SECTION 03 54 13

GYPSUM FLOOR UNDERLAYMENTS AND SOUND CONTROL MATS

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\*\* NOTE TO SPECIFIER \*\* Hacker Industries, Inc.; floor underlayments and sound control mats.  
This section is based on the products of Hacker Industries, Inc., which is located at:  
1401 Dove St. Suite 640  
Newport Beach, CA 92660  
Toll Free Tel: 800-642-3455  
Tel: 949-729-3101  
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Email: [request info (info@hackerindustries.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Hacker+Industries,+Inc.&coid=32918&rep=&fax=949-729-3108&message=RE:%20Spec%20Question%20(03540hac):%20%20&mf=)  
Web: [http://www.hackerindustries.com](http://http://www.hackerindustries.com)   
 [ [Click Here](http://www.arcat.com/arcatcos/cos32/arc32918.html) ] for additional information.  
Hacker Industries, Inc. was established upon the simple belief that when given a choice of floor underlayments, the building community would choose the product of greater value. This basic mission statement has formed the foundation of a growing business for the past 30 years. It controls the decisions we make in suppliers, applicators and partners. Our consistent commitment has been to supply extraordinary value through the highest quality floor underlayments applied by the best Licensed Applicators. This commitment remains solid and unchanged.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Gypsum concrete floor underlayment.
    2. Deep fill cementitious leveling underlayment.
    3. Sound control mats.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section - .
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Society for Testing and Materials (ASTM):
       1. ASTM C472 - Modified Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Cement (compressive strength).
       2. ASTM C33 - Standard Specification for Concrete Aggregates (sand aggregate).
       3. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
       4. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
       5. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
       6. ASTM E413 - Rating Classification for Rating Sound Insulation.
       7. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.
       8. ASTM F2419 - Standard Practice for Installation of Thick Poured Gypsum Concrete and Preparation of the Surface to Receive Resilient Flooring.
       9. ASTM F2678 - Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Poured Lightweight Cellular Concrete Underlayments with Underlayment Patching Compounds to Receive Resilient Flooring.
    2. International Concrete Repair Institute (ICRI) CSP 3+ - International Concrete Repair Institute, Concrete Surface Profile.
    3. National Wood Flooring Association (NWFA) - National Wood Flooring Association Instructions.
    4. Tile Council of North America (TCNA) F180 - Tile Council of North America Installation Handbook.
    5. Underwriter's Laboratory (UL) Fire Resistance Directory.
    6. Hacker Industries, Inc. Installation Guide.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Environmental Information: Submit product data for LEED Credits MR 4 and MR 5, Recycled Content and Regional Materials. Provide documentation indicating percentages, by weight, of post-consumer and pre-consumer recycled content. Also provide documentation substantiating Regional Materials.
     4. Shop Drawings:

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
    2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.
    3. Closeout Submittal:
       1. Certification: Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the Architect a certificate from manufacturer and signed by the licensed applicator, stating that the material used in this work complies with the specified requirements.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
     2. Installer Qualifications:
        1. Licensed Applicator of manufacturer using mixing and pumping equipment with a water meter approved by manufacturer.
        2. Minimum 2 year experience installing similar products.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
       1. Finish areas designated by Architect.
       2. Do not proceed with remaining work until workmanship is approved by Architect.
       3. Refinish mock-up area as required to produce acceptable work.
  1. PRE-INSTALLATION MEETINGS
     1. Convene minimum two weeks prior to starting work of this section.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
     2. Materials shall be delivered in their original, unopened packages, and protected from exposure to the elements before and after delivery. Do not allow bags to get wet. Product shall not be used beyond shelf life.
  3. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
     2. Installation shall not begin until the building is enclosed, including roof, windows, doors and other openings.
  4. SEQUENCING
     1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Hacker Industries, Inc., which is located at: 1401 Dove St. Suite 640; Newport Beach, CA 92660; Toll Free Tel: 800-642-3455; Tel: 949-729-3101; Fax: 949-729-3108; Email: [request info (info@hackerindustries.com)](http://admin.arcat.com/users.pl?action=UserEmail&company=Hacker+Industries,+Inc.&coid=32918&rep=&fax=949-729-3108&message=RE:%20Spec%20Question%20(03540hac):%20%20&mf=); Web: [http://www.hackerindustries.com](http://http://www.hackerindustries.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
  1. PERFORMANCE - GENERAL
     1. Fire Resistance: Provide materials and construction identical to those tested according to ASTM E119 by an independent testing agency.
     2. Fire Hazard Classification: Flame Spread Index 0; Fuel Contribution 0; Smoke Density 0.
     3. Acoustical Performance: For STC: Provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency. For IIC: Provide materials and construction identical to those tested in assembly according to ASTM E492.
     4. UL Rated Floor/Ceiling Assembly:
        1. Gypsum concrete floor underlayment with associated accessory products shall be listed as an allowed "floor mat material" for the rated assembled scheduled or indicated in the Underwriter's Laboratory (UL) Fire Resistance Directory.
  2. GYPSUM CONCRETE FLOOR UNDERLAYMENTS

\*\* NOTE TO SPECIFIER \*\* The original FIRM-FILL Gypsum Concrete floor underlayment is designed for use in multi-family housing to satisfy acoustical ratings and fire codes. With excellent STC and IIC ratings as well as over 100 UL listings, FIRM-FILL Gypsum Concrete floor underlayment is an excellent choice for jobs needing compressive strengths up to 2000 psi.  
Recommended for Multi-Family Application / Market Apartments, condominiums, hotels, motels, dorms, commercial buildings and commercial renovation projects.  
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment: FIRM-FILL as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be from 1200 to 2000 psi (8.3 to 13.8 MPa) as scheduled.
         2. 6 to 7 gallons (22.7 to 26.5 L) of water and sand as specified per 80-pound (36.3-kg) bag of FIRM-FILL Gypsum Concrete. Do not over water. Water amount will change with wetness of sand.
         3. FIRM-FILL Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Wood subfloors: Minimum of 3/4 inch (19 mm).
         2. Precast and Poured-In-Place Concrete: Minimum of 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* For use over wood subfloors, FIRM-FILL 2010+ floor underlayment is the product of choice. It stiffens the subfloor to eliminate squeaks and nail pops and provides a solid floor while remaining safe for the environment. FIRM-FILL 2010+ floor underlayment creates additional surface hardness and compressive strengths up to 3200 psi.  
Recommended For Multi-Family Application / Market, Custom homes, light commercial buildings, hotels, & renovation projects.   
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - FIRM-FILL 2010+ as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL 2010+ Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength can be specified from 2000 to 3200 psi (13.8 to 22.1 MPa).
         2. 6 to 7 gallons (22.7 to 26.5 L) of water and sand as specified per 80-pound (36.3-kg) bag of FIRM-FILL 2010+ Gypsum Concrete. Do not over water. Water amount will change with wetness of sand.
         3. FIRM-FILL 2010+ Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Wood subfloors: Minimum of 3/4 inch (19 mm).
         2. Precast and Poured-In-Place Concrete: Minimum of 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL 3310+, a premium poured floor underlayment from Hacker Industries, Inc., delivers best in class performance with compressive strengths from 3000-3900 psi. Ideal over wood or concrete subfloors in multi-family, hospitality, and renovation projects, FIRM-FILL 3310+ maximizes sound control and creates an enhanced surface for finished floor coverings.  
Recommended for Multi-family, custom homes, commercial buildings, hotels & motels, & renovation projects.   
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - FIRM-FILL 3310+ as supplied by Hacker Industries, Inc.
       1. Application: F FIRM-FILL 3310+ Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: Washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength of FIRM-FILL 3310 Gypsum Concrete Floor Underlayment shall be from 2000 to 3300 psi (approx. 13.8 to 22.8 MPa).
         2. 4 to 5.5 gallons (15.1 to 20.8 L) of water as specified per 80-pound (36.3-kg) bag of FIRM-FILL 3310 Gypsum Concrete Floor Underlayment. Do not over water. Water amount will change with wetness of sand. Amount of sand to vary with mix.
         3. FIRM-FILL 3310+ Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Wood subfloors: Minimum of 3/4 inch (19 mm).
         2. Precast and Poured-In-Place Concrete: Minimum of 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* An innovative product that elevates gypsum concretes to an unprecedented level of unyielding performance. FIRM-FILL 3310 Classic floor underlayment's fast-setting surface rapidly eliminates water allowing for accelerated drying time and unparalleled levels of strength and finish over wood and concrete subfloors in new construction and renovation projects.  
Recommended for Multi-family, custom homes, commercial buildings, hotels & motels, & renovation projects.  
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - FIRM-FILL 3310 Classic as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL 3310 Classic Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength of FIRM-FILL 3310 Classic Gypsum Concrete Floor Underlayment shall be from 2000 to 3300 psi (approx. 13.8 to 22.8 MPa).
         2. 4 to 5.5 gallons (15.1 to 20.8 L) of water as specified per 80-pound (36.3-kg) bag of FIRM-FILL 3310 Classic 3310 Gypsum Concrete Floor Underlayment. Do not over water. Water amount will change with wetness of sand. Amount of sand to vary with mix.
         3. FIRM-FILL 3310 Classic Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Wood subfloors: Minimum of 3/4 inch (19 mm).
         2. Precast and Poured-In-Place Concrete: Minimum of 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL High Strength floor underlayment is the economical solution to correct concrete problems. It resurfaces any cracked or damaged concrete to better than new, providing surface hardness from 2500 to over 3800 psi. From feather edge to 3-1/2 inches in thickness, FIRM-FILL High Strength floor underlayment provides a durable, flat floor for virtually any finished floor covering.  
Recommended For Concrete Toppings & Self-Levelers Cracked or damaged concrete, pre-cast concrete, & cast-in-place concrete.   
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - FIRM-FILL High Strength as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL High Strength Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster, masonry sand or silica sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be specified from 2500 to 3800 psi (17.2 to 26.2 MPa).
         2. 5 to 7 gallons (18.9 to 26.5 L) of water and sand as specified per 80-pound (36.3-kg) bag of FIRM-FILL High Strength. Do not over water. Water amount will change with wetness of sand.
         3. FIRM-FILL High Strength Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. The minimum thickness of FIRM-FILL High Strength varies with the type of concrete subfloor. FIRM-FILL High Strength can be featheredged in low traffic areas over all concrete subfloors. The maximum thickness of FIRM-FILL High Strength shall be 3-1/2 inches (89 mm) in one lift.

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL 4010 floor underlayment is designed for thin capping of concrete in new construction or over damaged concrete in renovation projects. FIRM-FILL 4010 floor underlayment's high strength and superior bonding characteristics will provide concrete floors with new life and exceptional surface hardness, offering compressive strengths ranging from 4000 to 5000 psi.  
Recommended for concrete toppings & self-levelers, new concrete & cracked or damaged concrete.  
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - FIRM-FILL 4010 as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL 4010 Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker Floor Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster or masonry sand or silica sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be specified from 4000 to 5200 psi (27.6 to 35.9 MPa).
         2. 4 to 6 gallons (15.1 to 22.7L) of water and sand as specified per 80-pound (36.3-kg) bag of FIRM-FILL 4010. Do not over water. Water amount will change with the wetness of sand.
         3. FIRM-FILL 4010 Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. The minimum thickness of FIRM-FILL 4010 varies with the type of concrete subfloor. FIRM-FILL 4010 can be featheredged in transition areas over all concrete subfloors. The maximum thickness of FIRM-FILL 4010 shall be 2 inches (51 mm) in one lift.

\*\* NOTE TO SPECIFIER \*\* TRUE-SCREED Cementitious Leveling Underlayment (CLU) is a Portland cement-based underlayment that is specifically designed for projects with deep-fill requirements that need to stay on budget. TRUE-SCREED CLU provides a cost-effective method to transform cracked, uneven concrete floors into a smooth, strong surface for finished floor coverings. The product also offers exceptional surface hardness and quick drying time, keeping construction projects on schedule.  
Recommended for concrete toppings & self-levelers, cracked or damaged concrete, new construction and renovation projects, & commercial buildings.  
Delete if not required.

* + 1. Cementitious Leveling Underlayment (CLU) - TRUE-SCREED as supplied by Hacker Industries, Inc.
       1. Application: (CLU) - TRUE-SCREED Hydraulic Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker TRUE-SCREED CLU Floor Primer or approved equal.
       3. Sand: Washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* ,Required for glue down finished floors. Delete if not required.

* + - 1. Sealer: Hacker TRUE-SCREED CLU Sealer.
      2. Mix Design:
         1. Compressive strength shall be up to 6000 psi (approx. 41.4 MPa) as scheduled.
         2. 3.75 gallons (approx. 14.2 L) of water as specified per bag of TRUE-SCREED CLU Hydraulic Cement Underlayment. Do not over water. Water amount will change with wetness of sand. Amount of sand to vary with mix.
         3. (CLU) - TRUE-SCREED Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. The minimum thickness of TRUE-SCREED CLU Hydraulic Cement Underlayment varies with the type of subfloor. Over wood subfloors, a minimum of 3/4 inch (19 mm) with mechanically attached mesh is required. Over precast or poured-in-place concrete, a minimum of 1/2 inch (13 mm) is required. Can be featheredged at transitional locations. Maximum recommended thickness is 2 inches (51 mm).

\*\* NOTE TO SPECIFIER \*\* GYP-SPAN Radiant is a gypsum concrete floor underlayment designed specifically for use over radiant heating systems. It encases the hot water tubes or electrical cables without air bubbles, creating a superior thermal mass that provides uniform heat transfer. GYP-SPAN Radiant floor underlayment is the energy efficient and cost-effective way to create a smooth, flat, evenly heated floor surface for the attachment of virtually any finished floor covering.  
Recommended For Radiant Floor Heating Application / Market. Installed over radiant heating systems (electric cables or hot water tubes)  
Delete if not required.

* + 1. Gypsum Concrete Floor Underlayment - GYP-SPAN Radiant as supplied by Hacker Industries, Inc.
       1. Application: GYP-SPAN Radiant Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Thermal Performance K-value of 4.35 Btu; R-value of 0.23 ft2.h. degree F/Btu.
       3. Subfloor Primer: Hacker Floor Primer or approved equal.
       4. Sand: 1/8 inch (3 mm) or less washed plaster, masonry sand or silica sand.
       5. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be specified from 2000 to 3200 psi (13.8 to 22.1 MPa).
         2. 4 to 6 gallons (15.1 to 22.7 L) of water and sand as specified per 80-pound (36.3-kg) bag of GYP-SPAN Radiant. Do not over water. Water amount will change with wetness of sand.
         3. GYP-SPAN Radiant Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. The minimum thickness of GYP-SPAN Radiant varies with the type of radiant tubing. Install the first lift (pour) to the top of the tubing or cable. After the first lift has set-up, install the second lift (pour) 3/4 inch (19 mm) above the first lift. The minimum thickness of GYP-SPAN Radiant is 3/4 inch (19 mm) over the top of the tubes or cables.
         2. For ceramic tile installations, a crack isolation membrane shall be used as recommended by setting material manufacturer for intended use or application.

\*\* NOTE TO SPECIFIER \*\* GYP-SPAN Radiant Commercial Grade (CG) is a high strength, fast applying gypsum concrete designed for use over electrical heat cables or hot water tubes. GYP-SPAN Radiant CG locks radiant tubes in place and evenly distributes heat throughout the building. The hard surface strength allows for lasting resistance against typical commercial construction activity and provides a smooth, durable surface for finished floor coverings.  
Recommended For Radiant Floor Heating Application / Market. Installed over radiant heating systems (electric cables or hot water tubes)  
Delete if not required.

* + 1. Commercial Grade Gypsum Concrete Floor Underlayment - GYP-SPAN Radiant CG as supplied by Hacker Industries, Inc.
       1. Application: GYP-SPAN Radiant CG Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Thermal Performance K-value of 4.35 Btu; R-value of 0.23 ft2.h. degree F/Btu.
       3. Subfloor Primer: Hacker Floor Primer or approved equal.
       4. Sand: 1/8 inch (3 mm) or less washed plaster, masonry sand or silica sand.
       5. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be specified from 2800 to 3800 psi (19.3 to 26.2 MPa).
         2. GYP-SPAN Radiant CG Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Thickness 1-1/2 inches (38mm).
         2. For ceramic tile installations, a crack isolation membrane shall be used as recommended by setting material manufacturer for intended use or application.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. DEEP FILL CEMENTITIOUS LEVELING UNDERLAYMENT

\*\* NOTE TO SPECIFIER \*\* Designed for use in multi-family, commercial and institutional buildings with light-gauge steel framing and a corrugated steel deck, FIRM-FILL CMD is a lightweight, high-strength gypsum concrete floor underlayment. Installed at 1" above the top of the flutes, FIRM-FILL CMD reduces deadloads and thickness, significantly lowering costs. Recommended For Corrugated Metal Decking Application / Market Multi-family, commercial projects, & industrial buildings. Delete if not required.

* + 1. Gypsum Concrete Floor Underlaymentt - FIRM-FILL CMD as supplied by Hacker Industries, Inc.
       1. Application: FIRM-FILL CMD Gypsum Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker FIRM-FILL CMD Primer or approved equal.
       3. Sand: 1/8 inch (3 mm) or less washed plaster masonry sand or silica sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Sealer: Hacker TopCoat SP.
      2. Mix Design:
         1. Compressive strength shall be specified at a minimum of 3500 psi (24.1 MPa).
         2. 4 to 4.75 gallons (15.1 to 17.9 L) of water and sand as specified per 80-pound (36.3-kg) bag of FIRM-FILL CMD. Do not over water. Water amount will change with wetness of sand.
         3. FIRM-FILL Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. Minimum thickness of FIRM-FILL CMD is 1 inch (25 mm) over the top of the flutes. Maximum thickness is 2 inches (51 mm).

\*\* NOTE TO SPECIFIER \*\* TRUE-SCREED Cementitious Leveling Underlayment (CLU) is a Portland cement-based underlayment that is specifically designed for projects with deep-fill requirements that need to stay on budget. TRUE-SCREED CLU provides a cost-effective method to transform cracked, uneven concrete floors into a smooth, strong surface for finished floor coverings. The product also offers exceptional surface hardness and quick drying time, keeping construction projects on schedule.  
Recommended For Concrete Toppings & Self-Levelers. Cracked or damaged concrete, new construction and renovation projects, & commercial Buildings.  
Delete if not required.

* + 1. Cementitious Leveling Underlayment (CLU) - TRUE-SCREED as supplied by Hacker Industries, Inc.
       1. Application: (CLU) - TRUE-SCREED Hydraulic Concrete is suitable for interior applications only and shall be covered by a finished floor covering.
       2. Subfloor Primer: Hacker TRUE-SCREED CLU Floor Primer or approved equal.
       3. Sand: Washed plaster or masonry sand.
       4. Water: Potable and free from impurities.

\*\* NOTE TO SPECIFIER \*\* ,Required for glue down finished floors. Delete if not required.

* + - 1. Sealer: Hacker TRUE-SCREED CLU Sealer.
      2. Mix Design:
         1. Compressive strength shall be up to 6000 psi (approx. 41.4 MPa) as scheduled.
         2. 3.75 gallons (approx. 14.2 L) of water as specified per bag of TRUE-SCREED CLU Hydraulic Cement Underlayment. Do not over water. Water amount will change with wetness of sand. Amount of sand to vary with mix.
         3. (CLU) - TRUE-SCREED Gypsum Concrete mix proportions, mix designs and methods shall be in strict accordance with manufacturer's recommendations.
      3. Application:
         1. The minimum thickness of TRUE-SCREED CLU Hydraulic Cement Underlayment varies with the type of subfloor. Over wood subfloors, a minimum of 3/4 inch (19 mm) with mechanically attached mesh is required. Over precast or poured-in-place concrete, a minimum of 1/2 inch (13 mm) is required. Can be featheredged at transitional locations. Maximum recommended thickness is 2 inches (51 mm).

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL SCM is a component in an overall floor/ceiling assembly. Its performance is affected by every other component and the likelihood of achieving code compliance is contingent upon many other trades including (but not limited to) framers, plumbers and drywall contractors. Developers and general contractors are responsible for building properly and testing field performance as soon as possible in order to assure the reliability of the project.  
WARNING: Laboratory tests are not a guarantee of field performance because of the issues noted above and many other design errors that may occur. Please consult a professional acoustical consultant to assure plans are proper and that the floor/ceiling assembly can perform to expectations.  
- See more at: http://www.hackerindustries.com/sound-attenuation-systems.shtml#sthash.EerFJFeu.dpuf

* 1. SOUND CONTROL MAT

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL SCM-125, a 1/8" (3mm) sound control mat, is engineered to limit impact sound transmission in multi-family construction. Ideal for when the gypsum concrete pour is not a standard thickness, FIRM-FILL SCM-125 is topped with a minimum of 3/4" (19mm) of a FIRM-FILL Brand Gypsum Concrete to create an effective low profile sound control system.  
Recommended For Sound Attenuation Systems. Application / Market: Wood subfloors & concrete subfloors.  
Delete if not required.

* + 1. Sound Control Mat - FIRM-FILL SCM-125 as supplied by Hacker Industries, Inc.
       1. Construction: A nominal 1/8" (3 mm), random filament, corrugated "U"- groove core sound control mat designed to limit impact noise between floors.
          1. Effectiveness of Reducing IIC Sound: AIIC 20.0` (ASTM E2179).
       2. Fire Resistance: Class A (D2859).
       3. Application: Designed for critical applications in which FIRM-FILL Brand Gypsum Concrete will be utilized. FIRM-FILL SCM-125 prevents liquid moisture from passing through to the substrate, which is an essential quality for wood frame construction. It prevents trapped moisture, since it continues to allow moisture vapor to pass through. Use in conjunction with a minimum 3/4 inch (19 mm) FIRM-FILL Brand Gypsum Concrete topping.
          1. Sound control mat shall be installed with a perimeter isolation strip.

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL SCM-250 (Sound Control Mat) is a 1/4" (6mm), random filament, corrugated, "U" groove core sound control mat designed to limit impact noise between floors. When used in conjunction with a 1" FIRM-FILL Brand Gypsum Concrete topping, the combined system has been tested to achieve a "Light Commercial" rating from the Tile Council of North America.  
Delete if not required.

* + 1. Sound Control Mat - FIRM-FILL SCM-250 as supplied by Hacker Industries, Inc.
       1. Construction: A nominal 1/4 inch (6 mm), random filament, corrugated "U"- groove core sound control mat designed to limit impact noise between floors.
       2. Effectiveness of Reducing IIC Sound: AIIC 20.0` (ASTM E2179).
       3. Fire Resistance: Class A (ASTM D2859).
       4. Application: Designed for critical applications in which FIRM-FILL Brand Gypsum Concrete will be utilized. FIRM-FILL SCM-250 prevents liquid moisture from passing through to the substrate, which is an essential quality for wood frame construction. It prevents trapped moisture, since it continues to allow moisture vapor to pass through. FIRM-FILL SCM-250 is a Class A fire-rated product. Use in conjunction with a minimum 1 inch (25 mm) FIRM-FILL Brand Gypsum Concrete topping.

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL SCM-400, is a 3/8 inch (10 mm) sound mat is efficiently engineered to limit sound transmission in multi-family construction. Ideal for when the gypsum concrete pour is not a standard thickness.  
Recommended For Sound Attenuation Systems. Application / Market: Wood subfloors & concrete subfloors.  
Delete if not required.

* + 1. Sound Control Mat - FIRM-FILL SCM-400 as supplied by Hacker Industries, Inc.
       1. Construction: a nominal 3/8 inch (10 mm), entangled polymeric filament sound control mat designed to limit impact noise between floors.
       2. Effectiveness of Reducing IIC Sound: AIIC 20.0` (ASTM E2179).
       3. Fire Resistance: Class A (ASTM D2859).
       4. Application: Designed for critical applications in which FIRM-FILL Brand Gypsum Concrete will be utilized. Use in conjunction with a minimum 1-1/4 inches (32 mm) FIRM-FILL Brand Gypsum Concrete topping.
          1. Sound control mat shall be installed with a perimeter isolation strip.

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL SCM-750, is a 3/4" (19mm) sound mat, that helps create sound resistant floors with the high IIC and STC level required by IBC 2009. It is a cost-effective way to address higher IIC requirements.  
Recommended For Sound Attenuation Systems. Application / Market: Wood subfloors & concrete subfloors  
Delete if not required.

* + 1. Sound Control Mat - FIRM-FILL SCM-750 as supplied by Hacker Industries, Inc.
       1. Construction: a nominal 3/4 inch (19 mm), entangled polymeric filament sound control mat designed to limit impact noise between floors.
       2. Application: Designed for critical applications in which FIRM-FILL Brand Gypsum Concrete will be utilized. Use in conjunction with a minimum 1-1/2 inches (38 mm) FIRM-FILL Brand Gypsum Concrete topping plus reinforcement.
          1. Sound control mat shall be installed with a perimeter isolation strip.

\*\* NOTE TO SPECIFIER \*\* Thickness 0.08 (2mm). Hacker Sound Mat I is a flat resilient rubber sound control underlayment used directly under all floor finishes, yielding exceptional results even under hard surface flooring and over concrete and wood joist construction.  
Delete if not required.

* + 1. Sound Control Mat - Hacker Sound Mat I as supplied by Hacker Industries, Inc.

\*\* NOTE TO SPECIFIER \*\* Hacker Industries, Inc. continues to provide solutions for maximizing sound control in multi-family projects, commercial buildings, and custom homes with the introduction of Hacker Sound Mat II. This innovative sound mat is composed of 100 percent recycled rubber and is designed to provide a quieter environment and meet the most demanding project specifications.  
Recommended For Sound Attenuation Systems Application / Market. Wood subfloors & concrete subfloors.  
Delete if not required.

* + 1. Sound Mat - Hacker Sound Mat II as supplied by Hacker Industries, Inc.
       1. Construction: A 1/4 inch (6 mm) sound control mat designed to control noise in multi-family projects. Integral part of a vibration isolation floor system. Composed of recycled tire rubbers.
       2. Application: Designed for critical applications in which Hacker Sound Mat II with a 1-1/4 inches (32 mm) FIRM-FILL Brand Gypsum Concrete topping.
          1. Shall be installed with a perimeter isolation strip.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. PRIMERS AND SEALERS

\*\* NOTE TO SPECIFIER \*\* Hacker Floor Primer is a white, liquid ethylene-vinyl co-polymer that is designed to enhance the bond between a FIRM-FILL Brand Gypsum Concrete and the existing structural substrate (wood, concrete, or existing floor coverings). Hacker Floor Primer is packaged in a concentrated formula that must be diluted with potable water before use. Contact Hacker Industries, Inc. for mixing instructions.  
Recommended For Topcoats & Sealers.

* + 1. Hacker Floor Primer as supplied by Hacker Industries, Inc.
       1. Meets ASTM F2419 - Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and the Preparation of the Surface to Receive Resilient Flooring.
       2. Primer: Water based, re-wetable polyvinyl acetate (PVA) or latex emulsion that is designed to enhance the bond between gypsum concrete or gypsum concrete radiant fill and existing structural substrate (wood or concrete). Packaged in a concentrated formula that is diluted with potable water prior to use.
          1. Available as dry or liquid concentrated active agent.

\*\* NOTE TO SPECIFIER \*\* Hacker Floor Sealer is a clear, water based, vinyl acrylic co-polymer sealer that is recommended over Hacker Floor Underlayments (depending on the specified finished floor covering adhesive). Approved Substrates: FIRM-FILL Brand Gypsum Concretes, FIRM-FILL CMD Gypsum Floor Underlayment, GYP-SPAN Radiant Underlayment, TRUE-SCREED CLU Hydraulic Cement Underlayment.   
Recommended For Topcoats & Sealers.

* + 1. Hacker Floor Sealer as supplied by Hacker Industries, Inc.
       1. Meets ASTM F2419 - Standard Practice for Installation of Thick Poured Gypsum Concrete Underlayments and the Preparation of the Surface to Receive Resilient Flooring.
       2. Sealer: A clear, water-based, vinyl acrylic co-polymer sealer.

\*\* NOTE TO SPECIFIER \*\* Hacker TopCoat SP is an acrylic based, film-forming surface preparation agent designed to meet ASTM F2419-05 compliance requirements for use on Thick Poured Gypsum Concrete Underlayments specified to receive resilient floor coverings. When used in conjunction with Hacker floor underlayments, Hacker TopCoat SP provides optimal surface bonding conditions for most floor covering adhesive products. Approved Substrates: FIRM-FILL Brand Gypsum Concretes, FIRM-FILL CMD Gypsum Floor Underlayment, GYP-SPAN Radiant Underlayment, TRUE-SCREED CLU Hydraulic Cement Underlayment.  
Recommended For Topcoats & Sealers.

* + 1. Gypsum Concrete Underlayment Top Coat - Hacker TopCoat SP as supplied by Hacker Industries, Inc.
       1. Top Coat: An acrylic based, film-forming surface preparation agent designed to meet ASTM F2419-05 compliance requirements.
       2. Application: For use on Thick Poured Gypsum Concrete Underlayments specified to receive resilient floor coverings.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Subfloor shall be structurally sound (L/360), broom cleaned, dry and free from oil, grease, paraffin, laitance, wax or other contaminants.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      3. Contractor shall inspect and approve the condition of the subfloor and test the existing subfloor for moisture.
      4. Leak Prevention: All cracks and voids shall be filled with a quick-setting patching or taping compound, or equal, where leakage may occur.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* 1. GYPSUM CONCRETE INSTALLATION
     1. Install in accordance with manufacturer's instructions.

\*\* NOTE TO SPECIFIER \*\* Prime wood subfloors with one coat of Hacker Floor Primer (diluted 1:4 with water) using one gallon (3.78 L) per 500 ft2 (47 m2).

* + 1. Wood Floors: Prime wood floors with manufacture's required primer.

\*\* NOTE TO SPECIFIER \*\* Hacker Floor Primer is not always required over concrete substrates. Multiple coats may be required over porous concrete or plank. The Hacker Licensed Applicator can give specific recommendations. (Note: For rehabilitation work or pours over old and/or porous concrete, consult a Licensed Applicator or Hacker Industries, Inc. for recommended preparation.)

* + 1. Concrete Floors: Prime concrete floors with manufacturer's required primer.
    2. Gypsum concrete shall be pumped onto floor areas, spreading and screeding to a smooth surface. Place as continuously as possible until installation is complete so that no gypsum concrete slurry is placed against gypsum concrete that has obtained its initial set, except at authorized joints.
    3. Drying: Building interior shall be ventilated and heated to a minimum of 50 degrees F (10 degrees C) to ensure completion of the drying process. Provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the gypsum concrete is dry. If necessary, provide mechanical ventilation. Do not install finished floor coverings until the gypsum concrete has been tested for dryness.
       1. Underlayment shall be dry prior to installation of finished floor. Follow ASTM D4263 to determine dryness of underlayment.
    4. Sealing: Any areas where the underlayment surface has been damaged shall be cleaned and sealed regardless of floor covering specified.
    5. Consult flooring contractor for recommended procedures to test for dryness and acceptable levels of moisture to avoid potential problems during the flooring process.

\*\* NOTE TO SPECIFIER \*\* (CLU) - TRUE-SCREED. Delete if not required.

* 1. HYDRAULIC CEMENT INSTALLATION
     1. Shot blasting, sandblasting, scarifying or other engineer-approved, non-wet method shall be done on concrete surfaces prior to application (reference ICRI CSP 3+ standards for acceptable profile height). Upon approval of successful bond test, degree of preparation may vary.
     2. TRUE-SCREED CLU Hydraulic Cement Underlayment is not an encapsulate. Consult local and Federal authorities for proper removal of asbestos.
     3. Thoroughly clean surface of all substances that interfere with the bond of TRUE-SCREED CLU Hydraulic Cement Underlayment, such as dirt, paint, tar, wax, asphalt, oil, grease, latex compounds, sealers, curing compounds, form release agents, laitance, loose toppings, foreign toppings and adhesive residue.
     4. Subfloor shall be properly prepared, sound, dimensionally stable, fully cured and at least 28 days old, and free from hydrostatic pressure.
     5. Ambient room temperature and concrete subfloor shall be between 50 degree - 900 degree F (10 degree - 320 degree C) before, during, and after TRUE-SCREED CLU Hydraulic Cement Underlayment installation.
     6. Provide for expansion joints where specified, including the perimeter of the room, columns, supports, and equipment pedestals. Do not bridge joints. Ensure control joints are honored through TRUE-SCREED CLU Hydraulic Cement Underlayment and primer. Cuts through TRUE-SCREED CLU Hydraulic Cement Underlayment shall be a minimum of 1/4 inch (6 mm).
     7. All dormant cracks in the substrate greater than 1/8 inch (3 mm) shall be repaired to minimize telegraphing through the underlayment.
     8. Leak Prevention: All cracks and voids should be filled with a quick-setting patching or taping compound, or equal, where leakage may occur.
     9. Prime wood subfloors with one coat of TRUE-SCREED CLU Floor Primer (diluted 4:1 with water) using one gallon of primer solution (3.79 L) per 500 sf (47 m2).
     10. Curing and Drying: TRUE-SCREED CLU Hydraulic Cement Underlayment is designed to self-cure. Do not use damp cure methods or sealers. Follow the following procedures for optimum performance:
     11. Protect the floor from excessive heat and drafts during curing.
     12. Avoid walking on surface for 2-3 hours. (Adjust for varying temperature and humidity conditions.)
     13. TRUE-SCREED CLU Floor Primer is required over substrates.
     14. Installation of TRUE-SCREED CLU Hydraulic Cement Underlayment shall not begin until the building is enclosed, including roof, windows, doors, and other openings.
     15. Consult floor covering manufacturer for maximum allowable Moisture Vapor Emission Rate (MVER) and retained moisture in substrate. Floor shall not exceed 4 lb per 1,000 sf per 24 hours (1.81 kg per 92.9 m2 per 24 hours).

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL CMD ONLY. Delete if not required.

* 1. DEEP FILL CEMENTITIOUS LEVELING UNDERLAYMENT INSTALLATION

\*\* NOTE TO SPECIFIER \*\* Contact Hacker Industries, Inc. Licensed Applicator for additional questions regarding joists and laps.

* + 1. Laps, where steel deck overlaps shall be screwed together. Maximum joist spacing shall be 24 inches on centers. Steel deck shall span across the joists, with deck ribs perpendicular to the joists.
    2. Apply FIRM-FILL CMD primer by pouring onto the deck and spreading out with a push broom at rate of 300 sf/gal; do not thin. Primer may also be sprayed onto the deck, but shall achieve a continuous uniform coating. Allow 3 hours for adequate drying to a maximum of 24 hours before pouring the FIRM-FILL CMD floor underlayment.
    3. FIRM-FILL CMD shall be pumped onto floor areas, spreading and screeding to a smooth surface. Place as continuously as possible until installation is complete so that no FIRM-FILL CMD slurry is placed against FIRM-FILL CMD that has obtained its initial set, except at authorized joints.
  1. FIELD QUALITY CONTROL
     1. Slump Test: Gypsum concrete shall be tested for slump at the beginning of each installation to establish the required slump. Slump tests shall then be taken periodically during installation to verify that the required slump is maintained. Slump tests shall be conducted on an approved Plexiglas surface using a 2 inches by 4 inches (51 mm by 102 mm) cylinder.

\*\* NOTE TO SPECIFIER \*\*FIRM-FILL High Strength, FIRM-FILL 4010 only. Delete if not required.

* + - 1. The acceptable patty size shall be 7 inches (178 mm) plus or minus 1/2 inch (13 mm) in diameter.

\*\* NOTE TO SPECIFIER \*\* GYP-SPAN Radiant only. Delete if not required.

* + - 1. The acceptable patty size shall be 7-1/2 inches (191 mm) plus or minus 1/2 inch (13 mm) in diameter.

\*\* NOTE TO SPECIFIER \*\*Delete if not required.

* + - 1. The acceptable patty size shall be 8 inches (203 mm) plus or minus 1/2 inch (13 mm) in diameter.

\*\* NOTE TO SPECIFIER \*\* FIRM-FILL CMD only. Delete if not required.

* + - 1. The acceptable patty size shall be 8-1/2 inches (216 mm) plus or minus 1/2 inch (13 mm) in diameter.

\*\* NOTE TO SPECIFIER \*\* GYP-SPAN Radiant GC only. Delete if not required.

* + - 1. The acceptable patty size shall be 8-1/2 inches (216mm) to 9-1/2 inches (241mm) plus or minus 1/2 inch (13mm) in diameter.
    1. Field Samples: Testing shall be done in accordance with ASTM C472 Modified testing procedures using 2 inches (51 mm) split brass molds.
  1. PROTECTION
     1. Protection: After installation, temporary wood planking shall be placed by the Contractor wherever the floor underlayment will be subject to wheeled or concentrated loads. The Contractor shall not place concentrated loadssuch as pallets of material, drywall, taping compounds or any heavy items which may cause deflectionin the middle of the floor or in hallways.
     2. Protect installed products until completion of project.
     3. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION