

DIVISION 02 EXISTING CONDITIONS
SECTION 024119
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal from the site of existing construction to accommodate the new construction.
 - 2. Removal of existing components for reinstallation.
 - 3. Salvaging of existing materials.
 - 4. Capping and identification of utility lines.
 - 5. Contractor design of shoring and bracing.
- B. Related Sections:
 - 1. 011000 - Summary: Contractor's use of the site; Owner occupancy requirements; Special work requirements.
 - 2. 015000 - Temporary Facilities and Controls: Temporary enclosures, guardrails, barriers, barricades, lighting and dust control.
 - 3. 017329 - Cutting and Patching.
 - 4. 017700 - Closeout Procedures: Project record documents.
 - 5. 078400 - Firestopping
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

- A. Make submittals in accordance with Section 013300, unless specified otherwise.
- B. Submit certification that temporary shoring, support, and restraining systems have been designed by a structural engineer licensed to practice in the State or Province of the Project.

1.3 QUALITY ASSURANCE

- A. Comply with the applicable health and safety regulations of the jurisdictional authorities.
- B. Regulatory Requirements: Comply with governing environmental notification requirements and regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Obtain and pay for all permits required for the demolition work.
- D. Obtain approval of demolition procedures which affect the normal operation of Owner occupied spaces. Make every effort to avoid disruption of Owner occupation or adjacent businesses.
- E. The design of shorings, temporary supports, and restraining systems shall be the responsibility of the Contractor. Such elements shall be designed and stamped by a Structural Engineer licensed to practice in the State or Province of the Project.
- F. Pre-bid Inspection: Visit the Site to determine existing conditions, and as much as possible to determine the extent of demolition required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Utilize patch and repair materials to match demolished material to fullest extent possible, if actual product match is not possible. Performance of those materials should meet or exceed that of existing materials. Comply with material and installation requirements from individual specification sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect existing conditions and verify that the work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin demolition until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective demolition caused by prior observable conditions.
- C. When unanticipated mechanical, electrical, structural or other elements that conflict with intended function or design are encountered, investigate and ascertain the nature and extent of conflict. Promptly submit a written report to the Construction Manager. Perform no further demolition in such areas, unless approved by the Construction Manager.

3.2 PREPARATION

- A. Provide and maintain all temporary barriers, warning signs and systems and security devices necessary for the demolition work and protection of workmen, Owner forces and the public. Conform to requirements of Section 015000.
- B. Provide protection to all surrounding public spaces. Perform work and provide temporary construction as approved by the local jurisdictional code authorities.
- C. Protect existing construction which will not be subject to demolition.

3.3 DEMOLITION

- A. Perform demolition as indicated and as required to accommodate the new work. Demolish in an orderly and careful manner. Where demolition exceeds that indicated, verify such demolition with the Construction Manager prior to proceeding.
- B. Protect existing structural members. Contact the Construction Manager prior to modifying structural members beyond the extent indicated. Cease operations and notify the Construction Manager immediately if continued demolition operations might endanger the existing structure.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- D. In areas where items are required to penetrate a fire separation, restore the fire protection with firestopping materials and methods acceptable by the authorities having jurisdiction.
- E. Where fireproofing membranes or coverings to existing structural steel members and open web steel joists are disturbed, restore the fire protection with materials and methods acceptable by the authorities having jurisdiction.
- F. Notify the Owner of hazardous materials discovered during demolition operations. If materials are suspected to contain hazardous materials, do not disturb. Immediately notify Architect and Owner.
- G. Provide Contractor designed temporary shoring as required to support existing construction against movement or overload during demolition operations, until permanent supports are in place.
- H. Except where noted or specified otherwise, take possession of materials being demolished, and immediately remove from site. Do not overload existing construction to remain with demolished materials. Demolished materials which cannot be recycled or reused shall be disposed of at a legal dump site.

- I. If relics, antiques, corner stones and their contents, commemorative plaques and tablets, or other similar items are discovered, they shall remain the property of the Owner. Notify the Construction Manager prior to removal and obtain approval on method of removal.
- J. Carefully remove, store, and protect all materials and components to be reused.
- K. Where removal of materials indicated to remain is necessary to facilitate new construction, carefully remove, store, and protect such materials for future reinstallation.
- L. Carefully remove, protect, and turn over as directed, materials and components claimed by the Owner for salvage. Prior to demolition, contact the Owner to determine which items will be claimed.
- M. Where cut edges of the existing construction will be visible in the completed work, cut in uniform straight lines. Account for patterns and seams in finishes being demolished to maintain whole tiles, grout lines, etc. Concrete and masonry shall be sawcut or core drilled.
- N. Coring into post-tensioned beams or structural slabs is not allowed unless x-ray surveying, scanning, or another submitted and approved method has been performed to accurately locate post-tensioned tendons. X-ray surveying at coring locations may be performed by the testing and inspection agency or by another testing agency under the General Contractor's direction. Trades requesting the coring shall pay surveying costs. No coring operations shall commence without the prior written approval of the Structural Engineer of Record or base building structural engineer. General Contractor is responsible for any damage to existing reinforcing.
- O. Repair all demolition performed in excess of that required, at no additional cost to the Owner.
- P. Remove all disconnected utility lines. Cap remaining ends. Place markers to indicate location of disconnected utilities. Indicate location of disconnected utilities on the Project Record drawings as specified in Section 017700.
- Q. Pay for and coordinate the work performed by public utilities. Notify the affected utility company well in advance of the scheduled work.
- R. Dust producing demolition operations shall be sprinkled in areas not subject to water damage. Provide other approved means of controlling dusting in areas subject to water damage.
- S. Electrical Demolition Requirements:
 - 1. Remove electrical system components as indicated on the electrical drawings
- T. Plumbing Demolition Requirements:
 - 1. Abandoned underslab piping shall be cut off flush with the floor line and sealed. Patch flush with the floor.
 - 2. Abandoned piping which is exposed and readily accessible shall be removed.
 - 3. Leave abandoned piping which is concealed in existing construction to remain.
- U. Exterior Walls: In areas where items are removed from exterior walls and patching is required, repair wall construction with materials compatible with existing wall construction. Maintain continuity of air and vapor barrier, and insulation inside wall cavity. Leave site in a condition acceptable to the Owner at all times. Remove demolished materials from site daily as work progresses. Do not overload existing structure with demolished materials.

3.4 CLEANUP

- A. After each demolition phase, leave the area broom clean and ready for the work of other Sections.
- B. Occupied spaces which receive demolition work shall be thoroughly and completely cleaned prior to Owner's daily operations. Cleaning shall include: vacuuming, dusting, stain and dirt removal.

END OF SECTION

DIVISION 03 CONCRETE
SECTION 030100
CONCRETE SLAB REPAIR AND RESURFACING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Repairing of existing slab surfaces.
 - 2. Sanding or grinding of existing concrete slab.
- B. Drawings, the provisions of the Agreement, including bonds and certificates, the General Conditions, and Division 1 specification sections apply to all work of this Section.

1.2 RELATED SECTIONS

- A. 033015 - Concrete Slabs on Grade: Replacement of full-thickness (portions of) existing concrete slab.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data: Submit manufacturer's literature for each product listed.

1.4 QUALITY ASSURANCE

- A. Provide materials for system produced by one manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material to the jobsite in the manufacturer's original, new, unopened packages and containers bearing manufacturer's name and label in good condition.
- B. Store materials not in actual use in tightly covered containers at ambient air temperature range of 40 to 90 degrees F (4.5 to 32 degrees C). Storage area should be clean, free of contamination, and in accordance with Data Sheet compliance.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Where ambient air temperature does not fall within the range of 40 to 90 degrees Fahrenheit (4.5 to 32 degrees Celsius), or in conditions with extremely high relative humidity, special application products and methods may be required. Contact manufacturer for specific job conditions and technical support.
- B. Installer is required to visit site and verify conditions prior to bidding.
- C. Permanent lighting shall be in place and operational prior to commencement of the work of this Section.
- D. Variations in conditions may require modification to preparation and installation requirements; failure to verify modifications may result in an unacceptable finish.

1.7 WARRANTY

- A. Furnish manufacturer's two-year warranty against failure of the concrete stain system by use of a defective product, in accordance with Section 017700.

1.8 SUBCONTRACTOR GUARANTEE

- A. Furnish Subcontractor Guarantees in accordance with Section 017700.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Metzger/McGuire, (603)-224-6122, www.metzgermcguire.com.
- B. CTS Cement Manufacturing Corp. (Garden Grove, CA; 800-929-3030)
- C. Hi-Tech Systems, 2764 S. Vista Ave Bloomington, CA 92316, <https://hitechpolyurea.com/>
- D. Ardex Inc., www.ardexamericas.com
- E. Laticrete International, Inc., www.laticrete.com
- F. Mapei Corporation, www.mapei.com
- G. Sika, www.usa.sika.com
- H. Prosoco, www.prosoco.com
- I. W.R. Meadows, www.wrmeadows.com

2.2 MATERIALS

- A. Concrete Repair Compounds for Non-Polished Floors:
 - 1. Self Leveling Underlayment System: Self-leveling, pourable, cement-based material, minimum 28 day compressive strength 2,000 psi; minimum bond strength 200 psi; one of the following.
 - a. "K-15" Self-Leveling Underlayment Concrete, Ardex Inc.
 - b. "Laticrete 86 LatiLevel Thin Pour Underlayment," Laticrete International, Inc.
 - c. Ultraplan Easy; Mapei Corporation "Ultraplan 1."
 - d. "TRU Self-Levelling" fast-setting, high-strength underlayment, CTS Cement Manufacturing Corp.
 - e. Sikafloor Level 125, Sika Canada Ltd.
 - f. Floor-Top STG (Canada), W.R. Meadows of Canada
 - 2. Trowelable Underlayment System:
 - a. "SD-P" Fast-Setting Underlayment, Ardex Inc.
 - b. "Laticrete 220 Medium Bed Mortar mixed with Laticrete 3701 Latex Mortar Admix," Laticrete International, Inc.
 - c. Mapei Corporation "Mapacem 100" or "Planitop 10".
 - d. CTS Cement Manufacturing Corp. "CR Concrete Resurfacer" fast-setting, high-strength trowelable underlayment.
- B. Primers: As recommended by cement materials manufacturer for conditions.
- C. Penetrating Sealer for Non-Polished Floors: Water-based penetrating sealer meeting VOC limits of 100g/L or less.
 - 1. "Consolideck Concrete Protector SB" by Prosoco Inc. (Lawrence, KS; 800-255-4255).
 - 2. "Liqui-Hard Concrete Densifier & Chemical Hardener" by W.R. Meadows, Inc.
 - 3. "SEAL HARD" Concrete Densifier by L&M Construction Chemicals, LATICRETE International, Inc.
 - 4. "Sikafloor-3S Liquid-Applied Concrete Densifier" by Sika Canada Ltd.

PART 3 - EXECUTION

3.1 GENERAL PROCESS AND PROCEDURE

- A. Refer to Attachment 030101 Guide to Basic Floor Repairs (Metzger/McGuire) for instructions and illustrations related to various repair conditions.

3.2 EXAMINATION

- A. Examine substrates and conditions under which concrete resurfacing will be performed for compliance with requirements for applications of flooring materials. Do not proceed with application

until unsatisfactory conditions have been corrected. Start of any of the resurfacing work will be construed as the Applicator's acceptance of the floor and environment conditions.

1. The scope of repairs shall be confirmed by the Owner and Architect of Record prior to commencement of work.
- B. Condition of Substrate: Verify that all jobsite conditions are within the product manufacturer's Data Sheet parameters. Report discrepancies to the Construction Manager.
 1. Surface temperature of slab must be at least 40 degrees F. (4.5 degrees C.) and no more than 90 degrees F. (32 degrees C.) for crack and joint fillers and coating.
 2. If there are any indications of a moisture problem, contact the Architect.

3.3 PREPARATION

- A. Comply with the product manufacturer recommendations and as follows: Prepared surface shall be smooth and free of ridges and irregularities including those occurring in concrete and from mastics.
- B. Protect surface of slab immediately adjacent to defect under repair.
- C. Initial Concrete Slab Preparation: Provide initial preparation of concrete surface as follows.
 1. Remove dirt, oil, soap, grease, mastic, and other bond-breaking contaminants.
 2. Surface shall be smooth and free of unwanted ridges from by either mastics or concrete.
 3. Remove loose chipped concrete down to solid substrate.

3.4 SURFACE REPAIR - GENERAL

- A. Fill holes, spalls, cracks, voids and joints as recommended by the system manufacturer with minimal residue on surrounding surface and as required to provide a smooth, level and even substrate.
- B. For surface spalling repair, joint repair and crack repair, refer to 030101 Guide to Basic Floor Repairs for instructions.

3.5 APPLICATION OF REPAIR AND RESURFACING MATERIALS

- A. Install trowelable underlayment at locations where slopes are indicated and at other locations as appropriate to installation conditions; install self-leveling underlayment at other locations as necessary to correct slab flatness and levelness.
- B. Set screeds, markers, and reference blocks. Set screeds at all construction and control joints to establish weakened plane joints in underlayment.
- C. Install patching compounds in accordance with the manufacturer's recommendations. Where subsequent finishing of the material is required, float to level surface. Do not trowel.
- D. Apply primer to all areas to receive underlayment; repeat application if necessary to achieve proper build.
- E. Mix materials and pour or pump and squeegee into place to achieve appropriate thickness. At areas to receive cork tile flooring, provide fill thickness as necessary to align cork flooring with adjacent floor surfaces.
- F. Finish to a smooth level surface within tolerances specified for concrete floors.
- G. Cure in accordance with the manufacturer's instructions.
- H. Tolerances: As specified in Section 033000.

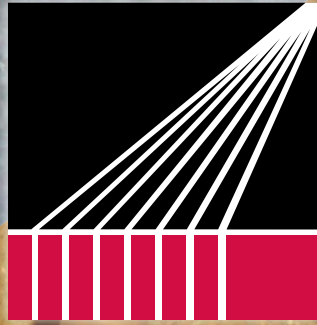
3.6 CLEAN-UP

- A. During progress of work, remove from site discarded materials, rubbish, cans and rags at end of each work day.
- B. Upon completion of work, clean spattered surfaces. Remove spattered coating by proper method of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.7 PROTECTION

- A. Protect completed concrete coating work against damage.
- B. Close application area after completion of each stage for a minimum of 48 hours and longer if required by the manufacturer.
- C. Protect coatings from general construction when tack-free with ¼ inch (6 mm) tempered hardboard, smooth side down. Remove prior to completion of Project.
- D. Correct damage by cleaning, repairing or replacing, and refinishing, as acceptable to the Construction Manager.

END OF SECTION



METZGER/McGUIRE

GUIDE TO BASIC FLOOR REPAIRS

Basic Repair Guidelines for Common Floor Defects
Including RANDOM CRACKS, SPALLED JOINTS,
GOUGES, JOINT FILLER SEPARATION AND MORE...



A Note about Metzger/McGuire Floor Joint Protection Systems

For nearly 50 years, Metzger/McGuire has been the industry leader in developing joint protection systems for trafficked concrete floors. Our Heavy Duty Semi-Rigid Epoxy Joint Filler, MM-80, was the industry's first semi-rigid epoxy joint filler and set the standards by which all joint fillers are evaluated today.

Prior to the development of semi-rigid filler concept, the widely accepted joint treatment practice was to "seal" joints with an elastomeric sealant such as a polyurethane. Elastomeric sealants were well suited for preventing the intrusion of moisture and dirt into the joint cavity, but lacked sufficient rigidity to protect the joint edge itself. Over time some contractors and designers recognized the protection limitations of sealants and accordingly some moved instead towards the use of high strength epoxies to provide joint edge protection. Unfortunately, such products often brought their own potential issues, including brittleness and joint restraint.

As a caulking contractor struggling with these imperfect options, Steve Metzger developed a notion that what was really needed was a product that was both "firm and flexible." Steve retained a chemist and began field trials on some of his projects using multiple formulations with varying adhesive, tensile and hardness properties until he found a product with the ideal balance of these properties. The result was a product with a Shore Hardness of A 80 and accordingly he named it MM-80. For the next several years the product was tested and monitored in some of the most demanding floors in the country, showing excellent results. Based on this proven success, in the late 1970's the American Concrete Institute (ACI), the Portland Cement Association (PCA) and other industry organizations began recommending A 80+ semi-rigid fillers as the best known solution to prevent joint edge deterioration. These same standards remain in place today.

Since the creation of our MM-80 Semi-Rigid Joint Filler, many industry changes have occurred which have had a direct impact on semi-rigid fillers. Changes in the material handling industry - to smaller wheels and heavier loading - changes in floor construction techniques such as joint spacing and finishing practices, and changes in construction schedules, including fast track buildings and multi-use spaces, have all lead to the need for continual evolution and innovation in floor joint filler technology.

At Metzger/McGuire, we have always done our best to anticipate, monitor and evaluate change and to adjust our products or develop new ones to meet the industry's ever evolving needs. As a recognized industry leader with a singular focus on joint fillers and joint edge protection, we take our obligation to the industry seriously. Providing "industry standard" products is the foundation of our company. Pairing these products with unequalled technical support, field support and customer service is the only way we know how to do things. Satisfying the building owner's long term floor protection needs is critical to our ongoing success and to ensuring that we remain "Known by the Floors We Protect."

If allowed the opportunity to partner with you on your next concrete floor project, rest assured you can place your confidence and trust in the entire Metzger/McGuire team to do everything in our power to meet or exceed your expectations and to provide you with the best floor joint protection systems the industry has to offer.

Your Partner in Floor Protection,

Scott Metzger

4 CRITICAL STEPS TOWARDS ACHIEVING PERMANENT, DURABLE FLOOR REPAIRS

1. DETERMINE CAUSE(S) OF FLOOR DETERIORATION

Before you begin repairing floor defects, it's important to identify their underlying causes in order to determine the best long-term repair strategy.

Example: Joint spalling may be the result of an improper joint filler installation (i.e. low filler profile or poor joint cleaning prior to filling), the wrong joint filler (i.e. urethane that is too soft to support traffic), or no joint filler at all. These are material problems. Joint spalling could also result from differing slab elevations (slab curl) or rocking slab conditions (subgrade deficiencies or voids). These are structural problems that need to be corrected prior to performing standard joint repair.

2. SELECT APPROPRIATE FLOOR REPAIR MATERIAL(S)

It's important to choose the repair material(s) best suited to meet the requirements of the facility's operations. Considerations may include frequency of traffic, vehicle loading and types, building temperature, time allowed to perform repairs, defect width, etc.

Example: The repair material best suited for repairing a spalled joint may be heavy-duty, semi-rigid epoxy or polyurea or a structural epoxy mortar... depending upon the width of the spalled joint (wider exposures require more rigid products), the access time required (will an epoxy take too long to cure?), structural condition of the floor (are the joints still opening?), is the defect in a freezer/cooler (polyurea is likely best)...

3. PREPARE DEFECT FOR REPAIR MATERIAL

The key to achieving long-lasting repairs is making sure the edges of the defect are defined and the defect is cleaned properly prior to filling with repair material.

Failure to properly clean and prepare a floor defect is probably the #1 cause of ultimate failure. Even the best possible repair material will not function properly if it's placed into a poorly cleaned joint or crack, or if the repair material is "feather-edged" along the outside of the defect. The edges of joints, cracks, and surface spalls all should be at least 1/2" deep vertically, and clean and dry prior to filling, to ensure the long term durability and structural stability of any repair.

4. FINISHED REPAIR SHOULD BE FLUSH WITH FLOOR

The goal in any floor defect repair is to restore a smooth, continuous transition across the floor surface. To achieve a flush profile, repair materials should be placed slightly higher than the floor, then shaved or ground flush with the surface.

The finished profile of any repair should be "flush" with the floor's surface. Simply filling a defect "even" with material generally results in a finished profile that is concave or dished, as repair materials typically settle a bit during cure. Repair materials should always be placed slightly higher than the floor surface and be allowed to cure. Once cured, excess material can be shaved or ground flush with the surface.

(I) = INDUSTRIAL OR HEAVY DUTY APPLICATION
(D) = DECORATIVE OR RETAIL APPLICATION

JOINT FILLER SEPARATION

Minor to Severe

Difficulty Of Repair



Adhesive Separation

Separation less than 1/32" (.75mm) typically requires no correction.

Cohesive Separation

REPAIR MATERIAL OPTIONS

Semi-Rigid Epoxy or Polyurea Joint Filler

MM-80 (I)

MM-80P (I)

Rapid Access

Edge-Pro 90 (I)

Spal-Pro RS-88 (I)

Edge-Pro 80 (D)

Spal-Pro RS-65 (D)

Freezer/Cooler

Spal-Pro 2000 or RSF (I)

TOOLS & EQUIPMENT NEEDED

Preferred:

Joint clean-out saw with dustless shroud, Abrasive Blade, Diamond blade, Vacuum system, Razor scraper/heat (MM-80/MM-80P)

Minimal:

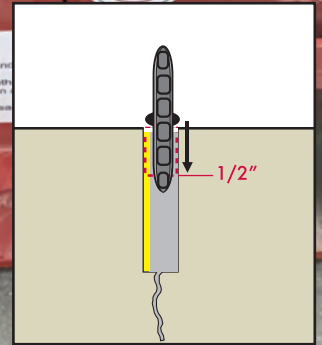
Right angle grinder, Nyalox wheel, Shop vacuum, Razor scraper/heat (MM-80/MM-80P)

OPTION 1 Partial Removal of Existing Filler

Before choosing this option, ensure that existing filler is well bonded structurally to one or both sides of the joint, and exhibits signs of being properly installed originally (i.e. flush with floor, proper depth, etc). If filler is not well bonded or original installation appears deficient, remove filler completely and re-apply with new material.

Step 1

Use joint cleaning saw or right angle grinder equipped with an abrasive or suitable diamond blade to remove existing joint filler to a nominal depth of 1/2" below surface. It's important that all filler residue remaining on joint walls be removed back to clean concrete.



Step 2

Vacuum joint clean.

[Click to watch Joint Filler Replacement Preparation or scan→](#)



(I) = Industrial

(D) = Decorative

JOINT FILLER SEPARATION

Minor to Severe *(Continued)*

Difficulty Of Repair



[Click to watch Joint Filler Replacement using Spal-Pro RS-88 or scan →](#)



Step 3

Overfill joint with appropriate semi-rigid filler. Monitor carefully during initial material placement as filler may run through joint bottom and leave filler profile low when cured.

Step 4

Allow filler to cure, then razor flush with floor surface. (MM-80/MM-80P heat, then shave)

Razor Off Overfill

1/2"

OPTION 2 Complete Removal of Existing Filler

If existing joint filler has lost complete adhesive bond on both sides of joint, and in examining material there appears to be evidence of inadequate adhesion (i.e. dirt/debris bonded to sides of filler), or inadequate filler depth (shallower than joint depth or placed over foam backer rod/debris, etc.), then the filler should be completely removed and replaced in order to provide maximum long-term durability. If this is the case, filler can be removed using methods described in Option 1.

(I) = Industrial

(D) = Decorative

JOINT SPALLING, MINOR

Up to 1" Wide

Difficulty Of Repair



REPAIR MATERIAL OPTIONS

Semi-Rigid Epoxy or Polyurea Joint Filler

MM-80 (I)

MM-80P (I)

Rapid Access

Edge-Pro 90 (I)

Spal-Pro RS-88 (I)

Edge-Pro 80 (D)

Spal-Pro RS-65 (D)

Freezer/Cooler

Spal-Pro 2000 or RSF (I)

TOOLS & EQUIPMENT NEEDED

Preferred:

Joint clean-out saw with dustless shroud, Abrasive Blade, Diamond blade, Vacuum system, Razor scraper/heat (MM-80/MM-80P)

Minimal:

Right angle grinder, Nyalox wheel, Shop vacuum, Razor scraper/heat (MM-80/MM-80P)

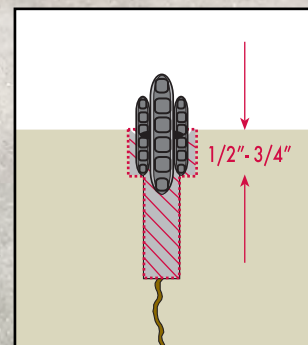
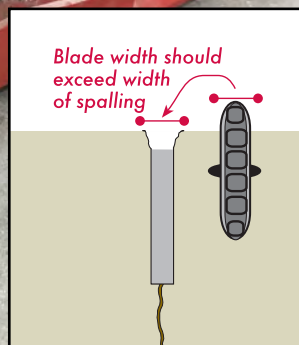
OPTION 1 Semi Rigid Filler (Neat)

The final width of a spalled joint, including the spalls, will determine the best cleaning/re-sawing method required to recreate a proper joint for filling. If spalled joint is narrow, it may be possible to use a single diamond blade to cut a "new" joint to the same depth as the original joint (or 2" minimum).

Step 1

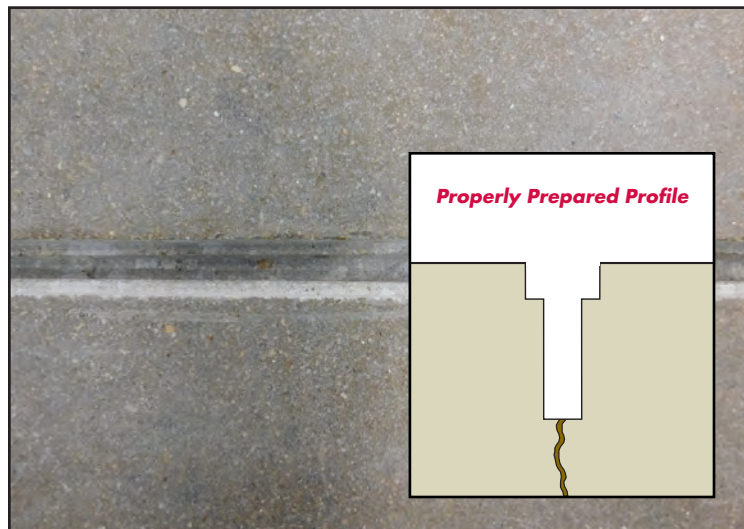
If joint spalling is wider than a single blade width can achieve, consider the use of a series of blades to reach the proper width. If using multiple blades, the center blade should reach the depth of the original joint and the outer blades should achieve a cutting depth of 1/2" - 3/4", creating a "T" shape after cutting.

[Click to watch Minor Spalled Joint Preparation Up to 1" video or scan →](#)



Step 2

Clean out any remaining debris or loose elements. Vacuum thoroughly joints should be dry.



Properly Prepared Profile

(I) = Industrial

(D) = Decorative

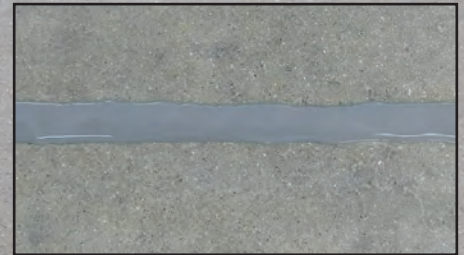
JOINT SPALLING, MINOR

Up to 1" Wide (Continued)

Difficulty Of Repair

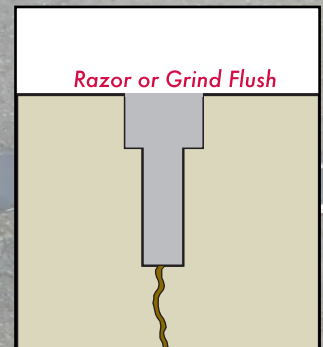
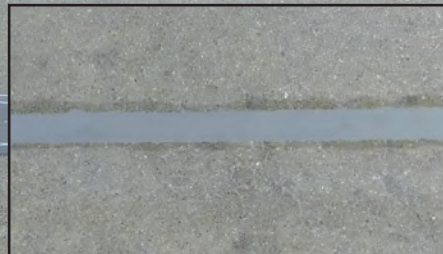
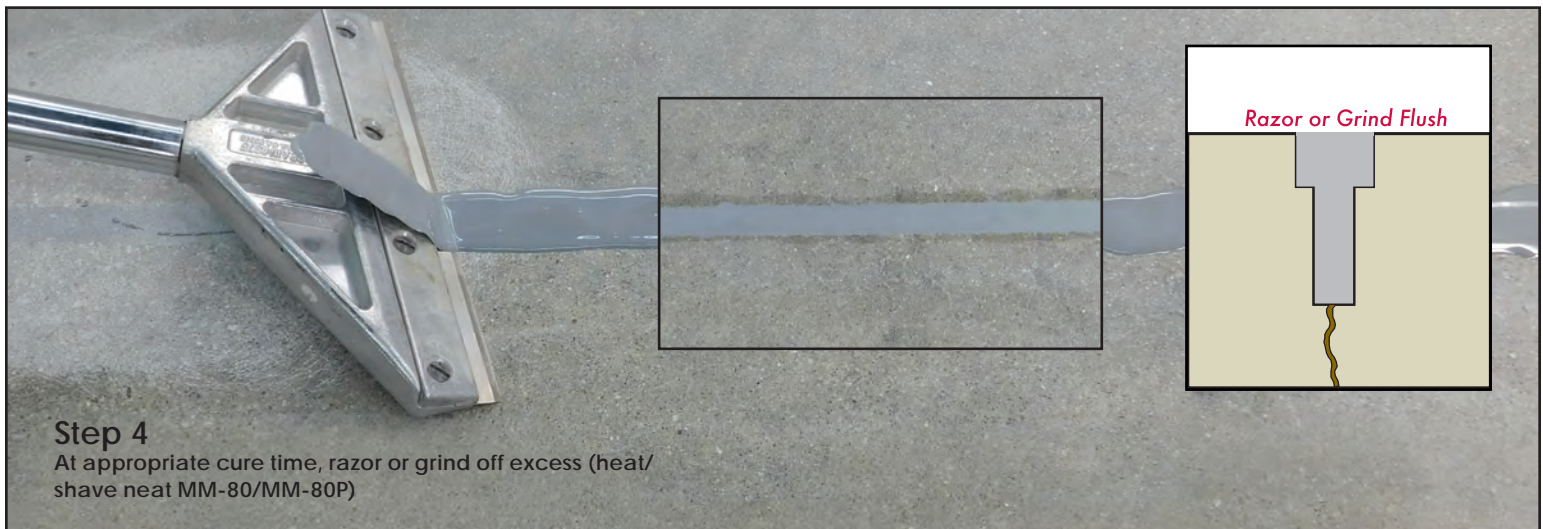


[Click to watch RS-88 Cartridge Installation & Finishing video or scan →](#)



Step 3

Slightly overfill cleaned joint with semi rigid filler (several passes may be required) and allow to cure.



Step 4

At appropriate cure time, razor or grind off excess (heat/shave neat MM-80/MM-80P)

OPTION 2 (I) SAND MODIFIED MM-80/MM-80P

(Follow Steps 1 & 2 for joint preparation)



Step 3

If using MM-80/MM-80P and joint width exceeds 1/2", it is preferable to modify the MM-80/MM-80P with silica sand. Most common ratio is 1 part mixed MM-80/MM-80P to 1 part silica, by volume.

(I) = Industrial

(D) = Decorative

JOINT SPALLING, MINOR

Up to 1" Wide *(Continued)*

Difficulty Of Repair



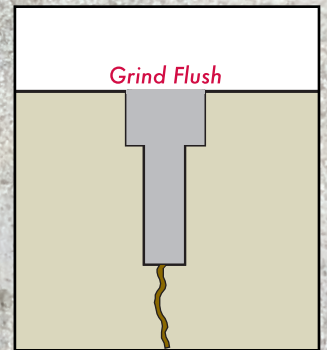
Step 4

After cure grind flush with floor surface. Grinding pad may be a diamond cup wheel, or similar silicon carbide disc.



Step 5

Re-seal/densify slab surface if necessary.



Re-sealed/Densified

(I) = Industrial

(D) = Decorative

JOINT SPALLING, MAJOR

Greater than 1"

Difficulty Of Repair



[Click to watch Spalled Joint Repair Preparation Greater Than 1" video or scan →](#)



REPAIR MATERIAL OPTIONS

Structural Epoxy Mortar
Armor-Hard (I)
Armor-Hard Extreme (I)
Armor-Hard Primer (I)

Sand Modified Semi Rigid Epoxy
MM-80/MM-80P (I)

Freezer/Cooler
Spal-Pro 2000 or RSF (I)

TOOLS & EQUIPMENT NEEDED

Preferred:

Stand up walk behind dry cut saw with dustless shroud, Diamond blades, Vacuum system, Razor scraper/heat (*MM-80/MM-80P*), Pneumatic/electric chipper, Diamond cup wheel or similar

Minimal:

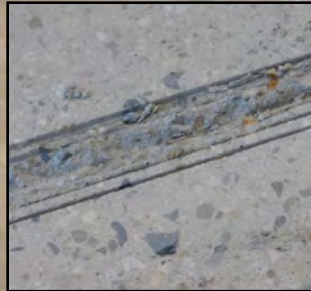
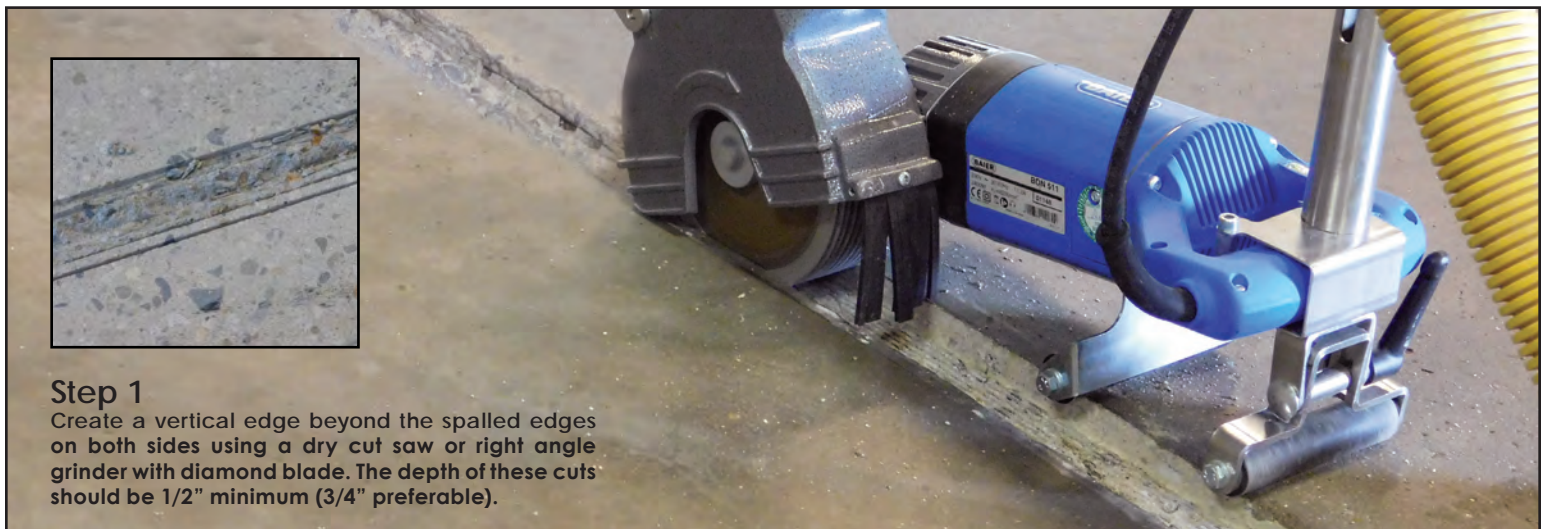
Right angle grinder with dustless shroud, Nyalox wheel, Shop vacuum, Razor scraper/heat (*MM-80/MM-80P*), hammer/chisel, Diamond cup wheel or similar

OPTION 1

Structural Epoxy Mortar

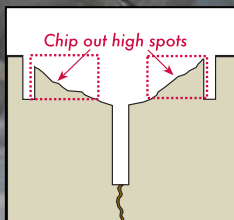
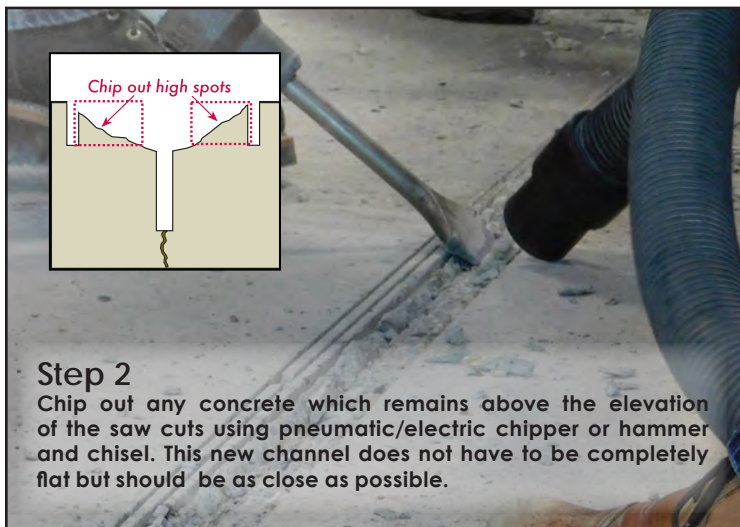
OPTION 2

Sand Modified MM-80/MM-80P



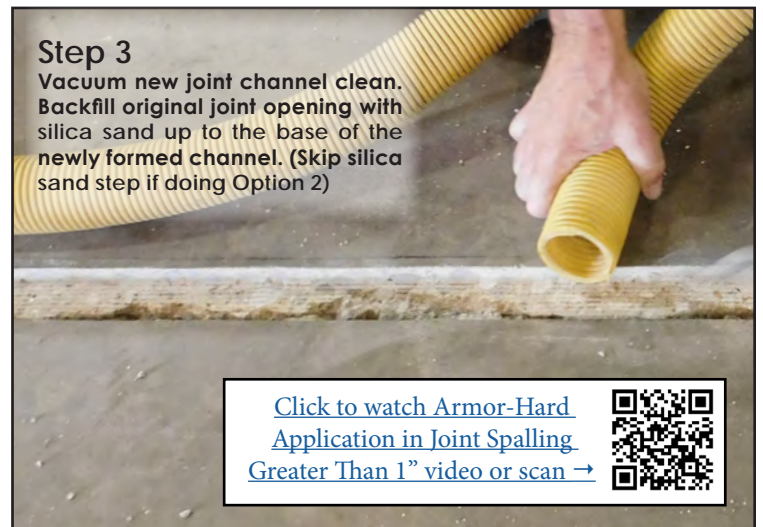
Step 1

Create a vertical edge beyond the spalled edges on both sides using a dry cut saw or right angle grinder with diamond blade. The depth of these cuts should be 1/2" minimum (3/4" preferable).



Step 2

Chip out any concrete which remains above the elevation of the saw cuts using pneumatic/electric chipper or hammer and chisel. This new channel does not have to be completely flat but should be as close as possible.



Step 3

Vacuum new joint channel clean. Backfill original joint opening with silica sand up to the base of the newly formed channel. (Skip silica sand step if doing Option 2)

[Click to watch Armor-Hard Application in Joint Spalling Greater Than 1" video or scan →](#)



(I) = Industrial (D) = Decorative

JOINT SPALLING, MAJOR

Greater than 1" (Continued)



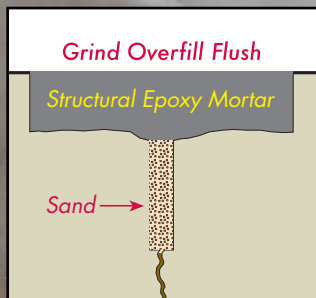
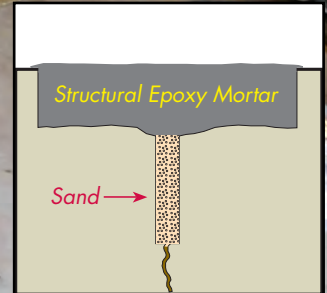
Difficulty Of Repair



OPTION 1 Structural Epoxy Mortar

Step 4

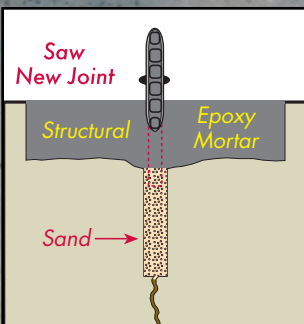
Trowel Armor-Hard/Armor-Hard Extreme mortar smooth and only slightly higher than edges of the slab panels. Pending how dry of mix is used, priming repair area first with Armor-Hard Primer may be required.



Step 5

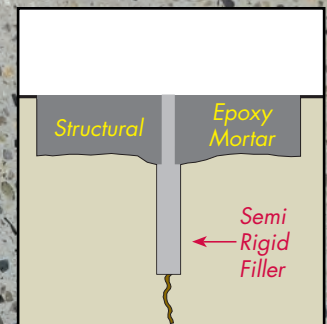
Allow mortar to cure. Grind off overfill until repair surface and edges are flush with both slab panels.

[Click to watch Edge Pro-90 Joint Filling in Armor-Hard Repair video or scan →](#)



Step 6

Using joint cleaning saw and diamond blade, create a new joint through structural repair mortar. Ensure depth of cut exceeds depth of mortar. Depth of cut should equal depth of original joint (or 2" minimum).



Step 7

Overfill newly formed joint with semi-rigid epoxy or polyurea joint filler. Allow to cure. Razor off excess filler flush with repair mortar.

(I) = Industrial

(D) = Decorative

JOINT SPALLING, MAJOR

Greater than 1" (Continued)



Difficulty Of Repair



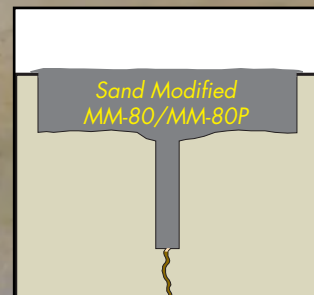
OPTION 2

Sand Modified MM-80/MM-80P

(Follow Steps 1-3 for joint preparation)

Step 4

Pour sand modified MM-80/MM-80P into prepared channel slightly higher than panel edges. Most common ratio is 1 part mixed MM-80/MM-80P to 1 part silica, by volume.



Step 5

Allow semi-rigid mortar to cure.

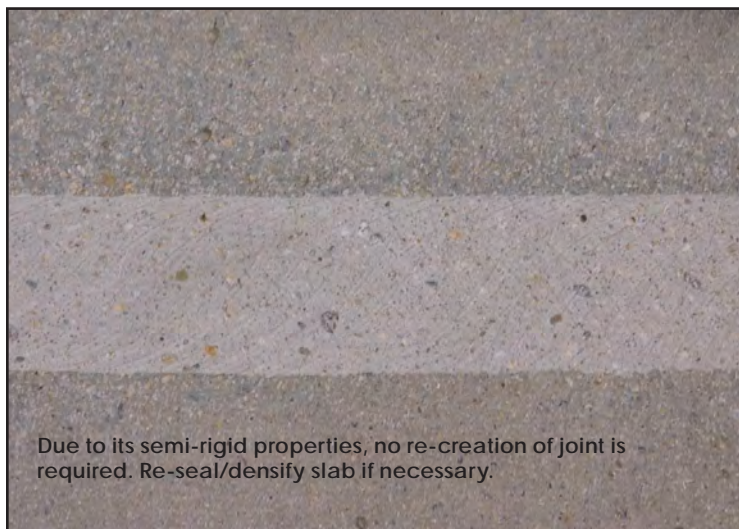


Grind Overfill Flush

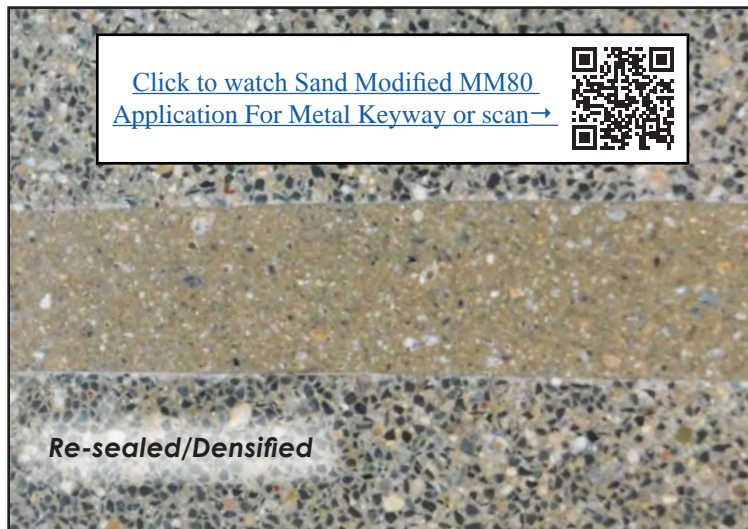
Sand Modified
MM-80/MM-80P

Step 6

After cure grind flush with floor surface. Grinding pad may be a diamond cup wheel, or similar silicon carbide disc.



Due to its semi-rigid properties, no re-creation of joint is required. Re-seal/densify slab if necessary.



Re-sealed/Densified

[Click to watch Sand Modified MM80 Application For Metal Keyway or scan→](#)



(I) = Industrial

(D) = Decorative

FLOOR JOINT FILLERS FOR CONCRETE FLOORS

For more than 45 years, Metzger/McGuire has been the world leader in concrete floor joint protection systems. From MM-80, the industry's first and widely acknowledged industry standard heavy-duty epoxy joint filler, to the cutting edge Spal-Pro and Edge-Pro lines of rapid-setting polyurea joint fillers, you can rely on Metzger/McGuire joint fillers to provide superior joint edge protection and to enhance the long term durability of your industrial or retail floor.

PRODUCT													
	NEW CONSTRUCTION		NEW CONSTRUCTION		NEW CONSTR./REPAIR		NEW CONSTR./REPAIR			NEW CONSTR./REPAIR		NEW CONSTR./REPAIR	
APPLICATION RANGE	Ambient	Cooler	Ambient	Cooler	Ambient	Cooler	Ambient	Cooler	Freezer	Ambient		Ambient	Cooler
PRODUCT DESCRIPTION	Rapid-Set Semi-Rigid Polyurea Joint Sealant		Moderate-Duty Semi-Rigid Polyurea Joint Filler		Rapid-Set Semi-Rigid Polyurea Joint Filler		Low-Temp Semi-Rigid Polyurea Joint Filler			Heavy-Duty Semi-Rigid Epoxy Joint Filler		Heavy-Duty Semi-Rigid Polyurea Joint Filler	
TYPICAL USES	Seal control and construction joints in retail and commercial concrete floors. Repair active cracks exceeding 1/8" in width.		Fill and protect joints in exposed concrete retail floors and in moderate-duty warehouse concrete floors.		Fill or repair control and construction joints in industrial and retail concrete floors. Repair active cracks exceeding 1/8" in width.		Fill and protect joints in freezer/cooler or ambient concrete floors subject to hard wheels and heavy loads.			Fill and protect joints in heavy duty industrial concrete floors subjected to frequent and demanding traffic. Repair joint deterioration.		Fill and protect joints in heavy duty industrial concrete floors subjected to frequent and demanding traffic. Repair joint deterioration.	
SHORE HARDNESS	A 64-69		A 80-81		A 86-90		A 88-94			A 90-95		A 90-92	
TENSILE STRENGTH	393 psi		505 psi		970 psi		930 psi			1200 psi		920 psi	
TENSILE ELONGATION	162%		152%		180%		170%			80-90%		238%	
ADHESION TO CONCRETE	350-400 psi		350-400 psi		350-400 psi		350-400 psi			300-350 psi		300-350 psi	
APPLICATION METHOD	Dual Pump or Cartridge		Dual Pump or Cartridge		Dual Pump or Cartridge		Dual Pump or Cartridge			Dual Pump or Hand Mix		Dual Pump or Cartridge	
POT LIFE	NA-No Hand Mix		NA-No Hand Mix		NA-No Hand Mix		NA-No Hand Mix			10-15 minutes		NA-No Hand Mix	
TACK FREE AT 70°F	10-15 minutes		3 minutes		5 minutes		30 minutes (at 32° F)			5 hours		10-15 minutes	
FULL TRAFFIC READY	30-60 minutes		1 hour		1 hour		3-5 hours (at 32° F)			8-12 hours		45 minutes	
COLORFAST	Yes		Yes		Yes		No			No		Yes	
MIX RATIO	1:1 by Volume		1:1 by Volume		1:1 by Volume		1:1 by Volume			1:1 by Volume		1:1 by Volume	
AVAILABLE PACKAGING	600 ml dual cartridge 10 gallon unit		600 ml dual cartridge 10 gallon unit		600 ml dual cartridge 10 gallon unit		1500 ml dual cartridge 10 gallon unit			1 gallon unit (MM-80) 10 gallon unit		600 ml dual cartridge 10 gallon unit	

When it comes to concrete floor joint fillers and repair products, "standard gray" is no longer the only color standard...



RAPID SET CONCRETE FLOOR REPAIR PRODUCTS

No one offers more innovative and durable repair solutions for industrial and polished concrete floors than Metzger/McGuire. Our rapid-setting repair products offer unequalled long-term durability with fast access times, thus ensuring minimal interruption to facility operations. All Metzger/McGuire products are 100% solids with no/minimal odor for safe and hassle free installation in all types of facilities.

												
REPAIR			REPAIR		REPAIR		REPAIR		REPAIR		REPAIR	
Ambient	Cooler	Freezer	Ambient	Ambient	Ambient	Cooler	Ambient	Cooler	Ambient	Ambient	Cooler	
Rapid-Set Semi-Rigid Polyurea Joint Polymer			Rapid-Set Surface Restoration Poylmer		Fast-Set Low Viscosity Surface Repair Product		Fast-Set Low Viscosity Structural Repair Product		Fast-Set Extended Pot Life Structural Repair Product		Early-Set Structural Epoxy Mortar	
Repair control/construction joints and cracks in ambient or freezer/cooler concrete floors.			Fill/repair concrete floor surface imperfections such as air holes, popouts, surface pitting, scratches and gouges, etc.		Structurally repair concrete Fill/repair concrete floor surface imperfections such as air holes, popouts, surface pitting, scratches and gouges, etc.		Structurally repair concrete surface defects, including popouts, gouges, nail holes, etc. Repair static cracks less than 1/8" wide.		Repair surface defects in industrial or stained/polished concrete floors including surface spalls/popouts, surface pitting, bolt-holes, random cracks and more.		Early-set system designed specifically for the repair of industrial concrete floors. Rebuild joint edges or repair large surface defects.	
D 95-100			D 70-75		D 70-75		D 70-75		D 75-80		D 86+	
2850 psi			4184 psi		5100 psi		5500 psi		4300 psi		1400 psi	
Not Tested			2.8%		7-9%		6-8%		14-18%		NA	
350 psi			Concrete Fails		Concrete Fails		Concrete Fails		Concrete Fails		Concrete Fails	
Dual Pump or Cartridge			Hand Mix		Cartridge		Cartridge		Hand Mix		Hand Mix	
NA-No Hand Mix			5 minutes		1-1½ minutes		NA-No Hand Mix		3½-4 minutes		30-40 minutes	
3-5 minutes			20-30 minutes		15 minutes		5-8 minutes		5-8 minutes		3-4 hours	
30 minutes			1 hour		45 minutes		15-30 minutes		60-120 minutes		4-8 hours	
No			Yes		Yes		Yes		Yes		No	
2:1 by Volume			1:1 by Volume		1:1 by Volume		1:1 by Volume		1:1 by Volume		4:1 by Volume	
450 & 900 ml dual cartridge 15 gallon unit			2 gallon unit 10 gallon unit		1500 ml dual cartridge		600 ml dual cartridge 250 ml universal cartridge		2 gallon unit 10 gallon unit		540 cubic inch kit (2.3 gallons)	
											300 cubic inch kit (1.3 gallons) Liquids only: 1 gallon unit and 30 gallon unit	

With the increased use of integral colors, stains and polishing on concrete floors, concrete has gone from being a simple, utilitarian gray work surface to a canvas of creativity. Exposed, decorative concrete is rapidly replacing traditional floor coverings as a cost-effective and earth friendly alternative work and showroom surface. Today's floors demand the availability of joint fillers and repair products in a range of colors to both protect and enhance the floor, while offering cost-effective and durable solutions. Metzger/McGuire's ColorFast line is the perfect solution when aesthetics are just as important as durability and longevity.

RANDOM CRACKS

1/8" Width or Less

Difficulty Of Repair



[Click to watch Random Crack Repair Preparation Up to 1/4" video or scan →](#)



REPAIR MATERIAL OPTIONS

Low Viscosity Structural Repair Polymer

Rapid Refloor (I, D)

Rapid Refloor XP (I, D)

SRG (D)

Freezer/Cooler

Rapid Refloor (I, D)

TOOLS & EQUIPMENT NEEDED

Preferred:

Drill with Nyalox wheel, Medium grit grinding pad, Vacuum

Minimal:

Wire Brush, Vacuum

If crack is approximately 1/8" wide or less and slab cure time is over 1 year, we recommend not to rout the crack wider. If future movement is anticipated, 1/8"-1" crack repair detail may be a better option.



Step 1

Use narrow tool to loosen debris in voids.



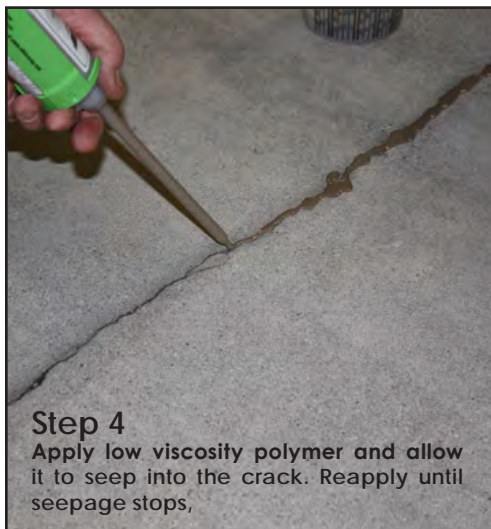
Step 2

Use drill with a Nyalox wheel or soft wire wheel to clean crack.



Step 3

Vacuum crack thoroughly. Crack must be dry prior to application of product.



Step 4

Apply low viscosity polymer and allow it to seep into the crack. Reapply until seepage stops,



Step 5

Allow to cure, use medium grit pad to remove excess flush to floor surface.



[Click to watch Rapid Refloor Random Cracks Installation Instructions - Industrial Floors Less Than 1/4" video or scan →](#)



(I) = Industrial (D) = Decorative

RANDOM CRACKS

1/8 - 1" Wide

Difficulty Of Repair



REPAIR MATERIAL OPTIONS

Semi-Rigid Epoxy or Polyurea Filler
MM-80/MM-80P (I)
(Neat or Sand Modified)
Spal-Pro 2000 (I)
Edge-Pro 90 (I)
RS-88 (I/D)
EP-80 (D)
RS-65 (D)

Freezer/Cooler
Spal-Pro 2000 or RSF (I)

TOOLS & EQUIPMENT NEEDED

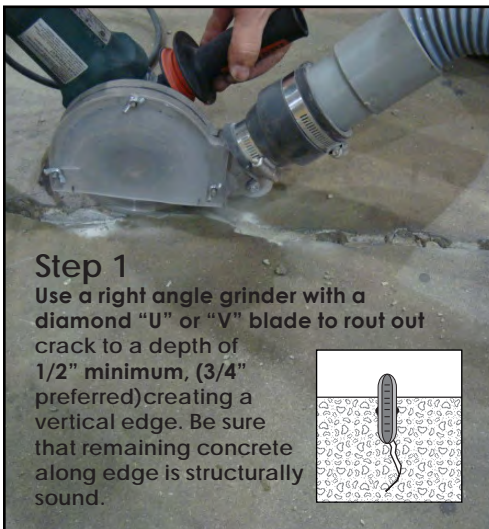
Preferred:
Right angle grinder, with dustless shroud,
Crack chasing saw, Diamond blades "U" or
"V" shaped, Vacuum system, Razor scraper /
heat (MM-80/MM-80P)

Minimal:
Right angle grinder, Diamond blades "U" or
"V" shaped, shop vacuum, Razor scraper /
heat (MM-80/MM-80P)

[Click to watch Industrial
Random Cracks 1/4" to 1"
Preparation video or scan →](#)



[RS-88 for Retail Cracks
1/4" to 1" Installation
Instructions](#)



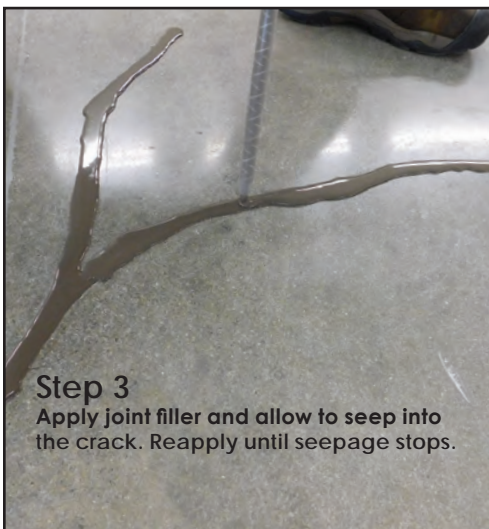
Step 1

Use a right angle grinder with a diamond "U" or "V" blade to rout out crack to a depth of 1/2" minimum, (3/4" preferred) creating a vertical edge. Be sure that remaining concrete along edge is structurally sound.



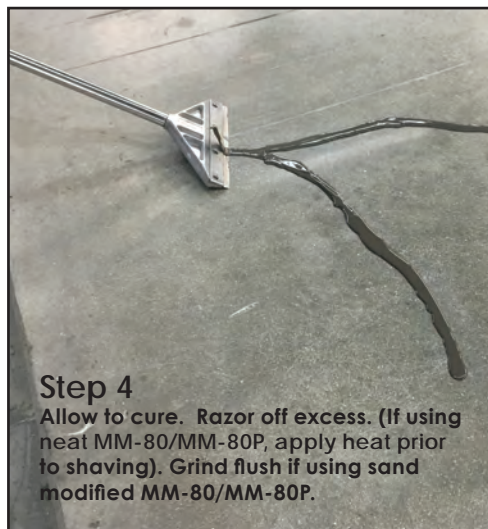
Step 2

Clean out any remaining debris or loose elements. Vacuum thoroughly.



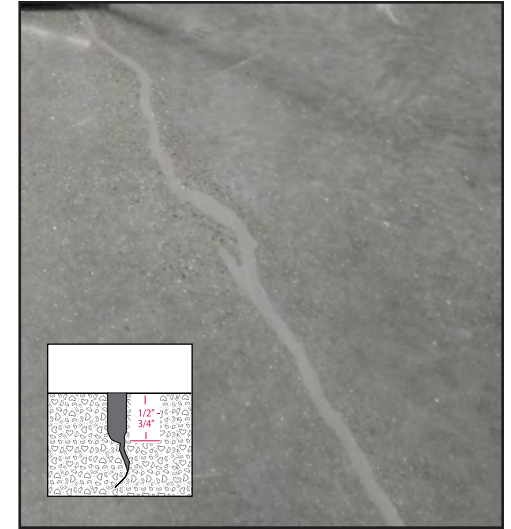
Step 3

Apply joint filler and allow to seep into the crack. Reapply until seepage stops.



Step 4

Allow to cure. Razor off excess. (If using neat MM-80/MM-80P, apply heat prior to shaving). Grind flush if using sand modified MM-80/MM-80P.



(I) = Industrial (D) = Decorative

SURFACE SPALLS/DEFECTS

Less than 6" Unmodified

Difficulty Of Repair



[Click to watch Surface Repair Preparation Less Than 6" video or scan →](#)



REPAIR MATERIAL OPTIONS

Low Viscosity Structural Repair Polymer (Neat)
Rapid Refloor (I, D)
Rapid Refloor XP (D)
SRG (D)

Freezer/Cooler
Rapid Refloor (I, D)

TOOLS & EQUIPMENT NEEDED

Preferred:

Drill with Nyalox or soft wire wheel,
Chipping hammer/hammer & chisel,
Medium grit grinding pad, Vacuum

Minimal:

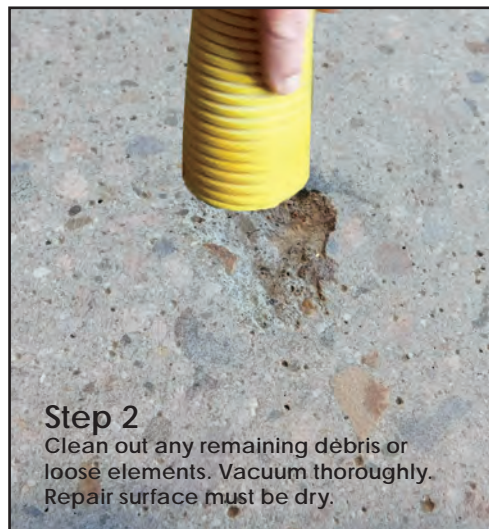
Wire brush, Vacuum, Medium grit grinding pad

Note: These repairs do not need to be “squared up” (such as structural epoxy/mortar repair) These products are designed to adhere in a “feathered edge” application.



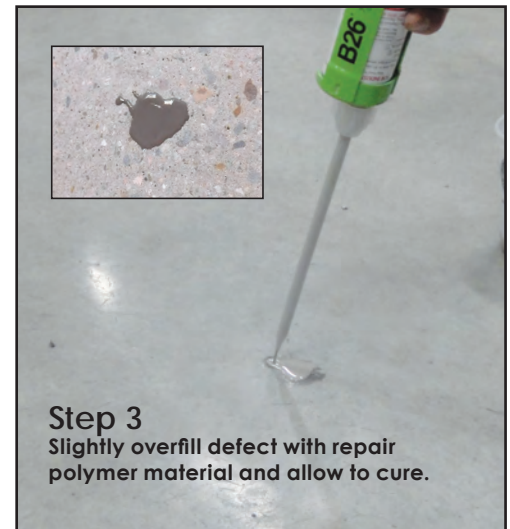
Step 1

Remove any unsound or loose concrete. Run drill with Nyalox or soft wire wheel over defects twice (in opposite directions). If bolt is present pound/cut down to allow 1/2" material cover.



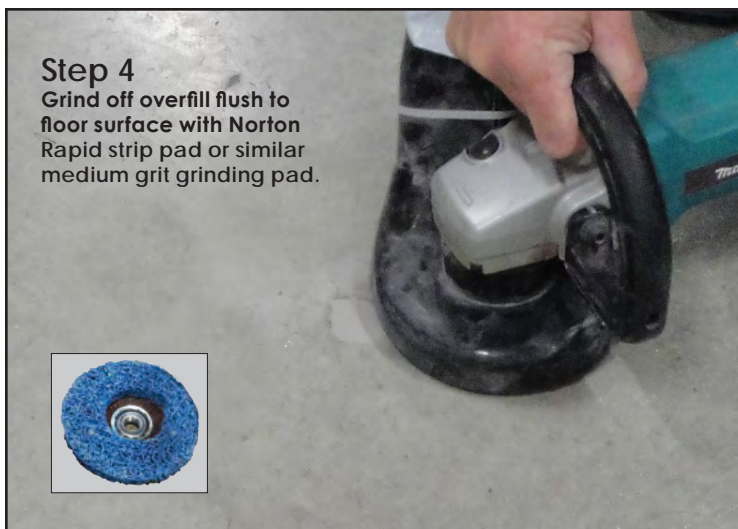
Step 2

Clean out any remaining debris or loose elements. Vacuum thoroughly. Repair surface must be dry.



Step 3

Slightly overfill defect with repair polymer material and allow to cure.



Step 4

Grind off overfill flush to floor surface with Norton Rapid strip pad or similar medium grit grinding pad.



[Click to watch Rapid Refloor Unmodified in Spalls/Defects Less Than 6" Install Instructions video or scan →](#)



(I) = Industrial (D) = Decorative

SURFACE SPALLS/DEFECTS

Less than 6" Modified



Difficulty Of Repair



[SRG Aggregate Modified 6" Surface Repair Installation Instructions video or scan →](#)



REPAIR MATERIAL OPTIONS

Low Viscosity Structural Repair Polymer
Rapid Refloor (I, D)
Rapid Refloor Pit Grout (I, D)
Rapid Refloor XP (D)
SRG (D)

TOOLS & EQUIPMENT NEEDED

Preferred:

Drill with Nyalox or soft wire wheel, Chipping hammer/hammer & chisel, Vacuum, Diamond cup wheel or similar

Minimal:

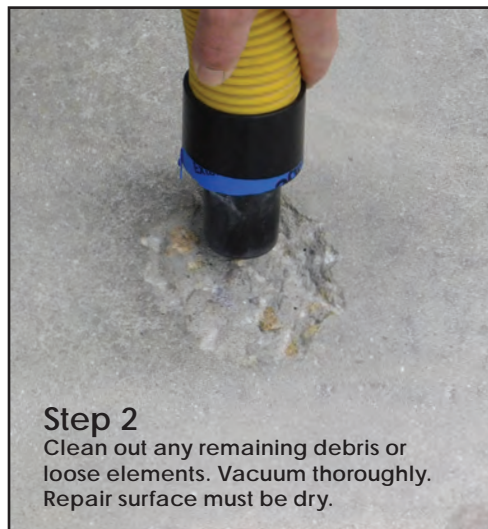
Wire brush, Hammer & Chisel, Vacuum, Diamond cup wheel or similar

Note: Polymer modification will depend highly on which product is chosen. Polymers with very rapid initial set times (Rapid Refloor & Rapid Refloor Pit Grout, 1-1^{1/2} minutes) may allow a quick sprinkling/mixing of dry sand/aggregate. Polymers with a slower initial set time (Rapid Refloor XP & SRG, 3-5 minutes) allow for a more customized blend to be added.



Step 1

Remove any unsound or loose concrete. Run drill with Nyalox or soft wire wheel over defects twice (in opposite directions). If bolt is present pound/cut down to allow 1/2" material cover.



Step 2

Clean out any remaining debris or loose elements. Vacuum thoroughly. Repair surface must be dry.



Step 3

If a dry mix is preferred, pre-prime repair with mixed polymer liquid.



Step 4

Once 2 part liquid polymer is blended, add modification material at 2-2^{1/2} parts to 1 part polymer by volume. Adjust loading as needed.



Step 5

Slightly overfill area with repair material.



Step 6

Trowel smooth, slightly high.

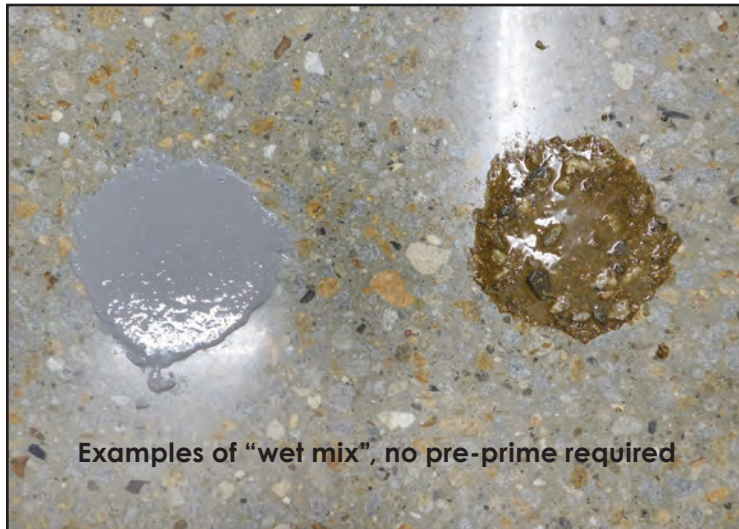
(I) = Industrial (D) = Decorative

SURFACE SPALLS/DEFECTS

Less than 6" Modified



Difficulty Of Repair

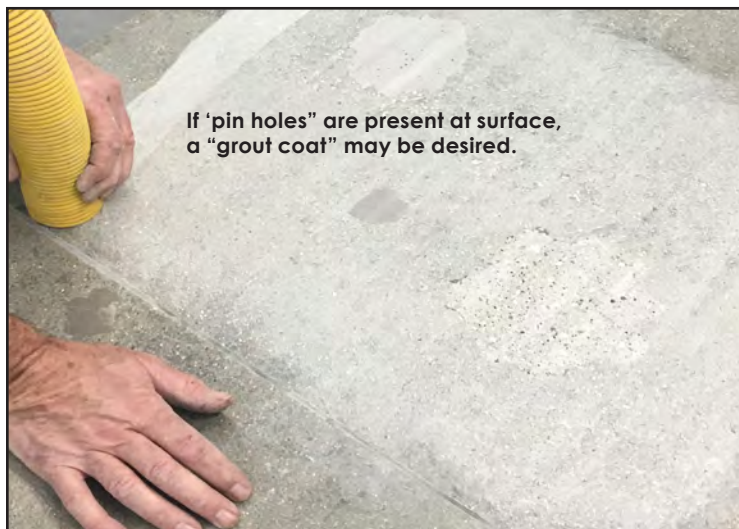


Examples of "wet mix", no pre-prime required

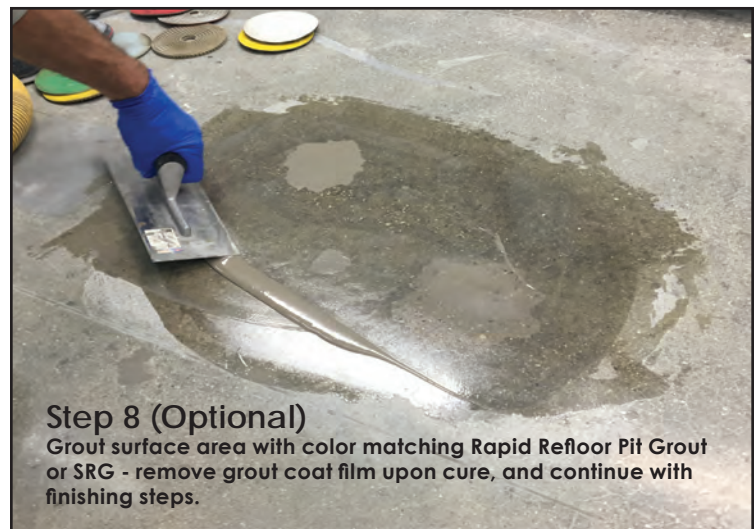


Step 7

Remove overfill to create smooth, flush surface by grinding flush with cup wheel or similar.

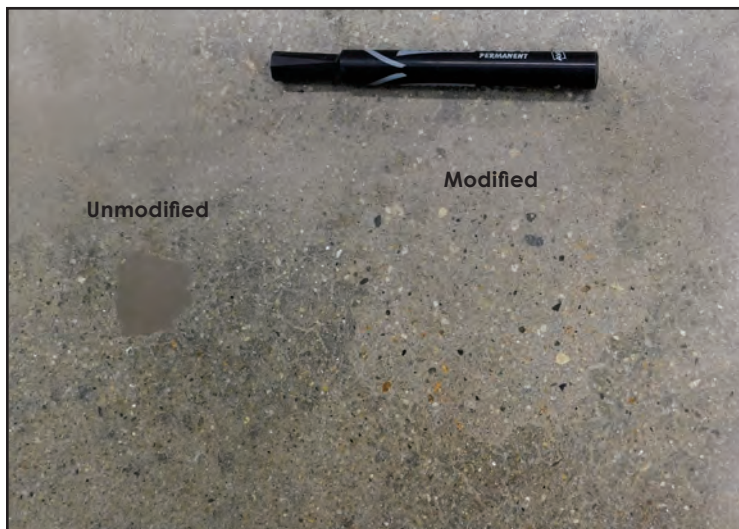


If 'pin holes' are present at surface, a "grout coat" may be desired.



Step 8 (Optional)

Grout surface area with color matching Rapid Refloor Pit Grout or SRG - remove grout coat film upon cure, and continue with finishing steps.



Unmodified

Modified



Examples of 3 different polymer colors used with the same sand blend.

(I) = Industrial

(D) = Decorative

SURFACE SPALLS/DEFECTS

Larger than 6"

Difficulty Of Repair



[Click to watch Surface Preparation Greater Than 6" video or scan →](#)



REPAIR MATERIAL OPTIONS

Structural Epoxy Mortar
Armor-Hard (I)
Armor-Hard Extreme (I)
Armor-Hard Primer (I)

Rapid Access
Rapid Refloor XP (D)
SRG (D)

Freezer/Cooler
Spal-Pro 2000 (I)
Armor-Hard Extreme (I)

TOOLS & EQUIPMENT NEEDED

Preferred:

Right angle grinder with dustless shroud,
Diamond blades, Chipping hammer,
Diamond cup wheel or similar, Vacuum
system

Minimal:

Right angle grinder with dustless shroud,
Diamond blades, 3 lb. hammer, Cold chisel,
Diamond cup wheel or similar, Shop vacuum

Note: This same process can also be used for defects less than 6" in heavy trafficked floors.



Step 1

Make cuts with blade or chip out section at outer edges of spalling, 1/2" deep (minimum) to 3/4" deep (preferred). Creating a vertical edge.



Step 2

Chip or grind out any high spots above level of cuts.



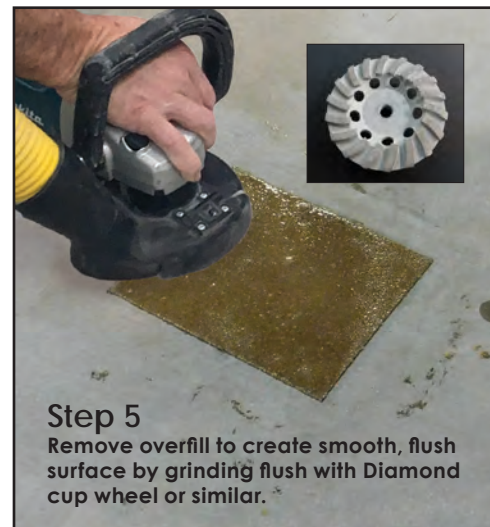
Step 3

Clean out any remaining debris or loose elements. Vacuum thoroughly. Repair surface must be dry. If a dry mix is preferred, prime repair area with Armor-Hard Primer prior to placement of Armor-Hard/Armor-Hard Extreme.



Step 4

Slightly overfill area with repair material and trowel smooth, slightly high.



Step 5

Remove overfill to create smooth, flush surface by grinding flush with Diamond cup wheel or similar.



Re-seal/surface if necessary

[Click to watch Armor-Hard Kit Surface Repair Greater Than 6" Installation Instructions video or scan →](#)



(I) = Industrial (D) = Decorative

SURFACE REFINEMENT

Difficulty Of Repair



REPAIR MATERIAL OPTIONS

Low Viscosity Structural Repair Polymer

Rapid Refloor Pit Grout (I, D) SRG (D)

Proper grinding/polishing equipment is necessary for use of these products. Please speak directly to Metzger/McGuire technical support for guidance.

TOOLS & EQUIPMENT NEEDED

Preferred:

Shot blast equipment, Drill with Nyalox or soft wire wheel, Vacuum, Steel trowel (stand up)

Minimal:

Drill with Nyalox or soft wire wheel, vacuum, Hand held steel trowel

Note: When grinding and polishing interior floors there may be small surface imperfections which need to be filled. These imperfections may vary from small air (pin) holes to larger surface deterioration. This system encapsulates surface repairs less than 1/2" in diameter.



Step 1

Perform initial grind on floor up to 70/80 metal step (or similar). **All steps must be dry**



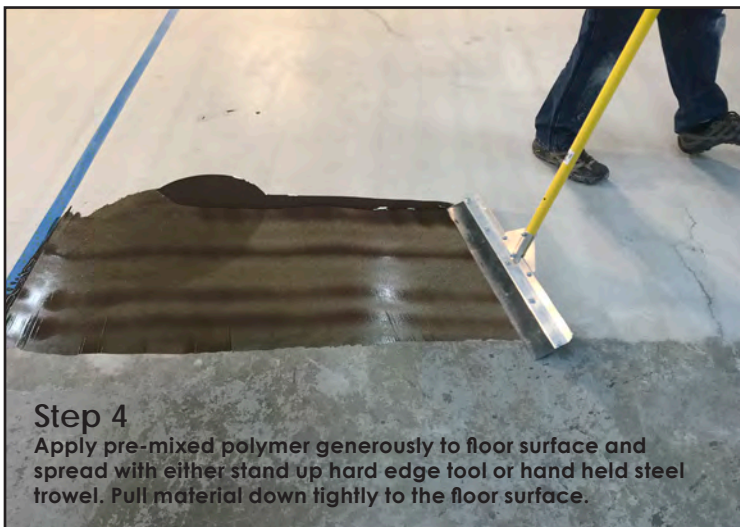
Step 2

Properly repair any surface defects 1/2" diameter or larger.



Step 3

Thoroughly vacuum slab surface.



Step 4

Apply pre-mixed polymer generously to floor surface and spread with either stand up hard edge tool or hand held steel trowel. Pull material down tightly to the floor surface.

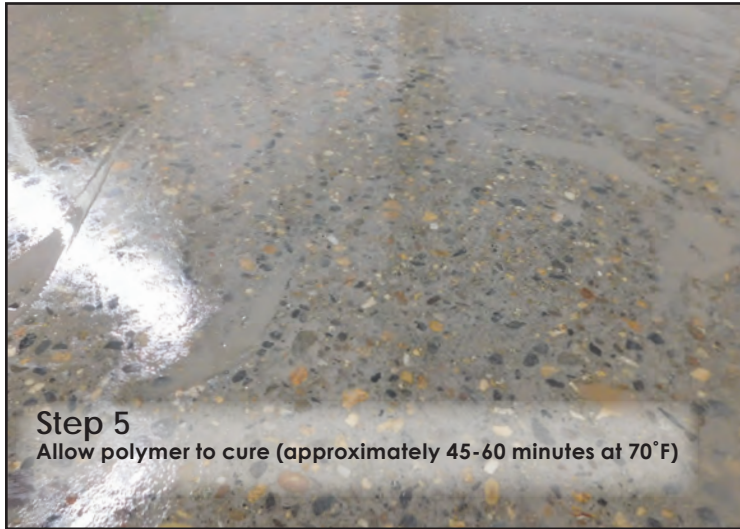


(I) = Industrial

(D) = Decorative

SURFACE REFINEMENT

Difficulty Of Repair



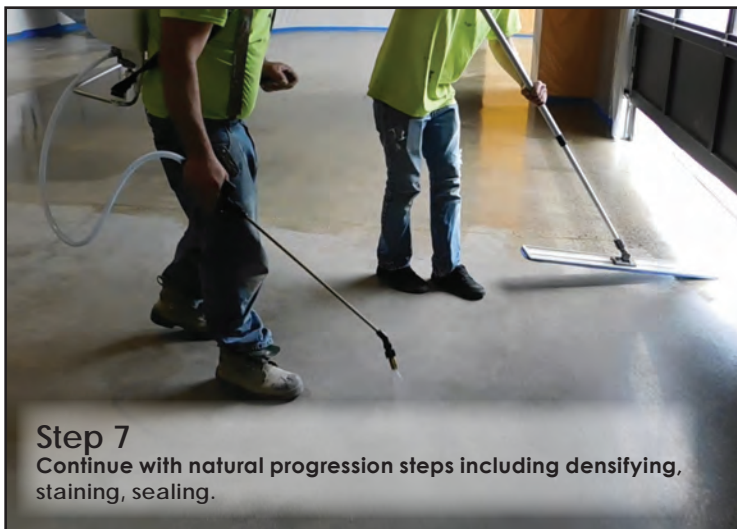
Step 5

Allow polymer to cure (approximately 45-60 minutes at 70°F)



Step 6

Use least aggressive tooling on grinder to remove surface film, typically this will be the next natural progression step in the grinding/polishing process.



Step 7

Continue with natural progression steps including densifying, staining, sealing.



Step 8

Polymer typically will not accept a stain. If aesthetics are a concern, choosing the proper colored repair materials and surface refinement polymer is important.



(I) = Industrial (D) = Decorative

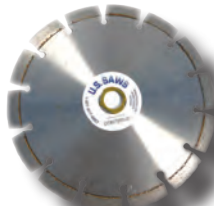
TOOLS & ACCESSORIES REFERENCED IN THIS GUIDE

— TYPICAL EXAMPLES —

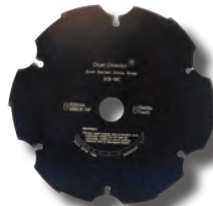
DIAMOND U BLADE



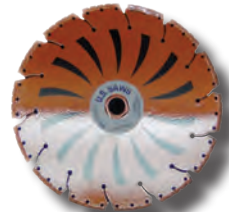
**JOINT CLEANING/PREP
DIAMOND BLADE**



**STELLITE JOINT FILLER
REMOVAL BLADE**



**JOINT FILLER
REMOVAL BLADE**



HEAVY ABRASIVE PAD



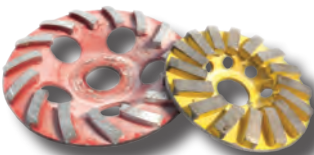
**TELESCOPING FLOOR
RAZOR SCRAPER**



**DUAL CARTRIDGE
DISPENSING GUN**



DIAMOND CUP WHEEL



**DUSTLESS SHROUD
FOR ANGLE GRINDER**



**SINGLE CHAMBER
BULK-TYPE
CAULKING GUN**



**MEDIUM GRIT
FINISHING PAD**



**.75" NYALOX
END BRUSH**



**2.5" NYALOX
CUP BRUSH**



**3" & 4" NYALOX
WHEEL**





APPROXIMATE MATERIAL COVERAGE RATES

Narrow Joints and Cracks

$1/8 \times 3/4"$	= 200 lf/gal.	$3/16 \times 3/4"$	= 135 lf/gal.	$1/4 \times 3/4"$	= 100 lf/gal.
$1/8 \times 1"$	= 150 lf/gal.	$3/16 \times 1"$	= 100 lf/gal.	$1/4 \times 1"$	= 80 lf/gal.
$1/8 \times 1-1/4"$	= 125 lf/gal.	$3/16 \times 1-1/4"$	= 85 lf/gal.	$1/4 \times 1-1/4"$	= 60 lf/gal.
$1/8 \times 1-1/2"$	= 100 lf/gal.	$3/16 \times 1-1/2"$	= 70 lf/gal.	$1/4 \times 1-1/2"$	= 50 lf/gal.
$1/8 \times 1-3/4"$	= 85 lf/gal.	$3/16 \times 1-3/4"$	= 60 lf/gal.	$1/4 \times 1-3/4"$	= 45 lf/gal.
$1/8 \times 2"$	= 75 lf/gal.	$3/16 \times 2"$	= 50 lf/gal.	$1/4 \times 2"$	= 40 lf/gal.

Wider Joints and Cracks

$3/8 \times 3/8"$	= 135 lf/gal.	$3/4 \times 1/2"$	= 50 lf/gal.	$1 \times 3/4"$	= 25 lf/gal.
$3/8 \times 1/2"$	= 100 lf/gal.	$3/4 \times 3/4"$	= 35 lf/gal.	$1 \times 1"$	= 20 lf/gal.
$1/2 \times 1/2"$	= 80 lf/gal.	$1 \times 1/2"$	= 40 lf/gal.	$1 \times 2"$	= 10 lf/gal.

Converting Gallon Coverage Rates for Cartridge Units

To determine coverage rates for cartridge units divide the gallon rates listed above by the following factors:

450 ML Divide Gal. Yield by 8

900 ML Divide Gal. Yield by 4

600 ML Divide Gal. Yield by 6

1500 ML Divide Gal. Yield by 2.5

250 ML Divide Gal. Yield by 15

Sand Modification Yields

Liquid Epoxy + Silica Sand = Mortar Yield

GAL. EPOXY + GALS. SAND = GALS. MORTAR

1	1	1.6
1	1.5	1.9
1	2	2.2
1	2.5	2.5
1	3	2.8

Defect Repair Yields

Standard Material Kit and Cartridge Units

UNIT SIZE NET MATERIAL YIELD

250 ML UNIT	16.50 cubic inches
450 ML UNIT	28.75 cubic inches
600 ML UNIT	38.34 cubic inches
900 ML UNIT	57.50 cubic inches
1500 ML UNIT	98.83 cubic inches
GALLON UNIT	230.00 cubic inches

Note: The above figures are approximate and for estimating purposes only. The rates shown do not allow for substantial waste, overfill, etc. Results may vary due to factors including material loss at joint base, grade of silica used, etc. Metzger/McGuire assumes no liability for results from using these figures.



PO BOX 2217 CONCORD, NEW HAMPSHIRE 03302

FAX: 603.224.6020 • E-MAIL: info@metzgermcguire.com

[Click here or scan QR code to use our Coverage Calculator!](#)



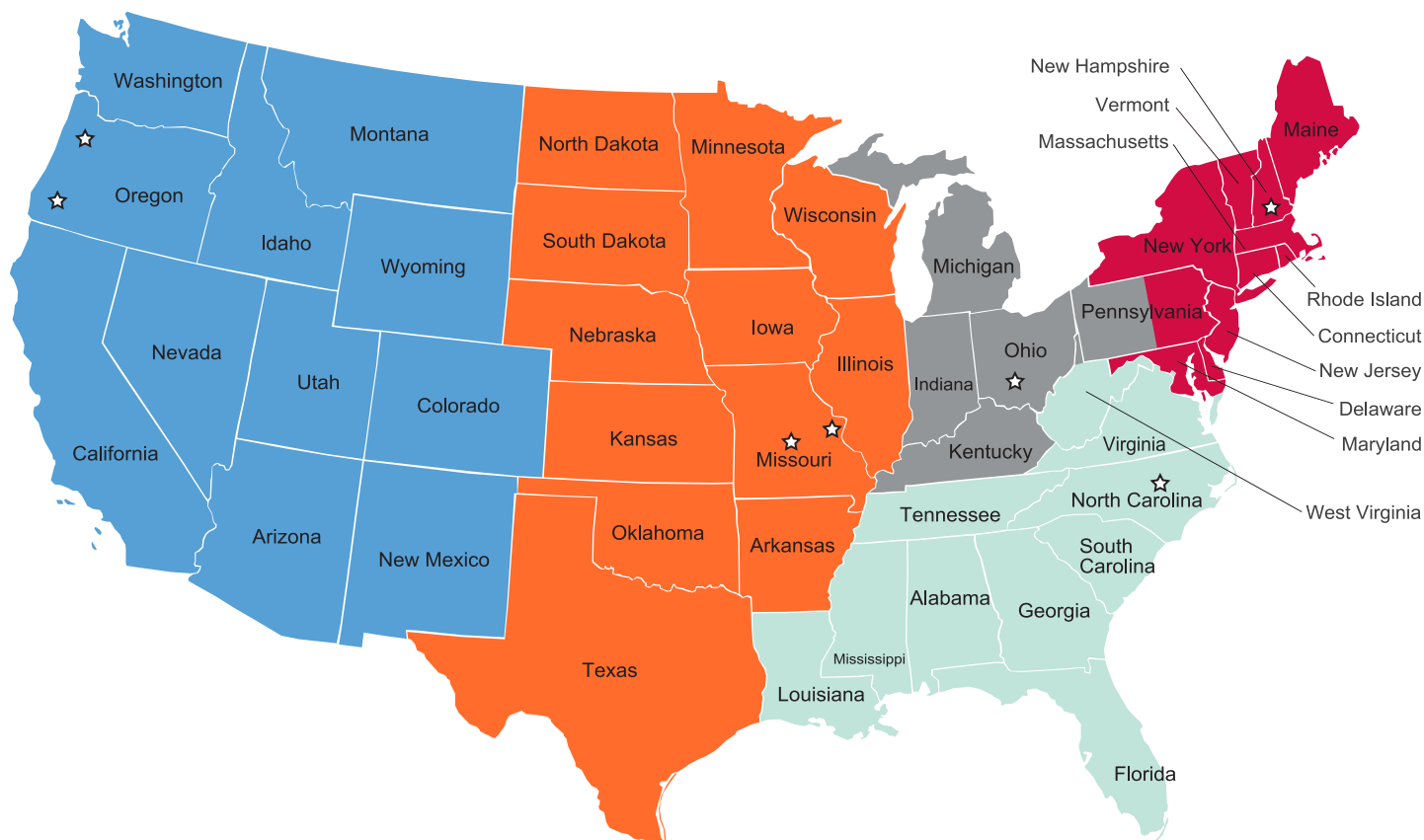
1-800-223-6680



METZGER/McGUIRE

INDUSTRY STANDARD INDUSTRIAL FLOOR JOINT FILLERS AND REPAIR PRODUCTS

TECHNICAL SUPPORT TEAM



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DIVISION 06 WOOD, PLASTIC AND COMPOSITES

SECTION 061000

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Blocking, nailers, and curbing.
 - 2. Plywood terminal back boards.
- B. Related Sections:
 - 1. 092200 – Lightgauge Metal Support Framing: Support framing; metal backing.
 - 2. 092900 - Gypsum Board:
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Plywood Association (APA)
- B. American Society for Testing and Materials (ASTM):
 - 1. D2898 - Test Method for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing.
 - 2. E84 - Test Method for Surface Burning Characteristics of Building Materials.
- C. American Wood Preservers' Association: Book of Standards (AWPA).
- D. National Lumber Grading Authority of Canada (NLGA).
- E. Product Standard (PS): PS-20 - American Softwood Lumber Standard.
- F. Southern Pine Inspection Bureau (SPIB)].
- G. West Coast Lumber Inspection Bureau (WCLB): Standard Grading Rules for West Coast Lumber.
- H. Western Wood Products Association (WWPA).
- I. American National Standards Institute / National Particleboard Association (ANSI/NPA)
 - 1. ANSI/NPA A208.1-[2009], Particleboard.
- J. ASTM International:
 - ASTM C 1396/C 1396M-[09a], Standard Specification for Gypsum Board.
 - 1. ASTM D 1761-[06], Standard Test Methods for Mechanical Fasteners in Wood.
- K. Canadian General Standards Board (CGSB):
 - 1. CAN/CGSB-11.3-[M87], Hardboard.
 - 2. CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.
- L. Canadian Standards Association (CSA):
 - 1. CAN/CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
 - 2. CAN/CSA O112 Series-[M1977(R2006)], CSA Standards for Wood Adhesives.
 - 3. CAN/CSA O121-[08], Douglas Fir Plywood.
 - 4. CAN/CSA O141-[05(R2009)], Softwood Lumber.
 - 5. CAN/CSA O151-[09], Canadian Softwood Plywood.
 - 6. CAN/CSA O153-[M1980(R2008)], Poplar Plywood.
 - 7. CAN/CSA O437 Series-[93(R2006)], Standards on OSB and Waferboard.
- M. Underwriters' Laboratories of Canada (ULC):

1. CAN/ULC-S102 - Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies
2. CAN/ULC-S706-[09], Standard for Wood Fibre Insulating Boards for Buildings.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data: Submit complete technical and product data on the following:
 1. Preservative and fire retardant wood treatments.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Work shall conform to the requirements of the currently enforced Building Code as adopted by the jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store and protect products under provisions of Section 016000.

PART 2 - PRODUCTS

2.1 DIMENSION LUMBER

- A. Lumber shall be manufactured in accordance with PS 20, and shall be stamped and graded in accordance with WWPA, WCLB, NLGA, or SPIB grading rules.
- B. Moisture Content: Kiln dried to 19% maximum moisture content, except for material whose least dimension is 4 inches thick or greater.
- C. Species: Hem-Fir, Spruce-Pine-Fir (SPF), or Douglas Fir Larch, unless indicated or specified otherwise.
- D. Structural Lumber Grades: As indicated on the Structural Drawings.
- E. Architectural Lumber Grades: Unexposed non-structural wood framing and blocking indicated on the Architectural Drawings shall be graded as follows:
 1. Blocking and Nailers: "Utility - Light Framing," or better.
- F. Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
 1. CSA O141.
 2. NLGA Standard Grading Rules for Canadian Lumber
- G. Plywood, OSB and wood based composite panels: to CSA O325
- H. Douglas fir plywood (DFP): to CSA O121, standard construction.
- I. Canadian softwood plywood (CSP): to CSA O151, standard construction.
- J. Poplar plywood (PP): to CSA O153, standard construction.
- K. Interior mat-formed wood particleboard: to ANSI/NPA 208.1

2.2 PANEL MATERIALS

- A. Miscellaneous Sheathing: APA Rated Sheathing; Structural I; CD grade; Exterior; unless approved otherwise; thicknesses as indicated.
- B. Terminal Backboards: APA AC grade exterior; fire retardant treated.

2.3 ACCESSORIES

- A. Fasteners:
 1. Hot-dipped galvanized steel for exterior, high humidity, and fire treated wood locations.
 2. For Use With Preservative Treated Wood: 300 Series stainless steel.
 3. Screws: Self tapping; countersunk or low profile head.
 4. Nails, spikes and staples: to CAN/CSA B111

2.4 WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment):
 - 1. Preservative treat all exterior lumber, including roofing nailers, curbs and other wood in contact with concrete, masonry, and moist conditions.
 - 2. For above ground use, use AWPAC certified Ammonium Copper Quaternium (ACQ) or Copper Hydroxide Sodium Dimethyldithiocarbamate (CDDC) waterborne preservative with 0.25 pounds per cubic foot (4 kg/m³) of wood retention.
 - 3. Treated lumber shall be kiln dried to a maximum moisture content of 19%; treated plywood shall be kiln dried to a maximum moisture content of 15%.
 - 4. Treated lumber shall bear the quality stamp of an inspection agency approved by the jurisdictional code authorities.
- B. Fire Retardant Treatment:
 - 1. Fire retardant treat all interior concealed lumber and plywood, and other wood as indicated or specified. Provide exterior fireproofing at rooftop blocking, nailers, curbs, sheathing, and other locations subject to wetting during construction operations.
 - 2. All fire retardant treated wood materials shall bear a UL "FR-S" label, or a label from an approved inspection agency certifying that the material meets the requirements of AWPAC C-20 Type A for lumber and AWPAC C-27 Type A for plywood.
 - 3. Treated lumber shall be kiln dried to a maximum moisture content of 19%; treated plywood shall be kiln dried to a maximum moisture content of 15%.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 BLOCKING, NAILERS, AND CURBS

- A. Provide blocking, nailers, and curbs for sheathing, roof construction, metal flashing, and other construction as indicated, and as necessary for firm support. Unless otherwise indicated, solid wood backing shall be minimum 2 inch (50 mm) nominal thickness; plywood shall be minimum 3/4 inch (19 mm) thick, except that sloped parapet caps may be 1/2 inch (13 mm) thick.
- B. Blocking: Install wood blocking to receive mechanical fasteners for support of plumbing and electrical fixtures and equipment, shelving, cabinets, door stop plates, millwork, wainscots, coat hooks, toilet and bath accessories, kitchen equipment, and all other wall and ceiling mounted components.
- C. Screw fasten wood components to metal framing and support elements.
- D. For attachment of plywood backing, kerf plywood 1/4" (6 mm) (3/8" (9.5 mm), maximum if required for heavy gauge studs) to receive flange return (or crimp the return closed); provide supplementary sheet metal angle attached to back of stud where necessary to support backing. Screws into edge of plywood are unacceptable.

3.3 PLYWOOD TERMINAL BACKBOARDS

- A. Provide a fire retardant treated plywood terminal backboard for telephone systems and data racks where indicated on the drawings.
- B. Mechanically apply directly over gypsum backing board.

END OF SECTION

DIVISION 06 EXISTING CONDITIONS

SECTION 064000

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Installation of Owner furnished casework and millwork.
 - 2. Statements of required quantities of Owner-furnished millwork.
 - 3. Transportation of casework and millwork from warehouse to jobsite.
 - 4. Substrate preparation.
 - 5. Coordination and installation of carpeted base to display casework.
 - 6. Accessories.
- B. Related Sections:
 - 1. 061000 - Rough Carpentry: Blocking for finish carpentry.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American National Standards (ANSI)
 - 1. ANSI A208.1 - Standard for Particleboard
 - 2. ANSI A208.2 - Standard for Medium Density Fiberboard (MDF)
 - 3. ANSI/HPVA HP-1-[04], Standard for Hardwood and Decorative Plywood.
- B. American Society for Testing and Materials (ASTM)
 - 1. C1036 Standard Specification for Flat Glass
 - 2. E84 Test Method for Surface Burning Characteristics of Building Materials
- C. American Plywood Association (APA)
- D. Architectural Woodwork Institute (AWI): Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program (Current Edition).
- E. Business Institutional Furniture Manufacturer's Association (BIFMA)
- F. West Coast Lumber Inspection Bureau (WCLB): Standard Grading Rules No. 16.
- G. U.S. Product Standard (PS) PS 1 Product Standard for Construction and Industrial Plywood.
- H. ASTM International
 - 1. ASTM E 1333-[96(2002)], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
 - 2. ASTM D 2832-[92(R2005)], Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings
 - 3. ASTM D 5116-[06], Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- I. Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - 1. Architectural Woodwork Quality Standards Illustrated, (current edition at date of tender)
- J. Canadian General Standards Board (CGSB)
 - 1. CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.
- K. CSA International

1. CSA B111-[74(R2003)], Wire Nails, Spikes and Staples.
2. CSA O112.4 SERIES-[M1977(R2006)], Standards for Wood Adhesives.
3. CSA O121-[08], Douglas Fir Plywood.
4. CSA O141-[05], Softwood Lumber.
5. CSA O151-[09], Canadian Softwood Plywood.
6. CSA O153-[M1980(R2008)], Poplar Plywood.

- L. National Hardwood Lumber Association (NHLA)
 1. Rules for the Measurement and Inspection of Hardwood and Cypress
- M. National Lumber Grades Authority (NLGA)
 1. Standard Grading Rules for Canadian Lumber

1.3 QUANTITY STATEMENTS

- A. Casework and millwork, including pertinent installation information will be furnished by Owner.
- B. Quantities of millwork purchased will be based on the approved Quantity Statement furnished by the Contractor for the exact amount required for the installation. Overage quantities will be added separately by the Owner for each type of millwork.
- C. Types and locations of each type of casework and millwork shall be as scheduled and indicated on the Owner's Purchase Order; base bid on special requirements for each woodwork type, including requirements for special veneer and pattern matching.
- D. Contractor shall be responsible for accuracy of quantity statements. In the event that insufficient quantity is discovered after order has been placed, proceed as follows:
 1. Immediately notify the Owner in writing of the additional quantities required, whereupon the Owner will, at his cost, obtain the additional quantities.
 2. Install additional quantities at no additional cost to the Owner.
 3. Pay for unusual transportation costs incurred in obtaining additional materials.

1.4 DEFINITIONS

- A. Exposed Portions of Casework: Those surfaces visible when doors and drawers are closed, including edges of doors and drawers, edges of cabinet boxes visible between doors and drawers, backs of hinged doors, interiors behind glass doors, and interiors in open cabinets.
- B. Semi-Exposed Portions of Casework: Those areas not defined as exposed, but visible when solid (not glazed) doors and drawers are opened.
- C. Concealed Portions of Casework: All remaining areas not defined as exposed or semi-exposed.

1.5 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Submittals Prior to Sub-bid:
 1. List of proposed bidders.
 2. For each proposed bidder, include evidence of compliance with installer qualification requirements.
- C. Submittal With Sub-Bid:
 1. Submit preliminary quantity statements for millwork from each prospective subcontractor. Base quantity statements on Drawings. Do not include overages in Quantity Statement.
 2. Architect will return acceptable quantity statements to the Contractor. Only sub-bidders with acceptable quantity statements shall be considered for subcontract.
- D. Submit following within 30 days after award of architectural woodwork subcontract:
 1. Quantity statements indicating proposed adjustments.
- E. Guarantee Drafts: Concurrent with initial product data submittal, submit draft of installers guarantee for Starbucks Construction Manager's review.

1.6 QUALITY ASSURANCE

- A. Fabricator: A minimum of 5 years experience in the fabrication of custom architectural woodwork of the type specified.
- B. All Architectural Woodwork shall be under the responsibility of a single fabricator.
- C. Qualifications of Installers: Use only journeyman finish carpenters who are thoroughly trained and skilled in the work, and who are completely familiar with the materials and quality standards specified. No allowance will be made for lack of skill on the part of workmen.
- D. Conform to AWI Custom grade standards except use premium grade standards for clearances and tolerances, unless specified or indicated otherwise.
- E. Solid Surfacing Fabricator Qualifications: Certified by the solid surfacing materials manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Comply with provisions of Section 016000.
- B. Owner furnished materials will be delivered to the Owner's warehouse facility; refer to Section 015000. Transport materials from the warehouse to the site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Finished Millwork Lumber: Furnished by Owner.
- B. Panel Products:
 - 1. Finished Millwork Paneling: Furnished by Owner.
 - 2. Accessory Panel Products:
 - a. Softwood Plywood: DOC PS 1; 3/4 inch (19mm) thick AC exterior grade unless indicated or specified otherwise; touch sanded where plastic laminate veneers are to be applied
 - b. Veneer-Faced Panel Products (Hardwood Plywood):
 - 1) HPVA HP-1, made with adhesive containing no urea formaldehyde.
 - 2) Wood Veneer Flitches: AWI Grade AA; American Black Walnut; plain sliced; hand selected for limited sapwood.
- C. Pre-finished Board: Low pressure melamine over particle board, MDF, or hardboard core; formaldehyde free; colors as selected from manufacturer's standard.
- D. Plastic Laminate:
 - 1. Brands and colors as scheduled on Drawings.
 - 2. Exposed: NEMA LD-3; general and vertical grade,
 - 3. Backing Sheets: NEMA LD-3; backing grade; undecorated.
- E. Solid Surfacing:
 - 1. Product as listed in the Finish Legend.
 - 2. Fabricate solid surface elements to the configurations indicated in accordance with the manufacturer's recommendations.

2.2 ACCESSORY MATERIALS

- A. Cabinet Hardware: As scheduled on the Drawings.
- B. Closet Hardware:
 - 1. Closet Rod: Knape & Vogt # 770 5; 1-5/16 inch (33mm) diameter; chrome finish.
 - 2. End Flanges: Knape & Vogt # 764/766; chrome finish.
- C. Wall Shelf Hardware:
 - 1. Brackets: Knape & Vogt # 185 Anochrome finish; length as appropriate for shelving indicated.
 - 2. Standards: Knape & Vogt # 85 Anochrome finish.
- D. Counter Support Brackets:
 - 1. Manufacturer/Source
 - a. Oodles of Parts Plus (Patchogue, NY; 800-286-5471)

- b. A&M Hardware Inc. (Manheim PA; 888-647-0200)
 - c. Steelcase
 - d. Herman Miller
- 2. Bracket: "Work Station Bracket"; 1/8" (3mm) steel; 24" x 24" (610mm x 610mm) size unless otherwise indicated; prime paint finish.
- E. Hanging Hardware: Brooklyn Hardware LLC (Portland OR; 888-232-1151) "Panelclip," Doug Mockett and Company (Manhattan Beach CA.; 800-523-1269) ZC3 "Z-Clips," or approved; interlocking aluminum clip.
- F. Contact Bond Adhesive: Water based low VOC.
- G. Plastic Laminate Faced Countertops:
 - 1. Fabricate to AWI Custom grade.
 - 2. Fabricate countertops from particle board and general purpose grade plastic laminate in the shapes indicated.
 - 3. Where countertops are indicated with sinks, use moisture resistant MDF in lieu of particle board.
- H. Wall and Closet Shelf Fabrication:
 - 1. Fabricate from prefinished board; edge banded with matching PVC edging unless indicated otherwise.
 - 2. Provide minimum 3/4 inch (19mm) thick shelves, except provide thicker shelves as required to support the loads and spans indicated without significant deflection.
- I. Hardware:
 - 1. Unless otherwise shown or specified, all drawers shall be equipped with standard full extension slides.
 - 2. Install hardware straight and true and in perfect alignment horizontally and vertically with adjacent casework and hardware.
 - 3. Carefully fit and securely attach cabinet hardware in accordance with manufacturers' printed instructions, and exercise caution not to mar or injure finish surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

- A. Coordinate the installation of blocking and other supports required for the installation of architectural woodwork elements.

3.3 STANDING AND RUNNING TRIM INSTALLATION

- A. Jointing: Make all joints to conceal shrinkage; miter all exterior corners; cope all interior corners, miter or scarf all end-to-end joints; install all trim pieces as long as possible, jointing only where solid support is obtained. Make no joints closer than 4 feet to corners.
- B. Lengths of Material: Use random lengths and show typical joint locations on shop drawings. The minimum length shall be 8 feet, except where short lengths are required by installation conditions.
- C. Fastening:
 - 1. Install all items straight, true, level, plumb, and firmly anchored in place; where blocking or backing is required, coordinate as necessary with other trades to ensure placement of all required backing and blocking in a timely manner.
 - 2. Fasten trim with finish nails or screws of proper dimension to hold the member firmly in place without splitting the wood.

3. On exposed finish work, set all nails and screws; fill to match adjacent finish.
 4. Align exposed fasteners for uniform pattern; random or "shotgun" patterns will not be accepted.
- D. Select and arrange standing and running trim so that abutting members have a similar grain and color match to the greatest extent possible

3.4 VENEER PANELING

- A. Install paneling as indicated in accordance with AWI Section 500C Premium grade standards.
- B. Install wood paneling over wall surfaces by concealed clips, hangers, or blind fasteners, unless approved otherwise.
- C. Cut and fit each panel to its particular position including cutting around items which cannot be remounted to panel face, and predrilling for holes for wire access for electrical devices to be mounted on the panel face.

3.5 CASEWORK INSTALLATION

- A. Coordinate casework installation with work of other trades for final electrical and mechanical connections.
- B. Install all casework accurately, plumb, square, and level, and permanently secured in precise position as indicated on the Drawings. Casework shall be scribed to adjacent surfaces as follows:
 1. Countertops and splashes to wall surfaces.
 2. Cabinet endwalls and other exposed surfaces to walls.
 3. Cabinet bases to floors.
- C. The casework installation shall be made complete with all required fastenings, clip angles, braces, anchors, shims, and other fittings as required to render the work rigid and secure.
- D. All fasteners securing casework shall be in concealed or semi-concealed locations, unless approved otherwise.
- E. Avoid damaging finished surfaces. Repair or replace all damaged materials and surfaces in a manner approved by the Architect.
- F. Upon completion of work, demonstrate hardware to work freely as intended.

3.6 CLEANING UP

- A. Keep the premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, free from accumulation of sawdust, cut-ends, and debris.
- B. At the end of each working day, or more often if necessary, thoroughly sweep and/or vacuum surfaces. Remove the refuse to the area of the job site set aside for its storage.

END OF SECTION

DIVISION 07 THERMAL AND MOISTURE PROTECTION

SECTION 078400

FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Firestopping systems for sealing penetrations through fire-rated construction.
- B. Related Sections:
 - 1. 014500 – Quality Control: Requirements for Owner paid inspections.
 - 2. 078500 - Fire Rated Joint Assemblies: Fire rated construction at fire rated building joint assemblies
 - 3. Division 22 Mechanical: Penetrating elements.
 - 4. Division 23 Electrical: Penetrating elements.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. E119 - Method for Fire Tests of Building Construction and Materials.
 - 2. E814 - Methods for Fire Tests of Through-Penetration Fire Stops.
- B. Underwriters Laboratories (UL): 1479 - Fill, Void or Cavity Materials and Through-Penetration Firestop Systems.
- C. Underwriter's Laboratories of Canada (ULC): CAN/ULC S115 – Standard Method of Fire Tests of Firestop Systems

1.3 SYSTEM DESCRIPTION

- A. Each firestopping system shall be selected to maintain fire rating of the assembly in which it is used.
- B. Firestopping systems shall be resilient as necessary to accommodate differential movement between assemblies.
- C. Where firestopping is used to seal penetrations through floors with waterproof membranes, system shall be selected for compatibility with membrane material.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Provide the following submittals for review and approval by the Architect and Engineers of Record for each system required by the project before starting any work of this Section:
 - 1. Underwriter's Laboratory design system references and printed instructions for installation. Where multiple components are possible or components are listed as optional, ensure all options are clearly indicated, including penetrant material used, where applicable. Submittals without Contractor mark ups will be automatically rejected.
 - 2. Manufacturer's product data for each material and prefabricated device in the system. Ensure descriptions are sufficient for identification at site or ensure copies of products are kept on site for consultant review.
 - 3. Shop drawings in the form of floor and ceiling plans showing location of all systems covered under this section. Shop drawings shall indicate every Underwriter's System Listing used.
- C. Where the assembly to be protected does not correspond exactly to a tested assembly, determine system from available engineering studies, or correspondence with the labelling agency indicating the effect of the differences on the fire separation of the assembly; confirm acceptance of system by local authorities having jurisdiction in writing.

- D. Construction details should accurately reflect actual job conditions.
- E. Upon completion of the work and prior to project close out, provide a digitally or hand signed letter on installer letterhead indicating that all systems have been installed per the submitted Underwriter's System Listings and to meet all required codes and requirements of the authority having jurisdiction. Reference every system listing used in this letter and ensure it corresponds to the shop drawings submitted. If there are any discrepancies shop drawings and submittals shall be resubmitted for consultant review.

1.5 QUALITY ASSURANCE

- A. Code Verification: Prior to installation of fire stopping systems obtain approval from the jurisdictional code authorities for the fire stopping systems and applications proposed.
- B. Firestopping: Tested in accordance with ASTM E119 or UL 1479 in the US and CAN/ULC S115 in Canada to meet the hourly fire ratings of the construction being sealed. Provide F rated assemblies, except where T rated assemblies are required by the code authority.
- C. Firestopping systems shall be UL/ULC assemblies.
 - 1. Certain municipalities have special requirements for the use of firestopping (Los Angeles and New York most notably). Consider leaving in for all regions but amplify with more specific references when applicable:
- D. Fire-resistive treatment shall be in compliance with requirements of local jurisdictional authorities.
- E. Subcontractor Qualifications: Firestopping work shall be performed by a single firestopping subcontractor, specializing in the installation of firestopping systems with a minimum of five (5) years proven experience.
- F. Obtain through penetration firestop and joint systems, for each kind of penetration and construction condition indicated, from a single source of installation responsibility.
- G. Use only components specified by firestopping and smoke seals system manufacturer and approved by the qualified testing and inspecting agency for firestopping and smoke seals systems indicated.
- H. The firestopping systems shall be subject to Owner paid inspection.
- I. Develop and maintain a system to quickly and easily identify each firestop assembly in the Project. The system shall include a graphic picture of each fire rated assembly being used. Make the system readily available to the Building Inspector, the Architect, and the Owner paid inspector.
- J. Pre-Installation Conference: Convene a meeting between related sections following award of contract to discuss firestopping requirements. Ensure that other sections are aware of the maximum and minimum clearance requirements to the penetration stipulated by the Underwriter's Design Listing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. In accordance with Section 016000.
- B. Deliver and store materials in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seals intact.
- C. Use stock before its expiration date.

1.7 ENVIRONMENTAL CONDITIONS

- A. Environmental Requirements: Comply with manufacturer's recommendations.
- B. Maintain maximum ventilation to remove volatile emissions produced during the installation process.

PART 2 - PRODUCTS

2.1 FIRESTOPPING SYSTEMS

- A. Systems meeting the requirements specified and suitable for the conditions indicated as manufactured by one or more of the following.
 - 1. Metacaulk.
 - 2. Tremco Inc.

3. Hilti USA / Hilti Canada Ltd.
 4. Grace Construction Products.
 5. Specified Technologies, Inc.
 6. 3M.
- B. Electrical Box Inserts:
1. Manufacturer: Rectorseal (Houston TX; 713-263-8001; 800-231-3345).
 2. Fire Rated Pads intumescent pads; sized to fit electrical boxes; classified by UL/ULC; minimum 2 hour rating.
- C. Systems with sodium silicate shall not be used.
- D. Systems shall be asbestos-free.
- E. Fire-resistance rating of installed fire stopping assembly in accordance with the applicable National or Provincial building code for the place of work.
- F. Fire resistance rating of installed firestopping and smoke seals assembly not less than the fire resistance rating of surrounding floor and wall assembly.
- G. Firestopping and Smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal; do not use a cementitious or rigid seal at such locations. Exemption to fire dampers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 INSTALLATION OF FIRESTOPPING

- A. Proceed with installation only when submittals have been reviewed by Architect and Engineers of Record.
- B. Provide firestopping at mechanical, electrical, and plumbing penetrations through fire rated floors, walls, and ceilings, and other locations as indicated on the Drawings.
- C. Use self contained sealing systems at all data, video, and communications cable locations.
- D. Install firestopping in strict accordance with the Underwriter's Listings, manufacturer's recommendations, accepted and approved test assemblies, approved details and as necessary to meet the specified fire rating requirements.
- E. Coordinate sizing of sleeves, openings, core drilled holes, or cut openings to accommodate firestopping and smoke seals systems.
- F. Seal holes or voids made by through penetrations, poke through termination devices, and unpenetrated openings or joints and verify continuity and integrity of fire separation are maintained.
- G. Install floor fire stopping before interior partition erections.
- H. Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- I. Ensure mechanical pipe insulation installation precedes fire stopping installation.
- J. Tool or trowel exposed surfaces to a neat finish.
- K. Remove excess compound promptly as work progresses and upon completion.
- L. Where firestopping is used to seal around penetrations through waterproof membranes, install to maintain integrity of waterproof barrier.

- M. For sealing electrical boxes, coordinate installation with Division 26. Comply with manufacturer's recommendations for preparation and installation. Install in locations as required by Code for protection of openings through fire rated partitions.
- N. Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.
- O. All firestopping installations to be inspected by Consultants or building inspector as required by authorities having jurisdiction.

3.3 PATCHING OF HOLES IN EXISTING CONSTRUCTION

- A. Fill open holes which remain after removal of existing mechanical, electrical, and plumbing components. Patch and repair holes as necessary to match the adjacent construction and to maintain the fire rating of the assemblies. Firestopping systems may be used to fill holes which will be concealed in the finish construction.
- B. Where firestopping systems are used to fill floor openings in occupied areas, provide minimum 16 gauge sheet metal covers as necessary to support floor loads and to prevent damage to the fire stopping assemblies. Secure sheet metal as necessary to prevent irregularities from telegraphing through the floor finishes over the sheet metal.

3.4 CLEANING

- A. Trim excess material flush with adjacent surface.
- B. Remove spills, leave area in undamaged, clean condition.

3.5 SCHEDULE

- A. Fire stop and smoke seal at:
 - 1. Penetrations through fire-resistance rated masonry, concrete, and gypsum board floors, partitions and walls.
 - 2. Edge of floor slabs at curtain wall and precast concrete panels.
 - 3. Top of fire-resistance rated masonry and gypsum board partitions.
 - 4. Intersection of fire-resistance rated masonry and gypsum board partitions.
 - 5. Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.
 - 6. Penetrations through fire-resistance rated floor slabs, ceilings and roofs.
 - 7. Openings and sleeves installed for future use through fire separations.
 - 8. Around mechanical and electrical assemblies penetrating fire separations.

END OF SECTION

DIVISION 02 THERMAL AND MOISTURE PROTECTION

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cleaning and preparation of joint surfaces.
 - 2. Sealant and backing materials.
- B. Related Sections:
 - 1. 093000 - Tiling: Grout color samples; mock-up.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. C834 - Standard Specification for Latex Sealants.
 - 2. C919 - Practice for Use of Sealants in Acoustical Applications.
 - 3. C920 - Standard Specification for Elastomeric Joint Sealants.
 - 4. C1193 - Guide for Use of Joint Sealants.
 - 5. C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 6. C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 - 7. D2240 - Standard Test Method for Rubber Property—Durometer Hardness.
- B. Canadian General Standards Board (CGSB):
 - 1. CAN/CGSB 19.13 M Sealing Compound, One-Component, Elastomeric, Chemical Curing.
 - 2. CAN/CGSB 19.17 M One-Component, Acrylic Emulsion Base Sealing Compound.
 - 3. CAN/CGSB 19.21 M Sealing and Bedding Compound, Acoustical.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data: Submit for each sealant material used. Include manufacturer's surface preparation, priming, and installation instructions for each proposed sealant.
- C. Samples:
 - 1. Submit cured samples of each sealant type and color proposed for the work.
 - 2. For each sealant type indicated for "color as selected," or for which no color is indicated, submit color card indicating available stock colors from manufacturer's complete line of pre-formulated colors for each type of sealant.
 - 3. For custom colors, request color selection from the Architect prior to sample submittal. Custom colors to match grout joints in tile shall match the sample submitted from the tile installer as specified in Section 093000.
- D. Quality Control Submittals:
 - 1. Schedule of sealant types, colors and respective locations.

1.4 QUALITY ASSURANCE

- A. Installers:
 - 1. Use only skilled workmen specially trained in the techniques of sealing, and familiar with the published recommendations of the manufacturers of the sealants being used.

- B. Verify that sealants are compatible with the substrates and accessory materials provided under other Sections.

1.5 ENVIRONMENTAL CONDITIONS

- A. Unless recommended otherwise by the manufacturer, install sealant systems as follows:
 - 1. Do not apply sealant when ambient temperatures are below 40 degrees F (4.5 degrees C), or expected to fall below 40 degrees F (4.5 degrees C) before sealant cure is complete.
 - 2. Do not apply sealant to substrates or accessories that are moist.
 - 3. Joint widths are within tolerances of those permitted by joint sealant manufacturer for applications indicated
 - 4. Substrates are free from contaminants capable of interfering with adhesion.

1.6 GUARANTEE

- A. Furnish guarantees in accordance with Section 017700.
- B. Furnish a 2 year installer's guarantee covering defects in installation.
- C. Furnish Type S sealant manufacturer's 20 year material guarantee.

PART 2 - PRODUCTS

2.1 SEALANTS

- A. Type S - Neutral Cure Silicone Sealants:
 - 1. Dow Corning, 790 Silicone Building Sealant, or "795 Silicone Structural Glazing and Weatherproofing Sealant."
 - 2. Pecora "890 Architectural Silicone Sealant."
 - 3. Spectrem 3 by Tremco Incorporated.
 - 4. General Electric Co. "Ultrapruf II SCS-2900."
 - 5. General Electric Co. "Silpruf."
- B. Type P: ASTM C920, Type M, grade NS, Class 25; Tremco "Dymeric," Chem-Calk 500, Pecora "Dynatrol II," Sonneborn "Sonalastic NP-II", PRC "Permapol RC-2," or approved.
- C. Type PT: ASTM C920, Type M, Grade P, class 25; Tremco "THC 900", Sonneborn/ChemRex "Sonolastic SL 2", Pecora "Urexpan NR-200", or approved; standard colors as selected.
- D. Type PTNS: ASTM C920, Type M, grade NS, Class 25, Use T; Pecora "Dynatred," Tremco "THC901," Sika "Sikaflex-2c NS TG," or approved; custom colors to match the Architect's samples.
- E. Type A:
 - 1. Sealants shall meet the requirements of the Southern California South Coast Air Quality Management District (SCAQMD) Rule 1168. (maximum VOC content of 250 grams/liter). In Canada also comply with the Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations (SOR/2009-264).
 - 2. "AC20+Silicone" by Pecora (800-523-6688). Select standard color to match adjacent finishes as close as possible.
- F. Type SM: Mildew Resistant Silicone Sealant:
 - 1. Sealants shall meet the requirements of the Southern California South Coast Air Quality Management District (SCAQMD) Rule 1168. (maximum VOC content of 250 grams/liter). In Canada also comply with the Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations (SOR/2009-264).
 - 2. "898 Silicone" by Pecora (800-523-6688), or approved. Select standard color to match adjacent finishes as close as possible; clear color, except use white at white fixtures.

2.2 ACCESSORY MATERIALS

- A. Primer:
 - 1. Non-staining type, recommended by sealant manufacturer to suit application.
 - 2. Primers for interior sealants shall meet the requirements of the Southern California South Coast Air Quality Management District (SCAQMD) Rule 1168. (maximum VOC content of 250 grams/liter for non-porous surfaces; 750 grams/liter for other surfaces). In Canada also comply

with the Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations (SOR/2009-264).

- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Backer Rod: Closed or open cell foam as recommended by the sealant manufacturer for the application; round profile; thickness approximately 130 percent of joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
- E. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.
- C. Verify joint dimensions and conditions are acceptable to receive the work of this Section.

3.2 PREPARATION

- A. Clean and prepare joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.
- B. Apply masking tightly around joints to protect adjacent surfaces from excess sealant.
- C. Prime as required for proper bond to substrate materials.
- D. Backing Materials:
 - 1. Place backer rod to achieve proper sealant width/depth ratios and to prevent sealant sag.
 - 2. Use bond breaker where there is insufficient depth to use joint filler.
 - 3. Do not use backer rod and bond breaker at joints to receive Type PTNS sealant.

3.3 COMPRESSIBLE FOAM TAPE INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install sufficiently deep to accommodate the installation of the Type S sealant.

3.4 INSTALLATION

- A. Perform work in accordance with ASTM C1193, unless specified otherwise or recommended otherwise by the sealant manufacturer.
- B. Apply sealant within recommended temperature ranges.
- C. Joint Profile:
 - 1. Sealant beads shall have a sectional width to depth ratio of 2 to 1, unless specified otherwise or recommended otherwise by the sealant manufacturer.
 - 2. Install Type PTNS sealant full depth in tile expansion joints with no backer rod.
- D. Tooling:
 - 1. Tool joints concave, unless indicated or specified otherwise. Finish to uniform profile and depth, free of air pockets, embedded matter, ridges, and sags.
 - 2. Tool type PTNS sealant to match grout joint profile.

3.5 CLEANUP

- A. Clean adjacent surfaces free of excess sealant as the work progresses. Use cleaning agents recommended by the sealant manufacturer.
- B. Upon completion, remove and dispose of masking.

3.6 PROTECTION

- A. Protect sealant in joints subject to dirt, moisture, and traffic during the sealant curing process. Protection shall be able to resist traffic while remaining securely in position.

3.7 SCHEDULE

- A. Type S: Provide at all exterior joints, unless specified otherwise; colors as selected from manufacturer's complete line for each type of sealant.
- B. Type P: Provide at all exterior joints in concrete or masonry, unless specified otherwise; standard colors as selected from manufacturer's complete line of pre-formulated colors.
- C. Type PT: Provide at all exterior and interior horizontal joints subject to traffic and abrasion, unless specified otherwise; standard colors as selected from manufacturer's complete line of pre-formulated colors.
- D. Type PTNS: Provide at all expansion joints in tile; custom colors to match grout samples submitted by the tile installer.
- E. Type A: Provide at all interior joints, unless specified otherwise.
- F. Type SM: Provide at joints around countertops in kitchen or coffee areas.

END OF SECTION

DIVISION 08 OPENINGS
SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rolled steel doors and frames.
 - 2. Accessories.
- B. Related Sections:
 - 1. 087100 - Door Hardware.
 - 2. 087300 - Door and Hardware Installation: Installation of doors and related hardware.
 - 3. 092200 - Lightgauge Metal Support Framing: Bracing for frame installation.
 - 4. 099023 – Interior Painting and Coating: Field painting of doors and frames.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.
 - 2. A250.11 - Recommended Erection Instructions for Steel Frames.
- B. American Society for Testing and Materials (ASTM)
 - 1. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - 2. A366 - Specification for Steel, Carbon, Cold Rolled Sheet, Commercial Quality.
 - 3. A569 - Specification for Steel, Carbon (0.15 Maximum Percent), Hot Rolled Sheet and Strip, Commercial Quality.
 - 4. A653 - Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
- C. International Building Code (IBC) or National or Provincial Building Code as applicable.
- D. National Fire Protection Association (NFPA): NFPA 80 - Fire Doors and Windows.
- E. Steel Door Institute (SDI): SDI-105 - Recommended Erection Instructions for Steel Frames.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Literature: Submit manufacturer's published literature for doors and frames.
- C. Shop Drawings:
 - 1. Frames: Indicate configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
 - 2. Doors: Indicate elevations, internal reinforcement, closure method, and cutouts for hardware, glazing and louvers.
 - 3. Reference door and frame types to door schedule; indicate door numbers related to Drawings and Door Schedule.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of ANSI A250.8 and A250.11.
- B. Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:

1. Fabricate work of this Section to meet the requirements of the Canadian Steel Door and Frame Manufacturer's Association, Manufacturing Specification for Doors and Frames as a minimum, and as further modified in this section.
 2. Fabricator shall be a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.
- C. Use installers who are experienced with the installation of hollow metal doors and frames of similar complexity and extent to that required for the Project.

1.5 DELIVERY, STORAGE AND HANDLING

- A. In accordance with Section 016000.
- B. Protect doors and frames with factory installed protective packaging. Maintain protective packaging until installation commences.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Members of the Steel Door Institute and of the National Association of Architectural Metal Manufacturers, subject to compliance with the specified requirements.

2.2 MATERIALS

- A. Steel Sheet: Cold rolled ASTM A366, or hot rolled pickled and oiled sheet conforming to ASTM A569, except ASTM A167, Type 304 stainless steel at locations scheduled.

2.3 DOORS

- A. ANSI A250.8; Seamless.
- B. Minimum 18 gauge face sheets for interior doors; minimum 16 gauge face sheets for exterior doors.
- C. Core:
 1. Interior Doors: Vertical steel stiffeners with sound deadening fill between stiffeners, or resin impregnated kraft paper honey comb core.
- D. Provide continuously welded seamless edges.
- E. Close top edges of exterior doors flush with steel filler cap; seal joints watertight.
- F. Cut mortises for butts using appropriate templates; universal non-handed preparation of doors is not acceptable.

2.4 FRAMES

- A. Design: Double rabbet, unless indicated otherwise; fully welded. Fabricate frames with throat dimensions as indicated. Provide 1 inch (25 mm) returns at exterior frames as detailed.
- B. Gauges:
 1. Interior Frames: Minimum 16 gauge for frames of door openings up to and including 4 feet in width (1220 mm); 14 gauge for frames greater than 4 feet (1220 mm) in width.
- C. Provide mortar guard boxes at masonry construction.

2.5 ACCESSORIES

- A. Glazing Stops: Rolled steel channel shape, butted corners; prepared for countersink style tamperproof screws.

2.6 FINISH

- A. Interior Units: Manufacturer's standard rust inhibitive primer.
- B. Stainless Steel Frames: No. 4 satin finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.
- C. Verify actual dimensions of openings by site measurements prior to fabrication.
- D. Establish required dimensions of openings and notify Starbucks Construction Manager when actual dimensions of openings cannot be verified in field without delaying construction.

3.2 INSTALLATION OF FRAMES

- A. Install frames in accordance with ANSI A250.11 / SDI-105 and in accordance with labeling requirements.
- B. Coordinate with wall construction for anchor placement.
- C. Coordinate installation of glass and glazing.
- D. Install accessories.
- E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- F. Installation Tolerances; Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.
- G. Door and hardware installation is specified in Section 087300.

END OF SECTION

DIVISION 08 OPENINGS

SECTION 083483

IMPACT DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Impact doors and hardware.
- B. Related Section:
 - 1. 081113 - Hollow Metal Doors and Frames: Stainless steel knock-down frames.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

- A. Make submittals in accordance with provisions of Section 013300.
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Shop Drawings: Indicate door elevations, hardware locations, vision lite locations and sizes, frame type, frame reinforcement requirements, and finishes.

PART 2 - PRODUCTS

2.1 IMPACT DOORS

- A. Basis of Design: Eliason Corporation, Easy Swing Door Division (Kalamazoo, MI; 800-828-2655)
- B. Type: Medium weight solid core doors, with self centering double swing pivot sets; configuration as indicated.
- C. Construction:
 - 1. Core: 3/4 inch (19 mm) exterior grade AB plywood, sanded.
 - 2. Faces: Plastic laminate, colors as scheduled.
 - 3. Vision Lites: 15 inch x 20 inch (380 x 500 mm) for single leaf doors, 9 inch x 20 inch (230 x 500 mm) in each leaf at pair of doors, 3/16 inch (4.8 mm) clear acrylic; secure in place with manufacturer's standard black rubber molding.
- D. Accessories:
 - 1. Edge Caps: Formed stainless steel channels, 18 gauge, minimum; typical at side and top edges.
 - 2. Base (kick) Plates: 18 gauge satin finish stainless steel; door width x 18 (450 mm) inches high; fastened with stainless steel rivets.
 - 3. Pivots: "Easy Swing" hinge mechanism; stainless steel.
 - 4. Fasteners: As required for complete installation of doors and accessories.

2.2 TOLERANCE

- A. Maximum Diagonal Distortion: 1/4 inch (6 mm) measured with straight edge, corner to corner.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to installation, verify that frames are prepared and ready to receive work of this Section.

3.2 INSTALLATION

- A. Install doors, hardware, and accessories in accordance with shop drawings and manufacturer's instructions.
- B. The bottom pivot assembly shall be secured to the frame only. Do not secure the bottom flange of the pivot assembly to the floor with fasteners as indicated in manufacturer's standard installation instructions as the fasteners will penetrate the waterproof membrane installed beneath the finish flooring.

3.3 ADJUST AND CLEAN

- A. Repair damage to doors and accessories to match fabricator's original finish.
- B. Adjust mechanism so moving parts operate smoothly.

END OF SECTION

DIVISION 08 DOOR HARDWARE

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finish hardware requirements.
 - 2. Requirements for bidder-supplied hardware schedule.
- B. General Requirements:
 - 1. Contractor shall provide complete hardware schedule including all pieces of hardware required at each opening as specified herein and indicated in the Drawings.
 - 2. Allowed hardware manufacturers shall be as directed by Owner. Where specific model numbers are provided, it is for the purpose of establishing basis for quality and design only. Contractor shall provide alternate products or functions as necessary to meet requirements of Drawings and specifications.
 - 3. Manufacturer substitutions are not permitted.
 - 4. Obtain each type of hardware from single manufacturer.
 - 5. Review Drawings, Door Schedule, and requirements of this Section thoroughly and provide required hardware for all openings, including openings which may have been inadvertently omitted from Door Schedule.
 - 6. Should an opening be omitted or an opening not indicated in Door Schedule, notify Architect and unless directed otherwise provide hardware of same quality, design and function as specified for similar openings.
 - 7. Furnish hardware complete with brackets, plates, fittings, and other accessories required for installation.
 - 8. Provide screws, nuts, bolts, through-bolts, washers, grommets, and other fastening devices necessary for proper installation of hardware; match finish of hardware being attached. Non-ferrous or corrosion resistant type required where exposed to exterior atmosphere.
- C. Related Sections:
 - 1. 017700 - Closeout Procedures: Submittal of keys.
 - 2. 081113 - Hollow Metal Frames.
 - 3. 083100 – Access Doors and Panels
 - 4. 087300 - Door and Hardware Installation
 - 5. Licensed Store Turnkey Services Supplement: Licensed Store Turnkey project.
- D. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- E. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Manufacturer's Data: Submit three (3) copies of manufacturer's data for each item of finish hardware.
- C. Samples: Within 35 days after award of the Contract, submit 3 samples each of Push Plates and Kick Plates in colors as selected for approval.
- D. Schedules: Upon award of hardware contract, submit 3 copies of the finish hardware schedule, organized into "hardware sets" and indicating complete designation of every item required for each door or opening. List in vertical form. Review of hardware schedules does not fulfill project requirements in accordance with Contract Documents.

- E. Templates: Furnish hardware templates to door and frame fabricators, and hardware installers. Upon request, check shop drawings of such other work to confirm that adequate provisions were made for the proper installation of hardware.

1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: Finish hardware shall be supplied by recognized builders' hardware supplier who has been furnishing hardware in the same area as the project for a period of not less than two years. The supplier's organization shall include a member of the American Society of Architectural Hardware Consultants who is available at all reasonable times during the course of the work to meet with the Owner, or Contractor for project hardware consultation.
- B. Regulatory Requirements:
 - 1. Conform to requirements of the jurisdictional code authorities.
 - 2. Where openings are noted with an hourly fire resistance rating, provide hardware components labeled by Underwriter's Laboratory or Underwriter's Laboratory of Canada, or other testing laboratory approved by the local code authorities, to meet the hourly fire rating noted.
 - 3. Hardware shall conform to NFPA 80 for fire rated class indicated.
 - 4. Comply with provisions of the Americans with Disabilities Act (ADA), including ADA Accessibility Guidelines and ANSI A117.1 in the US or the equivalent Canadian Accessibility code applicable in the province of work or the CAN/CSA B651, current edition where required by the drawings and additional accessibility requirements of the jurisdictional code authorities.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver all hardware in manufacturers' original unopened undamaged packages, clearly identifying manufacturer, brand name, and contents.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary.
- C. Mark each item of hardware as to description and location of installation in accordance with approved hardware schedule.
- D. Protection: Use all means necessary to protect the finish on hardware before, during and after installation.

1.5 GUARANTEES

- A. Furnish 5-year unconditional guarantees for all door closers, under provisions of Section 017700.

1.6 MAINTENANCE

- A. Factory representatives for door closers, exit bolts, and locksets shall be available during the construction to instruct the Contractor on the proper method of installation of their materials. They shall inspect and adjust their materials at the completion of the work, and supply proper maintenance manuals to the Owner.
- B. Furnish two (2) sets of special tools for installation and maintenance of hardware. Tools for maintenance and adjustments are to be delivered to the Owner upon completion of the work.

PART 2 - PRODUCTS

2.1 HARDWARE

- A. Furnish hardware items as scheduled in approved bidder-supplied hardware schedule.
- B. Except as listed in the following paragraphs, no substitutions of materials will be allowed unless approved by the Construction Manager and Architect.

2.2 HARDWARE MATERIALS AND FABRICATION

- A. Furnish fasteners for installation with each hardware item. Furnish Phillips head fasteners, countersunk oval, flat head, or undercut head as appropriate for material to be installed. Furnish door closers and exit devices applied to wood composite or mineral core doors with sex bolts sized to the thickness of the door.

- B. Compatibility: Provide fasteners which are compatible with both unit fastened and substrate, and which will not cause corrosion or deterioration of hardware, base material, or fastener.

2.3 HARDWARE FINISHES

- A. General: Unless specifically indicated otherwise in the Landlord's "Tenant's Design and Construction Manual" or Drawings, provide architectural hardware in the following finishes.
1. General: US26D, Satin Chrome Plated, except:
 2. Push Plates, Door Pulls, Kickplates: US32D, Satin Stainless Steel
 3. Door Closers: 689/Sprayed Aluminum.

2.4 KEYING

- A. All locksets and deadbolts shall be keyed as directed by the Owner.
- B. Construction master-key all locksets and cylinder items; provide 12 construction masterkeys.
- C. Locksets, exit devices, deadlocks, padlocks, and cylinders (all standard cylinder items) shall be:
1. Grand masterkeyed and/or masterkeyed in sets as required.
 2. Individually keyed in strict accordance with Owner's instructions.
 3. Keying shall be established specifically for the Owner by the manufacturer.
- D. For Licensed Store Turnkey projects, keying shall be established per Licensed Store Turnkey Services Supplement.

2.5 HARDWARE SETS

- A. Hardware Set No. 01
1. For use on door #: 10190
 2. Contractor to coordinate if existing door hardware removed can be reused.
 3. Hardware finish to match existing building department hardware.

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	626	IVE
1	EA	PRIVACY LOCK	L9496 17A	626	SCE
1	EA	SURFACE CLOSER	4111 CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

- B. Hardware Set No. 02
1. For use on door# 10191
 2. Contractor to coordinate if existing door hardware removed can be reused.
 3. Hardware finish to match existing department hardware.

Provide each SGL door(s) with the following:

Qty		Description	Catalog Number	Finish	Mfr
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	626	IVE
1	EA	OFFICE LOCK	(MATCH EXISTING)	626	SCE
1	EA	KEY PERMANENT	LOCK CORE	626	BES
1	EA	SURFACE CLOSER	4111 CUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of doors and hardware is specified in Section 087300.

END OF SECTION

DIVISION 08 OPENINGS
SECTION 087300
DOOR AND HARDWARE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Installation of hardware specified in Section 087100.
 - 2. Installation of hollow metal doors.
- B. Related Sections:
 - 1. 081113 - Hollow Metal Doors and Frames.
 - 2. 083100 - Access Doors and Panels.
 - 3. 087100 - Door Hardware.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

1.2 REFERENCES

- A. Hollow Metal Manufacturer's Association (HMMA): 840 - Installation and Storage of Hollow Metal Doors and Frames.
- B. National Fire Protection Association (NFPA): 80 - Fire Doors and Windows.
- C. American National Standards Institute (ANSI): A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames.
- D. The Door and Hardware Institute (DHI): Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
- E. The Door and Hardware Institute (DHI): Recommended Locations for Architectural Hardware for Wood Flush Doors.
- F. Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 - 1. CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3 QUALITY ASSURANCE

- A. Installers of doors and finish hardware shall be skilled mechanics experienced in this type of work.
- B. Fire rated doors and hardware shall be installed in accordance with the labeling requirements.

1.4 ENVIRONMENTAL CONDITIONS

- A. Do not subject wood doors to abnormal heat, dryness, or humidity, or sudden changes thereof. Condition doors to average prevailing humidity prior to hanging.

PART 2 - PRODUCTS

2.1 DOORS, FRAMES, AND HARDWARE

- A. Doors, frames and hardware are specified in other sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.

- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 DOOR INSTALLATION

- A. Install doors in accordance with the door manufacturer's printed instructions.
- B. Install doors plumb and square in associated frames maintaining specified clearances.
- C. Except where specified otherwise in the respective door sections, maintain clearances of 1/8 inch (3 mm) at jambs and heads, 1/8 inch (3 mm) at meeting stiles for pairs of doors, and 1/2 inch (13 mm) from bottom of door to top of decorative floor finish or covering, except where threshold is shown or scheduled provide 1/4-inch (6 mm) clearance from bottom of door to top of threshold.
- D. Install hollow metal doors in accordance with ANSI A250.8 and HMMA 840.
- E. Install fire rated doors in accordance with NFPA 80.
- F. Install doors to operate freely, but not loosely, free from hinge bound conditions, sticking or binding. Do not install in frames which would hinder operation of doors.
- G. Ensure doors are free from rattling when in latched position.

3.3 FINISH HARDWARE INSTALLATION

- A. Install hardware plumb, level and true to line in accordance with manufacturer's templates, printed instructions and Project conditions.
- B. Install fire rated hardware in accordance with NFPA 80.
- C. Where cutting and fitting is required on substrates to be field painted or similarly finished, install, fit, remove and store hardware prior to finishing. Reinstall hardware after finishing operations are completed.
- D. Do not install surface mounted items until finishes have been completed on the substrate.
- E. For substrates which are not factory prepared for hardware:
 - 1. Mortise work to correct size and location without gouging, splintering or causing irregularities in exposed finish work.
 - 2. Fit faces of mortised components snug and flush without excessive clearance.
- F. Coordinate installation of electronic hardware with electrical service and fire alarm system as applicable.
- G. Hardware Locations: The following is a general listing; refer to Drawings for project specifics.
 - 1. Butt Hinges:
 - a. Top: 5 inches (127 mm) from inside head of frame down to top of hinge.
 - b. Bottom: 10 inches (254 mm) from finish floor to bottom of hinge.
 - c. Intermediate: Equally spaced between top and bottom hinges.
 - 2. Pivots:
 - a. Top and Bottom: According to manufacturer's templates.
 - b. Intermediate: Equally spaced between top and bottom pivots.
 - 3. Locksets and Latchsets: 38 inches (965 mm) from finish floor to centerline of knob or lever.
 - 4. Dummy Trim: Backset and height to match locks and latches.
 - 5. Deadlocks and Deadlatches: 48 inches (1219 mm) from finish floor to centerline of cylinder in the US and between 35.4 inches and 43.3 inches (900 mm and 1100 mm) in Canada.
 - 6. Push/Pull Latches: 45 inches (1143 mm) from finish floor to centerline of latchbolt.
 - 7. Exit Devices: 38 inches (965 mm) from finish floor to centerline of cross bar or touch bar.
 - 8. Emergency Access Door Stops: 60 inches (1524 mm) from finish floor to centerline to stop.
 - 9. Door Closers:
 - a. Degree of door swing as indicated in Hardware Schedule approved by Architect, or if not indicated, locate to permit maximum door swing.
 - b. Locate on interior side of exterior doors.
 - c. Locate on stair side of doors at stairways.

- d. Locate on room side for doors in public areas, corridors and other similar areas.
- 10. Push/Pull Bar Sets:
 - a. Horizontal push bar centered at 42 inches (1067 mm) above finish floor, extending full width from centerline to centerline of door stiles.
 - b. Vertical pull bar centered on door stile centerline at 4 inches (102 mm) from door edge with top mounting at 45 inches (1143 mm) above finish floor and equipped with stud to pass through door for concealed set screw mounting of push bar on opposite side.
- 11. Push Plates and Pulls (Back to Back): Centerline 42 inches (1067 mm) above finish floor. Center plate between door edge and glazed opening, or 2 inches (51 mm) from plate edge to door edge if door is not glazed. Pull centered in relationship to plate size.
- 12. Door Pulls (Mounted Independently): Centerline of grip at 42 inches (1067 mm) above finish floor, centered between door edge and glazed opening, or centerline of pull 3 inches (76 mm) from door edge if door is not glazed.
- 13. Push Plates (Mounted Independently): Centerline 45 inches (1143 mm) above finish floor, centered between door edge and glazed opening, or 2 inches (51 mm) from plate edge to door edge if door is not glazed.
- 14. Combination Push/Pull Plates: Bottom edge 40 inches (1016 mm) above finish floor, centered between door edge and glazed opening, or 2 inches (51 mm) from plate edge to door edge if door is not glazed.
- 15. Wall Stops: Place on adjacent wall at height to contact knob, lever or pull.
- 16. Wall Stop/holders: Place on adjacent wall immediately above base materials positioned such that door will strike bumper and prevent door hardware from hitting wall. Place within 3 inches (76 mm) of latch edge of door.
- 17. Floor Stops and Floor Stop/holders: Place to permit maximum swing of door and to prevent door hardware from hitting wall. Place within 3 inches (76 mm) of latch edge of door, and out of foot traffic.
- 18. Kick Plates and Armor Plates: Mount on push side, 1/8 inch (3 mm) above bottom edge and centered.
- 19. Stretcher Plates: Mount on push side, top edge 36 inches (914 mm) above finish floor and centered.
- 20. Mop Plates: Mount on pull side, 1/8 inch (3 mm) above bottom edge and centered.
- 21. Existing Frames: Hardware locations to match existing conditions where new doors are installed in existing frames. If existing locations do not meet code requirements, inform Architect prior to proceeding.

3.4 ADJUSTMENT AND CLEANING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation of function of every unit.
- B. Lubricate moving parts with graphite type lubricant unless otherwise recommended by the hardware manufacturer.
- C. Ensure weatherstripping and seals do not inhibit closing and positive latching of door.
- D. Replace defective materials or units which cannot be adjusted to operate as intended. Reinstall items found improperly installed.
- E. Replace or re-hang doors which are hinge bound and do not swing or operate freely.
- F. Remove and replace doors which are warped, twisted or which are not in true planes.
- G. Replace factory finished doors damaged during installation.
- H. Prior to date of Substantial Completion, readjust and relubricate hardware items as necessary.

3.5 FINAL ADJUSTMENT

- A. Wherever hardware installation is made more than 30 calendar days prior to date of Substantial Completion of a space or area, return to the work during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean and lubricate operating items as necessary to restore proper function and finish of hardware and doors.

Adjust door control devices to compensate for final operation of heating and ventilating equipment, spring power, back check, closing and latching speeds, and accessibility requirements.

- B. Instruct Owner's personnel in proper adjustment of hardware during the final adjustment of hardware.

END OF SECTION

DIVISION 09 FINISHES

SECTION 092200

LIGHTGAUGE METAL SUPPORT FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior partition framing.
 - 2. Steel backing.
 - 3. Ceiling and soffit framing.
 - 4. Furring and resilient channels.
- B. Related Sections:
 - 1. 061000 - Rough Carpentry: Wood blocking; [framing and sheathing].
 - 2. 095113 – Acoustical Panel Ceilings: Proprietary overhead framing system.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A641 - Zinc-Coated Galvanized) Carbon Steel Wire.
 - 2. C635 - Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - 3. C645 - Non-Loadbearing Steel Studs, Runners, and Rigid Furring Channels.
 - 4. C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
- B. Underwriters Laboratories (UL): Standard 2079 - Tests for Fire Resistance of Building Joint Systems.

1.3 SYSTEM DESCRIPTION

- A. Structural Design:
 - 1. Select framing systems, gages, supports, bracing, and connections as necessary to meet the structural requirements specified.
 - 2. Partition framing shall conform to the widths indicated, unless approved otherwise. Provide thicker gages and decreased stud spacing as necessary to meet the design requirements.
 - 3. Select framing members based on the manufacturer's published span tables.
- B. Design Loads:
 - 1. Interior Ceiling Assemblies: 5 pounds per square foot uniform live load, plus dead loads.
 - 2. Interior Partitions without Wall Mounted Casework: 5 pounds per square foot uniform live lateral load.
 - 3. Interior Partitions with Wall Mounted Casework: 5 pounds per square foot uniform live lateral load, casework dead load, and casework live load of 25 PSF of shelf area.
- C. Deflection Requirements:
 - 1. Maximum deflection of 1/240 for flexible finish materials such as gypsum board and veneer plaster.
 - 2. Maximum deflection of 1/360 for rigid finish materials including gypsum plaster, cement plaster, ceramic tile, maximum 3/8" thick stone tile, or mirrors.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 013300.

- B. Shop Drawings:
 - 1. Indicate typical and special framing sections and details. Indicate fastening systems, gages, framing spacing, bracing configurations and locations, anchorage to acoustical ceiling grid, metal backing, attachment to overhead structure, and similar conditions.

1.5 QUALITY ASSURANCE

- A. Unless indicated or specified otherwise, perform work in accordance with ASTM C754.
- B. Code Requirements:
 - 1. Provide assemblies meeting the hourly fire ratings indicated and specified. Assemblies shall be tested in accordance with ASTM E119, and shall be approved by the local jurisdictional code authorities. Coordinate installation of other materials which are a part each assembly.
 - 2. Fire rating requirements take precedence over the construction requirements indicated. In the event of conflict, notify the Architect, and do not begin construction in the area of conflict until the conflict has been resolved.
- C. System components shall be in compliance with requirements of local jurisdictional authorities for lightgauge metal support framing and ceiling suspension systems, as applicable

PART 2 - PRODUCTS

2.1 NON-LOAD BEARING LIGHT GAGE METAL FRAMING:

- A. Base Steel (all stud types):
 - 1. ASTM C645; G40 galvanized; non-compliant materials will not be accepted.
- B. General:
 - 1. Furnish "C" shaped studs, depth as scheduled, with return lip and not less than 1-1/4 inch flanges; prepunched openings for the installation of stiffening channels and mechanical and electrical items.
 - 2. Furnish U shaped tracks (runners), hat and "Z" shaped furring channels, and other sizes and shapes as indicated on the Drawings, and required by the referenced standards.
 - 3. Minimum 25 gage unless indicated or specified otherwise; and as follows:
 - a. Furnish gages as necessary to meet deflection requirements, unless indicated or specified otherwise.
 - b. Top runner for partitions extending only to the acoustical ceiling grid shall be 20 gage.
 - c. Provide minimum 20 gage for full height partition framing extending from structure to structure.
 - d. Provide minimum 20 gage studs at jambs of doors and interior relites.
 - 4. Partition Head Compensating Channel (Non-Fire Rated): Design for minimum $\pm 1/2$ inch deflection. Profiles as indicated; one of the following.
 - a. 20 gage deep leg track; 2 inch legs.
 - b. Proprietary compensating channel system; Contractor's option.
- C. Standard Gage Metal Framing:
 - 1. Formed from minimum 36 KSI steel.
- D. "EQ Stud" Type Metal Framing:
 - 1. Formed from minimum 50 KSI steel.

2.2 OTHER FRAMING SYSTEMS

- A. Channels: Hot or cold rolled channels; rust inhibitive paint coating; sizes in accordance with ASTM C754.
- B. Proprietary Ceiling Suspension System:
 - 1. Manufacturer:
 - a. As specified: Chicago Metallic (Los Angeles CA; 800-323-7164).
 - b. Acceptable Substitutions:
 - 1) USG Interiors, Inc. (Chicago, IL; 800-874-4968).
 - 2) Armstrong (800-207-2321).

2. Suspension System: Similar to System 650, or 670; ASTM C635 heavy duty classification.
- C. Accessories:
 1. Screws: Self tapping; low profile head; galvanized.
 2. Hanger wire: ASTM A641; Class 1 zinc coating; soft temper; prestretched; 12 gage.
 3. Resilient Channels: USG "RC-1," or approved.
 4. Special Proprietary Backing: Dietrich Industries (Pittsburgh PA; 412-281-2805; Renton, WA; 425-251-1497) "Danback Flexible Wood Backing Plate;" model in accordance with stud spacing; fire treated.
- D. Other Framing Materials: Provide other framing materials in accordance with ASTM C754.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin work until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Steel Decking:
 1. Where fastening into bottom of steel decking is required, fasten only into lower flutes.
 2. Do not use fasteners in steel deck which penetrate more than 1 inch.
- B. Verify location of conduit in poured concrete construction before making attachments.

3.3 INTERIOR PARTITION FRAMING

- A. Runners:
 1. Secure runners with fasteners at maximum 24 inches oc.
 2. At concrete floors, use powder driven fasteners or drilled in concrete anchors.
 3. Top Runner: Secure head track to structure with allowance for structural deflection.
 - a. Non Rated Partitions: Use proprietary compensating channel or deep leg track at Contractor's option, as necessary to accommodate building deflection.
 4. Unless approved otherwise, at fire rated partition assemblies, use fire rated tracks, furnished from Section 078500. Install fire rated tracks in accordance with the fire rated assembly requirements.
 5. Align to tolerances specified.
- B. Unless indicated otherwise, install studs vertically at 16 inches oc, and not more than 2 inches from abutting construction, at each side of openings, and at corners.
- C. Fit runners under and above openings; secure intermediate studs at spacing of wall studs.
- D. Brace partition framing system and make rigid. Provide diagonal stud bracing at maximum 8 ft on center at framing which does not extend to structure. At partitions attached to acoustical ceiling grid with partition clip, screw attach bracing to clip. Brace shall allow placement of acoustical tile without cutting.
- E. Install double studs continuous from floor to ceiling track at the jamb of each door frame and cased opening. Studs shall be no less than 20 gage. Provide diagonal steel stud bracing to structure at each jamb at partitions which do not extent to structure.
- F. Install minimum 20 gage studs at partitions indicated for support of modular wall-mounted casework and counter support brackets. Install double studs and wood blocking at counter support brackets.
- G. Coordinate erection of studs with installation of service utilities. Align stud web openings.

- H. Coordinate installation of bucks, anchors, blocking, electrical, and mechanical work to be placed in or behind stud framing.
- I. Coordinate erection of stud system with requirements of door and window frames, fire extinguisher cabinets, recessed toilet accessories, access doors, acoustical insulation, and other construction within partition.
- J. Coordinate the installation of framing with the gypsum board installer to ensure support at board edges. Provide framing immediately either side of expansion joints.
- K. Stud splicing not permissible.
- L. At non-load bearing full height partitions subject to compression caused by overhead structural deflection, and where proprietary compensating channel system is not used, cut studs 1/2 inch short from full height. Do not rigidly connect stud to top runner.
- M. Stud Bridging:
 - 1. At interior partitions greater than 4 feet in length, and with rigid facing material on one stud flange only, provide 3/4" bridging channels in horizontal rows at a maximum of 5'-0" on center for the full height of the partition.
 - 2. Interior full height partitions (studs extending from the floor to the structure above) with rigid facing material stopping 3'-0" or more below top of studs - Provide one row 3/4" bridging channel horizontally at termination of gypsum board material, and one additional row for each 5'-0" of exposed studs.
 - 3. Install stud bridging channels in long lengths, wire tying and lapping the joints a minimum of 12 inches. Attach bridging channel to each stud as shown in manufacturer's printed instructions.

3.4 BACKING

- A. Provide steel or fire treated wood backing, unless indicated otherwise, for the support of wall mounted items, including wood trim, casework, and toilet accessories.
- B. Unless indicated otherwise, steel backing shall consist of minimum 4 inch wide 16 gage steel plate screwed rigidly to the studs.

3.5 CEILING, SOFFIT, AND FASCIA FRAMING

- A. Coordinate locations of hangers and supports with the work of other Sections.
- B. Ceiling framing shall consist of stud and runner framing or suspended framing, unless indicated or specified otherwise.
- C. Stud and Runner Framing:
 - 1. Secure runners to structure above with fasteners at a maximum of 24 inches on center. Size fasteners and use reinforcements as necessary to support the dead loads applied.
 - 2. Screw fasten framing at each flange joint.
 - 3. Space studs at 16 inches on center at horizontal locations.
 - 4. Select members to meet the structural requirements specified.
- D. Lightgauge Suspended Framing:
 - 1. Install in accordance with ASTM C754, unless indicated or specified otherwise.
 - 2. Suspend ceiling from overhead structural elements only. Do not support from any electrical, HVAC, plumbing, or sprinkler system components.
 - 3. Space carrying channels 4 feet on center with splices lapped 12 inches and tied.
 - 4. Support cold rolled carrying channels with hanger wires spaced at 3 feet on center for lath and plaster ceilings and 4 feet on center for gypsum board ceilings. Loop hanger wire around support element and tightly wrap around vertical wire 3 times; cut off neatly.
 - 5. Space furring channels 16" o.c. with splices lapped 12", minimum and tied; clip or saddle tie to runner channels with 16-gage tie wire.
 - 6. Where overhead obstructions prevent the regular spacing of hangers, provide secondary carrying members for indirect support of the suspension system, or reinforce the nearest adjacent hangers and related framing components as required to span the required distance.
- E. Proprietary Suspended Framing: Install in accordance with manufacturer's recommendations.

- F. Stabilize suspended ceiling, soffit, and fascia framing against lateral movement by means of diagonal bracing. At locations where partitions extend to ceiling, only, install supplementary bracing at maximum 8'-0" o.c. along length of partition, and above each door hinge and strike jamb.
- G. Form openings in ceilings and frame openings for recessed light fixtures, air diffusers, access doors, hatches, etc.
- H. Install supplementary hanger wires for support of ceiling mounted equipment, such as speaker support bracket, as required and as detailed.

3.6 TOLERANCES

- A. Install members to provide surface plane with maximum variation of 1/8 inch in 10 feet in any direction.
- B. Locate assemblies within 1/4 inch of required locations.
- C. Locate framing on the center of the joint between gypsum board panels, within a tolerance of 1/4 inch.

END OF SECTION

DIVISION 09 FINISHES

SECTION 092900

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Gypsum soffit board.
- B. Related Sections:
 - 1. 061000 - Rough Carpentry: Wood framing.
 - 2. 092200 – Lightgauge Metal Support Framing: Support framing for gypsum board; tolerance requirements.
 - 3. 093000 - Tiling: Finish materials; tile backer board.
 - 4. 098100 - Acoustic Insulation.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- D. Substitutions: Substitutions will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. C11 – Standard Terminology Relating to Gypsum and Related Building Materials and Systems
 - 2. C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
 - 3. C557 - Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - 4. C1002 - Steel Drill Screws for the Application of Gypsum Board.
 - 5. C1395 - Specification for Gypsum Ceiling Board
 - 6. C1396 - Specification for Gypsum Board
 - 7. D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- B. Gypsum Association (GA):
 - 1. GA-214 - Recommended Levels of Gypsum Board Finish
 - 2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Submit complete manufacturer's product literature and installation instructions for each of the materials used.

1.4 QUALITY ASSURANCE

- A. Perform work in accordance with GA 216, unless specified otherwise, or required otherwise to meet fire rating requirements.
- B. Regulatory Requirements:
 - 1. Provide assemblies meeting the hourly fire ratings indicated and specified. Assemblies shall be approved by the local jurisdictional authorities.
 - 2. Fire rating requirements take precedence over the construction requirements indicated. In the event of conflict, notify the Architect, and do not begin construction in the area of conflict until the conflict has been resolved.

- C. Assembly Instructions: Contractor shall keep at the site and make available to installers a copy of the following:
 - 1. Installation requirements for each fire rated assembly.
 - 2. GA 216.
- D. The work of this Section is subject to special fire rated construction joint assembly requirements specified in Section 078500.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD MATERIALS

- A. Furnish boards of maximum permissible length for type of installation indicated, tapered edge for boards to be exposed, taped and finished; square edge for boards in concealed applications; 5/8 inch (15.9 mm) thick unless noted or specified otherwise; furnish type X for fire rated partitions.
- B. Types:
 - 1. Standard Board, Backing Board, Exterior Water Resistant Soffit Board: ASTM C1396; 5/8 inch (15.9 mm) thickness unless otherwise indicated.
 - 2. Water Resistant Board: ASTM C1396.
 - 3. Ceiling Board: ASTM C1395; sag resistant.
 - 4. Abuse Resistant / Mold Resistant Board: ASTM C1278; USG Corporation "Fiberock Aqua-Tough Interior Panels"; Georgia Pacific "DensArmor Fireguard Interior Guard", National Gypsum Co. "Gold Bond Brand XP Fire-Shield Wallboard," or approved; 5/8 inch (15.9 mm) thickness; Type X; surfaces shall be resistant to mold and mildew growth; score of 10 when tested in accordance with ASTM D3273.

2.2 ACCESSORIES

- A. Interior Gypsum Trim:
 - 1. Conform to GA 216, unless indicated or specified otherwise.
 - 2. Concealed flange crimp-on or tape-on type; metal or PVC at Contractor's option.
 - 3. Control Joint Trim: USG 093 or approved.
 - 4. Reveal Moldings: Fry Reglet Co., Pittcon Industries, Inc., Gordon Inc, or approved; aluminum extrusions with taping flanges; shapes as indicated.
- B. Joint Compound, Tape, and Finishing Compound: ASTM C475; furnish setting type joint compound for use at water resistant and exterior soffit board.
 - 1. Typical: USG "SHEETROCK Brand Taping, All-Purpose, and/or Topping Compound," or approved.
 - 2. Setting Type: USG "SHEETROCK Brand Easy Sand Setting-Type Joint Compound," or approved.
- C. Provide auxiliary materials in accordance with referenced installation standards and manufacturer's written recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin work until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 GYPSUM BOARD INSTALLATION

- A. Install gypsum board in accordance with GA 216, and fire rated assembly requirements.
- B. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

- C. Erect wallboard so that edges and corners are firmly supported.
- D. Use screws to fasten gypsum board to metal furring or framing. Adhesive application of gypsum board may be used if it is in accordance with the manufacturer's recommendations and meets fire rating requirements.
- E. Trim:
 - 1. Use longest practical lengths, with no piece less than 2 feet (610 mm) long for continuous runs greater than 8 feet (2.5 m). Securely fasten and align trim ends at joints.
 - 2. Place concealed flange corner beads at external corners. At angles other than 90 degrees, bend the flange to conform to the angle.
 - 3. Place concealed flange type L trim where gypsum board abuts dissimilar materials.
 - 4. Use J trim at exposed gypsum board edges, and at joints where sealant is indicated.
- F. Allow a 1/2 inch (13 mm) gap where gypsum board extends to overhead structure and deflection provisions are incorporated into lightgauge metal framing. Do not fasten gypsum board to top runner. Where the ceiling is exposed in the finished work, finish top edge with a casing bead, and caulk with acrylic sealant as specified in Section 079200.
- G. Sealant Joints:
 - 1. Coordinate installation of firestopping and sealants at concealed joints between partitions and structure at fire rated and acoustically insulated partitions.
 - 2. Where sealant joints are indicated at ends or edges of wallboard, install for uniform 1/8 inch (3 mm) joint, unless otherwise indicated. Installation of sealant in exposed locations is specified in Section 079200.
- H. Provide water resistant gypsum board as a substrate where tile is indicated to be installed over gypsum board surfaces. Cement board backing for tile surfaces is specified in Section 093000.
- I. Provide cement board at walls in restrooms, toilets, shower rooms, janitor closets and other areas subject to similar damp conditions.
- J. Install required number of layers of wallboard behind panel boards, fire extinguisher cabinets, and other recessed elements as necessary to maintain fire rating of walls.
- K. Fire Rated Construction:
 - 1. At heads of fire rated metal stud and gypsum board partitions, install gypsum board in accordance with the fire rated assemblies specified in Section 078500.
 - 2. Fill joints between gypsum board surfaces and adjacent construction with fire rated joint compound in accordance with the requirements of the fire rated construction joint assembly manufacturer.
 - 3. Provide continuous fire rated assemblies. Where adjacent construction interrupts fire rated assemblies, provide additional construction as necessary to maintain the continuity of fire rated assemblies.

3.3 CONTROL JOINTS

- A. Discontinue gypsum board and use control joint trim at control joints.
- B. Coordinate with the framing installer to ensure that framing is installed immediately on either side of each control joint.
- C. Space control joints as indicated. When not indicated, locate as follows:
 - 1. At maximum 30 foot (9 m) intervals along continuous wall planes.
 - 2. At maximum 50 foot (15 m) intervals at continuous ceilings with perimeter relief.
 - 3. At maximum 30 foot (9 m) intervals at continuous ceilings without perimeter relief.
 - 4. At locations where expansion or control joints occur in the building structure.
 - 5. Locate control joints to form rectangular or square sections, in "L," "U," "T," or other irregularly shaped areas.
 - 6. Position control joints to intersect light fixtures, air diffusers, door openings, and other areas of stress concentration.
 - 7. Coordinate with Section 092200 for special requirements at fire rated assemblies.
- D. Verify location with the Architect prior to installation. Give the Architect a minimum of 48 hours notice.

3.4 FINISHING

- A. Provide finishing in accordance with GA 214.
- B. Where necessary to sand, do so without damaging the face of the gypsum board.
- C. Levels of Finish:
 - 1. Level 5: Provide at the following locations:
 - a. Surfaces perpendicular and adjacent to or near (within 24 inches (610 mm) of) exterior windows and surface mounted light fixtures.
 - b. Surfaces to receive deep tone colors.
 - 2. Level 4: Typical, unless indicated or specified otherwise.
 - 3. Level 3: Provide at the following locations:
 - a. Surfaces to receive fabric wall covering.
 - 4. Level 2: Provide at the following locations:
 - a. Storage rooms.
 - b. Mechanical rooms.
 - c. Janitor's closets.
 - d. Surfaces to receive tile or other thick finish materials applied to gypsum board surfaces.
 - 5. Level 1: Provide at the following locations:
 - a. Surfaces of fire rated assemblies concealed from view in the finished work ("fire-taping").
 - b. Surfaces of acoustical assemblies concealed from view in the finished work
 - 6. Level 0: Provide at surfaces of non-fire rated assemblies concealed from view in the finished work, including surfaces to be covered by casework, wood paneling,
- D. Level 4 and 5 finishes: Return to the site after primer is applied, and touch-up surface defects.
- E. Proprietary skim coat material may be used in lieu of joint compound as skim coat at surfaces indicated for Level 5 finish.
- F. Patch and finish existing gypsum board surfaces to match new surfaces. Finish to nearest joint, corner, or other break line.

3.5 TOLERANCES

- A. Install gypsum board with 1/8 inch (3 mm) in 10 feet (3050 mm) maximum variation from plane in any direction.

END OF SECTION

DIVISION 09 FINISHES

SECTION 093000

TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior wall tile.
 - 2. Interior floor tile.
 - 3. Crack isolation membranes.
 - 4. Tile backing board.
- B. Related Sections:
 - 1. 024119 - Selective Demolition: Preparation of existing substrates.
 - 2. 092900 - Gypsum Board: Substrate.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A108.1 - Ceramic Tile Installed with Portland Cement Mortar.
 - 2. A108.5 - Installation of Ceramic Tile With Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
 - 3. A108.6 - Installation of Ceramic Tile With Chemical-Resistant, Water Cleanable Tile-Setting and Grouting Epoxy.
 - 4. A108.10 - Installation of Grout in Tilework.
 - 5. A118.3 - Chemical Resistant Water Cleanable Tile-Setting and Grouting Epoxy.
 - 6. A118.4 - Latex-Portland Cement Mortar.
 - 7. A137.1 - Ceramic Tile
 - 8. B101.3 - Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials.
- B. Tile Council of North America (TCNA):
 - 1. Handbook of for Ceramic Tile Installation, current edition.
 - 2. 137.1 - Recommended Standard Specifications for Ceramic Tile.
- C. Tile, Terrazzo and Marble Association of Canada (TTMAC)
 - 1. Tile Installer Technical Handbook, current edition.
 - 2. Tile Specification Guide, current edition.

1.3 DEFINITIONS

- A. Expansion Joints: Unless otherwise detailed, expansion joints in tile fields are sealant-filled joints to accommodate expansion and contraction of tile and possible substrate movement at slab control and construction joints.
- B. Reinforced Waterproofing Membrane: Proprietary waterproofing membrane system installed in combination with tile application, as part of the ceramic tile work.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data: Submit for each type of tile, grout, adhesive, additive, accessory, and membrane specified.

- C. Samples:
 - 1. Tile: Submit samples of each type and color of tile. Include representative range of colors and finishes to be expected.
- D. Certifications:
 - 1. For each type of tile indicated, submit master grade certificates prior to the arrival of the shipment to the job site.
 - 2. For each type of tile indicated, submit certification that tile has successfully passed ANSI B101.3.
 - 3. Where required by jurisdictional authorities, for each type of tile indicated, submit certification that tile has successfully passed ANSI 137.1 test method for measuring dynamic coefficient of friction.

1.5 QUALITY ASSURANCE

- A. Conform to ANSI Standard Specifications for the Installation of Ceramic Tile.
- B. Pre-Installation Conference:
 - 1. In accordance with Section 013119, schedule and administer a meeting to review and discuss the tile installation a minimum of one week (7 calendar days) prior to start of setting tile.
 - 2. Require in attendance, the tile installer, and other parties affected by work of this Section.
 - 3. Agenda: Address installation scheduling and procedures, coordination, preparation and protection requirements, grout and expansion joint locations, tile quantities required, material and installation tolerances, overage required for waste, overage for maintenance stock, sealant joint locations.
- C. Tile backing board shall be in compliance with requirements of local jurisdictional authorities.
- D. Finished tile floor shall meet the dynamic coefficient of friction requirements specified.
- E. Obtain materials from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties.
- F. Execute Work of this Section using qualified personnel skilled in ceramic tile installation, having a minimum of five (5) years proven experience and have completed tile installations similar in material, design, and extent to that indicated for this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. In accordance with Section 016000.

1.7 GUARANTEE

- A. In accordance with Section 017700, furnish from the tile installer, a two year written guarantee, executed to the Owner, against defects in workmanship and materials.

1.8 MAINTENANCE

- A. Extra Stock: Furnish extra stock as required by Construction Manager.

PART 2 - PRODUCTS

2.1 TILE

- A. Tile Types:
 - 1. Furnish tile manufactured in accordance with ANSI A137.1.
 - 2. Dynamic Coefficient of Friction: Not less than 0.42 in accordance with ANSI B101.3.
 - 3. Types as indicated on the drawings.
- B. Special Shapes: Unless otherwise indicated or specified, furnish special shapes as standard with the tile manufacturer for uniform transitions and concealed edges in the finished installation. Special shapes include bullnoses, double bullnoses, corner bullnoses, and cove assemblies.

2.2 ACCESSORY MATERIALS

A. Setting Materials:

1. Thinset Mortar: Latex modified; "Kerabond" with "Universal Keralastic" by Mapei Corp., "211 Crete Filler Powder" with "4237 Latex Thin-set Mortar Additive," by Laticrete International, Inc., Hydroment "Tile-Mate Premium" with "447 Flex-a-lastic" by Bostik, or approved.
2. Rapid-Set Thin Bed Mortar: Latex modified; "Grani/Rapid" with "KER 318" Flexible Admixture" by Mapei Corp., Hydroment "Single Flex FS," by Bostik, or "211 Crete Filler Powder" with "4237 Latex Thin-set Mortar Additive" and "101 Rapid Set Latex"(proportions as recommended by the manufacturer for the setting time required)," by Laticrete International, Inc..
3. Medium Bed Mortar: "Grani/Rapid" by Mapei Corp., Hydroment "Medium Bed Mortar" by Bostik, or "226 Thick Bed Mortar Mix" with "3701 Latex Mortar Admix," by Laticrete International, Inc., or approved.
4. Rapid Set Medium Bed Mortar: "Grani/Rapid" by Mapei Corp., or "211 Crete Filler Powder" with "3701 Latex Mortar Admix" and "101 Rapid Set Latex" (proportions as recommended by the manufacturer for the setting time required), by Laticrete International, Inc., or approved.

B. Cementitious Sanded Grout:

1. Fast Setting: "Ultra/Color" by Mapei Corp., "Floor Joint and Grout Filler" with "3701 Latex Mortar Admixture" and "101 Rapid Set Latex", by Laticrete International, Inc. (proportions as recommended by the manufacturer for the setting time required); sanded, except unsanded at joints scheduled at 1/16 inch (1.5 mm) wide.
2. Standard Grout: "Keracolor S" by Mapei Corp., or "1500 Series Sanded Grout" with "1776 Grout Admix Plus;" "101 Rapid Set Latex", by Laticrete International, Inc., Hydroment "Ceramic Tile Grout /Joint Filler" with "425 Flexible Grout Admixture" by Bostik; sanded, except unsanded at joints scheduled at 1/16 inch (1.5 mm) wide.
3. Colors: As selected by the Architect from the manufacturer's standard line.

C. Cementitious Unsanded Grout:

1. Standard Grout: "Keracolor U" by Mapei Corp., or "1600 Series Unsanded Grout" with "1776 Grout Admix Plus" or "101 Rapid Set Latex", by Laticrete International, Inc., Hydroment "Ceramic Tile Grout /Joint Filler" with "425 Flexible Grout Admixture" by Bostik.
2. Colors: As selected by the Architect from the manufacturer's standard line.

D. Epoxy Grout: Mapei "Kerapoxy," Bostik Hydroment "100% Solids Epoxy Grout," Laticrete International Inc. "Latapoxy SP100," or approved. Colors as selected from manufacturer's standard.

E. Crack Isolation Membrane: One of the following.

1. "NobleSeal CIS," by The Noble Company; reinforced CPE sheet membrane; 36" (915 mm) width; NobleBond 21 adhesive.
2. "Dal-Seal CIS." By Dal-Tile Corp.
3. "ECB Membrane," by N.A.C. Products Inc.; self bonding reinforced modified asphalt sheet membrane; 36" (915 mm) width.
4. "Mapelastic SM" by the Mapei Corp.

F. Tile Backing Board and Accessories:

1. Cementitious Backing Board:
 - a. 1/2 inch nominal thickness aggregated portland cement panel, reinforced with glass fiber mesh;
 - b. "Durock Brand Cement Board" by USG (800-874-8968, "Wonderboard" by Custom Building Products (800-272-8786), or approved.
2. Gypsum Backing Board (moisture resistant core wall board): Georgia Pacific (800-225-6119) "DensShield," or approved; 5/8 inch thickness.
3. Joint Tape: Open weave glass mesh joint tape, self-adhesive; 2-1/2 inches (63.5 mm) wide.
4. Fasteners: As recommended by the backing board manufacturer; thread forming self-drilling wafer head screws; polymer coated or zinc plated; USG "Durock Screws," "Rock-On," or approved.

G. Grout Release: High-performance water-soluble; one of the following or approved:

1. "Ultra Care Grout Release" by Mapei.
2. "Aqua Mix Grout Release" by Custom Building Products.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.
- C. Verify that locations of expansion joints, control joints, and construction joints in substrate correspond to tile expansion joint locations.
- D. Verify that tile subject to color variations has been blended in the factory and packaged so tile units taken from one package show the same range of colors as those taken from other packages. If not factory blended, blend tiles at site before installing.
- E. Verify that back of tile is free from contamination before installation.
- F. Verify that concrete substrates have been allowed to cure for a minimum of 28 days.
- G. Where cementitious backing board is indicated as substrate for wainscot, shim as necessary to align with gypsum board above.

3.2 PREPARATION

- A. Clean substrate surfaces free of grease, dirt, dust, organic impurities, and other materials which would impair bond. Where curing agents have been used mechanically abrade or shotblast substrate surface.
- B. Use trowel-able levelling and patching compounds in accordance with tile setting material manufacturer's written instructions to fill cracks, holes, and depressions.
- C. Remove protrusions, bumps, and ridges by sanding or grinding.
- D. Maintain tile materials and substrate temperature between TTMAC recommended minimum and maximum temperature range, unless indicated otherwise by manufacturer, for 48 hours before and during installation until materials are fully set and cured as follows:
 - 1. Epoxy materials: 59°F (15°C) to 77°F (25°C)
 - 2. Cementitious materials: 54°F (12°C) to 100°F (38°C)
 - 3. Maintain temperatures after installation for time period recommended by setting and grouting materials manufacturer.
- E. Hoard and heat areas to receive tile finishes for a minimum of 48 hours before Work of this Section starts during winter months or at any other time when there is a risk that surface temperatures may drop below minimum recommended temperatures.
- F. Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.

3.3 TILE BACKING BOARD INSTALLATION

- A. Use cementitious backing board, except where gypsum backing board is indicated.
- B. Comply with requirements of TTMAC Tile Specification Guide and parts of ANSI A108 Series of tile installation standards that apply to types of setting and grouting materials, and to methods required for complete ceramic tile installation.
- C. Install in accordance with the manufacturer's installation instructions.
- D. Install units with edges firmly supported.
- E. Screw attach units with 1 inch (25.4 mm) long drywall screws spaced 6 inches (150 mm) on center along framing.
- F. Install fiberglass reinforcing tape at joints between panels. Completely embed in a thin set mortar bed. Trowel mortar smooth with adjacent surfaces.

3.4 SLAB LEVELING

- A. Prior to installation of thinset floor tile, where local irregularities in the substrate surface would prevent level installation of the tile, the substrate shall be brought to plane surface with variations not to exceed 1/8 inch (3 mm) in 4 feet (1200 mm) (cumulative) and 1/4 inch (6 mm) in 10 feet (3050 mm) (non-cumulative). Smooth abrupt changes in plane.
- B. Use thinset mortar or other cementitious filler for slab leveling. Other fillers are subject to endorsement by the setting mortar manufacturer. Submit manufacturer's letter of approval to the Architect, and the Owner's Representative.
- C. Screed or float to appropriate thickness and specified surface tolerance. Allow to set prior to proceeding with installation. Do not exceed the maximum thicknesses for thin bed mortar as recommended by the manufacturer.

3.5 CRACK ISOLATION MEMBRANE

- A. Install crack isolation membrane in accordance with the manufacturer's instructions, unless indicated or specified otherwise.
- B. Provide crack isolation membrane at following locations:
 - 1. At control and construction joints in concrete floors.
 - 2. At changes in substrate materials.
 - 3. On each side of building floor joint cover assemblies installed in grouted pockets; extend a minimum of 12 inches (300 mm) beyond grouted pocket.
 - 4. Shrinkage cracks 1/16 inch (19 mm) or larger in slabs.
- C. Extend a minimum of 12 inches (300 mm) each side of crack or joint.
- D. Do not apply crack isolation membrane at joints which will be reflected as expansion joints in the tile.
- E. Omit crack isolation at floors indicated for waterproof membrane.
- F. Substrate Examination:
 - 1. Substrates are subject to examination by the Owner and the Architect prior to installation of tile or slab leveling materials. Furnish a minimum of 7 days notice.
 - 2. The examination will determine the need for additional crack isolation membrane at shrinkage cracks and other special conditions.
 - 3. Provide additional crack isolation membrane in locations as directed, in accordance with provisions of Section 012200.

3.6 INSTALLATION OF TILE

- A. Interior Floor Application - Thinset over Concrete Substrate and Concrete Substrates with Waterproof or Crack Isolation Membrane.
 - 1. TCNA System: F113 or F122 at Waterproof Membranes.
 - 2. Installation Standard: ANSI A108.5.
 - 3. Setting Materials: Thinset mortar; 3/32 inch (28.5 mm) minimum thickness.
 - 4. Use cementitious sanded grout unless indicated otherwise.
 - 5. Use epoxy grout at service areas behind counters.
- B. Interior Floor Application - Thickset Over Concrete Substrate:
 - 1. TCNA System: F112.
 - 2. Installation Standard: ANSI A108.1.
 - 3. Bond Coat: Thinset mortar over thickset mortar bed; 3/32 inch (28.5 mm) minimum thickness.
 - 4. Slope the mortar bed evenly to the floor drains.
 - 5. Use cementitious sanded grout unless specified otherwise.
 - 6. Use epoxy grout at service areas behind counters.
- C. Wall Application - Gypsum Board Substrate:
 - 1. TCNA System: Similar to W243.
 - 2. Installation Standard: ANSI A108.5.
 - 3. Setting Materials: Thinset mortar.
 - 4. Use cementitious sanded grout unless indicated otherwise.

- D. Wall Application - Tile Backing Board:
1. TCNA System: Similar to W244.
 2. Installation Standard: ANSI A108.5.
 3. Setting Materials: Thinset mortar.
 4. Use cementitious sanded grout unless indicated otherwise.
- E. Joint Pattern:
1. Lay out tile pattern prior to commencing tile installation.
 2. Accurately locate grout joints on lines indicated; where not indicated, adjust grout joints within specified tolerances to minimize use of cut tiles at field edges.
 3. Where cut tiles are necessary, position tile such that cut tile at each edge of each rectilinear field is not less than half of a full size unit, unless indicated otherwise.
- F. Tiles which exhibit directional patterns shall be set with grain direction as indicated on the shop drawings, or, if not indicated, as directed by the Architect.
- G. Install tiles aligned with adjacent finishes, where indicated. Provide mortar fill as necessary for proper alignment.
- H. Clean joints of mortar to minimum depth of 1/4 inch (6 mm) to allow subsequent grout installation.
- I. Provide temporary setting buttons and shims as necessary to maintain wall tiles in position until setting mortar has set.
- J. Make joints between tile sheets the same width as joints within tile sheets so joints between sheets are not apparent in finished Work.
- K. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.
- L. Chipped or split edges are not acceptable.
- M. Sound tiles after setting material have cured and replace hollow sounding tile before grouting.
- N. Tolerances:
1. Joint Width Variation: Plus or minus 25 percent of the proposed joint width.
 2. Taper: Plus or minus 25 percent from one end to the other.
 3. No portion of a tile surface shall vary more than 1/16 inch (1.5 mm) above or below an adjacent tile surface.
 4. Install tile fields level to within tolerance specified for finished substrate.
- O. Special Requirements for Large Format Tiles (8 x 8 inch (200 x 200 mm) size or larger):
1. Wash backs of each tile to remove dust and soil that would compromise adhesion.
 2. Dampen substrate as necessary to prevent excessive suction.
 3. Key the mortar into the substrate with the flat side of the trowel.
 4. Comb mortar over the previously keyed substrate in one direction using the notch side of the trowel.
 5. Firmly press each tile into the mortar. Press down and move the tile back and forth perpendicularly across the ridges approximately 1/8 (3 mm) to 1/4 inch (6 mm) to flatten the ridges and fill in the valleys of the combed mortar.
 6. Set tiles in accurate alignment.
- P. Screed Installation:
1. Install screeds at tile field edges at the locations indicated.
 2. Accurately cut to length for flush tightly butted joints. Provide miter cut angle joints. Remove burrs at field cuts.
 3. Install in longest possible lengths, except that no screed section shall be longer than 12 feet or shorter than 4 feet in length for continuous runs greater than 16 feet.
 4. Install screeds free from waves and variations in height, flush with top of adjacent tile surfaces.
 5. Set screeds directly in setting bed as the tile installation proceeds. Comply with screed manufacturer's instructions to achieve mortar tightly compacted between screed and tile edge.
 6. Grind screed joints as necessary to correct minor misalignment and to ease sharp outside corners.

3.7 EXPANSION JOINTS

- A. Place expansion joints at maximum 30 foot (9 m) intervals for interior installations.
- B. Place expansion joints at control and expansion joints in concrete slabs, and at intersections with walls and columns.
- C. Joint Sizes: Set to match width of typical grouted joint; but in no case less than 1/4 inch (6 mm).
- D. Leave expansion joints free of mortar.
- E. Sealant materials and installation are specified in Section 079200.

3.8 GROUTING

- A. Comply with provisions of ANSI A108.10 and the requirements of the Terrazzo, Tile and Marble Association of Canada (TTMAC).
- B. Apply grout release to tiles prior to grouting. Use on all natural stone, non-glazed porcelain/ceramic tiles, masonry and quarry tiles. Use also at rough, textured and other difficult-to-grout surfaces. Use at all epoxy grout installations.
- C. Mix grouts in accordance with manufacturer's instructions.
- D. Grout joints, except expansion joints, in accordance with the manufacturer's recommendations. Float joints to a slightly concave profile.
- E. Remove excess grout from tile surfaces in accordance with the grout and tile manufacturer's recommendations. Do not use excess amounts of water.
- F. Protect adjacent surfaces from damage caused by cleaning agents. Do not use cleaners which would damage tile or grout surfaces.
- G. Do not grout joints indicated to receive sealants, including inside right angle corner joints between floors and walls of column bases. Grout joints perpendicular to expansion joints shall be finished flush with tile edges.
- H. Remove grout release from affected tiles in accordance with manufacturer's instructions.
- I. Cured grout joints shall be made free of efflorescence, prior to sealing.
- J. Only use epoxy grout in service areas and for restroom tiling.

3.9 CURING

- A. Cure installation in accordance with the grout manufacturer's recommendations. Protect tile and grout during curing operations.
- B. Protect tile surfaces during curing. Keep traffic off tile surfaces for a minimum of 4 days, unless recommended otherwise by the grout or mortar manufacturer.
- C. Do not allow the operation of walk-in coolers and freezers for a minimum of 14 days after tile installation in these areas.

3.10 PROTECTION

- A. Protect tile installations from damage, in accordance with Section 015000.
- B. Replace damaged tiles.

3.11 CLEANING

- A. In accordance with Section 015000 and Section 017700.
- B. Coordinate final cleaning with work of Section 079200. Do not begin cleaning operations until tile expansion joints sealants are fully cured.
- C. Where grout staining has occurred, clean tile in accordance with manufacturer's instructions.
- D. Prior to substantial completion, wash and thoroughly rinse tile. Leave tile surfaces clean.

END OF SECTION

DIVISION 09 FINISHES
SECTION 095113
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Suspended acoustical ceilings.
- B. Related Sections:
 - 1. 092200 – Lightgauge Metal Support Framing: Adjacent overhead structure.
 - 2. 092900 - Gypsum Board: Adjacent wall and ceiling surfaces.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000. Requests for substitution of ceiling panels shall be accompanied by samples of each proposed panel.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A641-98 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 2. E84 - Test Method for Surface Burning Characteristics of Building Materials.
 - 3. C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panels Ceilings.
 - 4. C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - 5. E580 – Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
- B. International Building Code (IBC) or National or Provincial Building Code as applicable.
- C. Ceilings & Interior Systems Construction Association (CISCA):
 - 1. Recommendations for Direct Hung Acoustical Tile and Lay-in Panel Ceilings – Seismic Zones 0-2.
 - 2. Guidelines for Seismic Restraint Direct Hung Acoustical Tile and Lay-in Panel Ceilings – Seismic Zones 3&4.
- D. Underwriter's Laboratories of Canada (ULC):
 - 1. CAN/ULC-S102 – Surface Burning Characteristics of Building Materials and Assemblies.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
 - 1. Submit product data for each type used in the project.
 - 2. Submit signed and sealed shop drawings prepared by a structural engineer registered in the state or province of work.
 - 3. Submit for incorporation into maintenance manual complete instructions for the maintenance of ceiling materials installed in the work.

1.4 QUALITY ASSURANCE

- A. Suspension system components shall be in compliance with requirements of local jurisdictional authorities for ceiling suspension systems, as applicable
- B. Installer: Company specializing in the installation of ceiling systems specified with a minimum (5) years proven experience for projects of similar size and complexity.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature of 60 degrees F (15 degrees C), minimum, and humidity of 70 percent, maximum, prior to, during, and after installation.

1.6 SEQUENCING/SCHEDULING

- A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Schedule installation of acoustic units after interior wet work is dry.
- C. Coordinate layout of grid framing and ceiling panels with mechanical and electrical services and fixture.

1.7 EXTRA STOCK

- A. Furnish 5 percent extra quantity of acoustical panel units under provisions of Section 017700.
- B. Store spread out above ceiling in Workroom.

PART 2 - PRODUCTS

2.1 SUSPENSION SYSTEMS

- A. Exposed T System: ASTM C635, intermediate duty classification; direct hung; exposed "T" design; 9/16" (14 mm) face; factory baked on finish to match acoustical panels. Furnish stabilizer bars, splices, edge and wall moldings, and other items as necessary to complete suspended ceiling grid system.

2.2 ACOUSTICAL PANELS

- A. Acoustic panels are scheduled on the Drawings.
- B. Panels shall meet a flame spread of 25 or less when tested in accordance with ASTM E84 in the US and CAN/ULC-S102 in Canada.

2.3 ACCESSORIES

- A. Suspension Accessories:
 - 1. Hanger Wire: ASTM A641; soft temper; prestretched; 12 gauge; zinc coated.
 - 2. Carrying Channels: 16 ga x 1-1/2" (38 mm) cold rolled steel; galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

- A. Coordinate the location of hangers with other work. Ensure hangers are located to accommodate fittings and units of equipment which are to be placed after the installation of ceiling grid system.

3.3 INSTALLATION OF SUSPENDED CEILING SYSTEMS

- A. Install after major above-ceiling work is complete.
- B. Install system in accordance with the applicable Building Code as amended by local jurisdictional authorities,
- C. Install grid to produce finished ceiling true to lines and levels indicated, within the specified tolerances.

- D. Install suspension systems in a manner to support all superimposed loads, with maximum permissible deflection of $1/270$ of span. At locations where partitions extend to ceiling, only, install supplementary diagonal bracing to structure at maximum 8'-0" (2550 mm) o.c. along length of partition, and above each door hinge and strike jamb
- E. Hang system independent of walls, columns, ducts, pipes and conduit. Where ducts or other equipment prevent the regular spacing of hangers, provide secondary carrying members for indirect support of the suspension system, or reinforce the nearest adjacent hangers and related carrying channels as required to span the required distance.
- F. Center system on room axis according to reflected ceiling plans.
- G. Anchorage:
 - 1. Provide all anchors required for the installation of the ceiling system.
 - 2. Do not fasten to the upper flutes of metal decking. Do not use fasteners in steel deck which penetrate more than 1 inch (25mm).
 - 3. Verify location of all conduit in poured concrete construction before making attachments.
- H. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Fabricate edge moldings to fit the surfaces encountered.
- I. Form expansion joints as detailed. Maintain visual closure.
- J. Fit acoustic lay-in panels in place, free from damaged edges or other defects detrimental to appearance and function. Fit border units neatly against abutting surfaces. Scribe and mill recessed tegular edge into partial border units supported at edge by wall molding.
- K. Adjust sags or twists which develop in the ceiling system and replace parts which are damaged or defective.
- L. Install hold-down clips to retain panels tight to grid system within 20 ft (6 m) of an exterior door.
- M. Tolerances:
 - 1. Variation from Flat and Level Surface: $1/8$ inch (3 mm) in 12 ft (3.5 m).
 - 2. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

3.4 CLEAN-UP

- A. Remove fingerprints and soil from ceiling materials. Use cleaning materials recommended by the manufacturer of the ceiling materials.

END OF SECTION

DIVISION 09 FINISHES
SECTION 097733
REINFORCED PLASTIC PANEL WALL COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforced plastic panel wall covering.
 - 2. Adhesives, sealants, and related accessories.
- B. Related Sections:
 - 1. 064000 – Architectural Woodwork: Honeycombed resin panels
 - 2. 092900 - Gypsum Board: Substrate.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM): E84 - Test Method for Surface Burning Characteristics of Building Materials

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data:
 - 1. Product literature on adhesives and sealants to be used in conjunction with panel system installation.
 - 2. Manufacturer's product literature for system components.
- C. Samples:
 - 1. Three samples of wall paneling material proposed for the work; 3 x 4 inch (75 x 100 mm) minimum size.
 - 2. One each of each cap, corner, and division molding proposed for the work; minimum 4 inches (100 mm) in length.

1.4 QUALITY ASSURANCE

- A. Panel system shall be USDA approved for use in food preparation and service areas.

1.5 SUBCONTRACTOR GUARANTEE

- A. Furnish Subcontractor Guarantees in accordance with Section 017700.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Section 016000.

1.7 ENVIRONMENTAL CONDITIONS

- A. Maintain a minimum temperature of 60 degrees F (15 degrees C) and relative humidity as prescribed by the adhesive manufacturer, during installation, and until installed adhesive is fully cured.
- B. Allow no containers of adhesive to be opened until all potential sources of flame or spark have been shut down or extinguished and until warnings against their ignition during adhesive application have been posted.

- C. Provide ventilation to disperse fumes during application of solvent based adhesive.

PART 2 - PRODUCTS

2.1 PANEL SYSTEM COMPONENTS

- A. Panel Material:
 - 1. Manufacturer/Type:
 - a. Marlite Brand Class I/A Fire Rated FRP by Marlite (Dover, OH 330/343-6621
 - b. Fire-X Glasbord with Surfaseal, by Kemlite Company (Joliet, IL 800/435-0080
 - c. Panolam FRP by Panolam Industries (Shelton, CT 877/726-6526).
 - d. Plastex NRP by Parkland Plastics (Middlebury, IN 800/835-4100).
 - e. Glasliner FRP by Glasteel (Moscow, TN 800/238-5546).
 - f. Glasbord with Surfaseal FRP by Crane Composites (Channahon, IL 800/435-0080).
 - 2. Color: As scheduled in the Finish Legend.
 - 3. Panel Type: Fiberglass reinforced polyester panels, with embossed textured face.
 - 4. Thickness: 3/32 inch (2.3 mm). (Match existing thickness.)
 - 5. Size: 48 inches (1220 mm) x length required for conditions indicated.
 - 6. Fire Rating: Maximum 25/450 flame spread / smoke developed in accordance with ASTM E84 and CAN/ULC S102.
- B. Moldings: Manufacturer's standard PVC cap, corner, and division moldings; color to match panels.
- C. Adhesive:
 - 1. Sustainability Requirements: Adhesives shall meet the requirements of the Southern California South Coast Air Quality Management District (SCAQMD) Rule 1168. (maximum VOC content of 250 grams/liter, using the method of dividing the weight of the solvent in the adhesive by the volume of the material, less water
 - 2. For Panel Installation: Marlite Brand C-375 or C-551 Construction Adhesive by Marlite, or 444 Non-Flammable F.R.P. Panel Adhesive by W. W. Henry Company,
 - 3. For Molding Installation: Marlite Brand C-375 C-551 Adhesive by Marlite, or 444 Non-Flammable F.R.P. Panel Adhesive by W. W. Henry Company.
 - 4. Furnish adhesive spreaders with 3/16 inch (4.7 mm) V-notches, 5/16 inch (8 mm) apart for application of adhesive to panels.
- D. Sealant: Flexible waterproof sealant for bedding panel edges, Marlite Brand Silicone Sealant MS-251 by Marlite, or Silicone Sealant S255C by Kemlite Company.

PART 3 - EXECUTION

3.1 CONDITION OF SURFACES

- A. Substrate: Verify that drywall substrate is clean, dry, solid, straight, and free from projections.
- B. Where conditions require installation of paneling prior to installation of flooring, coordinate with other trades to establish accurate location of top of base.
- C. Do not start work until other work requiring penetration of wall covering has been completed, or accurately located.
- D. Commencement of plastic paneling wall covering work constitutes installer's acceptance of the substrate.

3.2 CUTTING AND FITTING

- A. Cut panels accurately to size with proper allowance for expansion and moldings.
- B. Sand or file all edges smooth without chipping.
- C. Cut openings for penetrations in accurate location with approximate 1/8 inch (3 mm) clearance around penetrations.

3.3 INSTALLATION

- A. Install base molding to wall at proper elevation, in solid bed of adhesive. Allow adhesive to set thoroughly prior to installation of paneling.
- B. Seal base molding to top of wall base.
- C. Establish centerline of each distinct flat area to be covered. Trim division moldings to mate with base moldings; install in solid bed of adhesive, either on centerline, or offset 24inches (610 mm) from center, as necessary to maximize panel widths at corners. Molding shall be installed straight and plumb.
- D. Cut top cap and division or corner moldings to shape, with edges trimmed to fit to adjacent moldings.
- E. Apply sealant into installed moldings in sequence with panel installation.
- F. Apply adhesive to backs of panels in accordance with the manufacturer's recommendations.
- G. Maintain lines and levels of panel edges and moldings.
- H. Allow 1/8 inch (3 mm) gap between top cap, corner, or division molding posts, and panel edge; all edges shall be firmly bedded to the moldings in sealant.
- I. Promptly remove sealant squeeze out with a damp cloth, as work progresses; remove adhesive with appropriate solvent.
- J. Install sealant behind flanges and at penetrations through paneling, and between top cap of panel and substrate.

3.4 CLEANING

- A. Inspect surfaces of paneling and remove excess adhesive from face of laminate using solvent recommended by manufacturer.
- B. Promptly remove unused cut pieces from the site.
- C. Prior to substantial completion of each area where reinforced plastic panel wall covering is installed, clean all surfaces of plastic panels, using procedures recommended by the manufacturer.

END OF SECTION

DIVISION 09 FINISHES
SECTION 098100
ACOUSTIC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustical insulation in walls.
 - 2. Acoustical sealant.
- B. Related Sections:
 - 1. 078400 - Firestopping: Fire rated penetration seals.
 - 2. 092200 – Lightgauge Metal Support Framing: Support framing.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 2. E84 - Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product data for each product.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acoustical Insulation: ASTM C665, Type I; unfaced glass fiber batts, blankets, or rolls; minimum fire hazard classification rating of 25/50 per ASTM E84; minimum 3-1/2-inch (89 mm) thick, unless required otherwise to meet the STC requirements indicated or specified; formaldehyde free.
 - 1. For Installation in Stud Walls: Widths to friction-fit between studs
- B. Acoustical Sealant: Non-hardening, low-shrinkage; for use in conjunction with gypsum board; similar to USG "Sheetrock Brand Acoustical Sealant," Tremco "Acoustical Sealant 30CTG," Quiet Solution (Sunnyvale CA; ; 408-541-8000) "QuietSeal QS-350," or approved; maximum VOC content 250g/L.
- C. Accessories: Furnish other accessories such as fasteners and retainers, not specifically described, but required for a complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence.
- B. Notify the Construction Manager in writing of conditions detrimental to the proper and timely completion of the work.
- C. Do not begin work until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 PREPARATION

- A. Verify that adjacent materials are secure, properly spaced, dry, and ready to receive installation.
- B. Verify that mechanical and electrical services within spaces to insulated have been installed and tested.
- C. Furnish acoustical insulation to hollow metal installer for installation in hollow metal frames in acoustical partitions.

3.3 INSTALLATION

- A. Install insulation in stud cavities in accordance with manufacturer's instructions, and as indicated. Coordinate with other trades as necessary to complete acoustical barriers at wall penetrations.
- B. Install insulation without gaps or voids.
- C. Trim insulation neatly to fit spaces. Use insulation materials free of damage.
- D. Sealant:
 - 1. Install acoustical sealant continuously around perimeter of all acoustically insulated partitions; one continuous bead at each side of framing member interface with substrate.
 - 2. Except for penetrations in fire rated construction to receive firestopping or fire rated construction joint assemblies, seal all penetrations through acoustical assemblies, including cutouts for lighting fixtures, cabinets, pipes and plumbing, HVAC ducts, and electrical boxes.

END OF SECTION

DIVISION 09 FINISHES
SECTION 099023
INTERIOR PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Site applied interior paint coatings.
- B. Related Sections:
 - 1. 064000 - Architectural Woodwork: Shop finished materials.
 - 2. 081113 - Hollow Metal Doors and Frames: Pre-primed metal surfaces.
 - 3. 081400 - Wood Doors: Prefinished doors.
 - 4. 092900 - Gypsum Board: Substrate finishing.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. Master Painters Institute (MPI): Architectural Painting Specification Manual, current edition.
- B. Steel Structures Painting Council (SSPC).

1.3 DEFINITIONS:

- A. Sheen: Degree of luster of the dried paint film. Where terms such as "gloss," "semi-gloss," "low-gloss," "matte," "satin," "eggshell," or "flat," are used, it shall be subject to the Construction Manager interpretation, regardless of manufacturer's nomenclature for any particular sheen level. The Construction Manager reserves the right to select from any of manufacturer's published sheen levels for each paint system, if sheen of initial paint finish sample is not approved.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
 - 1. If requested, provide for approval three 8"x10" (200 mm x 250 mm) samples of each color on the actual base material. Colors shall be exact shade, texture and gloss value.
- B. Contract Closeout Submittals: Record Paint Samples: In accordance with Section 017700, submit three 8"x10" (200 mm x 250 mm) samples of each paint and color used, indicating paint manufacturer and formula number; bind in identical sets. Deliver to on site location as directed.

1.5 QUALITY ASSURANCE

- A. Applicator: Company specializing in commercial painting and finishing with a minimum of three years documented experience.
- B. Environmental Requirements for Solvent Based Paints: Comply with the Environmental Protection Agency (EPA) requirements for volatile solvents content limitations, as applicable to each classification of coating.
- C. Visual Standards: Each distinct area of the finished work shall be free of variations in color and sheen, orange peel, runs, sags, blistering, checking, cracking, scratches, dust, dirt, bugs, and other contaminants.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. In accordance with Section 016000.

- B. Delivery: Deliver paint materials to the jobsite in sealed, original, labeled containers, each bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and/or reducing.
- C. Storage: Store paint materials in original labeled containers at a minimum ambient temperature of 45 degrees F (7 degrees C). in a secure, dry, heated and well ventilated area.
- D. Toxic, acidic, and combustible materials: Take all necessary precautionary safety measures as recommended by the material manufacturers and governing regulations.
- E. Place cotton waste, cloths, and material which may constitute a fire hazard in closed metal containers and daily remove from the site.

1.7 SITE CONDITIONS

- A. Temperature:
 - 1. Do no painting work when surface and air temperatures are below 50 degrees F (10 degrees C) or below those temperatures recommended by the manufacturer for the material type used.
 - 2. Minimum temperatures for latex finishes: 45 degrees F (7 degrees C) for interior work and 50 degrees F (10 degrees C). for exterior work, unless approved otherwise.
- B. Lighting: Maintain a lighting level of minimum 50 foot-candles (540 Lux) on the surfaces to be painted or finished.
- C. Ventilation: Provide adequate continuous ventilation.
- D. Perform no painting work when moisture content of the substrate exceeds:
 - 1. 12% for gypsum board.
 - 2. 15% for wood.
- E. Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Unless specified otherwise, furnish manufacturer's highest grade coating systems by one of the following nationally available manufacturers:
 - 1. Benjamin Moore Paint Company.
 - 2. The Sherwin-Williams Company.
 - ~~3.~~ PPG Architectural Coatings
 - 4. Tnemec Company, Inc.
 - 5. Valspar
 - 6. Rustoleum
 - 7. Master Coating Technologies (MCT)
 - 8. Parker Paint Mfg. Co., Inc.
 - 9. Zinsser Co, Inc.

2.2 INTERIOR PAINT SYSTEMS

- A. Colors: As scheduled on the Drawings.
- B. Interior Gypsum Board Substrate: One of the following.
 - 1. Manufacturer: PPG Architectural Coatings.
 - a. Primer: Dulux Lifemaster Acrylic Primer Sealer 59113.
 - b. Finish: Dulux Lifemaster Acrylic Eggshell 59311 LM9300.
 - 2. Manufacturer: Sherwin-Williams
 - a. Primer: Harmony Primer 0 VOC B11W900
 - b. Finish: Harmony 0 VOC B9 Series; Eggshell sheen
 - 3. Manufacturer: Benjamin Moore Paint Company
 - a. Primer: Ultra Spec 500 Zero VOC Interior Latex Primer (N534)

- b. Finish: Ultra Spec 500 Zero VOC Interior Eggshell Finish (N538)
- C. All Metal Substrate (unless otherwise noted below) - Interior Trim Systems: One of the following.
 - 1. Manufacturer: PPG Architectural Coatings
 - a. Metal Primer: Pitt-Tech Plus 4020 DTM Waterborne Primer.
 - b. Finish: Dulux Lifemaster Acrylic Semi-Gloss 59211 Series.
 - 2. Manufacturer: Sherwin-Williams
 - a. Metal Primer: "Pro Industrial Pro-Cryl B66" Universal Acrylic Primer; 2.5 – 5.0 mils dft 138 g/l VOC
 - b. Finish: Pro Classic Waterborne Semi-gloss dft 157 g/l VOC
 - c. Metal Primer: (DTM waterborne). Super Spec HP D.T.M. Acrylic Semi-Gloss Enamel (P29)
 - d. Finish: (Semi-Gloss) Super Spec HP D.T.M. Acrylic Semi-Gloss Enamel (P29)
- D. Walls and Trim Subject to Frequent Cleaning or Potential Abuse - Interior Waterborne Epoxy Systems: One of the following.
 - 1. Manufacturer: Tnemec Company, Inc.
 - a. Gypsum Board Primer: "Series "151 Elasto-Grip"
 - b. Metal Primer: "Series 115 Unibond DF"
 - c. Finish Coat: "Series 113 Tnemec-Tufcoat".
 - 2. Manufacturer: ICI Dulux
 - a. Gypsum Board Primer: "Ultra-Hide Aquacrylic Gripper Stain Killer Primer-Sealer 3210-1200."
 - b. Metal Primer: "Tru-Glaze-WB 4030 Waterborne Epoxy Primer"
 - c. Finish Coat: "Tru-glaze 4406 Waterborne Acrylic Epoxy Semi-Gloss."
 - 3. Manufacturer: Sherwin-Williams
 - a. Gypsum Board Primer: "Preprite Classic Primer."
 - b. Metal Primer: "Procryl Primer"
 - c. Finish Coat: "Epo-plex Multi-mil WB Epoxy".
- E. Materials not specifically noted and otherwise required for the work, such as linseed oil, shellac, thinners and the like shall be of a quality not less than that required by manufacturers of the finish materials used in the work.
- F. Products for each general purpose shall be compatible. Each system shall be products of one manufacturer wherever possible.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, inspect installed work of other trades and verify that such work is complete to the point where work of this Section may properly commence. Perform adhesion tests on factory primed items. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.

3.2 MOISTURE CHECK

- A. Check for excess moisture using an electronic moisture meter. Do not paint materials with moisture levels which would impair the bonding of finish coatings.

3.3 PROTECTION

- A. Adequately protect surfaces not to be painted, from spills, drips, over painting, and other damage caused by this work. Include surfaces within the paint storage and preparation areas.
- B. Hardware and Miscellaneous Items:
 - 1. Remove electrical outlet and switch plates, mechanical diffusers, escutcheons, surface hardware, and fittings prior to starting work.

2. Store, clean and reinstall these items upon completion of work in each area. Use materials and techniques as necessary to prevent damage to finishes on such items.

3.4 SURFACE PREPARATION

- A. Prepare surfaces by removing dirt, dust, grease, oil, moisture, and other contaminants which would impair finish adhesion.
- B. Ferrous Metal Shop Primed under other Sections: Solvent clean to remove oil and grease. Remove loose rust and blistered and peeling paint to bare metal by scraping, sanding, and wire brushing in accordance with SSPC-SP2 and SP3. Immediately retouch damaged or abraded surfaces with compatible primer. Lightly sand all shop prime painted surfaces to receive paint finish.
- C. Existing Finished Surfaces To Be Repainted:
 1. Remove loose, blistered, scaled, or crazed finishes to bare substrate; feather new work into existing work. Prepare surfaces to the nearest break line if necessary to blend new finishes with old finishes.
 2. Wash and rinse surfaces with trisodium phosphate and water or other solution required to remove remaining film, wax, oil, grease, or foreign matter which would impair bond or cause bleed through.
 3. Lightly sand, or apply a liquid deglosser on existing semi-gloss and high-gloss finishes before refinishing.

3.5 GENERAL APPLICATION REQUIREMENTS

- A. Unless specified or indicated otherwise, follow paint manufacturer's label directions for general application procedures and coverage rates.
- B. Do not apply finishes on surfaces that are not sufficiently dry. Make sure each coat of finish is dry and hard before a following coat is applied unless the manufacturer's directions state otherwise.
- C. Tint filler to match stain when clear finishes are specified; work filler well into grain and, before it has set, working perpendicularly to the grain, wipe the excess from the surface.
- D. Opaque Finishes:
 1. Apply number of coats scheduled for each application, except that additional finish coats shall be applied as necessary for complete hiding of substrate colors.
 2. Apply primer coats untinted. Where more than one coat of paint is required, tint each succeeding coat up to the final coat similar in tint, but slightly lighter in value (shade).
 3. Sand lightly between coats if necessary to achieve required finish; sand between all coats applied to wood substrates.
- E. Rollers for application and backrolling of latex paints shall have a nap of 3/8 inch (10 mm) or less.
- F. Where roller texture is scheduled for application to gypsum board surfaces, finish coats may be roller-applied, or spray applied and backrolled at Contractor's option.
- G. Factory Primed Surfaces: Apply scheduled finish system, less primer coat, except at metal fabrications scheduled for low VOC Acrylic/Polyurethane System or as necessary for patching damage to factory prime coating.
- H. Except where scheduled or indicated otherwise, the intent is to paint all new rooms and areas. Existing areas which have not been remodeled or do not have patched surfaces are not to be repainted. Where existing surfaces have been remodeled or patched the entire room is to be repainted, including the associated access panels, electrical panels, hollow metal doors and frames (both sides), and similar elements within the room.

3.6 INTERIOR PAINTING AND FINISHING SYSTEMS

- A. Gypsum Board, Gypsum Plaster, and GFRG - Latex System:
 1. System: Three coats - first coat latex primer sealer (untinted), second and third coat latex paint.
 2. Sheen: Roller texture, satin sheen, except provide flat sheen at light coves, ceilings, skylight areas, clerestory areas, interior fascias, and other light sensitive surfaces. Verify locations of each sheen with Architect before proceeding with work.

3. Application:
 - a. Use on all exposed gypsum board, plaster, and GFRG surfaces, including the exposed portions of wall surfaces between adjacent fabric covered panels and mirrors.
 - b. Provide prime coat only behind permanently mounted mechanically anchored mirrors, fabric panels, and similar elements.
 - c. Do not apply primer or paint coatings to surfaces to receive adhesively mounted mirrors or tile.
- B. Gypsum Board - Surfaces to Receive Wall covering: Apply one coat of acrylic wall size.
- C. Gypsum Wall Board - Epoxy System:
 1. System: Three coats - first coat manufacturer's recommended primer sealer, and second and third coats epoxy coating.
 2. Sheen: Semi-Gloss, unless indicated otherwise.
 3. Application: Gypsum board wall surfaces as scheduled on the Drawings.
- D. Ferrous Metal and Galvanized - Acrylic System:
 1. System: Three coats; first coat acrylic DTM primer; second and third coats latex finish. The primer may be omitted at factory primed surfaces unless otherwise indicated, except as necessary to recoat damaged or abraded preprimed surfaces.
 2. Sheen: Semi-gloss, unless indicated otherwise.
 3. Application: Interior ferrous metal surfaces including hollow steel metal doors and frames, overhead doors and frames, access doors and panels, and fire extinguisher cabinets.

3.7 CLEANUP

- A. As the work proceeds and on completion of the work, promptly remove all sealers, primers, paints and finishes where spilled, splashed or splattered in a manner not to damage the surface from which it is removed.
- B. Remove masking.
- C. Clean, or replace with new, all lamps and electrical fixtures damaged by overspray; replace with new identical components all lighting fixture louvers and reflectors damaged by overspray.

3.8 COLOR SCHEDULE

- A. Provide paint colors to match those indicated on the drawings. Where a paint color is listed from a specific manufacturer, paint products from other approved manufacturers may be used, provided the color exactly matches the specified color, and the paint system meets the specified requirements. Where no paint color is indicated, provide color and sheen as selected by the Architect.

END OF SECTION

DIVISION 10 SPECIALTIES
SECTION 104400
FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire extinguishers.
 - 2. Cabinets.
- B. Related Sections:
 - 1. 092200 – Lightgauge Metal Support Framing: Rough framing.
 - 2. 092900 - Gypsum Board: Adjacent finishes.
 - 3. 099023 – Interior Painting and Coating: Field paint finish.
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.
- D. Substitutions: Substitute products will be considered only under the terms and conditions of Section 016000.

1.2 REFERENCES

- A. National Fire Protection Association (NFPA): NFPA 10 - Portable Fire Extinguishers.
- B. Underwriter's Laboratory (UL) and Underwriter's Laboratory of Canada (ULC).

1.3 QUALITY ASSURANCE

- A. Conform to NFPA 10 requirements for extinguishers.
- B. Extinguishers shall be Factory Mutual approved and UL or ULC listed as required by the country of work.
- C. Provide fire extinguishers, cabinets, and accessories from a single manufacturer.

1.4 SUBMITTALS

- A. Make submittals in accordance with Section 013300.
- B. Product Data: Submit product literature for fire extinguisher brackets, fire extinguisher cabinets, and each type of extinguisher proposed for the work. Indicate valve and standpipe sizes and configurations as appropriate for valve cabinets.
- C. Contract Closeout Submittal: Submit manufacturer's operation and maintenance data under provisions of Section 017700. Include test, refill or recharge schedules, procedures, and re-certification requirements.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

- A. Larsen's Manufacturing Company (Minneapolis, MN; 612-571-1181).
- B. J.L. Industries Inc. (Commerce, CA; 323-726-9070).
- C. Potter Roemer (Santa Ana, CA; 714-430-5300, 800-366-3473).
- D. Williams Brothers Corporation (Scarborough, Ontario; 540-636-4444; 800-255-5515).

2.2 EXTINGUISHERS

- A. Multi-Purpose Dry Chemical Type (FE): Heavy Duty DOT Steel tank; UL/ULC rating 2A: 10B: C, 5 lb capacity, with pressure gage; red enamel finish; metal valves and siphon tubes.

2.3 TYPICAL INTERIOR CABINETS

- A. Re-install existing recessed models in locations as indicated on the Drawings.
- B. Furnish sizes as necessary to accommodate extinguishers, at locations indicated on the Drawings.
- C. Trim: Formed Sheet Steel, minimum 20 gauge; 1-1/4 to 1-3/4 inches (32 to 45 mm) wide face; square edge configuration.
- D. Door: Formed Sheet Steel, minimum 20 gauge; reinforced for flatness and rigidity; satin zinc or aluminum pull, roller catch, and continuous hinge; clear glass vision panel.
- E. Cabinet Finishes:
 - 1. Cabinet Trim and Door: Manufacturer's standard primed finish to receive paint coatings as specified in Section 099000.
 - 2. Cabinet Interior: Manufacturer's standard white epoxy or white baked enamel.
- F. Signage: Pressure sensitive letters "FIRE EXTINGUISHER"; color and font as directed by the Construction Manager or jurisdictional requirements; vertical ascending.
- G. Fire Extinguisher Brackets: Wall mount type, appropriate to the size of the extinguisher, equipped with strap and quick release clip.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting work, carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence. Notify the Construction Manager, in writing of conditions detrimental to the proper and timely completion of the work.
- B. Do not begin installation until all unsatisfactory conditions are resolved. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 INSTALLATION

- A. Install cabinets plumb and level in wall openings and secured to framing in locations as indicated. Unless otherwise indicated, install 30 inches (762 mm) from finished floor to inside bottom of cabinet.
- B. Coordinate with Section 099000 for installation of signage on cabinets.
- C. Install fire extinguisher in each fire extinguisher cabinet by brackets mounted at back of cabinet.
- D. Where fire extinguishers are indicated for wall mounting, secure bracket to wall through finish to framing or blocking and as per manufacturer's installation instructions.
- E. Fire extinguishers shall be installed, charged, tagged, and dated, not more than 30 days prior to Substantial Completion.

END OF SECTION