the Field Office for the Engineer (rental basis)	1.00	lot		
1.2.2	laptop with minimum 8gb ram and 1tb storage (rental basis)	10	units		
1.2.3	office supplies	1.00	lot		
1.2.4	cellular phone units (rental basis) capable to take high definition photos with a 500 pesos monthly load.	10	units		
1.3	Safety Requirements (Personal Protective Equipment,	1.00	lot		
	Barriers/Barricades, Markings, Signages, Lightings,				
	Two-Way Radio & others as required by MOS &				
	other regulatory agencies)				
	Total 1.0				
2.0	**Equipment (RADAR)**				
2.1	Radar equipment (PSR)				
	a. PSR S-Band system including antenna, drive unit and weather channel.	1.00	set		
2.2	Radar equipment (MSSR)				
	a. 2 Channel Secondary Surveillance Radar Mode S including Antenna Pedestal	1.00	set		
2.3	Spare Parts	1.00	lot		
	Total 2.0				
3.0	**Local and Remote Control & Monitoring System**	1.00	lot		
	for PSR and MSSR complete with accessories and Service Terminal Notebook				
	Total 3.0				
4.0	**Standard Tools & Test Instruments**	1.00	lot		
	Total 4.0				
5.0	**Radome**	1.00	set		
	Total 5.0				
6.0	**System Ancillaries**	1.00	lot		
	(Lightning Protection, Working Rope and Safety Equipment, Obstruction Light, Fire Detection and Alarm System)				
	Total 6.0				
7.0	**Civil Works**				
7.1	Radar Equipment Building	1.00	lot		
7.2.	Radar Facility Renovation	1.00	lot		
7.3	Radar Antenna Tower	1.00	lot		
	Total 7.0				
8.0	**UPS (OEM recommendation)**	1.00	lot		
	Dual redundant UPS				
	Total 8.0				

9.0	**Generator**	1.00	lot		
	- Outdoor diesel generator with fuel tank, including ATS				
	- Conduits, Cables, Pipes, Cable Trays and other accessories				
	- Concrete Foundation				
	- Reserve Fuel Tank				
	Total 9.0				
10.0	**Electro-Mechanical**				
	a. Electrical wirings & conduits, Lightings, Panel Board, outlets, accessories, surge arrester, ground rods, Power Cable Trenching, Pipe laying/earth grounding, Transformers	1.00	lot		
	Air Conditioning Unit for Radar Equipment Building and Radar Facility	1.00	lot		
	Total 10.0				
11.0	**Communication Infrastructure**				
	a. Fiber optic media converter/hub and Ancillaries, complete with: - Fiber optic communication link including fiber optic patch cord - Enclosures & other necessary accessories	1.00	lot		
	b. Microwave Link	1.00	lot		
	Total 11.0				
12.0	**Installation, Testing, Commissioning, Trainings and other related services**				
13.1	Equipment Installation of PRS, MSSR, Antenna	1.00	lot		
13.2	Radar data Integration, Surveying and Measurements	1.00	lot		
13.3	Project Management and Supervision	1.00	lot		
13.4	Design and As Built Drawings	1.00	lot		
13.5.	Commissioning and Site Acceptance Test	1.00	lot		
13.6	Radar Flight Check	1.00	lot		
13.7	Construction/Maintenance Vehicle	1.00	lot		
13.8	Local On Site Training	1.00	lot		
13.9	Factory Training (Technical)	1.00	lot		
13.10	Factory Acceptance Test (FAT)	1.00	lot		
13.11	Maintenance Contract for 2 years during Defects Liability Period and Spare Parts	1.00	lot		
13.12	Airfreight Charges, Insurance Charges, Custom Brokerage, Storage, Delivery on Site Charges	1.00	lot		
	Total 12.0				
	GRAND TOTAL 1.0+2.0+3.0+4.0+5.0+6.0+7.0+8.0+9.0+10.0+11.0+12.0				
	TOTAL PROJECT COST				

TOTAL BID AMOUNT : _____
BID AMOUNT IN WORDS: _____
_____
Name of Bidder's Authorized Representative: _____

Position/Designation: _____

Section IX. Checklist of Technical and Financial Documents

Checklist of Technical and Financial Documents

I. TECHNICAL COMPONENT ENVELOPE

Class "A" Documents

Legal Documents

- ☐ (a) Valid PhilGEPS Registration Certificate (Platinum Membership) (all pages);
  or
- ☐ (b) Registration certificate from Securities and Exchange Commission (SEC), Department of Trade and Industry (DTI) for sole proprietorship, or Cooperative Development Authority (CDA) for cooperatives or its equivalent document;
  and
- ☐ (c) Mayor's or Business permit issued by the city or municipality where the principal place of business of the prospective bidder is located, or the equivalent document for Exclusive Economic Zones or Areas;
  and
- ☐ (d) Tax clearance per E.O. No. 398, s. 2005, as finally reviewed and approved by the Bureau of Internal Revenue (BIR).

Technical Documents

- ☐ (e) Statement of the prospective bidder of all its ongoing government and private contracts, including contracts awarded but not yet started, if any, whether similar or not similar in nature and complexity to the contract to be bid; **and**
- ☐ (f) Statement of the bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid, except under conditions provided under the rules; **and**
- ☐ (g) Philippine Contractors Accreditation Board (PCAB) License;
  or
  Special PCAB License in case of Joint Ventures;
  and registration for the type and cost of the contract to be bid; **and**
- ☐ (h) Original copy of Bid Security. If in the form of a Surety Bond, submit also a certification issued by the Insurance Commission;
  or
  Original copy of Notarized Bid Securing Declaration; **and**
- (i) Project Requirements, which shall include the following:
  - ☐ a. Organizational chart for the contract to be bid;
  - ☐ b. List of contractor's key personnel (*e.g.*, Project Manager, Project Engineers, Materials Engineers, and Foremen), to be assigned to the contract to be bid, with their complete qualification and experience data;
  - ☐ c. List of contractor's major equipment units, which are owned, leased, and/or under purchase agreements, supported by proof of ownership or certification of availability of equipment from the equipment

lessor/vendor for the duration of the project, as the case may be; **and**

- (j) Original duly signed Omnibus Sworn Statement (OSS);
  and if applicable, Original Notarized Secretary's Certificate in case of a corporation, partnership, or cooperative; or Original Special Power of Attorney of all members of the joint venture giving full power and authority to its officer to sign the OSS and do acts to represent the Bidder.

(k) Original Notarized Affidavit of No Pending Case. In case of joint venture or consortium, each partner of the joint venture or consortium shall submit their respective certification, under oath.

Financial Documents

- (l) The prospective bidder's audited financial statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "received" by the BIR or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission; **and**
- (m) The prospective bidder's computation of Net Financial Contracting Capacity (NFCC).

Class "B" Documents

- (n) If applicable, duly signed joint venture agreement (JVA) in accordance with RA No. 4566 and its IRR in case the joint venture is already in existence;
  or
  duly notarized statements from all the potential joint venture partners stating that they will enter into and abide by the provisions of the JVA in the instance that the bid is successful.

II. FINANCIAL COMPONENT ENVELOPE

- (o) Original of duly signed and accomplished Financial Bid Form; **and**

Other documentary requirements under RA No. 9184

- (p) Original of duly signed Bid Prices in the Bill of Quantities; **and**
- (q) Duly accomplished Detailed Estimates Form, including a summary shee indicating the unit prices of construction materials, labor rates, and equipmen rentals used in coming up with the Bid; **and**
- (r) Cash Flow by Quarter.

Section X. Bidding Forms

TABLE OF CONTENTS

BILL OF QUANTITIES

Project Title : SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF PRIMARY SURVEILLANCE RADAR AND MONOPULSE SECONDARY SURVEILLANCE RADAR

Item No.	Description	Quantity	Unit	Unit Cost (PhP)	Total Amount (PhP)
1.0	**General Requirements**				
1.1	Mobilization & Demobilization	1.00	lot		
1.2	Temporary Facilities including CIAC PMO Engineers	1.00	lot		
1.2.1	Furniture/Fixtures, Equipment & Appliances for the Field Office for the Engineer (rental basis)	1.00	lot		
1.2.2	laptop with minimum 8gb ram and 1tb storage (rental basis)	10	units		
1.2.3	office supplies	1.00	lot		
1.2.4	cellular phone units (rental basis) capable to take high definition photos with a 500 pesos monthly load.	10	units		
1.3	Safety Requirements (Personal Protective Equipment,	1.00	lot		
	Barriers/Barricades, Markings, Signages, Lightings,				
	Two-Way Radio & others as required by MOS &				
	other regulatory agencies)				
	Total 1.0				
2.0	**Equipment (RADAR)**				
2.1	Radar equipment (PSR)				
	a. PSR S-Band system including antenna, drive unit and weather channel.	1.00	set		
2.2	Radar equipment (MSSR)				
	a. 2 Channel Secondary Surveillance Radar Mode S including Antenna Pedestal	1.00	set		
2.3	Spare Parts	1.00	lot		
	Total 2.0				
3.0	**Local and Remote Control & Monitoring System**	1.00	lot		
	for PSR and MSSR complete with accessories and Service Terminal Notebook				
	Total 3.0				
4.0	**Standard Tools & Test Instruments**	1.00	lot		
	Total 4.0				
5.0	**Radome**	1.00	set		
	Total 5.0				
6.0	**System Ancillaries**	1.00	lot		
	(Lightning Protection, Working Rope and Safety Equipment, Obstruction Light, Fire Detection and Alarm System)				
	Total 6.0				
7.0	**Civil Works**				
7.1	Radar Equipment Building	1.00	lot		

7.2.	Radar Facility Renovation	1.00	lot		
7.3	Radar Antenna Tower	1.00	lot		
	Total 7.0				
8.0	**UPS (OEM recommendation)**	1.00	lot		
	Dual redundant UPS				
	Total 8.0				
9.0	**2 Generators**	1.00	lot		
	- Outdoor diesel generator with fuel tank, including ATS				
	- Conduits, Cables, Pipes, Cable Trays and other accessories				
	- Concrete Foundation				
	- Reserve Fuel Tank				
	Total 9.0				
10.0	**Electro-Mechanical**				
	a. Electrical wirings & conduits, Lightings, Panel Board, outlets, accessories, surge arrester, ground rods, Power Cable Trenching, Pipe laying/earth grounding, Transformers	1.00	lot		
	Air Conditioning Unit for Radar Equipment Building and Radar Facility	1.00	lot		
	Total 10.0				
11.0	**Communication Infrastructure**				
	a. Fiber optic media converter/hub and Ancillaries, complete with: - Fiber optic communication link including fiber optic patch cord - Enclosures & other necessary accessories	1.00	lot		
	b. Microwave Link	1.00	lot		
	Total 11.0				
12.0	**Installation, Testing, Commissioning, Trainings and other related services**				
13.1	Equipment Installation of PRS, MSSR, Antenna	1.00	lot		
13.2	Radar data Integration, Surveying and Measurements	1.00	lot		
13.3	Project Management and Supervision	1.00	lot		
13.4	Design and As Built Drawings	1.00	lot		
13.5.	Commissioning and Site Acceptance Test	1.00	lot		
13.6	Radar Flight Check	1.00	lot		
13.7	Construction/Maintenance Vehicle	1.00	lot		
13.8	Local On Site Training	1.00	lot		
13.9	Factory Training (Technical)	1.00	lot		
13.10	Factory Acceptance Test (FAT)	1.00	lot		
13.11	Maintenance Contract for 2 years during Defects Liability Period and Spare Parts	1.00	lot		
13.12	Airfreight Charges, Insurance Charges, Custom Brokerage, Storage, Delivery on Site Charges	1.00	lot		
	Total 12.0				
	GRAND TOTAL 1.0+2.0+3.0+4.0+5.0+6.0+7.0+8.0+9.0+10.0+11.0+12.0				
	TOTAL PROJECT COST				

TOTAL BID AMOUNT : _____
BID AMOUNT IN WORDS: _____
_____
Name of Bidder's Authorized Representative: _____

Position/Designation: _____

Bid Form for the Procurement of Infrastructure Projects

[shall be submitted with the Bid]

BID FORM

Date : _____

Project Identification No. : CIACBAC-Infra-P08

To: [name and address of Procuring Entity]

Having examined the Philippine Bidding Documents (PBDs) including the Supplemental or Bid Bulletin Numbers *[insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, declare that:

a. We have no reservation to the PBDs, including the Supplemental or Bid Bulletins, for the Procurement Project: *[insert name of contract];*
b. We offer to execute the Works for this Contract in accordance with the PBDs;
c. The total price of our Bid in words and figures, excluding any discounts offered below is: *[insert information]*;
d. The discounts offered and the methodology for their application are: *[insert information]*;
e. The total bid price includes the cost of all taxes, such as, but not limited to: *[specify the applicable taxes, e.g. (i) value added tax (VAT), (ii) income tax, (iii) local taxes, and (iv) other fiscal levies and duties]*, which are itemized herein and reflected in the detailed estimates,
f. Our Bid shall be valid within the a period stated in the PBDs, and it shall remain binding upon us at any time before the expiration of that period;
g. If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract, or a Performance Securing Declaration in lieu of the the allowable forms of Performance Security, subject to the terms and conditions of issued GPPB guidelines[1] for this purpose;
h. We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;
i. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract

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[1] currently based on GPPB Resolution No. 09-2020

is prepared and executed; and

j. We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.
k. We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the [Name of Project] of the [Name of the Procuring Entity*]*.
l. We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

Legal Capacity: _____

Signature: _____

Duly authorized to sign the Bid for and behalf of: _____

Date: _____

Contract Agreement Form for the Procurement of Infrastructure Projects (Revised)

[not required to be submitted with the Bid, but it shall be submitted within ten (10) days after receiving the Notice of Award]

CONTRACT AGREEMENT

THIS AGREEMENT, made this *[insert date]* day of *[insert month]*, *[insert year]* between *[name and address of PROCURING ENTITY]* (hereinafter called the "Entity") and *[name and address of Contractor]* (hereinafter called the "Contractor").

WHEREAS, the Entity is desirous that the Contractor execute *[name and identification number of contract]* (hereinafter called "the Works") and the Entity has accepted the Bid for *[contract price in words and figures in specified currency]* by the Contractor for the execution and completion of such Works and the remedying of any defects therein.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents as required by the 2016 revised Implementing Rules and Regulations of Republic Act No. 9184 shall be deemed to form and be read and construed as part of this Agreement, *viz*.:

   a. Philippine Bidding Documents (PBDs);
   - i. Drawings/Plans;
   - ii. Specifications;
   - iii. Bill of Quantities;
   - iv. General and Special Conditions of Contract;
   - v. Supplemental or Bid Bulletins, if any;

   b. Winning bidder's bid, including the Eligibility requirements, Technical and Financial Proposals, and all other documents or statements submitted;

   Bid form, including all the documents/statements contained in the Bidder's bidding envelopes, as annexes, and all other documents submitted (*e.g.*, Bidder's response to request for clarifications on the bid), including corrections to the bid, if any, resulting from the Procuring Entity's bid evaluation;

c. Performance Security;

d. Notice of Award of Contract and the Bidder's conforme thereto; and

e. Other contract documents that may be required by existing laws and/or the Procuring Entity concerned in the PBDs. **Winning bidder agrees that additional contract documents or information prescribed by the GPPB that are subsequently required for submission after the contract execution, such as the Notice to Proceed, Variation Orders, and Warranty Security, shall likewise form part of the Contract.**

3. In consideration for the sum of *[total contract price in words and figures]* or such other sums as may be ascertained, *[Named of the bidder]* agrees to *[state the object of the contract]* in accordance with his/her/its Bid.

4. The *[Name of the procuring entity]* agrees to pay the above-mentioned sum in accordance with the terms of the Bidding.

5. Pursuant to the Department of Transportation Department Memorandum, a slippage of more than thirty (30) days shall result in non-payment, cancellation of the contract, blacklisting of the Contractor and the engagement of another Contractor to finish the project.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

[Insert Name and Signature]	*[Insert Name and Signature]*
[Insert Signatory's Legal Capacity]	*[Insert Signatory's Legal Capacity]*
	for:
for:	*[Insert Name of Supplier]*
[Insert Procuring Entity]	

Acknowledgment

[Format shall be based on the latest Rules on Notarial Practice]

Omnibus Sworn Statement (Revised)

[shall be submitted with the Bid]

REPUBLIC OF THE PHILIPPINES)

CITY/MUNICIPALITY OF _____) S.S.

AFFIDAVIT

I, [Name of Affiant], of legal age, [Civil Status], [Nationality], and residing at [Address of Affiant], after having been duly sworn in accordance with law, do hereby depose and state that:

1. *[Select one, delete the other:]*

   [If a sole proprietorship:] I am the sole proprietor or authorized representative of [Name of Bidder] with office address at [address of Bidder];

   [If a partnership, corporation, cooperative, or joint venture:] I am the duly authorized and designated representative of [Name of Bidder] with office address at [address of Bidder];

2. *[Select one, delete the other:]*

   [If a sole proprietorship:] As the owner and sole proprietor, or authorized representative of [Name of Bidder], I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached duly notarized Special Power of Attorney;

   [If a partnership, corporation, cooperative, or joint venture:] I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for [Name of the Project] of the [Name of the Procuring Entity], as shown in the attached [state title of attached document showing proof of authorization (e.g., duly notarized Secretary's Certificate, Board/Partnership Resolution, or Special Power of Attorney, whichever is applicable;)];

3. [Name of Bidder] is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government/foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board, **by itself or by relation, membership, association, affiliation, or controlling interest with another blacklisted person or entity as**

defined and provided for in the Uniform Guidelines on Blacklisting;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. [Name of Bidder] is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. *[Select one, delete the rest:]*
[If a sole proprietorship:] The owner or sole proprietor is not related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a partnership or cooperative:] None of the officers and members of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

[If a corporation or joint venture:] None of the officers, directors, and controlling stockholders of *[Name of Bidder]* is related to the Head of the Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management Office or the end-user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. *[Name of Bidder]* complies with existing labor laws and standards; and

8. *[Name of Bidder]* is aware of and has undertaken the responsibilities as a Bidder in compliance with the Philippine Bidding Documents, which includes:

   a. Carefully examining all of the Bidding Documents;
   b. Acknowledging all conditions, local or otherwise, affecting the implementation of the Contract;
   c. Making an estimate of the facilities available and needed for the contract to be bid, if any; and
   d. Inquiring or securing Supplemental/Bid Bulletin(s) issued for the *[Name of the Project]*.

9. *[Name of Bidder]* did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

10. **In case advance payment was made or given, failure to perform or deliver any of the obligations and undertakings in the contract shall be sufficient grounds to constitute criminal liability for Swindling (Estafa) or the commission of fraud with unfaithfulness or abuse of confidence through misappropriating or converting any payment received by a person or entity under an obligation involving the duty to deliver certain goods or services, to the prejudice of the public and the government of the Philippines pursuant to Article 315 of Act No. 3815 s. 1930, as amended, or the Revised Penal Code.**

IN WITNESS WHEREOF, I have hereunto set my hand this __ day of ___, 20__ at _____, Philippines.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

Bid Securing Declaration Form

[shall be submitted with the Bid if bidder opts to provide this form of bid security]

REPUBLIC OF THE PHILIPPINES)

CITY OF _____) S.S.

BID SECURING DECLARATION

Project Identification No.: CIACBAC-Infra-P08

To: *[Insert name and address of the Procuring Entity]*

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid Securing Declaration.

2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by the procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1(b), 34.2, 40.1 and 69.1, except 69.1(f),of the IRR of RA No. 9184; without prejudice to other legal action the government may undertake.

3. I/We understand that this Bid Securing Declaration shall cease to be valid on the following circumstances:

    a. Upon expiration of the bid validity period, or any extension thereof pursuant to your request;
    b. I am/we are declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I/we failed to timely file a request for reconsideration or (ii) I/we filed a waiver to avail of said right; and
    c. I am/we are declared the bidder with the Lowest Calculated Responsive Bid, and I/we have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of *[month] [year]* at *[place of execution]*.

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]

[Insert signatory's legal capacity]
Affiant

[Jurat]

[Format shall be based on the latest Rules on Notarial Practice]

Performance Securing Declaration (Revised)

[if used as an alternative performance security but it is not required to be submitted with the Bid, as it shall be submitted within ten (10) days after receiving the Notice of Award]

REPUBLIC OF THE PHILIPPINES)
CITY OF _____) S.S.

PERFORMANCE SECURING DECLARATION

Invitation to Bid: [Insert Reference Number indicated in the Bidding Documents]
To: [Insert name and address of the Procuring Entity]

I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, to guarantee the faithful performance by the supplier/distributor/manufacturer/contractor/consultant of its obligations under the Contract, I/we shall submit a Performance Securing Declaration within a maximum period of ten (10) calendar days from the receipt of the Notice of Award prior to the signing of the Contract.

2. I/We accept that: I/we will be automatically disqualified from bidding for any procurement contract with any procuring entity for a period of one (1) year for the first offense, or two (2) years **for the second offense**, upon receipt of your Blacklisting Order if I/We have violated my/our obligations under the Contract;

3. I/We understand that this Performance Securing Declaration shall cease to be valid upon:

    a. issuance by the Procuring Entity of the Certificate of Final Acceptance, subject to the following conditions:
        i. Procuring Entity has no claims filed against the contract awardee;
        ii. It has no claims for labor and materials filed against the contractor; and
        iii. Other terms of the contract; or

    b. replacement by the winning bidder of the submitted PSD with a performance security in any of the prescribed forms under Section 39.2 of the 2016 revised IRR of RA No. 9184 as required by the end-user.

IN WITNESS WHEREOF, I/We have hereunto set my/our hand/s this ____ day of [month] [year] at [place of execution].

[Insert NAME OF BIDDER OR ITS AUTHORIZED REPRESENTATIVE]
[Insert signatory's legal capacity]
Affiant

[Jurat]
[Format shall be based on the latest Rules on Notarial Practice]

Bidder's Nominated Key Personnel

Bidder's Letters of Nominees for Key Personnel:

The Bidder shall execute the attached sample Letter of Nomination for each of the Proposed Key Personnel for the Design and Construction Stage of the Project.

List of Proposed Bidder's Key Personnel	
	Bidder's Key Personnel
Project Manager	
Project Engineer	
Structural Engineer	
Electrical Engineer	
Mechanical Engineer	
Radar Systems/Software Specialist	
Radar Systems/Software Specialist	
Safety Officer	

_____

Name and signature of Bidder's Authorized Representative

Summary of Qualifications/Credentials of the Proposed Key Personnel for the Project.

Name of staff	**Position**	**Education4**	**No. of Related Trainings 5**	**Years of Experience**	**Number of Projects in Same Position**
Design Phase					
1.	Project Manager				
2.	Project Engineer				
3.	Structural Engineer				
4.	Electrical Engineer				
5.	Mechanical Engineer				
6.	Radar Specialist				
7.	Radar Specialist				
8.	Safety Officer				

Format of Curriculum Vitae [CV] For Proposed Key Personnel

A. Proposed Position:

B. Name of Contractor:
   B.1 Name of Designer [as applicable]:

C. Name of Staff:

D. Profession:

E. Date of Birth:

F. Years with Firm/Entity:

G. Nationality:

H. Membership in Professional Societies:

I. Detailed Tasks Assigned with Firm:

J. Key Qualifications: Give an outline of staff member's experience and Describe degree of responsibility held by staff member on relevant previous projects and give dates and locations. Use about half a page.

K. Education: Summarize college/university and other specialized education of staff members, giving names of schools, dates attended, and degrees obtained. Use about one quarter of a page.]

K.1 Training/Seminars Attended: List at least three [3] related trainings/seminars.

L. Employment Record: [Starting with present position, list in reverse order every employment held. List all positions held by staff member since graduation, giving dates, names of employing organizations, titles of positions held, and locations of projects. For experience in last ten years, also give types of activities performed and client references, where appropriate. Use about twopages.]

M. Ongoing Projects if any:

Name of Project	Owner	Cost
_____	_____	_____
_____	_____	_____
_____	_____	_____

Time Schedule for Key Personnel

Contractor			Months [in the Form of a Bar Chart]					
Name	Position	Reports Due/Activities	1	2	3	4	..23	Number of Months
								Subtotal[1] Subtotal[2] Subtotal[3] Subtotal[4]

MINIMUM EQUIPMENT REQUIREMENTS

No.	Equipment	O	O or L	Total
1.	One (1) unit Air Compressor with jack hammer			
2.	One (1) unit Backhoe with Pavement Breaker			
3.	Two (2) units Concrete Cutter			
4.	One (1) Boom Truck			
5.	One (1) unit Skid Loader			
6.	One (1) unit Diesel Welding Machine			
7.	Two (2) units Service Truck			
8.	Two (2) units Dump Truck			
9.	Eight (8) units VHF Radios			
10.	Two (2) units Megger Insulation Tester			
11.	One (1) unit Boring Machine			
12.	One (1) unit Earth Resistance Test			
13.	Two (2) units Concrete Mixers			
14.	Two (2) units Mortar Mixers			
15.	One (1) unit Plate Compactor			
16.	One (1) unit Concrete Vibrator			
17.	One (1) unit Bar Cutter			
18.	One (1) Hydraulic Crane			
19.	Two (2) units Generator Sets			
20.	One (1) Total Station Surveying Equipment			
Total				
O or L – Owned or Lease				

Note: The Bidder shall furnish Certified True Copies of Ownership and/or Lease Agreement and certification of availability of equipment from the equipment lessor/vendor for the duration of the project.

Cash Flow by Quarter and Payments Schedule

Phase																TOTAL
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	
4.1	Design															
	Amount [PhP]															
	Per Cent [%]															
4.2	Construction															
	Amount [PhP]															
	Per Cent [%]															
Total																

Submitted by:

Name and Signature of Contactor's Authorized Representative Name of Contractor

Summary of Detailed Unit Price Analysis

ITEM NO.	DESCRIPTION OF BOQ ITEM	UNIT OF MEASUREMENT	QUANTITY

A. DIRECT COST				
A.1 Cost of Materials	UNIT	QUANTITY	UNIT COST	AMOUNT
A.2 Cost of Labor	NO.	NO. OF HOURS	RATE PER HOUR	AMOUNT
A.3 Equipment Expenses	NO.	NO. OF HOURS	RATE PER HOUR	AMOUNT
ESTIMATED DIRECT COST (EDC) [A.1 + A.2 +A.3]				

B. INDIRECT COSTS	% of EDC	AMOUNT
B.1 Overhead Expense		
B.2 Contingencies		
B.3 Miscellaneous Expense		
B.4 Contractor's Profit		
TOTAL MARK-UP		
EDC + TOTAL MARK-UP		
VALUE ADDED TAX [12% (EDC + TOTAL MARK-UP)]		
TOTAL INDIRECT COST [TOTAL MARK-UP + VAT]		
TOTAL COST [EDC + TOTAL INDIRECT COST]		
UNIT COST [(TOTAL COST) / (QUANTITY)]		

Statement of all on-going Government & Private Contracts including contracts awarded but not yet started, which are similar or not similar in nature and complexity to the contract to be bid;

Business Name: _____
Business Address: _____

Name of Contract	a. Owner's Name b. Address c. Telephone Nos. d. Date of Contract	Nature of Work	Contractor's Role		a. Total contract value at award b. Estimated completion time	a. Percentage of planned and actual accomplishment, if applicable b. Value of outstanding works, if applicable
			Description	%		
Government						
Private						

Note: This statement shall be supported with:

1. Certified True Copy of Notice of Award and Contract or NTP
2. Certificate of Accomplishment from Project Owner or Representative for On-going Project

Submitted by :_____
(Printed Name & Signature)
Designation :_____
Date :_____

Statement of the Bidder's Single Largest Completed Contract (SLCC) similar to the contract to be bid

Business Name: _____
Business Address: _____

Name of Contract	a. Owner's Name b. Address c. Telephone Nos. d. Date of Contract	Nature of Work	Contractor's Role		a. Total contract value at award b. Date of completion c. Total contract value at completion	a. Percentage of planned and actual accomplishment, if applicable b. Value of outstanding works, if applicable
			Description	%		
Government						
Private						

Note: This statement shall be supported with:

1. Certified True Copy of Notice of Award, Contract and Notice to Proceed
2. Certificate of Final Acceptance issued by the owner or CPES Final rating

Submitted by : _____
(Printed Name & Signature)
Designation : _____
Date : _____