EPICENTER Winter 2017

Inside This Issue:

Ted Didas, P.E.
President
801-255-7700 x. 114
ted@mcneileng.com

Message From Our President...

As we start a new year, it's a good time to reflect back over the more than 30 years McNeil Engineering has been in business. I am extremely proud of what we have accomplished, and even more excited about our outlook for an equally promising future.

First and foremost I want to thank you for your trust, your trust in McNeil Engineering and for allowing us to play such an important role in your projects and business. Your satisfaction is important to us. Customer satisfaction is the benchmark by which we measure our performance, and we hold ourselves, as do our clients, to the highest standards of quality.

In this continually changing marketplace, our clients are more informed and educated than ever about their design options. Even so, they continue to select McNeil Engineering as their partner of choice because of our experience, commitment to quality, and integrity.

When conveying McNeil Engineering's successes, I often reflect on three guiding principles-each of which has helped define who we are today:

Talented People: Among our most important and valued assets is the extensive knowledge base, deep-rooted professionalism and unwavering commitment of our highly-qualified, diverse staff. The McNeil Engineering staff is at the core of who we are and what we do. The McNeil Engineering team is committed to delivering the highest quality product and providing unparalleled service to our clients.

Communication: Through effective communication we set clear objectives with explicit, measurable, goals and a realistic timeframe for achievement. If effective communication creates clear objectives, then a lack of communication creates costly delays. We understand communication is critical to the success of the team, and our goal is to respond to all forms of communication as quickly as possible.

Proper Perspective: As we continue to grow, each new day offers a chance for us to work together, pursue new opportunities and improve upon the past. We establish in-depth relationships with our clients by learning what's important to them, their challenges and goals firsthand, so that we can offer real solutions with a straightforward perspective. We continue to manage our business around the evolving needs of our clients, so that we can be at the forefront of change and deliver value-because value is what our clients deserve.

Sincerely,

Ted Didas, President & CEO

Evaluating Existing Parking Structures

One of the services that McNeil Engineering's **Paving Consulting team** performs is evaluation and analysis of existing parking structures.

So what does something like this look like. Let's take a look at a recent evaluation completed by our Paving Consulting team, the Marriott Mountainside Resort located in Park City, Utah.

Marriott Mountainside Resort

The McNeil Engineering Paving Consulting team first completed an on-site evaluation of the parking structure. This evaluation consists of a visual and photographic inspection of all elements of the structure. From floor to ceiling, to columns and the condition of the concrete as well and all other structural elements.

Once the on-site evaluation was complete and all the data was collected the paving consulting team reviewed the data collected and made determination of any issues that needed attention. We then provided a comprehensive report detailing our findings, including recommendations for immediate repairs, short term maintenance and long term maintenance. We also provided a breakdown of cost estimations of what the needed repairs will cost.

When to Shovel the Snow Off Your Roof

By Matthew Roblez, SE, SECB

With the winter weather there is snow. We all know that most homes in the valley were built prior to even the first snow load study performed in 1990. I'm sure there are people reading this article who themselves are worried each time a heavy snow hits, or you know someone that gets worried each time a heavy snow hits. Each year, hundreds of people in the U.S. die unnecessarily by climbing on their roofs to remove the snow for fear of collapse. The question always comes about as to: when does one need to go on the roof to shovel snow off to save the roof? The purpose of this article is not to tell you when to go on the roof but to educate you and give you information so that you can make an informed decision as to what to do with your roof.

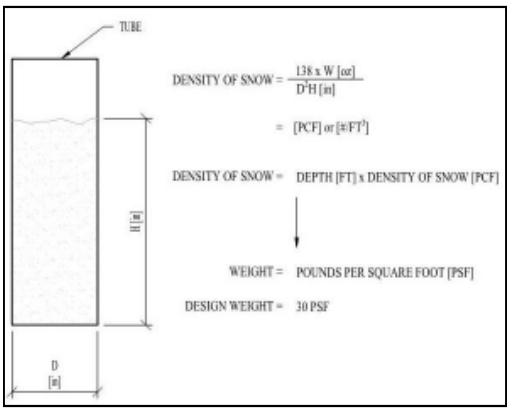


Figure 1

What is the actual weight of snow? According to a report by the National Oceanic and Atmospheric Administration, one cubic foot of snow can weigh up to 62.4 pounds. This is an extreme case, but has been observed in the past. Based on the current code provisions which were obtained from Michael J. Tobiasson's article in the ASCE Journal of Structural Engineering "Proposed Code Provisions for Drifted Snow Loads" ASCE, Vol. 112, No. 9, and the ground snow loads from the SEAU 1990 Utah Snow load Study, we know the general weight of snow in the valley is between 12 pounds per cubic foot to 19 pounds per cubic foot. In the SL Valley below 5000 feet in elevation, the design snow load is 30 pounds per square foot. This equates to about 2 to 3 feet of compacted snow on a roof.

So if you live in the valley and see less than two feet of snow, you are probably okay. However, I developed a simple method for finding out the approximate weight of snow on your roof using ordinary tools and simple measurements. Find a tube of known diameter. It works best if the tube diameter is a minimum of 4". If you can find a clear tube, that is the best. Go out to your yard and find a patch of snow close to your eave and carefully stab the tube in the snow. Make sure that the tube height is taller than the height of the snow you are measuring. There will be a cylinder of snow in the tube. Measure the height of this snow and note it. Then using a kitchen scale, measure the weight of the tube in ounces. Using the simple math provided (see Figure 1), one can figure out the approximate density at the site of your house. FROM THE GROUND measure the depth of snow on your roof. From this, you can determine the weight of the snow on your roof. You can use this to make a decision as to what to do with your roof. As stated before, the design snow load in the SL Valley below the 5000 foot sea level elevation is 30 pounds per square foot.

Part of your "investigation" should include looking at the warning signs that your roof may be overstressed. From the inside of your house you should look for the following warning signs:

- Roof leaks;
- Doors or windows that have become hard to open since the snowfall;
- Doors or windows that open on their own since the snowfall;
- Bent pipes or conduits that are attached to the ceiling;
- New cracks in ceilings or interior walls that have appeared since the snowfall;
- Popping or cracking sounds coming from the roof;
- New cracks or splits in the rafters or braces in the roof system as observed safely from the inside of the attic.

Continued on page 3...Snow

Matthew Roblez, SE, SECB
Structural Manager
801-255-7700 x. 128
matt@mcneileng.com

Changing Face of Healthcare in Utah County

Utah Valley Regional Medical Center in Provo, Utah is currently receiving a major facelift. This is a major construction project which will replace more than half of the building space on the current campus.

The current buildings will be replaced by two large buildings — a new patient tower and an outpatient building. Once completed, patients will receive treatment in one of the most technologically advanced and modern hospitals in the country.

McNeil Engineering's **Survey Department** completed some survey work for a portion of the construction being done by Steel Encounters.

Laser Scanning at the Utah Valley Regional Medical Center Construction Site

According to Intermountain Healthcare, here are some highlights of the project:

- A 600,000-square-foot, 12-story Patient Tower to house a number of hospital services.

Continued on page 4… Hospital

Michael Hoffman, PLS
Survey Manager
801-255-7700 x. 138
mike@mcneileng.com

The New and Improved Salt Lake International Airport

Salt Lake City's existing international airport was built 50 years ago. In airport years that's like 150 or 200 years. The airport currently serves double the passengers, annually, it was designed to serve. Salt Lake City has grown into a hub airport with many flights arriving and leaving around the same time. Security needs have changed and we need buildings that meet earthquake safety standards. All this means Salt Lake City is in desperate need of an upgraded airport.

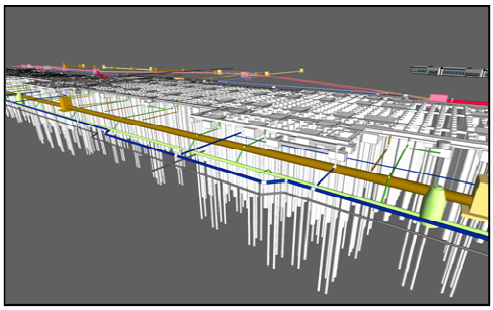
July 2014 was the official ground breaking for the new airport, which will be built in phases. The car rental facility was the first to be demolished and rebuilt. The new car rental facility consisted of two buildings and were completed this past spring.

Rendering of New Salt Lake International Airport

McNeil Engineering's **Civil Engineering Department** is currently working on BIM (building information modeling) of the electrical, water, sewer and storm drains as well as 550 LF of jet fuel piping. McNeil Engineering is providing 3D CAD models for Taylor Electric of the electrical designs, Ames Construction of the water, sewer and storm drain designs and Meccon for the jet fuel piping.

BIM is a digital representation of the physical and functional characteristics of a facility. A 3D BIM model is a shared digital model for providing information about a facility, used to show existing conditions or in the case the airport, new designs. BIM is a tool that provides greater insight in the design and construction of a facility.

One of the benefits of BIM and a reason why it is important in the design and construction of the Salt Lake International Airport is clash detection. It is so much cheaper and easier to determine if there are any elements that will clash with each other looking on your computer monitor rather than waiting until two elements run into each other during construction. When that happens is creates costly delays as systems have to be redesigned and reconstructed.



Example of a 3D BIM Model

The final cost estimate for the construction of the new airport is $2.9 billion. Construction began in 2014 and will continue in phases through 2023. The terminal building is scheduled to be completed in 2020.

Continued from page 2...Snow

Another thing that someone should consider is if they have improved the insulation in their attic since the last snowfall. Many roofs do not accumulate snow due to the fact that they are poorly insulated and heat escapes from the roof melting the snow. If you have an older roof, and you re-insulate it, you should have the rafters examined for adequacy for the current code requirements because this new insulation may prevent the snow from melting and therefore, your roof may be seeing loads that it has not seen in the past.

In summary, I personally don't think one should risk their health and safety by going on the roof to remove snow, one should use the techniques listed above to perform a simple investigation. Also, one should remember there are many qualified engineers in this valley who can help you out with evaluating your roof before there is an issue. There are also many professional contractors that have the tools and equipment to can safely remove snow from your roof.

Continued from page 3…Hospital

- A nine-story outpatient building that will be home to multiple clinics and an InstaCare.
- Larger patient rooms, which are all private and include large windows with views of the valley and surrounding mountains.
- Treatment space that brings together hospital services that are now spread out across the facility.
- "On-stage" and "off-stage" areas so certain hospital operations not directly involving the patient do not disrupt the patient or visitor experience.
- Educational and exercise space where patients and their families can learn more about living healthier lives.
- Stairwells that are pleasant to use and full of natural light.
- A large pond and waterfall, as well as a walking path for visitors and patients to enjoy.

The construction project is expected to be completed in 2019.

Rendering of New Utah Valley Hospital

Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful.

Employee Anniversaries this Quarter

Employee	Date Started	Years of Service
Michael Hoffman	2/13/1995	22
Dave Sumner	3/11/2002	15
Matthew Roblez	3/18/2002	15
Cody Palmer	2/5/2007	10
Scott "Skip" Schoonover	1/1/2011	6
Shane Brower	3/25/2013	4
Troy Taylor	1/24/2014	3
Jacob Hendrickson	2/18/2014	3
Shad Seitz	2/18/2014	3
Augusto Pereira	1/12/2015	2
Ryan Filby	2/23/2015	2

Fashion Place Mall's New Look

One of McNeil Engineering's latest undertakings was the Fashion Place Mall East Plaza project. This piece of work is truly an example of teamwork, featuring a collaboration between our landscape architecture and civil engineering departments.

East Plaza - Fashion Place Mall

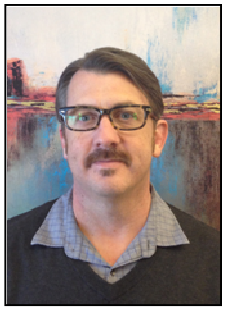
The design team was led by Principal Landscape Architect Scott Schoonover, PLA, ASLA and he was assisted by our very own Jacob Hendrickson, PLA, ASLA.

On the civil engineering side, Ted Didas, PE, led the team. Construction was handled by CRC Construction, and Intermountain Plantings alongside MC Greene Concrete and Hawk Electric.

East Plaza - Fashion Place Mall

General Growth Properties owns the property, and the job was completed on budget and in time for Thanksgiving weekend, including the annual Black Friday shopping sprees.

We couldn't be prouder of this addition to our portfolio, and if you are in the area we encourage you to go check out the completed piece of work.



Scott Schoonover, PLA, ASLA
Principal Landscape Architect
801-255-7700 x. 152
scotts@mcneileng.com

SEMINAR: Presented by Ted Didas, P.E.

Practical Site Engineering: Science and Techniques

Salt Lake City, UT

Wednesday, March 1, 2017

Marriott University Park

8:00 AM - 4:30 PM

- **Accommodate** the multiple purposes of site engineering, including slope stabilization, storm water management and landscape aesthetics
- **Identify** soil characteristics and engineering properties
- **Determine** volume and rate of storm water runoff
- **Grade** for stairs, ramps and slopes
- **Discuss** key issues in site engineering, with a review of case studies led by our experienced faculty

Continuing Education Credits:

Architects

6.5 HSW CE Hours

6.5 AIA HSW Learning Units

Landscape Architects

6.5 HSW CE Hours

6.5 LA CES HSW PDHs

Professional Engineers & Land Surveyors

6.5 PDHs

Floodplain Managers

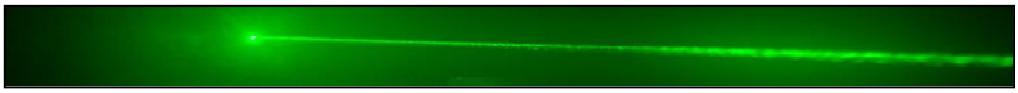
6.5 CECs

Contractors

Non-Credit CE Activity

For more information on cost and to register click the link: https://www.halfmoonseminars.org/seminars/130278/practical-site-engineering-science-and-techniques/salt-lake-city-ut

The Power of Light...



We're not talking just any light we are talking the power of laser light and the way it's used in survey technology. Compared to traditional survey methods, which capture one data point at a time and take several seconds to do so, a laser scanner can capture a million data points per second, or several million points from a single scan. The data collected from an individual scan is not a single point of an object, but, a "point cloud" consisting of the many data points that make up the object in that scan.

One analogy might be thinking of laser scanning as a shotgun, getting everything in its path, while traditional surveying technologies are more like a rifle shot, capable of hitting only one point at a time.

"Point cloud" data collected from multiple scans can be stitched together to form a complete representation of the whole object or facility being scanned. While this is an enormous paradigm shift in the way survey information is captured, the next part might be even more so. Unlike traditional survey methods, which pretty much begin and end in the field, laser scanning surveys have a second step. After the field work is completed, the captured point cloud data is fed into a computer, where, using laser scanning processing software, the data can be endlessly crunched, manipulated and mined, ultimately generating a 3D model of the facility that is unprecedented in its detail and accuracy.

Laser Scanning at Salt Lake International Airport

How does the use of laser scanning technology increase the value over traditional survey methods:

Detail/Accuracy of data:

The accuracy of laser scanning is within 1/8th of an inch tolerance. By the very nature of collecting millions of x,y,z data points from various setups, the accuracy of the survey is continually being verified.

Cost/Value:

With laser scanning technology, millions of data points are collected rather than only the limited number of points collected using traditional methods in less time for less money.

The need to return to the site to collect measurements that were missed the first, second or third time is eliminated.

The collection of data using Laser scanning can be completed with a one man crew vs. a 2 man crew for traditional methods.

Time:

Laser scanning captures 1,000,000 data points per second, with a range of 900 feet.

Time savings in field work average 80% using scanning as opposed to traditional methods.

Less time spent acquiring data, translates to more acquired data in less time.

Safety:

Laser scanning technology provides a safer working environment for the survey crew, giving them the ability to capture survey information from a distance, which would not be obtainable using traditional survey methods.