

The Power of Foam

BEYOND
LIFTING

The collage features several diamond-shaped images illustrating the application of foam in construction and repair work:

- Top left: A worker applying foam to a concrete surface.
- Top center: A large pile of foam material.
- Top right: A worker in a blue jacket applying foam to a concrete wall.
- Middle left: A worker using a pump to inject foam into a concrete slab.
- Middle center: A close-up of a yellow measuring tape next to a concrete slab.
- Middle right: A worker using a pump to inject foam into a concrete slab.
- Bottom left: A worker using a pump to inject foam into a concrete slab.
- Bottom center: A close-up of a pump nozzle injecting foam.
- Bottom right: A worker using a pump to inject foam into a concrete slab.

The BEYOND LIFTING logo is prominently displayed in the center of the collage. The logo consists of the word "BEYOND" in a bold, blue, sans-serif font, with a green swoosh underneath it. Below the swoosh, the word "LIFTING" is written in a smaller, blue, sans-serif font.



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Beginning in 2006, owners Curt Janzen and Kevin Boschee had a goal of building a company which would lead the Spray Foam industry. Quality-first installation, education of clients and outstanding warranty became a recipe for success.

Beyond Foam Insulation Ltd started with Spray Foam Insulation and branched out to doing Spray Applied Roofing Systems, Commercial Fire Proofing, Fire Stopping and Specialty Sound Insulation. From there, they moved into the world of Concrete Lifting. Concrete slab lifting has been around for a long time but the introduction of using foam to lift concrete is a game-changer. In the past, there was just one option, mud Jacking. This system required injecting a sand-based grout under the slab to lift it. Now there is a better option, polyurethane foam. Beyond Foam's expertise in using the equipment and understanding the chemical aspect of polyurethane made the move to slab lifting an easy choice. Thus, Beyond Lifting was born.

We are here to Create Safe Places and Happy Clients and would love to see if any of our products could be useful to you.

- Foamjection Certified Installers
- Deep Foamjection Certified Installers
- FillFoam trained installers
- COR Certified
- WCB Partner in Injury Reduction
- Fully Licensed and Insured

Our Foam Supplier

HMI's process and material will provide long lasting repair to sunken or moving concrete slabs in need of lifting and/or stabilization. Our repair method has proven to be more cost effective for the customer and saves them time in completing their repairs. Time is of the essence, when considering commercial projects where productivity could be lost replacing slabs as opposed to the HMI process of raising them with polyurethane foam.

HMI has been providing quality concrete raising equipment and material since 1974. Our customers and our own contracting division, have performed hundreds of thousands of projects over the course of 40 years for satisfied customers. These encompass residential, commercial, industrial, and government projects involving small walk way slabs, factory floors, airport runways and highways. Over 40 years of concrete raising experience, gives HMI the insight to develop innovative products assisting those wishing to remedy concrete problems with polyurethane foam and equipment.

Product Capabilities

Why Does Concrete Settle?

The stability of a concrete slab is directly proportional to the quality of the base on which it is poured.

Poor Base Conditions are Caused by:

Poor or improper compaction of the base: Failure to properly compact base materials before pouring can lead to hastened settling. The weight of the slab will further compact the base after curing, and settlement can happen quickly.

Climate: The freeze and thaw cycle experienced in many regions causes the ground underneath the slab to expand when frost is present. This in turn will cause slabs to heave or raise. When the frost melts, the slabs will settle and most often not to their original elevation. Slabs may become uneven resulting in trip spots. Drought often causes soil, such as expansive clays to shrink causing settling issues for concrete slabs. When expansive clay soils encounter wet conditions, they may swell leading to shifting concrete that needs leveling.

Erosion: Many different factors can lead to eroded base materials under concrete. Damaged water lines or sewer lines can lead to washout of base materials causing slabs to settle. Improperly placed downspouts can cause pooling of water, which can lead to erosion. Waves or flow can cause washout on bodies of water, lake & river- seawalls.

Machine/Traffic Vibrations: Concrete slabs may move or settle in industrial/highway settings where movement and heavy loads are present. The vibrations from the machinery and passing traffic can lead to the base compacting and the slabs settling or slab movement.

Slab Curl/Rocking Slabs: Slab curl occurs when a relatively large section of concrete is poured. During the curing process, the top of the slab may cure slightly faster. This leads to slabs that curl and may rock and become unstable. Vibration & heavy traffic may also cause slabs to eventually settle or move.



- ✓ Lift and Level
- ✓ Support
- ✓ Fill Voids
- ✓ Stabilize Soils

**Slabs and structures need a consistent layer of support.
When this is interrupted, HMI and FillRite have your solution.**

Project Samples Commercial - Government - Residential

Highway Repair



Seawall Repair



Airport Repair



Mine Fill



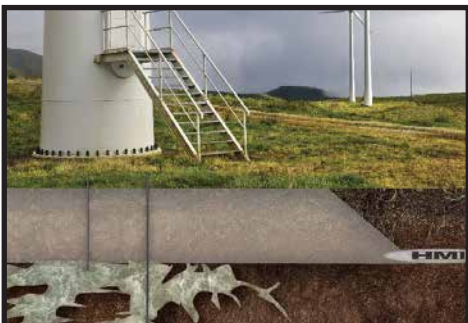
Foundation Lift



Grain Bin Stabilization



Wind Turbine Stabilization



Tunnel Fill



Processes - Concrete Raising and Leveling

Using HMI polyurethane foam, the HMI method for concrete raising utilizes the slab itself as a means of delivering raising, void filling, and stabilizing foam. A 5/8" hole is drilled through the slab into the subgrade. A tapered delivery port is then installed in the 5/8" hole. The injection equipment, which delivers the dual component polyurethane material, is then connected to the port. A two part liquid that expands into foam is then injected through the port and under the slab. Expansion of the material occurs within seconds, compressing loose soils and raising concrete.

Raising concrete with polyurethane foam is done with controlled incremental injections. Foam will fully expand within 10-15 seconds. This allows the applicator to monitor the lift and prevent over raising the slab. HMI suggests using air purged equipment to deliver foam under the slab. This equipment will keep the injection port open between injections, allowing for the installer to wait for foam to fully expand before injecting more material.

Injection Equipment: The HMI EliteONE injection gun has revolutionized concrete raising with foam. This propriety design allows the applicator to install material into a delivery port multiple times. This eliminates the need for excessive hole drilling and saves time. The EliteONE merges mechanical and air purged technology, it is the first ever injection tool specifically for concrete raising designed by HMI.



Processes - Deep Foamjection™

When soil settles, the core issue is the inability of the sub-grade to support the slab, or ground above. The job of the sub-grade is to have enough bearing capacity to evenly support the slabs.

Deep Foamjection™ is the process of injecting a two part polyurethane foam into those failed soils. Injected as a liquid, the polyurethane foam expands and pushes out on and into the weak soils. This expansion will take the path of least resistance as it travels. This expansion will follow voids, fissures or weak/loose soils. As it travels, it takes the shape of a tree root. This volume of expanded foam increases the density and strength of the soils that failed as well as adding a solid custom installed volume of foam.

Sample Results Achieved Deep Foamjection:

| Soil Layer | Estimated At-rest Pressure P (tsf) | | Limit Pressure P (tsf) | Net Ultimate Bearing Pressure (psf) | Net Allowable Bearing Pressure (psf), (Factor of Safety=3) | Percent of Change % |
|---------------------|------------------------------------|-------------------------|------------------------|-------------------------------------|--|---------------------|
| (CL) Fill | 0.07 | (Existing Fill In-situ) | 5.3 | 8,368 | 2,789 | 1.90 |
| | | (After Foam, 173 lbs) | 5.4 | 8,528 | 2,842 | |
| (ML, CL/ML) Outwash | 1.31 | (Native In-situ) | 9.6 | 13,264 | 4,421 | 13.30 |
| | | (After Foam, 496 lbs) | 10.7 | 15,024 | 5,008 | |
| (SP-SM) Outwash | 1.75 | (Native In-situ) | 8.9 | 11,440 | 3,813 | 211 |
| | | (After Foam, 552 lbs) | >24.0* | >35,600 | >11,866* | |

*Complete Engineering Report Available upon Request

The Foam of Choice, for sub grade repair. Deep Foamjection™ Foam is a heavy duty polyurethane foam specifically designed for jobs where water or moisture is present. This foam was designed to set up in the presence of water and to maintain strength in wet environments. Deep Foamjection™ Foam can also be used for foundations, warehouse footings, tracks, bridges, crossings, culverts, posts & anywhere there is weak sub base present.

A slower reaction time makes Deep Foamjection™ Foam great for Deep Foamjection™ allowing the material to spread further before curing. As foam reacts it will follow vein fissures and voids. A custom installed solution to make soil stronger.

Post Hole Job Example:



Processes - Void Filling

Voids can develop for a variety of reasons, erosion, sinkholes or settlement from vibrations. Voids can also be a result of abandonment of mines, tunnels, shafts, pipes or tanks. Voids commonly cause a lack of support that result in settled slabs or structures. If left unattended these voids can result in dangerous conditions, liabilities and even more catastrophic failures.

Filling voids with a lightweight foam is a fast and cost-effective solution to other alternatives.

Common Uses:

- Mines & shafts
- Culverts
- Tunnels
- Tanks
- Wells
- Sink Holes
- Pipes
- Seawalls
- Crawl Spaces
- Foundation Backfill

Benefits Over Alternatives:

- Lighter
- More Cost Effective
- Faster Installation
- Flows Further
- Less transport expense/heavy equipment
- Less labor to install
- Will not crack-inert
- Not affected by water
- Multiple formulas available that can seal or permeate water



Processes - soil stabilizer

When stabilizing soils, the material is saturated into the ground through a point. When saturation is achieved, the point is retracted and more material is installed. This produces a solid column amidst loose soils. Points of cured soil binder can offer support to a slab, like legs on a table.

Commonly installed in sandy or swampy environments, installing columns of soil binder can offer additional support to slabs that have been lifted. It can also be installed prior to pouring a slab to prevent settlement. Product can also be applied by spraying on top of various types of material, sand, gravel and top soil etc.

Soil binder is a great option when loose soils need improvement but there is not room for the volume expanding foams produce.

Note: SINGLE COMPONENT & Requires a single component airless paint sprayer and accessories to install.

Applications:

- Stabilize: Peat Moss, Loose Sands, Soil
- Support New Slabs, Foundations, Helical Piers
- Erosion Control: Sea Walls, Sand Bunkers, Retaining Walls, Rail Ways



Installation

Results



Stabilizing soils is often done in conjunction with concrete raising and leveling. It is a method to repair the unstable soils that contributed to the settlement.

Products - Polyurethane Foam

HMI is the ONLY company that makes polyurethane foam for concrete raising from recycled material. HMI manufactures an environmentally friendly, dual component polyurethane foam for raising and stabilizing concrete. Our patented materials are made from recycled components, making it the “greenest” polyurethane foam on the market. Available in 2, 4, 5 and 6 lbs. per cubic foot density (free spray). HMI has developed this revolutionary foam that is setting new standards in polyurethane foam quality. Recycled foam provides benefits like fast tack free time and a high compressive strength skin that avoids concrete adhesion and adds strength. Fast and aggressive expansion for lifting concrete, along with a 15 minute final cure time, allows for slab manipulation while adjusting for the perfect lift.

Benefits:

- Repair unstable soils
- Installing a stronger foundation to support the heavy demands of today's industry
- Foam follows the path of least resistance and will fill weak areas
- Fills fissures and ground voids
- Fills voids holding water & displaces collected water
- Increase load bearing capacity of sub grade
- Permanent repair, foam never changes shape or absorbs ground water
- Foam soaks into the weak soils and then expands, binding the soil and making it solid
- Does not leach chemicals into the ground

Signature Foam Line

| HMI RECYCLED FOAMS | APPLICATION |
|--------------------|---------------------------------|
| RR20I | RESIDENTIAL |
| RR40I & RR40I FAST | HIGHWAYS/INDUSTRIAL |
| RR40IG | WET CONDITIONS |
| RR50I | UNDERSEALING/STABILIZING JOINTS |
| RR60I | D.O.T-INFRASTRUCTURE REPAIR |

HMI Hydrofoam Line

| HYDROFOAMS | APPLICATION |
|--------------------|--|
| HF202 & HF202 FAST | SMALL LIGHTER SLABS WHERE WATER IS PRESENT |
| HF402 | HIGHWAYS/INDUSTRIAL/DEEP FOAMJECTION |
| HF402 FAST | HIGHWAYS/INDUSTRIAL/DEEP FOAMJECTION |

Polyurethane Foam Characteristics

HMI manufactures a variety of foams with different reaction times and strength. Each designed for your specific application.

| Foam Name | Density ASTM 1622 (lb/ft³) | Peak Compressive Strength ASTM 1621 (psi) | Tensile Strength ASTM D1623 (psi) | Time at Reaction (min:sec) | Peak Exothermic Temp. (°F) | Time at Peak Exothermic Temp. (min:sec) | Time at Tack Free (min:sec) | Time at Peak Expansion (min:sec) | Best For |
|-------------|----------------------------|---|-----------------------------------|----------------------------|----------------------------|---|-----------------------------|----------------------------------|--------------------------------|
| RR 201 | 2.5 | 32.4 | 42.4 | 00:10 | 247 | 00:24 | 00:18 | 00:32 | Small Residential Slabs |
| RR 401 | 4 | 121 | 208 | 00:14 | 273 | 00:26 | 00:22 | 00:37 | Commercial Projects |
| RR 401FAST | 4 | 121 | 208 | 00:10 | 270 | 00:19 | 00:16 | 00:29 | |
| RR 401G | 4 | 121 | 307 | 00:12 | 267 | 00:21 | 00:17 | 00:35 | |
| RR 501 | 5 | 112 | 124 | 00:53 | 302 | 01:26 | 01:21 | 01:45 | Joint Stabilization |
| RR 601 | 6 | 292 | 138 | 00:15 | 270 | 00:25 | 00:23 | 00:23 | D.O.T |
| HF 202 * | 2.5 | 51.3 | 77 | 00:11 | 220 | 00:47 | 00:45 | 00:58 | Small Slabs with water present |
| HF 202FAST* | 2.5 | 51.3 | 77 | 00:06 | 245 | 00:25 | 00:18 | 00:33 | Small Slabs with water present |
| HF 402* | 4 | 90-100 | 124 | 00:10 | 229 | 00:37 | 00:31 | 00:45 | Deep Foamjection |
| HF 402FAST* | 4 | 90-100 | 124 | 00:06 | 242 | 00:28 | 00:23 | 00:32 | Deep Foamjection |

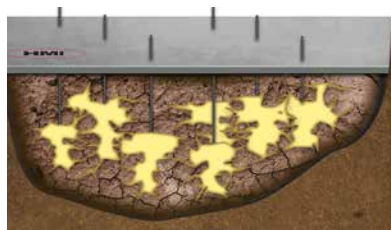
A HMI Foam for Every Application

*Foam Technical Data Sheets Available Upon Request

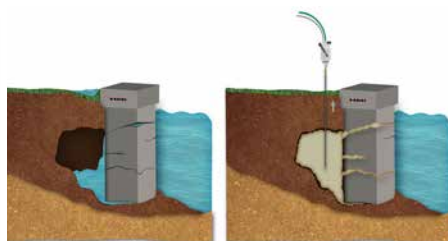
- Residential
- Factory/Warehouse Highway
- Deep Foamjection
- Soil Stabilization
- Void Fill
- Seawall



**DEEP
FOAMJECTION**
CREATES MAN-MADE ROOT SYSTEMS WITH FOAM

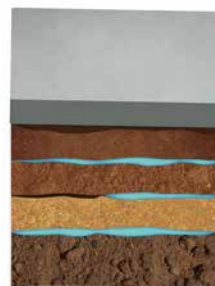


RR600 - SOIL STABILIZER

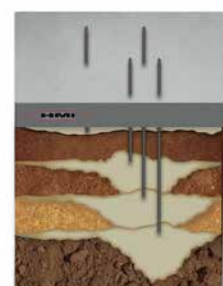


BEFORE

AFTER



BEFORE



AFTER

Environmental Impact of HMI Polyurethane Foam

HMI Foams are made from recycled and bio-based components, making it the “greenest” polyurethane foam on the market. The American Society for Testing and Materials standards (ASTM) stated this recycled material is the best foam available for raising concrete and stabilizing soils.



Saves our Natural Resource

- Made with Bio-based and/or Recycled Material
- Lasts a Lifetime



Non-Toxic and Non-Hazardous

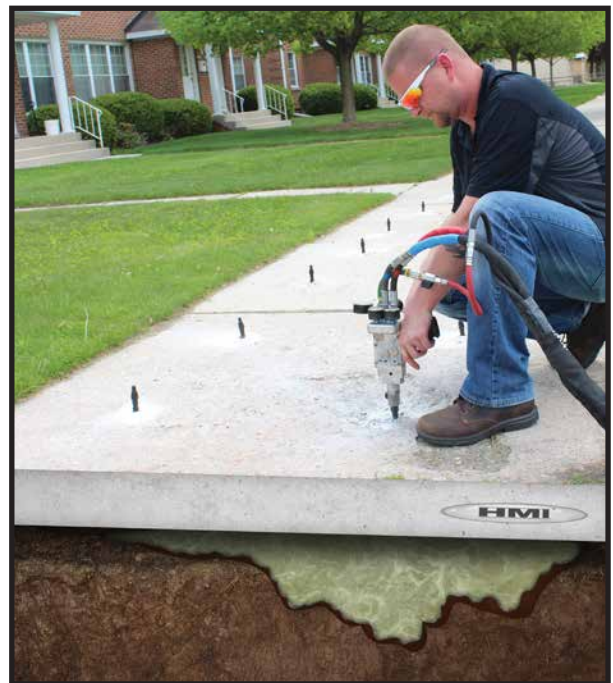
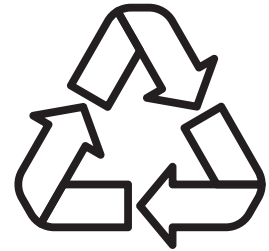
Major toxic chemicals, often associated with some types of polyurethanes, such as toluene, and VOC's are NOT USED IN HMI FOAMS! Most of what is warned against on the internet pertains to these chemicals/polyurethane.

- Cured Foam is Fully Inert
- Does Not Leach into Groundwater



Uses Environmentally Friendly Blowing Agents

- VOC Exempt
- US EPA SNAP Listed
 - Non-Ozone Depleting
 - Low GWP



Cured Polyurethane Safety Summary

Health Effects:

- Polyurethane foam consists of fully reacted polymers and are considered non-hazardous per OSHA 29 CFR1910.1200
- The primary adverse health effects of cured polyurethane are related to dust generated by sanding, grinding or cutting the cured foam. Similar to saw dust, or other fine powders, dust from polyurethane foam may irritate respiratory organs, eyes, and skin. Protective gloves, eye protection, and a dust mask should be worn when fabricating or cutting polyurethane foam.
- Not listed as a carcinogen (NTA, IARC, OSHA)

Ecological Information:

- Not a marine pollutant
- Does not bio-accumulate
- No mobility within soil

Disposal:

- Can be disposed of as ordinary industrial waste in compliance with local, provincial and federal regulations



Products - FillFoam™

FillFoam™ is a pre-expanded open/closed resin blown cell foam formula with ideal characteristics for any void filling applications. Pumped at full volume, FillFoam™ does not lose volume when pumped in confinement.

Benefits:

- No Heat is created during installation
- Safe to install at any rate or quantity
- Can absorb water from overburdened soils
- Immune to seasonal changes
- Hydro-Insensitive / UV-Insensitive
- Variable Densities of 10-50 PSI on site/same material
- 12 - 60 Cubic yards per hour depending on equipment
- Highly Flowable over 500 ft
- Lightweight & Strong
- FillFoam™ can be re-excavated if necessary



Density:

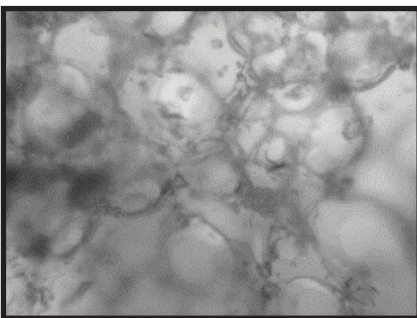
| | |
|-----------------------------|--------------------------|
| Average lbs/ft ³ | 4-15 lbs/ft ³ |
|-----------------------------|--------------------------|

Proportional Stress (PSI):

| | |
|-----|-------------|
| PSI | 10 - 50 PSI |
|-----|-------------|

Gel Time:

| | |
|---------|---------------|
| Minutes | 15-60 Minutes |
|---------|---------------|





Environmental Impact of FillFoam™

What is FillFoam™ Made Of?

FillFoam™ is an organic material that is resin blown. It is nitrogen rich and is harmless to the environment. Nitrogen is not toxic since about 78% of the air we breathe contains this gas. It is lightweight, durable, solvent free, non-toxic and inert, non-flammable, and rot-resistant to both salt and fresh water. This material can be removed and re-purposed to grow plants. It is biodegradable and the perfect substrate for agricultural purposes.

Advantages of FillFoam™ Compares to Alternatives?

- The installation process of FillFoam™ is less invasive to the environment because there is little to no on site excavation. Once installed some formulas of FillFoam™ are able to stabilize the soil without disturbing or redirecting natural water flow other formulas can stop water flow.
- FillFoam™ is transported as a concentrate. Requiring less trucking and transport pollution than alternatives.
- FillFoam™ can absorb and retain water from surrounding soils that are over-saturated or overburdened by water. This water can be retained until it is drawn out from soils or plant life requiring water. Carrying this extra weight from water does not impact the strength or structure of the foam.
- In addition to filling voids and stabilizing soils, versions of FillFoam™ can be used to support plant growth. FillFoam™ products can increase watering efficiency by storing water and nutrients important to healthy plant growth. Formula options can be biodegradable and the perfect substrate for agricultural purposes.

Proven Safe

- Testing of non-metallic material for use with drinking water
- Water-leachable organic substances
- Environmental Risk Assessment
- University Studies
- Municipal Studies



Products - Soil Stabilizer

RR600 HMI soil binder is a low viscosity single component polyurethane designed to bind and stabilize loose soils. When the resin is pumped into soils, it reacts with the moisture and expands to fill voids and form a watertight barrier.

Note: SINGLE COMPONENT



RR600

Physical Properties

| | |
|-------------------------------|-----------------------|
| Flash Point | 395° |
| Auto Ignition Temp | >600°C |
| Viscosity | Dynamic; 380 MPA |
| Weight | 10.4 per gallon |
| Boiling Point | >300° decomposes |
| Saturated Vapor Concentration | >32 µg/m ³ |
| Relative Density | 1.21 |
| Vapor Density | 8.5 |
| Corrosiveness | Non-Corrosive |
| Toxicity | Non-Toxic |

Appearance

| | |
|-----------------------|----------------|
| Physical State | Liquid |
| Color | Amber |
| Odor | Slightly Musky |

Applications

Stabilize Loose Soils in/under

| | |
|-------------|-----------------|
| Peat | Loose Sands |
| Sea Walls | Concrete Floors |
| Foundations | Helical Piers |

Cure Time

Results may vary

Factors that affect cure time

Moisture present % of catalyst used

Lab Results in Sand

| % of Catalyst | Cure Time |
|---------------|--------------|
| 0% | 4 hrs 58 min |
| .5% | 24 min |
| 1% | 23 min |
| 2% | 19 min |
| 3% | 16 min |
| 4% | 8 min |

HMI SOILBINDER in stone

519 psi | ASTM 39

HMI SOILBINDER in sands

783-2831 psi | ASTM 39

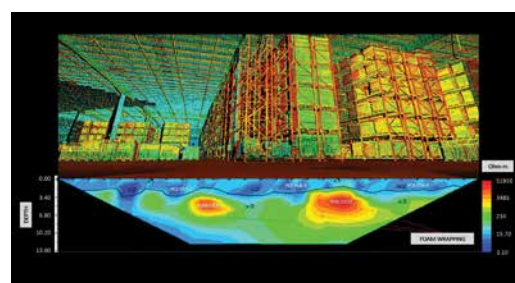
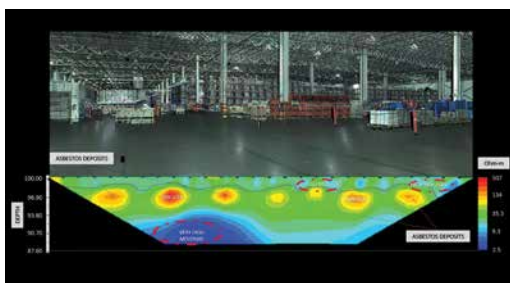
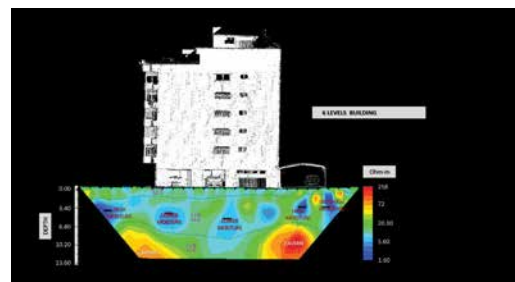
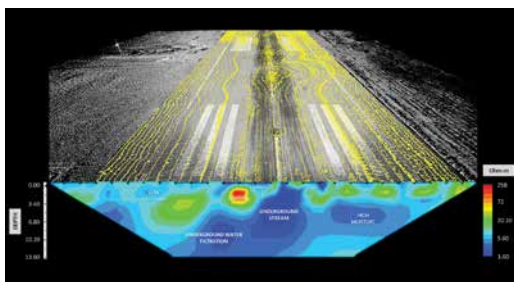
Engineering Support

- Project Consultation
- Project Design Recommendations
- Soil Evaluations

Project designs often call for more than one solution. Allow HMI to help evaluate your project. Understanding the existing soils, structures and failure points will show the way to your solution.

HMI and FillRite Technologies manufacture a variety of products to fit your project needs. With one or many of our amazing products you can stabilize soils, increase load bearing capacity and potentially reposition slabs or structures back to their original position.

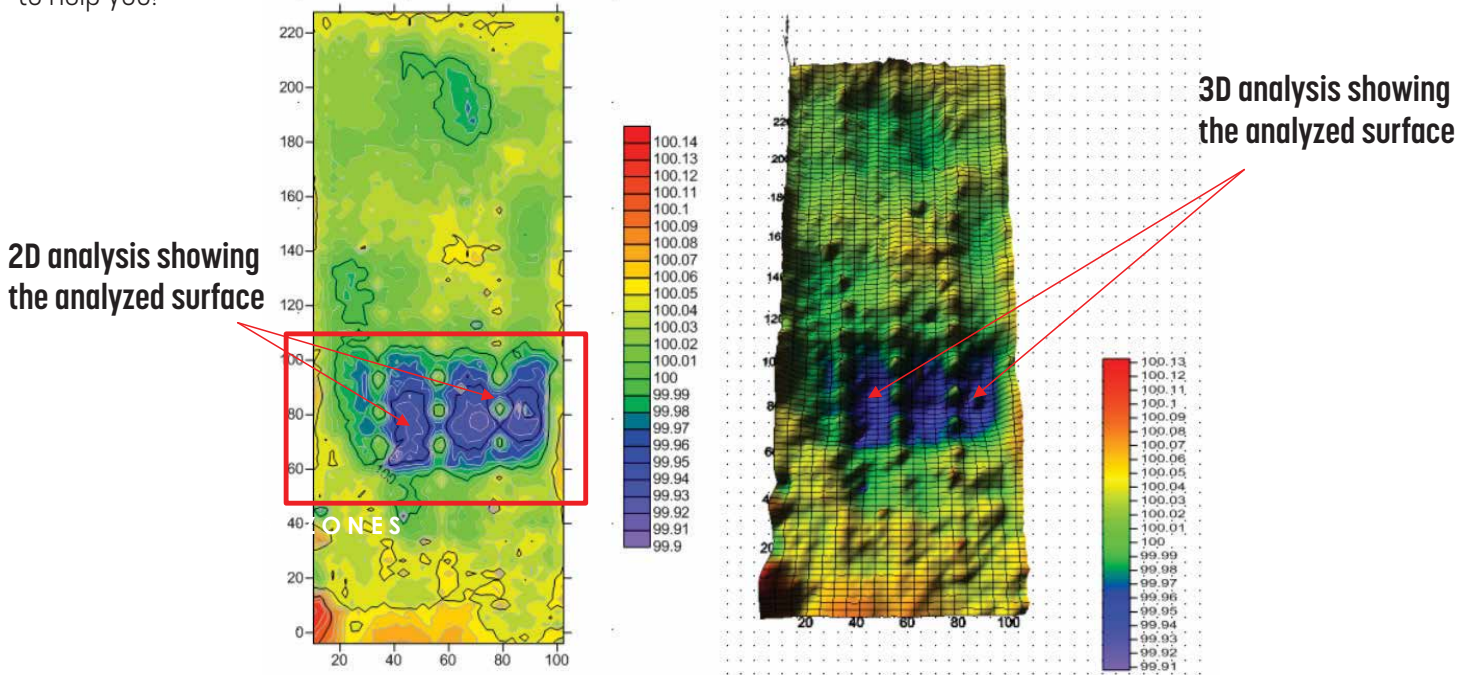
HMI & Fillrite Technologies rely on advanced technologies to evaluate and recommend project designs, allow our talented team to review your project. A complete understanding of the problem will allow for a customized solution.



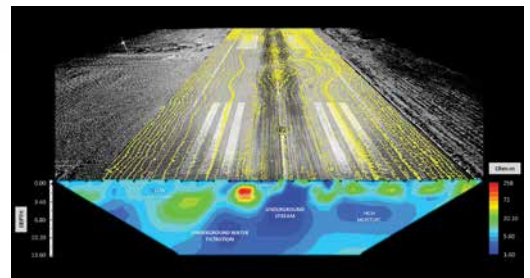
Engineering Potential

Vectorial System

Having a complete understanding of conditions above and below the surface is important to design an effective repair strategy. It is also important to consider how soils and moisture behaved that caused the failure. Knowing these details can guide the types of materials that should be used, where to put the materials and estimate how much material will be necessary. Not incorporating this engineering knowledge into a repair strategy could lead to insufficient repairs. HMI and FillRite technologies have access to the systems necessary for this sophisticated evaluation. Allow our team to help you!

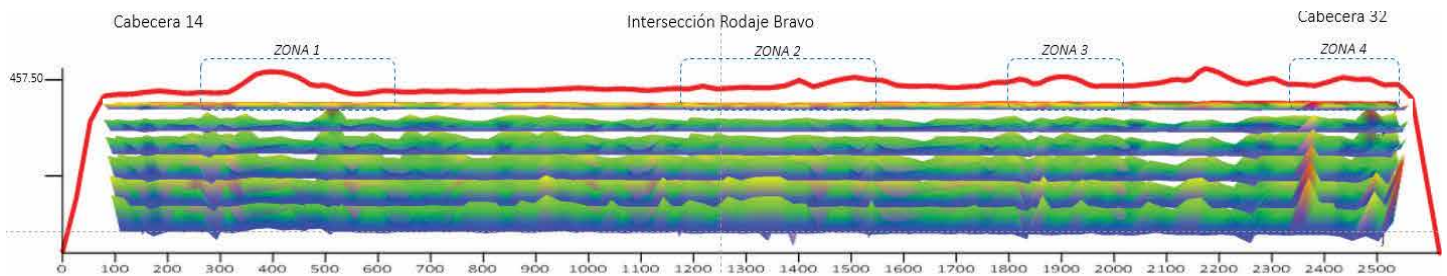


- | | |
|----------|----------|
| ZONE "A" | ZONE "H" |
| ZONE "B" | ZONE "I" |
| ZONE "C" | ZONE "J" |
| ZONE "D" | ZONE "K" |
| ZONE "E" | ZONE "L" |
| ZONE "F" | ZONE "M" |
| ZONE "G" | ZONE "N" |



High Frequency Microwave Definition

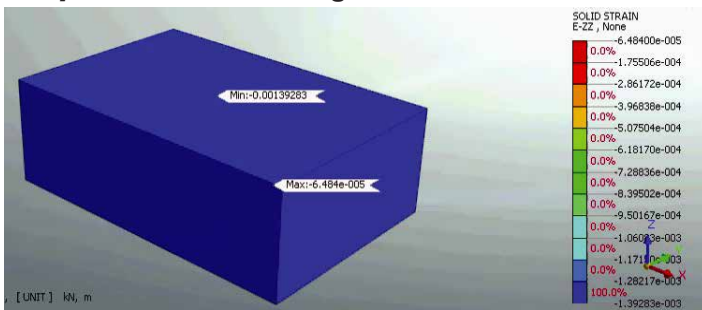
The study of High Frequency Microwave, allows to know the surface strata of the soil. 10,000 million signals per second bounce off the sub-floor, pavement, dirt and interior layers of concrete and masonry structures. Microwaves are measured and compared to mathematical models; The analysis of the data it generates allows to visualize and analyze the characteristics of these elements, and determine the thicknesses



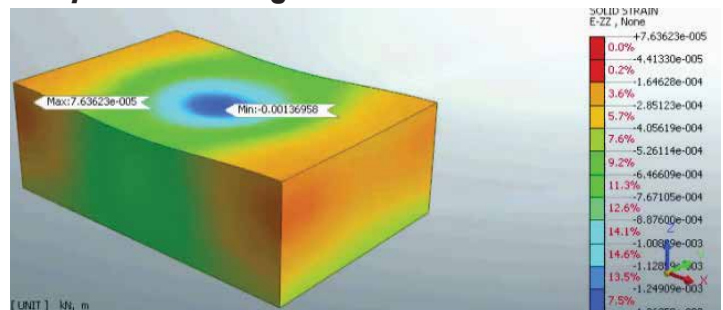
Finite Element Modeling Examples

After a Geophysical analysis is completed, modeling can be done to anticipate how the improvements will behave. Models can be executed to demonstrate how a runway was behaving prior to repair and also for how it is expected to behave after repairs are made. Similar models can show how a structure will behave with or without repair in a seismic event.

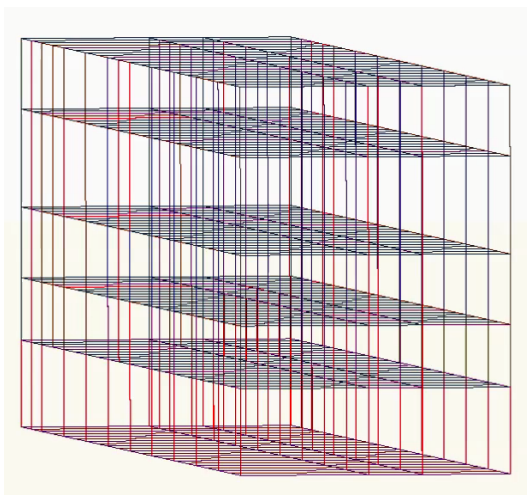
Polymer Free Modeling



Polymer Modeling



Seismic Accelerometer





LIFTING



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