

# PLAINS TALK

A Publication of West Plains Engineering, Inc.

## March/April 2018

Re-Creating Recreation: Boys & Girls Club of Aberdeen

Keeping Pace With Pool Design

Modernizing Family Fitness: Casper Family YMCA

The Value of Well-Being: Lone Tree Wellness Center

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## NEXT ISSUE

Get insight into the special mechanical and electrical considerations for industrial and manufacturing facilities, including design for equipment support, efficiency and safety.

MECHANICAL ELECTRICAL PLUMBING POWER

AN ENGINEERING SOLUTION CENTER

# IN THIS EDITION...

We don't know if it's the time of year, our recent backlog of recreation projects or that we're just now realizing we completely failed at our New Year's Resolutions – but this issue we're focused on wellness.

In the past decade there's been a cultural shift toward recreation and wellness. People are eating better, reducing stress and becoming increasingly active. To help accommodate all those active bodies, clients in many industries have started to update, remodel or build new recreational spaces. We've seen the gamut across our markets – everything from small town gymnasiums to community mega-centers with Olympic swimming pools and yoga rooms.

For engineers, these multi-purpose buildings are not only challenging... they're fun. Each space has a different use, which means we have to use a different mechanical and electrical perspective – all while tying it back together under one building envelope.



The photo on the cover of this issue is of the Roosevelt Swim Center's outdoor pool. Located in Rapid City, S.D., this complex also includes an indoor natatorium with a competitive lap pool, zero-entry play zone, vortex swirl pool, lazy river and water

slide. West Plains provided mechanical and electrical design for both spaces, focusing on maximum flexibility to allow the building to operate under a diverse schedule, while also utilizing energy efficient systems to maintain operating costs.



## Groves Speaks with SD Airport Managers

In April, Power Division Manager Kevin Groves, P.E., spent time at the South Dakota Airport Conference in Deadwood speaking with the state's airport managers and operators. Kevin, also a longtime pilot, gave a presentation to nearly 100 attendees on how electrical consultants can help rural airports maintain

outdated, aging and/or non-functioning electrical systems. This is particularly important when issues arise outside of the approved and funded Capital Improvement Plan, but must be addressed before the next CIP cycle.

West Plains Engineering, Inc. is proud to be a  
**USA Swimming  
Professional Provider**



Some of the most complex recreational spaces are swimming pools – both indoor and outdoor. There are design considerations present with pools that just aren't seen anywhere else, and we've spent a lot of years learning them. In fact, we're proud to be one of only 20 engineering firms in the United States currently recognized as a USA Swimming Professional Provider. That means USA Swimming acknowledges our firm as having proven knowledge in pool and facility design. We're happy to share some of that knowledge in this issue, but if you want to learn more, give us a call.



## PROJECT PROFILE NEW CONSTRUCTION

Boys and Girls Club of Aberdeen  
Aberdeen, SD

Team  
HKG Architects  
Helms & Associates  
Solien & Larson

## RE-CREATING RECREATION

Recreation and wellness, especially when it's tailored to kids and teens, takes on all forms. For more than 100 years, the Boys and Girls Club has delivered everything from sports and fitness programs to classroom learning, the arts and character development in the hopes of supporting complete health through recreation.



Like its parent organization, the Boys and Girls Club of Aberdeen focused on empowering community youth with innovative programs in South Dakota. But with more than 1,100 club members, they had simply outgrown their space. West Plains Engineering worked with local firm HKG Architects and, in 2017, the community opened the doors to a new 32,000 square foot, \$5.2 million facility. In keeping with the Club's mission, the new building includes a variety of recreational and learning spaces, including a gymnasium, game room, teen area, classrooms, locker rooms, offices and a lunchroom served by a commercial kitchen.

The plumbing system includes wall mounted battery flush valve water closets and battery powered lavatories. In the main game room and classrooms, semicircular wash basin showers were provided. The heating and cooling for the building was provided by multiple four pipe air handling units. The AHU that serves the majority of the building also includes VAV boxes with hot water reheat for additional individual space control.

Power to the facility was provided by a new 1200A, 120/208V 3 phase electrical service, which has potential to provide power for future growth. The new electrical service also provides power to many types of unique recreational equipment, such as motorized bleachers and backboards in the gymnasium.



**Isaac Anderson, P.E.** is a Mechanical Engineer with more than a decade of experience in our Sioux Falls office. Isaac was the project manager for the Boys and Girls Club of Aberdeen. [isaac.anderson@westplainsengineering.com](mailto:isaac.anderson@westplainsengineering.com)

# KEEPING PACE WITH POOLS

One of the largest and most complex areas of any recreational facility are its pools. From competitive lap pools to zero-entry play zones and intricate water slides; swimming pools and the spaces around them need special systems to keep users safe, comfortable and clean.



Some of the systems necessary include plumbing, ventilation and lighting. While prepackaged systems for pool filtration and water conditioning are available, every pool is different and appropriate attention to selection and design is important because operating costs are significant.

The heating, ventilation, pressure and lighting design also greatly impacts the user experience. Think about it. Swimming pools need to be warm, but that may quickly result in increased humidity throughout the natatorium. Pools need to be kept sanitary with chlorine, however a side effect of poor pool chemistry is chemical fumes or at the very least unpleasant smells. And finally, the space and the pool both need to be well lit for safety, but those lights can become a danger to swimmers and impediment to lifeguards if they create too much glare.

## HEATING

While the packaged drainage and filtration system keeps the water clean, there is still the issue of comfort. Nearly every commercial grade swimming pool requires heating because, indoors or outside, swimmers expect to be comfortable in the water. Special pool heaters are located in the mechanical room adjacent to the pool. These systems bring in the filtered, chemically-treated water, heat it to a desired temperature and pipe it back to return inlets on the sides of the pool basin. To achieve optimal energy efficiency, and swimmer comfort/performance based on user group, the water must be heated to between 76 and 95 degrees Fahrenheit. Additionally, the corresponding air temperature for indoor pools must be adjusted accordingly to prevent evaporation. A good rule of thumb is that the air should be two degrees warmer than the water.

## VENTILATION

Naturally, natatoriums are susceptible to extremely high humidity levels. Not only can too much humidity be uncomfortable for users, but it can be downright destructive to the space. Too much moisture in the air will inevitably impact the performance of the mechanical and electrical systems, not to mention damage the structure. Adequate ventilation is key to removing excess humidity, which will control condensation and improve the life cycle of equipment.

Another important element to ventilation design is the removal of destructive chloramines. "Swimming pool smell" as it's more commonly known, is easy to recognize, but too many chloramines in the natatorium creates a corrosive condensate. Additionally, excess chloramines are unpleasant and potentially dangerous for users to breathe. Combined with proper pool chemistry, a smart ventilation system that uses outdoor and exhaust air will bring clean air into the breathing zone above the water – reducing corrosion and health hazards. Excess evaporation will exacerbate the chloramine production.

## PRESSURE CONTROL

Excess chloramines are certainly destructive, but even a small amount of that particular smell can be undesirable in the wrong space. Hotels, for instance, don't want guest rooms inundated with odors from the pool. Pressure control between the air side of the natatorium relative to the adjacent areas prevents those chloramines from traveling where they aren't wanted. Additionally, correct pressure control can prevent moisture damage from humidity seeping into walls.

## ELECTRICAL SYSTEMS

The electrical systems for swimming pools are also unique. In addition to requiring the power to run complex mechanical systems, there is also interior and overhead pool lighting, and specialty equipment such as underwater touch pads for timing competitive swimming. Water and electricity don't mix, which clearly means all electrical components include waterproof measures to assure user safety. But there are additional safety factors in play. Appropriate natatorium lighting is critical for reducing glare off the water. For competitive swimmers, this is important to their performance. For lifeguards, it's paramount to their ability to clearly see any swimmers who may be in distress under the surface.

Recreational facilities might be one of the most common places to find swimming pools, but clearly clients across other industries are looking for smartly designed water features. From hotels and convention centers, to high schools, universities and hospitals, swimming centers are becoming an increasingly popular form of exercise and enjoyment. Designing them to deliver a comfortable, clean and safe experience for users will have to keep pace.



## PROJECT PROFILE

### NEW CONSTRUCTION

Casper Family YMCA - Phase 1  
Casper, WY

Team  
MOA Architecture – Denver & Casper  
Barker Rinker Seacat Architecture (BRS)

# Team Spotlight

## JULIE MORTON



Title: Draftsperson/Administrative Assistant

Years with WPE: 20 Years

Home Team: Julie is a proud mom to her furbabies – dogs, Harlee & Gus and cats, Addie & Greta.

Julie Morton is almost always on the go. The lifelong Casper native is incredibly active not only at home, but also in the community and at the office. We, for one, are particularly grateful for the latter.

At work, Julie pulls double duty for West Plains. She's both a talented CAD technician, and also keeps the place running on all cylinders as an administrative assistant. It's her friendly voice you'll usually hear answering the phone, while in the next breath she's discussing engineering design. It's a wonder to witness and clearly multitasking at it's best.

But that's just Julie. She's high energy with everything she does, which is a must in keeping up with her crew of furbabies at home. An avid animal lover, she's got two dogs and two cats, and rescues strays when she's needed. You can usually find her and the dogs on the Platte River and Bridle Trails, or working on agility training with the Agility Club of Central Wyoming. She and Gus are even in the process of getting registered to provide dog therapy for the local hospital.

In October, Julie will celebrate 20 years with West Plains Engineering and we want to be the first to say – Julie, will you please stay 20 more?



**Andrew Maxwell, EIT** is an Electrical Designer in our Casper office, and served as the Project Manager for Phase 1 of the Casper Family YMCA. In 2018, he celebrates 10 years with West Plains Engineering.  
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### MODERNIZING FAMILY FITNESS

In most Midwest communities, the local YMCA is a fixture for family recreation and wellness – and Casper is no exception.

The Casper Family YMCA has been in business since 1962, but by 2014, the maintenance and limitations of an outdated building led to the pursuit of a new, modern facility. After all, today's expectations for wellness go far beyond physical fitness, and the YMCA understood the need for a building to support far more.

West Plains Engineering provided mechanical and electrical design for the \$11.6 million project, which was designed in partnership by MOA Architecture and Barker Rinker Seacat Architecture.

From the beginning, the client prioritized design and construction into two phases in order to accommodate the budget.

Phase 1 was completed in 2016 and involved a 38,000 square foot space to house the important core components of the YMCA program – recreational space, drop-in daycare, offices and member locker rooms. *(See inset box for details)*

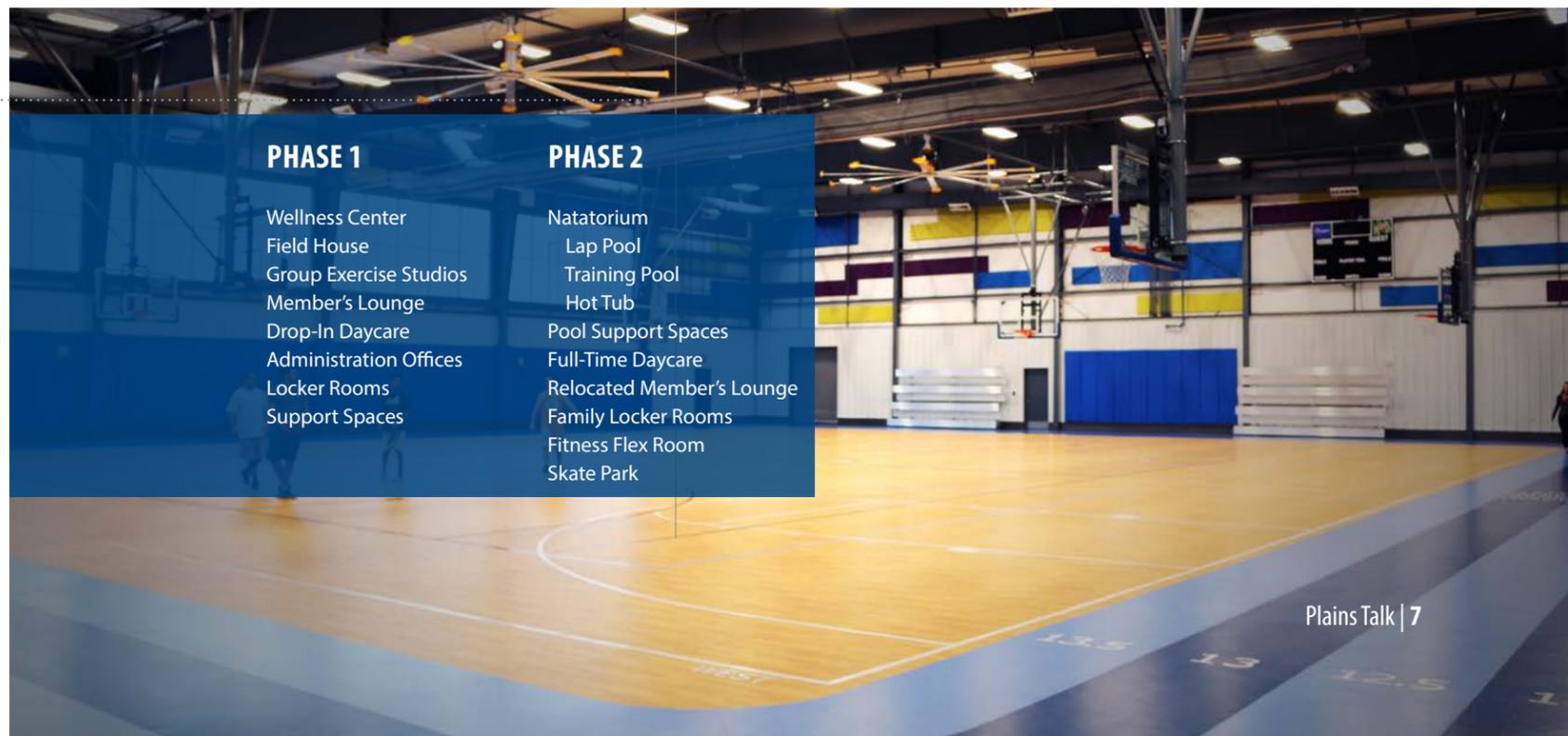
Phase 2 is in the planning and fundraising stages, but is expected to add some truly unique features. Currently, the scope includes another 15,000 square foot addition with a natatorium, full-time daycare and various member support spaces. This phase, estimated at \$10 million, will also involve partial renovation of 12,600 square feet of the original building. The rest will be demolished and developed into parking, a skate park and landscaping.

#### PHASE 1

- Wellness Center
- Field House
- Group Exercise Studios
- Member's Lounge
- Drop-In Daycare
- Administration Offices
- Locker Rooms
- Support Spaces

#### PHASE 2

- Natatorium
- Lap Pool
- Training Pool
- Hot Tub
- Pool Support Spaces
- Full-Time Daycare
- Relocated Member's Lounge
- Family Locker Rooms
- Fitness Flex Room
- Skate Park



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## PROJECT PROFILE

### NEW CONSTRUCTION

Lone Tree Wellness Center  
Lone Tree, IA

Team  
Neumann Monson Architects



**Mike Hessman, P.E.** is a mechanical engineer in our Cedar Rapids office. An Iowa native, he has more than 28 years of experience as a consulting engineer, and has been with West Plains since 2014.  
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### THE VALUE OF WELL-BEING

One of the core values for the City of Lone Tree is “a genuine concern for the well-being of it’s residents”. Currently, the City is making good on that promise with the construction of a new \$2 million recreation and wellness center to support the health of it’s 1,500 people.

The 20,000 square foot building includes a full size gymnasium with mezzanine running track, weight room, cardio room and aerobic/wrestling room, in addition to locker rooms, office space and amenities.

The gym is served by energy recovery rooftop units with dehumidification capability,

utilizing energy recovery, CO2 sensors for outside air control and a full outside air economizer. The gym’s air distribution system is served with fabric ducts and duct silencers for a comfortable, quiet atmosphere.

The locker rooms and office spaces are served with condensing furnaces and high efficiency condensing units, utilizing energy recovery ventilators to provide for fresh outside air and exhaust for a comfortable and easy system to maintain and operate

The project is currently under construction and should be ready to welcome the community later this summer.