

Standard Specification For Installation of M4 Panels in Underlayment Application For Floors

5/1/2024

SECTION 061626

1. GENERAL

1.01 SUMMARY OF WORK

- A. Materials shall be M4 cement board panels of minimum thickness ½” and 4’ x 8’ dimension.
- B. All M4 panels for use in underlayment application for floors shall be installed over and fully supported by a structural subfloor that has been designed and built to limit deflection to a maximum of L/360 or less as determined by project architect & engineer, or as required by floor finish manufacturers.
- C. Comply with applicable building codes for wind, seismic, vibration, snow, concentrated, impact and uniformly distributed live-loads and other loading requirements as determined by the project architect and engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 060000 Wood, Plastics and Composites
- B. Section 090000 Finishes

1.03 DESCRIPTION OF M4

- A. M4 is a cementitious panel mechanically fastened to the top of a structural subfloor
- B. M4 has a factory-applied sealer on the top face for added protection against elements.
- C. M4 is designed to increase sound and fire ratings in lieu of wet topping systems.
- D. M4 shall have underlayments and floor finishes applied over it.

1.04 SUBMITTALS

- A. Submit to the project design professional a copy of M4 panels product and installation specifications for underlayments and one product sample measuring 2” x 2” minimum.

1.05 QUALITY ASSURANCE

- A. Contractor shall have successfully installed products of a similar type as this project. These past projects shall have resulted in construction with a record of successful in-service performance.
- B. During construction, the jobsite will be visited by the owner’s representative, general contractor or construction manager to confirm M4 Panels are installed per this specification.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. M4 is typically delivered to site on factory pallets bound with plastic sheet protection, and wooden pallets to facilitate forklift handling.
- B. M4 must be stored above 0° F, and on leveled dunnage not exceeding 32” on centers at all times. M4 shall be stored indoors. If temporarily stored outdoors boards must be kept dry. Elevate above ground and protect from the weather with waterproof covering. Stacking of pallets should always be on a solid stable base and never be stacked higher than 5 pallets high.
- C. Acclimatize M4 by storing on site not less than three days prior to installation.
- D. All materials supplied by others shall be delivered and stored according to their instructions.

- E. Upon delivery, inspect materials for signs of damage during transportation and mark paperwork accordingly at time of delivery. Failure to note damages during delivery will result in the rejection of any claims for damage after delivery.
- F. Deliver, store & handle materials to prevent breakage, warping or damage caused by moisture.
 - 1. When transporting loose M4 panels by truck they must be laid flat and fully protected against edge damage and protected from weather with waterproof covering.
 - 2. When hand carrying single M4 panels they must be carried on edge with the short side held vertically.
 - 3. Handle M4 with care, improper handling can damage M4.
- G. Damaged or deteriorated materials shall be removed from the premises.
- H. Material Safety Data Sheets shall be available for all materials.

1.07 PROJECT CONDITIONS

- A. Install M4 panels in underlayment application for floors over a clean, dry, level, sound structural subfloor. Subfloor shall be structurally sound, free from bows, twists or other malformations, installed correctly, and in compliance with local building code requirements and project specifications. Damaged or incorrect subfloor conditions shall be remediated before installation.
- B. During installation of M4 the temperature shall be above 0° F. Do not install boards that are frozen or contain frost. If adhesive is being used temperature shall be in compliance with limitations of adhesive manufacturer.
- C. Prior to the application of toppings, underlayments and finished flooring, M4 must be properly conditioned and within acceptable moisture levels of the floor finish manufacturer. Toppings, underlayments and finishes shall not be applied over M4 that is wet, frozen or contains frost.
- D. M4 shall be regularly cleared of snow, ice and standing water during open jobsite conditions. Use caution not to gouge, scrape or damage M4.
- E. **Do not use salt or other chemicals for anti or de-icing purposes.**
- F. **Exposure to elements in Climate Zones 6, 7 & 8 shall be limited to 90 days, otherwise exposure is limited to 180 days. Climate Zones as determined by IECC at time of install.**

1.08 SEQUENCE AND SCHEDULING

- A. Sequence the installation of M4 panels with related work specified in other sections to ensure that the floor assemblies are protected against damage or abuse during and after construction.
- B. Provide sufficient labor and equipment to properly install all materials.

2. PRODUCTS

2.01 MATERIALS

- A. Underlayment Panels: M4 panels, minimum 1/2" thick x 4' x 8' with square edges.
- B. Adhesives: Adhesive suitable to bond cement and wood and can withstand exposure to the elements such as a polyurethane or solvent based adhesive meeting ASTM D3498 / APA AFG-01.
- C. Fasteners: Nails, Screws or Staples. Fastener must be treated for corrosion resistance, and compatible for use with cement and wood substrates. Length of fastener must be long enough to adequately attach into the subfloor.
 - 1. Nails: Typical when installing over 23/32 wood subfloor is a pneumatically driven ring-shank nail diameter 0.113 inches x 1.5 inches long minimum coated for corrosion resistance, Class D, ASTM A153 Hot-Dipped Galvanized or better.
 - 2. Screws: Typical when installing over 23/32 wood subfloor is a self-countersinking, hi-lo thread screw, #8 x 1-5/8" long minimum coated for corrosion resistance such as the Grabber CHSS8158JBW, INSP158 or equal.
 - 3. Staples: Typical when installing over 23/32 wood subfloor is a 1 1/2" long x16-gauge crown staple coated for corrosion resistance, code recognized.
 - 4. Fastener heads must not protrude above the surface of M4 panels. Fastener heads must be driven flush or slightly below the surface of M4. Patch as needed.

- D. Caulks: For penetrations select appropriately rated fire-caulking as normal.

3. EXECUTION

3.01 EXAMINATION

- A. Examine substrates upon which work will be installed. Ensure they are installed correctly with proper deflection, fasteners installed correctly and driven flush with surface.
- B. The floor joists, floor framing components, and subfloor must be designed to meet the strength and deflection criteria as determined by project architect & engineer and specified in the contract documents.
- C. Framing and subfloor to receive the M4 shall be in plane, and flat per project requirements and those of selected floor-finish manufacturers.
- D. Framing and subfloor must be of good quality, free of bows, twists, sags or other malformations.
- E. Inspect the subfloor for evenness along joints and flatness between joists. When necessary, sand the subfloor including near joints; install extra blocking and re-fasten the subfloor to flatten uneven areas. Thoroughly scrape, sweep and vacuum the entire surface and strip any built-up residues / adhesives before installing the M4 panels.
- F. Check subfloors for squeaks and refasten as necessary before installing M4 panels.
- G. Verify environmental conditions are appropriate for installation

3.02 INSTALLATION

- A. Before installing M4 panels in underlayment application for floors.
 - 1. Review installation specifications with the installers so they understand how to handle and install M4 panels correctly, and how to work safely with this product during and after installation.
 - 2. Plan ahead where to install sacrificial wear surfacing such as plywood / OSB in areas of high traffic and abuse to prevent damage to the M4 during and after installation.
 - 3. Plan the layout of the M4 so board edges of the M4 are offset from the edges of the subfloor panels by minimum 12". M4 panels should be installed in a running bond pattern and should never have four corners intersecting, and no joints should land over a subfloor joint.
- B. Inspect for damage to the panels such as cracks, breaks, edge damage, etc that may have occurred during handling. Do not install panels that have been damaged.
- C. Do not install panels that are wet, frozen or contain frost. Be sure panels have dried and acclimated to project conditions.
- D. Inspect for correct thickness, dimension & finish before installation. Do not install panels that do not match as required by the specifications.
- E. Ensure that sealed face of M4 panels is facing up (labeled).
- F. Panels shall be cut to size by either scoring and snapping, or with a circular saw equipped with carbide tipped or cement cutting blade and a dry dust collection device or a water-dispensing device that limits the amount of airborne dust. Wear safety glasses and a NIOSH approved dust mask when cutting the panel. Collected dust shall be disposed in a safe manner and in compliance with local, state and federal ordinances.
- G. Remove all debris from subfloor. Check that all fasteners of the subfloor have been fully driven and flush with the surface to not damage the M4.
- H. **M4 shall be installed in a cross-laid pattern to that of the subfloor.** This means the 8' direction shall run perpendicular to the 8' direction of the subfloor.
- I. M4 joints shall be offset from subfloor joints by at least 12".
- J. Plan the layout so first and last panel rows are a minimum 12" wide.
- K. M4 panel joints should be tight to each other. Do not gap panels.
- L. Before laying down M4 panels, apply a 1/4" to 3/8" bead of construction adhesive to top of subfloor to receive the M4 panels in a 24" x 24" OC grid pattern including all M4 edges. Apply adhesive one M4 panel at a time to ensure proper bonding and to avoid 'skinning' of adhesive.

- M. Once adhesive and M4 panels have been laid down, Fasten each panel to the subfloor after it has been placed using the following fastening schedule:
1. Fastener placement shall be 12" on center long board edges, and in the field of the panel. .
 2. Fastener placement shall be a minimum 1/2" from all panel edges.
 3. Corner fasteners shall be a minimum 2" from all panel corners.
 4. Do not place one fastener in the corner.
 5. Do not place two fasteners equidistant from the corner (45 degree placement).
 6. Off-set corner fasteners by placing 2" from the corner on one edge, and 4" from the corner on the adjacent edge, while maintaining appropriate edge set-back.
 7. Begin fastening at one end of the panel and fan out across the panel. Do not fasten all the corners first.
 8. **Drive fasteners so the heads are flush with, or slightly below the surface of the board. Do not overdrive, or underdrive fasteners.**
- N. After installing one complete row of panels begin the next row. Slide panels together so that they are butted tightly together (no gaps). Install all rows in a running bond pattern, off-set by at least 12" OC. Four corners of the board should never intersect. Do not force panels together
- O. Cutouts in the panels should be made before installing the panel whenever possible. If a cutout is required after the panel is installed, set the depth of the saw blade to ensure that the subfloor and framing is not scored. Apply fire-caulk / stops as needed at penetrations to maintain fire rating.

3.03 CLEAN-UP

- A. Left over material shall be removed from the job site.
- B. Remove foreign material from floor surface and vacuum all dust from the surface.

3.04 PROTECTION

- A. Avoid concentrated point loads and impact loads on M4. Pay close attention to staging areas for building materials and/or equipment such as masonry units, hoists, framing members, sheet goods, ladders, scaffolding, tool boxes, etc.
- B. Measures shall be taken to distribute concentrated and point loads on the deck system during construction such as the utilization of pallets, dunnage, and/or structural building panels such as plywood or OSB laid over multiple spans.
- C. Workers must take extra care to avoid impacts such as dropped masonry units, framing members, scrap material, tools, equipment, etc. Such impacts can cause deforming marks, penetrations or gouge marks. Damaged panels will need repair and / or replacement
- D. **Areas that are subject to construction traffic and abuse shall be protected with sacrificial panels such as plywood / OSB until these activities have completed.**

3.05 FINISHING

- A. M4 will exhibit some natural expansion and contraction during conditioning.
- B. **Be sure that floor system is dry and has been under end-use HVAC conditioning for a minimum 48 hours or longer as required by each respective floor finish material manufacturer.**
- C. M4 moisture levels should be within acceptable range of floor finish manufacturers requirements prior to installation. Test M4 for moisture allowing time as needed to reach desired levels.
- D. Before the application of floor finish materials, ensure that all panels are properly installed with the fastener head driven flush or slightly below the surface of the panels, and that the system is level and in appropriate condition to apply finishes.
- E. Fill all voids, depressions and gaps at board joints with compatible patching or leveling compounds. Treat any areas of the floor, including joints, as required by the manufacturer of the floor finish or underlayment.
- F. Check for floor squeaks and remediate as needed.
- G. Lightly sand any surface roughness, particularly around fasteners.

- H. Plan accordingly for expansion joints as required by floor finish manufacturers.
- I. Questions or conflicts arising between manufacturer installation instructions of any floor finish, underlayment, topping or accessory to those of M4 should be directed to a technical rep before proceeding with any specification or installation.
- J. Be sure that floor design and conditioning is appropriate for each finish, including joist spacing, underlayments, installation methods, application, deflection, point loading, dead & live loading, abuse, impact loading, environment, etc.
- K. M4 installations in areas routinely washed and wet, such as commercial kitchens, exterior balconies, etc. should have an additional layer of a waterproof membrane installed over the M4, which complies with ANSI A118.10 or as otherwise approved by local building code.
- L. Any finishes or components not addressed in this specification shall be discussed with a technical representative for review before proceeding with specification or installation.

M. CARPET & PAD:

1. Carpet should be installed using tack strips designed for the installation of stretched carpet.
2. **Fasteners to be treated for corrosion resistance and long enough to fasten through the M4 and attach into the subfloor.**
3. Finally install pad and carpet per manufacturer's instructions.

N. PLANK HARDWOOD FLOORING:

1. First ensure the M4 is kept dry and maintained in a conditioned space for the minimum requirements of the underlayment and plank hardwood wood flooring manufacturer.
2. Install a layer of building paper over M4, or as otherwise approved by hardwood flooring manufacturer prior to applying the wood flooring. Once prepared install plank hardwood flooring per manufacturer instructions.
3. **Fasteners must be treated for corrosion resistance and long enough to attach into the subfloor.**

O. ENGINEERED / LAMINATE WOOD FLOORING:

First ensure the M4 is kept dry and maintained in a conditioned space for the minimum requirements of the underlayment and engineered wood flooring manufacturers. Once conditions are met install underlayments and moisture barriers as recommended for the engineered wood flooring system. Follow the finish flooring manufacturer's installation instructions.

P. VINYL / LINOLEUM FLOORING:

For the installation of vinyl or linoleum flooring first install a decoupling membrane to M4 in accordance with the manufacturer's installation instructions. Follow the finish flooring manufacturer's installation instructions.

Q. CERAMIC / PORCELAIN TILE:

For the installation of ceramic or porcelain tile install a crack isolation membrane to M4 in accordance with manufacturer's installation instructions. Follow the finish flooring manufacturer's installation instructions.

END OF SECTION