

# **CIVIL AND AVIATION FUELING**

Presentation to Port Authority TCAP Community

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05.17.2022

# About Civil and Mechanical Design

## Introduction To Civil and Mechanical Engineering Design

- Engineering Department → Design Division
- Deliver Capital and Operating Projects
- Service Engineering
- Engineering and Authority Initiatives
- Tenant Alteration Applications
  - Civil: Typically reviewed by a Principal Civil Engineer, depending on facility
  - Fueling: Typically reviewed by external consultant under Mechanical

# Basic Info

## Civil Engineering

- Exterior site work triggers a Civil review. Review performed to ensure compliance with applicable codes, Authority policies and to protect existing adjacent infrastructure tenants.
- TAA's that require Civil review typically include the following:
  - Airfield Design (Aprons, Taxiways)
  - Pavements
  - Roadways, Parking Lots and Sidewalks
  - Utilities
    - Storm Drainage
    - Water Distribution
    - Gas
    - Sanitary
    - Assist with placement of other major utilities
  - Intermodal Rail
- Shown on construction plans and specifications as outlined in the TCRM.



*Greenville Yards, Jersey City, NJ*

# Basic Info

## Aviation Fueling Systems

Contract drawing are reviewed to verify that the construction will meet the applicable codes, regulations and standards  
All aviation fueling system modifications shall NOT negatively affect airport operations.

- All TAAs that involve aviation fueling system modifications are required for submission and review.
  - Aviation fueling hydrant systems
  - Bulk storage tank
  - Aviation fuel pump
  - Emergency fuel shut-off system
  - Truck loading and off-loading facilities
  - Control and inventory system modifications
  - Isolation valve vault modifications
  - Cathodic protection system
  - Leak detection systems
- Aviation fueling system construction documents shall be submitted to QAD with the TAA application for design review.
- Submit full set of construction drawings with project specifications.



# Review Process

## Civil - Codes, Regulations, Standards and Required Documents

- Typical Codes and Standards
  - Port Authority Civil Design Guidelines
    - Within Leasehold → PA Civil Design Guidelines not required
    - Affects Outside Lease and/or certain utilities → PA Civil Design Guidelines required
    - Includes storm drainage, sanitary, water distribution, public roadways, shared lots, taxiways or driveway connections
    - This is something to be clarified in future TCRM updates!
    - <https://www.panynj.gov/content/dam/port-authority/business-opportunities/pdf/civil.pdf>
  - Federal Aviation Administration (FAA) Advisory Circulars
  - American Association of State Highway Officials (AASHTO)
  - American Railway Engineering and Maintenance of Way Association (AREMA)/Conrail
  - Americans With Disabilities Act (ADA)
  - National Fire Protection Association (NFPA)
  - New York Department of Environmental Conservation Regulations
  - New Jersey Department of Environmental Protection Regulations
  - Local Municipal Water, Gas and Sewer
- Required Documents
  - Signed and sealed contract drawings
  - Project specifications
  - Calculations
    - Pavement Design
    - Drainage
    - Sanitary
    - Water Distribution



*Newark Liberty International Airport  
Runway 4R-22L*

# Review Process

## Aviation Fueling - Codes, Regulations, Standards and Required Documents

- Applicable Codes and Standards
  - New York Department of Environmental Conservation Regulations
  - New Jersey Department of Environmental Protection Regulations
  - New Jersey Uniform Construction Code
  - New York City Construction Code
  - New York State Construction Code
  - National Fire Protection Association Standard 407 & 30
  - American Petroleum Institute Standards 650 & 653
  - American Society of Mechanical Engineers B31.3
  - Air Transport Association Standard 103
- Required Documents
  - Signed and sealed contract drawings
  - Project specifications
  - State licensing/certification required documentation
  - Calculations
    - Fuel demand
    - Cathodic protection
    - Piping sizing



# Common Errors and Issues

## Civil

- Leasehold lines not shown
- Not locating or identifying existing utilities
- Unresolved conflicts with other utilities or structures
- Insufficient cover over proposed utilities
- Not meeting PA Security Guidelines for fence
- Grading not detailed sufficiently
- Storm water directed off leasehold
- Not providing pavement depth for utility trench cuts
- Individually detailed sidewalk ramps
- Wildlife attractants in or near aviation areas
- Conflicting notes due to utilizing PA standards



*Utility Work at JFK International Airport*

# Common Errors and Issues

## Aviation Fueling

- Updates to aviation fueling facility state licensure/MOSF license
- Provide means to permit state required piping tightness testing
- Provide emergency fuel shut-down system connections
- Modifications of existing low point drains and high point vents
- Installation of pipe coatings and cathodic protection systems
- Inground pits' aircraft load rating and installation procedures
- Coordinate with fuel system operator for draining/filling piping and scheduled system shut-downs
- Provide flushing and testing procedures
- Radiographic testing of piping welds





# Keys to Success

- Tenant Coordinators identify and notify Engineering as early as possible when involvement is required
- All comments are addressed, and comment responses provided
- Engineering invited to all applicable meetings
- Engineering involved with updating TCRM Document
- Facilitate meetings with the EOR during design/rider submission process
- Facilitate facility maintenance staff review of project documents
- Provide complete design packages during all review submittals

**QAD**

**Civil & Aviation Fueling  
(Inspection)**

Presentation to Port Authority TCAP Community Stakeholders

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# Civil and Aviation Fueling inspection process

- Attend inspections to ensure compliance with TAA documents (drawings and specifications) and applicable codes. The ultimate goal is to issue Permit to Occupy or Use.
- Airside (Aprons, Taxiways, Drainage & other utilities, Fencing, Striping, ...)
- Landside (Streets & Signs, Sidewalks, Utilities, Parking Lots, ADA, Fencing, Striping ...)
- Aviation Fueling (Piping, Storage Tanks, Pumps, Coating & Cathodic Protection, Leak Detection, Vaults, ...)
- Special Inspections and Special Inspections Check List

# Airside (AOA)

- Aprons (Thickness, Surface, Level, Expansion & Control Joints, Dowels, Drainage, Special Tests ...)
- Taxiways (Thickness, Surface, Lighting, Drainage, Level, Special Tests, ...)
- Drainage & Other Utilities (Piping, Manholes, Invert Elevations, Compaction, Manhole Cover Rating, Existing Utilities, Cover, Pitch, Ponding, Security Bolting, ...)
- Fencing (Location, Installation Details, Razor Wires, Signage, Obstruction Lighting, Tensions Wires or Rods, Grounding, ...)
- Striping (Color, Type, Thickness, ...)

# Land Side (Streets)

- Streets (Compaction, Drainage, Lighting, Signage, Surface, Striping, ...)
- Sidewalks (Compaction, Surface, Level, Tripping Hazards, ADA, ...)
- Parking Lots (Compaction, Surface, Level, Drainage, Lighting, Striping, ADA, Egress, Fencing, Access Gates ...)
- Drainage (Piping, Manholes, Invert Elevation, Compactions, Manhole Cover, Pitch, Ponding, ...)
- ADA (Ramps, Running & Cross Slops, Cross Walks, Curb line Cutouts, Striping...)
- Fencing (Installation Details, Tension, Wires or Rods, Grounding,
- Striping (Color, Type, Thickness ...)

# Fueling

- Piping (Installation, Support, Welding,
- Storage Tanks
- Fueling Hydrants
- Emergency Fuel Shut-Off System
- Leak Detection (Test Reports,
- Inventory Control
- Flushing

# Water Supply Piping

Domestic Water or Fire Protection Water Service | Public or Private Mains  
Refer to Jurisdictional Code Chapter 9\*\* and NFPA Standards 13, 14 & 24.

- NFPA 13 [2013] = 3.8 Private Water Supply Piping Definitions;  
NFPA 24 [2013] = 3.3.11 Private Water Supply Piping Definitions;  
NFPA 24 [2013] = 3.3.14 Test; 3.3.14.1 Flow Test; 3.3.14.2 Flushing Test;
- NFPA 13 [2013] & NFPA 24 [2013] = 10.10.2 Acceptance Requirements;  
NFPA 24 [2013] = 3.3.14 Test; 3.3.14.1 Flow Test; 3.3.14.2 Flushing Test
- Other NFPA 13 [2013] & NFPA 24 [2013] provisions (examples) =
  - 10.10.2.1\* Flushing of Piping;                      10.10.2.4 Operating Test;
  - 10.10.2.2 Hydrostatic Test;                              10.10.2.5 Backflow Prevention Assemblies

“Contractor’s Material and Test Certificate for Underground Piping”

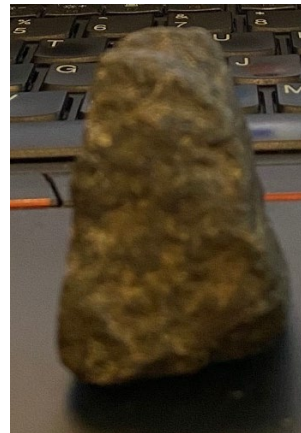
\*\*In NYC, in addition to Chapter 9, see Appendix Q

# Water Supply Piping

## Why flush?

One “rock” =>

Approximately  
2” X 1.25” X .75”  
Drainage stone?





# Special Inspections

## Special Inspections Check List

- Compactions, Welding, ...

# Keys to success

- Follow the TAA document (drawings and Specifications).
- Resolve Design Standards rider's comments as soon as possible (before start of construction).
- Code related deviations must be submitted to the PA for review.
- EOR must be engaged early and inspect the work frequently as it progresses.
- No one in the Port Authority performs TAA inspections. REO audit the work and QAD performs Building Department function.
- The EOR team is responsible to inspect the TAA work and perform all required inspections to ensure compliance with TAA documents and applicable codes.

# Thank You!

