**PART 1 GENERAL**

* 1. **SECTION INCLUDES**
1. Section Includes standards for:
	1. Tile for on-grade, concrete only, floor installations for automotive workshop and service drive environments.
	2. Tile for above-grade, concrete only, floor installations for automotive workshop and service drive environments.
	3. Tile for wall tile applications in automotive workshop and service drive environments.
	4. Cementitious backer board as tile in substrate (in wet areas) in automotive workshop and service drive environments.
	5. Non-ceramic trim and accessories in automotive workshop and service drive environments.
	6. **RELATED REQUIREMENTS**
2. Section Includes:
3. Section 07 1400 – Fluid applied waterproof membranes.
4. Section 07 9005 – Joint sealers.
5. Section 09 2116 – Gypsum Board Assemblies: Installation of tile backer board.
6. Section 22 4400 – Plumbing Fixtures: Showers.
	1. **REFERENCE STANDARDS**
7. ANSI A108/A118/A136.1 – American National Standard Specifications for the Installation of Ceramic Tile (Compendium) 2019.1.
8. ANSI A108.1a – American National Standard Specifications for the Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar, 2019.
9. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).
10. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2019).
11. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2019).
12. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2019 (Revised).
13. ANSI A118.7 - American National Standard Specifications for Cement Grouts for Tile Installation; 2019 (Revised).
14. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2019).
15. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation; 2019.
16. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2019.
17. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2019.
18. Basis of design and installation in the Finish Schedule and Drawings: see tile manufacturer (AutoStone Floor Systems) for recommended installation standards. Any deviation from ANSI standard should default to tile manufacturers recommend installation standards for automotive workshop and service drive environments, see/contact www.autostoneusa.com.
	1. **SUMMARY**
19. Section Includes:
	1. Un-glazed technical, impervious, through-body porcelain tile. Must be a through-body technical grade, porcelain material with water absorption rate of no more than 0.05%.
	2. A SETTINGS material warranty supplied by Mapei for no less than 10 years for this floor system installation.
	3. Roll-on, liquid applied, crack isolation membrane is required. See F125 standard for either partial or full coverage for all concrete grade installations.
	4. Waterproof membrane coverage recommendation which provides both waterproof protection and crack isolation protection for floor tile installations, on above-grade concrete decking.
	5. Setting materials, thinset, grout, grout release, self-leveling compounds, and floating compounds.
	6. Metal finish trims, metal control joints, transition trims, vehicle ramps and other metal system components as needed.
20. Related Sections:
	1. Section 03 3000: Cast-In-Place Concrete, for floor substrate.
	2. Section 07 9200: Joint Sealants
	3. Section 09 2116: Gypsum Board Assemblies, for glass-mat, water-resistant backer board.

**1.2 SUBMITTALS**

1. Product Data: Submit for each type of product specified, including installation and maintenance instructions.
	1. SDS Sheets.
	2. Product Data Sheets: provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives, as per tile manufacturers recommended installation standards for automotive workshop and service drive environments.
	3. Tile and labor warranty requirements for installed floor system.
	4. Setting materials warranty from setting materials manufacturer.
	5. Maintenance and Cleaning Data: include recommended cleaning methods, cleaning materials, and stain removal methods. Furnish the following for Owner's use in maintenance of project and any recommended cleaning chemical(s).
2. Shop Drawings:
3. Shop drawings must indicate tile layout, patterns, color arrangements, perimeter conditions, junctions with dissimilar materials, vehicle ramps, drain covers, control joints (CJ’s) and expansion joints (EJ’s), thresholds and setting details.
4. Samples for Verification:
5. Three submittal size samples of each type, color and finish of tile required for architect, general contractor, and owner.
6. Send all specification sheets on all setting materials, metal extrusions, grout colors and tile samples.

**1.3 QUALITY ASSURANCE**

1. Service drive and workshop tile to come from same manufacturer and be supplied in matching compatible dye-lot for each product code for uniformity and appearance.
2. Tile must be installed with no less than 95% thinset coverage on the back of all floor tile.
3. Finished floors must be sounded for hollow-spots as part of the quality check, upon completion of project.
	1. Tile Contractor must perform a chain-rake QC (quality check) on entire floor tiled surface upon completion to check for hollow-spots, identified by a hollow-sound during this process.
	2. Tile Contractor should perform this chain-rake QC check both on the horizontal (X) and vertical (Y) axis of the floor.
	3. Remove and replace any tiles identified as having hollow spot beneath tile surface.
4. Installer Qualifications: Company specializing in performing tile installation in automotive workshop and service drive environments, with minimum of five years of documented experience and multiple completed comparative workshop and service drive projects.
	1. References of automotive service facilities completed should be included with your bid proposal.
5. Mock-Up:
6. Dry-lay tile as directed by GC or Site Supervisor.
7. If mock-up is requested, architect will review for correct joint size, profile, and color.
8. Approved mock-up may become part of the finished Work.

**1.4 DELIVERY, STORAGE, AND HANDLING**

1. Deliver and store package materials in original containers with seals unbroken and labels

intact until time of use.

1. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

Protect from freezing.

**1.5 ENVIRONMENTAL REQUIREMENTS**

1. Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer’s written instructions.
2. Maintain ambient and substrate temperature a minimum of 50 degrees F (10 degrees C) and maximum of 95 degrees (35 degrees C) during installation of tile and setting materials.
3. Environment must be enclosed and protected from outside elements, rain, wind, and all types of weather conditions which may impact and interfere with tile installation.

**1.6 EXTRA MATERIALS**

1. Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

**PART 2 PRODUCTS**

**2.1 TILE MANUFACTURER**

1. Tile: Subject to compliance with requirements, provide products indicated for each designation in the Finish Legend in the Drawings.
2. Subject to compliance with requirements, provide product of the specified manufacturer AutoStone Floor Systems, Series: enviroshop.
3. Tile as indicated on the Finish Legend in the Drawings for Service Drive and/or Workshop Floor Tile. Floor tile for thinset installation is as listed.
	* 1. Enviroshop series by AutoStone Floor Systems – format 12” x 12” (nominal size) – 10 mm thick tile.
			1. Product Code: AS.ES.1212.12.SG.LINE.A+B+C.Brightfinish.

Color is: Smoke Grey

Sizes: 12” x 12” x 10 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

* + - * 1. Product Code: AS.ES.1212.12.AG.LINE.A+B+C.Brightfinish.

Color is: Alloy Grey

Sizes: 12” x 12” x 12 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

* + - * 1. Product Code: AS.ES.1212.12.CB.LINE.A+B+C.Brightfinish.

Color is: Carbon Black

Sizes: 12” x 12” x 12 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

* 1. Drive Series by Autostone Floor Systems- format 8” x 8” (nominal size) – 10 mm thick tile.

 a. Product Code: AS.DS.1212.12.SG.LINE.A+B+C.Brightfinish.

Color is: Smoke Grey

Sizes: 8” x 8” x 9.1 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

* + - * 1. Product Code: AS.ES.1212.12.AG.LINE.A+B+C.Brightfinish.

Color is: Alloy Grey

Sizes: 8” x 8” x 9.1 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

* + - * 1. Product Code: AS.ES.1212.12.CB.LINE.A+B+C.Brightfinish.

Color is: Carbon Black

Sizes: 8” x 8” x 9.1 mm (thickness) nominal dimension.

Finish: Brightfinish.

Structure: R-Shop Textured

1. Floor tile must have brightfinish, a permanent surface sealant applied during manufacturing process to seal surface micropores and aid with dealership cleaning practices.
	1. NO post-installation sealant application is allowed or permitted as an alternate.
2. DCOF Tile Standard: Provide tile that complies with ANSI A137.1, “Specifications for Ceramic Tile,” for types, compositions, and other characteristics as indicated below:
3. Tile must comply with DCOF for STF (slip, trip and fall) risk management, minimum standards for tile floors where, the presence on installed tiles of water (including standing water as can exist on floors which are not properly sloped for drainage or on exterior tiles immediately after a rain storm or on which snow is melting), oil, grease, and/or any other elements which reduce traction, creates slippery conditions where the risk of a slip cannot be completely eliminated.
	1. All service drive and workshop floor tile must comply requirements in ANSI A137.1 Section 6.2.2.1.10 Coefficient of Friction Specification and Section 9.6 Procedure for Dynamic Coefficient of Friction (DCOF) testing.
	2. All service drive and workshop floor tiles must be tested by TCNA laboratories and have testing data that is no less than 3-years old from date of contracting.
		1. R-ratings are not accepted.
4. Cleaning Materials:
5. Provide manufacturers recommended floor cleaning chemicals for tile contractor, general contractor, and dealership operations.
6. Recommended cleaning chemicals are:
	1. DealerClean by AutoStone Floor Systems.
	2. FILA Chemicals.

**2.3 TILE SETTING MATERIALS**

1. All setting materials as listed when installed according to the manufacturer’s instructions will provide customer a minimum of a 10-year Mapei Setting Materials Warranty.

**2.4 CRACK ISOLATION / WATERPROOFING MEMBRANE MATERIALS**

1. Provide materials complying with requirements of ANSI A118.10 for waterproof membranes, ANSI A118.12 for crack isolation membranes, and manufacturer’s proprietary uncoupling system allowing independent movement between tile and substrate and to limit transfer of stresses, as defined by TCNA for Uncoupling Membrane.
2. Unless specifically listed by architects plans, all floor tile is to be installed over a liquid applied, crack-isolation membrane over entire concrete slab surface, which is the F125-16 (Full Coverage), in the automotive workshop and service drive environments.
3. ANSI: Meets A118.12 standard (Crack-Isolation Membranes for Thin-Set Ceramic Tile)
4. ASTM: C627 (Robinson): Extra heavy service rating
5. Membrane is to be applied via a roll-on application of two separate coatings, no less than 20 mils wet and 15 mils when dried.
6. As an alternative (if selected by architect), a liquid applied, crack-isolation membrane is to conform to the F125-16 (Partial) standard which is 3x’s the width of the tile over all concrete substrate control joints.
	1. ANSI: Meets A118.12 standard (Crack-Isolation Membranes for Thin-Set Ceramic Tile)
	2. ASTM: C627 (Robinson): Extra heavy service rating
	3. Membrane is to be applied via a roll-on application of two separate coatings, no less than 20 mils wet and 15 mils when dried.
7. All floor tile to be installed on above grade concrete decking shall have 100% coverage of a water proofing membrane over entire floor and 12” up all walls, with a mesh membrane applied at floor and wall junctions.
8. ANSI: Exceeds A118.10 standard (Waterproofing Membranes for Thin-Set Ceramic Tile) and A118.12 standard (Crack-Isolation Membranes for Thinset Ceramic Tile).
	* 1. ASTM: C627 (Robinson) service rating for extra heavy
		2. ASTM: E-96 Method E, meeting requirements of <0.5 perms
9. Water proofing membrane is to be applied via a roll-on application of two separate coatings, no less than 20 mils wet and 15 mils when dried.
10. Provide materials complying with requirements of ANSI A118.10 for waterproof membranes, ANSI A118.12 for crack isolation membranes, and manufacturer’s proprietary uncoupling system allowing independent movement between tile and substrate and to limit transfer of stresses, as defined by TCNA for crack-isolation membrane.
11. Approved Crack Isolation Products:
	1. Laticrete Hydrobarrier
	2. Laticrete Hydroban
	3. Laticrete Fracture Ban SC
12. Approved Waterproof Membrane Products:
	1. Laticrete Hydrobarrier
	2. Laticrete Hydroban
	3. No Alternates accepted.

**2.5 THINSET ADHESIVE MATERIALS**

A. Latex-Portland Cement Mortar (Thin Set): Must meet these Industry Standards:

1. ANSI: Meets or exceeds ANSI A118.4HTF, ANSI A118.11.
2. ANSI A118.15HTF bond-strength requirements.
	1. Features and Benefits Industry Standards and Approved Uses:
3. Polymer-enriched for high performance and deformability.
4. Nonsag formula for heavy tile applications.
5. Interior/Exterior Service Drive and WorkShop Floor: Provide mortar that complies to ANSI A 118.4.
6. All tiles should no less than 95% thinset connection coverage between tile and substrate.
7. Interior/Exterior Service Drive and WorkShop Floors: Provide mortar that complies with Paragraph C-4.6.1 in addition to the other requirements in ANSI A 118.4.
	1. Acceptable Products:
		1. NA 3220 Multiflex.
		2. Mapei Ultraflex 2.
		3. Laticrete LHT Plus.
	2. No alternates accepted.
8. ShopWall Tile Applications: Provide non-sagging mortar that complies ANSI A 118.4.
	1. Acceptable Products:
9. Laticrete 4XLT.
	1. No alternates accepted.

**2.7 LEVELING COMPOUNDS and CAULK SEALANT**

1. Self-leveling and Patching Compounds:
2. Laticrete 3701 Modified Mortar Bed
3. Laticrete NXT Plus Leveler
4. No alternates accepted.
5. Caulk Sealants: Interior nonacid silicone rubber sealant, types as specified.
6. Sealants and caulking are NOT to be used for caulking control joints in the tile surface. See pre-fabricated metal extrusions for all control joints requirements. Sealants are to be used for all tile to metal or other conditions as outlined on the architect’s specs and details as shown on Finish Plans.
7. Approved manufacturers are
	1. Laticrete Acrylic Caulk Sanded
8. No alternates accepted.

**GROUT MATERIALS**

1. Grout is to be a Hydrated Cement Technology free of Portland Cement.
2. GROUT INDUSTRY STANDARDS AND APPROVALS must meet:
3. ISO 13007: Classification CG2WAF
4. Meet and exceeds ANSI A118.6 industry standards.
5. Meet or exceeds A118.7 industry standards.
6. SCS Green-Squared: Certified per ANSI A138.1
7. Grout must include Drop-Eﬀect™ technology which includes am ultra-premium, ﬁne-aggregate, fast-setting, polymer-modiﬁed, color-consistent, non-shrinking, eﬄorescence-free grout for joint widths from 1/16" to 3/4" (1,5 to 19 mm).
8. Grout must be formulated with High-Hydrated Cement Technology (HCT™) to eliminate the common problems related to Portland-cement grout, such as color consistency and eﬄorescence.
9. Grout must include a higher polymer content, HCT reduces absorption and increases stain resistance when compared with standard-performance cement grouts.

**2.8 APPROVED GROUT AND COLORS**

1. Laticrete Permacolor Select: Unless identified by architect on plans otherwise, grout colors are to be:
	1. Alloy Grey : 24 Natural Grey
	2. Smoke Grey : 42 Platinum
	3. Carbon Black : 45 Raven
2. Laticrete Permacolor : Unless identified by architect on plans otherwise, grout colors are to be:
	1. Alloy Grey : 24 Natural Grey
	2. Smoke Grey : 42 Platinum
	3. Carbon Black : 45 Raven

**2.9 EXTRUSIONS**

1. All installations must reflect the architect or structural designers plan which shows the specific location and details of movement joints on project drawings.
	1. Tile contractor shall follow the EJ171 standard for all movement joints within the tile installation.
	2. Location and Frequency of Joints:
		1. Interior: 20’ (preferred) up to 25’ (maximum) distance for CJ installation.
		2. Exterior: 8’ (preferred) to 10’ (maximum) distance for CJ installation.
		3. Interior exposed to sunlight: 8’ (preferred) to 10’ (maximum) distance for CJ installation.
		4. Above-ground concrete slab substrate: 8’ (preferred) to 10’ (maximum) distance for CJ installation.
	3. Tile contractor must submit a plan showing CJ plan for all extrusions and their location, in consult with architects or structural engineers plans.
	4. Extrusion height, when installed must be 1/16” (approximately) lower, when installed from the height of the tile floor to not create a damning effect to thwart or retard water migration and cause pooling or similar negative situations.
2. Perimeter Joints:
	1. Movement joints are required where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings and where changes occur in backing materials, but at drain locations and drain strainers.
	2. All true expansion joints (EJ’s), cold, isolation, contraction, and seismic joints in the structure, where two separate slabs abut, should continue through the tilework, including such joints at vertical surfaces.
3. An AutoStone floor system installation requires use of manufactured metal (aluminum) extruded components such as:
	1. Control Joints with expansion and contraction core, reducer trim, hybrid stair nose and end cap treads, “T” and “L” channels, vehicle ramps, floor cove, quarter round base trim and accessories.
4. There shall be a metal (anodized aluminum) edge transition strip between all adjoining non-tile, to tile surfaces.
5. Floor system shall include a 2” ramp at all vehicle entry points, unless shown flush to adjoining surface, or an alternative metal termination element is buried in concrete.
	1. For renovations projects, where existing in-ground drains center drains are level with floor grade concrete, the 2” ramp is to be used around drain, as a frame and transition from tile to grade-level at drain-edge.
6. All control joints (CJ’s) must be (aluminum) metal fabricated compression joints (color to match companion tile color), or as reflected on architects finish schedule.
	1. Siliconized or sanded caulking of CJ’s in either the service drive or workshop are not accepted.
	2. Any caulking materials (100% silicone) is to be used for tile to metal locations and to be applied to base trim to wall locations, or for expansion joints (EJ’s).
7. Brands approved are:
8. Schluter Anodized aluminum satin finish.
9. Great Lakes Metal aluminum satin finish.
10. INSTALLATION QUALITY: installer must push raked thinset to the edge of the fabricated metal edge so no voids under the tile and substrate are present. Tile contractor to test all installed tiles around all metal edges to confirm that no less than 95% or better thinset is present under tile, where tiles meet all fabricated metal extrusions.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

1. Verify concrete substrates, areas, and conditions where tile will be installed comply with requirements for installation tolerances and other conditions affecting performance of installed tile.
	1. AutoStone Workshop and Service Drive floors should be installed on a concrete substrate. No alternative substrates such as: poured self-leveling systems such as: MAXXON, GYPCRETE, or similar non-100% concrete materials are used.
	2. Excessive surface deflection will lead to delamination, broken tile, and will void all warranties by installation team, and both manufacturers of tile & setting materials. Must meet current TCNA standards in TCNA Handbook for Ceramic, Glass, and Stone Tile Installation, 2019.
	3. For tile installations maximum allowable floor member live load and concentrated load deflection for framed floor systems shall not exceed L/360, where “L” is the clear span length of the

supporting member per applicable building code.

* 1. **CONCRETE COMPOSITION AND SURFACE**
1. Thinset requires a porous substrate to bond to. If the concrete itself, or the surface unacceptable the tile installation will fail.
2. Curing compounds shall not be used where a tiled floor is to be bonded directly to the concrete cured surface. These surfaces shall be wet/damp cured for (28) days.
3. Manufacturers claim some resinous concrete curing compounds and sealers have been formulated and designed to lay on the surface of the concrete, become brittle as they age, and flake off with traffic and time, leaving no residue. It is claimed that use of these types of resinous curing compounds will have no effect on the bonding, however the tile industry’s experts indicate otherwise. These claims are not accepted by the National Tile Contractor Association (NTCA). There is a strong possibility that any tile installed on these type surfaces will lose bond, produce a hollow sound and result in a cracked or broken tile. No resinous concrete curing compounds and sealers should be used with concrete.
4. Other types of “cure and seal” curing compounds based on fluosilicates that combine chemically with the free lime in Portland cement have been declared as non-conforming with concrete curing requirements and may also cause the same problems as the resinous materials noted above. This type of material should not be used without a full and complete labor and materials guarantee from the curing compound manufacturer as it relates to any installed floor.
5. Concrete slab must be free of dirt, dust, oil, curing compounds, or any coatings that may prevent bond of the tile to the slab.
6. Concrete slab must be sound, crack-free, and fully cured.
7. Concrete slabs to receive a thin-set tile installation shall have no variations in plane exceeding ¼” in 10 feet.
8. Concrete slabs shall be steel troweled, then light broom finished.
9. Prior to commencing the installation, tile contractor shall inspect surface substrate. The architect is the designated authority to be notified in writing of any defects or conditions that will affect a successful tile installation. A copy of any report shall be provided to general contractor as well.
10. Installation work will proceed when satisfactory conditions are provided.
11. The removal of curing compounds, oil or other coatings can be accomplished by bush hammerings, sandblasting, shot blasting, water blasting, chipping or scarified to provide a substrate acceptable to receive the installed floor.
12. Proceed with installation only after unsatisfactory conditions have been corrected.
13. Comply with parts of ANSI A108 Series “Specifications for Installation of Ceramic

Tile” that apply to types of setting and grouting materials and methods indicated.

1. Comply with latest edition of TCNA’s (Tile Council of North America, Inc.) “Handbook

for Ceramic Tile Installation” guidelines for TCNA installation methods indicated.

1. Comply with mortar and grout manufacturer's printed instructions.
2. Lay tile in grid pattern, unless otherwise indicated in Drawings, with aligned joints.
3. Lay out tile work and center tile fields in both directions in each space or wall area.
4. Provide uniform joints, adjusted to minimize tile cutting.
5. Align joints when adjoining tiles on floor, base, walls, and trim are the same size.

**3.3 ADJUSTING, CLEANING and QUALITY CONTROL (QC)**

1. Tile Contractor must perform a chain-rake QC (quality check) on entire floor tiled surface upon completion to check for hollow-spots, identified by a hollow-sound during this process. Tile Contractor should perform this QC check both on the horizontal (X) and vertical (Y) axis of the floor. Remove and replace any tiles identified as having hollow spot beneath tile surface.
2. Tile Contractor to perform a post-clean flood rinse with clean water as final step in cleaning to remove acidic residue from the grout removal and tile cleaning process.
3. PH test floor to document that the clean water flood rinse removed the acidic residue so floors test between 6.8 and 8.0 on the PH scale. Use fresh water to test every 400 to 500 square feet, in the corners of (4) tiles. If PH levels are too high or too low, continue with clean water rinse to remove chemical residue.
4. Adjusting Defective Work:
	1. Replace cracked, chipped, broken, and unbonded tile.
	2. Rake and re-grout defective grout joints.
5. Final Cleaning:
6. Clean tile and joints with Tile Cleaner after curing mortar and grout.
7. Rinse with clean water and allow to dry.
8. Protective Paper: It is recommended to have Kraft protective paper applied to all finished floor goods to protect finished tile and grout work.
9. Kraft paper should be quoted as an “add” for all floor finished tile goods.

**END OF SECTION**