ATFL-1801: SPECIAL TOPICS: INTRO TO THE FLOOR COVERING INDUSTRY

Cuyahoga Community College

Viewing: ATFL-1801 : Special Topics: Intro to the Floor Covering Industry

Academic Term:
Fall 2019

Subject Code
ATFL - Appld Indus Tech - Floorlaying

Course Number:
1801

Title:
Special Topics: Intro to the Floor Covering Industry

Catalog Description:
Introductory course covering most aspects and characteristics of the floor laying industry including vinyl composition tile, carpet and ceramic tile and required transitions. In addition, installation procedures, including substrate preparation and edging for polished concrete and resinous floors and respective lay out practices are demonstrated and applied.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
Departmental approval and a current member of the Carpenter Union

Outcomes

Course Outcome(s):
Describe the different aspects of the floor laying Industry, identify the materials and tools used in flooring installations, and explain the various substrates used in construction and discuss respective contractor policies and documents.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):
1. List and define the terms related to the flooring industry.
2. Identify the various flooring applications typical in the commercial industry.
3. Describe the different flooring materials used including wood, resilient, carpeted, and ceramic products.
4. Identify the tools used in the flooring industry and describe the use of each.
5. Describe the different types of floor substrates and explain typical construction and discuss different factors affecting respective floor treatments.
6. Discuss the general contractor policies, chain of command, jobsite conditions, and expectations required of the flooring installer

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Course Outcome(s):
Discuss the importance of proper preparation including safety concerns, levels of patch, material types and demonstrate the ability to apply different hydraulic cements to level different substrates.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define terms related to floor preparation.
2. Identify the different types of hydraulic cements used in substrate preparation.
3. List various contaminates that affect flooring installations and identify common defects that need to be addressed.
4. Discuss the importance of safety awareness with respect to silica standards and identify proper PPE.
5. Describe the process of cleaning substrates including the importance of providing dust free environments.
6. List and differentiate between the levels of patching and discuss the relevance of telegraphed lighting on the desired result.
7. Differentiate between porous and non porous substrates with respect to primer selection and adhesives used for floor coverings type.
8. Explain how feather edging is used to smooth out variable heights in the substrate.
9. Demonstrate the ability to prepare substrates using different patching levels, proper mixing procedures, keying techniques and directional troweling

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Course Outcome(s):

Identify the characteristics, types and uses of resilient wall base including wall preparation and adhesive application.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define terms related to resilient wall base.
2. Explain the characteristics of resilient wall base including appearance and composition.
3. Differentiate between roll base and standard lengths
4. Identify the different types of resilient wall base and describe the use of each.
5. Describe specialty wall base including unique appearance, dimensions, including thickness and heights and corner treatments.
6. Describe the various wall conditions that may be addressed prior to base installation.
7. Discuss the different application techniques used to apply base adhesive to walls including material acclimation and layout practices

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Course Outcome(s):

Discuss the purpose of transitions including types and applications and describe and apply various installation techniques

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List the different types of floor covering transitions used in commercial and residential applications.
2. Identify and describe the various uses of transition used to terminate flooring edges.
3. Explain the importance of proper storage practices of transitions.
4. Demonstrate the ability to select and install transitions of different floor coverings.

Course Outcome(s):

Identify the tools and adhesives used to glue down different types of carpeting and describe the procedures followed, including “hand fitting”, estimates of material and installation techniques, including hot cutting of resilient flooring.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define the terms related to glue down carpet installations.
2. Identify the different types of glue down carpeting.
3. List the special hand tools used to layout and install glue down carpeting.
4. Explain the practice of “hand fitting” glue down carpet and describe the procedures followed.
5. Review the math concepts used in estimating material required for various sized rooms/areas

6. Demonstrate the ability to install glue down carpeting in commercial and industrial buildings in accordance with flooring industry standards.
7. Demonstrate the ability to transition carpeting to flooring materials.
8. Demonstrate the ability to properly hot cut resilient flooring materials around door casings, pipes, and drains

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Course Outcome(s):

Discuss the basics of ceramic tile and resinous flooring including material types, grid line layout, concrete imperfections, techniques used to cut ceramic tile, and perform edging operations for concrete polishing

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. List and define terms related to ceramics and resinous floors.
2. Review safety regulations for ceramic installations established by the American
3. Society of Testing Materials ASTM and the Occupational Safety and Health Administration OSHA.
4. Describe the various types of ceramic/hard tile and discuss the manufacturing process of each.
5. Apply the math concepts and layout procedures to establish grid lines for ceramic tile installations.
6. Identify the different types of thin set mortar and describe the purpose of each.
7. Demonstrate the ability to properly select, mix and spread thin set using keying, and combing techniques using a notched trowel
8. Demonstrate the ability to cut ceramic tile using snap cutters and tile nippers.
9. Introduce, explain and demonstrate the process of “edging” polished and resinous floors.

Methods of Evaluation:

quizzes, tests; class participation;

demonstration of installation techniques for all aspects of the course content;

Course Content Outline:

1. Hard surfaces
    a. Terminology
        i. Hard surface
        ii. Employability skill
        iii. Substrate
        iv. Job document
        v. Chain of command
        vi. Material handling
        vii. Staging
        viii. Removal
        ix. Layout
        x. Carpet
        xi. Resilient flooring
        xii. Wall base
        xiii. Ceramic tile
        xiv. Laminate
        xv. Engineered
        xvi. Floor truss
        xvii. Adhesive
        xviii. Disposal
        xix. Recycling
        xx. Polished concrete
        xxi. Epoxy floors
        xxii. Green products
        xxiii. VCT
    b. Flooring application

i. Durable installation
    1. Easily maintained
    2. Green product
ii. Vinyl composition tile
    1. Economical
    2. Labor friendly
    3. Costly over time
iii. Sound and walking comfort
iv. Natural products
    1. Wood
    2. Cork
v. Stairway

c. Flooring materials
i. Wood
    1. Solid
        a. Various species
        b. Soft wood
        c. Hard wood
    2. Costly
    3. Labor intensive
    4. Common wood substrate
    5. Engineered
        a. Varying quality
        b. Stable product
        c. Variable widths
    6. Laminate
        a. Floating
        b. Snap together
        c. Varying quality
ii. Resilient
    1. Linoleum
    2. Vinyl
    3. Plank
    4. Tile
    5. Rubber
    6. VCT
iii. Carpeted
    1. Broadloom
        a. Level loop
        b. Cut pile
        c. Greater than 27 inch width
    2. Tile
        a. 18 inch x 18 inch
        b. 2ft x 2ft
        c. 3ft x 3ft
        d. Metric sizes

1. Glue down
    a. Full spread
    b. Perimeter glue
    c. Grid system
    d. Wood substrate
    e. Concrete
    f. Limited existing
2. Ceramic
    a. Multiple size
    b. Wall
    c. Floor
    d. Different substrate
    e. Stone

   f. Porcelain
   g. Thin
3. Tools
   a. Standard
      i. Cutting
      ii. Fastening
      iii. Layout
      iv. Cleaning
      v. Rulers
      vi. Preparation
      vii. Removal
      viii. Utility
      ix. Adhesive application
   b. Specialty
      i. Trowels
      ii. Rollers
      iii. Files
      iv. Chisels
      v. Mallet
      vi. Stapler
      vii. Dry line
      viii. Laser
4. Substrate
   a. Concrete
      i. Vapor barrier
      ii. Cured
      iii. Reinforced
      iv. Water proofed
      v. Water-cement ratio
   b. Wood
      i. Floor construction
         1. Joists
         2. Trusses
         3. Sheathing
         4. Underlayment
         5. Opening
         6. Plywood grading
      ii. Deflection
      iii. Acclimation
      iv. Minimum thickness
   c. Factors
      i. Moisture
      ii. Deflection
      iii. Expansion
      iv. Contraction
      v. Anchored
      vi. Parting compounds
      vii. Curing
      viii. Drying time
5. Contractor policies
   a. Chain of command
      i. Apprentice
      ii. Journeyman
      iii. Foreman
      iv. Employer
      v. Superintendent
      vi. Project manager

vii. Architect
viii. End user

b. Policies
i. Break/lunch
ii. Restrooms
iii. Delivery time
iv. Contact person(s)
v. Parking
vi. Elevator use
vii. Material storage
viii. Open flames

1. Resources
a. Electricity
b. Lighting
c. Water
d. HVAC
e. Staging areas

2. Expectations

1. Proper substrate preparation
a. Terminology
i. Patch
ii. Hydraulic cement
iii. Existing adhesive
iv. Existing floor covering
v. Material removal
vi. Defect
vii. Expansion joint
viii. Control joint
ix. Silica
x. Silica standard
xi. Polymer
xii. Dust free environment
xiii. Porous substrate
xiv. Non porous substrate
xv. Removal equipment
xvi. Patching level
xvii. Ramping
xviii. Feather edge
xix. Keying technique
xx. Telegraphing
xxi. Telegraphed light
xxii. Desired result
xxiii. Crazing
xxiv. Pop-outs
xxv. Scaling
xxvi. Spalling
xxvii. Blistering
xxviii. Cracking
xxix. Curling
xxx. Freeze-thaw deterioration
xxxi. Delamination

b. Hydraulic cement
i. Hydraulic Portland
1. Grey color
2. Polymer
a. Quick drying
b. Mold resistant
c. High compressive strength

ii. Gypsum hydraulic
1. White
2. Versatile
3. Admixture strength
a. Latex based
b. Mildew resistant
4. Polymer
a. Quick drying
b. Economical
c. Ease of workability
5. Portland overlay

c. Contaminates and defects
i. Contaminates
1. Parting curing compounds
2. Oil
3. Grease
4. Wax
5. Dust
6. Adhesive residue
7. Paint overspray
8. Drywall compounds
9. Water
10. Acids
11. Alkyl ide salts

ii. Defects
1. Pop-outs
2. Crazing
3. Blisters
4. Cracking
5. Curling
6. Scaling
7. Spalling
8. Freeze –thaw deterioration
9. Delamination

d. Safety awareness
i. Silica standard
1. Types
a. Crystalline
b. Amorphous
2. History
a. 1500's; 14th century/
b. Europe
c. 1800's/USA
3. Exposure
a. Sawing
b. Hammering
c. Blasting
d. Demolition
e. Sweeping
f. Pouring/mixing
g. Abrasive blasting
h. Shot
i. Drilling
j. Cutting
k. Sanding
4. Health effects
a. Silicosis
b. Lung cancer
c. COPD

d. Auto-immune
e. Chronic kidney failure

5. Exposure limits
   a. Permissible
   b. Recommended
   c. Threshold limit values
   d. Time weighted average
   e. Action level
6. Exposure control
   a. Need
   b. Assessment
   c. Dust control
   d. Engineered controls
   e. Work practice
   f. High efficiency particulate air
   g. Control plan
   h. Respiratory protection
7. Medical evaluation
8. Competent person role

ii. PPE

1. Dust contaminate system
   a. HEPA filter
   b. Vacuum
   c. Shroud component
2. Respiratory
   a. Respirator
   b. Masks
3. General

e. Cleaning substrate and dust free environment

i. Cleaning

1. Scraping
2. Sanding
3. Sweep/vacuum

ii. Dust free environment

iii. Wet vs dry

f. Patching levels, telegraphed lighting and desired results

i. Patching levels

1. Carpet/minor telescoping
2. Vinyl/enhanced
3. Flat/premium

ii. Telegraphed lighting

1. Sunlight/natural
2. Fluorescent
3. Incandescent
4. Window placement

iii. Desired results

1. Eye level
2. Defect free
3. Smooth

g. Porous vs non-porous

i. Porous

1. Water absorption
2. Bond-ability
3. Adhesive set/open time

1. Non-porous
   a. Non water permeable
   b. Closed pores
   c. Difficult adhesion requirements
2. Primer selection

a. Epoxy: excessive moisture
b. Latex: better bond
c. Polymer modified: latex upgrade

3. Feather edging
   a. Purpose
      i. Low area filler
      ii. Blend varying surface edges
   b. Directional troweling
   c. Consistent pressure applied
   d. Cross filling multiple levels
4. Application
   a. Substrate preparation
      i. Tool selection
      ii. Evaluate and clean
   b. Hydraulic cement selection and mixing
      i. Selection
         1. Fill depth
         2. Specifications
      ii. Mixing
         1. Proper ratio
         2. Mix time per specification
         3. Powder to water sequence
   c. Substrate application
      i. Trowel(s) selection
      ii. Order
         1. High to low areas
         2. Center to perimeter
      iii. Time constraint per manufacturer
   d. Keying techniques
      i. Deep fill application
      ii. Smooth out
   e. Directional troweling
      i. Straight line application
      ii. Maintain proper thickness, trowel overlap

1. Resilient wall base
   a. Terminology
      i. Resilient wall base
      ii. Cove
      iii. Factory made corner
      iv. Factory made edges
      v. Fill section
      vi. Short return
      vii. Wall substrate
      viii. Inside corner
      ix. Outside corner
      x. Mitre corner
      xi. Roll base
      xii. Specialty base
      xiii. Acclimation
      xiv. Plasticizer migration
   b. Base characteristics
      i. Composition
         1. Rubber
         2. Vinyl
         3. Vinyl-rubber
      ii. Manufacture process
         1. Molded
         2. Extruded
      iii. Appearance

1. Varying height
2. Varying thickness

iv. Functional
v. Decorative

c. Standard versus roll base
i. Standard
1. 4′-0 conventional
2. General use
3. Straight face
4. Cove face

ii. Roll base
1. Lengths
a. 50′-0
b. 120′-0
2. Straight face
3. Cove face

d. Types
i. Cove
ii. Straight face
iii. Heights
1. 2 ½ inch
2. 4 inch
3. 4 ½ inch
4. 6 inch
5. Multiple height

e. Specialty base
i. Appearance
1. Multi-colored
2. Paintable
3. Stackable
4. Various shapes
5. Heights
a. Minimum 3 inch
b. Maximum 8 inch
6. Thickness
a. Minimum ¼ inch
b. Maximum 1 inch

ii. Cover treatments
1. Outside corner
a. Individual piece
b. Receives designer base
2. Inside corner
a. Pre-formed
b. Anchored separately

f. Wall conditions
i. Loose wall paper
ii. Excess drywall finish
iii. Out of square corners
iv. Existing adhesive
v. Voids or missing drywall

g. Adhesive application
i. Tools
1. Notched trowel
2. Caulk gun

ii. Types
1. Acrylic
2. Latex

iii. Material acclimation
1. Twenty-four hour minimum
2. Storage

- iv. Application techniques
    1. Wall application
    2. Base
    3. Trowel applied
    4. Caulk gun
    5. Uniform coverage
    6. Contact adhesive
    7. Film tape
    8. Wet rag wipe

1. Transitions
    a. Types
        i. Wood
        ii. Aluminum
        iii. Resilient
            1. Rubber
            2. Vinyl
            3. Combination
    b. Uses
        i. Terminating edge
            1. Carpet to VCT
            2. Carpet to wood
            3. Wood to wood
            4. Carpet to existing
            5. Varying floor heights
        ii. Nosing
            1. Stairs
            2. Material
                a. Rubber
                b. Wood
                c. Laminate
    c. Storage
        i. Containment
            1. Tubular protection
            2. Flat and straight

1. Protection
    a. Twist
    b. Deformation
        i. Moisture
        ii. Crimping
2. Acclimation
    a. Wood transition
    b. Resilient transition
3. Installation
    a. Tools
        i. Saws
            1. Hacksaw
            2. Handsaw
        ii. Mitre box
        iii. Clamps
        iv. Aviation snips
        v. Knife
        vi. Vinyl cutter
        vii. Hammer
    b. Layout
        i. Location
        ii. Balanced positioning
        iii. Field determination
        iv. Net fit measurements
        v. Angle considerations

1. Standard 45 degree/90 degree
2. Irregular

vi. Maximum use per length

c. Cut and install
   i. Clean and straight
   ii. Sharp blades
   iii. Install
      1. Tight fit
      2. Anchor mechanical fasteners
      3. Mitre install first
   iv. Resilient transition
      1. Contact cement
      2. Adhesive tape
      3. Stretch avoidance

1. Sequence
   a. Determined by material
   b. Tuck allowance

1. Glue down carpeting
   a. Terminology
      i. Tractoring
      ii. Open time
      iii. Working time
      iv. Bond breaker
      v. Porosity
      vi. Pile
      vii. Latex
      viii. Bow/skew
      ix. Foot friendly
      x. Direct scribe
      xi. Hot cut
      xii. Hand fit
   b. Carpet types
      i. Action back
         1. General use
         2. Plastic back
         3. Wide range pricing
         4. Pliable
         5. Workable
      ii. Soft back
         1. Residential or commercial use
         2. Cloth back
         3. Flexible
      iii. Unitary latexed
         1. Heavy back
         2. Thin
         3. Commercial application
      iv. Enhancer
         1. Hard rubber
         2. Cushion back
         3. Cushion cloth back
         4. Foot friendly

1. Vinyl back
   a. Poly vinyl chlorine PVC back
   b. Carpet tile
   c. Sized metrically

2. Special tools
   a. Carpet knife
   b. Sheer

   c. Trimmer
   d. Straight edge
   e. Tractor
   f. Hook knife
   g. Cushion back cutter
   h. Loop pile cutter
   i. Notched trowel
   j. Seventy-five pound roller
3. Hand fitting
   a. Net fitting to vertical surface
   b. Notching out
   c. Back cutting
   d. Column wrap
4. Math estimating
   a. Perimeter
      i. Base requirements
      ii. Border installation
   b. Area
      i. Carpet estimate
      ii. Glue requirement
      iii. Layout considerations
         1. Seam location
         2. Lighting
         3. Foot and roller
         4. Pile direction
         5. Entry location
5. Glue down installation
   a. Safety
      i. Ventilation
      ii. Hand tool safety
      iii. Lifting precaution
      iv. Gloves
   b. Measurements

1. Area cleaning
   a. Floor scrape
   b. Shop vacuum
   c. Floor patch
2. Determine seam location
3. Carpet cutting
   a. Over size cut
   b. Roll cut
4. Position carpet in area
   a. Trim allowance
   b. Align seams
5. Adhesive application
   a. Fold back carpet
   b. Apply to substrate
   c. Open time allowance
   d. Lay carpeting into adhesive
6. Roll and address seams
   a. Install additional rolls
   b. Seam sealer
   c. Tractor
7. Trim as needed
8. Repeat above as required
9. Transitions
   a. Angle determination
   b. Mitre cut angles
   c. Cut to length/install

i. Adhesive film tape
ii. Contact cement
iii. Adhesive

10. Hot cuts
    a. Required areas
        i. Door casings
        ii. Pipes
        iii. Drains
    b. Tools
        i. Propane torch
        ii. Heat gun
        iii. Marking tool
        iv. Dividers
        v. Utility knife
        vi. Hand roller
    c. Layout, scribe, heat and fit

1. Ceramics and polished concrete
    a. Terminology
        i. Ceramic
        ii. Mortar
        iii. Gridline
        iv. Thin bed
        v. Keying
        vi. Combing
        vii. Polymer modified
        viii. Deflection
        ix. Shrinkage
        x. Edging
        xi. Accelerators
        xii. Admixtures
        xiii. Polyuria filler
        xiv. Hydration
        xv. Curing
        xvi. Broad casting
        xvii. Resins
        xviii. Acrylic
        xix. Pigments
        xx. Batch
        xxi. Dust shroud
        xxii. Tile balanced
        xxiii. Slake time
        xxiv. Snap cutter
    b. ATSM/OSHA/regulations/flooring
        i. Silica standard
            1. Dry sweeping
            2. Vacuum
                a. Dust containment
                b. High efficiency particulate air filter
            3. Dust shroud
            4. Respiratory protection
        ii. Tile testing
            1. Hardness
            2. Compressive strength
            3. Types
            4. Size tolerances
        iii. Mortar

1. Pounds per square inch PSI
2. Mixing consistency
3. Types of setting material

iv. OSHA
1. Respiratory
2. Scaffolding
3. PPE
4. House keeping

c. Ceramic hard tile type and manufacturer
i. Stone: cutting, hone, polish
ii. Pavers: pressed
iii. Cement body: molded
iv. Porcelain: clay fired; kiln

d. Grid lines
i. Math concepts
1. Pythagorean theorem
2. Basic operation
3. Area
4. Centerline determination

ii. Purpose
1. Square area
2. Tile alignment
3. Mortar boundary

iii. Description
1. Chalk line
2. Tile/mortar boundary
3. Tile alignment

iv. Layout
1. 3-4-5 concept
2. Arc scribing
3. Centerline control
4. Tile balanced

e. Thin set mortar types and purpose
i. Dry set
1. Economical
2. General use
3. Application
a. Ceramic
b. Stone

1. Latex polymer modified
a. Improved adhesion
b. Shock/impact resistant
c. Deflection resistant
d. Wood substrate application
2. Medium bed
a. Minimize slump
b. Thicker bond coat
c. Large tile use
3. Epoxy: ceramic and natural stone
a. Chemical resistant
b. High bond strength
c. High impact resistant
4. Organic
a. Interior use only
b. Floors, walls, and countertops
c. Not suitable for wet areas
d. Avoid temperature extremes
5. Spreading thin set

   a. Tool selection
      i. Hand tools
         1. Notched trowel
         2. Margin trowel
         3. Chalk line
         4. Tape measure
         5. Dust shroud
      ii. Equipment
         1. Drill motor/ 1/2 inch
         2. Mortar paddle
         3. Vacuum
   b. Layout
      i. Border determination
      ii. Grid lines
   c. Mortar application
      i. Selection
      ii. Mixing/shake time
      iii. Placement within grid
      iv. Key and comb
1. Cutting ceramic
   a. Safety
      i. Gloves
      ii. Eye protection
      iii. Hard hats
   b. Tools
      i. Wax marker
      ii. Tile nippers
      iii. Snap cutter
   c. Cutting
      i. Nippers
         1. Layout tile
         2. Radius cut/"nip"
      ii. Snap cutter
         1. Layout
         2. Mark
         3. Align
         4. Score and snap
2. Edging
   a. Purpose
      i. Blend field with room perimeter
      ii. Uniform grid appearance
   b. Equipment
      i. Hand held edge
      ii. Walk behind
      iii. Multi-tool
      iv. Dust shroud and containment
   c. Edging operation
      i. Safety concerns
         1. Respiratory
         2. Eye protection
         3. Electrical
      ii. Bond tooling pad selection
      iii. Grind to range
         1. Grind
         2. Hone
         3. Polish
   d. Technique
      i. Swirling motion
      ii. Light pressure

Resources

United Brotherhood of Carpenters-FL0001M-1 , Carpenters International Training Fund, . *Standard Skills for Floor Layers*. 1st Edition,. Carpenters International Training Fund, Las Vegas, Nevada, Sept 2012. Sept 2012.

National Tile Contractors Association, , . *NTCA Reference Text*. 2016/2017 Edition. NTCA Technical Committee, Jackson, Mississippi, 2017.

Tile Council of North America Committee. *TCNA Handbook* . current. Tile Council of North America, Anderson, South Carolina, March 2016.

Resources Other

https://www.shawcontract.com/SCGDEV/media/Site/InstallationDocuments/Generic_Installation.pdf

https://www.ardexbuildingproducts.ie/service/datasheets-and-calculators/

https://ascconline.org/concrete-polishing-council/technical-documents

Top of page

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