

## THE EVOLUTION OF JOBSITE SEDIMENT CONTROL TECHNOLOGY



SEDIMENT IS THE WORLDS #1 POLLUTANT!

## INLET PROTECTION!



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## **JOBSITE SEDIMENT CONTROL TECHNOLOGY**

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- ❑ **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**

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**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**

# **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

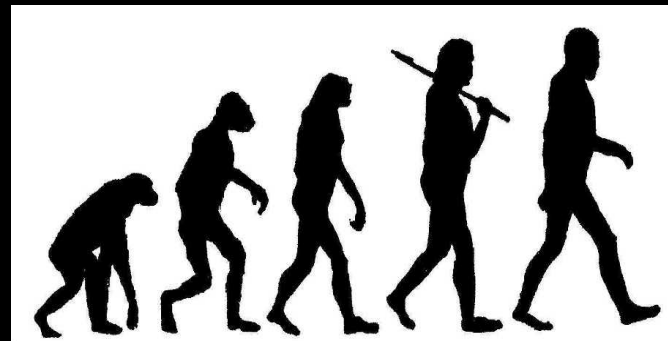


## PERIMETER PROTECTION

- SHOULD BE INSTALLED ANYWHERE WHERE SEDIMENT COULD LEAVE PROPERTY
- TO BE EFFECTIVE IT MUST BE INSTALLED CORRECTLY AND MAINTAINED PROPERLY



## PERIMETER PROTECTION EVOLUTION



HAY BALES > SILT FENCE > WATTLES > COMPOST FILTER SOCKS

## THREE KEYS TO SILT FENCE PERFORMANCE



- ❑ POST QUALITY AND THICKNESS
- ❑ FABRIC QUALITY
- ❑ POST SPACING

## OTHER PERIMETER PROTECTION TOOLS



- STRAW WATTLES
- EXCELSIOR LOGS
- COMPOST SOCKS



# STRAW WATTLES

- 8" TO 20" DIAMETER
- AVAILABLE WITH PHOTODEGRADABLE NETTING
- EASY TO INSTALL
- A VERSATILE SEDIMENT CONTROL TOOL



# ASPEN FIBER WATTLES

- ASPEN WOOD FIBER WATTLES
- EASY INSTALLATION
- VARIED USES
- TYPICALLY 8" – 20" IN DIAMETER



## COMPOST FILTER SOCKS

- GEOSYNTHETIC TUBE FILLED WITH COMPOSTED MATERIAL
- DESIGNED FOR BOTH SEDIMENT COLLECTION AND FILTRATION OF RUN OFF



## COMPOST BERMS



## PERIMETER PROTECTION NOTEBOOK

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



## CONCENTRATED FLOWS

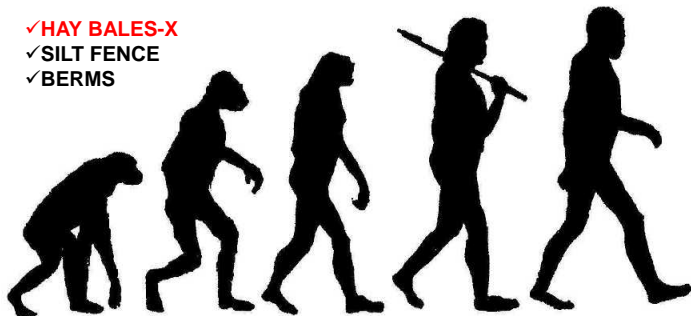
### DRAINAGE SWALES

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



## CONCENTRATED FLOW EVOLUTION

- ✓ HAY BALES-X
- ✓ SILT FENCE
- ✓ BERMS



ROCK CHECK DAMS > WATTLES/SOCKS > MANUFACTURED PRODUCTS

## 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



**OUR LUNCH,  
NOT YOUR  
SEDIMENT  
CONTROL!**

## **TEMPORARY DRAINAGE SWALE PROTECTION**

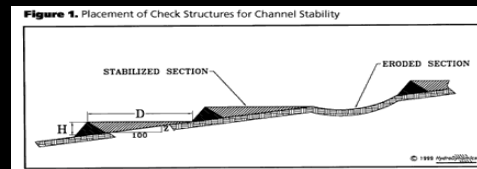


- **THE TOP PERFORMING PRODUCTS ON THE MARKET ARE DESIGNED FOR THIS SPECIFIC PURPOSE**
- **ACCEPTABLE PRODUCTS INCLUDE STRAW WATTLES AND EXCELSIOR LOGS**

## 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

## DITCH CHECK NOTES



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

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



## DITCH CHECK SUMMARY

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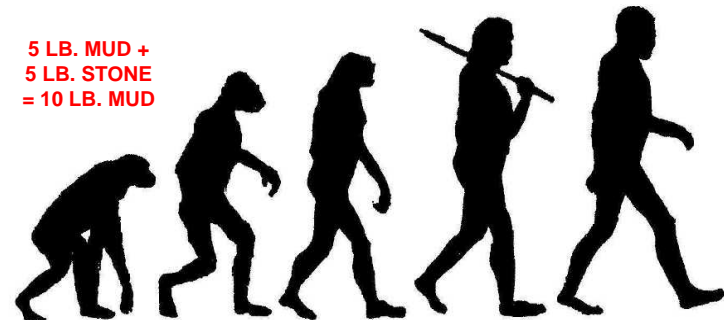
- CONCENTRATED FLOWS ON ACTIVE JOBSITES CREATE A UNIQUE PROBLEM
- THE MOST EFFECTIVE SOLUTIONS...
  - ...SLOW DOWN FLOW RATES
  - ...OVERTOP BY DESIGN
  - ...COLLECT SETTLING SEDIMENT

# TEMPORARY SURFACE PROTECTION

KNOW  
YOUR  
OPTIONS!

## SURFACE PROTECTION EVOLUTION

5 LB. MUD +  
5 LB. STONE  
= 10 LB. MUD



PLYWOOD

TIMBER MATS

ENGINEERED PRODUCTS



# TEMPORARY ROADWAY PROTECTION



# THE PLYWOOD ALTERNATIVE



## 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

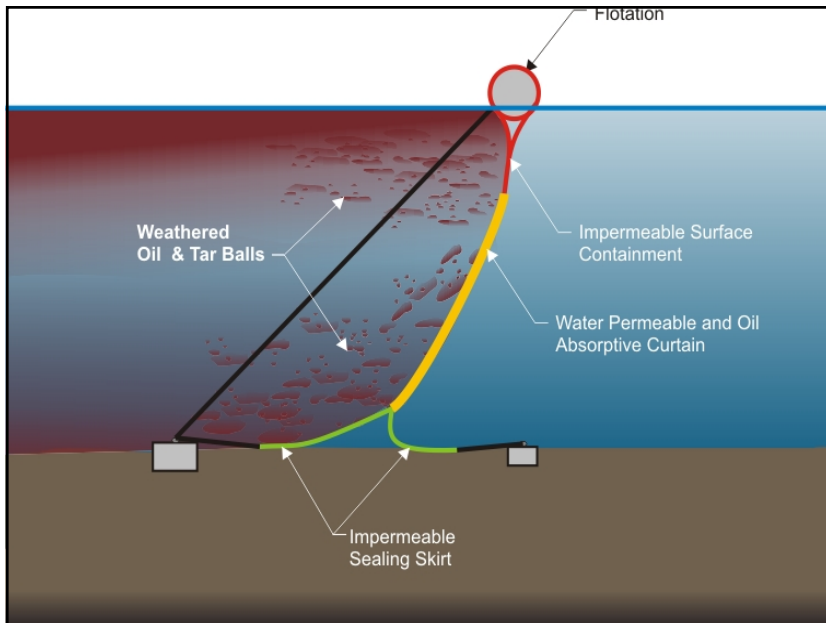
- ISOLATE AREAS THAT MUST BE DISTURBED ALONG WATER WAYS
- CUSTOM DESIGNED AND INSTALLED ACCORDING TO JOBSITE REQUIREMENTS



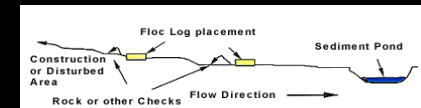
## TURBIDITY CURTAINS

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





# POLYMERS

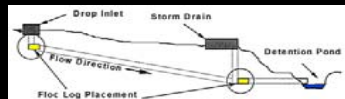


## SEDIMENT CONTROL TOOL BOX

- FLOC LOGS
- POWDER
- EMULSION



# FLOC LOGS



- SOIL PARTICLE REMOVAL
- USE WHERE TURBID FLOWS OCCUR
- SOIL TESTING IS ESSENTIAL

# POND SKIMMERS



- Skims just beneath the surface—avoiding floating debris
- Safely removes cleanest water from sediment basin



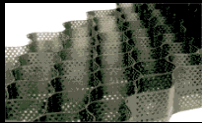


## STABILIZED CONSTRUCTION ENTRANCES



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

## STABILIZED ENTRANCES



- **NON-WOVEN  
GEOTEXILES MOST  
OFTEN USED FOR  
SEPARATION &  
FILTRATION**
- **CELLAR  
CONFINEMENT GRID  
FOR LOAD  
SUPPORT &  
DISTRIBUTION**

## TRACK OUT DEVICE



## WHEEL WASH STATIONS

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## ADJACENT ROADWAY PROTECTION NOTES

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- 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

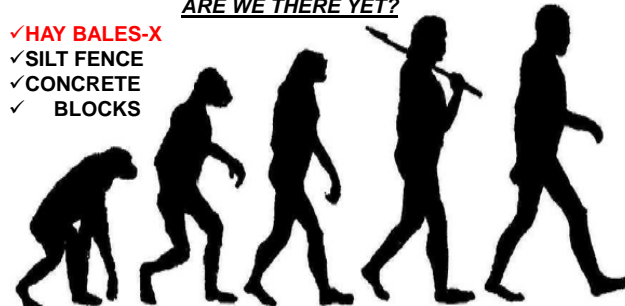


■ **MUST BE  
MAINTAINED!**

# INLET PROTECTION EVOLUTION

ARE WE THERE YET?

- ✓ ~~HAY BALES-X~~
- ✓ SILT FENCE
- ✓ CONCRETE
- ✓ BLOCKS



GEOTEXTILE FABRICS > INTERIOR/EXTERIOR FILTERS

## 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—  
METAL 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**

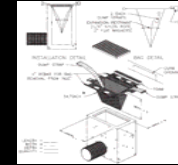
## EXTERNAL INLET PROTECTION



## INLET PROTECTION BOTTOM LINE

ASK TOUGH QUESTIONS!

- LONGEVITY
- DURABILITY
- FLOWABILITY
- SEDIMENT REMOVAL CAPABILITIES



# OTHER TOOLS

- ❑ TEMPORARY DIVERSIONS
- ❑ SEDIMENT TRAPS
- ❑ TEMPORARY BASINS



A TOO OFTEN OVERLOOKED JOBSITE TOOL

TEMPORARY DIVERSION



## 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!**



# THANK YOU

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[pete.hanrahan@ejprescott.com](mailto:pete.hanrahan@ejprescott.com)

