Q4. DECEMBER 2020

The American Society of Civil Engineers

Civil Engineering Alaska The Quarterly Newsletter of the American Society of Civil Engineers Alaska Section

Quarterly Highlights

- Nuigsut Airport Improvements
- Future Engineer from University of Alaska
- Life Member Recognition
- Outstanding Leaders in Research, Academics, and Technology
- Dale Nelson Memorial Civil Engineering Scholarship Recipients
- Job Opportunities

Change on the Horizon

As we are all feeling the fatigue that is a result of the COVID pandemic, we can also see light at the end of the tunnel, with hopes of a more normal 2020-2021 ASCE year. As the new ASCE-Alaska Section President I would like to introduce myself to those that I haven't had the chance to meet or talk to. I am a registered Professional **Civil Engineer and Project Manager** with DOWL in Juneau Alaska, specializing in small corridor civil infrastructure and utilities. I have been actively involved with ASCE over the years, having served as the President of the

Nuiqsut Airport Improvements—See Page 2

Juneau Branch, and on the Alaska Section board for the past 3 years. Outside of my duties with ASCE, I also volunteer on multiple nonprofit boards and currently also serve as the president of the aquatics GSC board. In my free time, I love spending time with my kids, hiking, hunting, and fishing. I look forward to hearing from you, as we strive to provide outstanding programs, volunteer opportunities, and recognition to our members. ASCE has brought me many great memories over the years, and this year will be no different.

I would like to also acknowledge Alaska Section Past-President, David Gamez, and the 2019-2020 Board who worked diligently toward progressing our mission and programs over the past year. These programs are at the core of what we stand for, and I look forward to their development for years to come. Thank you, David, and the members of the board for your continued service.

Four years ago, we released our first Report Card for Alaska's Infrastructure, which was a several year-long undertaking with hundreds of hours volunteered to complete. That same group of hardworking volunteers, along with several new volunteers and experts in their fields are diligently working on the 2021 Report Card for Alaska's Infrastructure. Our ASCE Region 8 Governor Tor Anderzen, P.E., F.ASCE, and I are cochairing and overseeing the development of this highly rewarding program. The 2017 Report Card has been used as an advocacy tool highlighting the importance of maintaining our existing infrastructure, and planning and funding for the future. The hard work of our volunteers, who have poured through thousands of pages of publicly available reports, are directly responsible for advocating for infrastructure that benefit all Alaskans. From funding for deferred maintenance, the need for a functional and sustainable ferry system, and repairs and replacement of aging

water and sewage systems, our volunteers advocate for infrastructure that is essential for maintaining and enhancing the quality of life for all Alaskans. I hope everyone is as excited as I am to see the final product this coming year. The Alaska Section of ASCE is working on many other great projects, and I can't wait to share as they come to fruition. I would like to thank my board, past board members, and branch boards for their support during these challenging times. Without their dedication, and the support of our members across the state, we cannot be the strong organization that we are today. I thank each and every one of you that are ASCE members because we could not do this work without vou.

I hope you all had a wonderful holiday season and wish you a Happy New Year!

Sincerely,

Justin Kanouse, P.E., M.ASCE ASCE Alaska Section President, '20-'21



Infrastructure Spotlight Nuigsut Airport Improvements

Over 200 communities in Alaska are not connected to the state's road system and rely upon the local airport for transportation outside their community. This is true for most arctic communities where the airport provides the lifeblood of goods, transportation, and emergency medical services. The airports must function year round and support air traffic that ranges from smaller Cessna 208 Caravans to the occasional large cargo plane.

The airport provides the lifeblood of goods, transportation, and emergency medical services

Resurfacing arctic runways presents a unique set of challenges that includes permafrost soil conditions, a short (<100 day) construction season where the temperature rarely gets above 50 degrees Fahrenheit, limited gravel resources, and lack of cross-wind runways that makes construction sequencing difficult. This article shares some of the common challenges with construction of arctic runway and presents the solutions used for the Nuigsut Airport Improvements project.

Permafrost Soils: Permafrost soils that are generally ice rich and susceptible to thaw settlement are present beneath

Sample of ice beneath the Nuigsut Runway



Photo: HDL Engineering Consultants

many arctic runways. Warming climate conditions threaten much of the arctic infrastructure including runways. In Nuigsut, the runway embankment was typically 4-feet to 6-feet thick and underlain by silty permafrost that contained layers of ice. Photo I illustrates a sample recovered from a layer of ice beneath the runway.

To protect the permafrost, the design included 4 inches of rigid insulation with an R-Value of 4.5 (°F·ft2·hr/Btu) per inch. The insulation was placed in 2 layers with the seams staggered between layers. While not Nuiqsut to the Dalton highway in late typical of all arctic construction, wicking geotextile was included in the design for the Nuigsut airport runway to improve drainage. The wicking geotextile also helped compared to some communities, the protect the insulation from damage during fill placement. The insulation was placed 24 inches below the top of the runway surface to allow a thicker lift of fill prior to compaction. Photo 2 illustrates insulation and geotextile placement.

Gravel Resources: Gravel is a precious resource for many communities in the arctic and particularly communities located open throughout construction and cre-

on Alaska's North Slope. Some communities, such as Anaktuvik Pass, are located in mountainous areas and have access to talus deposits that are adequate for processing into suitable, angular surfacing material. Coastal communities tend to have access to beach deposits along the shore. The beach deposit gravels typically have a small percentage of the material greater 1-inch in diameter. The particles are rounded and the deposits typically produce surfacing material that is sandy with lower gravel and fines content.

For interior communities like Atgasuk that can't be accessed by barge or ice roads, the cost of importing gravel can be as high as \$620 per ton. Techniques like blending of imported and existing gravel reduced the volume of import via barge for the Wainwright airport resurfacing. An industry ice road connects winter and this provided access to a gravel pit approximately 30 miles away. Even with the relatively easy access gravel surfacing costed over \$100 per ton for the Nuigsut Airport Improvements.

Construction Sequencing: Most arctic runways have one runway and lack parallel taxiways. However, because the airports provide the only access to many arctic communities, they need to remain

ates sequencing challenges.

In Nuigsut, the depth of excavation prohibited aircraft from landing near the work and precluded the preferred solution using half-width construction. The designed sequence called for half-length construction of the runway and required escorted access for vehicles along the taxiway and runway shoulder.

Additional Challenges: In addition to the challenges noted above that are typical for many arctic runways, the Nuigsut Airport Improvements project also overcame challenges with schedule and funding. The project was separated into three different contracts: electrical upgrades, gravel procurement, and resurfacing.

During construction, concerns arose about the ability of the surface course to support traffic along portions of the runway, taxiway, and apron. An alternative design was developed for mixing the dust palliative (EK35) into the upper 3inches of the gravel rather than applying it to the surface. This alternative was used along a portion of the runway. The resulting surface was firm and stable and some pilots have compared it to landing on asphalt.

Overall, the project addressed many of the challenges commonly faced in arctic runways and overcame the unique problems specific to Nuiqsut. The airport was open throughout construction and will serve the community for years to come.



Student Member Spotlight

Future Engineer from the University of Alaska—Fairbanks



Name: Jennifer Klebesadel

Aae: 20 Grade: Junior

I/AF

Hometown, State: Palmer, AK

Year you became a member of ASCE: 2020

Describe why you joined ASCE: I joined ASCE in my second year here at UAF, which was also my first year participating in Concrete Canoe. In order to fully participate in the Concrete Canoe competition in the spring and network with fellow students, I became a member of ASCE. Describe a little bit about yourself and why you chose Civil Engineering as a major: Hi my name is Jennifer, although I prefer to go by Jenni. I enjoy most sports, with my favorites being gymnastics, rock climbing, snowboarding and skiing. In my free time you can usually find me at the rock gym or exploring campus. I also enjoy writing poetry as well as playing music, particularly on the

piano, and have been since elementary school. I strive to do well in my classes, but being a total night owl, morning classes are my nemesis. I always try to make time for friends and family, and a few times a semester I make the trek back to the Valley general, and the thrill of potentially padto spend time with my parents, my sister, chickens, and puppy. Deciding on a major has always been tricky for me - in my first year here at UAF it was mechanical engineering, then last year it was civil, and this year I am on the fence between the two. I chose engineering because I like to problem for the next -solve, and I enjoy a good challenge. Engineers were, are, and will be essential to society, as they are part of the bridge between imagination and reality, and it would be an honor to be a part of that. Describe your involvement in the community: My community involvement is

mostly in the form of volunteering over the years. In high school I was a part of National Honor Society and participated in various community projects, including installing signs for the ski trails at Govern ment Peak Recreation Area, recycling at the fair, knitting baby hats and donating them to the hospital, playing piano at the hospital, being a scarer for the Haunted Hay Maze, and more. This last year I participated in the CEM outreach activity, giving kids a fun way to think about buoyan cy and surface area while building aluminum foil boats.

My favorite community/ASCE project was: Concrete Canoe, for the following reason: My favorite ASCE project is Concrete Canoe. Despite not being able to compete in Seattle with my team last year due to The Plaque, I learned a lot and made some new friends as well. Last year was my first time working with concrete in dling in a handmade boat made from concrete was really exciting! The chances of this are not looking too good for this year either, but I hope to eventually check that off of my bucket list.

I have set the following goals for myself

1 year: By next year, I hope to know whether or not I want to pursue Aerospace Engineering.

5 years: Have travelled to Europe (semester abroad?), and either be working with NASA out-of-state or working here in Alaska, preferably in the aerospace or aeronautical industry.

My parents (or other individual) have inspired me to: My parents have encouraged me to try anything that interests me, and to give it my best. They've also always been there to remind me that it's not the end of the world if things go awry, and to be okay with the fact that I did the best I can. In "Star Trek: The Next Generation", Picard says to Data, "it is possible to commit no mistakes and still lose. That is not a weakness. That is life." This quote conveys their message quite well that it is important not

to get caught up in what could have been, and to be able to move on and make the most of every opportunity. I binged Star Trek over the summer with my family, so it's fresh on my mind. My dad is also a civil engineer, and is my main inspiration for giving engineering a go.

My favorite civil engineering course is, or has been (also describe why): My favorite civil engineering course is Surveying. I have been interested in surveying since high school, in which I took part in Archaeology Field School three summers in a row here in Alaska. In addition to learning how to properly work in an archaeological dig and identify and catalog artifacts, I also gained experience using a Total Station - Now that was fun! It was always a treat to look down the scope, and shoot the laser at the prism which was only a couple inches above a microblade that had been quietly nestled away under the soil for millennia. My surveying class allowed me to learn the math behind that process, and oave me more experience behind the Total Station.

My favorite extra-curricular activity is, or has been (also describe why): My favorite extra-curricular activity would have to be climbing. It doesn't matter if it's rocks or trees, I will have a great time nonetheless. It's a good way to de-stress and be outdoors, and the view from the top is often hard to beat.

The most challenging thing I have ever experienced is (also describe why): Doing the IB, or International Baccalaureate program in high school and graduating with the IB

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diploma. In addition to the classes being advanced, oral presentations, internal assessments, and an extended essay were all required. I was essentially burning the candle from both ends, because as soon as the school day was over I went straight to gymnastics practice, and by the time I got home and ate dinner it was 8:30 at night. Throw in piano practice, a few hours of homework, and 6 or less hours of sleep, and I repeated the same thing the next day. l am glad to say it is over, but l did gain some valuable skills from that experience. I can manage my stress more effectively, see more of the big picture and prioritize, and have increased confidence, knowing that I will find a way to get the job done.

My greatest accomplishment to date has been (also describe why): Competing in gymnastics through my senior year of high school. I started gymnastics when I was 18 months old, and "retired" at 18. Some years were more challenging than others, as my homework load increased and injuries came and went. In my last season l was not at the level I had hoped I would be, being hindered by ankle injuries throughout the previous couple of seasons, and I had to rethink my goals multiple times. I persevered, and even though I may not have competed as many skills as I had wanted to, I made some great memories with my teammates and coaches, and learned quite a bit as well.

My ideal 1st Job in Civil Engineering will

be (also describe why): My ideal job would What made you want to become an engiinvolve working outdoors in a team, trying to push the boundaries of what is possible. I'm not sure what specific job it would be, but it would be something along those lines. Honestly, a job in surveying wouldn't be too had either

Life Member Spotlight



Name: Tom Wolf Hometown: Anchorage, AK

Background

Where did you grow up? What brought you to Alaska?

I grew up here in Anchorage. Members of my family were in Alaska during the Gold Rush and settled in Anchorage in 1915. My parents brought me to Alaska when I was 3 -months old. My Dad had oraduated from Anchorage High School and was returning to Alaska after a stint in the Navy.

neer? If you had to choose a different career, what would it be?

Like most kids my age at the time, the NASA space program and the first moon landing starting me thinking about engineering. My parents were not able to finish college and wanted me to get a college degree that was a profession. They had friends who were successful Civil Engineers and they encouraged me to go in that direction. One thing may parents did was send me to a summer program at Oregon State University, where, **ly?** as a high school student, I had the opportunity to listen to presentations from professors on engineering school and the engineering profession.

list your degrees, any honors and/or awards, and involvement in engineering organizations?

B.S. Civil Engineering from Oregon State University

M.S. Arctic Engineering from University of Alaska, Anchorage

Work/Professional Experience

What is your favorite part about being a **Civil Engineer?**

The ability/opportunity to work on a wide range of projects that make a difference in people's lives. In my career, I have worked on rural sanitation projects, small and large municipal water, wastewater, and storm water projects, oil spill contingency projects, a fish hatchery, and most recently rural energy and transportation projects. Unlike many professions, being a Civil Engi-

neer has also given me the opportunity to visit and work in communities throughout Alaska.

What skills do you find most valuable to focus on in your career?

The ability to get along with people. Also, developing writing and public speaking skills.

What drew you to your specific career path? If you could start your career differently, what would you do different-

I would consider my career path a long and winding road with some twists and turns along the way. When I was in high school, my best friend and I talked about starting an architectural-engineering firm after What college(s) did you attend? Can you college. My friend would be the architect and I would be the structural engineer. At Oregon State, Civil Engineering students were required to pick a specialty in your junior year. By the time I was a junior, I had come to realize that structural engineering was not for me, so I opted for transportation engineering. After taking classes like transportation planning and pavement design, I graduated and moved back to Anchorage to be a transportation engineer. What I did not know, was that at the time, virtually all transportation engineering work was done in-house by ADOT. This was right after the completion of the TAPS and engineering work in Alaska had slowed considerably. There were few if any job openings at ADDT and after some time passed without finding employment. I expanded my desired occupation to whatever came up first. A friend's father was the Medical Director at the Alaska Native Medi-



cal Center. He told me that the US Public Health Service had engineers that designed and built water and sewer projects in rural Alaska and he introduced me to the local leader of that organization here in Alaska. That led to my first job and my third potential career path; sanitary engineering. Since then I have been able to work on rural and urban water and sewer projects throughout Alaska, with a few one-offs thrown in the mix. I am currently managing the energy and sanitation grant programs at the Denali Commission.

What is the most challenging project, task, or role for which you were responsible? What lesson or skill did you earn from that experience?

I managed a facility project where there were staff changes on all sides (Owner, Design Consultant, and Construction Contractor). The biggest lesson for me was that change requires increased communication within the individual organizations and between the parties to mitigate issues that arise due to the change in personnel.

What was the project you felt had the greatest impact on your professional career?

The expansion of AWWU's Asplund Wastewater Treatment Plant in the late 1980's. I was AWWU's project manager for construction of the project that doubled the capacity of the plant and included a new effluent tunnel and outfall. Construction was performed by three prime contractors working on different portions of the project. I learned a lot about managing a complex construction projects and handling construction disputes during that multi-year project. I also developed relationships with AWWU's prime consultant on the project which led to job change for me and a 26-year career at CH2M (now Jacobs).

Looking back, what do you think was your greatest contribution?

I think the work that I have done in rural sanitation over the years has been impactful to the local residents.

Did you have any mentors? Who or what did you learn from as you grew in your career?

I don't think I had a specific mentor in my career, but I had the opportunity to work with several great leaders along the way who provided perspective on what's important in accomplishing goals, completing projects, and working with people.

How/Why did you get involved with ASCE? Why did you choose to stay involved?

I became an ASCE member after college, but I really did not get involved in ASCE until Sharen Walsh talked me into becoming involved in the YMF. With encouragement from Dale Nelson, Jim Allen, Bucky Tart and others, YMF led to going up through the leadership chairs on the Branch and Section levels and being Chair of the Pacific Northwest Council, which was the regional ASCE group at the time. Being president of the Section also got me involved in APDC where I eventually served as president. I was also active on the technical side of ASCE. I chaired the Awards committee of Technical Council for Cold Regions Engineering (TCCRE) and the Inspection Committee of the Construction Division (now

Institute). I found that being involved on both the professional side (Branches and Sections) and the technical side (Institutes and Councils) of ASCE to be important in understanding the whole organization. I met many people who were either involved in only the professional side or the technical side that did not have a clue what the other side did or that they even existed. I stayed involved because of the people I was able to meet and work with over the years both in Alaska and outside of the State. It was helpful to have a buddy along the way. Lynda Barber-Wiltse and I tag-teamed each other through many of the leadership positions. I was also extremely lucky that my employers supported me along the way.

How has ASCE impacted your work and/ or what is your favorite benefit of your involvement?

Being actively involved in ASCE provided an indicator of my leadership skills for my supervisors to take into account when considering me for advancement within their organization.

What has been your favorite ASCE event or experience since you got involved?

I do not think I have one favorite, but being the Anchorage Branch's nominee for Engineer of the Year for 1993 was certainly one of the top highlights. Active involvement in ASCE gave me the opportunity to travel around Alaska and the rest of North America to attend conferences, committee meetings, leadership trainings, and to meet and become friends many interesting and smart civil engineers.

What advice would you give to young professionals in the organization?

Say yes to opportunities that arise and get involved in professional organizations like ASCE. Once you do, you will never regret it. It is not as hard and time consuming as you initially think and the benefits out way the cost of your time.

Favorite hobbies, sports, and interests outside of engineering?

In the winter I like to alpine ski and in the summer recreate at our cabin on Big Lake.

Other volunteer organizations or experiences that you'd like to share?

I have also been actively involved in the American Public Works Association (APWA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF). For APWA, I served on the Alaska Chapter Board of Direction for many years and served as the Chapter's President. For AWWA and WEF, I served as the Chair of the Alaska umbrella organization, the Alaska Water and Wastewater Management Association (AWWMA) and as a national Board member for both AWWA and WEF.

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Outstanding Leaders in Research, Academics, and Technology



2020 Outstanding ASCE Faculty Advisor Scott Hamel, PhD, PE, M.ASCE UAA College of Engineering

Dr. Hamel grew up paddling and hiking in the mountains and lakes of New Hampshire. He completed a B.S. and M.S. in Civil Engineering at WPI in Massachusetts, and the University of Colorado at Boulder, respectively. Between degrees he worked as a bridge designer in Boston and a structural engineer in Denver designing hospitals and courthouses. After earning his PE in Colorado, he returned to school and completed his doctorate in Structural Engineering at the University of Wisconsin-Madison.

Dr. Hamel joined the faculty at the University of Alaska Anchorage (UAA) in 2011, where he teaches up to 7 courses per year in civil and structural engineering. In 2020, he was elected Chair of the Civil Engineering Department Between 2014 and 2019, he directed the UAA Summer Engineering Academies, a series of week-long summer

camps that promote engineering. This program tripled in size under his direction.

Dr. Hamel became a co-advisor of the UAA ASCE Chapter in 2014, and the sole Faculty Advisor in 2017. He assisted the chapter in re-starting UAA's participation in the AISC Student Steel Bridge Competition in 2017, which resulted in participation at the National Championships in 2019.

His current research activities involve Structural Insulated Panels (SIPs), accreted ice at the Port of Anchorage, and seismic reliability assessments of structures in Anchorage. He has published dozens of peer-reviewed journal articles and conference proceedings, and spoken at National and International conferences.

Dr. Hamel has been an active member of ASCE and SEAAK since 2011, including the SEAAK Snow Loads Committee, an 8-year project of which Dr. Hamel is a founder that has updated snow loads used across Alaska. He has led the "bridge breaker" or "tower crusher" events at the Anchorage E-week student competitions each February since 2012. Dr. Hamel currently lives in Anchorage with his wife and 3 kids.





2020 ASCE Can-Am Civil Engineering Amity Award Aaron Dotson, PhD, PE, M.ASCE UAA College of Engineering

Dr. Dotson joined the University of Alaska Anchorage Civil Engineering Department in January 2010 as an Assistant Professor with an Environmental Engineering focus. Since that time he has been actively teaching and conducting research regarding environmental and engineering processes involving water and wastewater.

Dr. Dotson was awarded the 2020 ASCE Can-AM Civil Engineering Amity award for "an academic and research career dedicated to water and wastewater treatment with specialization in cold regions processes with small remote systems typical of Alaskan bush communities."



2020 ASCE Hal Peyton Award Bob Tsigonis, PE, M.ASCE Lifewater Engineering—Fairbanks

Bob Tsigonis was awarded the 2020 ASCE Harold R. Peyton Award for Cold Regions Engineering. The award is made to a member of the Society who has made outstanding contributions to cold regions engineering or to a basic understanding of cold environments, including dissemination of knowledge of cold climate technology through publishing innovative technical or research papers.

Bob is an owner in Fairbanks based Lifewater Engineering, a consulting firm specializing in plastic fabrication and sewage treatment designed for use in extremely cold climates.

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EMAIL RESUME TO: info@lounsburyinc.com

Dale Nelson Civil Engineering Memorial Scholarship Recipient



Name: Wenshi Fraser Hometown: Juneau, AK University: University of Alaska, Southeast/University of Alaska, Fairbanks Major: UAS General Engineering Award: \$1,000

Education and Career Goals

My education goal starts with the first day of college. Early on I decided to save money by going to my hometown college, the University of Alaska Southeast (UAS). At UAS I took the opportunity to challenge myself with a variety of classes that did not pertain to my specific degree. Taking these classes allowed me to learn the advantages of being a well-rounded person. I also took this time to establish a foundation of what I wanted to get out of college. When starting a new semester, I reminded myself that my effort and my journey through the semester has a purpose and that is, to get out into the world and help people. All the hours spent on homework, lab reports, and readings shall reflect my cheievements on

future projects. By then, my actions will affect real people and not just hypothetical problems on paper. By the time I started my engineering degree at the University of Alaska Fairbanks, I was able to get a lot more out of the classes. I have toyed with the idea of graduate school as my next step, whether I take a gap year in between or not. I know if I end up choosing graduate school,, this means I do not feel ready to go into the job market and school has always been my place of comfort. I hope my summer internship will gave me the answers I need and a way to transition in the job market. As for a career, I know I will find a place where I belong with a job I love. My goals aren't to be rich and powerful. But to be surrounded by people I love.

Special Considerations

Being adopted from China always meant a different life for me. I love my family as much as they love me, but only by chance did I end up with the best family in the world. The few times I do feel like an outsider, I am overwhelmed by the wonderful and kind community I have been brought into. I feel I owe everything to my parents as they have sacrificed everything for me. My dad is retired and my mom is on the verge of retiring. I know she wants to make sure my college is paid for before she retires; yet she says otherwise. I want to prove to her that she can retire and I can pay for the schooling myself. I want this to be the beginning of me giving back to my parents. I know my parents want to travel like they did before they had my sister and adopted me. With me taking on the expenses of college, this may allow them to fulfill their dreams once more. Schooling gives me the education to get a job and eventually give my parents a retirement they deserve.

Best Experience on Campus

The best experience on campus has been the people I have met, in the clubs I have joined. The Society of Women Engineers opened me up to females in the engineering profession and Tau Beta Pi has introduced me to students with the same drive and ambition I have.

Why did you choose to attend UAF?

I choose to attend the University of Alaska because of the unique education we receive. Specifically, Alaska's climate and the permafrost that must be considered when doing engineering design. Alaska's also my home and is a beautiful place to live and work.

A Note for ASCE and Scholarship Donors

Thank you so much for the opportunity to receive the Dale Nelson Civil Engineering

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Memorial Scholarship, during the 2019-2020 academic year. I was thrilled to learn of my selection for this honor and I am deeply appreciative of your support. I aim to work hard in my career and be a prime example for future scholars. Receiving this scholarship has allowed me to focus on my school work and not worry about my financial standing. To be chosen based on my previous performance and future potential motivates me to produce quality work.

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