



ENGINEERING NEWS

SIoux FALLS, SOUTH DAKOTA

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MISSION STATEMENT

Engineering Division

To enhance the economic well-being and quality of life in Sioux Falls by working with both public and private partners to provide for a safe, cost-effective, and efficient public infrastructure system.

IN THIS ISSUE:

Welcome1

41st Street Bridge Replacement1

Filter Expansion and Backwash Basin Storage Improvement Project.....2

Traffic Sign Assessment and Management Program Update2

Winter Stabilization for Construction Sites.....2

Safe Routes to School Funding Update.....3

Sertoma Avenue Reconstruction Project Update3

2009 City Engineering Tentative Bid Dates4

2009 Bike Trail Counts.....4

Employee Updates4

Engineering News

is published quarterly in January, April, July, and October. Send articles and comments to lfuller@siouxfalls.org

Welcome

Where did the summer go? The kids are back in school, football is under way, and fall is here.

As we enter crunch time of the construction season, I want to congratulate an Engineering employee on an outstanding accomplishment. Wes Phillips,

a Civil Engineer on our project management team, recently became registered as a professional engineer by the South Dakota Board of Technical Professions. CONGRATULATIONS, WES!!

I also want to thank the organizers, presenters, and

attendees for making the Annual Consultant Meeting a success.

Chad J. Huwe, P.E.
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41st Street Bridge Replacement

One of Sioux Falls' busiest streets will soon be the scene of one of the largest Public Works projects ever. The replacement of the 41st Street bridge over the Big Sioux River will be a challenge for the designers, contractors, businesses, and the 40,000 vehicles that cross the structure daily. Bridge reconstruction will begin in the spring of 2010 at an estimated cost of \$10 million.

The current bridge was constructed in the 1960s and was widened in the 1970s. Although the bridge is safe to the traveling public, a new deck or riding surface is needed. During the evaluation of the City's current levee system, it was determined that the elevation of the bridge needed to be raised to accommodate the new required levee elevations. As a result, the existing structure will be replaced.

Before design of the new bridge started, many questions needed to be answered. What materials and methods could be used to expedite construction? Could the bridge be closed to traffic to expedite construction? Could the

structure be built safely under traffic?

A study was started in 2008 to answer these questions and the results are as follows:

- The bridge should be constructed one half at a time to minimize the impact to other corridors in the area. Two lanes of traffic will be maintained in each direction throughout the project with reduced turning movements.
- Turn lanes should be constructed at strategic intersections for the expected traffic increases at these locations during construction.
- Accelerated bridge construction techniques and materials such as precast concrete components should be used to expedite construction.
- Incentive/disincentive provisions for early completion should be used to motivate the contractor.

In preparation for the bridge reconstruction next year, several projects have been completed or will be completed this fall to prepare for the increased traffic

on other streets and to expedite the bridge reconstruction. A two-inch layer of asphalt was placed on Louise Avenue from 41st Street to 49th Street, right-turn lanes will be installed at the intersections of 49th Street and Western Avenue and 49th Street and Louise Avenue, and a second through lane will be added in the eastbound direction of 57th Street at Marion Road. In addition, private and public utilities will be relocating their facilities ahead of the bridge demolition and reconstruction to expedite construction in 2010.

Although the 41st Street Bridge Replacement Project will inconvenience businesses and commuters next year, the end result will be a structure that meets the City's flood mitigation and transportation needs for many decades.

Jeff DesLauriers
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Filter Expansion and Backwash Basin Storage Improvement Project

The Filter Expansion and Backwash Storage Improvement Project is necessary to expand the capacity of the existing Water Purification Plant to meet the future water demands of the City through 2025. The expansion will increase the total filtration capacity from 50 to 75 million gallons per day (MGD).

With the Filter Expansion, the City is constructing five new gravity filters. These filters use both bituminous coal and sand (filter media) to remove particles and organic materials from the water column prior to storage and pumping into the water distribution system. A new building will be constructed to house the filters and will match the architecture of the existing building. The new filters will be located on the west side of the

main building where the parking lot was located.

Another key element of this project will be the construction of a new backwash basin and pumping system. Backwashing the filters is necessary to remove the buildup of particles that are trapped by the filter media as part of the filtration process. When the filters become "clogged" with these particles, the filters lose capacity and the purification process becomes limited, especially during high-demand periods. The new backwash basin will be constructed in a large underground concrete vault adjacent to the new filter building and has a capacity of 400,000 gallons. A mechanical stainless steel scraper will be installed in the vault that will help remove sludge from the

backwash cycle thus removing solids from backwash water that is returned to the plant for "recycling."

The Filter Expansion and Backwash Basin Improvement Project was bid on April 16, 2009, with Gil Haugan Construction Inc. from Sioux Falls being the low bidder at \$7,448,500. Construction at the site began on June 8, 2009, and the contractor is currently 40 percent complete with the Backwash Basin. Due to a significant amount of work that has to take place during off-peak times, the construction time required to complete the project is longer than normal. The completion date for this project is June 30, 2011.

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Traffic Sign Assessment and Management Program Update

In January 2008, the Federal Highway Administration approved minimum standards for retroreflectivity (brightness at night) of all municipal and highway street signs. The final ruling gives municipalities deadlines over the next ten years to meet the new standards.

The first step in meeting those standards is to have an accurate inventory of all existing signs and their condition. Engineering hired five interns this summer to take on this monumental task. They were to canvas the city using handheld Topcon GMS2 units with integrated digital cameras and dual constellation capabilities to spatially locate all street signs. The interns collected 25,969 sign locations consisting of 15,001 regulatory signs, 2,682 warning signs,

915 guide/destination signs, 1,660 school signs, 5,537 street name signs, and 172 object marker signs. Information collected included sign location, type, year installed, condition, sign direction, and post type. The sign inventory database will be a new GIS utility layer.

The next steps in our project are to train traffic maintenance staff on the GPS units on sign location collection, research and purchase a retroreflectometer, replace the existing signs in poor condition, and prepare a logical approach to meeting the new standards for all street signs.

For more information, check out the July episode of *Public Works TV* on the CityLink 16 website, where we highlighted summer interns and their tasks.

Shannon Ausen, P.E.
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Winter Stabilization for Construction Sites

Inlet protection shall be removed from storm sewer inlets within paved street sections or parking lots between December 1 and February 15. Based on snowfall, the City may require removals earlier than December 1 or installations later than February 15. If this is the case, a notice will be placed on the City's website, www.siouxfalls.org. During the period when inlet protection has been removed, alternate erosion control methods for inlet protection must be employed to prevent sediment discharges to the City's storm sewer system.

Please be advised that the City of Sioux Falls Erosion Control Standards require that previously disturbed areas that will not be subject to further grading activities for longer than 21 days need to apply soil surface stabilization within 14 days of the initial disturbance. Permanent or temporary soil surface stabilization shall be applied to disturbed areas and soil stockpiles within 14 days after final grade is reached on any portion of the site.

Surface stabilization during winter months will be strictly enforced and staff will be closely monitoring compliance with this requirement. Please review your erosion and sediment control plan so that measures may be properly installed as dictated by the time frame requirements for stabilizing your project.

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Safe Routes to School Funding Update

What is Safe Routes to School?

The U.S. Congress created the Safe Routes to School program as part of the federal transportation bill SAFETEA-LU. The primary reason for the development of this nationwide program is to combat the growing epidemic of childhood obesity, diabetes, and to promote more healthy activities. The City of Sioux Falls has applied for two rounds of funding through this program and is beginning to start the process for applying for the third round.

First Round of Funding

On September 10, 2008, the South Dakota Department of Transportation (SDDOT) announced that Sioux Falls received \$148,850 in funding for Safe Routes to School. This money is being used to improve walking

conditions for students at Anne Sullivan, Hawthorne, Laura B. Anderson, and Terry Redlin Elementary schools. Infrastructure improvements include installing pedestrian countdown timers, improving access to push buttons, and placing more in-street yield signs to make intersections safer; the infrastructure improvements also include installing flashing beacons and permanent driver feedback signs to reduce speeds. An educational component with brochures and a television program that focuses on crossing safety are also being developed. These infrastructure improvements and educational materials will be implemented during the current school year.

Second Round of Funding

Applications for the second round of funding became

available on November 17, 2008, with the application period closing on April 8, 2009. The focus of the program in this round remained the same as the first round. The first round of funding focused on schools primarily in the northeast part of Sioux Falls; second round of funding shifted toward the center core area of Sioux Falls involving Cleveland, Eugene Field, Harvey Dunn, Horace Mann, Longfellow, Lowell, and Mark Twain Elementary Schools. The total request for the second round of funding was \$137,260. It is expected that the SDDOT will announce the funding awards for the second round sometime this fall.

Third Round of Funding

Applications for the third round of funding became available on September 14, 2009, with the

application period closing on March 25, 2010. It is expected that funding for the third round of applications will be announced in October of 2010. St. Mary's Elementary School will be hosting a National Safe Routes to School course on October 15, 2009, and ideas that develop from that course may be implemented in the third round of funding along with continuing the crossing improvements in another area of Sioux Falls.

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Sertoma Avenue Reconstruction Project Update

The number one priority for the 2009 Development Driven Street projects was the Sertoma Avenue Reconstruction from 12th Street to 26th Street. Highlights of the one-mile project include:

- 22nd Street to 26th Street—Replace the existing three-lane section with a five-lane section.
- 12th Street to 22nd Street—Replace the existing two-lane section and open ditches with a four-lane section, curb and gutter, and an enclosed storm sewer system.
- 12th Street—Add a lane on the north side of 12th Street so a westbound left turn lane can be provided at Sertoma Avenue.
- Cherry Creek—Construct a 12-foot high by 10-foot wide concrete box culvert under Sertoma Avenue. The box

culvert will provide additional hydraulic capacity and serve as a pedestrian underpass with sidewalk and bike trail connections to Legacy Park and the bike lanes on Sertoma Avenue.

- From 26th Street to 12th Street—Providing 16-foot-wide outside driving lanes to allow for exclusive bike lanes. The gutter slope was adjusted to match the driving lane. This provides an effective 6-foot bike lane (Sertoma Avenue is designated as a Bike Route).

Friessen Construction submitted the low bid (out of 11) for the project.

Construction began in May after school was dismissed for the summer. The portion of Sertoma Avenue from 22nd Street to 26th Street was opened to traffic in August 17, prior to the start

of the school year at adjacent Memorial Middle School and Discovery Elementary School. Major construction is scheduled to be completed by November 15. Some construction elements such as sidewalks and seeding may be completed in 2010.

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12' by 10' concrete box culvert is being constructed by Prairie Contracting south of Cherry Creek



Gutter slope matches the roadway slope to provide an effective 6' wide bike lane along both sides of Sertoma Avenue



EMPLOYEE SPOTLIGHT

DJ Buthe



Name: DJ Buthe, P.E., LSIT.
Place of Birth: DJ was born in Sioux Falls.
Job Title: Civil Engineer, P.E.
Job Functions: DJ is a Project Manager for a variety of City projects. His responsibilities include project development, design, plan review, inspection, and administration.

Education/Background: DJ earned his B.S. in Civil and Environmental Engineering from South Dakota State University in 2004.

How Long With the City of Sioux Falls Engineering Department: DJ has been with the City of Sioux Falls since 2004.

Personal Interest: He loves hanging out with his kids, Brayden and Taylor, and wife, Carrie.

Hobbies: DJ enjoys playing golf, hunting, bike riding, and traveling. He also enjoys watching his son Brayden play football and baseball.

2009 Bike Trail Counts

| Location | 2009 Weekday | 2009 Weekend |
|--|--------------|--------------|
| Falls Park by Farmers' Market | 500 | 551 |
| Downtown by 8th Street Bridge | 836 | 898 |
| Cherry Rock Park | 1,415 | 1,278 |
| Pasley Park Entrance | 1,683 | 1,367 |
| Yankton Trail Park, off of 57th Street | 1,427 | 1,000 |
| By the Zoo and Westward Ho | 773 | 734 |
| Off of Maple Street, Elmwood GC | 472 | 388 |

| Category | Weekday | | Weekend | |
|---------------|--------------|-------------|--------------|-------------|
| Bicyclists | 5,133 | 72% | 4,486 | 72% |
| Runners | 657 | 9% | 841 | 14% |
| Rollerbladers | 84 | 1% | 44 | 1% |
| Walkers | 1,232 | 17% | 845 | 14% |
| Total | 7,106 | 100% | 6,216 | 100% |

- Peak hour count for a weekday in 2009 was 202 at Yankton Trail Park from 7 to 8 p.m.
- Peak hour count for a weekend in 2009 was 169 at Pasley Park from 8 to 9 a.m.
- Traffic was observed from sunrise to sunset, typically 6 a.m. to 9 p.m.
- For a complete listing of bike trail counts, check out the Public Works, Engineering website.

2009 City Engineering Tentative Bid Dates

| Project Name | Estimated Bid Date |
|---|--------------------|
| 41st Street Bridge Interim Project | 09/24/09 |
| Linwood Court Sanitary Sewer Repair | 10/08/09 |
| Water Reclamation Plant HVAC | 10/08/09 |
| Water Reclamation Plant Lime Feed System | 10/15/09 |
| Sanford Youth Complex Grading and Utilities | 10/22/09 |
| Basin 13 Trunk Sewer Section 2 Phase 1 | 11/05/09 |
| 41st Street Big Sioux River Bridge | 11/23/09 |
| Central Main Interceptor Replacement Phase 3 Segment 4 | 12/03/09 |
| Sanitary Sewer Pipe Lining | 12/03/09 |
| Western Heights Watermain Improvements | 12/03/09 |
| Air Base Area Water Main Replacement | 12/10/09 |
| Central Main Interceptor Replacement Phase 3 Segment 3 | 12/10/09 |
| Central Main Interceptor Replacement Phase 3 Segment 2 | 12/10/09 |
| Pressure Zone Improvements | 12/10/09 |
| Water Reclamation Plant Energy Recovery | 12/10/09 |
| 69th Street—Charger Avenue to Tanner Avenue | January 2010 |
| 57th Street from Minnesota Ave. to Pennbrook Avenue | January 2010 |
| Large Diameter Valve Replacement | January 2010 |
| Southeastern Avenue—from 900' N to 1000' S of 69th Street | February 2010 |
| Maple Street—Marion Road to Career Avenue | March 2010 |

Note: Bid dates are tentative and subject to change. Contractors should verify the bid dates by reviewing the Notice to Bidders on the City's website at www.siouxfalls.org/Business/ntb.aspx. Not all of the City's projects are listed.

Did you know ...

- Any garbage dumpster or construction trailer will be prohibited from being placed on a city street from December 1 through April 1.

REMINDER

In all new developments, all valve boxes and manhole covers must be at the surface elevation of the lift regardless of the pavement depth by the first snowfall.

Employee Updates

New Hire



Nick Traupel
Engineering Technician

