Concrete dust, slurry, and other pollutant prevention controls

2011 North Dakota Storm Water & Pollution Control Conference
April 5, 2011
Gladstone Inn & Suites, Jamestown ND
Dwayne Stenlund, MSc., CPESC
Resource Professionals Alliance

NORTH DAKOTA WATER AND POLLUTION CONTROL CONFERENCE
NDWPCC

Unique Pollutants Prevention Design Items

- Discovered (illicit disposal/burial from the past)
- Demolitions
- Concrete sawing, grinding, cutting, crushing, staining, cleaning agents
- Mobile bituminous and concrete batch plants
- Refueling areas
- Equipment servicing
- Dredging and fills
- Trash, solid wastes
- Construction chemicals
- Dewatering
- Noxious critters
- Sediments

EPA SWPPP Guide

- Total Pollutant Management

Developing Your Stormwater Pollution Prevention Plan
A Guide for Construction Sites

Who?
Construction site operators (generally, the person who has operational control over construction plans and/or the person who has day-to-day supervision and control of activities occurring at the construction site)

Where?
Construction sites required to comply with stormwater discharge requirements

What?
A guide to help you develop a good Stormwater Pollution Prevention Plan (SWPPP)

Why?
Stormwater runoff from construction sites can cause significant harm to our rivers, lakes, and coastal waters

A SWPPP is required (by your construction general permit) and will help you prevent stormwater pollution

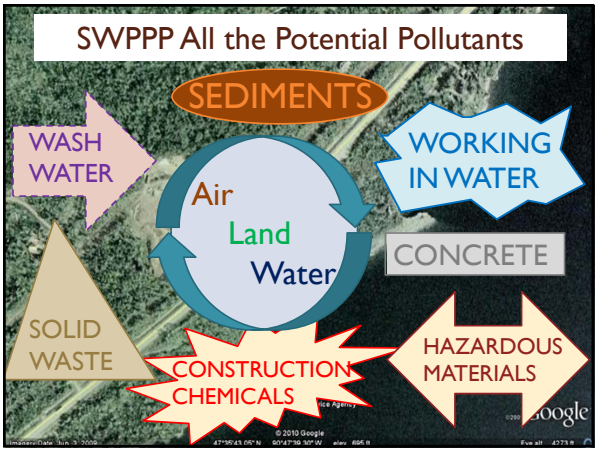
A SWPPP is more than just a sediment and erosion control plan.
It describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act

How? It's the law that directs the contractor to implement

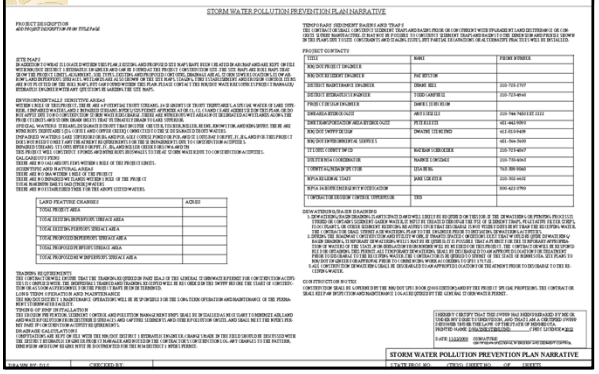
Construction Site Pollutants

Areas of Consideration	Primary Pollutant: Sediment	Other Pollutants: Nutrients	Heavy metals	pH (acids & bases)	Pesticides & herbicides	Oil & grease	Bacteria & viruses	Trash, debris, solids	Other toxic chemicals
Clearing, grading, excavating, and unstabilized areas	✓							✓	
Paving operations	✓							✓	
Concrete washout and waste				✓	✓			✓	
Structure construction/ painting/cleaning			✓		✓			✓	✓
Demolition and debris disposal	✓							✓	✓
Dewatering operations	✓	✓							
Drilling and blasting operations	✓				✓			✓	
Material delivery and storage	✓	✓	✓	✓	✓	✓		✓	✓
Material use during building process		✓	✓	✓	✓	✓		✓	✓
Solid waste (trash and debris)								✓	✓
Hazardous waste			✓	✓	✓	✓			✓
Contaminated spills		✓	✓	✓	✓	✓			✓
Sanitary/septic waste		✓		✓			✓		✓
Vehicle/equipment fueling and maintenance						✓			✓
Vehicle/equipment use and storage						✓			✓
Landscaping operations	✓	✓						✓	

SWPPP All the Potential Pollutants



'Owner' Goals and Expectations


STORM WATER POLLUTION PREVENTION PLAN NARRATIVE

Defined Methods and Responsibilities

Agenda

- Good housekeeping
  - Trash Management
  - Material handling
  - Refueling management
- Trackout controls
- Concrete management
  - Sawing, crushing, drilling
  - Truck washout
  - Machine & equipment washoff
  - Surface planing

Good Housekeeping/Trash Control

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Dumpsters

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Spill Management Program
Spill Kit
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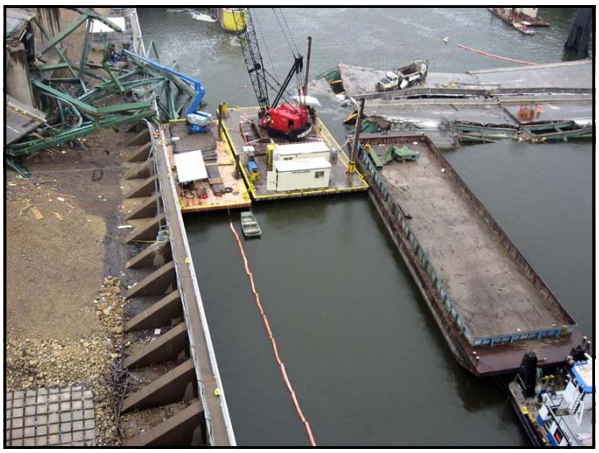


Always being ready


SPILL RESPONSE KIT
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Spills and Leaks
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PD 200


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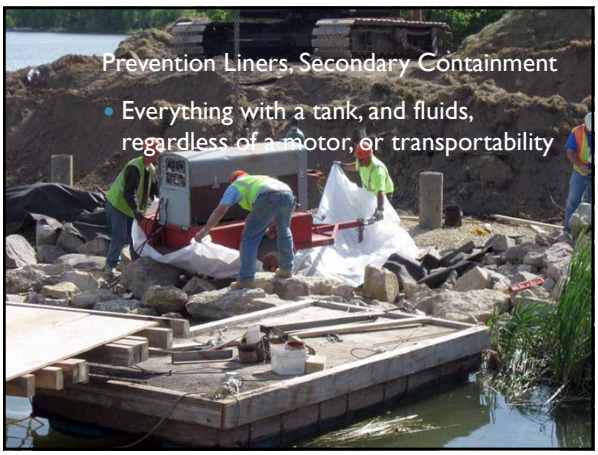
Prevention Liners, Secondary Containment
• Everything with a tank, and fluids, regardless of a motor, or transportability

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Secondary Containment

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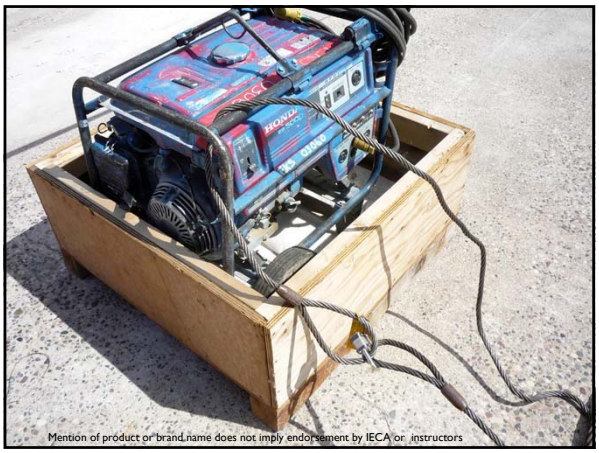
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Mississippi River
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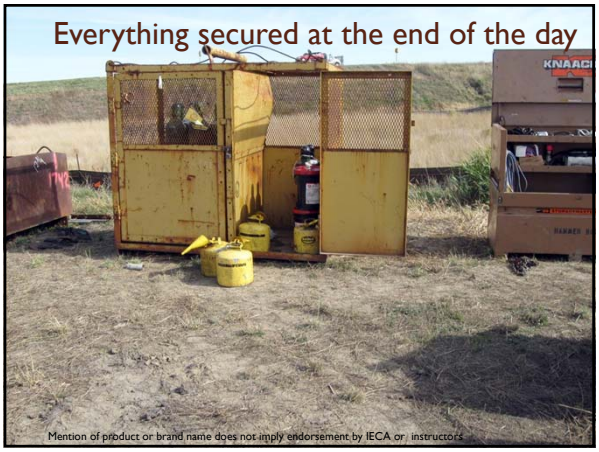
Everything secured at the end of the day
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DIESEL SPILLAGE
CONTAMINATES OUR
ENVIRONMENT
BE CAREFUL!!
YOU ARE RESPONSIBLE
FOR YOUR SPILLS
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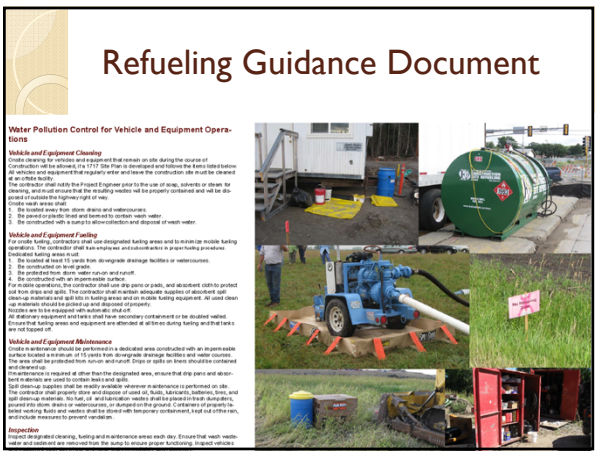
Refueling Guidance Document
Water Pollution Control for Vehicle and Equipment Operations
Vehicle and Equipment Cleaning
Vehicle and Equipment Fueling
Vehicle and Equipment Maintenance
Inspection


Refueling
VEIT
ZIEGLER
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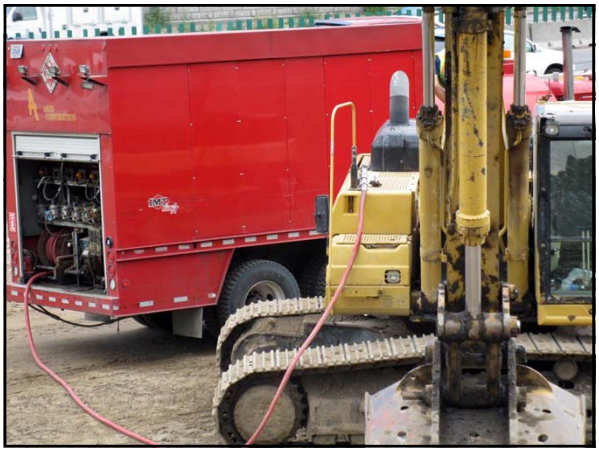


Equipment Maintenance


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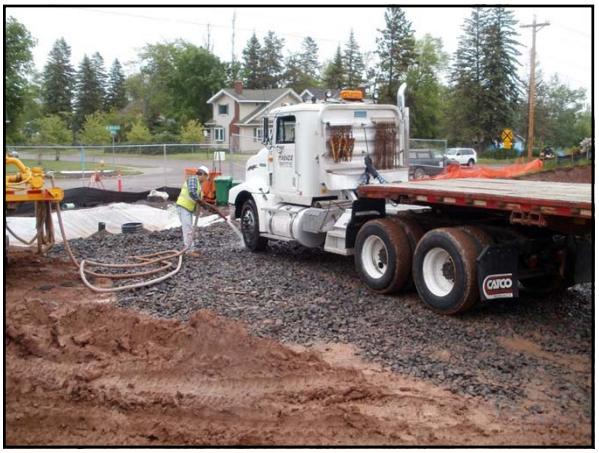
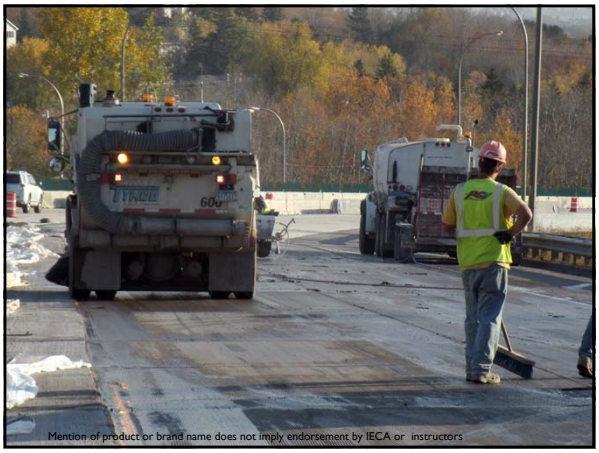



Street Sweeping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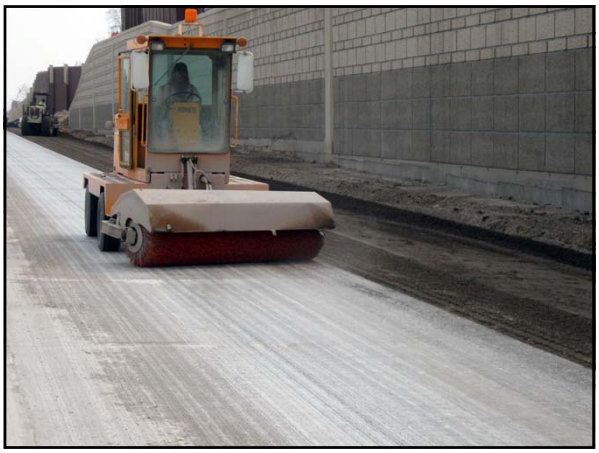
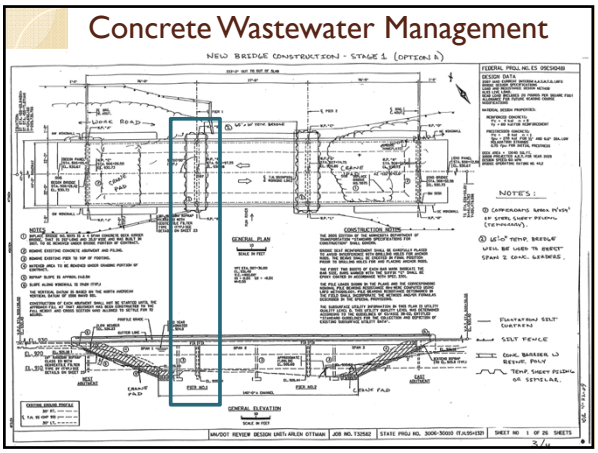
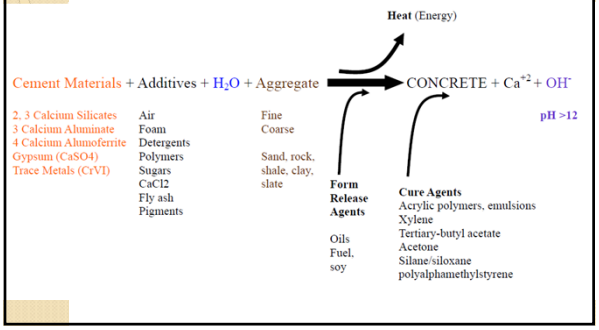


Concrete Wastewater Management



What is Concrete?



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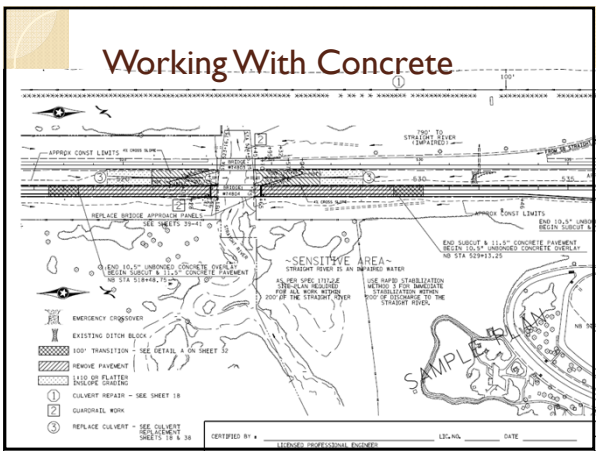
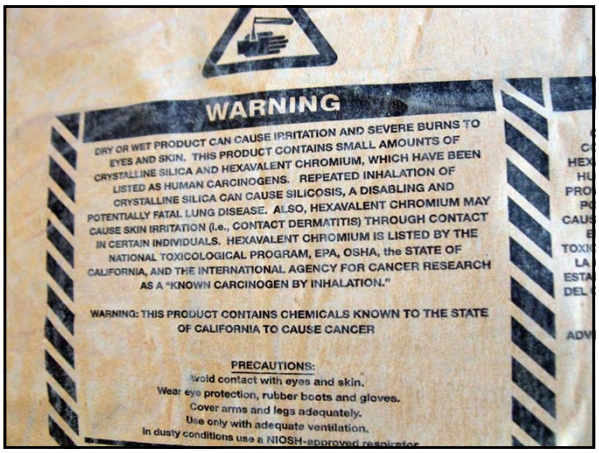
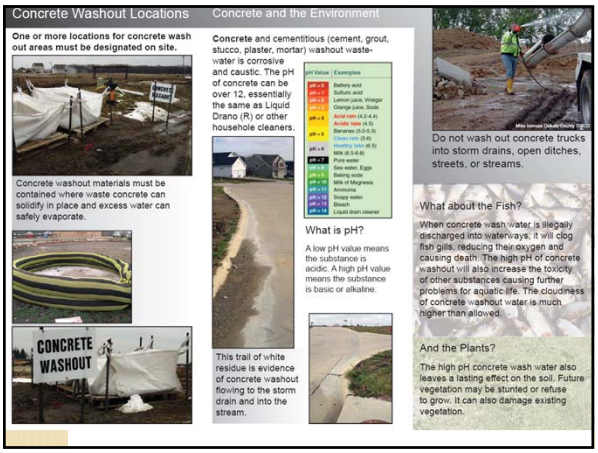
Working With Concrete







Material Safety Data Sheet

- Ready Mixed Concrete, Concrete Ready Mix, Portland Cement Concrete, Ready Mix Grout, Permeable Concrete, Shotcrete, Gunite, Colored Concrete, Flowable Fill, Roller-Compacted Concrete, Fiber Reinforced Concrete

Section 8: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Semi-fluid, Flowable, granular substance	**Evaporation Rate:**	NA
Appearance:	Variety of Color (usually gray)	**PH (in water):**	12-13
Odor:	Slight to none	**Boiling Point:**	NA
Vapor Pressure:	NA	**Freezing Point:**	<32°F (unhardened)
Vapor Density:	NA	**Viscosity:**	Varies
Specific Gravity:	1.9-2.4	**Solubility in Water:**	Slightly (0.1-1.0%)

Section 3: HAZARD IDENTIFICATION

WARNING

Corrosive-Causes severe burns.
Toxic-Harmful by inhalation.
(Contains crystalline silica)

Use proper engineering controls, work practices, and personal protective equipment to prevent exposure to wet or dry product.
Read MSDS for details.

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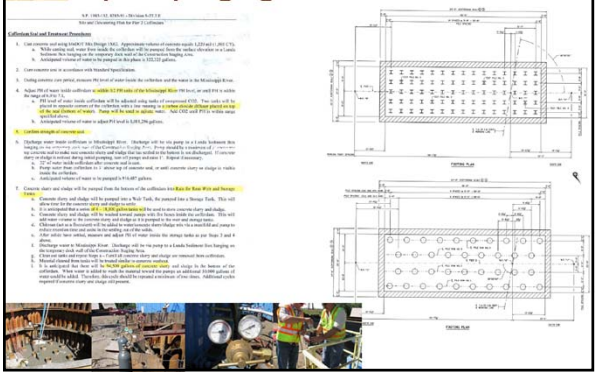
Alkaline Neutralization

- Muriatic acid
- Citric acid
- pH Sparging

pH Sparging




Concrete cleaning, staining, mortar


Material capture

Fugitive Dust Prevention

- The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a leeward position to minimize the effects of the wind. Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and minimize water usage.
- Aggregate stored on site in stockpiles should be contained within three-sided storage berms with windshields that project 0.5 yard above the bunker wall. Drive-over in-ground aggregate storage bins should be shielded on at least two sides to 0.5 yard high for the full length and width of the bin. Where overhead aggregate storage bins are not totally enclosed, aggregate should not be loaded within 0.5 yard of the top of the walls.
- Conveyors should be fully enclosed where possible. The minimum standard is a barrier on at least one side, roofed and equipped with spill trays, which direct material to a collection point. Belt cleaning devices at the conveyor head may also assist to reduce spillage.
- All material mixing operations must be carried out within an effective enclosure. Mixer loading points should be roofed and enclosed on either two (drive-through) or three sides. Water sprays and a robust curtain of suitable design, or an effective air extraction and filtration system, should be installed to suppress dust generated during mixer truck loading. Weigh bins and hoppers should be enclosed on three sides and roofed where a front-end loader is used. The roof should extend 2 yards in front of the bin.
- Any raw material spills should be removed promptly by dry sweeping. Water should not be used in the process of cleaning up spills except where the area drains to a wastewater collection point where washing down would be preferable to generating dust by sweeping.


Demolition Process SWQ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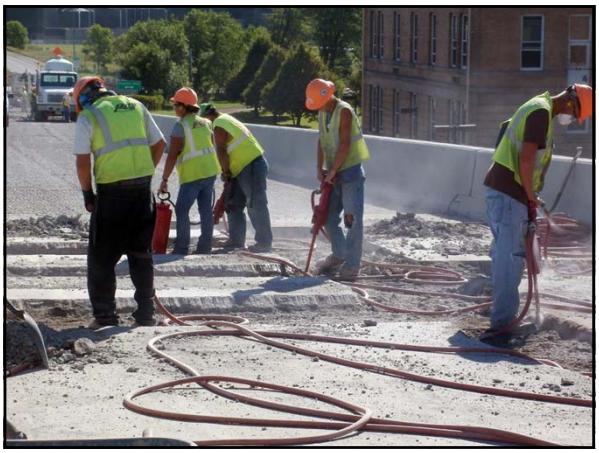
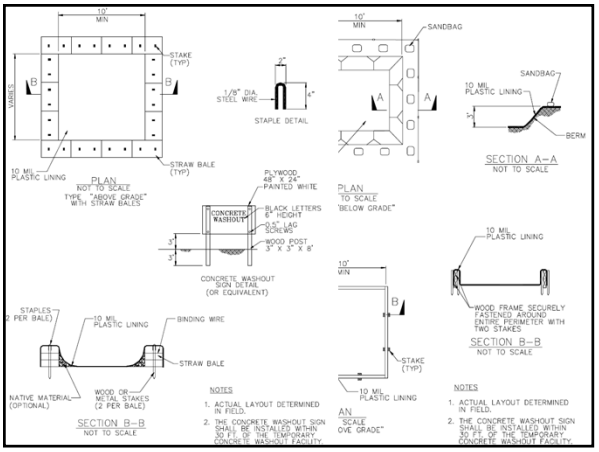


1. Concrete Washout

- The contractor shall submit a Concrete Operations Management Plan, adapted as often as necessary, for the Project Engineers approval.
- The Plan shall address potential means and methods (everything incidental) for NPDES permit compliance.
- All concrete management plans shall monitor and document operations performance that prevents loss into ground water, surface waters, areas to be ultimately vegetated), minimizing turbidity and heavy metal discharge, and neutralizing alkalinity, depending on conditions and project construction operations.
- The contractor shall modify the Concrete Program SWPPP as field conditions indicate by developing ramping up methods and corrective actions.
- **NPDES Construction Permit**
  - Concrete washout onsite: All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A compacted clay liner that does not allow washout liquids to enter ground water is considered an impermeable liner. The liquid and solid wastes must not contact the ground, and there must not be runoff from the concrete washout operations or areas. Liquid and solid wastes must be disposed of properly and in compliance with EPA regulations. A sign must be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.



Washout Traps/Pits

Washout Systems

Chute Washout System

2. Concrete Washoff

- 1. Vehicles
- 2. Equipment
- 3. Tools
- 4. Materials
- 5. Walls
- 6. Segments
- The NPDES Construction permit requires: Part IV.F.3. External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff must be contained and waste properly disposed of. No engine degreasing is allowed on site.
- To meet permit requirements the narrative, detail sheet and plan requirements along with the Project Engineer and the contractor Erosion Control Supervisor must amend the SWPPP and designate concrete washoff areas that prevent cementitious liquids and solids from entering the ground and surface waters, conveyance systems and areas to receive perennial vegetative covers.
- The SWPPP process must define machine/equipment, staging materials and final products washing/cleaning for every stage and phase of construction.
- All construction concrete mixing, forming, placing, and paving machines may be washed at the end of every shift operation on pre and post paved surfaces, plastic sheet covers and other Best Management Practices.
- All washoff operations shall use the 1717 Site Plan Process for the Project Engineers Approval prior to any washoff.

Designate the Areas (on the plan)


Diamond Pavement Planing
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Specialty traps

Utilizing Plastic

- Concrete management
  - Ground covers
  - Containment liners
- Slope/stockpile covers
- Ditch, channel, flume liners
- Dewatering traps
- Scour control
- Dust control shrouds


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GROVE
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TEREX


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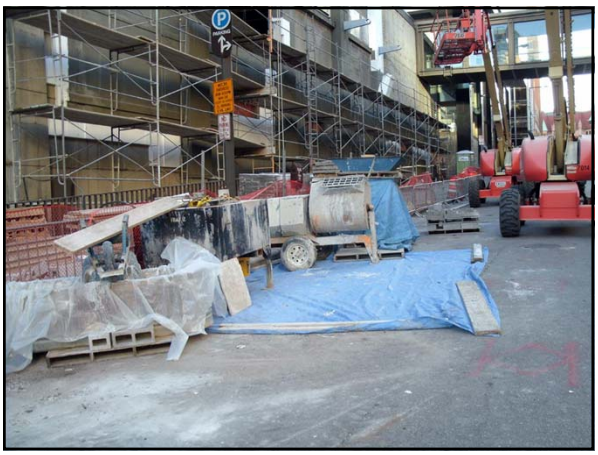
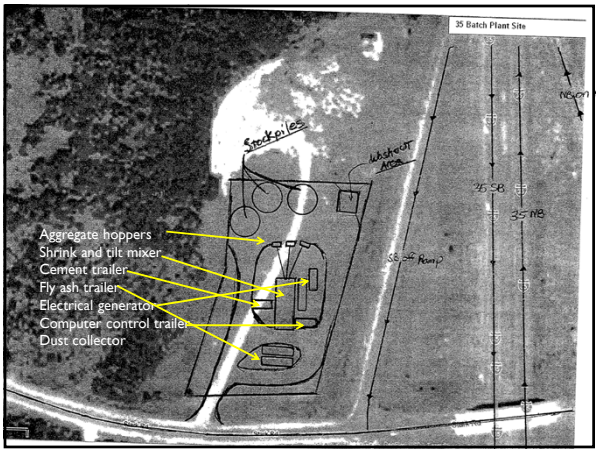


Typical Mobile Batch Plant Items

- Aggregate bin trailer
- Shrink and tilt mixer
- Computer batch controls
- Plant base trailer
- Cement section trailer
- Electrical generator trailer (460v)
- Office trailer
- Central dust collector

Proposed Batch Location Forensics CSI (Concrete Scene Investigation)

- Vegetative survey
- Soil survey
  - Soil health
  - compaction
- Perimeter control
  - Vegetative buffers
  - 3-dimensional berms
- Trackout control
- Dust control
  - Loading/unloading
  - haul/access roads
- Storm water conveyance
  - ditches
- Storm water inlets
- People

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STEAM
POWER