

Engineering Department

2016 Annual Report

PURPOSE:

The mission of the City Engineering Department is to provide quality engineering, planning, zoning, and building services to all citizens in a professional and efficient manner. This is accomplished through the planning, organizing and directing of construction and maintenance of public works facilities; the administration of building services and inspections; and the coordination of all public works projects with other city departments and local, state and federal agencies.

PERSONNEL:

The Engineering Department had a number of staff changes in 2016, with several internal job changes. Greg Miller, Building Services Administrator, retired in May, 2016, after 14 years of service with the City. Jared Thomas, Engineering & Building Services Technician, was promoted to the Building Services position in June, 2016. Greg Pearson returned to the Engineering Department as Engineering & Building Services Technician in September, 2016 after 8 years as a Code Enforcement Officer in the Community Development Department, although Greg was originally under the Engineering Department when he was hired in 2008. Finally, Lucas Dahl joined the airport in October as Airport Operations Technician, moving from his previous position in the City Forestry Department. He replaced Jeremy Scott, who took a new position with the Brookings Fire Department.

PROGRAMS AND SERVICES: (under the management of the City Engineer)

Engineering

Two licensed staff engineers, the City Engineer and the Assistant City Engineer, design, administer and inspect public works projects with the assistance of support staff. The office of the City Engineer also provides the following engineering services:

- In-house design and inspection for streets, sidewalks and drainage improvement projects
- In-house design and inspection for other City departmental projects, such as parking lots, sidewalks, chip seals, overlays, bike trails and building improvements
- Consultants are hired for specialty work such as airports, drainage, and larger street and building projects. The City Engineer and Assistant City Engineer work closely with the consultants during all phases from design through project construction and contract close-out
- Engineering staff reviews subdivision designs, drainage plans, and street designs
- Engineering staff administers and coordinates City Storm Water Management Program, monitors Notice of Intents and submits annual report to SD DENR
- City maps are updated regularly
- Assist the public and other departments and agencies with questions regarding drainage, transportation issues, ordinance questions, building codes, and general engineering advice

- City Engineer is the Traffic Engineer and manages the overall traffic system for the City and maintenance of the traffic system is performed by Brookings Municipal Utility staff

Building Services:

The building services staff reviewed building plans and issued building permits as well as assisted the building code questions. The staff also performed inspections of both private and public buildings that were constructed throughout the year. The City continued to enforce the 2015 International Building Codes and no amendments were adopted in 2016.

During 2016, the City experienced steady growth in the building permit activity, as follows:

- Single Family Building Permits: 78
- Townhouse Building Permits: 4
- Duplex Permits: 0
- Apartment Building Permits: 6 permits with 86 total units
- Total value of residential permits: \$22,649,574
- Total value of non-residential permits: \$30,121,919
- Total permit valuation for 2016: \$52,771,493

The City of Brookings roofing and siding permits were steady with 52 total permits issued in 2016 bringing in \$1,000 of revenue, which was slightly lower than 2015 which had 54 roofing and siding permits with \$1,350.00 of revenue. During 2016, the engineering department issued 78 single family building permits as compared to the previous year of 88 single family permits. The 2016 total valuation of residential building permits was \$22,649,574, which was less than the 2015 valuation of residential permits at \$23,015,536. The total 2016 valuation of commercial building permits was \$30,121,919, which was lower than the 2015 commercial valuation of \$35,169,950. The total value of permits issued for 2016 was \$52,771,493, which was approximately 9% lower than the 2015 total of \$58,185,486. The following chart shows the totals for the last three years:

Building Permit History

Year	Single Family	Townhouse No.Bldgs.	Duplex No.Bldgs.	Apartments No.Bldgs.	Residential Value	Nonresidential Value	Total Value
2014	79	5	2	3	\$20,414,213	\$27,963,772	\$48,377,985
2015	88	7	0	8	\$23,015,536	\$35,169,950	\$58,185,486
2016	78	4	0	6	\$22,649,574	\$30,121,919	\$52,771,493

The building permit valuations include construction of several large projects in 2016 including the SGS, Taco Bell, Brookings Cinema 8, an addition at 3-M, and an addition to Brookings Health System (hospital). Building activity has remained strong in Brookings throughout the past several years.

Construction Projects:

The engineering department experienced a very busy year in 2016 with bidding 9 construction projects for the season. The annual maintenance projects for 2016 included the Concrete Maintenance Project, Chip Seal Project, Asphalt Concrete Freight on Board Project and Street Maintenance and Overlay Project. The drainage projects for 2016 included construction of a detention pond Western Avenue near the airport, which completes the drainage improvements in that location of Brookings. The LeFevre Drive Drainage Project was also constructed in 2016 in advance of the 6th Street construction project. This project had been on the prioritized drainage list for several years and was a much needed drainage improvement to the area. The City also constructed a new traffic signal at the intersection of 3rd Street and 22nd Avenue, in conjunction with the Brookings Health Systems expansion

The summary of 2016 projects is as follows with the funding source shown in parentheses:

2016-01SWR Sidewalk Replacement Project (Street Dept. Budget) with Timmons Construction, Brookings, SD

This is an annual project and entailed construction of miscellaneous concrete work including curb and gutter repair, fillets, valley gutters, curb ramps, and sidewalk along City property. The City of Brookings is divided into 5 sections for sidewalk replacement and engineering staff inspects each sidewalk within one section every year. These inspections identify both the homeowner trip hazards as well as curb & gutter and city sidewalks that need replacement. This project also includes homeowner trip hazards that weren't repaired in the 2015 sidewalk area which is east of Medary Avenue South and south of Orchard Drive, and the 2016 sidewalk area which is east of Medary Avenue South and between 6th Street and Orchard Drive. This project also included a concrete sidewalk at the Swiftel Center, new concrete sidewalk to provide an accessible walkway between the Esther Heights Addition to the Valley View Addition, new concrete pads for bike racks at several City buildings, and upgraded curb & gutter and ADA ramps near the new Street Department building. The following is a summary of the project costs:

Bid Cost: \$244,463.75 Actual Cost: \$238,708.98



2016-03SSI Division Avenue Phase III Drainage Improvement Project (Drainage Fund) with Rounds Construction, Brookings, SD

The Division Avenue Drainage Improvement Project, Phase 3, is located on the east side of Western Avenue near the Brookings Regional Airport. This project was designed by Civil Design, Inc. (CDI) and was the third phase of drainage improvements in the Division Avenue area. The project included grading a stormwater detention pond, seeding and erosion control and was funded with the drainage fund budget.

Bid Cost: \$57,990.00

Actual Cost: \$58,495.00



2016-04STI 3rd Street & 22nd Avenue Traffic Signal Project (STP Funds) with Action Electric, Sioux Falls, SD

This project was the construction of new traffic signals at the intersection of 3rd Street and 22nd Avenue. This project was jointly funded by the City of Brookings and Brookings Health System. Brookings Health System changed their driveway and parking lot location with their reconstruction project, and a new street entrance was created on the east side of the intersection. The project included LED traffic signals with mast arms, curb ramps, conduit, emergency vehicle preemption, pedestrian push buttons and countdown timers. The project was designed by HDR Engineering of Sioux Falls and was constructed by Action Electric Company. The project improved traffic flow into the Brookings Health System parking lot.

Bid Cost: \$223,229.98

Final Cost: \$203,700.85



2016-05SSI Demolition Project (Storm Drainage Budget) with Bowes Construction, Inc., Brookings, SD

The City purchased a parcel of property located on the east side of Western Avenue in Bidco Addition near the Brookings Airport. This demolition project involved removing the storage buildings, underground service lines, footings, foundations, floor slabs, fencing, pallets and an asphalt parking lot. The City bid a separate project to construct a drainage improvement project on this site.

Bid Cost: \$17,500.00

Final Cost: \$17,500.00

2016-06STI, Chip Seal Project (Street Dept. Budget) with Topkote, Inc., Yankton, SD

This project was the chip seal project for the 2016 Project Area, which was located east of Medary Avenue, between 6th Street and 8th Street South. This is an annual project, where the contractor applies oil and city-purchased pea rock chips to the streets. The City then sweeps up the excess chips a few days afterward for re-use or sale.

Bid Cost: \$224,751.00

Final Cost: \$197,393.91

2016-07STI, Freight on Board Project (Street Dept. Budget) with Bowes Construction, Inc.

This project was the annual street maintenance project that provided asphalt patching material that the Street Department picked up at the plant to repair patches throughout the City. The Street Department used this material to patch numerous streets with their own equipment and crew which was a cost savings compared to hiring contractors to perform patching work. The final cost was higher than the bid cost due to the Street Department crew performing more street repairs in 2016.

Bid Cost: \$54,950.00

Final Cost: \$74,121.77

2016-08STI, Street Maintenance Project (Street Dept. Budget) with Bowes Construction, Inc.

This project is the annual street maintenance project which included asphalt milling, digouts and overlays on various streets in Brookings that are in need of repair. The streets repaired were:

- 3rd Street between 5th Avenue and Medary Avenue: asphalt overlay
- 8th Street South between Onaka Trail and Main Avenue South: asphalt overlay
- Summit Pass from Powderhorn Pass to the east approximately 500 feet: asphalt overlay
- Western Avenue, north of Summit Pass: new 13-foot-wide concrete valley gutter
- Heritage Drive between 7th Street South and 8th Street South: extra digouts were performed on this street
- David Cove, north of Martin Boulevard: Drain tile and asphalt patching
- Bike Trail from Sunrise Ridge Road, along I-29, and south of the railroad tracks: asphalt overlay and shallow concrete drainage structure east of the 3M property
- Soccer Complex Parking Lot: asphalt repair
- East Fire Station: asphalt overlay

- Additional street: Elm Avenue from 5th Street South to Orchard Drive: asphalt overlay
- Additional street: 2nd Street from 6th Avenue to 7th Avenue: digouts and asphalt overlay

This was a successful project that improved several streets on the City’s collector and arterial corridors, and improved the street condition near the new City Street Department building.

Total Bid Cost: \$390,036.50

Total Final Cost: \$454,425.55



2016-09STI, LeFevre Drive Storm Sewer Project (Street Dept. and Storm Drainage Budgets) with Timmons Construction, Inc.

This project is located on LeFevre Drive from the south side of 6th Street to the intersection of the LeFevre Drive cul-de-sac and was designed by the City Engineering staff. This project was on the drainage priority list for several years and provided much-needed drainage improvements to the area. The project included new storm sewer pipes and inlets, concrete pavement, striping, erosion control and miscellaneous items. This project was constructed in advance of the 6th Street reconstruction project to allow for storm sewer improvements and wider intersection pavement for truck traffic turning movements. The project was approximately 80% completed in 2016, and will be finished in the spring of 2017.

Bid Cost: \$271,765.50

Final Cost: \$ not completed



2016-10STI, Derdall Drive Drainage Project (Neighborhood Project) (Storm Drainage Budget) with Prussman Contracting, Inc.

This project was second phase of a neighborhood drainage improvement project, located on Derdall Drive, east of 17th Avenue South. The project involved installing a new storm sewer pipe and a drainage inlet to improve drainage flows.

Project Cost: \$17,963.88



2016-11STI, Airport Utility Project, (Airport Budget) with Bowes Construction, Inc.

This project involved installing water and sanitary sewer mains and services around the new hangar and taxilane area at the Brookings Regional Airport. The project was designed by Civil Design Inc. and include water and sanitary sewer in the grass areas between hangars and boring the water and sanitary sewer that crossed the taxilanes to reduce asphalt pavement repair costs. The project opened up several locations for new hangar construction and future tenants can access water and sanitary sewer for their hangars for restrooms and other uses.

Bid Cost: \$87,321.00 Final Cost: \$89,761.75

SDDOT Urban Project: P3245(08) PCN 03WF, 22nd Avenue Rail Crossing Improvement Project, (SDDOT Railroad Improvement Funds), Bowes Construction, Inc.

The South Dakota Department of Transportation (SDDOT) administered Project PP 3245(08) PCN 03WF, which was the construction of rail crossing signals on 22nd Avenue. The project was designed by Civil Design Inc. and was bid by SDDOT. This was a desired project by the City of Brookings as a safety enhancement at the railroad tracks. The SDDOT provided 90% of the funding and the City paid 10% of the design and construction costs.

Bid Cost: \$220,464.27 Final Cost: project not completed



Other budgets & departments:

The City Engineer administers several budgets, with the assistance of engineering and airport staff. The annual activity for these departments is summarized as follows:

Storm Drainage Fund:

This fund is derived from storm drainage fees that are charged on all properties in the City Limits. Brookings County is exempt from the fee since they perform the billing and collecting of the drainage fees along with the property taxes. The drainage fee calculation is determined using the following formula:

- square footage of the parcel x the runoff weighting factor x the unit financial charge

The unit financial charge had been 0.00054 from 2010 to 2016. The City Council discussed the drainage fee in 2016 and authorized the runoff weighting factor to be raised by 15% over a three-year time frame, and the unit financial charge was raised to 0.000567 for 2017. The drainage fee revenue is utilized to pay a small percentage of staff wages for drainage work, maintenance of the existing storm sewer system, land purchases, and storm drainage projects. The drainage projects for 2016 included the LeFevre Drive Storm Sewer Project with larger storm sewer pipe and drainage inlets, and phase 3 of the Division Avenue Drainage Improvement Project with a new detention pond. The fund was also used to install new storm sewer inlets and pipe near the Street Department building, and a new storm inlet and pipe on Derald Drive to improve drainage flows. The fund was also used to maintain and repair inlets and storm sewer pipes, and to maintain the City's Storm Water Management Plan for storm water quality compliance with DENR regulations.

Special Assessment Fund:

This fund is a tool to construct street assessment projects and the assessment fees are deposited back in the fund by the people who are assessed. The interest rate adopted by the City Council had typically been 10% and the assessment costs include an engineering and administration fee of 6% of the project. During 2016, there were no alley or street assessments, and the following sidewalk project was completed:

- 2016-01SWR, Sidewalk Assessment:
 - Sidewalk replacement assessment cost for trip hazards: \$10.07 per square foot to remove and replace 4" PCC sidewalk

Airport:

General Activity:

The Brookings Regional Airport is a general aviation airport with a Part 139 Class IV Certificate. The Part 139 Certificate allows the airport to receive unscheduled commercial service and provide fire response on the airfield. The airport had approximately 52 based aircraft including 2 gliders in 2016. In 2016, the largest transient aircraft was a Gulfstream G550 and the most active transient aircraft was the Cessna 172. Overall aircraft operations were higher in 2016 due to it being the first full year after the completion of the airfield realignment project.

Functionality:

The Brookings Regional Airport is able to provide the following functions:

- **Emergency Preparedness and Response** – Aeromedical Flights, Law Enforcement/National Security/Border Security, Emergency Diversionary Airport, Disaster Relief and Search & Rescue, Critical Community Services Supported by Government Agencies
- **Critical Community Access** – Personal & Community Connectivity and Air Taxi Operations
- **Other Aviation Specific** – Self-Piloted Business Flights, Corporate Flights, Flight Instruction, and Personal Flying
- **Commercial, Industrial, and Economic Activity** – Agriculture, Aerial Surveying and Observation
- **Destination and Special** – Tourism and Access to Special Events

Construction/Improvements/Changes:

In 2016, the airport completed a major utility project to service future hangars and some existing hangars on the airfield with water and sewer. The south end reconstruction of Runway 17/35 was designed in 2016 and is scheduled to be reconstructed in 2017.

The airport and engineering department also developed a hangar numbering system for the airfield to assist emergency responders and contractors with identifying hangars quickly. In addition to installing signs on the hangars, a map was created and added to the Airport Emergency Plan for quick reference.

Hangar Development:

With the completion of a new taxiway in late 2015, a new hangar was constructed and occupied in 2016. In addition, another hangar was finished and occupied as well. With the completion of the utility project and new taxiway, the airport now has over 4 “hangar-ready” sites, with utility hookup locations available.

Fixed Base Operator:

Pheasants Fury, LLC continued to provide fixed-based-operator services for the airport and the flying community. They have one full-time employee as well as a several part-time employees.

They provided assistance with aircraft fueling, flight line service, hangar rentals, pilot supplies, rental car arrangements, weather and flight planning, and nearly any other services an aviator could need. It is anticipated that fuel needs and other services will continue to increase now that the runway and taxiway project is complete.

SDSU Aviation Program:

SDSU was a large share of aircraft activity again in 2016, making up over 30% of all air traffic at the airport. Each SDSU aircraft had increased operations from the previous year and they had their highest annual operations since 2012. The flight-training program continued to expand the skills of future commercial and corporate pilots. SDSU also provides a maintenance program that trains students to work on airplanes for their Aircraft Maintenance Management degree program. SDSU also operates their transportation department utilizing the Brookings Regional Airport, which includes flying various representatives from SDSU and the State to meetings, legislative sessions, and other events in a King Air.

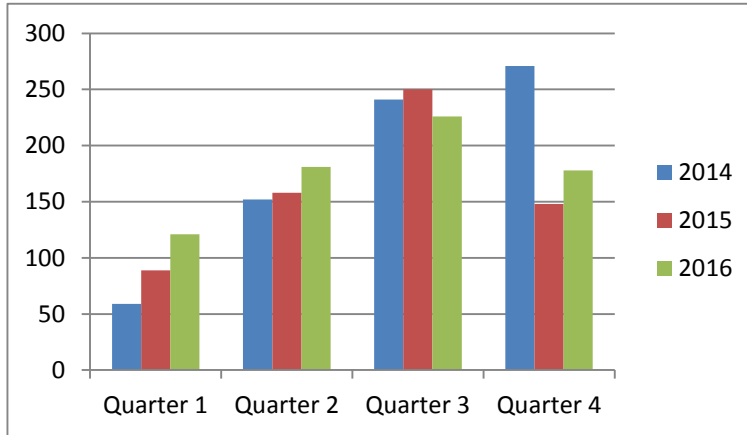
Comprehensive/Land Use Planning:

According to the recently released South Dakota State Aviation System Plan, only one-third of system airports are included in local comprehensive or land use planning efforts. The Brookings Regional Airport has been coordinating with the local and regional communities to address land use concerns and other planning efforts near the airport, which helps promote the safety of persons in the air and on the ground by encouraging compatible land uses. Planning for future compatible development helps protect the existing and future airport infrastructure as well. Typical planning tools that the airport has developed are; Airport Emergency Plan, Security Plan, Height Zoning Guidelines, land-use compatibility planning, Irregular Operations Contingency Plan, Wildlife Hazard Management Plan, Airport Layout Plan, and other documentation and planning tools outlined in the Airport Certification Manual.

Aircraft Operations:

One variable in gauging airport performance and usage is to track aircraft traffic, or operations, not based at the Brookings Regional Airport. While based aircraft and operations are valuable figures to track, we can learn more about specific trends and patterns by focusing on traffic flow into and out of the airport. In addition, based aircraft counts and operational growth has stayed consistent in relation to based aircraft, making forecasting and predicting local traffic reliable, which is not the case with other types of traffic that do not normally use the airport. In 2016, the airport saw an increase in non-tenant traffic in the first 2 quarters, but dropping down just slightly in the last 2 quarters over a 3-year span. The overall increase can be credited this being the first full year after completion of the airfield realignment project.

Non-Tenant Traffic Operations



SDSU Traffic Operations

