



ALLU Group is proud to present;  
“ The ALLU Solution to Meeting Jobsite challenges”

# Mass Stabilization (SS) - Remediation



## S/S - Mass Stabilization. Dry soil or slurry mixing

- Civil Engineering:
  - Ground Improvement for Construction/Building
  - Solidification/Stabilization Treatment
- Environmental:
  - Contaminated Sites
  - Remediation
  - Waste Management



## ALLU PMX, Power Mixer

- Maximum Torque per Drum 8500 ft/lb
- Drum drive 2 x hydraulic motor
- Operational Depth up to 23 ft
- For 25 - 60 ton excavator
- Powered by the excavator's 3rd valve hydraulics
- Equipped with drum RPM sensor (100 rpm max)
- Equipped with temperature sensor



### DEPTHS

10 ft.  
15 ft.  
23 ft.



# Sites where Allu is commonly used

Dredge Material Areas

Wood Preserving Sites

Herbicide and Pesticide Sites

Oil Refinery Sludge Lagoons

Manufactured Gas Plants

Poor Sediment sites

Metal Refining, Smelting, Plating, Recycling

Residual Ash

Landfill grounds



(1)

# Sites where Allu is commonly used

- ï Harbor and shipping areas
- ï housing & building site developments
- ï Highway paths and road junctions
- ï Industrial sites
- ï High speed railways
- ï sports fields/recreation areas
- ï Residential/business construction sites
- ï Easement & vacuation roadways
- ï railroad right of ways
- ï LNG & oil storage facilities along waterways (2)





S/S agents commonly used through ALLU  
improvement & remediation of soft and  
contaminated soils

Portland cement,	Clay	Cement kiln dust
Fly ash	Quicklime,	hydrated lime
Lime kiln dust	Slag	Organoclay <sup>®</sup>
EnviroBlend	Bentonite	Activated carbon
Silicate,	Phosphate,	Sulfate Cement
Powdered or	Slurry	proprietary mixtures



# Screen crush pulverize blend



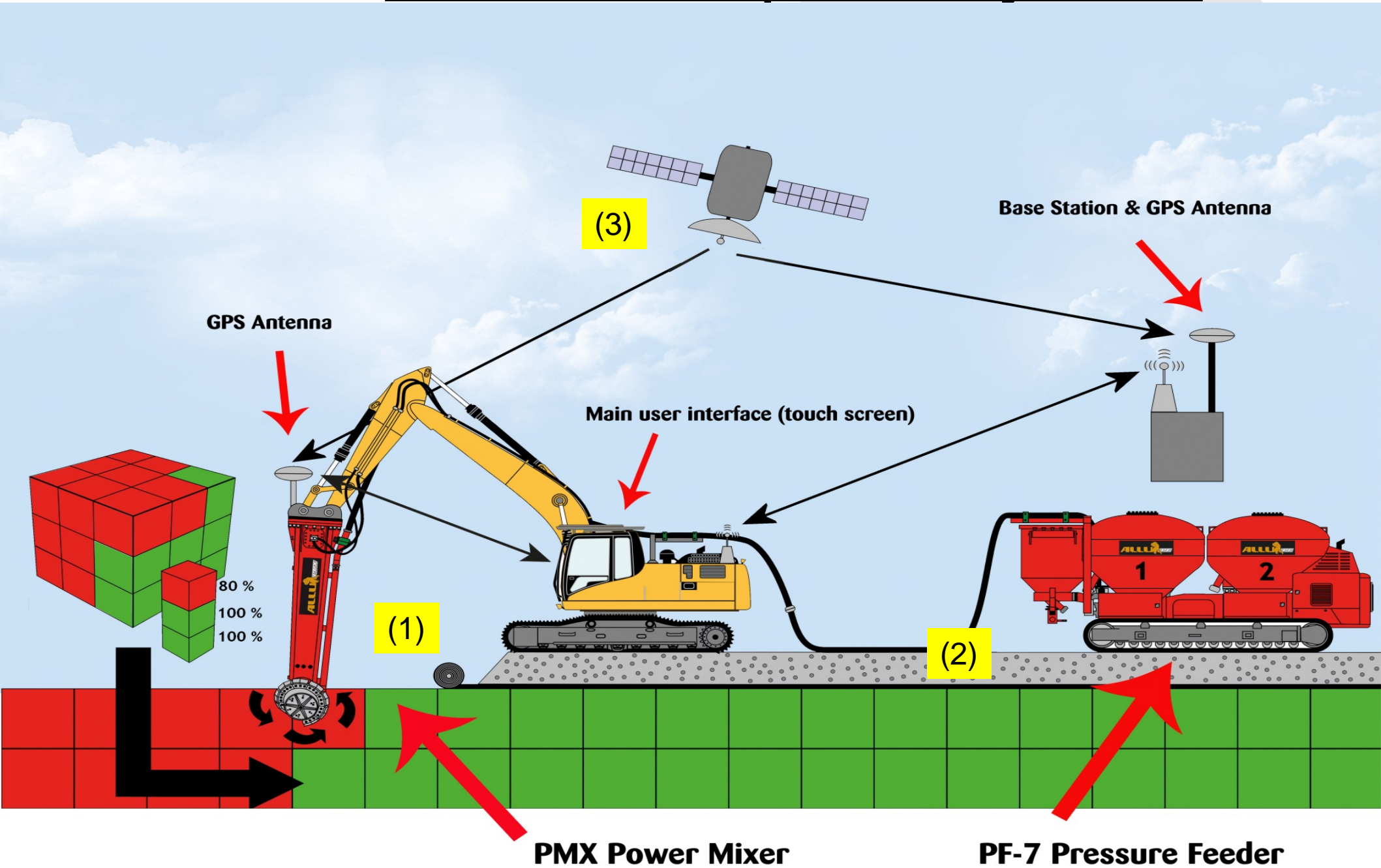
One Step Ahead







# ALLU Complete System



Pennala

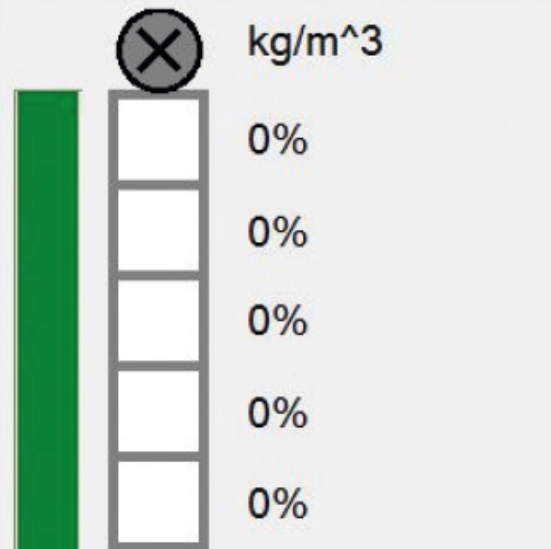
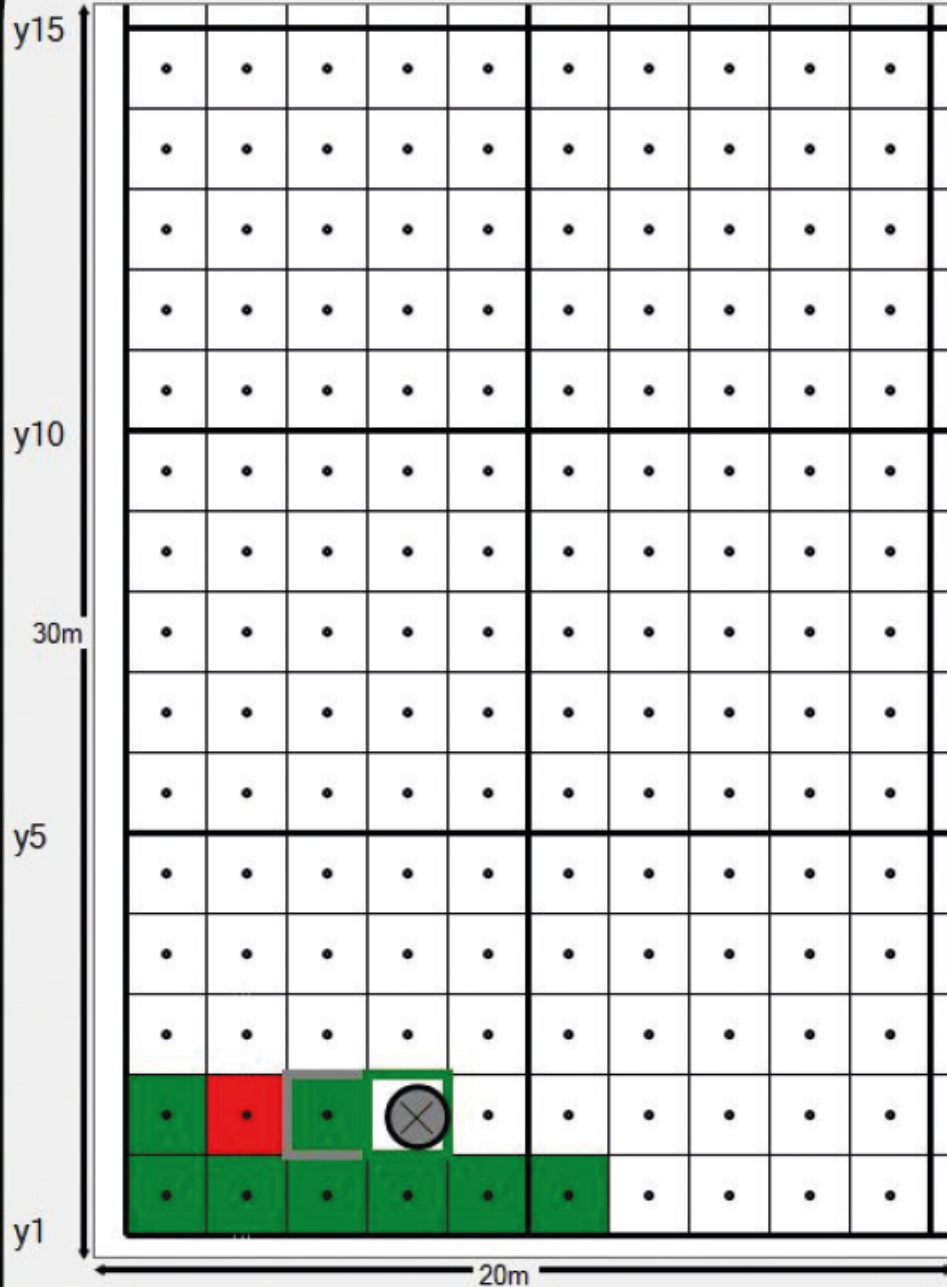
Zoom +

Zoom -

1:1

Working cell

Selected cell



kg/m<sup>3</sup>

0%

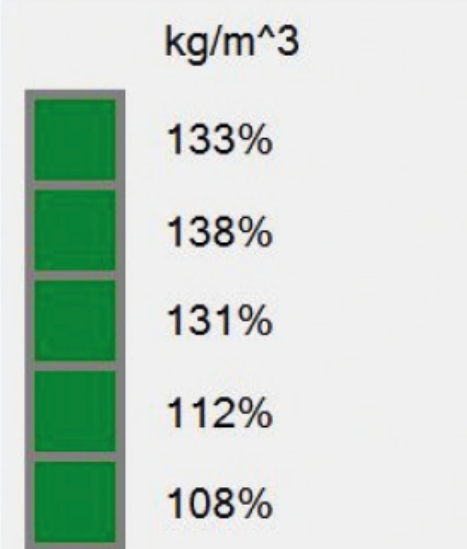
0%

0%

0%

0%

0%



kg/m<sup>3</sup>

133%

138%

131%

112%

108%



x=4 y=2

x=3 y=2

Accept

Accept

Set zero level

Number Of Satellites: 4

Inclination: 0

New work

Get work

Properties

Working

Info

Switch User

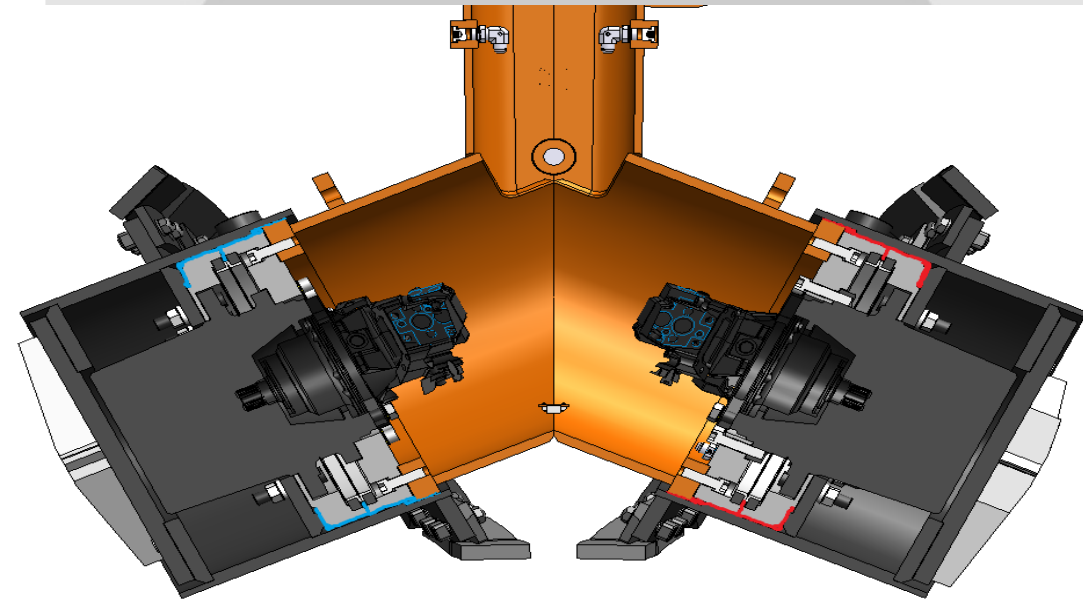
Close



# ALLU Power Mixer & Pressure Feeder Soil Remediation – Ground Solidification Tool



*Pressure Feeder*

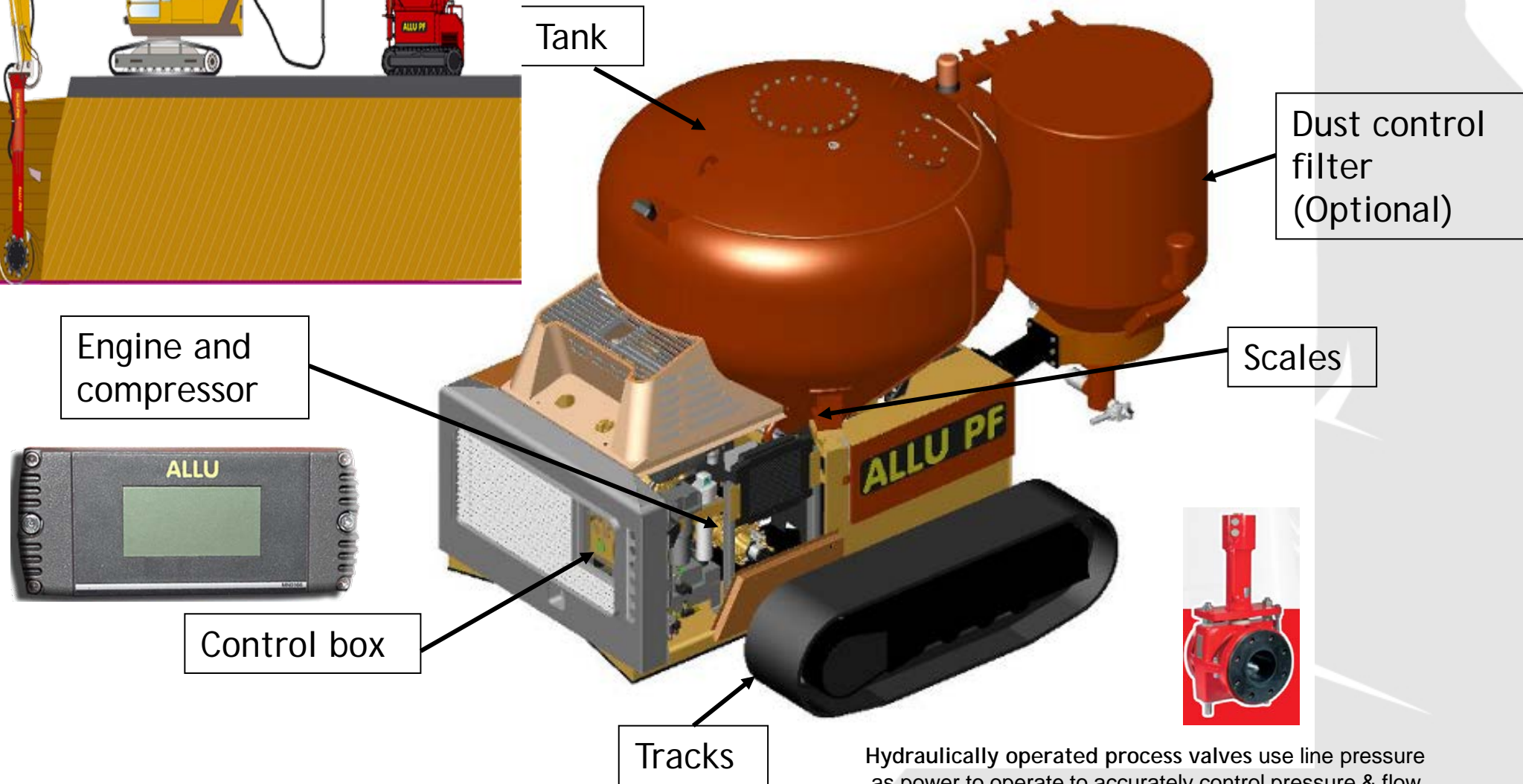
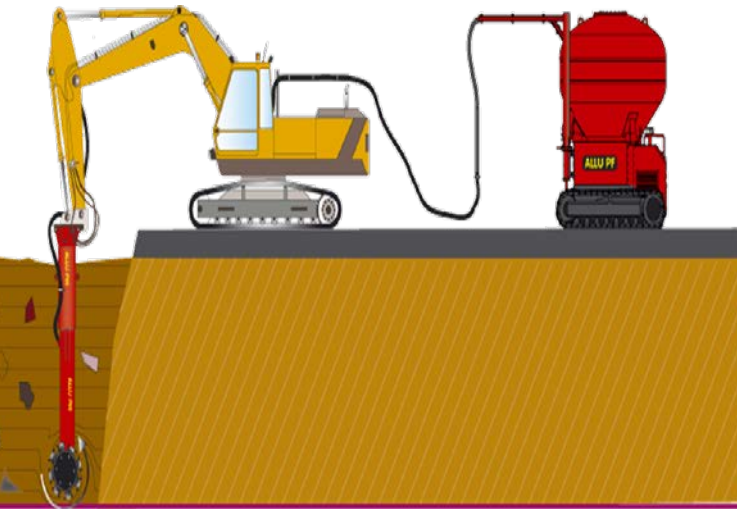


*Power Mixer*



One Step Ahead

# ALLU PF, TRACK DRIVEN BINDER FEEDING UNIT



Hydraulically operated process valves use line pressure as power to operate to accurately control pressure & flow.



# ALLU Pressure Feeder IS CONTROLLED BY DAC

DAC = Data Acquisition Controller

- ❑ ALLU DAC.2 controls the stabilization process.
  
- ❑ Includes:
  - Reporting program
  - ALLU-control devices
  - ALLU-control logic



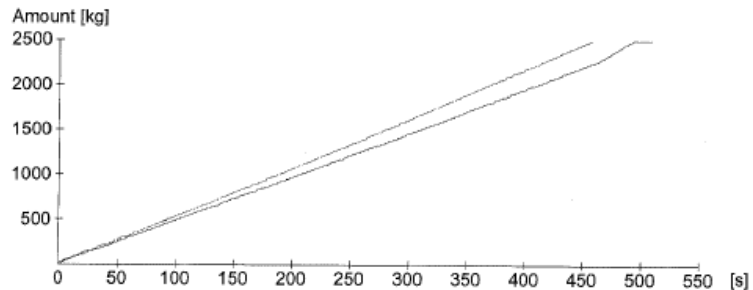
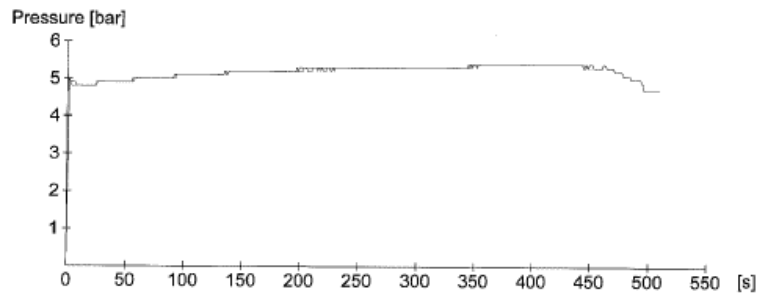
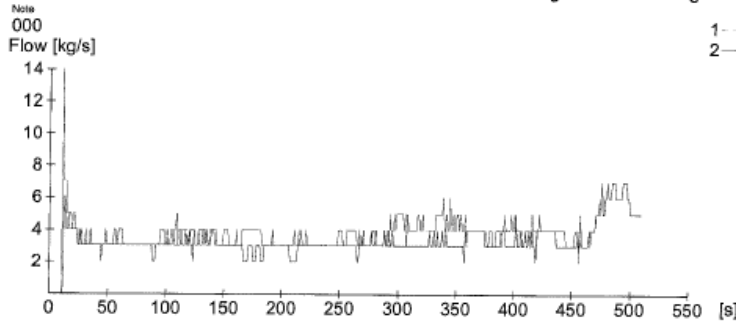
Run	Air Filter	Charge	Oil Pressure	Motor Temp	Compr. pressure	
Job ID: 00123456789						
Note : NOTE FIELD						
Flow :	47	%	Flow:	0,0 kg/s		
Prepressure:	4	bar	Pressure:	0,0 bar		
Batch Nr:	1		Tank 1:	0 kg		
Batch amount:	700	kg	Tank 2:	0 kg		
			Left:	0 kg		
Menu	Batch Start	Select Tank	1	2	Select	Prepressure Start



**Record keeping & Efficient use of binder material applied Matters!**

## STABILIZING REPORT

Job site PIHA2    Unit 1    Batch 00009    Start time 2.9.2009 13:57:25    Total amount 1 2 488 kg    Total amount 2 2 500 kg



## MEAN VALUE REPORT

Job site		Date range		Total amount 1		Total amount 2	
PIHA2				53 591 kg		59 064 kg	
Date	Unit	Batch	Started	Feed time	Flow 1 Flow 2 [kg/s]	Pressure 1 Pressure 2 [bar]	Amount 1 Amount 2 [kg]
2.9.2009	1	00009	13:57:25	00:08:29	4,89	4,69	2 488
2.9.2009	1	00010	14:55:43	00:06:28	4,91	5,20	2 500
2.9.2009	1	00011	15:05:40	00:06:22	0,00	0,00	0
2.9.2009	1	00012	15:40:05	00:08:37	6,44	4,04	2 500
					6,54	4,05	2 500
					0,00	0,00	0
					4,84	4,84	2 500
					4,84	4,61	2 500
						Total 1	7 488
						Total 2	7 500

for quality control purposes  
 DAC system provides;  
 numerical reports  
 graphical reports

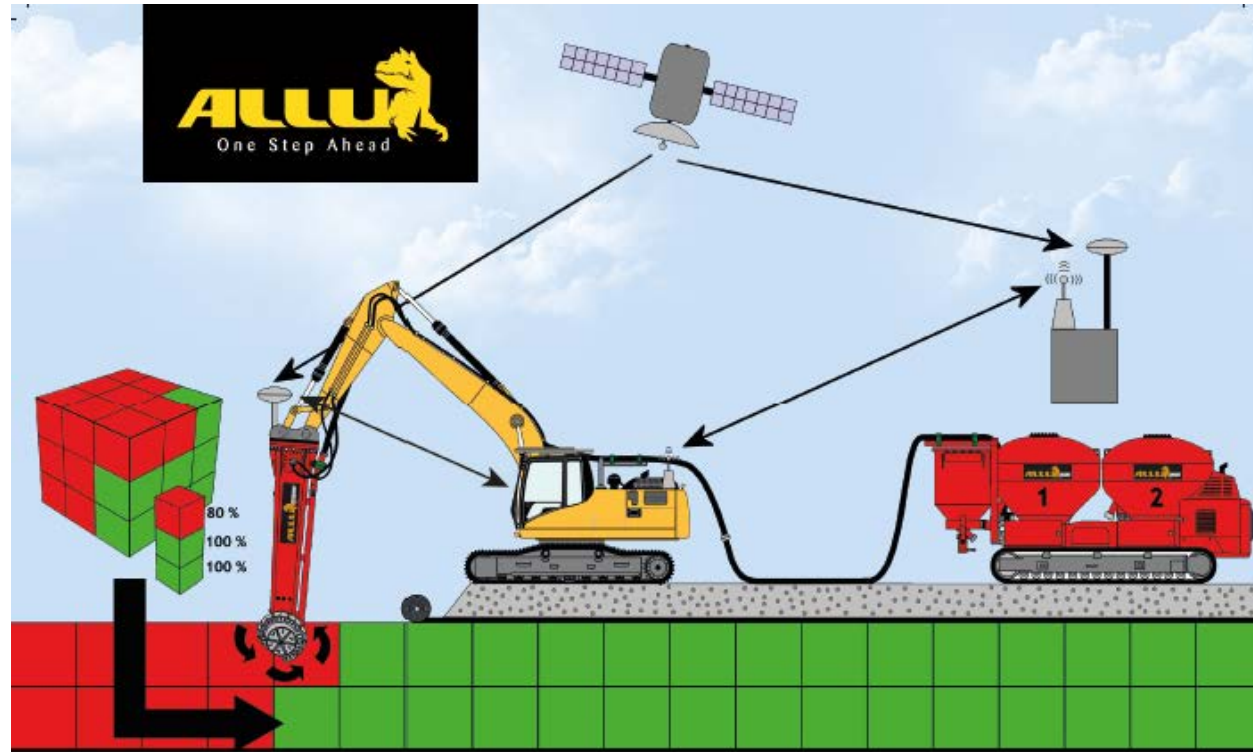
# Clear advantages for use of Allu S/S System

## Record and Proof of mixing matters

- Adherence to Mix Design
- Complete Area Treatment
- Thoroughness of Mixing
  - (time and rotation)
- QA/QC for Client and Regulators

## ALLU's Integrated System:

- Utilization of GPS locating mixing head, within 2 cm.
- In-Cab Display Guides Operator
  - Time/revolution
- Binder material delivered directly to treated block
- Data recorded for QA/QC



mass stabilization project binder/additives can represent **50 % or more of the total project cost**

Locating and metering of binder avoids under-dose and overdose.

Use of dry binders in wet materials conserves drying capacity of binders.

# Ashtabula Harbor, Ohio



Dredge and S/S treat 120,000 cy (92,000 m<sup>3</sup>) of contaminated sediment.

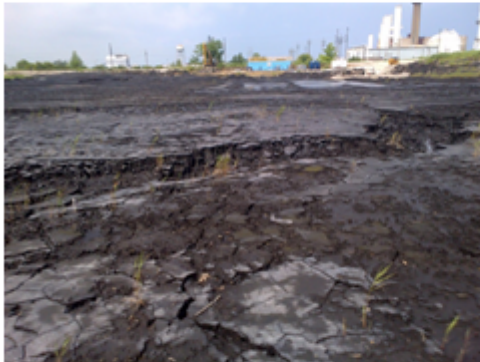


Placement of S/S treated dredge into Elkem 5C Pond, a 9-acre former settling pond. Additional material needed to facilitate closure of pond

# Atlantic Wood Industries creosote- and pentachlorophenol-impacted soil



# Solidification of Ashtabula OH Harbor



Binder added dry 20% by weight.  
 UCS goals range from 1,000 psf to 1,500 psf (0.05 to 0.07 MPa).  
 Unconsolidated shear strength goal of 1,250 psf (0.08 Mpa)  
 Mixing depths variable - 5 - 20 ft.



Attleboro, Mass Cadmium Contaminated job

• Solidification of existing contents 153,000 m<sup>3</sup>





One Step Ahead

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Worldwide Support

Chuck Wilk, Environmental Scientist , Manager of Mass Stabilization and Remediation Applications.

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Thank you for your attention. Questions?

*ALLU Stabilisation System* for strenghtening soft soils