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2 **THERESA G. ROJAS, ESQ.**  
3 Legal Counsel  
4 Guam Waterworks Authority  
5 Gloria B. Nelson Public Service Building  
6 688 Route 15, Suite 304  
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7 **BEFORE THE GUAM PUBLIC UTILITIES COMMISSION**

9 IN THE MATTER OF:

) **GWA DOCKET NO. 24-06**

10 **PETITION TO AUTHORIZE THE**  
11 **GUAM WATERWORKS**  
12 **AUTHORITY TO ISSUE**  
13 **PROCUREMENTS FOR GWA'S**  
14 **UPPER TUMON CAMPUS**  
15 **IMPROVEMENTS**

) **PETITION FOR GWA TO PROCURE**  
) **DESIGN-BUILD OF GWA'S UPPER**  
) **TUMON CAMPUS IMPROVEMENTS**

16 **COMES NOW**, the GUAM WATERWORKS AUTHORITY ("GWA"), by and through  
17 its counsel of record, THERESA G. ROJAS, ESQ., and hereby files its Petition seeking PUC's  
18 approval to issue an Invitation to Bid ("IFB") for the GWA Upper Tumon Campus Improvements.  
19 The project will be implemented in two Phases: Phase One (I) will address the Warehouse  
20 Rehabilitation and Meter Testing Facility repairs and Phase Two (II) will address the Customer  
21 Service Renovation and Laboratory Equipment Replacement.

23 **I. BACKGROUND**

24 **A. Phase I: The Warehouse Rehabilitation and Meter Testing Facility Repair**

25 GWA's Upper Tumon Warehouse and Meter Testing Facility building are two separate but  
26 similarly constructed structures (pre-engineered steel). Originally constructed in 1993, the existing  
27 Upper Tumon Warehouse has served as storage and an inventory management workspace for  
28

1 equipment and spare parts for the repair and maintenance of GWA's water and wastewater assets.  
2 Over the span of 30 years, normal wear due to Guam's tropical conditions have contributed to the  
3 deterioration of the overall structure. In May 2023, Typhoon Mawar exacerbated the warehouse  
4 deterioration by causing extensive damage to the warehouse roof and water damage to interior  
5 office partitions. Following the typhoon, the warehouse roof was mended with impermanent  
6 coverings intended to provide a temporary fix until permanent solutions could be procured. See  
7 **EXHIBITS A-006-014**. As a result of the damages, employees, who had offices inside the  
8 warehouse prior to storm, were also moved. Today, GWA warehouse employees share spaces with  
9 other divisions within GWA's Upper Tumon offices.  
10

11 The second structure, GWA's Meter Testing Facility building also suffered extensive  
12 roofing damage as a result of Typhoon Mawar. The Meter Testing Facility building is constructed  
13 with concrete walls and floors and a steel framed ceiling but has a corrugated metal roof. The  
14 building, built in 2013, had no major damages prior to Mawar and housed GWA's Asset  
15 Management (mezzanine level offices) and Meter Testing Facility divisions and GWA's meter  
16 testing workshop. After the storm, temporary and minor repairs kept the meter testing facility and  
17 workshop intact; but the remaining and major damage, including to the interior office partitions,  
18 forced all Asset Management Division employees to temporarily relocate to GWA's main offices  
19 in Mangilao. See **EXHIBITS A-015-021**. At its Mangilao offices, GWA's Asset Management  
20 team shares an open space with other GWA divisions.  
21  
22

## 23 **B. Phase II: The Customer Service Renovation and Laboratory Equipment**

### 24 **Replacement**

25 GWA's existing Customer Service Center sits on the first floor of GWA's Upper Tumon  
26 Office Building. This building is separate and apart from the warehouse, the meter testing facility  
27  
28



1 building, and GWA's laboratory. GWA's Upper Tumon offices were first built for GWA's  
2 predecessor, the PUAG, in 1979. The offices were initially uniquely outfitted for the water agency  
3 but following the consolidation of the water and power utilities board ("the CCU") in 2002, and  
4 the passage of subsequent CCU Resolutions and adopted MOA's, today, customers can pay GPA,  
5 GWA, and GSWA bills in-person at all GPA or GWA customer service centers. Presently, and  
6 although several methods exist to allow water and power customers to pay bills via phone, mail,  
7 drop box, drive-thru, and online, many customers still utilize in-person services to address billing  
8 issues, submit rebates, and to start, stop, or move services. Customers also appear in-person to  
9 make financial payment arrangements for delinquent and past due accounts to avoid service  
10 interruptions. In fact, the majority of GWA's in-person customer service traffic is at the Upper  
11 Tumon Customer Service Center. To continue to support these customer needs and to address the  
12 current building codes, fire/safety codes, other relevant codes and standards the 40-year-old and  
13 existing GWA Customer Service Center requires renovation.  
14  
15

16 Lastly, GWA's Laboratory ("Lab") is housed in a separate building on GWA's Upper  
17 Tumon Campus and also requires ventilation upgrades to ensure the Lab continues to optimally  
18 function. GWA's Lab monitors Guam's water quality to make sure that water from the tap is safe  
19 to drink and more specifically, the Lab personnel also monitor all contaminant levels identified,  
20 both for regulated contaminants and unregulated compounds, to ensure Guam's tap water is in  
21 compliance with safe drinking water regulations from all local water sources and in our distribution  
22 network.  
23  
24

## 25 II. REQUEST FOR APPROVAL

26 GWA now desires to procure experienced and qualified companies for Design-Build of its  
27 Upper Tumon Campus Improvements through an Invitation to Bid ("IFB"). The recommended  
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1 Scope of Work includes, design analysis, environmental clearance, technical support, detailed  
2 engineering drawings, specifications, all regulatory approval and permits, and construction  
3 including labor, tools, equipment and materials. The work for the Upper Tumon Campus  
4 Improvements is intended to be procured at one time, but executed in phases to address the most  
5 urgent typhoon-related repair/rehabilitation (Phase I) in alignment with schedules for potential  
6 insurance/federal emergency aid funding requirements. The subsequent rehabilitation and repair  
7 work (Phase II) can be executed at a later time.  
8

9 The rehabilitation of the Upper Tumon Warehouse and the repair of the Meter Testing  
10 Facility within Phase I are necessary and urgent to 1) make the facilities safe for the return of  
11 GWA's employees and 2) to properly safekeep, maintain, and store the necessary inventory of  
12 supplies and equipment used for GWA's water and wastewater system repair and maintenance. In  
13 support of the need for the Phase I work a complete damage assessment and report with estimated  
14 costs for repair are included at **EXHIBITS A-006-014** for the Upper Tumon Warehouse Facility  
15 and at **EXHIBITS A-015-021** for the Meter Testing Facility Building.  
16  
17

18 In support of GWA's request for its Phase II work, the renovations contemplated and  
19 designed for the Customer Service Center will upgrade GWA's current customer service area to  
20 comply with specific codes and customer accommodations and will improve the convenience and  
21 comfort for customers conducting business with GPA and GWA and all staff supporting ratepayer  
22 needs. Phase II also includes a separate equipment replacement for the Lab's critical ventilation  
23 and exhaust systems. This work will replace the existing ventilation equipment at GWA's  
24 Compliance Laboratory with a new Dedicated Outside Air Units ("DOAUs") which are necessary  
25 to meet current indoor air quality requirements and to ensure the continued operation of the  
26 laboratory under all operating conditions. *See* supporting reports at **EXHIBITS A-025-041**.  
27  
28



1 Applying GWA's initial assessment of damages and the needed repairs, renovations and  
2 equipment purchases Phase I of GWA's Upper Tumon Campus Improvements are estimated to  
3 cost \$3,167,500.00 and Phase II Improvements and purchases are estimated to cost \$5,080,900.00  
4 with a total estimated cost for Phase I and Phase II to be \$8,248,400.00. These estimates exceed  
5 GWA's \$1M contract review protocol limit which now requires GWA to seek the PUC's approval  
6 prior to advertising the procurement for the above-mentioned projects.  
7

8 Further, funds for the design-build work to complete the above-mentioned projects will  
9 come from multiple funding sources to include bonds funds, internal and existing Capital  
10 Improvement Project (revenue) funding, FEMA Public Assistance Program funding, and GWA  
11 Property Insurance claim payments. In support of this Petition, the has CCU approved GWA  
12 Resolution 10-FY2024 to procure the aforementioned services necessary for these projects. This  
13 resolution and its supporting exhibits are attached as **EXHIBIT A** and are incorporated by  
14 reference as if fully set forth herein.  
15

### 16 III. CONCLUSION

17 Based on the foregoing, GWA respectfully requests the PUC approve and authorize GWA  
18 Management to begin its procurement for the Design-Build of GWA's Phase I and Phase II Upper  
19 Tumon Campus Improvements as it is reasonable, prudent, and necessary.  
20  
21  
22

23 **RESPECTFULLY SUBMITTED** this day of March 12th 2024.

24  
25 By:

  
\_\_\_\_\_  
**THERESA G. ROJAS**  
GWA Legal Counsel



**CONSOLIDATED COMMISSION ON UTILITIES**  
Guam Power Authority | Guam Waterworks Authority  
P.O. Box 2977 Hagatna, Guam 96932 | (671)649-3002 | guamccu.org

**GWA RESOLUTION NO. 10-FY2024**

**RELATIVE TO REQUESTING APPROVAL TO PROCURE DESIGN-BUILD OF GWA  
UPPER TUMON CAMPUS IMPROVEMENTS**

**WHEREAS**, under 12 G.C.A. § 14105, the Consolidated Commission on Utilities (“CCU”) has plenary authority over financial, contractual, and policy matters relative to the Guam Waterworks Authority (“GWA”); and

**WHEREAS**, the Guam Waterworks Authority (“GWA”) is a Guam Public Corporation established and existing under the laws of Guam; and

**WHEREAS**, GWA will be utilizing the Design-Build project delivery method for the GWA Upper Tumon Campus Improvements project to make necessary repairs, rehabilitation and renovations of the Customer Service Center, Compliance Laboratory, Warehouse and Meter Testing Facility; and

**WHEREAS**, the GWA Upper Tumon Campus Improvements project will be implemented in two phases: Phase I (Warehouse Rehabilitation and Meter Testing Facility Repair) and Phase II (Customer Service Center Renovation and Laboratory Equipment Replacement); and

**WHEREAS**, the existing Upper Tumon Warehouse was originally constructed in 1993 to store and manage the inventory of equipment and spare parts needed for immediate repairs to maintain the water and wastewater assets in good working condition; and.

**WHEREAS**, the normal wear in Guam’s tropical conditions over the span of 30 years contributed to deterioration of metal roofing, gutters, z-purlins and other structural members of the warehouse resulting in rain water leaking through the damaged roof. In addition, Typhoon Mawar caused further extensive damage to the warehouse and the adjacent Meter Testing



1 Facility in May 2023, damaging the existing roof, offices, some stored parts and equipment (see  
2 Exhibits A and B); and

3  
4 **WHEREAS**, the extensive damage to Upper Tumon Warehouse and Meter Testing  
5 Facility have affected the integrity of stored materials and the safety for occupants of both  
6 buildings. GWA staff at the Upper Tumon Warehouse and the Asset Management office on the  
7 second floor of Meter Testing Facility have been temporarily relocated to the Upper Tumon  
8 Customer Service Center or the GBN Public Service Building in Mangilao; and

9  
10 **WHEREAS**, the rehabilitation of the Upper Tumon Warehouse and the repair of Meter  
11 Testing Facility are necessary and urgent to make the facility safe for GWA employees and  
12 visitors, and to properly protect and maintain the inventory of spare parts while in storage; and

13  
14 **WHEREAS**, in Resolution No. 2009-16 (Exhibit C), the CCU directed GPA and GWA  
15 to explore opportunities for the Upper Tumon Customer Service Center wherein services  
16 provided to customers may be improved by combining resources of the two utilities; and

17  
18 **WHEREAS**, the renovation of existing Customer Service Center, currently housing both  
19 GWA and GPA customer service, is necessary to improve general comfort and convenience for  
20 customers and staff, and to meet current requirements of the building code, fire/safety code, and  
21 other relevant codes and standards; and

22  
23 **WHEREAS**, the GWA Compliance Laboratory facility has three (3) laboratories served  
24 by a special laboratory ventilation and exhaust systems, components of which are beyond their  
25 useful life or no longer meet current standards; and

26  
27 **WHEREAS**, based on a condition report prepared by an engineering firm (see Exhibit  
28 D), a replacement of the existing ventilation equipment with new Dedicated Outside Air Units  
29 (DOAUs) is necessary to meet acceptable indoor air quality requirements per national standards  
30 and ensure continued operation of the laboratory; and

31 //

1           **WHEREAS**, the recommended Scope of Work includes design analysis, environmental  
2 clearance technical support, detailed engineering drawings, specifications, all regulatory  
3 approval and permits, and construction including labor, tools, equipment and materials; and  
4

5           **WHEREAS**, GWA management seeks CCU approval to procure a competitive design-  
6 build contract among experienced and qualified companies for the Design-Build of Upper  
7 Tumon Campus Improvements Phase I (Upper Tumon Warehouse Rehabilitation and Meter  
8 Testing Facility Repair) and Phase II (Customer Service Center Renovation and Laboratory  
9 Equipment Replacement); and  
10

11           **WHEREAS**, funding in the amount of Three Million One Hundred Sixty-Seven  
12 Thousand Five Hundred Dollars (\$3,167,500.00) for Phase I and Five Million Eighty Thousand  
13 Nine Hundred Dollars (\$5,080,900.00) for Phase II, for a total funding amount to Eight Million  
14 Two Hundred Forty-Eight Thousand Four Hundred Dollars (\$8,248,400.00), is available  
15 through GWA bonds funds, Internally Funded Capital Improvement Project (revenue) funding,  
16 GWA Property Insurance Claims and reimbursement through FEMA Public Assistance Program  
17 funding as applicable; and  
18

19           **WHEREAS**, GWA management further seeks CCU authorization to submit a petition to  
20 the PUC for approval under the PUC contract review protocol.  
21

22           **NOW BE IT THEREFORE RESOLVED**; the Consolidated Commission on Utilities  
23 does hereby approve the following:

- 24           1. The recitals set forth above hereby constitute the findings of the CCU.
- 25           2. The CCU finds that solicitation of bids for Design-Build of GWA Upper  
26 Tumon Campus Improvements is necessary to ensure public safety, equipment  
27 protection, continued operations and improve customer service (Exhibits A, B,  
28 and D).
- 29           3. The CCU hereby authorizes the amount for Design-Build of GWA Upper  
30 Tumon Campus Improvements Phase I (Warehouse Rehabilitation and Meter  
31 Testing Facility Repair) and Phase II (Customer Service Center Renovation



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and Laboratory Equipment Replacement) of Eight Million Two Hundred Forty-Eight Thousand Four Hundred Dollars (\$8,248,400.00).

- 4. The CCU hereby further authorizes the management of GWA to fund the Design-Build project delivery of GWA Upper Tumon Campus Improvements through GWA bonds funds, Internally Funded Capital Improvement Project (revenue) funding, FEMA Public Assistance Program, GWA Property Insurance Claims as applicable and other appropriate funding sources.
- 5. The CCU hereby further authorizes GWA management to petition the PUC for approval of the procurement of Design-Build of GWA Upper Tumon Campus Improvements.

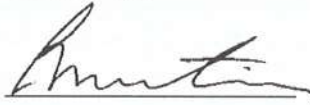
**RESOLVED**, that the Chairman certified, and the Board Secretary attests to the adoption of this Resolution.

**DULY AND REGULARLY ADOPTED**, this 27th day of February 2024.

Certified by:

Attested by:





**JOSEPH T. DUENAS**

**PEDRO ROY MARTINEZ**

Chairperson

Secretary

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**SECRETARY'S CERTIFICATE**

I, Pedro Roy Martinez, Board Secretary of the Consolidated Commission on Utilities as evidenced by my signature above do hereby certify as follows:

The foregoing is a full, true, and accurate copy of the resolution duly adopted at a regular meeting by the members of the Guam Consolidated Commission on Utilities, duly and legally held at a place properly noticed and advertised at which meeting a quorum was present and the members who were present voted as follows:

AYES:	<u>4</u>
NAYS:	<u>0</u>
ABSENT:	<u>1</u>
ABSTAIN:	<u>0</u>



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**DAMAGE ASSESSMENT/PROJECT WORKSHEET**

DATE: 06/02/2023

APPLICANT AGENCY: Guam Waterworks Authority

DAMAGED FACILITY: UPPER TUMON WAREHOUSE FACILITY

LOCATION: UPPER TUMON, GUAM

CATEGORY OF WORK: A, B, C, D, **F**, G (circle one)

INITIAL ASSESSMENT OF DAMAGE (DESCRIPTION AND DIMENSIONS):

1. APPROXIMATELY 4,469 SQUARE FEET OF BUTLERIB ROOFING WAS RIPPED OFF REQUIRING REPLACEMENT OF ROOF PANELS AND INSULATION.
2. ROOF FLASHING AND ROOF GUTTER WERE RIPPED OFF.
3. THE ENTIRE ACOUSTIC CEILING TILES AT THE SECOND FLOOR NEED REPLACEMENT. MANY TILES DROPPED DOWN TO THE FLOOR AND DAMAGED, THOSE THAT REMAINED IN THE CEILING WERE ALSO WATER DAMAGED.
4. REMOVAL AND REPLACEMENT OF WATER DAMAGED GYPSUM BOARD WALLS INCLUDING DOORS AND WINDOWS BOTH AT GROUND FLOOR AND MEZZANINE FLOOR.
5. REPAINTING OF NEW GYPSUM BOARD WALLS AND DOORS AT GROUND FLOOR AND MEZZANINE FLOOR.
6. REMOVAL AND REPLACEMENT OF WATER DAMAGED GYPSUM BOARD WALLS INCLUDING DOORS AND WINDOWS, ROOF, AND CEILING AT GROUND FLOOR STORE KEEPER OFFICE.
7. REPAINTING OF NEW GYPSUM BOARD WALLS AND DOORS, CEILING AT GROUND FLOOR STORE KEEPER'S OFFICE.
8. REMOVE AND REPLACE WATER DAMAGED LIGHTING FIXTURES AND WIRING (INTERIOR AND EXTERIOR OF WAREHOUSE)
9. REMOVE AND REPLACEMENT OF ROLL-UP DOORS INCLUDING MOTORS.
10. REPLACEMENT OF ASSORTED SHELVES AND CONTAINMENT PALLETS

INTERIOR/EQUIPMENT DAMAGE:

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SCOPE OF WORK:

1. REMOVE DAMAGED BUTLERIB ROOF PANELS UP TO THE RIDGE INCLUDING INSULATION.
2. REPLACE DAMAGED BUTLERIB ROOFING PANELS UP TO THE RIDGE INCLUDING INSULATION.
3. REMOVE AND REPLACE ROOF FLASHING
4. REMOVE AND REPLACE ROOF GUTTER
5. REMOVAL AND DISPOSAL OD DAMAGED ACOUSTIC CEILING
6. REPLACE/INSTALL NEW ACOUSTIC CEILING TILES (GROUND AND Mezzanine FLOORS)
7. REMOVE AND REPLACED WATER DAMAGED GYPSUM BOARDS, DOORS, AND WINDOWS AT GROUND FLOOR AND MEZZANINE FLOOR.
8. REPAINTING OF GYPSUM BOARDS, DOORS, AND WINDOWS AT GROUND FLOOR AND MEZZANINE FLOOR.
9. REMOVE AND REPLACED WATER DAMAGED GYPSUM BOARDS, DOORS, AND WINDOWS, ROOF AND CEILING AT GROUND FLOOR STORE KEEPER OFFICE.
10. REPAINTING OF GYPSUM BOARDS, DOORS, AND CEILING AT STORE KEEPER OFFICE GROUND FLOOR.
11. REMOVE AND REPLACE WATER DAMAGED LIGHTING FIXTURES AND WIRING (INTERIOR AND EXTERIOR OF WAREHOUSE)
12. REMOVE AND REPLACE STEEL ROLL-UP DOORS INCLUDING MOTORS
13. REPLACEMENT OF ASSORTED SHELVES AND CONTAINMENT PALLETS DAMAGED BY WATER.

ESTIMATED PROJECT COST: \$438,998.00

ITEM	NARRATIVE	QUANTITY/UNIT	UNIT PRICE	COST
1.	LABOR, MATERIAL, & EQUIPMENT	1 LS	\$67,035.00	\$67,035.00
2.	LABOR, MATERIAL, & EQUIPMENT	1 LS	\$111,725.00	\$111,725.00
3.	LABOR AND MATERIAL	1 LS	\$560.00	\$560.00
4.	LABOR AND MATERIAL	1 LS	\$600.00	\$600.00
5.	LABOR AND MATERIAL	1 LS	\$1,000.00	\$1,000.00
6.	LABOR AND MATERIAL	1 LS	\$41,118.00	\$41,118.00
7.	LABOR AND MATERIAL	1 LS	\$59,000.00	\$59,000.00
8.	LABOR AND MATERIAL	1 LS	\$22,500.00	\$22,500.00
9.	LABOR AND MATERIAL	1 LS	\$22,444.00	\$22,444.00
10.	LABOR AND MATERIAL	1 LS	\$8,310.00	\$8,310.00
11.	LABOR AND MATERIAL	1 LS	\$45,000.00	\$45,000.00
12.	LABOR AND MATERIAL	1 LS	\$16,500.00	\$16,500.00
13.	LABOR AND MATERIAL	1 LS	\$43,206.00	\$43,206.00



TOTAL ESTIMATED PROJECT COSTS \$438,998

DOES THE SCOPE OF WORK CHANGE THE PRE-DISASTER CONDITIONS AT THE SITE?

YES  NO

SPECIAL CONSIDERATIONS ISSUES INCLUDED? YES  NO

HAZARD MITIGATION PROPOSAL INCLUDED? YES  NO

IS THERE INSURANCE COVERAGE ON THIS FACILITY? YES  NO

PREPARED BY: ERNESTO VILLARIN

Agency Point of Contact (POC)

TITLE: SENIOR ENGINEER

BUSINESS ADDRESS: GLORIA B. NELSON BUILDING, 688 ROUTE 15, MANGILAO

BUSINESS TELEPHONE: 671-300-6063

ALTERNATE POC: \_\_\_\_\_

BUSINESS TELEPHONE: \_\_\_\_\_

VERIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FEMA Inspector

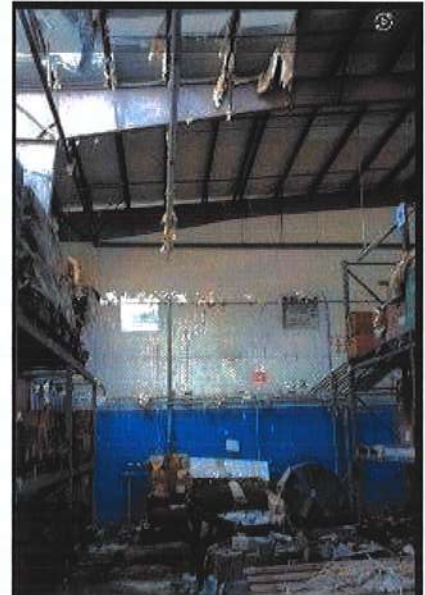
ATTACHMENTS:

- Photos or Videos
- Site Plan
- Agency Specific Forms or Worksheets



**ROOF TOP VIEW – GWA UPPER TUMON WAREHOUSE**



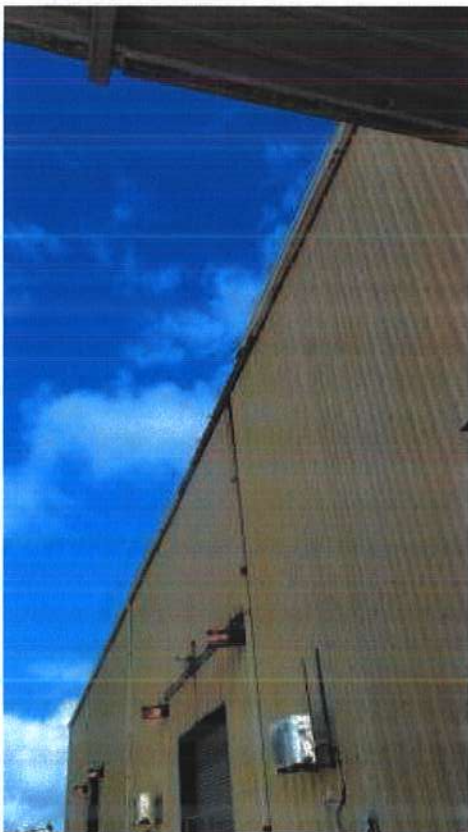


**ITEMS 1 & 1A- DAMAGED ROOFING BACKSIDE**

Exhibit A-010



**ITEMS 2, 3 & 4– DAMAGED ROOFING AND FLASHING**  
**(RIGHT SIDE OF WAREHOUSE)**



**ITEM 5 – DAMAGED ROOF**  
**GUTTER**  
**(FRONT OF WAREHOUSE)**





**ITEM 6 – DAMAGED ROOF RIDGE**

Exhibit A-012



**ITEM 7 & 7A – DAMAGED ROOFING NEAR THE RIDGE OF THE WAREHOUSE**





**ITEM 8 – DAMAGED ACOUSTIC CEILING AND WATER  
DAMAGED GYPSUM BOARD WALL  
WAREHOUSE MEZZANINE FLOOR**



**ITEM 8 – DAMAGE AT  
GROUND FLOOR OFFICE  
(ACOUSTIC CEILING TILES, WATER  
DAMAGED GYPSUM BOARD  
WALL)**

**NO POWER – INSIDE IS DARK**



**DAMAGE ASSESSMENT/PROJECT WORKSHEET**

DATE: 08/09/2023

APPLICANT AGENCY: Guam Waterworks Authority

DAMAGED FACILITY: METER TESTING FACILITY

LOCATION: UPPER TUMON, GUAM

CATEGORY OF WORK: A, B, C, D, E, **F**, G (circle one)

INITIAL ASSESSMENT OF DAMAGE (DESCRIPTION AND DIMENSIONS):

**1. APPROXIMATELY 99 SQUARE FEET OF BUTLERIB ROOFING WAS RIPPED OFF CAUSING WIND AND WATER DAMAGE TO THE OFFICE AREA AT THE SECOND FLOOR.**

**2. THE ENTIRE ACOUSTIC CEILING TILES AT THE SECOND FLOOR NEED REPLACEMENT. MANY TILES DROPPED DOWN TO THE FLOOR AND DAMAGED, THOSE THAT REMAINED IN THE CEILING WERE ALSO WATER DAMAGED.**

**3. REMOVAL AND REPLACEMENT OF WATER DAMAGED GYPSUM BOARD WALLS INCLUDING DOORS AT SECOND FLOOR OFFICE.**

**4. REPAINTING OF NEW GYPSUM BOARD WALLS AND DOORS AT SECOND FLOOR.**

**5. REMOVAL AND REPLACEMENT OF "NEW" AIR-CONDITIONING UNITS**

**6. CLEANUP OF AIR INTAKE DUCTING.**

INTERIOR/EQUIPMENT DAMAGE:

**SCOPE OF WORK:**

- 1. REMOVE DAMAGED BUTLERIB ROOF PANELS UP TO THE RIDGE INCLUDING INSULATION.**
- 2. REPLACE DAMAGED BUTLERIB ROOFING UP TO THE RIDGE INCLUDING INSULATION.**
- 3. REMOVE AND DISPOSE OF ALL ACOUSTIC CEILING TILES**
- 4. REPLACE ALL ACOUSTIC CEILING TILES.**
- 5. REMOVE MOLD INFESTED GYPSUM BOARD WALL**
- 6. REMOVE AND REPLACE WOODEN DOORS**
- 7. REPLACE GYPSUM BOARD WALL**
- 8. REPLACE WOODEN DOORS**
- 9. REPAINTING OF WALLS AND DOORS**
- 10. REMOVE AND REPLACE OF "NEW" AIR-CONDITION UNITS**
- 11. CLEAN FREE OF MOLDS THE AIR-INTAKE DUCTING**

**ESTIMATED PROJECT COST: \$164,622.70**

ITEM	NARRATIVE	QUANTITY/UNIT	UNIT PRICE	COST
1.	LABOR, MATERIAL, & EQUIPMENT	1 LS	\$5,285.20	\$5,285.20
2.	LABOR, MATERIAL, & EQUIPMENT	1 LS	\$11,765.00	\$11,765.00
3.	LABOR AND MATERIAL	1 LS	\$3,500.00	\$3,500.00
4.	LABOR AND MATERIAL	1 LS	\$16,100.00	\$16,100.00
5.	LABOR AND MATERIAL	1 LS	\$2,500.00	\$2,500.00
6.	LABOR AND MATERIAL	1 LS	\$2,500.00	\$2,500.00
7.	LABOR AND MATERIAL	1 LS	\$96,737.50	\$96,737.50
8.	LABOR AND MATERIAL	1 LS	\$2,500.00	\$2,500.00
9.	LABOR AND MATERIAL	1 LS	\$17,985.00	\$17,985.00
10.	LABOR AND MATERIAL	1 LS	\$5,250.00	\$5,250.00
11.	LABOR AND MATERIAL	1 LS	\$500.00	\$500.00
			<b>TOTAL</b>	<b>\$164,662.70</b>

TOTAL ESTIMATED PROJECT COSTS           **\$164,662.70**

DOES THE SCOPE OF WORK CHANGE THE PRE-DISASTER CONDITIONS AT THE SITE?  
YES  NO

SPECIAL CONSIDERATIONS ISSUES INCLUDED? YES  NO

HAZARD MITIGATION PROPOSAL INCLUDED? YES  NO

IS THERE INSURANCE COVERAGE ON THIS FACILITY? YES  NO

PREPARED BY: ERNESTO VILLARIN

Agency Point of Contact (POC)

TITLE: SENIOR ENGINEER

BUSINESS ADDRESS: GLORIA B. NELSON BUILDING, 688 ROUTE 15, MANGILAO

BUSINESS TELEPHONE: 671-300-6063

ALTERNATE POC: \_\_\_\_\_

BUSINESS TELEPHONE: \_\_\_\_\_

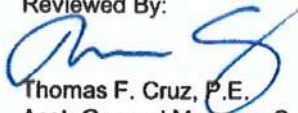
VERIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

FEMA Inspector

ATTACHMENTS:

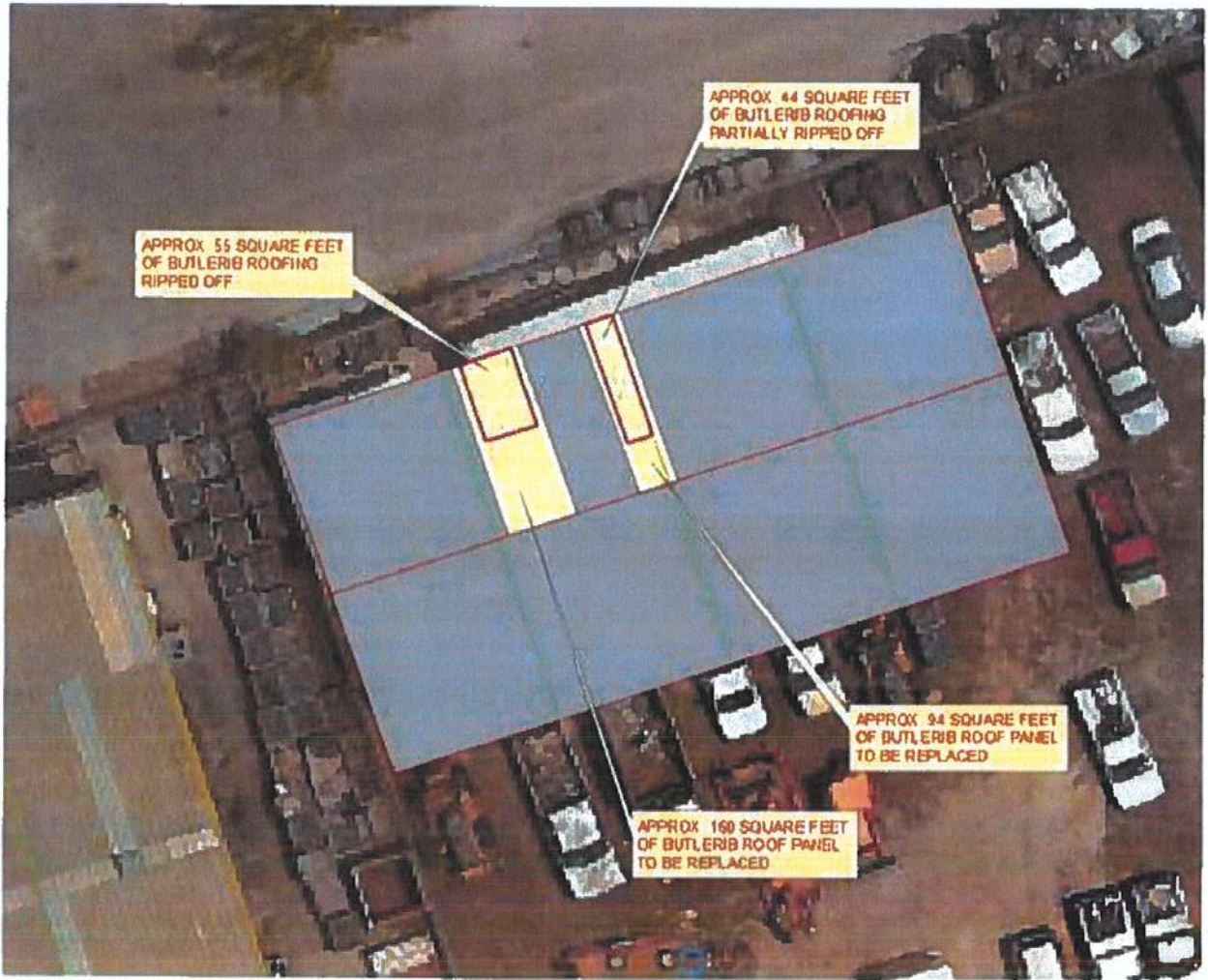
- Photos or Videos
- Site Plan
- Agency Specific Forms or Worksheets

Reviewed By:



Thomas F. Cruz, P.E.  
Asst. General Manager Operations





**METER TESTING FACILITY TOP VIEW**



**ITEMS 1 AND 2 – REMOVE AND REPLACE DAMAGED ROOFING  
PANELS UP TO ROOF RIDGE**

Exhibit A-019





Exhibit A-020





**ITEMS 3, 4, 5 AND 6 – METER TESTING FACILITY**

1 **GUAM CONSOLIDATED COMMISSION ON UTILITIES**

2 **RESOLUTION NO. 2009-16**

3  
4 **RELATIVE TO THE EXTENSION OF A MEMORANDUM OF**  
5 **UNDERSTANDING REGARDING COST SHARING BETWEEN THE GUAM**  
6 **WATERWORKS AUTHORITY AND THE GUAM POWER AUTHORITY**

7 **WHEREAS**, the Guam Power Authority and the Guam Waterworks Authority are  
8 governed by a common board – the Consolidated Commission on Utilities; and  
9

10 **WHEREAS**, the Consolidated Commission on Utilities has undertaken a number of  
11 initiatives to identify opportunities wherein the ratepayers of Guam may be better served if the  
12 Parties were to work together as a consolidated utility; and  
13

14 **WHEREAS**, one of the initiatives was to hire a consolidated general manager to serve as  
15 a liaison between the Consolidated Commission on Utilities and the Utilities – the General  
16 Manager of Consolidated Utility Services; and  
17

18 **WHEREAS**, the General Manager of Consolidated Utility Services has been directed to  
19 explore and make recommendations as to the eventual consolidation of the two utilities under the  
20 purview of the Consolidated Commission on Utilities; and  
21

22 **WHEREAS**, the Utilities require a legal structure under which resources can be  
23 provided back and forth between the Guam Waterworks Authority and the Guam Power  
24 Authority; and  
25

26 **WHEREAS**, the Guam Waterworks Authority and the Guam Power Authority entered  
27 into a Memorandum of Understanding (MOU) in 2003 which has now expired its own terms  
28 and both GWA and GPA wish to extend out the MOU; and  
29

30 **WHEREAS**, under the initial MOU, GWA has struggled to repay GPA for resources  
31 which were provided at the direction of the General Manager of Consolidated Utility Services;  
32 and



1  
2       **WHEREAS**, a new MOU has been drafted under which GWA is being allowed a four  
3 year period in which to repay amounts owed to GPA and pledges to remain current on any  
4 payments for resource provision in the future as well as setting forth some protocol  
5 requirements for future resource sharing; and  
6

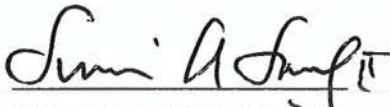
7  
8       **NOW THEREFORE, BE IT RESOLVED BY THE CONSOLIDATED**  
9 **COMMISSION ON UTILITIES, AS THE GOVERNING BODY OF THE GUAM**  
10 **WATERWORKS AUTHORITY, AS FOLLOWS:**  
11

- 12       1.       The General Managers of the Guam Power Authority, the Guam  
13 Waterworks Authority, and Consolidated Utility Services are authorized to  
14 sign the attached Memorandum of Understanding  
15       2.       The Commission reaffirms its desire for the Utilities to continue to explore  
16 opportunities wherein services provided to customers may be improved by  
17 combining the resources of the two utilities.  
18

19       **RESOLVED**, that the Chairman certifies and the Secretary attests to the adoption of  
20 this Resolution.  
21

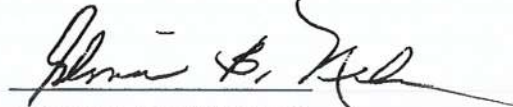
22       **DULY AND REGULARLY ADOPTED AND APPROVED THIS 23rd day of June,**  
23 **2009.**  
24

25       Certified by:

26 

27 **SIMON A. SANCHEZ, II**  
28 **Chairperson**  
29

30       Attested by:

31 

32 **GLORIA B. NELSON**  
**Secretary**

I, Gloria B. Nelson, Secretary for the Consolidated Commission on Utilities do hereby  
certify as follows:

1 The foregoing is a full, true and accurate copy of the resolution duly adopted at a regular  
2 meeting by the members of the Guam Consolidated Commission on Utilities, duly and  
3 legally held at a place properly noticed and advertised on April 28, 2009, at which  
4 meeting a quorum was present and the members who were present voted as follows:

5 AYES: \_\_\_\_\_ 4 \_\_\_\_\_  
6 NAYS: \_\_\_\_\_ 0 \_\_\_\_\_  
7 ABSTENTIONS: \_\_\_\_\_ 0 \_\_\_\_\_  
8 ABSENT: \_\_\_\_\_ 1 \_\_\_\_\_





GUAM **WATERWORKS** AUTHORITY

**CONDITION FOUND REPORT (CFR)**

- **DOAS Basis of Design**
- **Specifications**
- **Scope of Work**



[INFO@PNJFACILITIES.COM](mailto:INFO@PNJFACILITIES.COM)

**Exhibit A-025**



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## 1.0 Background

The Guam Waterworks Authority (GWA) Compliance Facility has three (3) laboratories served by a designated package unit (PCU) for each zone. The PCU's utilize an outside air (OA) economizer where OA enters the return air mixing box for conditioning the humid air. The PCUs are constant volume.

The design intent specified a Dedicated Outside Air Unit (DOAU) that have specific technical features. A DOAU's are designed to condition 100% outside air at all times. Not all units PCUs are designed to handle 100% latency load. The GWA laboratories should adhere to ASHRAE guidelines for laboratory HVAC design. There are fume hoods in these spaces that require air to be all positively pressured.

## 1.1 Design Specification

The following table contains the cooling load profile and the electrical characteristics as per the design requirement during the construction of the GWA Compliance Laboratory.

MARK	QTY	AREA SERVED	COOLING CAPACITY (BTUH)		OA (CFM)	ELECTRICAL
			TOTAL	SENSIBLE		
DOAU-PAC-1	1	Waste Water Lab (114)	220,000	87,000	2500 - 3100	208-230/3ø/60
DOAU-PAC-2	1	Micro/Bacterial Lab (112)	97,000	39,000	1100	208-230/3ø/60
DOAU-PAC-3	1	Wet Chem Lab (111)	97,000	39,000	1100	208-230/3ø/60

## 1.2 Purpose

The purpose of this document is establish the minimum acceptable technical requirements for the replacement of the DOAU equipment that serves the lab areas that includes the installation of a central controller dedicated for all three (3) DOAU's and permits further expansion utilizing an open protocol framework. This document also establishes the technical requirements for the contractors to comply with for submission.

## 1.3 References and Compliance

- ASHRAE 90.1-2019 Energy Standard for Buildings Except Low-Rise Residential Buildings
- ASHRAE Standard 62.1-2019 Ventilation for Acceptable Indoor Air Quality

## 1.4 Humidity Control

Active humidity control is the driver for the selection of the replacement equipment for the GWA labs. The DOAU's must have deep cooling coils and/or desiccant dehumidification components that are typically used to remove high latent loads or humidity. A standard PCU



with an OA economizer is not acceptable for the design intent for the proper cooling, conditioning (Indoor Air Quality), and dehumidification of the lab spaces.

### 1.5 Room Pressurization Monitoring

Each lab should be equipped with a stand alone pressure monitoring system that allows the occupants of the lab to monitor positive pressurization.

### 1.6 Conditions Found





Exhibit A-029





— END SECTION —

Exhibit A-030

## 2.0 Rough Order of Magnitude (ROMs)

The following table provides a budget overview of the replacement of the existing PCUs with the correct DOAUs as per design.

Category	Equipment	Installation / Materials	Crane Rental	TOTAL
1. DOAU-PAC-1: Waste Water Lab (114)	\$ 90,764.00	\$ 27,229.20	\$ 1,800.00	\$ 119,793.20
2. DOAU-PAC-2: Micro/Bacterial Lab (112)	\$ 86,719.00	\$ 26,015.70	\$ 1,800.00	\$ 114,534.70
3. DOAU-PAC-3: Wet Chem Lab (111)	\$ 86,719.00	\$ 26,015.70	\$ 1,800.00	\$ 114,534.70
4. Central Controller (Open Protocol Framework)	\$ 9,365.00	\$ 6,280.00		\$ 15,645.00
5. In-Room Pressure Sensors / Monitor	\$ 3,752.00	\$ 600.00		\$ 4,352.00
<b>Extended Totals</b>	<b>\$ 277,319.00</b>	<b>\$ 86,140.60</b>	<b>\$ 5,400.00</b>	<b>\$ 368,859.60</b>

The ROMS provide complete installed costs. This include all ductwork transitions, electrical works, equipment, appurtenances, coil corrosion protection, and crane rental to position the equipment on the roof of the building.

— END SECTION —



### 3.0 Scope of Work (SOW)

**This scope of work only defines the SOW for the replacement of DOAU-PAC-1, DOAU-PAC-2, and DOAU-PAC-3, the transition ductwork, related components, installation of the new control system, and start-up and commissioning (Cx) of the system with final Operations and Maintenance (O&M) documentation.**

Each DOAU have designated roof curbs that require air conveyance transitions. The existing pedestals would need to be removed and the area field inspected, before and after photos of the existing equipment and disposed of, and reporting of any concerns prior to the commencement of the installation of the new equipment. The contractor is responsible to submit all requisite administrative documentation and all equipment submittals inclusive of components, appurtenances, and utilized installation materials. Submittals shall require approval prior to ordering and the issuance of a Notice to Proceed (NTP).

Start-up and commissioning documentation shall include start-up reports, installation, operations, and maintenance manuals (IOMs), and the equipment manufacturer's warranty.

Performance of work activities include:

- Supply, delivery, and mechanical installation of three (3) DOAU units as per equipment schedule, duct work transition, control system, and related appurtenances
- Field verification, safety precautions, quality assurance, briefings, and coordinated work activities with GWA
- Recover refrigerant from existing systems in accordance with U.S. EPA 608 guidelines, removal of existing PCUs, and dispose equipment complying with industry and regulatory standards for disposal
- Placement, mounting, and installation of the DOAUs at the designed locations
- Installation of roof curbs, duct transition, drain, electrical works and appurtenances (e.g. voltage monitor, disconnect, conduits, etc. or as prescribed in the solicitation request)
- Installation of independent lab space pressure sensor for monitoring positive pressure when the DOAUs are running
- Termination of electrical works from provided disconnects
- Installation and programming of new control system, wiring and thermostats
- Charging of system with R410a following the manufacturer's design guidelines
- Calibration of system for proper operations as per defined SOOs
- Start-up and commissioning
- Provide manufacturer's warranty based on authorized Start-up and Commissioning report

### **3.1 Exclusions**

This excludes any work activities and supply of materials not specified in this scope of work and what will be specified in the solicitation request and engineered specifications. Exclusions are as follows:

- Civil works: concrete pads, protective barriers, etc.
- Electrical works outside the purview of the defined SOW
- Demolition works outside scope of mechanical installation

— END SECTION —



#### **4.0 Basis of Design (BOD)**

The BOD defined herewith is meant to establish the minimum evaluation requirements for the replacement of the PCUs from a package unit variety with an outside air (OA) economizer to a unit that can condition 100% outside air: Dedicated Outside Air System (DOAS).

The BOD will contain the technical features required for this project and shall be included in GWA's solicitation request.

---

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- A. This section includes units with integral cooling for outdoor installation. Integral cooling source shall be packaged DX. Airflow arrangement shall be Outdoor Air only. Each unit shall incorporate additional product requirements as listed in Section 2 of this specification.

### **1.2 SUBMITTALS**

- A. Product Data: For each type or model include the following:
  - 1. Complete fan performance curves for both Supply Air and Exhaust Air, with system operating conditions indicated, as tested in an AMCA certified chamber.
  - 2. Sound performance data for both Supply Air and Exhaust Air, as tested in an AMCA certified chamber.
  - 3. Motor ratings, electrical characteristics and motor and fan accessories.
  - 4. Performance ratings for all chilled water or DX coils.
  - 5. Dimensioned drawings for each type of installation, showing isometric and plan views, to include location of attached ductwork and service clearance requirements.
  - 6. Estimated gross weight of each installed unit.
  - 7. Installation, Operating and Maintenance manual (IOM) for each model.
  - 8. Microprocessor Controller (DDC) specifications to include available options and operating protocols. Include complete data on all factory-supplied input devices.

### **1.3 QUALITY ASSURANCE**

- A. Source Limitations: Obtain unit with all appurtenant components or accessories from a single manufacturer.
- B. For the actual fabrication, installation, and testing of work under this section, use only thoroughly trained and experienced workers completely familiar with the items required and with the manufacturer's current recommended methods of installation.
- C. Product Options: Drawings must indicate size, profiles and dimensional requirements of unit and are to be based on the specific system indicated. Refer to Division 1 Section "Product Requirements".
- D. End of line test with full report available upon request.
- E. Certifications
  - 1. Entire unit shall be ETL Certified per U.L. 1995 and bear an ETL sticker.
  - 2. Coils shall be Recognized Components for ANSI/UL 1995, CAN / CSA C22.2 No 236.05.



#### **1.4 COORDINATION**

- A. Coordinate size and location of all building penetrations required for installation of each unit and associated plumbing and electrical systems.
- B. Coordinate location of water system fittings to ensure correct positioning for connection to the water coil and condensate drain pipe.
- C. Coordinate sequencing of construction of associated plumbing, HVAC, electrical supply, roofing contractor.

---

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
  - 1. Mitsubishi Electric US, Inc.

#### **2.2 MANUFACTURED UNITS**

- A. Unit shall be fully assembled at the factory and consist of an insulated metal cabinet, downturn outdoor air intake with 2" aluminum mesh filter assembly, evaporator coil, hot gas reheat coil, packaged DX system, phase and brownout protection, motorized dampers, motorized recirculating damper, curb assembly, filter assembly intake air, supply air blower assembly, and an electrical control center. All specified components and internal accessories factory installed are tested and prepared for single-point high voltage connection except with electric post heat and exhaust fan only power which have dual point power.

#### **2.3 MANUFACTURED UNITS**

- A. Materials: Formed, double wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
  - 1. Unit's exterior shall be supplied from the manufacturer using G60 galvaneal steel with proprietary pre-painted material in the following finish color; Concrete Gray-RAL 7023. This has been subjected to a salt spray test per ASTM-B117 and evaluated using ASTM-D714 and ASTM-D610 showing no observable signs of rust or blistering until reaching 2,500 hours. Uncoated galvanized steel exterior is not acceptable.
  - 2. Internal assemblies: 24 gauge, galvanized (G90) steel except for motor supports which shall be minimum 14 gauge galvanized (G90) steel.
- B. Cabinet Insulation: Comply with NFPA 90A and NFPA 90B and erosion requirements of UL 181.
  - 1. Materials: Rigid urethane injected foam. Foam board not acceptable.
    - a. Thickness: 2 inch (50.8 mm)
    - b. Thermal Resistance R13

- c. Thermally broken
  - d. Meets UL94HF-1 flame requirements.
  - e. Location and application: Full coverage of entire cabinet exterior to include walls, roof of unit, unit base, and doors.
2. Materials: Fiberglass insulation. If insulation other than fiberglass is used, it must also meet the Fire Hazard Classification shown below.
- a. Thickness: 2 inch (50.8 mm)
  - b. Thermal Resistance R8
  - c. Fire Hazard Classification: Maximum flame spread of 25 and smoke developed of 50, when tested in accordance with ASTM C 411.
  - d. Location and application: Divider panels between outdoor air and return air/exhaust air streams.
- C. Roof Insulation: 2 inch (50.8 mm) fiberglass located above the 1 inch (25.4 mm) foam panel.
- D. Access panels / doors: Unit shall be equipped with insulated, hinged doors or removable access panels to provide easy access to all major components. Doors and access panels shall be fabricated of 18 gauge galvanized G90 steel or painted galvanized steel.
- E. Supply Air blower assemblies: Blower assembly shall consist of an electric motor and direct-drive fans. Assembly shall be mounted on heavy gauge galvanized steel rails and further mounted on 1.125 inch thick neoprene vibration isolators. Blower motors shall be capable of continuous speed modulation and controlled by a VFD.
- F. Evaporator Coil: Evaporator coil shall be (silver) soldered or brazed into the compressed refrigerant system. Coil shall be constructed of copper tubing, permanently bonded to aluminum fins and enclosed in a galvanized steel frame. If two compressors are used as components of the unit, then the evaporator coil shall be of "interlaced" configuration, permitting independent operation of either compressor without conflict with the other compressor. The evaporator, hot gas reheat and condensing coils are coated with ElectroFin® coil coating.
- G. Control panel / connections: Units shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections. RTU shall be equipped with a Unit Disconnect Switch.
- H. Condensate drain pan: Drain Pan shall be an integral part of the unit whenever a cooling option is included. Pan shall be formed of welded austenitic stainless steel sheet material and provided with a welded stainless steel drain connection at the front for connection to a P trap. Drain pan shall be sloped in two directions to provide positive draining and drain connector shall be sealed at penetration through cabinet wall.
- I. P trap: If the unit is equipped with a condensate drain pan, contractor shall provide, or fabricate, and install an appropriate P trap, in accordance with all local and area codes and Best Practices.
- J. Reheat coil with factory installed modulating hot gas reheat valve.
- K. Packaged DX System: Unit shall have an integral compressor(s) and evaporator coil located within the weather-tight unit housing. The evaporator, hot gas reheat and condensing coils are coated with ElectroFin® coil coating. Condenser coils and appurtenant condenser fan assemblies shall be factory installed as integral subassemblies of the unit and mounted



on the exterior of the unit. Lead condenser fan shall have EC motor to maintain condenser pressure at part load conditions. Motors shall be UL Recognized and CSA Certified. The lead refrigerant compressor(s) shall be inverter hermetic scroll-type and shall be equipped with liquid line filter drier, thermostatic expansion valves (TXV)(s), manual reset high pressure and low pressure cutouts and all appurtenant sensors, service ports and safety devices. Compressed refrigerant system shall be fully charged with R-410A refrigerant. Compressors shall be mounted within an insulated access compartment and on a raised cabinet shelf to reduce sound and vibration. Each compressor shall be factory-equipped with an electric crankcase heater to boil off liquid refrigerant from the oil.

- L. Condenser Fans: Fan blades must be constructed of aluminum or a composite material and have a geometry designed and documented to reduce sound and energy when compared to a traditional rectangular blade fan. Traditional rectangular blade fans are not allowed due to increased noise generated and increase power utilized. Condenser fan motors shall be three phase, external rotor, type 56 frame, open air over and shaft up. Each condenser fan motor shall have a vented frame, rated for continuous duty and be equipped with an automatic reset thermal protector. Lead condenser fan(s) will have an electronically commutated (EC) motor that will modulate to maintain a head pressure set point.] Motors shall be UL Recognized and CSA Certified. Single condenser fan running at max RPM and design static pressure shall not exceed an A-weighted sound power level of 75 db at free inlet/outlet test conditions.
- M. Packaged DX Control and Diagnostics: The Packaged DX system shall be controlled by an onboard digital controller (DDC) that indicates both owner-supplied settings and fault conditions that may occur. The DDC shall be programmed to indicate the following faults:
  - 1. Global alarm condition (active when there is at least one alarm)
  - 2. Supply Air Proving alarm
  - 3. Dirty Filter Alarm
  - 4. Compressor Trip alarm
  - 5. Compressor Locked Out alarm
  - 6. Supply Air Temperature Low Limit alarm
    - a. Sensor #1 Out of Range (outside air temperature)
    - b. Sensor #2 Out of Range (supply air temperature)
    - c. Sensor #3 Out of Range (cold coil leaving air temperature)
- N. Phase and brownout protection: Unit shall have a factory-installed phase monitor to detect electric supply phase loss and voltage brown-out conditions. Upon detection of a fault, the monitor shall disconnect supply voltage to all motors.
- O. Motorized dampers / Intake Air, Motorized dampers of low leakage type shall be factory installed.
- P. Motorized Recirculating Air Damper designed to permit 100% recirculation of exhaust air shall be factory installed.
- Q. Curb Assembly: A curb assembly made of 14 gauge galvanized steel shall be provided by the factory for assembly and installation as part of this division. The curb assembly shall provide perimeter support of the entire unit and shall have duct adapter(s) for supply air. Curb assembly shall enclose the underside of the unit and shall be sized to fit into a recess in the bottom



of the unit. Contractor shall be responsible for coordinating with roofing contractor to ensure curb unit is properly flashed to provide protection against weather/moisture penetration. Contractor shall provide and install appropriate insulation for the curb assembly. The curb shall be the height of 14 in.

- R. Hail Guards: Protects the condensing unit from damage due to extreme weather conditions such as hail and flying debris.
- S. 24V/120V Smoke detector: Duct smoke detector is shipped loose for field mounting and wiring in the supply or return air duct. The air duct smoke detector housing shall be UL listed per UL 268A specifically for use in air handling systems. The air duct smoke detector housing shall be suitable for mounting indoors. The detector shall operate at air velocities of 100 feet per minute to 4000 feet per minute (0.5 to 20.32 meters/second). The power supply voltage shall be 20-29 VDC, 24 VAC 50-60 Hz, and 120 VAC 50-60 Hz. The detector shall consist of an alarm initiation contact and two DPDT auxiliary contact closures. WARNING: Duct smoke detectors are NOT a substitute for open area smoke detectors; NOT a substitute for early warning detection; NOT a replacement for a building's regular fire detection system. Refer to NFPA 72 and 90A for additional information.

## **2.4 BLOWER**

- A. Blower section construction, Supply Air: direct drive motor and blower shall be assembled on a 14 gauge galvanized steel platform and shall be equipped with 1.125 inch thick neoprene vibration isolation devices.
- B. Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.
- C. Fan: Direct drive, airfoil plenum fan with aluminum wheel statically and dynamically balanced. Prop or belt-drive fan not acceptable due to low static capabilities.
- D. Blades: Welded aluminum blades only.
- E. Blower section motor source quality control: Blower performance shall be factory tested for flow rate, pressure, power, air density, rotation speed and efficiency. Ratings are to be established in accordance with AMCA 210, "Laboratory Methods of Testing Fans for Rating".

## **2.5 MOTORS**

- A. General: Blower motors greater than 1/2 horsepower shall be "NEMA Premium" unless otherwise indicated. Compliance with EPCAct minimum energy-efficiency standards for single speed ODP and TE enclosures is not acceptable. Motors shall be heavy-duty, permanently lubricated type to match the fan load and furnished at the specified voltage, phase and enclosure.
- B. Motors shall be 60 cycle, 3 phase 208 volts.

## 2.6 UNIT CONTROLS

- A. The unit shall be constructed so that it can function as a stand-alone heating and cooling system controlled by factory-supplied controllers, thermostats and sensors or it can be operated as a heating and cooling system controlled by a Building Management System (BMS). This unit shall be controlled by a factory-installed microprocessor programmable controller (DDC) that is connected to various optional sensors.
- B. Unit shall incorporate a DDC controller with integral LCD screen that provides text readouts of status. DDC controller shall have a built-in keypad to permit operator to access read-out screens without the use of ancillary equipment, devices or software. DDC controllers that require the use of equipment or software that is not factory-installed in the unit are not acceptable. Alarm readouts consisting of flashing light codes are not acceptable. Owner-specified ventilating conditions can be input by means of pushbuttons.
- C. Unit supply fan shall be configured for Constant Volume (ON/OFF).
- D. Unit exhaust fan shall be configured for
- E. Outside Air / Return Air damper control shall be
- F. Operating protocol: The DDC shall be factory-programmed for BACNetIP.
- G. Variable Frequency Drive (VFD): unit shall have factory installed variable frequency drive for modulation of the exhaust air blower assembly. The VFD shall be factory-programmed for unit-specific requirements and shall not require additional field programming to operate.
- H. Unit shall be provided with a space thermostat measuring temperature and relative humidity. Thermostat shall have an LCD display and push buttons allowing for setpoint adjustments.

## 2.7 FILTERS

- A. Unit shall have permanent 2 inch (50.8 mm) aluminum filters located in the outdoor air intake and shall be accessible from the exterior of the unit. MERV 8 disposable pleated filters shall be provided in the supply air stream. MERV 8 and MERV 13 disposable pleated filters shall be provided in the supply final air stream.

---

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
- B. Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
- C. Proceed with installation only after all unsatisfactory conditions have been corrected.



### **3.2 INSTALLATION**

- A. In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
- B. Piping installation requirements are specified in Division 22 (Plumbing). Drawings indicate general arrangement of piping, fittings and specialties.
- C. Duct installation and connection requirements are specified in Division 23 of this document.
- D. Electrical installation requirements are specified in Division 26 of this document.

### **3.3 CONNECTIONS**

- A. In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
- B. Piping installation requirements are specified in Division 22 (Plumbing). Drawings indicate general arrangement of piping, fittings and specialties.
- C. Duct installation and connection requirements are specified in Division 23 of this document.
- D. Electrical installation requirements are specified in Division 26 of this document.

### **3.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Service: Engage a factory authorized service representative to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to A / E in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM.

### **3.5 START-UP SERVICE**

- A. Engage a factory authorized service representative to perform startup service. Clean entire unit, comb coil fins as necessary, install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.

### **3.6 DEMONSTRATION AND TRAINING**

- A. Engage a factory authorized service representative to train owner's maintenance personnel to adjust, operate and maintain the entire unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.