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Attachments:

1. Assessment Photos
2. DuPont Report
3. Equipment List
4. Site Sketches and Plan Excerpts

1. Introduction Statement

Duenas Camacho and Associates (DCA) is contracted with the Guam Waterworks Authority (GWA) to provide program and construction management services. As part this contract, DCA has conducted a site assessment of the Ugum Surface Water Treatment plant (Plant) located in Talofofo, see Figure 1. The assessment was intended to cover the existing condition of the plant with the exception of the: Existing Steel 2.0 million gallon storage tank and the plant control system.

The results of the assessment are presented on this report. These results are to be used as part of a procurement package to repair, replace or upgrade equipment. GWA will issue a notice to bid to contractors for the:

- Demolition and removal works
- Purchase and installation of equipment
- Installation and/or replacement of safety equipment

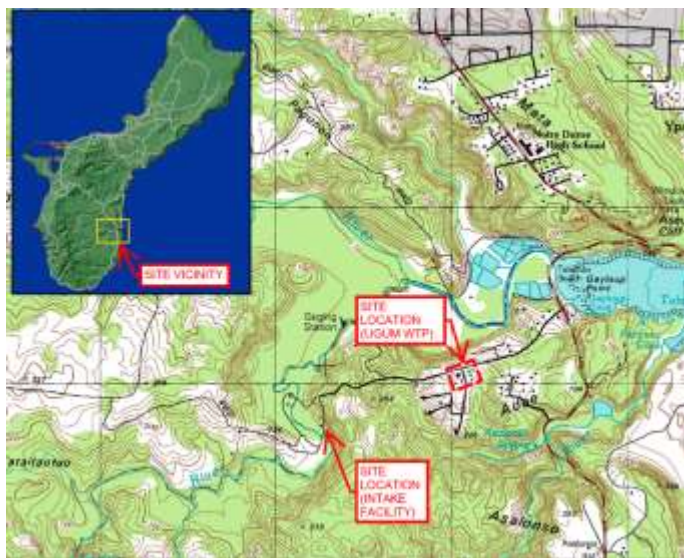


Figure 1: Project Location

2. Assessment Approach

The assessment was conducted in the months of June to August 2021. The project team consisted of process, civil and structural engineers from DCA, Electrical engineers from EMCE, and Mechanical engineer Marvic Acabado. GWA operations staff, Engineers and management assisted in the assessment. The assessment of the plant membranes was conducted by Mr. Charles Heard of DuPont.

Below is a list of the plans and reports provided by GWA and used as part of this assessment:

- 2007 Upgrade Plans Basis of Design
- 1993 As-built Plans
- 2021 DuPont Assessment Report

The objective of this assessment is to determine existing equipment that can be replaced or repaired in kind. In some cases the replacement will include operation modifications requested by the owner. These modifications are listed in section 3 of this report. This assessment is not intended to address any new parts of the plant that will require design works.

The methodology used for this assessment was:

- Inspect and evaluate all existing equipment
- Take field measurements
- Interview GWA operations and engineering
- Review past plans and record drawings
- Review past assessment reports
- Conduct coordination meetings
- Develop equipment replacement list
- Develop sketches and specifications for replacement works
- Prepare cost estimate
- Provide a listing of future design needs

3. Procurement and Installation Needs

Sections below provide site specific information and shall be used with the project bid form and specifications.

GWA will have first right of refusal for all materials removed. Contractor shall dispose of off demolished materials.

GWA will allow for a 30ft X 30ft area for contractor to use. Contractor may utilize the area adjacent to the site clarifiers to stage two 40ft containers, if needed. This area must be leveled by the contractor.

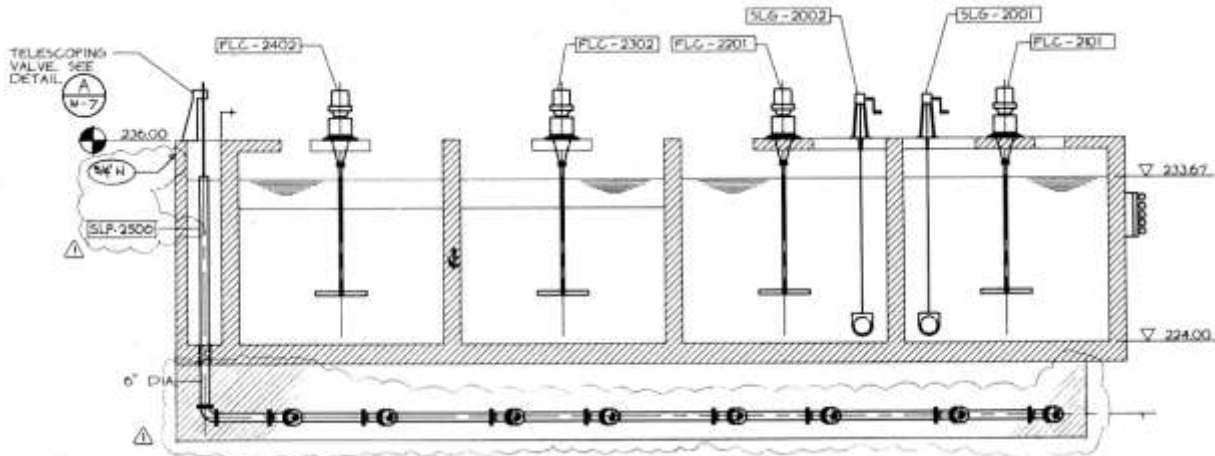
GWA Operations will provide the operator support for each tank outage. GWA operations will allow for an 8-hour outage duration non-peak times (9pm-5am).. Contractor will be responsible for all materials needed for each outage.

3.1. RIVER/INTAKE FACILITY

- A. Existing (3) intake pumps are old and outdated. Pumps (P100 and P102) will need to be replaced
 - Existing pumps' seals are leaking
 - Pump and motors #1 and #3 will be replaced in kind
 - No additional electrical power supply will be needed because of a one-to-one replacement
 - See attached photo assessment form for existing information.
- B. The VFD for pump #1 was removed to address a wastewater emergency and was replaced with MCC. Existing MCC will need to be removed and replaced with VFD. Existing VFD screens for pumps #2 and #3 will need to be replaced in kind.
- C. Existing 16-inch flowmeter screen is unreadable and will need to be replaced in kind
 - No additional electrical power supply will be needed because of a one-to-one replacement
 - Replacement includes all meter supports.
 - See attached photo assessment form for existing information.
- D. Strainers have been bypassed
 - Strainers shall be removed and disposed of. Twelve inch blind flanges shall be installed

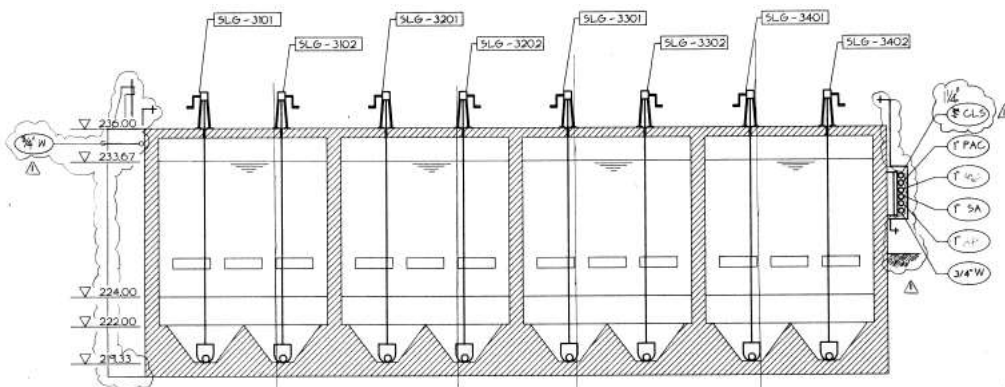
3.2. FLOCCULATION/SEDIMENTATION TANKS

- A. Furnish and install two (2) manual sluice gates on tank inlet.
 - Sluice gates will be removed and replaced in kind with manual ones.
 - Operators will need to be able to operate the new manual sluice gates
 - Water in tanks will need to be removed to replace the sluice gates
 - No electrical supply will be needed as the sluice gates will be operated manually
 - Inv. El. 224.50' 2. Top El. 236.00' 3. Opening 12" 4. Water El. 233.67' 5. Bott. El. 224.00'
 - Contractor will have to bypass at most two of the four basins at any time. Bypassing of two basins must be limited to one sedimentation basin and one backwash clarifying basin. Existing sluice drain line gates do not hold tight so temporary "trash" pumps will be needed to control the leakage from drain line.
 - See attached documents for existing pictures and specification.



Inlet Sluice Gates, Excerpt from 1989 As-built prepared by GMP Associates

- B. Furnish and install eight (8) sluice gates on drain line.
- Sluice gates will be removed and replaced in kind with manual hand crank.
 - Operators will need to be able to operate the new manual sluice gates
 - Water in drain wells will need to be removed to replace the sluice gates.
 - No electrical supply will be needed as the sluice gates will be operated manually
 - Inv. El. 219.33' 2. Top El. 236.00' 3. Opening 6" 4. Water El. 233.67' 5. Bott. El. 219.33'
 - See attached photo assessment form for existing information.

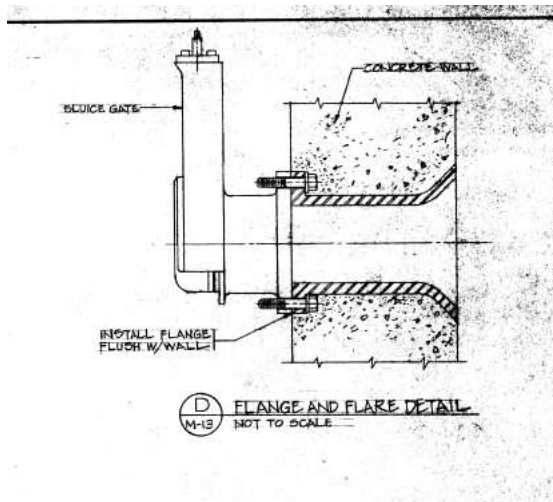


Drain Line Sluice Gates, Excerpt from 1989 As-built prepared by GMP Associates

The flocculation and sedimentation basins will need to be bypassed to install the eight new sluice gates along the drain line. The following is a suggested approach to bypassing these basins. This work may be done in 3 phases. Other, contractor proposed, bypass options may be considered.

Phase 1. GWA operations will stop production and all tanks will be drained. At this time sludge shall be removed and sluice gates may be inspected

Phase 2. GWA operations will stop production and all tanks will be drained. Existing sluice gates will be removed, and temporary plugs shall be installed in all four basins. These plugs shall be fitted into the drain opening shown below.



Insert 6-inch diameter plug on each of the 8 drains.

Phase 3. Single isolation of each tank may be done. A single tank will be drained while the remaining three tanks remain in operation. The new sluice gates shall be installed into isolated tank. This process shall then be repeated for the remaining tanks.

- C. Remove and Replace sludge collection system (chain and flight) motors and gear drives at contact basins (2 each) and recycle basins (2 each) total of four (4)
 - Water will need to be removed from the basins to replace the sludge collection system.
 - See attached photo assessment form for existing information.
 - See attached documents for specifications for new chain and flight system.

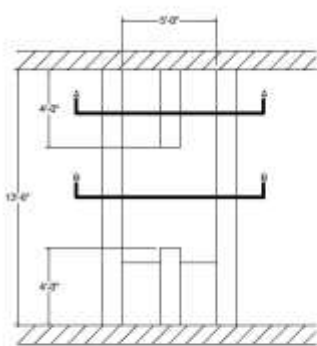
D. Remove and dispose of accumulated sludge.

E. Provide two forty-foot containers to be used as storage for new membrane equipment. These containers shall be new and equipped with padlocks. These two containers shall be delivered to the project site and located on site as directed by the Owner. The surface must be level and access into the container shall not exceed 6 inches in height without access steps. Pedestals may be used.

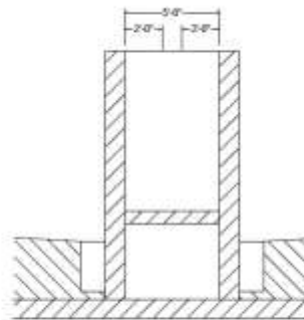
3.3. MEMBRANE CELLS

- A. Remove and replace membrane equipment, see bid form list.
- B. Provide and install new rack lock support and lower guide support brackets at each of the two membrane cells. See record drawings (0211193-241 & 0211193-242) for installation specifics. Contractor shall provide all materials and resources needed for the complete bracket install. Owner will provide the bypass needs for each membrane cell. One membrane cell may be worked on at any time. Contractor shall provide for the disinfection and testing for each cell after work is complete and shall not progress to next cell until disinfection results are received and acceptable.
- C. Membrane parts shall be by Memcor /Dupant or approved equal.
- D. Provide variable speed 1-ton chain hoist (2 each) for membrane cell maintenance.
 - Variable speed chain hoists will be needed to easily access the membranes for cleaning. Existing hoists are considered a hazard for the workers

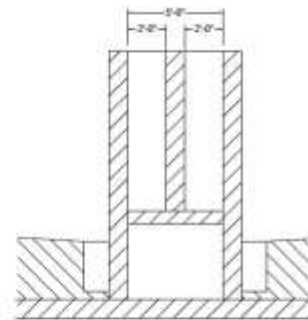
- Existing hoists will need to be replaced from its location and replaced in kind with a variable speed 1-ton chain
 - Electrical power supply will be needed to power the variable speed chain hoist
 - See attached photo assessment form for existing information.
- E. Angle irons holding up metal plates on walkway between filter cells are rusted out and need to be replaced.
- Steel 2X2X1/2 angle iron and 1/4 inch galvanized steel checkered plates with gaskets will be replaced, see sketch.
 - Electrical power supply not applicable
- F. Remove and install new rack lock support guides.
- G. Install new anchor bolts on upper and lower rack lock support angles to match existing. Install at 3 inch off set from exiting, see excerpt below and refer to sheets 021193-242-A and 021193-242-A both prepared by TG engineers/Memcor as part of the 2007 Ugum Rehabilitation
- a. Total number of bolts for upper rack lock support angle: 20
 1. Replace with Hilti HSL-GR Stainless Steel heavy duty expansion anchor with 4 inch embedment or approved equal
 - b. Total number of bolts for lower rack lock support angle: 10
 1. Replace with Hilti HSL-GR Stainless Steel heavy duty expansion anchor with 4 inch embedment or approved equal



PLAN

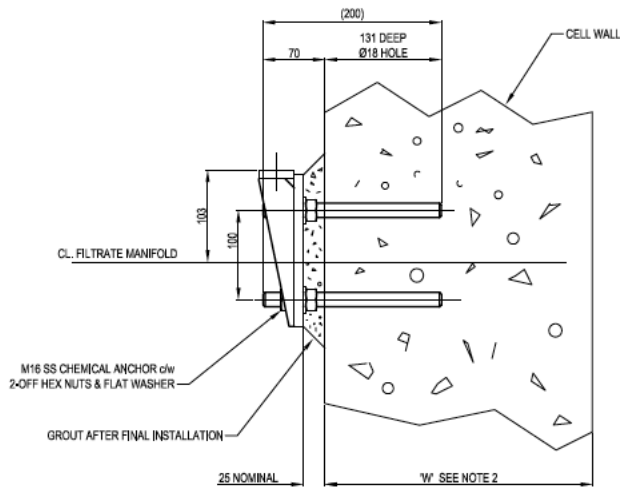


SECTION A-A



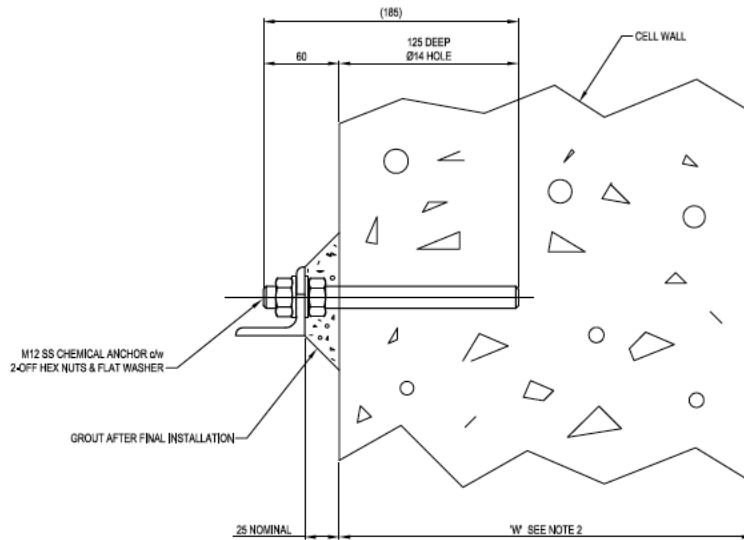
SECTION B-B

Filter Cell Center Tank Sketch



INSTALLATION OF RACK LOCK SUPPORT
BRACKET TO CONCRETE WALL

Existing upper rack bolts, 2007 Memcor Plan Set Excerpt



INSTALLATION OF GUIDE SUPPORT
BRACKET TO CONCRETE WALL

Existing Lower rack bolts, 2007 Memcor Plan Set Excerpt

3.4. FILTER PIPE GALLERY AND GENERATOR ROOM

- A. Replace single (1) aluminum door and jamb in the piping room and double aluminum door (1) and jamb the generator room, two (2) single aluminum doors and jamb at the upstairs MCC room
 - Remove existing steel door and jamb and replace in kind.
- B. Provide butterfly valves actuators and status monitors replacement spares to be turned

over to GWA.

- See attached document for specifications.
- BRAY BUTTERFLY VALVES: MAINLY SERIES 30/31 (Or approved Equal)
 - o 2 each - 16" Flanged butterfly valves
 - o 3 each - 14" Flanged butterfly valves
 - o 4 each - 12" Flanged butterfly valves
 - o 2 each - 10" wafer style butterfly valves
 - o 4 each - 8" wafer style butterfly valves
 - o 2 each - 4" wafer style butterfly valves
 - o 3 each - 2" wafer style butterfly valves

- BRAY PNEUMATIC ACTUATORS (Or approved Equal)
 - o 5 each - PART# 92-2100-11300-532
 - o 4 each - PART# 92-1600-11300-532
 - o 2 each - PART# 92-1270-11300-532
 - o 2 each - PART# 92-1190-11300-532
 - o 4 each - PART# 92-1180-11300-532
 - o 4 each - PART# 92-0630-11300-532
 - o 2 each - PART # 92-1190-11300-532

- BRAY VALVE STATUS MONITORS (Or approved Equal)
 - o 14 each - PART# 50-0406-12610-532

3.5. BACKWASH (HOLDING TANK)

- A. Install new submersible pumps (P301 and P302)
 - The submersible pumps will be replaced in kind.
 - Backwash will have to be drained or lowered to a certain level in order for operators to remove the existing backwash and install new one.
 - See attached document for specifications of submersible pump.
- B. Remove and install new level sensor/level monitor.
 - Level sensors/level monitors (one each) will be replaced in kind.
- C. Remove and install new mixer (M301)
- D. Remove and install new 4-inch magnetic flowmeter.
 - Magnetic flowmeter removed and will be replaced in kind.
 - No additional electrical power supply needed.
- E. Remove and dispose of accumulated sludge.

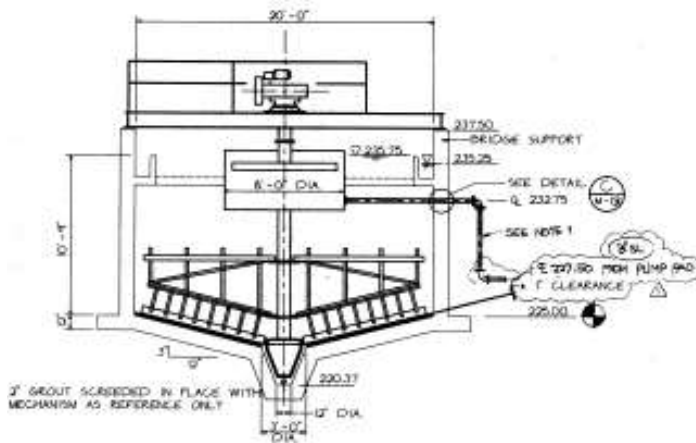
3.6. NEUTRALIZATION/SLUDGE TANK

- A. Install new submersible pump (P401) and nozzles within the tank.
 - Water will be drained from the neutralization tank for the submersible pump to be removed.
 - Submersible pump and nozzles will be replaced in kind.
 - See attached document for spec and information.
- B. Replace ORP and pH meter.
 - 1 inch pH meter will be replaced in kind.
 - Additional electrical power supply not applicable
 - Future expandability not applicable
- C. Replace level sensor/ level monitors.

- Level sensors/level monitors one each for Neutralization and sludge tank will be replaced in kind.
- D. Remove and dispose of accumulated sludge.

3.7. THICKENER TANK

- A. Remove and replace thickener assembly (M370), see attachment 4
 - Manufacture shall be IEMCO (Or approved equal), 20ft diameter with 10.75ft side water depth complete with drive assembly. Epoxy coated carbon steel with stainless steel hardware.
 - Complete drive assembly, with gear motor and weatherproof drive torque control. Drive unit shall be factory assembled, calibrated and tested.
 - Provide center drive platform, rake arms with plow blades and pickets, torque tubes and influent pipe.
 - Provide 2 days of startup service with manufacturer representative once unit installed and ready for startup,
 - Aluminum walkway with handrail and supports
 - Installed complete in place



Thickener assembly, Excerpt from 1989 As-built prepared by GMP Associates

- B. Remove and replace thickener feed pumps and motors (P371 and P372).
 - Thickener and feed pumps will be removed.
 - See attached document for additional information.
- C. Remove and dispose of accumulated sludge.

3.8. OPERATIONS BUILDING

- A. Remove and replace existing feed (piping) including metering pumps, 5 total.
- B. Remove and replace existing 2-ton hydraulic lift system to include cables, hydraulic cylinders, pump, hoses and motor assembly

3.9. ADMINISTRATION BUILDING

- A. Remove and replace front door
- B. Repair leak from roof hatch at control room.
- C. Remove and replace the existing roll up door located at the basement level of the administration building. The door opening is 104 inches X 98 Inches.