Concrete Tactile Warning Panels

CASTinTACT® 3

the dependable long-term concrete solution.

curb ramps | vehicular ways | transit platforms | blended transitions | pedestrian crossing transportation | downtown revitalization | commercial | residential | public right of way

CONCRETE IS BEST!
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The Dependable Long-Term Concrete Solution!

For more information please visit CASTinTACT.com
CASTinTACT® 3 - High strength cementitious concrete panels - enhanced with microsilica - 3 dimensionally reinforced with structural fibrillating monofilament fibers.

Cementitious concrete panels offer dimensional stability and compatibility to concrete; similar coefficient of expansion as base. Superior strength, durability and abrasion resistance achieved with an engineered mix design.

Microsilica enhanced to increase compressive strength and reduce permeability to chloride ion intrusion; resists severe exposure to wet freeze-thaw damage and de-icing chemicals.

Three dimensional reinforced with fibrillating monofilament fibers to increase flexural strength, ductility and toughness.

Panels are architectural finished to enhance concrete work. Full depth UV and weather proof integral colors provides long term visual contrast. Textured concrete finish for wet and dry slip resistance.

CASTinTACT® 3 panels are uniquely installed in a patented early entry-fast set method that takes 10 minutes. Panels are recessed flush to surface and bond to concrete base becoming a integral and permanent part of the walking surface. Because they are concrete, they offer long term durability, compatibility, similar coefficient of expansion as the concrete base, and easy to clean, maintain and repair.

CASTinTACT® has been successfully used by many states and cities in the United States. Call for a list of projects in your area.

**Technical support available with seminars, specifications, and drawings.**

**Everything needed for successful project!**
CASTinTACT® 3 Standard Colors

Custom colors available on request
Colors are approximate, samples available on request.

CASTinTACT® 3 Tactile Warning Panels comply with Americans with Disabilities Act 4.29.2 standards. CASTinTACT® 3 panels are manufactured in the United States. The CASTinTACT® 3 Tactile Warning Panel also meet all Access Board PROWAC requirements and physical properties listed below:

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CASTinTACT® 3 Technical Specifications

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Description</th>
<th>Requirement</th>
<th>CASTinTACT® 3</th>
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</thead>
<tbody>
<tr>
<td>R304.1</td>
<td>Dome Alignment</td>
<td>Square Grid Pattern</td>
<td>Yes</td>
</tr>
<tr>
<td>R304.1.1</td>
<td>Base Dome Diameter</td>
<td>0.9&quot; min - 1.4&quot; max</td>
<td>1.0&quot;</td>
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<tr>
<td>R304.1.1</td>
<td>Top Dome Diameter</td>
<td>50% to 65% Base Diameter</td>
<td>0.60&quot;</td>
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<tr>
<td>R304.1.2</td>
<td>Dome Height</td>
<td>0.20&quot;</td>
<td>0.20&quot;</td>
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<tr>
<td>R304.1.2</td>
<td>Dome Center to Center Spacing</td>
<td>1.6&quot; min - 2.4&quot; max</td>
<td>2.35&quot;</td>
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<tr>
<td>R304.1.3</td>
<td>Base to Base Spacing</td>
<td>0.65&quot; min</td>
<td>1.35&quot;</td>
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<tr>
<td>R304.1.3</td>
<td>Visual Contrast</td>
<td>Light on Dark or Dark on Light</td>
<td>Yes</td>
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<tr>
<td>R304.1.4</td>
<td>Size</td>
<td>24&quot; min direction of travel</td>
<td>Yes</td>
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<tr>
<td>R301.5</td>
<td>Surface</td>
<td>Firm, Stable and Slip Resistant</td>
<td>Yes</td>
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PROWAC Guidelines R304 Detectable Warning Surface

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Requirement</th>
<th>CASTinTACT® 3</th>
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<td>R304.1</td>
<td>Square Grid Pattern</td>
<td>Yes</td>
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<td>R304.1.1</td>
<td>0.9&quot; min - 1.4&quot; max</td>
<td>1.0&quot;</td>
</tr>
<tr>
<td>R304.1.1</td>
<td>50% to 65% Base Diameter</td>
<td>0.60&quot;</td>
</tr>
<tr>
<td>R304.1.2</td>
<td>1.6&quot; min - 2.4&quot; max</td>
<td>2.35&quot;</td>
</tr>
<tr>
<td>R304.1.3</td>
<td>0.65&quot; min</td>
<td>1.35&quot;</td>
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ASTM C 936-08 Standard Spec for Solid Concrete Interlocking Paving Units

<table>
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<tr>
<th>Test Method</th>
<th>Test Description</th>
<th>Requirement</th>
<th>CASTinTACT® 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM C 140</td>
<td>Compressive Strength/Average</td>
<td>8,000 psi</td>
<td>10,000 psi</td>
</tr>
<tr>
<td>ASTM C 140</td>
<td>Water Absorption/Average</td>
<td>5% max</td>
<td>&lt; 5.0%</td>
</tr>
<tr>
<td>ASTM C 1645</td>
<td>Freeze Thaw &amp; De-Icing Salt Durability</td>
<td>max loss 200g/m², 25 cycles, 3% saline</td>
<td>&lt; 20g/m², 25 cycles</td>
</tr>
<tr>
<td>ASTM C 418</td>
<td>Abrasion Resistance</td>
<td>15cm²/50cm² max loss</td>
<td>&lt; 1cm²/50cm² loss</td>
</tr>
<tr>
<td>ASTM C 293</td>
<td>Flexural Strength</td>
<td>1,000 psi</td>
<td>1,100 psi</td>
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</tbody>
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Other Test Results

<table>
<thead>
<tr>
<th>Test Method</th>
<th>Requirement</th>
<th>CASTinTACT® 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM C 1262</td>
<td>Freeze Thaw Durability</td>
<td>1% max loss, 100 cycles, 3% ChCl</td>
</tr>
<tr>
<td>ASTM C 672</td>
<td>Scaling Resistance</td>
<td>Visual Inspection Rating</td>
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<tr>
<td>ASTM C 666</td>
<td>Rapid Freezing and Thawing</td>
<td>1% max loss, 300 cycles</td>
</tr>
<tr>
<td>ASTM C 779</td>
<td>Abrasion Resistance / Prod. A</td>
<td>Loss in inches @ 30min/60min</td>
</tr>
<tr>
<td>ASTM C 482</td>
<td>Adhesion/Bond Strength</td>
<td>No Adhesion Failure</td>
</tr>
<tr>
<td>ASTM C 1028</td>
<td>Wet/Dry Slip Resistance (Mod)</td>
<td>0.80 min wet/dry</td>
</tr>
<tr>
<td>ASTM C 348</td>
<td>Flexural Strength</td>
<td>-</td>
</tr>
<tr>
<td>CRD-C 39</td>
<td>Coefficient of Linear Thermal Expansion of Concrete</td>
<td>Concrete = 8.0 x 10⁻⁴</td>
</tr>
</tbody>
</table>

CASTinTACT® 3 is offered with a five year limited warranty and will certify panels to meet or exceed internal standards as well as previously stated ASTM performance standards.

MADE IN THE USA

-3-
CASTinTACT® 3 Panel Drawings

CASTinTACT® 3 Panel Dimensions (Top Face)

<table>
<thead>
<tr>
<th>2.35&quot; Dome Spacing</th>
<th>Actual Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2' x 2' Panel</td>
<td>23.5&quot; width x 24&quot; depth</td>
</tr>
<tr>
<td>2.5' x 2' Panel</td>
<td>30.55&quot; width x 24&quot; depth</td>
</tr>
<tr>
<td>3' x 2' Panel</td>
<td>23.5&quot; width x 36&quot; depth</td>
</tr>
</tbody>
</table>

Dimension Tolerances:

+/- 1/8" (width, length, height)

Download the full-size panel drawings online at www.CASTinTACT.com

All dimensions in inches
**CASTiTACT® 3 Panels are Early Entry-Fresh Set with INSTAlaTACT® Tool.**

Recess concrete with INSTAlaTACT® Installation Tool, insert CASTiTACT® 3 panels and finish level with concrete surface.

- Fast installation method for fresh concrete; typically fresh set curb ramps take 10 minutes.
- CT2 tool can be used on 2'x4', 2'x5', 2'x6' or wider ramps.
- CT3 tool can be used on 3'x4', 3'x6' and 3'x8' ramps.
- Bottom shovel guides make sure proper setting depth is achieved.
- Powder coated finish on INSTAlaTACT® tool for easy clean up.

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**Supplies Needed:**
- **CASTiTACT® 3 Panels**
- CASTiTACT® PreMix or Portland Cement
- Masons Sand
- Potable Water

**Installation Tools Needed:**
- INSTAlaTACT®
  - MA CT2 (2'x4' Tool)
  - MA CT3 (3'x4' Tool)
- Level
- Square Point Shovel
- Wood Float
- Rubber Mallet
- Sprayer for Water
- Buckets
- 1/8" Radius Edger
- Hydra Sponge
- Stainless Steel Wire Brush

**INSTAlaTACT® Template**
US Patent No. 7,000,361 & 7,121,048.

**INSTAlaTACT® Tool Sizes**
- MA CT2 (2'x4' Tool)
- MA CT3 (3'x4' Tool)

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**CASTiTACT® 3 Installed Cross Section**

Place CASTiTACT® 3 at the bottom of curb ramps and other blended transitions. Install across the full width of ramp a minimum 24" in depth and set back 8" from curb line.
Concrete Tactile Warning Panels

CASTinTACT® 3 Finished Ramps
Early Entry - Fresh Set Install

3.3 CAST IN PLACE INSTALLATION PROCEDURES

A. Temperature affects the setting time and rate of strength of concrete, standard ACI procedures for storing, mixing, and placing concrete in hot or cold weather are recommended. See ACI 305 “Standards on Hot Weather Concreting,” or ACI 306 “Standard on Cold Weather Concreting.”

B. Provide expansion and control joint width indicated in drawings. All joint materials used follow manufacturer’s directions and instructions.

1. Expansion joints must be carried through all layers of installation materials including warning panels, concrete substrate and steel reinforcing. Joints should be spaced typically 8’ to 12’ in both directions. All perimeter edges of ramps or blended transitions should have expansion joints. (Refer to ACI 360R guidelines for details on placement, size and specifications of material)

C. Position forms for proper grade, slopes and uniform slab thickness. Consult contract documents for details on reinforcement and joint placement to prevent random cracking.

D. The concrete specified shall conform to contract documents with a maximum slump of 4”. Concrete shall be poured and finished to the proper grade and slope prior to warning panel placement. Concrete thickness shall be increased 1” in depth beneath area receiving warning panels.

E. Consult contract documents for more information on locations to receive detectable warning panels.

1. Monolithic poured curb and sidewalk - place panels 6” to 8” from curb line.

2. Existing curbs - place panels 8” from curb line to allow 2” of new concrete in front of panels.

3. Install across the full width of ramp or blended transition a minimum 24” in depth.

F. Recessed panels below finish grade with INSTAlaTACT® installation template tool before initial concrete set and level base with wood float to leave an open surface.

G. Pre-dampen back of CASTinTACT® 3 panels with potable water. Apply 1/8” thickness of CASTinTACT® Wet Set PreMix (3:1 ratio of powder to potable water) or (1:1:½ ratio of Portland cement, clean masons sand and potable water). Work into textured surface on back of panel with rubber float for 100% surface coverage. Alternatively a scrub coat of fresh concrete removed from the INSTAlaTACT® tool can be used as a parge coat.

H. Install Tactile Panels immediately in fresh concrete and lightly tap panels to grade using a rubber mallet to insure bond and 100% surface contact. Wedge or flared edge of panel facing the curb and square edges of panel joints butted together. Base of truncated dome should be flush with adjacent surfaces to permit proper drainage and eliminate tripping hazard between surfaces. Tolerance between tactile panels and surrounding surfaces is 1/16” maximum. Immediately after placement re-check slope and elevation for proper grade.

ALTERNATE (EXTREME CLIMATES) Leave a 3/16” gap between square cut panels joints and seal with a compatible elastomeric sealant conforming to ASTM C920. Follow sealant’s manufacturer’s recommendations for joint preparation and installation procedures. Protect from traffic until sealant cured.

I. Finish surrounding concrete flush with tactile panels. Edge around panels with 1/8” radius edger, install control joints and finish in accordance with project specifications.

J. Finish joints per specifications. Follow all manufacturer’s recommendations for joint preparation and installation procedures.

K. Clean fresh dried concrete residue off panels with a stainless steel wire brush and rinse with clean water and hydra sponge to ensure a clean appearance.

L. Fresh concrete surrounding tactile panels should be cured in accordance with ACI 308. Use a curing compound meeting ASTM C 309. PROTECT PANELS WITH PROTECTaTACT OR SIMILAR WHILE SPRAYING CURING COMPOUND.

3.4 CLEANING

A. Remove all unused material, tools, and equipment. Dispose of properly.

B. If the detectable / tactile surface requires, clean the panels in accordance with CASTinTACT® Cleaning and Maintenance Guide.

3.5 PROTECTION

Protect the CASTinTACT® 3 Warning Panel surface from traffic until desired strength is achieved. If necessary, protect panels with plywood and a underlayment layer of non-staining, non-woven curing blanket until acceptance of work. Secure plywood if needed.

3.6 STORAGE

Store products under cover in manufacturer’s unopened packaging until ready for installation. Store pallets on supported flat surface. DO NOT DOUBLE STACK PALLETS.

Download the full specifications online at www.CASTinTACT.com
Pour concrete and finish to proper grade. Set INSTALaTACT® into fresh concrete 6-8” from curb line.

Remove concrete is fast & easy with a square point shovel.

Remove the INSTALaTACT® tool and level concrete base with wood float.

Pre-dampen and parge the back of the panel with CASTinTACT® Premix or fresh concrete.

Set CASTinTACT® with rubber mallet. Wedge or flared edge of panel facing the curb. Check slope with level.

Finish surrounding concrete flush with panel. Install joints and finish to specifications.

Clean up is fast and easy with stainless steel brush and hydra sponge.

CASTinTACT® - THE DEPENDABLE CONCRETE SOLUTION!
Full Depth Retro Fit / Block Out

3.3 CAST IN PLACE INSTALLATION PROCEDURES

A. Temperature affects the setting time and rate of strength of concrete, standard ACI procedures for storing, mixing, and placing concrete in hot or cold weather are recommended. See ACI 305 “Standards on Hot Weather Concreting,” or ACI 306 “Standard on Cold Weather Concreting.”

B. Saw cut existing concrete full depth using a diamond blade. Oversize area a minimum 2” in each direction of warning panel layout. Contain slurry and dispose of properly. Partial depth and breakout will not be allowed. Do not chip the concrete on perimeter of cut out. The perimeter chips and over cuts must be filled and patched with an gray epoxy gel adhesive approve by manufacturer.

C. Provide expansion and control joints indicated in drawings. All joint materials used follow manufacturer’s directions and instructions.

1. Expansion joints must be carried through all layers of installation materials including warning panels, concrete substrate and steel reinforcing. Joints should be spaced typically 8’ to 12’ in both directions. All perimeter edges of ramps or blended transitions should have expansion joints. (Refer to ACI 360R guidelines for details on placement, size and specifications of material)

D. Dowel into existing concrete as necessary.

E. The concrete specified shall conform to contract documents with a maximum slump of 4”. Concrete shall be poured and finished to the proper grade and slope prior to warning panel placement. Concrete thickness shall be increased 1” in depth beneath area receiving warning panels. Prepare a well drained and properly compacted subgrade. Leave no puddles, standing water, ice, frost or mud. Consult contract documents for information on subgrade and compaction details.

F. Consult contract documents for more information on locations to receive detectable warning panels.

1. Monolithic poured curb and sidewalk - place panels 6” to 8” from curb line.

2. Existing curbs - place panels 8” from curb line to allow 2” of new concrete in front of panels.

3. Install across the full width of ramp a minimum 24” in depth.

G. Concrete shall be poured, floated and recessed ⅜” below finish grade to proper grade and slope.

H. Concrete shall be poured with wood float to leave an open surface.

I. Pre-dampen back of CASTinTACT® 3 panels with potable water. Apply 1/8” thickness of CASTinTACT® Wet Set Premix (3:1 ratio of powder to potable water) or (1:1½ ratio of Portland cement, clean masons sand and potable water). Work into textured surface on back of panel with rubber float for 100% surface coverage. Alternatively a scrub coat of fresh concrete removed from the INSTALaTACT® tool can be used as a parge coat.

J. Install Tactile Panels immediately in fresh concrete and lightly tap panels to grade using a rubber mallet to insure bond and 100% surface contact. Wedge or flared edge of panel facing the curb and square edges of panel joints butted together. Base of truncated dome should be flush with adjacent surfaces to permit proper drainage and eliminate tripping hazard between surfaces. Tolerance between tactile panels and surrounding surfaces is 1/16” maximum. Immediately after placement re-check slope and elevation for proper grade.

K. Finish surrounding concrete flush with tactile panels. Edge around panels with 1/8” radius edger, install control joints and finish in accordance with project specifications.

L. Finish joints per specifications. Follow all manufacturer’s recommendations for joint preparation and installation procedures.

M. Clean fresh concrete residue off panels with a stainless steel wire brush and rinse with clean water and hydra sponge to ensure a clean appearance.

N. Fresh concrete surrounding tactile panels should be cured in accordance with ACI 308. Use a curing compound meeting ASTM C 309. PROTECT PANELS WITH PROTECTaTACT OR SIMILAR WHILE SPRAYING CURING COMPOUND.

3.4 CLEANING

A. Remove all unused material, tools, and equipment. Dispose of properly.

B. If the detectable / tactile surface requires, clean the panels in accordance with CASTinTACT® Cleaning and Maintenance Guide.

3.5 PROTECTION

Protect the CASTinTACT® 3 Warning Panel surface from traffic until desired strength is achieved. If necessary, protect panels with plywood and an underlayment layer of non-staining, non-woven curing blanket until acceptance of work. Secure plywood if needed.

3.6 STORAGE

Store products under cover in manufacturer’s unopened packaging until ready for installation. Store pallets on supported flat surface. DO NOT DOUBLE STACK PALLETS.

Download the full specifications online at www.CASTinTACT.com
Predetermine measurements prior to cutting, oversize all sides minimum 2” each direction.

Prepare a well drained and properly compacted subgrade. Dowel into existing concrete as necessary. Oversize area minimum 2” in each direction.

Concrete shall be poured, leveled, floated and recessed 7/8” below finish grade.

Pre-dampen and parge back of panel with CASTinTACT® Wet Set PreMix or fresh concrete.

Place CASTinTACT® into fresh concrete 6-8” from curb line and set panels with a rubber mallet. Wedge or flared edge of panel facing the curb. 2” minimum new concrete all sides.

Fill perimeter with concrete, level with base of domes, edge panels, and finish to specifications.

Clean up is fast and easy with stainless steel brush and hydra sponge.

CASTinTACT® - THE DEPENDABLE CONCRETE SOLUTION!
3.3 THIN SET INSTALLATION PROCEDURES

A. Install Detectable Warning Panels in accordance with TCA Handbook for Tile Installation and ANSI A108.5 Specifications.

B. All expansion and control joints must be carried through all layers of installation materials including warning panels, setting bed, mortar bed, concrete substrate and steel reinforcing. Joints should be spaced typically 8’ to 12’ in both directions. All perimeter edges of ramps or blended transitions should have expansion joints. (Refer to TCA Handbook current issue of EJ-171 for details on placement, size and specifications of materials)

C. Install Detectable Warning Panels with a polymer modified medium bed thin set material complying with ANSI A118.4 in accordance with manufacturer’s installation instructions utilizing a ¼”x1/4”x1/4” square notched trowel.

D. Using flat side of trowel, apply a skim coat of mortar. Apply additional mortar with notched side of trowel held at 45º angle to the surfaces, combing in one direction. Do not spread more thin set than can be set within working life. If material is past working life, remove and replace with fresh material.

E. Pre-dampen back of tactile panels saturated surface dry (SSD) with clean water and parge back of panel with medium bed thin-set simultaneously while the mortar is being applied to the substrate. Adjust panels promptly and lightly tap panels to proper grade with rubber mallet to insure 100% surface contact with substrate. Wedge or flared edge of panel facing the curb.

F. Base of truncated dome shall be flush with adjacent surfaces to permit proper drainage and eliminate tripping hazard between surfaces. Tolerances between tactile panels and surrounding surfaces is 1/16” maximum. Immediately after placement re-check slope and elevation for proper grade.

G. Traffic should be kept off the detectable warning panels according to thin set manufacturer’s recommendations.

H. Provide joint widths indicated in drawings.

I. Panel Joints should be allowed to cure for minimum 24 hours before grouting or light traffic, depending upon temperature and humidity. Blow out all dust and debris in open panel joints.

J. Before grouting mist all sides of panel joints with cool clean water. Keep panel joints in a saturated dry condition (SSD) before grouting. Remove ponding water from bottom of joint opening before grouting. Maximum surface temperature for open panel joints to be grouted is 90º F.

K. Mix colored grout at a 1:2 ratio of gray or white portland cement (depending on panel color) and 30 mesh white sand with 1:1 ratio of acrylic admix and potable water; add integral color pigment to match CASTinTACT® panels.

L. Apply colored grout into (SSD) panel joints, forcing grout filling entire mortar joint. (A mortar squeeze bag works well for dispensing the mortar and tuck pointing tool works well for compacting mortar in the joint opening.)

M. Immediately clean excess mortar smears off panels and adjacent surfaces with a damp sponge to ensure a clean appearance. Change rinse water often to keep surfaces clean. Usually 2 or more clean sponge rinses are required.

N. After initial set of colored grout, finish joints with brick jointer to produce a slightly concave polished joint, free from cracks.

O. Proper curing of grout entails periodically misting the installation with clean, cool water for a period of 72 hours. Alternatively apply a cure coat to grout joints with a 1:1 ratio of acrylic admix mixed with potable water. Use a paint brush to apply a thin mil cure coat keeping off face of warning panels. Do not over apply cure coat; it will not dry clear.

P. Expansion Joint sealing should be performed a minimum 7 days after grouting of panel joints. Compatible expansion joint sealant must conform to ASTM C920, color to match panels. Tool joints to produce a slightly concave polished joint. Follow sealant manufacturer’s recommendation for joint preparation and installation procedures.

3.4 CLEANING

A. Remove all unused material, tools, and equipment. Dispose of properly.

B. If the detectable / tactile surface requires, clean the panels in accordance with CASTinTACT® Cleaning and Maintenance Guide.

3.5 PROTECTION

Protect the CASTinTACT® Warning Panel surface from traffic until desired strength is achieved. If necessary, protect panels with plywood and an underlayment layer of non-staining, non-woven curing blanket until acceptance of work. Secure plywood if needed.

3.6 STORAGE

Store products under cover in manufacturer’s unopened packaging until ready for installation. Store pallets on supported flat surface. DO NOT DOUBLE STACK PALLETS.

Download the full specifications online at www.CASTinTACT.com
Finish substrate 1-3/8” below finish grade.

Measure tactile area for precutting of panels.

Panels can be easily cut with diamond blade.

Panels can be radius cut around vault boxes.

Install tactile panels with polymer modified medium bed thin set material. Wedge or flared edge of panel facing the curb.

Pre-Mix grout and color pigment to match CASTinTACT® panels.

Expansion and panel joints must be installed and in compliance with TCA EJ171.

CASTinTACT® - THE DEPENDABLE CONCRETE SOLUTION!
MASCO CASTinTACT® DETECTABLE WARNING
2 EACH 2' x 2' PANELS

Download more ramp drawings online at www.CASTinTACT.com
GENERAL NOTES

1. PLACE TRUNCATED DOME DETECTABLE WARNING PANELS AT THE BASE OF CURB RAMP. INSTALL ACROSS FULL WIDTH OF RAMP A MINIMUM 610 mm (24") IN DEPTH AND SET BACK 200mm (8") FROM BOTTOM OF CURB.

2. SIDEWALK CURB RAMP SLOPES SHOWN ARE RELATIVE TO THE TRUE LEVEL HORIZON (ZERO BUBBLE).

3. SIDE FLARES THAT ARE NOT PART OF THE PATH OF TRAVEL MAY BE ANY SLOPE.

4. EXPANSION JOINTS ARE REQUIRED AT ALL SIDEWALK RAMP SLOPE BREAKS.

5. SIDEWALK FLARE IS NOT NECESSARY WHERE THE RAMP IS PROTECTED FROM PEDESTRIAN CROSS-TRAVEL.

6. THICKEN CONCRETE UNDER DETECTABLE WARNING PANEL.

7. IN EXTREME CLIMATES LEAVE 3/16" GAP BETWEEN SQUARE CUT PANEL JOINTS AND SEAL WITH A COMPATIBLE ELASTOMERIC SEALANT.

E.J. = EXPANSION JOINT  
P.J. = PANEL JOINT

THE SELECTION AND USE OF THIS DRAWING WHILE DESIGNED IN ACCORDANCE WITH GENERALLY ACCEPTABLE ENGINEERING PRINCIPLES AND PRACTICES IS THE SOLE RESPONSIBILITY OF THE USER AND SHOULD NOT BE USED WITHOUT CONSULTING A REGISTERED PROFESSIONAL ENGINEER.
**MASCO CASTinTACT® DETECTABLE WARNING**

**36” BLENDED TRANSITION - THIN SET INSTALLATION**

**GENERAL NOTES**

1. PLACE TRUNCATED DOME DETECTABLE WARNING PANELS AT THE BASE OF CURB RAMP. INSTALL ACROSS FULL WIDTH OF RAMP A MINIMUM 610 mm (24”) IN DEPTH AND SET BACK 200mm (8”) FROM BOTTOM OF CURB.

2. SIDEWALK CURB RAMP SLOPES SHOWN ARE RELATIVE TO THE TRUE LEVEL HORIZON (ZERO BUBBLE).

3. SIDE FLARES THAT ARE NOT PART OF THE PATH OF TRAVEL MAY BE ANY SLOPE.

4. EXPANSION JOINTS ARE REQUIRED AT ALL SIDEWALK RAMP SLOPE BREAKS.

5. SIDEWALK FLARE IS NOT NECESSARY WHERE THE RAMP IS PROTECTED FROM PEDESTRIAN CROSS-TRAVEL.

6. THICKEN CONCRETE UNDER DETECTABLE WARNING PANEL.

E.J. = EXPANSION JOINT  P.J. = PANEL JOINT

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Download more ramp drawings online at [www.CASTinTACT.com](http://www.CASTinTACT.com)
Cleaning and Sealing CASTinTACT® Concrete Tactile Warning Panels
A Maintenance and Protection Guide

When properly installed, CASTinTACT® concrete tactile warning panels have low maintenance and provide an attractive finish. Under foot traffic, CASTinTACT® become exposed to dirt, stains and wear. This is common to all pavements. This technical bulletin addresses various steps to insure the beauty of CASTinTACT® and to help restore their original appearance. These steps include removing stains, cleaning and sealing.

Stains on specific areas should be removed first. A cleaner should then be used to remove any efflorescence and dirt from the entire panel. A newly cleaned concrete can be an opportune time to seal it. In order to achieve maximum results, use stain removers, cleaners, and sealers specifically for colored concrete panels. These may be purchased from Masons Supply or other reputable dealers.

- **Removing Stains**

  Commercial stain removers available specifically for colored concrete provide a high degree of certainty in removing stains. Many kinds of stains can be removed while minimizing the risk of discoloring or damaging the panels. The container label often provides a list of stains that can be removed. If there are questions, Masons Supply should be contacted for help with determining the effectiveness of the chemical in removing specific stains.

  Identify the stains prior to applying the cleaner. A test application should be evaluated in a small inconspicuous stained area for cleaning effectiveness. Some stains may require repeated applications of the remover to achieve effective cleaning. This is often the case for deep set oil stains. Make sure that the cleaners will not remove or damage the CASTinTACT® panel. With all stain removers, cleaners and sealers, the label directions and warnings should be read and carefully followed for all precautions, and for first aid.

  Start removal of stains at the bottom of the panel and work up the slope in manageable sections. By working up the slope, cleaning fluids will drain down the pavement. This technique assists in uniform removal while allowing the used cleaner to be rinsed away consistently.

  Take care in selecting and applying cleaning products, as acidic ones may harm vegetation and grass. These cleaners should not run onto vegetation. When using strong acidic stain removers or cleaners that might drain onto vegetation, spread some agricultural lime on the ground around the perimeter of the concrete. This will help neutralize the cleaner and reduce the potential for damage to grass and/or vegetation. After cleaning, remove the lime from the vegetated ground in these areas.

- **Removal of Common Stains**

  There are proprietary cleaning products specifically designed for colored concrete panels. Many have been developed through extensive laboratory and field testing to ensure cleaning effectiveness. Using manufactured cleaning chemicals for specific stains relieves the user from the uncertainty of attaining the proper mixture of chemicals. These chemicals should be used whenever possible. If no proprietary stain removal products are available, a comprehensive source of information on stain removal is a 28 page booklet entitled *Removing Stains from Concrete* by William H. Kuennig. It describes chemicals, detergents or poultice (scrubbing) materials recommended for removing particular stains, and the steps to be followed in removal. Make sure that the cleaners will not remove or damage the CASTinTACT® panel. This publication recognizes that some of the treatments involve hazardous chemicals and it advises specific precautions. Masons Supply disclaims any and all responsibility for the application of the information. The user is advised to use cleaners specifically made to remove stains that commonly occur on colored concrete. They will likely be more effective.

- **Proprietary Stain Removers**

  - Asphalt and emulsified asphalt | MASCO CITRI-CLEAN
  - Cutback asphalt and roofing tar | MASCO CITRI-CLEAN
  - Blood, candy, ketchup, mustard, grease drippings from food | MASCO CITRI-CLEAN
  - Caulking | MASCO CITRI-CLEAN
  - Chewing gum | MASCO CITRI-CLEAN
  - Clay soil | DEIDRICH 202V
  - Creosote | MASCO CITRI-CLEAN
  - Leaf, wood rot, or tobacco stains | DEIDRICH 202V
  - Mortar | DEIDRICH 202V
  - Smoke | DEIDRICH 202V
  - Oil or grease that has penetrated | MASCO CITRI-CLEAN
  - Dried paint | MASCO CITRI-CLEAN
  - Tire skid marks | MASCO CITRI-CLEAN

- **Overall Cleaning**

  Overall cleaning of the panel can start after stains are removed. In preparation for cleaning, low tree branches, shrubs and vegetation adjacent to the pavement should be tied back or covered to protect from overspray of cleaning solutions or sealers. The area should be inspected for any cracked or broken units. These should be replaced. Badly stained units can be replaced, but it is usually easier to clean stains and less costly than replacing the panels.

  When panels have stains too difficult to remove, replace them with the same type of units. If panels must be replaced, there may be a difference in color from the surrounding panels. This variation should eventually disappear. If color variation is unacceptable, controlled use of proprietary cleaners designed to improve the color of concrete panels can minimize variation.

  Removal of accumulated dirt and efflorescence is the objective of cleaning. It is essential in preparing the panels for sealing as well. Many cleaners effective in removing dirt and efflorescence are a mix of detergent and acid. Cleaners with strong acids will change the color of the panels slightly.
The degree of change can be controlled by the type of acid in the cleaner, its concentration and the length of time on the panels. Proprietary cleaners will give specific instructions on their application. These directions should be followed. In order to achieve proper results, cleaners should be tried on a small area to test results and any color changes. The concentration and time on the panel can be adjusted accordingly. Protective clothing and goggles should always be worn when using acidic solutions.

Anticipate where the cleaning fluids will drain, i.e., across the pavement and not onto grass or vegetation. Sediment or cleaners allowed to pond in low spots may stain the panels. Be sure to rinse these areas thoroughly. Turn off all automatic sprinkler systems during cleaning, sealing and drying.

**Professional Cleaning Methods**

For most jobs, cleaning should be handled by a professional company experienced in the use of cleaners and spray equipment. Professionals typically use a pressure washer. The various methods for applying sealers are covered later.

A high pressure sprayer applies cleaner and water between 600 and 2,000 psi (4.1 and 13.8 MPa), and at a rate between 6 and 12 gallons/minute (22 and 45 liters/minute). The rate of flow is adjusted to ensure sufficient rinsing. The pressure loosens dirt and pushes water from the surface without the need for scrub brushes. The nozzle type and its distance from the panels surface influences the effectiveness of the cleaning as well. A nozzle that creates a wide spray enables a large area to be covered efficiently.

Cleaners to remove efflorescence are applied with a low pressure pump spray under 30 psi (0.2 to 0.7 MPa). A shower type spray nozzle will help ensure even distribution of the cleaner. Cleaning chemicals are applied, allowed to sit an appropriate time, then rinsed away with a high pressure sprayer. The final rinse should be water only.

For small areas, an adequate cleaning job can be achieved without this equipment. Cleaners can be applied by hand, the panels scrubbed to remove dirt and efflorescence, then thoroughly rinsed with water from a garden hose. Scrub brushes with steel bristles are not recommended. They will loosen from the brush, rust, and leave stains. Brass or plastic bristles are acceptable.

The additional time required to clean and seal panels without the help of a professional should be weighed against investing in a competent company to do the job. Professionals have the equipment and experience with the various chemicals. They can achieve the highest level of results in the least amount of time.

**What Is Efflorescence?**

Efflorescence is a white powdery deposit or milky film which can appear on the surface of concrete as water evaporates. Efflorescence occurs with all concrete and is most noticeable with colored concrete. It is generally accepted that the addition of inorganic color pigments does not enhance or retard the occurrence. Efflorescence is caused when soluble salts and other water dispersible materials migrate upward to the surface of concrete. This is caused by the sun evaporating the moisture on the surface. This capillary wicking action continues to draw moisture from within until the moisture is exhausted. Efflorescence is enhanced by low temperatures and moist conditions; condensation, rain, and dew.

If concrete placement happens during a dry period of the year, the next cycle of colder, wet weather may trigger the efflorescence to occur. Efflorescence will continue until all the salts have been exhausted. It may remain for months and some of it may wear away. In no way does it affect the structural integrity of the concrete.

Any concrete product containing portland cement can produce efflorescence. Calcium hydroxide (free lime) a by-product is produced in the hydration process of portland cement with water (approximately 140 pounds per cubic yard of concrete). During this reaction period, the excess water mixture, a calcium hydroxide solution migrates through capillaries in the concrete to the surface where it evaporates. There it combines with carbon dioxide from the air to produce calcium carbonate (insoluble salt). Only 0.2 ounce of calcium carbonate per square yard of surface area is needed to cause a significant change in color. In colder temperatures calcium hydroxide is actually more soluble to migrate to the surface. Efflorescence can also be caused by sulfates of either sodium or potassium that are more soluble in water than calcium and can easily be rinsed away. These type of salts can come from cement, aggregates, water, or admixtures.

**Removing Efflorescence**

**Powdery Efflorescence**

The recommended procedure is to allow the natural process to occur. Powdery efflorescence can often be removed with a stiff brush on a dry surface. Pressure washing or wet scrubbing can put the efflorescence in solution with water so it can be rinsed away. You must be careful to rinse the entire surface with fresh water so that no residue is left to dry on the concrete. Use an air jet or a wet vacuum to remove any standing water. Any remaining water can cause new efflorescence to appear. Cleaning on dry sunny days is best.

**Hard Efflorescence (Milky Film)**

Best results are obtained by using a proprietary masonry and concrete cleaner with pressure washing equipment. The acid in proprietary cleaning chemicals are buffered and blended with other chemicals to provide effective cleaning without damage to the surface when used properly. Always refer to the manufacturers recommendations for proper dilution, application and protection of adjacent surfaces. Cleaners are generally applied in sections beginning at the lowest point of the surface. If the area is large, a sprayer is an efficient means to apply the cleaner. The chemicals are scrubbed on the surface, then pressure washed away. Results can be verified after letting the area dry for 24 hours. In most instances one application is sufficient. However, in severe instances of efflorescence, a second application may be necessary.

**Note:** All acid based cleaners and acidic residues are dangerous to cars, plants and people. Wear proper safety gear and take adequate precautions. It is always recommended to do a small scale test section to determine dilution ratios and effectiveness before a full scale cleaning operation are performed.

**Natural Process**

If no attempt is made to remove efflorescence it can naturally breakdown after a period of time. Soluble calcium hydrogen carbonate gradually
formed from the insoluble calcium carbonate with the continued influence of carbon dioxide and water. Calcium hydrogen carbonate is very soluble and easily washed away with rainwater. Depending on weather conditions this process may however take up to two years to complete.

Snow & Ice Removal

The safest deicers for concrete are also the most common: sodium chloride-rock salt, and calcium chloride pellets. Sodium chloride, however, will damage vegetation and corrode metal. Calcium chloride works better at lower temperatures, has little effect on vegetation but promotes rust. Ammonium nitrate and ammonium sulfate fertilizers, sold as safe for grass and shrubs can rapidly attach and disintegrate concrete. Magnesium chloride chemically disintegrates concrete slowly. Urea in low concentrations will not damage plants, but will attack concrete. Manufacturer’s usage recommendations should always be followed to prevent over applying deicers. Do not use a chemical deicer to melt every bit of snow and ice. Once the bond between ice and pavement is broken, the slush and residual deicer should be mechanically removed using a large rotary brush attached to a small tractor to prevent refreezing.

Sealers

Uses: Application of a sealer follows stain removal, efflorescence removal and overall cleaning. Sealers are used for aesthetic and functional reasons. Sealers offer many functional advantages.

Sealers for Concrete Pavers

If the panels are sealed, Masons Supply should be consulted prior to verify that the sealer is compatible and will perform in the environment planned for its use. Sealers not recommended for use with panels are acrylics, urethanes, epoxies, alkyds, esters, and polyvinyl acetates. Some municipalities regulate building materials with high volatile organic contents (VOC’s). The restrictions usually apply to solvent based sealers. The VOC level of a sealer refers to the pounds per gallon (or grams per liter) of solvent which evaporates from the sealer, excluding the water. VOC’s have been regulated since they can contribute to smog. Most water based sealers comply with VOC restrictions and some solvent based products may comply as well. The user should check with the sealer supplier to verify VOC compliance in those areas which have restrictions.

Many solvent based products are combustible and emit hazardous fumes. Therefore, flame and sparks should be prevented in the area to be sealed. Persons applying sealers should wear adequate breathing and eye protection. Never use solvent based sealers in a poorly ventilated or confined area.

Silanes/Siloxanes

Silanes and siloxanes are durable and penetrate concrete well. Silanes are the simpler form that, when exposed to moisture begin to link up to other silanes. Siloxanes do the same linking together. Both chemicals become a polymer, curing as a film in the capillaries of the concrete. A hydrophobic barrier to moisture is created, preventing moisture from entering but allowing the concrete to “breathe” or release water vapor. Because silanes and siloxanes reduce moisture from entering the concrete, they can deter efflorescence from appearing on the surface of concrete panels. They initially enhance colors and produce a flat, no gloss finish on the panel surface. This makes silanes and siloxanes very suitable on exterior areas for resisting efflorescence. Silanes and siloxanes do not resist penetration of petroleum stains unless they have additives specifically for that purpose. When required, proprietary mixtures with additives can increase petroleum stain resistance. Silanes have smaller molecules, so they penetrate farther into the concrete than larger siloxane molecules. However, they are more volatile (tend to evaporate) until they bond to the concrete. Silane sealers generally require a higher percent of solids to counteract their rate of evaporation. Therefore, silanes tend to be more expensive than siloxanes. Silanes and siloxanes are typically used as water repellents for concrete bridge decks, parking garages, and masonry walls. Their primary use for reinforced concrete structures is to prevent the ingress of chloride ions from de-icing salts. This intrusion causes reinforcing steel corrosion in the concrete, and a weakened structure. Their ability to decrease intrusion of chloride materials makes them useful on panels subject to deicing salts or salt air, such as walks, streets, parking lots, plaza roof and parking decks.

Sealing Procedures

All dirt, oil stains and efflorescence must be removed prior to sealing. The cleaned surface must be completely dry prior to applying most sealers. Allow at least 24 hours without moisture or surface dampness before application. The panels may draw efflorescence to the surface, or the sealer may whiten.

Cover and protect all surfaces and vegetation around the area to be sealed. For exterior (low-pressure) sprayed applications, the wind should be calm so that it does not cause an uneven application, or blow the sealer onto other surfaces. For many sealers, especially those with high VOC’S, wear protective clothing and mask recommended by the sealer manufacturer to protect the lungs and eyes.

Sealers can be applied with a hand roller if the area is small (under 1000 ft² or 93 m²). For larger areas, more efficient application methods are a low pressure sprayer.

Hazardous Materials

The U.S. Federal Government and Canadian Government require that all shipments of hazardous materials by common carrier must be accompanied by a Material Safety Data Sheet (MSDS). All chemical manufacturers must supply sheets to shippers, distributors and dealers of cleaners and sealers if the materials are hazardous. The MSDS must accompany all shipments and be available to the purchaser on request. The MSDS lists the active ingredients, compatibility and incompatibility with other materials, safety precautions and an emergency telephone number if there is a problem in shipping, handling or use. The user should refer to the MSDS for this information.

References

THE CASTinTACT® ADVANTAGE:

- Cementitious concrete panels used for both new construction and retrofit.
- Easy to cut and core, use on radiuses, around bollards, stairs, and vault boxes.
- Textured concrete finish for wet and dry slip resistance.
- High compressive and flexural strength, durable, tough and crack resistant.
- Contrasting color is integral throughout concrete panel.
- Compatible with concrete base, similar thermal co-efficient of expansion as base.
- Resistant to severe exposure, wet freeze thaw damage from de-icing chemicals.
- Panels become an integral and permanent part of the walking surface.
- Unique patented early entry fast-set installation method that takes 10 minutes.
- CASTinTACT® 3 panels do not float during installation. Panels stay where placed.
- Recyclable concrete panel.

Total CASTinTACT® Solution - Installation, Durability, and Maintainability.