THE EVOLUTION OF JOBSITE SEDIMENT CONTROL TECHNOLOGY
JOBSITE SEDIMENT CONTROL TECHNOLOGY

- Technology was virtually non-existent just a few decades ago.
- Early solutions involved creative use of existing materials.
- New job specific technology is now available.
- There is more to come!
SEDIMENT

SEDIMENT IS MATTER DEPOSITED BY SOME NATURAL PROCESS
SEDIMENT PROBLEMS

- DEPOSITION ONTO ADJACENT PROPERTY
- CLOGGING OF DRAINAGE SYSTEMS
- DEPOSITION INTO WATERWAYS
- TRACKING ONTO ROADWAYS
SEDIMENT CONTROL

- TEMPORARY MEASURES OR STRUCTURES DESIGNED TO CONTAIN SEDIMENT
SEDIMENT CONTROL VS. EROSION CONTROL

SEDIMENT CONTROL
- COSTLY
- UNATTRACTIVE
- TEMPORARY
- HIGH MAINTENANCE
- SHOULD BE ELIMINATED AS SOON AS POSSIBLE

EROSION CONTROL
- COST EFFECTIVE
- ATTRACTIVE
- PERMANENT
- MINIMAL MAINTENANCE
- SHOULD BE IMPLEMENTED AS SOON AS POSSIBLE
RACHEL CARSON

- HER BOOK, SILENT SPRING, RELEASED IN 1962, BROUGHT WIDESPREAD ATTENTION TO THE ENVIRONMENTAL MOVEMENT
- EPA WAS FORMED IN 1970
1969 - CUYAHOGA RIVER ON FIRE!
CLEVELAND, OHIO
THE CLEAN WATER ACT

- THE DRIVING FORCE BEHIND A RAPIDLY GROWING INDUSTRY
- ENFORCED NATIONALLY BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA)
NPDES

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

- PHASE I ENACTED IN 1972
- ALL PROJECTS OF FIVE ACRES OR MORE WERE IMPACTED
- HAS CREATED A STRONG DEMAND FOR COST EFFECTIVE SOLUTIONS
SEDIMENT CONTROL TECHNOLOGY
SEDIMENT CONTROL

- COSTLY BUT NECESSARY
- MUST BE INSTALLED PROPERLY
- MUST BE MAINTAINED
- MUST BE REMOVED ON A TIMELY BASIS
SEDIMENT CONTROL TIPS

I. MINIMUM AMOUNT OF SOIL SHOULD BE EXPOSED AT ANY GIVEN TIME

II. DISTURBED AREAS SHOULD ALSO BE KEPT TO A MINIMUM

III. PERMANENT EROSION CONTROL MEASURES SHOULD BE INSTALLED AS QUICKLY AS POSSIBLE!
JOBSITE BASICS

**MUST PROTECT:**
- ADJACENT PROPERTY
- NEARBY STREAMS AND WATERWAYS
- ROADWAYS
- STORM WATER INLETS
PROBLEMS
MORE PROBLEMS
SAY IT’S NOT TRUE
PERIMETER PROTECTION

- Silt fence is most commonly used.
- It should be installed anywhere where sediment could leave the property.
- The fence must be effective if it is installed correctly and maintained properly.
SILT FENCE INSTALLATION

- MUST BE TRENCHED IN TO BE EFFECTIVE
- MACHINE INSTALLATION COMBINES INCREASED SPEED WITH SLICING METHODOLOGY
Half the spoil is unavailable for backfill
Trenching Method

Half the backfill is unavailable. Washouts are common.
SILT FENCE NOTES

- Posts can be wood or steel
- Post quality & spacing & fabric quality are critical components
- Wire back silt fence sometimes specified
- Fabric widths vary
- D. O. T. requirements vary state to state
- There is a lot of poor quality silt fence around
THREE KEYS TO SILT FENCE PERFORMANCE

- POST QUALITY AND THICKNESS
- FABRIC QUALITY
- POST SPACING
OTHER PERIMETER PROTECTION TOOLS

- STRAW WATTLES
- EXCELSIOR LOGS
- COMPOST SOCKS
- ROLLED UP SEDIMENT BARRIERS
STRAW WATTLES

- 8” TO 20” DIAMETER
- AVAILABLE WITH PHOTODEGRADABLE NETTING
- EASY TO INSTALL
- A VERSATILE SEDIMENT CONTROL TOOL
ASPEN FIBER LOGS

- ASPEN WOOD FIBER LOGS
- EASY INSTALLATION
- VARIED USES
- TYPICALLY 8” – 20” IN DIAMETER
COMPOST SOCKS

- Geosynthetic tube filled with composted material
- Designed for both sediment collection and filtration of run off
ROLLED UP SEDIMENT BARRIERS

- UNROLLED LENGTHWISE IN THE FIELD, THEN ROLLED UP WIDTH WISE
- NATIVE MATERIAL SUCH AS LEAVES, GRASS CLIPPINGS, ETC. CAN BE ROLLED UP TO INCREASE DIAMETER
PERIMETER PROTECTION
NOTEBOOK

- ALL MUST BE MAINTAINED
- GEOSYNTHETIC PRODUCTS MUST BE REMOVED AND DISPOSED OF PROPERLY
- STUDY YOUR OPTIONS!
PERIMETER PROTECTION TRENDS

- SPECIFICATIONS ARE BECOMING TIGHTER AND MORE JOB SPECIFIC
- MORE PAY ITEMS AND LESS "LUMP SUM" SPECIFICATIONS
CONCENTRATED FLOWS

DRAINAGE SWALES

- THE IDEA IS TO SLOW DOWN FLOWS AND COLLECT SEDIMENT
- HAY BALES AND SILT FENCE SHOULD NOT BE USED IN DRAINAGE SWALES
ILLINOIS DEPARTMENT OF TRANSPORTATION

EFFECTIVE 1-1-07
THE USE OF EITHER HAY BALES OR SILT FENCE IN CONCENTRATED FLOW AREAS WAS FORBIDDEN ON ALL I-DOT PROJECTS

NO!

BANNED!
OUR LUNCH, NOT YOUR SEDIMENT CONTROL!
NOT FOR CONCENTRATED FLOWS!
HAY BALES!!

FOR LACK OF A BETTER TOOL!
TEMPORARY DRAINAGE SWALE PROTECTION

- The top performing products on the market are designed for this specific purpose.
- Acceptable products include straw wattles and excelsior logs.
DRAINAGE SWALE TEMPORARY PROTECTION BASICS

- DESIGNED TO SLOW DOWN FLOW AND COLLECT SEDIMENT
- STRUCTURES MUST BE MAINTAINED
- MUST BE DESIGNED TO BE OVERTOPPED
- INSTALLATION MUST NOT ALLOW FOR STRUCTURES TO BE BYPASSED
PREScribed SPACING—BOTTOM OF UPHILL STRUCTURE LEVEL WITH TOP OF DOWNHILL DITCH CHECK
MANUFACTURED DITCH CHECKS

- TECHNOLOGY IS NOW AVAILABLE TO DEAL WITH CONCENTRATED FLOWS!
MANUFACTURED DITCH CHECK I

- Constructed of UV stabilized HDPE or Biodegradable plastic
- Lightweight
- Reusable
  - Length: 1 m (3.3 ft)
  - Height: 230 mm (9 in)
  - Width: 270 mm (11 in)
  - Weight: 1 kg (2 lbs)
MANUFACTURED DITCH CHECK II

KEY FEATURES

- FRONT APRON
- BARRIER SECTION
- SPLASH APRON
- OVERLAP AT BOTH ENDS
- 7-FOOT SECTIONS
WATTLES AND SOCKS

- VERSATILE AND EASY TO INSTALL
- TYPICALLY 8” TO 20” PROFILE
- SOME ARE TOTALLY BIODEGRADABLE
ROCK DITCH CHECKS

- A TRADITIONAL PRACTICE—WITH BOTH PROS AND CONS
- CAN BE LEFT IN PLACE PERMANENTLY
DITCH CHECK SUMMARY

- CONCENTRATED FLOWS ON ACTIVE JOBSITES CREATE A UNIQUE PROBLEM
- THE MOST EFFECTIVE SOLUTIONS...
  ...SLOW DOWN FLOW RATES
  ...OVERTOP BY DESIGN
  ...COLLECT SETTLING SEDIMENT
WATERWAY PROTECTION

- DEWATERING BAGS
- WATER INFLATED DAMS
- TURBIDITY CURTAINS
DEWATERING BAGS

- Filter fabric bag with sized intake
- Designed to fill with sediment & release water through filter fabric walls
- Should not be installed over disturbed soils
- Disposed of after filling with sediment
- Sized to fit job requirements
WATER INFLATED DAMS

- ISOLATE AREAS THAT MUST BE DISTURBED ALONG WATER WAYS
- CUSTOM DESIGNED AND INSTALLED ACCORDING TO JOBSITE REQUIREMENTS
TURBIDITY CURTAINS

- ALTERNATIVE TO WATER INFLATED DAMS
- INCORPORATE CABLES AND WEIGHTS TO SECURE CURTAINS IN PLACE
POLYMERS

SEDIMENT CONTROL TOOL BOX

- FLOC LOGS
- POWDER
- EMULSION
FLOC LOGS

- Soil Particle Removal
- Use where turbid flows occur
- Soil testing is essential
STABILIZED CONSTRUCTION ENTRANCES

- PREVENT TRACKING OF JOBSITE SEDIMENT ONTO ADJACENT STREETS
- SIZED ROCK AND GEOTEXTILES OR CELLULAR CONFINEMENT OFTEN USED
STABILIZED ENTRANCES

- NON-WOVEN GEOTEXTILES MOST OFTEN USED FOR SEPARATION & FILTRATION
- CELLAR CONFINEMENT GRID FOR LOAD SUPPORT & DISTRIBUTION
TRACK OUT DEVICE
WHEEL WASH STATIONS
FOR PRACTICAL PURPOSES, TEMPORARY ENTRANCE CAN OFTEN BE CONVERTED TO PERMANENT ENTRANCE

PROJECT SCOPE AND SITE SPECIFICS WILL VARY WIDELY

KNOW YOUR OPTIONS!
INLET PROTECTION

Designed to prevent sediment from entering drainage systems

● Must be maintained!
INLET PROTECTION TYPES

EXTERNAL
- DESIGNED TO INTERCEPT SEDIMENT BEFORE IT ENTERS THE STORM DRAIN STRUCTURE

INTERNAL
- DESIGNED TO FILTER STORM WATER AFTER IT ENTERS THE STRUCTURE
INLET PROTECTION TOOLS

- WOOD FIBER LOG INLET PROTECTION
- MANUFACTURED GEOTEXTILE INLET FILTERS
INLET PROTECTION TOOLS

- INLET FILTER—MетAL FRAME; GEOTEXTILE FILTER

- SILT BAG—INTERNAL FILTRATION DEVICE
EVOLUTION OF EXTERNAL INLET PROTECTION PRODUCTS

I. SILT FENCE, HAY BALES, WATTLES, SAND BAGS, ETC.

II. MONOFILAMENT GEOTEXTILES

III. MONOFILAMENT GEOTEXTILE MANUFACTURED PRODUCTS

IV. THREE DIMENSIONAL MANUFACTURED PRODUCTS
EXTERNAL INLET PROTECTION
INLET PROTECTION
BOTTOM LINE

ASK TOUGH QUESTIONS!

- LONGEVITY
- DURABILITY
- FLOWABILITY
- SEDIMENT REMOVAL CAPABILITIES
OTHER TOOLS

- TEMPORARY DIVERSION CHANNELS
- SEDIMENT TRAPS
- TEMPORARY BASINS
KEY POINTS

- Sediment control is temporary and very expensive
- Erosion control provides permanent solutions

Therefore: minimize disturbance in terms of both time and area and install permanent erosion control as soon as possible!
SPECIFICATIONS

- SHOULD INCLUDE PAY ITEMS—FOR ACCOUNTABILITY SAKE!

LUMP SUM = NO SUM
REMEMBER!

WHEN WE **SEND** WATER WE SEND THE WORKS! -- INCLUDING SEDIMENT AND POLLUTANTS!!