GUAM POWER AUTHORITY
ATURIDÅT ILEKTRESEDÅT GUÅHAN
P.O.BOX 2977 • HAGÅTÑA, GUAM U.S.A. 96932-2977

October 04, 2022

AMENDMENT NO.: IV

TO

INVITATION FOR MULTI-STEP BID NO.: GPA-042-22

FOR

FADIAN PUBLIC PARKING LOT SOLAR CANOPY

Prospective Bidders are hereby notified of the following changes, inclusions and response to inquiries received from Bidder No. 8 dated August 22, 2022 and September 06, 2022, Bidder No. 5 dated August 23, 2022, Bidder No. 10 dated August 31, 2022 and Bidder No. 6 dated September 06, 2022:

INCLUSION:

Under Volume IV – Appendices *ADD*:

1. Pages 206a thru 206a.78 (Appendix R) (see attached)

2. Pages 206b thru 206b.11 (Appendix S) (see attached)

CHANGES:

1. Under Volume II – Technical and Functional Requirements:

   REMOVE Page 108 of 212 and *REPLACE with* Page 108a of 212, Under 2.1.3 Experience of the Proposed Project Team – A BIDDER's proposal shall be deemed unacceptable if the following are not met A. (see attached):

   Verbiage is changed:

   FROM:

   A. The proposed Project Design Team must include a Licensed Professional Engineer with a minimum of five (5) years of experience in design of commercial PV systems, and previous experience in design of commercial, canopy-mounted PV systems and associated facilities required for proper grid interconnection.

TO NOW READ:

A. The proposed Project Design Team must include a Licensed Professional Engineer with a minimum of five (5) years of experience in design of canopy-mounted or commercial PV systems and associated facilities required for proper grid interconnection.

2. Under Volume II – Technical and Functional Requirements:

REMOVE Page 108 of 212 and *REPLACE with* Page 108a of 212, Under 2.1.3 Experience of the Proposed Project Team – A BIDDER's proposal shall be deemed unacceptable if the following are not met B. (see attached):

Verbiage is changed:

FROM:

B. The proposed Project Team must include at least one member with a minimum of five (5) years of experience in construction of canopy-mounted PV systems and associated facilities required for proper grid interconnection.

TO NOW READ:

B. The proposed Project Team must include at least one member with a minimum of five (5) years of experience in construction of canopy-mounted or commercial PV systems and associated facilities required for proper grid interconnection.

3. Under Volume II – Technical and Functional Requirements:

REMOVE Page 115 of 212 and *REPLACE with* Page 115a of 212, Under 3.3.7 Procurement and Delivery of Parking Canopy, PV System, and Other Necessary Equipment I. (see attached):

Verbiage is changed:

FROM:

I. Typhoons and Extreme Weather:
Due to the high potential for periodic extreme winds and the parking canopy being a structure exposed to those winds, the canopy and PV racking system must be designed to withstand 170 mph (76 m/s) sustained winds, and 250 mph (112 m/s) gusts.

TO NOW READ:

I. Typhoons and Extreme Weather:
Due to the high potential for periodic extreme winds and the parking canopy being a structure exposed to those winds, the canopy and PV racking system must be designed to withstand 170 mph (76 m/s) sustained winds, and 195 mph (87 m/s) gusts.

Bidder No. 2 inquiry dated August 22, 2022:

QUESTION:

1. Page (12 of 212)

Bid Announcement and Cut-Off Date

Bid Announcement was on 8/9/2022 but PEC received GPA's solicitation in our participation on 8/16/2022. Would you allow at least 2 weeks extension of Cut-Off Date for Receipt of Questions and Proposals?

ANSWER:

Kindly refer to Amendment No. III; dated October 4, 2022.

QUESTION:

2. (Page 13 of 212)

The PV System shall include a five-year workmanship warranty and five-year cost-free maintenance service for checking PV Array condition, DC output, inverter efficiency, maintaining and tightening interconnections, costs for parts replacement, and replacement labor costs.

(Page 115 of 212)

J. Workmanship Warranty: All construction and installation work under this project proposal shall include one (1) year workmanship warranty.

Please confirm if followings are correct.

- Workmanship Warranty for construction and installation work excluding PV System is one (1) year

- Workmanship Warranty for PV System is five (5) year

ANSWER:

A workmanship and materials warranty of minimum five years for parking lot canopy structures (e.g. steel pillars, canopy columns, truss bars, canopy frame, canopy fittings, canopy anchors) is required. The PV System (to include cabling) shall have a minimum workmanship and materials warranty of five (5) years with five (5) years of cost-free maintenance service for checking PV Array condition, DC output, inverter efficiency, maintaining and tightening interconnections, costs for parts replacement, and replacement labor costs. A minimum of twenty (20) years product warranty is required for solar panels. Solar module linear performance warranty of minimum 80% rated output for rating for minimum twenty (2)) years is required. Inverters or micro-inverters shall have a product warranty of twenty (20) years. Racking and mounting equipment shall have a minimum twenty (20) years warranty on workmanship and material defects. All other materials, construction and installation work shall have a minimum warranty of one (1) year.

QUESTION:

3. (Page 13 of 212)

GPA has obtained, or will obtain prior to construction, the following requirements:

A. Bureau of Statistics and Plans Guam Coastal Management Program (GCMP): determined the project is consistent with federal plan
B. U.S. Fish & Wildlife Service (USFWS): completed Endangered Species Act (ESA) Section 7 consultation and Biological Opinion
C. Guam State Historic Preservation Office: National Historic Preservation Act (NHPA) Section 106 consultation before construction start date
D. US Army Corps of Engineers: review and approval of Record of Environmental Consideration and supporting documents
E. U.S. Department of Interior, Office of Insular Affairs: Authorization to Proceed (ATP)

What has been obtained and what will be obtained prior to construction? Would you share obtained information to bidders?

ANSWER:
These requirements have not yet been obtained by GPA, however they are expected to be received prior to the bid award.

QUESTION:
4. (Page 42 of 212)
(d) All construction work must comply with applicable GPA standards. The Contractor shall be responsible for obtaining all applicable GPA standards.
Please provide applicable GPA standards for this bid.

ANSWER:
Please refer to the following links:
https://guampowerauthority.com/gpa_authority/engineering/gpa_engineering_standards.php
https://guampowerauthority.com/home/home_checklist.php

Please be advised that it is the Bidder's responsibility to request additional standards if those needed are not found on GPA's website.

QUESTION:
5. (Page 45 of 212)
h) GPA shall be allowed two (2) weeks to review and approve submittals without affecting the Contract completion date. Delays in delivery due to submittals that are disapproved during this review period are the responsibility of the Contractor.
GPA may require over two (2) weeks review period. In this case, will GPA allow timeline extension and additional cost reimbursement to the Contractor?

ANSWER:
In the event that delays are encountered during the review and approval of submittals, GPA may consider allowing a timeline extension. Please note that bulk submittals may need more than two weeks of review period and will not be considered for extension.

QUESTION:
6. (Page 48 of 212)
2. Factory inspection is that inspection of the point of manufacture of the various products which are shipped to the jobsite, including but not limited to, such items as electrical equipment.

(Page 82 of 212)
b) Factory tests at the point of manufacture of various products which are shipped to the jobsite as a unit, including by not limited to, such items as electrical equipment, as required by the Engineer.
Is GPA requiring any FAT (Factory Acceptance Test) witness inspection by GPA? For this bid, PV modules are commercial product and Canopy structures are steel product. Thus, PEC assumes that FAT witnessing by GPA would not be required. If it is required, please specify what products GPA Engineer would like to have witnessed FAT.

ANSWER:
GPA does not anticipate any required FAT (Factory Acceptance Test) for this project.

QUESTION:

7. (Page 72 of 212)

The CONTRACTOR must agree to fully complete the basic work under the Contract Agreement within three hundred sixty-five (365) calendar days from the issuance of Notice to Proceed (NTP). The CONTRACTOR must also agree to pay to GPA the amount of two thousand dollars ($2,000.00) per calendar day, not as a penalty, but as reasonable liquidated damages for failing, neglecting or refusing the work within the time specified.

What's the cap for LD (Liquidated Damages)? Up to the contract amount? We're not sure how much is GPA budget for this bid, but LD per day looks large. If the Contract delays project 1 year for certain reason and GPA will not allow extension, then total LD would be 365 days x $2,000 = $730,000. Would you reduce LD/day considering your total budget?

ANSWER:

GPA stands firm on the $2,000.00 per calendar day, not as a penalty, but as reasonable liquidated damages for failing, neglecting or refusing the work within the time specified. However, justifiable extensions will be considered.

QUESTION:

8. (Page 75 of 212)

Work scheduled and performed by the CONTRACTOR on GPA's premises shall conform to published GPA working hours and shall account for GPA's observed holidays.

(Page 101 of 212)

Working hours shall be between 7:00 a.m. and 4:00 p.m. Monday through Friday.

(Page 101 of 212)

No work shall be carried out on site outside of the specified working hours or on Saturdays, Sundays, or legal holidays without the Engineer's written consent unless the work is unavoidable, absolutely necessary to save life or property, or necessary for the safety of the work, in which case the CONTRACTOR shall immediately advise the Engineer. Engineer shall not unreasonably withhold any such consent save in exceptional circumstances, nor do so if work outside of the specified working hours or on Saturdays, Sundays, or legal holidays in considered by CONTRACTOR to be necessary to meet the Contract Time. The services of the Inspector and Engineer will be charged to the CONTRACTOR.

To make up the construction progress, the Contractor may require working hours beyond specified working hours and may require GPA inspector and/or engineer's overtime. In this case, the Contractor shall be responsible for GPA overtime payment. What is the average rate for this overtime assuming one GPA personnel working 8 hours on holiday?

ANSWER:

The hourly rate for Engineers and Inspectors ranges between $25 per hour to $50 per hour. The employee's hourly rate shall remain the same on holidays, unless that employee works over 40 hours for that week. The employee's overtime rate at one and a half times the regular pay rate shall apply after 40 hours have been worked for that week.

QUESTION:

9. (Page 96 of 212)

a) Environmental protection Plan: Submit two (2) copies of the proposed Environmental Protection Plan (EPP) to the Guam Environmental Protection Agency (GEPA) and 2 copies to the Contracting Officer for review and approval no later than 10 calendar days after receipt of the Notice to Proceed (NTP) with work under this project. Review of the plan by the Contracting Officer and GEPA will be accomplished simultaneously.

The Contractor shall not undertake any clearing, grubbing, earthwork, and excavations until the EPP has been approved by the GEPA and the Contracting Officer.

No later than 10 days after NTP is too early for EPP submittal. GEPA will start reviewing EPP when the Contractor proceeds with permit process by submitting permit set of design drawings.

ANSWER:

At this time there are no changes to EPP submittal date. The proposed EPP must be submitted to GEPA and the Contracting Officer no later than 10 calendar days after receipt of the NTP.

QUESTION:

10. (Page 99 of 212)

The CONTRACTOR shall submit for the information of GPA, shop and setting drawings and schedules required by the specifications or that may be requested by GPA.

Shop and setting drawings and schedules are information purpose during the construction. Normally, those submittals do not require local licensed Professional Engineer's review and stamp. How about this bid? Local licensed Professional Engineer (DoR, Designer of Records)'s review is required for shop and setting drawings and schedules? And DoR's stamp is required as well?

ANSWER:

The Designer of Record is responsible for ensuring all shop and setting drawings and schedules from manufacturers are appropriate for this project and must therefore approve these submittals. While these documents need to be approved by the DOR, they do not need to bear the DOR stamp.

QUESTION:

11. (Page 106 of 212)

There is an existing paved road along Route 15 that is used to access the site by public patrons and GPA and GWA employees.

Is this road public or private? If this is public road, the Contractor will be required DPW highway division's clearance and/or permit for excavation works which may require additional insurance bond equal to the amount of excavation works to DPW.

ANSWER:

This road is privately owned by the Guam Power Authority. The property line begins right where the gate is when entering to the Gloria B. Nelson Public Service Building.

QUESTION:

12. (Page 106 of 212)

There are currently eight possible options for PV Canopy locations, however the Basic Bid price will be based on Option 1 only. Options 2 through 8 will be Additive Bid items. These location options are outlined below, highlighted over the map of the Gloria B. Nelson Public Service Building Parking Lot. GPA reserves the right to change the location to one of the other options prior to the design phase. The adjusted price will be based on the Additive Bid price for the respective location provided by the CONTRACTOR.

How many areas for Option1? 3 pink areas or 2 pink areas on top? Please provide sqf information for each Options and as-built design (pdf and CAD). And as-built electrical design is required to bidders for interconnection.

ANSWER:

For Option 1, there are two (2) single-row parking areas and one (1) double-row parking area. For dimensions to determine square footage information, please see Appendix P - Existing Site Layout Plan.

QUESTION:

13. (Page 108 of 212)

A. The proposed Project Design Team must include a Licensed Professional Engineer with a minimum of five (5) years of experience in design of commercial PV systems, and previous experience in design of commercial, canopy-mounted PV systems and associated facilities required for proper grid interconnection.

This requires the bidders to secure a licensed electrical PE as a member of the proposed project design team. Where is the jurisdiction of licensed? Guam or US? Why is this specifying canopy-mounted PV systems? This is a mandatory requirement which may restrict local experienced professional engineer's participation. Under GPA's renewable program, Guam has already secured experienced electrical PEs in utility-scale PV systems. Professionals who have worked on similar types of projects that are equal to or exceed the scope of the project assigned with the same responsibilities should be acceptable. Bidders are able to work with Guam licensed electrical PEs who have experiences in 60MW Solar project interconnecting 34.5kV GPA's grid system. This experience exceeds the scope of this bid.

ANSWER:

Kindly refer to ***CHANGES*** No. 1 above.

The Guam Department of Public Works construction permitting process requires all design plans, specifications and calculations to bear the stamp/seal and signature of a professional engineer licensed to practice on Guam. At a minimum, the Licensed Professional Engineer must have a P.E. license registered under Guam PEALS. Additional licenses from other accredited bodies in other countries, states or jurisdictions other than Guam will not be cause for disqualification.

QUESTION:

14. (Page 108 of 212)

B. The proposed Project Team must include at least one member with a minimum of five (5) years of experience in construction of canopy-mounted PV systems and associated facilities required for proper grid interconnection.

Same as Question #14. Why is this specifying canopy-mounted PV systems? This is a mandatory requirement which may restrict local experienced construction expert's participation. Utility-scale PV construction experience exceeds the scope of this bid as well.

ANSWER:
Kindly refer to ***CHANGES*** No. 2 above.

QUESTION:
15. (Page 109 of 212)
C. Foundation design: using manufacturer's standard design or modified design with expected impacts clearly delineated

J. Removal of spoils (assuming soils) due to foundation drilling

Please provide existing geotechnical and environmental reports for bidders' information. If not, The Contractor shall perform boring test for this bid.

ANSWER:
Kindly refer to the newly added Subsurface Soil Investigation Report in Appendix R.
See ***INCLUSION*** No. 1 above.

QUESTION:
16. (Page 110 of 212)
The CONTRACTOR shall maximize, to the greatest extent practicable, the use of goods, products and materials produced in the United States, consistent with the grant funding requirements regarding Executive Order 13788 (Buy American and Hire American) and Executive order 13858 (Strengthening Buy-American Preferences for Infrastructure Project).

"to the greatest extent practicable" looks vague. When we review EO 13788 and EO 13858, bidders shall purchase Canopy structure and PV modules from US. For government procurement purposes, Buy American Act requires that a product be manufactured in the U.S. of more than 50 percent U.S. parts to be considered Made in USA. If a bidder submits less than 50 percent U.S. parts, then the bidder will be unacceptable in technical evaluation? Please provide specific grant funding requirement and/or acceptable minimum percentage of U.S. parts use requirement?

EO 13788 Section 1. Definitions: (b) Produced in the United States'' means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

EO 13788 Section 3. Immediate Enforcement and Assessment of Domestic Preferences According to Buy American Laws: (iii) develop and propose policies for their agencies to ensure that, to the extent permitted by law, Federal financial assistance awards and Federal procurements maximize the use of materials produced in the United States, including manufactured products; components of manufactured products; and materials such as steel, iron, aluminum, and cement.

EO 13788 Section 4. Judicious Use of Waivers: (c) To the extent permitted by law, before granting a public interest waiver, the relevant agency shall take appropriate account of whether a significant portion of the cost advantage of a foreign-sourced product is the result of the use of dumped steel, iron, or manufactured goods or the use of injuriously subsidized steel, iron, or manufactured goods, and it shall integrate any findings into its waiver determination as appropriate

EO 13858 Section 2. Definitions: f) ''Domestic Preference'' means a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United

States, including iron and aluminum as well as steel, cement, and other manufactured product.

ANSWER:

Exceptions and Considerations for Buy American Act requirements shall be reviewed for acceptance by the Department of Interior (DOI). There is no guarantee that products with less than 50% U.S. parts will be allowable under the federal grant. Vendor shall bear responsibility to ensure that goods, products and materials to be provided under this project follow the requirements under the Buy American Act.

QUESTION:

17. (Page 112 of 212)

The CONTRACTOR shall develop a site-specific foundation design to be submitted to the manufacturer for review. Foundation designs must be accompanied with the stamp of a registered Professional Engineer (PE).

Please confirm this requires registered PE in Guam. And also, what kinds of other designs require local licensed PE's stamp? When the Contractor submits building permit set to DPW, local licensed PE (Civil, Structural, and Electrical)'s stamp is required. So, is DPW building permit set the only one that GPA requires local licensed PE's stamp?

ANSWER:

Yes. The foundation design requires the stamp of a registered PE in Guam. PE stamp is also required for, but not limited to, design drawings for all construction and installations, as-built drawings, and specifications.

QUESTION:

18. (Page 114 of 212)

Canopy aggregate footprint shall be no larger than 8,900 square feet.

Please confirm 8,900 square feet is a restriction for Option1 only to provide 68kW PV system.

ANSWER:

Yes. 8,900 square feet is a restriction for Option 1 for a minimum 68 kW PV system. The other options may exceed 8,900 square feet but shall not exceed the footprint shown for each option.

QUESTION:

19. (Page 115 of 212)

E. Canopy Structure Height: The PV canopies shall have the proper height clearances for parking lot traffic, including garbage trucks and freight trucks.

Please specify minimum height requirement. If GPA excludes garbage trucks and freight trucks for parking, then less height requirement will reduce structural cost burden to GPA.

ANSWER:

Garbage trucks and freight trucks heights need not be considered for parking under the canopies, however height clearances for these vehicles must be considered for traffic around the parking lot, especially for canopy eave clearances.

QUESTION:

20. (Page 115 of 212)

I. Typhoons and Extreme Weather:

Due to the high potential for periodic extreme winds and the parking canopy being a structure

exposed to those winds, the canopy and PV racking system must be designed to withstand 170 mph (76 m/s) sustained winds, and 250 mph (112 m/s) gusts.

Current building and NESC code requirements are 170 mph wind load in Guam. Is there any specific reason for GPA requesting 250 mph (112 m/s) gusts? Normally, 170 mph sustained winds have 3 seconds gusts reaching 195-200 mph. Thus, 250 mph gusts will require roughly $(250mph/195\ mph)^2 = 1.65$ times load than 170 mph sustained winds. It is a big challenge to all bidders and will be a big cost burden to GPA. We have been reaching out U.S. manufacturers withstanding 170 mph design loading, but no one can provide product withstanding 250 mph gusts. The other bidders may propose site specific structural design; however, the weakest part is PV system rather than canopy structure. We don't see commercial PV system withstanding against 250 mph gusts. Typical number of bolting per PV module is four (4). To withstand 250 mph gusts, eight (8) bolting may be required. As it is in compliance with current code, 170 mph sustained winds requirement would be acceptable.

ANSWER:

Kindly refer to ***CHANGES*** No. 3 above.
The 250 mph gust requirement was determined by taking into consideration a pending Guam Building Code update. Guam's current building code follows International Building Code 2009. The wind load requirement also considered the recommendation by DPW to set a higher requirement. However, since the 2021 International Building code requires a basic design wind speed of 195 mph 3-second wind gusts, GPA will reduce the requirement to match this.

QUESTION:

21. (Page 116 of 212)

K. Load test of the foundation

What types of load test of the foundation are required?

ANSWER:

Kindly refer to the newly added Subsurface Soil Investigation Report in Appendix R. Contractor will determine the load tests needed based on design to ensure structural integrity of the canopy. See ***INCLUSION*** above No. 1.

Bidder No. 5 Inquiries dated August 23, 2022:

QUESTION:

1. Reference to Volume I Commercial Terms and Conditions

a. Reference to Section 4.8.4(g) Subcontracts

i. Do all proposed subcontracts require GPA's approval or are there threshold amounts of subcontract value that do not require GPA's approval?

ii. Solenergy Micronesia intends to subcontract certain professional services and local labor/installation. Does this require GPA prior approval?

b. Reference to Section 4.9.9(a) Guarantee of Work and Section 4.24 Warranty

i. This section appears to require that the Contractor provide a one (1) year guarantee on materials, equipment and workmanship, however Section 1.2 Project Overview and Scope indicates that PV System shall include a five (5) year warranty and Volume II Technical and Functional Requirements Section 3.3.12 states that Contractor is to provide a five (5) year guarantee on the parking lot canopy structures. Could GPA please clarify the various warranty requirements?

ANSWER:
i. Yes, all subcontracts require GPA's review and approval, regardless of subcontract value.

ii. Yes, all subcontracts require GPA's prior review and approval.

b. A workmanship and materials warranty of minimum five years for parking lot canopy structures (e.g. steel pillars, canopy columns, truss bars, canopy frame, canopy fittings, canopy anchors) is required. The PV System (to include cabling) shall have a minimum workmanship and materials warranty of five (5) years with five (5) years of cost-free maintenance service for checking PV Array condition, DC output, inverter efficiency, maintaining and tightening interconnections, costs for parts replacement, and replacement labor costs. A minimum of twenty (20) years product warranty is required for solar panels. Solar module linear performance warranty of minimum 80% rated output for rating for minimum twenty (2)) years is required. Inverters or micro-inverters shall have a product warranty of twenty (20) years. Racking and mounting equipment shall have a minimum twenty (20) years warranty on workmanship and material defects. All other materials, construction and installation work shall have a minimum warranty of one (1) year.

QUESTION:
2. Reference to Volume II Technical and Functional Requirements
a. Reference to Section 2.1.3 Experience of the Proposed Project Team

i. For proposal submission purposes, does the Contractor's Licensed Professional Engineer need to employed full-time by the Contractor?

ii. Or can the Licensed Professional Engineer's services be contracted?

iii. Can the Licensed Professional Engineer be licensed by an accredited body in another country, state or jurisdiction than Guam?

iv. Can the requirement for one (1) Project Team Member having a minimum of five (5) years of experience in the construction of canopy-mounted PV systems and associated facilities be waived?

v. We understand that the roof is composed of a thin topping slab over steel decking. Requesting information of the roof assembly detail/diagram to devise an appropriate roof attachment system.

b. Reference to Section 2.1.5. References i. Can the bidder's three (3) references or recommendations from client's be from another country, state or jurisdictions than Guam?

c. Reference to Section 3.3.3 Construction Site Survey i. Has GPA conducted a geotechnical/soils test analysis of the public parking lot prior to construction for the parking lot and GPA/GWA facility?

ii. If so, can GPA share this soils test analysis with registered bidders to aid in the foundation design?

iii. Is the contemplated Agreement intended to be based on AK's template, the Proposer's template, or to be agreed between AK and the Proposer?

ANSWER:
i. No, the Contractor's Licensed Professional Engineer is not required to be employed full-time by the Contractor. The Contractor's Professional Engineer shall however be registered with the Guam Board of Registration for Professional Engineers, Architects, and Land Surveyors (Guam PEALS).

ii. Yes, CONTRACTOR may subcontract a Licensed Professional Engineer for their services. GPA would like to remind bidders that the main CONTRACTOR shall be responsible for the coordination of the subcontractors engaged in his work.

iii. The Guam Department of Public Works construction permitting process requires all design plans, specifications and calculations to bear the stamp/seal and signature of a professional engineer licensed to practice on Guam. At a minimum, the Licensed Professional Engineer must have a P.E. license registered under Guam PEALS. Additional licenses from other accredited bodies in other countries, states or jurisdictions other than Guam will not be cause for disqualification.

iv. Kindly refer to ***CHANGES*** No. 2 above.

v. This bid does not involve the installation of solar panels on rooftops, therefore a detail diagram of the roof cannot be provided. This bid involves the design and construction of a parking lot canopy structure with solar PV mounted atop the structure.

b. Yes, references or recommendations may be from outside Guam.

c. Kindly see ***INCLUSION*** No. 1 above.
Yes, please refer to the newly added Subsurface Soil Investigation Report in Appendix R.

ii. Kindly see ***INCLUSION*** No. 1 above.
Yes, please refer to the newly added Subsurface Soil Investigation Report in Appendix R.

iii. Please clarify the reference to "AK" and confirm if this question applies to this GPA tender.

Bidder No. 10 inquiries dated 08/31/2022:

QUESTION:

1. Are we able to get the blueprints/drawings/electrical for the area?

ANSWER:

Kindly refer to ***INCLUSION*** No. 2 above.
Upon award, the original version may be disclosed to the awarded contractor upon signing of a non-disclosure agreement.

QUESTION:

2. Also, on the bid it mentions to provide a technical proposal for the bid? Does this mean that we need just the proposed architectural plans to be submitted along with the bid and approved by a licensed architecture/drawer design?

ANSWER:

Kindly reference Appendix A, A2: Technical Proposal Submittal Checklist. This checklist outlines the required contents of your Technical Proposal.

QUESTION:

3. Is there a scheduled meeting yet for the site visit?

ANSWER:

Kindly refer to Amendment No. II.

QUESTION:

4. Is there a amount of KW we need to meet for this solar canopy project?

ANSWER:

The rated capacity of the PV system shall be at minimum 68 KWdc. Please refer to Volume II Technical and Functional Requirements, Section 3.3.7 Procurement and Delivery of Parking Canopy, PV System, and Other Necessary Equipment.

QUESTION:

5. Do we need to obtain building permits for the bid?

ANSWER:

Yes, please refer to Volume I Commercial Terms and Conditions, Section 4.8.10.

Bidder No. 6 inquiry dated September 06, 2022:

QUESTION:

1. What is the interconnection voltage?

ANSWER:

Contractor may interconnect at the Gloria B. Nelson Public Service Building Main Distribution Panel. This panel is 480/277V, 3 Phase, 4 Wire, 65 KAIC minimum, Surfaced Mount; Total Connected Load on Phase A is 538,046 VA, Phase B is 525,872 VA, and Phase C is 519,835 VA. This panel has room for approximately 18 more breakers.

QUESTION:

2. What is the interconnection point to grid voltage?

ANSWER:

Contractor may interconnect at the Gloria B. Nelson Public Service Building Main Distribution Panel, which is 480/277V. The voltage after the panel will depend on the contractor's design. Please note that the design must meet all requirements under the scope of work.

QUESTION:

3. The multi-step bid is funded through a grant from the US Department of Interior. Was the funding only for Option 1 or was it for all other options as well? If only for Option 1, is it the intent of Guam Power Authority to self-capitalize the remaining options?

ANSWER:

The funding is originally for Option 1, but GPA may find external funding to fund other options or modify grant the project location for other Option locations.

QUESTION:

4. Can you confirm if AIA 702-703 doc schedule of values platform is acceptable?

ANSWER:

Yes, AIA G-702 and G-703 Application and Certification for Payment SoV form is acceptable. Please note that accompanying supporting documents would be required for payment (e.g. Monthly Progress Reports, Certification of Percent Completion, etc.)

QUESTION:

5. Is the award solely based on lowest price or does a contractor’s experience with solar on Guam and the Marianas, but more importantly, a contractor’s experience with designing, installing and constructing PV canopy structures on Guam and the Marianas have weight on the decision?

ANSWER:

Yes, experience in design, installation, and construction bears weight during Step 1 of the Multi-Step Bid, Evaluation of Technical Proposals. Please see Appendix M Qualitative Proposal Scoring Worksheet for score weight of Experience of Proposed Team. Price Proposals will not be opened until we move to Step 2, when vendors are deemed qualified from Step 1.

QUESTION:

6. Is more weight given to a contractor providing the most value to their proposal?

ANSWER:

Please see Appendix N Bid Schedule to see how proposal value or bid cost is determined.

QUESTION:

7. Is more weight given to a contractor that provides warranties greater than the minimum requirement mentioned in the scope?

ANSWER:

Vendors providing warranties greater than the minimum requirement may be given higher scores by evaluator compared to bid providing only the minimum requirement. This score however will only count towards Step 1, Qualification of Bidders through evaluation of Technical Proposals.

QUESTION:

8. Can you confirm that 100% of this project if Buy America Act (BAA) compliant to include the steel columns and beams for the PV canopy?

ANSWER:

Buy America Act shall apply to every contract, subcontract, purchase order, or change order that is chargeable against this project.

QUESTION:

9. An excerpt in the scope reads, *"The CONTRACTOR shall maximize, to the greatest extent practicable, the use of goods, products and materials produced in the United States, consistent with the grant funding requirements regarding Executive Order 13788 (Buy American and Hire American) and Executive order 13858 (Strengthening Buy-American Preferences for Infrastructure Project)".* Is more weight given to a contractor that provides ALL equipment and material produced in America, i.e., all major material (solar modules, inverters and mounting system), steel columns/beams and Balance of System material (conduit, disconnect switches, wiring, nuts & bolts, etc.)?

ANSWER:

The bidder's score in Step 1 of the Multi-Step Bid, Evaluation of Technical Proposals will be based solely on the Qualitative Proposal Scoring Worksheet in Appendix M.

QUESTION:

10. Page 115 letter I reads in part, "PV racking system must be designed to withstand 170mph sustained winds…". Will there be more weight given to a contractor that exceeds this wind speed requirement?

ANSWER:

Vendor providing wind loading greater than the minimum requirement may be given higher scores by evaluator compared to bid providing only the minimum requirement. This score however will only count towards Step 1, Qualification of Bidders through evaluation of Technical Proposals.

QUESTION:

11. Have geo-technical reports been completed for the locations selected for the PV canopies?

ANSWER:

Kindly see ***INCLUSION*** No. 1 above.
Please refer to the newly added Subsurface Soil Investigation Report in Appendix R.

QUESTION:

12. Is SHPO to be included in this proposal for excavating purposes or have PV canopy locations been cleared by SHPO?

ANSWER:

Though this location has been previously cleared by SHPO for construction of the Gloria B. Nelson Public Service Building, this Project shall undergo Section 106 Consultation due to added scope and the needed formality for SHPO to declare no negative impacts to Historic Properties. Since the canopy locations are on previously disturbed ground and is within an existing Parking Lot, there are no indications that SHPO will declare any impact to Historic Properties. This however, does not exempt the project from having to go through the Section 106 Process.

QUESTION:

13. Are all PV canopy locations existing soil or is it fill dirt?

ANSWER:

PV canopy locations are on fill dirt underneath the pavement. Please note that underneath the existing parking lot is a drain rock layer. Also worth noting are some drain pipes connected to the ponding basin which shall not be obstructed by new construction.

Bidder No. 8 inquiry dated September 06, 2022:

QUESTION:

1. PEC Question #1
2.1.6. Exceptions to the Bid Documents

The BIDDER shall indicate any exceptions to the bid requirements in this section. A BIDDER's proposal shall be disqualified if the GPA Evaluation Committee finds any exceptions to the bid requirements unacceptable.

According to our review, GPA will not allow any exceptions to the following bid requirements unless they are amended during the bid. Is there any other bid requirement which does not allow exceptions other than followings?

(Page 108 of 212)
A BIDDER's proposal shall be deemed unacceptable if the PV System requirements specified in Section 3.3.7 are not met.

(Page 108 of 212)
A BIDDER's proposal shall be deemed unacceptable if the following are not met:
A. The proposed Project Design Team must include a Licensed Professional Engineer with a minimum of five (5) years of experience in design of commercial PV systems, and previous experience in design of commercial, canopy-mounted PV systems and associated facilities required for proper grid interconnection.

B. The proposed Project Team must include at least one member with a minimum of five (5) years of experience in construction of canopy-mounted PV systems and associated facilities required for proper grid interconnection.
C. The Local Project Manager must have a minimum of three (3) years of construction management experience.

ANSWER:

Any exception to the bid requirements identified anywhere in the bid documents must be identified in the bidder's proposal.

All other Terms and Conditions in the bid package shall remain unchanged and in full force.

for JOHN M. BENAVENTE, P.E.
General Manager

2.1.2. Project Approach

The BIDDER shall provide all of the following:

A. Detailed description of the work plan to perform, meet, and achieve the objectives of this solicitation.
B. Detailed description of the planned scope of work for each Basic Bid and Additive Bid Item.
C. Specification documents from the manufacturer of the materials and devices included in the proposed canopy and PV System.
D. Brief description of information or coordination to be requested from GPA for the duration of the project.
E. A table specifying compliance for each required item in Section 3.3.7.

A BIDDER's proposal shall be deemed unacceptable if the PV System requirements specified in Section 3.3.7 are not met.

* **2.1.3. Experience of the Proposed Project Team**

The BIDDER shall provide all of the following:

A. Supporting information describing the past and current successful experience of the Project Team members with similar projects within the past five years. Describe the Project Team members' roles in past projects.
B. Supporting information demonstrating knowledge and experience in complying with U.S. federal and local standards pertaining to the requested scope of work.
C. Organizational chart of the Project Team with descriptions of the respective roles and duties of each team member.
D. Copies of Certifications of the Project Team.
E. Copy of current Certificate of Authorization (COA) issued by the Guam Board of Registration for Professional Engineers, Architects and Land Surveyors. As required in 10.E(1) of the PEALS Rules and Regulations, "Any corporation, partnership, joint venture or any other association of two (2) or more firms, whether organized under the laws of Guam or any other jurisdiction, may not offer to engage in the practice of engineering, architecture, land surveying or construction management services involving the practices thereof in Guam until such corporation, partnership, joint venture or association has obtained a certificate of authorization issued by the Board."

A BIDDER's proposal shall be deemed unacceptable if the following are not met:

* **A. The proposed Project Design Team must include a Licensed Professional Engineer with a minimum of five (5) years of experience in design of canopy-mounted or commercial PV systems and associated facilities required for proper grid interconnection.**

* **B. The proposed Project Team must include at least one member with a minimum of five (5) years of experience in construction of canopy-mounted or commercial PV systems and associated facilities required for proper grid interconnection.**

C. The Local Project Manager must have a minimum of three (3) years of construction management experience.

The CONTRACTOR shall submit to GPA the approved final design drawings in the following formats: hard copy of appropriate size, AutoCAD and PDF before construction commences.

3.3.7. Procurement and Delivery of Parking Canopy, PV System, and Other Necessary Equipment

* The CONTRACTOR shall be responsible for the procurement and delivery of all PV system, PV mounting equipment, parking canopy structure materials and other necessary equipment to construct and install this project in a turn-key manner.

The solar canopy shall comply with the following general specifications:

A. System Size:
The rated capacity of the PV system shall be at minimum 68 KWdc.

B. PV Module Tier 1:
PV Modules shall be Tier 1 PV modules

C. High Availability
The design shall consider systems with maintenance (routing preventative maintenance, inspections, tests, & adjustments) schedules that minimize interruption to normal system operations to allow for system high availability

D. Guarantee of Minimum Generation:
PV modules shall have at least a 10-year limited warranty that modules will generate no less than 90% and 20-year limited warranty that modules will generate no less than 80% of rated output under Standard Testing Conditions (STC).

E. Canopy Structure Height:
The PV canopies shall have the proper height clearances for parking lot traffic, including garbage trucks and freight trucks.

F. PV Source Circuit OCPDs:
All Overcurrent Protection Devices in the PV system shall have a minimum overcurrent size that is no less than 125% of the maximum PV circuit current

G. Footprint:
The solar canopy structure shall be erected within the public-access parking lot of the Gloria B. Nelson Public Service Building, and all associated facilities and equipment shall be placed entirely within GPA's property.

H. Marine, Anti-Corrosion Coating on all Metal Parts on Canopy Structure:
Any metal parts, if any, on the canopy structure must have effective protection of anti-corrosion coating suitable for wet, salty, sunny, corrosive, or abrasive environments or conditions.

* I. **Typhoons and Extreme Weather:**
Due to the high potential for periodic extreme winds and the parking canopy being a structure exposed to those winds, the canopy and PV racking system must be designed to withstand 170 mph (76 m/s) sustained winds, and 195 mph (87 m/s) gusts.

J. Workmanship Warranty:
All construction and installation work under this project proposal shall include one (1) year workmanship warranty.

K. Remote Output Monitoring:
The PV system shall include meters and other auxiliary devices to allow for the monitoring of PV system output. Also included are the necessary licenses for any software application

APPENDIX R SITE SUBSURFACE SOIL INVESTIGATION REPORT

REPORT

SUBSURFACE SOIL INVESTIGATION
GPA-GWA MULTI-PURPOSE FACILITY
FADIAN, MANGILAO, GUAM

Prepared for

RIM Architects
316 Hernan Cortez Ave., Suite 300
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Prepared by

Geo-Engineering & Testing, Inc.
136 Tun Felix Camacho Street
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20 August 2012

436.14

INTRODUCTION

This report presents the results of the subsurface soil investigation we performed for the GPA-GWA Multi-Purpose Facility, planned for construction on Route 15, Fadian, Mangilao, Guam.

We understand that the planned development will consist of a 3-story, large reinforced concrete building having 116,551 square feet of floor area, with split finished floor elevations of 265 feet (Mean Lower Low Water Datum) at approximately the west side and 279 feet at approximately the east side of the planned building. Site improvements will require up to approximately 12 feet thick of cuts and approximately 5 feet thick of fills at the main building location. Support facilities will include extensive paved parking lots, a small sewage pump station, and approximately 2,800 linear feet of force main sewer pipeline along Route 15. Route 15 will be widened in front of the project site. A storm-water disposal system will be constructed at the eastern edge of the property where the existing surface elevations are much lower at approximately 200 feet to 250 feet.

The project site is presently heavily vegetated and terrains are very rugged, with large coralline limestone rock outcrops.

The purpose of our investigation was to explore the subsurface conditions at the project site, perform appropriate laboratory testing and engineering analyses and evaluation to provide discussion, conclusions, and recommendations concerning the site grading earthwork, supports for structural

foundations, trenching and backfilling for the sewer and water pipelines, and asphalt concrete pavements generally as follows:

1. General geological and subsurface conditions at the project site (based on the geological reconnaissance and field investigation at the project site).

2. Site preparation and grading earthwork, including cuts and fills, slopes, soil material requirements, placement and compaction procedure, and subgrade improvements, as appropriate.

3. Foundation support methods for the new building, and the pump station.

4. Settlement estimates for the structural foundations.

5. Subgrade preparations for concrete on-grade floor slabs and asphalt pavements.

6. Lateral earth pressures for retaining wall design.

7. Flexible asphalt pavement section thicknesses, including pavement design for the Route 15 widening based on Federal Highways Administration standards.

8. Percolation rates for storm-water disposal design.

9. Pipeline trenching and backfilling procedure and backfill soil requirements.

10. Any unusual subsurface conditions that might be found during our field exploration, including hard rock, possible underground cavities, soft soil pockets.

REGIONAL GEOLOGY

Guam is the southernmost and largest island of the Mariana Islands chain, which form an arcuate belt in the Western Pacific. The islands occur along a ridge, which rises well above the deep ocean floor and generally divides the

Philippine Sea from the Pacific Ocean. About 70 miles southeast of Guam is the deep Mariana Trench. The trench has been formed approximately along the submerged surface trace of a westward dipping discontinuity in the oceanic crust, referred to as a subduction zone. The rocks constituting the crust of the Pacific Basin are being thrust under the Mariana Ridge and in the process; the ridge is being thrust upwards. Ridge formation has also been contributed to by submarine volcanism starting in Eocene geologic time (about 50 million years ago). Volcanism continued only through the Miocene geologic epoch on Guam but continues to the present in the Northern Mariana Islands.

Geological formations of Guam are both of volcanic and organic origins consisting predominantly of volcanic sediments and coralline limestone. Coralline limestone formations range in age from Miocene up through the present and are principally Pliocene and Pleistocene in age represented by the Mariana limestone. Essentially, the limestone has been deposited upon the crest and upper flanks of the underlying volcanic ridge. Compared to the several thousand feet of underlying volcanic rocks, the upper coralline limestone represents a relatively thin capping layer over the volcanic basement rocks.

Faulting and tilting of the rocks comprising the island system has occurred concurrently with volcanism and limestone deposition. All of the faults mapped on Guam are relatively high angle normal faults and most have produced relatively small displacements of the rocks over short distances. Somewhat greater displacements on the order of few hundred feet have occurred on the northwest striking Pago Bay - Adelup Point or simply Adelup Fault, which

approximately divides the northeast limestone plateau from the principally volcanic southwest portion of the island. In general, most faults occur in the volcanic and do not penetrate upwards and displace the overlying limestone. Some faults do, however, occur in the limestone plateau and displace the Pleistocene Mariana limestone. The Adelup Fault has displaced the Mariana limestone formation against Alutom volcanic formation, thus indicating that the fault has been active at least up until mid-Pleistocene time. The Adelup Fault lies in the Ordot - Asan village area, which is at the central part of the island of Guam.

Late Pleistocene displacements are inferred on the basis of apparent small uplifts of the island as indicated by raised reefs in the range of a few feet above present sea level. Tracy and others (1964) indicate that "In some places on jointed headlands the six-foot dip is slightly displaced and in a few places minor faults with displacement of 5 to 10 feet cut the reef margin; however, no significant movements of the island of Guam appear to have taken place since the late Pleistocene". Thus, from a seismic or earthquake risk standpoint, the island of Guam is in an active seismic belt but significant earthquakes are from movements in the deep under-thrust. One or more of the faults, such as the Adelup, visible on the island may have been active within Holocene time (last 11,000 years) but the amount of displacement would appear to have been small. So far as is known, none of the relatively shallow faults of the island of Guam has produced a significant magnitude earthquake and the probability of surface displacement due to these faults in the near future would appear to be small.

However, significant earthquakes have been generated from epicenters deep in the Pacific Ocean.

Only one distinct major geologic rock unit of Guam is exposed within or directly underlying the project site. It is the Mariana limestone formation (Tracey et al). The Mariana limestone formation includes about 80 percent of the exposed reef-associated limestone of Guam. It forms most of the north plateau of the island.

Specifically, the coralline limestone underlying the project site is the detrital facies of the Mariana limestone formation. The detrital limestone is generally friable to well cemented, coarse to fine-grained, porous at times, and occasionally with small voids and/or small cavities.

SITE GEOLOGY

In accordance with geological published information, the site is underlain by the reef facies member of the Mariana limestone formation.

The reef facies limestone is characterized by generally compact, porous, and cavernous white limestone of reef origin, especially along cliff faces, made up mostly of corals in position of growth in matrix of encrusting calcareous algae.

The reef facies is characterized by its highly nonconforming, irregular shape, highly porous with numerous fissures, voids, and cavities. However, the reef limestone is generally hard to very hard, with irregular, jagged and sharp edges. The thickness of the reef limestone could be limited to the upper crust,

approximately in the upper 15 to 30 feet, where exposures to severe coastal environment eroded any weak elements, leaving the reef limestone in its highly irregular and hard features.

SEISMICITY

Tracy and others (1964) have compiled a list of significant earthquakes on Guam extending back to April 1825. Between 1825 and 1936, there were 19 strongly felt or damaging earthquakes on Guam with Modified Mercalli intensities estimated in the range of VI to IX. The largest in the more immediate vicinity occurred on September 22, 1902 with an intensity IX on Guam. Richter (1958) reports the magnitude as 8.1 and the epicenter at latitude 18 North, longitude 146 East or about in the vicinity of Pagan Island north of Guam. It is reported to have caused many landslides in the mountainous areas of Guam. Another significant earthquake occurred on January 25, 1849 and also produced intensities up to IX. Gutenberg and Richter (1954) report magnitudes for earthquakes between 1904 and 1950. Four of these are significant, occurring in 1912, 1932 and October and November 1936. Magnitudes were in the range of 6 to 7 and focal depths were in the range of 106 miles. In October of 1936, a severe earthquake with Richter Magnitude of 7.75 occurred at about 78 miles southwest of Guam with no severe damage reported.

The more recent earthquakes of large magnitudes are in the range of 6 to 7 Richter scale and the depths are reported as approximately 71 miles. They

were centered from several to tens of miles from the island of Guam. All of the significant earthquakes for which focal depth estimates are available indicate that the active zone is the under-thrust, which is believed to dip eastward at about 45 degrees beneath the island.

In the more recent time from1975 to 1983, three significant earthquakes of Richter Magnitude of 5.2 to 7.1 were recorded with epicenters located at about 12.5 to 25 miles north of Guam. There were several buildings which suffered damages but all of which were repairable.

In August 8, 1993, a major earthquake of 8.1 Richter Magnitude with epicenter located at about 37.5 miles south of the island of Guam caused near-panic on Guam during day time but no reported direct loss of lives. There were two 8- to 9-story buildings that suffered severe damages but primarily due to poor construction and insufficient reinforcement. During this earthquake, Sierra Wharf at the main Naval Base at southern tip of the island of Guam suffered deck collapse that was believed to be caused by underlying soil liquefaction. The wharf is believed to be underlain with man-made fill placed over mostly relatively poor or loose to medium dense silty sandy soils with coral fragments to significant depths. A few other naval wharves in the same general vicinity suffered only minor damages. Minor liquefaction also occurred on a small, unpaved road in the city of Hagatna not far from the sea, with high ground water and silty fine sand subsurface soils that are susceptible to liquefaction.

The nearest known fault was the Tamuning Fault that would have passed approximately 0.65 miles south of the site which is considered inactive. It is

believed that the last active fault in Guam was the Asan-Adelup fault near the Asan and Piti villages, and the last activity of this fault was hundreds of years ago. In general, seismic hazards in Guam are pretty much the same for the entire island.

It is generally believed that earthquake hazards on Guam are pretty much the same just about everywhere for the fact that active earthquake epicenters had been deep in the Pacific Ocean which is very far from Guam (such as the 1993 earthquake was 37.5 miles away from Guam). Thus, comparatively, Guam is relatively very small in relation to the seismic travel distance and is subjected to just about the same earthquake effects throughout the island. However, localized conditions are different such as the northern half of Guam is underlain with coralline limestone formations and the southern half of Guam being underlain with volcanic formations.

SURFACE AND SUBSURFACE EXPLORATIONS

We performed a general geologic reconnaissance of the project site to evaluate the existing surface conditions including rock outcrops, existing cut slopes, and general geologic features.

The subsurface exploration program consisted of performing the following tasks:

1) A total of 8 test borings were drilled down to approximately 22 to 27 feet below the existing ground surface. Six of the test borings were located within the foot-print of the main building. The

remaining two test borings were drilled at the planned access road along Route 15.

2) Twenty test pits were excavated at the project site: One test pit each at the main building, the fuel tank location, and the cooling tower, 13 test pits were for the parking areas, and 4 test pits were for the access road. The depth of the test pits ranged from approximately 2 feet to 8 feet below the existing ground surface. The shallower test pits were terminated at shallower depths due to hard rock excavations. We also obtained 4 bulk samples.

3) Four percolation tests were performed at the planned storm-water runoff disposal locations.

The test borings were drilled utilizing rotary wash drilling rig equipped with 4-inch diameter drill bit that is capable of obtaining both undisturbed subsurface soil samples and rock coring utilizing a 3-inch diameter Nx rock core barrel. The test pits including percolation test pits were excavated utilizing a tractor backhoe. The approximate locations of the test borings, test pits, and percolation tests are shown on Plate 1 of this report.

The table below summarizes the boreholes (BH) drilled, test pits (TP) and percolation test pits (PT) excavated their locations, depths, and coordinates:

Test No	Depth (feet)	Structure	Coordinates	
			North	East
BH-1	27	Admin Building	194153.3289	107769.6214
BH-2	22	Admin Building	194100.58	107766.4558
BH-3	27	Admin Building	194165.5236	107724.8952
BH-4	27	Admin Building	194131.9116	107711.6995
BH-5	27	Admin Building	194098.4645	107726.2647
BH-6	27	Admin Building	194120.197	107684.7375
R-1	27	Access Road	194247.342	107591.2683

R-2	27	Access Road	194011.6339	107714.7179
TP-1	2.5	Admin Building	194126.7041	107758.6898
TP-2	3.0	Cooling Tower	194145.1503	107777.9736
TP-3	8.0	Fuel Tank	194093.6600	107807.5686
TP-4	1.5	Parking Area	194182.7602	107739.6042
TP-5	4.5	Parking Area	194215.6653	107702.0542
TP-6	6.0	Parking Area	194182.9520	107695.6188
TP-7	2.0	Parking Area	194190.8729	107660.0890
TP-8	7.0	Parking Area	-	-
TP-9	6.0	Parking Area	194154.1434	107655.8393
TP-10	4.0	Parking Area	194075.3077	107766.4369
TP-11	2.5	Parking Area	194036.2354	107766.5882
TP-12	4.5	Parking Area	194064.9585	107749.4692
TP-13	4.0	Parking Area	194081.8811	107713.9032
TP-14	3.5	Parking Area	194038.0030	107740.8892
TP-15	4.0	Parking Area	194048.2633	107716.0236
TP-16	3.0	Parking Area	194007.3237	107737.9788
TP-17	4.0	Access Road	193947.2276	107743.3388
TP-18	4.0	Access Road	194080.3049	107679.5147
TP-19	6.0	Access Road	194173.6030	107632.9127
TP-20	4.5	Access Road	194329.1265	107553.3854
PT-1	4.0	Dry Pond-1	194343.9091	107703.4519
PT-2	3.0	Dry ond-2	194310.2238	107711.4186
PT-3	5.0	Dry Pnd-3	194266.9589	107724.1862
PT-4	4.5	Dry Pond-4	194257.2638	107744.5839

During the subsurface exploration, our technical staff was at the site full-time, directing the exploration, and logging the subsurface materials that were encountered in the test bored holes and test pits, and obtained subsurface soil and rock samples for visual examination, field classification, and laboratory testing. The logs of the test borings and test pits are presented on Plates 2

through 29. Plate 30 is the Unified Soil Classification System that has been used for describing and classifying soils.

While obtaining the subsurface soil and rock samples, we also obtained the standard penetration test values or N-values. The N-value is defined as the number of blows per each foot of penetration into the underlying, undisturbed soil or weak rock of a 2.0-inch outside diameter, split spoon soil sampler, driven by a 140-pound drop weight free falling 30 inches per each blow. The N-values obtained from the test bored holes are shown on the logs of the test borings at the depths where they were taken.

However, in order to obtain better and larger, undisturbed subsurface soil samples, a larger, 3.0-inch outside diameter split spoon soil sampler was used, and the blow counts or N-values of the larger samples were corrected to the standard N-values by multiplying the 3.0 diameter blow counts with a correction factor of 0.68 to account for the larger soil sampler.

Because the relatively shallow coralline limestone formation is generally hard, we used a 3-inch diameter, Nx series rock core barrel for rock coring. During the rock coring, we recorded the drilling rates in minutes per each foot of rock coring, and the rock quality designation (RQD) of the cored limestone rock were recorded. The N-values, drill rates and RQDs are shown on the logs of the test borings at their respective depths.

Percolation Tests - We also conducted percolation tests to determine the infiltration characteristics of the upper soils. All four percolation tests exposed shallow overburden soils consisting of approximately 1 foot to 3 feet thick of

medium stiff, reddish brown sandy silt, and loose to medium dense, silty limestone gravel with sand, overlying coralline limestone to the 3.0 to 4.5 foot depths of the percolation test pits. The percolation test pits were saturated with water prior to performing the percolation tests. The following results were obtained from the tests, including our recommended percolation rates for the storm-water disposal design:

Percolation Test No.	Overall Rate (Inches/ minute)	Last Rate (Inches/ Minute)	Recommended Design Rate (Inches/minute)
PT-1	0.178	0.133	0.089
PT-2	1.211	0.204	0.204
PT-3	1.083	1.266	0.541
PT-4	8.667	37.5	2.000

The wide variations of the tested percolation rates were due to the complex structures of the coralline limestone ranging from very porous (such as PT-4) to dense or very dense to hard (PT-1).

LABORATORY TESTING

In our laboratory, we re-examined the subsurface soil and rock samples obtained from the project site and selected appropriate samples for testing to determine their in-situ moisture content, unit weight (dry density), particle size

distribution, percent passing No. 200 mesh sieve (silt and clay sizes), liquid limit and plasticity index, moisture-density relations (laboratory compaction), and California Bearing Ratio. The results of the tests are shown on the boring and test logs where the tested samples were taken, and are also shown graphically on Plates 31 through 40. The Key to Test Data on Plate 30 explains the abbreviations of the test designations shown on the logs of the test borings and the test pits.

The laboratory test results were also used to confirm and/or modify the field classification of the soils.

SITE CONDITIONS

Surface Conditions

The project site is fronting Route 15, and is high above sea level with surface elevations ranging from low of approximately 220 feet (Mean Lower Low Water Datum) at the northeast corner at the front near Route 15 where ponding basins are planned, and generally rise towards the back or south-southeast property lines to as much as 290 feet.

There are existing tenants occupying near the planned ponding basin, and near the planned building locations at the time of our field explorations. There is an existing old asphalt pavement that traversed the middle of the property.

The site is heavily vegetated mostly of thick shrubs, tangan-tangan, palm, and bread fruit trees.

The cut slopes at the back of the property were vertical or near vertical with a height of approximately 75 feet. It exposes moderately hard to hard, light brown-white, reef facies of the Mariana limestone formation. The slopes appear to be stable and does not show any signs of distress when we inspected the slopes during our site geologic reconnaissance. (Note: Reef limestone is generally more massive, well cemented, and hard, though generally is more porous, and often with fissures, voids, and cavities).

Subsurface Conditions

Administration Building (Borings 1 to 6 and Test Pit 1) - As encountered from the test borings drilled at the building site and the test pit, the building site is generally underlain with approximately 0.3 to 2 feet thick of light brown-white, loose to medium dense, silty sandy limestone gravel. Underlying the silty sandy limestone gravel soil is the native coralline limestone formation. The limestone is the reef facies of the Mariana limestone formation which is generally hard.

Cooling Tower and Fuel Tank (Test Pits 2 and 3) – Test Pit 2 at the cooling tower location exposed moderately hard to hard coralline limestone from the surface without overburden soil.

However, in Test Pit 3 at the fuel tank location, we encountered at least 8 feet thick of silty sandy limestone gravel with only the upper one foot being dense and the rest are all loose down to the 8-foot bottom of this test pit (maximum reach of the excavator due to constant caving in of the soils inside this test pit), which could extend deeper than 8 feet below Test Pit 3. It is possible that Test Pit

3 could have been a deep depression or pocket that had collected surface silt from surface run-offs over time or it could have been a man-made deposit.

Parking Areas and Access Road (Test Pits 4 to 16) - All the test pits generally encountered from none to as much as 4 feet thick of overburden soils consisting of reddish brown, soft sandy silt, and light brown-white, loose to dense silty sandy limestone gravel.

In fact, most of the overburden silty soils in the test pits are just about all soft; indicating that they could have been also resulted from surface run-off deposits, or possibly man-made deposit, and the original limestone surface could have been irregular which is possible for reef facies of the coralline limestone formation.

Underlying the sandy silt and the silty sandy limestone gravel is the native coralline limestone with some silt pockets in the upper 2 to 4 feet of the limestone formation. The native coralline limestone is generally moderately hard to hard, though mostly be hard rock.

The table below is a summary of the depths of soft or loose soils found in most of the test pits:

Test Pit No	Depth of Soft or Loose Soils (feet)	Location
TP-1	none	Building
TP-2	none	Cooling Tower
TP-3	8+' all loose sandy limestone gravel	Fuel Tank
TP-4	1.5' soft silt	Parking Area
TP-5	1.5' soft silt	Parking Area
TP-6	1.2' soft silt	Parking Area
TP-7	1.5' soft silt	Parking Area
TP-8	3' loose silty sandy limestone	Parking Area

	gravel, and 2' soft silt	
TP-9	4' soft silt	Parking Area
TP-10	2.5' medium dense silty sandy limestone gravel	Parking Area
TP-11	2' dense silty sandy limestone gravel	Parking Area
TP-12	3.5' medium dense to dense silty sandy limestone gravel	Parking Area
TP-13	1.5' dense silty sandy limestone gravel, and 1' soft silt	Parking Area
TP-14	2.5' dense silty sandy limestone gravel	Parking Area
TP-15	1.7' medium dense silty sandy limestone gravel, and 4' soft silt	Parking Area
TP-16	1.7' medium dense silty sandy limestone gravel	Parking Area
TP-17	2' loose silty sandy limestone gravel	Access Road
TP-18	3' medium dense silty sandy limestone gravel	Access Road
TP-19	1.5' medium dense silty sandy limestone gravel, and 2' soft silt	Access Road
TP-20	3' loose silty sandy limestone gravel	Access Road

Front Access Road (Borings R-1 and R-2, and Test Pits 17 to 20) – Borings R-1 and R-2 encountered approximately 6 inches to 1 foot thick of loose to medium dense, silty sandy limestone gravel, overlying hard coralline limestone formation throughout the remaining 26 feet thick of the boreholes.

Test Pits 17 to 20 found approximately 1.5 to 3 feet thick of loose to medium dense of silty sandy limestone gravel soils, similar to the gravelly soils found in other test pits.

Ground Water - No groundwater or seepage was encountered in all the

test borings and test pits conducted at the project site, which also suggest that the on-site soils and rocks are generally permeable. Ground water at the site should be at approximately the sea level and should have no significance on this planned development.

Seismic Site Class

Based on the published geologic reports and the results of our field investigation, the site is underlain with shallow limestone rock formation, which should extend much deeper than the 100-foot depth defining the seismic site class of the site.

Based on the above and in accordance with the 2009 International Building Code, the project site may be classified as Site Class C for seismic design of the planned building and the pump house. It is assumed that any soft silt or loose gravelly soils found within the building foot-print and the pump house will be replaced with densely compacted, suitable limestone sand/gravel soil fill which can be part of Site Class C.

Based on the mapped maximum considered earthquake ground motion for Guam, the 0.2 second spectral response acceleration (Ss) and the 1.0 second spectral response acceleration (S_1) for the project site can be taken as 1.5 g and 0.6 g, respectively.

DISCUSSION AND CONCLUSIONS

The 3-story concrete main building, the cooling tower, and the pump house locations are underlain with shallow coralline limestone formation which can be supported on conventional, shallow spread footings and/or continuous wall footings with moderate bearing capacities. The spread footings and/or continuous wall footings would have to bottom in either the undisturbed, native coralline limestone rock formation or on densely compacted, limestone sand/gravel fill with at least 95 percent of its maximum dry density (as determined by ASTM D1557 laboratory compaction test method), replacing any existing soft silt or loose sand/gravel soils.

The fuel tank can also be supported on shallow spread foundation such as thickened on-grade concrete slabs or continuous footings, but will require replacing the existing soft silty soil with engineered, compacted limestone sand/gravel soils having at least 95 percent of its maximum dry density.

The existence of very irregular depths of generally soft silt and loose gravelly soils would present challenging site grading earthwork for their removals and replacements with engineered, densely compacted, suitable limestone sand/gravel soil fill which can be obtained from a good portion of the on-site excavated, silty sandy limestone gravel soils if they meet the fill soil requirements.

Similar site improvements will have to be performed within the planned parking lots and access roads, which will also replace the potentially expansive,

silty soil that can be harmful to the on-grade concrete slabs, side walks, and asphaltic concrete pavements.

The relatively massive cuts will encounter hard limestone rock, which will require rock breaker or other tools to remove hard rock. Blasting is not permitted by Guam Environmental Protection Agency.

Details of our recommendations are presented in the remainder of this report.

RECOMMENDATIONS

Site Preparation and Grading

Clearing and Stripping – Initially, after demolition and removal of the existing structures and other unsuitable matters are made, the areas to be filled and the exposed areas after cuts should be cleared of any remaining vegetation, trees to be removed, and debris. Any remaining silty topsoil should be stripped and removed away or saved for landscaping use. The depth of stripping will likely range from several inches to a foot or so, except deeper for localized removal of large tree roots and thick silty soil.

Additional Excavation – After site clearing, stripping, and any required excavations are completed, any exposed, remaining, fine-grained, reddish brown to dark brown, soft to medium stiff silty soils should be excavated within all load-bearing areas including building and other structural footprints, parking lots, access roads, walkways, storage and loading areas, including at least 5 feet horizontally beyond their boundaries, should all be excavated and removed

away, or some may be saved for later landscaping use. Similarly, any exposed or remaining loose to medium dense, silty sandy limestone gravel soils within the above areas should also be excavated and removed away or some meeting the fill and backfill soils requirements can be stockpiled at the site for re-use as compacted backfill soils.

The above excavation and removal of the soft and loose soils should also be performed under the load bearing areas where new fill will be placed, so that there will be no new fill settlements due to the underlying, compressible, soft and loose soils.

Recompaction - After the site stripping and any required excavations are completed, in the areas to be filled and in exposed surface areas after cuts, any remaining, uncompacted surfaces should be scarified to about 6 to 8 inches deep, moisture conditioned as necessary and compacted to at least 95 percent of the maximum dry density of the compacted, noncohesive, sand and gravel soils or 90 percent if it is cohesive silt or clay soils. In non-load-bearing areas, the compacted densities may be lowered by 5 percent for both noncohesive and cohesive soils.

Fill and Backfill Soils – All fill and backfill soils should be free of organic matter, debris, and rock fragments or lumps larger than 4 inches or one-half the compacted layer thickness, whichever is less, in greatest dimension. In addition, within the top 2 feet of the finished subgrade elevations, the fill soils should be non-expansive with plasticity index 12 maximum, liquid limit no more than 35 and

not more than 25 percent finer than no. 200 mesh sieve (silt and clay sizes). All the fill and backfill soils should have adequate sand for dense compaction.

The on-site excavated limestone sand and gravel soils meeting the above criteria will be suitable for use as fill and backfill. The on-site excavated silty soil should only be used for backfill in non-load-bearing areas such as landscaping, utility trenches outside of building and pavement areas. The silty soil may also be used as backfill below the top 2 feet of the finished subgrade elevations under load-bearing areas – on the condition that the contractor can achieve the required compacted density or at least 90 percent of its maximum dry density.

Fill and Backfill Soil Placement - Approved fill and backfill soils should be placed in 10-inch maximum loose layers, moisture conditioned as necessary and compacted to at least 95 percent of their respective maximum dry densities, but can be reduced to 90 percent maximum dry density in non-load-bearing areas outside the building, pavement, and concrete slabs, plus 3 more feet wider all around.

Cut Slopes – The proposed cut slopes into the existing coralline limestone can be 1 to 3 (horizontal to vertical) slope ratio. Where it is applicable, cut slopes in soils at the top of the slopes should be trimmed back to not steeper than 2 to 1 slope ratio.

The cut slopes can extend to a maximum height of 20 feet without an intermediate bench. If a cut slope is higher than 20 feet, an intermediate bench would be needed. The bench, if it is needed, should be constructed at the mid-height of the slope or slightly lower. The bench should be at least 8 feet wide and

sloped slightly inward to direct surface flow away from the slopes for gravity drain to appropriate outlets.

The cut slopes should be performed in a cautious and neat manner to avoid any possible over-cut which can undermine the slopes. The final slope surfaces should be uniform and firm. Any loose rocks exposed should be removed and the voids filled with lean concrete as necessary.

Temporary cuts during construction in moderately hard to hard, massive limestone may be vertical but OSHA safety regulations should be followed, and should be inspected by the geotechnical engineer or a geologist if it is necessary or required by OSHA.

Fill Slopes – should not be steeper than 2 to 1 (horizontal to vertical) slope ratio. Fill to be placed over the existing surface steeper than 5 to 1 slope ratio should be keyed at the toe of the slope and benched into firm soil or rock as the fill is being raised. Typical fill over slope section is shown on Plate A. The final fill slopes should be compacted to dense and non-yielding, preferably by over-filling and trimming back to expose compacted, firm slope surface. (Note: the proposed fill can be 15 feet maximum as planned.)

However, the fill slope fronting Route 15 which will be some 8 feet high can be at 1.5:1 horizontal to vertical slope ratio provided the fill material will be the non-expansive limestone fill as recommended on page 21 of this report and with adequate sand for dense compaction to achieve at least 95 percent of its maximum dry density. The fill slope should be over-filled and cut back to provide a uniform and dense surface. Loose soil or rocks peeled off from cutting back

should be removed and voids filled with lean concrete or sand/cement mix at 50/50 ratio if it is necessary. The voids should be cleaned of loose particles before patching with the lean concrete or sand/cement mix.

Fill to be placed over exposed surface steeper than 5:1 (horizontal to vertical) slope ratio should be keyed at the toe of the fill and benched into firm soil or rock as the fill is being raised. Typical fill over slope section is shown on Plate A.

Wherever it is feasible, surface flows should be diverted away from the tops of the slopes via lined ditches or other appropriate measures for gravity flows to appropriate outlets.

Fill slopes should be planted with rapid growth ground cover to minimize surface erosion. Hydro seeding on fill slopes would be preferred.

Foundation Support

The planned administration building can be supported on conventional shallow spread footings resting directly on either the undisturbed, native coralline limestone or on densely compacted limestone sand/gravel soil fill having at least 95 percent of its maximum dry density. The footings can be designed with the following criteria:

1. Allowable bearing pressures

Dead plus live loads (psf = pounds per square foot)	4000 psf
Total design loads, including wind or seismic forces	5400 psf

2. Minimum footing bottom, below lowest adjacent final depth	2 feet
3. Minimum footing width	2 feet
4. Resistance to lateral loads.	
Friction across footing bottoms (Percent of total dead loads at the footing bottoms)	35
Passive soil resistance (with 95 percent maximum dry density backfill on one footing face. Ignore top one foot if it is not directly covered with concrete slab or asphalt pavement), equivalent fluid pressure (pcf = pounds per cubic foot)	800 pcf

During the footing excavation, any silty soil or uncertified old fill that are exposed beneath the footing bottoms should be entirely excavated and replaced with non-expansive limestone sand/gravel soil fill, including at least 12 inches wider all around the footings. Thereafter, the exposed surface should be lightly scarified and leveled to approximately 6 inches deep, moisture conditioned as necessary and compacted to at least 95 percent of its maximum dry density. Then approved limestone sand/gravel backfill should be placed in 8-inch maximum loose layers, moisture conditioned as necessary and compacted to at least 95 percent of its maximum dry density with a uniform, dense and unyielding surface.

The footings strictly constructed as recommended herein should be designed to tolerate 1/2 inch differential settlement across building width.

Foundation Probes – To determine possible existence of underground cavities/caverns in the underlying coralline limestone formation below foundation

footings, it is recommended to drill one probe hole at the center of each square footing of not wider than 8 feet. For continuous wall footings, drill one probe hole per every 15 feet along bearing wall or continuous footings. The probe holes should be at least 3 inches in diameter and should be at least 15 feet for both column or individual footings and 10 feet under continuous bearing wall footings, but not less than twice the width of the footing directly above.

Drilling of the probe holes should be performed under full-time observation of the geotechnical engineer or his authorized representative, who has at least two years of such experience. The engineer or his representative should record the probe hole drilling rates (minute-seconds per each one foot drilled, drilling behavior if it deviates from normal drilling conditions, and describe the soil/rock cuttings coming out of the drilled holes.

If significant size, more than a few inches, cavity/cavern is found, it should be thoroughly backfilled with lean concrete or sand-cement mix with at least 1000 psi 28-day old compressive strength. If cavity is bigger than 1 foot in diameter or depth, the grout backfilling should be performed under at least 30 psi or twice the overburden grouting pressure. The lean concrete or sand-cement mix should have high slump such as 8 to 10 inches, can be mixed with super-plasticizer admixture for ease of thorough backfilling. The engineer or his representative should keep record of grout volume used for backfilling in each probe hole.

The grout backfilling under pressure should be tremie method by lowering the grouting hose to the bottom of the probe hole and slowly raise the hose up as

the grout is being discharged into the probe hole. The bottom of the hose should be at least 12 inches below the surface of the grout as the grout is being raised.

Probe holes that do not encounter significant size cavity/cavern should be completely backfilled with the above lean concrete or sand-cement mix by thoroughly rodding into each hole. The engineer should keep record of the volume of grout backfill used to completely backfill each hole to verify that all the probe holes are thoroughly backfilled.

Retaining Walls

Where retaining wall is required, it can be supported on continuous wall footing resting on the native limestone or densely compacted, limestone sand/gravel fill with at least 95 percent of its maximum dry density. The wall footings can be designed with the same designed values recommended for the building foundation support.

The top-unrestrained retaining walls can be designed to resist active lateral earth pressure of 35 psf per foot of depth (or pounds per cubic foot, pcf) equivalent fluid pressure (with maximum 35H at the base of the wall, H = wall height).

For seismic design, assumed an additional earth pressure equals to 20 percent of the maximum static earth pressure (or 35H x .20 = 7H) but acting at the top of the wall and then decreasing linearly to zero at the base of the wall footing.

For top-restrained walls, the design lateral earth pressure should be as shown on Plate B, which will increase from zero at the top of the wall to a

maximum of 50H at wall height of 1/4H from the top down, and then constant down to the base of the wall. For seismic design, add 20 percent of 50H or 10H from the top of the wall down to zero at the base of the wall footing.

To prevent hydrostatic pressure building up behind the walls, one foot wide of the backfill immediately behind the walls, except the top one-foot thick, should be 3/4-inch or 1-inch maximum size concrete coarse aggregate. The aggregate should be placed in 8-inch loose layers with the surface lightly compacted to dense and unyielding without over-stressing the walls The remaining wall backfill should be limestone sand/gravel soils, to be placed in 8-inch loose layers, moisture conditioned as necessary and compacted to at least 95 percent of its maximum dry density without overstressing the walls.

The top one foot thick of the wall backfill should be impervious, fine-grained silty soil compacted in two equal layers to at least 90 percent of its maximum dry density. Limestone fines or silty fine sand that will be impervious after compacted to at least 90 percent of its maximum dry density may be used to replace fine-grained, silty soil.

The contractor should not damage the wall during wall backfilling and compaction.

Weep holes should be provided at the lower portion of the top-unrestrained walls at approximately 8 inches above the final ground surface outside the wall. For top-restrained walls, no weep holes but provide a 4-inch diameter pvc drain pipes at the bottom of the wall backdrain layer to appropriate outlet. The lower half of the pvc drain pipes should be perforated with the

perforations facing down. The pipe should be surrounded by 4 inches of the backdrain aggregate.

The wall footing strictly constructed as recommended above should be designed to tolerate 1/4-inch total settlement and 1/4-inch differential settlement measured every 40-foot length of the retaining wall.

Subgrade Preparation for Concrete On-Grade Floor Slabs

The new concrete on-grade floor slabs should be underlain with 6 inches thick aggregate base course, uniformly spread without segregation, moisture conditioned as necessary and compacted to at least 98 percent of its maximum dry density with a uniform, dense and unyielding surface.

The compacted base course aggregate should be covered with an impervious membrane to prevent moisture vapor migration into the concrete slabs.

Flexible Pavements

We recommend the following flexible pavement design thicknesses for the Route 15 merging lane, access roads, and parking areas.

New Pavement Areas	Asphalt Surface (inches)	Aggregate Base (inches)
Route 15 merging lane	3*	8
Main access road and heavy truck trafficking	3	8
Passenger cars, light trucks	2	6

*A 1-inch thick layer of non-skid, surface friction course should be added.

The subgrade below the base course should be either the moderately hard to hard, native coralline limestone or at least 2 feet thick of the nonexpansive limestone sand-gravel fill having at least 95 percent of its maximum dry density, to be placed and compacted in four equal layers of 6-inch compacted thickness.

The aggregate base course should conform to the following requirements:

Sieve Size	Percent Finer by Weight
2 inches	100
1.5 inches	90 – 100
0.75 inch	50 – 85
No. 4	25 – 45
No. 30	10 – 25
No. 200	3 – 13

California Bearing Ratio (CBR)	= 100 minimum
San Equivalent	= 35 minimum
Abrasion Wear	= 40 maximum
Liquid Limit	= 12 maximum
Plasticity Index	= 6 maximum

The aggregate base course should be uniformly spread without segregation, moisture conditioned as necessary, and compacted with a vibratory roller at least 10 tons in weight to 100 percent of its maximum dry density with a uniform, dense and unyielding surface.

Pipeline Trenching and Excavation

It is expected that the trenching excavation for the pipelines will encounter hard limestone. The contractor should be responsible in determining the type of equipment that would be appropriate in the excavation and/or trenching.

Prior to trenching operation, the areas should be cleared of all vegetation and surface debris. Topsoil should be stripped and removed away or temporarily stockpiled at the site for later landscaping uses. In general, temporary excavation deeper than 6 feet will have to be braced in accordance with the OSHA. During the excavation, the contractor should not stockpile materials or place relatively heavy equipment within a 6-foot distance of the trenches. The contractor should be responsible for the safety of men and equipment working or trafficking near the excavation.

Pipe Line Trenching and Backfilling

Pipe Bedding - Prior to placing the new sewer pipe lines, a layer of bedding sand at least 6 inches thick should be uniformly spread below the pipe bottom. The bedding sand should consist of non-plastic, relatively clean sandy soil meeting the following requirements:

Sieve Size		Percent Passing by Weight
¾ inch		100
No. 4		60 – 100
No. 40		20 – 60
No. 200		0 - 5
Liquid Limit	=	25 maximum
Plasticity index	=	6 maximum

Alternatively, 3/8-inch concrete fine aggregate may be used as bedding sand.

The bedding sand should be moisture conditioned as necessary and compacted to 90 percent of its maximum dry density. If clean, coarse grained

sand and/or fine gravel are used, the compaction may be limited to achieving a dense and unyielding condition.

Backfill from pipe bottom to 12 inches above the pipe – The backfill should be bedding sand or relatively clean, granular sandy soil such as 3/8- or 3/4-inch fine aggregate or sand (per ASTM C-33). The bedding sand should first be placed under and around the pipe and lightly compacted before placing above the pipe to approximately 6 to 8 inches above the pipe, moisture conditioned as necessary and carefully compacted until dense (without damaging the pipe) to achieve 90 percent of its maximum dry density.

From 12 inches above the pipe to 2 feet below roadway or finished surface – On-site excavated soils free of fragments larger than 4 inches in greatest dimension, debris, and organic matter may be used as backfill. However, only silt is available on site, imported backfill soil from quarry pit-run or equivalent limestone sand-gravel soil should obtained prior approval from the contracting officer before bringing onto the site. The approved fill soil should be placed in 10-inch maximum loose layers; moisture conditioned as necessary and compacted to at least 90 percent of its maximum dry density.

The above backfill may be extended to the final grades for areas outside of the roadways, road shoulders, or in non-load bearing areas; however, the top 12 inches should be compacted to 95 percent of its maximum dry density in two equal layers.

Upper 2 feet of roadway subgrades and road shoulders – The backfill soil should be subbase or select fill meeting the following requirements:

Sieve Size		Percent Passing by Weight
4 inches		100
No. 4		50 - 100
No. 40		15 - 60
No. 200		5 - 25
Liquid Limit	=	35 maximum
Plasticity index	=	12 maximum
California Bearing Ratio (CBR)	=	30 minimum

Approved backfill soil should be placed in 10-inch maximum loose layers, moisture conditioned as necessary and compacted to at least 95 percent of its maximum dry density.

Construction Inspection and Testing

During construction, the earthwork and foundation preparation and installation, foundation probe hole drilling and grout backfilling, and pavement construction, should be inspected and tested to ascertain that the works are performed in accordance with the project plans and specifications and our recommendations, and to modify our recommendations should unanticipated subsurface conditions are encountered.

INVESTIGATION LIMITATIONS

The findings, discussions and recommendations presented herein are based on the information obtained from the test borings and test pits performed for this project. Unanticipated subsurface conditions may be encountered during construction and cannot be fully determined by test borings and test pits.

Therefore, some contingency fund is thus recommended for the project to accommodate these possible costs.

This report has been prepared for the exclusive use of our client and its respective design consultants. It shall not be used by or transferred to any other party or to another project without the prior expressed written consent and/or thorough review by this facility.

Should this project be delayed beyond the period of one year from the date of this report, the report shall be reviewed relative to possible changed conditions. Breach of any recommendations provided herein will void the professional responsibility of this facility.

The following plates are included to complete this geotechnical investigation report for GPA-GWA Administration Building, Fadian, Mangilao, Guam.

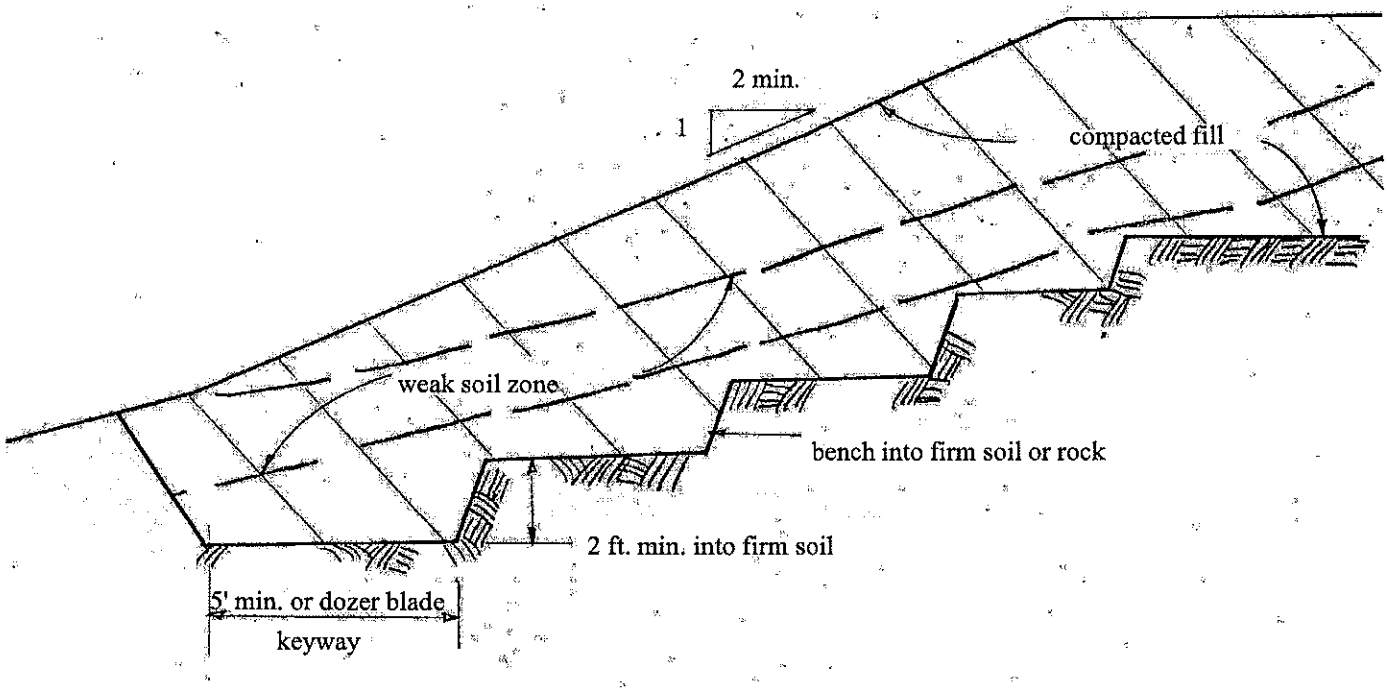
Plate A	-	Typical Fill over Slope
Plate B	-	Lateral Earth Pressure Diagram for Top-Restrained Wall
Plates 1A and 1B	-	Boring, test pit and Percolation test Location Plan
Plates 2 through 7	-	Logs of Borings 1 through 6
Plates 8 and 9	-	Logs of Borings R-1 and R-2
Plates 10 through 29	-	Logs of Test Pits 1 through 20
Plate 30	-	Soil Classification Chart and Key to Test Data
Plates 31 through 34	-	Particle Size Distribution Report
Plates 35 through 38	-	Liquid and Plastic Limits Test Report
Plate 39	-	Laboratory Compaction Test Report
Plate 40	-	(California) Bearing Ratio Test Report

Respectfully submitted,

GEO-ENGINEERING & TESTING, INC

Michael C. Rayo
Project Engineer

Ukrit Siriprusanan
Civil Engineer - 360



(No Scale)

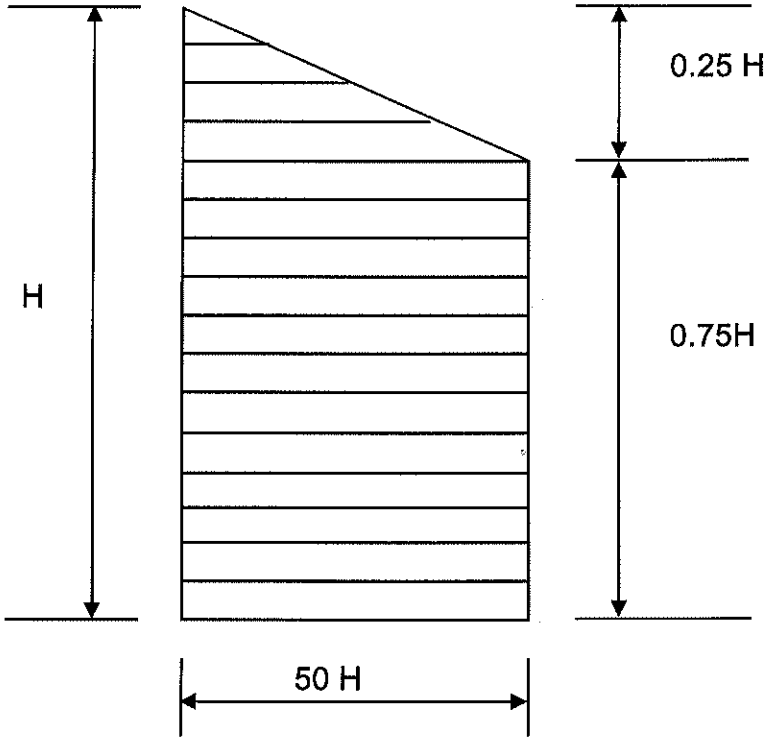
Notes:

1) Keyway and benches should be provided for fill placed over existing slopes steeper than 5 horizontal to 1 vertical slope ratio.

2) Subdrains should be provided beneath fill placed over drainage courses.

3) Actual dimensions may be modified by the geotechnical engineer during construction, depending on height, soil conditions.

GEO-ENGINEERING & TESTING, INC. Geotechnical & Material Testing Engineers	**TYPICAL FILL OVER SLOPE** GPA-GWA MULTI-PURPOSE FACILITY	**PLATE** **A**
Job No. 436.14 **Appr.** US/ Date 03/29/12	FADIAN, MANGILAO GUAM	



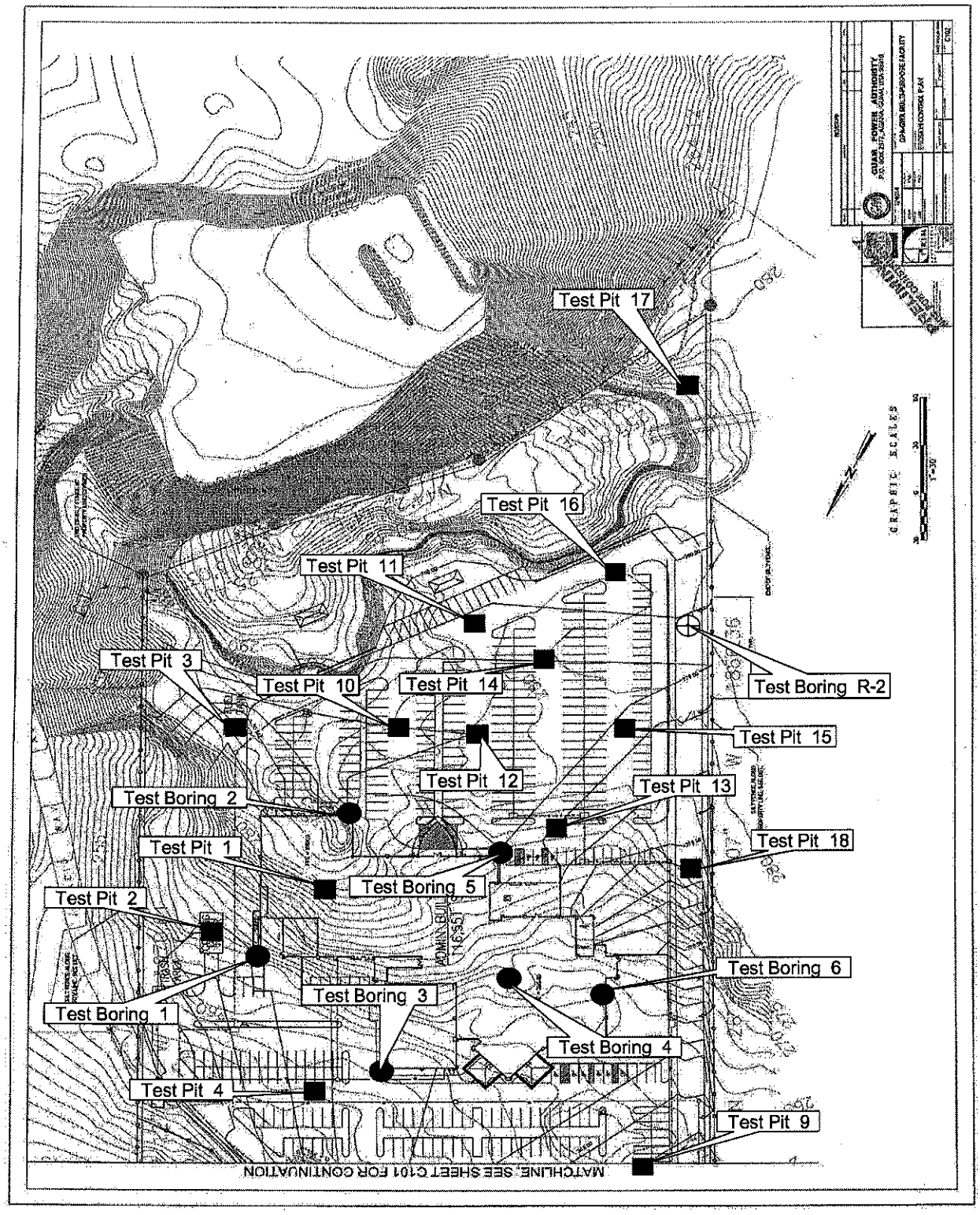
Note: 1. H = Height of wall in feet

2. Pressures are in pounds per square foot distributed as shown above.

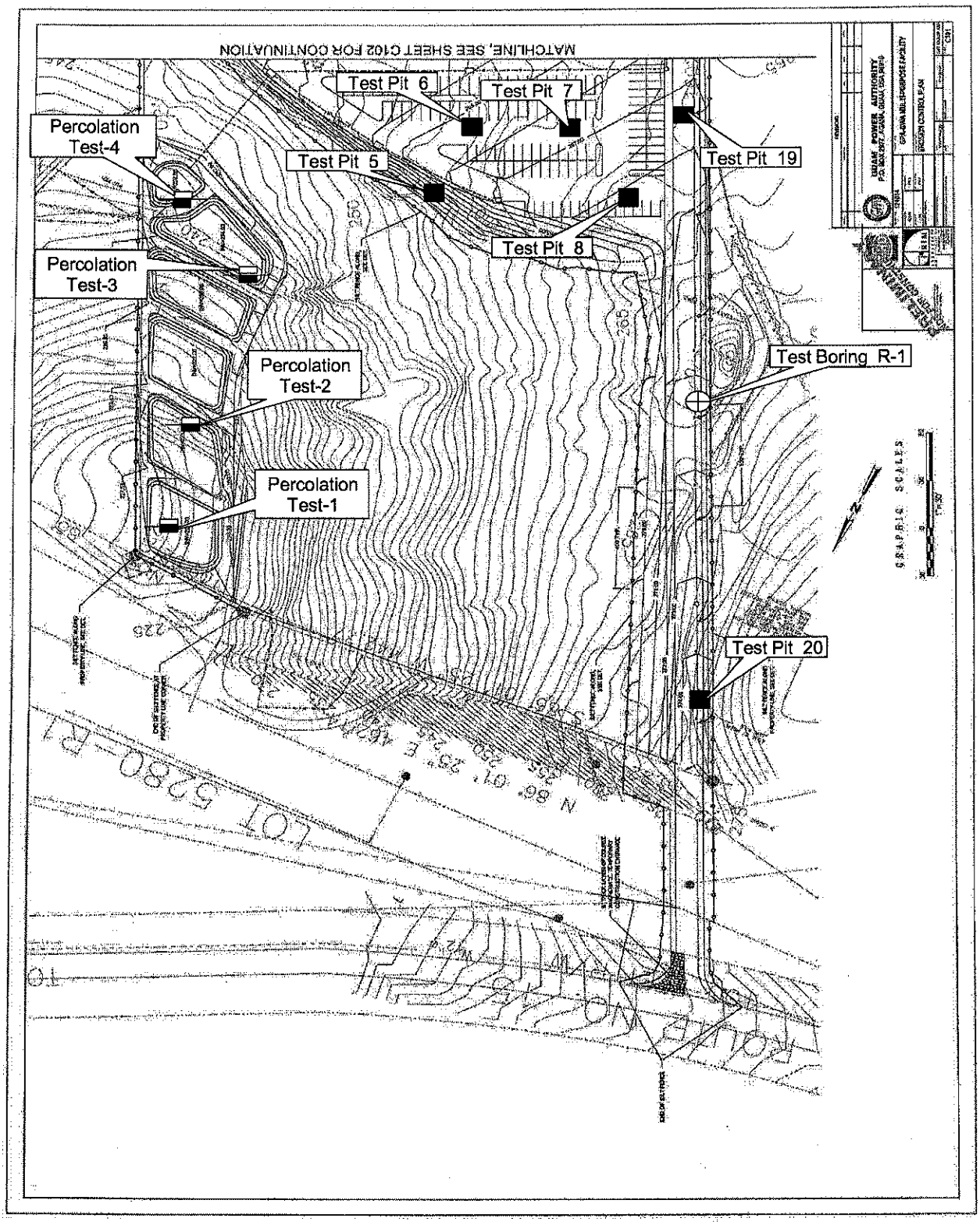
3. Assumed no hydrostatic pressure with wall backdrain.

4. Surcharge loads are additional.

GEO-ENGINEERING & TESTING, INC. Geotechnical & Material Testing Engineers Job No. 436.14 Appr _____ Date: 03/29/	**LATERAL EARTH PRESSURE DIAGRAM FOR TOP-RESTRAINED WALLS** GPA-GWA MULTI-PURPOSE FACILITY FADIAN, MANGILAO GUAM	**PLATE** **B**



GEO-ENGINEERING & TESTING, INC. Geotechnical & Material Testing Engineers	**TEST BORING, PIT & PERCOLATION LOCATION PLAN** GPA-GWA MULTI-PURPOSE FACILITY	**PLATE** **1A**
Job No. 436.14 **Appr.** US/ Date 07/16/12	FADIAN, MANGILAO GUAM	



GEO-ENGINEERING & TESTING, INC. Geotechnical & Material Testing Engineers	**TEST BORING, PIT & PERCOLATION LOCATION PLAN** GPA-GWA MULTI-PURPOSE FACILITY	**PLATE** **1B**
Job No. 436.14 **Appr.** US/ Date 07/16/12	FADIAN, MANGILAO GUAM	

LOG OF BORING 1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 08, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE / DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, slightly moist, boulders and grass on surface		0.58	14/1"			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard		1.09				
5		Nx Rock Core at 2'-7', RQD=0		1.00				
				0.39				
	2			1.37				
		Nx Rock Core at 7'-12', RQD=0			17/0"			
				0.23				
				0.35				
10	3			0.39				
				0.34				
		Nx Rock Core at 12'-17', RQD=0		0.43				
	4				90			
				0.27				
15				0.42				
	5			0.59				
		Nx Rock Core at 17'-22', RQD=0			20/1"			
				0.52				
				0.44				
20	6			1.06				
				1.08				
		Nx Rock Core at 22'-27', RQD=0			16/1"			
	7			0.48				
				1.82				
25				1.05				
	8			0.51				
					24/2"			
		(no free water encountered)						

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 1

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 2

LOG OF BORING 2

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 5, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE / DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, grass on surface		0.24				
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard		3.13	39/1"			
5	1			2.54				
				2.33				
	2			6.15				
				3.49	15/0"			
10	3			1.20				
				2.35				
				5.49	15/0"			
	4			5.07				
15				0.13				
				0.43				
	5			2.20	40/2"			
				4.35				
20	6			2.12				
				0.52				
				0.22				
				0.28				
		(no free water encountered)						

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 2

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 3

LOG OF BORING 3

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 08, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, boulders, grass on surface			0.24				
					0.26				
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				10/0"			
		Nx Rock Core at 2'-7', RQD=0			2.54				
5					2.33				
	2				6.15				
		Nx Rock Core at 7'-12', RQD=0			3.49				
						88			
					1.20				
10	3				1.43				
					0.48				
		Nx Rock Core at 12'-17', RQD=0				10/1"			
	4				0.54				
					1.12				
15					0.59				
	5				0.51				
		Nx Rock Core at 17'-22', RQD=0				10/0"			
					0.43				
	6				0.40				
20					0.49				
					1.48				
		Nx Rock Core at 22'-27', RQD=0				17/1"			
	7				0.41				
					1.27				
25					1.32				
	8				1.10				
						14/0"			
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 3

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 4

LOG OF BORING 4

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 08, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, boulders thrash, grass on surface			1.04	10/0"			
		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard			1.24				
5	1	Nx Rock Core at 2'-7', RQD=0			1.14				
					1.57				
	2				1.42				
		Nx Rock Core at 7'-12', RQD=0				12/0"			
					0.31				
					0.35				
10	3				1.08				
					1.12				
		Nx Rock Core at 12'-17', RQD=0.08				15/0"			
	4				1.15				
					1.08				
15					0.46				
	5				0.38				
		Nx Rock Core at 17'-22', RQD=0.17 (hole caved in 5' from 17'-22', possible cavities)				12/0"			
					0.20				
	6				0.31				
20					0.26				
					1.42				
		Nx Rock Core at 22'-27', RQD=0				10/0"			
	7				0.33				
					0.29				
25					0.24				
	8				0.42				
						11/0"			
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 4

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 5

LOG OF BORING 5

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 11, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, trash, tins, metal and grass on surface				22/8"			
		LIGHT YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - hard			0.7				
	1	Nx Rock Core at 2'-7', RQD=0.21			7.15				
5					4.06				
					1.03				
	2				3.15				
		Nx Rock Core at 7'-12', RQD=0.23				38/1"			
					4.39				
					3.29				
10	3				0.43				
					0.34				
		Nx Rock Core at 12'-17', RQD=0				31/0"			
	4				0.28				
					0.32				
15					0.29				
	5				0.58				
		Nx Rock Core at 17'-22', RQD=0				10/1"			
					0.27				
	6				0.29				
20					0.44				
					0.50				
		Nx Rock Core at 22'-27', RQD=0				16/0"			
	7				1.22				
					1.03				
25					2.02				
	8				1.08				
						12/0"			
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 5

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 6

LOG OF BORING 6

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 07, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, trash, metals and grass on surface			1.14	20/0"			
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard			3.48				
5		Nx Rock Core at 2'-7', RQD=0.18			3.32				
	2				1.53				
					3.06				
		Nx Rock Core at 7'-12', RQD=0				17/0"			
					9.56				
10	3				1.47				
					1.35				
					1.18				
		Nx Rock Core at 12'-17', RQD=0.29				12/0"			
	4				0.39				
					1.34				
15					2.41				
	5				2.08				
		Nx Rock Core at 17'-22, RQD=0.08				10/0"			
					1.07				
	6				1.21				
20					1.22				
					2.01				
		Nx Rock Core at 22'-27', RQD=0				14/0"			
	7				0.35				
					1.10				
25					1.37				
	8				3.01				
						20/0"			
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING 6

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 7

LOG OF BORING R-1

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 11, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, slightly moist, grass on surface			1.20	10/0"			SA Non-plastic Compaction CBR
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard			0.56				
5		Nx Rock Core at 2'-7', RQD=0			0.32				
					0.35				
	2				0.40				
		Nx Rock Core at 7'-12', RQD=0				14/0"			
					0.57				
10	3				0.37				
					0.55				
					0.46				
		Nx Rock Core at 12'-17', RQD=0				12/0"			
	4				0.30				
					0.31				
15					0.37				
	5				0.35				
		Nx Rock Core at 17'-22', RQD=0				11/0"			
					0.25				
	6				0.21				
20					0.41				
					0.46				
		Nx Rock Core at 22'-27', RQD=0				30/0"			
	7				0.33				
					0.40				
25					0.34				
	8				0.38				
						18/0"			
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF BORING R-1

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 8

LOG OF BORING R-2

Notes:

Relatively Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 140 lb (63.5 kg) hammer free falling 30 in (76 cm.)/blow

DATE June 06, 2012

EQUIPMENT 8" Dia. Hollow Stem Auger

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)*	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, grass on surface							SA Non-plastic Compaction CBR
					0.18				
					2.22				
	1	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard				17/0"			
		Nx Rock Core at 2'-7', RQD=0			2.16				
5					1.08				
	2				1.04				
		Nx Rock Core at 7'-12', RQD=0				34/2"			
					1.09				
					0.52				
10	3				3.27				
					4.29				
		Nx Rock Core at 12'-17', RQD=0				40/2"			
	4				0.26				
					5.25				
15					4.08				
	5				2.04				
		Nx Rock Core at 17'-22', RQD=0				25/0"			
					2.45				
					2.20				
20	6				2/-4				
					1.14				
		Nx Rock Core at 22'-27', RQD=0				14/0"			
	7				1.26				
					2.07				
25					5.38				
	8				2.45				
						19/0"			
		(no free water encountered)							

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LOG OF BORING R-2

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 9

LOG OF TEST PIT 1

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 28, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.4								
2									
	0.8	hard from 2.5' (Refusal to digging at 2.5') (no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 1

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 10

LOG OF TEST PIT 2

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 28, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.4								
2									
	0.8	hard from 3' (Refusal to digging at 3') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 2

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 11

LOG OF TEST PIT 3

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 29, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist, trees on surface					7.0		SA
	0.4	ORANGE-BROWN-WHITE-YELLOW SANDY LIMESTONE GRAVEL (GP-GM) - loose, moist (hole kept collapsing)							
2	0.8								
4	1.2						4.4		SA
	1.6								
6	2								
8	2.4	(no free water encountered)							

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Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 3

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 12

LOG OF TEST PIT 4

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 28, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN SANDY SILT (ML) - soft, moist, tall trees and grass on surface					43.8		SA PI=5; LL=30
	0.4								
2		YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - hard							
	0.8	(Refusal to digging at 3') (no free water encountered)							

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LOG OF TEST PIT 4

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 13

LOG OF TEST PIT 5

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 28, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SANDY SILT (ML) - soft, moist, grass and boulders on surface					37.6		-#200=66%
	0.4								
2		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.8								
4	1.2	hard from 4'					9.2		SA
		(Refusal to digging at 4.5')							
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 5

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 14

LOG OF TEST PIT 6

Notes:

- Undisturbed Sample
- Disturbed/Bulk Sample
- SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 30, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN SANDY SILT (ML) - soft, moist, trees on surface							
		YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.4								
2									
	0.8								
	1.2						6.9		
4									
	1.6								
6		hard at 6' (no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 6
GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 15

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

LOG OF TEST PIT 7

DATE May 30, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN SANDY SILT (ML) - soft, moist, trees on surface, and exposed coral head							
	0.4	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard (Refusal to digging at 2') (no free water encountered)							
2									

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 7

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
16

LOG OF TEST PIT 8

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 30, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE / DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, trees on surface						
	0.4							
2						13.5		SA PI=6; LL=35
	0.8							
		REDDISH BROWN SANDY SILT (ML) - soft, moist						
4	1.2					29.1		PI=7; LL=35 -#200=84%
	1.6	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard						
6								
	2							
		hard at 7'						
		(no free water encountered)						

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 8

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 17

LOG OF TEST PIT 9

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 30, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN SANDY CLAYEY SILT (MH) - soft, moist, short grass on surface							
	0.4								
2									
	0.8								
4	1.2	YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	1.6								
6		hard at 6' (Refusal to digging at 6') (no free water encountered)							

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Geotechnical & Material Testing Engineers

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LOG OF TEST PIT 9

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 18

LOG OF TEST PIT 10

Notes:

- Undisturbed Sample
- Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, trees on surface							
	0.4						10.8		
2									
	0.8	REDDISH BROWN-WHITE CORALLINE LIMESTONE - moderately hard					2.0		
4	1.2	hard from 4' (Refusal to digging at 4') (no free water encountered)							

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LOG OF TEST PIT 10

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 19

LOG OF TEST PIT 11

Notes:

- Undisturbed Sample
- Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	YELLOWISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist, trees on surface							
	0.4								
2		LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard, with silt pockets							
	0.8	(Refusal to digging at 2.5')							
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 11

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
20

LOG OF TEST PIT 12

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, trees on surface							
	0.4								
2							6.9		-#200=9%
	0.8	reddish brown-white, dense from 2.5'					5.7		-#200=14%
		LIGHT BROWN-WHITE CORALLINE LIMESTONE -							
4	1.2	moderately hard, with silt pockets							
		hard at 5'							
		(Refusal to digging at 5')							
		(no free water encountered)							

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Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 12

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 21

LOG OF TEST PIT 13

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist, trees on surface					5.7		SA
	0.4	REDDISH BROWN CLAYEY SILT (MH) - soft, moist					44.9		PI=13; LL=55 -#200=99%
2	0.8	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard, with silt pockets							
4	1.2	hard from 4' (Refusal to digging at 4') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 13

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
22

LOG OF TEST PIT 14

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 29, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN-WHITE-YELLOW SILTY SANDY LIMESTONE GRAVEL (GM) - dense, moist, trees on surface							
	0.4						4.6		SA
2									
	0.8	LIGHT BROWN-WHITE CORALLINE LIMESTONE - hard, with silt pockets							
		(Refusal to digging at 3.5')							
		(no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

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LOG OF TEST PIT 14

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 23

LOG OF TEST PIT 15

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	YELLOWISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, trees on surface							
	0.4								
2		REDDISH BROWN-WHITE GRAVELLY SANDY SILT (ML) - soft, moist							
	0.8	LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard, with silt pockets							
4	1.2	hard from 4' (Refusal to digging at 4') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 15

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
24

LOG OF TEST PIT 16

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMETONE GRAVEL (GM) - medium dense, moist, trees on surface					14.3		PI=6; LL=37 -#200=19%
	0.4								
2		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.8	hard from 3' (Refusal to digging at 3') (No free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 16

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
25

LOG OF TEST PIT 17

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 29, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, trees on surface					15.8		SA PI=7; LL=52
	0.4								
2		LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
	0.8								
4	1.2	hard from 4' (Refusal to digging at 4') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 17

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
26

LOG OF TEST PIT 18

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE May 30, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	YELLOWISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, trees on surface					18.1		-#200=31%
	0.4								
2									
	0.8								PI=5; LL=34
		YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - hard							
4	1.2	(Refusal to digging at 4') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 18

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 27

LOG OF TEST PIT 19

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test
based on 63.5 kg (140 lb) hammer
free falling 76 cm (30 in.)/blow

DATE May 30, 2012
EQUIPMENT Excavator
ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - medium dense, moist, short grass on surface					18.3		SA PI=5; LL=30
	0.4	REDDISH BROWN SANDY SILT (ML) - soft, moist					44.4		PI=5; LL=34 -#200=96%
2	0.8								
	1.2	YELLOWISH BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
4	1.6								
6		hard from 6' (Refusal to digging at 6') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 19

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE
28

LOG OF TEST PIT 20

Notes:

Undisturbed Sample

Disturbed/Bulk Sample

SPT = Standard Penetration Test based on 63.5 kg (140 lb) hammer free falling 76 cm (30 in.)/blow

DATE June 01, 2012

EQUIPMENT Excavator

ELEVATION --

DEPTH (FT.)	DEPTH (M.)	DESCRIPTION	GRAPHIC LOG	SAMPLE TYPE	DRILL RATE (time/ft)	SPT (Blows/ft.)	MOISTURE CONTENT, %	DRY DENSITY, pcf	LABORATORY TESTS
0	0	LIGHT BROWN TO RED-BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (GM) - loose, moist, trash, such as tires, metal, GI pipes on surface							
	0.4								
2									
	0.8								
		YELLOWISH LIGHT BROWN-WHITE CORALLINE LIMESTONE - moderately hard							
4	1.2	hard from 4' (Refusal to digging at 4.2') (no free water encountered)							

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Material Testing Engineers

Job No. 436.14 Date 07/06/12

LOG OF TEST PIT 20

GPA-GWA MULTI-PURPOSE FACILITY
FADIAN
MANGILAO, GUAM

PLATE 29

MAJOR DIVISIONS			SYMBOL		TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN # 200 SIEVE)	GRAVELS (MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
			GP		POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
		GRAVELS WITH OVER 12 % FINES	GM		SILTY GRAVEL, SILTY GRAVEL WITH SAND
			GC		CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
	SANDS (MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE)	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
			SP		POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
		SANDS WITH OVER 12 % FINES	SM		SILTY SAND, SILTY SAND WITH GRAVEL
			SC		CLAYEY SAND, CLAYEY SAND WITH GRAVEL
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN # 200 SIEVE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)		ML		SILT, SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY SILT
			CL		LEAN CLAY, LEAN CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY LEAN CLAY
			OL		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)		MH		ELASTIC SILT, ELASTIC SILT WITH SAND OR GRAVEL, SANDY OR GRAVELLY ELASTIC SILT
			CH		FAT CLAY, FAT CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY FAT CLAY
			OH		ORGANIC SILT OR CLAY, ORGANIC SILT OR CLAY WITH SAND OR GRAVEL, SANDY OR GRAVELLY ORGANIC SILT OR CLAY
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION SYSTEM

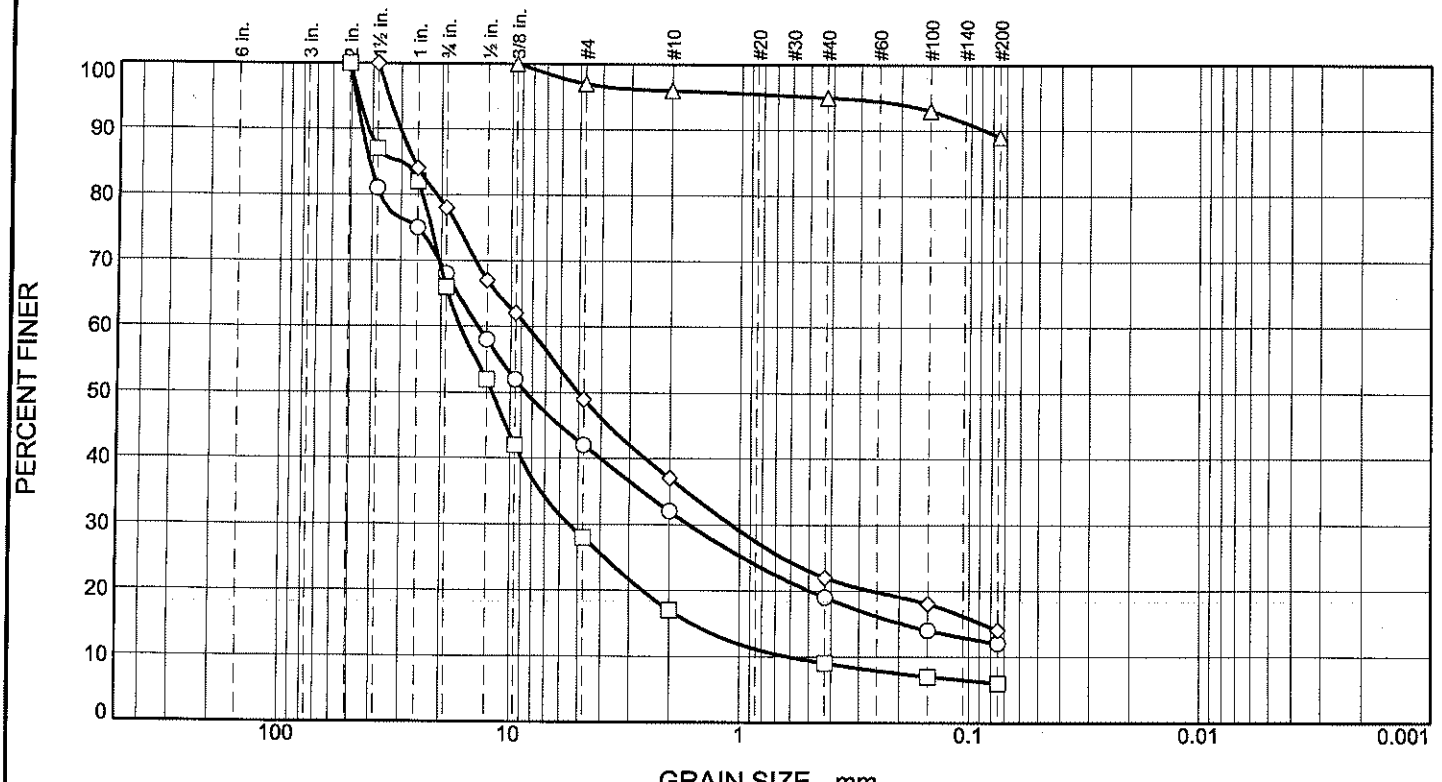
SA	=	Sieve Analysis with Hydrometer (ASTM C117/C136)
LL	=	Liquid Limit (ASTM D4318)
PI	=	Plasticity Index (ASTM D4318)
-#200	=	Minus No. 200 Mesh Sieve (ASTM C117)
MDD	=	Laboratory Compaction (ASTM D698)
CBR	=	California Bearing Ratio (ASTM D1883)

BLOW COUNTS REPORTED FOR UNDISTURBED SAMPLES ARE CORRECTED TO REPRESENT EQUIVALENT STANDARD PENETRATION TEST BLOW COUNTS

☒ DISTURBED SAMPLE ■ RELATIVELY UNDISTURBED SAMPLE

GEO-ENGINEERING & TESTING, INC. **Geotechnical & Material Testing Engineers**	**SOIL CLASSIFICATION CHART AND KEY TO TEST DATA**	**PLATE**
Job No. 436.14 Appr. U.S. Date: 07/16/12	GPA-GWA MULTI-PURPOSE FACILITY FADIAN, MANGILAO GUAM	**30**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	32	26	10	13	7	12	
□	0	34	38	11	8	3	6	
△	0	0	3	1	1	6	89	
◇	0	22	29	12	15	8	14	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			41.2332	13.8713	8.5108	1.6488	0.1953			
□			30.1334	16.5870	11.9542	5.4690	1.6079	0.6212	2.90	26.70
△	30	25								
◇			26.3121	8.4658	5.0202	1.0865	0.0877			

Material Description	USCS	AASHTO
○ LIGHT BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
□ ORANGE-BROWN-WHITE-YELLOW SANDY LIMESTONE GRAVEL	GM	
△ REDDISH BROWN SANDY SILT	ML	
◇ LIGHT BROWN-WHITE CORALLINE LIMESTONE	ROCK	

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY

○ **Source of Sample:** TP-3 **Depth:** 0.5

□ **Source of Sample:** TP-3 **Depth:** 4

△ **Source of Sample:** TP-4 **Depth:** 1

◇ **Source of Sample:** TP-5 **Depth:** 4

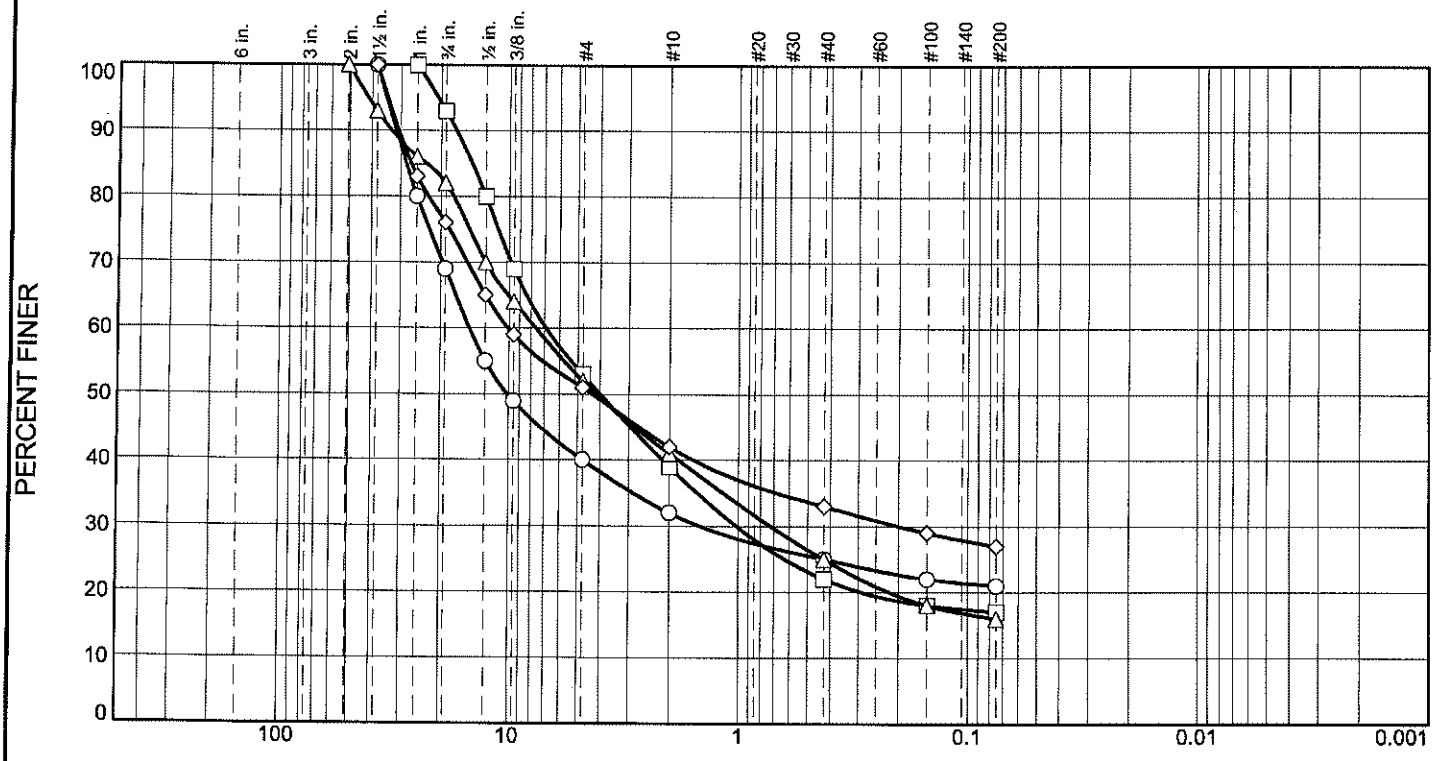
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 31

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	31	29	8	7	4	21	
□	0	7	40	14	17	5	17	
△	0	18	30	11	16	9	16	
◇	0	24	25	9	9	6	27	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	35	29	28.3814	14.9008	10.0982	1.4719				
□			14.6076	6.8981	3.9774	1.0173				
△			23.2684	7.6227	4.1492	0.7226				
◇	52	45	26.9889	10.0836	4.2999	0.1998				

Material Description	USCS	AASHTO
○ REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	
□ REDDISH BROWN SILTY SANDY LIMESTONE GRAVEL	GM	
△ LIGHT BROWN-WHITE-YELLOW SILTY SANDY LIMESTONE GRAVEL	GM	
◇ REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY

○ **Source of Sample:** TP-8 **Depth:** 2

□ **Source of Sample:** TP-13 **Depth:** 0.5

△ **Source of Sample:** TP-14 **Depth:** 1.5

◇ **Source of Sample:** TP-17 **Depth:** 1

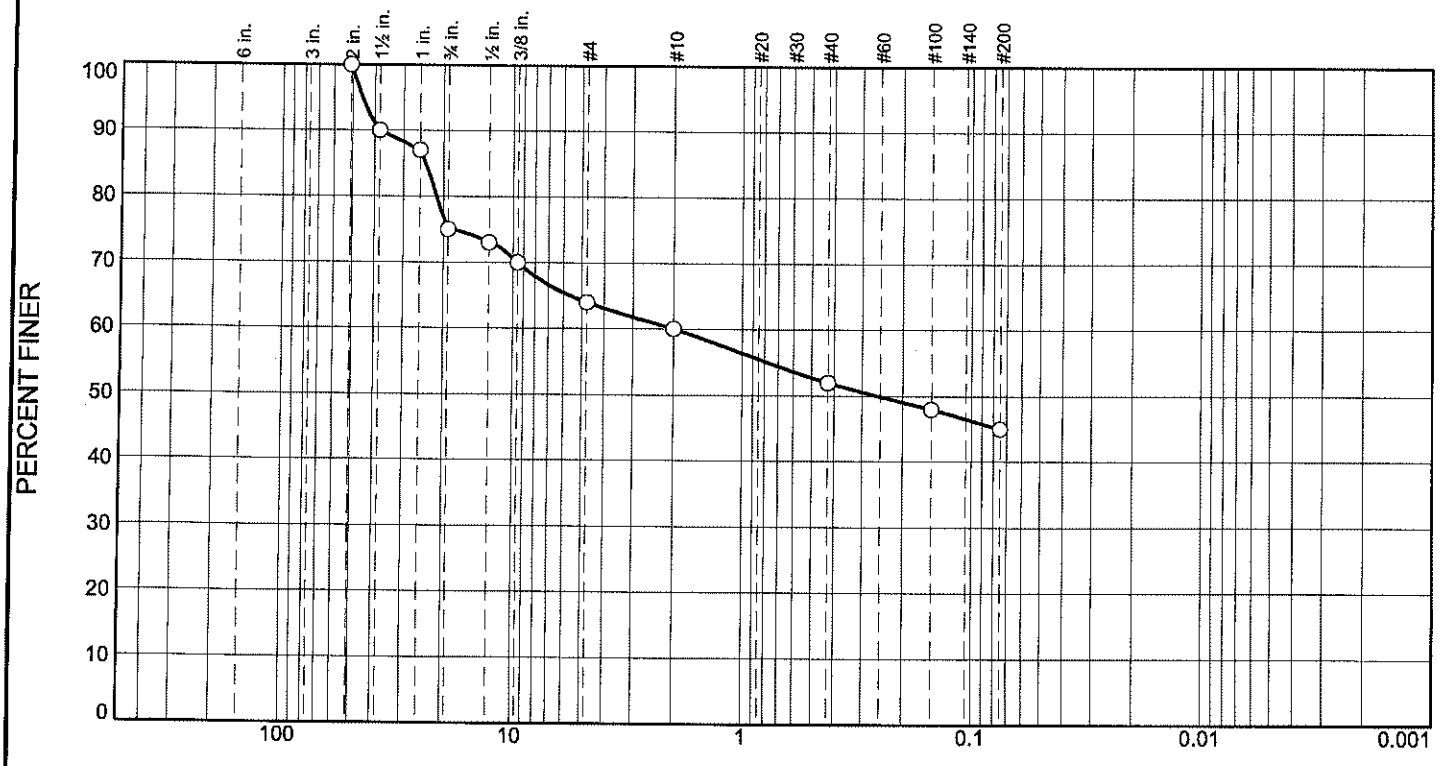
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 32

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	25	11	4	8	7	45	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	30	25	23.9946	2.0000	0.2568					

	Material Description	USCS	AASHTO
○	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	GM	

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY

○ **Source of Sample:** TP-19 **Depth:** 1.0

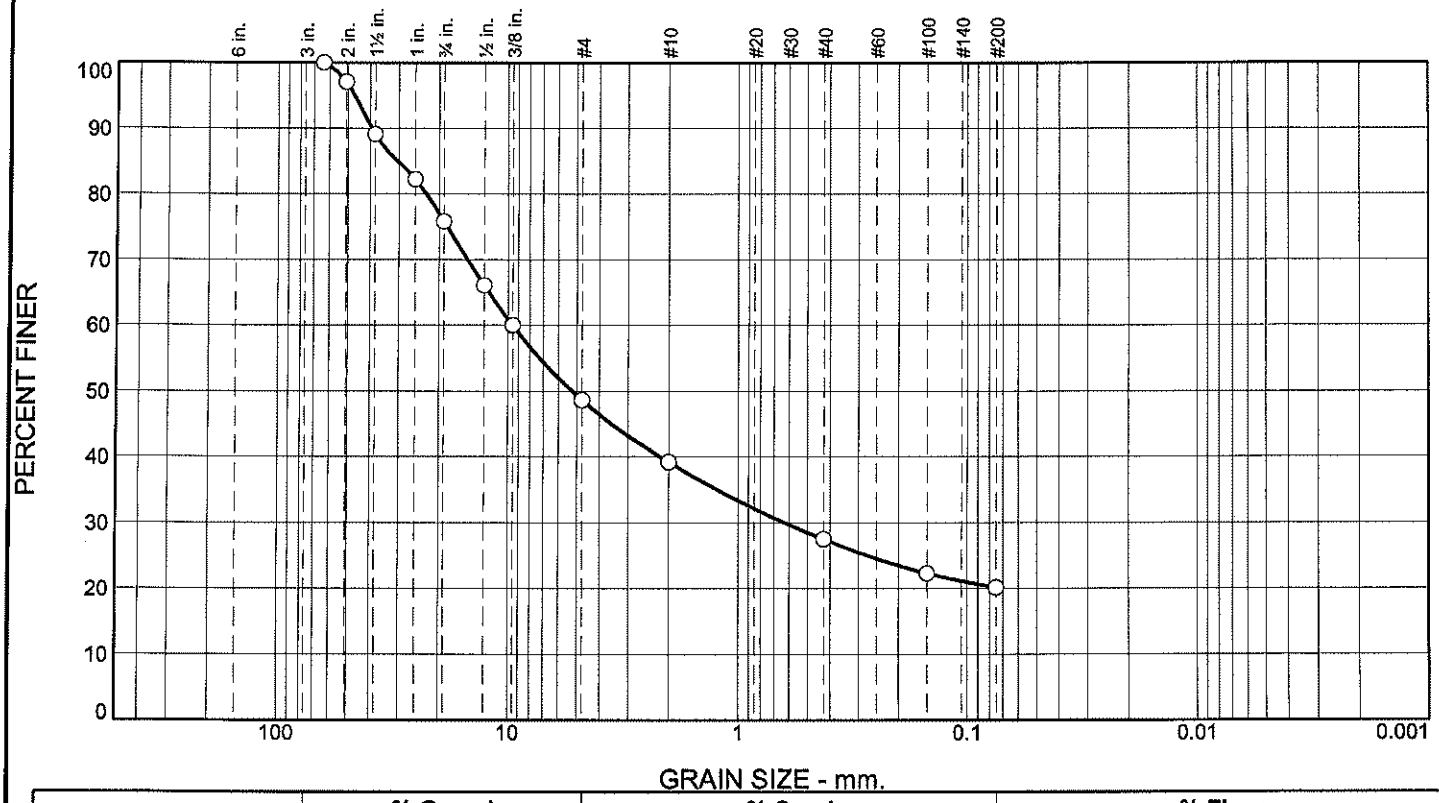
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 33

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0	24	27	10	11	8	20	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	30.5287	9.5250	5.2240	0.6287				

Material Description	USCS	AASHTO
○ REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (Bulk Sample)	GM	

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY

○ **Source of Sample:** R-1 & R-2 (Combined) **Depth:** 0.25

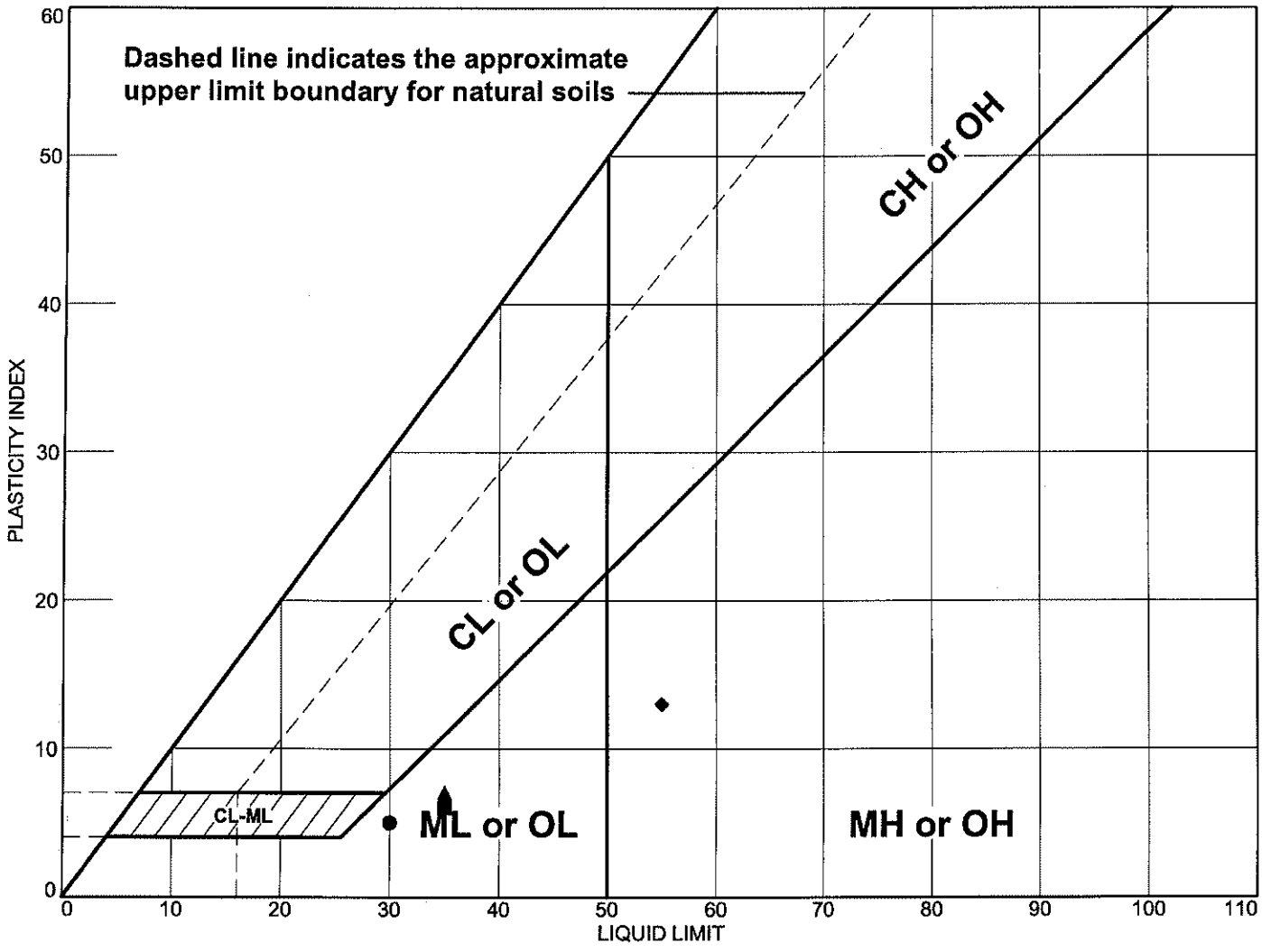
Remarks:

GEO-ENGINEERING & TESTING, INC.

Geotechnical & Materials Testing Engineers

Plate 34

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN SANDY SILT	30	25	5	95	89	ML
■	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	35	29	6	25	21	GM
▲	REDDISH BROWN SANDY SILT	35	28	7	--	--	ML
◆	REDDISH BROWN CLAYEY SILT	55	42	13	--	--	MH

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY
FADIAN

● **Source of Sample:** TP-4 **Depth:** 1
■ **Source of Sample:** TP-8 **Depth:** 2
▲ **Source of Sample:** TP-8 **Depth:** 4
◆ **Source of Sample:** TP-13 **Depth:** 2

Remarks:
● This test was performed on sample portion passing No. 40 sieve only.

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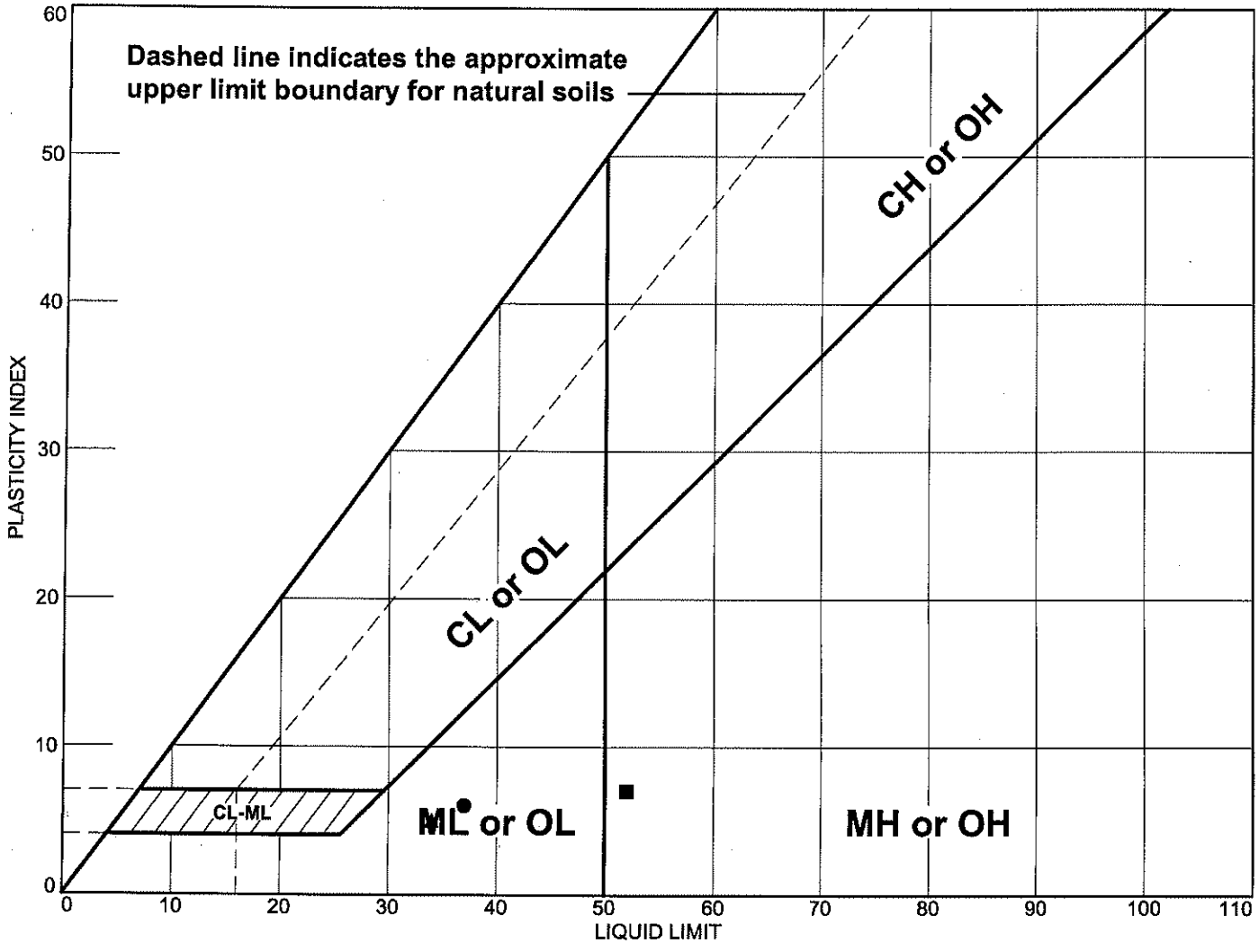
Plate 35

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	37	31	6	--	--	GM
■	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	52	45	7	33	27	GM
▲	YELLOWISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	34	29	5	--	--	GM

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY
FADIAN

● **Source of Sample:** TP-16 **Depth:** 1

■ **Source of Sample:** TP-17 **Depth:** 1

▲ **Source of Sample:** TP-18 **Depth:** 2.5

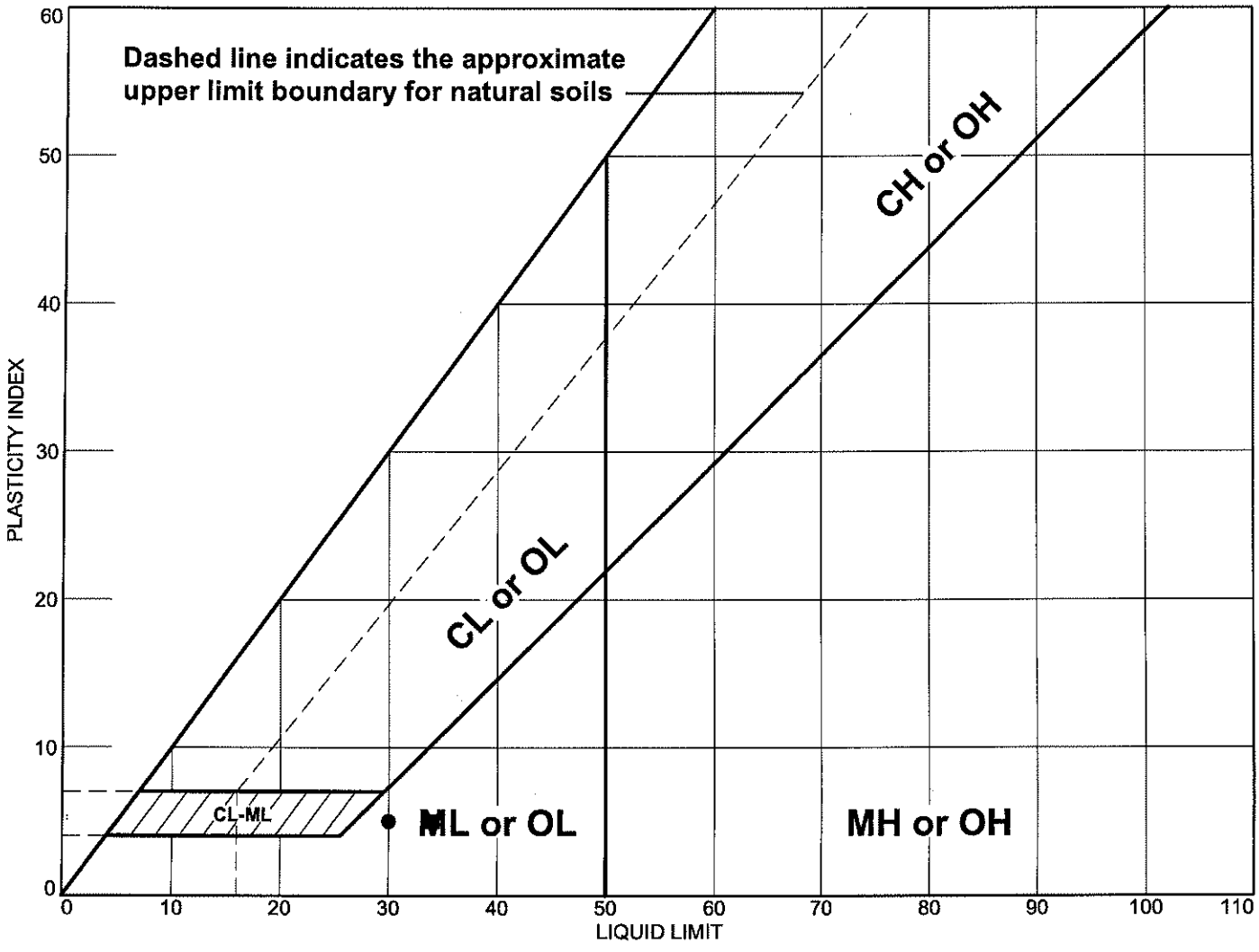
Remarks:

● This test was performed on sample portion passing No. 40 sieve only.

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 36

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL	30	25	5	52	45	GM
■	REDDISH BROWN SANDY SILT	34	29	5	--	--	ML

Project No. 436.14 **Client:** RIM ARCHITECTS

Project: GPA-GWA MULTI-PURPOSE FACILITY
FADIAN

● **Source of Sample:** TP-19 **Depth:** 1.0

■ **Source of Sample:** TP-19 **Depth:** 2.5

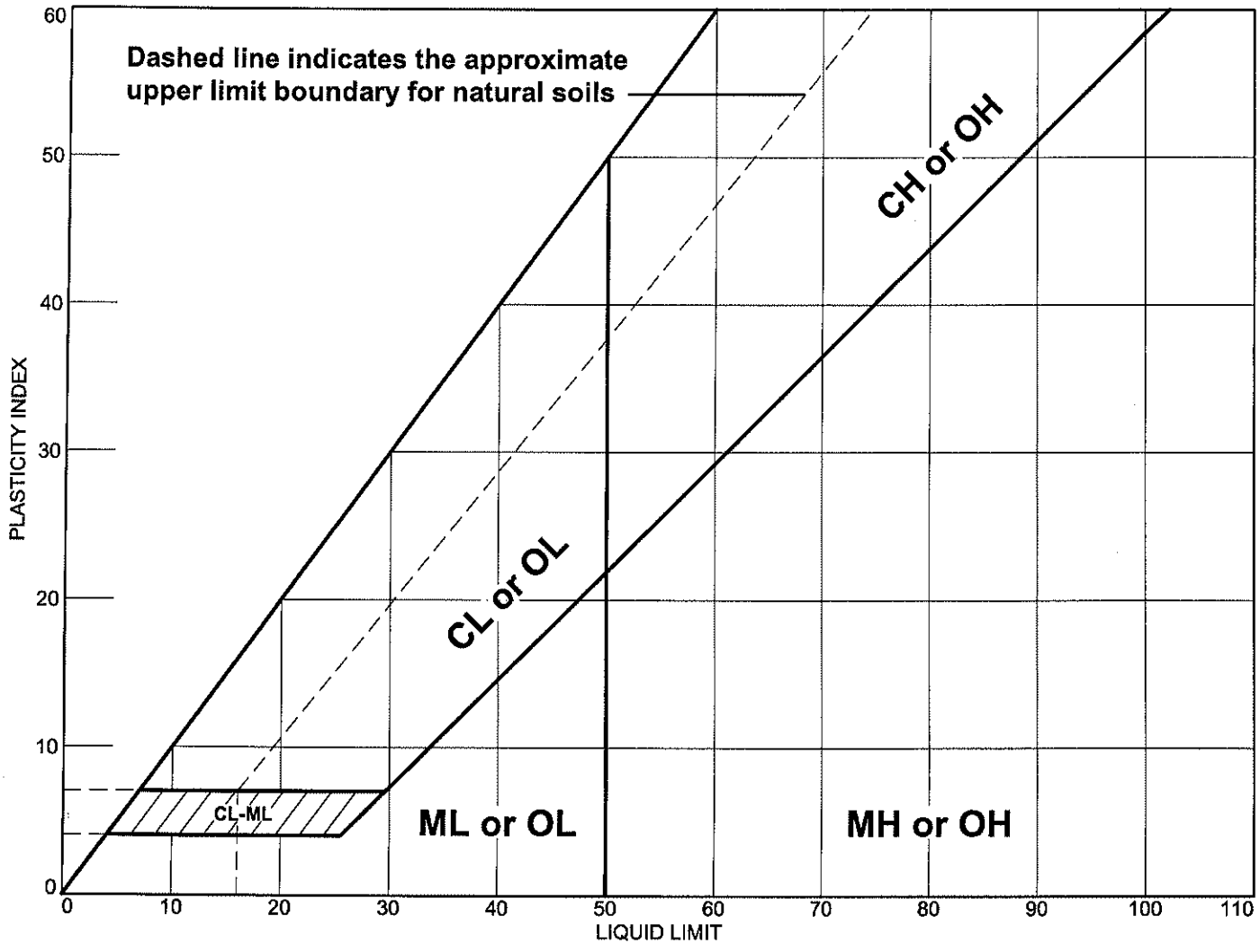
Remarks:

● This test was performed on sample portion passing No. 40 sieve only.

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 37

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (Bulk Sample)	NP	NP	NP	28	20	GM

Project No. 436.14 **Client:** RIM ARCHITECTS

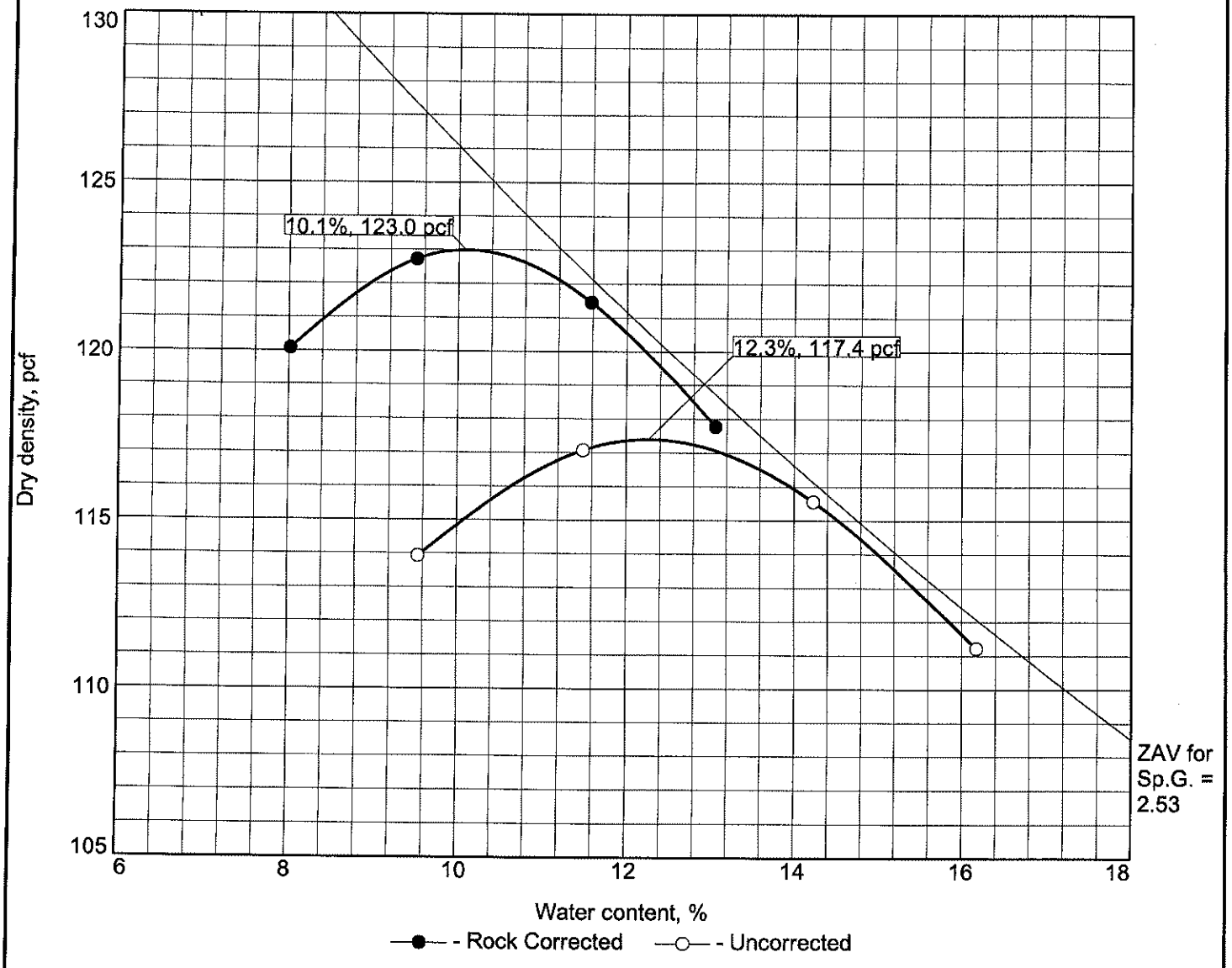
Project: GPA-GWA MULTI-PURPOSE FACILITY
FADIAN

● **Source of Sample:** R-1 & R-2 (Combined) **Depth:** 0.25

Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 38



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
0.25	GM	A-1-b		2.53	NP	NP	24	20

ROCK CORRECTED TEST RESULTS	UNCORRECTED	MATERIAL DESCRIPTION
Maximum dry density = 123.0 pcf	117.4 pcf	REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (Bulk Sample)
Optimum moisture = 10.1 %	12.3 %	

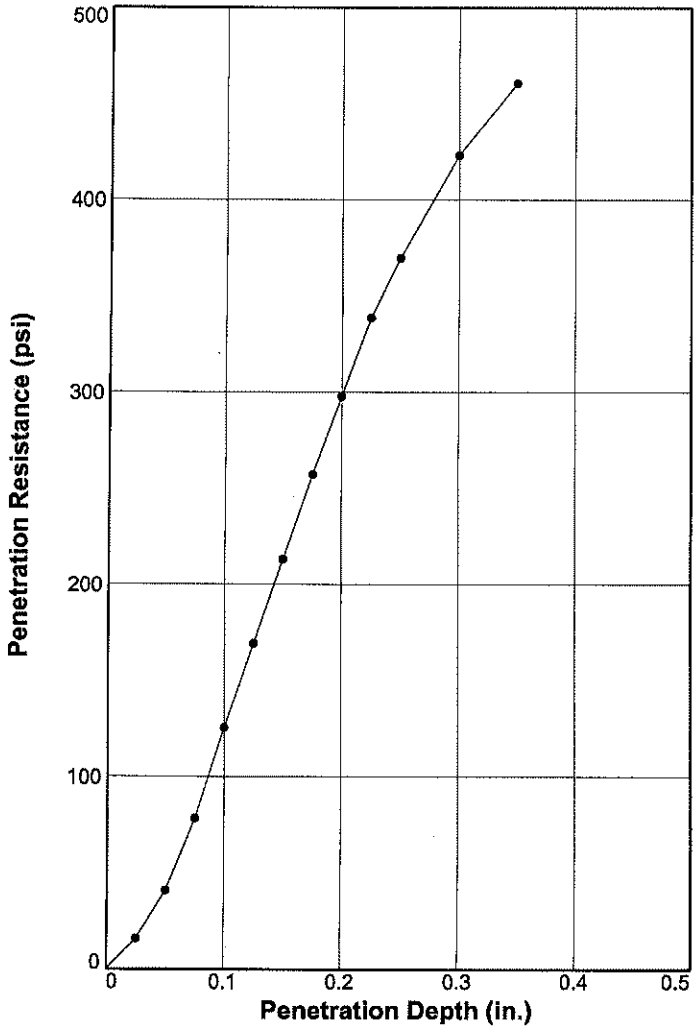
Project No. 436.14 **Client:** RIM ARCHITECTS
Project: GPA-GWA MULTI-PURPOSE FACILITY
FADIAN **Date:**
○ **Source of Sample:** R-1 & R-2 (Combined) **Depth:** 0.25

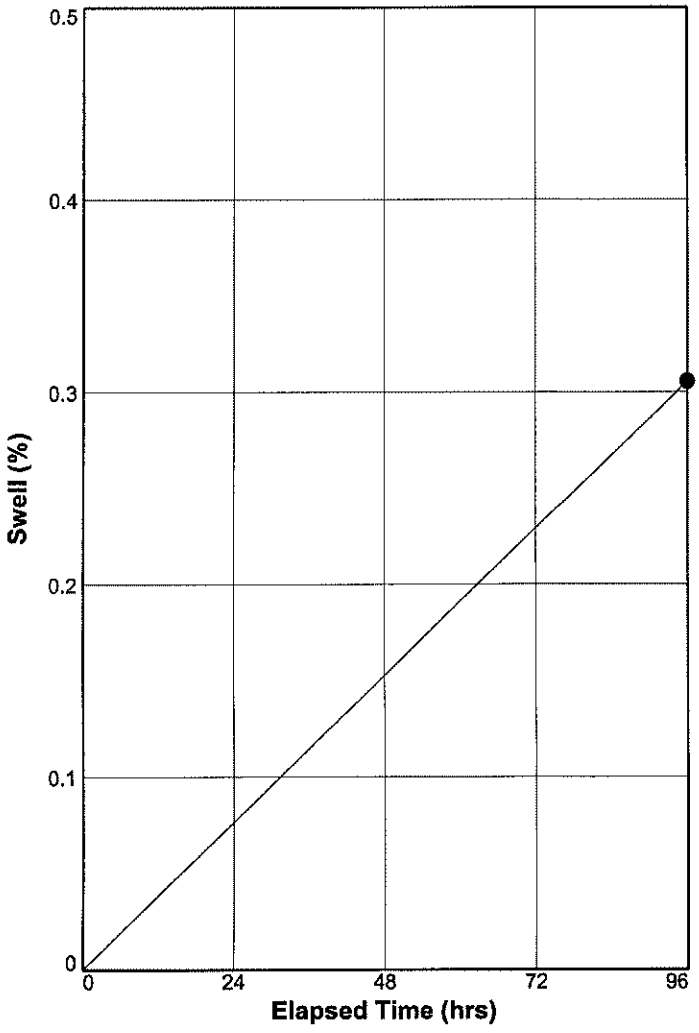
Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 39

BEARING RATIO TEST REPORT
ASTM D 1883-07





	Molded			Soaked			CBR (%)		Linearity Correction (in.)	Surcharge (lbs.)	Max. Swell (%)
	Density (pcf)	Percent of Max. Dens.	Moisture (%)	Density (pcf)	Percent of Max. Dens.	Moisture (%)	0.10 in.	0.20 in.			
1 ○	118.8	96.6	11.9	118.5	96.3	14.9	17.7	22.9	0.029	10	0.3
2 △											
3 □											

Material Description	USCS	Max. Dens. (pcf)	Optimum Moisture (%)	LL	PI
REDDISH BROWN-WHITE SILTY SANDY LIMESTONE GRAVEL (Bulk Sample)	GM	123.0	10.1	NP	NP

Project No: 436.14

Project: GPA-GWA MULTI-PURPOSE FACILITY FADIAN

Source of Sample: R-1 & R-2 (Combined) **Depth:** 0.25

Date:

Test Description/Remarks:

GEO-ENGINEERING & TESTING, INC.
Geotechnical & Materials Testing Engineers

Plate 40

APPENDIX S ELECTRICAL PANEL SCHEDULE and POWER ONE-LINE DIAGRAM

PANELBOARD "L1A" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	720			LOAD
LOAD		720		20	12	3		4	12	20		720		LOAD
LOAD			540	20	12	5		6	12	20			540	LOAD
LOAD	540			20	12	7		8	12	20	540			LOAD
LOAD		720		20	12	9		10	12	20		720		LOAD
LOAD			540	20		11		12	12	20			1,080	LOAD
LOAD	360			20	12	13		14	12	20	1,080			LOAD
LOAD		540		20	12	15		16	12	20		1,500		LOAD
LOAD			520	20	12	17		18	12	20			1,500	LOAD
LOAD	720			20	12	19		20	12	20	500			LOAD
LOAD		1,080		20	12	21		22	12	20		720		LOAD
LOAD			1,250	20	12	23		24	12	20			720	LOAD
LOAD	900			20	12	25		26	12	20	720			LOAD
LOAD		720		20	12	27		28	12	20		1,080		LOAD
LOAD			720	20	12	29		30	12	20			1,080	LOAD
LOAD	1,080			20	12	31		32	12	20	540			LOAD
LOAD		1,000		20	12	33		34	10	30		1,600		LOAD
LOAD			1,000	20		35		36	12	20			500	LOAD
SPARE				20		37		38		20				SPARE 9
SPARE				20		39		40		20				SPARE
SPARE				20		41		42		20				SPARE
TOTAL	4,320	4,780	4,570								4,100	6,340	5,420	TOTAL

TOTAL CONNECTED LOAD (VA): A = 8420 B = 11120 C = 9990

PANELBOARD "L1B" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,080			20	12	1		2	12	20	1,080			LOAD
LOAD		720		20	12	3		4	12	20		720		LOAD
LOAD			900	20	12	5		6	12	20			720	LOAD
LOAD	720			20	12	7		8	12	20	360			LOAD
LOAD		720		20	12	9		10	12	20		1,080		LOAD
LOAD			1,080	20	12	11		12	12	20			720	LOAD
LOAD	360			20	12	13		14	12	20	1,080			LOAD
LOAD		540		20	12	15		16	12	20		720		LOAD
LOAD			720	20	12	17		18	12	20			720	LOAD
LOAD	720			20	12	19		20	12	20	1,080			LOAD
LOAD		900		20	12	21		22	12	20		720		LOAD
LOAD			1,080	20	12	23		24	12	20			1,080	LOAD
LOAD	360			20	12	25		26	12	20	1,080			LOAD
LOAD		1,250		20	12	27		28	12	20		540		LOAD
LOAD			900	20	12	29		30	12	20			720	LOAD
LOAD	1,320			20	12	31		32	12	20	500			LOAD
LOAD		1,320		20	12	33		34	12			500		LOAD
LOAD			800	20	12	35		36						SPACE
SPARE				20		37		38						SPACE
SPARE				20		39		40						SPACE
SPARE				20		41		42						SPACE
TOTAL	4,560	5,450	5,480								5,180	4,280	3,960	TOTAL

TOTAL CONNECTED LOAD (VA): A = 9740 B = 9730 C = 9440

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PANELBOARD "L1C" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	500			20	12	1		2	12	20	1,200			LOAD
LOAD		1,200		20	12	3		4	12	20		1,200		LOAD
LOAD			1,200	20	12	5		6	12	20			1,500	LOAD
LOAD	1,500			20	12	7		8	12	20	1,500			LOAD
LOAD		1,000		20	12	9		10	12	20		1,000		LOAD
LOAD			1,000	20	12	11		12	12	20			1,000	LOAD
LOAD	900			20	12	13		14	12	20	360			LOAD
LOAD		720		20	12	15		16	12	20		500		LOAD
LOAD			500	20	12	17		18	12	20			1,000	LOAD
LOAD	1,000			20	12	19		20	12	20	900			LOAD
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	3,900	2,920	2,700								3,960	2,700	3,500	TOTAL

TOTAL CONNECTED LOAD (VA): A = 7860 B = 5620 C = 6200

PANELBOARD "L2A" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	540			20		1		2	12	20	540			LOAD
LOAD		720		20	12	3		4	12	20		360		LOAD
LOAD			900	20	12	5		6	12	20			360	LOAD
LOAD	1,080			20	12	7		8	12	20	720			LOAD
LOAD		900		20	12	9		10	12	20		720		LOAD
LOAD			360	20	12	11		12	12	20			540	LOAD
LOAD	540			20	12	13		14	12	20	1,000			LOAD
LOAD		720		20	12	15		16	12	20		1,000		LOAD
LOAD			720	20	12	17		18	12	20			720	LOAD
LOAD	500			20	12	19		20	12	20	360			LOAD
LOAD		720		20	12	21		22	12	20		1,500		LOAD
LOAD			1,500	20	12	23		24	12	20			1,500	LOAD
LOAD	900			20	12	25		26	12	20	1,500			LOAD
LOAD		900		20	12	27		28				900		LOAD
LOAD			1,320	20	12	29		30						SPACE
LOAD	1,320			20	12	31		32						SPACE
LOAD		1,320		20	12	33		34						SPACE
LOAD			800	20	12	35		36						SPACE
SPARE				20		37		38						SPACE
SPARE				20		39		40						SPACE
SPARE				20		41		42						SPACE
TOTAL	4,880	5,280	5,600								4,120	4,480	3,120	TOTAL

TOTAL CONNECTED LOAD (VA): A = 9000 B = 9760 C = 8720

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Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
9	REVISION 9		11.07.2013	
12	REVISION 12	JRL	03.21.2014	

RIM ARCHITECTS — GUAM — CALIFORNIA · ALASKA · HAWAII — 310 HERNAN CORTEZ AVE. SUITE 201 HAGATNA, GUAM 96910 Phone: 671.477.2111 Fax: 671.477.2511 www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.: 124014 - ELECT
PROJECT TITLE: GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC | CHECKED BY: WW
DRAWN BY: VC | APPROVED BY: GPA
SHEET CONTENTS: PANEL SCHEDULES
ENGINEER SUPERVISOR: PERRY B. TALADOC
MANAGER OF ENGINEERING: JOVEN G. ACOSTA, P.E.
DATE: 2012.11.06 | J.O. NO.: 100134 | SCALE: 1/8" = 1'-0" | SHT 417 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS: MELINDA R. CAMACHO, P.E.
DATE | GENERAL MANAGER: JOAQUIN C. FLORES, P.E. | SHEET: E-811

PANELBOARD "L2B" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	900			LOAD
LOAD		720		20	12	3		4	12	20		360		LOAD
LOAD			720	20	12	5		6	12	20			720	LOAD
LOAD	540			20	12	7		8	12	20	1,000			LOAD
LOAD		540		20	12	9		10	12	20		1,000		LOAD
LOAD			720	20	12	11		12	12	20			1,500	LOAD
LOAD	540			20	12	13		14	12	20	1,500			LOAD
LOAD		720		20	12	15		16	12	20		500		LOAD
LOAD			720	20	12	17		18	12	20			1,000	LOAD
LOAD	720			20	12	19		20	12	20	1,000			LOAD
LOAD		900		20	12	21		22	12	20		1,000		LOAD
LOAD			900	20	12	23		24	12	20			1,000	LOAD
LOAD	540			20	12	25		26	12	20	1,250			LOAD
LOAD			1,080	20	12	27		28	12	20		1,080		LOAD
LOAD	1,080			20	12	29		30	12	20			540	LOAD
LOAD		800		20	12	31		32						SPACE
SPARE				20		33		34						SPACE
SPARE				20		35		36						SPACE
SPARE				20		37		38						SPACE
SPARE				20		39		40						SPACE
SPARE				20		41		42						SPACE
TOTAL	4,140	3,680	4,140								5,650	3,940	4,760	TOTAL

TOTAL CONNECTED LOAD (VA): A = 9790 B = 7620 C = 8900

PANELBOARD "L2C" SCHEDULE

100A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	1,250			LOAD
LOAD		720		20	12	3		4	12	20		720		LOAD
LOAD			720	20	12	5		6	12	20			720	LOAD
LOAD	1,080			20	12	7		8	12	20	720			LOAD
LOAD		1,080		20	12	9		10	12	20		720		LOAD
LOAD			1,080	20	12	11		12	12	20			1,080	LOAD
LOAD	1,080			20	12	13		14	12	20	720			LOAD
LOAD		1,080		20	12	15		16	12	20		1,250		LOAD
LOAD			1,250	20	12	17		18	12	20			900	LOAD
LOAD	540			20	12	19		20	12	20	1,080			LOAD
LOAD		900		20	12	21		22	12	20		1,080		LOAD
LOAD			1,200	20		23		24	12	20			1,080	LOAD
LOAD	900			20	12	25		26	12	20	1,080			LOAD
LOAD		900		20	12	27		28	12	20		1,200		LOAD
LOAD			720	20	12	29		30	12	20			1,200	LOAD
LOAD	540			20	12	31		32	12	20	1,200			LOAD
LOAD		540		20	12	33		34	12	20		540		LOAD
LOAD			720	20	12	35		36	12	20			500	LOAD
LOAD	720			20	12	37		38	12	20	800			LOAD
LOAD		800		20	12	39		40	12	20		800		LOAD
LOAD			800	20	12	41		42		20				SPARE
TOTAL	5,580	6,020	6,490											TOTAL

TOTAL CONNECTED LOAD (VA): A = 12430 B = 12330 C = 11970

PANELBOARD "L3A" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	720			LOAD
LOAD		900		20	12	3		4	12	20		720		LOAD
LOAD			900	20	12	5		6	12	20			720	LOAD
LOAD	1,080			20	12	7		8	12	20	360			LOAD
LOAD		1,080		20	12	9		10	12	20		900		LOAD
LOAD			900	20	12	11		12	12	20			1,080	LOAD
LOAD	720			20	12	13		14	12	20	900			LOAD
LOAD		900		20	12	15		16	12	20		900		LOAD
LOAD			900	20	12	17		18	12	20			1,080	LOAD
LOAD	1,080			20	12	19		20	12	20	900			LOAD
LOAD		1,080		20	12	21		22	12	20		900		LOAD
LOAD			900	20	12	23		24	12	20			720	LOAD
LOAD	1,080			20	12	25		26	12	20	1,080			LOAD
LOAD		360		20	12	27		28	12	20		1,080		LOAD
LOAD			720	20	12	29		30	12	20			720	LOAD
LOAD	540			20	12	31		32	12	20	1,200			LOAD
LOAD		540		20	12	33		34	12	20		720		LOAD
LOAD			1,200	20	12	35		36	12	20			720	LOAD
LOAD	1,200			20	12	37		38	12	20	1,200			LOAD
SPARE				20		39		40	12	20		300		LOAD
SPARE				20		41		42		20				SPARE
TOTAL	6,420	4,860	5,520								6,360	5,520	5,040	TOTAL

TOTAL CONNECTED LOAD (VA): A = 12780 B = 10380 C = 10560

PANELBOARD "L3B" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,500			20	12	1		2	12	20	720			LOAD
LOAD		1,000		20	12	3		4	12	20		360		LOAD
LOAD			1,000	20	12	5		6	12	20			540	LOAD
LOAD	1,500			20	12	7		8	12	20	360			LOAD
LOAD		900		20	12	9		10	12	20		1,500		LOAD
LOAD			720	20	12	11		12	12	20			1,500	LOAD
LOAD	500			20	12	13		14	12	20	1,080			LOAD
LOAD		900		20	12	15		16	12	20		540		LOAD
LOAD			720	20	12	17		18	12	20			900	LOAD
LOAD	540			20	12	19		20	12	20	900			LOAD
LOAD		720		20	12	21		22	12	20		720		LOAD
LOAD			540	20	12	23		24	12	20			540	LOAD
LOAD	720			20	12	25		26	12	20	720			LOAD
LOAD		540		20	12	27		28	12	20		540		LOAD
LOAD			1,500	20	12	29		30	12	20			360	LOAD
LOAD	1,500			20	12	31		32	12	20	1,500			LOAD
LOAD		1,200		20	12	33		34	12	20		1,200		LOAD
LOAD			1,200	20	12	35		36	12	20			1,200	LOAD
LOAD	360			20	12	37		38	12	20	720			LOAD
LOAD		720		20	12	39		40	12	20		500		LOAD
LOAD			1,400	20	12	41		42	12	20			360	LOAD
TOTAL	6,620	5,980	7,080								6,000	5,360	5,400	TOTAL

TOTAL CONNECTED LOAD (VA): A = 12620 B = 11340 C = 12480

12. REVISION 12 JRL 03.21.2014

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
1	REVISION 1		1.10.2013	
9	REVISION 9		11.07.2013	

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GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO: 124014 - ELECT	PROJECT TITLE: GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC / CHECKED BY: WW	
DRAWN BY: VC / APPROVED BY: GPA	SHEET CONTENTS: PANEL SCHEDULES
ENGINEER SUPERVISOR: PERRY B. TALADOC	
MANAGER OF ENGINEERING: JOVEN G. ACOSTA, P.E.	DATE: 2012.11.06 / J.O. NO.: 100134 / SCALE: 1/8" = 1'-0" / SHT 418 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS: MELINDA R. CAMACHO, P.E.	DATE: / GENERAL MANAGER: JOAQUIN C. FLORES, P.E. / SHEET: E-812

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

PANELBOARD "L3C" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,100			20	12	1		2	12	20	720			LOAD
LOAD		360		20	12	3		4	12	20		500		LOAD
LOAD			540	20	12	5		6	12	20			180	LOAD
LOAD	900			20	12	7		8	10	30	2,500			LOAD
LOAD		720		20	12	9		10				2,500		
LOAD			900	20	12	11		12	12	20			1,080	LOAD
LOAD	720			20	12	13		14	12	20	540			LOAD
LOAD		900		20	12	15		16	12	20		720		LOAD
LOAD			540	20	12	17		18	12	20			1,500	LOAD
LOAD	540			20	12	19		20	12	20	1,500			LOAD
LOAD		540		20	12	21		22	12	20		360		LOAD
LOAD			540	20	12	23		24	12	20			720	LOAD
LOAD	540			20	12	25		26	12	20	1,200			LOAD
LOAD		540		20	12	27		28	12	20		540		LOAD
LOAD			540	20	12	29		30	12	20			540	LOAD
LOAD	360			20	12	31		32	12	20	1,200			LOAD
LOAD		900		20	12	33		34	12	20		1,320		LOAD
LOAD			700	20	12	35		36	12	20			1,320	LOAD
LOAD	700			20	12	37		38	12	20	1,000			LOAD
LOAD		800		20	12	39		40	12	20		500		LOAD
LOAD			800	20	12	41		42	12	20			800	LOAD
TOTAL	4,860	4,760	4,560								8,660	6,440	6,140	TOTAL

TOTAL CONNECTED LOAD (VA): A = 13520 B = 11200 C = 10700

PANELBOARD "H3" SCHEDULE

2 100A MCB, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	3,304			20	12	1		2	12	20	3,444			LOAD
LOAD		2,940		20	12	3		4	12	20		3,192		LOAD
LOAD			2,856	20	12	5		6	12	20			2,352	LOAD
LOAD	2,772			20	12	7		8	12	20	3,024			LOAD
LOAD		3,692		20	12	9		10	12	20		5,040		LOAD
LOAD			4,032	20	12	11		12	12	20			2,800	LOAD
SPARE				20		13		14						SPACE
SPARE				20		15		16						SPACE
SPARE				20		17		18						SPACE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	6,076	6,632	6,888								6,468	8,232	5,152	TOTAL

TOTAL CONNECTED LOAD (VA): A = 12544 B = 14864 C = 12040

PANELBOARD "H1" SCHEDULE

4 100A MCB, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	3,528			20	12	1		2	12	20	2,352			LOAD
LOAD		2,100		20	12	3		4	12	20		4,282		LOAD
LOAD			4,032	20	12	5		6	12	20			2,716	LOAD
SPARE	0			20		7		8	12	20				SPARE
		0				9		10	12	20				SPARE
			0			11		12	12	20				SPARE
SPARE				20	12	13		14	12	20				SPARE
SPARE				20	12	15		16	12	20				SPARE
SPARE				20	12	17		18	12	20				SPARE
SPARE				20	12	19		20	12	20				SPARE
SPARE				20	12	21		22	12	20				SPARE
SPARE				20	12	23		24	12	20				SPARE
SPARE				20	12	25		26	12	20				SPARE
SPARE				20	12	27		28	12	20				SPARE
SPARE				20	12	29		30	12	20				SPARE
TOTAL	3,528	2,100	4,032								2,352	4,282	2,716	TOTAL

TOTAL CONNECTED LOAD (VA): A = 5880 B = 6382 C = 6748

PANELBOARD "H2" SCHEDULE

4 2 100A MCB, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	3,304			20	12	1		2	12	20	3,444			LOAD
LOAD		2,940		20	12	3		4	12	20		3,192		LOAD
LOAD			2,856	20	12	5		6	12	20			2,352	LOAD
LOAD	2,772			20	12	7		8	12	20	3,024			LOAD
LOAD		3,692		20	12	9		10	12	20		5,040		LOAD
LOAD			4,032	20	12	11		12	12	20			2,800	LOAD
SPARE				20		13		14						SPACE
SPARE				20		15		16						SPACE
SPARE				20		17		18						SPACE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	6,076	6,632	6,888								6,468	8,232	5,152	TOTAL

TOTAL CONNECTED LOAD (VA): A = 12544 B = 14864 C = 12040

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

12 REVISION 12 JRL 03.21.2014

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
2	REVISION 2		01/18/2013	
4	REVISION 4		03/19/2013	

RIM ARCHITECTS GUAM — CALIFORNIA ALASKA HAWAII — 316 HERMAN CORTEZ AVE. SUITE 201 HAGATNA, GUAM 96910 Phone: 671.477.2143 Fax: 671.477.2144 www.rimarchitects.com

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

WILSON & ASSOCIATES CONSULTING ENGINEERS INC

PROJECT NO'S	124014 - ELECT
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC	CHECKED BY: WW
DRAWN BY: VC	APPROVED BY: GPA
SHEET CONTENTS	PANEL SCHEDULES
ENGINEER SUPERVISION	PERRY B. TALADOC
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	419 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS	MELINDA R. CAMACHO, P.E.
DATE	
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-813

PANELBOARD "M" SCHEDULE

600A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	45,672			250	250	1		2	250	250	45,672			LOAD
		45,672				3		4				45,672		
			45,672			5		6					45,672	
LOAD	4,706			30	10	7		8	10	30	4,706			LOAD
		4,706				9		10				4,706		
			4,706			11		12					4,706	
LOAD	2,491			15	12	13		14	12	15	2,491			LOAD
		2,491				15		16				2,491		
			2,491			17		18					2,491	
LOAD	2,491			15	12	19		20	12	15	2,491			LOAD
		2,491				21		22				2,491		
			2,491			23		24					2,491	
LOAD	2,491			15	12	25		26	8	50	6,920			LOAD
		2,491				27		28				6,920		
			2,491			29		30					6,920	
LOAD	6,920			50	8	31		32	1/0	150	28,990			PANEL M1
		6,920				33		34				28,990		
			6,920			35		36					28,990	
LOAD	63,759			300	350	37		38	2	100	19,752			PANEL M3
		63,759				39		40				19,752		
			63,759			41		42					19,752	
TOTAL	128,530	128,530	128,530								111,022	111,022	111,022	TOTAL

TOTAL CONNECTED LOAD (VA): A = 239552 B = 239552 C = 239552

PANELBOARD "M3" SCHEDULE

100A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	9,576			50	6	1		2	6	50	9,576			LOAD
		9,576				3		4				9,576		
			9,576			5		6					9,576	
LOAD	300			15	12	7		8	12	15	300			LOAD
		300				9		10				300		
			300			11		12					300	
SPACE						13		14						SPACE
						15		16						
						17		18						
SPACE						19		20						SPACE
						21		22						
						23		24						
SPACE						25		26						SPACE
						27		28						
						29		30						
TOTAL	9,876	9,876	9,876								9,876	9,876	9,876	TOTAL

TOTAL CONNECTED LOAD (VA): A = 19752 B = 19752 C = 19752

PANELBOARD "M1" SCHEDULE

150A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	500			175	3/0	1		2	12	15	300			LOAD
		500				3		4				300		
			500			5		6					300	
LOAD	10,690			175	3/0	7		8						SPACE
		10,690				9		10						
			10,690			11		12						
LOAD	7,500			60	8	13		14						SPACE
		7,500				15		16						
			7,500			17		18						
SPACE						19		20						SPACE
						21		22						
						23		24						
SPACE						25		26	#2	100 / 3	10,000			LOAD
						27		28				10,000		
						29		30					10,000	
TOTAL	18,690	18,690	18,690								10,300	10,300	10,300	TOTAL

TOTAL CONNECTED LOAD (VA): A = 28990 B = 28990 C = 28990

PANELBOARD "M2" SCHEDULE

300A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD
SPARE	18,407			175	3/0	1		2	12	15	2,100			LOAD
		18,407				3		4				2,100		
			18,407			5		6					2,100	
SPARE	13,494			175	3/0	7		8	12	15	2,100			LOAD
		13,494				9		10				2,100		
			13,494			11		12					2,100	
LOAD	700			15	12.000000	13		14	12	15	500			LOAD
		700				15		16				500		
			700			17		18					500	
LOAD	13,768			50	6	19		20	6	50	10,690			LOAD
		13,768				21		22				10,690		
			13,768			23		24					10,690	
LOAD						25		26	12	20	2,000			LOAD
						27		28				2,000		
						29		30					2,000	
SPACE						31		32						SPACE
						33		34						
						35		36						
SPACE						37		38						SPACE
						39		40						
						41		42						
TOTAL	46,369	46,369	46,369								17,390	17,390	17,390	TOTAL

TOTAL CONNECTED LOAD (VA): A = 63759 B = 63759 C = 63759

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

REVISIONS				
SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
1	REVISION 1		1.10.2013	

I HEREBY CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE TERRITORY OF GUAM (ELECTRICAL)

AS DEFINED IN GUAM PUBLIC LAW 30-30, SECTION 3211E

RIM ARCHITECTS GUAM — CALIFORNIA · ALASKA · HAWAII, 318 HERNAN CORTES AVE, SUITE 305, HAGATNA, GUAM 96910, Phone: 671.477.2311, Fax: 671.477.2105, www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.	124014 - ELECT
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC	CHECKED BY: WW
DRAWN BY: VC	APPROVED BY: GPA
ENGINEER SUPERVISOR	PERRY B. TALADOC
SHEET CONTENTS	PANEL SCHEDULES
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	420 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS	MELINDA R. CAMACHO, P.E.
DATE	
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-814

PANELBOARD "M4" SCHEDULE

400A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	18,407			175 / 3	3 / 0	1		2	10	30 / 3	13,494			LOAD
		18,407			3 / 0	3		4	10			13,494		
			18,407		3 / 0	5		6	10				13,494	
LOAD	18,407			175 / 3	3 / 0	7		8	10	30 / 3	13,494			LOAD
		18,407			3 / 0	9		10	10			13,494		
			18,407		3 / 0	11		12	10				13,494	
SPACE	18,407			175 / 3		13		14	10	30 / 3	13,494			SPACE
		18,407				15		16	10			13,494		
			18,407			17		18	10				13,494	
SPACE						19		20						SPACE
						21		22						
						23		24						
SPACE						25		26						SPACE
						27		28						
						29		30						
TOTAL	55,221	55,221	55,221								40,482	40,482	40,482	TOTAL

TOTAL CONNECTED LOAD (VA): A = 95703 B = 95703 C = 95703

PANELBOARD "LDP" SCHEDULE

1 600A MCB, 208/120V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL L1A	8,420			150	1/0	1		2	1/0	150	9,740			PANEL L1B
		11,120				3		4				9,730		
			9,490			5		6					8,640	
PANEL L2A	9,000			150	1/0	7		8	1/0	150	9,790			PANEL L2B
		9,760				9		10				6,820		
			7,920			11		12					8,900	
PANEL L2C	11,630			150	1/0	13		14	1/0	150	12,620			PANEL L3B
		10,730				15		16				11,340		
			10,670			17		18					10,720	
PANEL L3A	12,780			150	1/0	19		20	1/0	150	13,020			PANEL L3C
		10,080				21		22				9,900		
			10,560			23		24					9,100	
SPACE				150	1/0	25		26	1/0	150	7,860			PANEL L1C
						27		28				5,620		
						29		30					6,200	
SPACE						31		32						SPACE
SPACE						33		34						SPACE
SPACE						35		36						SPACE
SPACE						37		38						SPACE
SPACE						39		40						SPACE
SPACE						41		42						SPACE
TOTAL	41,830	41,690	38,640								53,030	43,410	43,560	TOTAL

1 TOTAL CONNECTED LOAD (VA): A = 94860 B = 85100 C = 82200

PANELBOARD "2M" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	8	40	2,300			LOAD
LOAD		720		20	12	3		4	12	20		540		LOAD
LOAD			720	20	12	5		6	12	20			720	LOAD
LOAD	720			20	12	7		8	12	20	540			LOAD
LOAD		540		20	12	9		10	12	20		540		LOAD
LOAD			540	20	12	11		12	12	20			540	LOAD
LOAD	540			20	12	13		14	12	20	720			LOAD
LOAD		500		20	12	15		16	12	20		700		LOAD
LOAD			500		12	17		18	10	30				SPARE
	500			20	12	19		20	12	20				SPARE
LOAD		540		20	12	21		22						SPACE
LOAD			720	20	12	23		24						SPACE
LOAD	500			20	12	25		26	10		2,400			LOAD
SPARE				20		27		28	10	30		2,400		
SPARE				20		29		30					2,400	LOAD
SPARE				20		31		32		30	2,400			
SPARE				20		33		34				2,400		LOAD
SPARE				20		35		36		30			2,400	
SPARE				20		37		38						SPACE
SPARE				20		39		40						SPACE
SPARE				20		41		42						SPACE
TOTAL	2,980	2,300	2,480								8,360	6,580	6,060	TOTAL

TOTAL CONNECTED LOAD (VA): A = 11340 B = 8880 C = 8540

PANELBOARD "EL1 SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL EL2A	7,020			100	2	1		2	6	60	3,420			PANEL EL2B
		7,740				3		4				3,240		
			6,120			5		6					2,700	
PANEL EL3	6,040			60	6	7		8						SPACE
		1,920				9		10						SPACE
			2,640			11		12						SPACE
SPARE				20		13		14						SPACE
SPARE				20		15		16						SPACE
SPARE				20		17		18						SPACE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	13060	9,660	8,760								3,420	3,240	2,700	TOTAL

TOTAL CONNECTED LOAD (VA): A = 16480 B = 12900 C = 11460

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
1	REVISION 1		1.10.2013	

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.
WAYNE A. WIXON CERTIFICATE No. 869 (ELECTRICAL) EXP. APRIL 30, 2013 GUAM PROFESSIONAL ENGINEER
AS DEFINED IN GUAM PUBLIC LAW 30-35, SECTION 32116

RIM ARCHITECTS
GUAM | CALIFORNIA ALASKA HAWAII
316 HERNAN CORTEZ AVE SUITE 300 HAGATNA, GUAM 96910 Phone: 671.477.2111 Fax: 671.477.2125 www.rimarchitects.com

WIXON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO: 124014 - ELECT		PROJECT TITLE: GPA - GWA MULTI PURPOSE FACILITY		
DESIGNED BY: VC	CHECKED BY: WW			
DRAWN BY: VC	APPROVED BY: GPA	SHEET CONTENTS: PANEL SCHEDULES		
ENGINEER SUPERVISOR: PERRY B. TALADOC				
MANAGER OF ENGINEERING: JOVEN G. ACOSTA, P.E.		DATE: 2012.11.06	J.O. NO.: 100134	SCALE: 1 : 80
ASSISTANT GENERAL MANAGER OF OPERATIONS: MELINDA R. CAMACHO, P.E.		DATE	GENERAL MANAGER: JOAQUIN C. FLORES, P.E.	

SHT 421 OF 428
SHEET E-815

PANELBOARD "C1A" SCHEDULE

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	1,500			LOAD
LOAD		1,500		20	12	3		4	12	20		1,000		LOAD
12 * SPARE				20		5		6	12	20			500	LOAD
SPARE				20		7		8		20				SPARE
9 SPARE				20		9		10						SPACE
SPARE						11		12						SPACE
TOTAL	720	1,500	0								1,500	1,000	500	TOTAL

TOTAL CONNECTED LOAD (VA): A = 2220 B = 2500 C = 500

NOTE: PANEL C1A SCHEDULE IS SIMILAR TO PANELS C2A AND C3A

* - CKT 5 (CONTROLLER) IS APPLICABLE TO PNL C1A "ONLY", C2A AND C3A SHALL BE MARK AS "SPARE".

PANELBOARD "C3C" SCHEDULE

9

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	540			20	12	1		2	12	20	360			LOAD
LOAD		360		20	12	3		4	12	20		720		LOAD
LOAD			540	20	12	5		6	12	20			720	LOAD
LOAD	500			20	12	7		8	12	20	500			LOAD
LOAD		500		20	12	9		10	12	20		500		LOAD
LOAD						11		12	12	20			500	LOAD
TOTAL	1,040	860	540								860	1,220	1,220	TOTAL

TOTAL CONNECTED LOAD (VA): A = 1900 B = 2080 C = 1760

PANELBOARD "D1" SCHEDULE

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,500			20	12	1		2	12	20	1,500			LOAD
LOAD		1,500		20	12	3		4	12	20		1,500		LOAD
12 LOAD			1,500	20	12	5		6	12	20			1,500	LOAD 12
LOAD	500			20	12	7		8	12	20	500			LOAD
LOAD		500		20	12	9		10	12	20		500		LOAD
LOAD			500	20	12	11		12	12	20			500	LOAD
LOAD	500			20	12	13		14	12	20	500			LOAD
LOAD		500		20	12	15		16	12	20		500		LOAD
SPARE				20		17		18						SPACE
TOTAL	2,500	2,500	2,000								2,500	2,500	2,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 5000 B = 5000 C = 4000

PANELBOARD "C1B" SCHEDULE

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	1,500			LOAD
LOAD		1,500		20	12	3		4	12	20		1,000		LOAD
SPARE				20		5		6	12	20			500	LOAD
SPARE				20		7		8		20				SPARE
12 SPARE				20		9		10						SPACE
SPARE						11		12						SPACE
TOTAL	720	1,500	0								1,500	1,000	500	TOTAL

TOTAL CONNECTED LOAD (VA): A = 2220 B = 2500 C = 500

NOTE: PANEL C1A SCHEDULE IS SIMILAR TO PANELS C2B AND C3B

9

PANELBOARD "SRA" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	2,500			20	12	1		2	12	20	2,500			LOAD
		2,500		20	12	3		4	12	20		2,500		
LOAD			2,500	20	12	5		6	12	20			2,500	LOAD
	2,500			20	12	7		8	12	20	2,500			
LOAD		1,500		20	12	9		10	12	20		1,500		LOAD
9 LOAD			1,500	20	12	11		12	12	20			1,500	LOAD
LOAD	1,500			20	12	13		14	12	20	1,500			LOAD
LOAD		1,500		20	12	15		16	12	20		1,500		LOAD
LOAD			1,500	20	12	17		18	12	20			1,500	LOAD
LOAD	1,000			20	12	19		20	12	20	1,500			LOAD
9 LOAD		1,500		20	12	21		22	12	20		1,500		LOAD
16 LOAD			1,500	20	12	23		24	12	20			1,500	LOAD
LOAD	3,120			30	10	25		26	10	30	3,120			LOAD
		3,120		30	10	27		28	10	30		3,120		
LOAD			1,500	20		29		30					1,500	LOAD
TOTAL	10,620	10,120	8,500								11,120	10,120	8,500	TOTAL

TOTAL CONNECTED LOAD (VA): A = 21740 B = 20240 C = 17000

PANELBOARD "C" SCHEDULE

100A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL C1A	2,220			60		1		2	60		4,380			PANEL C1B
		2,500				3		4				2,500		
			360			5		6					1,580	
PANEL C2A	2,200			60		7		8	60		4,380			PANEL C2B
		2,500				9		10				2,500		
						11		12					1,580	
PANEL C3A	2,20			60		13		14	60		4,380			PANEL C3B
		2,500				15		16				2,500		
						17		18					1,580	
9						19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	4,420	7,500	360								13,140	7,500	4,740	TOTAL

TOTAL CONNECTED LOAD (VA): A = 17560 B = 15000 C = 5100

PANELBOARD "EL3" SCHEDULE

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	720			LOAD
LOAD		540		20	12	3		4	12	20		720		LOAD
LOAD			540	20	12	5		6	12	20			360	LOAD
LOAD	1200			20	12	7		8	12	20	1200			LOAD
LOAD		1200		20	12	9		10	12	20		1200		LOAD
LOAD			540	20	12	11		12	12	20			1200	LOAD
LOAD	1200			20	12	13		14	12	20	1000			LOAD
SPARE						15		16						SPARE
SPARE						17		18						SPARE
SPARE						19		20						SPARE
SPARE						21		22						SPARE
SPARE						23		24						SPARE
TOTAL	3,120	1,740	1,080								2,920	1,920	1,560	TOTAL

TOTAL CONNECTED LOAD (VA): A = 6040 B = 3660 C = 2640

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

16 REVISION 16 VCC 11.20.2014

12 REVISION 12 JRL 03.21.2014

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
2	REVISION 2		01/18/2013	
9	REVISION 9		11.07.2013	

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF GUAM. No. 869 (ELECTRICAL) EXP. APRIL 30, 2015

AS DEFINED IN GUAM PUBLIC LAW 30-30, SECTION 70114

RIM ARCHITECTS GUAM | CALIFORNIA ALASKA HAWAII 334 HERNAN CORTES AVE SUITE 300 HAGATNA, GUAM 96910 Phone: 671.477.2111 Fax: 671.477.2125 www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.	124014 - ELECT
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC	CHECKED BY: WW
DRAWN BY: VC	APPROVED BY: GPA
SHEET CONTENTS	PANEL SCHEDULES
ENGINEER SUPERVISOR	PERRY B. TALADOC
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	422OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS	MELINDA R. CAMACHO, P.E.
DATE	
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-816

PANELBOARD "EL2A" SCHEDULE

100A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	900			20	12	1		2	12	20	540			LOAD
LOAD		1,080		20	12	3		4	12	20		720		LOAD
LOAD			540	20	12	5		6	12	20			720	LOAD
LOAD	720			20	12	7		8	12	20	720			LOAD
LOAD		720		20	12	9		10	12	20		720		LOAD
LOAD			900	20	12	11		12	12	20			720	LOAD
LOAD	1,080			20	12	13		14	12	20	720			LOAD
LOAD		720		20	12	15		16	12	20		360		LOAD
LOAD			720	20	12	17		18	12	20			720	LOAD
LOAD	720			20	12	19		20	12	20	540			LOAD
LOAD		1,080		20	12	21		22	12	20		720		LOAD
LOAD			540	20	12	23		24	12	20			540	LOAD
LOAD	540			20	12	25		26	12	20	540			LOAD
LOAD		1,080		20	12	27		28	12	20		540		LOAD
LOAD			540	20	12	29		30		20				SPARE
SPARE				20		31		32						SPACE
SPARE				20		33		34						SPACE
SPARE				20		35		36						SPACE
SPARE				20		37		38						SPACE
SPARE				20		39		40						SPACE
SPARE				20		41		42						SPACE
TOTAL	3,960	4,680	3,240								3,060	3,060	2,700	TOTAL

TOTAL CONNECTED LOAD (VA): A = 7020 B = 7740 C = 5940

PANELBOARD "SRB" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	2,500			20	12	1		2	12	20	2,500			LOAD
		2,500		20	12	3		4	12	20		2,500		
LOAD			2,500	20	12	5		6	12	20			2,500	LOAD
	2,500			20	12	7		8	12	20	2,500			
LOAD		1,500		20	12	9		10	12	20		1,500		LOAD
LOAD			1,500	20	12	11		12	12	20			1,500	LOAD
LOAD	1,500			20	12	13		14	12	20	1,500			LOAD
LOAD		1,500		20	12	15		16	12	20		1,500		LOAD
LOAD			1,500	20	12	17		18	12	20			1,500	LOAD
LOAD	1,000			20	12	19		20	12	20	2,500			LOAD
LOAD		1,500		20	12	21		22	12	20		2,500		
LOAD			1,500	20	12	23		24	12	20			1,500	LOAD
LOAD				20	12	25		26	12	20	1,500			LOAD
LOAD	3,120			30	10	27		28	10	30		3,120		LOAD
		3,120		30	10	29		30	10	30			3,120	
TOTAL	10,620	10,120	7,000								10,500	11,120	10,120	TOTAL

TOTAL CONNECTED LOAD (VA): A = 21120 B = 21240 C = 17120

/16.

PANELBOARD "EL2B" SCHEDULE

60A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	720			20	12	1		2	12	20	720			LOAD
LOAD		720		20	12	3		4	12	20		540		LOAD
LOAD			360	20	12	5		6	12	20			720	LOAD
LOAD	540			20	12	7		8	12	20	360			LOAD
LOAD		720		20	12	9		10	12	20		540		LOAD
LOAD			900	20	12	11		12	12	20			720	LOAD
LOAD	720			20	12	13		14	12	20	360			LOAD
LOAD		720		20	12	15		16						SPACE
SPARE				20		17		18						SPACE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	1,980	2,160	1,260								1,440	1,080	1,440	TOTAL

TOTAL CONNECTED LOAD (VA): A = 3420 B = 3240 C = 2700

PANELBOARD "SA" SCHEDULE

100A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	540			20	12	1		2	12	20	540			LOAD
LOAD		1,000		20	12	3		4	12	20		900		LOAD
LOAD			900	20	12	5		6	12	20			900	LOAD
LOAD	600			20	12	7		8	12	20	540			LOAD
LOAD		1,000		20	12	9		10	12	20		900		LOAD
LOAD			1,000	20	12	11		12	12	20			1,000	LOAD
LOAD	1,000			20	12	13		14	12	20	1,000			LOAD
LOAD		900		20	12	15		16		20				SPARE
LOAD			900	20	12	17		18		20				SPARE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	2,140	2,900	2,800								2,080	1,800	1,900	TOTAL

TOTAL CONNECTED LOAD (VA): A = 4220 B = 4700 C = 4700

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

REVISIONS

SYMBOL	DESCRIPTION	INIT.	DATE	APP'D.
/16.	REVISION 16	VCC	11.20.2014	

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF GUAM. No. 859 (ELECTRICAL) EXP. APRIL 30, 2015 AS DEFINED IN GUAM PUBLIC LAW 30-30, SECTION 82114

RIM ARCHITECTS GUAM — CALIFORNIA · ALASKA · HAWAII · 164 HERNAN CORTEZ AVE. SUITE 300 HAGATNA, GUAM 96910 Phone: 671.477.2522 Fax: 671.477.2525 www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.	124014 - ELECT
DESIGNED BY:	VC
CHECKED BY:	WW
DRAWN BY:	VC
APPROVED BY:	GPA
ENGINEER SUPERVISOR	PERRY B. TALADOC
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
ASSISTANT GENERAL MANAGER OF OPERATIONS	MELINDA R. CAMACHO, P.E.
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
SHEET CONTENTS	PANEL SCHEDULES
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	423 OF 428
DATE	
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-817

1 PANELBOARD "EDP" SCHEDULE

600A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL EH1	79,860				350	1		2	2		12,544			
		69,552		300 / 3	350	3		4	2	100 / 3		14,864		PANEL EH2
			69,618		350	5		6	2				12,040	
PANEL EH3	12,544				2	7		8	2		95,703			
		14,864		100 / 3	2	9		10	2	400 / 3		95,703		PANEL M4
			12,040		2	11		12	2				95,703	
SPARE						13		14						SPARE
SPARE						15		16						SPARE
SPARE						17		18						SPARE
SPARE						19		20						SPARE
SPARE						21		22						SPARE
SPARE						23		24						SPARE
SPARE						25		26						SPARE
SPARE						27		28						SPARE
SPARE						29		30						SPARE
TOTAL	92,404	84,416	81,658								108,247	110,567	107,743	TOTAL

TOTAL CONNECTED LOAD (VA): A = 200651 B = 194983 C = 189401

2 PANELBOARD "ELDP" SCHEDULE

400A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	40,000				350	1		2	350					
		40,000		300 / 3	350	3		4	350	300 / 3				LOAD
			40,000		350	5		6	350					
PANEL ELI	16,480				1/0	7		8	2		9,440			
		12,900		150 / 3	1/0	9		10	2	100 / 3		9,440		PANEL C
			11,460		1/0	11		12	2				9,440	
PANEL C3C	1,900				6	13		14						
		2,080		60 / 3	6	15		16		60 / 3				SPARE
			1,760		6	17		18						
SPARE						19		20						SPARE
SPARE						21		22						SPARE
SPARE						23		24						SPARE
SPARE						25		26						SPARE
SPARE						27		28						SPARE
SPARE						29		30						SPARE
TOTAL	58,380	54,980	53,220								9,440	9,440	9,440	TOTAL

TOTAL CONNECTED LOAD (VA): A = 67820 B = 64420 C = 62660

2 PANELBOARD "UDP" SCHEDULE

300A MCB, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL SRA	13,000				2	1		2	2		13,000			
		12,500		100 / 3	2	3		4	2	100 / 3		12,500		PANEL SRB
			14,000		2	5		6	2				14,000	
PANEL SRB	13,000				2	7		8	2		4,220			
		12,500		100 / 3	2	9		10	2	100 / 3		4,700		PANEL SA
			14,000		2	11		12	2				4,700	
PANEL D1	5,000				2	13		14						
		5,000		100 / 3	2	15		16		100 / 3				SPARE
			4,000		2	17		18						
SPARE						19		20						SPARE
SPARE						21		22						SPARE
SPARE						23		24						SPARE
SPARE						25		26						SPARE
SPARE						27		28						SPARE
SPARE						29		30						SPARE
TOTAL	31,000	30,000	32,000								17,220	17,200	18,700	TOTAL

TOTAL CONNECTED LOAD (VA): A = 48220 B = 47200 C = 50700

PANELBOARD "SA" SCHEDULE

100A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	540			20	12	1		2	12	20	540			LOAD
LOAD		1,000		20	12	3		4	12	20		900		LOAD
LOAD			900	20	12	5		6	12	20			900	LOAD
LOAD	600			20	12	7		8	12	20	540			LOAD
LOAD		1,000		20	12	9		10	12	20		900		LOAD
LOAD			1,000	20	12	11		12	12	20			1,000	LOAD
LOAD	1,000			20	12	13		14	12	20	1,000			LOAD
LOAD		900		20	12	15		16		20				SPARE
LOAD			900	20	12	17		18		20				SPARE
SPARE				20		19		20						SPACE
SPARE				20		21		22						SPACE
SPARE				20		23		24						SPACE
SPARE				20		25		26						SPACE
SPARE				20		27		28						SPACE
SPARE				20		29		30						SPACE
TOTAL	2,140	2,900	2,800								2,080	1,800	1,900	TOTAL

TOTAL CONNECTED LOAD (VA): A = 4220 B = 4700 C = 4700

2

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
1	REVISION 1		01/10/2013	
2	REVISION 2		01/18/2013	

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. No. 8413 (ELECTRICAL) REGISTERED PROFESSIONAL ENGINEER AS DEFINED IN GUAM PUBLIC LAW 30-35, SECTION 32118

RIM ARCHITECTS Guam — 318 HERNAN CORTES AVE SUITE 201 HAGATNA, GUAM 96910 Phone: 671.477.7111 Fax: 671.472.5487 www.rimarchitects.com

WTION & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO: 124014 - ELECT	PROJECT TITLE: GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC / CHECKED BY: WW	
DRAWN BY: VC / APPROVED BY: GPA	SHEET CONTENTS: PANEL SCHEDULES
ENGINEER SUPERVISOR: PERRY B. TALADOC	
MANAGER OF ENGINEERING: JOVEN G. ACOSTA, P.E.	DATE: 2012.11.06 / J.O. NO.: 100134 / SCALE: 1/8" = 1'-0" / SHT 424 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS: MELINDA R. CAMACHO, P.E.	DATE: / GENERAL MANAGER: JOAQUIN C. FLORES, P.E. / SHEET: E-818

PANELBOARD "HM" SCHEDULE

200A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	2,628			20	12	1		2	6	20	2,628			LOAD
LOAD		500		20	12	3		4	4	20		980		LOAD
LOAD			500	20	12	5		6	10	20			900	LOAD
LOAD	2,900			30 / 3	10	7		8	10	30 / 3	5,000			LOAD
		2,900			10	9		10	10			5,000		
			2,900		10	11		12	10				5,000	
PANEL "TM"	11,098			150 / 3	3 / 0	13		14	12	20	1,000			LOAD
		11,098			3 / 0	15		16		20				SPARE
			11,098		3 / 0	17		18		20				SPARE
SPARE						19		20						SPARE
SPARE						21		22						SPARE
SPARE						23		24						SPARE
SPARE						25		26						SPARE
SPARE						27		28						SPARE
SPARE						29		30						SPARE
TOTAL	16,626	14,498	14,498								8,628	5,980	5,900	TOTAL

TOTAL CONNECTED LOAD (VA): A = 25254 B = 20478 C = 20398

PANELBOARD "TM" SCHEDULE

150A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
SPARE	1,000			20		1		2	4		25,760			
SPARE		1,000		20		3		4	4	75 / 3		20,760		SPARE
SPARE			1,000	20		5		6	4				20,760	
SPARE	1,000			20		7		8		20	1,000			SPARE
SPARE		1,000		20		9		10		20		1,000		SPARE
SPARE			1,000	20		11		12		20			1,000	SPARE
SPARE	1,000			20		13		14		20	1,000			SPARE
SPARE		1,000		20		15		16		20		1,000		SPARE
SPARE			1,000	20		17		18		20			1,000	SPARE
SPARE	1,000			20		19		20		20	1,000			SPARE
SPARE		1,000		20		21		22		20		1,000		SPARE
SPARE			1,000	20		23		24		20			1,000	SPARE
						25		26						
						27		28						
						29		30						
TOTAL	4,000	4,000	4,000								28,760	23,760	23,760	TOTAL

TOTAL CONNECTED LOAD (VA): A = 32760 B = 27760 C = 27760

PANELBOARD "SRC" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	2,500			20	12	1		2	12	20	2,500			LOAD
		2,500		20	12	3		4	12	20		2,500		
LOAD			2,500	20	12	5		6	12	20			2,500	LOAD
	2,500			20	12	7		8	12	20	2,500			
LOAD		1,500		20	12	9		10	12	20		1,500		LOAD
LOAD			1,500	20	12	11		12	12	20			1,500	LOAD
LOAD	1,500			20	12	13		14	12	20	1,500			LOAD
LOAD		1,500		20	12	15		16	12	20		1,500		LOAD
LOAD			1,500	20	12	17		18	12	20			1,500	LOAD
LOAD	1,500			20	12	19		20	12	20	2,500			LOAD
LOAD		1,500		20	12	21		22	12	20		2,500		
LOAD			1,500	20	12	23		24	12	20			1,500	LOAD
LOAD	3,120			30	10	25		26	10	30	3,120			LOAD
		3,120		30	10	27		28	10	30		3,120		
LOAD			1,500	20	12	29		30	12	20			1,500	LOAD
LOAD	1,500			20	12	31		32	12	20	1,500			LOAD
LOAD		1,500		20	12	33		34	12	20		1,500		LOAD
						35		36						
						37		38						

PANELBOARD "LM" SCHEDULE

75A MCB, 480/277V, 3 PHASE, 4 WIRE, 35 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
SPARE	1,000			20		1		2		20	1,000			SPARE
SPARE		1,000		20		3		4		20		1,000		SPARE
SPARE			1,000	20		5		6		20			1,000	SPARE
SPARE	1,000			20		7		8		20	1,000			SPARE
SPARE		1,000		20		9		10		20		1,000		SPARE
SPARE			1,000	20		11		12		20			1,000	SPARE
PFB						13		14						PFB
PFB						15		16						PFB
PFB						17		18						PFB
TOTAL	2,000	2,000	2,000								2,000	2,000	2,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 4000 B = 4000 C = 4000

PANELBOARD "2HM" SCHEDULE

50A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	900			20	12	1		2	12	20	900			LOAD
LOAD		500		20	12	3		4	12	20		900		LOAD
LOAD				20	12	5		6	12	20			900	LOAD
LOAD	700			20	10	7		8	12	20	1,000			LOAD
		700		20	10	9		10				1,000		
			700	20	10	11		12		20				SPARE
TOTAL	1,600	1,200	700								1,900	1,900	900	TOTAL

TOTAL CONNECTED LOAD (VA): A = 3500 B = 3100 C = 1600

PANELBOARD "SRD" SCHEDULE

150A MCB, 208/120V, 3 PHASE, 4 WIRE, 10 KAIC MINIMUM, SURFACED MOUNT

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,500			20	12	1		2	12	20	1,500			LOAD
LOAD		1,500		20	12	3		4	12	20		1,500		LOAD
LOAD			1,500	20	12	5		6	12	20			1,500	LOAD
LOAD	1,500			20	12	7		8	12	20	1,500			LOAD
LOAD		1,500		20	12	9		10	12	20		1,500		LOAD
LOAD			1,500	20	12	11		12	12	20			1,500	LOAD
LOAD	2,500			20	12	13		14	12	20	2,500			LOAD
		2,500				15		16	12			2,500		
LOAD			2,500	20	12	17		18	12	20			2,500	LOAD
	2,500					19		20	12		2,500			
LOAD		2,500		20	12	21		22	12	20		2,500		LOAD
			2,500			23		24	12				2,500	
LOAD	2,500			20	12	25		26	12	20	2,500			LOAD
		2,500				27		28	12			2,500		
LOAD			1,500	20	12	29		30	12	20			1,500	LOAD
LOAD	1,500			20	12	31		32	12	20	1,500			LOAD
LOAD		1,500		20	12	33		34	12	20		1,500		LOAD
LOAD			1,500	20	12	35		36	12	20			1,500	LOAD
LOAD	1,500			20	12	37		38	12	20	1,500			LOAD
LOAD		1,500		20	12	39		40	12	20		1,500		LOAD
SPARE				20		41		42		20				SPARE
TOTAL	13,500	13,500	11,000								13,500	13,500	11,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 27000 B = 27000 C = 22000

Note: This has been modified to protect GPA confidential information. The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

16	REVISION 16	VCC	11.20.2014
15	REVISION 15	VCC	08/05/2014
12	REVISION 12	JRL	03.21.2014

REVISIONS				
SYMBOL	DESCRIPTION	INT.	DATE	APP'D.
1	REVISION 1		1.10.2013	WAW
9	REVISION 9	JRL	11.07.2013	WAW

I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
No. 869 (ELECTRICAL) EXP. APRIL 30, 2015
45 DEPNET 'N GUAM PUBLIC LAW 30-39 SECTION 3216

RIM ARCHITECTS GUAM CALIFORNIA ALASKA HAWAII 306 HERMAN CORTEZ AVE. HAGATNA, GUAM 96910 TEL 671.477.7774 FAX 671.477.7733 www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.	124014 - ELECT
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY:	VC
CHECKED BY:	WW
DRAWN BY:	VC
APPROVED BY:	GPA
ENGINEER SUPERVISOR	PERRY B. TALADOC
SHEET CONTENTS	PANEL SCHEDULES
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	425 OF 428
ASSISTANT GENERAL MANAGER OF OPERATIONS	MELINDA R. CAMACHO, P.E.
DATE	
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-819

MAIN DISTRIBUTION PANELSCHEDULE "MDP"

480/277V, 3 PHASE, 4 WIRE, 65 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
PANEL H1	79,860			300 /3	350	1		2	3-350	1000 /3	224,965			PANEL M
		69,552			350	3		4	3-350			224,965		
			69,618		350	5		6	3-350				224,965	
PANEL H2	12,544			100 / 3	2	7		8	2-300	500 /3	169,923			PANEL EDP
		14,864			2	9		10	2-300			169,443		
			12,040		2	11		12	2-300				167,223	
PANEL H3	15,700			100 / 3	2	13		14	3/0	200 /3	24,254			PANEL HM
		16,250			2	15		16	3/0			19,998		
			14,800		2	17		18	3/0				20,389	
LOAD	7,200			* 60 / 3	6	19		20	10	30 /3	3,600			LOAD
		7,200			6	21		22	10			3,600		
			7,200		6	23		24	10				3,600	
						25		26						
						27		28						
						29		30						
						31		32						
						33		34						
						35		36						
						37		38						
						39		40						
						41		42						
TOTAL	115,304	107,866	103,658								422,742	418,006	416,177	TOTAL

TOTAL CONNECTED LOAD (VA): A = 538046 B = 525872 C = 519835

PANELBOARD "EH1" SCHEDULE

200A, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	28,700				350	1		2						PFB
		28,700			350	3		4						PFB
			28,700		350	5		6						PFB
PFB						7		8						PFB
PFB						9		10						PFB
PFB						11		12						PFB
PFB						13		14						PFB
PFB						15		16						PFB
PFB						17		18						PFB
PFB						19		20						PFB
PFB						21		22						PFB
PFB						23		24						PFB
PFB						25		26						PFB
PFB						27		28						PFB
PFB						29		30						PFB
PFB						31		32						PFB
PFB						33		34						PFB
PFB						35		36						PFB
PFB						37		38						PFB
PFB						39		40						PFB
PFB						41		42						PFB
TOTAL	28,700	28,700	28,700								0	0	0	TOTAL

TOTAL CONNECTED LOAD (VA): A = 28700 B = 28700 C = 28700

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

PANELBOARD "EH2" SCHEDULE

100A, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,000			20	12	1		2		20	1,000			SPARE
SPARE		1,000		20		3		4		20		1,000		SPARE
SPARE			1,000	20		5		6		20			1,000	SPARE
SPARE	1,000			20		7		8		20	1,000			SPARE
SPARE		1,000		20		9		10		20		1,000		SPARE
SPARE			1,000	20		11		12		20			1,000	SPARE
PFB						13		14						PFB
PFB						15		16						PFB
PFB						17		18						PFB
PFB						19		20						PFB
PFB						21		22						PFB
PFB						23		24						PFB
PFB						25		26						PFB
PFB						27		28						PFB
PFB						29		30						PFB
TOTAL	2,000	2,000	2,000								2,000	2,000	2,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 4000 B = 4000 C = 4000

PANELBOARD "EH3" SCHEDULE

100A, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
LOAD	1,000			20	12	1		2		20	1,000			SPARE
LOAD		1,000		20	12	3		4		20		1,000		SPARE
SPARE			1,000	20		5		6		20			1,000	SPARE
SPARE	1,000			20		7		8		20	1,000			SPARE
SPARE		1,000		20		9		10		20		1,000		SPARE
SPARE			1,000	20		11		12		20			1,000	SPARE
LOAD	1,000			20	12	13		14						PFB
SPARE		1,000		20		15		16						PFB
SPARE			1,000	20		17		18						PFB
PFB						19		20						PFB
PFB						21		22						PFB
PFB						23		24						PFB
PFB						25		26						PFB
PFB						27		28						PFB
PFB						29		30						PFB
TOTAL	3,000	3,000	3,000								2,000	2,000	2,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 5000 B = 5000 C = 5000

PANELBOARD "EH4" SCHEDULE

100A, 480/277V, 3 PHASE, 4 WIRE, 14 KAIC MINIMUM, SURFACED MOUNT (ISOLATED GROUND)

LOAD SERVED	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	BKR TRIP	WIRE SIZE	CKT NO.	PHASE A B C	CKT NO.	WIRE SIZE	BKR TRIP	LOAD (VA) A	LOAD (VA) B	LOAD (VA) C	LOAD SERVED
SPARE	1,000			20		1		2	12	20	1,000			LOAD
LOAD		1,000		20	12	3		4		20		1,000		SPARE
LOAD			1,000	20	12	5		6		20			1,000	SPARE
SPARE	1,000			20		7		8		20	1,000			SPARE
SPARE		1,000		20		9		10		20		1,000		SPARE
SPARE			1,000	20		11		12		20			1,000	SPARE
PFB						13		14						PFB
PFB						15		16						PFB
PFB						17		18						PFB
PFB						19		20						PFB
PFB						21		22						PFB
PFB						23		24						PFB
PFB						25		26						PFB
PFB						27		28						PFB
PFB						29		30						PFB
TOTAL	2,000	2,000	2,000								2,000	2,000	2,000	TOTAL

TOTAL CONNECTED LOAD (VA): A = 4000 B = 4000 C = 4000

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D.

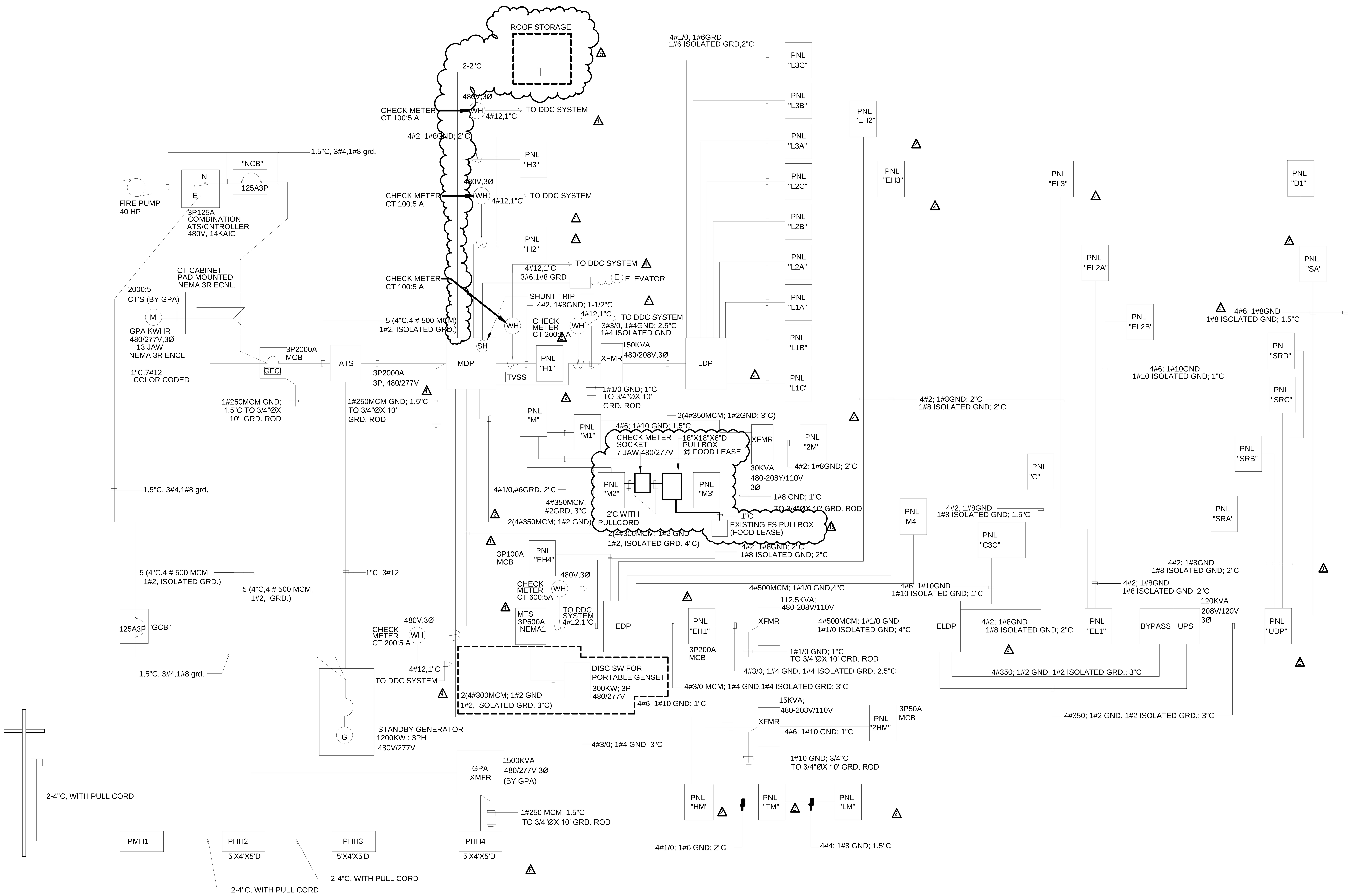
I CERTIFY THAT THIS DRAWING WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. No. 8453 (ELECTRICAL) REGISTERED PROFESSIONAL ENGINEER. AS DEFINED IN GUAM PUBLIC LAW 20-28, SECTION 3119

RIM ARCHITECTS Guam | California Alaska Hawaii 316 HERMAN CORTEZ AVE PACIFIC DAILY BLDG HAGATNA, GUAM 96910 Phone: 671.477.7311 Fax: 671.472.2601 www.rimarchitects.com

WILSON & ASSOCIATES CONSULTING ENGINEERING

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

PROJECT NO.	124014 - ELECT
PROJECT TITLE	GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC	CHECKED BY: WW
DRAWN BY: VC	APPROVED BY: GPA
SHEET CONTENTS	PANEL SCHEDULES
ENGINEER SUPERVISOR	PERRY B. TALADOC
MANAGER OF ENGINEERING	JOVEN G. ACOSTA, P.E.
ASSISTANT GENERAL MANAGER	MELINDA R. CAMACHO, P.E.
DATE	2012.11.06
J.O. NO.	100134
SCALE	1/8" = 1'-0"
SHT	426OF 438
DATE	11/1/12
GENERAL MANAGER	JOAQUIN C. FLORES, P.E.
SHEET	E-820



REVISION 16	VCC	11/21/2014	WAW
REVISION 15	VCC	08/05/2014	WAW
REVISION 12	JRL	03.21.2014	WAW
REVISION 9	JRL	10.21.2013	WAW
REVISION 6	VCC	08.06.2013	WAW

ONE-LINE DIAGRAM

1 E-801 NDTS

REVISIONS

SYMBOL	DESCRIPTION	INT.	DATE	APP'D
2	REVISION 2		01/18/2013	WAW
4	REVISION 4		03/19/2013	WAW

Note: This has been modified to protect GPA confidential information.
The original version will be disclosed to the awarded contractor upon signing of the non-disclosure agreement under GPA-042-22 multi-step bid.

GUAM POWER AUTHORITY
P.O. BOX 2977, HAGATNA, GUAM, USA 96910

RIM ARCHITECTS

WIXON & ASSOCIATES CONSULTING ENGINEERS

PROJECT NO.: 124014 - ELECT	PROJECT TITLE: GPA - GWA MULTI PURPOSE FACILITY
DESIGNED BY: VC	CHECKED BY: WW
DRAWN BY: VC	APPROVED BY: GPA
ENGINEERING SUPERVISOR: PERRY B. TALADOC	SHEET CONTENTS: POWER ONE-LINE DIAGRAM
MANAGER OF ENGINEERING: JOVEN G. ACOSTA, P.E.	DATE: 2012.11.06
J.O. NO.: 100134	SCALE: NDTS
SHT 411 OF 428	
ASSISTANT GENERAL MANAGER OF OPERATIONS: MELINDA R. CAMACHO, P.E.	GENERAL MANAGER: JOAQUIN C. FLORES, P.E.
SHEET: E-801	