Advanced Manufacturing Branch (AMB)

Scope of Work (SOW)

This procurement is necessary to keep gold electroplating services at the quality levels for the products at GSFC.

Description of Requirements:

This SOW shall include several requirements: Refining/reclaiming of gold and silver metals from bath solutions, or waste water that shall be provided by the Advanced Manufacturing Branch (AMB). Also, gold nuggets and silver bars shall be provided so that they may be refined and purity analysis performed to determine their value. All metals associated with the refinement of the solids (bars & nuggets) shall be provided by AMB. The SOW shall also include design and fabrication of a gold and gold strike plating module with tanks and accessories to renovate the current gold plating facility (physical tanks).

System Requirement Overview: (All drawings shall be approved by GSFC <u>before any tank/module construction begins</u>. Unless otherwise specified all dimensions shall be within +/- .125".)

This renovation shall include, but is not limited to the following:

Gold Plate Module:

The current gold and gold strike modules shall be replaced with a new gold and gold strike modules. The new modules shall include a tank for the gold solution and a tank for the gold strike solutions, with accessories and a counter flow rinse tank as well as a spray rinse tank.

Gold Strike Tank Fabrication and Accessories:

- Gold Strike tank: 36" x 24" x 36" deep, constructed from ½" thick white polypropylene with a 3" wide top flange
- Two (2) steel girth bands encapsulated in polypropylene and one (1) slotted partition (8" from the left side along the 36" length)

- A ¼" thick polypropylene outer safety jacket shall encapsulate the tank
- One (1) 9kw Titanium, immersable heater, (or equivalent to Model # 3T9223-P1)
- One (1) digital Temperature controller with a built in low level controller and float type probe (or equivalent to Model # DLC502-LT-LC)

- DI Spray Rinse Tank, 36" x 24" x 36" deep, constructed from ½" thick white stress relieved polypropylene with a 3" flange
- Two (2) polypropylene girth bands encapsulated in polypropylene and two (2) 1-1/4" NPT bottom drain half couplings
- One (1)3/4" diameter work rod mounted 2" down for the top inside of the tank.
- One (1) double sided, 3 tiered PVC Spray manifold with a cone sprayer (The spray shall be actuated by a knee-high mushroom switch with a 3 minute timer)
- One (1) dual column ion exchange system complete with two 33" high ion exchange columns
- Two (2) 10" pre-filter chambers and pump
- Provided two resin charges for gold solids

Gold Plate Tank Fabrication and Accessories:

- Gold Plate Tank: 36" x 24" x 36" deep, constructed from ½" thick white stress relieved polypropylene with a 3" flange
- Two (2) steel girth bands encapsulated in polypropylene and one (1) slotted partition (8" from the left side, along the 36" length)
- A ¼" thick polypropylene outer safety jacket shall also encapsulate the tank
- One (1) Model# HXF6213-35-P1, 6kw Teflon immersion heater or equivalent
- One (1) Model# DLC502-LT-LC, digital temperature controller w/built in low level controller and float type probe or equivalent
- Two (2) anodes and one (1) cathode constructed from ¾" stainless rod, drilled and tapped on one end and mounted to the tank with adjustable holders

- One (1) Model# A-300-BL, In-tank filter system complete with a ½ hp pump and a 30" CPVC filter chamber connected to a single leg CPVC dispersion tube <u>or equivalent</u>
- One (1) Model# P-1/4A (or equivalent), Solution Agitation 1/3hp pump connected to a double leg CPVC sparge system with two (2) eductors per leg
- One (1) Model# TPD-50 (or equivalent), amp hour meter complete with pre-determining and totalizing counters, audible and visual alarms and the required shunt and leads
- One (1) Model# SLT12-50, sealed power supply, 50 amps, 12 volts DC output, constant current/ constant voltage (CC/CV), less than 1% ripple, sealed electronics and digital meters <u>or equivalent</u>

- Counterflow Rinse Tank: 60" x 24" x 36" deep tank, constructed from ½" thick polypropylene with a 3" wide top flange
- Two (2) steel girth bands encapsulated in polypropylene, over/under flow partitions creating two (2), 28" x 24" compartments, each compartment shall have a 1" NPT drain coupling
- The first compartment (Station #3) shall have a 2" x 24" over-flow weir with a 1" NPT outlet
- One (1) water fed valve with sparge tube
- There is no Safety Jacket for this tank, Two (2) ¾" diameter stainless steel work rods with holders (1 per station) the work rods are for hanging parts while rinsing

<u>Tanks/Modules</u>

Module frame:
The tanks shall be mounted in a stainless steel frame measuring approximately 16" L x 42" W with a working height of 40"
A top work surface shall be provided with each tank, back splash and sliding front access panels and removable side panels
Shelves shall be provided for rectifiers and amp hour meter

Plumbing:
- All drain outlets listed shall be located on the front wall of the tanks and connected to a common drain manifold with PVC ball valves (except for the overflows) and terminated on one end

- One (1) drain coupling from the spray rinse tank shall be plumbed to the Dual column ion exchange system and the other drain coupling directly to the drain manifold
- Water fill valves shall be located along the rear of the tanks and connected to a common manifold located on the front of the module and terminated on one end
- All piping shall be labeled accordingly using pipe labels
- Electrical: All heaters, low level probes and filter systems shall be mounted in their respective tanks
- The temperature controls shall be located behind their respective stations. Outlets with on/off switches shall be provided for use with the filter system
- Outlets shall also be provided for use with the rectifiers and amp hour meter
- The Module shall be wired for 230V AC, 3 phase AC input

Ventilation:

- Exhaust outlets shall be provided for all the modules.
- Outlets shall be located behind their respective tanks and connected to a common manifold located behind the module
- Connection to the exhaust shall be on the left side of the module
- The system shall be a pull design
- All systems are designed in accordance with the current edition of the Industrial Ventilation Guide

Auxiliary Equipment:

- Item# 1 Six (6) 6" x 24" platinum clad niobium anodes; clad with 250 micro inches of platinum on both sides, framed in titanium with two (2) 1" x 6" titanium straps on one end of each anode
- Item# 2 Six (6) 6" x 24" platinum clad niobium anodes; clad with 250 micro inches of platinum on both sides, framed in titanium with two (2) 1" x 6" titanium straps on one end of each anode. These are identical to Item# 1
- Item# 3 Two (2) 1/2" thick white stress relieved polypropylene tank liners with a 3" wide top flange to fit a 36" x 24" x 36" deep tank

Additional Requirements:

- Provide engineering and as built-in Operation and Maintenance (O&M) manuals. The manuals shall be in both electronic and hard copy formats, describing in detail the system components and drawings for the entire system.
- One (1) year full system warranty which shall cover all parts and labor
- Anything not working correctly or any issues with parts are covered under the warranty
- Three (3) years support with on-site service after the warranty expires
- Provide any extra service contract information for this system

Shipping Requirements:

1. Deliver to GSFC Building 5 Electroplating Facility with installation/setup at this location to be included
2. Removal of old equipment shall be included

Description of Requirements:

This SOW shall include several requirements: Refining/reclaiming of gold and silver metals from bath solutions or solids. Waste water shall also be provided by the Advanced Manufacturing Branch (AMB) to be refined. Gold nuggets and silver bars shall also be provided so that they may be refined for purity and analysis performed to determine their value. All metals associated with the refinement of the solids shall be provided by AMB. The SOW shall also include design and fabrication of gold and gold strike plating modules with tanks and accessories to renovate the current gold plating facility.

Refining:

Refine gold and silver solutions, resins and burnables, as well as any gold and silver powders, bars, nuggets and solid scrap materials to be stripped from the solutions by the refinery.

Specification requirements for Refining (All items to be refined shall be provided by GSFC:

- Refining of gold solution (BDT 510) with an estimated gold concentration of 1.2 Troy oz/gal (capacity of the solution is 120 gallons)
- Refining of gold strike solution (Aurobond TN) with an estimated gold concentration of 1.1 grams per liter (capacity or the solution is 120 gallons)
- Refining of gold stripper solution ~~(s(4ix~~, 55 gallon drums and 1-5 gallon totaling 330 gallons)
- Refining of 4.059 pounds of gold metal (nuggets)
- Refining of 46 gold and gold strike filters (burnable)
- Refining of 120 gallons of silver plating solution
- Refining of 120 gallons of silver strike solution
- Refining of 119.594 pounds of silver bars

(All items listed for refining are estimates)