# Testing Sustainable Flooring

## A Johns Hopkins Health System Report

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# JHHS Facilities: Flooring Test Report

## Summary

This report is a result of a research study conducted at the Johns Hopkins Health System (JHHS) in Baltimore to identify solutions to challenging flooring questions. Recognizing these challenges are ongoing, this report provides a snapshot of the conditions and findings encountered during the 2014 to 2015 study period.

The goal of the JHHS Facilities Architecture + Planning Office in conducting this study was to improve the performance, safety, and cost-efficiency of flooring materials and flooring care while supporting the health and safety of patients and staff and safeguarding capital investment. In 2014 the project team launched a system-wide multidisciplinary floor testing study. The 2014 edition of the FGI *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* was used as one of the resources to structure the test protocol and process.

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# JHHS FACILITIES: FLOORING TEST REPORT

Johns Hopkins Health System
Facilities Planning Office
Architecture + Planning

Project Name: New Flooring Test
Test Dates: November 2014 through February 2015
Report Date: April 2016

Report prepared by:
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New Flooring Report – White Paper

Appendices

1. Flooring Test Protocol
2. Floor Plan
3. Product Tracking Log
4. Observation Data: Acoustic, Clean, & Slip-Resistance
5. Project Collaborative Team
6. Cleaning Product Data
7. EIPP: Use of Carpet in Patient Care Areas

JHHS PPT

Bibliography

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***Is it possible to specify healthcare flooring that is; easy to clean, sustainable, durable, slip-resistant, quiet, cushioned underfoot, and does not require wax?***

The Johns Hopkins Hospital (JHH), established in 1889, is a world-renowned teaching hospital and an international leader in patient care and medical research. It would be an understatement to describe the Johns Hopkins Hospital System (JHHS) facilities as merely large. Comprised of six academic and community hospitals, 4 suburban healthcare and surgery centers, and more than 30 primary healthcare outpatient sites, the amount of flooring, well over 98 million square feet, presents a constant challenge to maximize the positive effect of the built environment on patient outcomes (Taylor, 2015), ensure the health and safety of the staff, and safe-guard our capital investment. (The Center for Health Design, 2015)

In 2014 the Facilities Architecture + Planning Office of Johns Hopkins Health System (JHHS) were confronted with an array of complex flooring questions.

*How can we in good conscience specify green & sustainable, but untested flooring products?*

Consultants were specifying new green/sustainable flooring products, which incorporated recycled and alternative materials, but which were untested in active healthcare environments. We needed to determine whether it was possible to care for and maintain green/sustainable flooring.

*Can we continue to maintain carpeted floors at JHH?*

Carpeted floors throughout the JHHS campuses were perpetually soiled, structurally failing, puddling, and unraveling. (Pronovost, 2015) Care of carpeted flooring was an unsurmountable challenge, consuming disproportionally too much time to clean and maintain, and had become an unsustainable care and maintenance paradigm, ultimately affecting the hospital's ability to deliver quality patient care and adversely affecting our HCAHPS scores. (Rohde, 2015)

*Can we adopt a No-Wax flooring maintenance paradigm?*

Are there new flooring care products which do not require high gloss organic waxed finishes? JHHS is committed to the elimination of flooring requiring high-gloss waxed floor (Rohde, Healthcare Design for the Future, 2015) cleaning methods, an unsustainable floor maintenance paradigm causing glare, increasing room down time and delaying patient care, creating scheduling challenges, and possibly contaminating adjacent surfaces with airborne wax particles with the potential of contributing to healthcare-acquired infections (HAI's). (Kamerow, 2013) (Nancy F. Lenfestey, 2013) Further study is required to determine direct causality between the occurrence of HAI's and the potential for wax to support microbial growth.

*How to assure that new flooring selections are compatible with sustainable, low-VOC, neutral pH, hydrogen-peroxide-based, multi-purpose floor cleaning/sealing products?*

The JHH Environmental Care (EVC) department is actively pursuing green, low-VOC, matte shine, multi-purpose flooring care products to clean and maintain a broad range of flooring materials. (Forbo Flooring Systems, 2013)They identified a new floor maintenance regimen (Appendix Item #6) met all of our criteria, yet was untested at Johns Hopkins, an active healthcare environment.

*How can Johns Hopkins maximize the value of our capital investment in flooring?*

Can the decision to select flooring materials be made using the principles of evidence-based design? (The Center for Health Design, 2015) Applying the principles of evidence based design, JHHS A+P conducted literature research, applying scientific method to the problem, assembled a collaborative team, established a test protocol to conduct a flooring test to address our various care issues and build a database of flooring selection criteria to develop new flooring standards for selection of flooring products throughout JHHS. Our aim was to maximize patient & staff satisfaction while minimizing adverse future events related to the care and maintenance of flooring.

Our literature research effort began with the acknowledged professional resource of the Guidelines for Design and Construction of Hospitals and Outpatient Facilities, 2014 edition. (Facility Guidelines Institute, 2014) which was instrumental in developing our Flooring Test Protocol, our flooring product selection criteria,

and assembling our collaborative team. The JHHS collaborative team included representatives from Facilities Architecture & Planning, Director/Supervisors in Environmental Care and Environmental Safety, Nursing, Infection Control, Armstrong Institute for Patient Safety, and the manufacturer representatives for each of the flooring products selected for inclusion in the flooring test. (Appendix Item #5)

Under the direction of JHHS Facilities Architecture + Planning, the project team, determined that we would conduct a system-wide multi-disciplinary research flooring testing study over a 90 day period from November 22, 2014, to February 21, 2015. The primary test site location chosen was the corridor connecting the JHH Main Campus and the Johns Hopkins Outpatient Center (JHOPC), including the Metro subway entrance to the JHH East Baltimore Campus. We estimate that these areas receive more than 20,000 footfalls a day.

The flooring materials were installed cross corridor along the path of travel; each strip measured 6 feet by 18 feet, with an intentional seam across the middle of each strip perpendicular to the path of travel. Once installed the flooring test site was intentionally sealed using Oxi-Seal on one half of the test strip, leaving one half unsealed. While normally flooring would not be left unsealed, this scenario enabled us to test worst-case unsealed flooring situations.

Flooring material selection for this location involved 15 different flooring materials: 8 resilient surfaces and 7 acoustic, non-carpet surfaces; more specifically: textile composite, rubber, rubber composite, vinyl rubber composite, linoleum, vinyl sheet goods with recycled rubber backing, heterogeneous and homogenous resilient flooring. These 15 materials were donated by the respective manufacturers. Simultaneously, 5 additional flooring products were evaluated in other locations, bringing the total number of different flooring products tested to 20: 11 resilient surfaces and 9 acoustic carpet alternatives. Ultimately all flooring material chosen to be evaluated had to meet these flooring challenges: to be high performance, incorporate green/sustainable materials, promote safety, not require waxed finishes, and be able to be cleaned/maintained using sustainable cleaning protocols.

The test evaluation process involved weekly observation, photographing the test materials against control samples, a controlled stain test, various slip-resistance tests on wet and dry surfaces, and acoustic measurement of dB levels on each test

strip, on both the resilient and acoustic flooring test products. Additionally, we performed a "Drag test" to check for impact damage and seam integrity. The drag test used a weighted lounge chair with a broken glide which exposed an attachment screw. This was dragged across all test flooring strips. None of the flooring products tested experienced permanent damage or seam failure.

At the conclusion of the test, of the 16 flooring products in the primary test site, 18 of the 20 products tested were considered to have "passed" and are currently being utilized in new projects rather than traditional VCT and carpet. The only failures were due to our inability to keep the flooring clean without extra time and attention from our environmental care personnel. There were no structural failures of any of our test products. This effort, while not without cost, has successfully met our objective to develop new flooring standards criteria for selection and maintenance of flooring which can now be confidently used throughout JHHS. Specifically, of the product types assessed in this test: vinyl enhanced tile has become our new standard resilient tile. Textile composite tile is our first choice when a carpet alternative is needed. The vinyl sheet goods with recycled rubber cushion backing is currently being installed in 56 inpatient rooms. (Ecore Commercial Flooring, 2015) The rubber, rubber composite, vinyl rubber composite, heterogeneous and homogenous resilient preformed well and have been implemented in various projects since the test period ended. Additionally, the collaborative team has remained an integral part of the ongoing evaluation and selection process, and we continue to rely on their help to review new products. We would encourage our healthcare provider peers to consider conducting their own tests in order to expand our best practices flooring knowledge base.

2016 Epilog: JHHS is committed to a No-Finish/No-Wax, and No-Carpet new flooring paradigm. This will require a culture shift for our campuses who have become accustomed to both carpet and shiny floors. When we have new projects for which carpet would previously have been considered we take this as a learning opportunity to share our test findings, encouraging use of no-finish, no carpet new flooring options, including creative design solutions to address acoustic issues. We can honestly say that this is becoming easier, as more of our clients appreciate that we are all here to care for our patients, not flooring, realizing that flooring with efficient care and maintenance requirements will help them to accomplish that goal. Recently several high profile projects, and most of our clients, have requested no-finish/wax, no-carpet flooring solutions,

APPENDIX ITEMS

1. Flooring Test Protocol
2. Floor Plan
3. Product Tracking Log
4. Flooring Products – Test Observation Data, (2015)
5. Project Collaborative Team
6. Cleaning Product Data
7. JHM EIPP; Use of carpet in Patient Care Areas. March 14, 2014.

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NEW FLOORING TEST – PROTOCOL APPENDIX ITEM # 1

Johns Hopkins Health System - Facilities Architecture + Planning
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2016-01-28_TLB

| OBSERVATION/ISSUE | INVESTIGATION | TEST PROTOCOL |
|---|---|---|
| Carpeted Flooring is failing; puddling, seams opening, de-raveling, with permanent stains. | Frequent machine scrubber cleaning required to maintain appearance, causing product to fail. | Non-Carpet alternatives which can be maintained using standard EVC cleaning protocol. |
| Proposed use of new to market flooring product. | New flooring product has not been tested in healthcare setting. | Test product with standard JHH EVC cleaning protocol. |
| JHH EVC new cleaning protocols to standardize flooring maintenance procedures. | Determine sustainable cleaning procedure which can be standardized for JHHS. | Test new cleaning procedure on multiple flooring product types. |
| Non-Carpet policy for future projects. | Investigate Non-Carpet options which are cleanable, maintainable, and contribute to acoustics. | Install and test multiple flooring product types for potential use at JHHS. |
| Local building code requires Green – Sustainable material specifications. | Flooring manufacturers have responded with innovative new products which have not been tested in healthcare environments. | New Flooring products installed in heavy use location to assess JHHS ability to clean and maintain. |
| Baltimore building code requires Green – Sustainable Low VOC sustainable cleaning products and methodologies. | JHH-EVC has identified Low-VOC sustainable cleaning products and methodologies previously not used at JHH. | Flooring installed in heavy use location to assess JHHS ability to clean and maintain using Low VOC sustainable cleaning protocol. |
| Infection Control and Aging population issues require elimination of high gloss surfaces. | VCT requires High Gloss (Wax) finish. Investigate matte-finish, Non-VCT options, maintainable with Low-VOC sustainable cleaning products. | Flooring Test products to be cleaned and sealed with Low-VOC sustainable cleaning products. Assess JHHS ability to clean and maintain. |
| High Gloss Waxed finishes are organic products which support microbial growth. Wax particles become airborne. With normal use potentially contaminating adjacent areas. | Explore No-Wax Flooring Options which can be maintained with Low-VOC sustainable cleaning products. | New Flooring products which do not require wax finish to be cleaned with Low-VOC sustainable cleaning products. Assess JHH ability to maintain. |
| High Gloss Waxed surfaces require periodic maintenance, stripping and reapplying wax finish. Locations cannot be used during this maintenance down time resulting in admission delays, client dissatisfaction and failing HCAHPS scores. | VCT requires High Gloss (Wax) finish. Explore Non VCT options which can be maintained by less time consuming methods. | New Flooring products which do not require wax finish to be cleaned with Low-VOC sustainable cleaning products. Assess JHH ability to maintain. |

SCIENTIFIC METHOD APPLIED TO THIS EFFORT:

A. ASK QUESTION: Determine which new flooring product type(s) will best support the mission of Johns Hopkins Hospital (JHH) to provide facilities and amenities that promote the highest quality care, afford solace, and enhance the community. (Ref: JHH Mission Statement, URL http://www.hopkinsmedicine.org/the_johns_hopkins_hospital/about/mission.html)

B. BACKGROUND RESEARCH: Review of new flooring products to be considered for a test to determine which complies with the following criteria for use at Johns Hopkins Health System (JHHS) healthcare facilities environments. Ref. Facility Guidelines Institute (FGI) 2014 ed. Section A2.1-7.2.3.

1. Safe to use in occupied patient care clinical staff locations by minimizing or preventing the incidence and effect of noise, odor, gas, particulates, dust and debris during installation, maintenance, cleaning, repair, and demolition.

2. Support clinical needs and well-being of patients, staff and visitors by providing a glare free clean finish. Finishes shall be non-wax, maintainable with a matte low gloss finish. Wax flooring finishes encourage microbial growth; prolong cleaning times directly affecting patient room availability and access to quality care, and also cause glare which compromises vision and balance.

3. Address Safety Risk assessment issues related to cleaning and maintaining flooring finishes, and subsequent reduction of surface contamination linked to healthcare associated infections (HAI).

    a. Surfaces should have clear written cleaning protocols which comply with CDC and JHHS cleaning standards.

    b. Flooring should be easy to clean, with no surface crevices, rough textures, joints or seams, non-absorptive, non-porous, and smooth.

    c. Manufacturer recommended cleaning and disinfection methodologies should be easy to use and effective for meeting CDC and JHHS bacterial elimination requirements. Recommended methodologies should not require high-gloss wax finishes or prolonged "wet" times as they contribute to risk of patient falls and associated injuries. (FGI 1.2-3 and 2.1-7.3.1)

4. Acoustic properties that support clinical function, patient safety and well-being and contribute to HIPPA compliance. Flooring should provide acoustic dampening, comfort underfoot to reduce staff stress and fatigue, as well as sound mitigation to reduce ambient noise levels and potential for medication errors. Should comply with Medications Safety Zone guidelines as noted in FGI 2.1-2.6.6.

5. Made from non-toxic, non-allergenic materials to reduce potential product based allergens.

6. Inflammable: Finish Materials should meet NFPA 101 for fire and smoke toxicity requirements.

7. Durable: Finish surface resistant to breakage, puncture/tears, stains, damage and wear from abrasion.

8. Impact Resistant: Flooring products should remain intact, safe and functional in heavy weight bearing, high traffic, and impact susceptible areas.
   a. Meets pounds per square inch (PSI) weight tolerances for loads.
   b. Meets tensile strength flexibility, impact, and abrasion testing standards for required use.
   c. Self-repairs from compression caused by repeated use and does not shatter or fragment under abrasion or impact.
   d. reduce user fatigue and musculoskeletal injury by meeting industry criteria for flexibility to address foot compression, heel strike absorption, while allowing ease of movement of wheeled equipment.
   e. Compatible substrate and materials in surface and furnishings assemblies for use in 24/7 commercial healthcare environment warranted for a period of not less than 10 years' service life.
   f. Surface and assembly seams and joints should be smooth, fully sealed and remain intact.
   g. Water resistant materials, to be seam sealed and moisture impervious for use in areas where water/moisture is present to prevent seepage under assembly with consequence of delamination, and growth of mold, mildew and bacteria.

9. Improvement in facility investment by reduction of life cycle cost to increase funds available for patient care by providing flooring finishes that support JHHS commitment to quality care, strategic goals and service brand.

C. CONSTRUCT HYPOTHESIS: JHHS Facilities will provide and maintain new flooring product types which;

1. Support the mission of JHHS by providing facilities and amenities that promote the highest quality care, afford solace, and enhance the community.
2. Comply with industry standards for patient safety.
3. Improve patient outcomes by reducing environmental factors that contribute to illness.
4. Meets required standards of safety and durability for planned life cycle.
5. Easily maintained by EVC staff in occupied healthcare facility using CDC cleaning standards and JHHS SOP.
6. Supported by manufacturers' representatives to assist with maintenance, replacement, and repairs and refurbishing.

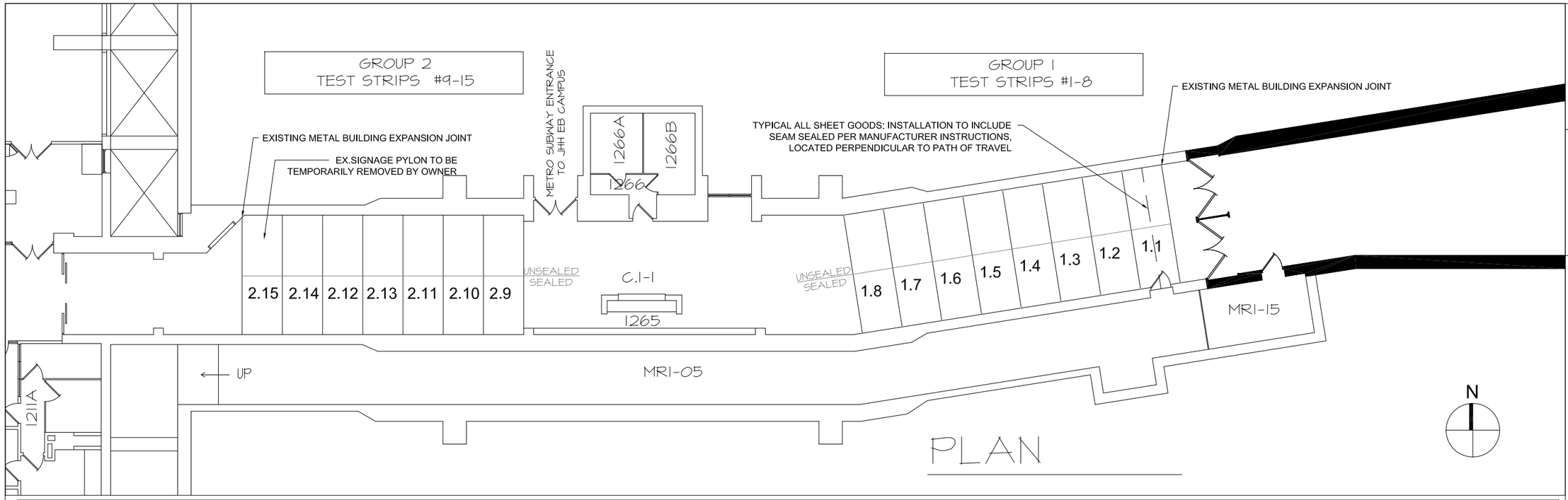
D. EXPERIMENT; Provide for testing diverse new flooring product types, including; resilient, homogeneous, heterogonous, textile composite, rubber, rubber composite and vinyl rubber composite. Selected flooring products will be installed in a high traffic location for a test period of 90 days.

1. All will be cleaned using standard JHHS protocol for low sheen non-wax floor cleaning. Half of each product will have sealer applied, half will not.

2. Data collection at regular intervals throughout the testing period will include direct observation, measurements, visual inspection, and interviews.
3. Documentation will utilize standard checklist protocol to provide data for all tested product types, with parameters clearly identified. Ref. FGI for standard testing protocol.
4. Evaluation test Methodologies to be documented and referenced.

E. ANALYZE RESULTS/DRAW CONCLUSIONS: Summary of evidence based findings of all product types will inform JHHS Facilities selection of flooring finish materials to use throughout JHHS campuses.

F. REPORT RESULTS. Peer review of the evidence based findings for these product types, may be shared within the healthcare design community, at the discretion of JHHS Facilities Architecture + Planning, in order to encourage an open collegial dialogue for the purpose of supporting quality facilities environments that contribute to best practice standards of patient care.




## FLOORING FINISHES MATERIALS

| GROUP | STRIP | MATERIAL | MANUFACTURER | PRODUCT | COLOR | MFR. CONTACT PERSON | NOTES |
|---|---|---|---|---|---|---|---|
| 1 | 1 | HOMOGENEOUS SHEET 1 | TARKETT | IQ NATURAL | 281 RYE SEED | C.COLUMBO 443-829-4077 (FISHMAN) | ALSO AVAILABLE IN TILE PRODUCT |
| 1 | 2 | HETEROGENEOUS SHEET 1 | MANNINGTON | PARADIGM INTERSECT FOUNDATION | PAR 103 | M.HUXTA 484-571-4051 (MANNINGTON) | 6 FOOT SHEET GOODS ONLY |
| 1 | 3 | PVC FREE RESILIENT SHEET 1 | MANNINGTON | ENLIGHTEN | RV006 TAUPESTONE | M.HUXTA 484-571-4051 (MANNINGTON) | RUBBER AND OLEFIN, POST CONSUMER |
| 1 | 4 | HETEROGENEOUS SHEET 2 | (UNKNOWN) | PURELINE | TITANIUM | L.BOCEK 703-585-2158 (MATS INC) | MADE IN GERMANY |
| 1 | 5 | LINOLEUM 1 | FORBO MARMOLEUM | REAL | 3249 MARLY GROUNDS | G.COIA 202-664-3854 (FORBO) | ROLL & TILE, MADE IN EUROPE. |
| 1 | 6 | LINOLEUM 2 | ARMSTRONG | MARMORETTE | LP556 ATMOSPHERE | P.HARRIS 443-750-1862 (ARMSTRONG) | ALSO AVAILABLE IN ROLL AND TILE |
| 1 | 7 | PVC FREE RESILIENT SHEET 2 | UPO FLOOR | CS COLLECTION | 5511 | J.BLODGETT 443-262-5132 (SPARTAN) | 2 MM THICKNESS, 1.45MM WEAR LAYER |
| 1 | 8 | VINYL ENHANCED TILE | JOHNSONITE TARKETT | AZROCK AZTERRA | AT104 GRAY ROCK | C.COLUMBO 443-829-4077 (FISHMAN) | TILE PRODUCT ONLY NO SEAM SEALING |
| 2 | 9 | TEXTILE COMPOSITE 2 | KINETEX | VELOCITY | 1604 DIRECTION | C.MASON 443-615-1064 (J&J) | 24X24 SQ TILE, VACUUM & WATER EXT. |
| 2 | 10 | TEXTILE COMPOSITE 1 | FORBO | FLOTEX STRATUS | 540001 SULPHUR | G.COIA 202-664-3854 (FORBO) | RECYCLED VINYL CUSHION BACK |
| 2 | 11 | RUBBER & CORK 3 | ZANDUR | SUSTAIN CORK & RUBBER | COOL GRAY CR3092 | S.GOLDMAN 410-279-0247 (DIVISION 9) | 65% RECYCLED PRODUCT, 2.5 MM STD |
| 2 | 13 | RECYCLED RUBBER 4 | ECOSURFACES | ECOROCKS | 903 BIG BOULDER | J.BLODGETT 443-262-5132 (SPARTAN) | 4 FT ROLL GOODS & 24 IN TILES. INTENTIONALLY INSTALLED OUT OF SEQUENCE. |
| 2 | 12 | RECYCLED RUBBER 2 | CAPRI CORK | RE-TIRE BASICS COLLECTION | RAIN RT4101 | B.BELL 301-529-9890 (FINISHES SALES GROUP) | 38 IN SQ TILES & INTERLOCKING, MADE IN USA. INTENTIONALLY INSTALLED OUT OF SEQUENCE. |
| 2 | 14 | RECYCLED RUBBER 1 | ATMOSPHERE | QUANTUM | TM957 BERKLEY CUSTOM CODE 200667 | B.BELL 301-529-9890 (FINISHES SALES GROUP) | 100% POST CONSUMER RECYCLED TIRE RUBBER (SAME AS 3.1) |
| 2 | 15 | RECYCLED RUBBER BACKED SHEET VINYL | ECORE | ECOSURFACES | TERRAIN RX6320 | J.BLODGETT 443-262-5132 (SPARTAN) | SHEET VINYL FUSED TO RECYCLED RUBBER BACKING |

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3/15/2016 9:51 AM

Revisions

Drawing Name: OUTPATIENT METRO CONCOURSE FLOORING TEST STRIPS

Designed/Drawn: AVH-TLB
Scale: 1/16" = 1'-0"
Date: 01 DEC 14
Job:

Project Name: JHHS EAST BALTIMORE CAMPUS NEW FLOORING PRODUCTS TEST

Drawing: F-1
Sheet 2 of 4

I:\ARCH & PLAN A_D OFFICE_TLB-AVH\02 FINISHES\02 FLOOR\00 FLOORING TEST PHASE 1_1-2014 TO 2-2015\03 DRAWINGS PLAN\CURRENT PLAN\FLOORING TEST PLAN.DWG

| JHHS - NEW FLOORING TEST - PRODUCT TRACKING LOG - PHASE 1: 11/2014 - 2/2015. PHASE 2: 3/2015 TO PRESENT. | | | | | | | | | FAIL | PHASE 2 | FAIL | FAIL | | FAIL | | | FAIL | | PHASE 2 | PHASE 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TEST ID-TAG & DATA** | **1.1** RESILIENT | **1.2** RESILIENT | **1.3** RESILIENT | **1.4** RESILIENT | **1.5** RESILIENT | **1.6** RESILIENT | **1.7** RESILIENT | **1.8** RESILIENT | **1.9** RESILIENT | **1.10** RESILIENT | **1.11** RESILIENT | **2.9** ACOUSTIC NON-CARPET | **2.10** ACOUSTIC NON-CARPET | **2.11** ACOUSTIC NON-CARPET | **2.12** ACOUSTIC NON-CARPET | **2.13** ACOUSTIC NON-CARPET | **2.14** ACOUSTIC NON-CARPET | **2.15** ACOUSTIC NON-CARPET | **2.16** ACOUSTIC NON-CARPET | **2.17** ACOUSTIC NON-CARPET |
| **PRODUCT TYPE** | PVC Free Homogeneous Resilient 1 | Heterogeneous Resilient 1 | PVC Free Homogeneous Resilient 2 | Heterogeneous Resilient 2 | Linoleum 1 | Linoleum 2 | PVC Free Homogeneous Resilient 3 | Vinyl Enhanced Tile 1 | Resilient Tile 1 | Resilient Tile 2 | Resilient Tile 1 | Textile Composite 2 | Textile Composite 1 | Rubber & Cork 1 | Recycled Rubber 2 | Recycled Rubber 4 | Recycled Rubber 1 | Recycled Rubber-Backed Sheet Vinyl 1 | Rubber & Cork 2 | Recycled Rubber 3 |
| **LOCATIONS TESTED** | EB; OC 1 - TEST. TBD - CA 1? | EB; OC 1 - TEST, NH 2 MFM. TBD - OC 3 & 4? | EB; OC 1 TEST. | EB; OC 1 TEST. | EB; OC 1 TEST. | EB; OC 1 TEST. | EB; OC 1 TEST. | EB; OC 1 - TEST, HO B-160-190. | NH 3-8 | CM 131 | OSLER 322 | EB; OC 1 TEST. | TEST - OC 1. OC 3011, 3023, 3038A. PH B RAD READING RMS. | EB; OC 1 TEST. | EB; OC 1 TEST. TBD; BV FK 1 ADMIN? | EB; OC 1 TEST. | OC 1, OC 8. | EB; OC 1 TEST. TBD-CM 7? | PH B-1 Ramp | Phipps 2 Ramp. |
| **TYP. JHHS LOCATIONS** | CLINICAL | CLINICAL | CLINICAL | CLINICAL | CLINICAL | CLINICAL | CLINICAL | CLINICAL | CLINICAL | OFFICES, ADMIN. | CLINICAL | OFFICES, STAFF WORK, ADMIN. | OFFICES, STAFF WORK, ADMIN. | TEST OTHER MFR. RUBBER-CORK PRODUCTS. | OFFICES, STAFF WORK, ADMIN. | OFFICES, STAFF WORK, ADMIN. | OFFICES, STAFF WORK, ADMIN. | OFFICES, STAFF WORK, ADMIN. | RAMPS | RAMPS |
| **PRIMARY ATTRIBUTES** | Vinyl smooth seam sealable | No sealer or wax required | No wax. Slip resistant, cushioned, green | Green/ non-vinyl/ smooth seam sealable, | 100% bio. Through body, Refinishable. Camo welds available. | NATURCote™ UV-cured coating is non-strippable and dirt resistant. | No sealer No wax. Slip resistant, cushioned, green - good acoustics | TZT look with vinyl wearability no wax, more slip resistant than TZT | BIO-BASED TILE | LVT ALTERNATIVE | BIO-BASED TILE | Durable, Easy to sanitize, superior acoustic properties, slip resistant, anti-fatigue. | Vacuum. acoustic slip resistance. Anti microbial. Water Impervious backing. | Slip resistant, cushioned, green - good acoustics | Slip resistant, cushioned, green - good acoustics | Slip resistant, cushioned, green - good acoustics | Slip resistant, cushioned, green | Carpet alternative - - good acoustics | Slip resistant, cushioned, green - good acoustics | Slip resistant, cushioned, green - good acoustics |
| **MANUFACTURER (Mfr./Distributor)** | Tarkett* | Mannington* | Mannington* | Wineo (Germany/Georgia US) | Forbo | Armstrong | UPO Floor | Johnsonite Tarkett* | Armstrong | Patcraft | Armstrong | J&J* | Forbo | Zandur | Capri Cork | Ecore Commercial Flooring | To Market* | ECORE Commercial Flooring | ROPPE | ECORE Commercial Flooring |
| **PRODUCT STYLE & COLOR** | IQ Natural, Color: 281 Rye Seed | Paradigm Intersect, Color: Foundation PAR103 | Enlighten Color: RV006 taupestone (2015-12-14 D/C'd-manufacturing issues) | Pureline, Color: Titanium. | Marmoleum Real, Color: 3249 Marly Grounds | Marmorette, Color: LP556 Atmosphere. | CS Collection, Color: 5511. (7/2015 CS Collection is renamed "ZERO") | Azrock - Azterra, Color: AT104 Gray Rock | Migrations BBT w/Biostride. Color: T3504 ICE WHITE | Typography collection; 1311V LETTERPRESS, Color; 00730 TAB | Striations BBT w/Biostride. Color: T3610 HAZE | Kinetex Velocity, Color: 1604 Direction | Flotex - Stratus. Color: 540001 Sulphur | Sustain Cork & Rubber Color: Cool Gray CR3092 | Re-Tire Basics Collection. Color: Rain RT4101. | ECO-SURFACES; ECO-ROCKS, Color: 903 Big Boulder | Atmosphere / Quantum / TM957 Berkley (Custom Color) | ECO-SURFACES, TERRAIN Rx. Color: 6420 WEATHERED TIN | Safe-T-Cork, P182 Toffee OR 124 TAUPE TLB TO CONFIRM. | ECO-SURFACES, ECO-EARTH 719 CATE MOSS |
| **PRODUCT COMPOSITION** | Homogeneous vinyl, | Vinyl flooring | rubber and polyolefin (vinyl 5% post consumer content/ 100% recyclable) | bio polyurethane, glass fiber, paper print layer, polyurethane top coat. Fleece Tech backing. | Linseed Oil, Rosin binders, Wood Flour, Limestone, and dry pigments. Natural Jute backing. | Linseed Oil, Rosin binders, Wood Flour, Limestone, and dry pigments. Natural Jute backing. | PVC -Free Polyolefin | 74% Natural Limestone/ Static Load Limit 400 psi. Manufactured in facility meeting ISO 14001 and ISO 9001 standards | | | | Solution Dyed Nylon Polyester Face with Polyester Felt Cushion back | 59% Recycled Vinyl cushioned backing - Nylon type 6.6 wear layer | 65% recycled product | EPDM and recycled rubber | Recycled rubber sheet flooring | 100% Post-Consumer Recycled Tire Rubber SBR | high quality cross-linked polyurethane reinforcment (PUR) face fused to a recycled rubber cushion back | RUBBER CORK EMBOSSED | Recycled rubber sheet flooring |
| **PRODUCT DIMENSIONS, Available as? SHEET, ROLL, TILE, etc.** | **ROLL**: 6'-6" x 75'-9" x .08" thick wear layer. **TILE**: 24" x 24" x.08" thick. Tile is not available at this time, will be available - check back in 6 months, approx. October 2015) | **ROLL**: 6', 9' 12' wide x .08" thick, 20 mil wear layer. **TILE:** N/A. | **ROLL:** 6'-6" wide x 63 yards x .08" thick (20 mil wear layer) **TILE**: N/A. | **ROLL:** 6'-7" x 65'-7" x 2.5 mm thick. **TILE:** plank: 59" | **ROLL**: 79" w x 105' x 2.5mm = 77SY. **TILE**: 20" x 20", 10" x 20", 10" x 10". | **ROLL**: 6'-7" x 98.4 ' x 0.100" (2.5 mm) thick. **TILE**: N/A. | **ROLL**: 4'-9" x 2.0 mm thick. **TILE**: N/A. | **TILE**: 13" square (CUSTOM OPTION FOR 16" SQ. TILE) **ROLL**: N/A. | **TILE**: 12" square. **ROLL**: N/A. | **ROLL: N/A. TILE**: 23+" square. | **PLANK**: 12" X 24" X 1/8". **ROLL**: N/A. | **TILE**: 24" x 24" x 1/8". **ROLL**: N/A | **TILE**: 19.7" x 19.7" x 3/8" thick. 12/carton = 32.3SF. **ROLL**: N/A | **TILE**: 24" X 24" X 1/8". **PLANK**: 12" X 24" X 1/8". | **ROLL**: 4' W x 3.2 mm. **TILE:** 24" x 24" x 3.2 mm. | **ROLL**: 4' roll goods x 3.2 mm thickness. **TILE**: 24" X 24". | **ROLL: N/A. TILE**: 38" x 38" straight edge, 37" x 37" interlocking, thickness varies. | **ROLL**: 1/4" thick. **TILE**: N/A | ROLL & TILE | ROLL & TILE? |
| **CARE & CLEANING** | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | ~~no wax buff or stripping no sealer or wax needed. Sweep, dust, mop.~~ | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. Pre-Finished at the factory. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. Pre-Sealed at the factory. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | | | | Vacuum, Spot Clean, and water clean extraction. | Vacuum, Spot Clean, and water clean extraction. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | ? | |
| **MATERIAL COST** - GOODS | $3.75 - $4.00 per SF. | Medasset: 6 ft. goods $25.70/see/roll of 63 SQ. yds. $28.68/SY. for cut. | $51.64 SY cut price | Roll goods $4.20 SF/roll. Rods are $82.15 each. Adhesive $94.00. Cork Spreader $30.60. | $2.25 SF | email request sent 6-12-15 | $3.00 goods cost per SF. Budget installed $6.00 per SF. | $2.50 - $3.00/sf. | $2.75 - $3.00 per SF. | $2.47 SF | email request sent 6-12-15 | N/A Failed test | $3.68 SF | N/A Failed test | $7.72 SF | $5.47 SF | $6.25 SF for 4mm goods | $4.25 goods cost per SF. Budget installed $8.50 per SF. | TBD | |

| JHHS - NEW FLOORING TEST - PRODUCT TRACKING LOG - PHASE 1: 11/2014 - 2/2015. PHASE 2: 3/2015 TO PRESENT. | | | | | | | | | FAIL | PHASE 2 | FAIL | FAIL | | FAIL | | | FAIL | | PHASE 2 | PHASE 2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TEST ID-TAG & DATA** | **1.1** RESILIENT | **1.2** RESILIENT | **1.3** RESILIENT | **1.4** RESILIENT | **1.5** RESILIENT | **1.6** RESILIENT | **1.7** RESILIENT | **1.8** RESILIENT | **1.9** RESILIENT | **1.10** RESILIENT | **1.11** RESILIENT | **2.9** ACOUSTIC NON-CARPET | **2.10** ACOUSTIC NON-CARPET | **2.11** ACOUSTIC NON-CARPET | **2.12** ACOUSTIC NON-CARPET | **2.13** ACOUSTIC NON-CARPET | **2.14** ACOUSTIC NON-CARPET | **2.15** ACOUSTIC NON-CARPET | **2.16** ACOUSTIC NON-CARPET | **2.17** ACOUSTIC NON-CARPET |
| **PRODUCT TYPE** | PVC Free Homogeneous Resilient 1 | Heterogeneous Resilient 1 | PVC Free Homogeneous Resilient 2 | Heterogeneous Resilient 2 | Linoleum 1 | Linoleum 2 | PVC Free Homogeneous Resilient 3 | Vinyl Enhanced Tile 1 | Resilient Tile 1 | Resilient Tile 2 | Resilient Tile 1 | Textile Composite 2 | Textile Composite 1 | Rubber & Cork 1 | Recycled Rubber 2 | Recycled Rubber 4 | Recycled Rubber 1 | Recycled Rubber-Backed Sheet Vinyl 1 | Rubber & Cork 2 | Recycled Rubber 3 |
| **ACOUSTIC PROPERTIES** | ? | ? | yes | MINIMAL | ISO 717-2 (impact sound reduction 6dB.) | 50-53 approx. IIC rating on 6" thick concrete slab floor. 53-56 IIC rating… | No | ? | | | | ASTM C 423-02 Noise reduction Coefficient NRC rating 0.30. | 3 tests- 1) ASTM E 492 (IIC 59); 2) ISO 354 Sound absorption (Noise reductions coefficient = | yes ASTM E492 (IIC 71) | yes | Yes | Acoustic Rating - Superior. 4mm = IIC 57 | Yes | ? | |
| **MFR: SLIP RESISTANCE. JHHS-HSE: DRAG-SLED RESULTS.** | MFR: ? JHHS-HSE: AVG 0.63 | MFR: meets ADAG. JHHS-HSE: AVG. 0.79 | MFR: meets ADAG. JHHS-HSE: AVG 0.66 | MFR: meets ADAG. JHHS-HSE: AVG. 0.71 | MFR: ASTM D 2047 meets or exceeds ADAG for flat surfaces. JHHS-HSE: AVG. 0.52 | MFR: meets ADAG value of 0.6 for level surfaces JHHS-HSE: AVG. 0.54 | MFR: ? JHHS-HSE: AVG. 0.49 | MFR: ? JHHS-HSE: | MFR: ? JHHS-HSE: | MFR: ? JHHS-HSE: | MFR: ? JHHS-HSE: | MFR: ASTM D 2047 Complies with ADAG for level surface. JHHS-HSE: | MFR: ASTM D 2047 Meets/exceeds A.D.A. 0.6 flat surfaces, 0.8 for inclined. JHHS-HSE: | MFR: Exceeds UL and ADAG. ASTM D2047 = 0.76 JHHS-HSE: | MFR: 083 dry / .98 wet JHHS-HSE: | MFR: >.9 JHHS-HSE: | MFR: Outstanding Wet or Dry. ASTM-D2047-93 Dry = 1.04 / Wet = 1.05 JHHS-HSE: | MFR: ADAG compliant. JHHS-HSE: | MFR: ? JHHS-HSE: | MFR: ? JHHS-HSE: |
| **SUSTAINABILITY - GREEN POINTS** | 25% pre-consumer recycled. Phthalate free. REA CH compliant. | 100% recyclable? Confirm w/Mannington | vinyl 5% post consumer content/ 100% recyclable | Greengard Gold certified made from 90% rapidly renewable materials | (confirm?) Greengard Gold certified made from 90% rapidly renewable materials | ? | Yes | 23% pre-consumer recycled - 6% post-consumer recycled. Floorscore certified. Phthalate Free | | | | ? | ? | Contributes to LEED MR 4.1, 4.2, 6.0, & IEQ 4.3 CHPS indoor air quality certified. | yes | no wax buff or stripping no sealer or wax needed. Sweep, dust, mop. | ? | ? | ? | |
| **GEOGRAPHIC CONSIDERATIONS** | Manufactured in Europe, Stocked/Distributed locally by L. Fishman. | Manufactured in Salem NJ USA | Manufactured in Salem NJ USA | Manufactured in Germany. Stocked/Distributed locally by Mats Inc. | Manufactured in Europe, Stocked/Distributed from PA. | Manufactured in Europe, Stocked/Distributed by Armstrong in Lancaster PA. | Manufactured in Finland, Stocked/Distributed in USA by UPO. | ? | ? | ? | ? | USA | Manufactured in Europe, Stocked/Distributed from PA. | Pennsylvania | made in USA | Made in USA | Oklahoma City OK. (CONFIRM made in or distributed from) | made in USA | ? | |
| **WARRANTY** | 5 years | 10 year wear & 10 year No Polish | 10 year wear & 10 year No Polish | 10 YEARS | 5 years | 5 year | 15 years | 11 years | 11 years | 11 years | 11 years | Lifetime Product Performance & backing. | 10 years | 10 years | 10 years | 5 years | 10 years | 5 years | ? | |
| **REP./DEALER** | Christine Colombo (L Fishman) 6301 E. Lombard St. Baltimore MD 21224 www.lfishman.com ccolombo@lfishman.com, 443-829-4077. Also Cynthia Hubbell (Tarkett International) | Brain Knutson (local rep) | Brain Knutson (local rep) | Luke Bosek Mats Inc. or Lori Hilty lhilty@matsinc.com (email) | Melanie McGeehan, 703-309-4283 (m) melanie.mcgeehan@forbo.com | Phil Harris Armstrong | Joe Blodgett (Spartan Surfaces) 131 Industry Lane Forest Hill MD 21050, www.spartansurfaces.com 443-262-5132. | Christine Colombo (L Fishman) & Cynthia Hubbell (Tarkett) | Phil Harris Armstrong | Rodney Dennis, 202-744-7736, rodney.dennis@patcraft.com | Phil Harris Armstrong | Chris Mason J&J Flooring. | Melanie McGeehan, 703-309-4283 (m) melanie.mcgeehan@forbo.com | Scott Goldman, Division 9 Assoc. | Joe Blodgett Spartan Surfaces. | Mark Huxta (ECORE national) Joe Blodgett Spartan Surfaces. | Bob Bell Finishes Sales Group | Joe Blodgett Spartan Surfaces. | Stanley Stephens | Joe Blodgett Spartan Surfaces. |
| **JHHS-EB TEST; OXI-CLEAN & OXI SEALER** | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | TBD | TBD | TBD | NO, UNABLE TO CLEAN OR MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | NO, UNABLE TO CLEAN OR MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | NO, UNABLE TO CLEAN OR MAINTAIN. | YES, ABLE TO CLEAN AND MAINTAIN. | TBD | TBD |
| **PASS/FAIL & ISSUES?** | PASS, NO ISSUES. JHHS STD SF-16, & RT-12 | PASS, NO ISSUES. JHHS STD SF-3. | PASS, NO ISSUES. JHHS SF-2. **2015-12-14 D/C'd** | PASS, NO ISSUES. JHHS STD SF-6. | PASS, NO ISSUES. JHHS STD SF-17. | PASS, NO ISSUES. JHHS STD SF-18. | PASS, NO ISSUES. JHHS STD. SF-19. | PASS, NO ISSUES. JHHS STD RT-9. | FAIL; unable to maintain with new cleaning protocol. | PASS, NO ISSUES. JHHS STD. RT-5. 6 & 44. | FAIL; unable to maintain with new cleaning protocol. | FAIL; SIGNIFICANT FACE WEAR. | PASS, NO ISSUES. JHHS STD TCT-1 | FAIL, UNABLE TO CLEAN AND MAINTAIN. | PASS, NO ISSUES. JHHS STD RBS-1 & RBT-1. | PASS, NO ISSUES. JHHS STD RBS-2 & RBT-2. | FAIL, UNABLE TO CLEAN AND MAINTAIN. | PASS, NO ISSUES. JHHS STD RBS-4. | cleanability & durability not confirmed | PASS, NO ISSUES. JHHS STD RBS-4. |

Notes: Manufacturer names with * indicate manufacturers representatives who requested return receipt of their test product flooring materials for their own further testing.

| JHHS - NEW FLOORING PRODUCT TEST | | | | Appendix 4: SLIP-RESISTANCE Graph | | |
|---|---|---|---|---|---|---|
| OBSERVATION - DATA COLLECTION: 11/2014 to 2/2015 | | | | | | TEST LOCATION: EB OC 1 |
| **Date Tested** | Test Strip # (unsealed) | OSHA Dry Test les than 0.40 | OSHA Dry Test 0.41 to 0.49 | **OSHA Dry Test Min. 0.50 Dry & Wet (ADA 0.60)** | OSHA Dry Test 0.41 to 0.59 | OSHA Dry Test greater than 0.61 |
| **Group 1 Resilient** | | | | | | |
| 11/24/2014 | 1.1 | Manufacturer stated AVG meets ADA. | | | | 0.69 |
| 1/6/2015 | 1.1 | | | | | 0.63 |
| 2/20/2015 | 1.1 | | | | | 0.63 |
| 11/24/2014 | 1.2 | Manufacturer stated AVG meets ADA. | | | | 0.86 |
| 1/6/2015 | 1.2 | | | | | 0.75 |
| 2/20/2015 | 1.2 | | | | | 0.79 |
| 11/24/2014 | 1.3 | Manufacturer stated AVG meets ADA. | | | | 0.67 |
| 1/6/2015 | 1.3 | | | | | 0.75 |
| 2/20/2015 | 1.3 | | | | | 0.66 |
| 11/24/2014 | 1.4 | Manufacturer stated AVG meets ADA. | | | 0.59 | |
| 1/6/2015 | 1.4 | | | | | 0.74 |
| 2/20/2015 | 1.4 | | | | | 0.71 |
| 11/24/2014 | 1.5 | Manufacturer stated AVG meets ADA. | | | | 0.72 |
| 1/6/2015 | 1.5 | | | | | 0.82 |
| 2/20/2015 | 1.5 | | | | 0.52 | |
| 11/24/2014 | 1.6 | Manufacturer stated AVG meets ADA. | | | | 0.76 |
| 1/6/2015 | 1.6 | | | | | 0.77 |
| 2/20/2015 | 1.6 | | | | 0.54 | |
| 11/24/2014 | 1.7 | Manufacturer stated AVG meets ADA. | | | | 0.62 |
| 1/6/2015 | 1.7 | | | | | 0.72 |
| 2/20/2015 | 1.7 | | 0.49 | | | |
| 11/24/2014 | 1.8 | Manufacturer stated AVG meets ADA. | | | | 0.78 |
| 1/6/2015 | 1.8 | | | | 0.59 | |
| 2/20/2015 | 1.8 | | 0.44 | | | |
| **Group 2 Acoustic options (Non-Carpet)** | | | | | | |
| 11/24/2014 | 2.9 | Manufacturer stated AVG meets ADA. | | | | 0.73 |
| 1/6/2015 | 2.9 | | | | | 0.67 |
| 2/20/2015 | 2.9 | | | | | 0.62 |
| 11/24/2014 | 2.10 | Manufacturer stated AVG meets ADA. | | | | 0.69 |
| 1//2015 | 2.10 | | | | | 0.66 |
| 2/20/2015 | 2.10 | | | | | 0.61 |
| 11/24/2014 | 2.11 | Manufacturer stated AVG meets ADA. | | | | 0.66 |
| 1/6/2015 | 2.11 | | | | | 0.73 |
| 2/20/2015 | 2.11 | | | | | 0.68 |
| 11/24/2014 | 2.12 | Manufacturer stated AVG meets ADA. | | | | 0.61 |
| 1/6/2015 | 2.12 | | | | | 0.63 |
| 2/20/2015 | 2.12 | | | | | 0.62 |
| 11/24/2014 | 2.13 | Manufacturer stated AVG meets ADA. | | | | 0.69 |
| 1/6/2015 | 2.13 | | | | | 0.68 |
| 2/20/2015 | 2.13 | | | | | 0.59 |
| 11/24/2014 | 2.14 | Manufacturer stated AVG meets ADA. | | | | 0.74 |
| 1/6/2015 | 2.14 | | | | | 0.69 |
| 2/20/2015 | 2.14 | | | | | 0.68 |
| 11/24/2014 | 2.15 | Manufacturer stated AVG meets ADA. | | | | 0.71 |
| 1/6/2015 | 2.15 | | | | 0.56 | |
| 2/20/2015 | 2.15 | | | | | 0.62 |

# JHHS - NEW FLOORING PRODUCT TEST

## Appendix 4: CLEAN Graph

**OBSERVATION - DATA COLLECTION: 11/2014 to 2/2015** — **TEST LOCATION: EB OC 1**

| Date Evaluated | Test Strip # | 1 = Filthy | 2 = Poor | 3 = Acceptable | 4 = Good | 5 = Like New |
|---|---|---|---|---|---|---|
| **Group 1 Resilient** | | | | | | |
| 11/24/2014 | 1.1 | | | 3 | | |
| 1/6/2015 | 1.1 | | | | 4 | |
| 2/20/2015 | 1.1 | | | | 4 | |
| 11/24/2014 | 1.2 | | | | 4 | |
| 1/6/2015 | 1.2 | | | 3 | | |
| 2/20/2015 | 1.2 | | | 3 | | |
| 11/24/2014 | 1.3 | | | | 4 | |
| 1/6/2015 | 1.3 | | | | 4 | |
| 2/20/2015 | 1.3 | | | 3 | | |
| 11/24/2014 | 1.4 | | | 3 | | |
| 1/6/2015 | 1.4 | | | | 4 | |
| 2/20/2015 | 1.4 | | | | 4 | |
| 11/24/2014 | 1.5 | | | 3 | | |
| 1/6/2015 | 1.5 | | | | 4 | |
| 2/20/2015 | 1.5 | | | | 4 | |
| 11/24/2014 | 1.6 | | | 3 | | |
| 1/6/2015 | 1.6 | | | | 4 | |
| 2/20/2015 | 1.6 | | | | 4 | |
| 11/24/2014 | 1.7 | | | 3 | | |
| 1/6/2015 | 1.7 | | | | 4 | |
| 2/20/2015 | 1.7 | | | | 4 | |
| 11/24/2014 | 1.8 | | | | 4 | |
| 1/6/2015 | 1.8 | | | | | 5 |
| 2/20/2015 | 1.8 | | | | 4 | |
| **Group 2 Acoustic Options (Non-Carpet)** | | | | | | |
| 11/24/2014 | 2.9 | | | 3 | | |
| 1/6/2015 | 2.9 | | 2 | | | |
| 2/20/2015 | 2.9 | | 2 | | | |
| 11/24/2014 | 2.10 | | | 3 | | |
| 1//2015 | 2.10 | | | 3 | | |
| 2/20/2015 | 2.10 | | | 3 | | |
| 11/24/2014 | 2.11 | | | 3 | | |
| 1/6/2015 | 2.11 | | 2 | | | |
| 2/20/2015 | 2.11 | 1 | | | | |
| 11/24/2014 | 2.12 | | 2 | | | |
| 1/6/2015 | 2.12 | | | | | 5 |
| 2/20/2015 | 2.12 | | | | | 5 |
| 11/24/2014 | 2.13 | | | | 4 | |
| 1/6/2015 | 2.13 | 1 | | | | |
| 2/20/2015 | 2.13 | | 2 | | | |
| 11/24/2014 | 2.14 | | 2 | | | |
| 1/6/2015 | 2.14 | 1 | | | | |
| 2/20/2015 | 2.14 | 1 | | | | |
| 11/24/2014 | 2.15 | | 2 | | | |
| 1/6/2015 | 2.15 | | | | | 5 |
| 2/20/2015 | 2.15 | | | | 4 | |

# JHHS - NEW FLOORING PRODUCT TEST

## Appendix 4: ACOUSTIC Graph

**OBSERVATION - DATA COLLECTION: 11/2014 to 2/2015**

**TEST LOCATION: EB OC 1**

| Date Tested | Test Strip # | 1 = PEAK greater than 87 dB (less preferable) | 2 = PEAK 86 dB | 3 = PEAK 85 dB | 4 = 84 dB | 5 = less than 84 dB (more preferable) |
|---|---|---|---|---|---|---|
| **Group 1 Resilient** | | | | | | |
| 11/24/2014 | 1.1 | 88 | | | | |
| 12/1/2014 | 1.1 | | 86 | | | |
| 2/20/2015 | 1.1 | 87 | | | | |
| 11/24/2014 | 1.2 | 88 | | | | |
| 12/1/2014 | 1.2 | 89 | | | | |
| 2/20/2015 | 1.2 | 87 | | | | |
| 11/24/2014 | 1.3 | 89 | | | | |
| 12/1/2014 | 1.3 | | 86 | | | |
| 2/20/2015 | 1.3 | 87 | | | | |
| 11/24/2014 | 1.4 | 87 | | | | |
| 12/1/2014 | 1.4 | 87 | | | | |
| 2/20/2015 | 1.4 | 87 | | | | |
| 11/24/2014 | 1.5 | | | | | 83 |
| 12/1/2014 | 1.5 | | 86 | | | |
| 2/20/2015 | 1.5 | | 86 | | | |
| 11/24/2014 | 1.6 | 91 | | | | |
| 12/1/2014 | 1.6 | | 86 | | | |
| 2/20/2015 | 1.6 | 87 | | | | |
| 11/24/2014 | 1.7 | 88 | | | | |
| 12/1/2014 | 1.7 | | | | 84 | |
| 2/20/2015 | 1.7 | | 86 | | | |
| 11/24/2014 | 1.8 | 91 | | | | |
| 12/1/2014 | 1.8 | | 86 | | | |
| 2/20/2015 | 1.8 | 87 | | | | |
| **Group 2 Acoustic options (Non-Carpet)** | | | | | | |
| 11/24/2014 | 2.9 | | | | | 83 |
| 12/1/2014 | 2.9 | | | | | 84 |
| 2/20/2015 | 2.9 | 87 | | | | |
| 11/24/2014 | 2.10 | | | | | 78 |
| 12/1/2014 | 2.10 | | | | | 79 |
| 2/20/2015 | 2.10 | 87 | | | | |
| 11/24/2014 | 2.11 | | | | | 83 |
| 12/1/2014 | 2.11 | | 86 | | | |
| 2/20/2015 | 2.11 | | | 85 | | |
| 11/24/2014 | 2.12 | | | | | 82 |
| 12/1/2014 | 2.12 | | | 85 | | |
| 2/20/2015 | 2.12 | | | 85 | | |
| 11/24/2014 | 2.13 | | | | | 81 |
| 12/1/2014 | 2.13 | | | 85 | | |
| 2/20/2015 | 2.13 | | | 85 | | |
| 11/24/2014 | 2.14 | | | | | 83 |
| 12/1/2014 | 2.14 | | | 85 | | |
| 2/20/2015 | 2.14 | | | 85 | | |
| 11/24/2014 | 2.15 | | | 85 | | |
| 12/1/2014 | 2.15 | | | 85 | | |
| 2/20/2015 | 2.15 | 87 | | | | |

JOHNS HOPKINS
MEDICINE
JOHNS HOPKINS
HEALTH SYSTEM

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Project: JHHS Facilities New Flooring Test - Collaborative Team

Appendix Item #5

JHHS Facilities Administration
Sally MacConnell – VP of Facilities

JHHS Facilities Architecture + Planning
Michael Iati RA – Senior Director
Teri Lura Bennett CID CHID EDAC - Lead Interior Design
Andrea Hyde CID CHID – Planner - Designer
Vicki Hartwig - Signage & Wayfinding
Valerie Robinson – Project Manager
Ann Pirkey – Facilities Planning Office – Administrative Coordinator

JHH Facilities Engineering & Environmental Care
Boubacar Maiga – Sr. Director (EVC)
Keith Farrar – Environmental Care (EVC)
Sean Nelson – Engineering
Harold Stewart – JHH Facilities Environmental Care (EVC – OC building)

JHH Health Safety & Environment (HSE)
Cliff Carter – JHH Health Safety & Environment (HSE)

JHH - Nursing Administration
Carla Aquino RN

JHH Infection Control (HEIC)
Bria Graham-Glover — Construction & Renovation Liaison

JHH - Armstrong Institute for Patient Safety
Nana Khunlertkit – Researcher

Manufacturer Representatives (Flooring Product Test ID#)
Bob Bell – To Market Finishes Sales group (2.14)
Joe Blodgett – Spartan Flooring (1.7, 2.12, 2.13, 2.15)
Luke Bosek – Mats Inc. (1.4)
Gary Coia – Forbo (1.5, 2.9, 2.10)
Scott Goldman – Division 9 (2.11)
Phillip Harris – Armstrong (1.6)
Cynthia Hubble – Tarkett with Christine Colombo – L Fishman (1.1, 1.8)
Mark Huxta – Mannington (1.2, 1.3)
Chris Mason – J&J (2.9)

Flooring Installer
Chris Gallagher – Carpetworks (Installer)

ENVIROX®
a healthier way to clean®

# INFECTION CONTROL SOLUTIONS

## Clean with the Power of Stabilized Hydrogen Peroxide!

### Superior Technology

- Patented, stabilized hydrogen peroxide based cleaning technology
- EPA Registered
- Sanitizer/Virucide*/ Hepatitis B**
- Neutral pH

In 1998, EnvirOx® stabilized and patented hydrogen peroxide based cleaning technology. This superior cleaning technology continues to out-perform competitors by delivering a safe, simple and effective cleaning solution for the most difficult of cleaning challenges.

### Deeper Clean

- Cleans 95% of any facility with only two dilutions
- Cleans glass, carpet, grout and all other water safe surfaces
- Deep renovation cleaning
- No residue build up

When EnvirOx® stabilized hydrogen peroxide with renewable resource surfactants, we created a product that cleans ***everything*** without leaving residue. This means truly clean surfaces that won't encourage bacteria growth or resoiling.

### Healthy Environment

- Biodegradable
- Low VOCs
- Non-asthmagenic
- Renewable resource ingredients
- HMIS 0,0,0 in use dilution

The EnvirOx® mission: "We will be the BEST at providing environmentally preferable products that effectively meet people's needs where they live, learn, work and play." EnvirOx® only develops and manufactures products that meet the strictest of human health and environmental standards.

### Cleaning for Health

Health and wellness are at the forefront of health care, education and government initiatives. The health care industry has the unique challenge of preventing hospital-acquired infections in an environment where the introduction of germs is inevitable. To further complicate this challenge, traditional cleaning technologies have health care facilities trapped in a cycle that kills bacteria and viruses, and also leaves behind a bio-film of residue that promotes bacterial growth.

Clean and healthy environmental surfaces are the first line of defense in preventing the spread of bacteria and viruses throughout a health care facility. Cleaning for infection control is cleaning for infection prevention. EnvirOx® hydrogen peroxide technology makes cleaning to prevent infection a reality.

*When used as directed H2Orange,® Concentrate 117 and 118 are EPA registered to kill *Herpes Simplex Virus Type 2***, *Influenza A2/Japan*, *HBV (Hepatitis B Virus)*** and *HIV-1 (Human Immunodeficiency Virus)*.
**Except in California.

# Prevention is the future of infection control...

***Clean and sanitize with the power of hydrogen peroxide every time you use $H_2Orange_2$® Concentrate 117 or Concentrate 118.***

EnvirOx® patented, stabilized hydrogen peroxide based cleaning technology delivers superior results with a simple, effective system.

## $H_2Orange_2$® Concentrate 117 or Concentrate 118


**Same ground breaking technology, cleaning power, safety and EPA registration. Choose Fresh Orange or Light Clean Scent.**

- Patented, stabilized hydrogen peroxide sanitizer,virucide*.
- One product at two dilutions = 95% of your facility general cleaning needs.
- Neutral pH in use dilution.
- HMIS of 0,0,0, in use dilution.
- Non-corrosive, won't irritate skin or eyes.
- No facility damage, safe on all water-safe surfaces.
- Cleans glass, tile, grout, bathrooms, carpet, marble, stainless steel and more!

**Follow-up on key facility touch-points with...**

### Critical Care™

- Silver Ion Disinfectant Technology.
- Kills MRSA, VRE and Norovirus.
- 24 hour residual§ kill.
- HMIS of 0,0,0.
- Mist on surface and walk away, no need to wipe.

*When used as directed $H_2Orange_2$® Concentrate 117 and 118 are EPA registered to kill *Herpes Simplex Virus Type 2***, *Influenza A2/Japan, HBV (Hepatitis B Virus)*** and *HIV-1 (Human Immunodeficiency Virus)*.
**Except in California.
§ When used as directed provides protection from *Pseudomonas aeruginosa, Staphylococcus aureus* and *Salmonella choleraesuis* up to 24 hours after initial application.

## The EnvirOx® Cleaning Solution is Prevention.

You *can* prevent bacteria and viruses from thriving. The right cleaning product and protocol limits bacterial growth and reproduction, reducing the transfer of infections and improving the overall health and wellness of your facility.

## Safe • Simple • Sustainable

### A cleaning system with unparalleled benefits.

- Safer chemicals lead to a healthier environment for staff and patients.
- Powerful cleaning results improve infection control and aesthetic appeal.
- With EnvirOx®, a facility can expect streak-free glass, clean grout, spotless carpets and much more.
- Say good-bye to surface damage due to harsh chemicals.
- One chemical, two dilutions = 95% of all your general cleaning needs.
- Reduce inventory and SKUs in addition to simplifying the training of new staff.

***With EnvirOx®, you can rest assured that your facility's cleaning choices are sustainable for people and the environment.***

9-855-HEA

ENVIROX®
*a healthier way to clean®*

# Critical Care™

## DISINFECTANT-FUNGICIDE-VIRUCIDE*


EPA Reg. No. 72977-3-69268

- 30 second+ immediate disinfection
- 24-hour§ residual bacteria kill
- Odorless-no harsh disinfectant smell
- Disinfectant-Fungicide-Virucide
- Reduced toxicity- HMIS Health = 0
- Ready-to-use
- No sticky or dulling residue
- Kills MRSA in 2 minutes

**Recommended for use in combination with $H_2Orange_2$ Concentrate 117™ for complete, low toxicity cleaning, sanitizing and disinfecting.**

## *30-Second+ Kill/ 24-hr.§ Residual Kill*
## *Fast, Easy, Effective*

***Fastest kill times, 24 hour§ residual kill, lowest toxicity***

Critical Care is formulated to use on critical disease transfer points. Use it in combination with $H_2Orange_2$ Concentrate 117™ multi-purpose cleaner-deodorizer-sanitizer, and eliminate elevated toxins from your cleaning and disinfecting program.

+ Organisms controlled with 30 second kill time
§ When used as directed provides protection from *Pseudomonas aeruginosa, Staphylococcus aureus* and *Salmonella cholerasuis* up to 24 hours after initial application.

9-855-CR

# Directions for Use

**It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.**

**CRITICAL CARE™** is a colorless, odorless broad spectrum antimicrobial disinfectant and deodorizer. Proven to kill bacteria, fungus and viruses*, CRITICAL CARE should be used on non-porous environmental hard surfaces in homes, offices, hospitals, nursing homes, medical clinics, dental clinics, pharmacies, laboratories, ambulances and patient transfer vehicles, funeral homes, hotels, restaurants, schools, daycare facilities, veterinary clinics, animal shelters, kennels, cages, stables, catteries, animal transport vehicles, bars, supermarkets, colleges, dorm rooms, churches, basements, garages, workshops, attics, gyms, spas, health clubs, laundromats, school buses, cars, RV's, mobile homes, trucks, trailers, shipping containers, rail cars, cruise ships, exercise facilities, beauty and barber shops, subways, trains, airplanes, ships, buses and other public transportation vehicles, locker rooms, kitchens and restrooms.

**CRITICAL CARE™** has been formulated to disinfect hard, non-porous environmental surfaces (painted, glazed tile, plastic, metal, glass, glazed porcelain) and objects including walls, floors, counters, sinks, exterior toilet surfaces, faucet handles, handrails, patio furniture, equipment tables, lab benches, toys, toy boxes, booster chairs, potty seats, laundry hampers, grocery carts, cabinets, tubs, showers, doorknobs, light switch covers, telephones, appliances, stove tops, bed frames, wheelchairs, over-bed tables, examination tables, waste containers, tables, chairs, children's toys, diaper pails, diaper changing tables, bathroom and or kitchen counters, desks, play tables, computer keyboard, jungle gyms, playhouses, child car seat (hard surfaces only), strollers, cribs, playpens, activity centers, tanning beds.

# Application Instructions

**Pre-clean surfaces prior to using this product.**

**General Disinfectant:** For general disinfection and control of the bacteria Pseudomonas aeruginosa, Staphylococcus aureus, Salmonella enterica, Listeria monocytogenes, Vancomycin resistant Enterococcus faecium (VRE), Methicillin resistant Staphylococcus aureus (MRSA), Community Associated Methicillin resistant Staphylococcus aureus (CA-MRSA), Community Associated Methicillin resistant Staphylococcus aureus (CA-MRSA-PVL), Escherichia coli 0157:H7, Acinetobacter baumannii and Campylobacter jejuni the surface must be completely wet with **CRITICAL CARE™** for 2 minutes. The surface may then be wiped dry with a clean towel. When used as directed, **CRITICAL CARE™** provides residual protection from the Pseudomonas aeruginosa, Staphylococcus aureus, and Salmonella enterica up to 24 hours after initial application. Do not touch treated surface after application if residual protection is to be maintained.

**Fungus Control:** For effective control of the fungus Trichophyton mentagrophytes, the surface must be completely wet with **CRITICAL CARE™** for 10 minutes. The surface may then be wiped dry with a clean towel. Re-apply when cleaning or when new growth appears.

***Viral Control:** To kill Herpes Simplex Type 1 F(1) Strain, Influenza A Virus, Hong Kong strain, Rhinovirus R37 Strain 151-1, Polio Virus Type 2 Lansing Strain the surface must be completely wet with **CRITICAL CARE™** for 10 minutes. The surface may then be wiped with a clean towel.

Respiratory illnesses attributable to Pandemic 2009 H1N1 are caused by Influenza A virus. **CRITICAL CARE™** is a broad-spectrum hard surface disinfectant that has been shown to be effective against Influenza A Virus and Avian Influenza A virus and is expected to inactivate all Influenza A viruses including Pandemic 2009 H1N1, formerly called swine flu.

**Kills HIV-1** on pre-cleaned environmental surfaces/objects previously soiled with blood/body fluids in health care settings (or other settings in which there is an expected likelihood of soiling of inanimate surfaces/objects with blood or body fluids, and in which the surfaces/objects likely to be soiled with blood or body fluids can be associated with the potential for transmission of HIV). Instructions for **Cleaning and Decontamination Against HIV** on pre-cleaned environmental surfaces/objects previously soiled with blood/body fluids: **Personal Protection:** When handling items soiled with blood or body fluids, use appropriate barrier protection such as latex gloves, gowns, masks or eye coverings. **Cleaning Procedure:** Blood and other body fluids must be thoroughly cleaned from surfaces and objects before application of this disinfectant. **Contact time:** Apply **CRITICAL CARE™** to area to be treated. The surface must be completely wet with **CRITICAL CARE** for 30 seconds. The surface may then be wiped dry with a clean towel. This contact time will not control all organisms listed on this label. Refer to application instructions for other organisms. **Disposal of Infectious Materials:** Blood and other body fluids should be autoclaved and disposed of according to federal, state and local regulations for infectious waste disposal.

## *Critical Care™ Disinfectant Information*

| Organism | Kill Time | Organism | Kill Time |
|---|---|---|---|
| +*Pseudomonas aeruginosa* | 30 sec. | *Campylobacter jejuni* | 2 min. |
| *Staphylococcus aureus* | 2 min. | *Trichophyton mentragrophytes* (Athlete's Foot Fungus) | 10 min. |
| +*Salmonella enterica* | 30 sec. | +*HIV* type 1-Strain HTLV IIIB[1] | 30 sec. |
| *Listeria monocytogenes* | 2 min. | *Herpes Simplex Type 1 VR-733 F(1) Strain[2] | 1 min. |
| Vancomycin resistant *Enterococcus faecium (VRE)* | 2 min. | *Rotavirus | 3 min. |
| Methicillin resistant *Staphylococcus aureus (MRSA)* | 2 min. | *Human Coronavirus | 3 min. |
| Community Associated Methicillin resistant *Staphylococcus aureus* (CA-MRSA) | 2 min. | *Norovirus | 10 min. |
| Community Associated Methicillin resistant *Staphylococcus aureus* (CA-MRSA-PVL) | 2 min. | *Influenza A VR-544, Hong Kong Strain | 10 min. |
| *Escherichia coli* 0157:H7 | 2 min. | *Rhinovirus R37 VR-1147, Strain 151-1 | 10 min. |
| *Acinetobacter baumannii* | 2 min. | *Polio Type 2, VR-1002 Lansing Strain | 10 min. |

### *Toxicology & Safety Information*

Skin irritation = non irritant
Eye irritation = non irritant
Acute Oral Toxicity = >5000 mg/kg
Dermal Sensitization = not a sensitizer
Flammability = non combustible
Dot Classification = non regulated
Hazardous waste = no

+ Organisms controlled with 30 second kill time.
* When used as directed Critical Care kills HIV type 1-Strain HTLV IIIB, Herpes Simplex Type 1 VR-733 F(1) Strain, Influenza A VR-544, Hong Kong Strain, Rhinovirus R37 VR-1147, Strain 151-1, Polio Type 2, VR-1002 Lansing Strain, Rotavirus, Norovirus, Human Coronavirus and Avian Influenza A.
§ When used as directed provides protection from *Pseudomonas aeruginosa, Staphylococcus aureus* and *Salmonella cholerasuis* up to 24 hrs after initial application.

9-855-CR

APPENDIX ITEM # 7

# Use of carpet in Patient Care Areas

Johns Hopkins Medicine

Epidemiology and Infection Prevention Programs

**Consensus Statement:** Carpet should be avoided in most clinical and patient care areas.

Johns Hopkins Medicine's Epidemiology and Infection Prevention Programs was asked to make a recommendation on the use of carpet in patient care areas.

**Rationale:**

Products and practices that reduce the potential for hospital acquired infection and promote patient safety are key elements in the operation and design of healthcare facilities. An Infection Control Risk Assessment (ICRA) is required as described in the Facility Guideline Institute's (FGI) Guidelines for the Design and Construction of Health Care Facilities (2010) when designing healthcare facilities. This assessment includes not only the interventions that will occur to mitigate the risk of infections during the construction but also the design aspects that might have long term impact on infection prevention (Bartley, 2010).

The FGI Guidelines state that "when selecting surfaces and furnishings, there is an expectation to ensure that surfaces meet necessary code requirements, while also looking for characteristics that support sustainability and infection prevention."

Floor finishes and environmental cleaning protocols are a part of the overall facility infection control risk reduction strategy, and associated guidelines. The choice of floor covering should promote a high level of cleanliness and hygiene within in the patient care environment. Floors are subject to staining, spills of body fluids, aggressive cleaning and a high volume of wheeled traffic.

Microbial count and survival count is higher in carpet compared to smooth impervious surfaces.
After discussion with the group, a consensus was obtain by the Epidemiology and Infection Prevention Programs from the member organizations of Johns Hopkins Medicine and recommend that carpet should be avoided in most clinical and patient care areas.

Epidemiology and Infection Prevention | 600 N. Wolfe Street,

Billings Admin 327 | Baltimore, MD | 410-502-9617 T | 410-502-7144 F

References information on carpet use in healthcare facilities:


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# New Flooring Test

Facilities Architecture + Planning

JOHNS HOPKINS
MEDICINE
JOHNS HOPKINS
HEALTH SYSTEM

Presented by: Teri Lura Bennett RN CID IIDA CHID EDAC NIHD
January 25, 2018

# New Flooring Test
## JHHS Facilities A+P



JOHNS HOPKINS MEDICINE
JOHNS HOPKINS HEALTH SYSTEM

# New Flooring Test
## JHHS Facilities A+P

Established in 1889, Johns Hopkins is a leader in patient care, medical research and teaching. Specializing in every aspect of medical care. Johns Hopkins Medicine includes six academic and community hospitals, four suburban health care and surgery centers, more than 30 primary health care outpatient sites, as well as programs for national and international patient activities.

The Johns Hopkins Health System Corporation functions as a parent holding company of its wholly owned affiliates, including:

- The Johns Hopkins Hospital East Baltimore historic campus with 1,059 beds
- Johns Hopkins Bayview Medical Center with 545 beds
- Howard County General Hospital with 267 beds
- Suburban Hospital with 229 beds
- Sibley Memorial Hospital with 318 beds
- All Children's Hospital with 259 beds
- Johns Hopkins Community Physicians, Inc. multi-specialty physician organization with over 400 providers

# New Flooring Test
## JHHS Facilities A+P

The Johns Hopkins Hospital East Baltimore campus has greater than 9 Million SF of flooring

- This staggering and ever increasing figure doesn't include the other four JHHS hospital campuses and many JHHS non-hospital outpatient and office support sites.
- Under the direction of the Facility Planning Office, & JHH Engineering a system-wide multi-disciplinary research flooring testing study was conducted over a 90 Day test period.
- The test protocol and process was informed by the 2014 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities, Surfaces and Materials Appendix, for performance criteria selection guidelines.

# New Flooring Test
## JHHS Facilities A+P

OBJECTIVES:

- Determine flooring selection protocol to fit diverse use applications, using the new 2014 FGI Guidelines Criteria for the selection of Surfaces and Furnishings.
- Create a collaborative multi-disciplinary JHH team to research and develop test protocols for flooring safety, performance and cleaning methodology.
- Implement those protocols in a coordinated comprehensive testing period, concluding in developing flooring standards for use at JHH.
- Learn how EBD surface material selection contributes to improved patient outcome and HCAHPS scores.

# New Flooring Test
## JHHS Facilities A+P

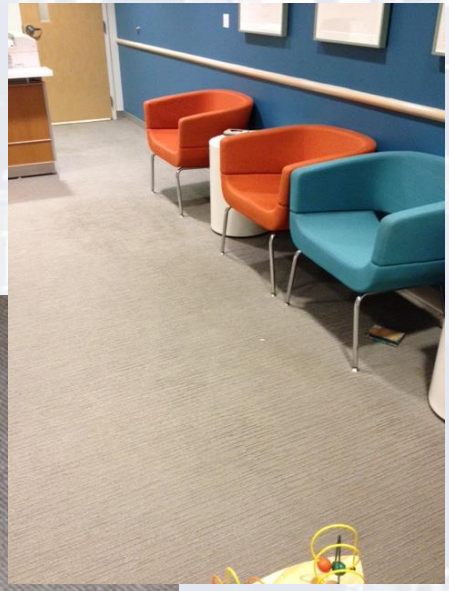
NEW FLOORING PRODUCTS SHOULD;

- Support the mission of JHHS by providing facilities and amenities that promote the highest quality care, afford solace, and enhance the community.
- Support Clinical Needs
- Comply with industry standards for patient safety
- Improve patient outcomes by reducing environmental factors which contribute to illness using non-toxic non-allergenic materials
- Meets required standards of safety and durability for planned life cycle
- Easily maintained by EVC staff in occupied healthcare facility according to CDC cleaning standards.
- Supported by manufacturers' warranty and designated representatives to

# New Flooring Test
## JHHS Facilities A+P

CHALLENGE: Reduce use of under-performing, environmentally harmful, expensive, difficult to maintain products.

INVESTIGATION: Carpet installed 2012 is puddling, seams opening, de-raveling, and showing permanent stains.





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# New Flooring Test
## JHHS Facilities A+P

CHALLENGE: Establish new standard cleaning procedures and protocols to comply with Sustainable, Low-VOC, guidelines.

INVESTIGATE: Identified Low-VOC sustainable cleaning products and methodologies, not previously been used at JHH.

TEST: Using Envirox Cleaner & Sealer

- Daily - Dust mop - Damp mop
- Weekly - Ride on Scrubber
- Monthly - Machine scrub

# New Flooring Test
## JHHS Facilities A+P

CHALLENGE: Can we promote & support a No-Carpet flooring policy for all future projects.

INVESTIGATE: Determine non-carpet alternatives which are cleanable, maintainable, and acoustically viable.

TEST: Install multiple flooring product types for healthcare environment testing.


# New Flooring Test
## JHHS Facilities A+P

CHALLENGE: Building code requires all renovation projects incorporate Green/Sustainable material specifications. Manufacturers have responded with innovative new flooring products.

INVESTIGATE: Conduct our own test to determine if JHH can clean and maintain these new flooring products in our healthcare environment.





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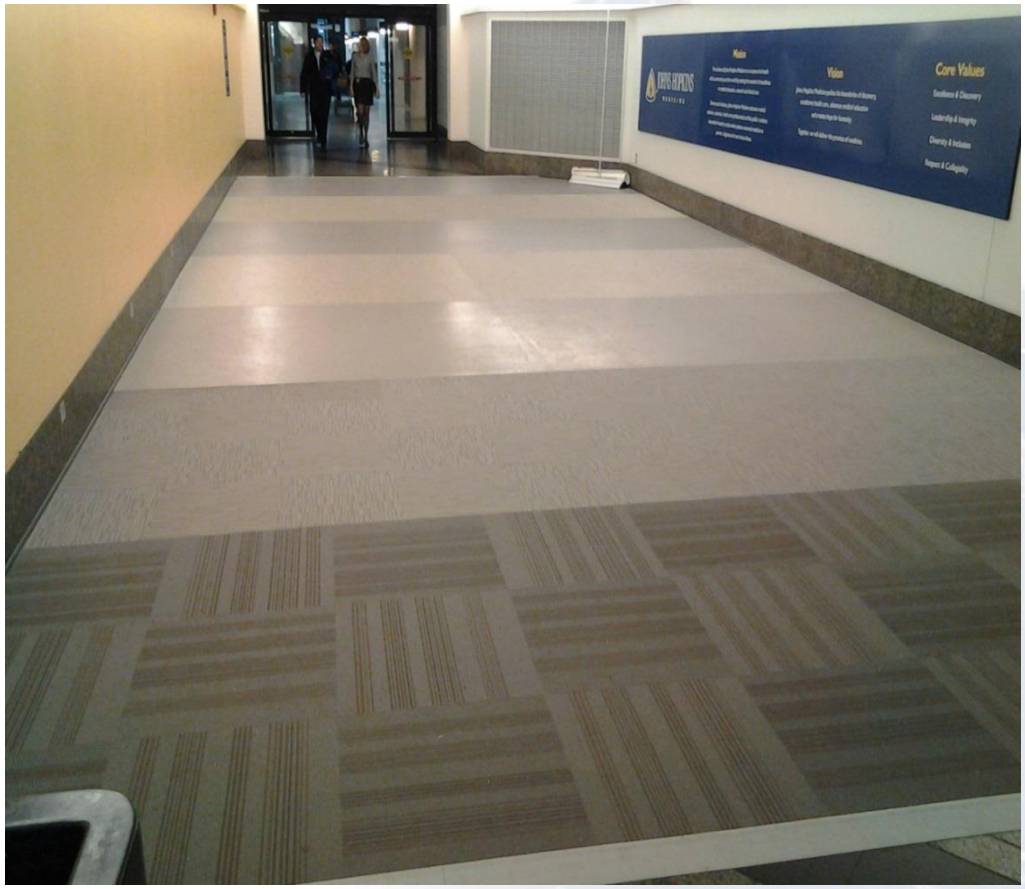
# New Flooring Test
## JHHS Facilities A+P

- CHALLENGE: Infection Control and Aging issues require elimination of high gloss surfaces. VCT requires use of high gloss wax finish. Wax is organic and capable of supporting microbial growth. Wax particles become airborne contaminating adjacent surfaces.

- INVESTIGATE: Can JHH clean & maintain No-Wax flooring products satisfactorily throughout JHHS campuses.



# New Flooring Test
## JHHS Facilities A+P


- TEST: Install Flooring products to be tested in heavy use location to assess JHH team ability to clean and maintain using new cleaning procedures and protocols.
- LOCATION: Corridor connecting JHH Main Campus and JHOPC, including Metro subway entrance to JHH East Baltimore campus. Estimated over 20,000 footfalls per day.

# New Flooring Test
## JHHS Facilities A+P

- TEST PROTOCOL:
- Provide for testing diverse new flooring product types; textile composite, rubber, rubber composite, vinyl rubber composite, heterogeneous and homogeneous resilient flooring products were tested.

- All were cleaned using same protocol for low sheen non-wax floor cleaning. Half of each product was sealed applied, half was not.

- Data collection at regular intervals throughout the testing period included direct observation, measurements, visual inspection, surveys and interviews.

- Documentation provided data with parameters clearly identified, using FGI for standard testing protocol.

# New Flooring Test
## JHHS Facilities A+P

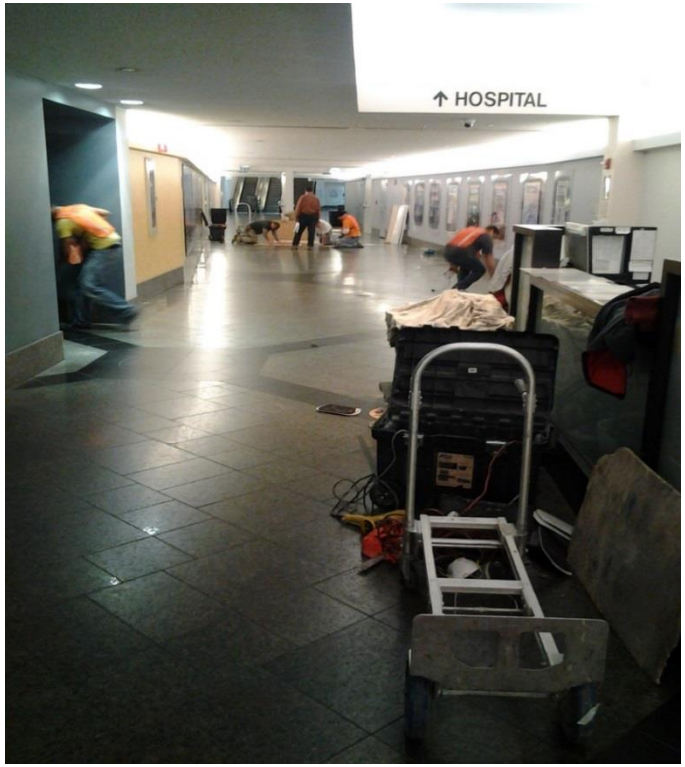
- BENCHMARK DATES FOR 90-DAY TEST

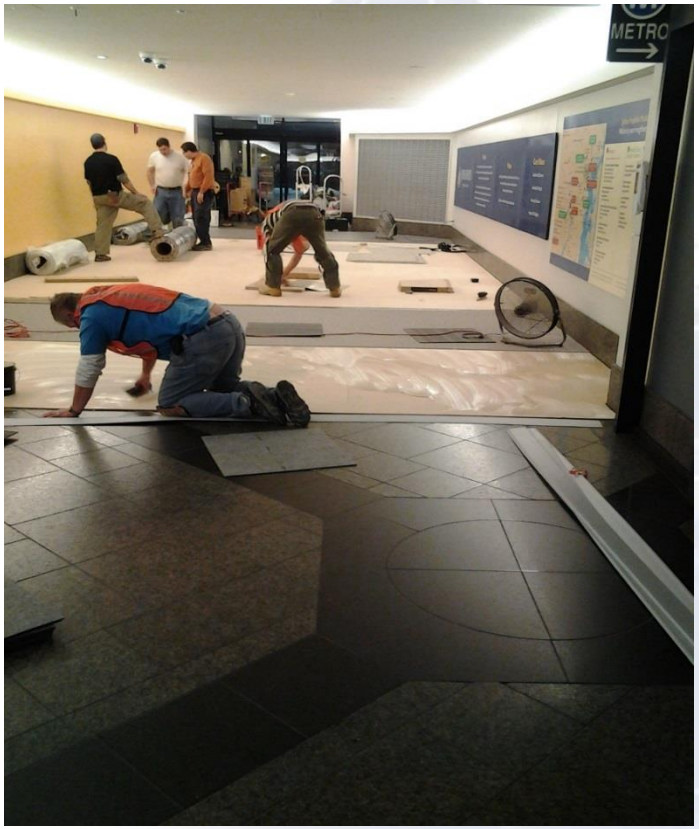
- Nov. 22, 2014 Installation
- Nov. 24, 2014 Baseline First Evaluation – Slip-resistance tested
- Jan. 3, 2015 EVC – First Machine Scrubber Clean
- Jan. 20, 2015 Mid-Point – Slip-resistance tested
- Jan. 8, 2015 Controlled Stain Applied
- Jan. 10, 2015 Controlled Stain Spot Clean
- Feb. 16, 2015 Final Evaluation week
- Feb. 20, 2015 Controlled Heavy Furniture Drag Test & Final Evaluation
- Feb. 21, 2015 Test Ends, All Flooring Products Removed. Underlayment assessed for leakage at product seams.

# New Flooring Test
## JHHS Facilities A+P

Nov. 22-23, 2014

Installation



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# New Flooring Test
## JHHS Facilities A+P

Nov. 24, 2014 –Feb. 20, 2015:

Weekly evaluations included photographs of each flooring product against a control sample.


# New Flooring Test
## JHHS Facilities A+P

SLIP-RESISTANCE TEST

- November 24, 2014
- Mid-Point
- February 20, 2015.

- Conducted by: JHH Health Safety & Environment Team (HES)

- Wet & Dry tests taken and recorded for each of 15 different flooring products, on both sealed & Unsealed portions of each Flooring product.

# New Flooring Test
## JHHS Facilities A+P

- ACOUSTICS EVALUATION

- November 24, 2014
- Mid-Point
- February 20, 2015.

- Record dB level baseline and upon dropping noise producing tool. Record results for comparison against Manufacturer ratings.

# New Flooring Test
## JHHS Facilities A+P


CONTROLLED STAIN TEST

- Jan. 8, 2015 Stain applied.
- Jan. 10, 2015 Not Clean on first evaluation. No special cleaning methods were used.
- Feb. 2, 2015 Subsequent regular cleaning did remove the stain. ***Success!***





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# New Flooring Test
## JHHS Facilities A+P

BENCHMARK DATES FOR 90-DAY TEST

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- Jan. 8, 2015 Controlled Stain Applied
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# New Flooring Test
## JHHS Facilities A+P

SUMMARY FINDINGS:

- No Wax floors are a reality we can all live with. Specifying No-Wax matte shine flooring products is the new JHHS reality.

***SHINY IS DIRTY, MATTE IS WHERE ITS AT!***

- Acoustical needs require a whole environment solution. Non-carpet flooring options can effectively contribute to those solutions.

# New Flooring Test
## JHHS Facilities A+P

CONTINUING EFFORTS:

- Identify the most successful flooring product types for use at JHHS.
- Beta test the best of these flooring product types in all projects requiring new flooring; Waiting, Office, Clinical.
- Continual Ongoing Evaluation and Assessment.
- Expand efforts to include testing of wall protection and upholstery materials.
- Prepare Flooring Test Report to share findings!

*Thank you !*

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