



November 28, 2008  
Self-Levelling Underlayment  
03 54 00  
[Project]

## **DAROTopp®**

# **Self-Levelling Synthetic Anhydrite Topping (Screed/Underlayment) Radiant Flooring Specification**

*This specification has been numbered, organized and formatted in accordance with the MasterFormat, Section Format and Page Format documents published jointly by Construction Specifications Canada (CSC) and Construction Specifications Institute (CSI).*

*The content of this specification is of general order and must be adapted to the specific requirements of a project. It is offered as a guide to experienced and knowledgeable construction professionals who must assume full responsibility for its interpretation and use. DARO Flooring Constructions Inc. is both a material supplier and installer.*

*The square brackets [ ] containing texts indicate an option to be considered/inserted by the specifier. Remove brackets and unused options before printing.*

### **Part 1. General**

#### **1.01 SECTION INCLUDES**

- A. Supply and installation of self-leveling synthetic (concrete) topping/underlayment on radiant floor heating tubes over an interior structural substrate using a separation (slip) sheet, sound and/or thermal insulation and edging strips.

[B. Impact sound and/or thermal insulation blanket under topping.]

#### **1.02 RELATED REQUIREMENTS**

A. Structurally sound substrate [Section \_\_\_\_\_]

*SPEC NOTE: Architect/Engineer to ensure structural subfloor integrity is sufficient to carry topping weight of approximately 1850 kg/m<sup>3</sup> (115 lbs./m<sup>3</sup>).*

B. Radiant-Heating Hydronic Piping [Section \_\_\_\_\_]

C. Finished floor [Section\_\_\_\_\_]

*SPEC NOTE: DAROTopp® synthetic topping/underlayment is suitable for receiving any type of floor covering. For light commercial applications or lofts, a polyurethane or epoxy finish may also be used. Once traffic ready, finishing/covering subcontractor to perform moisture test to verify topping surface is ready to accept finishing/covering!*

*SPEC NOTE: Prior to application of some floor coverings, DAROTopp® typically requires a light sanding/grinding 10-14 days after application. Consult with DARO for finish recommendations and moisture parameters.*

D. Caulking [Section\_\_\_\_\_]

### 1.03 CO-ORDINATION

A. [General Contractor] to ensure related trades protect topping contractor's work during and for 24 to 48 hours after final topping pour.

### 1.04 PRE-INSTALLATION MEETINGS

A. Convene with related trades [one] week prior to commencing work of this Section [under provisions of] [Division 01-General Requirements] [Section 01 33 19.33].

### 1.05 SUBMITTALS

A. Submit the following [in accordance with Section 01 33 00 - Submittal Procedures]:

1. Product Data: Flowing synthetic (concrete) topping manufacturer's printed product literature for proprietary materials used in system.
2. Shop Drawings: Provide CAD drawings showing details, dimensions, extent of work, and other data necessary for the satisfactory installation of the products stated herein.
3. Samples: [Duplicate] [Triplicate] 150 mm x 150 mm (6" x 6") size for review showing final colour. Label samples with origin and intended use if necessary.

4. Manufacturer's Instructions: Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets outlining hazards and safety precautions.
5. Sustainable Design Verification: Third party validation of product performance attesting to materials/systems life cycle and green building characteristics.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: to have minimum of 10 projects of similar type in the past 5 years.
- B. Installer Qualifications: Applicator to be registered by synthetic topping manufacturer using manufacturer's approved pumping equipment.

#### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Ensure materials, as transported using ready-mix vehicles, are provided to site in timely fashion ready for installation.
- B. Handle ready-mix product in manner to prevent adulteration, deterioration and soiling and in accordance with topping manufacturer's instructions.
- C. Remove and replace damaged products at own expense and to satisfaction of [Consultant] [Engineer].

#### 1.08 SITE CONDITIONS

- A. Ambient Conditions: Ensure building interior is enclosed and maintained at temperatures no lower than 5°C (40°F) and no higher than 30°C (85°F); and outside temperature no lower than -5°C (-20°F).
- B. Any exception to the above parameters to be approved by topping manufacturer.
- C. Keep windows and doors closed to avoid drafts during initial 48 hour period after pumping.
- D. Avoid "chimney effect" from stairwell or other vertical influences to prevent accelerated drying.
- E. Cover any windows that would allow direct sunlight onto installation areas during drying period and only if direct sunlight heats topping and interior temperature to higher than 30°C (86°F) typically influenced by huge windows or glass facades.

F. Avoid continuous exposure to high interior temperatures outside of parameters outlined above, to avoid completely altering area climate.  
*SPEC NOTE: Brickwork, plastering and similar operations tend to dry quicker thereby absorbing additional moisture from synthetic (concrete) topping and influencing drying characteristics.*

G. Advise [project manager] [building owner] of required climate and physical conditions of site to avoid possibility of cracks in flooring if manufacturer guidelines are not followed.

#### 1.09 SPECIAL WARRANTY

A. Provide a written and signed Warranty in the name of the Owner for a period of two (2) years from the date of Substantial Performance of the Work.

B. The Warranty to cover cracking of synthetic (concrete) topping.

### **Part 2. Products**

#### 2.01 MANUFACTURER

A. Acceptable Synthetic Anhydrite Topping Manufacturer: DARO Flooring Constructions Inc., 30 Pennsylvania Ave., Unit 5, Concord, Ontario L4K 4A5 Tel: 905-660-6340; Toll Free 1-877-760-3276; Fax: 905-660-6340; Email: info@daroflooring.com; Web: [www.daro-flooring.com](http://www.daro-flooring.com)

B. Substitutions: Alternative or substitution products or materials not permitted.

#### 2.02 DESIGN CRITERIA

A. Synthetic and anhydrite topping to provide compressive strength, after 7 days 80%, after 28 days, of [20-25 Mpa] [30-35 Mpa].

*SPEC NOTE: Strength class is dependent upon project requirements. Consult with DARO for recommendations.*

B. Design to meet or exceed NBC requirement of minimum IIC (Impact Insulation Class) of 55.

*SPEC NOTE: As an example, a 200 mm (8") concrete structural slab subfloor (30 to 38 IIC) with no insulation or gypsum board underneath and 25 mm (1") Type 1 footfall sound insulation (24 IIC) with 45 mm (1-3/4") DAROTopp® synthetic topping (7 IIC) will provide a total of 61 – 69 IIC, not including a separate final floor covering.*

- C. Minimum thickness of topping on radiant heating to be 45 mm (1-3/4") with coverage of heating pipes minimum 30 mm (1-3/16").
- D. For radiant heated basements, install minimum 64 mm (2-1/2") Type 2 or 51 mm (2") Type 3 insulation (R10) on top of structural slab subfloor to meet NBC requirement, or for all floors, with or without in-floor heating, install 6 mm (1/4") to 25 mm (1") polystyrene insulation, depending on sound/thermal rating noted on drawings.

*SPEC NOTE: Thermal insulation for any floor can provide up to 30% energy cost savings. Consult with DARO for optimum design recommendations for specific projects.*

### 2.03 MATERIALS

- A. Synthetic Anhydrite Topping Binder: DAROTopp floor underlayment and synthetic anhydrite compound based on specially treated calcium sulphate ingredients.
- B. Sand: 0-2 mm washed sand, free of organic materials meeting the requirements of synthetic anhydrite topping manufacturer.
- C. Aggregate: 2-8 mm well-graded, washed aggregate, free of organics, and meeting the requirements of synthetic anhydrite topping manufacturer.
- D. Water: Potable, free from impurities.
- E. Separation (Slip) Sheet: Manufacturer's standard white 6 mil polyethylene sheeting.
- F. Impact/Sound/Thermal Insulation: DuraFoam [Type 1] [Type 2] [Type 3] Moulded expanded polystyrene closed-cell rigid insulation, to CAN/ULC-S701, [i.e. Type 1 25 mm (1") thick R3.75], 1220 mm x 2440 mm (4'-0" x 8'-0") sheets, as manufactured by PlastiFab.

*SPEC NOTE: DuraFoam Type 1 insulation is recommended for impact/sound (footfall) benefit and Type 2 or Type 3 is recommended for thermal benefit, depending on requirements. Polystyrene (Type 2 or 3) can be applied at up to 250 mm (10") thickness as desired.*

- G. Flanking Insulation (Edging) Strips: Manufacturer's standard FSR edging strips, 8 mm (5/16") thick x 100 mm (4") high, with foil overlap and tear-off perforations, roll dimension 50 m (164'-0").

- H. Hydronic Piping Hold-down Clips: PVC DAROClips.

*SPEC NOTE: In hydronic piping Section, specify thermal tubes to be held in place using DAROClips at spacing recommended by synthetic (concrete) topping*

*manufacturer and/or mechanical contractor, usually 2 DAROClips per 305 mm (12").*

## 2.04 MIXES

- A. Mix synthetic (concrete) topping ingredients strictly in accordance with manufacturer's instructions and under the supervision of the manufacturer's quality control specialist to required [C-20] [C-30] mix design prior to ready-mix truck delivery to site.
- B. Using Hagermann funnel, provide on-site flow (sump) test to ensure mix proportions and methods have been adhered to, prior to pumping.
- C. Retain test-prisms of ready-mix for every delivery. Copy of delivery notice to accompany sample for quality control purposes, and to include flow rate at both plant and site, amount of any additional water if required, arrival time, and time of installation.
- D. Monitor ingredients with regular sieving. Any changes made to mix formula or gradation to be supervised by manufacturer's quality control specialist.
- E. At ready-mix plant, check moisture content of sand daily to ensure proper water requirement. Recycled water not permitted.
- F. Prior to loading ready-mix truck, ensure mixer is clean and free of water residue, salt or chlorides.
- G. After loading topping onto ready-mix truck, check consistency of mixture. Ensure flow dimension on manufacturer's measuring disc is 240 mm (+/- 10 mm). In the event of increased distance or time to site, increase dimension by 10 mm to 20 mm only on advice of manufacturer's quality control specialist.
- H. During warmer weather, employ higher water content of 250 mm flow diameter at plant and 260 mm flow diameter for longer distances to site.

## 2.05 FINISH

- A. Natural, light beige integral colour.

### **Part 3. Execution**

## 3.01 EXAMINATION

- A. Before installation, examine structural alignment, smoothness and evenness of subfloor. Notify [Contractor] in writing if subfloor does not comply with requirements of this Section.
- B. Ensure subfloor is free of mud, oil, grease, and other contaminants prior to starting work of this Section.
- C. Verify items provided by other trades are properly installed.
- D. Commencement of work will imply acceptance of substrate conditions.

### 3.02 PREPARATION

- A. Ensure installation area is free of all debris, broom clean, and dry.
- B. Brush or vacuum walls approximately 150 mm (6") up from subfloor to ensure walls are sufficiently clean to receive edging strips.
- C. Protect surrounding surfaces from damage due to work of this Section.

### 3.03 INSTALLATION

#### A General

- 1. Install synthetic (concrete) flooring strictly in accordance with manufacturer's printed instructions.
- 2. Co-ordinate work with related work.

#### B. [Base Slab] [Subfloor] Repairs

- 1. Patch larger cracks, holes and voids with standard concrete or a quick-setting patching material prior to installing synthetic concrete topping.

#### C. Thermal/Acoustic Insulation

- 1. Install insulation with reflective side facing cold side of room.
- 2. Place sheets in parallel rows with ends staggered, and in firm contact with one another.
- 3. Cut end sheets to suit.

- [4. Tape insulation joints between each sheet.]

*SPEC NOTE: Taped insulation joints applicable for non-DuraFoam insulation.*

5. Ensure insulated surfaces are suitably prepared to receive radiant-heating hydronic piping.

#### D. Field Isolation (Expansion) Joints

1. Ensure joints continue completely through the synthetic (concrete) topping and are of uniform width.
2. Locate expansion joints where shown on shop drawings.

#### E. Edging Strips

1. Install at least 8 mm (5/16") thick flanking insulation strips around perimeter of all walls, columns and other protrusions, and hold in place using silicone caulking or sheathing tape.
2. At sidewalls, tuck foil facing of edging strips under polyethylene separation (slip) sheet for distance of 100 mm (4").
3. Leave edging strips flush with top of synthetic (concrete) topping after topping has set.

#### F. Separation (Slip) Sheet

*SPEC NOTE: Slip sheet only required for insulation other than Durofoam (Plastifab) since Durofoam has thin plastic foil on top side of insulation. Joints are required to be taped between each board.*

1. Cover non-polyethylene faced insulation with 6 mil polyethylene sheeting without folds, creases, wrinkles or fishmouths. Lap edges 100 mm (4") and tape watertight with tape recommended by topping manufacturer.
2. Cut sheeting flush at walls.

#### G. Synthetic (Concrete) Topping

1. Ensure topping is mixing at normal speed and at optimal pumping consistency on ready-mix truck before installing.
2. Using topping manufacturer approved pump, apply synthetic topping evenly over floor surface holding hose reasonably close to ground, to required minimum 25 mm (1") thickness on slip sheet.

*SPEC NOTE: Thicker toppings can be pumped, however insulation is recommended to level larger depressions or recessed areas first in order to reduce overall weight and cost.*

3. Ensure topping does not "leak" between laps in separation (slip) sheet.

4. Remove any levelling blocks that may have been used directly after pumping and before “dubbing” procedures.
5. Although topping is self-levelling, achieve final finish by “dubbing” surface with T-bar (screed) in two passes to produce smooth, level surface without air bubbles.
  - a) Make first pass heavy and deep enough to create wave to help level and bring aggregates near surface.
  - b) Make second pass at right angles to first, drawing lightly across surface while being careful not to break contact with dubbing screed and surface.
  - c) Achieve “dubbing” within 15 minutes after placing topping.
6. Maintain ambient relative humidity of 50% or greater above topping during first 48 hours after application, avoiding rapid drying or drafts during this period.
7. After 48 hours, in which the floor has had no exposure to direct sunlight or excess drafts, employ accelerated drying procedures as necessary using heating in conjunction with continuous fresh air circulation.

### 3.04 SITE QUALITY CONTROL

#### A. SITE TESTS

1. Take at least 3 prisms of topping from each day’s pour during application.
2. Test prisms as recommended by topping manufacturer in accordance with published testing values.
3. Make test results available to [Consultant] [Engineer] upon request.

### 3.05 CLEANING

A. Clean and make good surfaces soiled or damaged by work of this Section.

B. Remove debris and surplus materials upon completion of work.

*SPEC NOTE: DAROTopp® is delivered as ready-mix therefore no waste management is required.*

### 3.06 PROTECTION

- A. After installation, during drying period, protect topping as follows:
1. Use barriers, markers or signs to limit access to floor areas as necessary.
  2. Use temporary wood planking for heavy wheeled or concentrated loads, or access by other trades, subject to the requirements of the work of this Section.

**END OF SECTION**