Bureau of Facility Design & Construction

Inside this issue:

Director's Notes	1-3
FDC Staff Assists in Small Projects with Big Impact at Hickory Run State Park	4
Mon Wharf Connector Completed at Point State Park	5
Sand Mound Installation for Lackawanna State Park's Lakeside Lodge	6-7
Little Summit Fire Station Furnace Repair at Delaware State Forest	8
Demolish Old Building and Build Public Restrooms on the Pine Creek Rail Trail	9- 10
Each One Reach One (Unless)	11
FDC Bridge Section Meeting with Design Consultants	12
Construction Projects in Progress	13- 15
Bidding Summary	16-









From the Director March 2024

Alfred Uzokwe, P.E.

Artificial Intelligence in the Design Realm - The Way I See Things So Far

Every time I turn on my computer these days, there is something about artificial intelligence (AI) staring back at me. It is there in word processing. It is there in photography and videography. It can be used to search for information on the world wide web and give you more targeted results faster. It is even there in the world of medical diagnosis!

But the one that gets my attention most is in the area of design, whether architectural design, civil engineering design or engineering in general. As director of Facility Design and Construction here, it is my duty to continue to look out for new technology because we have tons of them unfurling in the design and construction realm every day.

Looking out for and being aware of a

new technology does not mean adopting it right away. It means that you will have sufficient knowledge and information to make the right decision even if that decision is – no adoption. We will be looking at AI through the lens of "trust only when you have verified". This is important because AI works by learning mannerisms and idiosyncrasies gathered from so many sources. Sometimes and inadvertently, the source(s) could be flawed.

Below, I will reproduce a short commentary I once wrote about Artificial Intelligence on another platform. My commentary was titled, "Artificial Intelligence (AI) in Architectural and Civil Engineering Designing-Things I would Like to Know"

This is what I wrote:

"The traditional steps architectural and civil engineering designers use in

(continued on page 2)

17

Director's Notes (continued from page 1)

Alfred Uzokwe, P.E.

developing and designing projects is to first meet with clients to get details of the functional requirements and needs of the client. With this, a scope document is developed. With the scope document, designers begin to develop alternate but preliminary sketches (concepts) that they would show the client. This exercise often takes months depending on the complexity of the project itself.

Enter AI: What I found out in my quick preliminary search is that once consultants (those now using AI) develop a scope document, they somehow feed the data into AI tools and in very little time, not months, consultants using AI develop alternate but preliminary design sketches that the designer can show clients. Jointly, the designer and client pick the design option that best represent the functional needs of the client. In other words, it seems like AI takes work that would traditionally take months and reduces it

extensively, may be from months to days.

I must confess that this is all based on research from the internet and so I cannot state them with certainty or assuredness. As a result, I want to open up a chat to see what the experience of designers has been so far in the design and construction realm. I would also like to know how design quality assurance is affected in an AI environment and more. There are many things one would like to know and in the casual discussions I have had with other professionals on this matter, I am not alone in seeking to get a better understanding of this"

As they say, knowledge is power. We are constantly seeking that knowledge with respect to AI to understand what is out there and how relevant it is to what we do. Only at that time will an informed decision be made on the way forward.

Director Uzokwe is pleased to announce the appointment of the following new staff:

<u>Daniel (Dan) Wise, RLA</u>, Landscape Designer 2. Dan has over 38-years' experience in the landscape architecture and land development field working for several firms in Pennsylvania, and one in Maryland, performing landscape design, site and grading design, stormwater management, erosion and sedimentation control, and project management. He is experienced with both hand and computer drawing and rendering, including with the use of Autodesk Civil 3D, and other software programs. Dan is a graduate of the Pennsylvania State University with a Bachelor's of Science degree in Landscape Architecture, an Associates of Arts degree in Business Studies from HACC. Steven is a graduate of the Pennsylvania State University with a Bachelor's in Landscape Architecture degree.

Steven Charron, PLA, Landscape Designer Supervisor. Steven has more than 20-years' experience in the landscape architecture and land development field working for several firms in Virginia and Pennsylvania. In recent years he has worked on many projects in the Harrisburg area include streetscape projects in Shippensburg, Wormleysburg and West Fairview, master planning and park projects in Hampton Township, Messiah College, and Hershey Park, and student housing projects adjacent to Penn State's Middletown campus. He is a native central Pennsylvanian having graduated from Mechanicsburg High School.

(continued on page 3)

Director's Notes (continued from page 2)

Alfred Uzokwe, P.E.

Mark Spadea, Senior Civil Engineer (General). Mark is a lifelong resident of Southeastern Pennsylvania who graduated from the Pennsylvania State University with a Bachelor of Science degree in Civil Engineering. Before coming to DCNR he worked in the engineering departments at the Philadelphia Naval Shipyard, the National Park Service Northeast Regional Office and Amtrak. Mark likes to stay active and spend time outdoors and enjoys fishing, traveling, canoeing as well as spending time with family.

<u>Tyler Jones, P.E.</u>, Senior Civil Engineer (General). Tyler grew up in Northwestern Pennsylvania and currently resides in Conneautville, Pennsylvania. Prior to joining DCNR Western Engineering Office, Tyler started his professional career at the Department of Transportation District 1 in 2013 as Civil Engineer Trainee, in 2015 he started managing construction projects before transitioning to roadway and bridge design in 2018. Tyler is a graduate of Pennsylvania College of Technology, with a BS in Civil Engineering Technology.

<u>Timothy Fosnaught</u>, Senior Civil Engineer (General). Tim grew up near McConnells Mill State Park in Western Pennsylvania, and the time he spent there as a kid inspired the love for State Parks he still has today. Prior to joining DCNR Western Engineering Office, Tim worked as the Assistant Structure Control Engineer for PennDOT District 11. Tim is a graduate of Youngstown State University, with a BE in Civil and Environmental Engineering. Tim spent a decade in the Carpenters Union before going back to school to complete his engineering degree.

Andres Perez, P.E., Civil Engineer Consultant (Structural). Andres' work will include structural design projects and the structural design component of architectural, site, and other projects, review structural designs from consultants, and perform structural evaluations of existing buildings. Prior to joining DCNR, Andres worked for DGS as a Design Project Manager in their Capital Programs office performing project management duties. Andres has also worked for several private engineering companies including Providence Engineering in Lancaster and State College and CenterPoint Engineering in Mechanicsburg performing many aspects of structural engineering design and project management. Andres is a 2010 graduate of the Pennsylvania State University with a Masters in Architectural Engineering.

<u>Brian Hansbury</u>, Environmental Projects Construction Inspector. A graduate of Kutztown University, he began his professional career at Greater Hazleton CAN DO, Inc., in Hazleton, then the Schuylkill Economic Development Corporation in Pottsville. During his time with both organizations, Brian amassed over a decade of experience in the community, economic and industrial development fields. He helped manage multi-million-dollar infrastructure projects, commercial and public building projects and a variety of other initiatives aimed at community betterment and growth.

<u>Arthur Berarducci</u>, Environmental Projects Construction Inspector. Art grew up and still resides in the trail town of West Newton where he served as Mayor after graduating with Environmental Science degree from Slippery Rock University. He spent his first years in the Rostraver Sewage Plant as an operator, then moved on to a Law enforcement career with Westmoreland County Sheriffs. Prior to starting with FDC Western Region, Art worked numerous years with the PA Turnpike as a construction inspector.

FDC Staff Assists in Small Projects with Big Impact at Hickory Run State Park

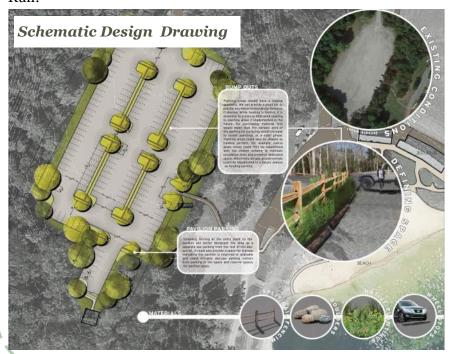
Patty McNeil

Designing new and improved facilities in State Parks and Forests can be a lengthy process. While some projects can take months or years to complete it is always important that we are designing the best product for our visitors. However, sometimes site and facility improvements don't require extensive engineering, permitting, or costly capital investment.

In 2022, the staff at Hickory Run reached out to the Bureau of Facility Design and Construction to request design ideas for parking improvements to their large day use lot near the lake. Through simple schematics and graphic aids, we were able to provide the park with a few design ideas for their reference. This enabled the park to utilize existing funds on hand to improve the parking area. The primary focus for this project was to maximize the number of parking spaces and create a uniform flow of traffic. Through fencing, parking bumpers and native planting areas the park staff were able to delineate space and create an optimized space for visitors to begin their adventures at Hickory Run!







FDC will continue to assist Hickory Run on two additional parking area improvement design initiatives in 2024 for their Hawk Falls Parking Area and Lower Shades of Death Parking Area.



Mon Wharf Connector Completed at Point State Park

Daniel A. Kauffman, P.E.

The Mon Wharf Connector at Point State Park is complete! That statement was years in the making and required the effort of many different individuals to get the finish line. As noted in a previous newsletter article, the Mon Wharf Connector provides a final completed link for the Great Alleghenv Passage Trail (GAP Trail) which starts in Cumberland, Maryland and ends at Point State Park. The GAP Trail section through Point State

Park is a heavily used section of the trail and, prior to construction this section of the trail, had several pinch points, obstructions, and poorly defined routes within the vicinity of Point State Park. The completed project eliminates those obstructions and provides a clearly delineated and unobstructed 8' to 12' wide trail through the Mon Wharf area to the riverwalk along the Monongahela River.

The construction of the project started in January 2023 and was completed in October 2023. There were several minor changes to the approved design during construction, however, a majority of the design remained unchanged. This is a testament to a well thought out design and the flexibility of the contractors working on the project. One of the major concerns going into construction was the

uncertainty for flooding of the nearby Monongahela River, which generally occurs multiple times throughout the year, particularly in late Winter or early Spring. The flooding would have



Photo by Bryan Perry, Executive Director for the Great Allegheny Passage Conservancy

impacted the lower elevation sections of the alignment. Fortunately, the construction was completed without any interruptions due to flooding.

The project team, including both prime contractors, design consultant and Park staff, did an excellent job working together to bring the project to completion. The General Contractor took great lengths to keep the project on schedule, including performing tasks out of sequence, when possible, to attempt to meet the original project schedule. Ultimately, there was a two-month delay in the opening of the trail to ensure everything was properly constructed. The result is a beautifully done trail that will serve our park visitors over the coming decades.

Project:
Project Coordinator:
Project Design Consultant:
Construction Manager:
Construction Inspectors:

Contractors:

Construction Cost:

Mon Wharf Connector Andrew Evans, PLA C.C. Johnson & Malhotra, P.C. (CCJM) Daniel A. Kauffman, P.E.

Chuck Karadus, TW Consultants

Tom Phillips, DCNR

Mosites Construction, Pittsburgh, PA (General) Allegheny City Electric, Inc., Pittsburgh, PA (Electric)

\$4,235,516.00

Sand Mound Installation for Lackawanna State Park's Lakeside Lodge

Joseph Herbstritt, P.E.

Do you ever wonder what happens to the water once you flush the toilet? Well, this is often an under-asked question, and while many folks may become queasy thinking about where their wastewater goes, sewage treatment is indeed a modern marvel that most of us take for granted. You'd also be surprised to hear that DCNR manages numerous wastewater treatment facilities and onlot sewage disposal systems throughout the Parks and Forests of Pennsylvania.

At Lackawanna State Park, problems were discovered at the Lakeside Lodge's sewage system. Odors were present and



Dosing Pump Tank



Sand Mound

it was determined that drains were not functioning the way they should. It was discovered that the Lakeside Lodge residence had a failing onlot sewage disposal system.

The Lakeside Lodge is a 3-bedroom residence which is primarily utilized by Park Ranger Trainees and other Park Staff who require a seasonal residence during their work assignment. In the future, DCNR is also considering plans to convert this lodge to a public rental, but for the time being this residence remains a home to many staff who work for the park system.

So, let's take a minute to talk about onlot sewage and how it is actually treated. Onlot sewage disposal systems are designed to take the wastewater generated from a household and safely dispose and treat this waste using a septic tank and a designated soil disposal area. As waste flows into a septic tank, organic materials are broken down by microorganisms and solids

(continued on page 6)

Sand Mound Installation for Lackawanna State Park's Lakeside Lodge (continued)

Joseph Herbstritt, P.E.

are settled out. Liquid effluent from the septic tank is then piped/pumped to a suitable area of land, where the excess wastewater percolates into the soil for further treatment and ultimate disposal.

To remedy the issues at the Lakeside Lodge, a sand mound system was designed. First, soils were evaluated to determine the percolation rate and limiting zone of the soil and to determine soil suitability. Due to wet conditions adjacent to the lodge, the nearest suitable location for a sand mound was approximately 350 feet away and uphill.

Next, sewage flows were estimated for the residence and the sand mound system was designed. A dosing pump tank, submersible effluent pump, and pressurized distribution piping was also specified. Drawings, calculations, and permits were then submitted to local Sewage Enforcement Officer for review and approval.

Construction commenced during the fall and was completed in December of 2023 by Minichi, Inc.



E&S Controls and Pressure Distribution Piping



Sand Mound

Project Name: Project Coordinator: Construction Engineer: Construction Inspector: General Contractor: Construction Cost: Lakeside Lodge Septic Joseph Herbstritt, P.E. Pradeep Gajurel C. R. Davis Minichi, Inc. \$109,227.13

Little Summit Fire Station Furnace Repair at Delaware State Forest

Jason Adams, C.B.C.P.

This project consisted of replacing the existing oilfired boiler with a new propane fired boiler on a raised platform. New exhaust and intake were installed through the existing chimney shafts. Other equipment replaced were pumps, expansion tank, air separator, valves, flow controls and piping in the boiler room. The new piping design consists of a primary and secondary hot water loop. This piping arrangement was originally developed as a method of increasing allowable system temperature design drops,



Propane Boiler

decreasing required pumping horsepower and increasing system control quality. The purpose of this installation is to deliver the same water temperature to each secondary loop. The office side of the building was heated with baseboard radiant tube which was left in place. The four existing hot water unit heaters in the garage bays were replaced with more efficient units.

This building is used as a Forest Fire workshop and storage building. Providing a new functioning heating system is just the start to upgrading this building and site to operate more effectively.

Project: Little Summit Fire Station Furnace Improvements

Designer/Project Coordinator: Jason Adams, C.B.C.P.

Construction Manager: Victor Li

Contractor: O&M Multi-Trade, Inc.
Location: Delaware State Forest

Tobyhanna Township, Monroe County

Cost: \$149,209.00

Demolish Old Building and Build Public Restrooms on the Pine Creek Rail Trail

Steve Delp

The project titled, "Demolish Old Building and Build Public Restrooms and Contact Station on Pine Creek Rail Trail" is currently in construction. This project is located along the southern section of the Pine Creek Rail Trail in Tiadaghton State Forest, Lycoming County. This stop on the rail trail is identified as "Whitetail" and located approximately halfway between Jersey Shore and Waterville.

A key to this project was the development of a site concept sketch by Ben Cassidy - Landscape Architect - DCNR/DGS. This sketch guided all future decisions through the design process. This facility is being entirely redeveloped based on this initial sketch and the construction drawings that followed. As the sketch and drawing indicate, there are three new structures included in this project. a trailhead structure ("contact"), a double-vault toilet ("CXT"), and a storage building ("garage").

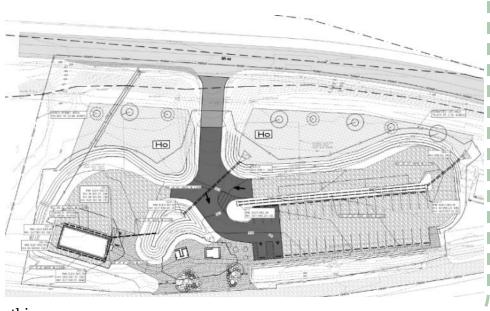
This site, which is adjacent to Pine Creek, is in the fringe area of the flood plain. New structures within this

area require floor levels to be at or above what is called the Base Flood Elevation. To meet this elevation requirement, 10,000 tons of fill or approximately 450 tri-axel truck loads had to be delivered and

(continued on page 9)



Concept Sketch by Ben Cassidy



Site Plan

Demolish Old Building and Build Public Restrooms on the Pine Creek Rail Trail (continued)

Steve Delp

(continued from page 8)

placed to raise the grade approximately five feet and allow for all new structures to meet this requirement. This process alone took approximately six days to complete.

The construction phase of this project is currently at 95 percent complete. On January 24, 2024, the double-vault toilet was delivered and installed.

Whitetail is scheduled to reopen to the public in the Spring of 2024.





Vault Toilet

Fill

Project: Demolish Old Building and Build Public Restrooms and Contact Station

on Pine Creek Rail Trail

Project Coordinator: Steve Delp

Designer: Ben Cassidy, Landscape Architect, DCNR

Anthony H. Visco, Jr., Architects

Larson Design Group

Micheal L. Norris & Associates

Construction Inspector: Mark Peters, Region 1

Contractors: Solid Ground Service, Inc., Troy, PA, \$965,000.00

Tra Electric, Watsontown, PA, \$36,428.78

Each One Reach One (Unless)

Stephen King, E.I.T.

During the fall and winter seasons, FDC Bridge section staff, Park Managers and District/ Foresters conduct field views for proposed design and construction projects. Often our projects are in heavily populated sections along a park trail or along a forest road where a stream carries water.

Our biggest concern is building structures that do not interfere with the natural travel and well being of aquatic organisms including wildlife. There is also a secondary goal we can achieve while we are on site and walking around.

This is by all means is a friendly suggestion that we can help keep the wildlife and water ways stay clean by picking up any trash we may find along the way. I also understand that we are not maids (paid cleaning professionals), but we can be good stewards of mother nature.

I like to keep a pick grabber stick and trash bag in the FDC vehicle when I travel or even in my personal vehicle so I can help keep the environment clean where ever I'm at. Especially within the great state of PA. I've even gotten a few "thank you's" from park or forest visitors.

If possible can we get reach and grab tool and trash bag in DCNR vehicles? This would promote removing trash among non-field staff who do not work on location at a park or forest. Where we can contribute to the park or forest natural beauty!

Just a thought?





FDC Bridge Section Meeting with Design Consultants

Wayne Nguyen, P.E.

A meeting was convened by the FDC Bridge Section staff with their design consultants on January 30, 2024, at the Rachel Carson State Office Building. The intended purpose of the meeting is to provide an open channel of communication between the two sides, to set clear DCNR expectations of the consultant design services, and to foster a climate of open discussion about emerging issues. FDC staff shared information about the upcoming Request for Proposal for the next agreement, pending inspection assignments, and to discuss the following:

- ABC construction
- Work Order review
- E&S Control Plan
- Provisions to protect and maintain access of forestry road during construction
- Cut-off wall for box culvert
- Stream crossing impact on fish and other aquatic organism passage
- Backfilling of stream substrate for open bottom culvert/bridge
- Stream diversion during construction
- Consultant design schedule

FDC Bridge Section is planning to hold this meeting annually with the consultants to discuss any project concerns that were identified in the previous year and to get their feedback so a resolution can be agreed upon. The meeting provides an avenue to establish a good working relationship with the consultants through a commitment of mutual cooperation and open communication.



Construction Projects in Progress



Black Moshannon State Park — Installation of 140kW Propane Generator System



Black Moshannon State Park — Installation of 140kW Propane Generator System



Forbes State Forest — Groomer Storage Building



Forbes State Forest — Groomer Storage Building



Laurel Hill State Park— Group Camp Rehab Foundation Repairs



Laurel Hill State Park— Group Camp Rehab Foundation Repairs

Construction Projects in Progress



Leonard Harrison State Park — Visitor Center Addition



Leonard Harrison State Park — Visitor Center Addition



Leonard Harrison State Park — Visitor Center Addition



Leonard Harrison State Park — Visitor Center Addition



Ohiopyle State Park — Falls Area Change House



Ohiopyle State Park — Falls Area Change House

Construction Projects in Progress



Presque Isle State Park — Solar Parking Canopies



Ohiopyle State Park — Full Service Campsites



Presque Isle State Park — Solar Parking Canopies



Tiadaghton State Forest — Demo Project on the Pine Creek Rail Trail



Tiadaghton State Forest — Demo Project on the Pine Creek Rail Trail



Tiadaghton State Forest — Demo Project on the Pine Creek Rail Trail

Bidding Summary

Bidding Summary September 2023

FDC-400-102665.4R Worlds End, Promised Land, Ricketts Glen SP Electrical Construction - Install EV Charging Stations at Three State Parks

Bid Price: \$138,

\$138,399.00

Apparent Low Bidder:

TRA Electric, Inc.

Bidding Summary October 2023

FDC-451-10264.1 White Clay Creek Preserve General Construction - Bridge Replacement Bridge No. 6451-7501 Penndel Trail Over East Branch White Clay Creek

Bid Price: \$234,750.00 Apparent Low Bidder: Maverick Construction, Inc.

FDC-210-103441.1R Moraine State Park General Construction - Force Main Replacement LS7

Bid Price:

\$239,000.00

Apparent Low Bidder: Klinginsmith Enterprises, Inc.

FDC-450-101095.1 Delaware Canal State Park General Construction - Lumberville Aqueduct

Bid \$3,131,000.00

Apparent Low Bidder: Loftus Construction, Inc.

FDC-202-102897.1 Cook Forest State Park General Construction - Rehab River Well

Bid \$143,500.00

.00 Apparent Low Bidder: Maverick Construction, Inc.

Bidding Summary November 2023

FDC-003-101782.1R Tuscarora State Forest General Construction - Replace Aboveground Gas/Diesel Tanks at

Bryner HQ

Bid Price:

\$179,849.00

Apparent Low Bidder: A. Graziani & Company, Inc.

FDC-003-10049.1 Tuscarora State Forest

General Construction - Structure Replacement - Bridge No. 03-0052

Wynn Gap Haul Rd over UNT to East Licking Creek

Bid \$323,543.04 Price: Apparent Low Bidder: Wen-Brooke Contracting,

FDC-020-10896.1 Tuscarora State Forest

General Construction - Construct Woven Wire Deer Fencing - FD #20,

Phase 2

Bid

Price:

\$423,085.85

Apparent Low Bidder:

BASH Contracting, Inc.

FDC-211-103399.4 Ohiopyle State Park

Electrical Construction - Construct Solar Array at Heliport

Bid Price: \$1,293,639.00 Apparent Low Bidder: Thoroughbred Construction Group, LLC

FDC-016-11018.1 Tioga State Forest

General Construction - Construct Woven Wire Fence - FD#16

Bid Price:

\$152,633.09

Apparent Low Bidder:

BASH Contracting, Inc.

FDC-015-11019.1 Susquehannock State Forest

General Construction - Construct Woven Wire Fence - FD#15

Bid Price:

\$310,842.45

Apparent Low Bidder:

BASH Contracting, Inc.

INTERESTED IN DOING WORK FOR DCNR?

For a list of current projects out for bid, visit the Bureau's current bid proposal page at:

<u>Bid Express :: Commonwealth of Pennsylvania -</u> Department of Conservation and Natural Resources

Bidding Summary

Bidding Summary December 2023						
FDC-411-102176.1R Nolde Forest Environmental Education Center General Construction - McConnell Hall Rehabilitation						
Bid Price:	\$298,800.00	Apparent Low Bidder:	S&S Electrical Services, Inc.			
FDC-411-102176.3R Nolde Forest Environmental Education Center Plumbing Construction - McConnell Hall Rehabilitation						
Bid Price:	\$65,000.00	Apparent Low Bidder:	W.C. Eshenaur and Son, Inc.			
FDC-411-102176.4R Nolde Forest Environmental Education Center Electrical Construction - McConnell Hall Rehabilitation						
Bid Price:	\$64,400.00	Apparent Low Bidder:	S&S Electrical Services, Inc.			

Bidding Summary January 2024						
	FDC-320-103137.1 Kings Gap Environmental Education Center General Construction - Mansion Generator Replacement					
Bid Price:	\$175,075.00	Apparent Low Bidder:	LEZ Electrical, Inc.			
FDC-418-10445.1 Marsh Creek State Park General Construction - West Launch Wetland Establishment						
Bid Price:	\$183,000.00	Apparent Low Bidder:	Meco Constructors, Inc.			

September Total Bids/Value: 1/\$138,399.00
October Total Bids/Value: 4/\$3,748,250.00
November Total Bids/Value: 6/\$2,683,592.43
December Total Bids/Value: 3/\$428,200.00
January Total Bids/Value: 2/\$358,075.00

Total: 16/\$7,356,516.43

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<u>Bid Express :: Commonwealth of Pennsylvania -</u> <u>Department of Conservation and Natural Resources</u>



Bureau of Facility Design & Construction

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Bureau Mission:

To provide multi-disciplined technical support to the other bureaus in DCNR in the areas of project design, project inspections, construction management, contract administration, surveying and other technical advice and consultation.

Questions – Comments?

We value our reader's feedback. Send your questions or comments to:

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