District Department of Transportation

Unique Challenges to Construction in the Nation’s Capital

Paul Hoffman
August 18, 2016

AASHTO Subcommittee on Construction
Safety, Environment and Workforce Development Section
Agenda

About DDOT

Safety
  • DDOT’s Safety Culture

Work force Development
  • Project Related Safety Training

Environment
  • Green Infrastructure
  • Urban Forestry
DDOT is Born

May 2002 – DC Council passes the District Department of Transportation Establishment Act of 2002, creating a cabinet-level agency responsible for the management of transportation infrastructure and operations. Prior to the Act, transportation was managed under the Department of Public Works.
DDOT by the Numbers

DDOT, born in 2002 out of DPW and multiple DC administrations

- 61 Square Miles Land Area
- 228 Bridges (209 vehicle, 19 pedestrian)
- 16 Tunnels
- 1,392 Linear Miles of Roadways (interstate, highways and neighborhood streets)
- 358 Linear Miles of Alleys
- 1,495 Linear Miles of Sidewalks
- 150,000 Street Trees
DDOT Mission

• The mission of the District of Columbia government's Department of Transportation (DDOT) is to enhance the quality of life for District residents and visitors by ensuring that people, goods, and information move efficiently and safely with minimal adverse impact on residents and the environment.
DDOT Safety Culture

• A work in progress...
• Recurring events:
  – Contact with overhead electric lines,
  – Concerns with operation of crane/boom trucks,
  – Trucks backing into/over workers,
  – Vehicular accidents (DDOT Fleet)
• Mandatory safety training for all construction inspectors (2010)
  – OSHA 10 Hour
  – Work Zone Traffic Control
• Heavy reliance on Consultant and Contractor community for additional training
When construction equipment touched overhead power lines, the result was shocking, literally. A construction worker was shocked and burned when the incident occurred. The 30 year old man was rushed to the hospital after this construction equipment accident, with what was considered life-threatening injuries. He had severe electrical burns. At first people thought it had been an explosion.

Reports from bystanders were that the construction vehicle became energized and a loud boom happened when the construction equipment touched the overhead power lines. The construction workers were doing trench work in the area.
A 10-year employee of the DC Department of Transportation (DDOT) staff member was seriously injured in an accident at an event to test the department’s readiness for snow. Donna Stewart’s legs were severely injured when she was struck by a snow plow at the RFK stadium parking lot last Friday. “We are actively determining the circumstances of the accident,” DDOT spokesperson Reggie Sanders said in a statement. “As well, our focus is on the well-being of our injured employee, her family, and the DDOT family.” DDOT declined to comment on camera, and the union which represents DDOT workers released a statement....
An unexplained “flash fire” atop a District streetcar late Saturday is under investigation, city officials said Sunday.

In a statement, the District’s Department of Transportation said “initial observations suggest this was an isolated incident,” but transportation officials did not explain why they think that to be the case or provide details on a possible cause.

D.C. police Officer Frederick Lee said there were a pair of streetcar incidents Saturday night. They coincided with the icy storm that was making its way over the city and the 2.2 mile H Street/Benning Road NE streetcar line. Safety concerns have repeatedly delayed the opening of...
**Hoffman, Paul (DDOT)**

*From:* Hoffman, Paul

*Sent:* Saturday, February 13, 2016 5:41 PM

*To:* Kaufmann, Andrew J. (DDOT)

*Cc:* Smith, Dee (COUNCIL); Matlesky, Gregory (Council); Whittier, Kelly (Council); Cheh, Mary (COUNCIL); ...  

**Subject:** Urgent! Electric lines hit

Andrew,

The contractor has just hit our electric lines and cut power to the 4900 block of Potomac Avenue. On the coldest day of the year.

Pepco only has a recorded line.

The contractors are non-English speaking and are of no help.

We are concerned about water lines breaking.

Please assist us.  

and residents of 4900 block of Potomac
DDOT Safety Culture

• DDOT Response
  – Agency Wide:
    • Name Interim DDOT Safety Officer
    • Implemented “Safety Stand Down”
  – Project Level:
    • Review Construction Inspector Safety Training
    • Provide project Safety Training for over 50 Construction Engineers and Inspectors on critical activities
    • Combined DDOT and Consultant leadership
      – Certificates, Hardhat Safety Stickers
    • Future Annual Safety Award
CONSTRUCTION SITE SAFETY LUNCH & LEARN
PRESENTATION
District Department of Transportation - 16th Street Bridge
May 4, 2015
DISCUSSION TOPICS

☑ Personal Protective Equipment
☑ Crane Awareness
☑ Fall Protection
☑ Electrical

SAFETY AWARENESS
Concrete has a high probability of posing a splash hazard when dropped from the chute of a truck, concrete crane bucket, or from a pump truck TREMI hose.

Concrete poses a corrosive hazard when left on human skin.

Usually when pouring concrete workers are bent over to some degree in an effort to better place the concrete.

Observations have been made of workers with their face very close to the splashing concrete.
Head Protection At Risk Behavior #1: Head Protection

Taking off hard hat in the work area

Baseball cap worn under hard hat
2 - CRANE SAFETY

Major Causes of Crane Accidents

- Contact with power lines
- Overturns
- Falls
- Mechanical failures
Types of Cranes

- Mobile
- Hydraulic
- Overhead
- Gantry
- Tower
Planning Before Start-Up

- Level the crane and ensure support surface is firm and able to support the load.
- Contact power line owners and determine precautions. Know the location and voltage of overhead power lines.
- Know the basic crane capacities, limitations, and job site restrictions, such as the location of power lines, unstable soil, or high winds.
- Make other personnel aware of hoisting activities.
- Barricade areas within swing radius.
- Ensure proper maintenance and inspections.
- Have an approved lift plan.
Workers continuously walked between the counterweight of this equipment and the barricade.
Damaged Ropes have been observed in the work area. These did not have tags taking them out of service.
3 - FALL PROTECTION

Use the Correct Standard

• Other fall related hazards are covered by:
  – Subpart N (Cranes and Derricks),
  – Subpart R (Steel Erection),
  – Subpart S (Tunneling),
  – Subpart V (Power Distribution and Transmission covered under 1926.105) and Subpart
  – X (Ladders and Stairways).
Recognize any Hazards?
This is actually a correction. This Barricade was weak and would not have supported 200 pounds of pressure. Metal Stanchions were installed.
Recognize any Hazards?
This is not an acceptable means of Fall Protection
How do we ensure our workers are protected?

- **Perform a Site wide (Extent of Content) Observation** to identify all active power lines, regardless of voltage
  - Create a diagram of these Power Lines to place into your Site Specific Safety Plan.

- **Conduct Safety Briefings** at the beginning of each day and each task which places the work in the vicinity of these power lines
  - To ensure each and every worker in the vicinity is aware of the hazard
Recognize any Hazards?
Recognize any Hazards? – YES!

Working in close proximity to this low voltage wire.
Every requirement in the OSHA standards requires the employer to ensure compliance not the worker.

Documented evidence that you are finding at risk behaviors and conditions will assist in protecting both the employee and the employer.

Providing feedback along with required corrections and documentation of each correction will protect the employer in court.

Creating a healthy Safety Environment on every work site will benefit everyone.

A healthy safety culture begins with communicating safe, as well as, at risk behaviors and conditions – a healthy safety culture is sustained through open and honest communication.
Green Infrastructure Sampler

GREENING DC STREETS
DDOT Green Streets Program Development

- 10 years of Building Green Infrastructure (GI) & Low Impact Development (LID) projects in District ROW
- Anacostia Waterfront Initiative (AWI)
- Great Streets Program
- Private Development LID in ROW
- Department of Energy & Environment (DDOE/DOEE)

- GI Retrofits
  - Green Alleys
  - RiverSmart Washington
  - LID Retrofits

- GI Standards
2013 DC Stormwater Regulations

- DDOE enacted new regulations for Stormwater Permits – July 22, 2013
  - Retention requirement effective January 15, 2014
- Land Disturbance triggers
  - > 5000 SF, meet requirements
  - Resurfacing, utility trenching exempt
- Options for Existing ROW projects
  - Retain full volume requirement (1.2 inch)
  - Retain half volume on-site & half off-site
  - Retain volume to the Maximum Extent Practicable (MEP) (No offsite or fee-in-lieu)
- Anacostia Waterfront Development Zone
  - Must treat 1.7 inches of runoff
Retaining Stormwater to the MEP

• What design will meet Maximum Extent Practicable (MEP)?
• A valid attempt to use all available space to manage stormwater
  – Tree Space, Parking lanes, public land open space
• Work around accepted conflicts
  – Pedestrian zones, bike lanes, bus shelters, mature trees, sidewalk cafes
  – Utilities, surface & subsurface uses
• MEP Process
  – Design package submitted at each phase
  – DOEE gives comments and/or concurrence
  – Reduces risk
• Significant change in design process
Green Infrastructure Standards

• Green Infrastructure Standards (Green Book) (2014)
• Greening DC Streets (Non-technical Design Guide)
• Practices
  – Permeable Paving
  – Bioretention & variations
  – Tree Space Design
    – Soil Volume Requirement
• Products
  – Construction drawings
  – Material specifications
  – Design procedure
  – MEP Procedure
  – Plant lists
  – Maintenance Schedules
Challenge: Quality Control

• Building capacity in design, construction (low bid contracts), and maintenance sectors for quality work
  – Work different from roadway construction
  – Paradigm shift for road drainage design
  – Training DDOT staff and contractors
  – Qualified personnel to oversee construction
  – Certification programs (Existing: pervious concrete, permeable pavers)

• New material quality control
  – Design techniques
  – Material supplier available
  – Construction placement
  – Testing, verification, & acceptance
Urban Forestry Administration

• Street Tree Management
• 20 Field Arborists
Urban Forestry Administration

- 20 arborists
- 150,000 Street Trees
- 12,000 - 15,000 Requests for Service Annually
- Uniquely Positioned Within District Dept. of Transportation (DDOT)
Benefits of Trees

- Reduce Vehicular Speeds
- Physical Buffer for Pedestrians
- Create Inviting Spaces
- Cleaner Air & Water
Benefits of Street Trees

- Trees create more approachable urban spaces, using nature to create scale and connection in the built environment.
Successful Street Trees...

...Can Lead to Challenges for Accessibility
Designing Better Sidewalks

• Tree Roots Need:
  – Oxygen
  – Moisture

• Causes of Buckled Sidewalks
  – Compacted Soil
  – Elimination of Pore Spaces

• Solution: Engineered Tree Spaces & Sidewalks
  – Structural Soil
  – Sufficient Soil Volumes
Solution: Structural Soils

SECTION A-A

SECTION B-B

NOTES:
1. Minimum open tree planting space dimensions: 4' x 4'.
2. Maximum watershed area: 6.6 times area of the open tree planting area.
3. See OIN No. 621.14 for bottom sand layer and subsurface drainage requirements.
4. For sidewalks over structural soil, metal options, see OIN No. 62.15 and 621.76.
5. See OIN. MOS 60.10 to 61.13 for tree installation requirements.

LEGEND:
- 1. Sidewalk / pavers
- 2. ODOT approved structural soil - 30' min.
- 3. Planting soil - 12'
- 4. Sand - 0' to 12' (as required)
- 5. Scouring subsoil - 4'
- 6. Crushed stone, double washed No. 57 - 0'
- 7. Mulch - 3'
- 8. Tree planting space
- 9. Sidewalk or pavers (covered soil)
- 10. Infiltration layer
- 11. Redtextile

REGIONAL OFFICE ENGINEER

DEPARTMENT OF TRANSPORTATION

DISTRICT OF COLUMBIA

STRUCTURAL SOIL UNDER SIDEWALK - COVERED TREE SPACE

DWG. NO. 621.70
Sustainable Tree Spaces & Sidewalks

A smarter way to plan for trees in the transportation network
Sustainable Tree Spaces & Sidewalks

- New Trees
- Sustainable Sidewalks
- Enhanced Pedestrian Experience
But What About Existing Trees?
How Can We Balance the Need for Trees... 

...With Our Need to Maintain an Accessible Transportation Network?
Urban Forestry Administration: Flexipave

- Permanently Porous
- Flexible
- Recycled
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Questions?