PART 2 **GENERAL**

cementitious toppings

Section 03540

* 1. **SUMMARY**
1. This is the recommended specification for self leveling concrete over radiant floor heating.
2. Cementitious toppings for traffic bearing surface with applied surface treatment as scheduled.
3. Integral coloring with oxide pigments
4. Clear top coats / sealers
	1. **RELATED SECTIONS**
5. Section 03300 – Cast-in-Place concrete
6. Section 03360 – Concrete Finishes
7. Section 09660 – High Performance coatings
	1. **REFERENCES**
8. ACI 201.1R Guide for Making a Conditions Survey of Concrete in Service.
9. ACI 224.1 R93 Causes and repair of Cracks in Concrete Structure.
10. ASTM C78 – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
11. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch Cube Specimens).
12. ASTM C190 – Method of Test for Tensile Strength of Hydraulic Cement Mortars.
13. ASTM C580 – Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes
14. ICRI 03372 – Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.
	1. **SUBMITTALS**
15. Submit under provisions of Section 01300.
16. Product Data: Manufacturer’s data sheets on each product to be used, including:
17. Preparation instructions and recommendations.
18. Storage and handling requirements and recommendations.
19. Manufacturer’s printed installation instructions for each product.
	1. **QUALITY ASSURANCE**
20. Manufacturer Qualifications: Firm specializing in manufacture of cementitious underlayments and toppings, resinous flooring and coloring systems for concrete and resins.
21. Installer Qualifications: Firm specializing in installation of cementitious underlayments and decorative concrete and resinous flooring, with minimum 5 years documented experience with projects of similar scope, design and materials.
22. Mock-up: Provide a mock-up of each type of installation for approval of quality of workmanship.
23. Pre-Installation Meeting: At least three weeks prior to commencing underlayments and toppings work conduct a meeting at the project site to discuss contract requirements and job conditions; require the attendance of installers, representative of installation manufacturer, and installers of related materials; notify Architect in advance of meeting.
	1. **DELIVERY, STORAGE AND HANDLING**
24. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.
25. Store materials subjects to manager by freezing or overheating.
26. Deliver and store materials n site at least 24hours before work begins.
	1. **PROJECT CONDITIONS**
27. Maintain environmental conditions and protect work during and after installation o comply with referenced standards and manufacturer’s printed recommendations.
28. Proceed with underlayments and toppings work after surface defects have been repaired and projections through substrate have been completed.

PART 2 **PRODUCTS**

**2.1 MANUFACTURER**

1. Acceptable Manufacturer & Distributor: Düraamen Engineered Products Inc. with its corporate office located at 116 West 23rd Street, 5th Floor. New York, NY 10011. Tel: 866.835.6595 | F: 866.629.4157 | Email: info@duraamen.com website: [www.duraamen.com](http://www.duraamen.com)
2. Substitutions: Not permitted
3. Requests for substitutions will be considered in accordance with provisions of Section 01600.
4. Obtain products from a single supplier.

**2.2 SELF LEVELING CONCRETE, MICRO-TOPPING, INTEGRAL COLOR AND CLEAR PROTECTIVE COATS**

1. SELF LEVELING CONCRETE PRODUCT: *Param 5500* – Calcium Aluminate Cement based self leveling concrete manufactured by Düraamen Engineered Products Inc.
2. Application: Feather edge to 1.5inch. For placements greater than 1.5inch first apply a coat of pre-blended Päram 5500 with 20lb (9kg) of 3/8inch clean, dry coarse aggregate to each 50lb (22.7kg) bag of Päram 5500 and then apply a neat coat of 0.25inch thick Param 5500.
3. Working Time at 700F: 20 minutes
4. Set Time – ASTM C 191 at 700F: Initial Set – 1 to 1.5hr / Final Set: 2 to 3hr
5. Compressive Strength (ASTM C109):

4hr – 1000psi

24hr – 3000psi

7 days - 4500psi

28 days – 5500psi

1. Flexural Strength: 28 days – 100psi
2. Wet density: 120lb/ft3
3. Modulus of Elasticity (ASTM C 469): 28 days – 1.8 X 10-6
4. Accepts tile/stone installations in 16 hours and decorative cementitious micro-toppings in 24 hours
5. MICRO-TOPPING PRODUCT: *Arapido* – Portland cement based acrylic modified concrete supplied by Düraamen Engineered Products Inc.
6. Application: Apply at least two coats of *Arapido* at a combined thickness not exceeding 1/16inch. The grades of *Arapido* to be decided by the Architect / Client after reviewing mock-ups or samples.
7. Compressive Strength, ASTM C109: 4350psi
8. Primer and Additive – Acrylic copolymer
9. INTEGRAL COLORANT: Colorfast – Integral iron oxide pigments modified with dispersants and wetting agents and graded to mix evenly with polymer modified concrete toppings / skim coats supplied by Düraamen Engineered Products Inc.
10. Colors – 24 colors – Interno, Chamois, Caramel, Cork, Potters Clay, Dune, Fresco, Cotta, Celadon, Putty, Olive Branch, Flint, Burnt Umber, Mica, Chintz, Sedona, Spring Dew, Sage, Verde, Pewter, Aqua, Nimbus Grey, Charcoal Suede, Carbon Black
11. PROTECTIVE TOP COATS: Manufactured by Düraamen Engineered Products Inc.
12. Primer - Perdüre E32 – Water based epoxy primer
13. Top coat – Perdüre U45 / Perdüre U46 (2 coats), water based polyurethane/Perdure U90, moisture cured polyurethane

**2.3 ACCESSORIES**

1. Primer – Päram Super Primer and Cp1000
2. Moisture vapor control – Perdüre MVT
3. Crack repair – Perdüre ECF
4. Joint filler – Perdüre EJF

PART 3 **EXECUTION**

**3.1 EXAMINATION**

* 1. Examine surfaces to receive underlayments and toppings and conditions under which they will be installed.
	2. Installation shall not begin until the building is enclosed, including roof, windows, doors and any other apertures.
	3. Wood substrate shall be structurally sound, preferably fastened, and dry. Contractor shall clean subfloor to remove mud, oil, grease, and other contaminating factors before arrival of the authorized applicator.
	4. Wood substrate: The wood subfloor must be adequate to withstand live and dead loads with a deflection limitation of L/360.

**3.2 PREPARATION**

1. Concrete Substrates:
2. Clean area and remove unsound concrete grease, oil, paint and any other foreign materials that will inhibit performance.
3. Substrate shall be stable, solid and structurally sound.
4. After sanding and cleaning the substrate, test for MVER (moisture vapor emission rate – reference ASTM F 1869).
5. Repair deep area, holes and non-moving cracks with Perdüre ECF.
6. Non-Porous Substrates:
7. Ceramic tile, terrazzo, quarry tile and stone shall be solid, well bonded, clean and free of bond breaking contaminates such as glazes, wax, oil and sealers.
8. Surfaces shall be mechanically abraded until a ‘profile’ (CSP 4) is obtained for maximum bonding strength. Wet mop the floor removing all debris, dust and loose material prior to installing the primer.
9. Wood Substrate:
10. The wood subfloor must be adequate to withstand live and dead loads with a deflection limitation of L/360.
11. Fill cracks and voids in subfloor where leakage of slurry could occur.

**3.3 INSTALLATION**

1. Priming:
2. Two or more application of primer may be required on porous substrates.
3. Test: If the primer turns clear in approximately 30 minutes, then additional coats are needed.
4. Allow the first coat to dry before applying additional coats.
5. Allow the primer to dry to a non-tacky film, approximately 3 to 4 hours depending on temperature and humidity before applying Päram 5500.
6. Primed floor shall be covered with Päram 5500 within 24 hours, or primer shall be reapplied.
7. Protect primed substrate from foot traffic.
8. Install a bond breaker where vertical surfaces meet the new topping.
9. Mix proportions and methods shall be in strict accordance with product manufacturer recommendations.
10. Self leveling concrete installation:
11. Temperature shall be a minimum of 500F and shall not exceed 800F.
12. Close all windows and doors to minimize air flow.
13. Divide the areas to permit continuous placement without cold joints.
14. To prevent ridges between batches, use a smoother tool and work a narrow dimension.
15. The minimum thickness of Päram 5500 over radiant heat systems is ¾”.
16. Protect the poured Päram 5500 from excessive heat or draft conditions during the curing process. Turn off all forced ventilation and radiant heating systems. The floor can be walked on in 3-4 hours. However, if the surface is colored using a dyes or stains or any other cementitious micro-topping (Arapido / Pentimento) or covered with epoxy or polyurethane resin coatings or simply sealed with acrylic, epoxy and polyurethane sealers, it is recommend to wait 24 hours.
17. Application of Micro-topping
18. Prime the surface with Cp1000 (at least twice…8 – 10 hours between the coats).
19. Apply two coats of Arapido with a specially designed *Arapido Sprayer* integrally colored with Colorfast as per dosage determined after the site mock-ups or samples.
20. Install in accordance with manufacturer’s instructions.
21. Sealing:
22. The sealing process should not begin before 24 hours after completion of the pour. There must be NO foot traffic on the poured floor prior to installation of the sealer.
23. As per manufacturers’ instructions, apply 1 coat of Perdüre e32 – water based epoxy primer and allow it to dry for at least 6 hours before applying the Polyurethane top coat.
24. Apply two coats of Perdüre U46 (gloss) or Perdüre U45 (matte) as per manufacturer’s instructions.
25. Surface and air temperature, humidity and air-movement conditions must be as specified in manufacturer’s technical data sheets.