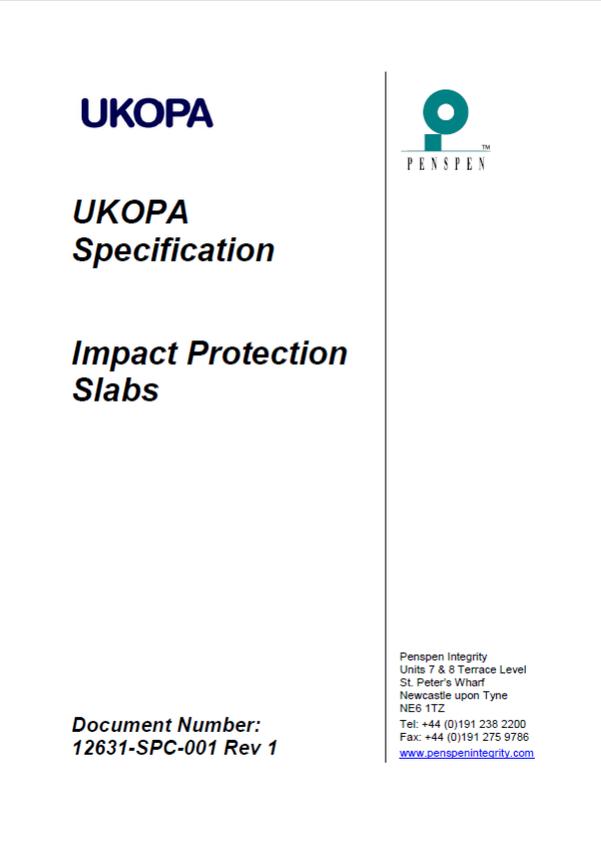


UKOPA Specification Scope

- Specification for impact protection slab
- Damage reduction factor.
- Concise set of guidelines
- Mitigate risk of third party interference
- Applies to HP pipelines

UKOPA/13/038



The image shows the cover page of the UKOPA Specification document. It features the UKOPA logo at the top left, followed by the title 'UKOPA Specification' and 'Impact Protection Slabs'. On the right side, there is the Penspen logo and contact information for Penspen Integrity. At the bottom left, the document number '12631-SPC-001 Rev 1' is listed.

UKOPA

*UKOPA
Specification*

*Impact Protection
Slabs*

**Document Number:
12631-SPC-001 Rev 1**

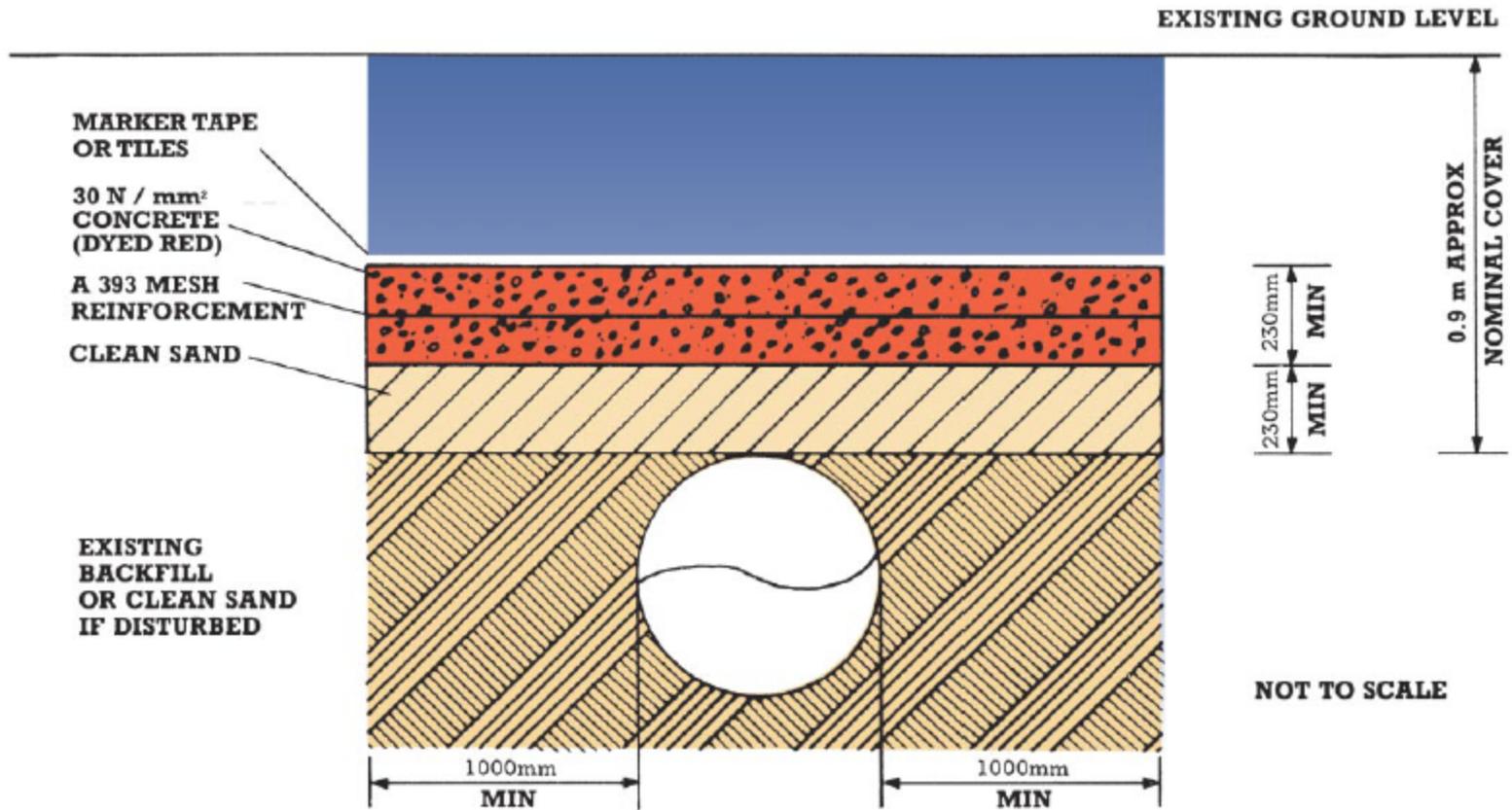
Penspen Integrity
Units 7 & 8 Terrace Level
St. Peter's Wharf
Newcastle upon Tyne
NE6 1TZ.
Tel: +44 (0)191 238 2200
Fax: +44 (0)191 275 9786
www.penspenintegrity.com

Impact Protection Slabs

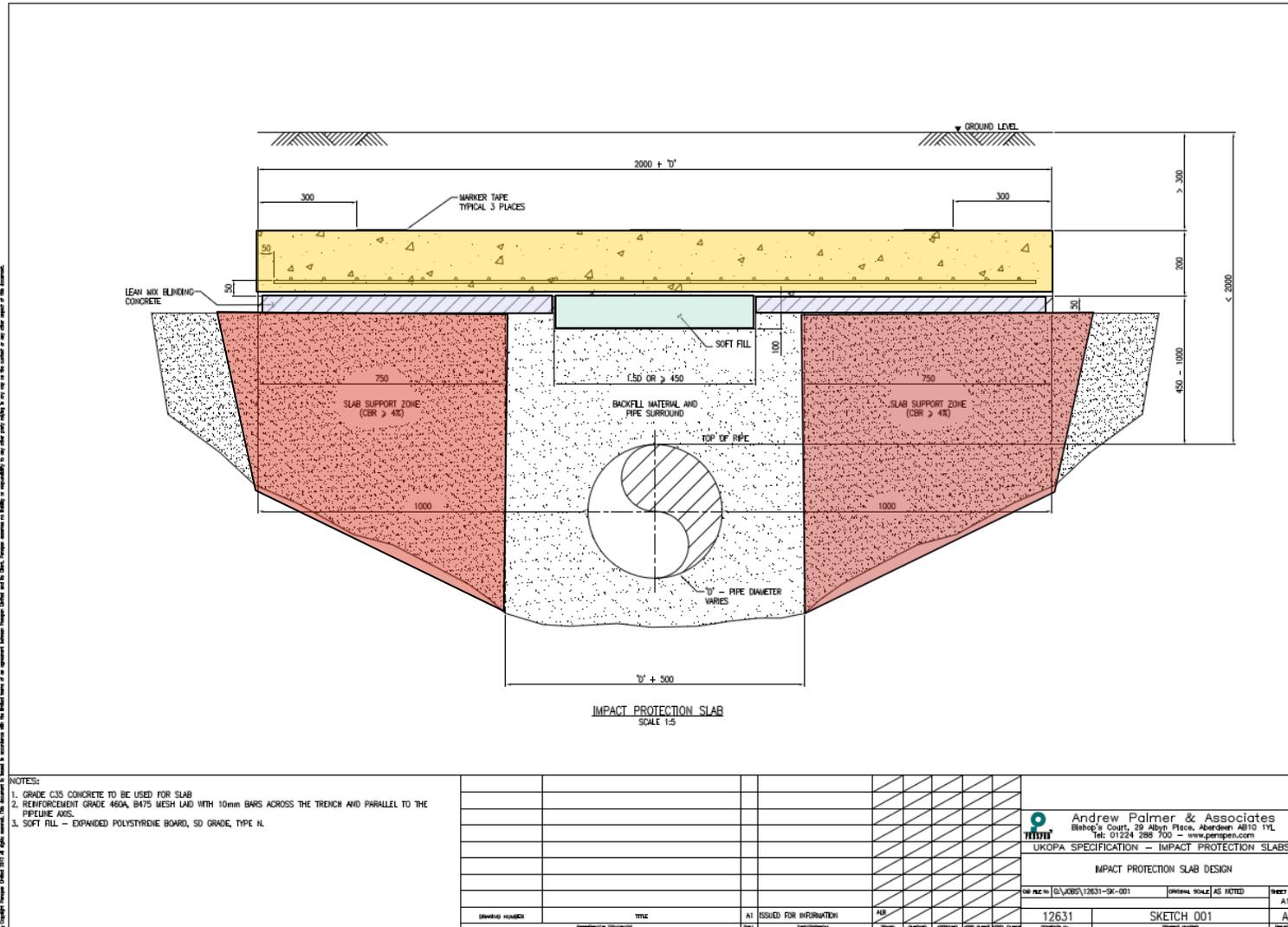
- **Impact protection slabs are used as a physical barrier that reduces the likelihood of pipeline damage from third parties**
- **Load bearing slabs are designed for transient live loading situations**
 - **Quarry plant**
 - **Construction plant**
 - **Highway vehicles – highest axle weights**



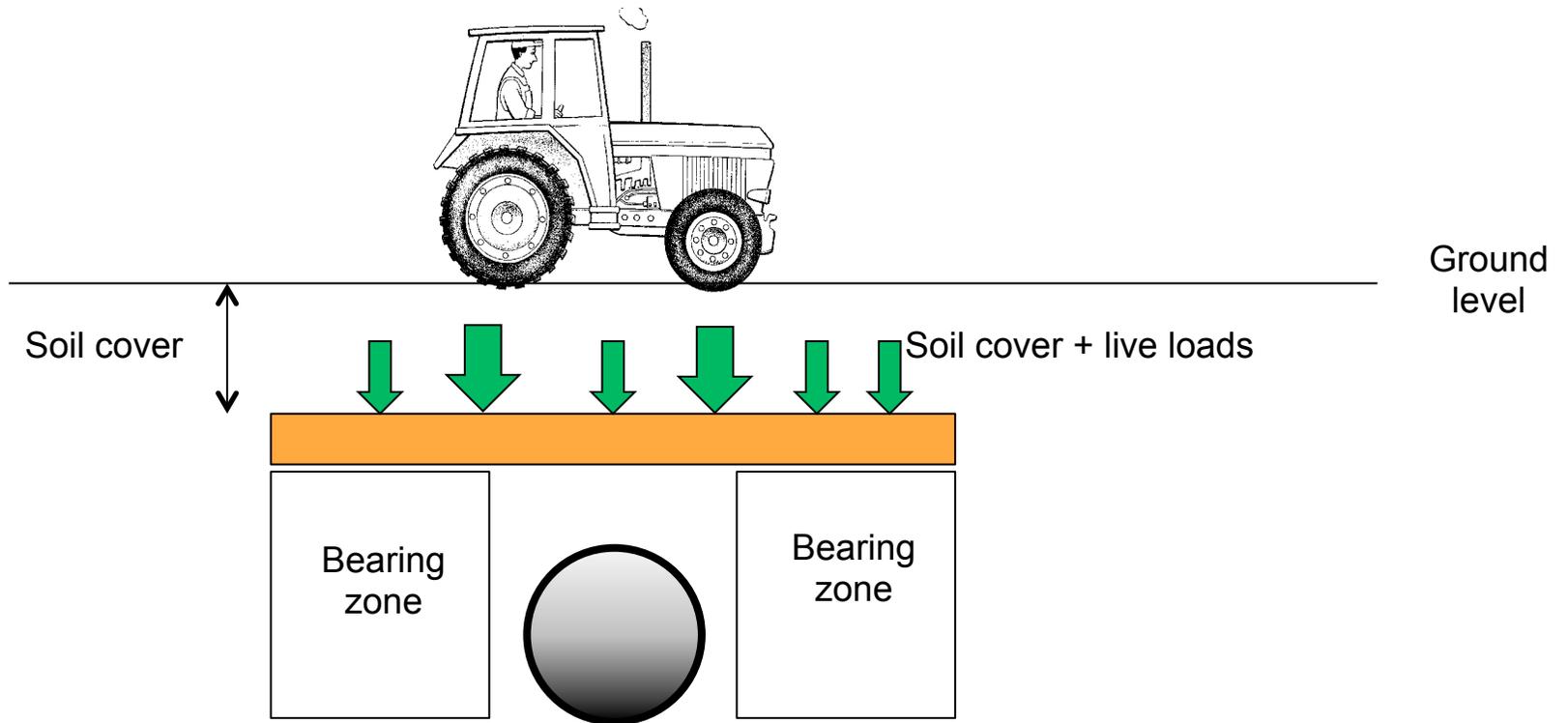
Current LINEWATCH Guidance



UKOPA Specification Guidance



Design Basis



Design Checks

•Slab moment capacity from BS EN 1992-2:2005 = 43.5 kN.m

Design check	Highest loading	Minimum FoS
1	Simply supported beam, UDL for 1.4 m soil cover	3.0
2	Simply supported beam, agricultural load	1.7
3	Beam element model 3.2m slab 1.4m soil cover and agricultural load	1.7
4	Meyerhof patch load for slab yield line analysis	6.1
5	Shear check to Eurocode 2	12.2

Concrete Slabs - Installation

- Pre-cast and cast in situ slabs allowed.
- The width of the softfill $\sim 1.5 D$ minimum
- The collapse load of the soft fill should not be high ~ 60 kPa or less
- Contraction and expansion joints installed on long cast slabs > 30 m.



Specification Content

- *Specification for impact protection slab*

- *Sections*

- *Standard Design*
- *Materials*
- *Site Preparation*
- *Installation*
- *Workmanship*
- *Drawings*

UKOPA

**UKOPA
Specification**

**Impact Protection
Slabs**

**Document Number:
12631-SPC-001 Rev 1**



Penspen Integrity
Units 7 & 8 Terrace Level
St. Peter's Wharf
Newcastle upon Tyne
NE6 1TZ
Tel: +44 (0)191 238 2200
Fax: +44 (0)191 275 9786
www.penspenintegrity.com

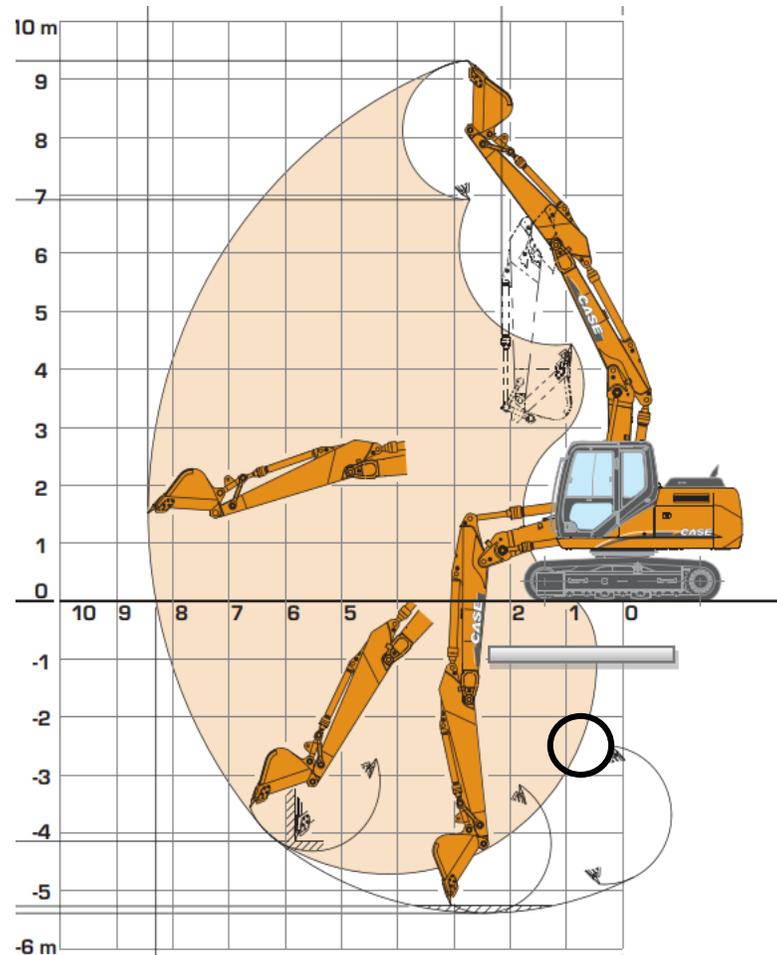
Principal Changes - 1

Property	Existing Linewatch Guidance	Proposed Specification
Slab thickness	230 mm	200 mm
Depth of overburden on slab	Not specified	0.3 m to 1.4 m
Nominal cover on pipe	0.9 m	0.9 m to 2.0 m
Slab to pipe crown	230 mm	450 mm
Lateral encroachment	1 m	1 m
Soft fill	N/A	100 mm

Principal Changes - 2

Property	Existing Linewatch Guidance	Proposed Specification
Concrete grade	C30	C35
Reinforcement type	A393	B785
Reinforcement location	Not specified	50 mm from slab base
Soil check	Existing backfill or clean sand	By competent engineer or CBR \geq 4%
Pipe loading	Unknown – potential increase for stiff pipe ring	Nominal due to bridging and soft fill
Thermal joints	Not specified	In situ contraction and expansion joints plus pre-cast option.

Lateral Encroachment



Large Vehicles

