SECTION 03 35 00

POLISHED CONCRETE FLOORING

DTI PolishCrete System

POLISHED CONCRETE (1500 GRIT) SPECIFICATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section covers mechanically ground, densified, polished, and guarded concrete floors using the DTI PolishCrete System, finished to the following specified polish level:

1. Level 4 - 1500 Grit: mirror gloss finish, maximum clarity and reflectivity.

B. The work includes surface grinding, crack and joint treatment, application of DTI CD7 densifier, progressive resin polishing to the specified final grit, application of DTI Seal Pro + guard, and final burnishing.

1.2 REFERENCES

A. ASTM C779 - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
B. ASTM D523 - Standard Test Method for Specular Gloss.
C. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers.
D. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials.
E. ACI 302.1R - Guide for Concrete Floor and Slab Construction.

1.3 DEFINITIONS

A. Polish Level: the final resin-bond grit reached in the polishing sequence, which determines sheen and reflectivity.
B. Aggregate Exposure: the degree of coarse and fine aggregate revealed by grinding. Exposure is a function of the existing slab and is not uniform across any floor; see 1.7.

1.4 SUBMITTALS

A. Product data for DTI CD7 densifier and DTI Seal Pro + guard.
B. Installer qualifications: minimum five years of concrete polishing experience and a minimum of 25 completed polished concrete projects of similar size.
C. Mock-up approval record (see 1.6).
D. Maintenance instructions for the finished floor.

1.5 QUALITY ASSURANCE

A. Pre-installation conference with the Owner, General Contractor, and polishing contractor to confirm polish level, aggregate exposure expectations, joint treatment, schedule, slab readiness, and power requirements.
B. Slab flatness: slabs to receive a Level 3 or Level 4 finish shall have a minimum overall F(F) of 50 measured per ASTM E1155. Floors below this value may show visible waviness in the reflection at high polish levels and shall be brought to the Owner's attention in writing before work begins.

C. Electrical: grinding and polishing equipment may require 480V three-phase power. Confirm availability before mobilization; generator requirements, if any, shall be identified at the pre-installation conference.

1.6 MOCK-UP

A. Before production work, complete a mock-up of not less than 100 square feet in an area designated by the Owner, carried through the full specified sequence including densifier, final grit, and guard.
B. The approved mock-up establishes the standard for aggregate exposure, sheen, color variation, and workmanship for the project. Production work shall match the approved mock-up.
C. The mock-up may remain as part of the finished floor.

1.7 DESIGN LIMITATIONS AND EXCLUSIONS

A. Uniform aggregate exposure cannot be guaranteed. Aggregate size, distribution, and depth are properties of the existing slab placement and vary across every floor.
B. Existing slabs may contain patching, trenching, pour-backs, and repairs that polish to a visibly different tone than the surrounding slab. Pour-backs and new concrete shall cure a minimum of 28 days before polishing.
C. Cracks, joints, and saw cuts in the existing slab will remain visible after polishing. Treatment under this Section improves their appearance and protects their edges; it does not eliminate them.
D. Color variation, including cream, salt-and-pepper, and exposed aggregate areas, is inherent to polished concrete and is not a defect.
E. This Section does not include structural slab repair, moisture mitigation, or leveling of slabs outside the flatness stated in 1.5. Where in-situ relative humidity exceeds 85 percent per ASTM F2170, or surface moisture readings indicate an active vapor problem, notify the Owner before proceeding; densifier performance on actively wet slabs cannot be warranted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Densifier: DTI CD7, a reactive silicate-based concrete densifier and hardener that penetrates the slab, reacts with free lime to form additional cementitious material within the pores, and increases surface hardness, abrasion resistance, and dust resistance.
B. Guard: DTI Seal Pro +, a breathable, penetrating guard treatment for polished concrete that protects against staining and etching while preserving the polished appearance and slip characteristics of the floor.
C. Joint filler: semi-rigid polyurea joint filler, Shore A hardness class 85 for warehouse and industrial traffic and class 45 where a softer fill is specified, as scheduled in Part 3.
D. Crack and spall repair materials: semi-rigid polyurea repair mortar compatible with the polishing process, capable of being ground and polished flush with the surrounding surface.
E. Grinding abrasives: metal-bond diamond tooling in progressive grits (40, 80, 150), transitional (hybrid) tooling at 100 grit, and resin-bond diamond tooling at 200, 400, 800, and 1500 grit as required to reach the specified polish level.
F. Water: potable, for wet grinding and rinsing where used.

2.2 EQUIPMENT

A. Planetary or rotary grinding machines of sufficient head weight and power to achieve full aggregate

processing without skipping, fitted with vacuum dust collection operating at HEPA filtration where dry grinding is performed.
B. Edging equipment capable of carrying the same sequence to within 1/4 inch of walls, columns, and obstructions.
C. High-speed burnisher, 1500 RPM minimum, with pads appropriate to the guard manufacturer's instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify the slab is cured a minimum of 28 days, is free of curing compounds, sealers, coatings, adhesives, oils, and other bond breakers, or identify areas requiring removal under 3.2.
B. Verify joints are free of debris and that joint filler installation can proceed after initial grinding.
C. Document existing cracks, spalls, pour-backs, and slab defects photographically before starting. Defects not documented are presumed to have been caused by the work of this Section.

3.2 PREPARATION

A. Remove existing coatings, mastics, curing compounds, and surface contamination by mechanical grinding. Chemical stripping alone is not acceptable.
B. Protect adjacent surfaces, walls, storefronts, racking, and equipment from dust and slurry. Maintain dust control for the duration of the work.

3.3 GRINDING AND POLISHING SEQUENCE

A. General: perform each step over the full floor area including edges before advancing to the next grit. Vacuum and inspect between steps. Do not skip steps; each grit removes the scratch pattern of the previous one.
B. Metal-bond grinding:
    1. 40 grit metal bond: initial cut, removes surface contamination and opens the slab.
    2. 80 grit metal bond: refines the 40 grit pattern.
    3. 150 grit metal bond: final metal step, produces a uniform scratch pattern ready for transitional tooling.
C. Transitional step: 100 grit transitional (hybrid) tooling to bridge metal and resin sequences.
D. Joint treatment: after the initial metal passes, clean and fill control joints and contraction joints flush with DTI semi-rigid polyurea joint filler per Section 3.4, then continue the sequence so filler is ground and polished flush with the floor.
E. Resin polishing and densification:
    1. Apply DTI CD7 densifier liberally to saturation per the manufacturer's instructions, keep the surface wet for the full dwell time, then allow to dry. Densifier may be applied after the 200 grit pass or the 400 grit pass per the approved mock-up; the application point, once established by the mock-up, shall not change for the project.
    2. Resin polishing passes for this finish level:
        a. Sequence: 200 grit, then 400 grit, then 800 grit, then a 1500 grit resin bond pass. The 1500 grit pass is the final resin pass for this finish level.
F. At each resin step, the floor shall show no visible scratch pattern from the previous step before advancing.

3.4 JOINTS, CRACKS, AND REPAIRS

A. Control and contraction joints: fill with semi-rigid polyurea, overfill slightly, allow to cure, and shave or grind flush during the polishing sequence. Filler shall finish flush with the polished surface, not crowned or recessed.

B. Dormant cracks: rout or open as needed and fill with semi-rigid polyurea repair material; grind flush in sequence.

C. Spalls and surface defects: sawcut the perimeter a minimum of 1/2 inch deep where required to obtain a sound edge, remove unsound material, fill with semi-rigid polyurea repair mortar, and grind and polish flush in sequence.

D. Moving or structural cracks are excluded from cosmetic treatment and shall be reported to the Owner.

3.5 GUARD APPLICATION AND BURNISHING

A. After the final resin pass, clean the floor thoroughly and allow it to dry.

B. Apply DTI Seal Pro + guard in a thin, uniform coat per the manufacturer's instructions. Do not allow puddling or over-application; excess guard causes hazing and tracking.

C. Burnish with a high-speed burnisher after the guard has dried per the manufacturer's instructions to set the finish.

D. At this finish level, a second guard application and burnish may be required to reach the specified gloss; include it where needed to meet 3.6.

3.6 FIELD QUALITY CONTROL

A. Sheen verification: measure specular gloss per ASTM D523 (60-degree geometry) at a minimum of one location per 2,000 square feet. Typical achieved ranges at the specified final grit are:

1. Level 4, 1500 grit: 65 gloss units and above, mirror gloss with sharp reflection.

B. Compare sheen, exposure, and overall appearance against the approved mock-up. Areas visibly below the mock-up standard shall be re-processed.

C. Slip resistance: the finished floor, including guard, shall provide a coefficient of friction consistent with the Owner's use requirements; verify by test where specified.

3.7 PROTECTION AND TURNOVER

A. Protect the finished floor from construction traffic, water ponding, and staining materials until turnover. Use breathable protective covering only; do not seal fresh polished floors under non-breathable sheeting.

B. Turnover cleaning: vacuum and damp mop with a neutral pH cleaner. Do not apply waxes or topical coatings over the guard.

C. Deliver maintenance instructions: neutral pH cleaning, dust mopping schedule, and periodic re-burnishing and guard re-application intervals based on traffic.

END OF SECTION 03 35 00