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Petrochemicals Operating Procedure – Level 2

Procedure number CCPL 4.40

Standard Conditions for Work in Close Proximity to High Pressure Ethylene Pipelines

Approved by:	G Pailor	Date	March 2014
Owning Manager:	G Pailor	(Phone number) 4273	

REVISION	DATE	DESCRIPTION
1	01-10	First Issue
2	09-10	Wind turbine siting added. Temporary crossing amended.
3	03-11	Wind Turbine data updated
4	03-14	General Revision



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1 PURPOSE

This document sets out the standard engineering conditions considered necessary to ensure the safety and integrity ethylene pipelines when third party work is being carried out, both at the design and construction stages, in close proximity to the pipelines.

2 SCOPE

This document applies to the Wilton to Grangemouth (WGEP), Trans-Pennine (TPEP), including the Lostock Spur and Holford Link, and Teesside to Salt End (TSEP) Ethylene Pipelines.

With respect to the design and construction of new work and the maintenance of existing work in close proximity to the pipeline, all costs associated with meeting the standard engineering conditions contained in this document are the responsibility of the promoter of the work.

Normal agricultural activities which result in ground disturbance to a maximum depth of 300mm are not within the scope of this document.

3 REFERENCES

Contact Details for Wilton and Runcorn Pipeline Offices

Wilton Office

Ethylene Pipeline Office

SABIC UK Petrochemicals

Olefins Offices

PO Box 99

Wilton Site

Redcar

TS10 4YA

Telephone:-

Office: 01642 834 531

Messages: Freephone 0800 318105

Runcorn Office

Ethylene Pipeline Office

SABIC UK Petrochemicals

CK Site

PO Box 9

Weston Point

Runcorn


Cheshire

WA7 4JE

Telephone:

Office: 01928 512 677

Message: Freephone 0800 318105

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4 DEFINITIONS

None.

5 SHE

5.1 Safety Procedures In the Event of Damage to the Pipeline

The following steps should be followed in the event of any damage to the pipeline during work activities:

- Remove all personnel from the vicinity of the incident.
- Shutdown all working plant and extinguish all naked flames in the vicinity of the incident.
- Remove all sources of ignition within an area 350 metres upwind and 750 metres downwind of the incident.
- Dial 999 to inform the Police and Emergency Services of the incident.
- **Contact SABIC UK at Wilton on 01642 452461, at Runcorn on 01928 572580 or Freephone 0800 318105.**
- Prevent the approach of traffic and members of the general public to the vicinity of the incident.
- Assist in safeguarding persons and property as necessary or as requested by the Police and Emergency Services.
- Do not attempt to seal a leaking pipeline.
- If the leak is burning do not attempt to extinguish the fire.


6 DESCRIPTION

6.1 Notification

The Pipeline Team are required to be notified in advance of any third party work within **50 metres** of the ethylene pipelines (other than normal agricultural activities) that may pose a threat to the safety and integrity of the pipeline. The pipeline can then be accurately located and clearly identified and all work in close proximity to it can then be controlled or monitored via the SABIC UK Approval to Work system.

Typical notifiable activities include:-

- Road/rail construction
- Installation of underground services
- Installation of overhead services
- Trial excavations or site investigation works

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- Trial boring or core sampling
- Water dredging
- Tree planting or felling
- Use of explosives
- Drainage works
- Mole ploughing
- **Sub-soil ploughing**
- Fencing
- New or upgrading of existing tracks
- Excavation pits for burial of animal carcasses
- Burning of scrub or rubbish

6.2 Control of Work


No work is permitted within the pipeline way leave, (3 metres either side of the pipeline), unless prior formal consent has been granted by SABIC UK Pipeline Team.

Where formal consent has been granted adequate notice is required before the commencement of work to enable a Pipeline Superintendent to be represented on the site and to ensure an **Approval to Work Form** has been agreed and signed by both parties. Sample shown in Appendix 1.

Before any work is carried out in the pipeline wayleave the Pipeline Superintendent will locate and peg out the line. The Pipeline Superintendent will also control the excavation of any trial holes necessary to confirm the position and depth of the pipeline.

The Pipeline Superintendent is the SABIC Pipeline Team representative who is responsible for maintaining the safety and integrity of the pipeline. He will control or monitor all third party work in close proximity to the pipeline and has the power to stop the work from proceeding if he believes that the safety or integrity of the pipeline is being threatened as a result of these activities. The actions of the Pipeline Superintendent do not remove the responsibility of the promoter of the work, his servants, agents and contractors for compliance with the requirements of the conditions contained in this document.

Where piling operations or other activities that may give rise to excessive vibration are required local to the route of the existing pipeline a suitable scheme of vibration monitoring shall be agreed with SABIC prior to work commencing.

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The following specific restrictions apply to all activities within the pipeline wayleave:

- Storage of materials within the wayleave or in the vicinity of above ground pipeline apparatus is not permitted.
- Lighting of fires within the wayleave or in the vicinity of above ground pipeline apparatus is not permitted.
- Hydraulic testing of pipework within the wayleave is not permitted.
- Work sites, plant and equipment must be left in a safe condition at the end of each working day and access to the pipeline must not be obstructed in any way.
- If it is necessary to leave excavations open the excavations must be effectively fenced using fixed hard barriers, in areas open to the public.
- For excavation in areas where livestock may be present, additional protection or arrangements with the landowner to restrict access may be required.

6.3 Major Developments


Guidelines for major work in close proximity to the pipeline detailing limits of encroachment for a range of third party activities including piling, opencast mining, land overburden, use of explosives and tree planting are given in the accompanying drawing no: A1/223143 shown in Appendix 3.

Where planning consent has been granted for a major development in close proximity to the pipeline, it may be necessary for secure demarcation fencing to be erected and maintained on the site at the extent of the wayleave by the promoter of the work. Where required, suitable warning notices advising of the location of the pipeline must be erected and maintained. Suitable crossing points for construction traffic, where required, must be installed at locations approved by the Pipeline Team.

6.4 Services

When a new underground service is to be installed across the pipeline, a design drawing must be submitted to the Pipeline Team for approval prior to construction work commencing.

In general, where a new service is to cross the pipeline, a minimum separation of 300mm must be maintained and the angle of crossing must not be less than 65 degrees. Concrete raft protection must be provided above the pipeline when a new service is to be installed above it. Concrete raft protection must be provided above and below the pipeline when a new service is to be installed below it.

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Where it is necessary to excavate below the pipeline the pipeline must be adequately supported during all stages of the operation to the satisfaction of the Pipeline Superintendent. If exposed, the pipeline coating must be inspected, repaired and double wrapped as necessary to the satisfaction of the Pipeline Superintendent.

A typical design of a new service crossing above the pipeline is detailed in the accompanying drawing no EPP/SK04, Appendix 2. A typical design for a new service crossing below the pipeline is detailed in the accompanying drawing no EPP/SK05, Appendix 2.

New services must be suitably supported to prevent future settlement and backfilling must be carried out to the satisfaction of the Pipeline Superintendent.


The pipeline is protected by a cathodic protection system and extreme care must be exercised during all construction work to avoid damage to cables, connections and test stations. Where a new service which is also protected by a cathodic protection system is installed in close proximity to the pipeline, the Pipeline Team will require interaction tests to be carried out. If the pipeline cathodic protection system is adversely affected, the cost of any remedial action must be met by the promoter of the new service.

A Pipeline Superintendent must be in attendance during the installation or removal of poles and pylons for overhead services such as power transmission lines and telecom services in close proximity to the pipeline. To mitigate the effects of AC induced voltages on the pipeline metal transmission poles and pylons must not be installed within 20 metres of the pipeline.

In line with UKOPA guidelines wind turbines shall be sited a distance of 1.5 x Nacelle height from the pipeline. If this distance is not achievable then the pipeline shall be suitably protected over the entire zone of influence using a suitable designed reinforced concrete slab. The slab shall be designed and located to ensure the pipeline is protected from both turbine fall or blade throw. The design shall ensure that in the event of turbine failure no load is transferred to the ethylene pipeline.

Temporary protection may also be required to protect the pipeline for construction traffic or during more permanent maintenance activities.

For temporary access roads crossing the pipeline type 'A' typical protection as detailed on EPP/SK02, Appendix 2, or similar approved shall be used. The contractor is responsible for ensuring the protection provided is adequate to transfer no additional load to the ethylene pipeline. This type of protection is designed for general light duty construction traffic. Additional protection may be required for to use the crossing for heavy construction vehicles and abnormal loads.

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The design of any crossing or pipe protection shall be agreed with the SABIC pipelines team.

6.5 Roads and Highways

Where a new road is to be installed over the pipeline, permanent protection in the form of a concrete raft extending over the complete width of the roadway, including verges, must be installed by the promoter of the work. A typical road crossing construction is detailed on the accompanying drawing no EPP/SK02, Appendix 2.

For major roads as classified in PD8010-1:2004 a suitably engineered scheme shall be installed, this may take the form of replacing the existing pipe with heavy wall pipe.

Permanent pipeline marker posts will be installed by the Pipeline Team in the verges of all new road and highway crossings.

6.6 Construction Traffic


Construction traffic and other plant having an axle weight in excess of 2 tonnes must only cross the pipeline by public road or at previously agreed temporary crossing points.

The pipeline must be protected at all temporary crossing points by a raft and the construction of the raft must be approved by the Pipeline Team. A typical raft construction for a temporary pipeline crossing in open country is detailed on the accompanying drawing no EPP/SK06, Appendix 2.

Temporary crossing points must be fenced off on both sides over a width not less than the pipeline wayleave and the fencing must extend for an agreed distance parallel to the pipeline along the wayleave boundary.

Suitable warning notices and flags must be erected advising of the location of the pipeline and of the need for construction traffic to use only the designated crossing points. It may be necessary to install lighting at the temporary crossing points in hours of darkness or in foggy conditions.

For stable ground conditions and light duty traffic the use of proprietary 'track mats' may be appropriate to form a crossing. The manufacturer's recommendations and load capability shall be sent to SABIC for approval prior to use.

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6.7 Excavations Within the Pipeline Wayleave

A Pipeline Superintendent must be in attendance at all times when excavation work is being undertaken within the pipeline wayleave and an Approval to Work form must be agreed and signed by both parties.

All excavations within the wayleave must be carried out by hand unless the Pipeline Superintendent specifically authorises the use of power tools. Under such circumstances a method statement must be agreed and approved on Site.


If the use of a JCB or similar type machine is approved the tines must be removed from the ditching bucket and the excavations must be carried out in layers not exceeding 150mm in depth. Trial excavations must be carried out by hand over the pipeline and the exact location of the pipeline must be checked by probing prior to each machine excavated layer being removed.

If it is necessary to expose the pipeline, the pipeline must be adequately supported during all stages of the operation and the condition of the coating must be inspected and repaired as necessary. All damage to the pipeline or coating, whether existing or new, must be brought to the attention of the Pipeline Superintendent.

It is the responsibility of the promoter of the new work to ensure that adequate provision is made for the protection of any foreign material within the extent of the excavation. The promoter is also responsible for ensuring that all aspects of the excavations are in compliance with the appropriate local and national safety regulations governing such work.

6.8 Backfilling Within the Pipeline Wayleave

Backfilling operations within the pipeline wayleave must be carried out in layers up to 300mm deep, to the satisfaction of the Pipeline Superintendent. Each layer must be carefully hand compacted and the backfill material must be free from flints, stones, metal or carbonaceous material within the first 300mm above and below the pipeline and 1 metre either side of the pipeline. Sand padding must be installed around the pipeline if it has been necessary to expose the pipeline.

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7 TRAINING & VALIDATION

The course code for this training package is WSD-420325.

7.1 Training Format

This Plant Instruction is relevant to the following 'job stations' across the CCPL Area:


Job Role	Relevance (✓ / ✗)
Pipeline Manager	✓
Pipeline NE Team Leader	✓
Pipeline NW Team Leader	✓
Pipeline Superintendent (NE)	✓
Pipeline Superintendent (NW)	✓

Individuals working in one or more of the above relevant capacities are required to complete the following Training & Validation procedure, in support of the issue / review of this Plant Instruction (once every 3 years):

- Read the content of this instruction (approx. 90 minutes).


Note: There is no formal validation for this module.


Complete a training & validation record sheet, and submit to Olefins Training Department (total suggested training time: 30 minutes).

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8 APPENDICES

8.1 Appendix 1 – Approval to Work Form (sample)

		
<h2 style="margin: 0;">Approval to Work Form</h2>		
<div style="border: 1px solid black; padding: 5px;"> <p>This form relates only to the Sabic ethylene pipeline apparatus and records the discussion and agreement on the method required for safe working near the cross country pipeline and does not negate other supervisory responsibilities. Any change in scope of work or timing must be agreed with the pipeline</p> </div>		
TPEP / WGEP / TSEP	CROSS-COUNTRY PIPELINES	
Date / /	Mileage:	Record No.
1. Location of works:		
2. Description of works:		
3. Sketch showing approximate position of pipe and works (append as required):		
4. Pipeline detector depth (in metres):		
5. Trial hole required? YES/NO	6. Method agreed? YES/NO	
7. Method of excavation (tick as required):		
<input type="checkbox"/> a. Approved machine work OUTSIDE pegged 3m pipeline easement. <input type="checkbox"/> b. HAND-DIG ONLY INSIDE 3m pipeline easement. <input type="checkbox"/> c. Restricted use of machine inside 3m pipeline easement. <u>PIPELINE REP PRESENT AT ALL TIMES</u>		
8. Other precautions/pipeline protection required/notes:		
9. Dates of work: FROM TO		
Pipeline contact:	Contractor:	
Mobile:	Mobile:	
Office Tel:	Office Tel:	
Sign/Date	Sign/Date	
IF IN DOUBT ASK ! <small>WHITE COPY – CONTRACTOR PINK COPY – OFFICE FILE GREEN COPY – REMAIN IN BOOK</small>		

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8.2 Appendix 2 – Protection Details for Ethylene Pipeline at Vehicular and Service Crossings

Drawings include:-

EPP/SK02 : Type 'A' : Typical protection to ethylene pipeline.

EPP/SK03 : Deleted


EPP/SK04 : Type 'C' : New service above ethylene pipeline.

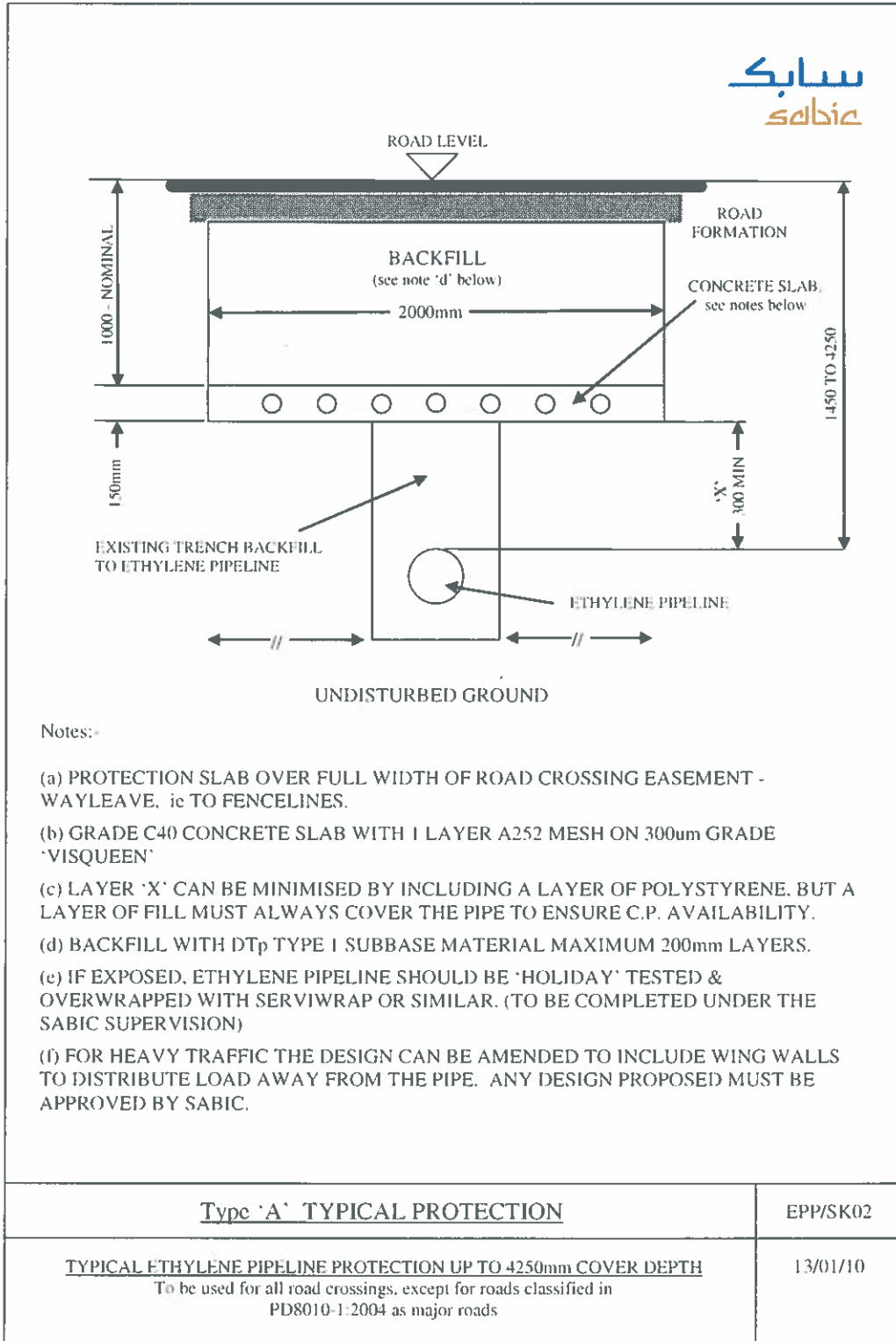
EPP/SK05 : Type 'D' : New service below ethylene pipeline.


EPP/SK06 : Type 'E' : Temporary protection for [access for light duty construction traffic](#) through open country.

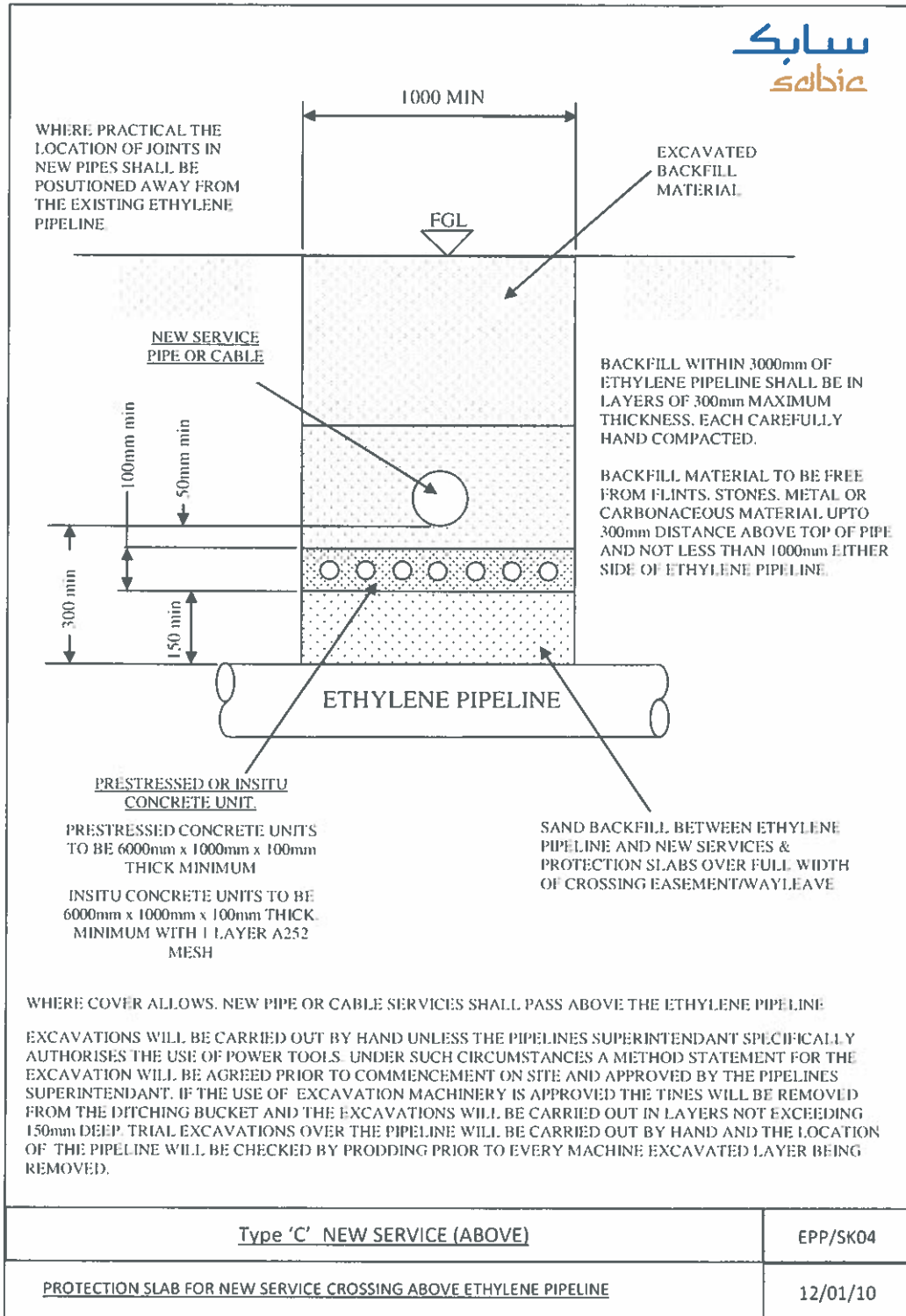
EPP/SK07 : Deleted

EPP/SK08 : Deleted


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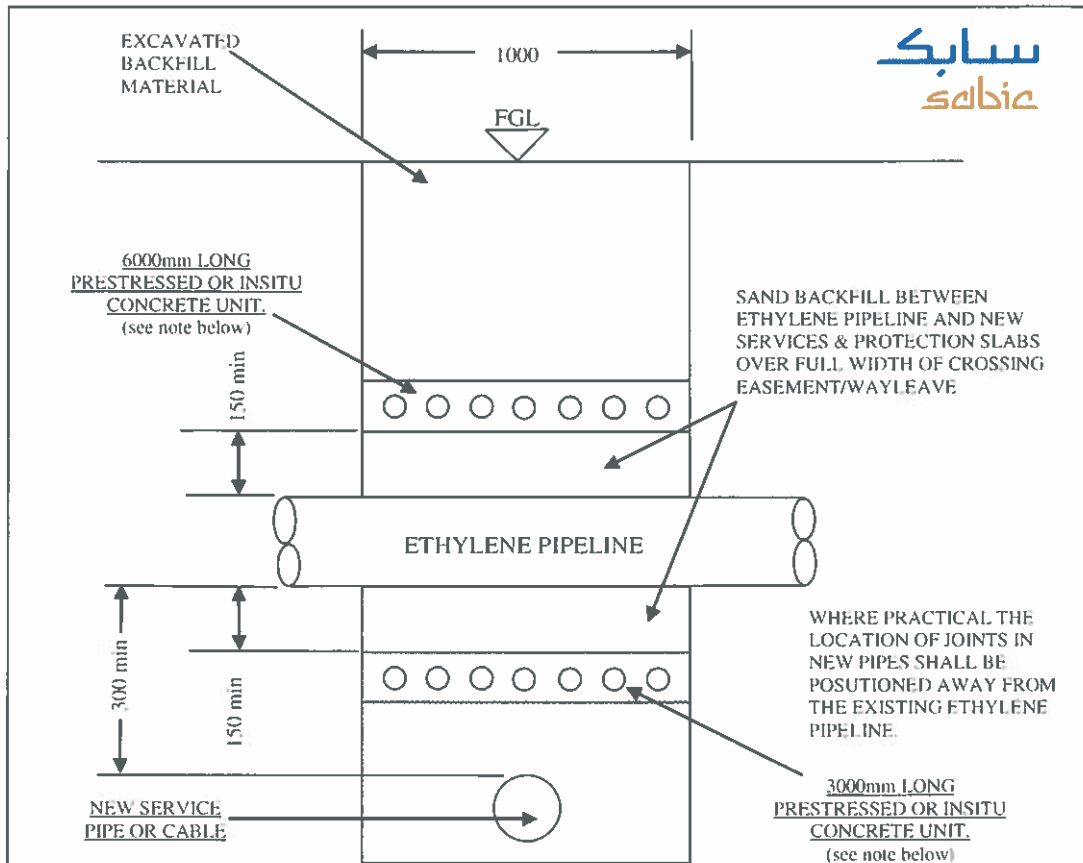


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Type 'C' NEW SERVICE (ABOVE)

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Note:- PRESTRESSED OR INSITU CONCRETE UNITS

PRESTRESSED CONCRETE UNITS TO BE 6000mm x 1000mm x 100mm THICK MINIMUM

INSITU CONCRETE UNITS TO BE 6000mm x 1000mm x 100mm THICK. MINIMUM WITH 1 LAYER A252 MESH

WHERE COVER ALLOWS, NEW PIPE OR CABLE SERVICES SHALL PASS ABOVE THE ETHYLENE PIPELINE

EXISTING PIPELINE TO BE SUITABLY PROTECTED WHEN EXPOSED.


THE PERIOD OF EXPOSURE OF ETHYLENE PIPELINE TO BE MINIMISED.

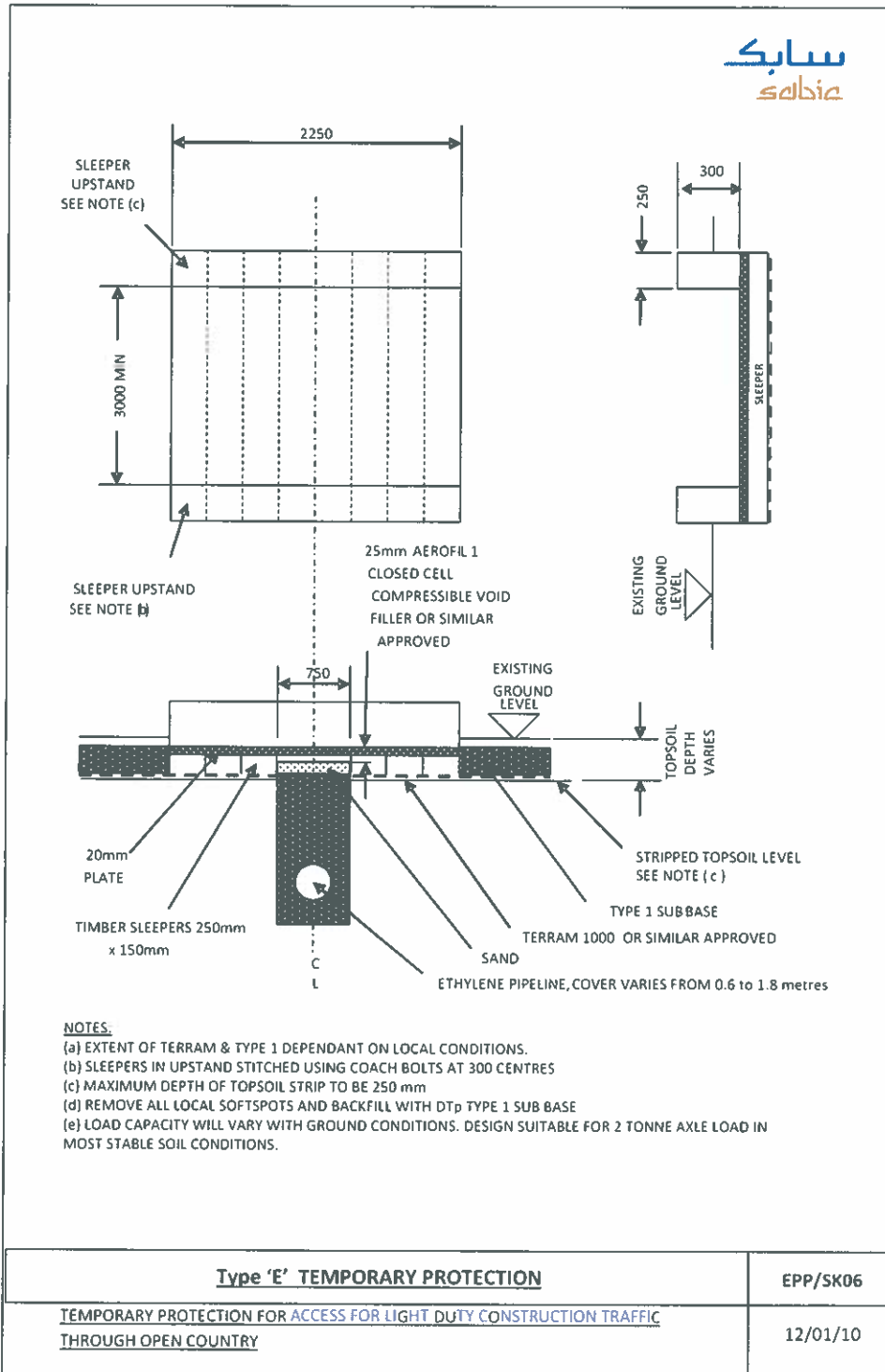
FOR EXCAVATIONS OVER 1.2M DEEP ADEQUATE SUPPORT WILL BE PROVIDED TO THE TRENCH WALLS


THE MAXIMUM UNSUPPORTED LENGTH OF THE ETHYLENE PIPELINE EXPOSED TO BE 2m.

EXCAVATIONS WILL BE CARRIED OUT BY HAND UNLESS THE PIPELINES SUPERINTENDANT SPECIFICALLY AUTHORISES THE USE OF POWER TOOLS. UNDER SUCH CIRCUMSTANCES A METHOD STATEMENT FOR THE EXCAVATION WILL BE AGREED PRIOR TO COMMENCEMENT ON SITE AND APPROVED BY THE PIPELINES SUPERINTENDANT. IF THE USE OF EXCAVATION MACHINERY IS APPROVED THE TINES WILL BE REMOVED FROM THE DITCHING BUCKET AND THE EXCAVATIONS WILL BE CARRIED OUT IN LAYERS NOT EXCEEDING 150mm DEEP. TRIAL EXCAVATIONS OVER THE PIPELINE WILL BE CARRIED OUT BY HAND AND THE LOCATION OF THE PIPELINE WILL BE CHECKED BY PRODDING PRIOR TO EVERY MACHINE EXCAVATED LAYER BEING REMOVED


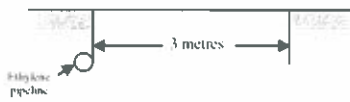

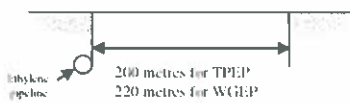
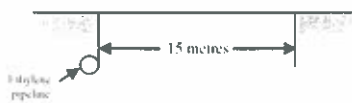
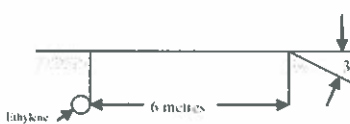
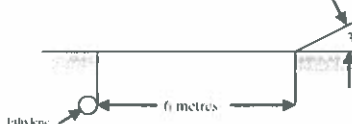
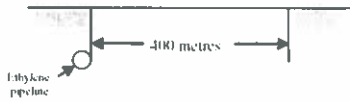
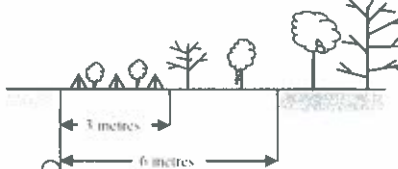
Type 'D' NEW SERVICE (BELOW)	EPP/SK05
<u>PROTECTION SLABS FOR NEW SERVICE CROSSING BELOW ETHYLENE PIPELINE</u>	12/01/10

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8.3 Appendix 3 – Guidelines for Work in Close Proximity to Pipelines

<div style="border: 1px solid black; padding: 5px; display: inline-block;"> GUIDELINES FOR WORK IN CLOSE PROXIMITY TO CROSS COUNTRY PIPELINES </div> 	
<p style="text-align: center;">1. PIPELINE WAYLEAVE</p>  <p style="text-align: center;">NO MECHANICAL WORK WITHIN PIPELINE WAYLEAVE UNLESS APPROVED BY PIPELINE TEAM</p>	<p style="text-align: center;">2. PRE-NOTIFICATION OF WORK</p>  <p style="text-align: center;">PRE-NOTIFY PIPELINE TEAM OF ALL PROPOSED MECHANICAL WORK OTHER THAN NORMAL AGRICULTURAL ACTIVITIES WITHIN 50M OF PIPELINE</p>
<p style="text-align: center;">3. LAND USE PLANNING</p>  <p style="text-align: center;">PLANNING AUTHORITY REFERS ALL LAND USE PLANNING APPLICATIONS WITHIN CONSULTATION ZONE TO HSE FOR COMMENT</p>	<p style="text-align: center;">4. PILING</p>  <p style="text-align: center;">STAND OFF DISTANCE FOR PILING ACTIVITIES</p>
<p style="text-align: center;">5. OPENCAST MINING</p>  <p style="text-align: center;">STAND OFF FOR OPENCAST MINING ACTIVITIES WITH AN ANGLE OF REPOSE OF 30° TO HORIZONTAL</p>	<p style="text-align: center;">6. LAND OVERBURDEN</p>  <p style="text-align: center;">STAND OFF FOR LAND OVER BURDEN WITH AN ANGLE OF REPOSE OF 30° TO HORIZONTAL</p>
<p style="text-align: center;">7. USE OF EXPLOSIVES</p>  <p style="text-align: center;">CONSULTATION DISTANCE FOR USE OF EXPLOSIVES</p> <p style="text-align: center;">VIBROGRAPH SPECIFICATIONS ARE:-</p> <ol style="list-style-type: none"> 1. PEAK PARTICLE VELOCITY < 25mm/sec 2. VIBRATIONAL AMPLITUDE < 0.1mm 	<p style="text-align: center;">8. TREE PLANTING AND RETENTION</p>  <p style="text-align: center;">UP TO 3 metres – SEE SCHEDULE 'A' 3 – 6 metres – SEE SCHEDULE 'B' OVER 6 metres – SEE SCHEDULE 'C' <small>(SEE NEXT PAGE)</small></p>

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SCHEDULE 'A'
UP TO 3 METRES

GROUND COVER INCLUDING ARABLE LAND, PASTURE CROPS, GRASS, BRACKEN, HEATHERS AND LING.
SOFT FRUIT, INCLUDING RASPBERRIES, LOGANBERRIES, GOOSEBERRIES, CURRANTS, ROSES
AND NURSERY SHRUB CROPS.

SCHEDULE 'B'
3 TO 6 METRES

AS BELOW AND RELATED SPECIES

MOST GARDEN SHRUBS, TRUE DWARF CONIFERS,
RHODODENDRONS, SPECIES OF CRATAEGUS, MALUS,
PRUNUS, SORBUS, BETULA, SMALL ACER SPP,
LABURNUM SPP, MAGNOLIA SPP,
AND OTHER SMALL TREES.

OCCASIONAL INDIVIDUAL TREES FROM SCHEDULE 'C'
MAY BE ACCEPTABLE, COPPICE CUT ON UP TO
A FORTY YEAR ROTATION OF SPECIES,
OAK COPPICE ON A FORTY YEAR ROTATION
ORCHARD CROPS OF APPLE, PEAR AND CHERRY, VINES,
AND HOPS.

- ALDER - ALNUS GLUTINOSA
- ALDER BUCKTHORN - FRANGULA ALNUS
- BIRCH - BETULA SPP
- BIRD CHERRY - PRUNUS PADUS
- BLACKTHORN - PRUNUS SPINOSA
- BOX - BUXUS SEMPERVIRENS
- BUCKTHORN - RHAMNUS CATHARTICUS
- CRAB APPLE - MALUS SYLVESTRIS
- CURRANTS - RIBES SPP
- DOGWOOD - THELVERANIA SANGUINEA
- ELDER - SAMBUCUS NIGRA
- FIELD MAPLE - ACER CAMPESTRE
- GORSE - ULEX SPP
- GREY WILLOW - SALIX CINEREA
- GUELDER ROSE - VIBURNUM OPULUS
- HAWTHORN - CRATAEGUS SPP
- HAZEL - CORYLUS AVELLANA
- HOLLY - ILEX AQUIFOLIUM
- JUNIPER - JUNIPERUS COMMUNIS
- PRIVET - LIGUSTRUM VULGARE
- ROSES - ROSA SPP
- ROWAN - SORBUS AUCUPARIA
- SALLOW - SALIX CAPREA
- SPINDLE - EUONYMUS EUROPAEUS
- WHITEBEAM - SORBUS ARIA
- WILD PEAR - PYRUS COMMUNIS
- WILD SERVICE TREE - SORBUS TERMINATIS
- WAYFARING TREE - VIBURNUM LANTANA
- YEW - TAXUS BACCATA

SCHEDULE 'C'
OVER 6 METRES

AMENITY SPECIES FOR NON-RURAL AREAS
AS BELOW & RELATED SPECIES AND VARIETIES.

LARGER ACER SPP, PLATANUS SPP, EUCALYPTUS SPP,
ALANTHUS SPP, ROBINIA SPP, QUERCUS ILEX, GINGKO,
BIBOBA AND NON DWARF CONIFER. OTHER SPECIES
NOT INCLUDED IN THE FOLLOWING COLUMN

- OAKS - QUERCUS SPP
- POPLARS - POPULUS SPP
(APART FROM ASPEN)
- LARGE WILLOW SPECIES - SAXIS SPP
- ELMS - ULMUS SPP
(NOT RECOMMENDED
SINCE DUTCH ELM
DISEASE)
- ASH - FRAXINUS EXCELSIOR
- BEECH - FAGUS SYLVATICA
- SYCAMORE - ACER PSUEDOPLATANUS
- CHERRY - PRUNUS AVIUM
- LIME - TILIA SPP
- HORNBEAM - CARPINUS BETULUS
- ASPEN - POPULUS TREMULOIDES
- SWEET CHESTNUT - CASTANEA SATIVA
- WALNUT - JUGLANS REGIA
- HORSE CHESTNUT - AESCULUS HIPPOCASTA
- OAK - CROPPED ON 40 Yr ROTATION
- CONIFERS (such as)
- PINES - PINUS SPP
- FIRS - ABIES SPP
- SPRUCE S - PICEA SPP
- LARCHES - LARIX SPP
- CYPRESSES - CUPRESSUS SPP &
CHAMAECYPARIS SPP
- HEMLOCK - TSUGA HETEROPHYLLA