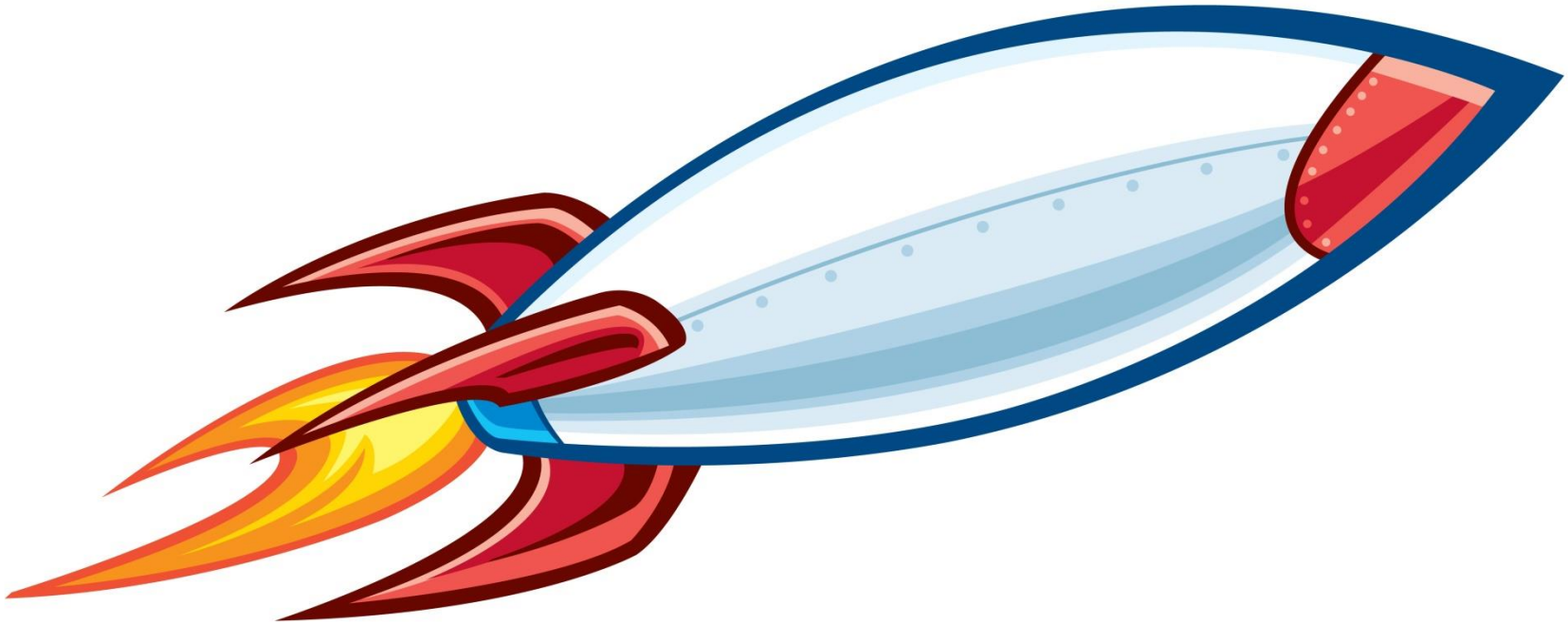
East Northamptonshire Council

Local Authority requirements and expectations for capping layers

Mandy Dennis

Senior Environmental Protection Officer

ITS NOT ROCKET SCIENCE!



clipartimage.com

East Northamptonshire Council

Made or natural ground

Uncontaminated ground

East Northamptonshire Council

Typical scenario

The National Planning Policy Framework (NPPF) 2018

- Section 178
- a) - planning decisions should ensure a site is suitable for its proposed use…….
- b) - after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990…..
- c) - adequate site investigation information, prepared by a competent person, is available to inform these assessments.
- Section 179 - Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

East Northamptonshire Council

What do I look for

- Robust site investigation
- Good conceptual site model
- Confidence in the developer
- Confidence in the consultant
- Site specific requirements
- Source of capping material

East Northamptonshire Council

The Conceptual Site Model

- Understand the proposed end use
- Identify sensitive areas such as gardens and allotments
- Base remediation on sound site investigation information
- Appropriate risk assessments
- Zoning
- More testing?
- Know the formation levels – don’t fall foul of planning!

East Northamptonshire Council

Back to basics: Why is cover needed?

- To break the pollutant linkage
- Acts as a barrier to underlying contamination
- Provides a growing medium

Factors affecting the cover system

- Presence of soil gases or vapours
- Groundwater mobility, level and solubility of contaminants
- Slope stability
- Excavations
- Burrowing animals

East Northamptonshire Council

IS CAPPING REQUIRED?

East Northamptonshire Council

Not all capping is soil

East Northamptonshire Council

Four easy steps

- Who does what and why
- Design technical specification
- Carry out the work
- Validation

East Northamptonshire Council

Who does what and why!

- The developer
- The consultant
- NHBC
- The regulator

East Northamptonshire Council

Design specification – simple soil cap

- Understand your conceptual site model
- It is considered a reasonable assumption that any disturbance or intermixing of soils is unlikely to exceed 600mm depth from earthworm activity, double digging, root depth, etc
- Site specific assessment using appropriate model eg

‘Cover systems for land regeneration –

thickness of cover systems for contaminated land’

prepared by RSK ENSR Ltd

East Northamptonshire Council

Sources of soil capping

- Site won (CL:aire Definition of Waste Code of Practise and material management plans)
- Processed/manufactured (Eg British Sugar, enriched quarry overburden)
- Greenfield site
- Topsoil supplier
- Builders mate down the road

East Northamptonshire Council

Laying the soil cap

This is the easy bit or is it!

How much do I need?

Standard 8 wheel tipper truck carries 20 tonnes or 15 cubic metres of soil

A 5x5m square garden to 600mm will take 15m^3

Small gardens

Big gardens

Access

Levels

East Northamptonshire Council

Questions for your soil supplier

- Where does the soil come from?
- Natural or manufactured?
- Is it all coming from the same place?
- Is it free from invasive weeds – Japanese Knotweed?
- How was it sampled?
- Has it been independently tested?
- Does the laboratory have MCERTS accreditation?
- When was it tested?

East Northamptonshire Council

Verification or how do I know its been done properly

Sampling rates

- Many Local Authorities produce guidance
- NHBC
- Site or source specific

Test results

Depth profiling

- Third party
- Site inspection

East Northamptonshire Council

Soil test results – can be tricky

Certificate of Analysis

Client	:		Our Ref	:
Date Received	:	29/05/2010	Date	:
Suite ID	:	BS3882 : 2007 - Multipurpose Grade	Sampled by	: Client
Site Details	:			

Soil Sample Reference : **Topsoil**

Particle Size Distribution*	**(UK Classification)**		
Clay (<0.002mm)	%	12	✓
Silt (0.002-0.06mm)	%	16	✓
Sand (0.06-2.0mm)	%	73	✓
Textural Class		SL	✓
Stone Content (Dry Weight Basis)			
Stones 2-20mm	%w/w	40	×
Stones 20-50mm	%w/w	1	✓
Stones >50mm	%w/w	0	✓
Soil Reaction & Soluble Salts			
pH Value ‡	units	7.6	✓
Electrical Conductivity ($CaSO_4$)†	µS/cm	2410	✓
≠ ESP±	%	0.5	✓
Organic Matter & Nutrient Status			
Organic Matter (WB^)	%	1.2	×
Total Nitrogen	%	0.06	×
Carbon : Nitrogen Ratio		12:1	✓
Extractable Phosphorous	mg/l	65	✓
Extractable Potassium	mg/l	281	✓
Extractable Magnesium	mg/l	309	✓
Phytotoxic Metals'			
Zinc (Zn)	mg/kg	82.7	✓
Copper (Cu)	mg/kg	15.6	✓
Nickel (Ni)	mg/kg	16.3	✓
Visibile Contaminants (Dry Weight Basis)			
Total foreign matter > 2 mm	%w/w	0.0	✓
… of which plastics	%w/w	0.0	✓

This is better

		Lab No.	300500	300501	300502	300503	300504
		Sample ID	WS01	WS02	WS03	WS04	WS04
		Depth	0.60	0.50	0.80	0.40	0.70
		Sample Ref	08/12/2010	08/12/2010	08/12/2010	08/12/2010	08/12/2010
		Sample Type					
Test	Units	DETSxx					
Arsenic	mg/kg	DETS 042#	7	7.5	1.5	24	11
Cadmium	mg/kg	DETS 042#	0.4	0.4	0.1	1.2	0.4
Chromium	mg/kg	DETS 042#	20	17	7	14	10
Hexavalent Chromium	mg/kg	DETSC2204'	< 1	< 1	< 1	< 1	< 1
Copper	mg/kg	DETS 042#	20	21	3	43	18
Lead	mg/kg	DETS 042#	20	32	5	88	42
Mercury	mg/kg	DETS 081#	0.06	0.17	< 0.05	0.3	0.64
Nickel	mg/kg	DETS 042#	13	14	4	19	8
Selenium	mg/kg	DETS 042#	< 0.5	< 0.5	0.7	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	60	68	15	71	45
Cyanide total	mg/kg	DETS 067#	0.1	0.2	< 0.1	0.2	0.2
Organic matter	%	DETS 002#	1.4	2.6	0.2	2.1	1.6
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	82	70	120	200	93
pH		DETS 008#	9.3	9.0	9.1	8.8	9.1
Acenaphthene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	DETS 050	0.1	< 0.1	0.2	0.2	< 0.1
Fluorene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	DETS 050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	DETS 050	0.1	< 0.1	0.3	0.2	< 0.1
PAH	mg/kg	DETS 050	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenol - Monohydric	mg/kg	DETS 067#	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

East Northamptonshire Council

Verification

East Northamptonshire Council

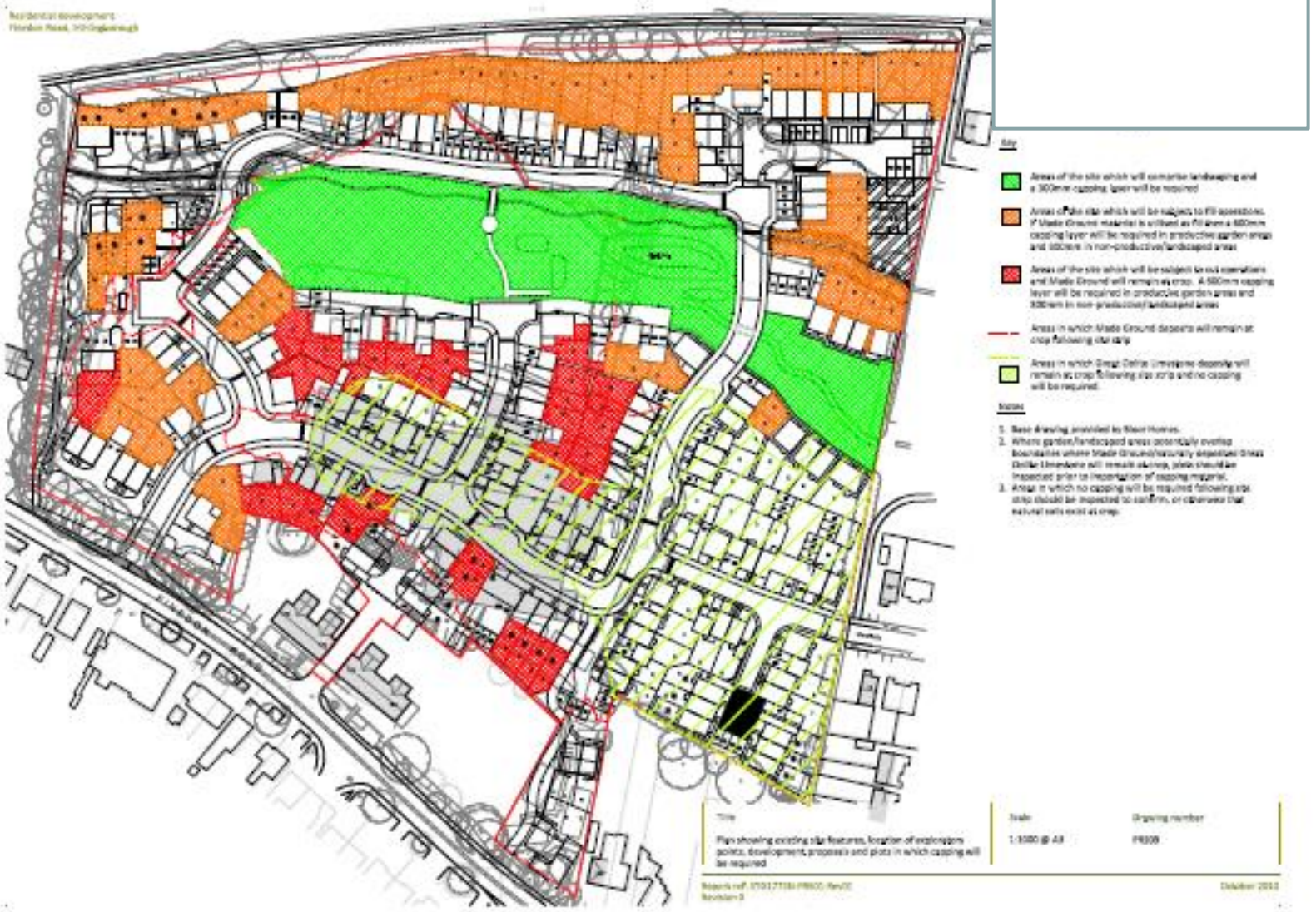
Depth profile

Photographs

Go and have a look

Depth of excavation

East Northamptonshire Council



East Northamptonshire Council

It can be complicated!

East Northamptonshire Council

Soil capping and trees

- Tree protection orders
- Public open space
- Prickly planting

East Northamptonshire Council

Trees

- Most tree roots are located in the top 150 to 600mm (6 to 24 inches) of the soil
- About 10% go deeper
- Feeder roots absorb water, oxygen and minerals they grow outwards and upwards from the main roots near the soil surface
- Water, oxygen and minerals are more abundant at the surface
- Root growth (direction) affected by soil compaction, obstructions, etc

Soil capping around retained tree with TPO in public open space

Problem – sulphate bearing red shale
Mitigation

- Remove any red shale (hand digging) to a depth of 300mm
- Are not to sever any roots, if cut by accident then should be trimmed with a sharp blade
- Work in small sections covering exposed roots with wet sacking
- Minimise exposure of roots to air to prevent drying out
- Sharp sand placed around exposed roots and covered with topsoil
- No compaction of topsoil

The tree in 2005

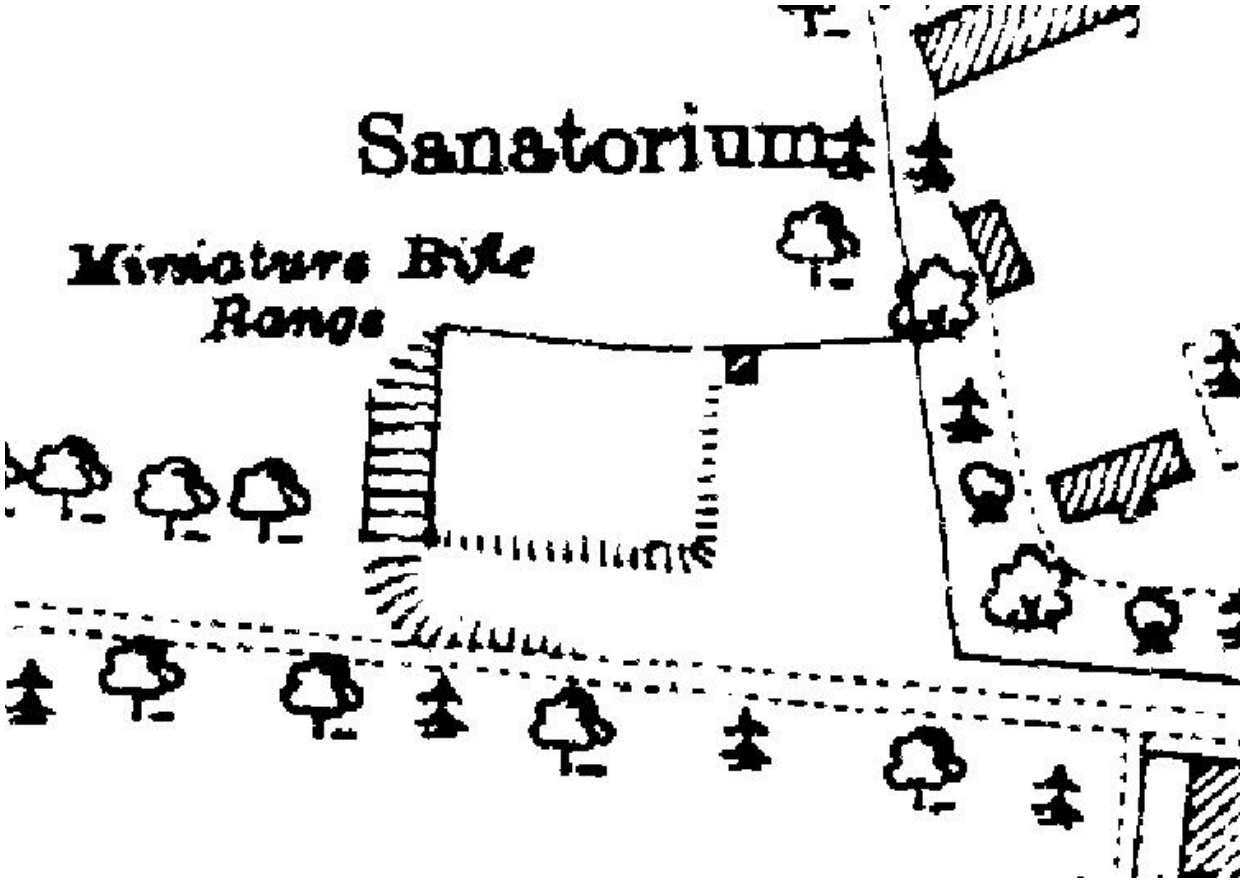
East Northamptonshire Council

The tree last Wednesday

The tree in 2013

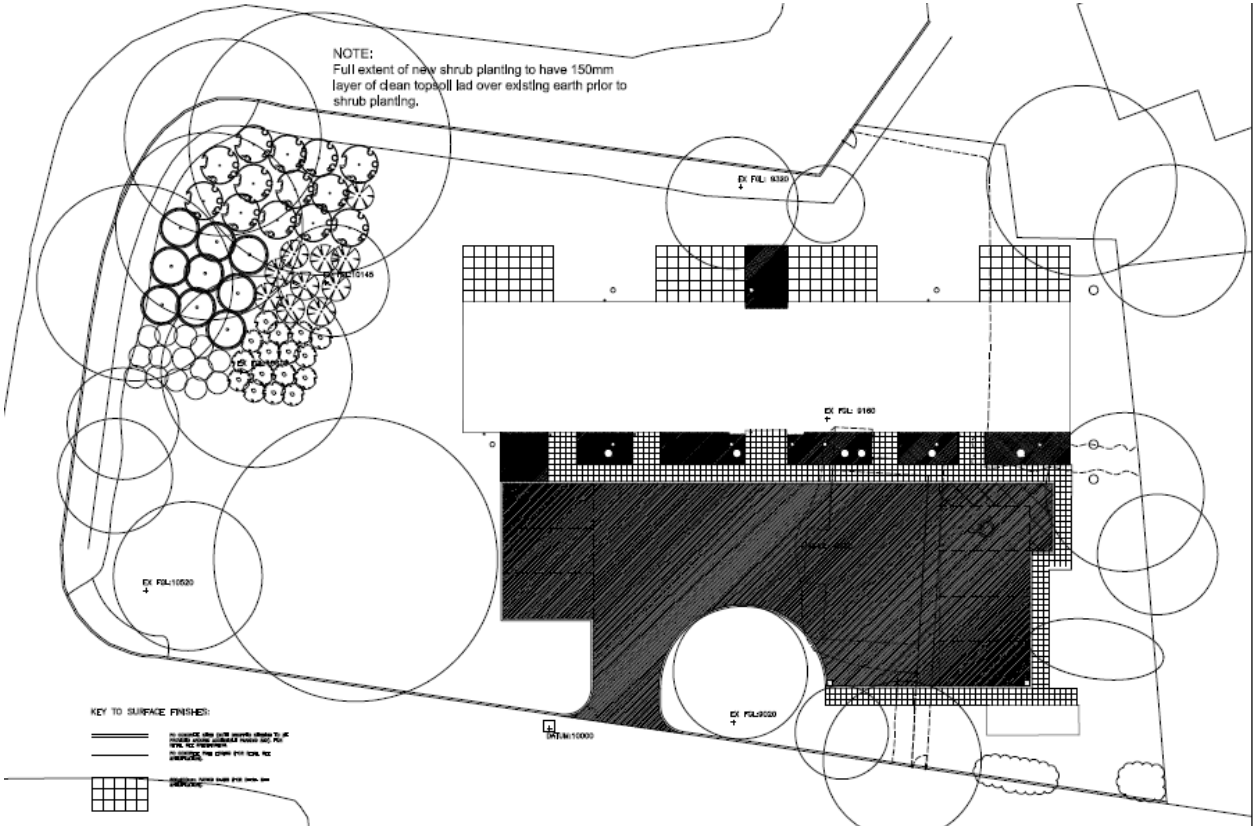
East Northamptonshire Council

Former rifle range



East Northamptonshire Council

Landscaping plan



East Northamptonshire Council

East Northamptonshire Council

Former landfill site

- Near surface metals and PAHs
- 300mm soil capping where possible
- Prickly planting
- Fencing

East Northamptonshire Council

East Northamptonshire Council

THANK YOU FOR LISTENING

Mandy Dennis

Senior Environmental protection Officer

01832 742037

mdennis@east-northamptonshire.gov.uk

East Northamptonshire Council