

Waste Segregation Diagrams



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Waste Definitions
On-site or off-site segregation
Transfer & Bulking stations
Recycling/Recover/Incineration
Inert/mixed/hazardous landfill sites



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Waste Definitions

**Site Waste Management
General Definitions**

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Definitions: Materials

- Inert
- Non-hazardous
- Hazardous

Inert

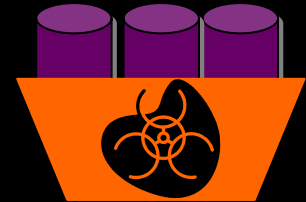
- Clean soils
- Clean Sand and Gravels

Non-hazardous

- Concrete
- Brick/Block
- Active (Putrescable/Bio-degradable)
 - Timber
 - Plasterboard
- Mixed

Hazardous

- Paints
- Solvents
- Oils
- Batteries
- Treated timber
- Discharge luminaires
- Asbestos

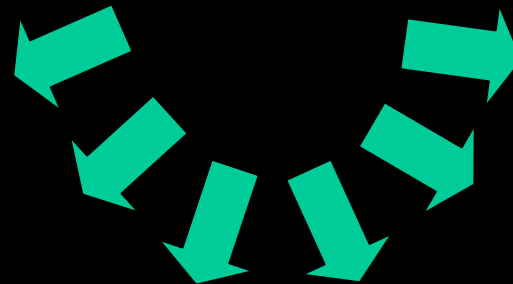


Clean:

- **Not contaminated with:**
 - Hazardous
 - Active
 - Liquids (Paints, Oils, Solvents)

Segregate

- **Brick Block Concrete**
- **Timber**
- **Plasterboard**
- **Metals**
- **Glass**
- **Packaging**
 - Cardboard
 - Timber
 - Plastics
- **Plastics**



Salvageable

- Protection
- Packaging
- Pallets
- Crates

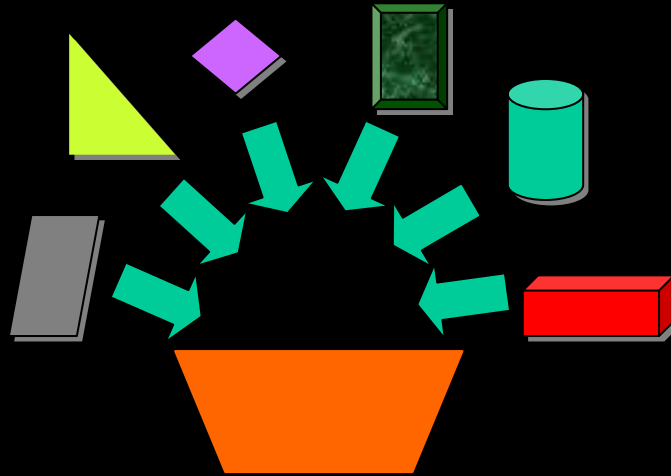
Practice Options

- Legal minimum
- Good practice
- Better practice

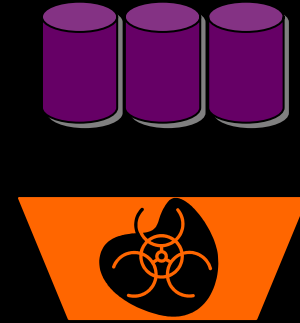
Legal Minimum

- **Duty of Care**
 - Waste Transfer Notes
 - European Waste Catalogue
- **Special Waste Consignment Notes**
- **Pollution Prevention**
 - Watercourses
 - Noise
 - Nuisances

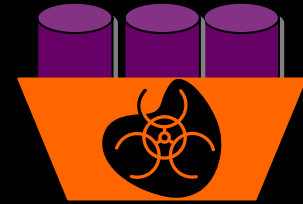
Mixed
Construction
Waste



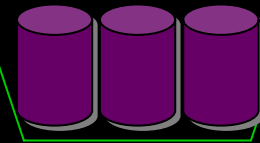
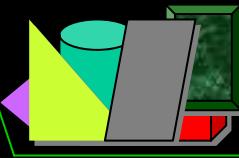
Hazardous
Waste



Waste
Handling



Landfill sites



Normal on &
off-site Practice

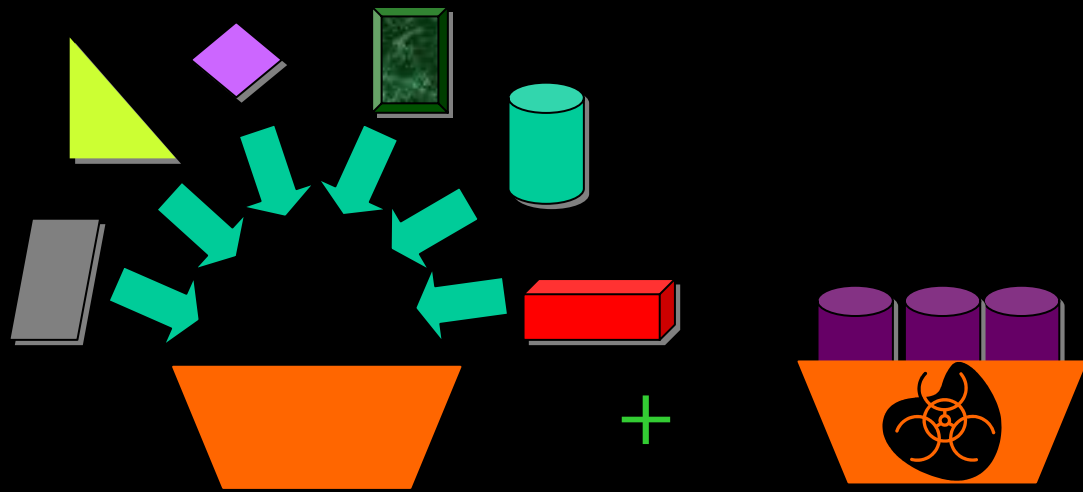
Mixed
Waste

Hazardous
Waste

July 2004

Good Practice

- See Separate presentation
- Legal minimum +
- Waste segregation
- Packaging Waste segregation for recovery or reprocessing

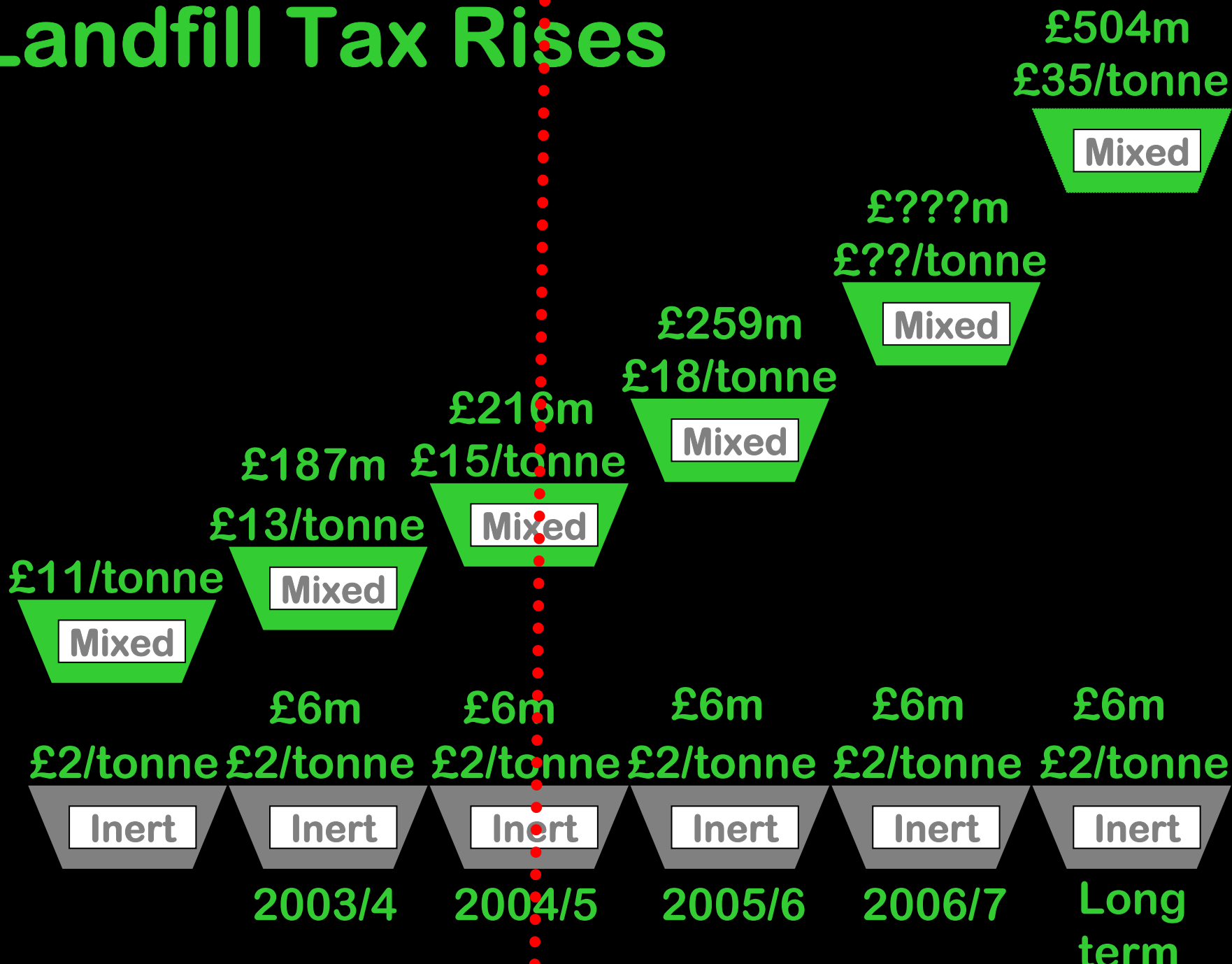


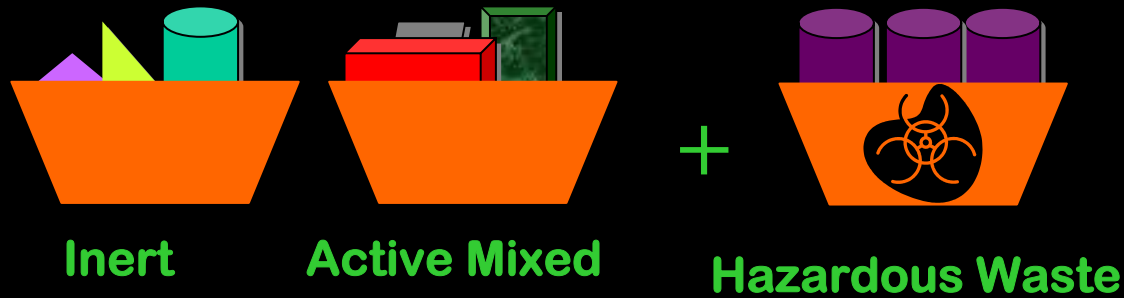
Inert & Active Mixed
1 Skip System Normal

Hazardous Waste
From July 2004 1=2

On-site Practices from July 2004

Landfill Tax Rises

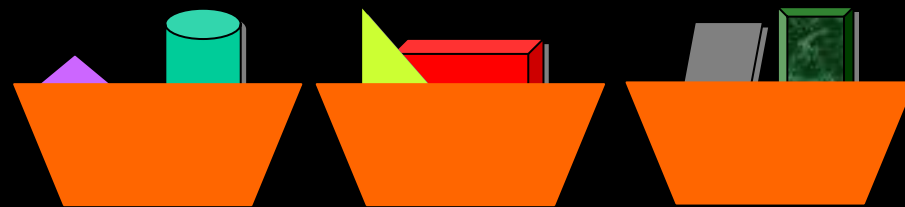




2 Skip System Good
Landfill Tax driven

From July 2004 2 becomes 3

On-site Practices from July 2004



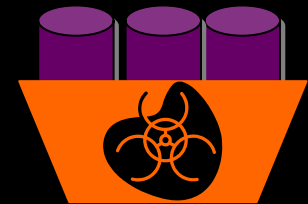
Packaging
(timber/plastics)

Inert

Active

3 Skip System
Landfill Tax driven

+



Hazardous Waste

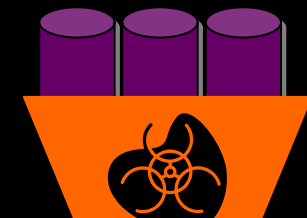
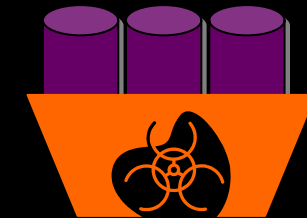
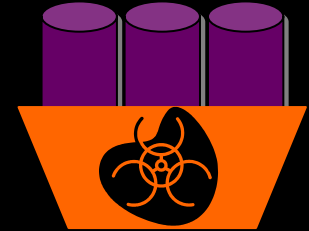
From July 2004 3
becomes 4

On-site Practices from July 2004

Hazardous Waste



- We know Asbestos Cement
- Soon it all changes
- Reclassification of materials
- Gypsum is added to list
- Others to follow
- Need special licence to carry
- Need special landfill to tip

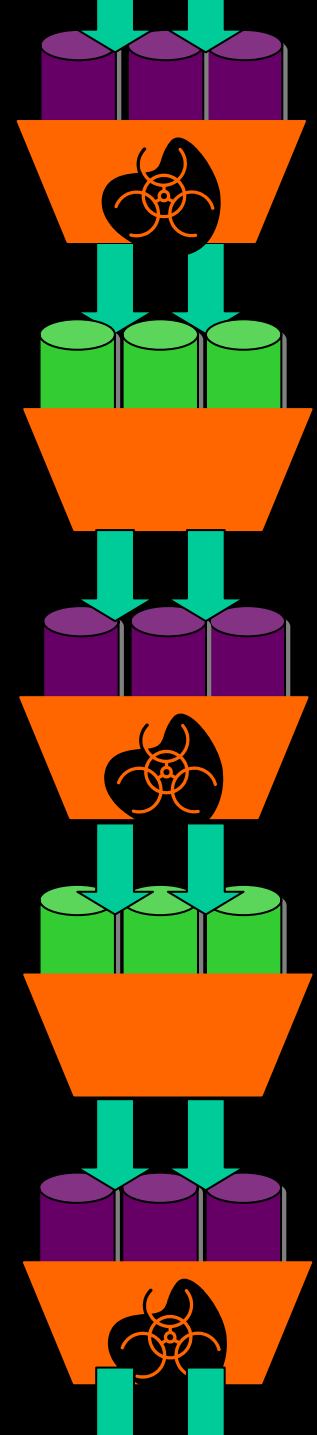


What's wrong with Gypsum?

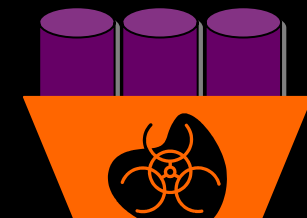
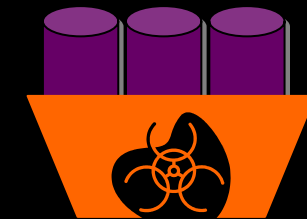
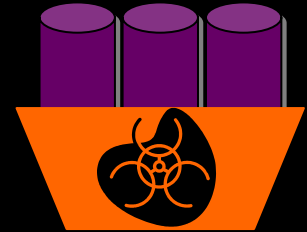
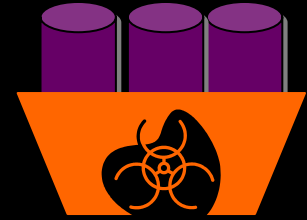
- Gypsum in mixed waste landfill can react with decomposing organic materials and produce Sulfur Dioxide SO_2 (new OED spelling)
- SO_2 responsible for acid rain

Hazardous Waste

- One companies HW may be another companies raw materials
- We must match supply to demand
- We need a material information exchange to link them up



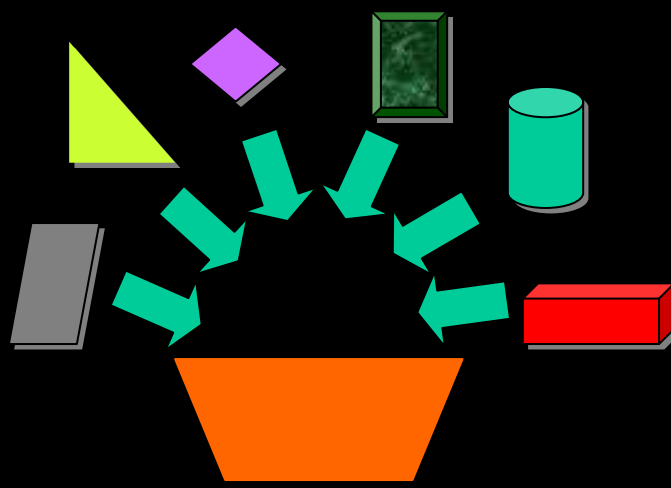
Deleterious Substances



- European Waste Catalogue
- Lists material that are DS
- And should be recorded on collection tickets for skips containing DS

Better Practice

- Legal Minimum + Good Practice +
- Materials Storage
- Protection
- Care
- Good workmanship
- Prefabrication/Preassembly where appropriate
- Site Waste Management Plans



Reject & Return Defective Materials

Return Protective & Packaging Materials

Less Materials wasted

Segregate waste local to source to enable reuse on-site

Recycle Materials on-site

Reduce Demand on use of Materials

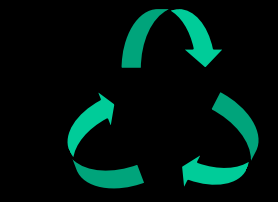
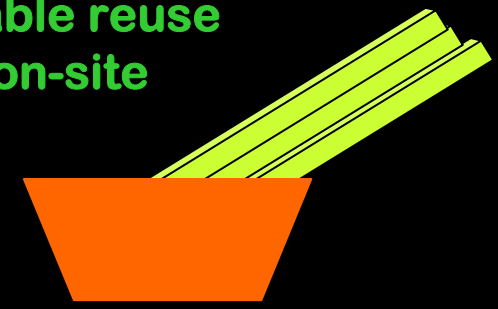
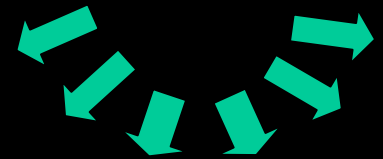
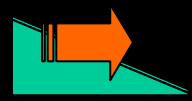
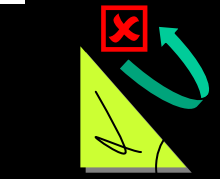
No Materials imported to site
No export from site

Reuse spare materials on-site & in use

Segregate Materials off-site

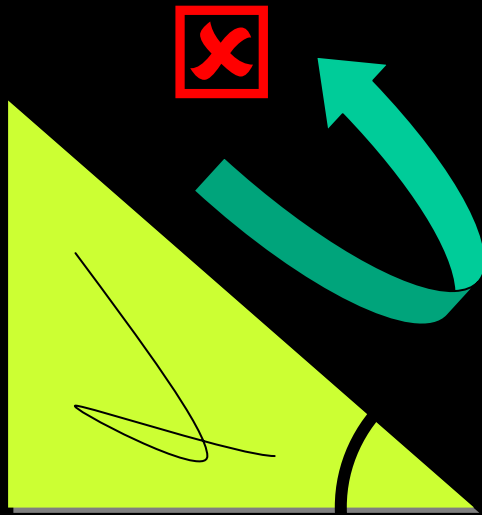
Redesign To reduce waste

On-site Good Practice



Waste Reduction @ Design: Diagrams

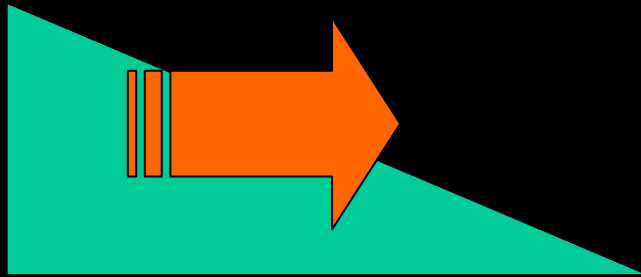
Easy steps to reduce your share
of the 90 m tonnes of construction and
demolition waste each year



**Reject &
Return
Defective
Materials**



**Return
Protective
& Packaging
Materials**

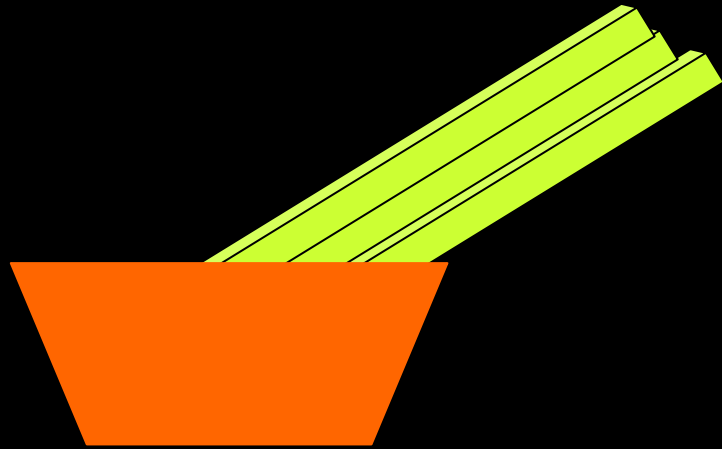


**Reduce
Demand
on use of
Materials**



**Recycle
Materials
on-site**

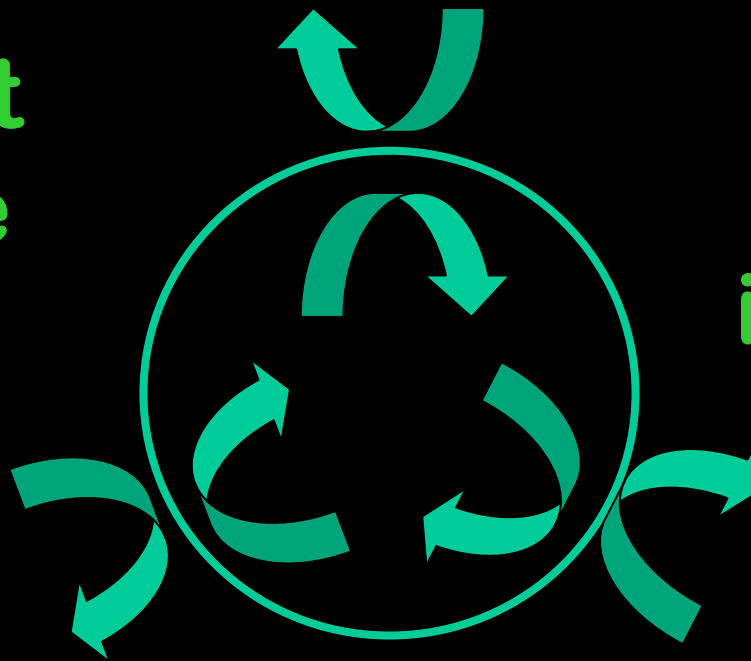
**Reuse spare
materials
on-site & in use**



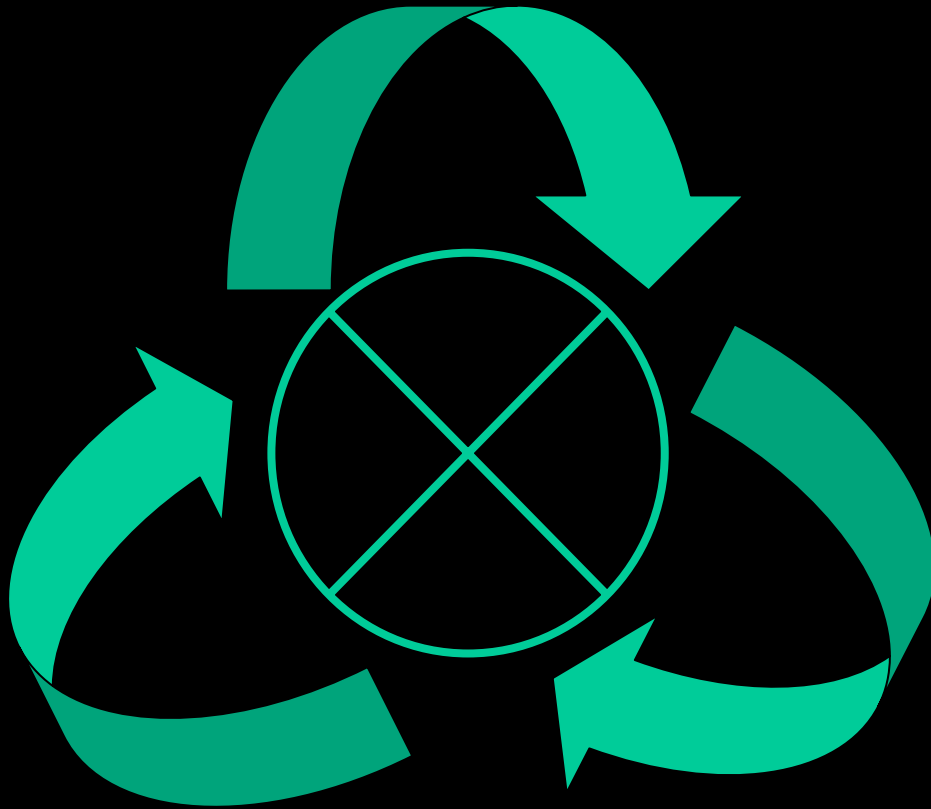
**Segregate waste
local to
point of generation
to enable reuse
on-site or offsite
And even on-site again**

Site Autonomy

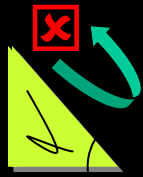
No export
from site



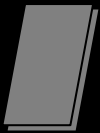
No
Materials
imported to
site



**Redesign
To reduce
waste**



Reject & Return Defective Materials



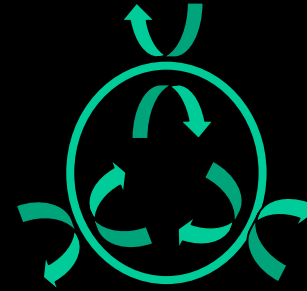
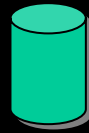
Return Protective & Packaging Materials



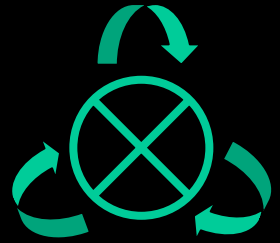
Reduce Demand on use of Materials



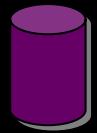
Reuse spare materials on-site & in use



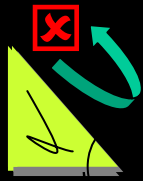
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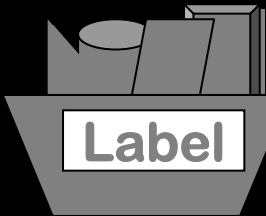
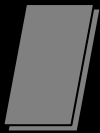
Redesign To reduce waste



On-site Better Practice



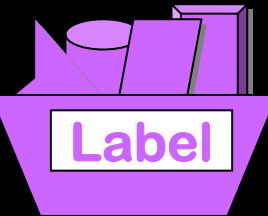
Reject & Return Defective Materials



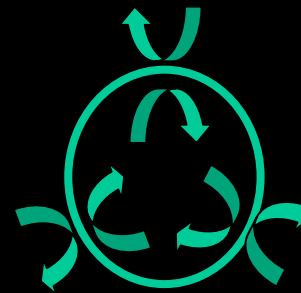
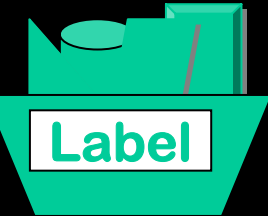
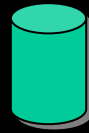
Return Protective & Packaging Materials



Reduce Demand on use of Materials



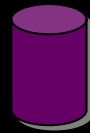
Reuse spare materials on-site & in use



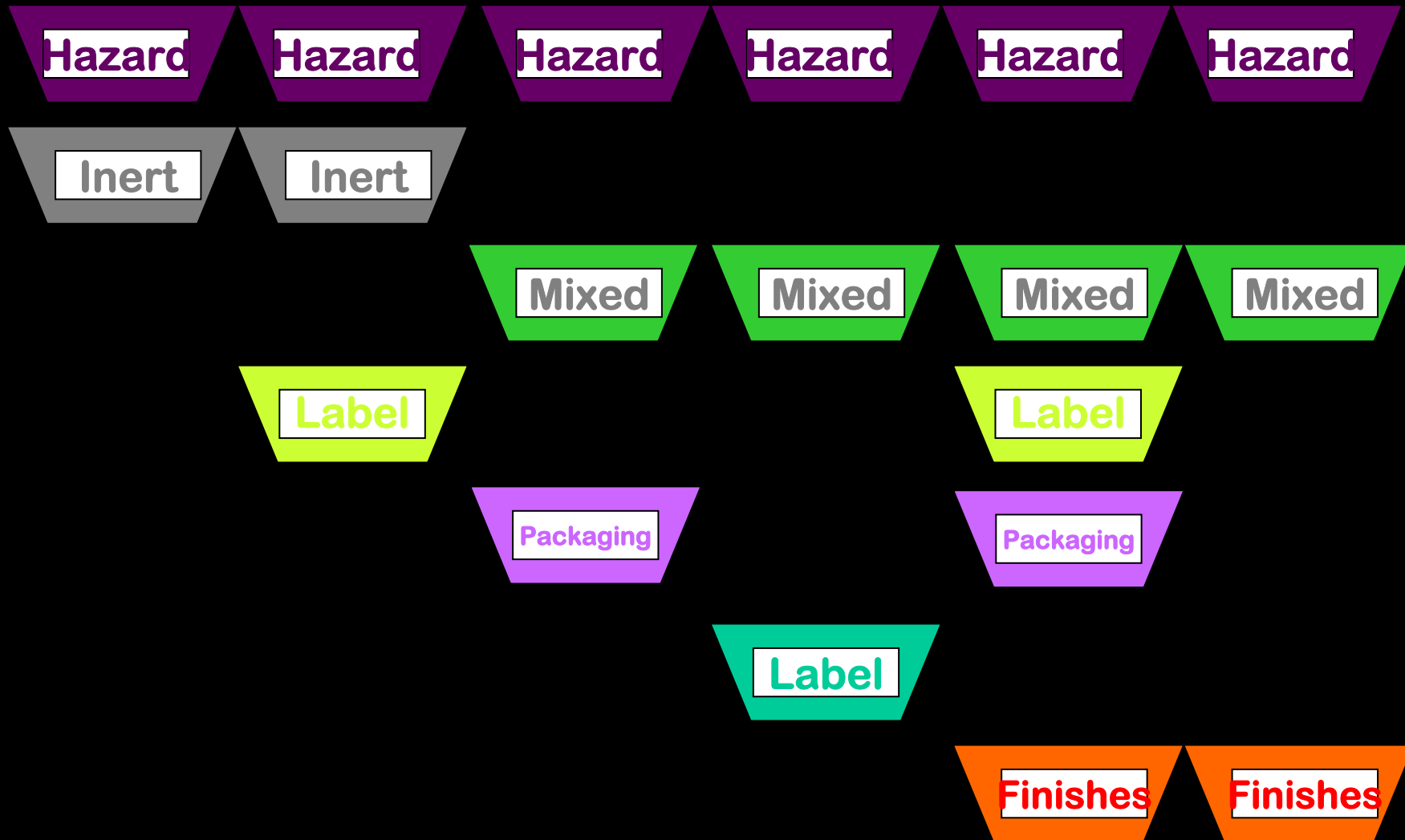
No Materials imported to site No export from site



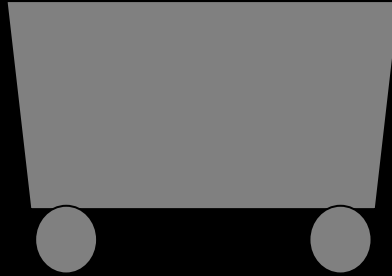
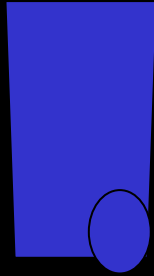
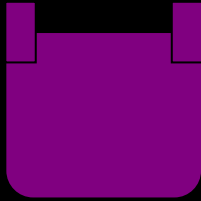
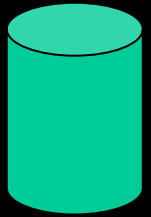
Redesign To reduce waste



On-site Best Practice



On-site Best Practice: Programme



Oil drums

Sacks

2 wheel bins

4 wheel bins

Skips of many sizes



On-site Best Practice: Different Sizes

On-site Best Practice: Initial Site Strip: Landscape Waste

Topsoil
Stockpile

Grass
Compost

Leaf
Compost

Bush & Tree
Trimmings

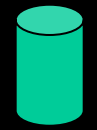
Turf

Sub-soil
Hardcore

Spread Seeds on topsoil to
discourage weeds

Cover topsoil with turf

Collect
Seeds



Site Strip Area

Mix Green Waste with grass cuttings compost



On-site Best Practice: Reuse of Green waste in Landscape

Collect
Seeds
Topsoil
Stockpile



Use stockpiled topsoil
in landscape

Use stockpiled turf
in landscape



Compost
Add mature Leaf compost to Green Compost

Use hardcore in road sub-base
and under floor slabs

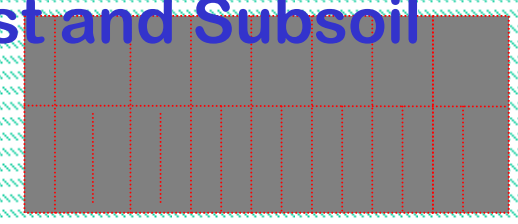
Add manufactured topsoil to gardens

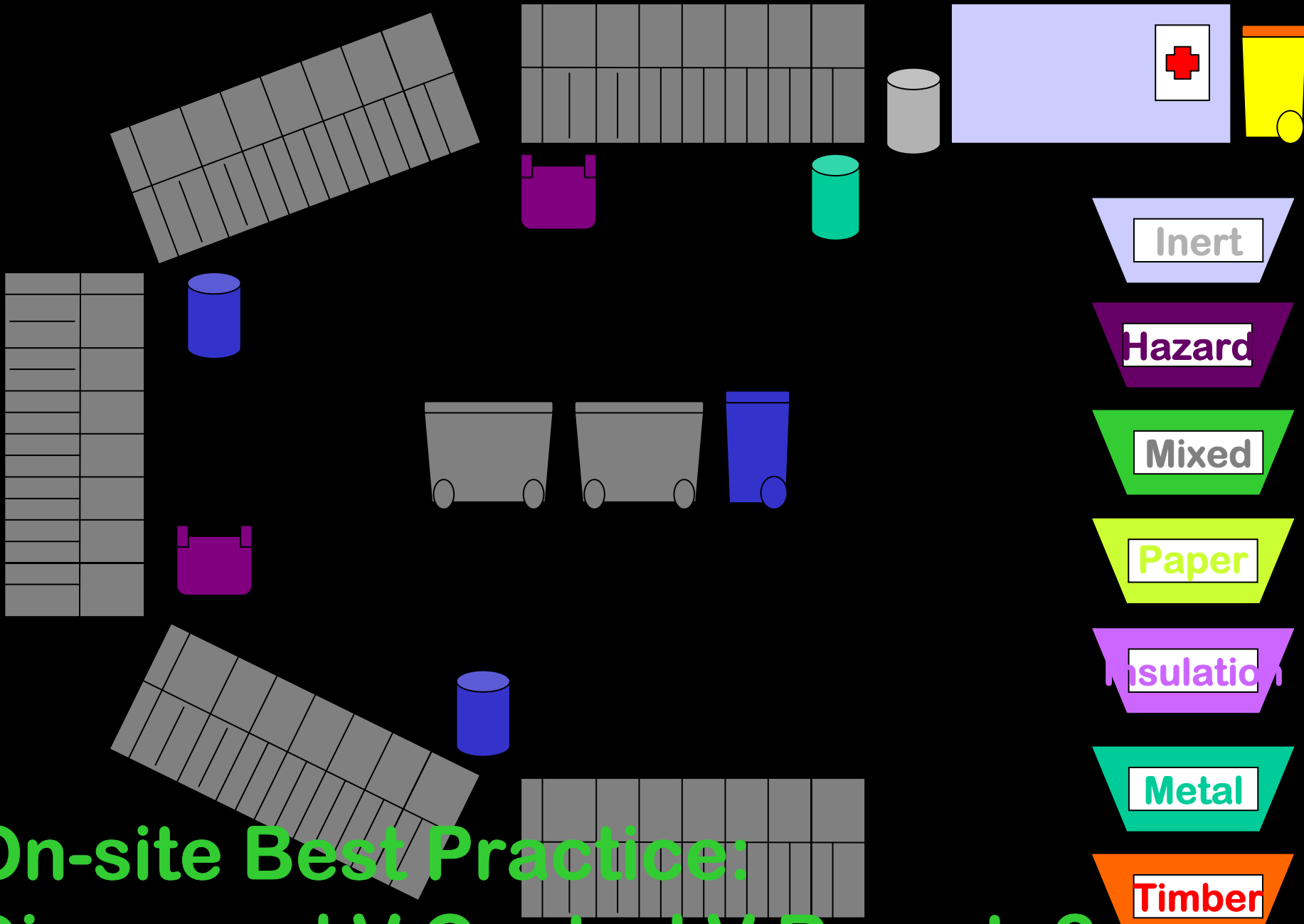
Turf
Topsoil
Stockpile



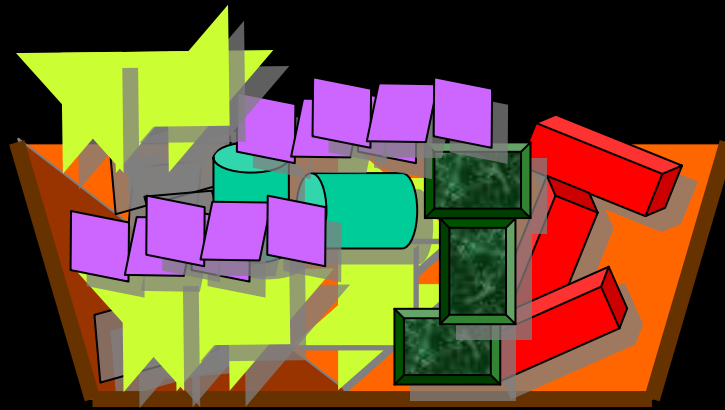
Add mature compost and Subsoil
to make Topsoil

Sub-soil
Hardcore



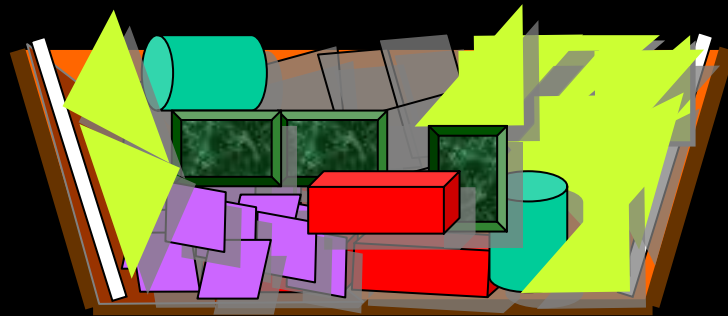


**On-site Best Practice:
Dispersed V Central V Remote?**



45% air voids
And much outside
of skip volume

On-site Poor Practice: Filling



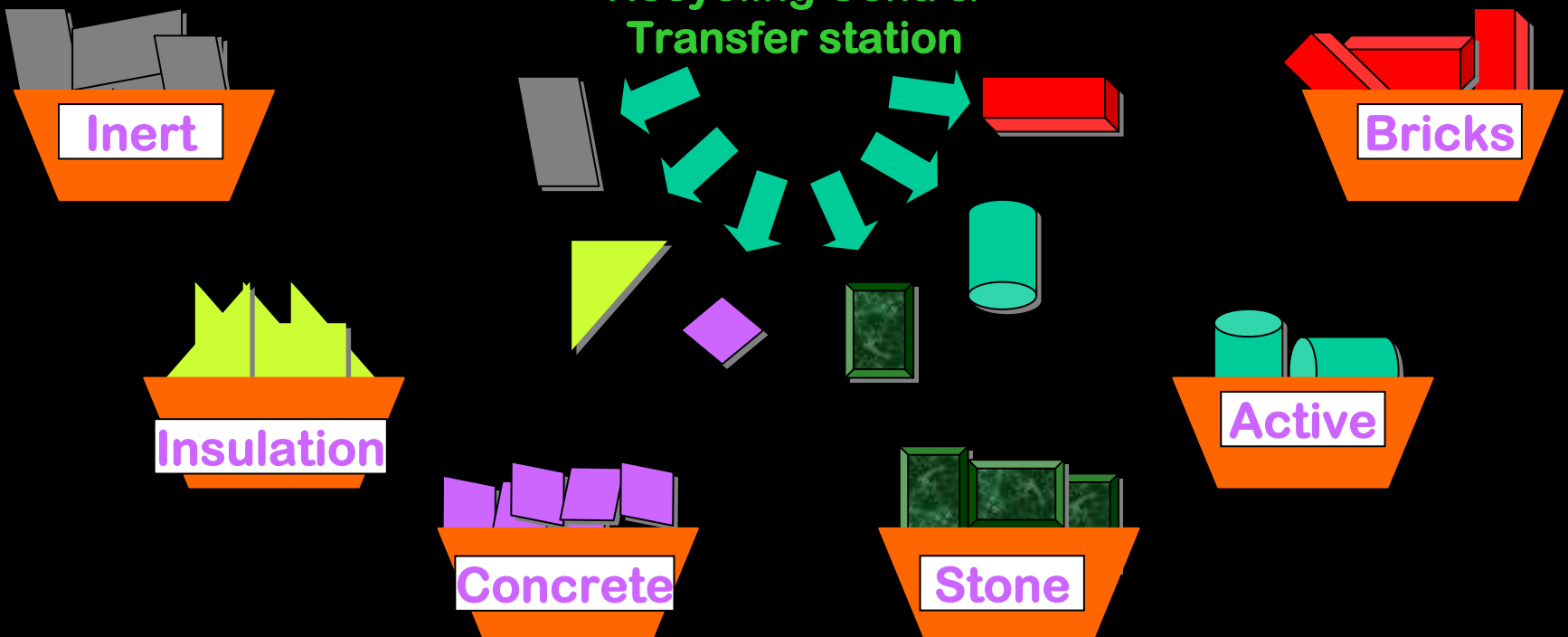
Well filled

On-site Best Practice: Filling

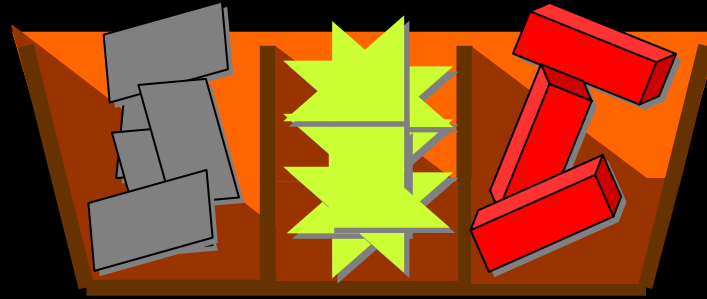
Bulking station
brings one
material type
Together from
many sites



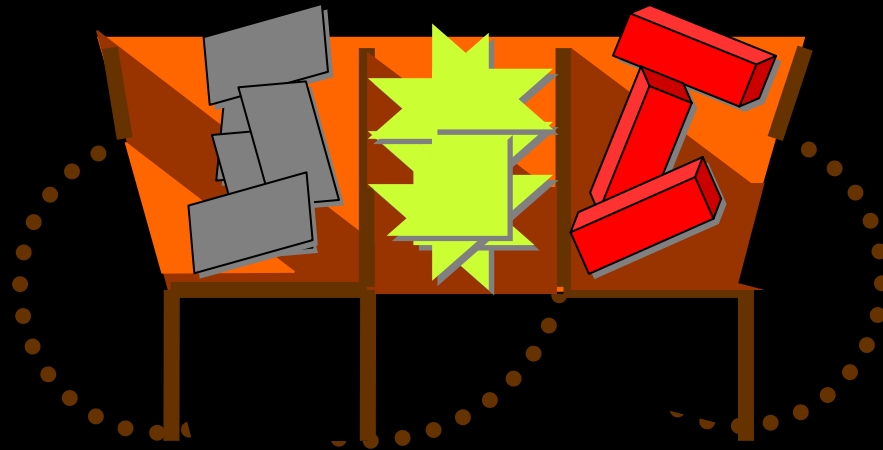
Waste Segregated
off-site at
Recycling Centre/
Transfer station



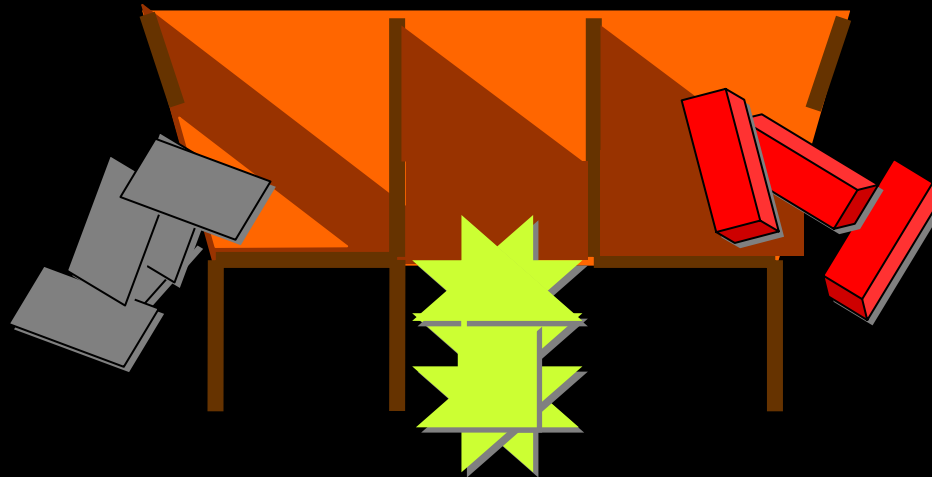
Off-site Good Practice: Segregation



Compartmented
Skips

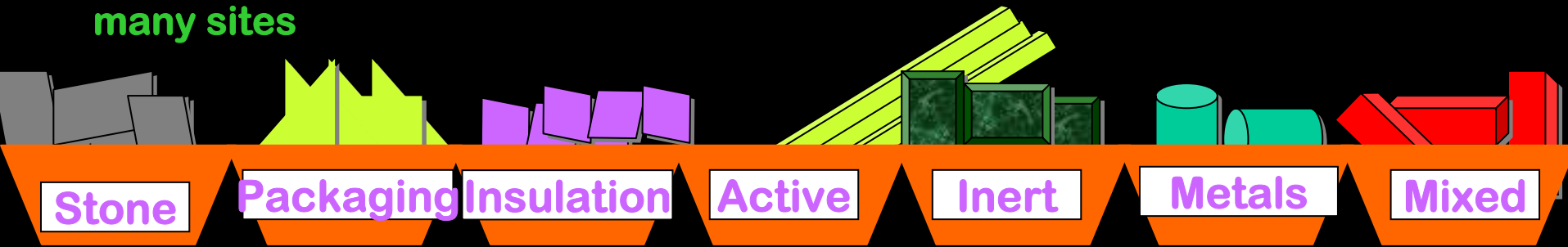


Hinged Traps
in Skips



Selective
discharge
of contents

Bulking station
brings one
material type
Together from
many sites



Clean Waste
Recyclate
Sold To
manufacturers



Packaging
Waste
Returned to
Producer
or recycled

Waste
Segregate
off-site
return to
Manufacturer
For reuse



Resell
reclaimed
Materials
to sites

Inert
Waste
Crushed
For
Hardcore

Subsoil
Mixed with
Compost
to make
topsoil



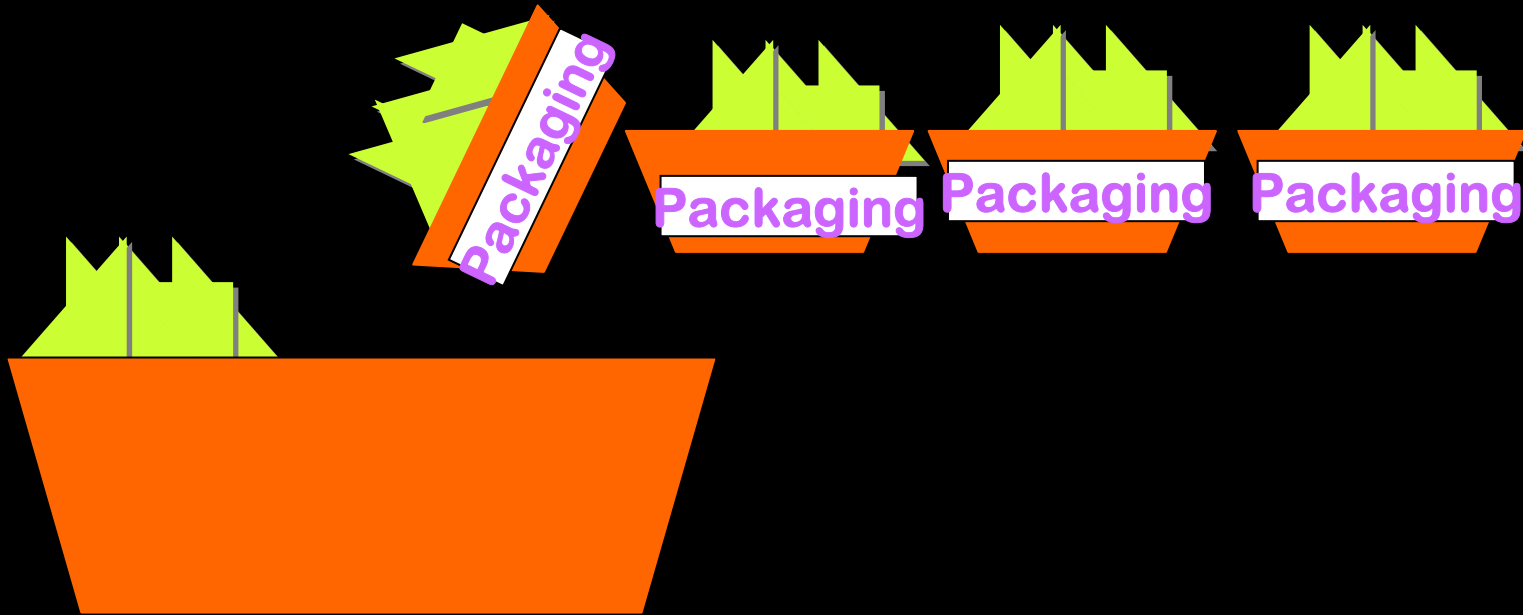
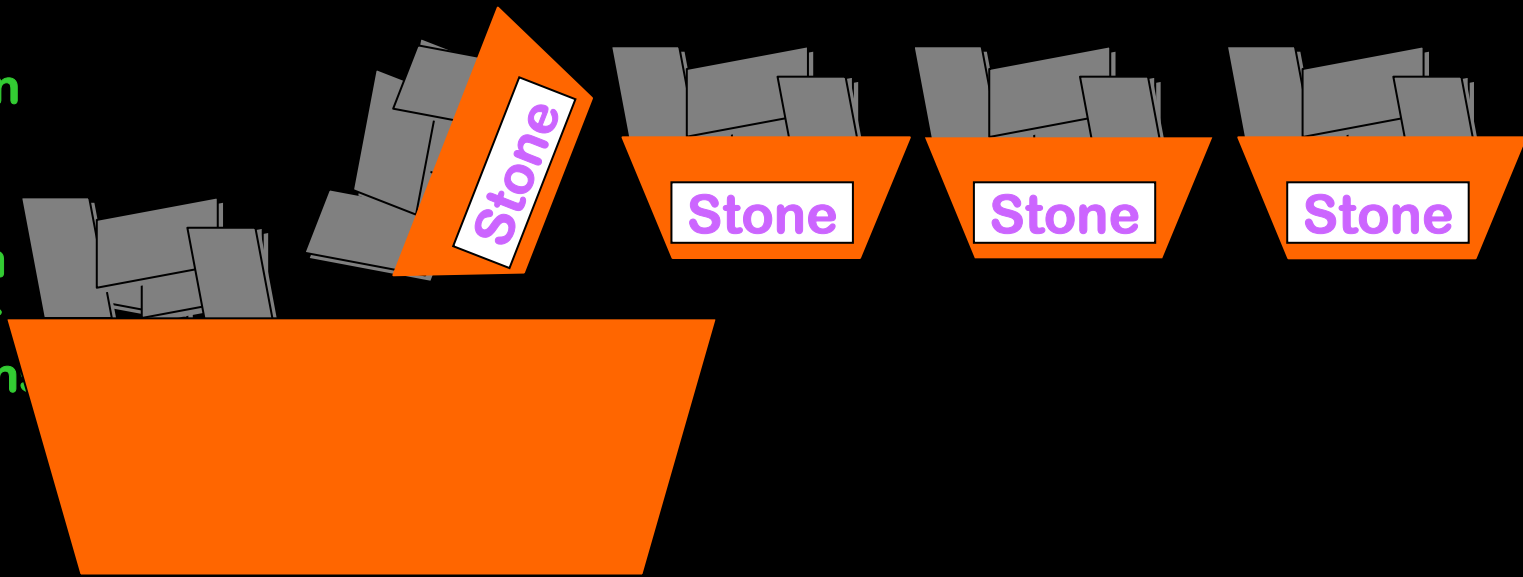
Valuable
Waste
Recycled

Mixed
Waste
With no
Reuse
To
Landfill

Hazardous
Waste
To special
Landfill

Off-site Best Practice: Recycling

Bulking station
brings one
material type
together from
many sites or
Transfer station.



Off-site best practice: Bulking



Reduce



Reuse

Reclaim



Recycle
Recover
Materials



Incinerate to
Recover Energy



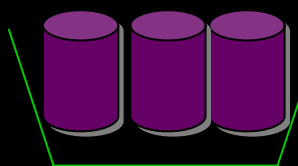
Segregated/Inert



Mixed waste

Best Good Normal Bad

Practice



Hazardous waste

What's wrong with landfill sites?

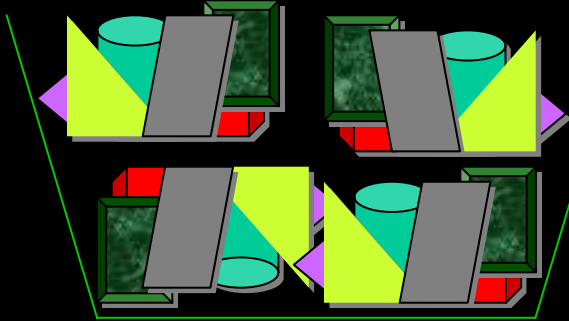
- Decomposing materials generate methane CH_4
- A Green House Gas
- Global Warming Potential: 21 x CO_2
- Plaster and acidic decomposing material generates SO_2
- Generates Acid Rain

What's wrong with landfill sites?

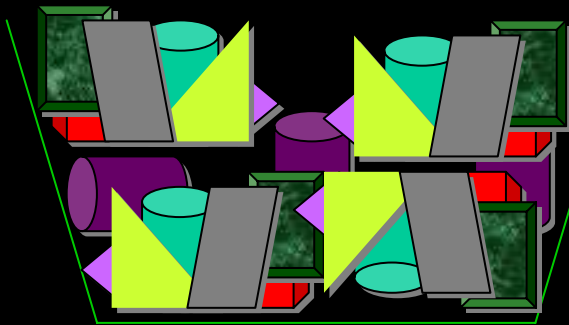
- Squander materials resources
- Done in a destructive method
- Landfill sites are unlikely to be excavated to reuse resources
- Future techniques may change this
- But segregated waste could be stored separately to allow this to happen

Bad Landfill Practices

- **Mixed waste**
- **Mixed waste with hazardous waste**
- **Generate CH₄ and SO₂**
- **sometimes combust**
- **Little or no potential to reclaim recycle recover materials**

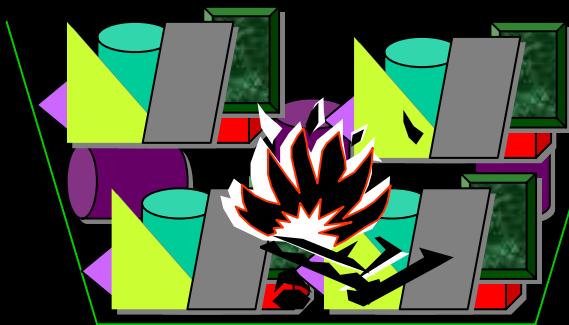


Methane created
Mixed waste
Leachate released



Mixed waste
Hazardous waste

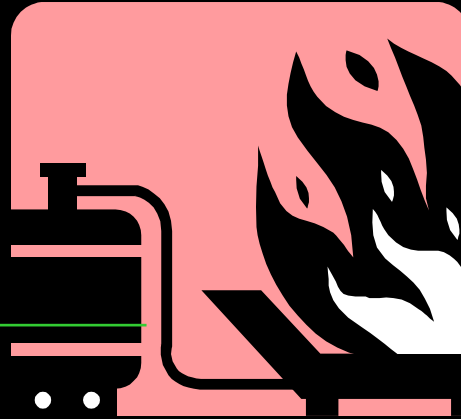
**Little or no
Opportunity to
Recycle and
Recover
Materials**



Mixed waste
Hazardous waste
And Combustion

Bad Landfill Practice

Cap site
Bottle the Methane
Use for fuel



Little or no
Opportunity to
Recycle and
Recover
Materials

Impervious wall
Drained cavity

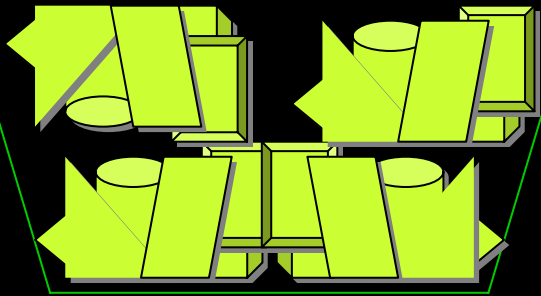
Collect Leachate
Move to hazardous waste landfill

Mixed waste

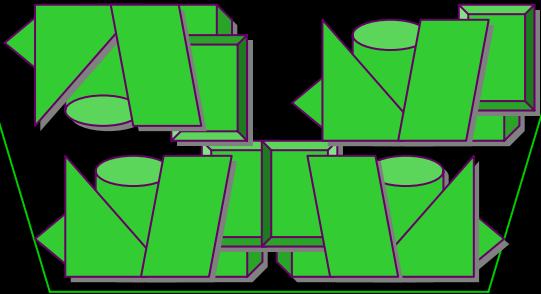
Better Landfill Practice

Good Landfill Practice

- **Single Material Segregated**
- **Later Potential to Reclaim Recycle Recover Materials**

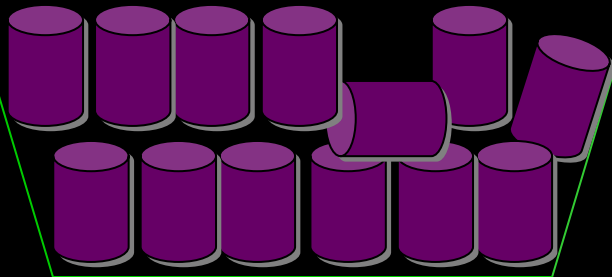


Segregated waste



Segregated waste

**Leaves future
Option to
Recover and
Recycle
Materials**

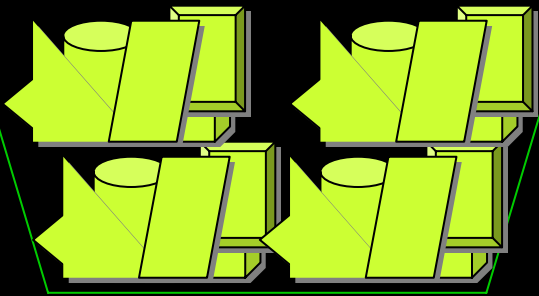


Segregated Hazardous waste

Good Landfill Practice

Best Landfill Practice

- **Single Material Segregated**
- **Segregated Compartmented**
- **Hazardous waste**
- **Stored monitored & retrievable**
- **Later Potential to Reclaim Reuse
Recycle Recover Materials**

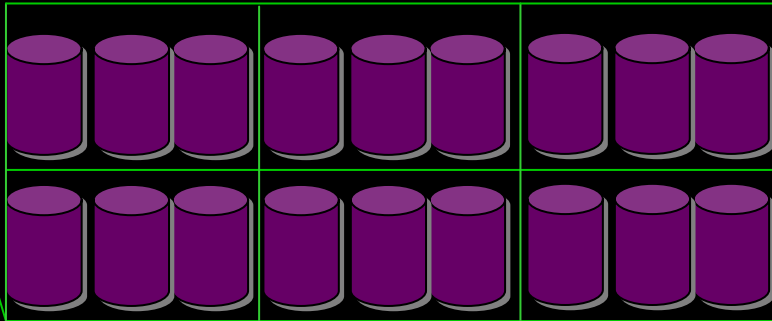


**Segregated waste
Single materials**

**Leaves future
Option to
Recover and
Recycle
Materials**



**Segregated waste
Compartmented 'cells'
Landfill site
Re-excavate able**



**Hazardous waste
Accessible Storage
Monitored
Retrievable
Reusable**

Best Landfill Practice