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Statement of Work

Date: February 19, 2010
ROME Tracking No.: AN02486
Project Title: Exterior Building Repairs at Building 1229

Scope:

This task will take place at Building 1229. The task requires the subcontractor to make repairs to the exterior in accordance with the following;

Masonry Repairs:

A. Tuckpointing Of Randomly Located Defective Mortar Joints:

1. The defective masonry joints will be removed to a depth of $\frac{3}{4}$ ". This will be accomplished using handheld dustless grinding equipment fitted with diamond segmented grinding wheels. Care should be taken so as not to over-cut the joints and score the brick faces.
2. Upon removal of the mortar, the joints will be cleaned to remove any loose dust and debris. This will be done using a combination brushes and low-pressure, oil-free, compressed air.
3. The resulting joint cavities will then be wetted, with clean potable water, to prevent the adjacent masonry and mortar from prematurely dehydrating the new tuckpointing mortar.
4. The dry ingredients, of the mortar, will be thoroughly blended prior to the addition of any water. After blending the dry ingredients, water will be added and the mortar will be allowed to hydrate prior to placement into the joint cavity.
5. The tuckpointing mortar shall be placed in lifts of $\frac{3}{8}$ ", until the joint cavity is filled flush with the brick faces. The mortar will be allowed to cure until it is thumbprint hard, at which time the joint will be tooled to a slightly concave profile.
6. The majority of excess mortar, on the brick faces, shall be removed after the joint is tooled. This will be done using wooden scrapers and dry brushing. After allowing several days of curing, the tuckpointed area(s) will receive a final cleaning. This will consist of scrubbing the area(s) with a stiff bristle brush and clean potable water. If it is determined that this method of cleaning does not achieve the desired results, then a mild masonry cleaner would be employed, such as SureKlean 600. If a chemical cleaner is utilized, it will be followed by a thorough rinse of clean potable water.

B. Repair Of Cracks Located In The Concrete Foundation:

1. At areas where there are cracks in the concrete foundation, expose the section of the foundation down to the footer.
2. The cracks will be prepared for injection by first setting injection ports, centered over the cracks, and sealing them in-place using an epoxy gel resin such as Sikadur 31 Hi-Mod Gel. The remainder of the crack would then be sealed using the same epoxy gel resin. This resin is applied at approximately 1/8" thickness by 1/2" in width.
3. After allowing sufficient time for the epoxy resin to cure, the surface-mounted ports will be injected using a low-viscosity epoxy injection resin such as Sikadur 35 Hi-Mod LV. The ports shall be injected in sequence until the crack will accept no more resin. The resin will be delivered using either an epoxy injection pump or hand-held epoxy cartridge guns. The delivery method will be determined primarily by the root opening of the crack and thickness of the foundation.
4. After allowing the injection resin to cure, the injection ports and the epoxy gel seal will be removed. This removal will be done using handheld grinders equipped with abrasive discs. The material will be removed so as to be flush with the adjacent surfaces. Care will be taken not to gouge the surface of the concrete during this removal process.

C. Repair Of Randomly Located Damaged Bricks:

1. Every effort will be made to repair the damaged bricks in-place. In-place repairs of individual brick, which are cracked, will be accomplished by the following method:
 - a. Inject the crack with a low-viscosity, structural, epoxy resin. The resin will be placed into the crack using disposable hypodermic syringes.
 - b. Before the resin has achieved its final set and is still tacky to the touch, brick dust will be applied onto the surface of the epoxy to color the repair.
2. Cracked bricks that are loose and can be removed will be repaired using the following method:
 - a. Remove the loose mortar from around the brick(s) and carefully remove the brick sections.
 - b. Clean the mating surfaces, of the cracked brick, to remove any dirt and or biological growth.
 - c. Apply a thin layer of structural epoxy gel onto both of the mating surfaces. Clamp both halves together until the epoxy has set.
 - d. After the epoxy has fully cured, re-lay the brick back into position.
3. Bricks that are badly damaged, or that have multiple fractures, will be discarded and replaced with new brick. The replacement brick will be matched as close as possible, in size, color, and texture, to that of the existing bricks.

D. Cleaning & Sealing Of The Brick Veneer:

1. The brick veneer will first be cleaned, using a combination of a mild detergent solution and a clean potable water rinse, to remove any dirt and biological growth. The solution will be scrubbed onto the bricks and mortar using stiff bristle brushes and allowed set to 5 to 10 minutes. The masonry will then be rinsed using a 1500-psi pressure washer. The nozzle of the pressure-washing wand will be held off from the surface of the wall approximately 24 inches.
2. Clean random tar and asphalt spills from the brick. This will be accomplished by first treating the areas with a biodegradable citrus concentrate to breakdown and loosen the deposits. Then the bulk of the residue will be removed using wooden scrapers so as not to damage the face of the brick. The remaining residue will be removed using a stiff bristle scrub brush, followed by a clean water rinse. The process will be repeated until the stain is removed.
3. Following the cleaning process, the entire masonry exterior will be sealed using a clear, non-yellowing, penetrating sealer such as Chemtrete BSM 40 VOC. The sealer shall be applied starting at the bottom of the wall and working upwards. The material will be applied so that an 8 to 10 inch run-down curtain is achieved. The sealer will be applied at a rate recommended by the sealer manufacturer.

E. Cleaning & Sealing Of The Limestone Entrance Façade and All Limestone Or Precast Concrete Window Sills:

1. The limestone Entrance Façade, limestone windowsills and precast window sills will be cleaned, using a combination of a mild detergent solution and a clean potable water rinse, to remove any dirt and biological growth. The solution will be scrubbed onto these building elements using stiff bristle brushes and allowed set to 5 to 10 minutes. The elements will then be rinsed using a 1500-psi pressure washer. The nozzle of the pressure-washing wand will be held off from the surface of the wall approximately 24 inches.
2. Remove any defective mortar joints in the Façade panels, using dustless grinding equipment, and repair them by tuckpointing.
3. Remove all windowsill head joints and replace them using a single component, polyurethane caulk such as Sikaflex 15LM.
4. After the joint repairs have been completed, an acrylic-latex base coat, such as Sika Elastic Base Coat, will be applied. The base coat will be applied using conventional paint rollers and brushes.
5. After base coating, apply an intermediate coat of a high-performance, anti-carbonation, crack-bridging, acrylic-latex, elastomeric, waterproof coating such as Sika 550W Elastocolor.
6. A finish coat, of the same elastomeric waterproofing, is then applied to complete the system.

F. Cleaning & Sealing Of Main Entrance Granite Steps, Landing & Wing Walls:

1. The first step in cleaning and sealing the granite elements will be to tuckpoint all of the mortar joints. The defective masonry joints will be removed to a depth of $\frac{3}{4}$ ". This will be accomplished using handheld dustless grinding equipment fitted with diamond segmented grinding wheels. Care should be taken so as not to over-cut the joints and score the stone.
2. Upon removal of the mortar, the joints will be cleaned to remove any loose dust and debris. This will be done using a combination brushes and low-pressure, oil-free, compressed air.
3. The resulting joint cavities will then be wetted, with clean potable water, to prevent the stone and residual mortar from prematurely dehydrating the new tuckpointing mortar.
4. The dry ingredients, of the mortar, will be thoroughly blended prior to the addition of any water. After blending the dry ingredients, water will be added and the mortar will be allowed to hydrate prior to placement into the joint cavity.
5. The tuckpointing mortar shall be placed in lifts of $\frac{3}{8}$ ", until the joint cavity is filled flush with the brick faces. The mortar will be allowed to cure until it is thumbprint hard, at which time the joint will be tooled to a slightly concave profile.
6. The majority of excess mortar, on the stone, shall be removed after the joint is tooled. This will be done using wooden scrapers and dry brushing. After allowing several days of curing, the tuckpointed joints will receive a final cleaning. This will consist of scrubbing the area(s) with a stiff bristle brush and clean potable water. If it is determined that this method of cleaning does not achieve the desired results, then a mild masonry cleaner would be employed, such as SureKlean 600. If a chemical cleaner is utilized, it will be followed by a thorough rinse of clean potable water.
7. The next step will be to clean the granite surfaces with cleaning solution specifically formulated for granite.
8. After allowing the cleaner to stand for 10 to 20 minutes, thoroughly rinse the surface with clean potable water.
9. Once the granite has been allowed to dry, apply a specially modified silane, penetrating, sealer onto the granite. The sealer should be formulated so as to repel water, oil, and stains while at the same time allowing the stone to "breathe". The sealer should not be a vapor barrier, but instead should allow the stone to release any residual moisture trapped within.

G. Cleaning Anodized Aluminum & Non-Anodized Aluminum Building Elements:

1. The initial step will be to clean the anodized & non-anodized aluminum surfaces using a solution of clean potable water and mild detergent to remove any loose surface dirt and pollutants. The solution can be spray applied onto the surfaces using low-pressure sprayers or applied with an oil-free rag. The surfaces will then be rinsed using pressure-washers.

Note: The solution should not be allowed to dry on the surface or be applied when the aluminum too "hot-to-the-touch".

If the initial cleaning procedure fails to produce satisfactory results, apply a specially formulated wax, such as Woody Wax, designed to disintegrate oxidation, corrosion, and water spots. When applied to metal that is in relatively good condition, the wax should be allowed to remain on the surface, for approximately 30 minutes, then wiped off with a clean oil-free cloth.

2. Some surfaces to be treated have heavy pitting or corrosion. On these surfaces, it may be necessary to leave the wax on overnight. This extended set time is not detrimental to the metal, but it does allow a longer time to attack the corrosion and oxidation. Using a piece of bronze wool, that has been sprayed with the solution; rub the surface to remove the corrosion. Buff the treated area(s) down with a clean oil-free cloth to complete the process.

Note: Two or three applications may be required to remove corrosion in severely pitted areas.

H. Seal Perimeter Of Window Frames & Door Frames:

1. Remove the existing backing materials and sealant from the joint at the intersection of the metal frame-to-masonry. This will be done using electric caulking cutters and / or conventional razor knives.
2. Install new closed-cell polyethylene backer rod into the joint cavity. The backer rod will be recessed from the surface of the joint, at the appropriate depth, to insure maximum joint sealant performance.
3. Fill the remaining void using a commercial grade, single-component, silicone sealant, such as Dow Corning 790. The sealant will be tooled to a slightly concave profile. The color of the sealant should be a medium-to-dark bronze in order to blend with the window frames. The color of sealant for the door frames will be selected to match the casing color..

I. Clean and Paint All Steel Window and Door Lintels:

1. Remove all loose and flaking paint from the steel lintels using dustless grinding equipment fitted with braided wire wheels.
2. Areas, which are badly rusted, will be mechanically cleaned using dustless grinding equipment fitted with composite abrasive grinding discs.
3. Voids, existing between the masonry and the lintels, will also be addressed by inserting the grinding wheels into the void and abrading the top surface of the steel lintel.
4. The voids will then be cleared using oil-free, compressed air to remove any grinding dust and debris.
5. All prepared surfaces shall then be primed using a zinc-free, corrosion inhibiting primer.
6. Once the primer has dried, paint the steel lintels with a commercial grade, exterior, acrylic latex enamel paint. The color of this paint will be matched as close as possible to the bronze colored window frames.

Note: If testing indicates that the existing paint contains lead or other heavy metals above acceptable limits, the surfaces must be abated in accordance with State and Federal regulations.

J. Clean and Waterproof The Exposed Portions of The Concrete Foundations:

1. Using a 3500-PSI pressure washer, clean the surface of the concrete to remove any dirt and biological growth.
2. After allowing the concrete to dry, an acrylic-latex base coat, such as Sika Elastic Base Coat, will be applied. The base coat will be applied using conventional paint rollers and brushes.
3. After base coating, apply an intermediate coat of a high-performance, anti-carbonation, crack-bridging, acrylic-latex, elastomeric, waterproof coating such as Sika 550W Elastocolor.
4. A finish coat, of the same elastomeric waterproofing, is then applied to complete the system.

K. Re-glaze All Window and Door Glass:

1. Cut back all existing glazing and / or gaskets so as to be flush with the metal framing.
2. Clean both the glass and the edges of the metal framing with oil-free cloths and denatured alcohol.
3. Apply a commercial grade silicone glazing, such as Dow 795 Sealant, at the intersection of the glass-to-metal framing. The sealant shall be tooled to form a small fillet.

L. Seal All Masonry-to-Lintel Joints:

1. Remove any existing filler materials from the void between the masonry and steel lintels.
2. Insert 3/8" diameter polyethylene tubing, on 18" centers, into the cavity. The tubing is to be set perpendicular to the wall.
3. Place closed-cell, polyolefin foam, backer rod into the cavity between the polyethylene tubing segments. The use of backer rod will be determined by the width of the cavity's opening.
4. Fill the remaining opening with a commercial grade silicone sealant, such as Dow 790, to an approximate depth of 1/2". The sealant will be tooled to a slight concave profile.
5. After allowing the sealant to achieve an initial set, remove the polyethylene tubing segments. This will result in a 3/8" diameter weep hole, which is flush with the surface of the lintel.

M. Paint The Steel Personnel Doors:

1. Clean the doors and frames to remove all loose paint and surface rust. This will be done using hand tools and / or dustless grinders fitted with sanding discs or braided wire wheels.
2. Areas, which are badly rusted, shall be mechanically cleaned using dustless grinders fitted with composite abrasive discs.

3. Wipe down the metal frames with a solution of clean potable water and TSP. This should be followed by a clean water rinse to remove any residue.
4. After allowing the surface to thoroughly dry, apply a commercial grade, acrylic latex, metal primer.
5. Once the primer has dried, paint the frames with a commercial grade, exterior, acrylic latex enamel paint. The color of this paint will be matched as close as possible to the bronze colored window frames, located on the structure.

Note: If testing indicates that the existing paint contains lead or other heavy metals above acceptable limits, the surfaces must be abated in accordance with State and Federal regulations.

N. Refinish the Building's Wall Plaques:

1. Remove the various wall plaques from the building for refinishing off-site.
2. Remove all oxidation from the raised lettering and perimeter framing. This is to be done by sanding the surfaces with different grades of garnet abrasives.
3. Strip the painted background areas to bare metal and then follow with a solvent wipe with a lint-free cloth.
4. The lettering and borders will then be taped to protect the cleaned surfaces.
5. Paint the background areas with a dark bronze, exterior grade, acrylic paint. Apply the paint using HVLP spray equipment.
6. Remove the tape from the lettering and borders and treat the entire plaque with three coats of a transparent, UV-resistant, acrylic sealer.
7. Reinstall the plaques using color matched, corrosion-resistant fasteners.

O. Replace All Building Expansion Joints:

1. Remove any existing joint filler and backing material except in those joints, which have copper bellows joints installed.
2. Clean the sides of the joint cavity to remove any sealant residue. This can be done using razor knives and / or dustless grinding equipment fitted with composite abrasive discs.
3. Insert a closed cell polystyrene backer rod into the joint cavity. Recess the backer rod, from the face of the joint, to provide the proper depth-to-width ratio.
4. Fill the remaining void with Sikaflex 15LM polyurethane sealant. Tool the sealant to a slightly concave profile.

P. Repair Spalled Areas On the Concrete Foundation & Front Entrance Apron:

1. Cut a 1/4" kerf around the perimeter of the damaged area to provide a shoulder for the repair material to bear against. This will be done using dustless grinding equipment fitted with a segmented diamond cutting wheel.

2. Any exposed reinforcing steel will be cleaned to remove any rust and scaling. It would then be treated with a epoxy-cement, rust-inhibitor such as Sika Armatec Epocem 110.
3. Mechanically remove any loose or deteriorated concrete down to a sound substrate.
4. Prime the repair area with a slurry produced from the repair mortar.
5. While the slurry coat is still green, apply a polymer-modified, structural repair mortar such as SikaTop 123 Plus. Place the patching material, starting at the center of the repair area, and work it outwards towards the kerf. If the depth of the repair is greater than 1", the material will need to be installed in lifts.
6. The repair mortar will be applied and finished by hand so as to be flush with the adjacent surfaces.

Q. Clean and Paint all Exterior Wall Louvers:

1. Remove all loose and flaking paint from the louver frame and vanes using hand scrapers and wire brushes.
2. Wipe down the louvers with a solution of clean potable water and TSP. This should be followed by a clean water rinse to remove any residue.
3. After allowing the surface to thoroughly dry, apply a commercial grade, acrylic latex, metal primer.
4. Once the primer has dried, apply two coats of a commercial grade, exterior, acrylic latex enamel paint. The color of this paint will be matched as close as possible to the bronze colored window frames, located on the rest of the structure. *Note: If testing indicates that the existing paint contains lead or other heavy metals above acceptable limits, the surfaces must be abated in accordance with State and Federal regulations.*

R. Apply Non-Skid Coating on the Front Entrance Apron, the North Entrance & West Entrance Landings:

5. Clean the concrete to remove any dirt and biological debris. This will be done using 2500 PSI pressure washers.
6. Repair any cracks in the surfaces using the previously described crack repair method.
7. Cut out and replace any expansion or control joint sealants and replace with new backing material and a two component, traffic-grade, polyurethane joint sealant such as Sikaflex 2C-NS-TG.
8. Mask off the expansion / control joint sealant to prevent non-skid coating from getting onto the sealants.
9. Apply a basecoat of BASF Tuf-Coat non-skid coating. The coating is to be applied in one direction.
10. Apply a topcoat of BASF Tuf-Coat non-skid coating in a direction perpendicular to the basecoat.

S. Repair Spall Damage on the Main Entrance Limestone Façade:

1. Cut a ¼” kerf around the perimeter of the damaged area. This will be done using dustless grinders fitted with diamond-segment grinding wheels.
2. Remove any loose and / or deteriorated material from within the repair area.
3. Prime the cavity with a slurry made from Conproco Matrix Mortar.
4. Apply the Matrix repair mortar into the cavity while the slurry primer is still “green”.
5. Allow the Matrix Mortar to achieve an initial set, then carve and texture finish the material to match the adjacent limestone.

T. Seal Miscellaneous Wall Penetrations:

1. Remove abandoned wall anchors and brackets. Fill the resulting holes using color matched materials. The materials may be sealants, mortar or Matrix depending on the location and type of material in which the hole is located.
2. Wall penetrations, which are to remain, will be sealed using Dow 790 Silicone Caulk. The caulk will be color matched to the penetration’s material and / or the adjacent wall material.

U. Stabilize the Damaged Masonry Located at the upper Northeast Corner and Southwest Corner:

1. Stabilize this section of masonry by install Helifix Retro-Fit Wall Anchors.
 - a. Clean out the existing cracks in the masonry, removing any caulk or mortar.
 - b. Drill a 6.5mm entry hole through the brick veneer by means of high-speed rotary percussion drill. Extend the hole to a maximum of 3” into the backup substrate. Exact spacing of the wall ties will be determined in the field.
 - c. Install an 8mm Helifix, 304 stainless steel, remedial wall tie into the entry hole. The Helifix wall tie will be driven into position and recessed by means of a Helifix “DryFix” setting tool, mounted on a SDS type drill.
 - d. The remaining recessed hole shall be filled with a brick colored mortar or a brick colored caulk to seal the repair.
2. After the wall anchors have been installed, repair all defective mortar joints using the methods described in repair Item “A”.

V. Tint the Entrance Door and Sidelight Glass on the East, West and North Entrances.

1. Install 3M Night Vision NV 15 Solar Control Film on the doors and sidelight panels. The film will be installed on the interior side of the glass.

W. Clean All Window and Door Glass:

1. Upon completion of all repair activities, the window glass and door glass will be cleaned to remove any residue from the application of the Woody Wax and to remove other surface dirt and contamination.

Optional Bid Item No.1: Replace 150 ea. Insulated Window Glass Units and 1 ea. Spandral Window Glass Unit.

1. Replace randomly located window glass units, which are fogged or otherwise damaged, with new 1" bronze tinted, annealed, insulated glass units.

This job can be performed during normal working hours. Normal working hours at NASA LaRC is from 7:00 a.m. – 3:30 p.m. Monday thru Friday. Any work being performed outside of normal working hours is considered after hours work and requires an onsite security escort at all times. The intent to work after hours must be pre-approved during bid proposal. All scheduling must be coordinated through the construction manager prior to the start of work. All ROME sub-contracting employees must attend the ROME safety training, performed on Tuesday mornings at 7:30 a.m. at 5 Manhattan, approximate length is 3 hours. Employees must also attend the NASA safety training in order to receive a temporary badge. NASA safety training is held every morning at 7:30 a.m. at Building 1238, approximate length is 45 minutes.

All statements made herein shall be field verified by the subcontractor before ordering material or accomplishing work.

Bids shall include estimated time to complete job and delivery time of parts if applicable. Bids shall include all local and Virginia state taxes. Bids shall include all applicable shipping & handling charges.