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USACE / NAVFAC / AFCEC / NASA **UFGS-32 01 11.51 (May 2016)**
Change 2 - 08/17

Preparing Activity: USACE **Superseding**
UFGS-32 01 11.51 (April 2006)
UFGS-32 01 11.52 (April 2008)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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SECTION 32 01 11.51

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05/16, CHG 2: 08/17

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SECTION 32 01 11.51

RUBBER AND PAINT REMOVAL FROM AIRFIELD PAVEMENTS
05/16, CHG 2: 08/17

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NOTE: This guide specification covers the requirements for removal of rubber deposits and paint from asphalt concrete or portland cement concrete airfield pavements.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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NOTE: It is recommended that friction and/or texture testing be performed for affected pavement areas after hydroblast operations are performed for rubber and/or paint removal work. This is recommended because the effective friction level may be reduced by polishing of the aggregates within the pavement surface.
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NOTE: On the project drawings, show:

1. Locations and dimensions of areas applicable to removal work.

2. Type and general condition of pavement and any joints or markings for each removal area.

3. Indication of whether rubber, paint, or both are to be removed in each work area.

4. Locations of Government hydrants to be provided for Contractor use.

****

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Measurement

[Rubber] [and] [paint] removal is measured by the number of square meters feet of [rubber] [and] [paint] to be removed.

1.1.2 Payment

[Rubber] [and] [paint] removal is paid for at the contract unit price per square meter feet of [rubber] [and] [paint] to be removed.

1.2 REFERENCES

****

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910 Occupational Safety and Health Standards

1.3 ADMINISTRATIVE REQUIREMENTS

Submit a schedule of work to the Contracting Officer. Describe the work

to be accomplished; noting the location of work, distances from the ends of runways, taxiways, buildings, and other structures; and indicating dates and hours during which the work will be accomplished. Schedule the work to conform to aircraft operating schedules. The Government will try to schedule aircraft operations so as to permit the maximum amount of time for the Contractor's work. However, in the event of any emergency, intense operational demands, adverse wind conditions, and other unforseen difficulties, discontinue all work at locations in the aircraft operational area. Keep the approved schedule of work current and notify the Contracting Officer of any changes prior to beginning each day's work.

1.4 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G". Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Schedule of work; G[, [_____]]

[Rubber] [and] [Paint] Removal Process Plan; G[, [_____]]

Waste Collection, Identification and Disposal Plan; G[, [_____]]

SD-03 Product Data

Mechanical [rubber] [and] [paint] removal equipment

Chemical [rubber] [and] [paint] removal equipment

[Rubber] [and] [Paint] Removal Detergents or Chemicals ; G[, [_____]]

SD-06 Test Reports

Test Section Results

1.5 MECHANICAL REMOVAL EQUIPMENT

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NOTES: Shotblasting is prohibited for use on airfield pavements.
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Submit product data for mechanical [rubber] [and] [paint] removal equipment including area of coverage per pass, range of water pressures, and water tank capacity.

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NOTE: For Navy, delete sandblasting. The use of sandblasting is prohibited for use on Navy airfield pavements.
****

Mechanical removal equipment includes waterblasting[, sandblasting], grinding or scarifying, or other approved non-chemical systems. [Control the equipment used on asphalt or tar concrete to remove [rubber] [and] [paint] accumulations while minimizing disturbances to asphalt or tar mixtures.] [Control the equipment used on portland cement concretes to remove [rubber] [and] [paint] accumulations and prevent removal of hardened paste from the concrete.] Basic hand tools and the following major types of mechanical equipment are considered acceptable for this project:

a. Waterblasting Equipment.

b. Grinding or Scarifying Equipment.[

c. Sandblasting Equipment.]

1.5.1 Waterblasting Equipment

Provide mobile waterblasting equipment capable of producing a pressurized stream of water that effectively removes [rubber] [and] [paint] from the pavement surface without significantly damaging the pavement. Provide equipment, tools, and machinery which are safe and and in good working order at all times. Provide equipment interlocks to prohibit high

pressure water discharge when the vehicle or cleaning head is stationary (not moving forward or side to side).

[1.5.2 Sandblasting Equipment

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NOTE: For Navy, delete sandblasting. The use of sandblasting is prohibited for use on Navy airfield pavements.
****

Provide mobile sandblasting equipment capable of producing a pressurized stream of sand and air that effectively removes [rubber] [and] [paint] from the pavement surface without filling voids with debris in asphalt or tar pavements or removing joint sealants in portland cement concrete pavements. Include with the equipment an air compressor, hoses, and nozzles of adequate size and capacity for removing [rubber] [and] [paint]. Equip the compressor with traps and coalescing filters that maintain the compressed air free of oil and water.

]1.5.3 Grinding or Scarifying Equipment

Provide equipment capable of removing surface contaminates, paint build-up, or extraneous markings from the pavement surface without leaving any residue. If a weed torch is used to remove paint, the surface must be cleaned by hydro blast afterwards to remove surface contaminates and ash.

1.6 CHEMICAL REMOVAL EQUIPMENT

Submit product data for chemical [rubber] [and] [paint] removal equipment. Use chemical equipment capable of applying and removing chemicals from the pavement surface while leaving only non-toxic biodegradable residue.

1.7 TEST SECTION

Prior to the start of work, remove [rubber] [and] [paint] on designated test areas not less than 15 m 50 feet in length. Use procedures, water pressures, nozzle height, nozzle spacings, nozzle angle, and equipment movement rate to achieve the required degree of [rubber] [and] [paint] removal in accordance with Paragraph [RUBBER] [AND] [PAINT] REMOVAL. Methods included in paragraph COMPLIANCE TESTING will be used to detemine if the [rubber] [and] [paint] was successfully removed from the test section. The test will examine seven random locations within the test section. Submit the test section results before conducting any further removal work. Provide photos of seven random locations within the test area taken before and after the removal. Provide photos of four random locations at joint seals within the test area taken before and after removal.

1.8 DELIVERY, STORAGE, AND HANDLING

Deliver required materials in original manufacturer's containers labeled with appropriate EPA, OSHA, or other agency warnings, if applicable, and Safety Data Sheets. Protect materials from degrading until their use is required during execution of the work.

1.9 PROJECT/SITE CONDITIONS

1.9.1 Environmental Requirements

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NOTE: For Navy, delete sandblasting. The use of sandblasting is prohibited for use on Navy airfield pavements.
****

Ensure pavement surface is free of snow, ice or slush. Ensure surface temperature is at least 5 degrees C 40 degrees F and rising at the beginning of operations[except those involving sandblasting for which a lower surface temperature may be approved]. Cease operation during thunder and lightning storms. Cease operation during rainfall except for waterblasting and removal of previously applied chemicals. Cease waterblasting where surface water accumulation alters the effectiveness of material removal.

1.9.2 Airfield Traffic Control

Coordinate performance of all work in the controlled zones of the airfield with the Contracting Officer and with the [Flight Operations Officer or Airfield Manager] [control tower]. Neither equipment nor personnel can use any portion of the airfield without permission of these officers unless the runway is closed. Runways will be closed during the following times:

Day or Date	Runway Closing Time	Runway Opening Time	Important Notes
[_____]	[_____]	[_____]	[_____]

1.9.3 Radio Communication

No personnel or equipment will be allowed in the controlled zones of the airfield until radio contact has been made with the control tower and permission is granted by the control tower. A radio for this purpose [will be provided by the Government. The Contractor is responsible for the radio and must reinburse the Government for repair or replacement of the radio if it is lost, damaged, or destroyed] [is to be provided by the Contractor and approved by the Contracting Officer]. Maintain contact with the control tower at all times during work in vicinity of the airfield. Notify the control tower when work is completed and all personnel, equipment and materials have been removed from all aircraft operating surfaces.

1.9.4 Emergency Landing and Takeoff

Emergencies take precedence over all operations. Upon notification from the Control Tower of an emergency landing or imminent takeoff, stop all operations immediately and evacuate all personnel and equipment to an area not utilized for aircraft traffic which is at least 76 m 250 feet measured perpendicular to and away from the near edge of the runway unless otherwise authorized by the Contracting Officer or the Contracting Officer's Representative. Equipment and chemicals or detergents as well as excess water must be able to clear the work area within 3 minutes.

1.9.5 Airfield Lighting

When night operations are necessary, provide all necessary lighting and equipment. Direct or shade lighting to prevent interference with aircraft, the air traffic control tower, and other base operations. Provide lighting and related equipment capable of being removed from the runway within 15 minutes of notification of an emergency. Night work must be coordinated with the Flight Operations Manager or Airfield Manager and approved in advance by the Contracting Officer or authorized representative.

1.9.6 Water

Water to be used for high-pressure water equipment will be made available from Government hydrant[s] [as shown on the drawings,] [within [_____] m feet of all points of the work area,] [at no cost to the Contractor] [at the prevailing rates]. Furnish equipment and labor for delivery of water from the hydrant to the job site. Notify the Contracting Officer on location of fire hydrant[s] to be used and the respective times of use. The Contracting Officer will notify the Fire Department of fire hydrants to be used and designated times of use. Connections to a fire hydrant will be subject to the Contracting Officer's inspection and approval. The Contractor must provide and use a backflow prevention device for filling water tanks. The Contractor is responsible for testing, treating, and filtering the water to ensure it will not interfere with the rubber removal or damage or clog the rubber removal equipment.

1.10 SAFETY

Comply with OSHA 29 CFR 1910.

PART 2 PRODUCTS

2.1 [RUBBER] [AND] [PAINT] REMOVAL DETERGENTS OR CHEMICALS

The use of environmentally acceptable detergents or chemical agents must be considered on a case-by-case basis. Submit the Safety Data Sheet (SDS) for detergents or chemicals in the [rubber] [and] [paint] removal process. Use of any detergents or chemicals in the [rubber] [and] [paint] removal process must be approved in advance by the Contracting Officer. The Government specifically reserves the right to reject the use of any process which the Contracting Officer determines may pose unnecessary risks to human health, the environment, the pavement, aircraft or NAVAIDS due to corrosion or foreign object damage (FOD) potential as a result of its use, storage, or disposal.

PART 3 EXECUTION

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NOTE: The Contracting Officer's Representative, the airfield manager and the pavements engineer will jointly develop guidelines and requirements for rubber and paint removal operations; and will jointly evaluate the feasibility of the Contractor's methods and project compliance with applicable regulations.

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3.1 [RUBBER] [AND] [PAINT] REMOVAL

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NOTE: The following provides recommended rubber and paint removal percentages based on visual estimation of pavement area required to be exposed by the removal process. The degree of removal possible without damaging the pavement surface will depend on pavement condition. Portland cement concrete pavements can withstand more water pressure impact than asphaltic concrete pavements before aggregates are exposed. Do not specify 100 percent removal, as this will result in excessive exposure of pavement aggregates.

1. Rubber removal from Portland cement concrete pavements: 90 percent.

2. Rubber removal from asphaltic concrete pavements: 85 percent.

3. Paint removal from Portland cement concrete pavements and asphaltic concrete pavements: 85 percent.

NOTE: The drawings should indicate areas surfaced with a porous friction course.

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Prior to any work being completed, submit a [Rubber] [and] [Paint] Removal Process Plan for approval by the Contracting Officer.

a. The pavement surface type is [portland cement concrete] [and] [asphalt mixture] [as indicated].

b. [Remove 90 percent of all visible rubber on portland cement concrete pavements and 85 percent of all visible rubber on asphaltic concrete pavements.] [Remove 85 percent of paint on portland cement and asphaltic concrete pavement. Remove all paint that is loose, flaking, chalky, or not to be re-marked or does not comply with size or pattern standards.]

c. Chemical methods used must be compatible with pavement materials, the environment and working personnel.

d. Exercise close control of water pressure and blasting time/duration to prevent damage to joints, existing markings that are not intended for removal, or the wearing surface. [Neither hydroblasting or abrasive blasting may be used for rubber removal on porous friction courses.]

e. Demonstrate the ability to remove rubber at a touchdown area of the runway selected by the Contracting Officer; at least one site per runway will be chosen. Rubber removal must not damage the pavement surface. The surface texture of the cleaned demonstration area will be compared to that of non-rubber traffic areas to determine satisfactory completion of the removal operation.

f. After approval of the Contractor's operations by the Contracting Officer, the cleaned sample area will become the standard for rubber

removal and final surface texture for the remainder of work.

g. Compliance testing for the amount of rubber and paint to be removed must conform to the requirements in paragraph COMPLIANCE TESTING.

3.2 RATE OF REMOVAL

[Remove rubber at a minimum rate of 929 square meter 10,000 square feet per hour.] [Remove paint at a minimum rate of 93 square meter 1,000 square feet per hour.] Do not permit high-pressure water application to remove the existing pavement surface, joint seals or crack seals.

3.3 WATER PRESSURE

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NOTE: The optimum water pressure to be used for rubber and paint removal will be determined by the test specified in paragraph entitled "Rubber and Paint Removal."

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Provide water pressure impact upon the indicated pavement areas sufficient to remove the designated [rubber] [and] [paint] to the required degree of removal without damaging the existing pavement, joint sealant, or other airfield appurtenances. The Contractor is responsible for repairing any damage caused by the removal work.

3.4 CLEANUP AND WASTE DISPOSAL

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NOTE: The Contractor is normally responsible for total contract performance. However, at geographically isolated airfields, it may be necessary to furnish Government equipment and personnel for cleanup operations.

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Keep the worksite clean of by-products, debris and waste from [rubber] [and] [paint] removal operations. Perform cleanup operations continuously. [Residue will be removed from the pavement by Government-furnished sweepers and personnel. Notify the Contracting Officer for coordination.] [Remove all residue from the pavement. Obtain the approval of residue removal and disposal method from the Contracting Officer prior to beginning work.] Submit a Waste Collection, Identification and Disposal Plan describing proposed actions regarding waste collection, control, identification, and disposal to the Contracting Officer's Representative for approval prior to the start of work. The plan will address disposal methods and requirements for hazardous and non-hazardous wastes.

3.5 COMPLIANCE TESTING

a. Compliance with the [rubber] [and] [paint] removal requirements must be determined by direct testing within the designated work area.

b. Use a 0.1 square meter one square foot section of transparent material inscribed with a grid of 100 equal squares as a tool for quantitative measure of the percent removal. Place the grid pattern on the pavement surface at random locations. Then count the squares which

contain rubber and/or paint deposits. The number of squares containing rubber and/or paint deposits must not exceed the allowed percentage in each of the randomly selected locations.

c. Divide each work area designated for [rubber] [and] [paint] removal into at least four equal zones for the purpose of compliance testing. The layout of each zone must be approved by the Contracting Officer. Within each zone, a minimum of seven random locations must be evaluated. The amount of [rubber] [and] [paint] removed at each of the randomly selected test locations within each zone must meet the requirement described in paragraph [RUBBER] [AND] [PAINT] REMOVAL. Evaluate each zone independently. A zone not meeting the required percentage must be recleaned by the Contractor at the Contractor's expense.

d. Deposits of [rubber or rubber buildup] [and] [paint] are defined as any surface deposit that can be removed by scratching the deposit with a flat sharp object (such as a pocket knife) without damaging the pavement surface. Stains are defined as materials in the pavement surface microtexture that cannot be removed without damaging the pavement surface. Stain is generally embedded in the surface of the pavement below the horizontal plane of the surface texture. The Contractor is not responsible for stain removal.

3.6 DAMAGE REPAIR

Repair any damage to the pavement surface, joint, joint and crack seals, or other Government property caused during the performance of the work at the Contractor's expense. Submit a repair plan to include methods and material to the Contracting Officer's Representative for approval prior to performance of the repairs. Complete the repairs within the performance period of the Contract.

-- End of Section --