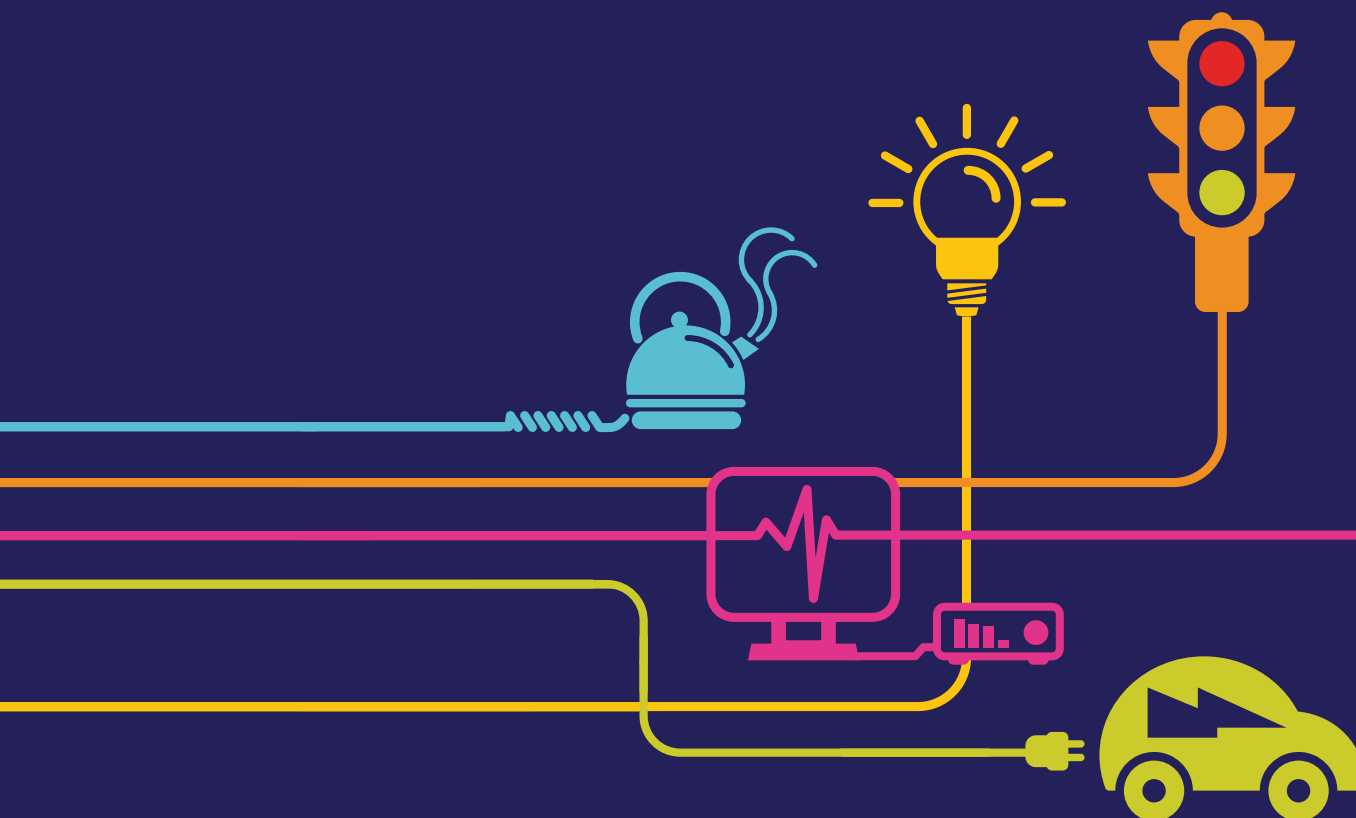


Environmental Statement Project Description Appendices

Hinkley Point C Connection Project

*Regulation 5(2)(a) of the Infrastructure Planning
(Applications: Prescribed Forms and Procedure)
Regulations 2009*



Environmental Statement

Hinkley Point C Connection Project

5.3.2 – Project Description - Appendices

Appendix	Title
3A	Pylon Staking Tables
3B	Preliminary Construction Programmes
3C	Crossings Schedule
3D	Utilities Schedule
3E	Bellmouth Schedule
3F	400kV and 132kV Cable Crossing Schedule
3G	Construction Risk Assessments and Method Statements
3H	T-pylon Construction Information

Document Control			
Document Properties			
Organisation		National Grid	
Author		National Grid and TEP	
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Title		Environmental Statement - Environmental Impact Assessment Approach and Method - Appendices	
Document Reference		Volume 5.3.2	
Date	Version	Status	Description/Changes
09/05/14	A	Live	Final version for DCO submission

Appendix 3A – Pylon Staking Tables

 nationalgrid Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA	Hinkley Point C Connection Project				Drawn:	CFK	Originator Drawing Number:	02_13205_79
	Bridgwater - Seabank 400kV Newbuild Staking table				Checked:	GY	NG Drawing Number:	22/WEA/2438
					Approved:	GY	Revision:	B
					NG Scheme 20897L1		Date:	21/03/2014

DCO Route Alignment Staking Table - Bridgwater Tee to Huntspill Split (L12 / T-Pylon Towers - 2 x 850mm² at 90°C)

DCO Structure Number	S.42 Structure Number	Alignment X Easting (m)	Alignment Y Northing (m)	Tower Offset From Alignment (m)	Tower Centre X Easting (m)	Tower Centre Y Northing (m)	Centreline Z Elevation (m)	Ahead Span (m)	Section Length	Line Angle (deg)	Transverse Axis Azimuth (deg)	Direction	Structure Description	Struct. Height (m) TBC	Height Adjust (m)	Adjusted Structure Height (m)	Elevation at Tower top	Comments / Amendments from Section 42
VQ044R	VQ044R				332308.412	139608.174	6.421			0	187.5836		L8(c) BK DT E3.7	49.988			56.409	
VQ043R	VQ043R	331939.8	139657.25		331939.8	139657.25	5.855	360.6	361	-60.0825	157.552	n/a	L12 DJ E3	52			57.855	CR133/169/192
ZGA1	C-ZGA1				332159.354	139943.268	5.731	330.2	676	0	127.5107		T Pylon D30	34.26	2		41.991	CR133/169/192
ZGA2	C-ZGA2				332360.428	140205.206	5.897	366.8		0	127.5107		T Pylon D30	34.26			40.837	CR133/169/192
ZGA3	C-ZGA3	332571.028	140479.564		332571.028	140479.564	9.234	369.8	610	1.8136	128.4175	R	T Pylon D30	34.26			43.944	CR133/169/192
ZGA4	C-ZGA4				332805.361	140765.616	46.564	239.7		0	129.3243		T Pylon D	34.94			81.504	CR133/169/192
ZGA5	C-ZGA5	332957.285	140951.07		332957.285	140951.07	49.78	335.1	684	28.6077	143.6282	R	T Pylon D30	34.26	1.5		85.54	CR133/139/169/192
ZGA6	C-ZGA6				333267.856	141076.977	45.757	348.8		0	157.932		T Pylon D	34.94	1		81.697	CR133/169/192
ZGA7	C-ZGA7	333591.07	141208.01		333591.07	141208.01	39.49	322.5		-30.0305	142.9168	L	T Pylon D30	34.26	1.5		75.25	CR133/169/192
ZGA8	C-ZGA8				333789.159	141462.452	24.105	343.4	1772	0	127.9016		T Pylon D	34.94			59.045	CR133/169/192
ZGA9	C-ZGA9				334000.11	141733.416	10.807	337.4		0	127.9016		T Pylon D	34.94			45.747	CR133/169/192
ZGA10	C-ZGA10	334207.38	141999.65		334207.38	141999.65	6.952	371.7		-5.8289	124.9871	L	T Pylon D10	34.94			41.892	CR133/169/192
ZGA11	C-ZGA11				334404.772	142314.654	4.79	396.8		0	122.0726		T Pylon D	34.94	2.5		42.23	CR133/169/192
ZGA12	C-ZGA12				334615.456	142650.869	4.737	367.5	367	0	122.0726		T Pylon D30	34.26	4		42.997	CR133/169/192
ZGA13	C-ZGA13	334810.59	142962.27	4.953	334812.827	142957.851	4.959			62.159	153.1521	R	L12 D90 E3	52			56.959	CR133/169/192

ZGA route length (km)*: 4.469

* Excludes section from VQ43R to VQ44R

Average	344
Maximum	397
Minimum	240

Max line angle (°):	62.2
Max Tower height:	52.00

DCO Route Alignment Staking Table - Huntspill Split to Seabank (L12 / T-Pylon Towers - 2 x 850mm² at 90°C)

DCO Structure Number	S.42 Structure Number	Alignment X Easting (m)	Alignment Y Northing (m)	Tower Offset From Alignment (m)	Tower Centre X Easting (m)	Tower Centre Y Northing (m)	Centreline Z Elevation (m)	Ahead Span (m)	Section Length	Line Angle (deg)	Transverse Axis Azimuth (deg)	Direction	Structure Description	Struct. Height (m) TBC	Height Adjust (m)	Adjusted Structure Height (m)	Elevation at Tower top	Comments / Amendments from Section 42
LD1	C-LD1	334029.67	143026.32	-2.13	334028.97	143028.331	5.174	324.7	325	-48.3927	160.6921	L	L12 D55 STD	45.84			51.014	
LD2	C-LD2				334265.218	143249.876	4.745	374.7	1464	0	136.4958		T Pylon D30	34.26	1	35.26	40.005	
LD3	C-LD3				334536.981	143507.808	4.654	344.0		0	136.4958		T Pylon D	34.94	1.5	36.44	41.094	
LD4	C-LD4				334786.467	143744.596	4.999	373.1		0	136.4958		T Pylon D	34.94	1	35.94	40.939	
LD5	C-LD5				335057.07	144001.428	5.019	372.1		0	136.4958		T Pylon D	34.94	2	36.94	41.959	
LD6	C-LD6	335326.99	144257.61		335326.99	144257.61	4.74	344.3	1349	-17.5979	127.6968	L	T Pylon D30	34.26	1	35.26	40	
LD7	C-LD7				335493.367	144559.029	4.791	328.0		0	118.8978		T Pylon D	34.94	-1	33.94	38.731	
LD8	C-LD8				335651.853	144846.151	4.824	350.9		0	118.8978		T Pylon D	34.94	-1	33.94	38.764	CR232
LD9	C-LD9				335821.407	145153.326	4.922	325.7		0	118.8978		T Pylon D	34.94	-1	33.94	39.862	CR232
LD10	C-LD10	335978.79	145438.45		335978.79	145438.45	5.04	359.2	1022	15.251	126.5233	R	T Pylon D30	34.26		34.26	39.3	
LD11	C-LD11				336228.981	145696.187	4.685	331.6		0	134.1488		T Pylon D	34.94	1	35.94	40.625	CR109
LD12	C-LD12				336459.949	145934.122	4.738	331.6		0	134.1488		T Pylon D	34.94	-0.5	34.44	39.178	CR109
LD13	C-LD13	336690.94	146172.08		336690.94	146172.08	5.102	291.4	591	-30	119.1488	L	T Pylon D30	34.26	-1.5	32.76	37.862	CR109
LD14	C-LD14				336762.17	146454.638	5.207	300.0		0	104.1488		T Pylon D	34.94	-3	31.94	37.147	CR109
LD15	C-LD15	336835.49	146745.49		336835.49	146745.49	5.17	372.1		-29.3454	89.4761	L	T Pylon D30	34.26	0.5	34.76	39.86	CR109
LD16	C-LD16				336737.944	147104.604	4.952	399.8	1680	0	74.8034		T Pylon D	34.94	2	36.94	41.892	CR109
LD17	C-LD17	336633.15	147490.401		336633.15	147490.401	5.054	350.0		6.6797	78.1433	R	T Pylon D10	34.94	2	36.94	41.994	CR109
LD18	C-LD18	336581.318	147836.521		336581.318	147836.521	5.388	265.1		10	86.4832	R	T Pylon D10	34.94		34.94	40.328	CR109
LD19	C-LD19				336588.179	148101.507	5.359	292.6		0	91.4832		T Pylon D	34.94	-2	32.94	38.299	CR109
LD20	C-LD20	336595.751	148393.96		336595.751	148393.96	5.174	327.5		26.9125	104.9394	R	T Pylon D30	34.26	-3	31.26	36.434	
LD21	C-LD21	336751.507	148682.076		336751.507	148682.076	5.035	367.4	1062	5.3356	121.0635	R	T Pylon D10	34.94	1.5	36.44	41.475	CR140
LD22	C-LD22				336955.528	148987.631	4.97	367.4		0	123.7312		T Pylon D	34.94	2	36.94	41.91	CR140
LD23	C-LD23	337159.549	149293.187		337159.549	149293.187	5.216	348.3		-29.4108	109.0259	L	T Pylon D30	34.26		34.26	39.476	CR140
LD24	C-LD24				337185.79	149640.525	5.116	373.8	1859	0	94.3205		T Pylon D	34.94		34.94	40.056	CR140
LD25	C-LD25				337213.948	150013.231	5.336	380.8		0	94.3205		T Pylon D	34.94	1	35.94	41.276	
LD26	C-LD26				337242.635	150392.943	5.038	382.0		0	94.3205		T Pylon D	34.94	1.5	36.44	41.478	
LD27	C-LD27				337271.409	150773.808	5.188	374.7		0	94.3205		T Pylon D	34.94	2	36.94	42.128	
LD28	C-LD28				337299.601	151146.96	5.216	378.7		0	94.3205		T Pylon D30	34.26	2	36.26	41.476	Tension tower to split section
LD29	C-LD29				337328.127	151545.55	5.209	378.8		0	94.3205		T Pylon D	34.94	1	35.94	41.149	
LD30	C-LD30				337356.667	151902.304	5.564	376.0		0	94.3205		T Pylon D	34.94	1	35.94	41.504	
LD31	C-LD31	337384.989	152277.192		337384.989	152277.192	5.718	336.2	2176	-2.7606	92.9401	L	T Pylon D10	34.94	1	35.94	41.658	CR139
LD32	C-LD32				337394.142	152613.308	5.765	344.0		0	91.5598		T Pylon D	34.94	-1.5	33.44	39.205	CR139
LD33	C-LD33				337403.507	152957.22	5.718	362.7		0	91.5598		T Pylon D	34.94	1	36.94	41.658	CR139
LD34	C-LD34	337413.38	153319.79		337413.38	153319.79	5.878	343.6	989	-5.1751	88.9723	L	T Pylon D30	34.26	0.5	34.76	40.638	CR139
LD35	C-LD35				337391.713	153662.717	6.607	326.6		0	86.3848		T Pylon D	34.94	-1	33.94	40.547	CR232
LD36	C-LD36				337371.117	153988.696	5.782	319.0		0	86.3848		T Pylon D	34.94	-2	32.94	38.722	
LD37	C-LD37	337351	154307.1		337351	154307.1	5.987	222.4	222	-0.2201	86.2747	L	T Pylon D30	34.26	-1.5	32.76	38.747	CR209
LD38A	C-LD38	337320.031	154527.284		337320.031	154527.284	5.92			0	86.1646		Goalpost	16.6		16.6	22.52	CR209
LD38B	C-LD38	337349.033	154529.317		337349.033	154529.317	5.92			0	86.1646		Goalpost	16.6		16.6	22.52	CR209

UNDERGROUND SECTION

UNDERGROUND SECTION

LD39A	SF G 1	341597.02	160583.24		341597.02	160583.24	7.052	164.2		0	74.6264		Goalpost	16.6				CR234
LD39B	SF G 2	341554.71	160557.92		341554.71	160557.92	7.277	187.3	187	0	88.9001		Goalpost	16.6				CR234
	C-LD39A																	
	C-LD39B																	
LD40		341567.449	160744.779		341567.449	160744.779	5.561	182.6		15.7259	98.763	R	T Pylon D30	34.26				CR234
LD41	C-LD40	341628.782	160916.775		341628.782	160916.775	5.102	313.0		-8.4861	105.3829	L	T Pylon D10	34.94		34.94	40.042	CR140
LD42	C-LD41				341689.256	161223.88	4.806	314.3	1435	0	101.1399		T Pylon D	34.94	-2	32.94	37.746	CR140
LD43	C-LD42				341749.971	161532.211	4.938	321.3		0	101.1399		T Pylon D	34.94	-1	33.94	38.878	CR140
LD44	C-LD43				341812.052	161847.481	4.725	303.9		0	101.1399		T Pylon D	34.94	-2	32.94	37.665	
LD45	C-LD44	341870.77	162145.67		341870.77	162145.67	4.25	339.9		-14.6273	93.8262	L	T Pylon D30	34.26	-2	32.26	36.51	
LD46	C-LD45				341850.092	162484.979	4.433	378.6		0	86.5126		T Pylon D	34.94	1	35.94	40.373	
LD47	C-LD46				341827.063	162862.958	4.593	369.2		0	86.5126		T Pylon D	34.94	1	35.94	40.533	CR140
LD48	C-LD47				341804.603	163231.407	4.427	356.3	2524	0	86.5126		T Pylon D	34.94	0.5	35.44	39.677	
LD49	C-LD48				341782.928	163587.073	4.506	370.7		0	86.5126		T Pylon D	34.94		34.94	39.446	
LD50	C-LD49				341760.378	163957.107	4.841	377.8		0	86.5126		T Pylon D	34.94	1	35.94	40.781	
LD51	C-LD50				341737.396	164334.218	4.965	331.0		0	86.5126		T Pylon D	34.94	1	35.94	40.905	
LD52	C-LD51	341717.264	164664.562		341717.264	164664.562	5.27	277.1		-13.7569	79.6341	L	T Pylon D30	34.26	-1	33.26	38.53	
LD53	C-LD52				341635.118	164929.21	5.69	360.2		0	72.7557		T Pylon D	34.94		34.94	40.63	CR232
LD54	C-LD53				341528.346	165273.192	5.492	269.6		0	72.7557		T Pylon D	34.94	2	36.94	42.432	CR233
LD55	C-LD54				341448.413	165530.708	5.47	371.3	2505	0	72.7557		T Pylon D	34.94	2	36.94	42.41	CR233
LD56	C-LD55				341338.357	165885.271	5.463	339.6		0	72.7557		T Pylon D	34.94	1	35.94	41.403	
LD57	C-LD56				341237.697	166209.561	5.642	319.9		0	72.7557		T Pylon D	34.94	-2	32.94	38.582	
LD58	C-LD57				341142.851	166515.122	5.498	313.9		0	72.7557		T Pylon D	34.94	-2	32.94	38.438	
LD59	C-LD58	341049.785	166814.949		341049.785	166814.949	5.816	253.0		6.9915	76.2514	R	T Pylon D10	34.94	-2.5	32.44	38.256	
LD60	C-LD59	341004.759	167083.875		341004.759	167083.875	5.65	301.7	302	30	94.7472	R	T Pylon D30	34.26	-2	32.26	37.91	CR140
LD61	C-LD60	341106.696	167347.837		341106.696	167347.837	5.856	262.8		29.3111	124.4027	R	T Pylon D30	34.26	-2	32.26	38.116	CR140
LD62	C-LD61	341305.2	167520.04		341305.2	167520.04	5.8	338.1		7.9532	143.0348	R	T Pylon D10	34.94	-3	31.94	37.74	
LD63	C-LD62				341588.795	167704.129	5.708	372.3	2454	0	147.0114		T Pylon D	34.94	1	35.94	41.648	
LD64	C-LD63				341901.067	167906.832	5.619	374.8		0	147.0114		T Pylon D	34.94	1	35.94	41.559	
LD65	C-LD64				342215.442	168110.9	5.546	378.5		0	147.0114		T Pylon D	34.94	1	35.94	41.486	
LD66	C-LD65				342532.931	168316.99	5.381	380.3		0	147.0114		T Pylon D	34.94	1	35.94	41.321	
LD67	C-LD66				342851.95	168524.072	4.714	347.0		0	147.0114		T Pylon D	34.94	1	35.94	40.654	
LD68	C-LD67	343143	168713		343143	168713	4	316.8		-8.8272	142.5978	L	T Pylon D30	34.26	-1	33.26	37.26	
LD69	C-LD68				343379.071	168924.139	4.35	303.2	2015	0	138.1842		T Pylon D	34.94	-3	31.94	36.29	CR139
LD70	C-LD69				343605.037	169126.338	4.131	337.3		0	138.1842		T Pylon D	34.94	-1.5	33.44	37.571	CR139
LD71	C-LD70				343856.417	169351.222	4.423	349.2		0	138.1842		T Pylon D	34.94		34.94	39.363	CR139
LD72	C-LD71				344116.709	169594.079	4.175	357.0		0	138.1842		T Pylon D	34.94	-1	33.94	38.115	CR139
LD73	C-LD72	344382.75	169822.079		344382.75	169822.079	4.13	351.7		6.1023	141.2352	R	T Pylon D10	34.94		35.94	40.407	CR139
LD74	C-LD73	344668.276	170027.352		344668.276	170027.352	4.069	346.9		-5.0385	141.7673	L	T Pylon D30	34.26	0.5	34.76	38.829	
LD75	C-LD74				344931.067	170253.803	4.11	354.7		0	139.248		T Pylon D	34.94	1	35.94	40.05	
LD76	C-LD75A				345199.77	170485.348	4.16	372.4	2132	0	139.248		T Pylon D	34.94	1.5	36.44	40.6	
LD77	C-LD75				345481.891	170728.456	4.373	346.8		0	139.248		T Pylon D	34.94		34.94	39.313	
LD78	C-LD76				345744.6	170954.836	4.504	372.9		0	139.248		T Pylon D	34.94	0.5	35.44	39.944	
LD79	C-LD77				346027.098	171198.269	4.538	338.4		0	139.248		T Pylon D	34.94	1	35.94	40.478	
LD80	C-LD78	346283.46	171419.18		346283.46	171419.18	5.072	302.2	576	-30.2491	124.1235	L	T Pylon D30	34.26	-1	33.26	38.332	
LD81	C-LD79				346381.842	171704.919	21.334	274.3		0	108.999		T Pylon D	34.94	-2.5	32.44	53.774	
LD82	C-LD80	346471.126	171964.232		346471.126	171964.232	25.499	331.7	332	29.9065	123.9522	R	T Pylon D30	34.26		34.26	59.759	
LD83	C-LD81	346721.07	172182.23		346721.07	172182.23	33.44	371.5		14.9512	146.3811	R	T Pylon D30	34.26	2	36.26	69.7	
LD84	C-LD82				347054.542	172345.909	39.79	341.5	1155	0	153.8567		T Pylon D	34.94		34.94	74.73	
LD85	C-LD83				347361.125	172496.389	52.41	441.6		0	153.8567		T Pylon D	34.94	1	35.94	88.35	

 Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA	Hinkley Point C Connection Project						Drawn:	CFK	Originator Drawing Number:	02_13205_79
	Bridgwater - Seabank 400kV Newbuild Staking table						Checked:	GY	NG Drawing Number:	22/WEA/2438
							Approved:	GY	Revision:	B
							NG Scheme 20B97L1		Date:	21/03/2014

LD86	C-LD84	347757.525	172690.955			347757.525	172690.955	93.248	250.4			-28.9601	139.3767	L	T Pylon D30	34.26	-3	31.26	124.508		
LD87	C-LD85	347900.772	172896.321			347900.772	172896.321	128.12	246.2			-9.571	120.1111	L	T Pylon D10	34.94	-2	32.94	161.06		
LD88	C-LD86					348006.086	173118.855	131.98	417.4	2213		0	115.3256	T	Pylon D	34.94	-3	31.94	163.92		
LD89	C-LD87					348184.62	173496.111	131.993	260.0			0	115.3256	T	Pylon D	34.94	-2	32.94	164.933		
LD90	C-LD88					348295.838	173731.122	124.246	310.1			0	115.3256	T	Pylon D	34.94	-3	31.94	156.186		
LD91	C-LD89					348428.476	174011.396	101.056	351.3			0	115.3256	T	Pylon D	34.94	2	36.94	137.996		
LD92	C-LD90					348578.754	174328.945	76.8	377.6			0	115.3256	T	Pylon D	34.94	3.5	38.44	115.24		
LD93	C-LD91	348740.297	174670.297			348740.297	174670.297	41.855	206.4	206		-29.9336	100.3588	L	T Pylon D30	34.26	3	37.26	79.115		
LD94	C-LD92	348723.715	174876.032			348723.715	174876.032	18.076	250.7	251		29.2217	100.0028	R	T Pylon D30	34.26	7.5	41.76	59.836		
LD95	C-LD93	348828.13	175103.95			348828.13	175103.95	10.94	268.3			29.2888	129.258	R	T Pylon D30	34.26	-3	31.26	42.2		
LD96	C-LD94	349044.89	175262			349044.89	175262	7.4	280.3	1439		9.3208	148.5623	R	T Pylon D10	34.94	-2	32.94	40.34		
LD97	C-LD95					349295.096	175388.261	6.365	268.2			0	153.2232	T	Pylon D	34.94	-4	30.94	37.305		
LD98	C-LD95A					349534.576	175509.109	8.631	273.3			0	153.2232	T	Pylon D	34.94		34.94	43.571		
LD99	C-LD96					349778.559	175632.229	11.228	348.6			0	153.2232	T	Pylon D	34.94	-1.5	33.44	44.668	Reprofile for min ground clearance	
LD100	C-LD97	350089.78	175789.28			350089.78	175789.28	6.31	275.0	275		6.7541	156.6003	R	T Pylon D30	34.26	3	37.26	43.57	CR114	
LD101	C-LD98					350348.159	175883.438	6.111	275.0	1161		0	159.9773	L	L12 D25 STD	45.3			51.411	CR114	
LD102	C-LD99					350606.534	175977.595	7.228	271.1			0	159.9773	L	L12 D E3	49.5			56.728	CR114	
LD103	C-LD100					350861.222	176070.408	9.88	306.3			0	159.9773	L	L12 D E3	49.5			59.38	CR114	
LD104	C-LD101					351148.964	176175.266	9.963	308.4			0	159.9773	L	L12 D E3	49.5			59.463	CR120	
LD105	C-LD101A	351439.614	176278.415			351436.079	176281.951	9.362	344.1	344		-49.9235	135.0156	L	L12 D55 STD	45.84			55.202	CR120	
LD106	C-LD102	351555.167	176602.556			351555.166	176602.556	12.051	345.9	1095		-2.8675	108.6201	L	L12 D10 STD	45.3			57.351	CR120	
LD107	C-LD103					351657.379	176933.031	9.155	425.2			0	107.1863	L	L12 D E30 Special	76.5			85.655	CR135	
R I V E R A V O N												0	107.1863	L	L12 D E30 Special	76.5			84.577	CR135	
LD108	C-LD104					351783.005	177339.208	8.077	323.5			0	107.1863	L	L12 D E30 Special	76.5				CR135	
LD109	C-LD105	351878.578	177648.217	5		351873.776	177646.823	8.878	305.6	636		-66.7453	253.8136	L	L12 D90 E3	52			60.878	CR135	
LD110	C-LD106					351646.009	177846.435	9.236	330.3			0	40.441	L	L12 D STD	46.5			55.736	CR135	
LD111	C-LD107	351394.607	178060.706			351394.607	178060.706	8.171	273.8		274		8.3646	44.6233	R	L12 D10 E6	51.3			59.471	CR135
LD112	C-LD108	351214.29	178266.72	5		351219.243	178267.404	8.62	245.6		246		66.6711	82.1411	R	L12 D90 E3	52			60.62	
LD113	C-LD109	351319.92	178488.41	2.13		351321.337	178486.82	8.656	301.2		301		45.6209	138.2871	R	L12 D55 E6	51.84			60.496	
LD114	C-LD110	351604.865	178585.982			351604.865	178585.982	7.497	205.6		206		-18.8901	151.6525	L	L12 D25 E6	51.3			58.797	CR226
LD115	C-LD111	351767.299	178711.945	2.13		351767.783	178709.871	7.195	290.0			49.3367	166.8758	R	L12 D55 E9	54.84			62.035	CR226	
LD116	C-LD112					352051.442	178653.907	7.661	358.6		964		0	191.5442	L	L12 D E9	55.5			63.161	CR226
LD117	C-LD113					352402.74	178582.153	7.659	315.4				0	191.5442	L	L12 D E6	52.5			60.159	CR226
LD118	C-LD114	352711.78	178519.03	-2.13		352711.524	178521.145	6.5	358.7	727			-36.8882	173.11	L	L12 D55 E3	48.84			55.34	
LD119	C-LD115					353035.976	178672.443	6.286	368.4			0	154.6759	L	L12 D E3	49.5			55.786		
LD120	C-LD116	353368.97	178830.02			353368.97	178830.02	6.4	338.7	681		-17.8131	145.7694	L	L12 D25 E3	48.3			54.7		
LD121	C-LD117					353616.098	179061.579	6.043	342.4			0	136.8628	L	L12 D STD	46.5			52.543		
LD122	C-LD118	353865.97	179295.71			353865.97	179295.71	6.278	382.3		382		-16.1697	128.778	L	L12 D E3	48.3			54.578	
LD123	C-LD119	354061.088	179624.416			354061.088	179624.416	6.458	321.4	628		-19.7571	110.8146	L	L12 D25 E6	51.3			57.758	CR140	
LD124	C-LD120					354122.056	179939.953	6.367	306.5			0	100.936	L	L12 D E6	52.5			58.867	CR140	
LD125	C-LD121	354180.2	180240.87			354180.2	180240.87	6.71	365.3		716		6.4889	104.1804	R	L12 D10 E6	51.3			58.01	CR119
LD126	C-LD122					354289.591	180589.408	7.248	350.5		0	107.4249	L	L12 D E3	49.5			56.748	CR119		
LD127	C-LD123	354394.558	1809223.85	-2.13		354392.463	180923.463	6.479	358.1	391		-55.7024	79.5737	L	L12 D55 E3	48.84			55.319	CR119	
LD128	C-LD123A					354172.104	181205.751	6.304	33.3			0	51.7225	L	L12 D E3	49.5			55.804	CR119/231	
LD129	C-LD124	354089.3	181311.6			353967.177	181468.601	6.26	199.1		469		46.5628	75.0039	R	L12 D55 STD	45.84			52.1	CR119/231
LD130	C-LD125	353993.934	181665.917			353993.934	181665.917	7.127	269.6			-25.8715	85.3496	L	L12 D25 STD	45.3			52.427	CR119/231	
LD131	C-LD126	353912.47	181922.94			353912.47	181922.94	9.57	302.4	302			302	60.3687	L	L12 D25 E3	48.3			57.87	CR119
LD132	C-LD127	353711.42	182148.78			353711.42	182148.78	9.55	54	54		-35.5456	28.7507	L	L12 DT (Mk3) M3	46			55.55		

LD route length (km):	42.26	Average	322	Max line angle (°):	302.4
Portbury option route length (km):	3.47	Maximum	442	Max Tower height:	76.50
		Minimum	33		

DCO Route Portishead Alternative Alignment Staking Table (L12 / T-Pylon Towers - 2 x 850mm² at 90°C)

DCO Structure Number	S.42 Structure Number	Alignment X Easting (m)	Alignment Y Northing (m)	Tower Offset From Alignment (m)	Tower Centre X Easting (m)	Tower Centre Y Northing (m)	Centreline Z Elevation (m)	Ahead Span (m)		Line Angle (deg)	Transverse Axis Azimuth (deg)	Direction	Structure Description	Struct. Height (m)	Height Adjust (m)	Adjusted Structure Height (m)	Elevation at Tower top	Comments / Amendments from Section 42
LD93	C-LD91	348740.297	174670.297		348740.297	174670.297	41.855	206.4	206	-29.9336	100.3588	L	T Pylon D30	34.26	3	37.26	79.115	
P-LD94	P-LD92	348723.715	174876.032		348723.715	174876.032	18.076	358.5	1071	-5.1824	82.8008	L	T Pylon D30	34.26	7.5	41.76	59.836	
P-LD95	P-LD93	348662.747	175229.358		348662.747	175229.358	6.116	337.4		-10.0009	75.2092	L	T Pylon D10	34.94		34.94	41.056	CR124/179
P-LD96	P-LD94				348548.501	175546.84	5.994	374.7		0	70.2088	T	Pylon D	34.94		34.94	40.934	CR124/179
P-LD97	P-LD95	348421.64	175899.379		348421.64	175899.379	6.5	337.0		30	85.2088	R	T Pylon D30	34.26	4.5	38.76	45.26	CR124/179
P-LD98	P-LD96	348481.36	176230.995		348481.36	176230.995	6.249	349.6		6.991	103.6992	R	T Pylon D10	34.94	4	38.94	45.189	CR124/179
P-LD99	P-LD97	348584.67	176564.95		348584.67	176564.95	7.19	288.4	288	29.7478	122.0636	R	T Pylon D30	33.67		33.67	40.86	
P-LD100	P-LD98	348795.38	176761.87		348795.38	176761.87	7.08	318.0	288	29.6988	151.787	R	T Pylon D30	34.26	1.5	35.76	42.84	CR121
P-LD101	P-LD99	349104.73	176835.36		349104.73	176835.36	11.791	310.1		23.7288	178.5008	R	T Pylon D30	34.26	1	35.26	47.051	CR121
P-LD102A	P-LD99A				349409.785	176779.564	9.391	376.6		0	190.3652	T	Pylon D	34.94	1.5	36.44	45.831	CR121
P-LD102B	P-LD99B	349780.205	176711.812		349780.205	176711.812	9.399	339.1	2114	-2.2406	189.2448	L	T Pylon D10	34.94	1	35.94	45.339	CR121
P-LD102C	P-LD99C				350115.896	176663.889	9.93	353.0		0	188.1245	T	Pylon D	34.94	2	36.94	46.87	CR121
P-LD103	P-LD99D				350465.355	176614.001	9.148	371.3		0	188.1245	T	Pylon D	34.94	3	37.94	47.088	CR121
P-LD104	P-LD100				350832.889	176561.533	8.802	364.4		0	188.1245	T	Pylon D	34.94	3.5	38.44	47.242	CR121
P-LD105	P-LD101	351193.66	176510.03		351193.66	176510.03	11.817	373.2	373	-22.4809	176.8841	L	T Pylon D30	34.26	4	38.26	50.077	CR121
P-LD106	P-LD102	351555.165	176602.555	-2.13	351553.7	176604.101	12.051			-58.2649	136.5112	L	L12 D55 E6	51.84			63.891	CR120

Hinkley Seabank 400kV OHL - Associated WPD Works staking table										Doc no.	02_12342_71		Rev. E
Tower no.	Location	Tower type		Extension	Conductor Type	Bundle Type	Easting (X)	Northing (Y)	Transverse Axis Azium (deg)	Route Length	Tension	Suspension	Foundation type
DA2R	Seabank	L7c DT	SEP	E3	Rubus	Single	353786.865	182140.012	0.001		1		Pd
BW2R	Seabank	L7c DT	SEP	STD	Rubus	Single	353884.517	182089.216	39.304		1		Pd
G42R	Seabank	L7c DT	SEP	STD	Upas	Single	353854.896	182069.255	39.854		1		Pd
G31R	Avonmouth (NE)	L7c DT	SEP	STD	Upas	Single	354164.545	179704.132	109.689		1		Pd
BW28R*	Avonmouth (S)	L7c DT	SEP	STD	Zebra	Single	351552.196	176454.644	139.825		1		Cn
BW29A*	Avonmouth (S)	L7c DT	SEP	E3	Zebra	Single	351400.168	176411.409	174.286		1		Cn
BW36R*	Portishead	L7c DT	SEP	STD	Zebra	Single	349032.254	176767.772	190.464				Cn
W36R	Nailsea	L7c DT	SEP	STD	Upas	Single	345573.561	169444.251	99.458		1		Ec
Y1R	Churchill	L4m DJT	SEP	E3	Upas	Single	345423.469	162150.851	54.773		1		Cn
N15R	Sandford	L4m DJT		STD	Upas	Single	341781.147	160154.602	21.096		1		Cn
N16A	Sandford	W Pole			Upas	Single	341755.081	160174.216	49.479	0.282km	1		screw pile
N17A	Sandford	W Pole			Upas	Single	341709.087	160242.73	56.133			1	screw pile
N18A	Sandford	W Pole			Upas	Single	341660.138	160318.773	85.978		1		screw pile
N19A	Sandford	W Pole			Upas	Single	341684.184	160370.993	86.068		1		screw pile
N20A	Sandford	W Pole			Upas	Single	341674.063	160386.826	57.412		1		screw pile
N16B	Sandford	W Pole			Upas	Single	341772.184	160184.584	60.637	0.284km	1		screw pile
N17B	Sandford	W Pole			Upas	Single	341725.799	160253.715	56.133			1	screw pile
N18B	Sandford	W Pole			Upas	Single	341682.893	160320.373	85.978		1		screw pile
N19B	Sandford	W Pole			Upas	Single	341710.384	160380.075	86.068		1		screw pile
N20B	Sandford	W Pole			Upas	Single	341696.784	160401.351	57.412		1		screw pile
AT25R	AT route diversion	L7c DT		E3	Lynx to Upas	Twin to single	340284.43	162531.94	193.466	2.2km	1		Pd
AT26R	AT route diversion	L4m D60		STD	Upas	Single	340563.23	162441.2	225.507		1		Pd
AT27R	AT route diversion	L4m D		E3	Upas	Single	340652.732	162148.708	252.986			1	Pd
AT28R	AT route diversion	L4m D		STD	Upas	Single	340737.974	161870.138	252.986			1	Pd
AT29	AT route diversion	L4m D		STD	Upas	Single	340813.217	161624.245	252.986			1	Pd
AT30	AT route diversion	L4m D30		STD	Upas	Single	340889.29	161375.64	244.314		1		Pd
AT31	AT route diversion	L4m D		E3	Upas	Single	341058.198	161128.568	235.642			1	Pd
AT32	AT route diversion	L4m D30		STD	Upas	Single	341227.11	160881.49	221.419		1		Cn
AT33	AT route diversion	L4m DT	SEP	STD	Upas	Single	341419.23	160782.77	207.196		1		Cn
* Towers BW28R + BW29A are for Portbury route, BW36R is for Portishead alternative route											Totals		
										Lattice	14	4	
										wood pole	8	2	

Cn = Standard concrete
Ec = Extended concrete
Pd = Piled

* Towers BW28R + BW29A are for Portbury route, BW36R is for Portishead alternative route

Tower Position moved from S.42

Tower Type/Height changed from S.42

nationalgrid Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA	Hinkley Point C Connection Project							Drawn:	DA	Originator Drawing Number:	P075/3150
								Checked:	RH	NG Drawing Number:	22/WEA/3109
	Hinkley Point 400kV Newbuild Staking table							Approved:	MG	Revision:	1
								NG Scheme 20832		Date:	05/08/2013

R1 Hinkley Point Staking Table (L8c Towers - 2 x 620mm² at 170°C)

Structure Number (Final)	Alignment X Easting (m)	Alignment Y Northing (m)	Tower Offset From Alignment (m)	Tower Centre X Easting (m)	Tower Centre Y Northing (m)	Centerline Z Elevation (m)	Ahead Span (m)	Line Angle (deg)	Transverse Axis Azimuth (deg)	Direction	Structure Description	Struct. Height (m)	Height Adjust (m)	Elevation at Tower top (m)	Comments
VQ1	320592.5	145402.5		320592.5	145402.5	14	331		233.9208		L8(c) BK DT M3.7	42.673		56.673	Ground level 14m
VQ2	320807.16	145149.77	-1.828	320808.019	145151.383	6.89	282	-43.2211	28.0461	L	L8(c) bk d60 SH	44.5		51.39	
VQ3				321088.282	145118.061	5.905	361		186.4355		L8(c) BK D SH	46.431		52.336	
VQ3A				321447.129	145077.584	8.906	358		186.4355		L8(c) BK D E3.7	50.089		58.995	
VQ3B	321802.5	145037.5		321802.5	145037.5	14.72	396	26.5152	199.6931	R	L8(c) BK d30 sh	43.815		58.535	
VQ4	322134.89	144822.05		322134.89	144822.05	7.86		-10.2068	211.8473	L	L2 D30 E12 BK IMP_TGN161	45.491	-0.2	53.151	Existing Structure
ZZ1	320535.005	145387.005		320535.005	145387.005	14	353		237.8577		L8(c) BK DT M3.7	42.673		56.673	Ground level 14m
ZZ2	320745.82	145102.43	-1.828	320746.732	145104.014	10.34	278	-47.0468	29.9453	L	L8(c) bk d60 SH	44.5		54.84	
ZZ3				321022.703	145071.266	7.959	338		186.4219		L8(c) BK D SH	46.431		54.39	
ZZ4				321358.56	145033.463	11.38	366		186.4219		L8(c) BK D SH	46.431		57.811	
ZZ5	321722.5	144992.5		321722.5	144992.5	14.63	439	28.9592	200.9015	R	L8(c) bk d30 E3.7	47.473		62.103	
ZZ7	322080.5	144738.26	1.067	322079.632	144737.639	9.02		38.0877	237.425	R	L2 D60 E12 BK IMP_RHD	46.558	-0.25	55.328	Existing Structure
JP1	320702.5	145447.5		320702.5	145447.5	14	297		211.9589		L8(c) BK DT M3.7	42.673		56.673	Ground level 14m
JP2	320947.5	145277.5	-1.828	320947.673	145279.32	5.1	319	-58.6204	5.4457	L	L8(c) bk d60 SH	44.5		49.6	
JP3	321240.54	145407.14	-1.828	321239.3	145408.483	4.81	354	-37.7271	317.272	L	L8(c) bk d60 SH	44.5		49.31	
JP4	321319.688	145553.469		321319.688	145553.469	4.86	121	-19.6927	100.5622	L	L8(C) BK SF60°	13.59	-0.5	17.95	Existing Structure ZZ3
JP5	321338.02	145673.05		321338.02	145673.05	5.46	92	8.9675	101.1996	R	L8(C) BK SF60°	13.59	-1.2	17.85	Existing Structure ZZ2
JP6	321365.92	145760.56		321365.92	145760.56	6.97			89.0413		L2 BK DT45 SH	44.577	-1.1	50.447	Existing Terminal Structure ZG1
ZG1	321283.31	145759.59		321283.31	145759.59	8.29			89.1354		L2 BK DT45 SH	44.577	-1.1	51.767	Existing Terminal Structure ZZ1

VQ L8c Newbuild route length (km): 1.728

ZZ L8c Newbuild route length (km): 1.774

JP L8c Newbuild route length* (km): 0.970

Average	312
Maximum	439
Minimum	92

Max line angle (°): 58.6

Max Tower height: 50.09

*Includes JP3 - ZG1. Excludes JP3 - JP4 - JP5- JP6

Appendix 3B – Preliminary Construction Programmes

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Proposed Development Components

Proposed Development Component	Proposed Start Date	Proposed Finish Date
400kV Overhead Line 400kV Route	Q1 2016	Q3 2019
400kV Cable Mendip Hills Route	Q4 2015	Q3 2019
Bridgwater Tee 400kV Cable Route	Q1 2016	Q4 2016
AT Route Underground and Overhead Line	Q4 2017	Q2 2018
W Route	Q4 2015	Q3 2017
BW Route Avonmouth Option A	Q4 2015	Q2 2017
BW Route Portishead Option B	Q4 2015	Q2 2017
G Route	26/06/2017	Q2 2018
Seabank BW, G, DA Routes	Q1 2016	Q2 2018
N Route Overhead Line	Q4 2017	Q2 2018
Hinkley Line Entries	Q1 2016	Q4 2018
Y Route Churchill	Q4 2016	Q3 2017
W Route Churchill	Q4 2016	Q3 2017
Sandford 400/132kV Substation	Q3 2016	Q3 2018
Seabank 400/132kV Substation	Q3 2017	Q3 2019
Churchill 132/33kV WPD Substation	Q4 2015	Q3 2017
Portishead 132/33kV WPD Substation	Q2 2017	Q3 2017
Avonmouth132/33kV WPD Substation	Q4 2017	Q2 2018
Removal of Southern Half F Route	Q3 2017	Q3 2018
Removal of Northern Half F Route	Q3 2018	Q4 2019
Removal of 132kV G Route	Q2 2018	Q4 2019

Proposed Development Construction Compounds

Construction Compound Name	Local Authority	Proposed Development Component	Anticipated Start Date
1: Bridgwater Tee (Bath Road)	Sedgemoor District Council	Bridgwater Tee	March 2016
2: A38 Bristol Road (underground cables)	Sedgemoor District Council	400kV underground cables	November 2015
3: A38 Bristol Road (overhead lines)	Sedgemoor District Council	400kV overhead lines	January 2016
4: South of the Mendip Hills (Hams Lane)	Sedgemoor District Council	400kV underground cables	November 2015
5: Barton Road	Sedgemoor District Council	400kV underground cables	December 2015
6: Castle Hill	North Somerset Council	400kV underground cables	January 2016
7: Towerhead Road	North Somerset Council	400kV underground cables	February 2016
8: Sandford Substation	North Somerset Council	Sandford	September 2016
9: AT Route	North Somerset Council	AT Route	October 2017
10: Churchill	North Somerset Council	Churchill	October 2016
11: Engine Lane	North Somerset Council	W Route underground cables	November 2015
12: Nailsea	North Somerset Council	W Route	November 2015
13: Church lane	North Somerset Council	W Route	November 2015
14: Clevedon Road	North Somerset Council	W Route underground cables	November 2015
15: Whitehouse Lane	North Somerset Council	W Route underground cables	November 2015
16: Caswell Hill	North Somerset Council	W Route	November 2015
17: Sheepway	North Somerset Council	W Route	November 2015
18: BW Route (west)	North Somerset Council	BW Route	November 2015
19: BW Route (east)	North Somerset Council	BW Route	November 2015
20: St Andrews Road	Bristol City Council	400kV overhead lines	March 2017
21: Kings Weston Lane	Bristol City Council	G Route	June 2017
22: G Route (east of M49)	Bristol City Council	G Route underground cables	June 2017
23: Seabank (Severn Road)	Bristol City Council	Seabank	July 2017

Appendix 3C – Crossings Schedule



BNI - Highways & Infrastructure
Mott MacDonald Limited
Prince House, 43 - 51 Prince Street
Bristol, S1 4PS
United Kingdom

Comments: For Information
Document Reference: MMD-322069-C-SPR-GEN-XX-0004
Pages: 6
Title: Crossings Survey Schedule
Revision: P5
Date: 21/03/2014
Originator: JS
Checker: EVI
Approver: MS

Crossing measurements have been estimated (where possible), due to either no access or route changes after site survey (some measurements have been obtained from the topographical survey)
Information taken from topographical survey
Information measured during site walkover
Measured from top of bank to water level from topographical survey
Unknown

Bridge
Box Culvert
Circular Culvert
Porous Fill
Unable to assign type

Information present for P1 issue
Information present for P2 issue
Information present for P3 issue
Information present for P5 issue

Haul Road Walk Over Survey Data												Identified Stakeholder (information taken from information provided from drawing models and spread sheets provided)							
Tower Route	Crossing Reference	Previous Schedule Crossing Reference (S/S)	Dimensions if Applicable - Measured on site & taken from topographic survey				Approx. Required Cable Depths (m)	Existing Culvert	Existing Bridge	Proposed Bridge/Culvert Type/Fill	Revision Added	Under the control of the Environment Agency	SSSI	Internal Drainage Board					Farmer / Land Owner
			Total Depth (m)	Water Depth (m)	Width Top (m)	Width Bottom (m)								Lower Severn Drainage Board	North Somerset Levels Internal Drainage Board	River Parrett Rhyme	Axe/Brue Rhyme	Somerset Drainage Board Consortium	
VQ3C	VQ3C-CR01	N/A	0.70	Dry	3.00	2.00	N/A			Box Culvert (2005x990mm)	P1		X						X
	VQ3C-CR02	N/A	0.70	Dry	3.00	1.00	N/A	Yes		Circular Culvert (300mm dia.)	P1								X
VQ043R	VQ043R-CR01	VQ043R-CR05.3	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	VQ043R-CR02	VQ043R-CR05.2	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	VQ043R-CR03	VQ043R-CR05.1	1.66	Unknown	6.50	2.463	N/A			Box Culvert (2005x990mm)	P1								
	VQ043R-CR04	VQ043R-CR05	1.04	Unknown	4.46	1.979	N/A			Box Culvert (1390x990mm)	P1								X
C-ZGA4	C-ZGA4-CR01	N/A	1.90	0.50	3.70	1.20	N/A			Box Culvert (1390x990mm)	P1						X		
	C-ZGA4-CR02	N/A	0.90	Dry	3.60	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-ZGA4-CR03	N/A	1.20	Dry	3.50	1.00	N/A		Yes	Circular Culvert (600mm dia.)	P1								X
	C-ZGA4-CR04	N/A	1.20	Dry	2.70	0.80	N/A			Circular Culvert (600mm dia.)	P1								X
	C-ZGA4-CR05	N/A	0.80	Dry	2.20	0.50	N/A			Circular Culvert (300mm dia.)	P1								X
C-ZGA12	C-ZGA12-CR01	N/A	1.80	Unknown	3.20	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
C-ZGA13	C-ZGA13-CR01	N/A	2.00	0.70	5.00	1.50	N/A			Bridge	P1								X
C-LD3	C-LD3-CR01	ZQ043B-CR01	1.60	Unknown	3.80	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD3-CR02	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	C-LD3-CR03	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	C-LD3-CR04	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	C-LD3-CR05	C-LD1-CR05.1	Unknown	Unknown	Unknown	Unknown	N/A				P1						X		
	C-LD3-CR06	C-LD1-CR05	2.20	1.00	3.00	0.90	N/A			Box Culvert (1390x990mm)	P1						X		
	C-LD3-CR07	C-LD1-CR04	2.40	1.40	3.50	1.00	N/A			Box Culvert (1390x990mm)	P1						X		
	C-LD3-CR08	C-LD1-CR02	2.00	1.00	6.00	2.00	N/A		Yes	Bridge	P1						X		
	C-LD3-CR09	C-LD1-CR03.1	Unknown	Unknown	Unknown	Unknown	N/A				P1						X		
C-LD9	C-LD9-CR01	N/A	2.00	0.70	3.80	Unknown	N/A		Yes	Box Culvert (1390x990mm)	P1								X
	C-LD9-CR02	N/A	2.20	1.10	4.60	1.70	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD9-CR03	N/A	1.30	0.40	3.60	Unknown	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD9-CR04	N/A	2.00	1.00	4.70	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD9-CR05	N/A	2.00	1.00	4.70	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD9-CR06	N/A	1.00	Dry	3.00	0.50	N/A			Circular Culvert (300mm dia.)	P1								X
	C-LD9-CR07	N/A	1.30	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD9-CR08	N/A	2.50	1.00	6.00	2.00	N/A			Bridge	P1						X		
	C-LD9-CR09	N/A	1.20	Dry	4.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD9-CR10	N/A	2.00	1.00	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1						X		
	C-LD9-CR11	N/A	2.00	1.00	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD9-CR12	N/A	2.00	1.00	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
C-LD10	C-LD10-CR01	N/A	1.50	Dry	4.50	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR02	N/A	0.70	Dry	3.60	1.00	N/A			Circular Culvert (300mm dia.)	P1								X
	C-LD10-CR03	N/A	0.80	Dry	3.40	1.00	N/A			Circular Culvert (300mm dia.)	P1								X
	C-LD10-CR04	N/A	1.30	Dry	4.60	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD10-CR05	N/A	1.30	Dry	4.60	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD10-CR06	N/A	1.30	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR07	N/A	1.30	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR08	N/A	1.10	Dry	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR09	N/A	1.00	Dry	5.00	2.00	N/A			Bridge	P1								X
	C-LD10-CR10	N/A	1.70	0.60	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR11	N/A	1.20	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR12	N/A	1.40	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR13	N/A	1.00	Dry	5.00	1.50	N/A			Bridge	P1								X
	C-LD10-CR14	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR15	N/A	1.40	Dry	4.50	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR16	N/A	1.90	0.90	7.80	3.50	N/A		Yes	Bridge	P1	X							
	C-LD10-CR17	N/A	2.00	1.00	4.00	Unknown	N/A			Box Culvert (1390x990mm)	P1	X							

	C-LD10-CR18	N/A	2.10	1.00	4.70	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR19	N/A	1.40	0.50	3.60	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR20	N/A	1.60	0.70	3.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR21	N/A	1.20	Dry	4.20	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR22	N/A	1.80	0.70	5.00	1.30	N/A			Bridge	P1								X
	C-LD10-CR23	N/A	1.80	0.70	5.00	1.30	N/A			Bridge	P1								X
	C-LD10-CR24	C-LD10-CR25	1.50	0.50	8.00	3.00	N/A			Bridge	P1						X		
	C-LD10-CR25	C-LD10-CR26	1.00	Unknown	4.00	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR26	C-LD10-CR28	1.40	0.60	5.00	1.80	N/A	Yes		Bridge	P1								X
	C-LD10-CR27	C-LD10-CR29	Unknown	Unknown	Unknown	Unknown	N/A				P1								
	C-LD10-CR28	C-LD10-CR30	1.30	0.40	2.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR29	C-LD10-CR31	1.20	Dry	4.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR30	C-LD10-CR32	1.00	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR31	C-LD10-CR33	1.00	Unknown	2.50	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR32	C-LD10-CR34	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR33	C-LD10-CR35	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR34	C-LD10-CR36	1.00	Dry	2.80	1.20	N/A			Box Culvert (1390x990mm)	P1					X			
	C-LD10-CR35	C-LD10-CR37	Unknown	Unknown	Unknown	Unknown	N/A				P1					X			
	C-LD10-CR36	C-LD10-CR38	1.70	0.80	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR37	C-LD10-CR40	1.50	0.50	3.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD10-CR38	C-LD10-CR41	1.60	0.70	4.20	1.70	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR39	C-LD10-CR42	1.60	0.70	4.20	1.70	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR40	C-LD10-CR42.1	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR41	C-LD10-CR42.2	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR42	C-LD10-CR43	1.80	1.00	3.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR43	C-LD10-CR44	1.80	1.00	4.50	2.00	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD10-CR44	C-LD10-CR44.1	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR45	C-LD10-CR44.2	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR46	C-LD10-CR44.3	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR47	C-LD10-CR44.4	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR48	C-LD10-CR44.5	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR49	C-LD10-CR44.6	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR50	C-LD10-CR44.7	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR51	C-LD10-CR44.8	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR52	C-LD10-CR44.9	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR53	C-LD10-CR45.1	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR54	C-LD10-CR45.2	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR55	C-LD10-CR45.3	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR56	C-LD10-CR45.4	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR57	C-LD10-CR45.5	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD10-CR58	C-LD10-CR45.6	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
C-LD38	C-LD38-CR01	400-UG-CR02.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	C-LD38-CR02	400-UG-CR04	0.90	0.10	4.128	1.514	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD38-CR03	N/A	1.40	0.10	4.50	1.70	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD38-CR04	N/A	1.70	0.70	4.00	2.70	N/A			Box Culvert (2005x990mm)	P1								X
400-UG	400-UG-CR01	400-UG-CR00.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR02	400-UG-CR01	1.01	Dry	5.079	3.00	1.650			Bridge	P1								X
	400-UG-CR03	400-UG-CR02	1.40	0.50	2.707	1.900	1.900	Yes		Box Culvert (2005x990mm)	P1					X			
	400-UG-CR04	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR05	400-UG-CR05	1.53	1.20	6.00	3.191	2.150			Bridge	P1					X			
	400-UG-CR06	400-UG-CR06	1.03	0.60	2.669	1.20	1.650			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR07	400-UG-CR07	1.27	Dry	4.075	1.651	1.900			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR08	400-UG-CR08	1.68	0.48	11.953	8.105	2.150			Bridge	P1					X			
	400-UG-CR09	400-UG-CR09	1.16	Dry	4.32	2.501	1.650			Box Culvert (1390x990mm)	P1								X
	400-UG-CR10	400-UG-CR10	1.23	0.30	3.109	0.575	1.650			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR11	400-UG-CR11	1.55	1.00	4.246	2.00	2.150			Bridge	P1								X
	400-UG-CR12	400-UG-CR12	1.23	Dry	4.427	1.50	2.150			Bridge	P1								X
	400-UG-CR13	N/A	1.23	Dry	5.427	1.50	Unknown			Bridge	P1								X
	400-UG-CR14	400-UG-CR13	1.21	0.10	5.928	2.50	1.900			Bridge	P1								X
	400-UG-CR15	400-UG-CR15	1.07	Unknown	11.441	1.60	2.150			Box Culvert (1390x990mm)	P1								X
	400-UG-CR16	N/A	1.21	0.10	5.928	2.50	Unknown			Bridge	P1								X
	400-UG-CR17	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR18	N/A	1.07	Unknown	11.441	1.60	Unknown			Bridge	P1								X

	400-UG-CR19	400-UG-CR16	1.37	0.30	4.097	1.10	1.900			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR20	400-UG-CR17	1.70	0.30	4.092	1.50	2.150			Box Culvert (1390x990mm)	P1								X
	400-UG-CR21	400-UG-CR18	4.27	1.00	10.00	4.00	4.000			Bridge	P1	X							
	400-UG-CR22	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P2								X
	400-UG-CR23	N/A	4.27	1.00	10.00	4.00	4.000			Bridge	P1								X
	400-UG-CR24	400-UG-CR19	2.50	0.80	9.249	4.00	2.900			Bridge	P1								X
	400-UG-CR25	400-UG-CR20	1.67	0.40	5.857	2.50	2.150			Bridge	P1								X
	400-UG-CR26	400-UG-CR21	1.50	Dry	4.558	1.50	1.900			Bridge	P1								X
	400-UG-CR27	*400-UG-CR21.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR28	400-UG-CR22	1.00	Dry	4.087	1.00	1.650			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR29	N/A	1.00	Dry	4.087	1.00				Circular Culvert (600mm dia.)	P2								X
	400-UG-CR30	N/A	1.02	Dry	3.677	0.675				Circular Culvert (600mm dia.)	P2								X
	400-UG-CR31	400-UG-CR23	1.02	Dry	3.677	0.675	1.650			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR32	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P2								
	400-UG-CR33	*400-UG-CR23.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR34	*400-UG-CR23.2	0.35	Unknown	3.248	1.999	0.900			Porous Fill	P1								X
	400-UG-CR35	N/A	Unknown	Unknown	Unknown	Unknown					P2								
	400-UG-CR36	400-UG-CR24	1.00	Dry	2.448	1.50	1.400			Box Culvert (1390x990mm)	P1								X
	400-UG-CR37	N/A	1.00	Dry	2.448	1.50				Box Culvert (1390x990mm)	P2								X
	400-UG-CR38	400-UG-CR25	0.77	0.10	5.022	0.741	1.400			Box Culvert (1390x990mm)	P1								X
	400-UG-CR39	N/A	0.77	0.10	5.022	0.741				Box Culvert (1390x990mm)	P2								X
	400-UG-CR40	*400-UG-CR25.1	0.25	Unknown	3.738	0.658	0.650			Porous Fill	P1								X
	400-UG-CR41	*400-UG-CR25.3	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR42	*400-UG-CR25.4	0.63	Unknown	5.036	0.452	1.150			Circular Culvert (300mm dia.)	P1								X
	400-UG-CR43	*400-UG-CR25.5	Unknown	Unknown	Unknown	Unknown	Unknown				P1								X
	400-UG-CR44	400-UG-CR26	0.48	Dry	2.748	1.254	2.150			Box Culvert (1390x990mm)	P1								X
	400-UG-CR45	400-UG-CR27	1.64	0.20	7.473	2.302	2.150			Bridge	P1								X
	400-UG-CR46	400-UG-CR28	0.53	Dry	4.205	0.557	1.150			Box Culvert (1390x990mm)	P1	X							
	400-UG-CR47	400-UG-CR29	0.48	Dry	3.582	0.70	1.150			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR48	*400-UG-CR29.1	0.43	Unknown	4.931	0.70	0.900			Porous Fill	P1								X
	400-UG-CR49	400-UG-CR30	0.73	Dry	3.813	0.611	1.150			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR50	400-UG-CR36	1.33	Dry	4.49	0.995	1.900			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR51	*400-UG-CR36.1	0.31	0.1	3.686	0.50	0.900			Porous Fill	P1								X
	400-UG-CR52	400-UG-CR32	0.68	Dry	3.733	0.954	1.900			Circular Culvert (300mm dia.)	P1								X
	400-UG-CR53	400-UG-CR33	0.85	Unknown	4.124	0.873	1.900			Circular Culvert (600mm dia.)	P1								X
	400-UG-CR54	400-UG-CR34	1.60	Dry	12.77	5.00	2.150			Bridge	P1								X
	400-UG-CR55	*400-UG-CR34.1	0.45	Unknown	6.193	1.50	0.900			Porous Fill	P1								X
	400-UG-CR56	400-UG-CR35	1.20	0.20	3.00	1.00	1.650			Permanent cable and access bridge (Open Span) /Support by a culvert	P1								X
	400-UG-CR57	N/A	1.20	0.20	3.00	1.00	1.650			Bridge	P1								X
	400-UG-CR58	*400-UG-CR35.1	0.14	Unknown	4.408	0.90	0.650			Porous Fill	P1								X
	400-UG-CR59	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P3								X
	400-UG-CR60	N/A	0.60	Dry	Varies	Varies	0.650			Circular Culvert (300mm dia.)	P3								X
C-LD39	C-LD39-CR01	C-LD39-CR0.1	Unknown	Unknown	Unknown	Unknown	N/A				P1				X				
	C-LD39-CR02	C-LD39-CR0.2	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD39-CR03	C-LD39-CR0.3	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD39-CR04	C-LD39-CR01	0.20	Dry	2.50	0.90	N/A			Porous Fill	P1								X
	C-LD39-CR05	C-LD39-CR02	2.20	1.00	2.50	2.50	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD39-CR06	C-LD39-CR03	0.60	Dry	2.20	1.20	N/A			Circular Culvert (300mm dia.)	P1								X
	C-LD39-CR07	C-LD39-CR04	1.46	0.84	3.50	2.10	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD39-CR08	C-LD39-CR05	1.60	0.80	2.80	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD39-CR09	C-LD39-CR06	2.30	1.28	4.40	3.70	N/A			Bridge	P1			X					
	C-LD39-CR10	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD39-CR11	C-LD39-CR07	1.70	1.20	3.50	2.50	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD39-CR12	C-LD39-CR08	1.70	1.10	4.20	2.80	N/A	Yes		Box Culvert (2005x990mm)	P1								X
	C-LD39-CR13	C-LD39-CR09	3.20	1.20	3.40	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD39-CR14	C-LD39-CR10	1.30	0.40	3.50	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	C-LD39-CR15	C-LD39-CR10.1	Unknown	Unknown	Unknown	Unknown	N/A				P1				X				
	C-LD39-CR16	C-LD39-CR10.2	Unknown	Unknown	Unknown	Unknown	N/A				P1				X				
	C-LD39-CR17	C-LD39-CR11	1.80	1.20	3.20	2.50	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD39-CR18	C-LD39-CR12	1.80	1.00	5.00	2.30	N/A			Bridge	P1			X					
	C-LD39-CR19	C-LD39-CR13	2.00	1.00	5.80	2.50	N/A			Bridge	P1								X
	C-LD39-CR20	C-LD39-CR14	1.90	1.00	6.00	2.30	N/A			Bridge	P1			X					
	C-LD39-CR21	C-LD39-CR15	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD39-CR22	C-LD39-CR16	Unknown	Dry	5.50	2.60	N/A			Bridge	P1								X

	C-LD39-CR23	C-LD39-CR17	Unknown	Dry	11.50	5.50	N/A			Bridge	P1								X
	C-LD39-CR24	C-LD39-CR18	0.90	0.20	Unknown	Unknown	N/A				P1								X
	C-LD39-CR25	C-LD39-CR19	0.65	Dry	6.00	3.424	N/A	Yes		Porous Fill	P1								X
	C-LD39-CR25	C-LD39-CR19	0.40	Dry	1.653	0.544	N/A				P1								X
AT Route	AT-Route-CR01	C-LD39-CR20	0.60	Dry	Varies	Varies	0.650			Circular Culvert (300mm dia.)	P1								X
	AT-Route-CR02	N/A	0.20	Unknown	4.149	1.38	Unknown			Porous Fill	P1								X
AT30	AT30-CR01	N/A	0.73	Dry	2.887	1.102	N/A			Circular Culvert (300mm dia.)	P1								X
	AT30-CR02	N/A	2.00	0.75	6.652	2.00	N/A			Bridge	P1			X					
	AT30-CR03	N/A	1.50	Dry	3.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
AT29	AT29-CR01	AT29-CR01.1	0.50	Dry	2.00	0.50	N/A			Circular Culvert (300mm dia.)	P1								X
	AT29-CR02	AT29-CR01	1.20	Dry	3.70	1.30	N/A			Circular Culvert (600mm dia.)	P1								X
	AT29-CR03	AT29-CR02	3.00	0.30	3.00	1.00	N/A			Circular Culvert (600mm dia.)	P1								X
	AT29-CR04	AT29-CR03	0.50	Dry	3.50	2.00	N/A			Circular Culvert (300mm dia.)	P1								X
	AT29-CR05	AT29-CR04	0.50	Dry	3.50	2.00	N/A			Circular Culvert (300mm dia.)	P1								X
	AT29-CR06	AT29-CR05	1.30	0.60	5.50	4.00	N/A			Bridge	P1			X					
	AT29-CR07	AT29-CR05.1	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
Y1R	Y1R-CR01	N/A	1.10	Unknown	Varies	0.447				Circular Culvert (300mm dia.)	P1								X
C-LD53	C-LD53-CR01	N/A	1.80	0.90	3.00	Unknown	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD53-CR02	N/A	1.30	0.70	4.80	3.00	N/A		Yes	Box Culvert (2005x990mm)	P1								X
	C-LD53-CR03	N/A	2.10	0.90	6.50	5.70	N/A		Yes	Bridge	P1			X					
	C-LD53-CR04	N/A	3.40	1.18	11.00	7.00	N/A			Bridge	P1		X	X					
	C-LD53-CR05	N/A	1.20	0.70	4.50	2.00	N/A	Yes		Box Culvert (2005x990mm)	P1			X					X
	C-LD53-CR06	N/A	1.50	0.40	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1			X					X
	C-LD53-CR07	N/A	1.51	0.41	4.01	1.51	N/A			Box Culvert (1390x990mm)	P3			X					X
C-LD54	C-LD54-CR01	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1								X
	C-LD54-CR02	N/A	1.50	0.50	3.50	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR03	N/A	1.50	0.50	3.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR04	N/A	1.50	0.70	3.00	1.50	N/A			Box Culvert (1390x990mm)	P1			X					
	C-LD54-CR05	N/A	1.50	0.70	2.00	1.50	N/A			Box Culvert (1390x990mm)	P1			X					
	C-LD54-CR06	N/A	1.80	0.70	2.00	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD54-CR07	N/A	1.30	0.80	3.50	2.00	N/A			Box Culvert (2005x990mm)	P1				X				
	C-LD54-CR08	N/A	1.80	0.85	3.00	2.50	N/A	Yes		Box Culvert (2005x990mm)	P1			X					
	C-LD54-CR09	N/A	1.90	1.00	3.50	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR10	N/A	1.90	1.00	3.60	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR11	N/A	2.50	1.00	5.00	2.00	N/A			Bridge	P1								X
	C-LD54-CR12	N/A	1.40	0.60	3.00	2.00	N/A			Box Culvert (2005x990mm)	P1								X
	C-LD54-CR13	N/A	1.50	Unknown	4.00	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR14	N/A	1.50	Unknown	4.00	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR15	N/A	1.10	0.50	1.80	1.80	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD54-CR16	N/A	1.90	1.00	5.00	3.40	N/A	Yes		Bridge	P1			X					
	C-LD54-CR17	N/A	1.90	1.00	5.00	3.40	N/A	Yes		Bridge	P1			X					
	C-LD54-CR18	N/A	0.80	Dry	2.90	1.50	N/A			Box Culvert (1390x990mm)	P1								X
C-LD62	C-LD62-CR01	N/A	1.70	0.65	4.20	2.40	N/A			Box Culvert (2005x990mm)	P1							MEADMOOR	
	C-LD62-CR02	N/A	1.00	Dry	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD62-CR03	N/A	1.40	Dry	3.50	Unknown	N/A			Box Culvert (1390x990mm)	P1								X
	C-LD62-CR04	N/A	1.80	Dry	4.20	1.50	N/A			Box Culvert (1390x990mm)	P1								X
C-LD70	C-LD70-CR01	N/A	0.40	Dry	3.00	0.75	N/A			Porous Fill	P1			X					
	C-LD70-CR02	N/A	1.70	0.70	3.10	1.80	N/A			Box Culvert (1390x990mm)	P1			X	X				
	C-LD70-CR03	C-LD70-CR04	0.70	Dry	3.00	1.50	N/A	Yes		Box Culvert (1390x990mm)	P1			X					X
	C-LD70-CR04	C-LD70-CR05	1.90	0.50	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1			X					X
	C-LD70-CR05	C-LD70-CR06	2.00	0.50	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1			X					X
	C-LD70-CR06	C-LD70-CR07	1.70	0.80	4.00	2.00	N/A			Box Culvert (2005x990mm)	P1			X					X
	C-LD70-CR07	C-LD70-CR08	2.40	1.64	8.50	5.50	N/A			Bridge	P1			X					X
	C-LD70-CR08	C-LD70-CR09	1.55	0.70	4.00	1.90	N/A			Box Culvert (1390x990mm)	P1			X					X
	C-LD70-CR09	C-LD70-CR10	0.9/0.7	Dry	4.20	2.00	N/A			Box Culvert (2005x990mm)	P1			X					X
	C-LD70-CR10	C-LD70-CR11	2.00	0.50	3.40	2.00	N/A			Box Culvert (2005x990mm)	P1			X	X				
	C-LD70-CR11	C-LD70-CR12	2.10	0.50	3.30	1.50	N/A			Box Culvert (1390x990mm)	P1			X					X
	C-LD70-CR12	C-LD70-CR13	1.50	0.30	4.90	1.50	N/A			Box Culvert (1390x990mm)	P1			X					X

	C-LD70-CR13	C-LD70-CR14	1.5/1.1	0.45	2.50	1.60	N/A			Box Culvert (1390x990mm)	P1		X				X
C-LD74	C-LD74-CR01	N/A	2.00	0.80	3.50	1.50	N/A			Box Culvert (1390x990mm)	P1		X	X			
	C-LD74-CR02	N/A	1.50	0.50	3.00	1.50	N/A			Box Culvert (1390x990mm)	P1		X	X			
	C-LD74-CR03	N/A	1.50	0.50	3.00	1.80	N/A			Box Culvert (1390x990mm)	P1		X				X
	C-LD74-CR04	N/A	1.70	0.60	5.00	2.70	N/A			Bridge	P1		X				X
	C-LD74-CR05	N/A	2.00	0.70	3.50	1.50	N/A			Box Culvert (1390x990mm)	P1		X				X
	C-LD74-CR06	N/A	1.65	0.40	3.50	1.50	N/A			Box Culvert (1390x990mm)	P1		X				X
	C-LD74-CR07	N/A	1.65	0.40	3.50	1.50	N/A			Circular Culvert (600mm dia.)	P1		X				X
	C-LD74-CR08	C-LD74-CR07	1.90	1.10	3.50	2.00	N/A			Box Culvert (1390x990mm)	P1		X				X
	C-LD74-CR09	N/A	1.30	0.65	2.60	1.00	N/A			Circular Culvert (600mm dia.)	P1		X				X
	C-LD74-CR10	N/A	1.60	0.60	3.30	1.80	N/A			Box Culvert (1390x990mm)	P1		X				X
	C-LD74-CR11	N/A	1.90	0.80	4.00	1.40	N/A			Box Culvert (1390x990mm)	P1		X				X
C-LD76	C-LD76-CR01	N/A	1.70	0.30	4.20	2.00	N/A	Yes		Box Culvert (2005x990mm)	P1		X	X			
	C-LD76-CR02	N/A	2.00	1.00	5.00	2.20	N/A			Bridge	P1		X				X
	C-LD76-CR03	N/A	1.20	Dry	2.80	1.20	N/A			Circular Culvert (600mm dia.)	P1		X				X
	C-LD76-CR04	N/A	1.30	0.40	2.80	1.40	N/A			Box Culvert (1390x990mm)	P1		X				X
C-LD78	C-LD78-CR01	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P3			X			
	C-LD78-CR02	C-LD78-CR01	1.80	0.50	4.00	1.80	N/A			Box Culvert (1390x990mm)	P3		X	X			
W-Route	W-ROUTE-CR01	N/A	1.94	0.217	Varies	14.784	2.400			Bridge	P1						X
	W-ROUTE-CR02	N/A	1.80	0.40	3.50	1.20	Unknown			Box Culvert (1390x990mm)	P1		X	X			
	W-ROUTE-CR03	N/A	0.76	0.15	4.902	1.50	1.400			Box Culvert (1390x990mm)	P1						X
	W-ROUTE-CR04	N/A	1.08	0.25	0.25	Varies	2.150			Box Culvert (1390x990mm)	P1		X	X			
	W-ROUTE-CR05	N/A	1.38	0.90	5.03	2.415	1.900			Box Culvert (2005x990mm)	P1		X	X			
	W-ROUTE-CR06	N/A	0.98	1.10	Varies	Varies	1.400			Bridge	P1		X				X
	W-ROUTE-CR07	N/A	1.31	1.00	11.309	Unknown	1.900			Bridge	P1	X					
	W-ROUTE-CR08	W-ROUTE-CR07.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1						X
	W-ROUTE-CR09	W-ROUTE-CR08	2.02	0.40	5.437	1.60	2.650			Box Culvert (1390x990mm)	P1			X			
	W-ROUTE-CR10	N/A	0.9	Dry	4.2	1.6	Unknown			Box Culvert (1390x990mm)	P1						X
	W-ROUTE-CR11	N/A	2.01	Dry	13.522	2.01	Unknown			Box Culvert (2005x990mm)	P1						X
	W-ROUTE-CR12	W-ROUTE-CR10	2.00	Dry	14.81	2.00	1.400			Bridge	P1						X
	W-ROUTE-CR13	W-ROUTE-CR11	Unknown	Unknown	8.693	Unknown	Unknown				P1						X
	W-ROUTE-CR14	W-ROUTE-CR12	Unknown	Unknown	Varies	Unknown	Unknown				P1						X
C-LD95	C-LD95-CR01	N/A	2.40	0.05	6.00	1.20	N/A		Yes	Bridge	P1	X					
C-LD96	C-LD96-CR01	N/A	1.00	Dry	8.00	Unknown	N/A			Bridge	P1						X
P-LD99	P-LD99-CR01	N/A	L 2.00, R 0.75	Dry	13.654	2.00	N/A			Bridge	P1						X
	P-LD99-CR02	N/A	1.50	1.20	8.308	2.00	N/A			Box Culvert (2005x990mm)	P1						X
	P-LD99-CR03	N/A	1.60	0.50	19.564	1.50	N/A			Box Culvert (1390x990mm)	P1						X
	P-LD99-CR04	N/A	1.50	0.50	Varies	2.00	N/A			Box Culvert (1390x990mm)	P1						X
	P-LD99-CR05	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1						X
BW-P	BW-P-CR01	BW37R-CR01	Unknown	Unknown	Varies	Unknown					P1						X
P-LD101	P-LD101-CR01	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1						X
C-LD114	C-LD114-CR01	N/A	2.00	Dry	4.00	1.50	N/A			Box Culvert (1390x990mm)	P1						X
	C-LD114-CR02	C-LD114-CR01.2	Unknown	Unknown	Unknown	Unknown	N/A				P1						X
G-Route	G-ROUTE-CR01	*G-ROUTE-CR00.1	0.62	Unknown	3.599	Unknown	1.150				P1						X
	G-ROUTE-CR02	G-ROUTE-CR00.2	Unknown	Unknown	Unknown	Unknown	Unknown				P1						X
	G-ROUTE-CR03	G-ROUTE-CR00.3	Unknown	Unknown	9.947	Unknown	Unknown				P1						X
	G-ROUTE-CR04	G-ROUTE-CR01	Unknown	Unknown	7.773	Unknown	Unknown				P1						
	G-ROUTE-CR05	G-ROUTE-CR02	1.60	0.80	6.00	4.00	2.150			Bridge	P1		X				
	G-ROUTE-CR06	G-ROUTE-CR03	1.60	0.80	6.00	4.00	2.150			Bridge	P1		X				
	G-ROUTE-CR07	G-ROUTE-CR03.1	Unknown	Unknown	Unknown	Unknown	Unknown				P1		X				
	G-ROUTE-CR08	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P1						X
	G-ROUTE-CR09	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P1						X
	G-ROUTE-CR10	G-ROUTE-CR04	1.00	Unknown	5.863	1.00	1.400			Bridge	P1		X				
	G-ROUTE-CR11	*G-ROUTE-CR04.1	1.69	0.70	4.84	2.00	Unknown			Box Culvert (2005x990mm)	P1		X				
	G-ROUTE-CR12	G-ROUTE-CR05	1.83	0.70	4.72	2.00	2.150			Box Culvert (2005x990mm)	P1		X				
	G-ROUTE-CR13	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P1						X

	G-ROUTE-CR14	N/A	Unknown	Unknown	Unknown	Unknown	Unknown				P2							X
C-LD118	C-LD118-CR01	*G-ROUTE-CR03.4	Unknown	Unknown	Unknown	Unknown	N/A				P1			X				
C-LD119	C-LD119-CR01	N/A	2.70	1.20	9.00	4.00	N/A			Bridge	P1			X				
C-LD120	C-LD120-CR01	N/A	2.70	1.20	9.00	4.00	N/A			Bridge	P1			X				
	C-LD120-CR02	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P3			X				
C-LD121	C-LD121-CR01	C-LD121-CR01	Unknown	Unknown	Unknown	Unknown	N/A		Yes		P1							X
	C-LD121-CR02	C-LD121-CR01.2	Unknown	Unknown	Unknown	Unknown	N/A				P1							X
	C-LD121-CR03	C-LD121-CR01.3	Unknown	Unknown	Unknown	Unknown	N/A				P1							X
	C-LD121-CR04	C-LD121-CR02	Unknown	Unknown	Unknown	Unknown	N/A				P1							X
	C-LD121-CR05	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P5							X
C-LD125	C-LD125-CR01	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1							X
C-LD127	C-LD127-CR01	N/A	Unknown	Unknown	Unknown	Unknown	N/A				P1							X
Seabank	Seabank-CR01	N/A	2.20	0.50	4.00	2.00	2.650			Circular Culvert (600mm dia.)	P1							X
	Seabank-CR02	N/A	0.60	0.40	3.50	1.50	1.150			Box Culvert (2005x990mm)	P1							X

Appendix 3D – Utilities Schedule



BNI - Highways & Infrastructure
Mott MacDonald Limited
Prince House, 43 - 51 Prince Street
Bristol, S1 4PS
United Kingdom

Comments: For Information

Document Reference: MMD-322069-C-SPR-GEN-XX-0005

Pages: 3

Title: Utility Crossings Schedule

Revision: P

Date: 20/12/2013

Originator: AF

Checker: JS

Approver: JW

Cable Route	Utility Crossing Reference	Utility(s)	Assumed		Trial Holes			Service Providers			Cable installation depth (Edge of Cable) (m)		
			Depth (m)	Diameter (m)	Ref	Depth (m)	Diameter (m)	Ref	Depth (m)	Diameter (m)	Individual Utilities	Multiple utilities	
AT-Route	AT-Route-UTIL01	BT	0.35	0.05							1.00	1.00	
W-Route	W-Route-UTIL01	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL02	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL02.1	Gas	0.60	0.20 - 0.30							1.20	1.20	
	W-Route-UTIL03	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL04	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL05	Surface Water Drainage Virgin Media	Unknown 0.35	Unknown 0.05							Unknown 1.00	Unknown 1.00	
	W-Route-UTIL06	Virgin Media	0.35	0.05								1.00	2.20
		Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20	
		Water	0.75 - 0.90	0.30 - 0.90								2.10	
		Gas	0.60	0.20 - 0.30								1.20	
		Low Voltage	0.45	0.40 - 0.60								1.35	
		Surface Water Drainage	Unknown	Unknown								Unknown	
	W-Route-UTIL07	BT	0.35	0.05								1.00	1.35
		Low Voltage	0.45	0.40 - 0.60								1.35	
	W-Route-UTIL08	Virgin Media	0.35	0.05								1.00	2.10
		Water	0.75 - 0.90	0.30 - 0.90								2.10	
		BT	0.35	0.05								1.00	
	W-Route-UTIL09	Foul Water	0.75 - 0.90	0.30 - 0.90								2.10	2.20
		High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	
		Low Voltage	0.45	0.40 - 0.60								1.35	
		Surface Water Drainage	Unknown	Unknown								Unknown	
		Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20	
		Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20	
		BT Cables	0.35	0.05								1.00	
		Virgin Media	0.35	0.05								1.00	
		Gas	0.60	0.20 - 0.30								1.20	
	W-Route-UTIL10	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL11	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20	
	W-Route-UTIL12	Low Voltage	0.45	0.40 - 0.60								1.35	2.10
		Low Voltage	0.45	0.40 - 0.60								1.35	
		Virgin Media	0.35	0.05								1.00	
		High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	
BT		0.35	0.05								1.00		
Water		0.75 - 0.90	0.30 - 0.90								2.10		
W-Route-UTIL13	Foul Water	0.75 - 0.90	0.30 - 0.90								2.10	2.20	
	Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20		
	High Voltage	0.75 - 0.90	0.40 - 0.60								1.80		
	Low Voltage	0.45	0.40 - 0.60								1.35		
	Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20		
	Virgin Media	0.35	0.05								1.00		
	Gas	0.60	0.20 - 0.30								1.20		
W-Route- UTIL14	BT	0.35	0.05								1.00	2.20	
	Foul Water	0.75 - 0.90	0.30 - 0.90								2.10		
	Water	0.75 - 0.90	0.30 - 0.90								2.10		
	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10		
	Low Voltage	0.45	0.40 - 0.60								1.35		
	Wessex Water	0.75 - 0.90	0.30 - 0.90								2.20		
	Virgin Media	0.35	0.05								1.00		
	Gas	0.60	0.20 - 0.30								1.20		
	BT	0.35	0.05								1.00		
Surface Water Drainage	Unknown	Unknown								Unknown			
W-Route-UTIL15	BT Cables Surface Water Drainage	0.35 Unknown	0.05 Unknown							1.00 Unknown	1.00		
W-Route-UTIL16	Gas	0.60	0.20 - 0.30							1.20	1.20		
W-Route-UTIL17	Water	0.75 - 0.90	0.30 - 0.90							2.10	2.10		

Cable Route	Utility Crossing Reference	Utility(s)	Assumed		Trial Holes			Service Providers			Cable installation depth (Edge of Cable) (m)		
			Depth (m)	Diameter (m)	Ref	Depth (m)	Depth (m)	Ref	Depth (m)	Diameter (m)	Individual Utilities	Multiple utilities	
W-Route	W-Route-UTIL18	Water	0.75 - 0.90	0.30 - 0.90							2.10	2.20	
		Low Voltage	0.45	0.40 - 0.60							1.35		
		Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20		
		Virgin Media	0.35	0.05							1.00		
		Gas	0.60	0.20 - 0.30							1.20		
		BT	0.35	0.05							1.00		
		Surface Water Drainage	Unknown	Unknown							Unknown		
		W-Route-UTIL19.1	Wessex Water Pipes	0.75 - 0.90	0.30 - 0.90								2.20
	High Voltage Cables	0.45 - 1.20	0.40 - 0.60							2.10			
	High Voltage Cables	0.45 - 1.20	0.40 - 0.60							2.10			
	Virgin Media Cables	0.35	0.05							1.00			
	W-Route-UTIL19	BT	0.35	0.05							1.00	2.20	
		BT	0.35	0.05							1.00		
		Virgin Media	0.35	0.05							1.00		
		Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20		
		Surface Water Drainage	Unknown	Unknown							Unknown		
		High Voltage	0.45 - 1.20	0.40 - 0.60							2.10		
	W-Route-UTIL20	Low Voltage	0.45	0.40 - 0.60							1.35	2.10	
		Water	0.75 - 0.90	0.30 - 0.90							2.10		
		Water	0.75 - 0.90	0.30 - 0.90							2.10		
	W-Route-UTIL21	Surface Water Drainage	Unknown	Unknown							Unknown	4.05	
	Wessex Water										4.05		
	W-Route-UTIL22	Wessex Water							31	2.50	1.15	4.05	3.85
		Gas	0.60	0.20 - 0.30					32	2.30	1.15	3.85	
		Surface Water Drainage	Unknown	Unknown								Unknown	
	W-Route-UTIL23	Water	0.75 - 0.90	0.30 - 0.90								2.10	2.10
	W-Route-UTIL23.2	Gas	0.60	0.20 - 0.30								1.20	1.20
	W-Route-UTIL24	Gas	0.60	0.20 - 0.30								1.20	1.20
	W-Route-UTIL25	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10
		High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	
	W-Route-UTIL26	Low Voltage	0.45	0.40 - 0.60								1.35	1.35
	W-Route-UTIL27	Foul Water	0.75 - 0.90	0.30 - 0.90								2.10	4.15
		Wessex Water							43	3.50	0.25	4.15	
	W-Route-UTIL28	Gas	0.60	0.20 - 0.30								1.20	1.20
			0.75 - 0.90	0.30 - 0.90								2.10	
	W-Route-UTIL29	Foul Water										1.95	2.10
		Wessex Water							46	1.40	0.15	1.35	
		Low Voltage	0.45	0.40 - 0.60								1.35	
	W-Route-UTIL30	Fuel Line - GPSS	Unknown	Unknown								Unknown	2.10
		Fibre Optics	0.35	0.05								1.00	
		BT	0.35	0.05								1.00	
		BT	0.35	0.05								1.00	
		Water	0.75 - 0.90	0.30 - 0.90								2.10	
	W-Route-UTIL31	BT	0.35	0.05								1.00	1.00
	W-Route-UTIL32	Gas	0.60	0.20 - 0.30								1.20	1.20
	W-Route-UTIL32.1	Gas	0.60	0.20 - 0.30								1.20	1.20
	W-Route-UTIL33	Gas	0.60	0.20 - 0.30								1.20	1.20
	W-Route-UTIL35	Water	0.75 - 0.90	0.30 - 0.90								2.10	2.10
	W-Route-UTIL36	Low Voltage	0.45	0.40 - 0.60								1.35	1.35
	W-Route-UTIL38	Gas	0.60	0.20 - 0.30								1.20	1.20
W-Route-UTIL41	BT	0.35	0.05								1.00	1.00	
	Low Voltage	0.45	0.40 - 0.60								1.35	1.35	
	Low Voltage	0.45	0.40 - 0.60								1.35		
	Low Voltage	0.45	0.40 - 0.60								1.35		
W-Route-UTIL43	Water	0.75 - 0.90	0.30 - 0.90								2.10	2.10	
	BT	0.35	0.05								1.00		
W-Route-UTIL44	Fibre Optics	Unknown	Unknown								Unknown	Unknown	
	Fuel Line - GPSS	Unknown	Unknown								Unknown		
W-Route-UTIL45	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10	
W-Route-UTIL46	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10	
	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10		
	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10		
	Gas	0.60	0.20 - 0.30								1.20		
	BT	0.35	0.05								1.00		
	Water	0.75 - 0.90	0.30 - 0.90								2.10		
W-Route-UTIL46.1	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10	
	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10		
W-Route-UTIL46.2	Cable & Wireless Cables	Unknown	Unknown								Unknown	Unknown	
W-Route-UTIL48	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10	
W-Route-UTIL49	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10	2.10	
W-Route-UTIL50	BT	0.35	0.05								1.00	1.00	
	Foul Water	0.75 - 0.90	0.30 - 0.90								2.10	2.20	
	Wessex Water	0.75 - 0.90	0.30 - 0.90					77			2.20		
	High Voltage	0.45 - 1.20	0.40 - 0.60								2.10		
W-Route-UTIL50.1	Cable & Wireless Cables	Unknown	Unknown								Unknown	Unknown	

Cable Route	Utility Crossing Reference	Utility('s)	Assumed		Trial Holes			Service Providers			Cable installation depth (Edge of Cable) (m)	
			Depth (m)	Diameter (m)	Ref	Depth (m)	Depth (m)	Ref	Depth (m)	Diameter (m)	Individual Utilities	Multiple utilities
G-Route	G-Route-UTIL01	Wessex Water	0.75 - 0.90					79		0.20	1.50	2.65
		Wessex Water	0.75 - 0.90					79		1.35	2.65	
		Wessex Water	0.75 - 0.90					79		0.53	1.83	
	G-Route-UTIL01.1	High Voltage x 3	0.45 - 1.20	0.40 - 0.60							2.10	2.10
	G-Route-UTIL02	Wessex Water	0.75 - 0.90					81		1.20	2.50	2.50
	G-Route-UTIL03	Wessex Water	0.75 - 0.90					82		0.20	1.50	3.25
		Wessex Water	0.75 - 0.90					82		1.95	3.25	
		Wessex Water	0.75 - 0.90					82		1.35	2.65	
	G-Route-UTIL04	Wessex Water						84	6.00	2.74	9.14	9.14
	G-Route-UTIL05	Wessex Water						86	6.00	2.70	9.10	9.10
Wessex Water		0.75 - 0.90					86		1.80	3.10		
Wessex Water		0.75 - 0.90					86		1.80	3.10		
G-Route-UTIL06	Fuel Line - GPSS	Unknown	Unknown							Unknown	Unknown	
G-Route-UTIL07	Wessex Water						90	4.50	1.35	6.25	6.25	
G-Route-UTIL07	High Voltage x 3	0.45 - 1.20	0.40							2.10		
BW-P	NO UTILITY CROSSINGS IDENTIFIED											
Y-1R	NO UTILITY CROSSINGS IDENTIFIED											
BW-A	NO UTILITY CROSSINGS IDENTIFIED											
Seabank	S-BANK-UTIL01	Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	2.20
	S-BANK-UTIL02	Water	0.75 - 0.90	0.30 - 0.90							2.10	2.10
400-UG	400UG-UTIL01	Water			TH1	1.60	0.45				2.35	2.35
		Plastic Duct				1.05	0.07				1.42	
	400UG-UTIL02	Water	0.75 - 0.90	0.30 - 0.90	TH3A	0.75	0.10 - 0.15				2.10	2.10
		High Voltage									1.20	
	400UG-UTIL03	Water	0.75 - 0.90	0.30 - 0.90							2.10	2.10
		BT	0.35	0.05							1.00	
		Low Voltage			TH2	0.80	0.15				1.25	
	400UG-UTIL04	Water			TH3	1.80	0.45				2.55	2.55
		Trace cable				1.90	0.025				2.23	
	400UG-UTIL05	Low Voltage			TH4C	0.45	0.01				1.00	1.00
	400UG-UTIL05.1	Low Voltage	0.45	0.40 - 0.60							1.35	1.35
	400UG-UTIL05.2	Water			TH4	1.10	0.70 - 0.90				2.30	2.30
		Trace cable				1.10	0.025				1.43	
	400UG-UTIL06	Water			TH5	0.80	0.90				2.00	2.00
	400UG-UTIL07	Water			TH6A	1.05	0.30 - 0.40				1.75	1.75
		Trace cable				1.30	0.025				1.63	
		Water			TH6B	0.75	0.025 - 0.030				1.08	
		Water Main (not shown)			TH6Z	1.02	0.300				1.62	
	400UG-UTIL08	(Cluster of 3) High Voltage			TH6E	0.85	0.04 - 0.06				1.21	1.21
	400UG-UTIL09	BT	0.35	0.05							1.00	1.20
		Gas x 3	0.60	0.20 - 0.30							1.20	
	400UG-UTIL10	Water			TH7	1.20	0.50 - 0.90				2.40	2.40
	400UG-UTIL11	Trace cable				0.75	0.025				1.08	
	400UG-UTIL11.1	Gas			TH8	1.55	0.20 - 0.30				2.15	2.15
	400UG-UTIL11.2	Water			TH9	0.90	0.40 - 0.60				1.80	1.80
	400UG-UTIL11.2	Gas			TH10	1.45	0.20 - 0.30				2.05	2.05
	400UG-UTIL12	Low Voltage	0.45	0.40 - 0.60							1.35	2.10
		Water	0.75 - 0.90	0.30 - 0.90							2.10	
		BT	0.35	0.05							1.00	
		Gas			TH11	1.50	0.20 - 0.30				2.10	
	400UG-UTIL12.1	Gas			TH12	1.30	0.20 - 0.25				1.85	1.85
		Unknown Service				0.65	0.10				1.05	
	400UG-UTIL13	Gas	0.60	0.20 - 0.30							1.20	2.20
		Foul Water	0.75 - 0.90					23		0.25	1.45	
		Wessex Water	0.75 - 0.90	0.30 - 0.90							2.20	

Notes/Assumptions:

1. Clearance between cable and utilities has been assumed as 300mm
2. Clearance between cable and Wessex Water has been assumed as 400mm
3. Any cable installation depths for individual utilities below 1m have been rounded up to 1m
4. Statutory information has been provided by NG/EAW on the 13-March-2013 and thus is out of date, file name: *Bridge Water - Avonmouth Master Drawings + Additional Areas.dwg*
5. All cable installation depths shown are assumed to be installed below services, which may be subject to change.

Appendix 3E – Bellmouth Schedule



Mott MacDonald

Title: Bellmouth Schedule
Revision: H
11/03/2014

Agreed/In election in principle. Mitigation measures may be required and consultation with LA required.	1
To standard, this assessment requires by MM and NS.	2
Not to standard yet, but assumed adequate by MM and NS. Mitigation measures required.	3
Under discussion	4
Not standard	5
Undisputed Highway	6

Originator: Jonathan Stephens
Checker: Evert Jan Van Iersden
Approver: Mark Secker

Comments: For information
Document Reference: 320069-C-SPR-GEN-XX-0002
Pages: 5

NSL	National Speed Limit
BM	Bellmouth
Y (A, N)	Local Authority designates with categorisation (date set or accepted highway)

RED TEXT - Denotes changes to latest submission due to Local Authority comment or bellmouth re location



GENERAL					BELLMOUTH								On adopted highway?		Iteration 1		Iteration 2		Iteration 3		JUSTIFICATION		
REFERENCE	LOCAL AUTHORITY REFERENCE	DRAWING NUMBER	MAIN ACCESS ROAD	CURRENT STATUS	HIGHWAY AUTHORITY	BELLMOUTH TYPE	ROAD WIDTH (m)	SPEED LIMIT (mph)	EXISTING BELLMOUTH	VISIBILITY SPLAY (RIGHT) (m)	VISIBILITY SPLAY (LEFT) (m)	ADEQUATE VISIBILITY IN ACCORDANCE WITH DMBS?			First Submission	MM Change	LA Change	Second Revision	MM Change	LA Change		Third Revision	MM Change
C-LDS4-BM01		MMD-322069-C-DR-C-LDS4-XX-0200	A370	No objection in principle (Subject to road safety audit)	North Somerset	2	8m	50	Stone Hardened	215 (RB)	180	Y	Y	05-Apr-13 & 25-Apr-13 - BM located to utilise existing field access and provide maximum visibility	N/A	E-mail (July-13) and Meeting (11-July-13): -LA recommendation for an alternative site access has been reviewed and a concern due to spatial constraints on the existing access/egress. A LA response use of existing right hand lane and provide access between Manlybury Farm and Broomfield (West end of existing BM position) as a feasible alternative.	29-Jul-13	N/A	N/A			Required visibility achieved: -BM considered proposed re location by LA, however, location not preferred due to the requirement for consultation with additional stakeholders, expansion/upgrade of existing bellmouth, the narrow nature of the proposed lane and risk of potential conflicting vehicle movements associated with existing industrial unit (Broomfield Works). -Further assessment of existing industrial unit (Broomfield Works). -Further assessment of existing industrial unit (Broomfield Works). -Proposed use of off road lane not required as a type 2 BM is to be used to ensure access and egress is from the west access - left turn only, egress - right turn only.	
C-LDS4-BM01A		MMD-322069-C-DR-C-LDS4-XX-0200	B3133 Kern Road	No objection in principle	North Somerset	2	7.3m	40	None	100	120	N	Y	28-Mar-13 & 25-Apr-13 - Type 1 bellmouth access to C-LDS4 and 61 was originally provided via Post Lane directly off Lamprey Road	MM proposed two options off Kern Road and 200m south of Kern Road.	E-mail (July-13) Access not acceptable. In the interim LA to investigate access 200m west of Kern Road. Meeting (11-July-13) - LA suggest use of disused railway to pass under each bridge to access Post Lane (B3133) to East NSL LA also suggested use of Kern Road.	29-Jul-13	BM relocated west off Lamprey road due to restricted visibility created by disused railway bridge being left when exiting the bellmouth	-Re location discussed with NS and LA, Kern Road location chosen to avoid disused railway each bridge onto Lamprey Road	10-Sep-13	N/A	E-mail (26-Sep-13) - Re location subject to road safety audit and road subsidence. -Temporary Traffic signals installed if deemed necessary. -Temporary Traffic signals installed if deemed necessary.	
C-LDS4-BM02A		MMD-322069-C-DR-C-LDS4-XX-0201	Post Lane (private road)	Agreed (Undisputed)	North Somerset	2	3.5m	N/A	None	70	70	Y	N	28-Mar-13 & 25-Apr-13 - Type 1 bellmouth access to C-LDS4 and 61 was originally provided via Post Lane directly off Lamprey Road	BM location introduced due to new BM access of Kern Road - see C-LDS4-BM01A	Undisputed Highway	29-Jul-13	Bellmouth reference no. change	Undisputed Highway	10-Sep-13	N/A	Undisputed Highway	Required visibility achieved: -Post Lane is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).
C-LDS4-BM03A		MMD-322069-C-DR-C-LDS4-XX-0202	Post Lane (private road)	Agreed (Undisputed)	North Somerset	1	3.5m	N/A	None	70	70	Y	N	28-Mar-13 & 25-Apr-13 - Type 1 bellmouth access to C-LDS4 and 61 was originally provided via Post Lane directly off Lamprey Road	Bellmouth reference no. change	Undisputed Highway	13-Sep-13	N/A	Undisputed Highway				Required visibility achieved: -Post Lane is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).
C-LDS4-BM04		MMD-322069-C-DR-C-LDS4-XX-0203	Post Lane (private road)	Agreed (Undisputed)	North Somerset	2	5.7m	N/A	None	70	70	Y	N	28-Mar-13 & 25-Apr-13 - Type 2 bellmouth access to C-LDS4 and 61 was originally provided via Post Lane directly off Lamprey Road	Bellmouth reference no. change	Undisputed Highway	10-Sep-13	Bellmouth moved approximately 20m south, due to clash with proposed scaffolding and CHL tower re-location.	Undisputed Highway				Required visibility achieved: -Post Lane is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).
C-LDS4-BM05		MMD-322069-C-DR-C-LDS4-XX-0204	Lamprey Road	Not to standard. Mitigation measures required	North Somerset	3	5.7m	NSL	None	160	215	N	Y	28-Mar-13 & 25-Apr-13 - Type 1 bellmouth access to C-LDS4 was originally provided directly off Lamprey Road	BM type changed to type 3 (lanes) and re-located, due to decision by MM to avoid disused railway each bridge onto Lamprey Road -MM suggested in conjunction with LA to move BM to eastern boundary of existing field away from Acorns Lake	E-mail (July-13) and during Meeting (11-July-13): -Proposed re location - East to the north of field, or to the west of field to increase the visibility. BM moved accordingly.	13-Sep-13	Bellmouth moved approximately 55m west, due to clash with proposed scaffolding.	E-mail (10-Sep-13 & 30-Sep-13) - Acceptance of BM location subject to use of appropriate warning signs.			Currently being revised	Despite not achieving adequate visibility: -Location chosen to avoid clash bridge onto Lamprey Road -150m visibility right (one step below standard) allows users to see entrance to Acorns Lake. Minimum grass verge management required. -Temporary Traffic signals installed if deemed necessary. -Temporary Traffic signals installed if deemed necessary. -Visibility right (east) meets DMBS standards. -BM provides crossing point so vehicles spend less time on highway.
C-LDS4-BM06		MMD-322069-C-DR-C-LDS4-XX-0204	Lamprey Road	Not to standard. Mitigation measures required	North Somerset	3	5.7m	NSL	None	215	160	N	Y	28-Mar-13, 05-Apr-13 & 25-Apr-13 - Type 1 bellmouth access to C-LDS4 was originally provided directly off Lamprey Road	BM type changed to type 3 (lanes), due to decision by MM to avoid disused railway each bridge onto Lamprey Road	E-mail (July-13) and during Meeting (11-July-13): -LA acceptance of the access is noted.	13-Sep-13	Bellmouth moved approximately 55m west, due to clash with proposed scaffolding.	N/A			Currently being revised	Despite not achieving adequate visibility: -Location chosen to avoid clash bridge onto Lamprey Road -150m visibility left (one step below standard) allows users to see entrance to Acorns Lake. Minimum grass verge management required. -Temporary Traffic signals installed if deemed necessary. -Temporary Traffic signals installed if deemed necessary. -Visibility right (east) meets DMBS standards. -BM provides crossing point so vehicles spend less time on highway.
C-LDS4-BM07		MMD-322069-C-DR-C-LDS4-XX-0205	Wentham Lane	To Standard. Assumed adequate	North Somerset	3	3.2m	NSL	None	215	215	Y	Y	05-Apr-13 & 25-Apr-13 - Bellmouth located along Wentham Lane to provide maximum visibility	N/A	E-mail (July-13) and during Meeting (11-July-13): -Access considered with regards to edge failure and subsidence. -Access considered acceptable assuming adequate signage in place.	10-Sep-13	Bellmouth moved approximately 30m east, due to clash with proposed scaffolding.	E-mail (10-Sep-13 & 30-Sep-13) - Previous comments resolved.			Currently being revised	Required visibility achieved: -Advanced warning signage will be required on all approaches. -Temporary Traffic signals installed if deemed necessary.
C-LDS4-BM08		MMD-322069-C-DR-C-LDS4-XX-0205	Wentham Lane	To Standard. Assumed adequate	North Somerset	3	3.2m	NSL	Field Access Bridge	215	215	Y	Y	05-Apr-13 & 25-Apr-13 - Bellmouth located along Wentham Lane to provide maximum visibility	N/A	E-mail (July-13) and during Meeting (11-July-13): -Local authority acceptance of the access is noted subject to vegetation clearance and management (maximum height of 900mm within visibility splay).	29-Jul-13	N/A	E-mail (10-Sep-13) - Visibility is acceptable subject to vegetation clearance.			Currently being revised	Required visibility achieved: -Advanced warning signage will be required on all approaches, due to road straight alignment encourages high traffic speeds. -Temporary Traffic signals installed if deemed necessary. -Concern for edge failure to considered as part of detailed design.
C-LD70-BM01		MMD-322069-C-DR-C-LD70-XX-0200	Kernmore Road	To Standard. Assumed adequate	North Somerset	1	6m	NSL	Field Access	215	215	Y	Y	28-Mar-13, 05-Apr-13 & 25-Apr-13 - Bellmouth located adjoining Kernmore Road to provide maximum visibility and other existing field access	BM moved approximately 50m north to avoid to reduce the impact of re-vegetation removal, subject to vegetation clearance and management (maximum height of 900mm within visibility splay).	E-mail (July-13) and during Meeting (11-July-13): -Local authority acceptance of original access is noted subject to vegetation clearance and management (maximum height of 900mm within visibility splay).	29-Jul-13	Bellmouth moved approximately 50m north, due to clash with proposed scaffolding and CHL tower re-location.	E-mail (10-Sep-13) - Visibility is acceptable subject to vegetation clearance.			Currently being revised	Required visibility achieved: -Advanced warning signage will be required on all approaches, due to road straight alignment encourages high traffic speeds. -Temporary Traffic signals installed if deemed necessary.
C-LD74-BM01		MMD-322069-C-DR-C-LD74-XX-0200	Nalase Wall Lane	Agreed	North Somerset	2	4.8m	NSL	None	215	215	Y	Y	28-Mar-13, 05-Apr-13 & 25-Apr-13 - Bellmouth originally located at the entrance to North Drive (200m south east of proposed location)	MM moved bellmouth to create new access onto Nalase Wall due to construction of existing entrance to North Drive. Existing N Drive entrance not retained at the proposed entrance location (visibility splay). Also noted that construction access is only accepted from the west only.	E-mail (July-13) and during Meeting (11-July-13): -Local authority acceptance of original access is noted subject to vegetation clearance and management (maximum height of 900mm within visibility splay). Also noted that construction access is only accepted from the west only.	29-Jul-13	N/A	E-mail (10-Sep-13) - Nalase Wall Lane is subject to subsidence. Visibility and general acceptance noted.			Currently being revised	Required visibility achieved: -Advanced warning signage will be required on all approaches, due to road straight alignment encourages high traffic speeds. -Temporary Traffic signals installed if deemed necessary. -Nalase Wall Lane is subject to edge failure and general subsidence. -Access for construction traffic will be from the west only. Nalase Wall Lane to the east is unsuitable. During site visit Nalase Wall Lane was very uneven, requiring stable loads.
C-LD74-BM02		MMD-322069-C-DR-C-LD74-XX-0201	N Drive	Agreed (Undisputed)	North Somerset	2	3.4m	N/A	Field Access	70	70	Y	N	13-Sep-13 - NOT ISSUED WITHIN FIRST SUBMISSION - Bellmouth introduced to due to re-location of C-LD74-BM01	N/A	Undisputed Highway						Required visibility achieved: -N Drive is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).	
C-LD74-BM03		MMD-322069-C-DR-C-LD74-XX-0202	N Drive	Agreed (Undisputed)	North Somerset	2	3.4m	N/A	None	70	70	Y	N	05-Apr-13 & 25-Apr-13 - Type 1 bellmouth originally located at opposite C-LD74-BM02 current location	Bellmouth relocated approximately 50m north, to be closer proximity to bus stop. Bellmouth type changed to type 2.	Undisputed Highway	13-Sep-13	N/A	Undisputed Highway			Required visibility achieved: -N Drive is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).	
C-LD74-BM04		MMD-322069-C-DR-C-LD74-XX-0203	N Drive	Agreed (Undisputed)	North Somerset	3	3.8m	N/A	None	70	70	Y	N	05-Apr-13 & 25-Apr-13 - Bellmouth originally located to utilise existing field access gateways	Bellmouth BM05 originally located at field access gateway. MM moved BM approximately 50m north to avoid clash with proposed scaffolding and CHL tower re-location. Bellmouth types changed to type 2.	Undisputed Highway	13-Sep-13	C-LD74-BM04 moved approximately 50m north west and C-LD74-BM05 50m south east due to four road alignment change request. Bellmouth types changed to type 3 (lanes).	Undisputed Highway			Currently being revised	Required visibility achieved: -N Drive is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).
C-LD76-BM01		MMD-322069-C-DR-C-LD76-XX-0200	Hartman Way/Causeway	Agreed	North Somerset	2	5.4m	30	Tarmac	70	180	Y	Y	April-13 - Access provided from the junction of Causeway/Hartman Way and across Watery Lane.	N/A	E-mail (10-Sep-13): -Causeway subject to edge failure and subsidence. -Visibility subject to vegetation clearance is acceptable. -There is a number of local structures that require inspection.	29-Jul-13	N/A	E-mail (10-Sep-13) - Visibility and general acceptance noted.			Currently being revised	Required visibility achieved: -Advanced warning signage will be required on all approaches and footpath users. -Existing bellmouth access to be upgraded/relocated to enable vehicle movements. -Visibility splay considered to be easily achieved through minimal vegetation removal/management.
C-LD76-BM02		MMD-322069-C-DR-C-LD76-XX-0201	N Drive	Agreed (Undisputed)	North Somerset	1	3m	N/A	Field Access	70	70	Y	N	05-Apr-13 & 25-Apr-13 - Bellmouth located adjoining N Drive utilising existing field access	BM changed from type 1 to type 2, due to reduced use of N Drive.	Undisputed Highway	13-Sep-13	Bellmouth moved approximately 5-10m east to avoid scaffolding.	Undisputed Highway			Currently being revised	Required visibility achieved: -N Drive is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).
C-LD76-BM03		MMD-322069-C-DR-C-LD76-XX-0202	N Drive	Agreed (Undisputed)	North Somerset	2	3m	N/A	Field Access	70	70	Y	N	28-Mar-13, 05-Apr-13 & 25-Apr-13 - Bellmouth originally located within corner of field to utilise field access	BM moved west to avoid clash proximity to ditch and allow road alignment	Undisputed Highway	13-Sep-13	N/A	Undisputed Highway			Required visibility achieved: -N Drive is an unadopted lane that is used for agricultural purposes. -Warning signage to be implemented as requested (considered to be a typical requirement for all BMs).	
W-ROUTE-BM01		MMD-322069-C-DR-W-Route-XX-0212	Engle Lane	No objection in principle. Based on draft drawing which was not anticipated to change	North Somerset	1	5.3m	30	None	70	70	Y	Y	21-Nov-13 DRAFT									Required visibility achieved: -Advanced warning signage will be required on all approaches. -Temporary Traffic signals installed if deemed necessary.
W-ROUTE-BM01		MMD-322069-C-DR-W-Route-XX-0200	Engle Lane	No objection in principle	North Somerset	1	5.3m	30	None	70	70	Y	N	29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION - Bellmouth located off Engle Lane opposite Blackwires Road	N/A	E-mail (10-Sep-13) and E-mail (20-Sep-13): -Visibility splay recently indicated, therefore, not acceptable. -LA recommends relocating the access east of the proposed access point on the outside of the nearby bend in the road.	21-Oct-13					Required visibility achieved: -Advanced warning signage will be required on all approaches. -Existing bellmouth located opposite Blackwires Road - existing access to industrial zone, which is commonly accessed by HGVs. -Temporary Traffic signals installed if deemed necessary.	
W-ROUTE-BM02		MMD-322069-C-DR-W-Route-XX-0201	Causeway	Agreed	North Somerset	1	4.2m	NSL	None	90	90	N	Y	29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION - The access at original BM02A location has been moved to junction of Causeway/Hartman Way	MM provided two options (bellmouth ref no. W-Route-BM02 & W-Route-BM01) for LA review	E-mail (10-Sep-13) and E-mail (20-Sep-13): -Visibility splay recently indicated, therefore, not acceptable. -LA recommends relocating the access east of the proposed access point on the outside of the nearby bend in the road.	21-Oct-13					Required visibility achieved: -Advanced warning signage will be required on all approaches. -Temporary Traffic signals installed if deemed necessary.	
W-ROUTE-BM01		MMD-322069-C-DR-W-Route-XX-0210	Hartman Way/Causeway/Watery Lane	No objection in principle	North Somerset	1	5.3m	30	None	50	70	N	Y	29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION - Proposed access point considered sub standard to the west side.	MM provided two options (bellmouth ref no. W-Route-BM02 & W-Route-BM01) for LA review	E-mail (10-Sep-13): -Visibility available at the proposed access point considered sub standard to the west side. -Proposed relocation east (currently between Patten Brook Road and Rhine View)	21-Oct-13					Currently being revised	Despite not achieving adequate visibility: -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -Public footpath, Watery Lane will need to be closed for duration of works, or arrangements made for crossing. -Visibility left to standard. -5m to be located centrally between Patten Brook Road and Rhine View to provide maximum visibility and prevent diversion to alternative road headland. -Alternative or shared use with bellmouth reference no. W-Route-BM02 could be used to reduce use.
W-ROUTE-BM03		MMD-322069-C-DR-W-Route-XX-0202	Church Lane	Agreed	North Somerset	3	5.5m	NSL	None	84	95	N	Y	29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION - Proposed crossing at Church Lane	N/A	E-mail (10-Sep-13): -WPD FWD within proposed bellmouth will need to be re-located. -The visibility for both access arrangements (subject to the widening of the access boundary) will be considered to be acceptable. -To reduce the impact on the existing access and consider using the existing gateway and associated field tracks located 20m east of the proposed bellmouth.	N/A	BM location not changed, see justification				Despite not achieving adequate visibility: -Yellow flag to be done less than allowable speed limit due to the nature of the existing road. -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -BM location governed by Tackham and Land Yeo.	
W-ROUTE-BM04		MMD-322069-C-DR-W-Route-XX-0202	Church Lane	Agreed	North Somerset	3	5.5m	NSL	None	52	84	N	Y	13-Sep-13 - NOT ISSUED WITHIN FIRST SUBMISSION - BM introduced off Washing Pound Lane	MM proposed/presented the addition of BM ref no. W-ROUTE-BM04 to reduce the amount of traffic along the existing point of access into proposed compound area and access to southern town.	E-mail (10-Sep-13): -Visibility available at the proposed access point considered sub standard to the south side. -Proposed relocation north (between Clevedon Road), away from bridgehead to increase visibility south.	21-Oct-13					Despite not achieving adequate visibility: -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -BM location provided to reduce usage of W-ROUTE-BM03. -Visibility right is provided to Clevedon Rd junction where traffic speeds will be lower, due to their approach to the junction.	
W-ROUTE-BM05		MMD-322069-C-DR-W-Route-XX-0203	B3130 Clevedon Road	No objection in principle	North Somerset	1	6m	NSL	None	35	100	N	Y	29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION - BM proposed/presented the addition of BM ref no. W-ROUTE-BM05 to reduce the amount of traffic along the crossing point at access into proposed compound area and access to southern town.	MM proposed/presented the addition of BM ref no. W-ROUTE-BM05 to reduce the amount of traffic along the crossing point at access into proposed compound area and access to southern town.	E-mail (10-Sep-13): -The original access point was considered acceptable. However, location moved closer to the junction with Clevedon Lane to facilitate a combined compound and road access. New location not reviewed.	21-Oct-13					Despite not achieving adequate visibility: -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -BM location governed by cable alignment. BM location considered best between Cadbury Camp Lane and Nalase Wall.	
W-ROUTE-BM07		MMD-322069-C-DR-W-Route-XX-0204	Cadbury Camp Lane (private)	Agreed	North Somerset	2	6m	NSL	None	70	70	N	Y	05-Apr-13 & 25-Apr-13 - BM located at junction between Whitelake Lane and Cadbury Camp Lane	N/A	E-mail (July-13) and during Meeting (11-July-13): -Relevant visibility to be reviewed at the existing junction arrangement on Whitelake Lane - not the access arrangement on the right. -A number of control PTAs have occurred due to a number of vehicles waiting at the junction. -LA response with no further comments, therefore, acceptance of the access is noted.	29-Jul-13	N/A	E-mail (10-Sep-13) - Considered appropriate with advanced warning signage in place.			Despite not achieving adequate visibility: -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -BM location off existing highway (Whitelake Lane) and located within existing layby area. -BM located further away from Cadbury Camp Lane to avoid conflict. -Large layby provides for BM entrance - proposal uses existing access. -Visibility directly from bellmouth greater than shown on drawing (signal) junction.	
W-ROUTE-BM08		MMD-322069-C-DR-W-Route-XX-0205	Whitelake Lane	Agreed	North Somerset	1	5.7m	NSL	None	100	160	N	Y	05-Apr-13 & 25-Apr-13 - BM originally located at the top of Caswell Hill (junction between Caswell Hill and Nalase Wall)	MM after site visit proposed relocation south to provide visibility	E-mail (July-13) and during Meeting (11-July-13): -Initial location considered unsuitable. Therefore, relocation to be considered. -The BM 250m south from original location (see current).	29-Jul-13	N/A	E-mail (10-Sep-13) - Visibility acceptable subject to vegetation clearance.			Despite not achieving adequate visibility: -Warning signage to be implemented considered to be a typical requirement for all BMs. -Temporary Traffic signals installed if deemed necessary. -BM location governed by cable alignment. BM location considered best between Cadbury Camp Lane and Nalase Wall.	
C-LD79-BM01		MMD-322069-C-DR-C-LD79-XX-0200	B3130 Clevedon Road	No objection in principle	North Somerset	1	6m	NSL	None	90	90	N	Y	05-Apr-13 & 25-Apr-13 - BM originally located at junction of Clevedon Road and Cadbury Camp Lane	N/A	E-mail (July-13) and during Meeting (11-July-13): -Initial location considered unsuitable. Discussed during meeting to relocate BM to current (between highway) bench.	29-Jul-13	N/A	E				

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MMD-32069-C-OR-S-Bank-XX-000				A403 Severn Road				No objection in principle				Bristol				2				Unknown				50				None				160				70				N				Y				13-Sep-13 - BM located off Severn Road using an old access/waying.				NA				Meeting 6-Oct-13 - Currently showing use of buslane cycle route. This would need to be maintained through PHRF issue. Mitigation measures needed for cycle approaching from Cheltenham Road to the north. Review 29-Oct-13 - Comply with geometry of road, vegetation and trees (Further scrutiny required to ensure the access is achievable in relation to visibility and physical constraints) E-mail 27-Nov-13 - provided adequate traffic management - mitigation - consider surveys and removal works can be defined where necessary to ensure safety and future maintenance, these locations are acceptable in principle																								Despite not achieving adequate visibility Warning signs to be implemented (considered to be a typical requirement for all BMs) Temporary Traffic signs installed if deemed necessary. Visibility study signs to be installed. Use with bellmouth ref no. C-LD27-BM01 a one way system could be implemented if required.			
MMD-32069-C-OR-SP1-XX-000				Wick Moor Drive				No objection in principle				West Somerset				2				5.6m				NSL				Stone Hardened				215				100				N				Y				30-Aug-13 - Type 2 BM located off Wick Moor Drive				NA				Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. Classification of vehicle movements, X & Y distance required. Road reinstatement, camberage edge markings and prevention measures for surface water run-off/compensatory required. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																								Despite not achieving adequate visibility Traffic flows anticipated to be low as road is only used to access Hilday Potential extension of 30mph speed limit into Hilday site to include BM. Consider use of existing historic park access north of proposed BM location, however, this would reduce visibility footprint. Visibility assessment required due to road alignment (horizontal bend in highway), vehicles travelling southbound are anticipated to be travelling at lower speeds due to 30mph speed restriction existing/through site. Consideration to re-locate BM south-south-east of junction to sub-entrance visibility north. Unknown equipment to be BM, potential conflict with vehicle movements. Access not agreed to. JPS-BM01 and public transport. Adequate advance warning signs will be implemented. Temporary Traffic signs installed if deemed necessary. Change to be assessed during detailed design stage			
MMD-32069-C-OR-JPS-XX-000				Wick Moor Drive				No objection in principle				West Somerset				1				5.6m				NSL				Stone Hardened				215				215				Y				Y				30-Aug-13 - Type 1 BM located off Wick Moor Drive using existing field access				NA				Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. Classification of vehicle movements, X & Y distance required. Road reinstatement, camberage edge markings and prevention measures for surface water run-off/compensatory required existing change grid required. There is an existing historic fence and gate which requires confirmation on this will continue in operation. 21-Nov-13 - SCC bellmouth review. Happy with location. Need to check sweep path. May need to increase ball to keep HDV in correct lane. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																								Full 215m sight distance can be achieved in both directions with hedge-row and timber fence. Adequate advance warning signs will be implemented. Change to be assessed during detailed design stage Fencing and gate access to be agreed/discussed with land owner.			
MMD-32069-C-OR-VQ2C-XX-000				Wick Moor Drive				No objection in principle				West Somerset				1				6m				NSL				Field Access				215				215				Y				Y				30-Aug-13 - Type 1 BM located off Wick Moor Drive using existing field access				NA				Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. Classification of vehicle movements, X & Y distance required. Road reinstatement, camberage edge markings and prevention measures for surface water run-off/compensatory required existing change grid required. 21-Nov-13 - SCC bellmouth review. Happy with location. Need to check sweep path. May need to increase bellmouth to keep HDV in correct lane. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																								Full 215m sight distance can be achieved in both directions with hedge-row and management/review. Adequate advance warning signs will be implemented. Change to be assessed during detailed design stage			
MMD-32069-C-OR-VQ2C-XX-001				Un-named Track				To Standard. Assumed adequate. (Undeveloped Highway)				West Somerset				3				5.6m				N/A				None				70				70				Y				N				30-Aug-13 - Crossing located to use existing field access and positioned perpendicular				Bellmouth moved approximately 35m north to avoid issue with existing building				Report 22-Oct-13 - Confirmation road to be constructed highway. Bellmouth reference VQ2C-BM02 does not allow neighbouring field access gate 21-Nov-13 - SCC bellmouth review. Not highway. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)				Currently being revised																Due to the nature of the track visibility signs can be reduced to 30mph Use to vehicle usage (agricultural use only) First gate access not used as bellmouth and to be positioned opposite to allow vehicle manoeuvres. Positioning of road to be assessed during detailed design stage. Access to be assessed during detailed design stage. The maximum is not possible for large vehicles.							
MMD-32069-C-OR-VQ2C-XX-001				Un-named Track				To Standard. Assumed adequate. (Undeveloped Highway)				West Somerset				3				5.6m				N/A				None				70				70				Y				N				30-Aug-13 - Crossing located to use existing field access and positioned perpendicular				Bellmouth moved approximately 35m north to avoid issue with existing building				Report 22-Oct-13 - Confirmation road to be constructed highway. Bellmouth reference VQ2C-BM02 does not allow neighbouring field access gate 21-Nov-13 - SCC bellmouth review. Not highway. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)				Currently being revised																Due to the nature of the track visibility signs can be reduced to 30mph Use to vehicle usage (agricultural use only) First gate access not used as bellmouth and to be positioned opposite to allow vehicle manoeuvres. Positioning of road to be assessed during detailed design stage. Access to be assessed during detailed design stage. The maximum is not possible for large vehicles.							
MMD-32069-C-OR-Z27-XX-000				Whitwick Lane				Agreed				West Somerset				1				4.2m				NSL				Concrete				120				120				N				Y				30-Aug-13 - BM located west of existing highway bridge				Currently being revised				Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. Classification of vehicle movements (including entering & exiting the bellmouth access due to narrow nature of the road). X & Y distance required. Speeds are considered to be lower than road speed limit and 120 visibility is considered acceptable. Signs to be revised to prevent construction vehicles crossing bridge structure. 21-Nov-13 - SCC bellmouth review. LA acceptance of bellmouth noted. Proposed 120m visibility splat both directions is suitable. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																								Despite not achieving adequate visibility Traffic flows anticipated to be low as road is only used to access properties adjacent to road or Stafford (dead end) Visibility footprint restricted due to road alignment Narrow nature of the road (preventing two vehicles passing) suggests vehicle will travel at speeds below NSL. Consideration to re-locate BM east to increase visibility both west and eastbound. Visibility assessment through level elevation needs Z27-BM01 westbound visibility sign. (Traffic will only pass Z27-BM01, affecting driver perception) Adequate advance warning signs will be implemented. Temporary Traffic signs installed if deemed necessary. Bellmouth requirement enhanced Potential diversion route to Stafford via Green Cottage could be implemented			
MMD-32069-C-OR-Z27-XX-000				Whitwick Lane (2m)				Agreed				West Somerset				2				4.2m				NSL				Field Access				120				120				N				Y				30-Aug-13 - BM located off Whitwick Lane using existing existing field access				Currently being revised				Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. Classification of vehicle movements (including entering & exiting the bellmouth access due to narrow nature of the road). X & Y distance required. Speeds are considered to be lower than road speed limit and 120 visibility is considered acceptable. Signs to be revised to prevent construction vehicles crossing bridge structure. 21-Nov-13 - SCC bellmouth review. LA acceptance of bellmouth noted. Proposed 120m visibility splat both directions is suitable. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																								Despite not achieving adequate visibility Traffic flows anticipated to be low as road is only used to access properties adjacent to road or Stafford (dead end) Visibility footprint restricted due to road alignment Narrow nature of the road (preventing two vehicles passing) suggests vehicle will travel at speeds below NSL. Consideration to re-locate BM east to increase visibility both west and eastbound. However, this would require an structural assessment of existing bridge. This may also cause conflict with existing CHL. Visibility assessment through level elevation needs Z27-BM01 westbound visibility sign. (Traffic will only pass Z27-BM01, affecting driver perception) Adequate advance warning signs will be implemented. Temporary Traffic signs installed if deemed necessary. Bellmouth requirement enhanced Potential diversion route to Stafford via Green Cottage could be implemented			
MMD-32069-C-OR-AT-P-XX-000				Putter Road				Agreed				North Somerset				1				5.3m				NSL				Stone Hardened				100				130				N				Y				29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION BM located to avoid existing field access and stone track				NA				E-mail 10-Sep-13 - Visibility available subject to the proposed vegetation clearance works considered acceptable. There are a number of associated structures that have been installed on the site to be discussed. Requested to be inspected relating to the construction access route to the proposed access.																				Despite not achieving adequate visibility Warning signs to be implemented (considered to be a typical requirement for all BMs) Temporary Traffic signs installed if deemed necessary. BM after existing field access and stone track. No other structures considered viable due to road alignment and the requirement for traffic to remain longer on the network and pass additional residential areas.							
MMD-32069-C-OR-Whitwick-XX-000				Wood Lane				Agreed				North Somerset				2				4.0m				NSL				None				90				50				N				Y				29-Jul-13 - NOT ISSUED WITHIN FIRST SUBMISSION BM located opposite station adjacent Wood Lane after site visit				E-mail 10-Sep-13 - The visibility at the proposed access point subject to the necessary vegetation clearance are considered acceptable. BM located opposite station adjacent Wood Lane bend within the B3133 road alignment and the junction of the public highway and the field road will be required																				Despite not achieving adequate visibility Warning signs to be implemented (considered to be a typical requirement for all BMs) Temporary Traffic signs installed if deemed necessary. BM after existing field access and stone track. No other structures considered viable due to road alignment and the requirement for traffic to remain longer on the network and pass additional residential areas.											
MMD-32069-C-OR-Whitwick-XX-000				Wood Lane				No objection in principle. Based on draft drawings which are not anticipated to change				North Somerset				2				4.0m				NSL				None				50				70				N				Y				21-Nov-13 DRAFT				Bellmouth introduced to allow access to substation				Currently being revised				21-Nov-13 - SCC bellmouth review. LA acceptance of proposed bellmouth location noted. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																See Y-Plan-BM01							
MMD-32069-C-OR-C-LD15-XX-011				Southwick Road				Agreed				Bridgeman				3				4.0m				NSL				None				215				215				Y				Y				21-Nov-13 DRAFT				Bellmouth introduced due to cable alignment (change CR 108)				Currently being revised				21-Nov-13 - SCC bellmouth review. LA acceptance of proposed bellmouth location noted. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																Full visibility study achieved, road geometry flat and straight. Little vegetation removal required.							
MMD-32069-C-OR-C-LD15-XX-011				Southwick Road				Agreed				Bridgeman				3				4.0m				NSL				None				215				215				Y				Y				21-Nov-13 DRAFT				Bellmouth introduced due to cable alignment (change CR 108)				Currently being revised				21-Nov-13 - SCC bellmouth review. LA acceptance of proposed bellmouth location noted. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																Full visibility study achieved, road geometry flat and straight. Little vegetation removal required.							
MMD-32069-C-OR-C-LD15-XX-012				Un-named Road				To Standard. Assumed adequate				Bridgeman				3				2.8m				NSL				None				215				215				Y				Y				21-Nov-13 DRAFT				Bellmouth introduced due to cable alignment (change CR 108) Bellmouth moved 10m south to avoid proposed substation				Currently being revised				21-Nov-13 - SCC bellmouth review. LA acceptance of proposed bellmouth location noted. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																Full visibility study achieved, road geometry flat and straight. Little vegetation removal required.							
MMD-32069-C-OR-C-LD15-XX-012				Un-named Road				To Standard. Assumed adequate				Bridgeman				3				2.8m				NSL				None				215				215				Y				Y				21-Nov-13 DRAFT				Bellmouth introduced due to cable alignment (change CR 108) Bellmouth moved 10m south to avoid proposed substation				Currently being revised				21-Nov-13 - SCC bellmouth review. LA acceptance of proposed bellmouth location noted. See SCC Bellmouth Review 2013.11.214 (Sat.doc Meeting Minutes)																Full visibility study achieved, road geometry flat and straight. Little vegetation removal required.							
MMD-32069-C-OR-C-LD15-XX-013				B3141 Church Road/Factory Lane				Agreed				Bridgeman				N/A				5.3m				30				Existing road junction between B3141 Church Road and Factory Lane. This was presented on our 200 drawings.				70				70				Y				Y				30-Aug-13 - NOT ISSUED WITHIN FIRST SUBMISSION. New BM introduced following original access off factory lane				Report 22-Oct-13 - Change Location as increase traffic conflict could affect traffic flow and congestion. Meeting 6-Nov-13 - BM not introduced, alternative option to be considered. Location discussed by LA due to proximity of the existing junction. BM location on highway. Alternative BM location proposed to be considered. BM location proposed to be considered to be closer to junction and near drop kerb. Meeting 20-Nov-13 - BM location proposed to be considered to be closer to junction and near drop kerb. Report 22-Oct-13 - Sweep path drawings should be provided at scale 1:250. The drawing should show 17m movements in and out of the junction for the proposed 17m vehicle expected to use the junction. An Y distance of 2.4m is required.																								- Bellmouth reference changed due to the requirement for greater improvements rather than a reduction of a new bellmouth - Bellmouth removed - original access from factory lane to be used				21-Nov-13 - SCC bellmouth review. Revert to Factory Lane Junction and Create new 'Roundabout' in vehicle usage area required additional 10m to be provided for the junction for improvement (see 17m vehicle expected to use the junction. An Y distance of 2.4m is required) - Bellmouth removed - original access from factory lane to be used			

Appendix 3F – 400kV and 132kV Cable Crossing Schedule

400kV & 132kV Cable Crossing Schedule



Document Reference: MMD-322069-SPR-GEN-XX-0006

Rev: P5

Date: 20/03/14

Originator: AB

Checker: EVI

Approver: JW

400kV Reference	Crossing	Coordinates	HDD/Open Cut/Bridge
(see note 3)		(see note 4)	(see note 2)
400-HDD-01	River Axe	(337839.259, 154901.869)	HDD/Bridge
400-HDD-02	Old Lox Yeo	(339834.635, 157813.952)	HDD
400-HDD-03	Webbington Road	(338031.278, 155489.149)	HDD/Open Cut
400-HDD-04	Lox Yeo River	(338072.418, 155156.176)	HDD
400-HDD-05	Castle Hill	(340835.202, 158449.845)	HDD/Open Cut
400-HDD-06	Gas pipe (South of Sandford)	(341406.142, 158836.407)	HDD/Open Cut
400-HDD-07	Towerhead Brook	(341154.571, 159756.001)	Bridge (see note 6)

132kV Reference	Route	Crossing	Coordinates	HDD/Open Cut/Bridge
(see note 3)			(see note 4)	(see note 2)
132-HDD-01	W-Route	Multiple SSSI ditches (Tickenham boundary Rhyne, Parish Brook x 2)	(345995.218, 171234.239)	HDD
132-HDD-02	W-Route	Land Yeo	(345921.218, 171731.037)	HDD
132-HDD-03	W-Route	Clevedon Road	(346081.440, 171908.500)	HDD/Open Cut
132-HDD-04	W-Route	Cadbury Camp Lane	(347872.107, 172966.498)	HDD
132-HDD-05	W-Route	Whitehouse Lane	(348038.896, 173397.657)	HDD/Open Cut
132-HDD-06	W-Route	M5	(349024.195, 175034.884)	HDD/Open Cut
132-HDD-07	W-Route	The Portbury Hundred	(348629.966, 175446.383)	HDD
132-HDD-08	W-Route	Network Rail/Sheep Way	(348552.012, 176005.987)	HDD/Open Cut
132-HDD-09	W-Route	Portishead Substation	(348381.063, 176822.889)	HDD
132-HDD-10	G-Route	Kings Weston Lane	(353415.995, 178796.660)	HDD/Open Cut
132-HDD-11	G-Route	M5/M49 Underpass	(353742.709, 178943.508)	HDD/Open Cut
132-HDD-12	G-Route	M49	(353798.083, 179115.414)	HDD

Notes:

- Options to cross ditches/roads are subject to change during detailed design and agreement with 3rd party stakeholders.
- Based on the current parameters and assumptions made, crossing techniques highlighted in bold are anticipated to be used, though this may change during detailed design.
- Locations numbered working south to north along respective routes
- Coordinates taken either at centre point of item crossed, or midpoint between drive & reception site
- All cables will be installed via open trench method unless alternative options are available as set out in this schedule.
- Permanent cable bridge will also be used to accommodate AIL access

Appendix 3G – Construction Risk Assessments and Method Statements

Hinkley Point C Connection Project

Appendix 3G: Risk Assessments and Method Statements

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**1. CONSTRUCTION METHOD
STATEMENT FOR NEW
400kV OVERHEAD STEEL
LATTICE TRANSMISSION
LINES**

Contents

Construction Summary

1. **Planning the Work**
 - Access
 - 3rd Party Searches
 - Topographical Survey
 - Ground Investigations
 - CPT
 - Boreholes
 - Trial Pit/Excavation
 - Scaffold Survey
 - Tree Survey
 - Traffic Management Plan
 - Soil Management Plan
 - Network Rail
 - Noise Assessment
2. **Site Set-up and Mobilisation**
3. **Access and Construction Lay Down Area**
 - Bellmouth Access
 - Access Road to Pylon Site
 - Construction Pad and Working Area
4. **Foundations**
 - Piled (steel tube piles or augered concrete piles)
 - Pad & Chimney
 - Rock
 - Installation of the Stubs
5. **Pylon Assembly**
 - Steelwork Delivery
 - Onsite Assembly
6. **Pylon Erection**
 - Lifting Plan
 - Crane Pad
7. **Wiring/Stringing**
 - Scaffolding
 - Machine Sites
 - Pilot Wires
 - Puller
 - Tensioner
 - Pull-through Tower
 - Line Tower
 - Sagging and Clipping In
 - Safety from the System
8. **Re-instatement**
9. **Overall Construction Period**

CONSTRUCTION OF OVERHEAD TRANSMISSION LINES

An Overhead Transmission Line (OHL) is used to connect and to transfer power between substations situated around the country, which in turn provide power to businesses and homes. The OHL is constructed using a variety of materials, from concrete and steel for the foundations, steelwork for the pylon and aluminium alloy/steel for the conductors. To construct an OHL there will be a number of key phases involved before the OHL becomes operational. These can be categorised as follows:

1. Planning
2. Site Set-up
3. Access
4. Foundations
5. Pylon Assembly
6. Erection
7. Wiring
8. Re-instatement

1. Planning of the Works

The construction of an OHL requires a great deal of early planning to manage the activities during the construction period. There will be detailed studies of the local environment to identify constraints, interactions with 3rd Parties, and management of the various construction phases, from initial entry at start up to final re-instatement at the end of the construction.

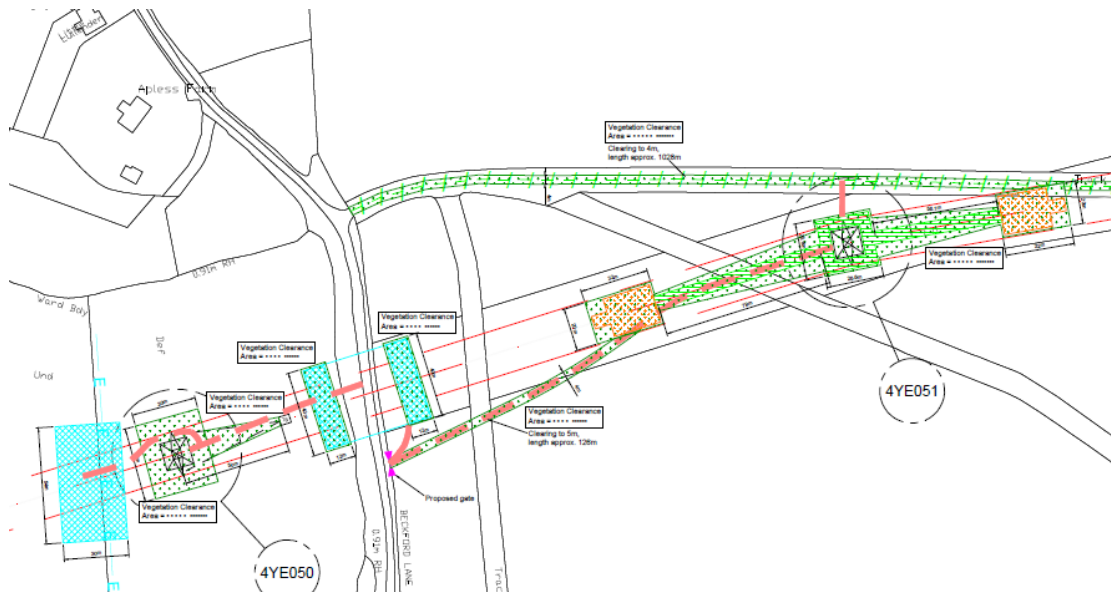
Many of the materials required for the OHL will require long lead in times for delivery to site. It is common for much of the materials to be produced overseas, so large quantities of materials need ordering in advance to allow delivery to site to be on time and to programme.

Design

Substantial design work will be undertaken at the early stage of the work. Foundation design, pylon spotting, wire clearance drawings are just a few of the areas involved. A Design Intent Document (DID) will be prepared listing all the areas that need to be addressed.

Access

This phase involves accessing the various areas where the OHL will be constructed. The access requirements will depend on the size and type of pylon, the proposed construction activities and what works (temporary and permanent) will be required within this working area. Plans showing the extent of the working area will be drawn up to indicate the area and land-take required.

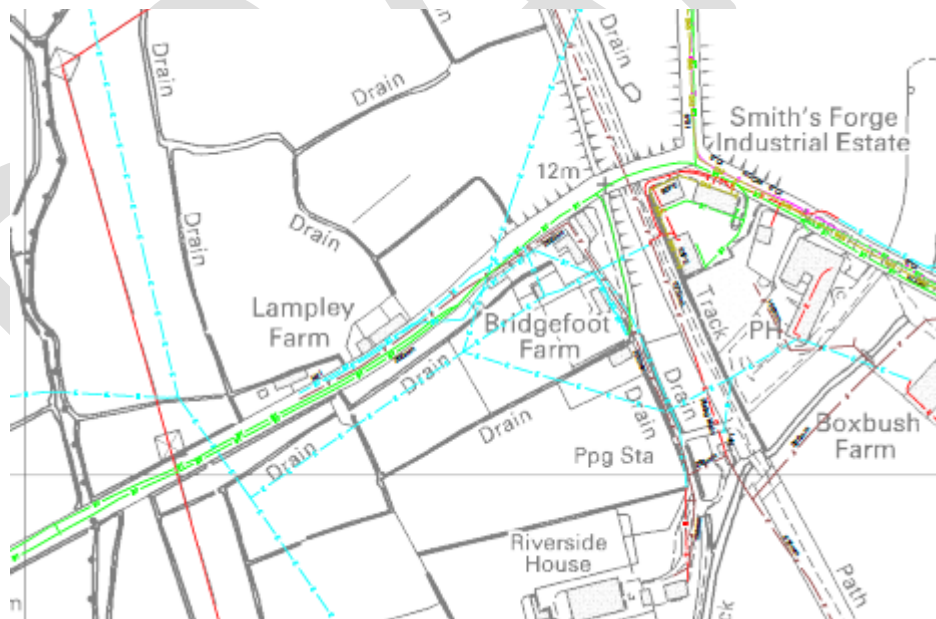


Example of a plan that details the extent of the workings on a grantors land

3rd Party Searches

The 3rd Party search will detail all known services in the swathe, and will include:

- Overhead and underground power lines
- Overhead and underground telecommunications
- Water and drainage services
- Gas, petroleum and chemical pipelines



Example of a plan showing services from 3rd Parties

The presence of a service indicated by the search is used as a guide only. Where works are to take place in the vicinity of a known service, the location of the service is confirmed prior to works commencing by physical means (eg. hand dig), ground penetrating radar (GPR) or cat & genny.

Where the service is an overhead line (low voltage – 66kV) it is normal to negotiate with the Distribution Network Operator (DNO) to have these services undergrounded where they pass

beneath the new OHL. A permanent undergrounding is preferred but sometimes the service has to be re-erected on completion of the works due to DNO operational requirements.

Topographical Survey

A topographical survey is required to establish elevations and co-ordinates of all natural and manmade features along the route of the OHL. The survey includes a swathe, normally approx. 25m either side of the OHL centre line (to identify side slope) and will also identify any crossings, buildings, obstacles and vegetation present. Modern mapping techniques allow the survey work to be carried out by helicopter (LIDAR survey), but traditional surveying techniques are also used. LIDAR mapping data can be quickly transferred into design software such as PLSCAD which allows the design and location of the OHL to be quickly determined. In addition, changes and alterations can be readily manipulated.

Ground Investigations

In order to determine the foundation type and size, ground investigations will need to be undertaken at every pylon location. Typically, a desktop study will have identified the type of survey to be undertaken, and will normally be either a cone penetration test (CPT) or a borehole (or a combination of both). In addition, trial pits (excavations of approx. 1m to 2m depth) may be undertaken.

CPT

This test is a method used to determine the geotechnical properties of soils and soil layers. The test method consists of pushing an instrumented cone, with the tip facing down into the ground at a controlled rate. The common arrangement is for this to be mounted inside a truck and driven straight to the pylon site if the ground conditions allow. Track mounted vehicles are also available for poorer ground conditions. The cone penetrometer is pushed vertically from inside the truck into the ground at a constant rate of penetration (usually 20mm per second).

During penetration, measurements are made of the cone resistance, side friction and the pore water pressure. The results will aid in the selection of the correct foundation type.



Examples of CPT rigs

Boreholes

Boreholes are often required to determine physical data and properties of the sub soil and strata at the pylon location. They can be driven to a greater depth than CPTs and also provide core samples for laboratory analysis Cable percussive boreholes are a common method of borehole drilling where disturbed and undisturbed samples are retrieved from the boreholes. In addition, monitoring wells or piezometers will be installed to record water table information and flow rates. Typically, a 4x4 type vehicle (eg. Land Rover) will tow the rig on to the majority of sites. Samples collected from the boreholes are tested in a laboratory to determine their physical and chemical properties.



Set-up of a typical percussive borehole rig

Trial Pit Excavation

These will also be undertaken out to confirm the geology and the water table of the site. They are usually between 1 and 4 metres deep, and are generally excavated using a mechanical digger. The sides of the excavation are often battered back to avoid the need for side support during this temporary operation (normally a few hours).



Trial hole excavation

Scaffold Survey

Scaffolding is required to both protect the public/ assets and to enable the hauling bonds etc to be erected along the route of the OHL. It is assembled in situ prior to the stringing works. Preparation for access and land take is required beforehand. Items that usually require protection are roads, railways, buildings, power lines, waterways, footpaths. A typical protection scaffold consists of 2 structures, one either side of the asset, connected by a net overhead.

A scaffold schedule is developed at an early stage of the project. This is used to identify the size, type and location of the scaffolding structure. As the scaffold may be located at a place separate from the pylon site, an alternative access may be required to construct the scaffolding.

The scaffold schedule also identifies the asset owner, be it the Highways Agency, Network Rail, land owner or other 3rd Party. Prior to any structure being designed, detailed negotiations are needed to determine what constraints may be present and to identify any mitigating measures that may be required. At the scaffold location, ground investigations may be necessary to determine the ground suitability for ground anchors. This is normally carried out by "pull tests" or trial pits. Where the ground is not suitable for ground anchors (or there is a presence of buried services), alternative kentledge anchors may be installed which involves large concrete blocks placed on the ground and being used as holding down weights. If ground conditions are not suitable it may be necessary to install stone pads for the erection of the scaffold.



Kentledge blocks placed at the base of the scaffold.

Tree Survey

The tree survey is carried out along the route of the OHL and for 400kV, the area of survey is normally up to 30m either side of the centre line. The survey identifies all trees in this swathe as follows:

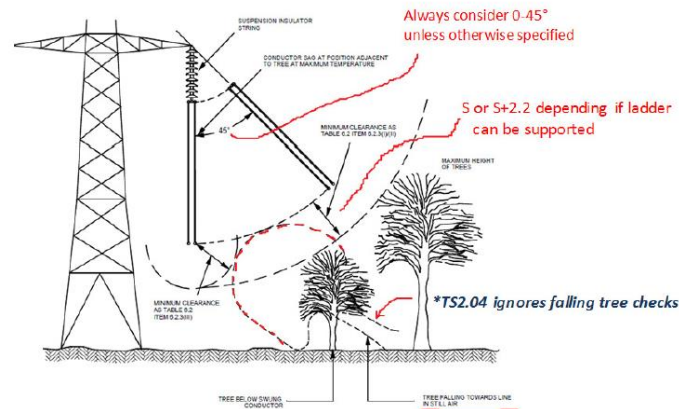
- Tree type/species

- Height of the tree

- Girth at 1.2m at from the base

Canopy spread

The information on the dimension of the tree is used to calculate any clearance infringements with the tree's falling distance. If any part of the falling tree infringes the statutory clearance of the OHL, then a decision to either lop, or fell the tree, can be made. Other considerations can be the type of tree and its growth pattern. If a fast growing tree is within the swathe but not infringing clearance, a decision may be made to fell in any case, due to the fact that in a short time it may well become an issue.



How tree clearances are determined

Traffic Management Plan

A detailed traffic management plan (TMP) is required to identify the impact of the construction activities during the OHL construction. Identification of haulage routes, vehicle types and numbers is required to assess the effect on the local area, and to help place with mitigation measures to lessen the impact, and also to facilitate the construction works.



Access will be required for large vehicles during construction

During the initial stages, assessments are made as to the suitability of local haulage roads. A and B classified roads are generally suitable for OHL construction traffic. Roads below these categories require assessment as they are often quite narrow and winding with little or no road markings and are often in a poorer state of repair than A and B roads. In addition, they are generally used by the local community that will mostly be affected by the localised OHL works.

The TMP will include details of vehicle types and quantities that will be involved at each stage of the construction. It will identify measures required to minimise disruption to the local road network and identify where control measures are required, such as temporary traffic lights, stop go boards, diversions etc. All of these measures will require negotiating with the local highways departments to seek agreement on the control measures required. The TMP will also identify peak construction periods where increased activity will be taking place (eg access preparation), followed by lesser activity for other construction phases (eg. pylon assembly).

Refer to Appendix A for example of vehicle movement assessment for a D tower.

Where the OHL crosses motorways/ major roads, detailed negotiations with the Highways Agency and the police will be required. To protect the motorway, scaffolding may require lane closures in order to net the scaffolding. This is usually undertaken the outside of peak hours when there is minimal traffic.

Soil Management Plan

During the construction works, there will be significant earth works where topsoil and subsoil will be temporarily removed and stored to allow access to the works. To identify the procedure and method of carrying out this temporary re-location and storage, a detailed soil management plan (SMP) will be developed. The SP will also include the re-instatement procedures once the construction work is complete.

Network Rail

Early contact is required with Network Rail if the OHL crosses any railway (both active and disused). Some electrified lines require advanced notification of up to 1 year (or more in some cases) where a possession will be required for scaffolding construction. Due to the problems and complexities with advanced planning of the OHL works, it is normal to book at least two dates for netting, and a further 2 dates for de-netting.

Site Set-up and Mobilisation

Before any construction works commence on site, office and yard accommodation will be required. It is common (but not necessary) for both office and yard to be situated at the same location, close to where the works will be taking place. The office accommodation may consist of existing buildings with all the adequate facilities built in, or alternatively there may be the need to provide a number of temporary offices. A large area of hard standing is required for the storage of materials, plant and equipment, and the area needs to allow access and turning space for large articulated vehicles.

Where existing hard-standing is not available, there may be a requirement to set up a temporary area on a greenfield site. Here, the area will be stripped of its topsoil and banked (in accordance with the Soil Management Plan), and a temporary surface laid down for the hard-standing. Portable generators may be required to provide power to the offices and the site yard, as well as temporary drainage for ground water and sewage being needed.



Typical greenfield office and storage layout area

2. Access and Construction Lay-down Areas

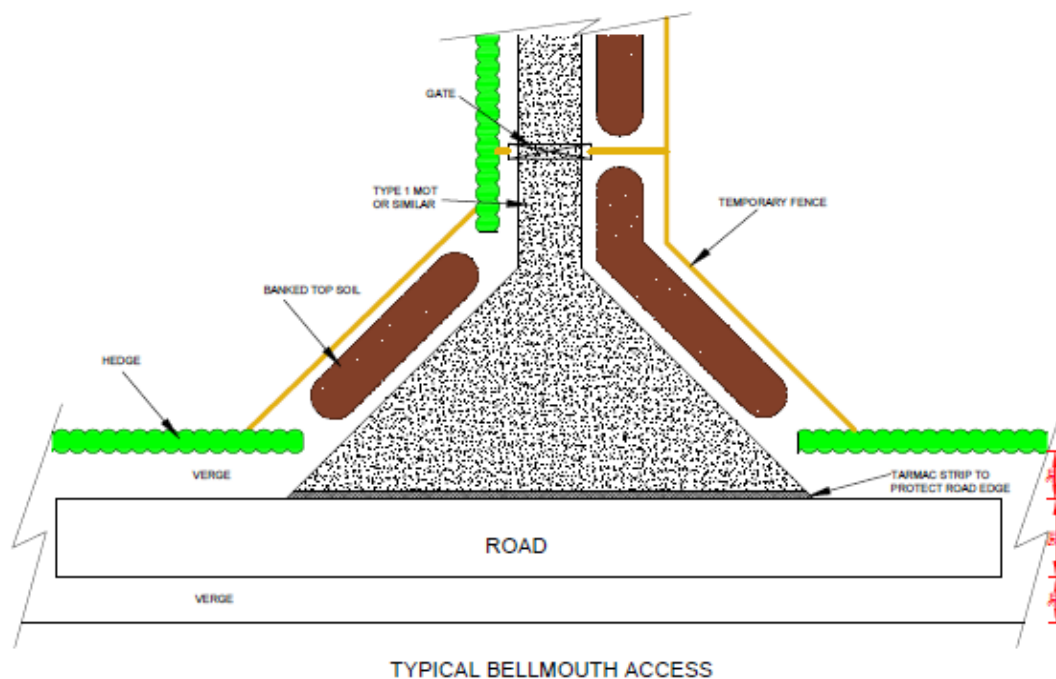
This will involve the construction of temporary access roads, upgrading existing roads or utilising specialist equipment to access the pylon site. The area will be fenced off and cleared to keep livestock and the public away from the construction activities. The TMP will be used to control the number and frequency of delivery vehicle etc constructing these areas.

The access phase can be split into three distinct stages

Bellmouth Access

In order for construction traffic to enter on to the land at the pylon location, a suitable access point off the local highway will be constructed. The bellmouth is often gated and access may be controlled by security.

Each access point will be individually designed in order to meet local conditions. To facilitate construction traffic, the access point needs to be of sufficient size to allow the longest vehicle (12m to 15m in length) to exit/ enter the highway without causing an obstruction to other road users

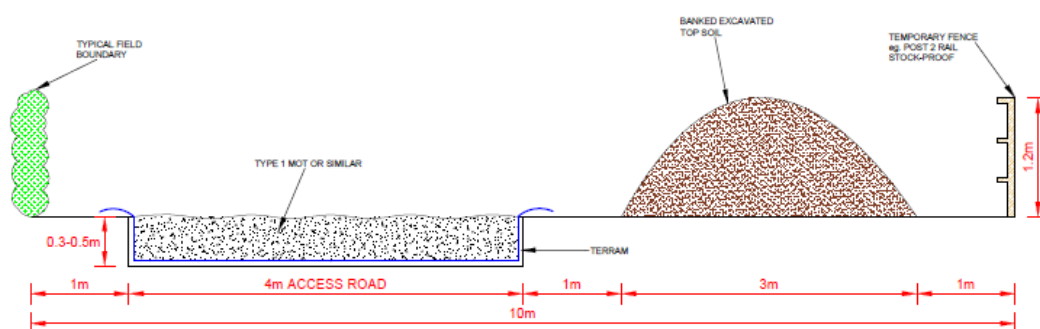


Construction of the bellmouth access will require removal of the topsoil/ subsoil and possibly hedgerows and/or existing boundary fences and gates. The existing metalled roadway will also require protection and this is normally catered for by the inclusion of a tarmac edging strip along the length of the bellmouth access. A geotextile membrane and a geotextile mesh are laid down and stone is laid on top to a suitable designed depth which is dependent on ground conditions (typically 300mm to 500mm in depth). Excavated topsoil/ subsoil will be placed in suitable separate areas adjacent to the access point and a fence installed to demark the area.

Access Road to Pylon Site

Once the access point is constructed, the access road to the pylon site can commence. Typically, a 4m wide road is required, and where existing access roads are available, these may be utilised. The existing track may require upgrading, with culvert and ditch (rhyne) crossings requiring strengthening as required. Existing field access gates may also require widening, with the possibility of some hedgerow being removed and new gates being installed.

Where a new access road is required across land that has no existing access, a new stone road may be required. Typically, the topsoil will be removed to a suitably designed width and depth (usually 4m wide and 300mm deep). A geotextile membrane is then laid down in the excavated area, and imported stone is then laid and rolled to provide the temporary access road. The topsoil is placed to one side of the track, battered down, and will remain in place until the track is re-instated at the end of the works. The access road is fenced off to prevent livestock entering the access area, and is also used as the demarcation area for the works. A typical swathe required to cater for the temporary access is 12m wide.



A number of pylon locations may be accessed from the same bellmouth and it may be necessary to install a number of passing places along the access route to enable vehicles to pass. The passing places will generally be around 15m long and will increase the width of the road to 8m at these locations.



Access to working area. Topsoil is stripped to one side before stone is laid on geotextile membrane. Area is fenced off with stock-proof fencing or post and rope.

Where required, the access road can be strengthened by the introduction of an additional geogrid mesh. This is introduced as an additional layer and results in a stiff mechanically stabilised road, which in turn is capable of controlling differential settlement.



Examples of geogrid being laid to add additional strength to access roads

Where stone roads are not suitable, alternative temporary access roads are available for consideration. These can be in the form of aluminium sheets laid down and bolted together (eg Trakway), wooden bog-mats/sleepers, or other types of temporary roadways such as plastic panels (Terraforma). These types of access systems are generally considered where access is required for a shorter term period.



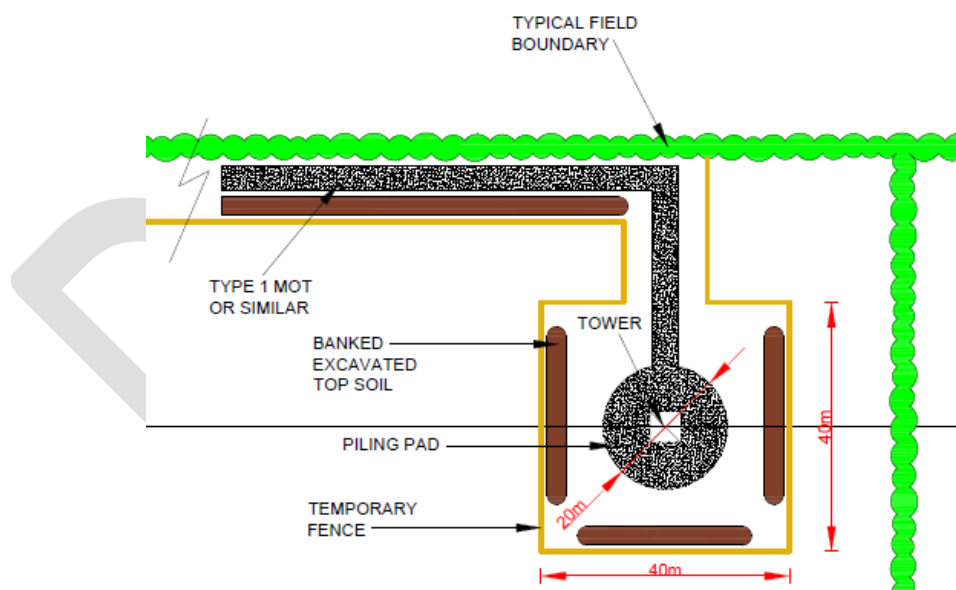
At the pylon location, a stone pad and working area will be required for construction work. The stone pad will be required to cater for a piling rig for the foundations and for a mobile crane for

the pylon erection phase. The pads are designed to cater for the loads imposed by the plant, in order to provide them with a stable base during the works. Local ground conditions will dictate the depth of the stone pad, and typically these will be in the region of 500mm. The size of the pad is dependent to on the size of the pylon base and the type of foundation being installed (examples of working areas are shown in Appendix B). Concrete delivery Lorries will need to access all sides of the foundation from the outside of the pylon base.



Access road and stone pad being installed

Topsoil is removed and stored in areas adjacent to the working area. A geotextile membrane is laid down before stone is placed, compacted and rolled to provide the working area. The perimeter of the working area is fenced off where required and a typical area for a suspension pylon is approx. 40m by 40m in size.



Example of a working area and demarcation



Typical working area

Timeframe

A typical access road (1km) and associated lay stone pads will take approx 2 to 3 weeks to install depending on the ground conditions encountered.

Culvert Crossings and Temporary Bridges

Certain accesses to pylons may require temporary culvert crossings to get across rhynes and ditches, typically at field boundaries. Here, the topsoil is stripped and stored to one side, suitable diameter pipes laid with a geotextile membrane and stone to a suitable designed depth laid on top to form the crossing. Temporary fencing and an access gate may need to be installed at boundary crossings.



Examples of shallow culvert crossings

Some culverts are either too wide, too deep or are protected in special areas such as Sites of Special Scientific Interest (SSSI's), preventing any disruption to the ditches. In these circumstances it may be necessary to install a temporary bridge to span the ditch. This will require civil works either side of the crossing to provide pads and ramps for the temporary bridge. The bridge will be designed to cater for the construction traffic required to cross it (see Appendix C).



Examples of temporary bridge crossings

Site Welfare

Prior to any works commencing, temporary welfare facilities will be placed on site, in the form of portable toilets and a cabin (sometimes as a combined 'Groundhog' unit). These will be used by the site workers and any night-time security throughout the construction phases.



Groundhog unit

3. Foundations

There are various types of pylon foundations used for OHLs, and these will depend on the ground conditions where the pylon is located. The main types are

Piled (steel tube piles or augered piles)

Piled foundations normally take the form of steel tubes driven into the ground in the same direction as the rake (the angle and direction) of the pylon leg at the base of the tower. Typically for a standard suspension tower, a 600 mm steel tube is driven to a pre-determined depth, until 'set' is achieved (the point at which the pile is at an acceptable stable position). The 4 pylon stubs (the pylon steelwork that is cast in to the foundation) are then accurately placed inside the steel tubes at ground level and cast with concrete. Once set, the pylon can then be constructed on top of these stubs. The advantage of this type of foundations is that there is little ground disturbance with minimal excavation around the base of the tower.

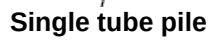


Finished piled leg on a typical line pylon with single tube (not pile cap).

Where more than one steel tube is required per leg, then the piles will need encapsulating in a pile cap. A pile cap is required at each leg of the tower, and the size will depend on the number, and diameter of the piles. Normally, the pile cap will be approx. 1.2m to 1.5m deep, and will incorporate a re-bar cage that is cast into the concrete. Pile caps tend to be required at angle and junction towers, where greater forces are encountered. In general, the larger the pylon and forces, the larger the number of piles and the pile cap. It is common for the pile cap to sit approx. 600mm below ground level. With pile caps, there may be a substantial volume of sub soil that will require removal and disposal from site.



Typical excavation area for a pile cap (multiple piles per leg)



Piles being lifted into position to be driven into the ground.

Pad & Chimney

Essentially, a stub is cast into a footing that has a chimney (approx. 500-800mm square) that leads down to a concrete base; a large block of concrete that is designed to resist uplift and compression forces from the pylon above. In order to install these foundations, large excavations are required for each pylon leg and the larger the pylon, the larger and deeper the excavation required. Once cast, the excavation can be back-filled to ground level, but as with the pile caps, there may be a substantial volume of sub soil that will require removal and disposal from site.



Typical Layout of a pad and chimney foundation (4 deep excavations) and a stub setting template being assembled



Views of a pad and chimney type foundation (one leg).

Rock

Where rock is encountered close to the surface, consideration for a rock anchor foundation is required. There are a number of options available, and these will be determined by detailed design dependent on the type of rock encountered.

Installation of the Stubs

Whatever the type of foundation installed, there will always be the need for four stubs to sit the pylon on. These stubs have to be level and square, and this is normally achieved by the use of a stub hanging template. The template holds all four stubs in position during the

concrete pour. Once the concrete has set and the excavation backfilled, the template is removed.

Timeframe

For piled foundations, a typical line pylon with single tube piles will take approx. 2 weeks to install. If multiple tube piles are required for each leg, such as at angle pylon locations, a pile cap will be required, which would increase the construction activity to approx. 4 weeks.

Where pad and chimney type foundations are required, the construction time and activity will vary between 2 and 4 weeks, depending on the size of foundation.

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4. Pylon Assembly

Steelwork Delivery

Steelwork is delivered to site in preparation for pylon assembly. It is normal for the steelwork to be delivered on a number of 7 tonne trucks from a central depot, which will have a crane mounted on the rear to allow the steelwork to be off loaded on site. The number of deliveries is dependent on the pylon type and total weight of the tower. The steelwork is offloaded at the site ready for assembly. Steelwork can also be taken directly to site on articulated lorries.



Typical steelwork delivery vehicles.

Pylon Assembly

To assist with the pylon assembly and the lifting and moving of steelwork around the site, it is usual for the operatives to use a tractor with a mounted crane or a telehandler. The telehandler can be used to erect the lower section of the pylon.



Typical layout of steelwork in preparation for erection

Timeframe

Assembly of the steelwork will normally take between 1 and 3 weeks depending on the size of the tower. See photos for typical steelwork assembly areas.

5. Pylon Erection

During this phase, a mobile telescopic crane will be brought on to site to lift the remaining assembled steelwork sections into position. Detailed planning is required for all phases of the assembly/ erection of the tower.

Lifting Plan

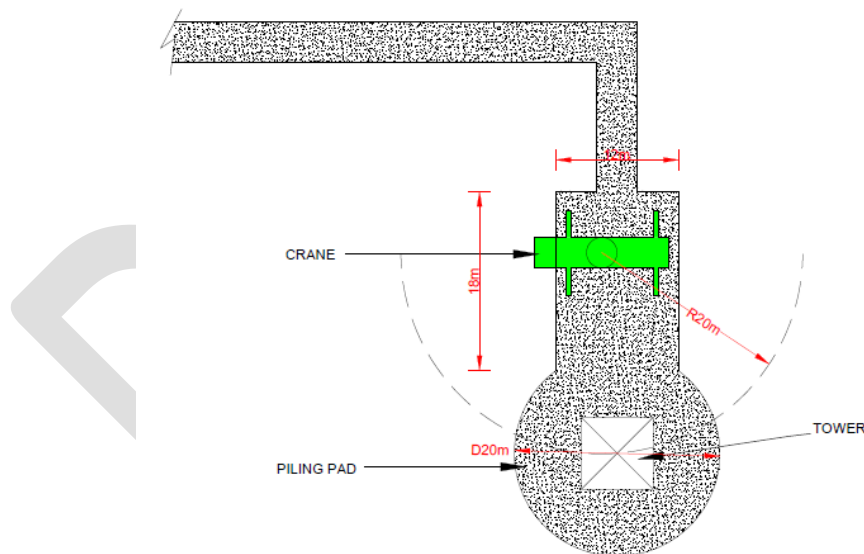
The lifting plan will document the process for lifting all the assembled steelwork. It will identify where the crane will access and be positioned on the site, the weight, size and position of each assembled section to be lifted, the order of the lifting of the sections, and who will control the operation. The lifting plan will identify all the hazards on the site and the mitigating measures put in place to minimise the risks. Hazards can be in many forms, and control measures may include height and weight restrictions, slew restrictors, wind speed limits etc.



Pylon erection

Crane Pad

The crane pad will be a designated area, close to the pylon base, that will have been specifically designed to allow for the siting of the crane. It will be large enough for the crane to drive onto, and position its outriggers ready for lifting.



Typical stone area to include for a crane pad

The crane pad area needs to be relatively flat, although a small amount of side slope can be catered for.



Crane positioned close to the pylon base

Timeframe

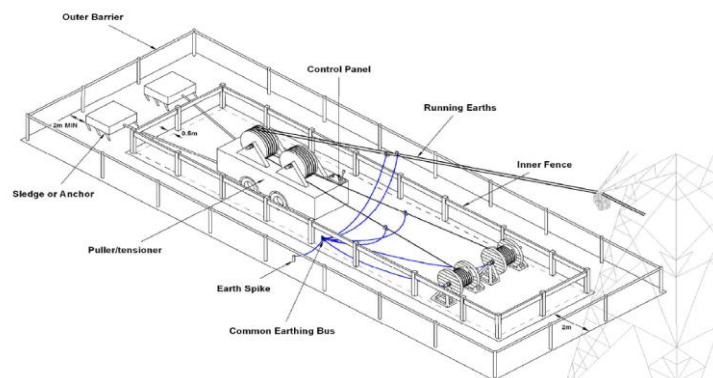
The crane is usually on site for 1 to 3 days, depending on the size of the tower.

6. Stringing

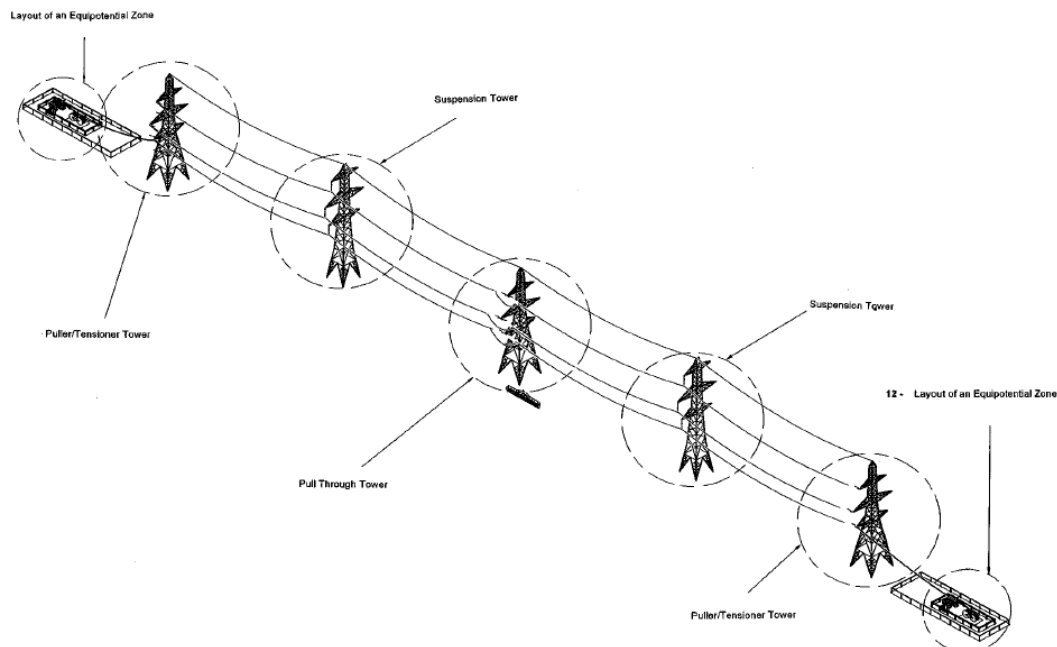
This is the phase of works where the wires (conductors) are installed. This is usually done in sections of about 10 or more pylons, between two angle towers. Firstly, pilot wires are run out at ground level (and over temporary scaffolding protecting obstacles, roads etc) along the full length of the section, between the pulling site and the tensioning site where the new conductor is positioned. The pilot wires are fed through running wheels on the cross arms of all the towers in the section and then fed round stringing machines at the pulling and tensioning sites. In order to keep the wires off the ground, the tensioning site machine stops the wire running freely when the pulling machine pulls the pilot wire. When the new wire is fully run out, it is then installed at its finished tension and height above ground.

Equipotential Zones

To provide protection to personnel from the effects of potential differences that may arise whilst lowering, raising or restringing overhead line conductors, the machine sites are required to sit on Equipotential Zones (EPZ's). The EPZ consists of a mat of linked conducting metal panels, where all the stringing equipment and machinery sit on. They are then electrically bonded together to a common point, an earthing bus welded onto one of the panels.



Example of an Equipotential Zone (EPZ)



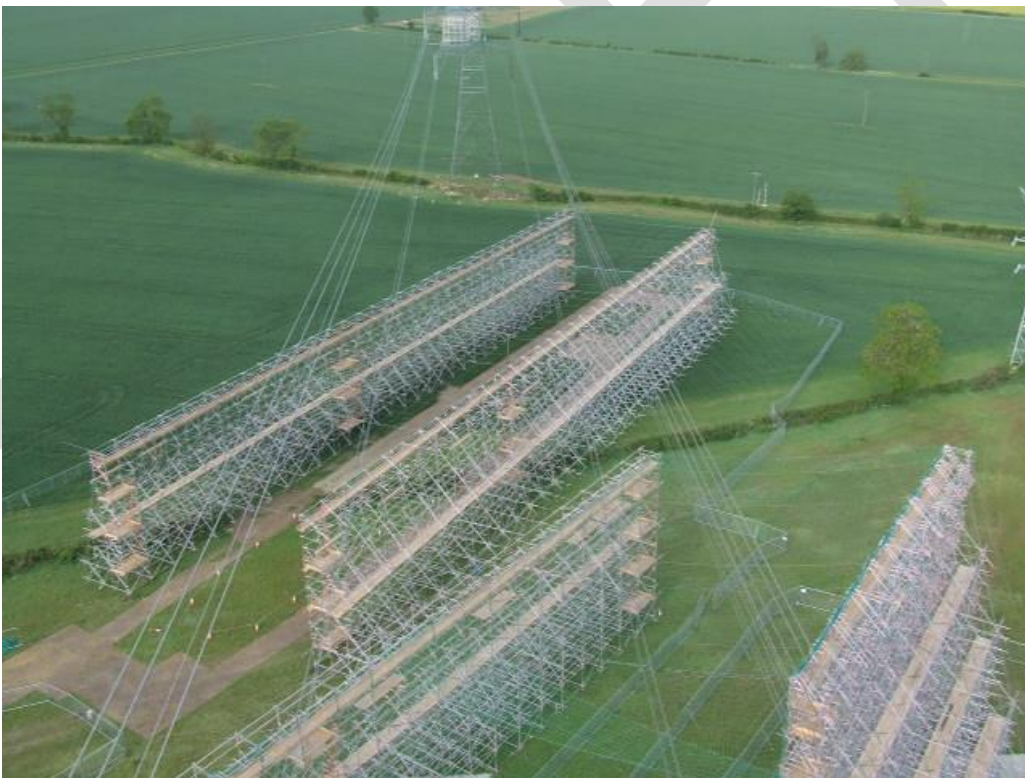
Example of a pulling section with EPZ positions

Scaffolding

In preparation for the stringing operations, the scaffolding required to protect any asset in the pulling sections will be erected. Will be completed before stringing operations commence.



Scaffolding protecting an 11kV pole line



Multiple scaffold protection during wiring work.

Machine Sites

The machine sites are positioned at the angle towers at each end of a section where there is normally good access to, and around, the pylon bases. As there is a lot of vehicle movements and activity at these sites, an angle pylon with minimal restrictions is selected in preference to an angle pylon with restricted access or obstacles close to the pylon base. The machine sites are normally placed at a position approx. 1.5 times the pylon height, at a position in line with, and behind, the first and last towers in the section being pulled. This gives a good angle from the ground up to the cross arms of the towers in order to pull wire. The area required for a machine site for a 50m tall pylon will be approx. 40m wide and up to 100m from the pylon base. This allows for access to the area and for a large Equipotential Zone (EPZ) where all the pulling machinery and materials are positioned.



Machine site sat behind the pylon and sat on EPZ

Pilot Wires

In order to pull conductors through a section, light pilot wires are required to be run out at ground level, over scaffolding protecting roads etc., between both machine sites. The pilots pass through the running-out blocks (large wheels to enable the conductors to travel freely) installed at each pylon in the section, and are then connected to the machines at each end. The light pilot wires are may also be installed by helicopter. The light pilot wires then pull through heavy pilot wires. Finally, the heavy pilot wires pull the new conductor through.

Puller

The pulling machine is situated at one end of the section, and this will pull the new conductor from the other end of the section (from the tensioner/drum site). The heavy pilot wires (used to pull the new conductor) are recovered at this site and wound onto empty drums, ready for removal from this site, and moved on to another site/section.

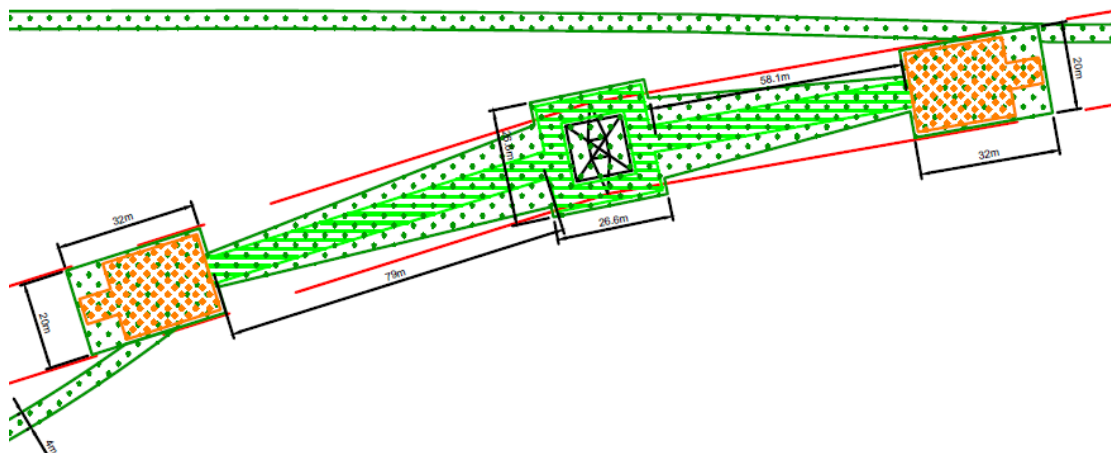
Tensioner

The tensioner is the machine site at the other end of the section from the puller. It is at this site where the new conductor drums are situated and are wound round the bull wheels of the tensioner, before being connected to the pulling bonds. When the puller pulls the heavy pilot wires, they in turn, pull the conductor through the tensioner. By adjusting the tension at the tensioner, the conductors can be lifted off the ground in the section being pulled. By

increasing the tension, the pulling bonds will rise, and conversely by lowering the tension, the wires will drop down. By applying a continuous tension while pulling, the wires can be safely positioned above the ground and scaffolding protection, both to protect the obstacles and the new conductor being installed.



Typical Machine sites on EPZ, with tensioner machine and new conductor drums.



This sketch shows a typical layout of the area required at an angle pylon where the machines will be positioned for pulling wire. Each side of the pylon will need an area for pulling both adjacent sections.

Pull-through pylon

Some pulling sections will have additional tension pylons. Here, the pylon will be treated as a normal line pylon when pulling wire (except that the wire may be going through an angle), but the work on the pylon when the pulling has stopped will need more plant, equipment and materials than a line tower. This is because when sagging the conductor, the wires will be anchored from these pylons in the same way as any other angle pylon, and therefore a long access platform (approx. 21m) will be utilised to attach the conductors and insulators to the cross arms.



Pull through tension pylon.



View of men working on a pull through pylon and access platform

Line pylon

Work at line pylons during wiring operations is minimal. The new strings of insulators are attached to the cross arms, and a running-out block is hung from the fittings at the end of the insulators carrying the pilot wires.



Typical Running-out block for multiple conductor bundles

Sagging and Clipping in

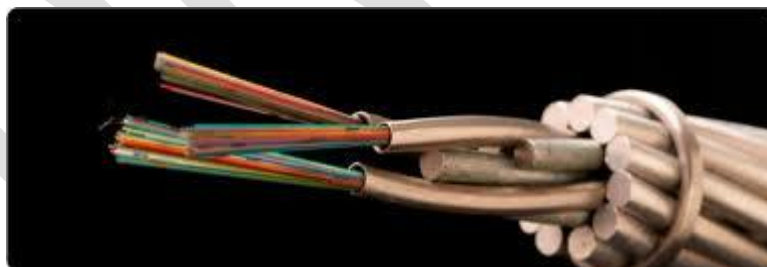
Once the new conductor has been run out, it is caught off (normally at the tensioner end) and back hung. This is a term used where the conductor is cut, attached to a string of insulators, which is then attached to the cross-arm. At the other end of the section, the puller can then raise the conductor. This is determined by calculations in the form of sag tables. The most common method of achieving sag is by measuring the sag of the conductor in the longest span of the section, the 'sagging span'. Factors such as the temperature of the conductor at the time of sagging will affect the sag of the conductor, so accurate measurements are required.

Once the conductors have been sagged, they can be back-hung at the puller end, and then clipped-in at all the line pylons in the section. Here, the conductors are lifted from the running-out blocks in to their final position on the fittings attached to the bottom of the insulators. The running-out blocks are then lowered to ground and removed from site.

In pulling sections where there are pull-through pylons, each section between angle pylons will require sagging independently.

OPGW

It is common for the earthwire to carry several fibre optic strands in one of the internal wires of the earthwire. This is known as Optical Path Ground Wire (OPGW). The installation of the OPGW requires careful handling, so as not to damage any of the fragile fibres. Along a section of line, there will be a need to install joint boxes on the certain towers between each length of OPGW. The joint boxes are normally positioned above the anti climbing device.



Multiple fibre optic contained in an Earthwire

Safety from the System

When running new conductors, lightning strikes and induced current from adjacent electrical circuits can pose significant dangers to operatives working on the new line. Measures to control the risks are detailed in National Grid's National Safety Instructions (NSI's), and are applied when working on, or near to, OHL's and Substations.

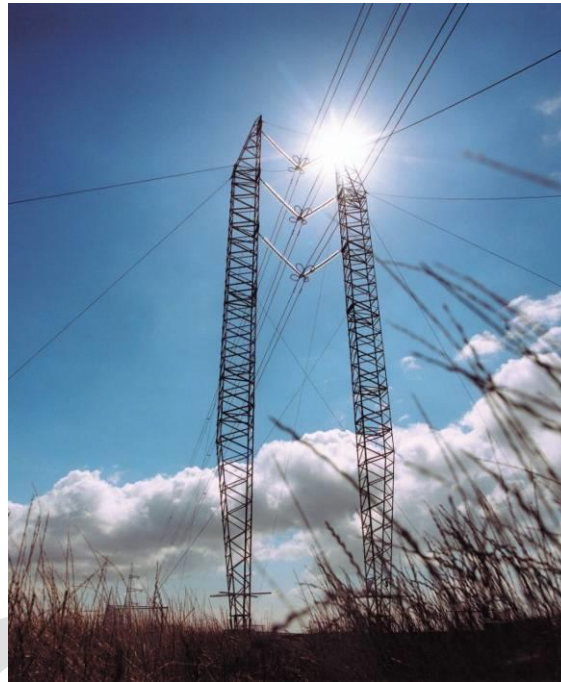
Temporary Pylons

When a new pylon is required to be constructed on a point that is on or close to an existing OHL, outages will be required to construct it, and (if required), remove an existing pylon that it is replacing. Unless a double circuit outage is available for a long period of time, one of the circuits may need to be diverted away from the existing pylons, so that this diverted circuit can

be kept energised whilst the other circuit can be de-energised. This then will allow enough room for the new pylon to be constructed safely.

It is normal for the temporary pylon to sit at ground level on a suitable base, and anchored using stabilising stays to either sledges weighed down by concrete blocks, or deadman anchors dug into the ground.

Temporary pylons are designed to divert lines for periods up to 6 months (and not through the winter period). If longer periods are required, consideration will be made for a 'standard pylon on a temporary basis.



Temporary pylon arrangement

Ground Anchors/Deadmen

Ground anchors or deadmen are used to stabilise temporary structures or towers during the construction works. They can be surface mounted or buried. Surface mounted anchors take the form of sledges weighed down by concrete blocks. These are ideal where land damage must be kept to a minimum, or there is a presence of buried services close to the works.



Ground Anchors (buried)

River Crossings

Special measures will be required when an OHL passes over a large river. In order to get the initial pilot wires across it, a specific method will be developed, and many factors will need to be taken into account. Factors will include river width, accessibility, flow (depth, tidal etc). Options can include using a boat to carry the pilot cable across, or alternatively be carried across by helicopter.

Timeframe

A typical wiring section will take approx 4 to 6 weeks to install and complete.

7. Re-instatement

Once the OHL is constructed, re-instatement of all the temporary accesses will take place. The works will be similar to the installation phase, but in reverse. Removal of temporary fencing, bellmouth access and any other temporary structures will also take place. Any hedgerows that were removed to facilitate the access will be re-planted and protected for a period of time so that it can re-establish itself.

8. Overall Construction Period for a Section of OHL

Many factors will determine how long (or quickly) a section of OHL will take to construct and complete, ready to energize. This will depend on the environment, constraints, constructability, resource availability etc, along with many others. The attached programme shows a typical construction period for a section of 12 towers, with the various stages of the work (Refer to Appendix D).

2. CONSTRUCTION METHOD
STATEMENT FOR DISMANTLING
132kV OVERHEAD STEEL
LATTICE TRANSMISSION LINES

Contents

Construction Summary

1. **Planning the Work**
 - Design
 - Access
 - 3rd Party Searches
 - Topographical Survey
 - Scaffold Survey
 - Traffic Management Plan
 - Network Rail
 - Noise Assessment
2. **Site Set-up and Mobilisation**
3. **Access to the Working Area**
4. **Conductor Recovery**
5. **Pylon Dismantling**
 - Pylon Felling
 - Dismantling by Crane
 - Dismantling by Derrick
 - Steelwork removal
6. **Foundation Removal**
7. **Reinstatement**
8. **Overall Dismantling Period**

DISMANTLING OF OVERHEAD TRANSMISSION LINES

The dismantling and removal of an overhead transmission line (OHL) involves a systematic process of removing conductors, pylons and foundations along the route length of the line.

In order to remove an OHL, various stages will be involved. They are as follows:

1. Planning
2. Site Set-up
3. Access
4. Conductor Removal
5. Pylon Dismantling
6. Foundation Removal
7. Re-instatement

1. Planning of the Works

The dismantling of an OHL requires a great deal of early planning to manage the activities during the construction period. There will be detailed studies of the local environment to identify constraints, interactions with 3rd Parties, and management of the various work phases, from initial entry at start up, to final re-instatement at the end of the work.

Design

Design work will be undertaken at the early stage of the work, and a Design Intent Document (DID) will be prepared listing all the areas that need to be addressed. This will cover issues such as steelwork and conductor condition, temporary works (scaffolding, foundation removal etc)

Access

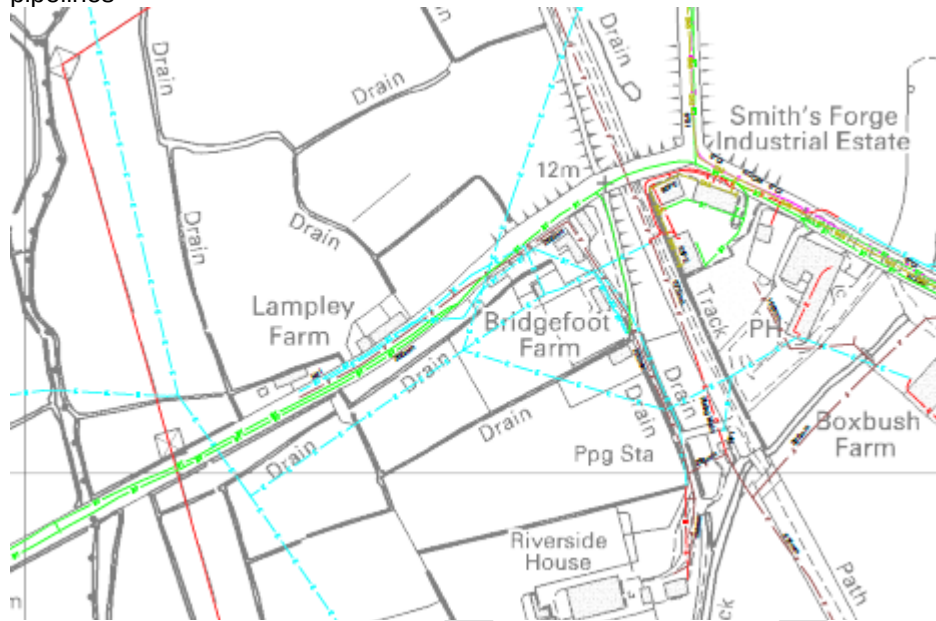
Plans showing the extent of the workings will be drawn up to indicate the area and land-take required.

3rd Party Searches

The 3rd Party search will detail all known services in the corridor, and will include:

- Overhead and underground power lines
- Overhead and underground telecommunications
- Water and drainage services

Gas, petroleum and chemical pipelines



Example of a plan showing services from 3rd Parties

The presence of a service indicated by the search is used as a guide only. Where works are to take place close to a known service, the location is proved by physical means (eg. hand dig), Ground Penetrating Radar (GPR) or CAT & Genny.

Scaffolding Survey

Scaffolding is required to both protect the public/ assets and to enable the conductors to be recovered. It is assembled in situ prior to the stringing works. Preparation for access and land take is required beforehand. Items that usually require protection are roads, railways, buildings, power lines, waterways, footpaths. A typical protection scaffold consists of 2 structures, one either side of the asset, connected by a net overhead.

A scaffold schedule is developed at an early stage of the project. This is used to identify the size, type and location of the scaffolding structure. As the scaffold may be located at a place separate from the pylon site, an alternative access may be required to construct the scaffolding.

The scaffold schedule also identifies the asset owner, be it the Highways Agency, Network Rail, land owner or other 3rd Party. Prior to any structure being designed, detailed negotiations are needed to determine what constraints may be present and to identify any mitigating measures that may be required. At the scaffold location, ground investigations may be necessary to determine the ground suitability for ground anchors. This is normally carried out by "pull tests" or trial pits. Where the ground is not suitable for ground anchors (or there is a presence of buried services), alternative kentledge anchors may be installed which involves large concrete blocks placed on the ground and being used as holding down weights. If ground conditions are not suitable it may be necessary to install stone pads for the erection of the scaffold.

When dismantling the conductors on an existing overhead line, the majority of the scaffolds can be avoided even for motorways, A roads and other major crossings.

This is achieved by careful planning with the Local Authorities, police, DNO etc. The majority of the conductors can be removed safely by closing roads etc for short period of time during quiet periods eg night time, dawn or Sundays.

For example, suitable traffic management can be employed on an A road to stop traffic for a period of up to 15 minutes to allow one or more conductors to be lowered to the ground where they are cut and cleared from the carriageway. The road is then reopened for a period of time and further short closures are repeated until all the conductors have been removed.



Kentledge blocks placed at the base of the scaffold.

Traffic Management Plan

A detailed traffic management plan (TMP) will be required to identify any potential impact of the construction activities during the removal works. Identification of haulage routes, vehicle types and quantities of vehicles is required to assess the effect on the local area, and to help place mitigation measures to lessen the impact, and also to facilitate the construction works.

During the early stages, assessments are made as to the suitability of local haulage roads. A and B classification of roads are normally deemed suitable for OHL construction traffic. Roads below these categories require assessment as they are often quite narrow and winding with little or no road markings, are often in a poorer state of repair than A and B roads. Also, they are generally used by the local community that will mostly be affected by the localised OHL works.

The TM plan will include details of vehicle types and quantities that will be involved at each stage. It will identify measures required to minimise disruption to the local road network and identify where control measures are required, such as temporary traffic lights, stop go boards, diversions etc. All of these measures will require negotiating with the local highways departments to seek agreement with the control measures required.

Network Rail

Early contact is required with Network Rail if the OHL crosses any railway, both active and disused. Some electrified lines require advanced notification of up to 1 year (or more in some cases) where a possession will be required for scaffolding construction. Due to the problems and complexities with advanced planning of the OHL works, it is normal to book at least two dates for netting, and a further 2 dates for de-netting.

As detailed in the scaffolding section, the requirement for the majority of the scaffolding can be removed by detailed planning with Network to undertake the removal during the night or at dawn.

2. Site Set-up and Mobilisation

Before any works start on site, office and yard accommodation will be required. It is common (but not necessary) for both office and yard to be situated at one location, close to where the works will be taking place. The office accommodation may consist of an existing building with all adequate facilities built in, or alternatively there may be the need to provide a number of temporary portakabin offices. A small area of hard standing is required for the storage of scrap materials, plant and equipment.

Generally, removal of the OHL route will use the same office and storage facilities as the OHL build.



Typical greenfield office and storage layout area

3. Access and Working Area

Wherever possible, existing access will be by agreed wayleaves. There may be a requirement to carry out some upgrades of the access route, such as replacing worn or inadequate gates, filling in potholes, erecting goalposts to warn of overhead dangers etc.

Where the ground is not suitable, alternative temporary access roads are available for consideration. These can be in the form of aluminium sheets laid down and bolted together (eg Trakway), wooden bog-mats/sleepers, or other types of temporary roadways such as plastic (Terraforma). These types of access systems are generally considered where access is required for a short term.

For the removal of OHLs, these temporary roadways are the preferred option as the time spent at each pylon location is generally short.



Site Welfare

Prior to any works commencing (and during the access works); temporary welfare facilities will be placed on site, in the form of portable toilets and a cabin (sometimes as a combined 'Groundhog' unit). These will be used by the site workers, and any night-time security throughout the construction phases.

Scaffolding

As noted earlier, scaffolding will generally be avoided where possible but the photograph illustrates a typical scaffold for the protection of an 11kV line.



Scaffolding protecting an 11kV pole line

4. Conductor Recovery

Machine Sites

Machine sites for the recovery of the conductor will be kept to a minimum size as generally the conductor will be recovered in short lengths of around 1 to 1.5km.

The conductor is first placed in to running out wheels at each of the suspension towers in the section.

Winch tractors are positioned approx. 1.5 times the height of the tension pylon and from one end of the section the conductor is lowered to the ground one at a time.

Where scaffold is not required roads etc are closed briefly (using suitable traffic management) as the conductor is lowered to the ground.

At the pulling machine, the old conductor is wound on to empty conductor drums to be taken away and scrapped. This can be done using a small puller winch.

It may be necessary to install temporary backstays at some of the tension pylons to avoid overstressing of the tension pylon when all the conductors are lowered off one side.

This process is repeated for each wire in the section, until all the wires have been removed. The section is left with free standing pylons, ready for the next phase.

5. Pylon Dismantling

Once the old conductor has been removed from the pylon, the insulators and fittings are lowered to the ground, and taken away from site. This leaves the pylon standing freely and ready to be taken down. There are a number of ways this can be done, and are broadly as follows:

Pylon Felling

This is the simplest way of bringing a pylon down. A bond is attached to the top of the pylon and secured to a winch situated up to about 1.5 times the pylon height away from the pylon base, in the direction being felled. The pylon legs are cut close to ground level, just above the concrete foundations, except for the 2 front faces which are only partly cut and act as a hinge. When everything is ready and the area is clear, the bond pulls at the pylon peak and the pylon will fall in the desired direction. The pylon can then be cut up at ground level and taken from site and scrapped.

During this felling operation it may be necessary to stop traffic on any nearby road for a few minutes to avoid causing any distraction to road users as the pylon falls.



Dismantling by Crane

Where the pylon cannot be pulled over due to restrictions or other risks, consideration can be made to using a mobile crane to take down the pylon. Where necessary a temporary access road (usually plastic) will be laid to enable the crane to get to the tower position.

The pylon will be unbolted in section which will be lowered to the ground using the crane. The sections are then unbolted at ground level, placed in skips ready for removal from site.

Dismantling by Derrick

Where pylon felling or the use of a mobile crane is not practicable due to the remoteness of the pylon etc consideration to using a derrick can be made. A derrick is erected on or in the pylon and this is used to lower sections of the pylon, similar to the crane. However, the sections are usually smaller than that that can be lowered by crane so the process is generally slower.

Steelwork Removal

Steelwork is usually cut-up/dismantled on site. It is normal for the steelwork to be deposited in to skips on and removed to scrap merchants for re-cycling. Options for cutting up the pylon can be by using oxy acetylene cutting equipment, powered cutting discs or by large hydraulic cutters (below). The advantage of using hydraulic cutters is the reduced risk of fires during hot, dry periods of the year.



Large hydraulic steel cutting attachments

6. Foundation Removal

Once the pylon steelwork has been removed from the site, the foundation at ground level and below will be left. In most cases, there will be a need to remove these foundations from ground level to a depth of up to 1.2m. This is carried out by excavating around the foundation to the required depth, breaking off the concrete and cutting/removing any steelwork. The excavation is then backfilled and the area re-instated.



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7. Re-instatement

Once the OHL has been completely removed, re-instatement of all the pylon sites and temporary accesses will take place. Unless considerable construction activity was required to gain access, this work will normally involve re-seeding or re-grading of areas around the pylon bases.

8. Overall Construction Period for Dismantling and Removing a Section of OHL

Many factors will determine how long a section of OHL will take to be removed completely. This will depend on the environment, constraints, access, resource availability etc, along with many others. Typically, it normally takes approx. 6 to completely remove a section of 10 pylons of 132kV OHL.



NEARY CONSTRUCTION

3. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 02

For the
Construction of site compounds

Hinkley Point 132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	06/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	06/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1
Approved by:	██████	on behalf of Neary Construction		Date	06/09/13
Designation:	Project Manager	Mobile Tel No. ██████████			
Received by:		Customer/Client (if applicable)	Date		
Designation:					

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1. Introduction	12. Plant, Tools and Equipment
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4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe construction of site compounds.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures

Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

*Only toothless buckets to be used on the excavator, the excavator **MUST** only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest*

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

Construction of Site Compounds

As part of the easement fencing works, the compounds perimeter will be demarcated in the form of post and rail fencing and once this is complete, the area will be topsoil stripped ready for the hard standing installation as per relevant RAMS document.

Hard Standing

The area to be stoned up will be marked out by a site engineer prior to stone delivery as per relevant drawing.

Prior to any laying of stone, a layer of geotextile separator membrane will be laid on any stripped ground onto which the hardstand will be installed with a minimum overlap of 300mm for neighbouring sheets.

The first stage of construction will be the installation of the 600mm deep stone hard standing, the first layer of which will be made up of a 450mm deep bed of class 6f2 stone (or similar). The class 6f2 stone (or similar) will be delivered to site on wagons and tipped off within the compounds perimeter. Upon delivery, the stone will be spread using machines and levelled using a wide grading bucket. The stone will then be rolled using a ride on roller until compacted thoroughly. This process will be repeated in layers until the 350mm depth has been reached.

Once the class 6f2 (or similar) stone layer has been completed it will be capped using type 1 stone in a layer 150mm thick. This will be delivered and laid as the class 6f2 stone (or similar) was and the same process of compaction will be used.

There may well be stone lay-by areas constructed just after the access point of the site compound to aid with the cable drum delivery. These are to be of a class 6f2 / type 1 stone (or similar) make up as per the main hard standing and will be (20m x 5m) and (40m x 5m) in size. The smaller of these hard stands will provide an area into which the cable drum wagons can drive into prior to reversing into the larger bay to park. This could be upon reaching site or in between cable pulls.

Tarmaced areas such as car parks and access roads

The existing ground will be taken down by 300mm using an excavator (topsoil will be stored adjacent to the works), again with HSG47 guidelines being followed. Once the ground is at this level a 200mm layer of Type 1 stone will be laid and compacted using a ride on roller.

As shown on an as yet to be issued drawing 'Typical bellmouth drawing' a kerb line will be laid to form a 5m radius on either side of the bellmouth opening. This will be marked out by the site engineer. The half battered kerb stones will be bedded onto a 100mm a kerb mix concrete bed and 75mm haunch which will be installed at the same time as the stone prior to the bituminous topping. Kerbs will be hand laid, mauled into position and levelled using a

string line and pins maintaining a 125mm up-stand from ground level at all times. At either end on the kerb lines on the carriageway drop kerbs will be installed.

Once the stone layer and kerb lines are in place and concrete has cured adequately to avoid kerb movement or settling the bituminous layer will be installed.

20mm DBB will be laid and raked in by hand to a depth of 60mm to 40mm below ground level. The layers will be compacted using a ride on BOMAG roller or similar in readiness for wearing course. A cold tar paint or similar will be poured onto the walls of the trench prior to wearing course being installed. Wearing course to match existing or agreed will be laid and raked up to ground level and spread evenly. Once laid it will be rolled using the ride on roller until fully compacted, and the edges tidied using shovels and grafts if required. The roller will release cold water as it rolls the layer to ensure the wearing course does not break up on compaction. Once installed the new road surface should be given at least 3 hours to cure prior to it being subjected to traffic loads.

Demarcation, Signage and Establishment

Fencing demarcation types need be erected to segregate the different areas within the compound area. The compound is to be segregated using the following types of fencing;

- Post and Rail
- Heras fencing
- Chain Link fencing

All roadways around the compound site will be lined with traffic cones at intervals of around 5m - 10m to make it clear to vehicles where the edge of the hard stand is where stone roads have been used.

Vehicle movements will be controlled by operating a one way system around the compound which will be abided to by ALL vehicles.

As part of the fencing installation a lockable gate will be installed as part of the chain link fencing that surrounds the car park area. This will be locked out of hours to ensure the security of vehicles left in the car park overnight.

Easement security itself will be maintained at the access point off the main link road by use of a lockable gate and site security which will be based in a security hut just inside this access point. Security procedures are to be outlined in a separate approved RAMS document.

To maintain the cleanliness of all main link roads a wheel/tyre cleaner will be installed to service all site vehicles exiting from the easement / compound area back onto the highway. This will be detailed in a separate RAMS document where the installation / maintenance procedures will also be outlined. This wheel/ tyre cleaner will be sited on the inside of the access point off any main road.

Appropriate signage will be erected throughout the compound itself and its approaches to notify of all manner of things from traffic directions through to skip types. Notice boards will be placed accordingly containing all documentation required by CDM including the project F10.

The compound will be populated with the following;

- Offices / Containers
- Welfare Units
- Drying Rooms
- Generators
- Toilets inc septic tanks

-
- Fuel Store – fuel bowser / spill kits / jerry cans
 - Refuelling area for above
 - Storage containers – General stores / COSHH
 - Skips – General Waste / Metal / Timber
 - Water bowzers – Potable / Drinking
 - Low level directional lighting
 - Segregated storage areas for materials and plant
 - Car parking facilities
 - Wheel wash facilities on exit
 - Security hut
 - Lay-by parking for larger delivery vehicles where possible

Any of the above to be delivered to site will come on appropriate delivery wagons and will be unloaded as per an approved lifting plan.

All tanks that require emptying shall be done so by approved waste carriers and all records of waste removal / transfer shall be kept in the offices.

Electrical Feed

Cabins will be temporarily powered using a standalone generator that will be constantly refuelled using a connected fuel cube and all electrical connections will be made by a qualified electrical installer. As soon as possible, the site compound shall be connected to the local electricity supply and the generator and fuel cube can be off hired and removed from site.

- The trench will be only 300mm in depth and so will not require benching on either side of the excavation. It will be excavated by machine or hand dependant on the CAT scan and service records review as per HSG47.
- The working areas are to be barriered off using Chapter 8 barriers at all times.
- Excavated arisings are to be deposited a minimum of 1m from trench side to be removed from the point of works to a pre agreed storage area via dumper.
- A 75mm duct will be laid in 6m lengths onto the bed of the excavation.
- Once the duct is in place it will be surrounded with yellow warning tape and brought up to ground level with backfill. Once the backfill is in place it will be compacted with a fwd/rev whacker plate.
- Cable will then be installed as required and terminated by competent qualified persons able to do so.

Drainage

A site specific drainage plan will be drawn up covering the drainage requirements for each individual compound. This will be used to identify where specific types of drainage will be needed prior to installation.

Where possible drains will be installed through the use of shallow buried ducts, however if more sophisticated systems are required a drainage contractor may be employed.

White Lining

Any white lining that needs to be installed can be completed once the car park and access roads have been fully installed. Thermoplastic white lining will be used which is installed by rolling out the desired line or marking and using a paraffin blow lance to heat the compound until it becomes soft and moulds to the ground below. All white lining should be given around an hour to cure.

Alternatively, a sub contractor may be brought in to carry out white lining and markings using hot pour thermoplastic lining. These works will be carried out as per a separate RAMS document if required.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

Type 1 stone (or similar)
Class 6f2 stone (or similar)
Signage
Post and Rail fencing

Heras fencing
Chain Link Fencing
Traffic cones
Geotextile separator membrane
Contractor spray paint
Bituminous materials
White lining
Drainage materials
Ducting (various sizes)

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
Transit van
Hiab wagon c/w certified lifting equipment
Bomag roller
Wheel /tyre cleaner
Office cabin
Welfare cabin
Water bowser – Potable / Drinking
Toilets inc septic tank
Drying room
Skips
Fuel Store – Fuel Bowser / Spill Kits
Store cabins – General stores / COSHH stores
Generators
Hand tools
Dumpers
Low level directional lighting

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			2	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Construction of Site Compounds						Risk Assessment Ref. N ^o & Issue		RA/7334/DN/02	
Site and Location of work:	Various Locations						Project No:	7344	Method Statement Ref. N ^o & Issue	MS/7334/DN/02
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████	Assessed On Site By:	██████
	7						Date of Assessment	13/09/13	Date of Site Assessment	13/09/13
Duration of Task		As per programme		view Cycle		AS REQUIRED				

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement. All vehicles to abide by the one way system implemented in the site compound.	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing.	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to ground the bucket and switch off the engine before encroaching into the exclusion zone (within radius of machine arm).	Site Supervision Individuals	4	1	4
		Damage to overhead/underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
9	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
10	General Working	Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, sunscreen, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
11	General Working	Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Suspended loads	Load falling, load swinging, uncontrolled load	4	3	12	Safe and approved method of work, clear work area, Safe lifting zone, flat level ground. Certified lifting equipment. Certified Hiab and operator. Use of slings / banksman.	Site supervision Individuals	4	1	4
14	Access and Egress	Falls from height	4	4	16	Ladder access on both sides of the Hiab lorry. Guard rails running around the perimeter of the Hiab lorry.	Site Supervision. Individuals.	4	1	4
15	Use of vibrating equipment	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
16	Driving compaction plant	Vehicle overturning	3	2	6	Controlled by certified operator on well levelled ground.	Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

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Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
17	Concrete use	Cementatious materials - dermatitis	3	3	9	Waterproof gloves and wellingtons to be work	Site supervision Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
 PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2
 Page 14 of 13

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



4. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT

REF. 20492/PWI/018

FOR

The Construction of Reinforced Concrete Foundations At Brelston Green SEC

PROJECT NUMBER: 20492

Original Author	██████████	Risk Assessment Reference:	Internal to this document	Date:	22/02/13
Signed		Review Cycle	Where circumstances dictate		
Designation:	Site Engineer			Issue No:	0
Site Author	██████████	Signed:		Date:	22/02/13
Designation	Project Engineer			Site Revision	05

Approved by:	██████████	on behalf of EAW\	Date	
Designation:	Site Construction Manager			

Accepted by:		Client (National Grid MDE)	Date	
Designation:				



CONTENTS

1. Introduction 2. Reference Documents 3. Safety Documents 4. Access and Egress 5. Work Boundaries 6. Method of Working 7. Emergency Procedures 8. Manual Handling 9. PPE 10. ERTS 11. Materials	12. Tools and Plant 13. Labour 14. Delineation 15. Supervisory Requirements 16. Programme 17. Waste Management 18. Environmental Issues 19. Other issues / General Considerations 20. Risk / Hazard Assessment 21. Employee Register 22. Appendices (if relevant)

1 INTRODUCTION

This document covers the construction of reinforced concrete foundations within Brelston Green Cable Sealing End Compound.

2 REFERENCE DOCUMENTS

National Grid MDE 3rd Edition Safety Rules
 P032 / Emergency Plan/EAW Project Emergency Plan
 MMD Brelston Green SEC Construction drawings
 CDM Demarcation Arrangement Brelston Green SEC (Current Revision)
 EAW-PL-PECP-20492/Project Environmental Control Plan (PECP)
 EAW-PL-SHES-20492/Construction Phase SHES plan
 CWI-02-008-A/Standard Trench Excavation
 Existing Earthing Assessment for Brelston Green CSE's/ERM 832
 Certificates of competence for all personnel
 EAW WAP form
 EAW DASS
 HSG47 Guidance
 HSG185 Guidance
 GPR survey drawings and Hazard survey drawings
 Toolbox talk 'Awareness of risk due to increased touch voltage potential'
 SSWP

3 SAFETY DOCUMENTS

At the discretion of the SAP NG safety documents will be issued.

The EAW will erect a designated CDM area before the work commences which will be agreed with National Grid MDE SAP prior to any work starting. The placement of demarcation to identify the CDM area will be personally supervised by the National Grid MDE SAP. Form UKBP/TP137.06 (Appendix K) will be completed to document the CDM arrangements agreed with NG MDE.

EAW documents will be issued in the form of a WAP and DASS prior to works commencing. **All Service drawings will be attached to the WAP.**

All the working party will be briefed on the toolbox talk 'Awareness of risk due to touch voltage increases potential' prior to any work taking place.



4 ACCESS AND EGRESS

All vehicles will enter the EAW CDM areas via the main EAW entrance gates and then further access will be controlled by EAW site management utilizing site security prior to entering the Brelston Green SEC. **All plant and vehicle movements into the Brelston Green SEC will be authorised and coordinated by The National Grid MDE SAP prior to entry.**

All operatives will have an EAW site induction and will log their attendance on site by signing the attendance register located in the EAW site office locations. All operatives will hold Persons and BESC competence for Substations.

A competent person will receive a NG safety document and will co-ordinate the access arrangements with the SAP. All members of working party working will hold persons / BESC certification for substations.

The competent Person & Works supervisor will read and understand the 'Lightning Risk & Weather Warnings ESBP – AS001 – Issue 1 – May 2003' and 'SHESQ-GN-105 Lightning Risk and Weather Warnings' documents prior to any work starting. Prior to any work starting National Grid NOC will be contacted to determine the lightening risk and the supervisor/competent person for the working party will place themselves on the lightening risk register. The competent person holding the National Grid document will with the assistance of the EAW site management make the decision if the lightening risk is a 1 at the start of a working shift or becomes a 1 during the working day. The lightning risk will then be recorded on the mounted 'lightning risk sign' that is placed to the entrance of the CDM area where works are to take place.

Safety distances will be adhered to at all times within the 400kV Sealing End Compound.

400kV = 3.1m

A distance of 300mm shall also be maintained from that part of the insulators supporting exposed unearthed high voltage conductors which are outside the appropriate safety distance.

All long objects will be carried horizontally & as close to the ground as possible.

All plant whilst working or moving within the EAW and NG CDM areas will be fully controlled by a banksman, providing personal supervision at all times. All plant will use the access route as per **CDM Demarcation Arrangement Brelston Green SEC (Current Revision)** during the works, the routes will be demarcated with water filled barriers to ensure plant will not pass into the 'Plant Restricted Zone'.

Only plant and equipment authorised by the MDE NG SAP will access over the existing NG access bridge.



5 WORK BOUNDARIES

- Heras fencing demarcation will be erected as per sketch CDM Demarcation Arrangement Brelston Green SEC (Current Revision), to prevent any unauthorised access to the SEC following the removal of the palisade fencing and to provide a clear indication of EAW and NG CDM (plant restriction) zones. The internal heras fence line shall be connected to the SEC MES whilst the external fence line shall be earthed to the ground. **Physical separation between 2 earth systems (including earthed plant) must be minimum 2m.**
- Chapter 8 red and white demarcation will be erected within the Sealing End Compound at locations agreed with the SAP to ensure that the safety distances from the live equipment cannot be infringed by plant movement within the SEC.
- It must be ensured that earthed equipment operating in the red zones as indicated in Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832 report are not touched by personnel working in the same area. Methods to avoid direct contact must be employed to ensure risk of shock is reduced to a minimum. For this activity these measures are;
 - a. Use of demarcation barrier
 - b. Exclusion of non –essential personnel
 - c. Use of specific PPE
- Water filled barriers will be placed as per sketch CDM Demarcation Arrangement Brelston Green SEC (Current Revision), to provide protection to NG structures within the plant restriction zone.

This CDM area is to be planned and agreed with the NG SAP and placed under personal supervision of the NG SAP. Safety from the system will be the responsibility of National Grid.

6 METHOD OF WORKING

On arrival at site, the operatives will contact the Site Manager or site engineer. All operatives must be competent to carry out the tasks they are employed to do. Valid Person and BESC Cards will be required for any operatives who are part of the working party.

Operatives will be given a site specific induction by the Site Manager or nominated representative to highlight the risks and hazards associated with the construction site and inform them of the first aid facilities and details of emergency contact numbers.

Operatives will be given a Method Statement / Risk Assessment / Toolbox Talk brief and will sign a briefing sheet to indicate that they have understood the scope of work, plant and materials to be used and their duties to be carried out.

The following work will involve:-

Demarcation of CDM zone through erection of HERAS fencing and water filled barriers as per **CDM Demarcation Arrangement Brelston Green SEC** (Current Revision). Demarcation to prevent unauthorised access following removal of the palisade fencing, ensure separation between EAW and NG CDM zones and protection of NG structures. Earth links will be connected to each HERAS fencing panel.



All fencing will be placed under personal supervision from the National Grid MDE SAP. The demarcation will have signage mounted detailing the EAW CDM area and relevant health and safety warning signs.

The method of excavation will be carried out in accordance to the HSG47 guidance (AVOIDING DANGER FROM UNDER GROUND SERVICES) and the Alliance Work Authorisation Procedure. A Work Authorisation Permit and the GPR survey along with all the utility drawings will be briefed to the working party before the work commences. The recipient of the EAW Work Authorisation Permit will personally supervise all ground penetration works and will be responsible for ensuring that all of the working party works in accordance with the EAW Work Authorisation Permit procedure. The issuer of the Work Authorisation Permit must have completed the 2 day awareness HSG (47) course. The receiver of the permit must be the person in direct control of the work: either an EAW employee or a sub-contractor who has received WAP training and is an authorised receiver.

All excavation works will be supervised at all times by a certified HSG47 operative in accordance with EAW procedure on safe digging; this will include the acceptance of the permit to dig WAP. A certified HSG47 operative will use a buried service locating device to sweep the full area. If any potential services are located under the surface, these will be marked with red spray before the excavation commences. All ground works are to be marked up according to the EAW colour scheme for excavation works prior to any work commencing and must be maintained throughout the works.

EAW colour scheme for excavations:-

- **Red = Identified Hazard**
- **Yellow = Machine Dig Area**
- **Blue = Hand Dig Only Area**
- **White = Route Of Excavation**

[Important: No machine digging within 500mm of an identified hazard]

All works within excavations will be undertaken in accordance with HSG185 guidance and supervised by a trained and competent supervisor.

The area to be excavated by hand will be marked on the ground with blue spray paint and the area to be excavated by machine marked in yellow by the EAW Site Engineer. The ground will then be scanned using CAT and Genny avoidance tools by the HSG47 trained/competent operative. Excavated layers will be removed in layers not exceeding 300mm thickness, in accordance with HSG185 guidance. Each time a layer is excavated a new scan of the excavated area will take place by the HSG47 competent operative. All excavations are to be battered or stepped accordingly to a safe angle.

Known services within the excavation area will be exposed by hand dig only. A timber length will be placed across the open excavation and connected to the service with cable ties to provide support to the duct.



The machine excavation works to reduce ground level ~~within the highlighted area as shown on CDM Demarcation Arrangement Brelston Green SEC Rev. 5~~ will be carried out by a slew restricted 6 Tonne excavator and 3 tonne dumper only. Water filled barriers will be used to demarcate the area where the excavators can safely operate whilst maintaining the required safe distance. A competent banksman will provide personal supervision for all excavator and dumper movements. The competent banksman will also carry an airhorn, this will be used as a audible warning if the excavator or dumper operator comes close to the demarcation of the live equipment.

If excavations cannot be battered or stepped back sufficiently, then the EAW temporary works coordinator will be consulted and work will stop.

Access and egress will be established before any work starts and will be kept unobstructed at all times.

The spoil created during excavation will be loaded into a dumper and removed so it can be stored locally. Spoil and materials must be stored at a minimum of 2m from any National Grid MDE fence line or temporary Heras fence installation. **Any Spoil removed from excavations should be placed a minimum distance equal to the depth of the excavation away from the excavation.** All open excavations will be demarcated using chapter 8 barriers, chapter 8 demarcation will have signs attached displaying 'keep out' and 'danger deep excavation'.

Once the founding level is reached the EAW engineer will check the ground conditions before the separation membrane is placed. Once the founding level has been checked and approved by the site engineer, the preparation works for the reinforced concrete base can be started.

Preparation of Blinding

The level of the excavation will be checked and cleared of water and other debris. The concrete will then be placed with as per the concrete placement section.

Constructing Reinforcement

The pre-fabricated steel reinforcement will transported to site on the back of the pick up and unloaded at site and checked by the engineer for its size, spacing etc.. The J-bolts will be suspended from the formwork at positions provided by the setting out engineer.

Formwork Construction

The formwork will be constructed at the site of the foundation to reduce the risk of manual handling injuries and other risks caused by transporting large shutters across site. The formwork will be constructed as per the manufactures instructions and guidelines, see SSWP. As operatives will be required to carry materials to site and prepare formwork, they must pay attention to the manual handling issues raised from these tasks. Heavy loads will be shared by operatives distributing the load equally, walking routes will be checked prior to use to check for obstructions/hazards, suitable gloves will be worn, good lifting techniques will be used and good housekeeping will be maintained at all times. Once the formwork has been erected, the steel reinforcement is then to be checked for its position within the shutters. Shutter oil is



applied using a manual operated spray bottle, see appendices for COSHH assessment on shutter oil.

Setting of J-bolts and Finished Concrete Heights

Positioning of any holding down bolts will be set by the engineer when the steel work and formwork is satisfactorily positioned. These will be set using a template fixed to the formwork. The bolts where required will be set inside tubes that will be removed once the concrete has been poured and then cured. The bolts will be checked for their projection/embedment and their coordination/dimensions checked against the design drawings by the setting out engineer. Finished concrete heights will be set by the engineer using level nails or timber fillet to create the finished level.

Concrete Placement

The concrete will be placed using the slew restricted 6 tonne excavator.

The driver/operator of the concrete wagon will act as a visitor whilst on site and will be instructed to stay within a segregated area around his machine. The driver/operator of the concrete wagon will not be Person or BESC trained, but will be briefed by the Competent Person and Supervisor controlling the works and personally supervised for their short duration on site and personally supervised at all times. The concrete wagon driver/operator will work in accordance to the suppliers general risk assessment.

The delivery note will be checked for quantity, mix and slump prior to discharge. The concrete will then be slump tested to check that it falls between the design mix limits. If the concrete passes the slump test, the concrete will be placed into the receiving base foundations formwork.

On completion of discharge, concrete wagons will be personally supervised at all times to the designated washout area.

The base foundations will be filled to the required level, vibrated and floated off, this process will continue until all required foundations/structures are complete.

Access to enable operatives to vibrate and float off the concrete to the required level will be from existing ground level adjacent to the excavation. Voids between the formwork and existing ground level will be covered with plywood to reduce the risk of slips, trips and falls. Operatives using vibrating plant will be rotated to reduce exposure to Hand/Arm Vibration Syndrome and all exposure will be monitored and recorded.

Where the ambient temperature is less than 2°C it will be deemed to be cold weather working conditions. During such conditions the concrete once poured will be covered with a frost blanket. If the temperature falls below 5°C no concreting works will take place. Prior to pouring concrete in cold working conditions all steel reinforcement and formwork will be cleared of any frost or snow. Once placed the concrete will also be monitored to check it is between 5°C and 30°C using a thermocouple. The concrete must not fall below 5°C until a strength of 5N/mm² has been achieved.

Concrete test cubes will be cast and tested for compressive strength after 7 and 28 days.



The formwork will remain in place for 48 hours before being stripped. All tie holes and superficial voids will be made good with concrete mortar.

Backfilling Operations

Aggregate material will be delivered to site by a delivery wagon that will be met at the gate by an EAW banksman and reversed into position within the laydown area. The aggregate will then be loaded into a dumper by a 6 Tonne excavator and whilst under the personal supervision and control of a banksman at all times.

Type 1 sub-base material will be transported by the dumper to the required location and tipped. The stone will be positioned by the excavator and compacted as per Method 2 in accordance with SHW Table 6/4.

Stone Chippings will be transported by the dumper to the required location and spread by the excavator and/or with a rake as per MMD-20492-C-DR-0012 Detail 1. On even and stable ground within Brelston Green SEC, the roll bar of the 6 Tonne dumper can be removed, as per manufacturers guidelines, in order to adhere to height restrictions within the SEC.

Grouting

Fosroc Conbextra GP grouting shall be used to fill the void between the base plate and foundation. A timber shutter shall be constructed and the grouting applied as the the manufacturers guidelines.

7 WORK SPECIFIC EMERGENCY PROCEDURES

In the event that you are involved in an incident or accident, you should do the following:-

- Stop work immediately
- Inform your supervisor of the incident, if you are not injured but are a witness
- Dial 999 or 112 and give clear instructions and the location of the incident.
- Move well away from the incident.
- Report all injuries even minor ones and fill in the accident book.

8 MANUAL HANDLING

Risks as identified in risk assessment.

All manual handling activities will be assessed prior to any manual handling activity taking place.

9 PERSONEL PROTECTIVE EQUIPMENT (PPE)

The following is to be worn by all operatives in line with National Grid Safety Line Policy:

Hard hat to EN397

Safety Footwear

Fire retardant overalls



High visibility site vest
Safety Glasses
Ear Defenders (Whilst using Air Pick)
Gloves (Task Specific)
Face Visor (Whilst using Air Pick)
Insulated Gloves (whilst entering/exiting excavator & whilst wrapping earth tapes)
Insulated wellington boots (whilst entering/exiting excavator & whilst wrapping earth tapes)

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable for this work.

11 MATERIALS

C25/30 Concrete
Pre-fabricated Steel Reinforcement cage
Lotrak 2300 separation membrane
Hazard marker tape
Insulating Rubber Matting

12 PLANT, TOOLS AND EQUIPMENT

Air pick / Air Lance
Towable Compressor
Red and white chapter 8 barriers
HERAS fencing (with couplers and feet)
Earth Links
Fire extinguisher (CO2 or Powder)
Insulated Shovels
CAT & GENNY
6 Tonne excavator
3 Tonne Dumper
Certified Lifting Chains
Abrasive Wheel

13 LABOUR

4no. Person / BESC operatives
1no. Supervisor (HSG47 certified)
1no. Competent Person
1no Certified operator for 6Tonne excavator
1no Certified operator for 3Tonne dumper
1no Banksman/Slinger
1no Engineer

At least 1no. Competent person to operate the fire extinguisher.
All operatives are to hold Persons and BESC.

14 DELINEATION



Security Fencing – HERAS fencing erected as security measure when Palisade fencing is removed.

CDM Separation – HERAS fencing separating EAW and NG CDM areas

Excavator Position – Red and white chapter 8 barriers to ensure slew restricted excavator cannot encroach safety distance of live equipment

Barrier signage indicating CDM Areas

CDM area access point to be closed off and locked at the end of the working shift.

Excavations will be protected by the use of chapter 8 demarcation with signs stating “KEEP OUT” and “DANGER DEEP EXCAVATIONS”

The Site manager and Site Engineer will agree the extents of the safe working area with the National Grid MDE SAP prior to any work starting.

15 SUPERVISORY REQUIREMENTS

The Supervisor will be HSG47 certified and will be present during the excavation works at all times. The Work Authorisation Permit - Work Authorisation Permit will only be accepted by the responsible HSG47 certified supervisor. The permit must be within his possession at all times during the operation.

16 PROGRAMME

Working hours will be 07:30 until 17:30 subject to daylight restrictions.

17 WASTE MANAGEMENT AND HOUSEKEEPING

All excavated material is to be disposed of to a licensed landfill in accordance with the EAW site waste management plan, should you be unsure – ASK.

All waste management will be in accordance with the ‘Environmental protection act 1990’, Section 34 - Duty of care.

All disposable waste to be placed in specifically designated skips provided.

18 ENVIRONMENTAL ISSUES

A spill kit and suitably sized plant nappy are to be in the vicinity during the operation of motorised plant to ensure that any spillages of diesel or hydraulic oil are quickly contained and cleaned up.

Drip trays are to be provided with generators & compressor.

All construction noise will be kept to a minimum.

All litter or waste generated during this operation will be disposed of in the correct manner as outlined above.



All persons are to read the Project Environmental Emergency Control Plan (EAW-PL-PECP-20492).

19 OTHER ISSUES

Application of Field Equipment Earths (F.E.E's)

Plant that requires connection to the site M.E.S must have the field earth connected in a specific sequence depending on the plants positioning in the S.E.C (based on the **Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832**)

- **When plant is standing on a green (earth mat installed) area** – In this case earths must be connected to the M.E.S 'D-loop' first then connected to the plant.
- **When plant is standing on a red (No earth mat installed) area** – In this case earths must be connected to the plant first then connected to the M.E.S 'D-loop'.

Earthing of HERAS fencing is only to be completed by a competent person.



20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Construction of Reinforced Concrete Foundations at Brelston Green SEC								Risk Assessment Ref. N ^o & Issue	20492/PWI/018	
Site and Location of work:	Brelston Green SEC/Ross On Wye						Project No:	NG302	Method Statement Ref. N ^o & Issue	20492/PWI/018	
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	Assessed By:	██████	Assessed On Site By:	██████	Duration of Task	Ongoing	
	2	4	0	0	Date of Assessment:	09/01/13	Date of Site Assessment	/02/13	Review Cycle	Where circumstances dictate	
Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor											
Hazard Ref. N ^o .	Task	Hazard Identification & Foreseeable Risks				Without Controls	Control Measure			Methods of monitoring control measure	With Controls

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3
 PROBABILITY: Frequent = 5 Probable = 4
Trial Hole Investigation of National Grid MDE 400kv of Walford Sealing End Compound

Minor Injury = 2 No injury = 1
 Occasional = 3 Possible = 2 Improbable = 1

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	Access to work site by pedestrians	Struck by moving vehicle – impact & crush along NG access road	4	2	8	- Pedestrians to use designated segregated access routes. - All operatives to wear hi-visibility clothing inline with EAW procedure. - Safe Access and Egress to be maintained at all times. - Potential trip hazards and areas of poor access and egress to be highlighted in the briefing by the supervisor.	EAW Site Manager/ EAW Foreman	4	1	4



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
2	Works adjacent to live 400kv Electrical Cables.	High voltage electricity – shock, burns, fire, explosion from HV conductors	4	4	16	- All personnel to be Competent / Person & BESC trained. - All personnel to be supervised by a competent person. - Competent person to ensure that no member of the work party or working plant leaves the CDM area without his instruction. - Safety distances must be adhered to at all times - NG 3rd edition safety rules apply at all times. - No Lone working - Working under NG safety documents where required & with NG demarcation. - Work within CDM delineated area or NG safety demarcation. Any damage found to the protective tile will be reported immediately to the National Grid MDE All plant and equipment must not be earthed using the field equipment earths, as per the recommendation of the Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832. - No machinery is to cross the existing circuits following the excavation of the overlying ground Safety from the system will be the responsibility of National Grid.	EAW Site Manager/ EAW Foreman	4	1	4



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
3	Works adjacent to live electrical equipment.	High voltage electricity – shock, burns, fire, explosion from HV conductors	4	4	16	All personnel to be Competent / Person & BESC trained. All persons to be supervised by a competent person. Competent person to ensure that no member of the work party or working plant leaves the CDM area without his instruction. No plant equipment will be held above shoulder height. Safety distance must be adhered to at all times NG 3rd edition safety rules apply at all times. No Lone working Working under NG safety documents where required & with NG demarcation. Work within CDM delineated area or NG safety demarcation. - All plant and equipment must not be earthed using the field equipment earths, as per the recommendation of the Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832. - No plant is to cross the existing circuits following the excavation of the overlying ground. - Safety from the system will be the responsibility of National Grid. See attached drawing and CDM Demarcation Arrangement Brelston Green SEC (Current Revision), showing plant use restrictions. Only specified plant to operate within the specified area. No Plant to be used within the restricted plant zones. Competent Banksman to provide personal supervision and to control all plant movements. Competent Banksman will ensure no machine parts to extend over 'Plant Restriction Zone' demarcation. Only plant and equipment authorised by the MDE NG SAP will access over the existing NG access bridge.	Competent Person/SAP	4	1	4

Construction of Reinforced Concrete Foundations at Brelston Green SEC



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
4	Working in increased touch potential risk zones	High Touch Voltages – Electric Shock, burns, resultant injuries/health problems from electrocution and shock	4	3	12	- Exclude works in high potential zones - Erect demarcation barriers to delineate and separate differing potential areas by minimum 2 metres as per CDM Demarcation Arrangement Brelston Green SEC (Current Revision). - Install safety signage - Reduce risk of contact by installing insulating materials - Use of insulating PPE and insulated working methods - Highlight risks to all operatives by toolbox talks - Attach field earth to plant before attaching to MES	EAW Site Manager/ EAW Foreman	3	1	3



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Manual Handling	Muscular/skeletal disorders, hernia, slipped disc, slips, trips, falls, crushing of limbs, laceration, being trapped and loss of load whilst handling reinforcement and formwork.	3	2	6	- Plan the lift. - Ensure there is adequate supervision. - Ensure that all operatives ensure all concerned receive adequate training. - Personnel to be aware of manual handling techniques prior to lifting operations being undertaken. - Make an assessment prior to undertaking a manual lift. - Use mechanical lifting equipment wherever possible. - Never exceed personal lifting capacity, - Adhere to manufacturers operating procedures. - Try to use mechanical aids wherever possible - Observe weights and/or centre-of-gravity as indicated - Keep good housekeeping in the area. Keep walking routes clear - Look at the individual and their capabilities. - Share Heavy Loads, use good lifting posture (Keep back straight and lifting using the legs). Do not allow twisting movements. - Refer to manual handling risk assessment for positioning of goal posts, steel reinforcement, formwork and other tasks. Additional manual handling risk assessments will be undertaken where required.	EAW Site Manager/ EAW Foreman	3	1	3



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
6	Use of Long objects in live compounds	Infringement of safety distances, induced voltages	4	3	12	• NGC SAP to give authorisation prior to transportation of long objects • Persons with NSI 8 • Keep long object horizontal and as low to the ground as possible • Ensure two persons are transporting long object across site • Stay to designated access / egress routes • Never leave long objects unattended • Ensure that step ladders are stowed and locked when not in use • No metallic tapes or rules to be used.	Competent Person	4	1	4



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
7	Using Plant (Excavator, 6 Tonne Dumper, Telehandler, wagons)	Damage to electrical equipment, plant conducting electricity and creating a lethal hazard to operatives. Plant falling into excavations	4	4	16	- All plant to be assessed for its heights and potential heights prior to it arriving on site. - Work to be within CDM barriers at all times, only trained and competent operatives to operate plant, competent banksman to personally supervise plant at all times. All plant and equipment must not be earthed using the field equipment earths, as per the recommendation of the Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832. - No plant is to cross the existing circuits following the excavation of the overlying ground. Safety from the system will be the responsibility of National Grid. See attached drawing CDM Demarcation Arrangement Brelston Green SEC (Current Revision), showing plant use restrictions. 6 Tonne Excavator. 3 Tonne Dumper. - Telehandler only to operate in parallel to the plant restriction zone. Plant movement within the NG CDM area to adhere to LAC. Competent Banksman to provide personal supervision and to control all plant movements. Competent Banksman will ensure no machine parts to extend into safety distances of live HV equipment. Only plant and equipment authorised by the MDE NG SAP will access over the existing NG access bridge.	Foreman/ Competent Person	4	1	4



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
8	Excavation works by use of 6 Tonne excavator	Overturning, collapse of excavation, People struck by plant, materials and people falling into the excavation and fumes generation.	4	3	12	EAW Work Authorisation Permit (WAP) to be followed at all times. A WAP is to be issued and received and briefed by the HSG47 Supervisor. Competent Banksman to provide personal supervision with all excavators at all times. HSG47 is to be followed at all times and HSG7 competent operatives are to scan area and check service drawings prior to work commencing. Work in accordance with HSG 185, excavation areas to be segregated off using chapter 8 barriers. Daily excavation checks to be carried out and check sheets filled in, excavation tags are to be completed prior to starting a working shift. Work is not to take place until all the checks on the excavation have taken place and the excavation tag has been completed and displayed. Stop blocks must be made available for excavators and concrete mixers and any other plant that needs to work adjacent to excavations. - All plant and equipment must not be earthed using the field equipment earths, as per the recommendation of the Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832. - The Excavator is not to cross the existing circuits following the excavation of the overlying ground. - No Plant to be used within the restricted plant zones. Competent Banksman to provide personal supervision and to control all plant movements. Competent Banksman will ensure no machine parts to extend over 'Plant Restriction Zone' demarcation. - Safety from the system will be the responsibility of National Grid . See attached drawing CDM Demarcation Arrangement Brelston Green SEC (Current Revision) showing plant use restrictions.	Competent Person/ Competent Banksman	4	1	4
		Construction of Reinforced Concrete Foundations at Brelston Green SEC								



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
9	Working with plant, equipment and accessories to lift	Over stress & Overturning counter weights – Crush Loss of control – Impact and crush Loss of load – Impact and Crush	4	5	20	- Lift to be planned by a competent person. - All lifting equipment and accessories certified and checked under the supervision from a lift supervisor. - Sliding to be carried out by a competent slinger/banksman. - Approved excavator/ telehandler lifting attachments to be used. - Weekly checks on all lifting equipment prior to any lifting taking place. - Inline with LOLER regulations:- - Accessories for lifting must be thoroughly examined every 6 months. - Plant and equipment for lifting must be examined every 12 months. See attached drawing CDM Demarcation Arrangement Brelston Green SEC (Current Revision) showing plant use restrictions.	Competent Person/ Competent Banksman	4	1	4



Hazard Ref.N°.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
10	General Working	Slips, Trips and Falls Cuts and bruises	2	3	6	- National Grid MDE documents to be issued by SAP to cover work and ensure safety from the system. - Working party to be personally supervised at all times by a competent person. - Operatives to be signed onto relevant permits and RAMS required to undertake work. - Good Housekeeping to be maintained at all times - No trailing leads - Toolbox talks given - Instructed and Trained personnel - PPE to worn – inline with Grid/EAW procedure. - No lone working to take place. All operatives to be National Grid Persons (Minimum) therefore trained in substation awareness.	EAW Individuals and EAW Site Manager	2	1	2
11	Use of power tools	Electric shocks, injuries to hands and eyes	2	3	6	- The generator will be operated at 110v with a centre tap earth and have a current test certification label indicating recent PAT test examination. - All power tools will be maintained, inspected and operated inline with manufacturer guidance in order to conform with POWER regulations. - Visual check of all electrical equipment prior to use.	EAW Site Manager/ EAW Foreman	2	1	2



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
12	Use of Air Pick	Struck by the high velocity air pressure, flying debris. Whip lash from air hose. Hearing loss	2	4	8	- A trained operator to use the soil pick, the pick is to be held vertically approximately 1 to 2 inch's above the ground. - Use helmet with face visor along with ear defenders. - Operatives not directly holding air lance are to vacate from the excavation activities. - A demarcation area will be set up, no un-authorised personnel to enter the demarcation area during the use of the soil pick. Whip checks to be used on compressor.	EAW Site Manager/ EAW Foreman	2	1	2
13	Ground Penetration / Locating a service	Cable Strike – shock, burns, fire, explosion	4	4	16	- A trained operator to use cable avoidance tools (CAT & GENNY) to HSG47 guidance. - Excavation to be carried out by trained and skilled operatives using a soil pick. Work Authorisation Procedure to be followed at all times. A Work Authorisation Permits to be issued, received and briefed by the HSG47 Supervisor. - Operatives are to hand dig with insulated shovels within 500mm of any service. - All persons involved in the works are to wear fire retardant clothing. - First Aid/burns kits to be made available on site	EAW Site Manager/ EAW Foreman	4	1	4
14	Dewatering excavations.	- Weils disease - Wet conditions - Ice / slippery conditions	3	4	12	- Groundwater to be removed when practical. - Hands to be washed prior to eating, cuts to be covered, nitrile gloves to be worn - Excavations to be pumped as required - Wellington boots and PVC gloves to be worn during dewatering	Site Foreman and Site Management	3	1	3



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
15	Working in/or near to Open Excavations	Collapse of Excavation Slips, Trips and Falls	3	3	9	- All excavations are to be inspected daily and depending on depth must be battered or stepped accordingly. - No access into excavations unless they are inspected by a competent person and an excavation tag is completed to manage access into all excavations. - All access/egress points must be kept unobstructed at all times. - All spoil must be placed 1.5m away from the edges of all excavations in order prevent risk of premature collapse and falling objects into the excavation. - Safe means of access and egress to be provided to open excavations. - Excavations to be backfilled as soon as reasonably practicable. - Vehicle movements are to be kept away from excavations, required safety distance and an exclusion zone to be established by SAP and EAW Site manager . - Chapter 8 will be used to demarcate any excavations.	EAW Site Manager/ EAW Site Engineer	3	1	3



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
16	Working with reinforcement, formwork and cutting of metals	Cutting metals and manual handling injuries	3	4	12	- WAP permits to be issued to cover hot works, - Operatives to wear task specific gloves, ear defenders, goggles and fire retardant clothing whilst cutting materials with an abrasive wheel. - Operatives using the abrasive wheel will be competent in the use of the abrasive wheel and have a valid 'Abrasive wheels Ticket'. - All exposed reinforcement will have protective caps placed or be wrapped to protect against sharp exposed edges. Plant to be used to carry heavy items of steel work and formwork. EAW Site Engineer to undertake manual handling risk assessments prior to manual handling activities taking place.	Site Manager/ Site Engineer	3	1	3
17	Working near machine mounted or hand operated breaker	Impact injuries, hearing problems, eye injuries, cuts & bruises from concrete projectiles	4	4	16	- Exclusion zone set up around breaking area, task specific ear defenders to be worn by any operative supervising/banking the breaking activity. - All areas to be removed using the breaker attachment must have a debris screen surrounding it. There is to be no breaking within 500mm of a known service.	Foreman	4	1	4



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
18	Wearing of PPE	Personal Injury	3	5	15	- All mandatory Personal Protective Equipment (PPE) must worn and in accordance with NG Safety Line Policy. PPE must be regularly cleaned, inspected and stored appropriately to ensure it remains fit for purpose. - Replacement for worn or damaged PPE will be made available. Below standard PPE must not be used on site and must be discarded correctly at the earliest convenience. All the working party will where insulated Wellington boots and insulated gloves. PPE will all be risk assessed for its use in relation to the task.	EAW Site Manager/ EAW Site Engineer	3	1	3
19	Working with concrete	Personnel Injury caused by concrete coming into contact with the skin. Working at height	4	3	12	- Operatives to wear rubber gloves during all concrete works. - All operatives to wear goggles when placing concrete. - Operatives to wear disposable overalls/ or waterproofs at all times, wash any body parts that accidentally come into contact with concrete. - Operatives to be briefed on concrete COSHH Data Sheets& Risk Assessments. Disposable overalls are to be worn during concreting works. - All operatives not involved in the concrete placement are to reside to safe location to avoid contact with the operation. - EAW site supervisor to personally supervise concreting works.	Foreman/ Site Engineer	4	1	4



Hazard Ref.N°	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
20	Concrete wash out	Environmental damage caused by concrete	3	3	9	- Concrete wagon are to only use designated concrete wash out areas to wash out their wagons and equipment . - The concrete wash out skips are to be clearly signed and good access is to be maintained to them. - All concrete wash out skips are located in compound A and no concrete washout will take place in or around the SEC.	Foreman/ Site Engineer	3	1	3
21	Using Diesel Oil	Spills – contamination of ground, irritation to skin	3	4	12	- Operatives to wear appropriate gloves when filling plant with diesel - Drip trays to be used when filling plant or using small plant. - Spill kits to be supplied with large items of plant and to be generally available on site.	Foreman	3	1	3
22	Excavating around existing BT duct	Cable strike/damage to BT duct and cable	4	4	16	- A trained operator to use cable avoidance tools (CAT & GENNY) to HSG47 guidance to locate BT duct. - Hand Excavation to be carried out by trained and skilled operatives using a soil pick and insulated shovels to fully expose the BT duct. Work Authorisation Procedure to be followed at all times. A Work Authorisation Permis to be issued, received and briefed by the HSG47 Supervisor. - Operatives are to hand dig only with insulated shovels within 500mm of the BT duct. - Duct to be supported following exposure within excavation by timber spanned across excavation. - Machine excavation beyond 500mm of the BT duct to be carried out by a competent person with a 6 Tonne excavator and personally supervised by a competent banksman.	EAW Site Manager/ EAW Foreman	4	1	4

**21 SIGNING ON REGISTER****PERSONS IN ATTENDANCE DURING THE WORK**

I, the undersigned, have read, discussed and fully understand the above Method Statement and Risk Assessment for the 'Construction of Reinforced Concrete Foundations at Brelston Green SEC' and I will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE



22 APPENDICES

- Existing Earthing Assessment for Brelston Green and Walford CSE's/ERM 832.
- Tool box talk 'Awareness of risk due to touch voltage increases potential'.
- Sketches CDM Demarcation Arrangement Brelston Green SEC (Current Revision).
- National Grid MDE Safety Line Policy document.
- COSHH Data Sheets & COSHH Risk Assessments
- JCB MIDI 8065 RTS Plant Specification Sheet .

5. Access Scaffolds for 400kV CSE Compounds

METHOD STATEMENT

Incorporating The Assembly, Use and Dismantle Plan



Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv Sealing ends installations.

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Guidance For The Users Of The Scaffold

- Users of the scaffold are directly responsible for ensuring the structure is used only for its intended purpose and within its specified loading limits.
- Users must ensure the scaffold is not interfered with e.g. removal of ties, guardrails or platform boards, overloaded with materials, modified e.g. by sheeting a scaffold that is not suitable for extra wind loading this imposes on the structure.
- Any modifications to the scaffold must be carried out only by our competent trained scaffolders
- Every user of a scaffold must check the structure before use "Regulation 13 The Work at Height Regulations 2005"
- Ensure that the statutory 7 day inspection is carried out and recorded.
- Any queries or concerns relating to use of this scaffold should be raised with Lyndon Supervisor or Manager responsible for the project.

Specification of the Works to be Carried Out.

Quotation No :	11-0458-01	Item No :	All Items	Design No :	D-2012-061-01 Rev B D-2012-061-02 Rev B D-2012-061-03 Rev B D-2012-061-04 Rev B
i. All scaffolds will be erected in accordance with The Work at Height Regulations 2005 and NASC TG20:08.					

Supervision.

Supervisor :	██████████	Contact No :	██████████
Emergency Contact :	██████████	Emergency Contact No :	██████████

Programme.

Start Date :	Subject to program	Working Days & Hours :	Mon-Thurs	0800 – 1630	Please note that the program is indicative only
Duration :	Subject to work content		Fri	0800 – 1530	

Manpower Resources and Competency.

Manpower to be Utilised :	AS REQUIRED TO MEET CONTRACT REQUIREMENTS.
i. Operatives will hold a relevant CISRS registration card.	
ii. Operatives will hold the relevant NGC/ BESC registration cards.	
iii. Scaffold inspectors will hold a relevant CISRS registration card that may be supplemented by scaffold inspection certification.	
iv. Plant operators will hold relevant certification i.e. CPCS or NPORS, subject to what is acceptable on site.	

Equipment to be Used and Conformity Requirements.

The scaffold will be constructed of scaffold tube, scaffold fittings, scaffold boards, ladders and ancillary equipment.

- All materials will be in accordance with a relevant British Standard or its equivalent i.e. scaffold tube to S355JOH grade, scaffold boards BS2482 (MG), scaffold fittings BS EN 74, ladders BS1129, BS2037 or BS EN 131 etc.
- Materials will be free from visual damage that will foreseeably affect its performance whilst in use.
- Materials are visually inspected prior to issue from the depot.
- Materials will be visually inspected prior to use by the operative, defective materials will be segregated to prevent use.

Delivery and Collection Arrangements.

- Materials will be delivered and collected using designated traffic routes, at dates and times to be agreed with the customer.
- Materials will be delivered and collected utilising Rigid, Trailer unit or Demountable bodied HGV's.
- Materials will be unloaded into an agreed area on site and loaded from an agreed area on site.
- Where it is necessary to leave the trailer unit or demountable body on site, it will be left in a designated area on site.
- Material storage will be subject to good housekeeping.

METHOD STATEMENT

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Unloading and Loading Arrangements.

Materials will be unloaded/loaded utilising the following methods :-

- i. Manual handling.
- ii. Tele-Handler supplied by Lyndon Scaffolding.

On Site Storage Arrangements

- i. Materials will be stored in an agreed area on site and be subject to good housekeeping

Method to Be Used to Move Materials

Materials to be transported as close to the workplace by lorry.

- i. Chaining from person to person.
- ii. Tele-Handler supplied by Lyndon Scaffolding.

Method to be Used to Segregate the Work Area.

- i. Work area to be segregated by physical barriers, warning signs will be displayed at prominent locations.

Personal Protective Equipment.

- i. The minimum PPE to be worn and utilised on site will comprise of Safety Helmet, Safety Boots, Safety Harness, Flame Retardant Work wear, Hi-visibility vest, Gloves and (light eye protection) safety glasses.
- ii. Additional items of PPE will be determined by risk assessment and will meet or exceed the relevant British or EN standards.

Environmental Impact.

- i. All our materials will be removed from site on completion of our works and recycled.
- ii. Scaffold boards will be FSC or PEFC certified, other timber will be certified subject to specific contract conditions.
- iii. Packaging materials will be segregated into the appropriate onsite disposal bins or be removed from site.
- iv. Noise, may be an issue if work is outside of the agreed site working hours.
- v. Where plant or equipment is serviced or fueled on site, COSHH assessments will be available for the substances in use.
- vi. Plant refueling will be undertaken in agreed areas, spill kits will be available.
- vii. No other substances that are subject to the COSHH regulations will be used on site.

Emergency Procedures.

- i. We will comply with the site emergency procedures as detailed in the construction phase health and safety plan. When working in sub stations call for help right away, the number is on the locations access gate. Do not try to rescue someone unless the SAP tells you to. Give first aid if you have been properly trained. Secure the site, keep the site gate locked until the SAP arrives and take control of the emergency.
- ii. In the event of fall involving a safety harness, refer to the site specific fall recovery plan.
- iii. The Customer will provide first aid personnel and facilities on site.
- iv. Operatives will carry a basic travelling first aid kit in their vans.
- v. Operatives will initially report any incident/accident to their immediate Supervisor.

Monitoring and Compliance.

- i. Supervision will implement, monitor and enforce this method statement by periodic visits to site.

Assessment of Significant Risks.

- i. This Method statement to be read in conjunction with the attached risk assessment.
- ii. Operatives to take part in on site Tool Box Talk on Impressed Voltage.

Procedures for Changing this Method Statement.

- i. This method statement may be modified to reflect changes in the working procedures by the raising a revised version in this format or by utilising the On Site Risk Assessment and Method Statement Revision Form.

METHOD STATEMENT

Incorporating The Assembly, Use and Dismantle Plan



Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv Sealing ends installations.

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Erection Procedure

- i. The location where the scaffold is to be erected, the method statement and risk assessment will be shown to the operatives by supervision and the relevant hazards and preventive/control measures will be explained.
- ii. The operatives will sign the method statement to confirm the adequate transfer of information to enable them to work safely. This must also be formally documented as a Toolbox Talk.
- iii. Record everyone's name in the work party register.
- iv. Operatives to undergo site specific/ client induction prior to the start of any works.
- v. No person or part of any vehicle, plant or equipment may work in a position where they are liable to be within 15 metres of overhead lines suspended from steel towers, or 9 metres in the case of wooden poles, unless the Electricity Company has confirmed that the power is switched off.
- vi. Storage areas and racks for surplus material must not be located anywhere near overhead cables.
- vii. At the planning stage of any operation, the Electricity Company should be approached for advice, and asked whether any cables interfering with the safe operation or movement of equipment can be rendered dead or diverted. Discussions with them should be recorded in writing.
- viii. Work on line crossing operations may take place only after consultation has taken place with the relevant Electricity Company or main contractor, and a safe working procedure has been clearly established.
- ix. Unless **YOU** are **TOTALLY** satisfied an area is electrically safe, suspend operations and contact the **SHEQ** department for advice/ assistance. Do not accept verbal assurances an area is safe. Unless it is demonstrated as safe in accordance with the permit for work – **DO NOT WORK**.
- x. **General Precautions where Overhead Lines Cannot be made dead or diverted.**
- xi. In situations where no work is to be carried out directly under the cables and no passageway is required, ground level barriers should be erected parallel to the overhead line.
- xii. Where equipment, such as mobile cranes, MEWP'S and forklift are used, the minimum distance from ground level barriers to overhead cables should be the jib length plus 6 metres.
- xiii. **OVERHEAD AND UNDERGROUND CABLES/ SUB STATION WORK.**
- xiv. Before you start work, Identify what you are going to do, understand – and make sure that everyone working on the job understands : **what you are going to do : where you are going to do it and the limits of the work or work area.** Discuss any concerns with your supervisor.
- xv. Ensure all operatives adhere to all demarcation and safety signs during all scaffolding operations. Ensure you are familiar and clear with all colour coded demarcation, signs and symbols.
- xvi. Ensure a means of access that's right for the job, as identified by the risk assessment/ method statement. Do Not step on trench covers at any time.
- xvii. The senior Authorised Person will ensure that a safe work area is established, usually using red cones and red and white chains. When receiving the safety document, read it and be sure you understand it. If you don't, ask the SAP.
- xviii. Materials will be transported to site and stored in an agreed location on site.

METHOD STATEMENT

Incorporating The Assembly, Use and Dismantle Plan



Customer : Prysmian Group Ltd.

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Work Area : Access scaffolds for 400kv Sealing ends installations.

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- xix. Materials must be carried horizontally and close to the ground. The movement of any long objects must be supervised by a competent person. Don't let anyone work outside the safe work area. Make sure no one drives vehicles unsupervised.
- xx. The person in charge of the work party must monitor and ensure that all operatives or equipment never encroach the safety distance. The distances being **3.1METRES ON 400KV SYSTEMS, 2.4METRES ON 275KV SYSTEMS AND 1.4METRES ON 132KV**
- xxi. Demountable load beds will be demounted, access to a raised load bed will be by ladder and using the common site loading/unloading provision. Scaffolders will assist the HGV driver when common provision is not provided, Scaffolders follow SG4:05 to install single guard rail protection to the raised load bed, use fall arrest equipment provided.
- xxii. Operatives must be aware of their surroundings and must work safely, ensure you are looking where you are walking and working, do not step onto or over debris, avoid tripping or slipping hazards, do not stand on manhole covers. Choose an access route or work area that is free from hazard. Do not enter access routes or work areas where hazards are not adequately controlled or lit. Be aware of plant and lifting movements and maintain a safe distance. Report any uncontrolled hazard to Supervision, **do not ignore an uncontrolled hazard**.
- xxiii. When the 1st bay is erected an "incomplete" scaffold sign or similar will be displayed on the scaffold. As the means of access onto the lifts is erected an "incomplete" scaffold sign or similar will be displayed adjacent to the point of access, 3rd party access will be restricted by physical barriers.
- xxiv. The materials used will be Haki system scaffold the base will be erected with 4m standards and followed on with 3m standards to ensure safety distance from LIVE Circuit.
- xxv. Earthing strips will then be attached to the scaffold structure by a competent person in accordance with TGN : 190 (Design and use of temporary scaffold guards). This is specific to overhead line working only.
- xxvi. Whilst erecting further lifts, operatives will work from a minimum of a four board wide fully transomed working platform that is protected by a single guardrail, when working outside of this protected platform i.e. when establishing the protected platform or moving the protected platform, operatives will work in accordance with NASC SG4:10 and SG4:10 appendix A Interim Guidance on Collective Fall Prevention Systems in Scaffolding, the Safety Step will be the preferred means of achieving collection protection.
- xxvii. All scaffold boards and decking will be secured to stop accidental movement (wind ect.).
- xxviii. Access to the scaffold will be via a Haki type system stairway erected progressively with the scaffold.
- xxix. A runway beam will be installed at high level and fitted with a girder trolley and chain block SWL 1 ton. A beam proof test will be carried out by Lloyds British to certify lifting point.
- xxx. The structure will then be fully encased with Keder sheeting. The tracking will be attached to the scaffold with specialist scaffold fittings, The track ranges in size up to 6m long this will be controlled by securing one end with rope and pulling the track into position manually chaining the track up the scaffold the sheeting will then be pulled through the track and fastened to the scaffold with ratchet straps. The roof will be placed into position first then the sides all works will be carried out working from within the scaffold and ground level.
- xxxi. On completion of the scaffold all spare materials will be cleared from the work area and stored in an agreed position or removed from site. When works are complete and leaving site always remember to **SIGN OUT**.

Hand Over Procedure

- i. Following the completion of the scaffold the Scaffold Inspector will carry out a visual inspection to ensure that the scaffold complies with the specification.

METHOD STATEMENT

Incorporating The Assembly, Use and Dismantle Plan



Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv Sealing ends installations.

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- ii. On satisfactory completion the Scaffold Inspector will update the scaffold tag and schedule 7 inspection records.

Inspection Procedure

- i. On a weekly basis the Scaffold Inspector will inspect the scaffold in accordance with the requirements of The Work at Height Regulations 2005 and record the findings on the scaffold inspection tag and the schedule 7 inspection record.
- ii. Minor issues may be rectified at the time of inspection, major issues or repetitive issues will be recorded on an unsafe scaffold report, for action by the customer.

METHOD STATEMENT

Incorporating The Assembly, Use and Dismantle Plan



Lyndon
SCAFFOLDING PLC

Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

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Dismantle Procedure

- i. The location where the scaffold is to be dismantled, the method statement and risk assessment will be shown to the operatives by supervision and the relevant hazards and preventive/control measures will be explained.
- ii. The operatives will sign the method statement to confirm the adequate transfer of information to enable them to work safely.
- iii. The Chargehand will initially inspect the scaffold to ensure that ties and braces are still intact and that platforms are clear of debris.
- iv. Once satisfied that the scaffold is safe to dismantle the work area by will be segregated by the specified means and an "incomplete" scaffold sign or similar will be displayed on the scaffold adjacent to the means of access which will be restricted by physical barriers.
- v. The sheeting and tracking will be systematically removed.
- vi. Ties and braces will not be removed from below the lift being dismantled.
- vii. The scaffold will then be dismantled methodically.
- viii. Scaffolders and Supervision will ensure that the structure remains stable and that it does not become overloaded with dismantled materials.
- ix. No materials will be bombed, all fittings will be bagged or passed by hand to ground level.
- x. In general scaffolds will be dismantled in the reverse order to the erection procedure.
- xi. On completion all materials will be cleared from the work area and stored in an agreed position or removed from site.
- xii. A final visual check will be made by the Chargehand prior to leaving site.

Method Statement Prepared By.			
Name :	██████████	Signature :	████████████████████
Contact Address :	Valepits Road, Garretts Green, Birmingham, B33 0TD.		
Telephone :	██████████	Facsimile :	██████████
Email :	██████████@lyndonscaffolding.co.uk		

Incorporating The Assembly, Use and Dismantle Plan



Lyndon
SCAFFOLDING PLC

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- i. Copy to be submitted to our Customer for approval.
- ii. Operatives to sign onto the method statement.
- iii. Chargehand to be issued with a copy to be retained on site.

I confirm that I understand and will work in accordance with this method statement and its attached risk assessment

[illegible]

RISK ASSESSMENT

Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv sealing end installations.

Quotation No : 11-0458-01

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Hazard	Persons Affected	Risk Assessment	Preventive/Control Measures	Residual Risk Assessment
Contact with delivery or collection vehicles.	Scaffolders, supervision, site personnel and the general public	Moderate	Materials to be delivered/collected from site by HGV utilising an agreed traffic route. Make sure no one drives vehicles unsupervised. Reversing vehicles will be controlled at all times.	Low
Fall of person during dismount from the delivery vehicle and during unloading/loading operations	Scaffolders, supervision and HGV driver	High	Operatives to observe ground conditions and surroundings before dismounting in a controlled manner, under no circumstances is the operative to jump from the vehicle. Dismount demountable load beds, access raised load bed by ladder, use common site loading/unloading provision. Scaffolders will assist the HGV driver, when common provision is not provided by customer, Scaffolders follow SG4:10 to install single guard rail protection to load bed, use fall arrest equipment provided.	Low
Fall of materials during unloading, loading, movement on site and during erection and dismantle.	Scaffolders, supervision, site personnel	Moderate	The work area is to be physically barriered off and identified by signage or look outs posted to prevent 3 rd party access. Only Lyndon personnel that are directly involved in the operations should be in the work area. Plant to be operated by trained personnel. Unloading and loading to be supervised to ensure material is not accidentally dislodged. Materials to be stored by suitable means to prevent inadvertent movement i.e. scaffold fittings to be bagged. Materials must not be stored vertically unless they are prevented from falling. Suitable protection to be provided when working adjacent to public and site access routes. The use of tool restraint lanyards will be subject to a job specific risk assessment using the on site risk assessment and method statement revision form. Personnel to wear safety helmets and safety boots.	Low
Manual handling during unloading/loading and during movement of materials on site.	Scaffolders	Moderate	Materials to be unloaded/loaded into an agreed storage area by forklift, crane or man handled. Materials to be transported to the work area by forklift, HGV, tractor and trailer, V barrows or man handled. Materials to be raised or lowered by passing hand to hand or utilising a gin wheel and or rope. When handling materials good manual handling technique to be utilised. Ensure workers carry long objects horizontally and close to the ground. Movement of these objects must be supervised by a Competent Person.	Low
Trips, slips and falls whilst moving around site.	Scaffolders and supervision	High	Operatives to be aware of their surroundings, ensure they are looking where they are walking and working, do not step onto or over debris, avoid tripping or slipping hazards. Do not enter access routes or work areas that are not adequately lit. Choose an access route or work area that is free from hazard. Be aware of plant movements and maintain a safe distance. Report any hazard to your Supervisor.	Low

RISK ASSESSMENT

Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv sealing end installations.

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<i>Hazard</i>	<i>Persons Affected</i>	<i>Risk Assessment</i>	<i>Preventive/Control Measures</i>	<i>Residual Risk Assessment</i>
Abrasion, splinters from handling scaffold boards, lubricant from handling scaffold fittings	Scaffolders	Moderate	All site personnel to wear suitable overalls and gloves whilst handling scaffold materials.	Low
Trips and slips over our materials whilst being stored on site or whilst being used during erection/dismantle.	Scaffolders, supervision, site personnel	Moderate	Material storage and work areas will be physically barriered off and identified by signage to prevent access, materials within such areas will be subject to good housekeeping. The provision of suitable storage areas is subject to agreement with the customer.	Low
Fall of persons during erection and dismantle.	Scaffolders and supervision	Moderate	Scaffolders to wear a full body safety harness equipped with a 1.75m shock absorbing lanyard and WRAPPA sling. The harness to be used in accordance with current NASC guidance note SG4 as amended by Appendix A. The Safety Step will be the preferred means of achieving collection protection. Birdcage scaffolds to be erected in accordance with NASC Guidance Note SG23:03. Rescue will be in accordance with the hierarchy of recovery actions detailed in the fall recovery plan or SHEQ handbook. In most cases recovery can be undertaken from the existing scaffold, with the lift adjacent to the fallen person being boarded out and the person then pulled onto the lift. Where the lift is not guard railed, the rescuers to be clipped onto the scaffold structure via their safety harness.	Low
Collapse of scaffold during erection and dismantle	Scaffolders, supervision, site personnel	Moderate	Scaffolds to be erected and dismantled by suitably qualified operatives who hold relevant CISRS registration cards. Scaffolds to be erected in accordance with The Work at Height Regulations 2005, NASC TG20:05 or the design drawing. The scaffold and ties will be erected/dismantled progressively. Material storage on the scaffold will not exceed the loading capacity of the scaffold.	Low
Access to scaffold during erection prior to formal inspection handover and during dismantle.	Site personnel	High/ Moderate	On commencement of erection and dismantle an "incomplete" scaffold sign will be displayed adjacent to the access routes. Physical barriers to be erected to prevent access.	Low
Collapse of scaffold when erected.	Site personnel	Moderate	Customer to use the scaffold in accordance with the loading specified on the hand-over certificate/scaffold tag. No modifications are to be made to the scaffold, especially removal of ties or structural members. Drilled anchorage to be tested in accordance with the NASC guidance note TG4.	Low
Contact with scaffolding when erected.	Scaffolders, supervision, site personnel	High	Where scaffolds are erected on access routes the 1 st lift is to be erected at a height that allows free access under the scaffold. In circumstances where this is not reasonably practicable the scaffold is to be guardrailed off utilising suitable means to prevent access.	Insignificant

RISK ASSESSMENT

Customer : Prysmian Group Ltd.

Site : Walford / Brelston Sub Stations.

Work Area : Access scaffolds for 400kv sealing end installations.

Quotation No : 11-0458-01

Item No : All items

Date : 05/03/2014

Issue No : 1

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Hazard	Persons Affected	Risk Assessment	Preventive/Control Measures	Residual Risk Assessment
Environmental conditions (wind, rain, lightning etc.)	Scaffolders and supervision	Moderate	Supervision will monitor the environmental working conditions to ensure that employees are not put at risk. Wet weather gear may be utilised, however the Senior Authorised Person/ Supervision will determine when work will cease due to environmental conditions. Noise, may be an issue where work is outside of the agreed site working hours. The electrical earthing of scaffolds will be subject to SAP control and organisation.	Low
Environmental impact from our scaffolding operations	Scaffolders, supervision, site personnel	Low	Scaffold materials will be removed from site on completion of our works. Packaging will be segregated into the appropriate onsite disposal bins or be removed from site.	Insignificant
Electricity.	Scaffolders and supervision	High	All work to be undertaken under the Customers permit to work system. The Senior Authorised Person in attendance to establish safety from the system. The minimum clearances to live equipment will be established and maintained. Where equipment is isolated, customer to demonstrate that the equipment is DEAD, before we commence any works. For work on substations and overhead lines Operatives to hold relevant National Grid and BESC certification. Operatives to have a Toolbox talk before works commence on the Risk of Impressed Voltage.	Low
Substances hazardous to health	Scaffolders, supervision, site personnel	Moderate	Refer to the relevant COSHH assessment for the substance and follow the control measures and PPE requirements.	Low
Permit for work conditions such as confined spaces, roof work, electricity etc	Scaffolders and supervision	High	Supervision to unequivocally establish if work is subject to customer permit for work system. If so strict compliance is mandatory, if in doubt, STOP, check with customer or SHEQ department.	Moderate/ Low

Risk Assessment By :		Signature :	

Notes :

- When completing the risk assessment, please be aware what the definitions of Hazard and Risk are - Hazard "Something with a potential to cause harm" Risk "The likelihood that harm from the hazard will take place"
- For the Risk Assessment and Residual Risk Assessment, please use the terms High, Moderate, Low and Insignificant to reflect the level of risk.
- Where the Residual Risk Assessment is High or Moderate, the control measures identified are inadequate and you will need to consider alternatives to reduce the risk assessment to Low or Insignificant.
- This risk assessment will be reviewed, when there is a reason to suspect that it is no longer valid, when there has been a significant change in the matters to which it relates, every 2 years
- If in doubt please consult your Manager or the SHEQ department at Birmingham.



6. RISK ASSESSMENT AND METHOD STATEMENT

For The Demolition of Redundant Bay Structures

Our Ref:	
Contract Ref:	
Project Title:	
Contractor:	
Prepared by:	
Date:	
Location:	

**THERE MUST BE NO DEVIATION FROM THIS METHOD STATEMENT
WITHOUT PRIOR APPROVAL FROM THE SITE ENGINEER**

Reviewed for Safety Aspects by: Title: SHES Advisor	Reviewed for Work Activities by: Title: Site Manager

Contents

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Method statement	page5
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METHOD STATEMENT RISK ASSESSMENT CONTROL SHEET						
SITE: A 275/132kv S/S			CONTRACT REF :			
CLIENT :			START DATE:		FINISH DATE:	
BRIEF DESCRIPTION OF WORK TO BE CARRIED OUT :						
Demolition Of Redundant GT7B Bay Foundations At 132/275kv s/s.		NAME		POSITION		TELEPHONE NO
		Site		Site Manager		
		Site		SHESQ advisor		
CONTRACTOR DETAILS (For Review Of contractor Documentation Only)						
Name				Telephone		
Address				Contact		
NUMBER OF PERSONNEL INVOLVED IN ACTIVITY			Min	1	PERMIT TO WORK	Yes (Delete as required)
			Max	2		
REVIEW OF SIGNIFICANT HAZARDS			CONTROL MEASURES ADEQUATE			
Description	Yes/No	Yes/No	Comment / Document Link			Hold Point
Craneage	No	No				
Confined Spaces	N/A	No				
Working at Heights	Yes	Yes	Barrier off excavation area			
Access Routes	Yes	Yes	As per site induction			✓
Electrical	Yes	Yes	Work to be controlled by DNO Safety Document			✓
Process	No	N/A				
Flooding	No	No				
Weather	Yes	No	Continuous Monitoring			
COSHH	Yes	Yes	COSHH Assessments on site for all COSHH			
Delivery / Off Loading	Yes	Yes	Banks man & Gate Man			
Craneage / Lift Plan?	No	N/A				
Environmental – Pollution	Yes	Yes	Spill kits & drip trays			
Plant and Machinery	Yes	Yes	Banks man & NSI 8 full required			
Temporary Works	Yes	Yes	Perimeter excavations			
Overhead/Underground Services	Yes	Yes	Refer to hazard plan LV & HV cables both live & redundant plus earth tape within vicinity of works area.			✓
Operative Competency	Yes	Yes	NG persons & BESC			✓
Other Contractors	Yes	Yes	Barriers to be erected			
Others (Specify) Wells disease	Yes	Yes	Op's to be briefed.			
ALL WORK TO BE AUTHORISED BY PRINCIPAL CONTRACTOR						
	Signed	Print Name	Position / Status	Date	NOTES	
PREPARED BY			Site Manager		To be completed by Person Preparing Method Statement	
TECH REVIEW BY					To be completed by a Competent Person	
H+S, ENV REVIEW BY			SHES		To be completed by a Competent Person	
AUTHORISED FOR CONSTRUCTION (Principal Contractor / Peer Review)					To be completed by the Principal Contractor	
REJECTED BY					To be completed by the Principal Contractor or Competent Person	

1. INTRODUCTION

This document covers the safe method of working to carry out the demolition of redundant Grid Transformer bay foundations & structures at a 400/275/132kV sub station.

2. REFERENCE DOCUMENTS

- Construction Phase Health and Safety Plan
- HASAW 1974
- Management H&S Regulations 1999
- Site Site Rules.
- Site Hazard Plan 11/111111 Rev A and CDM Access Egress Plan which forms part of the H&S plan
- Construction Drawing 22/222222 Rev A
- Certificates of Competency – Site Files
- Manual Handling Regulations 1992
- Control Of Substances Hazardous To Health Regulations 2002
- Provision & Use Of Work Equipment Regulations 1998
- HS(G) 47
- NSI 8 Safety Rules
- NGTS 3.10

3. SAFETY DOCUMENTS

- Principal Contractor safety permits i.e. task clearance, safe plan of action & excavation & hot works permit.
- No work is to take place without the issue of an NG/DNO Safety Document or verbal authorisation by NG/DNO SAP.

Site verbal incident reporting chain is as follows, site manager to be informed along with SHES adviser.

4. ACCESS AND EGRESS

- Access to the site will be via the compound gates and will be opened only by the key holder or Gate Person. The Site speed limit will be 10mph.
- Document holder to inform National Control Centre when the working party is entering and leaving the live compound. All operatives to use the T- card system to register their attendance on site.
- There is to be no reversing or moving of plant without a banksman in attendance.

5. WORK BOUNDARIES

- All works will take place within the 400/275/132kV compound specifically surrounding the redundant Grid Transformer bay
- Additional safety barriers will be erected to mitigate any construction hazards.

6. METHOD OF WORKING

- Prior to works commencing, all personnel to receive on site induction and read/understand and sign onto the method statement.
- Prior to any works taking place Principal Contractor site manager is to confirm that any live services that are associated with the demolition works have been isolated. This is a **HOLD POINT**. There are several redundant services e.g. 66kV cables plus LV supplies. Additionally there is a live 275kV cable circuit plus earth tape within the vicinity of the works.
- Barrier off area to establish a safe working environment and stop third party interface.
- Prior to any demolition works taking place any services indicated within the area are to be positively identified by hand dig techniques. This will be carried out with the use of insulated shovels and an air pick.
- The areas in question will be Cat & Genny scanned to determine where the services are present. All excavations will be in line with HSG 47. The site hazard plan and ground mapping will be referred to and any known services will be marked up prior to ground disturbance. Services to be identified with **Red** paint. White paint to indicate route of excavation & **Blue** paint to indicate hand excavation.
- Once the service(s) has been exposed all works will cease and Site management will be informed so that a decision will be made with respect to protection of the service prior to any works continuing. **THIS IS A HOLD POINT**.
- The Excavation TAG system will be followed which requires the area in question to be barriered off and the TAG to be completed by the works foreman. This will require inspecting the excavation and signing off the tag as safe to enter the excavation and continue working, this is to be carried out at the start of every shift or when severe weather may affect stability of the excavation.
- Once the aforementioned services have been exposed and protected a demolition screen is to be installed to the South of the oil tank foundation prior to any breaking out.
- Heras panels double clipped and fitted with a field equipment earth lead will be situated around the foundation and these panels are to be draped in a heavy gauge visqueen and secured to the Heras panels using cable ties. **Due to the likelihood of high winds catching the visqueen and tearing it away from the Heras panels and subsequently coming into contact with adjacent live conductors all demolition Heras panels will be monitored during the works and must be lowered to ground level at the end of every shift. THIS IS A HOLD POINT.** These demo screens will then stop any debris from injuring the working party or third parties whilst the demolition works are underway & stop flying debris from the demolition works damaging any live HV equipment within the vicinity.
- A 14 ton rubber tracked excavator fitted with an hydraulic pecker and a field equipment earth lead will then commence demolition of the redundant foundation. All vehicle movements within the CDM area will be supervised by a banks man wearing an orange hi visibility to identify himself.
- All operatives within this area are to wear hearing protection.
- If dust becomes apparent a hose at low flow rate or buckets of water will be used to suppress the dust.
- If reinforcing requires removal this will be cut out using a petrol disc cutter under a hot work permit. Operatives to wear safety goggles and ear defenders. Fire extinguisher to be at the point of works.
- Once the foundation has been demolished the excavator will have it's toothless bucket fitted and will load up the concrete debris into a dumper and this will be tipped at the Site lay down area for removal at a later date.
- Once all demolition materials are removed back fill to commence with a layer of teram & Type 1 sub base in layers of 300mm and compacted with a ride on roller/wacker plate.
- Blast wall is then to be pulled down using the excavator. It will be pulled down towards away from the adjacent live HV equipment. No operatives are to be within this area and a barrier is to be placed around the works as for all demolition works. Brickwork to be loaded into a dumper and removed from site.
- Redundant earthing transformer bund is then to be demolished. Again the same methods as stated above will be utilised. Before this work commences the a cable route is within close proximity to the foundation and a hand dug trial hole is required to locate the exact position and depth of this cable route. Once this has been established no works are to proceed until the Senior Authorised Person provides approval to continue. **THIS IS A HOLD POINT**.

- After removal and back fill to this area the blast wall foundation is to be removed again following aforementioned methodology.
- Marshalling kiosk foundation, Cable Sealing End structures and a redundant Grid Transformer bund wall to be demolished in their entirety.
- Grid Transformer bund slab is then to be partially removed to allow for installation of Post Insulator foundations.
- If the adverse weather conditions require withdrawal of operatives due to the risk of lightning strikes etc then the Site foreman to cease works until such time it is safe to continue.
- If at any time the safety of the working party is in question then all work to be aborted until such time it is safe to continue.

7. EMERGENCY PROCEDURES

- First Aid Trained Personnel on site are:
- Emergency site contact numbers as per first aid contacts.

8. MANUAL HANDLING

Manual handling shall be kept to a minimum at all times.

9. PPE – As stipulated in the Principal Contractor/NG safety line policy

Minimum Requirements: Hard Hat, FR Overalls/Trousers, Fire Retardant Hi-Vis, Safety Boots, Gloves, Ear Defenders & Safety Glasses. For hot works additional PPE safety goggles, ear defenders to be worn.

10. Emergency Return To Service - ERTS

There are no ERTS required for this work.

11. MATERIALS

Marker Paint, Petrol, Gas Oil, Hydraulic Oil. Visqueen
COSHH Assessments to be with MS pack & in COSHH file in site office.
All the above to be stored in Site lay down area.

12. TOOLS AND PLANT

Hand Tools, Chapter 8 Barriers, Heras Panels, Disc Cutter, Fire Extinguisher, Compressor, Air Pick, 12 Ton Excavator, Hydraulic Pecker, 9 Ton Dumper, Field Equipment Earth.

13. LABOUR

Operatives 2 – 4 persons
Any other operatives / visitors to be competency checked prior to start.

14. DELINEATION

Crowd barriers Minimum of 2 metres from work front, if applicable.

15. SUPERVISORY REQUIREMENTS

Supervision by foreman and site supervisor.

16. PROGRAMME

Start date:

Completion: 3 weeks approximately.

Working hours generally to be as per Environmental statements

17. WASTE MANAGEMENT

Waste material will be concrete debris material that will be removed from site by a licensed waste carrier and deposited at a licensed waste station.

18. ENVIRONMENTAL ISSUES

Activity

Diesel / petrol powered equipment.

Potential Impact

Fuel spillages. Spill kits and granules shall be kept on site at all times. Mobile plant to be set on drip trays at all times. Flammable materials i.e.: gas oil & petrol to have fire extinguisher at point of re fuelling.

19. OTHER ISSUES / GENERAL CONSIDERATIONS

Welfare facilities to be shared at site.

20. TRAINING AND COMPETENCE

All operatives to be NG Person & BESC, plant operators to be CPCS or equivalent.

Document holder to be NG Competent Person & BESC.

HS(G) 47 where required.

HAZARD IDENTIFICATION AND ASSESSMENT

Method Statement Title	Demolition Of Redundant Grid Transformer Bay Foundations at a 400/275/132kV s/s.							
Site and Location of work:	A 275/132kV s/s.				Project No:		Method Statement Ref.	
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	Assessed By:	Assessed On Site By	Duration of Task	3 weeks
	10	4	0	2	Date of Assessment:	Date of Site Assessment:	Review Cycle	

Code: Persons at Risk **EMP** – Employee **CON** – Contractor **PUB** – Public **VIS** – Visitor

Hazard Ref.N°	Task	<u>Hazard Identification & Foreseeable Risks</u>	Without Controls			<u>Control Measure</u>	With Controls			
			S	P	RR SxP		Method of Monitoring Control Measure	S	P	RR SxP
1	Working within live HV compound	Risk of infringing safety distances and contact with live equipment.	4	4	16	All operatives to be NG Person & BESC trained, all works to be as per MS/RA and NG Safety Document.	Checks by competent person and site supervisor Training/induction provided	4	1	4
2	Safe Access/Egress & Movement in Work Area	Contact with Plant to Slips, trips & Falls –resulting in Fracture, sprains to death	4	3	12	- Site Induction - Personnel to adhere to specified access/egress points - Use of mandatory hi viz jackets - Barrier off work areas & signage of hazards - Good House Keeping	Checks by competent persons and site supervisor Walking routes set up and kept-clear	4	1	4
3	Plant movements.	Risk of infringing safety clearances. Induced voltages	4	4	16	Banks man to be present, NSI 8 full operative to oversee works where required. Field equipment earths to be fitted to excavator.	Checks by competent persons and site supervisor	4	1	4
4	Manual handling.	Skeletal and muscular injuries	3	3	9	- All operatives to be trained in manual handling techniques. Use of machinery to lift heavy items. - Max lift of 25kg per person - Team lift where required	Checks by supervisor	3	1	3
5	All works	Third party interface	4	2	8	Erect barriers where required.	Checks by supervisor	4	1	4

Method Statement Title	Demolition Of Redundant Grid Transformer Bay Foundations at a 400/275/132kV s/s.							
Site and Location of work:	A 275/132kV s/s.				Project No:		Method Statement Ref.	
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	Assessed By:	Assessed On Site By	Duration of Task	3 weeks
	10	4	0	2	Date of Assessment:	Date of Site Assessment:	Review Cycle	

Code: Persons at Risk **EMP** – Employee **CON** – Contractor **PUB** – Public **VIS** – Visitor

Hazard Ref. N ^o .	Task	<u>Hazard Identification & Foreseeable Risks</u>	Without Controls			<u>Control Measure</u>	With Controls			
			S	P	RR SxP		Method of Monitoring Control Measure	S	P	RR SxP
6	Excavating within live compound.	Risk of service strike resulting in severe burns to fatality. Loss of service.	4	4	16	Refer to hazard plan. Cat & Genny scanning. HS G47. Principal Contractor ground disturbance training.	Checks by competent persons and site supervisor	4	1	4
7	Open excavations	Risk of falls	4	3	12	○ Barriers to be maintained during all excavation works	Checks by competent persons and site supervisor	4	1	4
8	Excavating with air pick.	Injury to eye sight & hearing.	4	3	12	○ Safety goggles & ear defenders to be worn.	Checks by competent persons and site supervisor	4	1	4
9	Demolition of existing foundations	Risk of injury to operatives eye sight & hearing, dust, air borne debris. Damage to surrounding HV plant. Demolition screens could tear and come into contact with live HV equipment.	4	3	12	○ Safety goggles & ear defenders to be worn. Dust suppression via a hose or buckets. Demo screens to be erected. These are to be lowered to ground level at the end of every shift.	Checks by competent persons and site supervisor	4	1	4
10	Demolition of existing foundations	Risk of damage to existing services e.g. 275kv cable, earth tape etc resulting in severe burns to fatality. Loss of service.	4	4	16	○ Hand dig trial holes prior to demolition works. Site hazard plan. CAT & Genny area.	Checks by competent persons and site supervisor	4	1	4

Method Statement Title	Demolition Of Redundant Grid Transformer Bay Foundations at a 400/275/132kV s/s.							
Site and Location of work:	A 275/132kV s/s.				Project No:		Method Statement Ref.	
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	Assessed By:	Assessed On Site By	Duration of Task	3 weeks
	10	4	0	2	Date of Assessment:	Date of Site Assessment:	Review Cycle	

Code: Persons at Risk **EMP** – Employee **CON** – Contractor **PUB** – Public **VIS** – Visitor

Hazard Ref. N ^o .	<u>Task</u>	<u>Hazard Identification & Foreseeable Risks</u>	Without Controls			<u>Control Measure</u>	With Controls			
			S	P	RR SxP		Method of Monitoring Control Measure	S	P	RR SxP
11	Use of disc cutter/angle grinder	Injury to eye sight & hearing. Spontaneous combustion of plant, electrocution from 110V equipment	4	4	16	○ Safety goggles & ear defenders to be worn. ○ Fire extinguisher at point of works. ○ Flame retardant overalls to be worn ○ PAT test equipment & visual inspection prior to use.	Checks by competent persons and site supervisor	4	1	4
12	Use of disc cutter/angle grinder	Noise and vibration	3	3	9	○ Wear ear defenders when cutting steel ○ Do not exceed the trigger time provided for the saw to be used	Supervisor to use HSE HAVS Calculator to advise on trigger times ,100 points per person per day	3	1	3

The undersigned have read and understood the above Method Statement and/or Risk Assessment.

[illegible]



NEARY CONSTRUCTION

7. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 01

For the

Installation of pipe and box culverts at watercourse
crossings along the cable route including duct formations
beneath them

Hinkley Point 132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	06/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	06/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1
Approved by:	██████	on behalf of Neary Construction		Date	06/09/13
Designation:	Project Manager	Mobile Tel No.	██████████		
Received by:		Customer/Client (if applicable)	Date		
Designation:					

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5. Work Boundaries	16. Programme
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7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

This document is produced to identify the safe system of work for the installation of pipe and box culverts and the cable trenches beneath these along the underground cable route as per drawings 13/NG/0221 Issue P2.

2 REFERENCE DOCUMENTS

13/NG/0221 Issue P2.

Nearby Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design
Schedule of crossings

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client: - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Nearby Instructions and Standard Procedures
Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

YELLOW – Machine dig area i.e. Trench Width

BLUE – Hand dig area i.e. Within 0.5m of a service

RED – Any hazards i.e. Services

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

Temporary pipe and box culvert requirement

At certain points along the cable routes watercourses are to be crossed and the flow of these need to be maintained throughout the works. To do this culverts will be installed along the bed of each watercourse to enable easement construction to continue whilst maintaining the flow of the watercourse which has to be crossed.

When installing culverts to maintain water flow it is vital the two following points are observed;

- Maintain the original and natural full bank capacity (cross-sectional area) of the channel. Constrictions at these points are contributing factors in costly bridge and culvert “blow-outs” which generate a large volume of sediment deposited directly into the stream.
- Align and center the culvert with the existing stream channel whenever possible.

Due to the varying dimensions of the watercourses to be crossed various designs have been drawn up to cover each eventuality and have been split between the use of concrete pipe culverts and reinforced concrete box culverts.

As per figure 1 on drawing 13/NG/0221 Issue P2 the type and size of culvert to be utilised will be decided upon. Once this is known the specific design for that type and size of culvert will be used for construction.

All culvert installation should satisfy the ecologist, the EA and maintain water through flow as to ensure the culvert installed never reaches capacity. If figure 1 on drawing 13/NG/0221 shows the use of culvert type / size that is unsuitable, perhaps due to large volumes of water in a particular ditch then a different specification pipe or box shall be agreed by all parties prior to installation.

Culvert installation method

It is assumed that the easement installation and haul road has been completed up to the watercourse that needs to be culverted and access can be gained safely up to the ditch bank from at least one side.

Prior to any works being carried out at each ditch, an ecologist will visit and assess each location with a finger search to advise whether strimming of the banks can be done safely. Once the banks have been strimmed the ecologist may advise the banks be scorched to ensure they are barren and no wildlife species will be affected.

The profile of the ditch banks will remain the same and the soil strip at ground level will begin at least 10m away from the ditch bank.

Prior to main works the flow of the watercourse needs to be diverted around the section to be culverted. The watercourse will be bunded at either end of the culvert length to be installed using bags filled with agreed material. The upstream bund will now have water backing up at it. Water shall be pumped directly from this point to the far side of the downstream bund where the water will continue on its course downstream. The enclosed bunded area will now be pumped out downstream until clear of water and the bund walls altered until minimal water ingress has been achieved. An area of sufficient length will now be clear in which the works can be carried out.

The banks and bed of the ditch will be lined with Lotrok geo-membrane 2300 or similar. This will be laid by hand by a minimum of two operatives ensuring safe access and egress has been achieved.

With all pipe culvert installations a concrete bed must be laid onto which the pipe will be installed. The trench for this bed shall be excavated by machine bucket to the dimensions shown on the drawing. If a trench is to be dug, it is after this is completed that the geo membrane be laid. Once the membrane is in place and the trench is lined, the concrete shall be laid by machine bucket and levelled off to form a level bed ready for pipe installation.

With box culvert installation it is vital that there is a level bed onto which to lay the culverts. If this cannot be achieved through the existing ground then a layer of granular material shall be laid and levelled prior to the box culvert installation. This shall be installed on top of the geo membrane.

Once the concrete bed or granular fill bed has been laid the culvert pipe shall be lifted into place using the excavator. Certified lifting straps and chains will be used to drop the pipe into position. If laying a pipe culvert the pipe shall be bedded into its concrete bed using the machines arm prior to the concrete curing. This will secure the pipe in position prior to the reinstatement of the area.

The width of the haul shall be culverted using box or pipe culverts, dependant of ditch width and shall have a slight overhang beyond the edge of where the haul road is to be installed. Culvert type shall be decided in conjunction with Figure 1 on NG drawing 13/NG/0221.

The culverts running beneath the proposed trenches are to be piped only as these areas are to be undermined to accommodate said trenches. All pipes installed are to be laid with this in mind and any pipe joints need to be in a position as to avoid areas of trench excavation and also wheel loads that the haul road above will be subjected to when in use. Each pipe joint shall be wrapped with filter terram which shall be installed at least 2ft either side of the joint itself.

Any interface between box and pipe culverts shall be resolved using a concrete header wall section that will butt directly up against the last box and allow the pipe to feed in and be sealed. This will in turn maintain flow once the bund walls have been removed.

Stage 1 – Culvert beneath haul road (boxes or pipes) and two trenches closest to it (pipes) including interface header wall if required.

Stage 2 – Independently culvert the two outside trenches (pipes) leaving 11.5m (approx) of ditch between these and the two trenches closest to the haul road undisturbed. These two trench locations can be culverted using 1 x 6m length at each point. The same methodology for bunding and over pumping will be applied here as well.

Once each stage has been completed the area shall be reinstated as follows;

Where the width of the ditch is significantly wider than the proposed culvert, all space between the wall of the box or pipe and the ditch bank shall be filled with Type B single sided filter material to SHW clause 505 to a level either the same as the box/pipe top, or to the FGL after soil strip, depending on which is lower. These levels can be seen on drawing 13/NG/0221. The filter material shall be laid by machine and levelled using the machines bucket.

If filter material has been installed the geo-membrane sheet must then be overlapped to encase the filter material prior to the granular backfill being laid. If no filter material is to be used, the geo-membrane sheet shall remain solely up the banks of the ditch.

Granular backfill shall now be installed to a depth of 600mm min above a pipe culvert, and 200mm above a box culvert to ensure regular traffic / HB loading conditions can be satisfied. If the 600mm or 200mm granular backfill level takes the installation above the adjacent haul road finished level then the haul road shall be raised and taken over the granular fill level with a minimum cap of 50mm of haul road material laid over this section.

Once reinstatement has been completed header walls will be built up using concrete filled bags that will surround the culvert ends and butt up to the backfill material behind. When these walls have been erected the bund walls can be removed and the pumps stopped.

Excavation and Installation of Cable Ducts beneath Culverts

Before undermining the pipe culverts installed as above, operatives must first ensure that the trench leading up to the ditch and continuing past it needs to be excavated and shored.

As the ditch depths vary greatly for the purpose of this method statement it is assumed the trench depth shall be deep enough to want to avoid battering back the sides of the excavation. Due to this trench boxes shall be used to support the sides of the trenches in which the operatives can install the duct formations beneath the culvert and reinstate as normal.

The ducts installed beneath the culverts will be deeper than as per spec for the rest of the route, because of this the trenches excavated back from the culvert should be of sufficient length to allow the ducts to rise back up to nominal depth. All trenching that is excavated during this work that is deeper than nominal depth shall be supported using trench boxes.

The trench boxes to be used are 3m in length and come in various depths.

Dependant on the depth of the trench, the number of trench boxes used will vary, with base boxes coming in 2m, 2.5m and 4m depths. A base will be chosen and then a top/s will be added to the base box to bring the total level above surrounding formation level. The tops come in heights of 1m and 1.5m, and a maximum of two can be stacked on top of a base. Boxes will be stacked to make sure they protrude above ground level in all instances, with purpose built handrail protection being fitted by hand to all top level boxes. Trench box widths will be set to an internal width that suits the duct formation design and struts pinned at this width before lifting them into position.

Once installed, access and egress point will be via the trench box that is at the highest level, ie, the box furthest away from the obstruction. It will be in the form of a tied ladder put into place by hand from ground level, with a gated entrance installed as part of that boxes handrail system.

As the trench level begins to rise again as it heads away from the obstruction crossing, the number of trench boxes stacked will reduce accordingly dependant on surrounding ground level. The gradient of the fall is dependant on duct design and also the trench box design. If trench boxes are installed on a bend that is too severe then the boxes will not sit next to each other flush which can result in gaps forming between them, which of course is not acceptable. The gradient up from final bottom level to standard trench depth will be slow to make sure this does not occur.

Dependant on ground conditions, especially water levels, the ducts at these depths may have to be surrounded in concrete as opposed to simply CBS so the methodology for both is included in this document.

The trench box / duct installation methodology is as follows;

Phase 1

Excavation will begin by scraping back from the culvert pipe slowly down to trench depth level. At least 6m of trench needs to be dug at this depth, so this means 2 trench base box lengths need to be installed back from the culvert pipe. The machine will remove ground down to level excavating a vertical face alongside the wall of the culvert pipe to allow a trench box base to be installed as tight to the pipes line as possible. The first trench box base will be laid as soon as at least 3m of trench has been excavated and a solid level floor has been achieved with the excavator bucket. The base will be lowered into position and the required number of tops, if any, will be installed on top of the base box until ground level height has been passed. The machine will continue removing ground for the next 3m, still maintaining the same level of dig, and repeat the trench box installation of the same formation. The ground past these trench boxes will need to be graded back and benched to minimise the amount of loose ground that could fall into the installed boxes. Once this 6m length of support has been installed and the ground around them graded to suit, the machine will move to the other side of the culvert pipe and repeat the same process. When the excavation for the first box is being carried out the ground directly beneath the culvert pipe will be pushed through using the machines bucket, and the loose ground removed as much as is practically possible by machine bucket. Any ground remaining in the trench will be removed by shovel into the lowered machine bucket after the access/egress point has been put into place.

A length of 6m either side of the overhanging culvert pipe should now be fully shored. The machine will now make the surrounding ground on the second side safe through grading down and benching where required, and the handrail system will be installed at both sides. An access/egress point will be created on one side of the obstruction using a wooden ladder tied to the gate which forms part of the handrail system. Operatives will now access the trench and remove any loose ground that may remain in the trench via shovelling into the machines lowered bucket. This process will be repeated on both sides of the obstruction once the access / egress ladder has been moved to the opposite side. No operatives are permitted to physically pass under the culvert pipe at any time and this will remain a no go area.

If the trench boxes closest to the culvert pipe could not be installed flush to the pipes face then a timber shoring system will need to be used to support the ground remaining between the trench box end and the culvert pipe. All timbers will be passed down from ground level and the shoring system chosen will be in relation to trench depth as per Hewson temporary works design. This only applies to trenches that are less than 2.2m in depth. For trenches deeper than this a double frame will have to be put in place.

At this stage there will now only be the culvert pipe running over the trenches path under the obstruction, any ingress of water that is not diverted into the culvert pipe by the concrete header wall will be dealt with by means of a 2" submersible pump pumping from a hand dug sump hole.

Phase 2

Now that there is an adequate length of trench excavated and supported, CBS / concrete, ducts etc can be put into place (shown below). It should be noted that any duct length passing under the obstruction itself will be passed through from either side of the overhanging culvert pipe and no operative shall pass beneath the culvert pipe at any time. Any CBS laid under the culvert pipe will be shovelled across to depth and compacted using small whacker plate, or, if not possible, by the back of shovels at arms length. CBS installation will cease 1m from the duct ends, the ducts will be capped and 8ft boards will be vertically stood, held in place by spoil, to mark the ends of the ducts prior to backfilling. Once the CBS / concrete has been installed to level (shown below), the ground will be brought up to warning tape level, and the tape installed by hand. The top trench box will now be lifted out by machine, followed by the removal of the base box. Backfilling will be carried out using the removed spoil stockpiled alongside the trench in layers of 300mm, with each layer being sealed by the back of the machines bucket and then by passes of a Rammax roller. The ground will be brought up to surrounding ground. Once the ground has been fully compacted, excavation for the next section of trench can begin, beginning at the 8ft board markers that were installed before the

backfilling process began. During any backfilling that takes place while the trench boxes are still in place the ladder must be raised and removed, and installed once again if any access is required.

CBS duct surround installation is as follows;

- The CBS bed will be placed immediately by machine bucket and compacted by hand-tamp/light vibrating plate to a finished depth of 75mm.
- Ducts will be laid in position and where required fed beneath the culvert pipe from one side to the other. Once in position the CBS surround will be dropped into the box using the excavator's bucket and once safe to do so operatives will shovel the CBS by hand into position until the ducts are encased as per specification.
- Stokboard covers will now be laid by hand on top of the CBS encasement and securely held together using the plastic bullets packaged with them.
- 100mm depth of previously excavated spoil will be placed in the trench over the stokboards, warning tape laid and a further 200mm depth of spoil placed on top.
- Trench backfill and compaction will then continue in 300mm as stated above.

Concrete duct block installation (where required) is as follows;

- The length of the concrete duct block at each ditch will be agreed prior to works beginning.
- As before, all ground will be compacted and drained to ensure a firm, dry bed to concrete upon.
- A visqueen membrane will be used to line the trench including up the walls of the boxes where required to stop the concrete bonding with the box prior to removal.
- Shuttering will not be used along the sides of the duct block as the walls of the boxes will form their own barriers. A plywood shuttering will be used at either end of the duct block to form a stop end to the installation 300mm back from the ends of the ducts.
- All ducts will be capped to prevent intrusion.
- Concrete will be delivered to site via a concrete wagon and deposited onto a pre-installed area made up of bog mats laid with a visqueen matting. This area will be big enough for any single concrete delivery. The concrete wagon will wash out at a designated site wash out area.
- A bed of semi-dry concrete will be laid by machine, at which point the ducts will be laid into position as per spec.
- Concrete will now be laid by hand until the required cover is obtained throughout the length of the duct block over the formation.
- C25/30 semi-dry concrete will be used at all times.
- Care must be taken at all times that ducts are kept clear of any concrete intrusion and that all ends are free to be coupled onto once the concrete duct block has cured.
- Once the concrete has been installed it will be covered through timber sheets spanning the shoring above and will be left to cure for 24 hours.
- Once cured the backfilling process will be carried out as per CBS installation above.

Clearing the Work Area:

On completion of operations all equipment/materials to be removed from site and the site reinstated to its original condition.

The area will be checked for good housekeeping at the end of each shift.

7. WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

TBC – Hospitals and site emergency contact list to be added

8. MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9. PERSONEL PROTECTIVE EQUIPMENT (PPE)

Hard hat
Gloves where required
Safety glasses
Safety boots
Hi-viz vest
Fire retardant pants and top
Wellington boots where concreting

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable

11 MATERIALS

PVC twin wall culvert pipe or unreinforced concrete pipe
Reinforced box culvert
Interface header wall
C25/30 concrete
Granular fill
Type B single sized filter material
Geo membrane
Sandbags for bund walls
Fill for sandbags
CBS

COSHH

Petrol
Diesel
Contractor spray paint
Concrete

12 PLANT, TOOLS AND EQUIPMENT

Excavator with toothless buckets
Lifting straps and chains

Dumper
Rammax Roller
Light whacker plate
Hand tools inc shovels and grafts
Ladders
Strimmer
Tamp
Trench boxes and related equipment

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists.

13 LABOUR / MANPOWER

Number of Neary Operatives – 6

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Installation of culvert pipes at ditch crossings along easement route						Risk Assessment Ref. N ^o . & Issue		RA/7334/DN/01	
Site and Location of work:	Various ditch crossings along easement for Hinkley Point UG cable route						Project No:	7344	Method Statement Ref. N ^o . & Issue	MS/7334/DN/01
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████	Assessed On Site By:	██████
	5	6					Date of Assessment :	10/09/13	Date of Site Assessment	10/09/13
Duration of Task		As per programme		Review Cycle		AS REQUIRED				

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref. N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site supervision/ Individuals	4	1	4
2	Work in vicinity to overhead HV cables & underground Apparatus	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. When working near O/H lines, work to GS6 guidelines. Requirements of HSG47 to be strictly implemented and observed. Permit to Dig system to be implemented	Site Manager/ Site supervision/ Individuals	4	1	4
3	Contact with contaminated land	Infection and or illness from contact with Hazardous substances	3	4	12	Specialist PPE to be Worn	Site Manager/ Individuals	3	2	6
4	Dispersal of Invasive Species (Japanese Knotweed)	Cross contamination of plant resulting in uncontrolled spread and damage to third party property.	3	4	12	All equipment and stores to be manually decontaminated at the location of the hazard.	Site supervision/ Individuals	3	2	6
5	Manual Handling	Cuts, bruises & musco skeletal strains	3	3	9	Staff to be trained in manual handling techniques. Correct PPE including gloves to be used. Never exceed personnel capacity (25kg).	Site supervision/ Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability/Major environmental incident = 3 Minor Injury/minor environmental incident = 2 No injury = 1
 PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2 Improbable = 1

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
6	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision/ Individuals	2	1	2
7	Use of hand tools/air pick.	Vibration white finger	4	4	16	Rotate use of any vibrating tools in line with manufactures guide lines	Site supervision Individuals	2	1	2
8	General work	Slips, trips and falls	3	3	9	Good housekeeping and awareness.	Individuals	3	1	3
9	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Shoring to be put in place as required. Excavated soil to be stored minimum of 1 metre away from the trench. PPE to be worn.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	Barriers to be erected and closed around perimeter.		3	1	3
10	Personal Hygiene	Leptospirosis Contaminated Ground Japanese Knotweed	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective equipment. Apply dressings to wounds/broken skin.	Individuals	4	1	4
11	Use of excavators Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator. Operator to wear seat belt.	Individuals	3	1	3
12	Use of excavators Dumper driving	Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3
13	Use of excavators Dumper driving	Damage to underground services i.e. electric, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
14	Use of excavators Dumper driving	Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
15	Fuel spillages during re-fuelling.	Contamination of Ground, Fire,	4	4	16	Fuel to be stored in bunded area. When refuelling plant using double skinned mobile bowser, the hose will be equipped with automatic cut off handle and lockable valve which will be locked in the closed position when not in use. Fuel must be filled with the aid of a funnel, drip tray and fire extinguisher available. Spill kit to be available at site of re-fuelling. No naked lights in vicinity.	Site supervision Individuals	4	1	4

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
16	Fuel spillages	Contamination of Water courses	4	4	16	Spill kits & Oil absorbent matting to be sited at all Water Courses, (Rivers, Ditches)	Site supervision Individuals	4	1	4
17	Pumping of groundwater from excavations.	Silt entering waterways.	3	4	12	Pump water from excavation to unbroken grassland at least 30m from nearest watercourse. Vary the outlet point discharge point to other side of the spread. Monitor quality of water in the nearest watercourse on regular basis.	Site supervision Daily inspections	3	2	6
18	Vehicle movements.	Silt and mud entering watercourses	3	4	12	Self contained automatic wheel washing facilities with integral bund and water recycling, to be positioned at major access and egress points. Facilities to be minimum of 10 metres from watercourse.	Site supervision Daily inspections	3	2	6
19	Excavation of Trenches	Silt and mud entering watercourses.	3	4	12	Topsoil to be stored a minimum of 20 metres from nearest watercourse, and the topsoil mound to be sealed by tamping with the excavator bucket.	Site supervision Daily inspections	3	2	6
21	Excavation of Trenches	Disturbance of great crested newts.	2	4	8	GCN fencing previously installed to be inspected on daily basis	Site supervision Daily inspections	2	2	4
22	Excavation of Trenches	Disturbance of water voles.	2	4	8	Banks to be strimmed on those watercourses identified in environmental plan, arisings raked away.	Site supervision	2	2	4
24	CBS/concrete use	Cementatious materials - dermatitis	3	3	9	Waterproof gloves and wellingtons to be work	Site supervision Individuals	3	1	3
25	Manual Handling-Duct Installation	Cuts, bruises & musco skeletal strains	3	3	9	Use Hi-ab for unloading at compound. Staff to be trained in manual handling techniques. Correct PPE including gloves to be used. Never exceed personnel capacity (25kG).	Site supervision Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

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Low Risk	=	1 to 6
Medium Risk	=	7 to 11
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21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment and will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

8. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 03

For

Topsoil Stripping

Hinkley Point 132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	06/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	06/09/13
Designation	Site Engineer	Mobile Tel No.	07920 - 299334		Site Revision 1
Approved by:	██████	on behalf of Neary Construction		Date	06/09/13
Designation:	Project Manager	Mobile Tel No.	██████████		
Received by:		Customer/Client (if applicable)	Date		
Designation:					

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3. Safety Documents	14. Delineation
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5. Work Boundaries	16. Programme
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7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
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11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe method of topsoil stripping along the cable easement route.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures
Tool Box Talks – As required (Documented)

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

Topsoil Stripping

A 40m wide topsoil strip is required to accommodate the 4 no. circuits and haul road required for The Mendips 400kv cable installation works.

The topsoil will be stripped in layers of no more than 150mm by machine and cast to the side laid parallel with the easement in a mound that will be no greater than 2m in height. The exact depth of the topsoil layer varies by plot but can be assumed to be between 75mm – 300mm. If the machine operator and banksman are unsure as to the depth of the topsoil layer on a particular stretch they will consult a site engineer. The engineer has access to these topsoil depths in the Soil Resource Assessment prepared by others.

Topsoil will be stripped from the entire width of the working easement with the exception of the area to be used for topsoil storage, and any section within the easement that is to remain completely undisturbed throughout the duration of the project.

As the topsoil casting proceeds larger stones (>150mm) should be removed by hand to ensure they are not placed in the topsoil stockpile and ultimately form part of the topsoil layer upon reinstatement. This also cuts down on labour time if stone picking is required upon reinstatement.

The topsoil mound will be battered to ensure minimal slumping and throughout its length will be capped using the back of a machines bucket. The capping process will ensure the mound remains stable in wet weather and also aids in protecting the topsoil from wind erosion. If in some areas the topsoil proves to be subject to wind erosion or requires extra protection from the elements throughout the storage period then an appropriate geotextile separator should be used. This should not be a factor on this project and is only mentioned as a contingency if further protection was deemed necessary.

Topsoil mounds will be kept weed free through the ongoing programmed use of herbicide spraying that will be carried out along the entire length of the topsoil mound at agreed intervals. Whether herbicide spraying is carried out at all on a topsoil mound will be subject to land owners' discretion.

Soils will not be stripped when they are too wet or snow covered and should be carried out in the driest practicable conditions. The soil types on this route coupled with the high level of rainfall over the winter months restricts soil stripping and reinstatement to the drier periods of the year.

Topsoil Reinstatement

Topsoil reinstatement should also be restricted to drier periods of the year. The topsoil will be reinstated as removed to the depths shown in the Soil Resource Assessment prepared by others.

Topsoil will be reinstated using the machines wide ditching bucket and will be carried out in a linear fashion, meaning the plant and operatives will enter at one end of the plot and carry out the works whilst heading for the egress point at the opposite end of the plot. All contours and existing levels will be followed to ensure land irrigation remains as it was upon soil stripping.

A dozer shall then be used to evenly spread the cast topsoil along each plot for inspection.

Stone picking of stones 100mm in diameter or larger may be necessary. All topsoil must be free from terram when being re-cast. This can be done visually and any terram must be picked out by hand and stored to be taken off site.

The relocated soil will require watering if replaced during dry weather. Individual plants salvaged from the original vegetation will be replanted in appropriate places.

During this reinstatement land owners are notified to agree reinstatement recommendations.

The above methodology will be followed, but works will be under the supervision of an Ecological Clerk of Works (ECoW) in plots of specific interest.

If a situation arises where a plant of interest is found, they will be transplanted by the ecologist and maintained in appropriate facilities.

It will be assumed that any pre / construction / post drainage will have been completed prior to top soil removal and reinstatement. This will be carried out by others.

Any existing drainage ditches previously laid are to be removed and the ditch sides reinstated and returned to their previous state to match existing make up.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

Top Soil
Weed Killer (as appropriate)
Geo textile membrane

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
JCB Dozer
Transit van
Hand tools
CAT+ & Genny+ (if required)

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			2	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Construction of Site Compounds										Risk Assessment Ref. N ^o . & Issue	RA/7334/DN/03
Site and Location of work:	Various Locations								Project No:	7344	Method Statement Ref. N ^o . & Issue	MS/7334/DN/03
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████████	Assessed On Site By:	██████████	Duration of Task	As per programme
	7						Date of Assessment	13/09/13	Date of Site Assessment	13/09/13	view Cycle	AS REQUIRED

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct.	Site Supervision Individuals	4	1	4
		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3
9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
		Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
10	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
11	General Working	Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, suncream, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
12	General Working	Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
13	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms,contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4

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21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

9. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 05

For the
Installation and Removal of Haul Roads
Hinkley Point
132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	13/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	13/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1

Approved by:	██████	on behalf of Neary Construction	Date	13/09/13
Designation:	Project Manager	Mobile Tel No.	██████████	

Received by:		Customer/Client (if applicable)	Date	
Designation:				

CONTENTS

1. Introduction	12. Plant, Tools and Equipment
2. Reference Documents	13. Labour/Manpower
3. Safety Documents	14. Delineation
4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe installation and removal of haul roads.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

Highways Authorities :- Road Opening Notices

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures
Tool Box Talks – As required (Documented)

Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

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***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

*Only toothless buckets to be used on the excavator, the excavator **MUST** only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest*

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

All areas will have been topsoil stripped prior to haul road construction.

The extremities and route of the haul road including passing bay locations will be marked up using pegs or similar with line marker spray being used to mark up the area of passing bays.

In sites of biological interest (SBI's) there may be a requirement to use an alternative material to construct the granular stone haul road rather than the limestone based sub grade material to be used elsewhere. This is due to limestones tendency to leach which is unacceptable in such areas; as such an alternative shall be agreed between Neary and the relevant parties before installation works commence.

SBI's TBC.

Granular Stone Haul Road

Notes to a standard temporary works drawing will be made below; this refers to a standard haul road design used where ground conditions similar to The Mendips were experienced.

All materials will be delivered to site on tipper and tipped at the point of works.

Regardless of haul road design particulars, the first stage of stone road construction is to roll out a layer of geotextile separator membrane across the stripped area onto the sub grade material onto which the stone road is to be constructed. There will be a minimum overlap of 300mm between adjoining sections of this membrane.

Once the membrane is in place, a capping layer of stated depth will then be spread using an excavator in layers and compacted thoroughly. This capping layer will be constructed using a capping material to SHW clause 600 class 6F2 or similar.

On underlying grounds with a CBR value of <3% where settlement may still be possible under heavy loading, option 3 on the standard temporary works drawing shows a Tensar Trax Geogrid mesh or similar will be rolled out along the strip. This will be laid during the capping layer installation approximately 150mm up from the bottom of the capping material.

Dependant on the granular stone road design required and used, this capping layer may remain shy of existing ground level (pre topsoil strip) or come above this to form part of the haul road elevation.

Once the capping layer has been laid and compacted thoroughly the next stage is to top the construction off with a Type 1 sub base material to SHW clause 803 or similar.

The sub base material will be laid and spread by the excavator bucket in layers and thoroughly compacted. Once the sub base has been laid and compacted to its required depth stated on the standard temporary works drawing then the construction is complete.

All sides to the haul road elevation should be banked and graded as to avoid steep falls in gradient and will be banked at a suitable angle using the excavators bucket.

Granular Stone Passing Bays

Passing bays are to be spaced approximately 200m apart along the haul road. Dependant on the granular stone road design used, the passing bays will form an extension of the road using the same make up and installation method. This includes the use of Tensar Triax Geogrid (or similar).

The passing bay will be 16m in length with 2m tapers back into the main haul road construction at either end, forming a passing bay that is 20m in total length.

The passing bay will protrude 1m out from the main haul.

This passing bay design will be mirrored on the opposite side of the road at all passing bay locations meaning the haul road itself will widen at these points by 2m. The overview of this will be shown on the temporary works drawing (DWG – TBC).

Removal of granular stone haul road

All granular stone haul road will be removed using excavators and placed in dumpers / lorries to be taken to an agreed storage area. Care will be taken to remove and store the sub base and capping layers of stone separately. Once stockpiled, a method of disposal or re-use of the materials will be decided upon by site management.

All geotextile separator membrane and Tensar Trax Geogrid (or similar) will be disposed of into suitable skips on site.

Areas stripped of granular material will be returned to the condition in which they were found prior to installation i.e. sub grade material condition after topsoil strip.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

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On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

MOT Type 1 stone
Capping layer material class 6F2
Geotextile separator membrane
Tensar Triax Geogrid (or similar)
Various signs

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
Dumper
Transit van
Hand tools including rakes
Compaction equipment i.e. rollers / whacker plates
String lines and pegs
Stone delivery / collection wagons
Low level direction lighting (where required)

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,

			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			3	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Construction of bellmouth and ducted road crossings						Risk Assessment Ref. N ^o & Issue	RA/7334/DN/05
Site and Location of work:	Various Locations						Project No:	7344
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	Assessed On Site By:
	7						Date of Assessment	Date of Site Assessment
							13/09/13	13/09/13
							view Cycle	AS REQUIRED

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to ground the bucket and switch off the engine before encroaching into the exclusion zone (within radius of machine arm).	Site Supervision Individuals	4	1	4
		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2
10	Use of vibrating equipment and tools – Vib plate / Poker / Rammer	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
11	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
		Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, sunscreen, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
		Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
		Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
		Damage to underground services i.e. electric,gas.water,telecom,sewers	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
		Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
14	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Shoring to be put in place as required. Excavated soil to be stored minimum of 1 meter away from the trench.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	PPE to be worn. Barriers to be erected and closed around perimeter.		3	1	3
15	Suspended loads	Load falling, load swinging, uncontrolled load	4	3	12	Safe and approved method of work, clear work area, Safe lifting zone, flat level ground. Certified lifting equipment. Certified Hiab and operator. Use of slings / banksman.	Site supervision Individuals	4	1	4
16	Access and Egress	Falls from height	4	4	16	Ladder access on both sides of the Hiab lorry. Guard rails running around the perimeter of the Hiab lorry.	Site Supervision. Individuals.	4	1	4

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Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

10. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 04

For the
Ducted Road Crossings and Access Bellmouth Installations

Hinkley Point 132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	13/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	13/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1
Approved by:	██████	on behalf of Neary Construction		Date	13/09/13
Designation:	Project Manager	Mobile Tel No. ██████████			
Received by:		Customer/Client (if applicable)	Date		
Designation:					

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6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
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10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe installation of ducted road crossings and access bellmouths along the entire route.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Nearby Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – ‘Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Access Point drawings (various)
Typical bellmouth drawing (dwg number not yet issued)
DWG (TBC) Open cut road crossing cross section
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client: - Wayleaves access consents (Landowners)

Highways Authorities: - Road Opening Notices

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures
Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

It is assumed prior to ducted road crossings and access point installation all hedgerows at the access point will have been removed.

Drainage Ditches

Where drainage ditches are running adjacent to the carriageway an agreed pipe will be laid along the length of the ditch ensuring it is laid beyond the extent of the works i.e. bellmouth as to not impede the flow of the drainage ditch. Any vegetation / top soil will be removed to an agreed lay down /storage point, ideally adjacent to the works, to be re laid upon completion of the works. Well compacted stone will then be used to surround and cap the pipe to top of sub base level.

Ducted Road Crossings

Where the route crosses a road a ducted road crossing will need to be installed as a priority to minimise disruption to the local residents. A traffic management plan will be drawn up for the specific area to be excavated and agreed with local council. A Road Opening Notice (R.O.N) will be applied for and a duration of work agreed which will be adhered to strictly. Once all documentation is in place and the traffic management is erected, the construction works can begin.

Two road cuts will be made, each to provide room for an excavation capable of housing two no. circuits. The widths and depths at this stage are still to be confirmed so any measurements stated are purely for completeness of method description. The method below outlines the construction of one of these circuits.

The outside lines of the duct block will be marked across the road using line marker spray paint and a road saw used to cut the bituminous layer ready for breaking out at a suitable width. An excavator, fitted with a hydraulic breaker will then break away the bituminous layer down to stone level and the material removed to an agreed stockpile on the site by dumper. The excavator, now fitted with a digging bucket will begin to excavate down to a depth of 1200mm from ground level. As stated above HSG47 will be followed at all times with a mixture of both machine dig and hand dig methods employed dependant on the ongoing CAT scan results. Once the excavation is to a depth of 1200mm and of the desired length, the duct block installation work can begin. The duct block will extend a minimum of 1500mm past the edge of the road on both sides.

It is expected that the cable route will encounter a number of services especially in the vicinity of these road crossings and as such the horizontal and vertical alignments are subject to change dependant on possible conflicts. The Principal Contractor will be notified of any change that may deviate from any agreed drawings.

Trench support using timber poling boards and walers along with steel trench struts will be installed (method dependant on ground conditions) to support the open trench.

The base of the excavation will be compacted thoroughly and will be lined with a visqueen membrane. 50mm spacer blocks will then be placed onto the visqueen ready for the steel mesh to sit on. A393 steel mesh will then be cut to a width of approximately 650mm and laid onto the spacer blocks along the excavations length.

Concrete will be vibrated using a vibrating poker during installation to ensure all air voids are removed prior to curing.

C32/40 concrete will now be poured into the excavation to a level 50mm above the installed layer of steel mesh, at which point the ducts will be laid as per issued construction drawing into position spanning the road and extending to the edges of the duct block length. Ducts will be laid in a fashion as to ensure all joints are running with the cable pull and will not interfere with the cable installation or duct proving when they commence. All ducts will have a cover level to top of duct from ground level of at least 900mm, and visually checked prior to laying for any defects or blockages.

Once the ducts are bedded in, concrete will slowly be added to the excavation to a level 100mm above the ducts top. At this point a further layer of A393 steel mesh will be added and the concrete installation completed up a further 50mm. This will bring the top of the concrete duct block 150mm above the top of the installed ducts.

Stokboard covers will be laid on top of the finished duct block prior to full reinstatement.

As stated, the concrete installed will be vibrated comprehensively to ensure all air pockets are removed before being left to cure. If required, a concrete frost blanket will be applied to the concrete dependant on expected weather conditions.

Curing of the concrete will take place overnight, after which time the road will be reinstated including the construction of the access point/s required to allow access from the roadway into the cable easement (see next section).

The excavation will be stoned up using the removed arisings if suitable, or MOT Type 1 imported stone if not stone will be laid in well compacted layers to the NRSWA specification, this will continue until the bituminous layer is reached. There will always be a minimum 200mm layer of type 1 stone prior to the bituminous layer regardless of the material backfill used.

It should be noted that 2 lines of cable warning tape will be laid onto the first 100mm of stone backfill running over the duct formations.

Dependant on road type, the depth of bituminous layer will vary but will always contain both dense base binder course (DBB) and wearing course (WC).

All edges of the excavation will be checked prior to the base and wearing course being installed and re-cut using a sthil saw if needed.

20mm DBB will be laid and raked in by hand to a given depth dependant on road type to 40mm below ground level. The layers will be compacted using a ride on BOMAG roller or similar in readiness for wearing course. A cold tar paint or similar will be poured onto the walls of the trench prior to wearing course being installed. Wearing course to match existing or agreed will be laid and raked up to ground level and spread evenly. Once laid it will be rolled using the ride on roller until fully compacted, and the edges tidied using shovels and grafts if required. The roller will release cold water as it rolls the layer to ensure the wearing

course does not break up on compaction. Once installed the new road surface should be given at least 3 hours to cure prior to it being subjected to traffic loads.

Over banding may now be installed along the joints of the new reinstatement subject to local highways discretion.

Access Points

Installed access points (see individual access point drawing) will allow access from the roadway into the cable easement. They will provide a bituminous extension of the road itself in the form of a bellmouth leading to the stone haul road within the easement. The openings will be installed as part of the 20m wide cuts made in the hedgerows previously, with the bellmouths themselves being around 8m in width with 5m radius curves splaying to meet the existing roadway (see Typical Bellmouth Drawing).

Again, traffic management will be required and plans / erection etc will follow the same procedure as previously mentioned. Once the area is safely demarcated construction work can begin.

The concrete duct block will have been laid prior to the construction of the access point.

The existing ground will be taken down by 300mm using an excavator (topsoil will be stored adjacent to the works), again with HSG47 guidelines being followed. Once the ground is at this level a 200mm layer of Type 1 stone will be laid and compacted using a ride on roller.

As shown on an as yet to be issued drawing 'Typical bellmouth drawing' a kerb line will be laid to form a 5m radius on either side of the bellmouth opening. This will be marked out by the site engineer. The half battered kerb stones will be bedded onto a 100mm a kerb mix concrete bed and 75mm haunch which will be installed at the same time as the stone prior to the bituminous topping. Kerbs will be hand laid, mauled into position and levelled using a string line and pins maintaining a 125mm up-stand from ground level at all times. At either end on the kerb lines on the carriageway drop kerbs will be installed.

Once the stone layer and kerb lines are in place and concrete has cured adequately to avoid kerb movement or settling the bituminous layer will be installed.

20mm DBB will be laid and raked in by hand to a depth of 60mm to 40mm below ground level. The layers will be compacted using a ride on BOMAG roller or similar in readiness for wearing course. A cold tar paint or similar will be poured onto the walls of the trench prior to wearing course being installed. Wearing course to match existing or agreed will be laid and raked up to ground level and spread evenly. Once laid it will be rolled using the ride on roller until fully compacted, and the edges tidied using shovels and grafts if required. The roller will release cold water as it rolls the layer to ensure the wearing course does not break up on compaction. Once installed the new road surface should be given at least 3 hours to cure prior to it being subjected to traffic loads.

10m into the bellmouth access from the road line a lockable farm gate will be installed along with the erection of easement fencing (to match existing). This will be the case at all access points and the installation of these are to be covered in a separate RAMS. Other variations of the access point design include the installation of a wheel cleaning facility where the bituminous area is slightly longer and splayed. The installation of these facilities will again be covered in a separate RAMS document.

Due to the alteration of the road system and future traffic movements additional semi permanent signage will need to be erected at designated points. These will service both site traffic and the general public and will be shown on an approved drawing prior to erection.

Installation of these signs will involve a hand dig of around 600mm into which a fast curing wet postcrete mix will be placed. Immediately the post and sign will be dropped into the wet

postcrete mix ensuring the sign is both vertical and at the required height stated in the relevant drawing. Once the postcrete mix has been given time to cure the area will be backfilled with the removed arisings.

White Lining

Any white lining that needs to be replaced or newly installed can be completed once the road has been fully reinstated up to ground level. Thermoplastic white lining will be used which is installed by rolling out the desired line or marking and using a paraffin blow lance to heat the compound until it becomes soft and moulds to the ground below. All white lining should be given around an hour to cure.

Alternatively, a sub contractor may be brought in to carry out white lining and markings using hot pour thermoplastic lining. These works will be carried out as per a separate RAMS document if required.

Removal of Access Points

Once the access point is no longer required its removal can commence. All bituminous material and stone will be broken up and stripped to be removed from site by a registered waste carrier. All easement fencing and farm gates installed are to be removed and taken to storage at an agreed storage area, and reinstatement of the area will be carried out using the removed topsoil that was stored adjacent to the works on installation.

Any drainage ditch pipes that were installed will also be removed at this time along with any stone surround that was put into place, before the ditch is returned to its original profile and shape using the excavators bucket.

All hedgerows that were removed to accommodate the access point shall, upon completion of the top soiling and ditch remediation now be replaced.

All signage that was erected to accompany the new access point shall now be removed and all areas of removal returned to there original level through well compacted backfilling.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

C32/40 Concrete / Kerb mix concrete
Emtelle 150/160mm ID/OD UPVC ring seal ducts
MOT Type 1 stone
A393 steel mesh
Visqueen membrane
50mm concrete spacer blocks
Warning tape / Stokboard Covers
Wearing course
20mm dense base binder course
Bitumen tack / cold tar paint
Thermoplastic lining tape / markings
Contractor line marker spray
Half battered kerb stones
Drop kerb stones
Post crete
Traffic signage / posts
Drainage pipes
Farm gates
Fencing types

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
Dumper
Transit van
Hand tools including rakes
CAT+ & Genny+
Hydraulic breaker for excavator
Vib plate / tamper
BOMAG 600 roller or similar
Vibrating poker
Road saw

Sthil saw
String lines and pegs / pins
Paraffin lance blow torch
Grab wagon/ Hiab Lorry
Chapter 8 / Heras Fencing
Chapter 8 signage
Low level directional lighting

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			3	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Construction of bellmouth and ducted road crossings						Risk Assessment Ref. N ^o & Issue	RA/7334/DN/04
Site and Location of work:	Various Locations						Project No:	7344
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	Assessed On Site By:
	7						Date of Assessment	Date of Site Assessment
							13/09/13	13/09/13
							view Cycle	AS REQUIRED

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to ground the bucket and switch off the engine before encroaching into the exclusion zone (within radius of machine arm).	Site Supervision Individuals	4	1	4
		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2
10	Use of vibrating equipment and tools – Vib plate / Poker / Rammer	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
11	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
		Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, sunscreen, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
		Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
		Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
		Damage to underground services i.e. electric,gas.water,telecom,sewers	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
		Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
14	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Shoring to be put in place as required. Excavated soil to be stored minimum of 1 meter away from the trench.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	PPE to be worn. Barriers to be erected and closed around perimeter.		3	1	3
15	Concreting	Dermatitis, burns, vibration white finger	4	4	16	Wear waterproof gloves, Wellingtons, rotate time using vib poker	Individuals	4	1	4
16	Bituminous materials	Dermatitis, burns	4	4	16	Wear heat resistant gloves	Individuals	4	1	4
17	Working in the highway	Injury to pedestrians and Staff	4	4	16	Correct Traffic Management in Place, segregation of workers from public, Tool Box Talks.	Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

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Low Risk	=	1 to 6
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High Risk	=	12 to 20

Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

11. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 06

For the

Installation of Easement Fencing using Stock Proof,
Demarcation and Post and Rail

Hinkley Point

132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	13/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	13/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1

Approved by:	██████	on behalf of Neary Construction	Date	13/09/13
Designation:	Project Manager	Mobile Tel No.	██████████	

Received by:		Customer/Client (if applicable)	Date	
Designation:				

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1. Introduction	12. Plant, Tools and Equipment
2. Reference Documents	13. Labour/Manpower
3. Safety Documents	14. Delineation
4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe installation of easement fencing using stock proof, demarcation and post and rail type fencing including footpath crossings, bridleway crossing and farm crossings.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – ‘Avoiding Underground Services
Temporary Works Design
Stock Proof Fencing Drawing
Demarcation Fencing Drawing
Post and Rail Fencing Drawing
Bridleway Arrangement Drawing
Footpath Arrangement Drawing
Farm Crossing Arrangement Drawing

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client: - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures
Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver /

engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

The position of fencing will be determined with the use of GPS and will be marked by using wooden stakes which will generally be placed at the end of runs or at a change of direction.

Stock Proof Fencing

Straining posts will be knocked in using a post driver mounted on a 2.5T tracked dumper at a maximum of 150m apart and at any change of direction. Struts will be fitted to strainers to prevent movement and maintain tension on the wire.

Intermediate posts will be knocked in at 3.0m spacing, again using the post driver.

Stock netting will then be spooled out and tensioned. The ends will then be stapled to the strainers and tied off to secure fully. The netting will then be stapled to each intermediate post.

2 Strands of barb wire will also be spooled out and tensioned and stapled to each post.

Post and Rail Fencing

Tanalised posts will be knocked in using a post driver mounted on a 2.5T tracked dumper at 1.8m spacing.

4No. rails will then be fitted to the posts using galvanised nails with rails being staggered to add extra rigidity to the fence line.

Demarcation Fencing

Straining posts will be knocked in using a post driver mounted on a 2.5T tracked dumper at any change of direction. Struts will be fitted to strainers to prevent movement and maintain tension on the rope.

Intermediate posts will be knocked in at 3.0m spacing, again using the post driver.

6mm rope will then be rolled out and stapled to the posts.

Pedestrian Gates

In order for post installation, 450mm x 350mm x 200mm deep holes will be excavated.

The posts and frame will be set in quick set concrete with the base of the gate 200mm above ground level.

The gate will then be tied into the existing fencing as per footpath crossing drawing.

Agreed signs will then be installed on the haul road and fencing.

Bridleway Gates

The bridleway gate will come with an extended handle for ease of opening and closing for users. In order for post installation, 550mm x 350mm x 200mm deep holes will be excavated.

The posts and frame will be set in quick set concrete with the base of the gate 200mm above ground level.

The gate will then be tied into existing fencing as per bridleway crossing drawing.

Agreed signs will then be installed on the haul road and fencing.

Farm Crossings

Exact locations will be determined after consultation with Land & Development and Landowners.

The gates will be hung on wooden straining posts with the posts being driven into the ground using a post driver.

All metal work will be galvanised and hinges will be inverted to prevent theft. Gates will interlock when closed.

The gates will then be tied into existing fencing as per farm crossing drawing.

Agreed signs will then be installed on the haul road and fencing.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

Waterbased Spray Paint
Wooden Stakes
Diesel/Petrol
Straining Posts
Struts
Intermediate Posts
Tanalised Posts
Timber Rails
Netting
Barb Wire
Staples
Pedestrian Gates
Bridleway Gates
Farm Crossing Gates
6mm rope
Various signs

12 PLANT, TOOLS AND EQUIPMENT

GPS
CAT and Genny+
2.5T tracked dumper with post knocker
Tractor
Hand Tools
Pick Up and Trailer
Drip Trays
Low level direction lighting (where required)

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			1	Plant Operator	Permanent – CSCS, Plant certificates
			2	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Installation of Easement Fencing using Stock Proof Demarcation and Post and Rail						Risk Assessment Ref. N ^o & Issue	RA/7334/DN/06
Site and Location of work:	Various Locations						Project No:	7344
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	Assessed On Site By:
	7						Date of Assessment	Date of Site Assessment
							13/09/13	13/09/13
							view Cycle	AS REQUIRED

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, in fields use green/red line access drawings, banksman to assist movement	Site	4	1	4
4	Use of Tractor	Person struck by machine, over turning	4	3	12	Operator to be fully trained, daily inspections to be carried out, only use suitable and fit for purpose attachments, ensure moving parts are guarded. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to switch off the engine before encroaching into the exclusion zone.	Site supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk = 1 to 6
Medium Risk = 7 to 11
High Risk = 12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of dumper and post knocker	Damage to underground services i.e. electric,gas.water,telecom,sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Hand digging to be carried out. Use of a Permit to Dig.	Site supervision Individuals	4	1	4
6	Use of dumper and post knocker	Contact with OHLs	5	3	15	Comply with GS 6, travel within goal posts, work to permit to dig, use of restrictors if necessary	Site supervision Individuals	5	1	5
7	Use of dumper and post knocker	Vehicle overturning, crushing injuries	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
8	Use of dumper and post knocker	Person falling from vehicle	3	3	9	Seat belts to be worn	Site Supervision Individuals	3	1	3
9	Use of dumper and post knocker	Fuel leakage	4	4	16	Containment by drip trays, cleaning by approved method	Site Supervision Individuals	4	1	4
10	Transport of Materials and Plant	Unsafe Load, overweight	4	3	12	Ensure all loads are safely secured using the correct straps, check straps for damage, do not exceed weigh limit, refer to manual handling	Site supervision Individuals	4	1	4
11	Working in a Noisy Environment	Damage to Hearing	3	3	9	All staff are issued with hearing protection, and are advised to wear if above 80dB and instructed to wear if above 85dB.	Site Supervision individuals	3	1	3
12	Use of Hand Held Powered Equipment	HAVS (Hand Arm Vibration Syndrome)	3	3	9	Operators to take regular breaks, equipment is to be maintained, inspected and tested as per manufacturers instructions	Site Supervision individuals	3	1	3
13	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
14	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
15	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3
16	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary. Only use if competent to operate	Site supervision Individuals	2	1	2
17	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
18	General Working	Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, suncream, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
19	General Working	Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
20	Personal Hygiene	Letrospirosis	4	4	16	Flu like symptoms,contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
21	Mixing Concrete	Eye splashes, dermatitis	4	3	12	Suitable PPE, wear waterproof gloves, wear safety glasses	Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
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Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

12. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 07

For the
Excavation and reinstatement of cable trenches
Hinkley Point
132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	18/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	18/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1

Approved by:	██████	on behalf of Neary Construction	Date	18/09/13
Designation:	Project Manager	Mobile Tel No.	██████████	

Received by:		Customer/Client (if applicable)	Date	
Designation:				

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1. Introduction	12. Plant, Tools and Equipment
2. Reference Documents	13. Labour/Manpower
3. Safety Documents	14. Delineation
4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe excavation and reinstatement of cable trenches for both the 132kV and 400kV routes.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design
NG drawing 13/NG/0237

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures

Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

*WHITE – Outline working area i.e. Joint Bay
YELLOW – Machine dig area i.e. Trench Width
BLUE – Hand dig area i.e. Within 0.5m of a service
RED – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

All areas will have been topsoil stripped prior to cable trench excavation.

The route of the cable will be marked up using pegs or similar with line marker spray being used to mark up the outer lines of the trench as per HSG47 guidelines.

It is assumed all services shown on the service drawings shall be identified prior to machine excavation through trial holes and all excavation work will, as stated above, be carried out following HSG47 guidelines.

All dewatering to be carried out in agreement with relevant authorities.

Cable trench excavation

Prior to the works being carried out temporary works designs will be drawn up and issued for construction outlining the support methods to be used on the open trenches. These designs will vary slightly dependant on ground conditions in that area and the correct cross section / support method chosen prior to the works being carried out on a particular area.

Assuming a basic close boarded timber support system the methodology is as follows;

The trench, commencing at the joint bay will be excavated in 6m lengths to accommodate a 6m trench support frame to the agreed line with depth checks being carried out as the excavation proceeds, the excavated arisings will be stored and capped for re-use a minimum of 1m from the trench side as per easement drawing.

Access and egress to the trench will be via a secured and tagged ladder which will move along as the excavation progresses.

A skeleton frame will now be installed using poling boards and a 9'x3' waler on each side of the trench. These will be secured using adjustable accrow struts. Once the skeleton timbering is in place the remaining poling boards will be dropped behind the waler until the trench has been fully close boarded.

The distance between accrow struts, height of waler etc are all determined on the temporary works design so dimensions are drawing dependant.

Access and egress to the trench will be via a secured and tagged ladder which will move along as the excavation progresses.

Edge protection can now be erected on either side of the trench using scaffold tubes spaced every 3m (1.5m) by knocking them into the ground 0.5m at the back of the poling boards. Horizontal scaffold tubes will then be fixed to the upright tubes every 3m with a minimum height of 950mm. A secondary horizontal tube will be fixed to the uprights a maximum of 470mm from the top rail.

If required, plastic footway matting would then be placed parallel with the trench (on the spoil side) in 1000 x 500mm sections placed 500mm apart, where required the ground is levelled.

Semi-permanent ladder access points will be provided approximately every 100m along the open timbered trench by leaving a 1m spacing between upright scaffold poles which can be guarded by attaching short 1m tubes across the opening.

Pedestrian crossing points approx 1m wide are to be constructed approx every 200m by ensuring upright poling boards are flush with ground level, and a temporary trench cover of suitable size placed across the trench. Scaffold tubes can then erected (as edge protection) are placed across the trench to act as a barrier rail.

No person is to re-enter any trench until a temporary works supervisor has issued a temporary works load tag which will be signed on a daily basis and fixed to the section of trench it relates to.

Reinstatement

A 150mm bed of CBS will be laid and compacted with hand tamps by lowering the CBS into the bottom of the trench with the excavators bucket.

Cables will be installed as per relevant RAMS document.

Once the cables are in-situ the CBS surround will be placed and compacted as above until the desired cable cover has been achieved.

Stokboards will be placed by hand on top of the CBS covering the full trench width and fully secured to each other using the provided plastic fixings.

Using the excavator, a layer of spoil, approx 150mm will be laid on top of the boards and warning tape rolled out by hand at this level.

The trench, now being partly reinstated can be stripped of timbers prior to the waler board level being reached. Accrow struts will be loosened slowly by hand until the boards can be removed either by hand or use of the excavator fitted with certified shackle and strap.

Once the warning tape is laid out and the timbers stripped the reinstatement will continue in layers of no more than 300mm. Once each layer has been laid by machine it will be compacted using suitable equipment until ground level has been reached. Any services that need to be reinstated around will be done so as to what was removed, and any removed warning tape shall be replaced with new.

All ground level reinstatement shall be taken to topsoil level and levelled accurately using the excavator prior to the spreading of the topsoil. The level this subsoil layer is taken to will depend on what was removed, records of which should be taken during the topsoil strip process.

Working around existing services

There will be occasions during the cable trench works that existing services are encountered. These could be running with the line of the trench, where if needs be either the service or the trench line may need to be deviated, or services are running across the line of trenches and need to be avoided as well. It assumed here that any service at a depth greater than 600mm below the bottom of the trench bed can be avoided simply by excavating the trench above it, except in exceptional circumstances such as a HP gas or water main where greater clearances will be requested by the asset owner.

When a service needs to be passed under there are various methods by which this can be achieved as shown in drawing 13/NG/0237.

(i) Service Protection Pad

Where there is an instance that the haul road crosses above an existing service there may be a call to protect the service from the above vehicle loadings through the installation of a concrete protection pad. This will be installed as the haul road installation is progressing and will consist simply of a concrete slab being poured at the same depth and width as the haul road, in which A393 reinforcement mesh will be laid and the slab left to cure overnight before any vehicles are permitted to travel over it. A layer of geo membrane will be laid on top of the geo textile layer laid for the haul road stone to prevent concrete leeching into the soil below. The haul road installation can resume as normal leading up to and after the slab with the stone layers laid directly up against the concrete slab itself.

(ii) Cable duct crossing

Where the cables need to pass beneath the service the same method shall be used as is outlined for the ditch crossings. This involves using trench boxes for trench support given the increased depth required for the installation, as well as the installation of a concrete duct block being cast as the service is passed under. As before the clearance distance of 600mm shown on drawing 13/NG/0237 may be increased dependant on the type of service being passed beneath, however this will be known prior to the works taking place.

The ducts installed beneath the service will be deeper than as per spec for the rest of the route, because of this the trenches excavated back from the service should be of sufficient length to allow the ducts to rise back up to nominal depth. All trenching that is excavated during this work that is deeper than nominal depth shall be supported using trench boxes.

The trench boxes to be used are 3m in length and come in various depths.

Dependant on the depth of the trench, the number of trench boxes used will vary, with base boxes coming in 2m, 2.5m and 4m depths. A base will be chosen and then a top/s will be added to the base box to bring the total level above surrounding formation level. The tops come in heights of 1m and 1.5m, and a maximum of two can be stacked on top of a base. Boxes will be stacked to make sure they protrude above ground level in all instances, with purpose built handrail protection being fitted by hand to all top level boxes. Trench box widths will be set to an internal width that suits the duct formation design and struts pinned at this width before lifting them into position. Due to the extra depth the cables will be installed at, the phase separation increases, and because of this it is vital trench boxes of the correct width are chosen.

Once installed, the access and egress point will be via the trench box that is at the highest level, i.e. the box furthest away from the service. It will be in the form of a ladder put into place by hand from ground level, with a gated entrance installed as part of that boxes handrail system.

As the trench level begins to rise again as it heads away from the service crossing, the number of trench boxes stacked will reduce accordingly dependant on surrounding ground level. The gradient of the fall is dependant on duct design and also the trench box design. If trench boxes are installed on a bend that is too severe then the boxes will not sit next to each other flush which can result in gaps forming between them, which of course is not acceptable. The gradient up from final bottom level to standard trench depth will be slow to make sure this does not occur.

The trench box / duct block installation methodology is as follows;

Phase 1

Hand digging will expose the service and reveal its depth and size. Once this is known the trenches leading up to and away from the service can begin to be excavated at their required depth.

The machine will remove ground down to level excavating a vertical face alongside the wall of the service to allow a trench box base to be installed as tight to the service line as possible. The first trench box base will be laid as soon as at least 3m of trench has been excavated and a solid level floor has been achieved with the excavator bucket. The base will be lowered into position by the excavator and the required number of tops, if any, will be installed on top of the base box until ground level height has been passed. The machine will continue removing ground for the next 3m, still maintaining the same level of dig, and repeat the trench box installation of the same formation. The ground past these trench boxes will need to be graded back and benched to minimise the amount of loose ground that could fall into the installed boxes. Once this 6m length of support has been installed and the ground around them graded to suit, the machine will move to the other side of the service and repeat the same process. When the excavation for the first box is being carried out the ground directly beneath the service will be pushed through using the machines bucket, and the loose ground removed as much as is practically possible by machine bucket. Any ground remaining in the trench will be removed by shovel into the lowered machine bucket after the access/egress point has been put into place.

A length of 6m either side of the service should now be fully shored. The machine will now make the surrounding ground on the second side safe through grading down and benching where required, and the handrail system will be installed at both sides. An access/egress point will be created on one side of the obstruction using a wooden ladder tied to the gate which forms part of the handrail system. Operatives will now access the trench and remove any loose ground that may remain in the trench via shovelling into the machines lowered bucket. This process will be repeated on both sides of the service once the access / egress ladder has been moved to the opposite side. No operatives are permitted to physically pass under the service at any time and this will remain a no go area.

If the trench boxes closest to the service could not be installed flush to its face then a timber shoring system will need to be used to support the ground remaining between the trench box end and the service. All timbers will be passed down from ground level and the shoring system chosen will be in relation to trench depth as per temporary works design.

Any ingress of water will be dealt with by means of a 2" submersible pump pumping from a hand dug sump hole.

Phase 2

Now that there is an adequate length of trench excavated and supported, the concrete duct block can be installed (shown below). It should be noted that any duct length passing under the service itself will be passed through from either side of the service and no operative shall pass beneath it at any time.

Concrete duct block installation is as follows;

- The length of the concrete duct block at each service crossing will be agreed prior to works beginning.
- As before, all ground will be compacted and drained to ensure a firm, dry bed to concrete upon.
- A visqueen membrane will be used to line the trench including up the walls of the boxes where required to stop the concrete bonding with the box prior to removal as well as spacer blocks onto which the reinforcement mesh will be laid.

- Shuttering will be installed to form the walls of the duct block and will be secured into place using pieces of 4" x 2" as struts. A plywood shuttering will be used at either end of the duct block to form a stop end to the installation 300mm back from the ends of the ducts.
- Concrete will be delivered to site via a concrete wagon and deposited onto a pre installed area made up of bog mats laid with visqueen matting. This area will be big enough for any single concrete delivery. The concrete wagon will wash out at a designated site wash out area.
- A bed of semi dry concrete will be laid by a combination of machine and hand including the first layer of steel reinforcement mesh, at which point the ducts will be laid into position as per spec.
- All ducts will be capped to prevent intrusion.
- Concrete will now be laid by hand until the required cover is obtained throughout the length of the duct block over the formation and the remaining layer of reinforcement steel mesh laid as required.
- C25/30 semi dry concrete will be used at all times.
- Care must be taken at all times that ducts are kept clear of any concrete intrusion and that all ends are free to be coupled onto once the concrete duct block has cured.
- Once the concrete has been installed it will be covered through timber sheets spanning the shoring above and will be left to cure for 24 hours.
- Where concrete is not required but trench boxes have been used due to depth, ducts shall be now be installed until nominal trench depth is reached and CBS installed in these sections around the ducts. This will allow the trench boxes to be removed.
- Once cured the backfilling process will be carried out as normal up to ground level with the trench boxes being pulled out by the excavator once the concrete / CBS has been installed.
- All ground removed from above the service shall be replaced and thoroughly compacted using only approved equipment.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

CBS
Sand
Concrete
Ducts
A393 reinforcement steel mesh or similar
50mm spacer blocks / bars

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator c/w 4 legged lifting chains / straps etc
Dumper
Transit van
Hand tools including hand tamps
Compaction equipment i.e. rollers / whacker plates
String lines and pegs
Timbers (5fts, 8fts, 9'x3' walers)
Edge protection
Pedestrian matting and crossing boards
Low level direction lighting (where required)
Stokboard covers c/w fixing pegs
Warning tape
Trench boxes and accompanying handrail system / ladder access

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			3	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Excavation and reinstatement of cable trenches.						Risk Assessment Ref. N ^o & Issue		RA/7334/DN/07	
Site and Location of work:	Various Locations						Project No:	7334	Method Statement Ref. N ^o & Issue	MS/7334/DN/07
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████	Assessed On Site By:	██████
	7						Date of Assessment	18/09/13	Date of Site Assessment	18/09/13
Duration of Task		view Cycle		As per programme		AS REQUIRED				

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o .	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to ground the bucket and switch off the engine before encroaching into the exclusion zone (within radius of machine arm).	Site Supervision Individuals	4	1	4
		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

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9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2
10	Use of vibrating equipment and tools – Vib plate / Poker / Rammer	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
11	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
		Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, suncream, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
		Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
		Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
		Damage to underground services i.e. electric, gas, water, telecom, sewers.	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
		Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
14	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Shoring to be put in place as required. Excavated soil to be stored minimum of 1 meter away from the trench.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	PPE to be worn. Barriers to be erected and closed around perimeter.		3	1	3
15	Suspended loads	Load falling, load swinging, uncontrolled load	4	3	12	Safe and approved method of work, clear work area, Safe lifting zone, flat level ground. Certified lifting equipment. Certified Hiab and operator. Use of slings / banksman.	Site supervision Individuals	4	1	4
16	Access and Egress	Falls from height	4	4	16	Edge protection in place and ladder access / egress maintained at all times.	Site Supervision. Individuals.	4	1	4
17	CBS/concrete use	Cementitious materials - dermatitis	3	3	9	Waterproof gloves and wellingtons to be work	Site supervision Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
 PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
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High Risk	=	12 to 20

Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

13. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 08

For the

Excavation of Joint Bays and Link Pillar Installation

Hinkley Point

132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	18/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	18/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1

Approved by:	██████	on behalf of Neary Construction	Date	18/09/13
Designation:	Project Manager	Mobile Tel No.	██████████	

Received by:		Customer/Client (if applicable)	Date	
Designation:				

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1. Introduction	12. Plant, Tools and Equipment
2. Reference Documents	13. Labour/Manpower
3. Safety Documents	14. Delineation
4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe excavation of joint bays along the underground cable routes.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures

Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

*WHITE – Outline working area i.e. Joint Bay
YELLOW – Machine dig area i.e. Trench Width
BLUE – Hand dig area i.e. Within 0.5m of a service
RED – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

Only toothless buckets to be used on the excavator, the excavator MUST only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

All areas will have been topsoil stripped prior to joint bay excavation.

The position of the joint bay will marked up using pegs or similar with line marker spray being used to mark up the outer lines of the excavation as per HSG47 guidelines.

Joint bay positions will have been chosen as to avoid conflict with existing services. To this end, it is assumed that all excavation works shall be in clear ground.

All dewatering to be carried out in agreement with relevant authorities.

Joint Bay Excavation

All excavation works will be carried out in conjunction with a pre-approved temporary works design that will confirm the excavation support system to be used in each location, dependant on ground conditions. Usually the excavation support design for a joint bay will be either close boarded timber with a double frame or sheet piles throughout. This RAMS assumes that the ground make up and depth of the joint bay dig will dictate sheet piles must be used and the methodology will be written to suit.

The timbered trench will have been completed and will have end at either side of the joint bay position. It will allow enough for a bellmouth area to be installed using timber at the point where the trench widens to joint bay width and falls to joint bay depth.

The joint bay excavation will be carried out using a 360 excavator and in 300mm scrapes as dictated by HSG47 guidelines. CAT scans will be carried out as the excavation continues. Where required due to depth, the excavation shall be benched to allow the CAT operative to enter safely. Either a ladder or a stepped excavation bank will be used for access and egress to the area throughout the digging works.

Once the joint bay excavation is at the required dimensions with care taken to allow for any extra width required to accommodate the piles and horizontal walers, the pile installation can begin.

It is likely KD4 piles will be used although this may change dependant on temporary works design. The excavators bucket will be removed and a pile cap / chain will be attached. Each pile will be attached to this and guide ropes tied to it to allow the operatives on the ground to guide the pile as it is suspended in the air. The excavator will be used to slowly lift the pile into position and lower it into the excavation, where it will be guided by hand from ground level into its drive position. When ready the excavator will apply pressure with its arm to the pile cap and drive the pile into the ground until its top is at the required height above ground level.

The pile installation will continue along the walls of the excavation until the required length has been piled on both sides. Once the piles have been driven in the required number of waler timbers will be installed by hand (one or two frames), and strutted with accrow struts to

hold them in place. If shown on the temporary works 'horses heads' will be installed which consist of 9"x3" timber uprights installed at intervals in front of the walers. These will be nailed to the waler behind them and struted with accrow struts to fully secure the system. Any gaps behind the piles will be filled in using the removed arisings.

As the horses heads will not be toed into the ground at this point the accrow struts will be lower than their final positions to make them secure prior to the concrete base being installed.

The gaps remaining between the existing track and the sheet piles of the joint bay can now be timbered using the relevant system as per temporary works and the ramp CBS'd to give a smooth transition from regular track depth to joint bay depth.

The excavation bed will have a 300 x 300mm sump hole dug by hand at either end and this will be shuttered around using timber prior to the concrete base being poured. This will allow for future dewatering of the bay when works inside it commence.

The excavation floor will be lined with geo-membrane prior to the concrete pour taking place which will prevent leeching of concrete into the ground below.

Once complete the floor will be lined with 50mm spacer blocks and A393 reinforcement mesh (cut on site to suit) will be laid into position.

Concrete (specification and class to be specified on design drawing) will be delivered to site and poured from the wagons chute either directly into the bay using an extended chute, or into the excavator's bucket which will lower the concrete down itself. As the pour continues the operatives will spread and distribute the concrete by hand until the level of the 2nd sheet of steel mesh has been reached. This will be laid into position after which the concrete installation will continue until the required depth of concrete has been reached (usually 150mm). The desired finish will be applied to the concrete's surface using either a float or brush.

Throughout the concrete pour a 2" vibrating poker will be used to ensure all of the air pockets are removed from the concrete which could affect its strength and integrity.

The concrete will be left to cure overnight and in adverse conditions the joint bay excavation will be covered using a tarpaulin of timber sheeting to protect the concrete during this time.

Once this overnight curing period has passed the accrow struts can be moved into their final positions as shown on the temporary works design construction drawing.

The bay will be brushed and tidied prior to vacating it.

A water proof shelter system will need to be erected over the bay providing a dry working environment when the jointing works commence. This may also include the installation of a lifting beam and tackle. These items will be designed by other and may consist of a scaffold frame with tarpaulin cover or a shack that will be put together on site. These works would be covered on a separate RAMS document.

Link Pillar Construction (after cable installation and jointing / reinstatement)

Link boxes are to be constructed at each joint bay at pre-determined positions.

- The link box area is excavated with the arisings removed to an agreed location.
- A plastic membrane will be laid; shuttering positioned and secured to construct the concrete base, with reinforcement positioned prior to laying and vibrating of the concrete with all exposed surfaces "float" finished. After a minimum curing period of 1 day the shuttering is struck and removed to store. The base will have a hole cast within it to allow the cables to be pulled through into the box when in position.

-
- A trench will be excavated from the joint bay to the link boxes for each cable circuit, and the bonding leads and Fibre / DTS installed. They will be surrounded with sand and marker tape placed above during backfilling and compacted with the previously excavated arisings.
 - The cabinet will be lifted into place on the concrete base and securely fixed.
 - On completion of the installation of the link boxes and bonding leads the surrounding ground is backfilled and reinstated to match existing. Fencing) will be erected around the link pillar as determined by the construction drawing.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
 Safety boots, (not Rigger type)
 Hi-visibility jackets (own company logo only)
 Flame retardant clothing (if required)
 Gloves
 Safety glasses

In addition the following PPE is to be carried / stored by all operatives on the construction site:
 Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

CBS
Concrete (spec to be confirmed)
A393 reinforcement steel mesh or similar
50mm spacer blocks / bars
Geo-membrane sheeting

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
Dumper
Transit van
Hand tools including hand tamps
Compaction equipment i.e. rollers / whacker plates
String lines and pegs
Timbers (5fts, 8fts, 9'x3' walers)
Pedestrian matting and crossing boards
Low level direction lighting (where required)
Stokboard covers c/w fixing pegs
Warning tape
Ladders
Fencing
Sheet piles (KD4 or similar)
Pile cap / chain

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			3	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

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Welfare facilities at a designated compound will be provided during the works.

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19 OTHER ISSUES

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Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Excavation of joint bays and link pillar installation.						Risk Assessment Ref. N ^o & Issue		RA/7334/DN/08	
Site and Location of work:	Various Locations						Project No:	7334	Method Statement Ref. N ^o & Issue	MS/7334/DN/08
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████	Assessed On Site By:	██████
	7						Date of Assessment	18/09/13	Date of Site Assessment	18/09/13
Duration of Task		view Cycle		As per programme		AS REQUIRED				

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

Hazard Ref.N ^o	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
1	General Working	Slips, Trips & Falls	3	3	9	Good housekeeping & awareness of the working area to be maintained at all times. Personnel to carry out Daily Risk Assessment Wear safety boots with ankle protection Walk with care. Suitable PPE to be worn	Site Supervision Individuals. Copy of DRA to be held in site records.	3	1	3
2	Manual Handling	Sprains & Strains	3	3	6	Manual handling training & tool box talks to be given prior to the commencement of any works. Ensure ground is firm, level & clear when lifting.	Site Supervision Individuals	3	1	3
3	Access and egress	Vehicular and pedestrian impact	4	3	12	Use designated routes only, banksman to assist movement	Site	4	1	4
4	Work in vicinity to overhead HV cables	High voltage electricity – shock, burns, fire, explosion	4	3	12	Work only in area covered by the safety document. Competent person or person trained as minimum. ALL personnel briefed and overhead lines clearly identified on the service drawing	Site Supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
5	Use of excavators	Shovel or load dropping	3	3	9	Manufacturers bucket size must not be exceeded	Site Supervision Individuals	3	1	3
		Overturning of machine	4	2	8	Machine to work on flat ground, Banksman to direct.	Site Supervision Individuals	4	1	4
		Person struck by machine	4	3	12	Operatives not to work/stand in radius of machine arm. Hi-viz vest to be worn. Banksman to direct, make eye contact with the operator and wait for the operator to ground the bucket and switch off the engine before encroaching into the exclusion zone (within radius of machine arm).	Site Supervision Individuals	4	1	4
		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

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			S	P	RR SxP			S	P	RR SxP
9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2
10	Use of vibrating equipment and tools – Vib plate / Poker / Rammer	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
11	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
		Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, suncream, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
		Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
		Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3

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			S	P	RR SxP			S	P	RR SxP
		Damage to underground services i.e. electric, gas, water, telecom, sewers.	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
		Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
14	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Sheet piles to be installed as required. Excavated soil to be stored minimum of 1 meter away from the trench.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	PPE to be worn. Barriers to be erected and closed around perimeter.		3	1	3
15	Suspended loads (Sheet piles)	Load falling, load swinging, uncontrolled load	4	3	12	Safe and approved method of work, clear work area, Safe lifting zone, flat level ground. Certified lifting equipment. Use of guide ropes.	Site supervision Individuals	4	1	4
16	Access and Egress	Falls from height	4	4	16	Edge protection in place and ladder access / egress maintained at all times.	Site Supervision. Individuals.	4	1	4
17	CBS/concrete use	Cementitious materials - dermatitis	3	3	9	Waterproof gloves and wellingtons to be work	Site supervision Individuals	3	1	3

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21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.



NEARY CONSTRUCTION

14. HAZARD IDENTIFICATION/RISK ASSESSMENT AND METHOD STATEMENT REF. MSRA / 7334 / DN / 09

For the
Installation of temporary bridges across watercourses
Hinkley Point
132 / 400kv Undergrounding

Original Author	██████	Risk Assessment Reference:	Internal to this document	Date:	19/09/13
Signed	██████	Review Cycle	1		
Designation:	Site Engineer	Mobile Tel No.	██████████	Issue No:	1
Site Author	██████	Signed:	██████	Date:	19/09/13
Designation	Site Engineer	Mobile Tel No.	██████████	Site Revision	1

Approved by:	██████	on behalf of Neary Construction	Date	19/09/13
Designation:	Project Manager	Mobile Tel No.	██████████	

Received by:		Customer/Client (if applicable)	Date	
Designation:				

CONTENTS

1. Introduction	12. Plant, Tools and Equipment
2. Reference Documents	13. Labour/Manpower
3. Safety Documents	14. Delineation
4. Access and Egress	15. Supervisory Requirements
5. Work Boundaries	16. Programme
6. Safe Method of Working	17. Waste Management and Housekeeping
7. Work Specific Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Other issues / General Considerations
9. PPE	20. Risk / Hazard Assessment
10. ERTS	21. Employee Signing on Register
11. Materials	22. Appendices (if relevant)

1 INTRODUCTION

To identify the proposed method for the safe installation of temporary bridges across watercourses.

Prior to commencement of these works all members of the working party will be subject to personal and equipment checks.

2 REFERENCE DOCUMENTS

Neary Construction: – H & S Policy
H, S & E Manual
COSHH data Sheets and Assessments
Quality Manual
Certificates of Competence for all Personnel (available at site office)
Location Drawings
Service Drawings (issued from each utility)
UXO Report
Drain Crossing Methodology
HSG47 – 'Avoiding Underground Services
Temporary Works Design

Principal Contractor: - Easement Drawings (pegged/ painted)
Site Access Drawings
Environmental Policy & Aspect Register
Health and Safety Policy & SHE Plan
Quality Policy & Quality Plan
Ecological Method Statement
Pollution Prevention Guidelines (PPG)
EA Consultation and relevant permits / permissions

Client : - Wayleaves access consents (Landowners)

3 SAFETY DOCUMENTS

Site Instructions (MSRA's)
Site Installation Pack including access points and utility drawings
Safe Systems of Work – Neary Instructions and Standard Procedures

Tool Box Talks – As required (Documented)
Site Inductions (Documented)
Daily Risk Assessments
Advice for safe digging – HSG47 card

4 ACCESS AND EGRESS

4.1 Induction Training

Before Commencing Work:-

1. All personnel will attend a site induction / MSRA briefings and Tool Box Talks, as per the CDM requirements, prior to any works commencing.
2. All working personnel will have passed and hold a current and approved Drugs & Alcohol (D&A) Test.
3. All working personnel will have passed and hold a current CSCS qualification or Safety Passport.

4.2 Permit to work

1. All Works are to be carried out under a Permit to Work, with all necessary precautions taken prior to the commencement of excavation works.
2. All work under or in close proximity to overhead electric lines shall be undertaken in conjunction with Neary permit to work documentation (NCF – 070(a) 'Permit to work under overhead lines'), which is specific to such works. This includes document (NCF-70 (d) 'Overhead lines pre-works checklist').

4.3 Transport

1. All private cars and works vehicles will be parked safely so as not to cause any obstruction on roads / parking areas.
2. Access and egress to the works sites shall be determined before commencing work, and via routes that have been agreed and approved by all parties.
3. Extreme care shall be taken when entering or leaving the works site onto the adjacent highway; if necessary a member of the site staff shall assist in the vehicular movement to allow a safe passage.
4. A banksman will be in attendance for all reversing and unloading of delivery vehicles in and out of the works area

4.4 Lighting

Lighting of access/egress and the works area in general will be by natural daylight (daylight hours), and by low level directional lighting out of hours.

5 WORK BOUNDARIES

Working areas will be within the easement fencing (stock proof / post and rail / demarcation fencing) and will form part of the CDM work zone.

Access and works locations for all working areas shall be determined prior to commencement.

Should livestock be seen in fields across which the route passes then arrangements between Land and Development and the land owner will be made to remove them for the works period, L & D require a minimum of 14 days notice prior to works commencing.

6 SAFE METHOD OF WORKING

The working party members will receive instruction on the forthcoming work and identified hazards. All will read and sign the method statement/risk assessment indicating they have understood the duties to be carried out.

The following will be adhered to:-

Due to the presence of potential infection from livestock, ensure good personal hygiene. Wear gloves and long sleeved clothing. Cover cuts and abrasions with waterproof plasters. Wash hands prior to eating and smoking and wash all PPE on a regular basis.

Wear any required general site PPE.

The site supervisor shall conduct a daily risk assessment to identify any site specific hazards such as weather / underfoot conditions and brief working party on hazards and any required precautions including COSHH assessments. Ensure working party signs the briefing register to confirm understanding of any hazards and precautions.

Deliver method statement briefing / toolbox talk and ensure working party signs the briefing register to confirm understanding of task requirements.

Prior to commencing work a Permit to dig must be issued.

Excavation work must adhere to HSG47 i.e. before any works below ground can take place, the area will be checked using the Utility searches and a CAT and Genny scan will be completed. The works will be marked out using the colour scheme shown below.

WHITE – Outline working area i.e. Joint Bay

***YELLOW** – Machine dig area i.e. Trench Width*

***BLUE** – Hand dig area i.e. Within 0.5m of a service*

***RED** – Any hazards i.e. Services*

Other signs to assist in the identification of the presence of other utilities such as valve boxes, meter boxes and marker posts will be searched for.

*Only toothless buckets to be used on the excavator, the excavator **MUST** only be operated while under the control of a banksman recognised by wearing a orange hi-vis vest*

Excavation in green field sites where services are not likely to be present is to be excavated in 300mm layers and CAT scanned every 300mm layer.

All work equipment will meet the requirements laid out in PUWER and will be suitable, maintained and inspected prior to use.

A LOLER thorough examination certificate shall be available for all lifting equipment prior to works commencing along with plant inspection records. The Neary site foreman / plant driver / engineer will ensure (visually) that the item of plant is acceptable and has all the relevant documentation prior to commencing work on site.

All lifting equipment and methods to be stated and agreed on site prior to the activity in the form of an approved lifting RAMS included separately.

All documentation to be passed to principal contractor prior to work commencing.

HSE – Avoidance of Overhead Electric Power Lines (GS6) will be consulted and followed in all works in the vicinity of overhead lines. Control measures will be in place throughout the route as outlined in this document.

All plant operators shall be in possession of the relevant valid plant operator certification along with all personnel to produce valid certification to be retained in site offices.

The wayleaves officer will be consulted and works agreed prior to any access being gained to the work area.

Routing of equipment will be advised in line with item 4.3.2 and must not be deviated from.

Installation of concrete bridge footings at either side of the watercourse

Footings will be marked up as per the exact positions dictated on the design construction drawing.

These need to be extremely accurate and will be set out using GPS equipment.

The area will be stripped of topsoil as per the topsoil strip RAMS.

As the bridge may be located in a flood plain it is likely the bridge itself and the footings may be slightly higher than existing ground level.

Guidelines dictate that any build up of ground in a flood plain needs to be taken from the same area and cannot be imported. Due to this a 'cut and fill' method must be used to build up the ground leading up to the bridge on both sides of the watercourse.

Ground will be removed from an agreed area and layered and compacted to form a gradual mound which will lead up to the bridge level. This will ensure that all vehicles using the bridge can gain access without 'bottoming out' and that the haul road installed onto it can bear the axle loads it is required to do.

The actual make up of these lead up ramps needs to be agreed by all concerned parties as the visual and environmental impact of such work needs to be minimised as much as possible.

An excavation slightly bigger than the design dimensions for the footing will be excavated by machine and all arisings stored in a pre agreed area at least 1m away from the excavations edge.

The base that the footing needs to be installed upon needs to be solid and level and so will be constructed using MOT type one; a layer of geotextile membrane will be laid within the excavation and 200mm of stone will be laid and thoroughly compacted on top of it..

Shuttering delivered to site and transported by telehandler to site excavation.

The formwork including any fillet timbers will now be installed within the excavation and if required its walls coated with mould oil.

The reinforcement schedule will now be used to either have the cage made off site and delivered, or fixed on site by a steel fixer.

Concrete will be delivered to site by concrete wagon via the haul road and concrete discharged into the excavation to fill level during which time a 2" vibrating poker will be used to remove all air voids from the concrete.

Due to the loadings to be placed on the concrete footings 3 no. concrete cubes will be taken from the batch to be tested for compressive strength.

After the concrete has cured (minimum 2 days), the formwork will be struck, cleaned and taken to the storage area.

The concrete footing will be rubbed up using carborundum stones if required.

It is likely the footing positions will have been bore holed prior to these works and where possible screw piles installed by others and the above methodology used to form a concrete cap. This would ensure footing stability when the bridge is opened for vehicular use.

Using the previously excavated arisings the area around the footing will now be completely backfilled and compacted, leaving the required cover of footing above ground level.

The above methodology will be followed for both footings on either side of the watercourse.

On completion of the above, the working area required for the installation of the temporary bridge will be demarcated & the excavation fenced off with Herras fencing until the installation of bridge deck.

Installation of temporary bridge

The actual make up and design of the bridge chosen will depend on a variety of factors. The methodology that follows assumes that the bridge will arrive on site in several sections which will be crane lifted into place and fixed together, followed by the installation of a deck.

The main factors to consider here are the crane lift itself and the delivery of the bridge sections. The area onto which the crane will sit during the lift needs to be a well compacted hard standing (MOT type one and 6f2 stone) that has been proven to be able to take the loads expected during the installation. This can be done using a plate test for example, the results of which will be used by the crane company when preparing the lifting plan and crane size etc. It should also be noted that a lifting beam will be required when lifting the bridge sections.

Once the area is suitably prepared and the delivery schedule agreed with both the bridge supplier and all site parties the installation process can commence.

Once the crane is set up and it's outriggers suitably lowered onto outrigger pads, the bridge suppliers will bring the first of the bridge component deliveries alongside the crane on a delivery wagon. The slinger / signaller, equipped with an inertia reel will access the back of the wagon using the ladder access and hook themselves onto the handrail system while he hooks up the bridge section onto the cranes lifting equipment.

The slinger / signaller will now work in tandem to slowly lift the section off the wagon and rest it onto the hard standing in a suitable position. This will be repeated until all bridge sections are rested on the hard standing at which time the crane will manoeuvre them section by section allowing them to be fixed to one another.

The installation order for each section will be outlined by the bridge supplier and each section will be fixed into place as per the supplier's methodology by their operatives with all fixings and friction plates being installed to specific torques and positions respectively.

Once all sections are fixed together the bridge can be lifted into its final position on the concrete footings and all connections, fixings etc secured as required.

As the bridge is lowered onto the footings, its horizontal finishing point will have already been marked out to ensure that when the bridge is lowered it sits central on the footings.

The decking panels will then be lifted and fixed in position by the operatives from the bridge supplier.

Once complete, site will be cleared of all delivery vehicles and the crane has left site the area leading up to the bridge on both sides of the watercourse needs to be prepared.

Before using the bridge, relevant signage needs to be erected at both sides of the crossing. A priority give way system is to be used. The give way system will work through a combination of visual awareness and signage adhering. Passing bays will be installed just before the bridge at either side as part of the haul road installation.

All fencing erected will tie into the existing easement fencing as to ensure a maintained solid perimeter around the works at all times.

Clearing the Work Area:

Any left over materials/ equipment will be removed to a pre-agreed temporary storage area and subsequently removed from site to a registered landfill site or recycled.

The area will be checked for good housekeeping at the end of each shift.

7 WORK SPECIFIC EMERGENCY PROCEDURES

Should an emergency arise the site emergency procedure, outlined at the site induction, will be followed.

If any contact is made with buried or overhead services the work must stop immediately and the site supervisor informed who will inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.

TBC – Hospitals and site emergency contact list to be added

8 MANUAL HANDLING

On site review of items to be lifted.

If unable to lift alone request help.

No one person should lift more than 25kg at a time and all loads lifted must be of a comfortable shape and size.

Safe lifting practices must be observed at all times.

9 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following PPE is to be worn by all operatives on the construction site.

Hardhat
Safety boots, (not Rigger type)
Hi-visibility jackets (own company logo only)
Flame retardant clothing (if required)
Gloves
Safety glasses
Inertia reels and harness etc

In addition the following PPE is to be carried / stored by all operatives on the construction site:

Ear defenders / plugs.

10 EMERGENCY RETURN TO SERVICE (ERTS)

Not applicable.

11 MATERIALS

Concrete (spec to be confirmed)
Steel reinforcement
50mm spacer blocks / bars
Geo-membrane sheeting
MOT Type One
6f2 stone

12 PLANT, TOOLS AND EQUIPMENT

360` Excavator
Dumper
Transit van
Hand tools including hand tamps
Compaction equipment i.e. rollers / whacker plates
String lines and pegs
Formwork panels
Submersible pump
Low level direction lighting (where required)
Fencing
Bridge panels and related components

Where an item of plant and equipment requires a test/maintenance calibration certificate, the person in charge will check the tags or labels are in date, and complete the check lists, copies kept on file at the site offices.

First aid kit, spill kit and drinking water carried in site vehicles.

13 LABOUR / MANPOWER

The following Supervision and Manpower has been identified as sufficient to carry out the Works, together with levels of Competency:

PC			Neary / Sub-Contractors		
No.	Position	Competency required	No.	Position	Competency required
1	Site Engineer	Visiting – CSCS	1	Site Engineer	Visiting – CSCS,
			1	Site Supervisor	Permanent – CSCS, HSG47
			2	Plant Operator	Permanent – CSCS, Plant certificates
			4	General Operatives	Permanent – CSCS

14 DELINEATION

All working area to be demarcated correctly using Chapter 8 barriers where possible.

15 SUPERVISORY REQUIREMENTS

Works will be supervised by a Competent Person (Site Engineer) appointed by the contractor along with the constant supervision of an authorised Foreman who will be present on site as required during the work period.

Appointed person (AP) to be on site during lift.

16 PROGRAMME

Works to be carried out as per project programme of works – TBC

17 WASTE MANAGEMENT AND HOUSEKEEPING

All personnel have a responsibility to keep the work area tidy. Any general rubbish will be disposed of into a general waste skip located at the site compound. Any waste classed as hazardous shall be disposed of into a separate skip.

Any surplus excavated material will require a waste transfer note, and be taken to a licensed tip by a registered carrier. Copies of the waste transfer note to be on file at site offices.

18 ENVIRONMENTAL ISSUES

Welfare facilities at a designated compound will be provided during the works.

All refuelling to be carried out in designated areas wherever possible. Refuelling of small plant to be carried out using funnels at all times and always at least 10m away from any watercourse.

19 OTHER ISSUES

If at any time it is considered unsafe to commence or continue with any activity to be undertaken under the scope of work, then work must not proceed and the Site Supervisor shall be informed. The Site Supervisor, in consultation with the site engineers, will reassess and advise before work can recommence / continue.

Should any issues arise during the course of the work which is outside of the scope of this Method Statement, all such issues shall be brought to the attention of the Site Manager / nominated deputy. The work shall cease immediately and a new Method Statement and Hazard Identification Assessment shall be agreed with between all concerned parties.

20 Hazard Identification and Assessment

Brief description of work or Method Statement Title	Installation of temporary bridges across watercourses.						Risk Assessment Ref. N ^o & Issue		RA/7334/DN/09	
Site and Location of work:	Various Locations						Project No:	7334	Method Statement Ref. N ^o & Issue	MS/7334/DN/09
Number of Persons at Risk (anticipated in each category)	EMP	CON	PUB	VIS	PW	YP	Assessed By:	██████	Assessed On Site By:	██████
	7						Date of Assessment	19/09/13	Date of Site Assessment	19/09/13
Duration of Task		view Cycle		As per programme		AS REQUIRED				

Code: Persons at Risk EMP – Employee CON – Contractor PUB – Public VIS – Visitor PW – Pregnant woman YP – Young Person

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		Damage to underground services i.e. electricity, gas, water, telecom, sewers	4	4	16	Full assessment of available drawings and identification of known services. Use of HSG47. Excavate by scraping bucket in 75mm layers. Hand dig within 0.5m of any detected service. CAT scan to be repeated as excavation progresses. Use of a Permit to Dig.	Site Supervision Individuals	4	1	4
		Infringement of safety distance	4	4	16	Banksmen to assist digger, Digger to stay within defined demarcated boundary	Site Supervision	4	1	4
6	Plant, Machinery and Vehicle Operating	Inhalation of Dust and Toxic Exhaust Fumes	3	3	9	Dust masks to be worn when conditions arise, ensure exhausts and flying debris/dust are pointing away from the workforce/ passing public and not working within a confined area	Site Supervision individuals	3	1	3
7	Re-Fuelling of Plant and Equipment	Fuel Spillage, dermatitis, fire and explosion	4	4	16	Fuel stored in correct containers, use of funnels to fuel plant, only re-fuel over drip trays or site nappies, spill kits and fire extinguishers to be adjacent while re-fuelling	Site Supervision individuals	4	1	4
8	General	Aggravated trespass or assault by members of the general public	3	3	9	Provide advice to working party for dealing with members of the public. Walk away from any potential conflict. Call Police if necessary.	Site supervision Individuals	3	1	3

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
 PROBABILITY: Likely/Frequent = 5 Probable = 4 Possible = 3 Remotely Possible = 2

Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
9	Use of hand tools	Cuts and bruises	2	3	6	Suitable PPE to be worn. Flame retarded clothing as necessary	Site supervision Individuals	2	1	2
10	Use of vibrating equipment and tools – Vib plate / Poker / Rammer	Hand arm vibration	3	4	12	HAVS tabulated figures to be available to all operatives. Operatives to be made aware of periods of use for plant.	Site supervision. Individuals	3	1	3
		Noise pollution	3	4	12	Working hours to be agreed. All operatives operating and in the vicinity of plant/tools producing noise to be issued with ear protection which must be work at all times of operation.	Site supervision. Individuals	3	1	3
11	General Working	Injury by Livestock	4	2	8	Work with land owners to remove livestock from area prior to survey. Where livestock are present be aware of their presences and do not make sudden movements or approach livestock. Should livestock approach then slowly retreat to a safe distance.	Site Supervision Individuals	4	1	4
		Exposure to elements – Heatstroke, sunburn, hypothermia	3	3	9	Wear suitable good quality outdoor clothing HEAT: ensure breaks, fluid, suncream, barrier creams COLD: wear warm clothing, hot drinks, eat hot food WET: wear waterproof clothing	Individuals	3	1	3
		Interference from members of the public	3	3	9	Speak politely, issue them with CR cards and Q & A sheets, encourage them to call the hotline	Individuals	3	1	3
12	Personal Hygiene	Leptospirosis	4	4	16	Flu like symptoms, contact doctor immediately, clean hands before eating, wear protective gloves	Individuals	4	1	4
13	Dumper driving	Vehicle overturning	3	2	6	Even loading of dump skip. Controlled by certified operator.	Individuals	3	1	3
		Vehicle falling into excavation	3	3	9	Handbrake to be applied when stationary.	Site supervision individuals	3	1	3

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Hazard Ref.Nº.	Task	Hazard Identification & Foreseeable Risks	Without Controls			Control Measure	Methods of monitoring control measure	With Controls		
			S	P	RR SxP			S	P	RR SxP
		Damage to underground services i.e. electric, gas, water, telecom, sewers.	4	4	16	Full assessment of available drawings and identification of known services. Hand digging to be carried out to locate existing services. CAT scan to be repeated as excavation progresses in accordance with HSG47.	Site supervision Individuals	4	1	4
		Injury to pedestrians	4	4	16	Pedestrians routes to be used. Plant movement under banksman control.	Individuals	4	1	4
14	Working in trenches inc around open excavations	Collapse of trench	4	4	16	Sheet piles to be installed as required. Excavated soil to be stored minimum of 1 meter away from the trench.	Site supervision Individuals	4	1	4
		Falling into open excavation	3	3	9	PPE to be worn. Barriers to be erected and closed around perimeter.		3	1	3
15	Suspended loads (Sheet piles)	Load falling, load swinging, uncontrolled load	4	3	12	Safe and approved method of work, clear work area, Safe lifting zone, flat level ground. Certified lifting equipment. Use of trained crane operative and slinger / signaller.	Site supervision Individuals	4	1	4
16	Access and Egress	Falls from height	4	4	16	Edge protection in place and ladder access / egress maintained at all times.	Site Supervision. Individuals.	4	1	4
17	CBS/concrete use	Cementitious materials - dermatitis	3	3	9	Waterproof gloves and wellingtons to be work	Site supervision Individuals	3	1	3
18	Working around open watercourses	Falling into open watercourse.	4	4	16	Full body harnesses to be worn when working directly over the watercourse. Barriers erected along watercourse bank.	Site supervision Individuals	4	1	4

IF THE RISK RATING (RR) IS ABOVE 6 WORK WILL NOT BE ALLOWED TO PROCEED

Risk Rating (RR.) = Severity (S) x Probability (P)

SEVERITY: Fatalities = 4 Major Injury/Disability = 3 Minor Injury = 2 No injury = 1
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Low Risk	=	1 to 6
Medium Risk	=	7 to 11
High Risk	=	12 to 20

Improbable = 1

21 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read (or had explained to me), discussed and fully understand the above Method Statement and Risk Assessment will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Should circumstances arise that lead to a need to depart from the proposed working method, then work should cease until a revised Risk Assessment and Method Statement has been produced and agreed.

**15. Perimeter – Brelston Green CSE
Compound – Installation of Palisade
Fence, 2 x Gates, Anti – Burrow Strip
and Cable Bridges**

PERIMETER SECURITY SOLUTIONS

METHOD STATEMENT: Doc No. PSSL 1048 rev01

This document contains 1 to 23

Title: Installation of palisade fence, 2 x gates, anti-burrow strip and cable bridges

CUSTOMER: **EAW**

SITE: Brelston Green Sealing End Compound

Summary of Civil Works:

To install 2.4metre high palisade fence with 4 metre high strain post complete with a 300 x 350 anti-burrow strip around the perimeter of the sealing end compound.

Summary of Sequence of Works:

- Excavate for post holes using Auger attachment and min-digger
- Install palisade fence in two part foundation pour.
- Install anti-burrow strip and bridge beam

List of Content:

- 1 Site inductions
- 2 Safety documents
- 3 Identification
- 4 Manoeuvring of the machinery
- 5 Manual handling
- 6 Excavations
- 7 Safe digging techniques
- 8 Installation of Palisade Fence Post and Foundations.
- 9 Installation of timber shutter
- 10 Installation of Gate Posts
- 11 Installation of the Gate
- 12 Delineation
- 13 Access and egress
- 14 Personal protective equipment
- 15 Work specified emergency procedures
- 16 Materials
- 17 Plant and tools
- 18 Waste management and house keeping
- 19 Environmental issues
- 20 Estimated staff on site
- 21 Approval and distribute
- 22 Amendments
- 23 Variation form

**Perimeter Security
Solutions Limited**

**Greengate
Middleton
Manchester
M24 1RU**

**Tel: 08708 508739
Fax: 0161 654 9958**

CCTV

POWER FENCES

ACCESS CONTROL

INTRUDER ALARMS

**ELECTRIC GATES
AND BARRIERS**



Directors:

Company Reg No. 3585214



1 Site Inductions

All staff will receive an induction from the EAW site team before commencing work on site. A team brief will be provided each day by the PSSL team leader and a Daily assessment Schedule "DASS" (Dailey Activity Safe Start) form filled in provided by the EAW. Any 3rd party requesting entry into the PSSL working area will need a site brief by the team leader and sign onto the DASS form. PSSL operative shall also receive a TBT on impressed voltage management during induction due to the areas we are working in.

2 Safety Documents

A National Grid Safety Document will be issued at the SAP discretion for this work to control the risk of death and electrocution from the surrounding apparatus. For all digging works an EAW WAP (Work Authorisation Permit) will be issued by an EAW authorising engineer. PSSL operatives will need to be trained as WAP acceptors (1 hour) The use of the EAW signing in and out register will be used at all times. The EAW & National Grid safety rules / Golden Rules and procedures shall be adhered to at all times.

3 Identification

Services will be identified by PSSL from the Survey records/PSSL will dig trial holes to identify a route. PSSL will adhere to HSG 47 techniques, thus reducing the risk of striking. PSSL will have copies of all service drawings, also unidentified services will be marked up on the existing survey drawing / all live services will be protected The excavation area is detailed on drawing PSSL1544/1048 and EAW MMD-20492-C-DR-BRE-0010.

4 Manoeuvring of the Machinery

Movement of machinery within the work area will be controlled by the document holder with NSI 8R. Perimeter will control / Bank their machinery (All machinery movements will be co-ordinated with all relevant parties). National Grid NSI 8 Full will escort vehicles above 2.3metres high to the working area.

5 Manual Handling

Safe working method for manoeuvring of fence materials, generators, shutter pans and site equipment. Examine the object to be moved. Does it require more than one person or a mechanical lifter. Check the weight and for sharp edges. Wear gloves for sharp objects. Gloves shall have a minimum cut resistance level 4 to EN388. Plan the route to the area required, remove any tripping obstacles and make sure there are no slippery surfaces on route. Decide how to lift the object safely before handling. Grasp firmly with both hands and obtain a good posture at all times making sure you do not twist, stretch or over reach. As a guide an average lifting capacity for a man would be approximately 25kg which will also be dependent on their physical capabilities. Have rest breaks when moving heavy objects. Manual handling assessment will be carried out prior to any Manual handling issues.



6 Excavations

CAT scans will be carried out where there are known services. The EAW, WAP (Work Authorisation Permit) to dig will only identify CAT scanning through HSG 47 procedures) A Genny is to be used along with CAT Scan and must be completed in all modes.

The site is a new extension to an existing compound and all services have been identified by the EAW who have provided a safe area to auger the fence post holes or use the mini digger were the auger is not practicable.

All excavation work will be in accordance with HSG47 procedure. Plans will be provided by the EAW. As the accuracy of these drawings cannot be relied upon, CAT / jenny scanning of the area will be carried out to identify any services. Persons carrying out the CAT scanning will be trained and competent to do so, with certificates available. Once all services have been identified then we will complete the holes for the fence line and gates using a mini digger and auger on agreement with the SAP prior.

NO mechanical excavation to be carried out within 500mm of a known service.

We will excavate using a mini digger and Auger attachment, Non conductive hand tools will be used / grafters and shovels for the fence posts, gate post and sill as required.

All excavations will take place on the perimeter of the SEC at the position marked out by the engineer.

The mini-digger will be stood on firm ground when auguring the fence post holes.

We will be excavating holes at 600mm diameter x 1200mm deep for the intermediate posts and 600mm diameter x 1900mm deep for the strain posts.

The anti-burrow strip will be 300mm x 350mm deep and the cable bridge beam will be 1000mm wide x 450mm deep.

7 SAFE DIGGING TECHNIQUES			
Tasks		Key Points	
1.	Endeavour to obtain plans and all other relevant information regarding buried underground services in the vicinity.	1.1	Information obtained from National Grid Plans are not normally drawn to scale and so should not be heavily relied upon.
		1.2	
2.	To detect services that you are liable to encounter for the palisade fence / anti-burrow strip installation route.	2.1	Lines should be drawn out in a number of colours to differentiate between services. White / dig perimeter / RED for identified services / hazard areas, YELLOW for machine dig areas, BLUE for hand dig areas and ORANGE for route of excavations.
3.	Look for signs of service connection cables and pipes.	3.1	For example by a gas meter or service connection entry into a building or a street light.
4.	Use a locating device to pinpoint fully the position of any cables/pipes.	4.1	A locator may not be able to distinguish between cables or pipes running closely parallel. Frequent and repeated use of the CAT is required as per HSG 47
5.	Repeat steps 1 – 4 until you are satisfied that there are no services undetected.	6.1	Remember that the detection equipment alone is not sufficient to detect unknown services.
6	Hand dig for services		Safe digging will be layers of 75mm and CAT scan after each layer is removed to identify all detected services on site in the route of the palisade fence.
7	Identify ALL detected services on the site.	7.1	Use waterproof crayon, chalk on paved/tarmac surfaces or wooden pegs on verges.
		7.2	Steel pins or pegs should not be used as they could damage shallow cables/pipes.

		7.3	The marks should extend well past the area of excavation to ensure that detection marks remain throughout the works.
8.	Where there are no services located in the way of the proposed works then excavation can commence by the use of mechanical diggers, if required.	8.1	Refer to the "Use of Mechanical Diggers" procedure. To comply with HSG 47 safe digging procedures.
9.	If services are detected in the proposed workspace then dig by careful use of spade or shovel.	9.1 9.2	Do not use picks, forks or other pointed tools. Digging should be undertaken alongside the service rather than above it and the final excavation should be achieved by horizontal digging. Do NOT use power tools within 500mm of the identified line of cable/pipe.
10.	Identify ALL detected services.	10.1	Water, electricity and telecommunication may be of black plastic – assume all black plastic cables are electric until proved otherwise. Cast iron or steel pipes may look like gas pipes – assume that they are.
11.	Ensure that you understand the national colour coding system for buried underground services.	11.1 11.2	Black – Electricity, Red – Electricity (some 11kV cables), Blue – Water, Yellow – Gas, Grey/White – Telecommunications, Green – Cable Television/Phone. As cable is a recent advancement treat every unidentified cable/pipe with caution.
12.	If any services are damaged, however minor, during excavation then National Grid/ EAW and the relevant authority/public/private utility owner MUST be informed IMMEDIATELY and a record kept.	12.1	If there is an escape of gas then remove all personnel, prevent smoking and remove naked flames for at least 5m from the leak.
13.	On completion of task ensure that the area is cleaned.	13.1 13.2	Any accidents or defects to be reported IMMEDIATELY to the person in charge. Ensure that all equipment and/or materials are removed from site.

8 Installation of Palisade Fence Post and Foundations

The site engineer will mark out the position and orientation of each individual fence post foundation base as per the site plan.

Were excavated post holes are left unfilled over night, they will be excavated with a slight ramp on one side of the excavation so animals can escape, a wood ladder will be inserted into the hole to act as a climbing aid for different animal types. Excavations are also to be covered at the end of each day to help prevent animal entering the excavations.

The spoil will be excavated using a mini digger and auger / graft and spade to provide the correct dimensions for the base foundations.

The preformed steel reinforcement will be inserted into the foundation hole.

Upon delivery of the concrete the driver will be escorted to the pour location by an appointed banks man. The delivery note will be checked for quantity, mix and slump prior to discharge.

The concrete will be poured direct in to the hole for the lower foundation level.

Were the concrete cannot be directly poured into the hole the concrete delivery vehicle will then off load the concrete into the dumper. The dumper will then place the concrete directly in the foundation.



Continued:

The dumper must only be filled to a safe level with small quantities so while manoeuvring no spillage or over turning will occur do to uneven ground levels.

The concrete may be off loaded on top of the polythene for the fence posts.

The concrete delivery wagon will wash off back at the depot.

The ends of the reinforcement will be covered using plastic mushrooms or split ducting.

The foundation will then be levelled off using a float.

The fence posts will then be manually lifted into position under the above manual handling statement.

Once the engineer is satisfied that the lift is safe and correct the lift can begin. The posts will then be positioned and levelled.

The concrete foundation will be drilled using a portable drill and the post will be fixed using M12 thunder bolts to the lower foundation.

The second pour of concrete will be poured into the hole below the anti-burrow strip level.

The concrete will be poked to remove all the air using a portable generator and vibrating poker.

The bottom rail will be attached using snap off nuts and bolts.

The posts will be left for approximately 24 hours before the top rail and anchor pales are attached.

The shutter pans for the anti-burrow will be fixed and levelled; corners will be fabricated as necessary.

The concrete will be poured directly into the shutter pans for the anti-burrow strip where practicable.

Operatives using vibrating plant will be rotated to reduce exposure to Hand/Arm Vibration Syndrome.

The palisade fence will then be paled completely and all concrete access will be removed once the anti-burrow has been poured.

The snapped off bolts will be collected and placed in a suitable container.

9 Installation of timber shutter

A timber top shutter will be placed around the open excavation to retain the concrete above original ground level for the anti-burrow strip.

The formwork will be constructed on site and area for this work will be identified. An electrical circular saw's will be operated by trained operatives; the saws will be used to cut the timber to size. All electrical tools will be approved insulated tools and be 110V supply

The shuttering will then be set to control points then levelled by the engineer.

Where strain pins are installed to hold the shutter pans in place then plastic protection caps will be used.

Dowels will be drilled into the existing concrete foundation if required.

The formwork will remain in place for 48 hour before being stripped. All tie holes and superficial voids will be made good with concrete mortar. Should early striking be required a cube for early strength test will be taken.

10 Installation of Gate Posts

The gate posts will be lifted into position by hiab / mini-digger.

Slings are tested to BS EN 1492-2-2000CE 2004 which will be strapped onto the gate posts by a competent slinger.

The posts will be positioned and levelled on the lower concrete foundation. The post will be fixed using M16 thunder bolts.

Then the post hole will be filled with concrete.

The post will be left for up to 48 hours for the concrete to cure before the gate is hung.



11 Installation of the Gate

A National Grid safety document will be required for the installation of the double leaf gates. The gate will arrive to site on a wagon and with a banks man manoeuvre the wagon to the gate position.

The hiab will enter the site through a route agreed by National Grid SAP to the lifting position.

Outriggers will be lowered onto firm ground.

The SAP to provide an overhead clearance area as the gate will be lifted up to 4 metres in height. Slings are tested to BS EN 1492-2-2000CE 2004 which will be strapped onto the gate by a competent slinger.

The gates will then be positioned between the gates posts onto the hinges. PSS will supply a banks man to command the positioning of the gate.

We estimate this will take one full day and we may require the working area to be closed off to others for some of this work.

12 Delineation

The site boundary is demarcated by National Grid cones and chains, Chapter 8 plastic barriers will identify any hazards by EAW. The area access point will be closed off at the end of the working shift.

Site manager or Engineer to identify the extents of the safe working area

13 Access and Egress

Traffic/Routes in an accordance with the site traffic management plan.

All vehicles entering the work area will be fitted with orange beacons.

The vehicles will need to enter the site from the country road that runs alongside the EAW site compound. The vehicle will park in the area provide by the EAW.

Note: Site Speed limits apply 10MPH

All operatives will log their attendance on site by signing on to the site register controlled at the main gate or in the site control book in the office cabin.

14 Personal Protective Equipment (PPE)

The following PPE will be worn by all operatives on the site and comply with site policy:

Hard hat, Safety glasses, Lace up, ankle supporting Safety boots and Hi-visibility clothing, Industrial gloves and fire retardant overalls. The fire retardant overalls are to be worn at all times in the work area.

Ear defenders will be carried by all operatives on site and used accordingly:

Note – Fire retardant overalls, gloves and welding mask are worn at all times during welding.

Safety goggles and a full face screen will be worn when using equipment such as Stihl saws and grinders etc.

Where substances are to be used a COSHH assessment will be provided and the appropriate PPE will be worn as stated in the risk assessment. White disposable overalls and safe4u EN388 2013 gloves will be worn during concrete pours.

15 Work Specified Emergency Procedures

Specific emergency procedures particular to this work will be provided at the National Grid safety induction.

Should an emergency arise during the work then the site procedure for raising the alarm will be followed. All personnel are informed of the procedure at the Site Safety Induction Course

In the event of the site emergency alarm being sounded personnel should report to the designated muster point.

Adverse Weather warnings including lightning risk may be given by the National Grid engineer to the Site Nominated Person who will inform the working party directly. Personnel will take any necessary actions arising from the warning.



7

16 Materials

Fence materials

Gates

Reinforcement steel

Cover plates

Temporary wood ladder (animal escape)

Concrete

Petrol

COSHH assessments for petrol, galvafruid paint and concrete materials will be available in our site file.

17 Plant and Tools

4 inch Angle Grinder

Barriers

Cable avoidance tool (CAT)

Drip Tray

Hand Tools

Spill kit

Spade, graft

Mini digger with auger

18 Waste Management and House Keeping

All operatives have a responsibility to keep the work area clean and tidy.

Skips will be supplied for the segregation of waste materials.

19 Environmental Issues

Concrete spillages – to be cleaned up immediately (NOT to be washed away with water), concrete to be discharged onto visqueen or into a dumper or other suitable container, never straight onto the ground. Concrete wagons to wash off back at depot.

Pollution of any water course (not just rivers) or body of water directly or indirectly via drainage will be prevented by the use of drip trays under plant and spill kits to be kept in the work area

If any wildlife is discovered in the work area (particularly newts or nesting birds) work is to stop immediately and a supervisor informed

All environmental incidents to be reported immediately, any environmental hazards/issues to be reported via the 'near miss card' system.

20 Estimated Staff on Site

██████ Contracts Manager Machine/Civils ,BESC, NSI 6,8, Competent Person, dumper &10 ton 360 excavator CPCS no.3/10063,SCS 91, first aid, MH, abrasive wheels, CSCS, HSG47

██████ Fencer BESC, NSI 6 and 8R Person, CSCS EUSR201676

██████ Machine/Civils, BESC, NSI 6 and 8R, Person, Dumper &10 ton 360 excavator CPCS no01965415/1, First aid, MH, CSCS, HSG47, EUSR201672.

██████ Team leader, BESC, NSI 6 and 8 Competent Person, 10 tonnes dumper, first aid, MH, CSCS, HSG47, EUSR50051.



21 Approval and Distribute

Author of Method Statement	Print: [Redacted]	Sign: [Redacted]	Date: 13 th May 2013
Approved by Customer	Print:	Sign:	Date:
Engineer holding Permit for Work and understands the above methods of safe working.	Print:	Sign:	Date:
Staff on site Who have had the above methods of safe working and the risks explained to them by the site document holder? You will take full responsibility if you do not work to them.			
Start	Date :	Completion	Date:
Method statement no.	Revision no.	Date revised:	By whom:
1048	01	20/05/2013	NAH

22 Amendments

When the site was visited there were no other safe methods required with regards to the environment at that time. Any additional requirements will be viewed and added and removed when applicable to the daily inspection form attached.

23 METHOD AND RISK ASSESSMENTS DOCUMENT SITE DAY TO DAY VARIATION FORM

Date added.....Date risk removed.....

New risk to be added

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Method to resolve the risk

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Site viewed by sign..... Approved by sign.....

Date added.....Date risk removed.....

New risk to be added

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Method to resolve the risk

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Site viewed by sign..... Approved by sign.....

Date added.....Date risk removed.....

New risk to be added

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Method to resolve the risk

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viewed by sign..... Approved by sign.....

EAW Project no. 20492 Assessment By: XXXXXXXXXX Duration of Task: Phased 1 & 2 see program										
CODE.	EMPLOYEE ☒	CONTRACTOR ☒	MEMBER OF PUBLIC ☐			PREGNANT WOMAN ☐		YOUNG PERSON ☐		
Severity	1 = No injury	2 = Minor injury	3 = Major injury / disability			4 = Fatalities				
Frequency	1 = Improbable	2 = Remotely possible	3 = Possible			4 = Probable				
1 to 6 = Low risk 7 to 11 = Medium risk 12 to 16 = High risk Risk assessment to be read and signed in conjunction with the method statement										
Ref No	Task	Hazard/Risk	Without Controls			Control Measures	Methods of Monitoring	With Controls		
			S	F	RR			S	F	RR
1	Working in live substations Installation and tying in of palisade fence, gates	HV equipment, over head cables// Death , personal injury	4	4	16	National Grid Golden Rules & safety procedures will be kept at all times. Work to National Grid Safety document at all times. Do not walk on cable trenches or troughs. Plant crossing points to be created over cable routes and their presence is to be cleared marked and all plant operatives briefed to use them at all times. All personal to be Competent / Person & BESC trained. All persons to be supervised by a competent person. Competent person to ensure that no member of the work party leaves the working area without his instruction. No plant equipment will be held above shoulder height other than during planned lifting operations. Safety distance must be adhered to at all times NG 3rd edition safety rules apply at all times. Supervisor to carry out brief prior to works.	Supervision by competent person	4	1	4

2	General working activities and access and egress across site.	Slips, trips and falls // Personal injury, Broken limbs and lacerations. Cuts and bruises	3	3	9	Ensure good house keeping, maintain clear access and egress ways. Responsible personnel. Correct use of PPE and adherence to all control measures put in place as identified in other tasks. Good housekeeping. Competent, instructed and trained personnel. 3 rd edition N Grid safety rules apply to work on N Grid access roads. Record lone working on site Works to be fully compliant with RAMs at all times	Housekeeping regime monitored by PSS supervisor	3	1	3
3	Access to work site by pedestrians	Struck by moving vehicles // impact & crush along N Grid access road	3	4	12	Pedestrians to use designated segregated access route. All operatives to wear hi-visibility clothing. Barriers and fencing to be maintained throughout working shifts. The boundaries are to be highlighted on the work plan in the site pack and explained in the site induction and briefed prior to the works commencing.	PSS site supervisor	3	1	3
4	Excavations, auger attachment grafter and spades with 2.5 ton machine.	Damage to existing underground services. earth tape, over head cables // death, gate post excavation constitute leg traps – broken limbs, Animal entrapment, diseases, flooding.	4	3	12	Ensure compliance with HSG47 document and permit for dig is in place. Ensure excavations are properly barriered and signage erected. Back fill wherever possible Compliance with Method Statement when excavating. CAT scan to be used to identify underground services. Excavations will be to a depth of 1900mm for the strain post no entry will be made into the holes unless they have been battered and inspected by a competent person who can provide an excavation entry tag as a safe means of entry. Use of wood ladder and slope sides for animal escape, holes to be covered if not back filled overnight to prevent animal access.	Contractor supervision to ensure compliance with Risk Assessment/ Method statement. Continual vigilance by contractor supervision	4	1	4

5	Use of portable electric tools (drill)	Electric shock, Personal entanglement // injury, burns and lacerations	3	4	12	Safety goggles to be worn when using this equipment. 110 volt and 36volt equipment will be used. Equipment will be PAT tested. Equipment will be inspected prior to each use and replaced immediately if damaged or badly worn.	PSS site supervision whilst equipment being used.	3	2	6
6	Site vehicles Material delivery	Violation of safety distances Crushing, overturning, collision, pollution, over head cables Struck by moving vehicle-impact & crush around the working area.	4	3	12	Only used by trained operatives. Ensure approved access / egress routes are used. Pedestrians to use designated segregated access route. 10MPH speed limit enforced all the time on site. 25mph on power station access road. All operatives to wear hi-visibility clothing. Banksman / vehicle marshal will accompany any reversing vehicle. Supervisor to carry out brief prior to works. All moving plant to turn on flashing beacons for the duration of their works. GS6 barriers on haul road route set at 4m. Site survey to be undertaken prior to delivery and route / controls agreed. PSSL to confirm height of gate delivery. Persons with NSI 8 full will be required to escort any vehicle into the any HV compound and any other plant / equipment over 2.3metres high	NSI 8 full competent person to escort all vehicles and plants over 2.3metres high	4	1	4
7	Work at height	Falls from height // Entrapment Falling causing injury or death, tools or equipment falling to work site below.	4	4	16	Sherposcopic step, platform step ladder to be used wherever possible. Ladder / sherposcopic steps to be checked for its suitability and condition prior to use. Chin strap to be used whilst climbing ladder. Sherposcopic steps / ladder to be securely stored when not in use to prevent possible damage. To be placed on level ground.	Ladders to be used for a short duration and for light work. PSS supervision	4	2	8

7						Fibreglass / Wooden Ladders only used for short durations of work after approval from the site manager / SAP. Ladders to be securely footed by another operative whilst in use. 3 points of contact to be maintained at all times when using ladders.				
8	Noise generated from tools,	High levels of Noise // Hearing loss Power tools, machinery, operating sounders, Electrical switching of apparatus	3	4	12	Guidance notes noise at work regulation 2005, Ear protection carried and worn when required 80 dB for the lower exposure action value and 85 dB for the upper exposure action value. Noise assessment to be carried out	Site : Foreman site supervisor PSS supervision	3	2	6
9	Off loading fence material	Falling from rear of delivery vehicle during offloading of materials // personal injury	3	2	6	Instruct haulier to load vehicle in appropriate manner. Use hiab. Use appropriate access / egress ladders / steps. Use bean bags / access scaffold when unloading.	Site supervision periodic inspections by PSS staff	3	1	3
10	Working with vibrating plant (drill)	Vibration // Hand/Arm Vibration Syndrome (White Finger)	3	4	12	Operative to be provided with vibration absorbing gloves. Ensure Operatives are suitably trained in preventative techniques. E.g. holding equipment loosely. Enforced Adherence to specified trigger times for vibrating plant – regular breaks. HAVS sheet to be completed.	PSS Supervisor	3	1	3
11	Manual handling	Muscular skeletal injury, heavy objects // Trapping / crushing / lacerations Cuts, bruises & strains, whilst handling	3	3	9	Plan the lift. Personnel to be aware of manual handling techniques prior to lifting operations undertaken. Never exceed personal lifting capacity. Use mechanical aids wherever possible. Adhere to manufacturer's operating procedures. Observe weights and centre of gravity as indicated or make an assessment prior to undertaking a manual lift. Keep good housekeeping in the area. Heavy loads to be lifted by multiple	PSS supervisor	3	1	3

11						operatives. Keep walking routes clear. Use good lifting posture (keep back straight and lifting using the legs).				
12	Welding equipment	Burns, weld flash // Fire	3	4	12	Welding area will have protected screen erected. Weld mask, gloves will be used. Trained operatives. certificates for welding equipment. Ensure fire extinguishers available at work face. Make sure there are no smouldering items left in area.	Supervision of area whilst welder is being used.	3	2	6
13	Hot Works / Welding / Grinding	Damage to life and property// Fire	4	3	12	Ensure flammable substances are correctly stored. Ensure fire extinguishers available at work face. Do not allow waste materials to accumulate. Make sure there are no smouldering items left in area.	Site surveillance EAW hot works permit	4	1	4
14	Evacuation	Electrocution, fire, explosion / personal injury, damage to site plant	4	5	15	Ensure evacuation procedure is in place. Muster point identified. Tool box talks at start of works, Pre hazard check sheet complete daily, Check all panic gates are operational, evacuation drills,	Site surveillance at all times, air horn situated in designated area.	4	1	4
15	General installation	Asbestos // Inhale of asbestos fibres, Lung diseases, cancers	3	3	9	The use of asbestos is prohibited. Ask the client if an asbestos survey has been completed before opening of control panels or any drilling into building material. If any suspect of asbestos is present in the working area stop all works and report direct to SAP / foreman for the area to be checked. Asbestos awareness trained staff.	Asbestos awareness at all times especially in aged control buildings and panels.	3	1	3
16	Environment Welfare	petrol, substances, waste material, spillages, hedgerows, trees // Pollution to surrounding areas, burns	3	4	12	Correct storage of substances, Drip trays and spill kits to be available. Use funnels when refuelling. Switch off machine /plant engines when not in use. Switch off lights in welfare when not in use. Waste to be separated and recycled.	Site awareness	3	1	3

16.HORIZONTAL DIRECTIONAL **DRILLING**

Client: Neary Construction	Project No: DD 20441
GWYNT-Y-MOR WIND FARM 132KV ON LAND CABLE CONNECTION BETWEEN PENSARN SANDS AND ST ASAPHS GIS SUBSTATION	

Method Statement		
Horizontal Directional Drill Crossing Operations		
Document Number		
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Document preparation, review and approval:			
	Name	Position	Signature
Prepared by:	██████████	Site Agent	
Checked by:	██████████	HDD Crew Leader	
Checked by:	██████████	SHEQ Manager	
Approved by:	██████████	Project Manager	
Document review and approval by Neary Construction			
	Name	Position	Signature
Reviewed by:	██████████	Project Manager	
Reviewed by:	██████████	SHEQ advisor	

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1.0 Purpose and Scope

This Method Statement covers the procedures for the proposed directional drilling at various locations & the site access required as part of the planning, design and construction of the Gwynt – Y – Mor wind farm 132KV on land cable connection between Pensarn Sands and ST Asaphs GIS Substation and describes the general purpose Health Safety and Environmental constraints which apply to all persons entering, travelling or working on the site.

The arrangements described in this method statement apply to all persons at all times whilst on site.

Reference shall also be made to the following project documentation: -

	Document Title	Document Reference
i	Project Quality Plan	QP
ii	Project Environmental Management and Control Plan	PEM C Plan
iii	Construction Traffic Management Plan and Control Plan	CTMP C Plan Rev05
iv	Avoiding Danger from Underground Services	HS(G)47
v	PPG5	PPG5 – October2007
vi	Work Procedures for Excavation	WP046
vii	Construction Health & Safety Plan	CHS Plan
viii	Site Waste Management Plan	SWM Plan
ix	Avoidance from Over-head Lines	GS6
xi	RWE Environmental Statement	RWE ES

Nature of Installations – 5 No 3 x 180mm SDR11 PE Pipe & 1 x 125mm SDR11 PE Pipe per drill location listed below:

(Obstruction No. 03) Drill 1 – A548 Towyn Road Crossing – 33 metres – Access into the entry side will be from the A548 (North Side Entrance), And exit side will be from A548 (South Side Entrance)

(Obstruction No. 09) Drill 2 – Z4 River Gele Major Crossing – 60 metres - Access into the entry side will be from the A548 (South Side Entrance), And exit side will be from A547 (North Side Entrance).

(Obstruction No. 19) Drill 3 – Bodoryn Cut Crossing – 64 metres - Access into the entry side will be from the A547 (North side Entrance) And exit side will be from A547 (North Side Entrance).

(Obstruction No. 22) Drill 4 – A547 Ruddlan Road Crossing – 42 metres- Access into the entry side will be from the A547 (North side Entrance) And exit side will be from A547 (South side Entrance)

(Obstruction No. 26) Drill 5 – Access Road & secondary ditch Crossing – 30 metres- Access into the entry side will be from the (Glan-Y-Morfa Access Road South Side Entrance) And exit side will be from (Glan-Y-Morfa Access Road North Side Entrance)

(Obstruction No. 27) Drill 6 – St Asaph Road Crossing – 55 metres - Access into the entry side will be from (St Asaph Avenue Access “C”) And exit side will be from (Glan-Y-Morfa Access Road South Side Entrance)

(Obstruction No. 32) Drill 7 – Sarn Lane/A525 Crossing – 35 metres - Access into the entry side will be from (St Asaph Avenue Access “C”) And exit side will be from (St Asaph Avenue Access “C”)

(Obstruction No. 46) Drill 8 – Cwttir Lane Access Road Crossing – 60 metres - Access into the entry side will be from the (St Asaph Avenue Access “C”) And exit side will be from (St Asaph Avenue Access “C”)

(Obstruction No. 47) Drill 9 – Glaescoed Road Crossing – 60 metres - Access into the entry side will be from the (Glascoed Rd South Side Entrance) And exit side will be from (Glascoed Rd North Side Entrance)

To install 3 No 180mm ducts and 1No 125mm ducts at a depth in accordance with Neary Construction requirements. There will be a minimum of 3 metre cover over the installed pipe, below the bed of all watercourses. The cover will remain at 1m below bed of river for a minimum of 3 metres either side of the watercourses. Others will mark the location at either side of each watercourse crossed and others will install permanent marker post to indicate the owner of the installed pipe. Refer to – PPG5.

There will be a minimum of 3 metres cover to the surface of minor roads and a minimum of 1 meter below services.

Entry will be from an excavation approximately 2m x 2m x 1.5m on the chosen entry side. Exit pit will be the same dimensions, excavations will be constructed by Land & Marine and all pits will a minimum of 3 metres away from ditches and hedge lines. Refer to – WP046.

2.0 Methodology and Work Procedure

2.1 Preliminaries

This Method statement defines the procedures required to rig up/down the drilling rig and auxiliary equipment as well as the drilling operations and welding.

The Site Agent shall ensure that the HDD Crew Leader has the relevant Method Statement for the works.

All information regarding any pre-entry agreements / requirements to be implemented shall be transferred to the Site Agent and Crew Leader in a timely fashion.

The Crew Leader shall check with the HSE Advisor that all personnel working under him have attended Land and Marine Safety Induction and Environmental Induction, Prysmian site induction and have an up to date relevant CSCS card.

2.2 Programme

The execution of each drill will depend on the Prysmian / Neary work programme for the duct installation works (e.g. preparation of ROW, string preparation) and the availability of the HDD rig. Works programme will be stored in the site pack file and updated when required.

Set up and during the drilling operations works are foreseen to be executed in single 12 hour shifts.

Taking into account the ground conditions of the crossings 24 hour working is not anticipated. We will reassess the working hours if ground conditions are not as site investigation boreholes show.

The pipe strings will be prepared previous to the drilling activities.

2.3 Location

HDD sites will be set out as two working areas 1) Entry Side and 2) Exit Side. Also to contain commence of HDD lay-down string.

Drilling will be carried out from the entry sides.

2.4 Materials

Materials will be stored within a 10ft container located at Rhuddlan Road Main compound. COSHH materials will be stored within a COSHH container located at Rhuddlan Road Main compound. Pipe will be stored on exit side of drill crossings. All delivery vehicles must adhere to the routes specified within the Construction Traffic Management and Control Plan. Refer to - CTMP C Plan Rev05. Also see Appendix.

2.5 Waste Management and House Keeping

If suspect Contaminated Land is found all works must stop and an investigation carried out.

Any surplus material will be disposed of with pre approval of Neary. Refer to – Site Waste Management Plan.

2.6 Manual Handling

Mechanical handling will be utilised where ever possible. Land & Marine manual handling procedure will be followed. Refer to – WP041.

2.7 Procedures

Land & Marine procedures will be followed at all times and will be stored within the site pack.

Refer to – Land & Marine Site Pack file.

2.8 Access and Egress

Access and Egress to all drilling sites will be via the approved access roads only. Refer to - Construction Traffic Management Plan and Control Plan.

2.8.1 Transport

All private cars to be parked within each site compound designated area, work vehicles will be parked at an agreed designated area within each site compound when not in operation.

2.9 Known Services

Where there are known services that will have an effect on the drills. These will all be located visually and protected where necessary with the installation of sheet piles prior to the start of drilling operations.

This will be covered by a separate set of RAMS issued and undertaken by Neary.

No drilling will commence until a permit has been issued by Neary Project management team and Land & Marine HDD Crew Leader or Site Agent detailing all known services. Refer to – HS (G) 47.

2.9.1 Site Set-up

Neary will ensure that temporary herras fencing will be erected (and maintained as necessary) along the entire boundary of the site compounds. Signage will be placed along the perimeter fencing warning of the activities in the work area.

There will be a Towable Welfare that will be based at the Entry Side compound of each drill location.

A slinger / signaller will direct all wagons to the correct location within the compound for off loading. The stores will be off loaded, positioned and levelled within the Rhuddlan Road main compound.

PAT testing will be completed by a qualified electrician.

All plant will be delivered to the required site location, if the site is not prepared or ready for the plant then it will be delivered to Neary compound and collected from compound when required.

Pipe will be delivered to Neary compound and unloaded with on-site tele-handler. Pipe to be delivered to various locations as required on site.

They will be transported to the required site locations on the bed of a flat-bed Lorry, & unloaded with tele-handler/JCB c/w fork attachments.

Lifting plans will be required for any non-standard lifts this will be assessed by Neary.

2.9.2 Delineation

Work will only be performed within the agreed demarcated boundaries of all crossing compounds (at the work site and to and from the work site).

2.9.3 Preparation for HDD

On the entry site, this is called the rig or entry side.

Small pits will be constructed to collect the mud flowing back to surface in the annulus of the hole. Submersible pumps will be put in to pump the mud into the recycling system. The dimension of pit required will be 2m x 2m x 1.5m deep. Pits will be battered to 2:1 or stepped.

Pits will be constructed to fill with approx 4 metres cubed of concrete which will be used as the thrust block during each (Obstruction No. 1) Drill 11 - Installation operations.

Neary will prepare Land & Marine entry side working areas to approximate dimensions of 20m x 25m.

Exit Site – Small pit will be constructed to collect any mud that may surface the dimension of pit required will be 2m x 2m x 1.5m deep. Access will be provided through the already stripped easement. This will be co-ordinated with Neary to avoid any conflict between any works already taking place within the easements. Neary will prepare Land & Marine exit side working area to approximate dimensions 10m x 10m.

Water ingress during the construction of the pits will be monitored and if it necessary it will be pumped into the recycling system after the construction is complete.

2.9.4 Methodology: Nature of Installations – 5 No 3 x 180mm SDR11 PE Pipe & 1 x 125mm SDR11 PE Pipe

The drilling rig D36 x 50 will push drill pipe into the ground. In front of the drill pipes an increa drill head will be used to penetrate the ground. Directly behind the bit non-magnetic drill pipe is used in which the steering tool for the locating of the drilling head is positioned.

The technique involves directionally drilling a pilot bore along the predetermined drill profile distances shown above of each separate drill to exit into exit pit. Controlled directional variance is affected by applying non-rotary forward feed (thrust) to the fluid-assisted angular faced drill head. Progress information from the drill head is transmitted to a receiver directly above and monitored on a VDU by the steering engineer. From this data the engineer determines the steering actions necessary to maintain required depth and direction; this information is communicated to the driller by means of radio. This data will also be recorded into a note book once every full length of drill rod is installed, later transferred onto an A4 sheet of paper and then onto an electronic spread sheet – this data will then be plotted onto an As-Built drawing and submitted to Neary weeks after installation.

Once the pilot hole is finished, the drill bit and non magnetic drill pipe will be removed at the exit side of the drill and replaced by a 14" Back Reamer. Back reaming will commence for the 2nd pull. After each drill rod is pulled back fully, on exit side a drill rod will be attached (trailing rods) When the reamer reaches the drill rig, there will be drill rods through the full length of hole. Reamer will then be removed. A 20" Back Reamer will then be connected to drill rods at exit side. Back reaming will commence for 3rd pull, with rods being trailed again, when the reamer reaches the drill rig it will then be removed. An 18" Back Reamer will then be connected to drill rods at exit side. Back reaming will commence for the 4th pull, this will be the cleaning run. When the reamer reaches the drill rig it will then be disconnected with the drill rods. Drill rods at exit side will be attached to the swivel and pulling head which will be attached to the pipe string.

Please refer to appropriate Prysmian profile design drawing.

During the installation the swivel will prevent the ducts from losing formation. When bundle installation is completed the pipes will be aligned as per Neary requirements, the rig will be moved to the next programmed crossing location.

All previous operations are then repeated from pilot drill to final ream and pipe pulling. The concrete thrust block will be broken with a breaker and loaded into a wagon and removed from site. Refer to - Site Waste Management Plan.

Once all pipes are installed, the ducts will be proved and roped using a 'pig' handle and compressor. Refer to – L&M Quality Plan.

After the pipe is proven the pits will be emptied of drilling mud. Backfill material will be pre excavated. Depending on the type of soil, each layer should generally not exceed 300mm – 500mm in depth; each layer will be compacted by mechanical compaction equipment. Ground to be reinstated to original ground levels as per site arrival i.e. topsoil stripped. Leaving the pipe at the required level with a cap attached.

2.9.5 Drilling Mud

During the hole drilling process Bentonite shall be used for the drilling fluid COSHH and data sheets will be in the site pack file.

The most important functions of the drilling mud are:

- Loosening the soil in front of the bit
- Lubricating of the drill string and BHA
- Pulling of the string and BHA
- Removal of soil parts out of the hole
- Keeping the soil parts in solution
- Stabilisation of borehole wall

This mud consists mainly of water (>90%) mixed with bentonite, a natural clay with specific properties.

Some additives may be used in very low quantities. All possible additions are tested for its toxic qualities. The water required for mixing will be brought on site by tanker which is filled from an approved extraction location, a fire hydrant utilising a Welsh Water approved standpipe. It will be stored on site in containers or bunded lagoons.

The drilling mud will be mixed in special developed units to obtain the right specific gravity and viscosity.

The mud that returns to the surface at both sides will be recycled during drilling operations (treated with shale-shakers, desanders and desilters) in order to keep the bentonite consumption and disposal volumes as low as possible. During a part of the operations mud will re-surface at the pipe side.

Regular checks will be made for any sudden loss or visible leakage of drilling mud, if this does occur checks for bentonite breakout will be undertaken.

The cuttings which have been separated from the mud, as well as the remainder of the mud, will be disposed of in a controlled manner, and in accordance with EA legislation.

Mud containment pits will be excavated at both entry point and exit point. These pits will contain the drilling fluid during the operation and allow the recycling of the fluid to keep the quantities used to the absolute minimum. These pits will be bunded to prevent over spill and suitable barriers erected.

If necessary excess drilling fluid will be pumped into a mud storage pit during the course of the operation to ensure pits do not overflow. Drilling mud contained within storage pit will either have supasorb mixed through it - this will solidify and will be removed from site as an inert and will be disposed of in a controlled manner and in accordance with EA legislation and approved by Neary and Land & Marine before transportation. Refer to – SWM Plan and PEM C Plan.

The liquid mud is mixed on site using an onboard mixing system which utilises any available freshwater supply and a Bentonite mixture appropriate to anticipated soil conditions. Water will be supplied by Neary when requested by Land & Marine.

The 'mud' we use, Sodium Bentonite with additives, is compounded clay and, being a naturally occurring substance, achieves an environmentally acceptable multipurpose solution.

It permits a bore to be drilled and held open in ground that would otherwise collapse. In addition, the liquid mud is essential for cooling the guidance transmitter and removal of the drilling spoil as the hole is enlarged.

Once the pipe is installed the bore will shrink in size around the pipe with the drilling mud starting to solidify.

2.9.6 De-rigging Side

Once each bundle is installed in the hole the rig will be moved across to the following entry point and after the last bundle is installed the rig and auxiliary equipment will be rigged down and transported to the following crossing location as per programme. Refer to – Site Pack File.

2.9.7 Personnel, Plant and Equipment

LABOUR (per shift)

- 1 No. HDD Crew Leader / Steering Engineer (Pilot Hole)
- 1 No. Site Agent
- 1 No. Drilling Operative / Mud Engineer
- 1 No. Drilling Operative
- 1 No. Drilling Operative
- 1 No. Drilling Operative

PLANT (major items)

- Drilling rig 36 x 50
- 20Te Excavator
- 13.5Te Excavator
- Drill pipe – 4.5m lengths – 2.625" Diameter (36 x 50)
- Mixing plant
- Bits, Reamers, swivel
- 2 No Super Silent Generator's – 1No 6 Kva and 1 No 20Kva
- 3No. Super Silent 4" Mud Pumps.
- Recycling plant (Shaker Unit)
- Store container
- COSHH Container

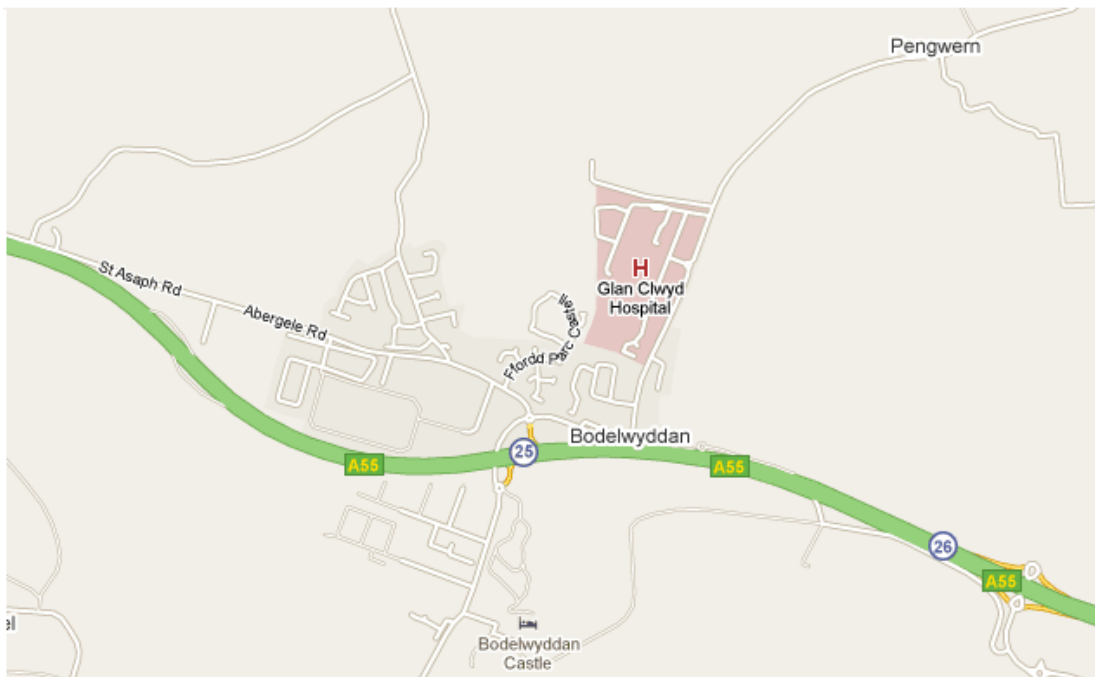
Office
Radios
Mud Bowser
HGV Hiab
Tractor
4x4 Trucks
Transit Van

2.9.8 Emergency Arrangements

WORK SPECIFIC EMERGENCY PROCEDURES

The Prysmian site emergency procedure, outlined during the site induction, shall be implemented. If any contact is made with buried services the work must stop immediately and the site supervisor informed who will in turn inform the relevant utility/emergency services.

All accidents, incidents and near misses will be recorded and the client notified.
The nearest accident and emergency hospital is attached.



Emergency services contact numbers are to be posted in the site office.

Site First Aiders are identified on notice boards.

Route to nearest A&E Hospital is identified in site office. (As above).

3.0 Traffic Management – Please refer to CTMP C Plan

There will be automated wheel washers at each of the HDD site entrances which lead onto public roads this will minimise the amount of mud carried onto the roads. These will be used at all times when exiting site. Prysmian / Neary will provide a road sweeper to sweep site entrances and exits when required.

Delivery vehicles must adhere to the routes specified within the Traffic Management Plan as some routes are prohibited.

Construction traffic will have the same routes prohibited – There will be a Yellow card / Red card system in operation at all times during construction.

Site speed limit is 4.5mph within yard and – Haul road 15mph.

4.0 Job Health & Safety Analysis

Prior to commencing work all personnel shall have read and understood this method statement and the project brief.

Prior to commencing work, all personnel including subcontractor's personnel will be inducted by the L&M Site Agent and attend the Prysmian site induction. Personnel who have not attended this induction shall undertake no work.

The induction will outline the safe working practices that must be adhered to at all times. Personnel will also be informed at this time of any relevant environmental issues and any safety equipment that they will require.

As outlined in the Induction PPE requirement will be Fire retardant overalls, safety helmets, gloves, high visibility vests, protective boots (with ankle protection) and safety glasses.

All works will be carried out in a safe manner, using only certified equipment, and the work site maintained so that it functions safely and efficiently.

All personnel shall be in possession of a relevant CSCS.

Any recommendations or corrective actions highlighted by the health and Safety Manager / Officer shall be corrected immediately as instructed.

All site visitors will attend a Prysmian visitor's induction. Visitor's who have not attended this induction shall not be allowed on site.

A Job Health & Safety Analysis (Risk Assessment) is attached.

FREQUENCY OF OCCURRENCE	SCORE	SEVERITY OF INJURY / DAMAGE OR LOSS		SCORE	RISK RATING (Frequency Score X Severity Score)		ACTION	TIMESCALE
Improbable = Infrequent	1	Trivial	First Aid only	1	Low	1 – 4	Review Risk and Existing Controls	12 – 14 months
Possible = Annual	2	Minor	Medical Treatment	2	Medium	5 – 9	Review Risk and Existing Controls	6 – 7 months
Occasional = 2 to 3 times/year	3	Major	Lost Time	3	High	10 – 16	Review Risk and Existing Controls	3 – 6 months
Frequent = Monthly	4	Major	Multiple Injuries	4	Major	17 – 19	Implement Action Plan for progressive reduction	3 months
Regular = Weekly	5	Death	Fatality	5	Unacceptable	20 – 25	Stop activity immediately	Immediate

No	Hazard / Activity	Possible Consequences	Pre-Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
1	Unload / remove equipment at site	Failure of lifting equipment. Load slippage or load dropped. Injuries or fatalities to personnel	3x5 = 15	All lifting equipment will be checked prior to start of works No defective equipment will be used. Certification for the lifting equipment must be valid The lifting equipment operator to carry out daily checks to ensure the equipment is fit for purpose Radius chart to be with the lifting equipment. The operator must fully understand charts and SWL A slinger / signaller will control lift shall be used. Only qualified personnel will operate lifting equipment. Permit to lift.	1x5 = 5 MEDIUM
2	Positioning the Lifting equipment	Lifting equipment tip over, Unstable ground, Impact with other items of plant and equipment Crushing injuries or fatalities to personnel, plant damage	3x5 = 15	The lifting equipment will have a banksman present at all times during travel The banksman will be fully conversant with good signalling practise. The ground stability must be assessed prior to any lifting Clear access must be given to the lifting equipment when moving around the works area. The swing radius must not be any less than 600mm from any building Traffic control measures where required	1x5 = 5 MEDIUM
3	Rigging and slinging	Failure of lifting equipment, Impact with swinging load, load exceeds SWL Injuries or fatalities to personnel	3x5 = 15	All lifting equipment to be visually inspected prior to any lifting All slings & chains will be of correct rating. Lifting equipment operator will not undertake any lift that will take him out of safe working radius All lifts will be correctly balanced prior to lift Safe lifting practise to be used at all times. Sharp edges to be suitably packed to prevent chaffing of slings	1x5 = 5 MEDIUM
4	Lifting a load	Load falling, Personnel trapped by the load, Personnel trapped by lifting equipment radius. Overhead power lines Injuries or fatalities to personnel	4x5 = 20	All loads will be lifted using the correct rigging methods. Riggers will be knowledgeable with regards to hitches that reduce the lifting capacity of slings and chains The safety latch will be in good condition on the lifting equipment hook Tag lines are to be used on lifts where required. All loads will only be lifted to the minimum height necessary to clear obstacles No personnel are to be allowed to stand under a suspended load. A banksman is to be used at all times Only qualified personnel will operate lifting equipment	1x5 = 5 MEDIUM

No	Hazard / Activity	Possible Consequences	Pre-Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
5	Positioning the load	Injury caused by trapping, fingers, hands, overloading of landing areas. Over head power lines Limb injuries, electrocution – death, burns	4x5 = 20	All personnel will be instructed in safe lifting practises, The lifting equipment will be under the control of a banksman at all times. The landing position will have been assessed prior to the load being landed. The banksman will ensure that the lifting equipment does not encroach into any power line exclusion zones identified by goal posts and signs	1x5 = 5 MEDIUM
6	Excavation of Mud Pit	Machine Impact with personnel, Collapse of excavation, Noise, Dust, Underground Utilities Personnel falling in Death body injuries, electrocution. Long term hearing damage. Dust inhalation	4x5 = 20	Only competent machine operators to be used No personnel to enter in to any excavation that is unsafe, Batter, stepped or supported is a requirement. Hearing protection to be issued to all personnel when required Dust suppression to be employed when required. CAT scan to be carried out prior to excavation. All underground utilities to be confirmed with the utility authority and staked out All mud pits to have Herras barriers and signs	1x5 = 5 MEDIUM
7	Tool up for drilling activities	Manual handling injuries, Slips, trips and falls Muscle Strains Personnel injuries. Electrocution Heat exhaustion Spillage.	4x3 = 12	Use mechanical handling where ever possible All electrical equipment to be inspected and tagged prior to use. Area to be kept clear of all debris A supply of good water to be available at all times All spillages to be contained and spill kits to be available at all times	1x3 = 3 LOW
8	Mud mixing	Skin contact with drilling mud, Manual Handling, Falls, Dust	4x2 = 8	COSHH sheets to issued and the correct PPE to be worn Use mechanical handling where ever possible Correct working platforms to be installed at all times. Dust masks to be used	2x2 = 4 LOW

No	Hazard / Activity	Possible Consequences	Pre-Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
9	Drilling operations	Noise, Dust Entanglement / impact with rotatory equipment. Injuries to personnel	3x4 =12	Hearing protection to be issued to all personnel when required Dust suppression to be employed when required. Emergency stop buttons to be fitted in accessible positions All hoses to be secured, gauges to be inspected prior to use Only experienced and competent operators to be used. Correct guarding to be in place at all times. Lock out /Tag out & Permit to Work to be used for all maintenance operations Spill kits to be available at all times Two way communications to be in place for lone workers No persons to be allowed to stand in close proximity to the moving drill string	1x4 = 4 LOW
10	Bentonite breakout (frac-out)	Slipping or skidding Body injuries	4x3 = 12	All drilling equipment and pressures will be checked and monitored at all times Monitor return flows to control over-pressure Small frac-outs will be controlled by temporary sumps and sand bags/earth banks. Larger frac-outs or frac-outs in waterways will be controlled by temporary suspension of operations until a re-assessment of the set up is made and control measures put in place. See also Environmental Risk Assessment.	2x3=6 MEDIUM
11	Survey Drill Path with DCI's Eclipse	Slipping on incline while surveying.	2x3=6	Operatives will wear well treaded safety boots.	1x3=3 LOW
12	Noise output of the drill rig.	Damaged hearing when working on site. Surrounding residents unhappy with noise levels	5x4=20	Ear protection will be worn on site. Strict site working hours to comply with clients requirements.	2x4=8 MEDIUM
13	Striking Underground Services	Death, body injuries, electrocution.	2x5=10	CAT scan to be carried out prior to excavation. All underground utilities to be confirmed with the utility authority Neary permit to dig will be in use Safe digging techniques will be used	1x5=5 LOW

No	Hazard / Activity	Possible Consequences	Pre-Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
ADDITIONAL COMMENTS: All persons in the survey crew to be instructed that they are not required to work in any situation or with any equipment that they do not believe is safe (If personnel feel at risk they are to stop work, inform their supervisor of their concerns and sort the situation out). Ensure adequate communications are available, i.e. project radios. Report any near misses/dangerous occurrences or incidents to HS Team Member and Supervision. Prior to the commencement of the work shift; Vehicle pre-start checks to be completed and documented in logbook. Report any safety related faults to supervision. All foremen to be involved in the morning pre-start meeting with the construction manager. Review JHSA to ensure site conditions do not require further control measures to be implemented.					

5.0 Environmental Risk Assessment

Any recommendations or corrective actions highlighted by the L&M Environmental Advisor will be actioned immediately.

An Environmental Impact Assessment for the works to be covered in this method statement can be found below.

All site personnel will attend an environmental induction prior to working on site.

Site personnel shall ensure that:

Spill kits are maintained by the drilling crew, these kits will be regularly inspected to ensure they are complete.

Drip trays will also be placed below static plant and plant while re-fuelling with bunded fuel bowsers used.

No newt fencing is damaged – should any damage occur this will be reported to Neary / Prysmian, also Land & Marine Environment Manager and repaired.

The site is left clean and tidy at all times.

Access to EA flood assets will be maintained at all times.

Land & Marine will conform to document: PPG5 October 2007. (Appendix 1)

Nesting birds are not disturbed and reported immediately to L&M Environmental Advisor.

Plants and animals protected under the schedules of Wildlife and Countryside Act 1981 and other Acts are not harmed or their habitat damaged.

Spills and leaks are reported immediately to the Environmental Advisor and cleaned up promptly.

Re-fuelling on site to be carried out at least 30m away from any drain or watercourse.

Waste will be segregated and disposed of in accordance with the Projects Waste Management Plan. (refer to Prysmian PWMP)

All gates, when not in use, are shut.

Any complaints raised, should be directed through to L&M

If a large bentonite breakout were to occur the HDD operation must be stopped; the breakout will be controlled with earth bunding, sand bags, sedimatts and straw bales. When controlled drilling will continue and breakout monitored.

Sand bags and sedimatts will be stored on site.

If breakout were to occur into a watercourse the HDD operation must be stopped; the flow will be stemmed using straw bales and sedimatts. After control are in place the following must be informed:

Environment Agency via there hotline – Tel: 0800 80 70 60.

Neary Project Manager – Pat Furey

ASSIST Incident Helpline – Tel: 08450 83 03 03.

All work will be in compliance with L&M, Neary and RWE Environmental Statements.

A job environmental analysis (Risk Assessment) is below.

LIKELIHOOD OF THE ENVIRONMENTAL IMPACT OCCURRING	SCORE	SEVERITY OF THE ENVIRONMENTAL IMPACT	SCORE	RISK RATING (Frequency Score X Severity Score)		ACTION	TIMESCALE
Possible = Annual	1	No or insignificant impact	1	Low	1 – 4	Review Risk and Existing Controls	12 – 14 months
Occasional = 2 to 3 times/year	2	Small, local (i.e. on site only) impact	2	Medium	5 – 9	Review Risk and Existing Controls	6 – 7 months
Frequent = Monthly	3	Local impact, affecting off site receptor	3	High	10 – 16	Review Risk and Existing Controls	3 – 6 months
Regular = Weekly	4	Major local impact	4	Major	17 – 19	Implement Action Plan for progressive reduction	3 months
Common = Daily	5	Large scale environmental incident	5	Unacceptable	20 – 25 Pulling	Stop activity immediately	Immediate

No	Hazard/ Activity	Possible Consequences	Pre-Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
1	Any work in ecologically sensitive areas. All activities generate noise, fumes, ground compaction and disturbance	Failure to work to procedures exacerbating the disturbance. Damage to flora and fauna. Species exclusion from their habitat. Permanent damage to site integrity. Landscape / visual impact	3x2 = 6	Strict adherence to procedures detailing the constraints in these areas. Following Method Statement and direction of L&M Environmental Team.	1x2 = 2 LOW

No	Hazard/ Activity	Possible Consequences	Pre- Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
2	Fuel, Oil and Chemical Storage. Hazardous materials on site	Spills and leaks. Ground water contamination from toxic substances.	2x3 = 6	Stored in a safe designated areas located away from watercourses and drains. Tanks banded (110% capacity) Adequate supply of spill kits and granules. Locks on fuel tank.	1x3 = 3 LOW
3	Refuelling. Use of fossil fuels	Spills and leaks. Ground water contamination from toxic substances.	2x3 = 6	Refuel as much as practicable in the yard. All fuel bowsters to carry spill kit, granules and funnels. Refuelling only to be carried out by designated person. Refuelling not to be carried out within 30m of a watercourse / drain.	1x3 = 3 LOW
4	Vehicle and plant operations - Emission of noxious gases	Excessive emissions to the atmosphere. Environmental degradation.	3x2 = 6	Frequent vehicle and plant maintenance.	1x2 = 2 LOW
5	Vehicle and Plant operations - Working in proximity to trees.	Lack of care when working near trees. Damage to trees and hedgerows.	2x2=4	Careful operations near trees and hedgerows. No working under canopy of trees	1x2 =2 LOW
6	Vehicle and plant operations – Emission of noise	Disturbance to public and livestock. Complaints from public and landowners	2x3 = 6	Frequent vehicle and plant maintenance. Noise mitigation methods employed as required. Noise monitoring.	1x3 = 3 LOW
7	Construction work impact on local communities. Increased noise, traffic, dust, mud, light and working hours.	Excessive disturbance to local communities and dwellings in proximity. Complaints from the local communities and dwellings in proximity.	3x2 = 6	Observe traffic management plan, dust management, observe agreed working hours if practicable.	2x2 = 4 LOW
8	Waste collection. Waste generation.	Waste material left on site. Uncontrolled waste on site, detrimental to animals, possibly toxic to plants and soil. Failure of duty of care.	3x3 = 9	All waste to be segregated on site where practicable and brought back to the appropriate waste containers in the yard.	2x3 = 6
9	HDD Drilling mud control. Breakout of bentonite during drilling operations.	Potential contamination of ground. Ground water surface Water Features (Rivers). 1) Visual impact of surface breakout. 2) Potential contamination of ground water (Aquifer) 3) Potential damage to fish pollution through fine silt pollution of rivers	2x4 = 8	Bentonite is controlled at drill site, any breakout detected by drop pressure controlled by operator. Follow Emergency Response Procedure.	1x4 = 4 LOW

No	Hazard/ Activity	Possible Consequences	Pre- Control Value Frequency x Severity	Control Measures	Post Control Results Frequency x Severity
10	Production of HD Drilling Mud -Waste Mud	Excess bentonite left on site - Detrimental to watercourses / groundwater	3x3 = 9	Bentonite taken off site and disposed of in accordance with SEPA guidelines	1x3 = 3 LOW
11	Waste in a floodplain	- Potential pollution of groundwater / groundwater - Damage to soil	2x3 = 6	Where possible works to take place outside floodplains. No hazardous material i.e. fuel / oil to be stored in floodplain.	1x3 = 3 LOW

6.0 Records

During the pilot hole drilling all relevant steering data such as inclination, azimuth, magnetic interference etcetera are recorded on the survey sheet as well as stored on a computer. For easy reference the position of the drill head is also indicated on the plan/profile drawing

All relevant drilling parameters such as push/pull forces, torque, rpm, mud pressure and flow are recorded as well on a driller's sheet. Mud parameters as specific gravity, viscosity and mud weight are also measured and recorded on the mud data sheet.

Appendices all on 1 sheet:

APPENDIX 1 – PPG5 October

See enclosed.

APPENDIX 2 – D100 x 120 Drill Rig Data Sheet

See enclosed.

APPENDIX 3 – D36 x 50 Drill Rig Data Sheet

See enclosed.

APPENDIX 4 – Bentonite COSHH Data Sheet

See enclosed.

APPENDIX 5 – Z-50 Grease COSHH Data Sheet

See enclosed.

APPENDIX 6 – Supasorb COSHH Data Sheet

See enclosed.

APPENDIX 7 – Typical Site Layout Drawing

See enclosed.

APPENDIX 8 – 2 Stroke Oil COSHH Data Sheet

See enclosed.

APPENDIX 9 – Bio Hydraulic Oils COSHH Data Sheet

See enclosed.

APPENDIX 10 – Generic Washing Up Liquid COSHH Data Sheet

See enclosed.

APPENDIX 11 – Ready Mix Concrete and Mortar COSHH Data Sheet

See enclosed.

APPENDIX 12 – Antifreeze Oils COSHH Data Sheet

See enclosed.

APPENDIX 13 – Clear Head COSHH Data Sheet

See enclosed.

APPENDIX 14 – Grease Cartridge COSHH Data Sheet

See enclosed.

APPENDIX 15 – Spray Paint COSHH Data Sheet

See enclosed.

APPENDIX 16 – Bar Soap COSHH Data Sheet

See enclosed.

APPENDIX 17 – Gas Oil – Diesel COSHH Data Sheet

See enclosed.

APPENDIX 18 – Hydraul – Ez COSHH Data Sheet

See enclosed.

APPENDIX 19 – Generic Engine Oil COSHH Data Sheet

See enclosed.

APPENDIX 20 – Hydraulic Fluid COSHH Data Sheet

See enclosed.

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17. Sandford 400 Kv GSP and Sandford 132kV BSP

Construction Phase

Duration and Construction Staff

Construction of the substation is expected to take approximately 2 years. Core construction hours will be from 07.00 to 19.00 7 days a week. The average number of construction personnel at any one time will be 30, peaking for several months at 60.

Site Preparation

The first phase will be to ensure the land is clear from other services such as:

- 11kV electricity cables. These are expected to be diverted along another route.
- Rhynes draining across the proposed site will need to be diverted.

The Second phase will be to profile the site to achieve a flat platform. The platform will be gently sloping (1 in 80) to improve material retention on site. Site levels range from 11m A.O.D. in the South to 8m A.O.D. in the North. This will be achieved by balancing the amount of excavation and fill on the site, thus reducing the need for any import or export of soils. A topographical survey of the site will need to be undertaken, indicatively the volume of soil to move is 50,000m³.

The third phase will comprise of substation construction including drainage, foundations, erection of structures and electrical equipment, these will then be commissioned into operational service.

Any trees or hedgerows to be cleared will be chipped and used on site to avoid the need for additional vehicle movements.

Temporary Laydown Area

To create temporary laydown areas, topsoil will be stripped and retained, geotextile sheeting will be laid before applying a stone capping.

There are 2 temporary laydown areas. Laydown area 1 will be situated next to the A368 and will also be used to facilitate cable installation once the substation is built. Laydown area 1 will be used for construction parking and site establishment cabins and the majority of storage of plant and equipment. The cable haul road will be the access route to the construction site. Laydown area 2 will be used for welfare facilities and a smaller laydown area next to the construction site. Once construction is complete the laydown areas will returned to pasture by removing stone, matting and replacing topsoil and re-seeding. The cable haul road substructure will remain to allow a structurally sound route for future abnormal vehicle movements to or from the site.

Foundations

Pending a Geotechnical Survey, the foundations of the substation are expected to consist of piled foundations, pad foundations (area and thickness depending on load and ground bearing capacity), and raft foundations (often used to support equipment and pre-fabricated modular buildings). Approximate depth of excavations for the SGTs will be 2m, with the oil containment tank at an approximate depth of 5m. Steel frames will be delivered and subsequently bolted together on site to minimise on site works and erection times. The installation of the equipment and perimeter fencing will then be undertaken.

Pollution Prevention

The construction contractor will be required to work to conditions and in a manner that reflects the high environmental requirements embodied within this report. Particular attention will be drawn to the need to suppress dust, operate within traffic and noise restrictions, and to operate only during agreed times of working.

Construction work will be carried out in accordance with the following:

- ◆ CIRIA (Construction Industry Research and Information Association) publication C502 - Environmental Good Practice on Site;
- ◆ Non statutory guidance for site waste management plans, DEFRA 2008; and
- ◆ Considerate Contractor Scheme. This scheme provides incentives for contractors to be considerate, good neighbours, respectful, responsible, accountable and operate a clean and safe site. Contractors must also minimise noise, use local resources wherever possible, manage waste properly, recycle waste, use recycled materials and avoid pollution. Contractors will work under this guidance and in the appropriate spirit.

Relevant Pollution Prevention Guidance Notes (PPGs), published by the Environment Agency¹, will be taken into account in order to minimise the risk of pollution to soil and water.

Lighting and Security

Since work will be carried out throughout the year, there will be a need to illuminate parts of the construction area in normal working hours during the winter to comply with the Health and Safety at Work Act 1974. The position of any portable or temporary lights will be such as to avoid creating any disturbance to local residents and ecology. During the construction period, the site would be ringed by a 'Heras' type security fence, approximately 2.0m high, complemented with security guards.

Other

A WPD transformer and associated switchgear is required to provide ancillary power to the site. This will be within palisade fenced compound approximately 1m x 1m. The height of the equipment will be approximately 2m.

Seabank 400kV Substation extension

Construction Phase

Duration and Construction Staff

Construction of the substation is expected to take approximately 2 years. Core construction hours will be from 07.00 to 19.00 7 days a week.. The average number of construction personnel at any one time will be 15, peaking for several months at 40.

Site Preparation

The first phase will be to extend the GIS building to the South. This will be achieved by removing the relevant roads and building structures to make space for the extension works.

The second phase, once system access is granted is to remove the existing SGT 4 and associated foundations (south-east corner of the substation compound). The SGT 4 unit will be relocated to another site for re-use. The activities will then comprise of substation construction including foundations, erection of structures and electrical equipment, these will then be commissioned into commercial service.

¹ <http://www.environment-agency.gov.uk/business/444251/444731/ppg/>

Any vegetation to be cleared will be chipped and used on site to avoid the need for additional vehicle movements.

Temporary Laydown Area

The temporary laydown area will be situated adjacent to the existing 400kV Seabank substation. If additional space is required, hard-standing in adjacent industrial areas will be used.

Foundations

Pending a Geotechnical Survey report, the foundations of the substation are expected to consist of piled foundations, pad foundations (area and thickness depending on load and ground bearing capacity), and raft foundations (often used to support equipments and pre-fabricated modular buildings). Approximate depth of excavations will be 2m.

Pollution Prevention

The construction contractor will be required to work to conditions and in a manner that reflects the high environmental requirements embodied within this report. Particular attention will be drawn to the need to suppress dust, operate within traffic and noise restrictions, and to operate only during agreed times of working.

Construction work will be carried out in accordance with the following:

- ◆ CIRIA (Construction Industry Research and Information Association) publication C502 - Environmental Good Practice on Site;
- ◆ Non statutory guidance for site waste management plans, DEFRA 2008; and
- ◆ Considerate Contractor Scheme. This scheme provides incentives for contractors to be considerate, good neighbours, respectful, responsible, accountable and operate a clean and safe site. Contractors must also minimise noise, use local resources wherever possible, manage waste properly, recycle waste, use recycled materials and avoid pollution. Contractors will work under this guidance and in the appropriate spirit.

Relevant Pollution Prevention Guidance Notes (PPGs), published by the Environment Agency², will be taken into account in order to minimise the risk of pollution to soil and water.

Lighting and Security

Since work will be carried out throughout the year, there will be a need to illuminate parts of the construction area in normal working hours during the winter to comply with the Health and Safety at Work Act 1974. The position of any portable or temporary lights will be such as to avoid creating any disturbance to local residents and ecology. During the construction period, the CDM area would be ringed by a 'Heras' type security fence, approximately 2.0m high, complemented with security guards. This will be within the existing 400kV operational compound.

² <http://www.environment-agency.gov.uk/business/444251/444731/ppg/>

**18. Risk Assessment & Method Statement
For**

Removal and Installation of 400kV CVT's

Document Reference:

**There must be no deviation from this Method Statement
Without prior approval from the PC Site Manager.**

	Prepared By:	Reviewed By:	Approved By:
Name			
Signed			
Date			

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1. Introduction	12. Tools and Plant
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1. INTRODUCTION

This document is to outline a safe working method to be adopted by ALL members of the working party involved in the removal and installation of 3 x CVT's and all associated plant and equipment using a MEWP and a Crane.

2. REFERENCE DOCUMENTS

- **Principal Contractor (PC) Construction Phase Health & Safety Plan**
- **HASWA 1974 Management of H&S Regs 99**
- **PC Site Rules**
- **Site Hazard Plan:**
- **Site CDM Layout :**
- **PC safe lifting procedure.**
- **Working at height Regs**
- **Loler Regs 98**
- **PUWER Regs 1998**
- **Manual Handling Reg 1992**
- **Lifting Plan :**
- **Drawing no. And title**
- **List O&M Manual**
- **Operation and Instruction manual of MEWP**

3. SAFETY DOCUMENTS

NG Safety Documents will be issued by the N.G SAP and are to be used alongside the Principal Contractor (PC) safety documents(SPA, TCC, Verbal incident Reporting chain) Contained in the Principal Contractor Construction Phase Health & Safety Plan and briefed out to all operatives in the PC site induction.

The PC verbal incident reporting chain is as follows, site supervisor to be informed along with SHES advisor who will then inform site manager.

4. ACCESS AND EGRESS

Access to the site will be via the main entrance gate following the access route designated by the N.G SAP and the boundaries set out in the Site CDM Layout Plan. All personnel will sign in and out on the CDM register located in portacabin at the main gate and report to the PC site office. The NOC will be informed on our arrival and departure. Whilst working within a live compound the N.G T card system will be used.

All vehicles will be banked with the assistance of a Banks man and the site speed limit is 5 M.P.H. Appropriate PPE will be worn by all people attending the site outside of the welfare area. Pedestrians will follow the designated routes (where applicable) and will wear Hi-Vis clothing

All deliveries will follow the agreed routes to site to avoid the weight limit, when on-site they will follow the designated access routes

All materials will be stored in our designated lay down area.

All site plant will adhere to the designated access routes.

5. WORK BOUNDARIES

Work is to be carried out within the CDM area as shown on the CDM plan under agreement with the N.G SAP and N.G documentation. PC will use barriers around lifting operations and signage to inform all who are not part of the working party.

6. METHOD OF WORKING

Prior to any work being carried out all personnel will undergo a site induction and be briefed on their RAMS by their own supervision before signing onto the Rams and any appropriate N.G documentation.

Removal of CVT's

- Access/working at height will be via MEWP emergency procedures explained below.
- Care must be taken when dismantling at height for this reason there has been an extra factor of safety added on to load.
- The first operation will be to remove associated bus bars two soft slings will be used chocked around bus bar tag lines will be attached to help control from the ground, these will then be lowered in to a suitable location on the ground lowered onto timber bites to enable to free slings once lowered.

- When Slinger/Signaller (S/S) has instructed crane op to position hook block above CVT he will slowly lower off to enable S/S to attach lifting equipment to lifting points as specified in O&M manual. The top of CVT needs to be tied off to slings as lifting points are on the bottom of this unit & it can become top heavy while trying to lift.
- Once all of the above is complete S/S will check hook block for plumb. Care needs to be taken that bolts are not removed before crane has the weight of this unit. S/S will then instruct Crane Operator (C/Op) to slowly raise hoist.
- Once S/S has confirmation from C/Op that he has the weight of unit, S/S will instruct mechanical fitter to start to loosen the nuts on bolts that are holding unit to structure but not fully remove.
- This has to take place as dismantling at height can be a risky procedure & care has to be taken that cranes SWL is not exceeded as this unit has been on this structure for some time which can cause cohesion to structure i.e. rust.
- When loosening bolts if CVT is free then fitter can remove bolts all together if not then a pinch bar or metal type wedges may need to be used to help free.
- If for any reason this unit does not come free then the bolts tightened & torqued up to make safe C/S will contact AP & a new method would need to be planned & rams amended to take this into account.
- When unit is free S/S apply tag line & will check there are no obstructions i.e. personnel or equipment in the area the will need to manoeuvre he will then instruct C/Op to slew over towards skip & stop before reaching skip.
- As this skip is bunded & there will not be an access door a footed ladder will be leant on the side of the skip. S/S will then climb ladder, attach lanyard to top of skip & proceed to tie ladder off. Once this has been completed another ladder will be passed up to enable entry inside skip & tied off.
- S/S will now climb into skip a place a piece of timber inside, he will then instruct C/Op to slew & slowly lower hoist to enable tower unit onto one side of timber & stop operation. He will then climb back out off the skip standing on ladder on the outside & reattach lanyard this will enable S/S to safely instruct crane op to slowly lower hoist & slew to lay the unit down on it side. Once complete, S/S will climb back into skip make sure unit is stable & then remove lifting equipment. He will then climb out of skip & repeat operation on the next 2 phases.
- When all 3 CVT's have been removed the steel work will then be removed by the crane.

Installation of CVT

- All site personnel to 'sign in' and receive site induction, before work commences all personnel will then read/understand and sign onto the RAMS.
- All work will be carried out from inside the working area.
- Access and egress to and from the working area will be by the route agreed with the S.A.P. and highlighted on the site CDM plan.
- A safety document will be issued by NG to the competent person.
- The steelwork for the CVT's will be put into position on studs located on the plinth and levelled off. The nuts will then be torqued to the correct setting using a certified torque wrench.
- Crane to be escorted on site by competent person full NSI8 and located in position shown in the berthing study.
- All plant & vehicles will be earthed using a field equipment earth attached at an appropriate point before any lifting takes place.
- Packing crates/cases to be opened emptied and dismantled appropriately. All wood shall be de-nailed as the work progresses.
- Small crates/cases which are accessible from ground level will have their lids removed using a crowbar/hammer as necessary. The sides of the crate will be removed if required to gain access to the contents using a crowbar/hammer where necessary. Contents may be removed by hand (utilising good manual handling practices, 2 man lift etc.) or utilising mechanical devices, e.g. Tele-handler as appropriate.
- The CVT's will be slung by the slinger/banksman at the appropriate position according to the manufacturers' installation manual and bolted onto the steelwork. Once all CVT's are in position they will be secured to the steelwork using the appropriate torque settings. Guide ropes will be used when necessary. The slings will then be removed at height using a MEWP.
- Clean all old joints to be re-used...
- Clean and install new flexible connections to CVT's as per detailed drawing.
- All bolts to be torqued with torque wrench and denso putty applied to bolt recesses.
- Ductor test all joints.
- **In the event of a person working alone in a platform/mewp then a second man must be at ground level to operate the controls in the case of an emergency.**
- **During this task if the weather should become inclement (high winds) or should there be a lightning risk 1 then the work will be suspended until the weather improves.**
- Workplace will be left clean and tidy. Any defects to be reported to the PC site manager. Any waste will be disposed of in the appropriate skip.

Removal of Plant and Materials.

1. Once all of the equipment has been installed, the tele-handler will be utilised to remove the timber packing cases,
2. The timber will be removed to the lay down area where it will be put into the wood skip.

7. WORK SPECIFIC EMERGENCY PROCEDURES

In case of an accident, the nearest 24 hour Accident and Emergency department is

The nearest A&E hospital is:

Operatives are to be made aware of the muster point. First Aid personnel are

-
-

In the event of somebody being injured the injuries will be assessed and if deemed to be severe for the first aiders to deal with then. The person will remain in situ, made comfortable, kept warm till suitable medical aid arrives.

In the event of a person working alone in a platform/MEWP then a second man must be at ground level to operate the controls in the case of an emergency.

The emergency response plan for working at height unconscious person / suspension trauma is as follows.

- If able to do so the suspended casualty should be encouraged to use the following techniques to reduce risk of suspension trauma
- If the person who is suspended is conscious and not injured they should be encouraged to mobilise all four limbs, i.e. by flexing the leg muscles until they can be brought to a position of safety, this will maintain circulation.
- Frequent pumping of the legs against a firm surface will also activate the muscles and improve the blood circulation.
- Rescue the casualty by the most appropriate means, e.g. by lowering the MEWP to the ground
- Get the person to the ground as quickly as possible.

Following any suspension once the casualty is on the ground follow these procedures.

- Raise the knees within the first five minutes (using an improvised tape sling or something similar).
- If unconscious protect the airway
- NEVER allow the casualty to lay down during the rescue
- Keep the casualty in a sitting position for at least 30 minutes and provide 100% O2
- Any suspension trauma more than ten minutes must go to hospital for evaluation.

8. MANUAL HANDLING

Manual handling tasks will be kept to a minimum as much as possible

- Before any item is lifted it must be assessed for its weight and structure. If it is outside of acceptable limits a suitable lifting device will be used.
 - Consideration must be given to the personal capabilities the weather, general site conditions, location and environment.
 - Employees are to be made aware of manual handling techniques.
 - Appropriate PPE to be worn (gloves)
- Operatives will have a good general fitness and be familiar with manual work.

9. PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following is to be worn by all PC employees and subcontractor operatives and supervisors on the construction site:

- Hard Hat
 - Lace-up Safety Boots
 - Hi-visibility clothing
 - Safety Glasses
 - Ear Defenders/protection (as required)
 - Flame-retardant Overalls
 - Industrial Gloves for any manual work.
 - Harness and fixed lanyard FOR WORKING IN MEWP
- Specialist PPE as and when required.

10. EMERGENCY RETURN TO SERVICE (ERTS)

The CVT that is being installed must be complete before the circuit can be returned.

11. MATERIALS

CVT's

12. PLANT, TOOLS AND EQUIPMENT

- Tele-handler
- 40T Crane
- MEWP
- Strops/Shackles certified and tested
- Guide ropes
- Hand tools
- Torque wrench
- Zip up scaffold
- Plant nappies
- Field equipment earths

13. LABOUR

Appointed person/ lift supervisor

4 fitters

2 wireman

Tele-handler driver

Slinger/signaller

14. DELINEATION & DEMARCATION

The lifting area will be demarcated as well as the permitted area

15. SUPERVISORY REQUIREMENTS

Site supervisor / Appointed person / lift supervisor.

Competent person to be the document holder

16. PROGRAMME

The working day will be 10hrs.

These dates and hours of work may change.

17. WASTE MANAGEMENT

Good house keeping will be maintained throughout the duration of the task. All waste materials will be placed in the appropriate bins provided and will be removed by a registered disposal company recorded on-site.

18. ENVIRONMENTAL ISSUES

All stationary plant and machines shall have drip trays. In the event of spillages spill kits will be on hand. For refuelling purposes a fire extinguisher will be present

19. TRAINING & COMPETENCE

All operatives working within the 400Kv sub-station will be a minimum of NG person and BESC trained. The permit holder will be an NG competent person.

All plant drivers and operators will hold current and relevant licenses.

Slinger/Signaller to be trained, competent and certified

All operatives will be competent and able to carry out these tasks

PASMA trained operative

20 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read, discussed and fully understand the above Method Statement and Risk Assessment for the CVT replacement, and will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Once approved, this method statement shall not be deviated from or amended without agreement of the Principal Contractor.

RISK ASSESSMENT

Brief description of work	Removal and Installation of 3 x CVT's			RA ref n° & issue	
Location of work		Project n°		MS ref n° & issue	
Assessed by				Date of creation	
Print name and signature					
Review cycle	Where any significant change to work or environment occurs, a thorough review of their risk assessment must take place and a new method statement written				

HAZARD CATEGORY – WHAT MIGHT GO WRONG											
	Members of public	Operatives	Other		Members of public	Operatives	Other		Members of public	Operatives	Other
1 Access / Egress		Y		16 Lifting operations		Y		Other Hazards			
2 Working at height		Y		17 Exposure to vibration *				31 RMHZ		4	
3 Multi level working				18 Manual handling *		Y		32			
4 Confined space working				19 Radiation *				33			
5 Restricted means of escape / rescue				20 Asbestos *				34			
6 Excavations				21 Hot Process – welding, burning, grinding				35			
7 Buried services				22 Fire / flammable Atmosphere				36			
8 Mobile or fixed plant		Y		23 Explosion				37			
9 Live plant or equipment		Y		24 Water / Drowning				38			
10 Hand tools / equipment etc		Y		25 Asphyxiation				39			
11 Pneumatic powered tools				26 Adverse weather		Y		40			
12 Electrically powered tools				27 Temperature (High or Low)				Other Considerations			
13 Electricity		Y		28 Lighting				1 Young persons			
14 Stored pressure/energy				29 Noise				2 New or expectant mothers			
15 Hazardous substances		Y		30 Dust / Fume				3 Disabled persons			

* Additional assessment required for these hazards

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
Severity (S)					

Acceptable Risk Rating is below 6

Hazard category	Identified Hazard	Associated Risks	Control measure	Risk Rating with controls L x S			Person responsible for methods of monitoring control measure
1	Work area access/egress & movement within the work area	Contact with structures, slips trips and falls.	Site induction Personnel to adhere to specified access/egress points and demarcated work areas NSI 6 demarcation by NG SAP	3	1	3	Supervisor
2	Working at Height	Fall from height, broken bones, fatality	Trained competent personnel Use of MEWP for access at height with harness and lanyard Use of zip-up scaffold or podium steps	2	2	4	Checks by competent persons and site supervisor.
8	Working in the vicinity of Crane, MEWP and Telehandler	Head injuries, fatality, crush injuries.	Crane lifting area to be barriered off MEWP movements to be monitored by banksman Tele-handler movements to be monitored by banksman	2	2	4	Checks by competent persons and site supervisor.
9	Infringement of safety clearances resulting in electrocution/serious burns Impressed voltage	Working adjacent to live H.V. equipment	- Trained and competent personnel - Use of Banksman when manoeuvring/working - Site safety rules - Fence line separating existing live equipment - Field earths to be applied to all moveable plant and heras fencing - Full NSI8 for all vehicle movement	1	5	5	Site Manager
10	Using hand tools	Cuts, strains, eye injury	Loose clothing to be tied back	2	2	4	Checks by competent

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
	Severity (S)				

Acceptable Risk Rating is below 6

Hazard category	Identified Hazard	Associated Risks	Control measure	Risk Rating with controls L x S			Person responsible for methods of monitoring control measure
			Correct PPE to be used Correct operating procedures to be adopted				persons and site supervisor.
13	Electricity	Operatives coming into contact with live electrical services or plant	All work and plant will be restricted to demarcated area No vehicles or plant will leave the access road Field earths to be applied to all plant inside the s/s All materials/ equipment to be carried below shoulder height. Water for cooling to be gravity fed to core bit.	1	3	3	Supervisor
15	Cleaning and greasing clamps	Burns, skin irritation	Ensure all COSHH assessment and data sheets are available Ensure correct PPE is used at all times Ensure all hazardous materials are locked away in the CoSHH cabinet when not in use	2	2	4	Checks by competent persons and site supervisor.
16	Working with cranes	Overtuning – impact & crush Moving booms – crush Loss of control – impact & crush Induced voltage	Work only in demarcated area Ground supervision or operator present at all times Operative to be trained & certified in use of MEWP SWA drain earth to be applied at all times Use only on firm level ground	2	2	4	Checks by competent persons and site supervisor.
18	Manual handling	Movement of tools / equipment / Materials	Trained and competent personnel Mechanical means of handling to be used where practicable. All equipment and materials are to be placed as close to the work face as reasonably practicable to reduce handling distances	1	3	3	Supervisor

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
	Severity (S)				

Acceptable Risk Rating is below 6

Hazard category	Identified Hazard	Associated Risks	Control measure	Risk Rating with controls L x S			Person responsible for methods of monitoring control measure
			Personal capabilities are not to be exceeded.				
26	Adverse weather	Lightning strike Heavy rain	Ensure Lightning risk is gained from NOC every day Ensure as soon as LR1 is declared all plant is brought down to ground level In heavy wind ensure that crane and MEWP are brought down to ground level	2	2	4	Checks by competent persons and site supervisor.
26	Working in hot weather	Burns to skin Nausea Vomiting	Ensure regular drink breaks are taken Ensure a good supply of cold water Ensure operatives are using sun bloke Ensure sun glasses are worn on very sunny days and all operatives can see what is going on around them Ensure that operatives regular take shade breaks	2	2	4	Checks by competent persons and site supervisor.

19. 400kv Substation Shunt Reactor

Risk Assessment & Method Statement Shunt Reactor HV build of new asset equipment

DATE:

Document Reference:

**There must be no deviation from this Method Statement
Without prior approval from the Site Manager.**

	Prepared By:	Reviewed By:	Approved By:
Name			
Signed			
Date			

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1. Introduction	12. Tools and Plant
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7. Emergency Procedures	18. Environmental Issues
8. Manual Handling	19. Training & Competence
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10. ERTS	
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1. INTRODUCTION

This document details the safe method of staged working to install Shunt Reactor HV build of new asset steel support structures, Post Insulators, surge arrestors, ES, CB, PD, PD/ES, PI, bus bars and alu. Conductors

ERECTION OF THE PI-PD-PD/ES- BUS BARS WILL BE AT A LATER DATE TO ELIMINATE IMPRESSED VOLTAGES

Once approved this Method Statement shall not be deviated from or amended without agreement of the Principal Contractor

2. REFERENCE DOCUMENTS

PC Construction Phase Health and Safety Plan
PC Site rules.
CDM Plan
Hazard Plan
Provision & Use of Work Equipment Regulations 1998
Manual Handling Regulations 1992
COSHH Management File
Certificates of Competency - Site File
Lift plan

3. SAFETY DOCUMENTS

Principal Contractor (PC) M&E supervisor will issue a Task Clearance Certificate. Safe Plans of Action are used by competent workers (already briefed by their Supervisor on the RA & MS) before starting work.

National Grid has indicated that they will probably not issue a Safety Document for these works whilst the works occurs inside the CDM area, this however could change at any time.

These documents will be retained at the workplace in a waterproof wallet so that they are available for reference and/or inspection at any time.

PC Verbal Incident reporting procedure as follows; all accidents, injuries, near misses and environmental or security incidents are to be reported to the PC Site Manager.

4. **ACCESS AND EGRESS**

- The Substation is operational and the gates are to be locked at all times. Access and Egress for Authorised Personnel only.
- All operatives will report to the site office on entering this area.
- All operatives entering this area will record their attendance via the site register. There shall be one T-card for all PC personnel.
- Pedestrian access to the work area will be by the designated route show on the CDM plan as detailed in the site induction.
- Document holder will contact the NOC at the start and end of each shift. If the risks is at 1 the Competent Person shall reassess the task and abort if it necessary **Hold point**
- The CDM areas are within the Substation and will be shown on the current CDM Drawing,
- There is to be no reversing or moving of plant without a banks man in attendance.
- All Plant and Equipment in excess of 2.3m high including long objects to be moved within the HV sub station compound by an NSI8 Full Authorised Person under direction of the SAP
- Merlo 360 degree telehandler will be moved within the HV sub station compound by an NSI8 Full Authorised Person.
- Site speed limit is 10mph
- Emergency vehicles are to be met at the site entrance gate by the SAP before being allowed access to site. The Electric fence to the 275kv compound will be disarmed before entry. SAP to provide access code and access fob for entry to mains site Key holders.

5. **WORK BOUNDARIES**

All work will be carried out within the CDM Area.

National grid SAP demarcation from NSI 6 relevant to the issued documentation

6. **METHOD OF WORKING**

- Prior to works commencing, Members of the Working Party must be site inducted and will receive a Work Site Safety Brief from the PC Supervisor or Working Party Leader on the contents of all relevant documentation which will include this document.
- All personnel will have their certificates of competence checked and operator's licences checked and copied before work is permitted.
- All structures and equipment will be moved across site using the approved access route identified by the NG SAP by conventional means of the Tele-handler the load will be ratchet strapped to the forks. All movements and operations will be carried out by a banksman who shall be the only person to control the actions of the tele-handler driver.

Use of a telehandler

- Maximum load capacity of the telehandler is 4T, Lifting of loads shall only take place on stable level ground
- The tele-handler will be positioned as close to the load as is safe and practicable.
- Outriggers will be deployed and the tele-handler levelled prior to any extension of the telescopic boom when relevant.
- The boom will be extended over the load. Lifting accessories will be attached by qualified slingers.
- The operator will raise the boom to tension the slings, then the load will be raised slightly, under direction of the signaller and the lift halted to enable the operator to check both the load and tele-handler.
- Safety hand lines will be attached to the load to control any swinging or rotation during the lifting operation, if deemed necessary.
- Once satisfied all is safe the lifting operation may continue.

Travel with Load Procedure

- The operator will retract and lower the telescopic boom as far as possible but maintain a safe clearance distance to the load from his operating position and ground clearance.
- The weight of the load and the boom length extended will be compared to the duty chart to ensure that travel with the load is permitted by the manufacturer's guidelines for safe operation. This will act as a fail safe to the electronic safe working load indicating device if fitted.
- When satisfied all is safe the operator can withdraw the outriggers and travel with load.
- The operator must request a Banksman to direct the route of his travel or to steady the load during travel.

Lowering Procedure

- Lowering of loads shall only take place on firm level ground. No lowering of loads below wheels.
- The tele-handler will be positioned as close to the destination point as is safe and practicable.
- Outriggers will be deployed and the tele-handler levelled prior to any extension of the telescopic boom.
- The boom and load will be extended over the destination point. The operator will lower the boom and the load into the desired resting place as directed by a signaller. The load will be secured and the lifting accessories removed.
- Note: All Lifting Procedures will be carried out to LOLER 1998.

Lifting Procedure using 360 Merlo

- Prior to works commencing, all personnel involved in lifting operations to receive on site induction and be briefed on and signed onto the method statement & risk assessment & any associated NGRID permits. All members of the lifting team shall also be briefed of their instructions and shall sign onto the Lift Plan also.
- Once merlo op, has been briefed on all of the above by either appointed person or lift supervisor all operatives competency (**C.P.C.S. OR HSE ACCREDITED BODIES**) all relevant certificates of merlo and all lifting equipment to be checked I.E. conformity twelve monthly & six monthly copies to be taken and filed in sites lifting equipment register.
- Merlo op will be briefed by either appointed person or lift supervisor on lifting operations.
- Merlo will now be instructed to rig crane to merlo manufactures instructions merlo op to take care that out riggers are pinned & all wheels have been elevated off the ground. A field equipment earth will be connected to all plant before operation.
- Before any lifting operation commences slew restrictor will be applied as specified in lift plan.
- If any of cranes lifting equipment is to be used either the appointed person or lift supervisor will check serial numbers on lifting equipment corresponds with test cert.
- Before any lifting operation is to be attempted it will be necessary for the lift supervisor ascertain the wind speed from crane op via cranes anemometer if crane is not fitted with one then the lift supervisor will check at frequent intervals wind speed data from site hand held device & from specialist forecasters I.E. met office under no circumstances will it be permitted to exceed the merlo's specified duty charts with regards wind speeds.
- It must be envisaged that the merlo op may decide to take merlo out of operation at a lower wind speed due to type of load being lifted or difficulty in controlling merlo.
- The merlo op has the primary responsibility for making the decision, in conjunction with appointed person & lift supervisor. The operator's decision to take merlo out of service should not be overridden by site management under any circumstances.
- A member of the installation team will be appointed on a daily basis as a watchman as under NSI 8, this person will be in contact at all times with crane op & slinger/signaller to warn if there is any chance of encroaching distance or machine & operator malfunction.
- Once merlo is fully rigged crane supervisor will instruct crane raise boom & slew 360 degrees over out riggers & visually check for any subsistence under mats.
- In this case the crane supervisor will carry out slinger/signaller duties as stated in lift plan as this person has the correct training authorisation to carry out these duties.
- Cranes jib/boom will now be extending to a specified length as in lift plan.

- The lifting equipment required will now be brought into work area. All slinging & signalling duties will be carried out by a trained competent slinger/signaller before raising any loads he will check hook block for plumb, Clear area to be lifted at no time will it be permitted to lift over operatives working within this area.
- Tag lines will be attached before lifting to help guide.
- The appointed slinger/signaller will attaché lift equipment to hook block of crane, hand signals are only permitted where there is no chance of blocking view for either crane operator/s.
- Support structures and equipment will be accessed from MEWP's by trained and authorised personnel whilst wearing full body harnesses and restraint lanyards which will be secured to MEWP basket anchor point
- A trained MEWP operator will be positioned on the ground adjacent to the work area to act as banksman whilst manoeuvring and in the event of a mechanical failure
- During this task if the weather should become inclement (high winds) or should there be a lightning risk 1 then the work will be suspended until the weather improves.

Erection of Steel Support Structures and equipment

- All structures prior to erection will be inspected and positioned on wooden packers, no equipment will be placed on the ground
- Structures and equipment will be erected as per manufacturers drawing and O&M Manuals as listed in Section 2
- All fixings will be torqued using a calibrated torque wrench and recorded to the PC Quality Plan
- The merlo will then lift the relevant piece of steelwork as instructed by the AP and it will be lowered into position onto the studs in place, check for level and use shims if required then bolt the structure down securely.
- Cross members and braces will follow using appropriate fixings
- Repeat this for all structures
- The merlo will then lift the PI's, PD, PDES, ES, CB & SA's one at a time into their relevant positions and lower them onto the appropriate steelwork, they will be bolted to the steelwork using the fixings provided.
- PD/ES,ES rotary mobile arms, earthing blades and transmission rods will be aligned in readiness for commissioning

USE OF MEWP

- Access to height shall be by MEWP. Care must be taken when setting up the MEWP that the ground it is to be set up on is even and can support the weight of the MEWP on all of its out-riggers. If necessary, the Lift Appointed Person shall be consulted and to determine ground loading and stability and his decision shall be final in this matter if it is determined that any ground is unsuitable and further re-enforcement or remedial works are required.
- The MEWP shall only be operated by CPCS/IPAF/NPORS accredited operators for the MEWP being utilised. A second suitably authorised MEWP operator must be attendance on the ground at all times whilst the MEWP is in operation to lower the Boom in an emergency. Where there are 2 MEWP in use in close proximity one MEWP operator on the ground will be deemed sufficient minimum cover for emergencies.

Erection of Bus bars and alu. conductors

- Clamps and connectors will be cleaned on the ground by cleaning contact surface with emery cloth, deoxidising with Jizer and applying a liberal coat of Rustilo. Each clamp assembly will be taken by MEWP to each elevated location and secured using the fixings provided.
- Using a non conductive measuring tape, individually measure the distance between Post Insulators for each phase and stranded conductor lengths for each phase and note the sizes.
- Measure & cut the bus-bars to the correct length using a Stihl saw whilst wearing goggles and ear defenders.
- The bus-bars must then be drilled at one end and secured into the clamp using the steel pin provided, making this the fixed end.

- The crane will then lift the bus-bars into position as per drawing ref. where they will be secured using fixings provided.
- All bolts/clamps must be tightened to the appropriate torque settings and Ductor readings taken for each joint and recorded
- The stranded conductor will be taken by MEWP to each elevated location and secured using the fixings provided.
- All bolts/clamps must be tightened to the appropriate torque settings and Ductor readings taken for each joint and recorded.
- Once all work is complete, area shall be cleared of all materials/plant used.
- **Aborting task – the task will be aborted if conditions change or if there is a change in safety conditions.**

7. WORK SPECIFIC EMERGENCY PROCEDURES

- In the event of a site emergency the air horn will be sounded.
- All operatives to move immediately to the muster point located at the Site entrance.

Emergency contact numbers are:-

Site Manager:

Civils Supervisor:

In the event of an emergency, use the PC Verbal Incident Reporting Chain once it is safe and reasonable to do so. The PC verbal incident reporting chain is as follows, site manager to be informed along with SHES adviser.

DO NOT wait until the severity or outcome of the incident is known before reporting.

All accidents, injuries, near misses and environmental or security incidents are to be reported to the PC Site Manager

Full address of the nearest hospital with an operational emergency department:

A&E Hospital address:

High winds will be constantly monitored on site and www.metoffice.gov.uk is checked daily for a long term forecast. In the event that wind speeds pick up above safe levels during works, the Lifting operations will be stopped from working and not returned to service until wind speeds have dropped to safe levels.

Fire Extinguishers must be in place before refuelling of any plant or machinery.

8. MANUAL HANDLING

- All manual handling shall be avoided where reasonably practicable by using mechanical means to handle materials and equipment.
- Operatives to be trained in Manual Handling
- All weights are to be known and personal capabilities are not to be exceeded.
- Team Handling shall be utilised where practicable
- Any operative with a predisposition to muscular skeletal conditions shall be excluded from the handling operation.

9. PERSONAL PROTECTIVE EQUIPMENT (PPE)

The following is to be worn by all Principal Contractor employees, subcontractor operatives and supervisors on the construction site:

- Hard hat
- Lace-up safety boots with mid sole protection and ankle support
- Safety glasses and goggles
- Flame-retardant overalls or coveralls
- Hi-visibility clothing
- Orange vest for banksman
- Ear defenders/protection(as required)
- Full body harness and restraint (lanyard)
- Cut resistant gloves

10. EMERGENCY RETURN TO SERVICE (ERTS)

There will be no ERTS for this task.

11. MATERIALS

- Packing shims
- Bolt packs
- Rags, jizer and rustilo
- Alu-oxide paper
- Steel wire armour
- Cutting/flapper discs

12. PLANT, TOOLS AND EQUIPMENT

- Merlo 360 degree tele-handler, ecky pads and wind speed meter
- 2 no 3te x 3mtr endless slings and 2 leg x 3mtr x 6.7t chains
- Stihl saw
- Hand tools, levels
- Tag lines
- MEWP
- Field equipment earths
- Powder fire extinguisher
- Clamps, bus bars, connectors and alu. conductors
- Calibrated torque wrench
- Support structures & equipment

13. LABOUR

- AP/LS
- Merlo 360 degree Tele-Handler operator
- 4-5 fitters
- 2-3 Wiremen

14. DELINEATION & DEMARCATION

Work and set down area for tools and plant to be demarcated using pedestrian barriers, with signage displayed, or NSI 6 demarcation as put out by SAP

15. SUPERVISORY REQUIREMENTS

- All operatives will be supervised by a site supervisor
- Site supervisor contact details

16. PROGRAMME

- Start date July 2013
- Completion date December 2013
- Work to be undertaken during daylight hours.
- Site hours are 07.30 – 18.00 unless otherwise notified by the PC site management.

17. WASTE MANAGEMENT

Waste material will be removed from site by a licensed waste carrier and deposited at a licensed waste station.

18. ENVIRONMENTAL ISSUES

Any cleaning fluids, cutting compounds grease or lubricants to be used will be stored within the COSHH Store only. COSHH Data Sheets must be available on site and be held on file. Rags, Paper towels that have been used in conjunction with any of these materials will be disposed of within the appropriate bin and stored within the COSHH cabinet until disposed of by an appropriately licensed carrier. All Gas will be stored in an approved container and only transported on site on an appropriate trolley being pulled / pushed by hand.

There are no water courses in the vicinity, or any species living in the area.

19. TRAINING & COMPETENCE

- All tasks will be carried out by or supervised by experienced personnel trained in aspects of Health and Safety, site activity/awareness.
- All operatives to be CSCS / BESC card holders. Permit Holder to be a Competent Person
- IPAF trained personnel only.
- CPCS trained Merlo 360 degree tele-handler operator
- All operatives will have passed a D&A screening and provided a copy of a pass certificate

20 SIGNING ON REGISTER

PERSONS IN ATTENDANCE DURING THE WORK

I, the undersigned, have read, discussed and fully understand the above Method Statement and Risk Assessment for the TASK DESCRIPTION, and will adhere to all its method of working and conditions set down.

PRINT NAME	COMPANY	SIGNATURE	DATE

Once approved, this method statement shall not be deviated from or amended without agreement of the Principal Contractor.

RISK ASSESSMENT

Brief description of work	Shunt Reactor build of new asset equipment			RA ref n° & issue	
Location of work		Project n°		MS ref n° & issue	
Assessed by				Date of creation	
Print name and signature					
Review cycle	Where any significant change to work or environment occurs, a thorough review of their risk assessment must take place and a new method statement written				

HAZARD CATEGORY – WHAT MIGHT GO WRONG											
	Members of public	Operatives	Other		Members of public	Operatives	Other		Members of public	Operatives	Other
1 Fall from height (person)		Y		17 Exposure to vibration *				Other Hazards			
2 Trip / fall on same level		Y		18 Repetitive motion / action				34 lifting Operations		Y	
3 Fall down stairs/steps				19 Collision – moving objects/vehicles		Y		35			
4 Struck by moving object		Y		20 Fire / flammable Atmosphere				36			
5 Struck by falling object				21 Explosion				37			
6 Collapse / overturning				22 Drowning				38			
7 Trapped between objects				23 Asphyxiation				39			
8 Strike stationary object				24 Loss of containment – liquid/gas				40			
9 Manual handling *		Y		25 Adverse weather		Y		41			
10 Contact with tools / equipment / etc		Y		26 Sharp objects		Y		42			
11 Contact with projectiles				27 Radiation *				43			
12 Contact with electricity		Y		29 Exposure to fumes / dust				Other Considerations			
13 Contact with air / water /pressure / pressurised gas / gas / liquid				30 Young persons				1			
14 Contact with heat / cold				31 New or expectant mothers				2			
15 Contact with hazardous substance		Y		32 Environmental threat				3			
16 Exposure to noise				33 Asbestos *				4			

* Additional assessment required for these hazards

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
	Severity (S)				

Acceptable Risk Rating is below 6

Identified Hazard	Aspect of task giving rise to Hazard	Risk Rating Without controls L x S			Control measure	Risk Rating Without controls L x S			Person responsible for methods of monitoring control measure
Contact with electricity	Infringement of exposed HV conductors & OHL while working with mobile crane. (electrocution/Death)	5	5	25	Work only in demarcated areas as agreed with NG SAP PFW,LAC or other Safety Document Access/Egress routes as agreed with SAP and identified on CDM Drawing. All long objects and vehicles over 2.3M shall be escorted by an NSI 8 Full authorised competent person NG safety rules (3rd Edition) to be adhered to at all times Safety distances to be adhered to at all times Field equipment earths to be fitted to protect against impressed voltages Slew restrictor applied before any lifting commences. Member of working party appointed as watchmen to enable to warn of any unforeseen dangers, also in the case of malfunction the emergency stop on outside of cab will be pressed to enable to cease operation.	1	5	5	M&E Supervisor
Fall from height	Working from MEWPs	3	3	9	Visual inspection of equipment prior to use Full body harness and restraint/lanyards	3	1	3	M&E Supervisor

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
	Severity (S)				

Acceptable Risk Rating is below 6

Identified Hazard	Aspect of task giving rise to Hazard	Risk Rating Without controls L x S			Control measure	Risk Rating Without controls L x S			Person responsible for methods of monitoring control measure
					to be used and attached to the MEWP basket anchorage point at all times				
Trip/Fall on same level	Personnel movement around site	3	3	9	Operatives to be aware of local site conditions. Good Housekeeping Safety boots mid-sole and ankle support to be worn. Operatives to use dedicated walk ways	1	3	3	M&E Supervisor
Struck by moving plant	Moving plant/vehicles in the work area	3	5	15	Ensure pedestrian segregation from moving plant were possible. Dedicated walk ways to be used at all times. NSI8 full authorised person to escort all vehicles and long objects over 2.3M Use trained and competent Banksman, Slinger and Signaller at all times	1	5	5	M&E Supervisor
Manual handling	Movement of tools and equipment	3	3	9	Trained and competent personnel Mechanical means of handling to be used where practicable. All equipment and materials are to be placed as close to the work face as reasonably practicable to reduce handling distances All weights are to be known. Personal capabilities are not to be exceeded.	1	3	3	M&E Supervisor
Contact with tools and equipment/etc	Work equipment-Incorrect use/selection of work equipment – leading to cuts and abrasions	3	5	15	Correct selection of equipment to undertake the work task	1	5	5	M&E Supervisor

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
Severity (S)					

Acceptable Risk Rating is below 6

Identified Hazard	Aspect of task giving rise to Hazard	Risk Rating Without controls L x S			Control measure	Risk Rating Without controls L x S			Person responsible for methods of monitoring control measure
					Retractable Stanley knives only to be used with cut resistant gloves Authorised trained competent operatives to use equipment PUWER registers maintained Competent Operatives to inspect record all equipment and report issues to Supervisors Daily Any equipment with faults to be quarantined until Competent Mechanical Engineer has inspected investigated and undertaken repairs				
Contact with Hazardous Substances	Contact with diesel oil while re-fuelling. Cleaning & greasing clamps	4	2	8	Control measures stated within the CoSHH assessment must be adhered to. Ensure correct PPE is worn at all times. Ensure all hazardous waste materials are locked away in COSHH cabinet when not in use.	1	2	2	M&E Supervisor
Adverse weather	Lightning strike / high winds making crane or loads to become unstable/ heavy rain (poor visibility)	3	3	9	CP will call NOC before every shift to gain lightning risk, at lightning risk 1 operation stops. Crane supervisor will gain weather report from met office before starting operation, wind speed will be monitored locally via mobile cranes anemometer at no time will it be permitted to exceed duty charts relating to	1	3	3	M&E Supervisor

RISK ASSESSMENT

Likelihood:		Severity:	
5	Very Likely	5	Fatality
4	Likely	4	Major Injury
3	Probable	3	Moderate Injury
2	Possible	2	Minor Injury
1	Very Unlikely	1	No Injury

Likelihood (L)	5	10	15	20	25
	4	8	12	16	20
	3	6	9	12	15
	2	4	6	8	10
	1	2	3	4	5
Severity (S)					

Acceptable Risk Rating is below 6

Identified Hazard	Aspect of task giving rise to Hazard	Risk Rating Without controls L x S			Control measure	Risk Rating Without controls L x S			Person responsible for methods of monitoring control measure
					wind speeds. In the case of heavy rain if visibility becomes poor so as that crane op or S/S is unable to see then operation will stop until it is safe to proceed				
Contact with sharp objects	Materials handling	4	3	12	Cut resistant gloves to be worn at all times when handling materials	2	2	4	M&E Supervisor
Lifting Operations	Crane collapsing/toppling. Loads falling striking	3	5	15	All operatives to be trained & competent. Crane supervisor to have overall responsibility, to make sure lift plan is followed, to make sure appointed person is contacted if operation changes or cannot be completed. Crane op to rig to crane manufactures specifications, crane op to also operate within cranes duty charts regards wind speeds, never overload or tamper with SWL indicator. Slinger/signaller to be in control of all slinging & signalling duties. S/S to always make sure route to be lifted or slewed over is free from obstructions or personnel.	1	5	5	Crane supervisor

20. Generic SGT Transport and positioning Method Statement

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1. INTRODUCTION

1.1. SCOPE OF DOCUMENT

This Method Statement is concerned with the delivery and installation of 1 No. 170t Transformer to site at Sub-station to the SGT plinth.

Dimensions - 8570mm (L) x 5290mm (W) x 4750mm (H) Weight - 170t

Prior to the arrival of the Transformer on a girder trailer, a 55t mobile crane will be positioned adjacent to the installation plinth. The crane will be used to rig load spreading mats, the skid system and various other equipment used for the installation.

The Transformer will be driven over the mats and positioned in line with the plinth. Using the integral hydraulics of the girder trailer, the Transformer will be raised to a height whereby 100t climbing jacks can be inserted under the Transformer base at each corner. With the climbing jacks positioned, the Transformer is lowered until the weight has been transferred to the climbing jacks.

The front trailer will be disconnected from the girder beam and moved clear of the area. The rear trailer will pull the girder beams clear of the load spreading mats and wedges, after which the girder beams will be disconnected from the rear trailer. The girder beams will be lifted by the crane and loaded to a flat back trailer.

The Transformer will be jacked up to a height sufficient to allow the assembly of stools, skid beams, skates and propulsion system under the Transformer base. The skid beam assembly will be extended over to the plinth. Following final checks, the Transformer will be lowered until the weight of the Transformer is transferred to the skates. Using the propulsion system, the Transformer is skidded along the skid beams until positioned over the plinth.

Using climbing jacks the Transformer is jacked up to allow for the removal of the skidding system. Packing timbers are inserted under the ends of the Transformer to a height which will allow for the removal of the climbing jacks. The Transformer is lowered onto the packing timbers and the climbing jacks removed. 100t conventional jacks are positioned underneath the jacking shelves at one end only and the Transformer is lowered 'end for end' until alignment plates can be introduced. The Transformer will be jacked down onto the alignment plates, positioned above to the centre lines marked on the plinth and jacked down on to the plinth.

It is the aim of the Method Statement to define and describe equipment, safe system of work and procedures that will be employed by the Contractor to conduct the operations in compliance with the current guidance and documentation.

LEGISLATION
Health and Safety at Work Act 1974
Lifting Operations and Lifting Equipment Regulations 1998
Provision and Use of Work Equipment Regulations (PUWER) 1998
The Management of Health and Safety at Work Regulations 1999
APPROVED CODES OF PRACTICE
BS7121 Safe Use of Cranes part 1 – General 2006
BS7121 Safe Use of Cranes part 2 – Inspection, testing and examination
BS7121 Safe Use of Cranes part 3 – Mobile cranes
OTHER
Abnormal Load Engineering Limited General Conditions
Abnormal Load Engineering Limited HSE & Q Procedures

1.2. PARTIES

The relevant parties involved with the operation are:

- Site Owner
- Principal Contractor
- Transformer and Installation Contractor
- Client
- Subcontractor Transport & Lifting
- Mobile Crane Hire

2. MANAGEMENT OF OPERATIONS

Outlined below are the responsibilities of the contractor personnel. This section also details the procedures to follow if a deviation from the original operations procedure occurs.

2.1. THE CONTRACTOR ENGINEER & PROJECT MANAGER

The Engineer will prepare the Method Statement along with all drawings and calculations, which will be checked by the contractor authorised Manager. It is the responsibility of the Project Manager to ensure that the on-site Operations Supervisor is adequately briefed on the content of this Method Statement.

2.2. THE CONTRACTOR OPERATIONS SUPERVISOR

Prior to the commencement of the works the supervisor must ensure that all site personnel are adequately briefed on the contents of this Method Statement. This briefing shall take the form of a short 'toolbox talk'. The supervisor must liaise with the Contractor manager should site circumstances require material change to the methods to be employed during the operation and follow the 'Transport Contractor management of change procedure' provided within this document. It is the responsibility of the supervisor to have completed all safety checklists and briefings as identified within this scope of works.

2.3. MANAGEMENT OF CHANGE

This procedure has been prepared to categorise and authorise any intended deviation from the intended scope of works outlined within this safe system of work. The contractor Operations Supervisor on site is responsible for the work being conducted in accordance with the current approved Method Statement. Any deviation from that approved method is categorised as follows:

2.3.1. Category 1 – (Minor) Deviation

The Contractor Operations Supervisor on site considers a deviation from the intended scope of work to be a small adjustment to meet local site conditions. They must bring this matter to the attention of the client's on-site representative, the principle contractor's representative, the occupier's representative and for items within the HV compound the site SAP. When all agrees that the adjustment is minor and would not introduce any risk to personnel or the integrity and safe operation of the equipment, authorisation to proceed may be approved by both parties concerned by signing of the changes to the Method Statement in the record of changes box provided within the Method Statement.

Any changes must be communicated back to the Engineer / Project Manager and communicated to the work force by means of a toolbox talk, which must also be recorded. The work may then proceed.

Any change from the intended scope of work must comply with the manufacturer's recommendations for the use of the equipment and any associated procedural documentation, i.e. Contractor and client procedures and / or requirements. Where there is any doubt as to the implications changes may have on the safety and / or integrity of the system/equipment or any conflict from the client's representative on site, for whatever reason, this change will become a category 2 – Major and the appropriate category 2 action will apply.

2.3.2. Category 2 – (Major) Deviation

Category 2 deviations are those that the Contractor Operations Supervisor or the client's nominated representative considers to be significant or deviations from category 1 that

become category 2 as identified in 1.5.1 above. Any proposed deviations / changes to the intended scope of work under this category shall be communicated to the Contractor Engineer / Project Manager who will revise the Method Statement and liaise with the client's representative, the principal contractor's representative, the occupier's representative and for items within the HV compound the site SAP to agree any changes for approval prior to commencement of work.

Where necessary, engineering deviations / changes will be approved by the client or nominated third party. On approval, any changes in the Method Statement and / or intended scope of work affecting the safe system of work will be communicated to the work force by means of a recorded toolbox talk.

All deviations and / or changes will be recorded and authorised within the record box provided within this Method Statement.

A record of authorised changes during scope of work is available within the template of any Method Statement devised for the erection and/or operation of any equipment. An example is provided below:

Cat	Date	Change to MS	Action	CONTRACTOR Engineer	CONTRACTOR Supervisor	Clients Responsible Person

Example of a record of authorised changes during the execution of work within an CONTRACTOR Method Statement

2.4. SITE SAFETY

When there is a situation or area on site that any person believes is no longer safe, and the unsafe situation is caused by factors beyond the control of Contractor personnel, the supervisor has the authority to stop all Contractor activities at all times.

The unsafe situation / activities / area will be reported to the client for the client to take measures to make it safe again for the activities to continue.

No Contractor activities will be performed until the situation or area is again made safe for working by the client or the client's agent. Should the measures taken by the client prove inadequate, the works can and will be stopped until adequate steps have been taken.

2.5. TOOLBOX TALK RECORD

The following toolbox talk record is provided for the purpose of recording the initial toolbox talk on commencement of the works under the scope of this Method Statement. A toolbox talk record sheet is also provided within the appendix of this document and should be used to record any future toolbox talks conducted on site. A minimum of one daily toolbox talk should be conducted at the earliest opportunity prior to commencement of works.

The record is to be completed by all Contractor and subcontracted labour personnel employed within the scope work and working to this Method Statement and associated Risk Assessment.

Prior to commencing the operation all site personnel are to sign below to confirm that a clear briefing explaining the job has been given and is understood:

'I am satisfied that I understand the work to be carried out. All known hazards have been identified to me and I have been made fully aware of the control measures in place to reduce any risk to both myself and others'.

Employee Name:	Signature:	Date:
Content of TBT:	Supervisor Signature:	

3. PREREQUISITES AND INITIAL CONDITIONS

3.1. GENERAL

1. Method Statement is subject to approval prior to the commencement of work.
2. Method Statement to be read in conjunction with the attached Risk Assessment Documentation.
3. After any break in the operational procedure, the Contractor Supervisor will have a walk round and a visual inspection will be made of the equipment in its current set up to check that nothing has changed since leaving the work place.
4. Minimum Personnel Protective Equipment (PPE) to be worn on site is as follows:
 - Overalls,
 - Hard Hat,
 - Safety Footwear,
 - Eye Protection,
 - Hearing Protection (to be carried)
 - Gloves,
 - Full Safety Harnesses (Task Specific),
 - Hi Vis Vest.

3.2. RESPONSIBILITIES

1. Client to ensure clear area for working afforded at all times by site.
2. Client to ensure ground preparatory work to be carried out prior to arrival of transport and to be able to withstand the loadings imposed during this operation.
3. Client to ensure centre lines marked on Transformer plinth.
4. Client to ensure entrance to site is prepared as shown in Dwg. no.11111-000.

3.3. CONTROL OF OPERATION

Outlined below are the responsibilities of the Contractors personnel associated with the Contractors on-site operations.

1. The Contractors site supervisor is responsible for the performance of the operational disciplines, which can be divided into two main areas, namely on-site operations and equipment maintenance.
2. All operations associated with the installation of the Transformer are under the direct control of the CONTRACTOR site supervisor.
3. After any break in the operational procedure, the CONTRACTOR Supervisor will have a walk round and a visual inspection will be made of the equipment in its current set-up to check that nothing has changed since leaving the work place.
4. In the unlikely event of a breakdown the CONTRACTOR operators are capable of fixing most problems that could occur.
5. Should a problem occur that the CONTRACTOR operators can't resolve other CONTRACTOR maintenance engineers are available on call to assist in rectifying any equipment malfunction in the shortest possible time.

5. OPERATIONAL PROCEDURES

On the days that the operations will take place there will be a 'toolbox' talk prior to the start of activities that will review the following items:

- a) Procedures, requirements and details specified in the work plans and drawings.
- b) Review of safety items such as weather concerns, plant activity, escape routes, contingency plans, locations of fire-fighting and personal safety equipment etc.
- c) Review of National Grid safety document.
- d) Designate key personnel, such as banksman, slinger-signaller, tagline handlers etc.
- e) Complete and sign off all appropriate checklists and safety permits.
- f) Check the placement of all banners and barricades that define the safety boundaries of the work areas.
- g) Discuss and give due consideration to any additional appropriate steps that any participant feels is necessary to perform a safe and timely operation.

4.1. OPERATIONAL PROCEDURE

Note: Control measures are outlined in italics under each task.

Item Checked	Checked
Supervisor briefing	
Site Induction attended by all personnel	
Method Statement available for all personnel	
Tool Box talk carried out and recorded	
Certification for all equipment available	
Exclusion zones marked with hazard tape	

1. The mobile crane will arrive on site and be positioned as per Dwg. No. 33333-000. The crane will be rigged as per crane manufacturer's instructions.

The crane will require an escort through site by the SAP.

Prior to starting crane operations, CONTRACTOR to check with site the lightning risk.

Field Equipment earth to be fitted to the crane

2. Prior to the arrival of the Transformer, all CONTRACTOR equipment will arrive on 13.6m flat top trailers. All items will be offloaded using either a telehandler or the mobile crane.

IMPORTANT: *If fitted to the tele-handler, outriggers must be used as per the manufacturer's recommendations when unloading equipment from the trailers. The area next to the trailer where the tele-handler is to be positioned must be level and free from defects that may cause the telehandler to tilt during unloading.*

Prior to operation the attached Tele-handler Guidance Booklet must be read and pages 24 to 26 filled in for the machine being used.

During operation of the tele-handler, the operation is under the control of one banksman.

Items will be unloaded where possible using the tele-handler to avoid operators working on the trailer bed. Items over 3t or overly large items will be lifted off the trailer using the mobile crane inside the CONTRACTOR working area. Operators will use fall arrest block attached to cranes hook block whilst operating on trailer bed.

3. The initial CONTRACTOR equipment will be set up as per Dwg. No. 33333-000.

The Lift Supervisor will check all lifting tackle before use and will ensure tag lines are employed by slinger-signallers when lifting large items such as skid beams and loadspreading mats.

The crane will require an escort through site by the SAP.

Prior to starting crane operations, CONTRACTOR to check with site the lightning risk.

Field Equipment earth to be fitted to the crane.

Field earth equipment will be attached to each skid beam run.

4. The load spreading mats and wedges will be positioned using the tele-handler or the 55t mobile crane, the Transformer will arrive on a 16 axle girder trailer and will be positioned over the load spreading mats. See transportation arrangement drawing 123456-001 sheet 1

Working at height on trailers requires the use of taglines and a harness.

5. Climbing jacks will be positioned at each corner under the Transformer base. See drawing 44444-000 Sheet 1 Stage 1.

Jacking equipment including lubricants, power pack, jacks and hoses are to be inspected and tested with the pre-operational checklist completed appropriately.

6. Once the climbing jacks are in place, the Transformer will be lowered off using the trailers integral hydraulics until the jacks are taking the full weight of the Transformer and the girder beams will then be lowered to the mats before disconnecting the front trailer.

7. The rear trailer will pull the girder beams clear of the mats and wedges with the aide of skates and then disconnected and removed using the crane.

8. Using the climbing jacks the Transformer is raised to approximately 1100mm sufficient to allow support stools, skid beams and propulsion system to be inserted beneath the transformers base and extended over the transformer plinth as shown in drawing 44444-000 Sheet 1, Stage 2.

The operators where possible will maintain clear visibility and direct communication during jacking and skidding operations.

The track is levelled through the use of a dumpy level and a spirit level and shimmed as necessary.

The propulsion system and skates are checked prior to use and the pre-operational check list completed.

9. The Transformer is lowered onto the skates until the climbing jacks come free and the weight is transferred through the skates. The jacks and timbers can now be cleared from the area as per drawing 44444-000 Sheet 2, Stage 3.

10. The Transformer is skidded approximately 20.6m onto the plinth with the use of push/pull rams, the rams may require moving from pulling the Transformer to the rear to push the remaining distance as shown in drawing 44444-000 Sheet 2, Stage 4.

If the rams are moved only one cylinder is to be changed at a time to keep the transformer braked at all time.

11. Once the centre line of the Transformer is above the centre line of the plinth, climbing jacks are re-positioned beneath the base of the Transformer in all four corners. The jacks are used to jack the Transformer clear of the skid system to allow the removal of the skates, propulsion system, skid beams and stands using the crane shown in drawing 44444-000, Sheet 3, Stage 5 and 12345-001 Sheet 1 for the lifting study details.

12. The Transformer is then jacked down to the climbing jacks final stroke, where 2 No. 100t conventional jacks are introduced underneath the Transformers jacking lugs to jack the Transformer initially to a height where the climbing jacks can be removed.

13. Once removed, the Transformer is jacked down end for end in 75mm increments using the conventional jacks until it is resting on Teflon alignment gear as shown in drawing 44444-000, Sheet 4, stage 7.

Conventional jacking equipment to be checked prior to use and the pre-operational checklist completed.

14. Using the alignment gear, the Transformer is final aligned to centre lines marked on the plinth.

15. Final alignment of the Transformer will be taken place through the use of hand jacks and Teflon alignment gear.

16. Once the position is confirmed by the client the Transformer will be jacked up off the alignment gear and anti-vibration pads will be installed by others before being jacked down onto the plinth as per drawing 44444-000 Sheet 4, Stage 8.

17. All remaining equipment will be demobbed from site using the crane and telehandler where applicable.

During operation of the telehandler the operation is under the control of one banksman.

Items will be unloaded where possible using the telehandler to avoid operators working on the trailer bed. Items over 3t or overly large items will be lifted off the trailer using the mobile crane inside the CONTRACTOR working area. Operators will use fall arrest block attached to cranes hook block whilst operating on trailer bed.

Prior to starting crane operations, CONTRACTOR to check with site the lightning risk.

CONTRACTOR operators who require to work on the trailer bed will do so wearing safety harnesses connected to a fall arrest block attached to the cranes hook block.

Item	CONTRACTOR AP/Supervisor Signature	Client Rep. Signature
Transformer is in the correct position on SGT plinth and no damage noted		

5. TOOLS AND PLANT

Plant

- 55t mobile crane
- 3.5t telehandler (JCB 535-135)

See Section 12 Appendices for specifications.

Equipment

- Loadspreading mats and wedges
- skid system
- 8 No. 330mm Support Stands
- 18 No. 500mm High Drum Stands
- 5 No. 100t climbing jacks
- 4 No. 100t conventional jacks
- Diesel jacking engine
- 100x100x1000mm jacking timber
- 75x150x1000mm jacking timber
- 150x150x1000mm jacking timber
- Steel shims
- Timber and plywood shims
- Rigging box
- Teflon Alignment Gear

6. LABOUR

On site there will be a minimum of 5 personnel on site at any one time and a maximum of 12. The minimum personnel to include:

- CONTRACTOR Site Supervisor
- CONTRACTOR Engineer/AP as required
- 3 No. Operators / Banksman

All other personnel be made up of transport crew who may be onsite for only small periods of time.

7. TRAINING AND COMPETANCE

All operatives to be NG Person & BESC.
Plant operators to be CPCS or equivalent.

Appointed Person to be CPCS

8. WELFARE

Toilets and mess rooms for the CONTRACTOR personnel to be supplied onsite.

9. WASTE MANAGEMENT

The CONTRACTOR anticipates no waste unless there is a requirement to use spill kit granules. If there is no waste facility onsite for this material the CONTRACTOR will remove waste from site and dispose of it at its own facility.

10. PROJECT DRAWINGS

DRAWING NUMBER	SHEET	DESCRIPTION
11111-001	1 to 1	Transportation Arrangements
22222-004	1 of 1	Swept Path (Gate Entrance)
33333-010	1 of 1	Lift Plan
44444-000	1 of 4	Installation of the Transformer

11. TEMPORARY WORKS

Temporary works will be used during the installation of the Transformer. See attached calculations for verification.

12. CERTIFICATION

All transport and lifting equipment is to have current test and/or inspection certification at the time of the operation.

Copies of the test and inspection certificates will be available from the Project Site Supervisor.

13. RISK ASSESSMENTS AND ASSOCIATED DOCUMENTS

21. ERECTION AND DISMANTLING OF
SCAFFOLDING AND NETTING TO
MINOR AND MAJOR ROAD
CROSSINGS

GENERIC WORK INSTRUCTION

SAFE WORK PROCEDURE		SWP/TRANS/007	
ERECTING & DISMANTLING SCAFFOLDING TO MAJOR (NETTED) ROAD CROSSING			
DATE	20/01/10	REVISION	B



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Erecting / Dismantling Scaffolding & Netting To Minor & Major Road Crossings (Where Netting is deemed necessary)

- Only after agreement with electricity board and/or contractor and with circuits made dead or it deemed by electricity company there be safe and sufficient clearance for scaffolding to be erected will operatives commence work in erecting scaffolding.

a) Materials to be Delivered to Site by One of the Following Operations:-

- All traffic management organised for the loading /unloading of goods vehicles on public highways while delivering and or collecting materials from / to sites is to be carried out by suitably competent personnel (i.e. Holders of **NRASWA** Certificate for - Unit 10 '**Signing, Lighting and Guarding**').

Road vehicle to be unloaded while on public carriageway or verge

- Before goods vehicle pulls up and stops on road / verge alongside scaffold positions for unloading scaffold materials, sufficient road signs and cones are to be set out in accordance with procedures laid down in booklet '**Safety at Street Works and Road Works**'. **Stop/Go Boards**, **Traffic Lights** to be used on customers' instruction after his consultations with *local highway authority*.
- Operatives engaged in unloading goods vehicles or erecting scaffolds on roads/verges must wear an approved pattern '**high visibility yellow vest**' to class 3 BS EN 471
- Any vehicle stopping on road/verges while unloading to illuminate amber flashing lamps.
- When unloading goods vehicles positioned on carriageway/verges operatives should take care and ensure materials do not encroach upon carriageway beyond coned off areas/vehicles body (i.e. swinging tubes/boards around).
- Materials to be taken off rear of goods vehicle within confines of coned off area or from side of goods vehicle while adjacent to road edge.
- Where '**Hiab**' type vehicle cranes are to be used for unloading :-
 - Operatives should be especially careful not to allow materials while in raised position to swing out, impeding carriageways beyond coned off areas.
 - '**Hiab**' type crane to be operated by competent personnel only.
 - All personnel to stand clear of loads while slung in raised position.

Vehicle to be unloaded on private property (ie Behind highway authority boundry)

GENERIC WORK INSTRUCTION

SAFE WORK PROCEDURE		SWP/TRANS/007	
ERECTING & DISMANTLING SCAFFOLDING TO MAJOR (NETTED) ROAD CROSSING			
DATE	20/01/10	REVISION	B



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- Where permission has been obtained goods vehicles may enter fields and where possible, keeping to agreed accesses drive up alongside scaffold position and unload in field, thus elevating the need for road signs, cones etc while unloading.
- If access cannot be made through field via goods vehicle arrangements should be made to transport materials from goods vehicle to scaffold location using tractor and trailer or other suitable off road vehicles.
- Transferring of materials from goods vehicle to off road vehicle should be carried out while vehicles are positioned off public roads / carriageways.

NOTE Any special arrangements for road management to particular scaffold positions as required by *highways authority* will be detailed on additional attached pages.

Storage of Materials

Where materials are to be unloaded on road verges: -

- Operatives to ensure no materials are stacked within 500mm of road edge.
- Materials to be stacked to prevent movement, especially at end of each working day when materials are to be left overnight.
- Sufficient cones, road signs and/or temporary barriers erected utilising high visibility red fencing to cordon off materials from road edge where necessary.
- Materials to be so position so as not to impede any public footpaths, bridle way or right of way.
- Where materials are to be stored in fields/private property, as with storage of materials on roadside verges, materials should be stacked carefully and in a tidy manner.
- Materials to be stored in position in accordance with safe working procedure if erection of scaffold involves working under or near live overhead lines.

b) Erection of Scaffold Structures

- All erection and / or dismantling of scaffolds to be carried out by competent personnel.
- Scaffolds to be erected to sides of road in accordance with design drawing or site work instruction issued for the job in hand.
- Position of scaffolds to be pegged out by, or indicated on site by, with customers engineer as per Design Drawing / Site Work Instruction and in accordance with **Highway Authorities**

GENERIC WORK INSTRUCTION

SAFE WORK PROCEDURE	SWP/TRANS/007
ERECTING & DISMANTLING SCAFFOLDING TO MAJOR (NETTED) ROAD CROSSING	
DATE	20/01/10
REVISION	B



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requirements agreed prior to commencement of work. Scaffold positions in relation to road edge to be to highway authorities requirements :-

Minor Roads

- (i) Scaffolds erected 2.00m from edge of road (To alleviate the need for temporary lighting and reflective barrier fencing).
- (ii) Scaffolds erected 4.50m from edge of road (Where A.I.P principals for major truck roads are to be adopted) if instructed by **Highways Authority**.
- (iii) Scaffolds erected from edge of road at distance instructed by **Highways Authority**.
- (iv) Scaffolds to be erected 1.50m behind crash barriers and / or concrete barriers to allow for deflection if vehicles collide with barriers.

Trunk Roads / Major 'A' Roads to A.I.P. Agreement (Motorways & Dual Carriageways)

- (i) Scaffold erected 4.50m from edge of road or as agreed with Highway Authority
 - (ii) Scaffold erected 1.50m behind crash barriers and / or concrete barriers to allow for deflection if vehicles collide with barriers.
- Where scaffolds are to be erected on verges to side of roads:-
 - (i) Operatives to wear approved pattern high visibility vests.
 - (ii) Cones /road signs to be placed to road edge adjacent to scaffold position.
 - Scaffolds while being based out are to be set out ensuring uprights are not placed over / adjacent to services access / manholes so as to obstruct access.
 - Operatives to ensure materials do not impede carriageways or occupied public footpaths when man-handling materials into position during erection of scaffolds. Where possible materials should be man-handled up scaffold from ends.

Procedures Carried-Out at end of each Working Day Shift

Where scaffolds are left incomplete at end of work period the following points should be addressed: -

- Where the scaffold have not been completed, temporary guys and anchors are to be installed and fixed to provide stability at end of each days work / or during adverse weather conditions. The design drawing should be referred to ascertain the number and at what level of scaffold erection anchorage and guy ropes are required to provide stability to in complete scaffolds

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- At the end of a days work, where scaffolds are incomplete or during adverse weather conditions, all loose boards and materials to be temporary secured / tied down on scaffold or lowered to ground, including hand lines used for lifting / lowering of materials.
- **'Danger of Death'** signs to be fixed to each elevation of scaffolds at maximum 6.00m centres above the anti climbing level.
- **'Scaffold Incomplete Do Not Use'** signs to be affixed.
- When base and first lift of scaffold structure has been completed the barbed wire anti climbing should be fixed in position. The barbed wire anti-climbing will consist of strands of barbwire positioned against uprights with strands fixed in between at approximately **305mm** (12") centres at the first lift level approximately **2.50m** minimum. Additionally at the same level (unless ground level configuration requires otherwise), transoms and ledger tubes will extend beyond the scaffold face approximately **1.20m** to form outrigger tubes on which an extra **5N** barbed wire strands will be fixed at approximately **250mm** centres (10"). Barbed wire to be fixed with wire bag ties to transoms / ledgers at 1.50m centres. Extended transoms acting as outriggers should be erected at each upright position and at each intermediate position between uprights along length of scaffolds.
- Operatives to be supplied with necessary **PPE** for fixing and removal of barb wire (i.e. gloves etc)
- Where scaffold elevations are adjacent to public areas / footpaths the customers engineer should be made aware of the proximity of the public foot paths / areas to the scaffold elevations. The following additional measures to the anti climbing should be suggested for use in these circumstances
 1. Chestnut fencing 1.20m high fixed along elevations of scaffold adjacent to public foot paths / areas.
 2. Red plastic high visibility barrier 1.00m fixed along elevations of scaffold adjacent to public foot paths / areas.
 3. A combination of both the above.

Installation of anchorage

- No anchorage or driven tubes for stabilising scaffold structures are to be installed prior to permission being given by the customer, who must ensure they are no underground services present where anchorage / driven tubes are to be installed.
- Site Supervision / Operatives to ensure all underground services locations, when present within the scaffold structures anchorage positions, have been clearly marked out/indicated on site by the customers engineer prior to any driven tubes or anchorage installed into ground.
- Where necessary customers engineer to arrange for personnel from the appropriate utility company to clearly mark out and indicate position of underground services on site in vicinity of anchorage positions.

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- No anchorage is to be installed within 3.00m of any underground service indicator and / or markers.
- Should there be any doubt or confusion regarding the location of the under ground services, scaffold operatives must seek clarification from customers engineer prior to any attempt to install anchorage / driven tubes.
- During erection of scaffold structures anchor tests will be carried out on site to determine actual loads anchors will sustain (When considered appropriate). Where anchor load readings are less than those required (see Design Drawings / Site Work Instruction for anchor load requirements). Supervision to liaise with design office to determine number of additional anchors needed to be installed based on the readings obtained from anchor tests.

Installation (Stringing) Of Netting between Scaffold Structures

The netting operation will be carried out to a method agreed with the local highway authority and / or police prior to netting work commencing.

- On completion of scaffold erection to each side of road, netting will be pulled onto top of scaffold to one side of road and laid out along its length then prepared ready for clipping onto ropes.
- Netting temporary secured to scaffold to prevent movement in adverse weather conditions prior to being strung over road.

Prior to traffic being stopped for net stringing operations the following will be carried out: -

- All operatives required to encroach upon highway will wear approved pattern high visibility vests.
- Polypropylene fibre ropes are to be uncoiled and made ready for use as hand line. The length of rope required for the operation will be approx. 1.5 times span across road between scaffold, with a snap hook fixed to end of the rope length.
- One end of fibre rope will be lifted up the scaffold structure to one side of the road and temporary fastened off at top lift position.
- The wire catenary ropes will be uncoiled with the leading end taken up the front elevation of the scaffold structure at upright positions. They will be pulled over the top ledger and then lowered back down to ground level to the scaffold structure on the opposite side of the road to scaffold with fibre rope hand line as described previously.
- When all preparations for netting have been completed traffic will be controlled to allowing netting work to be carried out by a method agreed or arranged by customer with local highway authority and or police, usually being one of the following:-

Traffic Control for Single Carriageway Roads

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Traffic to be controlled as per agreement with local authority / police usually by one of the following methods: -

- Traffic stopped using *stop / go boards*, along with all other relevant road signs (all as detailed in '**Safety At Street Works And Road Works - 'A Code Of Practice'**').
- Traffic stopped by using traffic lights, along with all other relevant road signs (all as detailed in in '**Safety At Street Works And Road Works - 'A Code Of Practice'**').
- Traffic stopped by and with *Police* presence. All operatives to follow instructions given by police officer in charge. A method to be agreed with police on how their instructions will be relayed to scaffolding operatives / supervision prior to any work commencing.

All personnel involved will wear the appropriate approved pattern high visibility vests.

Traffic Control for Major 'A' Roads / Trunk Roads (Dual Carriageways / Motorways)

Traffic to be controlled as per agreement with local authority / police usually by one of the following methods :-

- Traffic controlled by police presence / and their method of working (Rolling Block etc).
- Traffic controlled by method determined by local highways authority, i.e. traffic lights operated by highways personnel, road closures etc.

Sequence for Traffic Control using either Traffic Lights or Stop/Go Boards

- Only after all road signs and *Traffic Lights* or *Stop/Go Boards* are in position as per '**Safety at Street Works and Road Works**' will operations commence.
- One operative will be tasked (designated) with operating the *Traffic Lights* or co-ordinating with operatives responsible for **Stop/Go** Board operation.
- When road is clear of traffic in both directions the *Traffic Lights* or *Stop/Go Boards* will be set to **Stop** in both directions on the instruction of the designated operative.
- When operatives are assured lights are on stop, and traffic is under control, scaffold erection or dismantling / netting installation or removal will commence (**See procedures as follows**).
- Work will continue until traffic starts to build up and tail back from traffic lights in either or both directions. The designated operative tasked with controlling the traffic lights or stop/go boards will maintain vigilance, and determine when to stop scaffold operations. Traffic will not be held waiting for more than 5 minutes at any one time.

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- On deciding to let traffic flow through the work area after being held under control for the limited 5 minute work interval, the designated operative will instruct operatives to cease work, secure any loose equipment and retire to a safe area.
- When the work area has being cleared of materials and operatives removed themselves to a safe area, the *Traffic Lights* or **Stop/Go Boards** will be set to **Go** on the designated operative's instruction to allow traffic to move.
- After the traffic has flowed through the work area and the road is once again clear of traffic approaching the work area in either direction, will the designated operative repeat the previous operation. The *traffic lights* or *Stop/Go Boards* will be set to **Stop** at each end of the work area (both directions) and instructions for work to re-commence will be given when the work area is clear and traffic is under control.

Work to be carried out with Traffic Management in Operation.

- When nominated personnel/police supervising traffic management have safely stopped traffic in both directions and give permission for work to proceed will work begin to string netting - (Note all personnel who encroach upon highways must wear the appropriate approved pattern high visibility vest 'Yellow').
- Firstly operatives will pull free end of fibre rope hand line out over road, to opposite scaffold, where catenary rope ends will be to base of scaffold at upright positions.
- Fibre rope hand line will be attached for first wire rope catenary at one end of scaffold via snap hook.
- Fibre rope hand line with catenary rope attached will be pulled over from one scaffold to scaffold on opposite side of road.
- The catenary rope will be taken off snap hook and attached to scaffold, the loose end of the catenary rope will then be pulled back and tensioned to give correct sag and fastened to scaffold on opposite side of road. Fibre rope hand line with snap hook will be lowered to ground level. After checking with the nominated person/police officer supervising traffic control that it is safe for work to carry on, the fibre rope hand line be pulled out over the road again and attached to the end of the second wire rope catenary via snap hook and previous procedure repeated.
- The procedures described will be repeated until all wire rope catenaries have been pulled over road and strung between scaffolds and safely secured.
- Netting clipped at 1.00m centres to each end of catenary rope.
- Polypropylene fibre hand line rope / snap hook taken over road and lifted up on to top lift position stretching out between both scaffolds and fixed to leading edge of netting.

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- Netting then pulled out over supporting catenary ropes.
- Net squares pulled over top of tubes of top lift level to scaffold to hold netting in position and clipped to scaffold in centre of each bay, to scaffolds each side of road.
- Fibre rope coiled up and taken down scaffold on completion of netting.
- During installation of netting/wire rope catenaries, operatives prior to entering/crossing carriageways should check it is still safe to do so with the nominated person/police officer supervising traffic management.
- During netting operations, work maybe suspended by the nominated person / police officer supervising traffic control to allow traffic to pass prior to operations re-commencing.
- After netting work has been completed any traffic control arrangements i.e. *Stop/Go Boards, Signs, Traffic Lights* etc to be removed from site.

Procedures Carried-Out On Completion Of Scaffold Erection.

On Completion of scaffold structures charge hand / operatives to ensure:-

- Scaffold structure erected to Site Work Instructions / Design Drawing where appropriate
- All anti-climbing completed to specification.
- **'Danger of Death'** signs fixed as specification.
- All spare materials if on road verges if on road verges stored ready for collection if being collected within 24 hours and surrounded with cones and or barrier fencing. Alternatively if materials are not to be collected within 24 hours stacked and where possible tied down to scaffold, within scaffold base surrounded in barb wire / chestnut fencing anti-climbing deterrent.

c) Commissioning of Scaffold

- When required by customer, Charge hand / Site Supervisor, on inspection of scaffold after completion, will issue relevant **"Handing Over Certificate"**
- Inspection of scaffold structures will be carried out using guide lines detailed on Dixon Scaffolding (Transmission) Limited **'Handing Over Check List'**
- Inspections may be carried out with customer's engineer when requested by customer.
- Before Handing Over Certificates are issued, Dixon Scaffolding (Transmission) Limited Site Supervisor / Charge hand will ensure the scaffold structure is per the customers requirements.

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- After **Handing Over Certificate** has been issued any prohibition signs '**Scaffold Incomplete - Do Not Use**' will be removed.

d) Dismantling of Scaffold Structure and Clearing Site

Scaffolding is to be dismantled in reverse sequence to erection sequence taking into account the following: -

- All operations / procedures for erecting scaffolds i.e. road signs, cones, traffic lights, stop / go boards etc will apply the same to the dismantling of scaffolds, but in reverse order when and where appropriate
- All **Highway Authority** requirements will be the same for dismantling scaffolds as they were for the erection of scaffolds.
- Materials to be stacked safely and in locations so as not to impede further works from being carried out and lorries from being loaded.
- At the end of each working day all loose materials will be lowered to ground level. Nothing loose will be left on scaffold at height over night.
- During adverse weather conditions boards used by operatives for access during dismantling phase will be lowered or made secure.
- As with erection sequence, during the dismantling of the scaffold structures, temporary guys will be used as and when necessary to provide stability to incomplete scaffolds.
- After scaffold structures have been dismantled, anchorage retrieved from ground and materials loaded on lorries, a thorough check will be made of the site, making use of metal detectors, to ensure all materials have been cleared from site, including any accumulation of rubbish etc.

After operatives have checked sites, to the satisfaction of site supervision and management of Dixon Scaffolding (Transmission) Limited a '**Site Clearance Certificate**' will be issued to the customers authorised representative on site, if requested.

22. WPD SUBSTATION METHOD
STATEMENTS (AVONMOUTH,
CHURCHILL, PORTISHEAD &
SEABANK)

Construction at Avonmouth 132kV BSP Substation

Description

A Bulk Supply Point (BSP) substation is the electrical interface point between the high voltage transmission network and the distribution network owned by the Distribution Network Operator (DNO), in this case Western Power Distribution (WPD). Substations are a method of controlling power flows and voltages between the transmission system and distribution system. A transformer within a BSP substation will change (or “transform”) the level of a voltage from one value to another value. Transformers generally reduce a voltage from a higher level to a lower level. Due to the magnitude of Transmission Voltages (hundreds of thousands of volts), the voltage reduction equipment is referred to as a Grid Transformer (GT). Other components within the BSP includes switchgear, steel support structures, welfare accommodation, ancillary buildings, backup diesel generator, oily water interceptor and a low voltage electricity supply connection.

Avonmouth BSP is an existing substation that requires modification as part of the F Route removal. It contains two GTs to reduce the voltage from the transmission system at 132kV to the 33kV required in the area to allow onward distribution of the electricity to homes and businesses.

The extension to the substation will utilise 132kV air insulated switchgear (AIS) for outdoor use. This equipment is required for safe operation of the network and to isolate any faults that may occur on it. The maximum height of new electrical equipment in the substation will not exceed that of the existing equipment and buildings.

The detailed design of the proposed substation is still preliminary and will be confirmed based on planning, technical and commercial considerations.

Construction

The construction activities will use the existing permanent access road to the substation. The following information is provided to guide the assessments although this may be subject to some refinement before the DCO application is granted.

A contractor's compound and office would be established in the vicinity of the development (compounds will be shared where appropriate) to house the staff during the working day, as well as equipment and materials for the works. The substation is accessible for heavy goods vehicles and has an area of hardstanding within WPD landownership with suitable services for these purposes. The compound will be shared with the cable installation and overhead line installation contractors to make best use of available land. The construction compound area will generally comprise temporary portacabin style accommodation units for the purposes of activities associated with the site, project and safety management of the construction site. Further temporary facilities will be provided for the statutory provision of welfare facilities for construction site workers. There will also be allocated regions for the delivery and storage of materials and the removal (where required) of excavated material and waste items.

The initial preparatory works for the substation extension will comprise the temporary removal of topsoil and the installation of a temporary stone capping within areas of the substation construction area to provide a clean and stable working platform. Where required, excavations, piling and concrete foundations will be provided for the substation electrical equipment. A copper earth grid will be installed below the ground to create an “earth mat” to make the compound electrically safe. The substation support structures and electrical equipment will then be erected.

Prior to completion of the substation commissioning tests will be required, starting with testing the individual items of plant and culminating with testing the installed system as a whole. Following successful testing, the substation will be connected to the electricity transmission system.

The construction work will take place during hours agreed with the Local Planning Authority (LPA). Lighting may be provided to create safe construction areas and for security.

Pollution, dust and noise will be prevented and controlled in accordance with construction regulations, industry construction practice and agreements with the LPA.

Excavations will be carried out through a combination of hand and mechanised methods.

In addition to mechanised excavators of various sizes, mobile elevated work platforms (MEWPs or cherry-pickers), cranes, soil compaction equipment, drills, piling rigs, cutting equipment (gas and electrical), equipment used in the preparation and pouring of concrete and testing equipment will be among the equipment used. The final list of equipment and machinery used will only be known once the detailed design for the development is completed.

Although the construction duration will be subject to the outcome of commercial processes such as tendering, it is envisaged that construction will start in 2015 (in the form of some preparatory works) and be completed in 2018. This will also be subject to the availability of system outages on the WPD network to allow the new equipment to be connected.

Maintenance

The substation would be unmanned. Maintenance of the BSP substation would be undertaken during a rolling 3 year cycle, which involves electrical isolation of the appropriate equipment. Visual checks would be undertaken on a monthly inspection visit to the site. If the BSP substation requires refurbishment and/or replacement works, vehicles will be used to carry workers in and out of site and suitable vehicles will be used to bring new materials and equipment to site and remove old equipment.

Decommissioning

The lifespan of the substation equipment is approximately 40 years. If its useful life has expired and it is to be removed, the equipment will be safely disconnected from the transmission system and carefully dismantled. Much of the dismantled substation equipment will be taken for recycling. Similar methods and equipment will be required as for construction.

Construction at Churchill 132kV BSP Substation

Description

A Bulk Supply Point (BSP) substation is the electrical interface point between the high voltage transmission network and the distribution network owned by the Distribution Network Operator (DNO), in this case Western Power Distribution (WPD). Substations are a method of controlling power flows and voltages between the transmission system and distribution system. A transformer within a BSP substation will change (or “transform”) the level of a voltage from one value to another value. Transformers generally reduce a voltage from a higher level to a lower level. Due to the magnitude of Transmission Voltages (hundreds of thousands of volts), the voltage reduction equipment is referred to as a Grid Transformer (GT). Other components within the BSP includes switchgear, steel support structures, welfare accommodation, ancillary buildings, backup diesel generator, oily water interceptor and a low voltage electricity supply connection.

Churchill BSP is an existing substation that requires extension and modification as part of the F Route removal. It contains two GTs to reduce the voltage from the transmission system at 132kV to the 33kV required in the area to allow onward distribution of the electricity to homes and businesses.

The extension to the substation will utilise 132kV air insulated switchgear (AIS) for outdoor use. This equipment is required for safe operation of the network and to isolate any faults that may occur on it. The maximum extension of the proposed substation fenceline will be 10m to the south and 12m to the north. The maximum height of new electrical equipment in the substation will not exceed that of the existing equipment.

The extension to the substation will be largely constructed on impermeable concrete surfaces, surrounded by areas of permeable stone chippings. The impermeable surfaces will mostly be around the base of structures and stays, below and around the ground mounted equipment like transformers and marshalling kiosks and where new troughs are installed. The substation will be secured with an electrified palisade fence approximately 3m high and will use the existing permanent access road from the public highway.

The detailed design of the proposed substation is still preliminary and will be confirmed based on planning, technical and commercial considerations.

Construction

The construction activities will use the existing permanent access road to the substation. The following information is provided to guide the assessments although this may be subject to some refinement before the DCO application is granted.

A contractor's compound and office would be established in the vicinity of the development (compounds will be shared where appropriate) to house the staff during the working day, as well as equipment and materials for the works. The substation is accessible for heavy goods vehicles and has an area of hardstanding within WPD landownership with suitable services for these purposes. The compound will be shared with the cable installation and overhead line installation contractors to make best use of available land. The construction compound area will generally comprise temporary portacabin style accommodation units for the purposes of activities associated with the site, project and safety management of the construction site. Further temporary facilities will be provided for the statutory provision of welfare facilities for construction site workers. There will also be allocated regions for the delivery and storage of materials and the removal (where required) of excavated material and waste items.

The initial preparatory works for the substation extension will comprise the temporary removal of topsoil and the installation of a temporary stone capping within areas of the substation construction area to provide a clean and stable working platform. If possible, the permanent site boundary perimeter fencing will be extended early in the construction programme to secure the construction area. This will include its electrification. Where required, excavations, piling and concrete foundations will be provided for the substation electrical equipment. A copper earth grid will be

installed below the ground to create an “earth mat” to make the compound electrically safe. The substation support structures and electrical equipment will then be erected.

Prior to completion of the substation commissioning tests will be required, starting with testing the individual items of plant and culminating with testing the installed system as a whole. Following successful testing, the substation will be connected to the electricity transmission system.

Some of the existing equipment in the substation will be reconfigured and upgraded to accommodate the substation extension.

The construction work will take place during hours agreed with the Local Planning Authority (LPA). Lighting may be provided to create safe construction areas and for security.

Pollution, dust and noise will be prevented and controlled in accordance with construction regulations, industry construction practice and agreements with the LPA.

Excavations will be carried out through a combination of hand and mechanised methods.

In addition to mechanised excavators of various sizes, mobile elevated work platforms (MEWPs or cherry-pickers), cranes, soil compaction equipment, drills, piling rigs, cutting equipment (gas and electrical), equipment used in the preparation and pouring of concrete and testing equipment will be among the equipment used. The final list of equipment and machinery used will only be known once the detailed design for the development is completed.

Although the construction duration will be subject to the outcome of commercial processes such as tendering, it is envisaged that construction will start in 2015 (in the form of some preparatory works) and be completed in 2018. This will also be subject to the availability of system outages on the WPD network to allow the new equipment to be connected.

Maintenance

The substation would be unmanned. Maintenance of the BSP substation would be undertaken during a rolling 3 year cycle, which involves electrical isolation of the appropriate equipment. Visual checks would be undertaken on a monthly inspection visit to the site. If the BSP substation requires refurbishment and/or replacement works, vehicles will be used to carry workers in and out of site and suitable vehicles will be used to bring new materials and equipment to site and remove old equipment.

Decommissioning

The lifespan of the substation equipment is approximately 40 years. If its useful life has expired and it is to be removed, the equipment will be safely disconnected from the transmission system and carefully dismantled. Much of the dismantled substation equipment will be taken for recycling. Similar methods and equipment will be required as for construction.

Construction at Portishead 132kV BSP Substation

Description

A Bulk Supply Point (BSP) substation is the electrical interface point between the high voltage transmission network and the distribution network owned by the Distribution Network Operator (DNO), in this case Western Power Distribution (WPD). Substations are a method of controlling power flows and voltages between the transmission system and distribution system. A transformer within a BSP substation will change (or “transform”) the level of a voltage from one value to another value. Transformers generally reduce a voltage from a higher level to a lower level. Due to the magnitude of Transmission Voltages (hundreds of thousands of volts), the voltage reduction equipment is referred to as a Grid Transformer (GT). Other components within the BSP includes switchgear, steel support structures, welfare accommodation, ancillary buildings, backup diesel generator, oily water interceptor and a low voltage electricity supply connection.

Portishead BSP is an existing substation that requires modification as part of the F Route removal. It contains two GTs to reduce the voltage from the transmission system at 132kV to the 33kV required in the area to allow onward distribution of the electricity to homes and businesses.

The extension to the substation will utilise 132kV air insulated switchgear (AIS) for outdoor use. This equipment is required for safe operation of the network and to isolate any faults that may occur on it. The maximum height of new electrical equipment in the substation will not exceed that of the existing equipment and buildings.

The detailed design of the proposed substation is still preliminary and will be confirmed based on planning, technical and commercial considerations.

Construction

The construction activities will use the existing permanent access road to the substation. The following information is provided to guide the assessments although this may be subject to some refinement before the DCO application is granted.

A contractor's compound and office would be established in the vicinity of the development (compounds will be shared where appropriate) to house the staff during the working day, as well as equipment and materials for the works. The substation is accessible for heavy goods vehicles and has an area of hardstanding within WPD landownership with suitable services for these purposes. The compound will be shared with the cable installation and overhead line installation contractors to make best use of available land. The construction compound area will generally comprise temporary portacabin style accommodation units for the purposes of activities associated with the site, project and safety management of the construction site. Further temporary facilities will be provided for the statutory provision of welfare facilities for construction site workers. There will also be allocated regions for the delivery and storage of materials and the removal (where required) of excavated material and waste items.

The initial preparatory works for the substation extension will comprise the temporary removal of topsoil and the installation of a temporary stone capping within areas of the substation construction area to provide a clean and stable working platform. Where required, excavations, piling and concrete foundations will be provided for the substation electrical equipment. A copper earth grid will be installed below the ground to create an “earth mat” to make the compound electrically safe. The substation support structures and electrical equipment will then be erected.

Prior to completion of the substation commissioning tests will be required, starting with testing the individual items of plant and culminating with testing the installed system as a whole. Following successful testing, the substation will be connected to the electricity transmission system.

The construction work will take place during hours agreed with the Local Planning Authority (LPA). Lighting may be provided to create safe construction areas and for security.

Pollution, dust and noise will be prevented and controlled in accordance with construction regulations, industry construction practice and agreements with the LPA.

Excavations will be carried out through a combination of hand and mechanised methods.

In addition to mechanised excavators of various sizes, mobile elevated work platforms (MEWPs or cherry-pickers), cranes, soil compaction equipment, drills, piling rigs, cutting equipment (gas and electrical), equipment used in the preparation and pouring of concrete and testing equipment will be among the equipment used. The final list of equipment and machinery used will only be known once the detailed design for the development is completed.

Although the construction duration will be subject to the outcome of commercial processes such as tendering, it is envisaged that construction will start in 2015 (in the form of some preparatory works) and be completed in 2018. This will also be subject to the availability of system outages on the WPD network to allow the new equipment to be connected.

Maintenance

The substation would be unmanned. Maintenance of the BSP substation would be undertaken during a rolling 3 year cycle, which involves electrical isolation of the appropriate equipment. Visual checks would be undertaken on a monthly inspection visit to the site. If the BSP substation requires refurbishment and/or replacement works, vehicles will be used to carry workers in and out of site and suitable vehicles will be used to bring new materials and equipment to site and remove old equipment.

Decommissioning

The lifespan of the substation equipment is approximately 40 years. If its useful life has expired and it is to be removed, the equipment will be safely disconnected from the transmission system and carefully dismantled. Much of the dismantled substation equipment will be taken for recycling. Similar methods and equipment will be required as for construction.

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Construction at Seabank 132kV BSP Substation

Description

A Bulk Supply Point (BSP) substation is the electrical interface point between the high voltage transmission network and the distribution network owned by the Distribution Network Operator (DNO), in this case Western Power Distribution (WPD). Substations are a method of controlling power flows and voltages between the transmission system and distribution system. A transformer within a BSP substation will change (or “transform”) the level of a voltage from one value to another value. Transformers generally reduce a voltage from a higher level to a lower level. Due to the magnitude of Transmission Voltages (hundreds of thousands of volts), the voltage reduction equipment is referred to as a Grid Transformer (GT). Other components within the BSP includes switchgear, steel support structures, welfare accommodation, ancillary buildings, backup diesel generator, oily water interceptor and a low voltage electricity supply connection.

Seabank BSP is an existing substation that requires extension and modification as part of the F Route removal. It contains two GTs to reduce the voltage from the transmission system at 132kV to the 33kV required in the area to allow onward distribution of the electricity to homes and businesses.

The extension to the substation will utilise 132kV air insulated switchgear (AIS) for outdoor use. This equipment is required for safe operation of the network and to isolate any faults that may occur on it. The maximum extension of the proposed substation fenceline will be 58m x 14m to the south and east. The maximum height of new electrical equipment in the substation will not exceed that of the existing equipment and buildings.

The extension to the substation will be largely constructed on impermeable concrete surfaces, surrounded by areas of permeable stone chippings. The impermeable surfaces will mostly be around the base of structures and stays, below and around the ground mounted equipment like transformers and marshalling kiosks and where new troughs are installed. The substation will be secured with an electrified palisade fence approximately 3m high and will use the existing permanent access road from the public highway.

The detailed design of the proposed substation is still preliminary and will be confirmed based on planning, technical and commercial considerations.

Construction

The construction activities will use the existing permanent access road to the substation. The following information is provided to guide the assessments although this may be subject to some refinement before the DCO application is granted.

A contractor's compound and office would be established in the vicinity of the development (compounds will be shared where appropriate) to house the staff during the working day, as well as equipment and materials for the works. The substation is accessible for heavy goods vehicles and has an area of hardstanding within WPD landownership with suitable services for these purposes. The compound will be shared with the cable installation and overhead line installation contractors to make best use of available land. The construction compound area will generally comprise temporary portacabin style accommodation units for the purposes of activities associated with the site, project and safety management of the construction site. Further temporary facilities will be provided for the statutory provision of welfare facilities for construction site workers. There will also be allocated regions for the delivery and storage of materials and the removal (where required) of excavated material and waste items.

The initial preparatory works for the substation extension will comprise the temporary removal of topsoil and the installation of a temporary stone capping within areas of the substation construction area to provide a clean and stable working platform. If possible, the permanent site boundary perimeter fencing will be extended early in the construction programme to secure the construction area. This will include its electrification. Where required, excavations, piling and concrete foundations will be provided for the substation electrical equipment. A copper earth grid will be

installed below the ground to create an “earth mat” to make the compound electrically safe. The substation support structures and electrical equipment will then be erected.

Prior to completion of the substation commissioning tests will be required, starting with testing the individual items of plant and culminating with testing the installed system as a whole. Following successful testing, the substation will be connected to the electricity transmission system.

Some of the existing equipment in the substation will be reconfigured and upgraded to accommodate the substation extension and network reconfiguration.

The construction work will take place during hours agreed with the Local Planning Authority (LPA). Lighting may be provided to create safe construction areas and for security.

Pollution, dust and noise will be prevented and controlled in accordance with construction regulations, industry construction practice and agreements with the LPA.

Excavations will be carried out through a combination of hand and mechanised methods.

In addition to mechanised excavators of various sizes, mobile elevated work platforms (MEWPs or cherry-pickers), cranes, soil compaction equipment, drills, piling rigs, cutting equipment (gas and electrical), equipment used in the preparation and pouring of concrete and testing equipment will be among the equipment used. The final list of equipment and machinery used will only be known once the detailed design for the development is completed.

Although the construction duration will be subject to the outcome of commercial processes such as tendering, it is envisaged that construction will start in 2015 (in the form of some preparatory works) and be completed in 2018. This will also be subject to the availability of system outages on the WPD network to allow the new equipment to be connected.

Maintenance

The substation would be unmanned. Maintenance of the BSP substation would be undertaken during a rolling 3 year cycle, which involves electrical isolation of the appropriate equipment. Visual checks would be undertaken on a monthly inspection visit to the site. If the BSP substation requires refurbishment and/or replacement works, vehicles will be used to carry workers in and out of site and suitable vehicles will be used to bring new materials and equipment to site and remove old equipment.

Decommissioning

The lifespan of the substation equipment is approximately 40 years. If its useful life has expired and it is to be removed, the equipment will be safely disconnected from the transmission system and carefully dismantled. Much of the dismantled substation equipment will be taken for recycling. Similar methods and equipment will be required as for construction.

Appendix 3H – T-pylon Construction Information

Hinkley Point C Connection Project

Appendix 3H: T-pylon Construction Information

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National Grid

Appendix 3H: T-pylon Construction Information

1. T-pylon Construction Activity



T-pylon construction Activity

This document provides a comparison of the construction activities of the T-ylon against the L13 lattice pylon.

Activity	Lattice (L13)	T-ylon
Anticipated Work Area	Base: 9.31m by 9.31m Surface: 30m by 30m	Base: 2m Surface: 55m by 22m
Specialist equipment	Standard	Specialist piling rig for monopile.
Construction Access	Crane, Standard climbing, possibly MEWP and alternatively helicopter for extremely difficult terrain	Crane, MEWP and alternatively helicopter for extremely difficult terrain
Maintenance	Standard climbing, possibly MEWP and alternatively helicopter for extremely difficult terrain, linescout	MEWP and alternatively helicopter for extremely difficult terrain, Linescout
Structural Sections	250-350	~10
Stringing	Standard tension stringing methods	Under review, strategy being developed by OHL contractor.
Piling operation (construction)	For extremely poor ground conditions	Preferred generic solution.
Foundations	Standard pyramid foundation	Monopile preferred Optimised minipile and concrete foundations are available as alternatives
Erection	Standard erection procedures use large crane. 100-200T	Large crane 100-200T and supporting MEWPs
Works Duration	3-4 weeks incl concrete curing	~1 week if monopile foundation is used. Typically 5days erecting equipment.1-2days for foundation and pylon erection. 3-4weeks if concrete foundation is used due to curing time.

National Grid

Appendix 3H: T-pylon Construction Information

2. T-pylon Foundations



T-pylon foundations

1. Introduction

The purpose of this document is to provide a qualitative framework for a National Grid employee to understand the implementation constraints of a monopile type foundation.

The T-pylon foundation is one of the most critical mechanical components of the pylon structural system. Due to the large surface area of the monopile the critical load case is extreme wind. Therefore, any foundation solution must accommodate a large overturning moment, which is in excess of both the horizontal or vertical loads. The foundation solution must be capable of being installed quickly with varying degrees of access whilst minimising land take post-construction.

2. Monopile foundations

2.1 Introduction

Any T-pylon foundation is subject to large horizontal (H) and moment (M) loads that are in excess of the vertical (V) loads. Therefore the monopile foundation design is that of a laterally loaded pile, although a check is made to ensure the pile can withstand the vertical loads. Nevertheless, lateral loading is generally more onerous as a result the monopile will be larger for equivalent vertical loads applied laterally.

The monopile (hollow steel tubular section) solution is the preferred choice (Figure 1). Installation of the foundation involves the delivery of the section to site, up-righting with a large crane (circa 200t) followed by driving into the soil. The pile hammer is then placed on top of the monopile using the same crane. During driving the pile hammer rests on top of the monopile whilst a bulldozer with a pile gripper supports the monopile. The gripper can also apply a lateral force to aid verticality during installation.



Figure 1 Pile crane and gripper (left) with pile hammer (right)

For the monopiles for the Eakring test line the p-y method has been used for design. This method is currently the most prolifically used in the monopile industry (e.g. American Petroleum Institute and Det Norske Veritas, design codes for offshore monopile). This method of analysis assumes that the pile acts as a beam supported by a series of separate springs, which represent the soil reaction. The key parameters for the method are the soil stiffness and the soil strength. The p-y method (Figure 2) can be used to calculate the capacity of a monopile and the subsequent deformations.

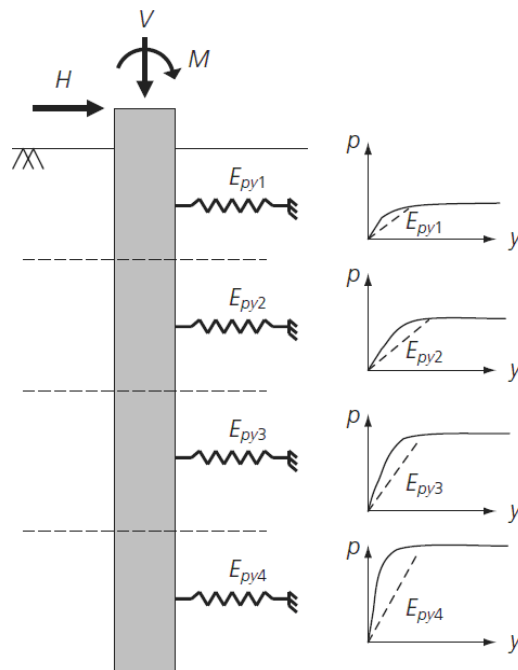


Figure 2 p-y method

The capacity of a monopile is a function of its diameter (D), length (L) and thickness (t). The thickness of a monopile is at least $D/70$. The length (L) of the monopile may vary due to the pylon type and the 'quality' of soil on site. The length of the monopile is dependent on the quality of soil on site. The diameter (D) depends on the T-pylon type. There are practical restrictions on the length of the monopile. The design of the T-pylon foundations (at Eakring) will be designed using Eurocode 7 Design Approach 1 (BS EN1997-1) and the UK National Normative Annex (UK NNA).

2.2 Installation

There are additional complexities regarding the implementation of the monopile centred on the installation requirements. Monopile foundations are driven into the soil using a large hammer.

The size of the hammer is defined by the diameter of the monopile and the soil properties, namely soil strength. If the soil is too 'strong' then the monopile hammer will require a larger drop weight. However, if the soil is 'strong' with localised 'very strong' layers then during driving the monopile may be "rejected".

Monopile "rejection" occurs when the hammer cannot drive the monopile further into the soil. If the monopile has been driven more than $1/3$ of its length before rejection then it is

extremely difficult to extract. This situation is problematic for overhead lines as the pylon location will have to be moved or construction of a modular type foundation with mini-piles and concrete cap will have to be undertaken.

In order to mitigate the risk of monopile rejection a pile driveability analysis is regularly carried out by the pile installation contractor. The pile driveability analysis is carried out using numerical software, and is conducted in house or sub-contracted to specialist. The analysis is used to specify the hammer size and to predict rejection depths.

A technique known as annulus drilling is to be trialled at Eakring to allow monopiles to be driven in 'strong' soils. The process involves pre-drilling at least 300mm diameter bores at a centre-centre spacing of 450mm to a depth equivalent to the monopile length, followed by backfilling with cement-bentonite and then monopile driving at least a day.

The cement-bentonite used has a nominal shear strength (c_u) of **xxx** and **200kPa** after 3 and 28 days of cure time, respectively. The mix contains bentonite (kg), cement (kg) and water (litres) in 1:2.5:10 parts.

If annulus drilling is required then an engineering check must be completed on the monopile design. This is to ensure that it can accommodate the presence of the cement-bentonite pile-soil interface, given that the interface is likely to be weaker than the in situ soil. This design and contractor must satisfy themselves that the most onerous case has been modelled.

2.3 Access constraints

The use of a monopile foundation requires delivery of the section to site, up-righting with a large crane (circa 200t) which sits at least 3-11m from the work location...to verify with BH. The lay down area for a monopile installation regime may be up to 15m by 45m. This may render use of a monopile foundation impractical where access or available area for the support wagons (e.g. hammer power pack, monopile and hammer delivery). The installation area options for monopile installation are both approximately 600m² (Figure 3).

Construction on a slope may require local levelling of the slope in order to facilitate the heavy lifting of the monopile into place. In most cases the monopile is likely to be longer than a single section of the T-ptylon monopile (12m).

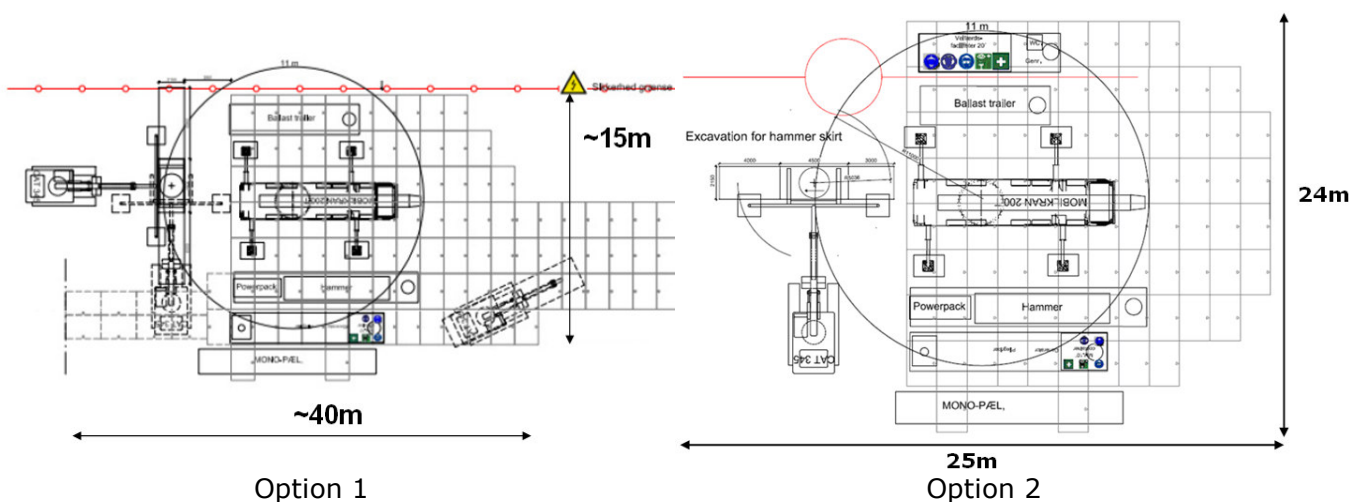


Figure 3 Monopile installation area

2.4 Monopile dimension limits

There are dimension limits on current (Q1 2013) monopiles that are to be installed for the Eakring test line. These limits need to be considered for future implementation.

The monopile design limits are based on consultation with Bystrup during the test line design process. The lower bound on the length is due to the idealisation of the pile as a beam in the p-y method. Below the ratio of $L/D=4.5$, the pile ceases to act as a beam. At $L/D>10$ the pile may deform excessively and become extremely prone to buckling.

There is also a limit on the monopile due to transportation length. If section lengths are longer than 18.65m then two days clear notice is required to the police to organise an escort.

The pile gripper currently is only able to attach to monopiles with diameters of 1.5m to 2.1m. The limitations of the Aarsleff gripper (Table 1) refer to the as built device in Q1 2013, however it may be modified for Eakring. The 17m on length limit is based on the combination of weight of pile and hammer with the geometry and strength of the A frame.

	Length	
	Maximum	Minimum
Monopile design (p-y method)	$L/D > 10$	$L/D < 4.5$
Transportation	18m	-
Aarsleff pile gripper	17m	10m

Table 1 Monopile dimension constraints

2.5 Foundation testing

Although design codes (BS EN1997-1) are well established there may be a perceived need by the one of the parties (Table 3) to conduct foundation tests. This may be to gain a better understanding of in situ performance if the designer has no previous experience of the ground conditions or if there are additional construction complexities (e.g. annulus drilling).

Foundation tests may also be carried out in order to optimise the design. In the UK National Normative Annex (UK NNA) to Eurocode 7 partial factors are used to "ensure safety by design". In Table A.NA.7 of the UK NNA if tests are conducted on 1% of the foundations to be installed then reduced partial factors may be applied, which will reduce the required foundation size.

In order to trigger the allowable reduction of partial factors the foundation must be loaded to 1.5 times its maximum design load. This load is different to the "proof load", which is only 75% of maximum design load and traditionally used for transmission tower foundation testing, which is specified in BS EN61773.

It should be recognised that the load schedule in BS EN61773 has been derived from pyramid/pad and chimney foundations used for lattice towers rather than monopiles support monopiles.

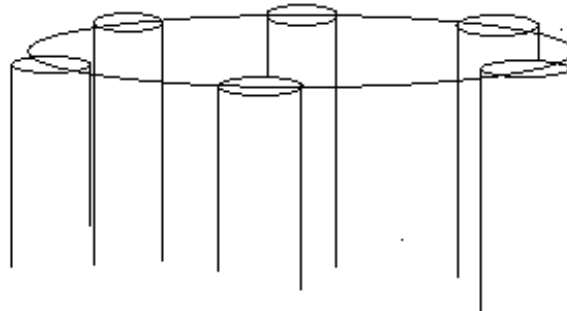


Figure 5 Annulus drilling



Figure 6 Elemex solution

2.6.2 Bored and driven pile groups

In soft soils large monopile lengths (20m+) would be required to accommodate the large lateral loadings. This makes the monopile extremely difficult to install being very heavy and would require large pile wall thicknesses to prevent buckling.

Alternative foundation designs currently involve the use of a concrete cap with an array of bored or driven piles. Foundation choices would prioritise the use of precast concrete sections to avoid prolonged installation durations associated with casting and curing of concrete onsite.

These solutions do not require the use of cranes associated with the driving of the monopile. Yet, they involve significantly larger volumes of concrete. Furthermore, in some instances installation may be protracted due to identified issues with casting concrete on site.

For augered piles a tracked augur vehicle is used, which bores into the soil using a rotary drill. During extraction of the drill concrete is pumped through an orifice in the centre of the drill forming the pile in the hole. For driven piles a tracked pile hammer is used. These vehicles are more mobile, and would be able to work on steeper gradients than the cranes associated with monopiling driving.

The minipiles are generally reinforced with a steel single threaded bar (Figure 9) or a small reinforced cage. The bar diameter determines the optimum design capacity of the pile. Standard corrosion protection (increased concrete cover) for mini piles and steel bar galvanization or corrugated plastic sheath is specified for ground condition

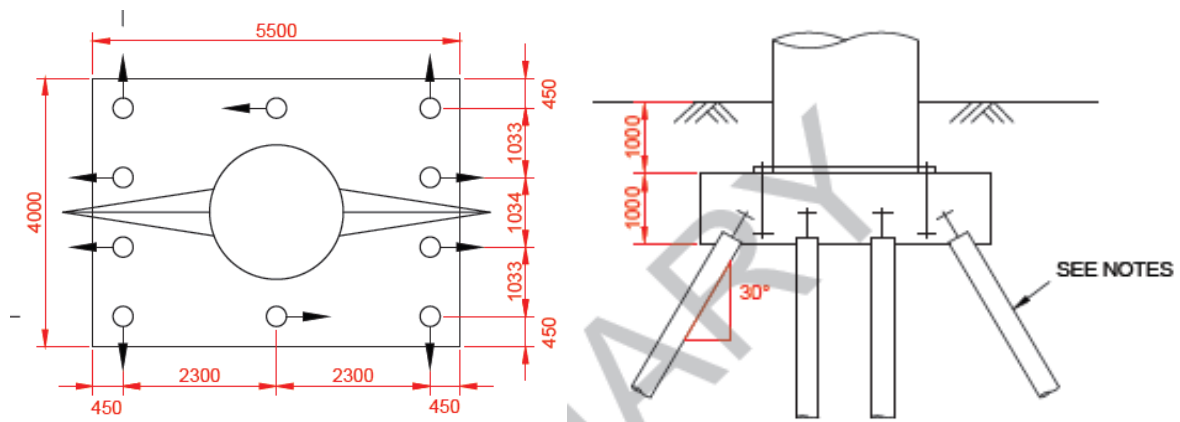


Figure 7 Bored mini pile solution

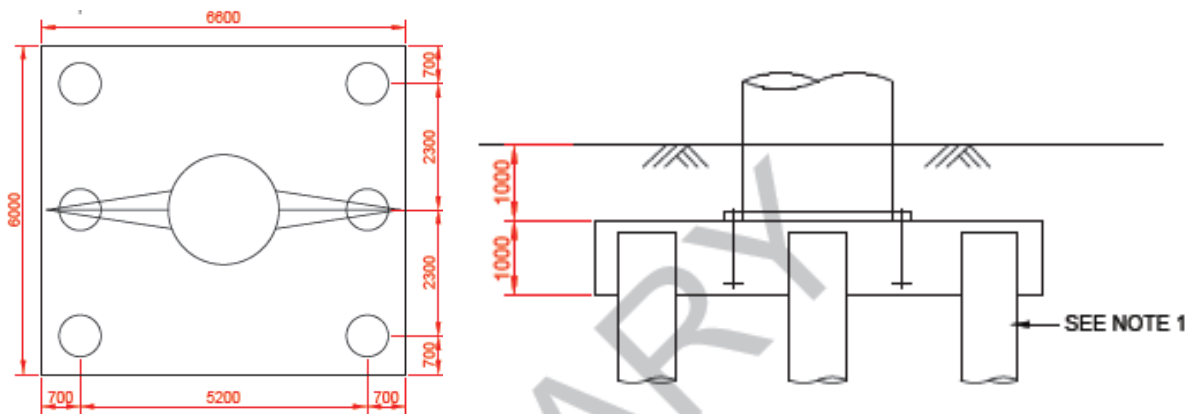


Figure 8 Driven pile solution (suspension)

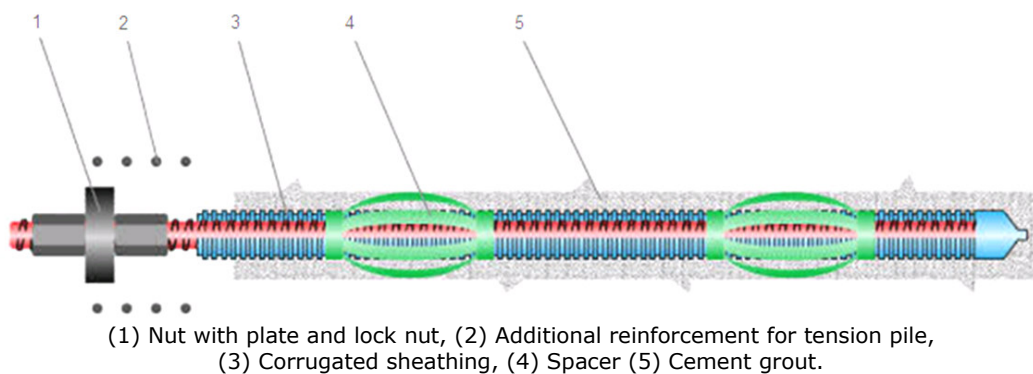


Figure 9 GEWI Pile reinforcing bar, Available from www.dywidag.co.uk

2.6.3 Concrete raft and rock foundations

In soils that are unsuitable (too stiff) for pile driving or boring a raft solution would be required. This solution requires large volumes of reinforced concrete. As with the pile caps of the bored pile solution multiple deliveries of concrete would have to be made to site.

For rock a grouted anchor foundation solution would be used. Designs for the T-pylon currently do not exist for this type of foundations as these ground conditions have not been encountered at Eakring or Hinkley.

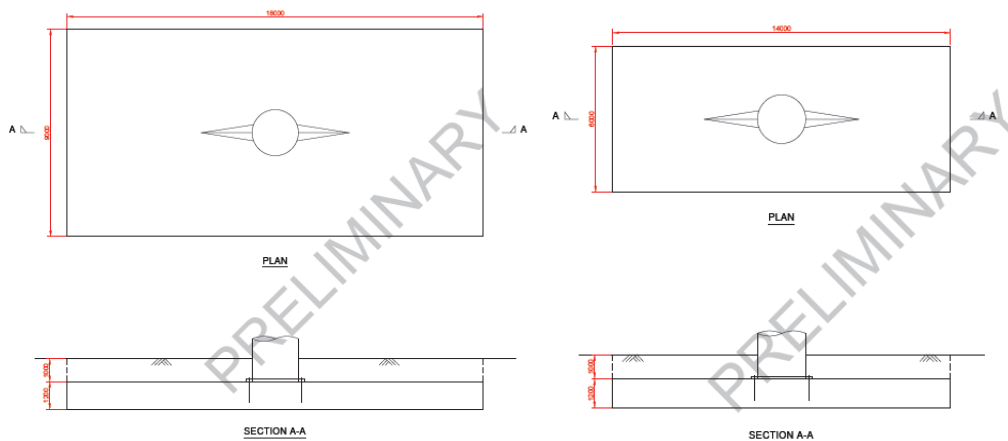


Figure 10 Tension (left) and suspension (right) raft

2.7 Summary of foundation solutions

Foundation Type		Suspension Tower				Tension Tower				Comments
		Spoil volume per base ³ m ³	Budget cost per base ⁴ £	Eakring cost, single base ⁵ £	Duration (weeks)	Spoil volume per base ³ m ³	Budget cost per base ⁴ £	Eakring cost, single base ⁵ £	Duration (weeks)	
Per L12 Pad/Chimney		20 ¹¹	<u>£40,000</u>	<u>£40,000</u>	1	65	<u>£70,000</u>	<u>£70,000</u>	1	For comparison.
Raft		109	<u>£81,000</u>	<u>£81,000</u>	1 - 2	210	<u>£136,000</u>	<u>£136,000</u>	2 - 3	Large material requirement.
Pile	Cap (Con)	44	£47,000	TBC		109	£91,000	TBC		Use of bored piles reduces concrete and spoil quantities. Where driven piles can be utilised this will reduce further.
	Piles (Con)	27	£24,000			63	£36,000			
	Platform	12	£2,000			30	£3,000			
	Mob ¹²		£2,000				£2,000			
	Tests ¹		£2,000				£2,000			
	Total	83	<u>£77,000</u>		2	202	<u>£134,000</u>		3	
Mini Pile	Cap (Con)	24	£33,000	TBC		51	£48,000	TBC		Use of mini piles minimises concrete and spoil quantities.
	Piles (Con)	7	£23,800			14	£47,600			
	Platform	7	£2,000			14	£3,000			
	Mob ¹²		£10,450				£10,450			
	Tests ²		£9,100				£9,100			
	Total	44	<u>£78,350</u>		3	79	<u>£118,150</u>		4	
Monopile		25 ⁸	<u>£33,460</u>		1 day	25 ⁸	<u>£33,460</u>		1 day	Denmark max 2-3 per day
Monopile + DTH AD		75 ⁹ (50m ³ C-B)	<u>£44,372</u>		2-3 days	75 ⁹ (50m ³ C-B)	<u>£44,372</u>		2-3 days	Additional time required for drilling the stitches and for curing the cement-bentonite
Monopile + Elemex AD		139 ¹⁰ (114m ³ C-B)	<u>£67,760</u>		2-3 days	139 ¹⁰ (114m ³ C-B)	<u>£67,760</u>		2-3 days	

Table 2 Summary of foundation solutions

Notes regarding Table 2

Spoil volume per base refers to the amount of soil removed where this volume is equivalent to reinforced concrete (Con) or cement-bentonite (C-B) it has been highlighted. Although cement-bentonite volumes are high for annulus drilling solutions the proportion of cement to bentonite is approximately 2.7:1. For the concrete foundations pulverised fly ash (PFA) can reduce the amount of cement, with a ratio of up to 1.5:1 cement:PFA, although the exact amount will depend on the contractor.

The additional time for the concrete solutions is due to the design and installation of re-bar.

1. Pile testing to include vertical and lateral loading, and integrity testing.
2. Mini pile testing to include axial loading and integrity testing.
3. In situ volume, includes for 100mm concrete blinding, assumes inert material.
4. Average cost for 10 bases with mobilisation and testing costs shared.
5. Eakring cost includes for mobilisation and installation of a single base.
6. Excludes access tracks/ remote sites.
7. Monopile testing: lateral and vertical load testing required.
8. Based on a normal excavation size for hammer
9. Based on 18 x D=300mm x L=10m bores (filled with grout) + hammer for excavation (Ref AJ Drilling)
10. Based on 18 x D=450mm x L=10m diameter bores (filled with grout) + hammer for excavation (Ref Van Elle)
11. L12 family reinforced concrete; suspension 4.2m³ (total 13.8m³) ; D25 12.8m³ (total 51.2m³)
12. For mobilisation costs, for Eakring it was proposed that two piling rigs would be mobilised to construct seven pylon foundations.

Budget rates (verbal, awaiting confirmation) provided by:

Reinforced Concrete - GridLine Foundations.

Piling - Simplex Westpile.

Mini Piling-Bachy Soletanche (Invoice for Eakring)

Monopiling - Aarsleff DK

DTH - AJ

Elemex - Van Elle

2.8 Qualitative design

The installation of a monopile requires a more detailed understanding of the soil properties and access constraints than a typical lattice type foundation. Figure 11 shows an indicative decision tree surrounding the implementation of a monopile foundation. The length constraints have been presented in the same order as Table 1.

During the design and build process there will be at least three parties involved (Table 3): designer, contractor and ground investigator. These parties need to effectively coordinate the dimensioning of the monopile such that the driveability analysis and pile design occur in tandem.

Party	Role	Output
Client (e.g. National Grid)	To define the project specification; to delegate construction risk to the parties below	Project specification.
Ground investigator (e.g. Card Geotechnics)	To carry out soil characterisation; to provide details on soil stiffness and strength.	Geotechnical report
Designer (e.g. Bystrup)	To use the provided parameter within the geotechnical report to design the foundation.	Foundation design
Contractor (e.g. Aarsleff)	To install the foundation; would conduct driveability analysis using parameters from geotechnical report and pile design geometry.	Foundation installation

Table 3 Roles in foundation design

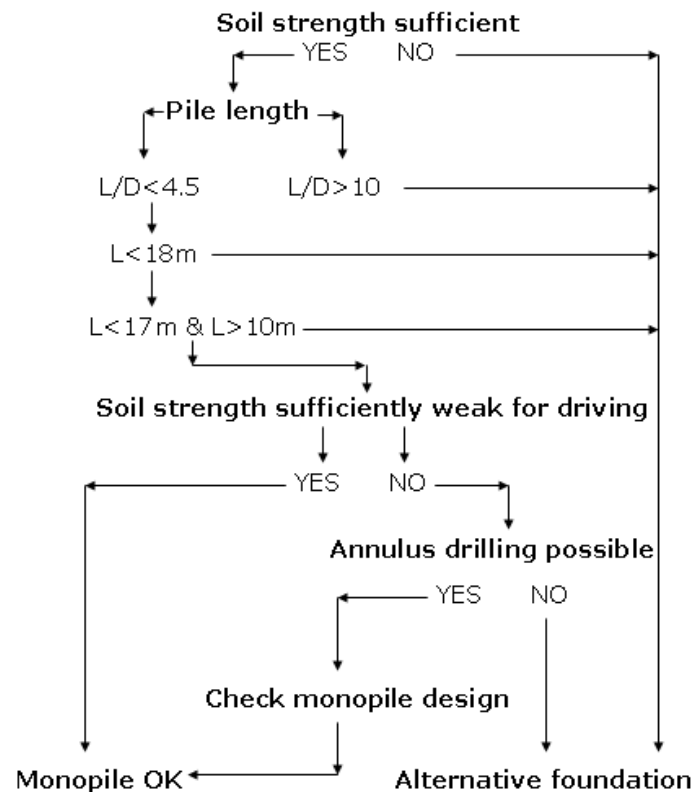


Figure 11 Monopile feasibility decision tree

2.8.1 Geotechnical Report

The geotechnical report serves to inform the design and contractor of the ground properties on site. Within the report there are two levels of detail regarding soil characterisation: borehole logs and soil testing.

Borehole logs: Cylinders of soil at different depths are extracted and then described using a standard set of qualitative terms. These terms may be used to provide indicative values of stiffness and soil strength.

Soil testing: The latter is carried out on (intact) soil samples obtained from site to provide explicit values for soil properties.

From the geotechnical report there may be some indication given on the extent of rock weathering. However, the extent and orientation of the fissures as a result of weathering is not included. Obtaining this information requires a large excavation or the downhole observations with a video camera. In design it is considered sufficient to consider rock joint angles of 45°.

2.8.2 Framework

The following tables in this section aim to provide an insight into suitable soil and rock environments where monopiles may be designed and installed.

The following needs to be taken into consideration when viewing the tables:

1. The tables take into account design and driveability feasibility. Some soil/rock environments may be able to provide suitable monopile strengths but too strong to drive through, and visa-versa.
2. The tables are indicative only as on site variations within the soil are extremely varied.
3. The designations of soil types are based on borehole log observations within the geotechnical report.
4. Soil is layered rather than a continuous block of homogeneous material. At moderate depths there may be extremely strong soil or bed rock, where a monopile could not be driven. In these situations shallow foundation systems (e.g. raft) need to be considered.

2.8.2.1 Soil definitions

Table 13.13: Soil characteristics for design of foundation according to EN 50 341-3-4

1	2	3	4	5		6
Type of soil	Specific weight force naturally humid (values for design) γ kN/m ³	with buoyancy γ' kN/m ³	Angle of internal friction φ Degree	Bearing pressure at a depth of 1,5 m permissible ultimate ¹⁾ $\sigma_{1,5}$ kN/m ²		Coefficient κ —
Non-cohesive soil						
1 Sand, loose	17	9	30	200	320	3,5
2 Sand, semi-loose	18	10	32,5	300	480	4
3 Sand, dense	19	11	35	400	640	5
4 Gravel, bolder, uniform	17	9	35	400	640	5
5 Gravel, sand, graded	18	10	35	400	640	5
6 Boulder, stones, macadam, graded	18	10	35	400	640	6
Cohesive soils						
7 pasty	16	8	0	0	0	1
8 soft (easy to knead), purely cohesive	18	9	15	40	65	2
9 soft, with non-cohesive additions	19	10	17,5	40	65	2,5
10 firm (difficult to knead), purely cohesive	18	9	17,5	100	160	2,5
11 firm, with non-cohesive additions	19	10	22,5	100	160	3
12 stiff, purely cohesive	18	10	22,5	200	320	3
13 stiff, with non-cohesive additions	19	11	25	200	320	3,5
14 hard, purely cohesive	18	—	27,5	400	640	3,5
15 hard, with non-cohesive additions	19	—	30	400	640	4
Organic soils and soils with organic additions						
	5 to 16	0 to 7	15			1
Rock						
-with considerable fissures or unfavourable stratification	20			up to 1000 ²⁾	1600 ²⁾	
-in sound, non-decomposed condition with minor fissures or favourable stratification	25			up to 3000 ²⁾	4800 ²⁾	
Made up ground and fill						
uncompacted embankment	12 to 16	6 to 10	10 to 25	30 to 100	48 to 160	2
compacted embankment	Classification according to type of soil, density of stratification and consistence, respectively					

¹⁾ data established by the authors; ²⁾ independent of depth

Table 4 Soil characteristics for design of foundations according to BS EN 50341-3-4

Soil type	Monopile	Bored Mini pile	Driven pile	Raft
Cohesionless (granular)				
Sand, loose		X [1]	X [2]	X [3]
Sand, semi-loose	X [1]	X [2]	X [3]	X [4]
Sand, dense	X [1]	X [2]	X [3]	X [4]
Gravel, bolder, uniform	X [1]	X [2]	X [3]	X [4]
Gravel, sand, graded	X [1]	X [2]		X [3]
Boulder stones, macadam, graded				X [1]
Cohesive (clay)				
Organic soil (peat/made ground)		X [2]	X [1] ⁶	
Pasty ¹		X [2]	X [1] ⁶	
Soft ²		X [2]	X [1] ⁶	X [3]
Soft ² , with non-cohesive additions (silt/sand)	X [1]	X [2]	X [3]	X [4]
Firm ³	X [1]	X [2]	X [3]	X [4]
Firm ³ , with non-cohesive additions (silt/sand)	X [1]	X [2]	X [3]	X [4]
Stiff ⁴	X (AD) [1]	X [2]	X [3]	X [4]
Stiff ⁴ , with non-cohesive additions (silt/sand)	X (AD) [1]	X [2]	X [3]	X [4]
Hard ⁵	X (AD) [1]			X [2]
Hard ⁵ , with non-cohesive additions (silt/sand)	X (AD) [1]			X [2]

Table 5 Foundation options by soil type

Notes

AD – refers to Annulus drilling

X – Available choice with n being order of preference, deference paid to sustainability and cost.

1. Soil exudes between fingers when squeezed in the hand
2. Soil easily moulded with fingers
3. Soil can be moulded only by strong pressure of fingers
4. Soil cannot be moulded in fingers
5. Soil can be indented by the finger nail
6. Due to ease of construction

UPDATED AS PART OF FEEDBACK FROM FOUNDATIONS REVIEW 3

Rock classification				Foundation type			
Rock weathered state	Code	Strength of rock	Strength of surface	Monopile	Bored Mini pile	Driven pile	Raft
Mountain fresh	W0	Powerful hammer needed	Only scratched with knife tip	Specialist rock anchor			
Weathering started	W1	Fissures crack with hammer	Very difficult to split with knife tip	X (AD) [1]			X [2]
Moderately weathered	W2	Visual cracks that can be split with hammer	Difficult to split with knife tip	X (AD) [2]	X [1]		X [3]
Strongly weathered	W3	Breaks easily, may fragment	Splits with knife tip	X [1]	X [2]		X [3]
Completely weathered	W4	May fall apart due to light hammer blow	Particles may be rubbed off	X [1]	X [2]	X [3]	X [4]
Formation of soil	W5	Crushable by hand	Falls apart when rubbed	X [1]	X [2]	X [3]	X [4]

Table 6 Foundation options by rock type

Notes

AD – refers to Annulus drilling

X – Available choice

Weathered rock codes related to Mercia mudstone weathering grades at Eakring test line.

UPDATED AS PART OF FEEDBACK FROM FOUNDATIONS REVIEW 3

3. Case studies

This section gives two project examples where the qualitative framework (Figure 11) has been combined with the options tables (Table 5 Foundation options by soil type Table 5 and Table 6). A geotechnical report and preliminary foundation designation for each tower site has been conducted for each route.

3.1 Eakring T-pylon test line

3.1.2 References

[1] Card Geotechnics (CGL), 2012, *Ground investigation for T-Pylon test line, Eakring, Nottinghamshire*, CGN03104_IGGR_Dec12, Available at [[..\..\12. UK Test Line\Ground Investigation\CGN03104 IGGR Dec12.pdf](#)]

[2] British Geological Survey (BGS), 2002, *Mudstones of the Mercia Mudstone Group*, Available at [[..\..\12. UK Test Line\Ground Investigation\BGS Mercia Mudstone.pdf](#)]

3.1.3 Outline

Card Geotechnics provided a soil cross section in their geotechnical report [1] for the proposed route for the T-pylon test line at Eakring (Fig. 1). It is normal for geotechnical reports the soil to be classified in line with a grading system used for that particular soil. For Mercia Mudstone, the soil predominant at Eakring, Card Geotechnics provided a BGS document that defined the (weathering) grades of mudstone shown in Figure 12 and Table 7. The grades in Table 1 can be related to the grades outlined in Table 6.

From the geotechnical report and subsequent preliminary calculations it was calculated that a monopile length of $L=6\text{m}$ ($L/D=3$), would be sufficient. However, from Table 1 the pile length satisfies the delivery criterion ($L<18\text{m}$) yet for detailed design verification (p - y method, $10>L/D>4.5$) and installation ($17\text{m}>L>9\text{m}$) it fails. Therefore a decision was taken whereby the pile was lengthened to a minimum of $L=10\text{m}$.

From Table 8 Grades 4b and 4a are suitable for monopile installation, Grades 2 and 3 require Annulus Drilling whereas Grade 1 is unsuitable for any form of monopile installation.

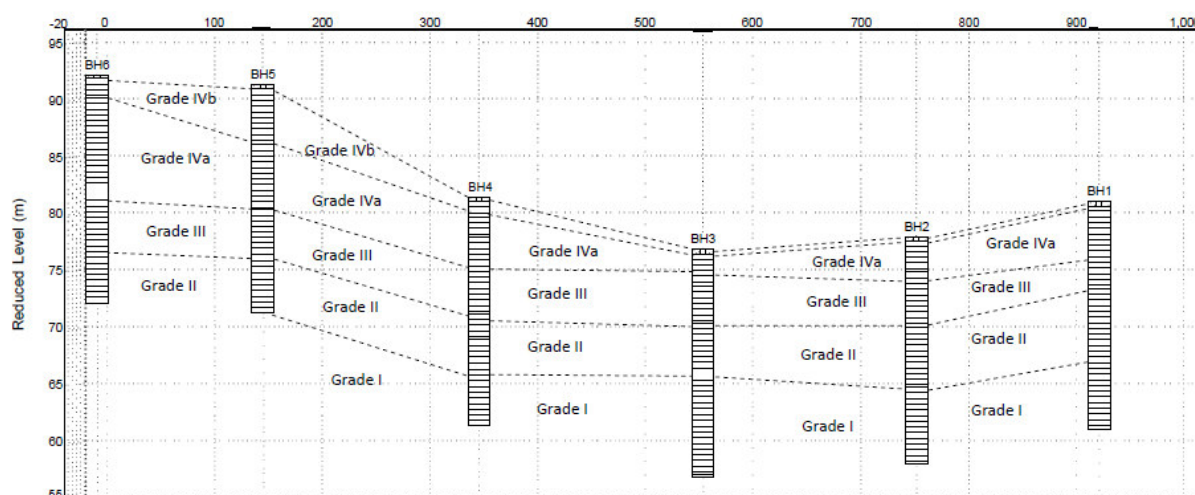


Figure 12 Soil cross section at different boreholes (BH) [1]

State	Zone	Description	Comments
Fully weathered	4b	Matrix only	Can be confused with solifluction or drift deposits, but contains no pebbles. Plastic slightly silty clay. May be fissured
Partially weathered	4a	Matrix with occasional clay-stone pellets, usually about sand-size	Little or no trace of original (Zone 1) structure, although clay may be fissured
	3	Matrix with frequent lithorelicts becoming less angular with increasing weathering	Moisture content of matrix greater than that of lithorelicts
	2	Angular blocks of unweathered marl with virtually no matrix	Spheroidal weathering matrix starting to encroach along joints; first indications of chemical weathering
Non-weathered	I	Mudstone (often fissured)	Moisture content varies due to depositional variations

Table 7 Weathering classification of Mercia Mudstone [2]

BGS Grading	Grading in Table 5	Monopile
4b	W4	X
4a	W3	X
3	W2	X (AD)
2	W1	X (AD)
1	W0	X

Table 8 Equivalent grading of Mercia Mudstone and monopile construction

3.2 Hinkley Point (MID project)

3.2.2 References:

[1] LSTC, 2012, *Electricity Alliance West Hinkley Point – Seabank 400kV Overhead Line Geotechnical Desk Top Study, 20_12249_05 LSTC Geotech Desk Study*, Available at [[..\..\04. MID\Hinkley\Hinkley Geotech Information\20 12249 05 LSTC Geotech Desk Study.pdf](#)]

[2] LSTC, 2013, *LSTC Proposed foundations for T Pylons, LSTC Proposed foundations for T Pylons_280113*, Available at [[..\..\04. MID\Hinkley\LSTC Proposed foundations for T Pylons 280113.pdf](#)]

[3] T-pylon development team, 2013, *Summary of soil and foundation information from West Hinkley Point*, Available at [[..\..\04. MID\Hinkley\Foundations Ground.xls](#)] and [[..\..\04. MID\Hinkley\Hinkley Foundations.doc](#)]

3.2.3 Outline

The West Hinkley Point overhead line route is a good example of the variability soil properties throughout the route. The geotechnical report [1] provided by LSTC is a desk study type report where no new ground data was created. A desk study is a literature study of current available information of the area, including old and current maps in addition to available ground data, predominantly borehole logs from the BGS, which is then related to positions of the proposed (lattice or T) pylons.

The route involves the construction of ~141 towers, of which ~134 locations are suitable for the erection of T-pylons. Out of these locations LSTC identified [2] that at 115 (86%) tower sites the ground conditions were suitable for the installation of a monopile. The remaining sites required either bored pile (12, 9%) or driven minipile (7, 5%) solutions. The ground data and foundation choices have been combined in documents by the T-pylon development team [3].

The soil in the geotechnical desk study has not been characterised beyond the basic labels applied to soils (i.e. stiff/hard/soft not stated).

Table 9 shows the tower locations and extracted soil conditions along the tower route. In the majority of cases CLD1-CLD78, CLD92-CLD96 and CLD104-CLD128 there is a deep (soft) clay layer, with depth sufficient to satisfy the conditions of the monopile feasibility tree (Table 1). Sites CLD97-CLD128 may also be suitable if the weathering of the underlying rock-type material is sufficient to allow driving.

Where the soil is too weak (CLD80-CLD91) or too strong (CZG1-CZG13) alternative foundation solutions need to be implemented. Bored mini piles are more suitable for weak soils as the grouping of minipiles enhances lateral capacity. Smaller driven piles are required in strong soil/weak rock as boring or monopile driven is not feasible, although with AD a monopile solution may be realised.

Tower	Soil description	Soil	Monopile	Alternative
CLD1 – CLD38	Soft clay/peat (0-14.3/22.3m), clay onwards (16.7/23.8m)	Soft (Table 4)	X	
CLD39 – CLD57	Soft clay/peat (0-13m), mudstone (13m+)	Soft (Table 4)	X	
CLD58	Soft clay (0-8.7m), mudstone (8.7-16.2m)	Soft (Table 4)	X	
CLD59 – CLD78	Soft clay (0-12.6m), mudstone (12m)	Soft (Table 4)	X	
CLD80 – CLD91	Muddy gravel (0-15m), limestone (15-17m)	Sand loose (Table 4)		Bored mini pile
CLD92 – CLD93	Made ground (0-10m), stiff clay (10-11.4m)	Soft (Table 4)	X	
CLD94 – CLD96	Soft sandy clay (0-23m), Marl (23.2+m)	Soft (Table 4)	X	
CLD97 – CLD99	Made ground (0-3.7/6m), mudstone (3.7/6.5m-8.2m)	Soft (Table 4) and W2 (Table 5)	X	
CLD100 – CLD103	Soft clay (0-4.6/3.35m), Marl/conglomerate (4.6/3.35-19.7m)	Soft (Table 4) and W4 (Table 5)	X	
CLD104 – CLD128	Soft clay (0-15/19.5m), clay/rock (15/19.5 - 24.3m)	Soft (Table 4)	X	
CZG1 – CZG3	Clay (0-1.9/2.9m), shallow limestone/mudstone (1.9/2m-9/9.2m)	W2 (Table 5)		Driven pile*
CZG11 – CZG13	Clay (0-1.9/2.9m), shallow limestone/mudstone (1.9/2m-9/9.2m)	W2 (Table 5)		Driven pile*

Table 9 Soil descriptions with reference to foundation options

* Potential for AD

7. Whole Life Value Assessment

"The aim of a WLV assessment is to make the optimum policy/investment decision is vital to National Grid, particularly when the choices made today can have a huge impact on the available options in the future."

A Whole Life Value (WLV) assessment according to PS(T) 101 was carried out to assess the T-pylon foundation options. The results of which are shown in Figure 13. It was identified that the monopile solution provides the best sustainability (due to recycled steel), safety-by-design (due to contractor experience) and performance (due to decreased risk during construction due to speed).

The raft is the most versatile solution since it can be installed in most soil conditions identified.

The pile group option is the most "do-able" because there are a wide variety of contractors who can construct this foundation type.

The full WLV sheet and PS(T) 101 is contained in [[.\WLV](#)], the latter describes the aspects of the assessment theme and the appraisal criterion used to value each assessment theme.

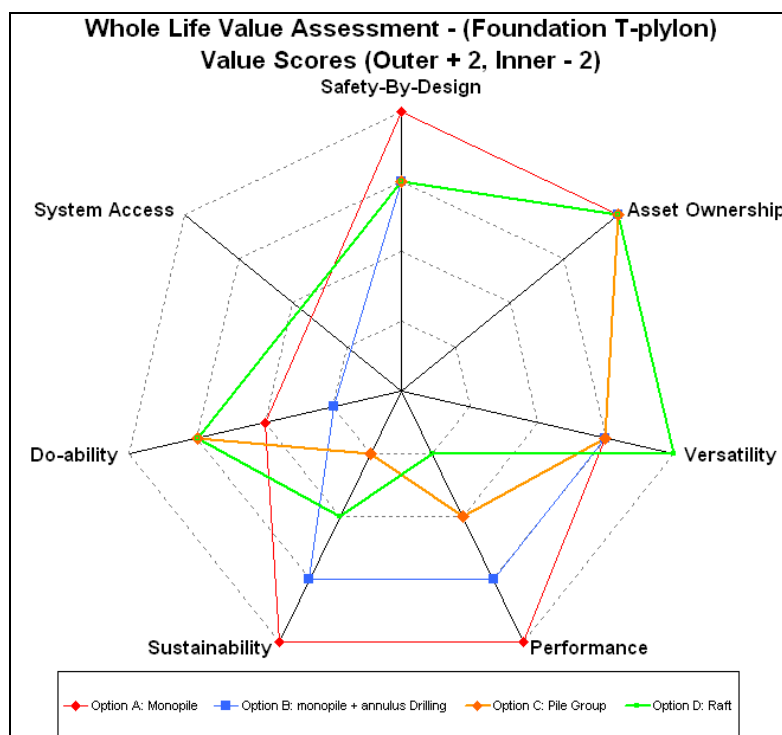


Figure 13 Whole Life Value assessment



Soil type	Monopile	Bored mini pile	Driven pile	Raft
Cohesionless (granular)				
Sand, loose		X [1]	X [2]	X [3]
Sand, semi-loose	X [1]	X [2]	X [3]	X [4]
Sand, dense	X [1]	X [2]	X [3]	X [4]
Gravel, bolder, uniform	X [1]	X [2]	X [3]	X [4]
Gravel, sand, graded	X [1]	X [2]		X [3]
Boulder stones, macadam, graded				X [1]
Cohesive (clay)				
Organic soil (peat/made ground)		X [2]	X [1] ⁶	
Pasty ¹		X [2]	X [1] ⁶	
Soft ²		X [2]	X [1] ⁶	X [3]
Soft ² , with non-cohesive additions (silt/sand)	X [1]	X [2]	X [3]	X [4]
Firm ³	X [1]	X [2]	X [3]	X [4]
Firm ³ , with non-cohesive additions (silt/sand)	X [1]	X [2]	X [3]	X [4]
Stiff ⁴	X (AD) [1]	X [2]	X [3]	X [4]
Stiff ⁴ , with non-cohesive additions (silt/sand)	X (AD) [1]	X [2]	X [3]	X [4]
Hard ⁵	X (AD) [1]			X [2]
Hard ⁵ , with non-cohesive additions (silt/sand)	X (AD) [1]			X [2]

Notes

AD – refers to Annulus drilling

X [n] – Available choice with n being order of preference, deference paid to sustainability and cost.

1. Soil exudes between fingers when squeezed in the hand
2. Soil easily moulded with fingers
3. Soil can be moulded only by strong pressure of fingers
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Rock classification				Foundation type			
Rock weathered state	Code	Strength of rock	Strength of surface	Monopile	Bored mini pile	Driven pile	Raft
Mountain fresh	W0	Powerful hammer needed	Only scratched with knife tip	Specialist rock anchor			
Weathering started	W1	Fissures crack with hammer	Very difficult to split with knife tip	X (AD) [1]			X [2]
Moderately weathered	W2	Visual cracks that can be split with hammer	Difficult to split with knife tip	X (AD) [1]	X [2]		X [3]
Strongly weathered	W3	Breaks easily, may fragment	Splits with knife tip	X [1]	X [2]		X [3]
Completely weathered	W4	May fall apart due to light hammer blow	Particles may be rubbed off	X [1]	X [2]	X [3]	X [4]
Formation of soil	W5	Crushable by hand	Falls apart when rubbed	X [1]	X [2]	X [3]	X [4]

NB Being worked on

Notes

AD – refers to Annulus drilling

X [n] – Available choice with n being order of preference, deference paid to sustainability and cost.

Weathered rock codes related to Mercia mudstone weathering grades at Eakring test line.

National Grid

Appendix 3H: T-pylon Construction Information

3. Information on the Transportation of the T-pylon during the Construction Phase

1. Introduction

The construction of the T-pylon requires the transport of large and heavy sections to the pylon locality. This note provides indicative information relating to the size of these sections in addition to information relating to possible transportation options.



Figure 1: Example of the varying nature of country roads

2. T-pylon construction sections

The following tables present the section dimensions and weights of the suspension and tension (D30) T-pylon structures. Table 1 presents a summary of Highways Agency limitation and actions on loads.

Although none of the sections in Table 2 or Table 3 breach these limitations on smaller roads (e.g. country lanes) the size of the vehicles may render the road impassable for a significant duration. In this circumstance the Highways Agency and police would need to be informed.

Section	Length (m)	Diameter (m)	Thickness (mm)	Weight (tonnes)
Suspension Pylon				
Monopile	10.0	2.1	30	7.7
Shaft Section 1*	12.0	2.0 – 1.7	25 – 18	10.8
Shaft Section 2	12.0	1.8 – 1.4	16 -14	7.4
Shaft Section 3*	12.7	1.5 – 1.2	14 – 12	5.5
Crossarm (CA)	9.4	1.2 – 0.7	20 -15	3.9
Central node (CN)**	2.2 (width) 1.3 (depth)	1.8 (height)	n/a	5.2
Horns (H)+	1.0	1.7 (depth) 0.7 (radius)	n/a	1.2
CA+H	10.4	1.7	n/a	9.0
CA+CN+H	12.6	1.8	n/a	10.0

Table 2 Suspension sections

Key:

* Excluding flange

** Attached to one crossarm

+ Attached to crossarms

++ Dimensions refer to the range of steel tubes used to create the steel diamond

Limitations	Action
Weight	
Gross weight of vehicle carrying the load exceeding C & U limits up to 80,000kgs (78.74 tons)	2 clear days notice with indemnity to Highway and Bridge Authorities.
Width	
Width exceeding 2.9m (for C & U loads) 3.0m (9ft 10ins) up to 5.0m (16ft 5ins) for other loads	2 clear days notice to Police
Length	
Length exceeding 18.65m (61ft 2in) up to 30.0m (98ft 5ins) rigid	2 clear days notice to Police
Vehicle combination exceeding 25.9m (85ft)	2 clear days notice to Police

Table 1 Highways agency actions and limitations

Section	Length (m)	Diameter (m)	Thickness (mm)	Weight (tonnes)
Tension (D30) Pylon				
Monopile	10.0	2.3	35	9.9
Shaft Section 1*	18.0	2.2-1.8	40-30	32.7
Shaft Section 2*	13.0	1.7-1.4	20-15	9.3
Crossarm (CA)	9.6	1.4-0.7	20	4.9
Central node (CN)**	2.8 (width) 1.5 (depth)	2.1 (height)	n/a	TBC (min 5.2)
Horns (H)+	1.1	1.8 (depth) 0.7 (radius)	n/a	TBC (min 1.2)
CA+H	10.7	1.8	n/a	TBC (min 6.1)
CA+CN+H	13.5	2.1	n/a	TBC (min 11.3)
Steel diamond++	6.5-1.6	0.36-0.19	32-15	6.5 (including nodes total) 0.5 (heaviest tube)

Table 3 Tension (D30) pylon sections

3. Transportation requirements

Table 4 presents the indicative requirements of the T-pylons sections from Table 2 and Table 3.

Sequence	Transport vehicle	
	Length (m)	Width (m)
Monopile - hammer and power*	19 (Figure 1) (incl. 3m for cam) OR Two of Figure 3	2.5
Monopile – monopile	16.5 (Figure 2)	2.5
Alternative foundations – Tracked vehicles	16.5 (Figure 2)	2.5
Alternative foundations – steel for reinforcement	12 (Figure 3)	2.3
T-pylon S/D30 – shaft sections	16.5 (Figure 2)	2.5
T-pylon S/D30 – CA + H	16.5 (Figure 2) OR 12 (Figure 3) + 2m overhang	2.5 OR 2.3
T-pylon S/D30 – CA + H + CN	16.5 (Figure 2)	2.5
T-pylon D30 – Steel diamond	12 (Figure 3)	2.3

Table 4 Indicative transport requirements

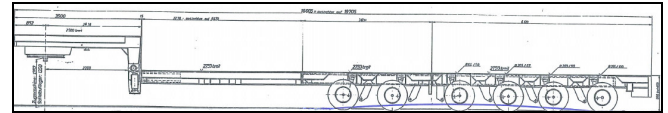


Figure 1 16m trailer

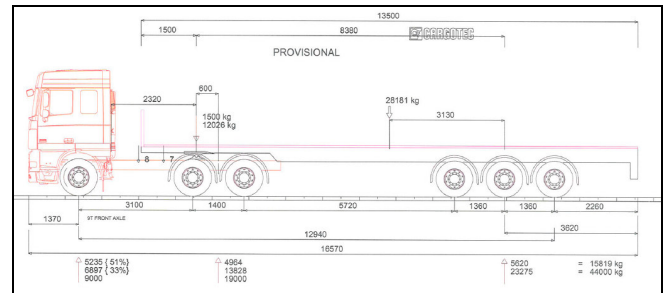


Figure 2 13.5m trailer with DAF XF105

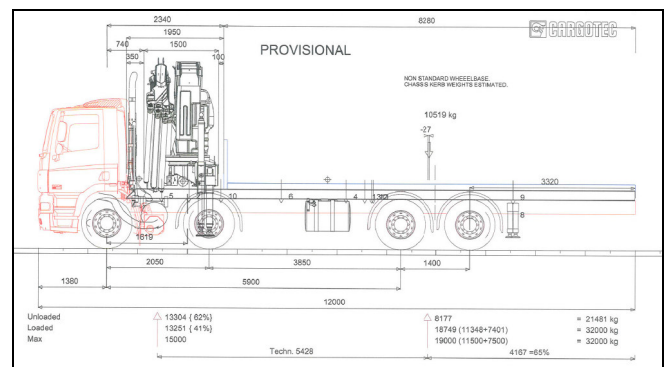


Figure 3 8.3m trailer and crane with DAF CF85

The number of vehicles for a T-pylon is currently under consideration and will be partially dependent on availability of access. The combining of sections (Figure 4) will be determined by the supplier. It is noted that if a transformer can reach the start of the OHL route via a long vehicle (65m) then the transportation described above will not be problematic.

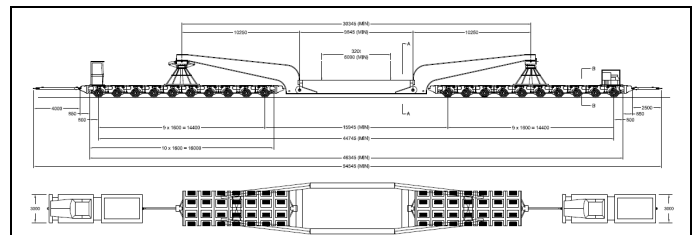


Figure 4 14 Axle girder frame trailer



Figure 5 Section transportation option

3.1 Foundations

The principle foundation of choice for the T-pylon is a monopile (steel tubular) type foundation. The installation of the monopile foundation requires the delivery of the monopile, the pile hammer and the power pack for the hammer. The monopile currently may be between 9-14m in length, whilst the hammer may be approximately 8.8m long (46t, total weight), and the power pack has a length of 4m long.

The hammer and power pack are transported on a 16m trailer with the monopile on a separate vehicle. The monopile and hammer need to be moved into position using a 200t crane. The installation also requires the transportation of an excavator and pile gripper.

Alternative foundation solutions are also available where the ground (i.e. too stiff or too soft) and access (i.e. large inclines) mean that the monopile solution may not be preferable. The alternative foundation solutions are a bored mini (transport length 8m) or driven (transport length 19m, overhang possible) pile system with a concrete cap. However, the tracked vehicles used for installation still have to be transported to site.

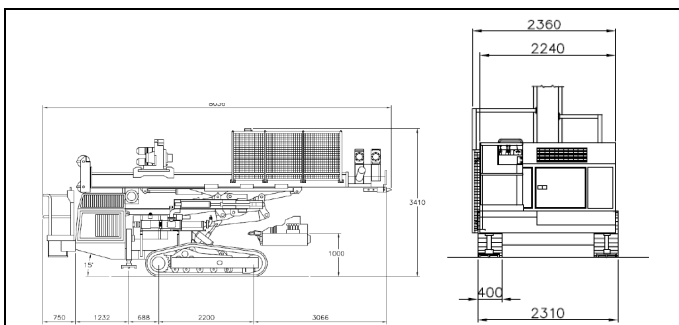


Figure 6 Mini boring rig

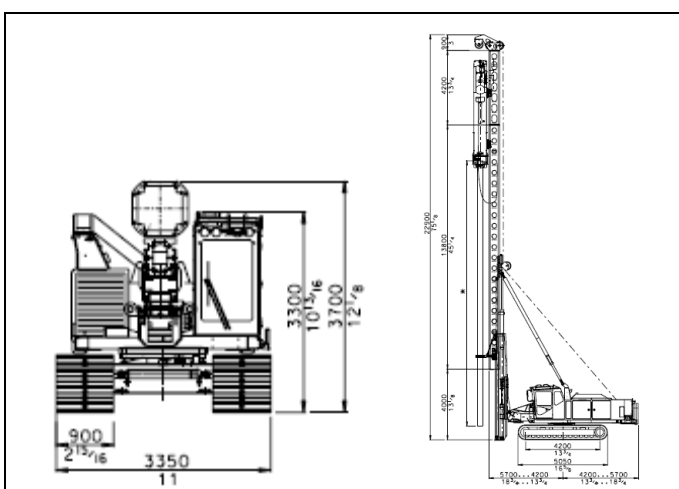


Figure 7 Driven pile rig

3.2 Construction

The current T-pylon design requires the transportation and erection of large and heavy sections. The suspension pylon is made up of three slip joint sections whereas the tension pylon is composed of two internally flanged sections. Horizontal or vertical slip jointing or bolting of flanges still requires a 200t crane.

4. 200t 'Mobile' Crane

There are multiple hire companies offering similar 200t cranes. This size of crane caters for the largest size of monopile hammer which is proposed for the construction of the T-pylon. Some details are as follows for a Liebherr crane.

- 82t gross vehicle weight including a 16t counterweight on crane.
- 60t additional counterweight transported separately.
- 12t per axle.
- Length = 15.3m
- Width = 3.0m - 3.1m (8.3m extended out riggers)

It is envisaged that the crane will operate on a flat made up road, with a maximum allowable deviation from level up to 15° . The crane can traverse inclines up to 35° .

A 200t crane would require a made up road, and could not operate off-road. From engaging with hire operators it is understood that a crane of this size has been used historically on an incline up to 15°. The following table shows the cranes traversing capabilities:

Speed (mph)	Speed (km)	Incline	Incline (°)
23	36	60%	31
24	39	55%	29
46	75	48%	26
50	80	43%	23

Table 5 - Traversing capabilities of a 200t crane



Figure 8 - 200t crane

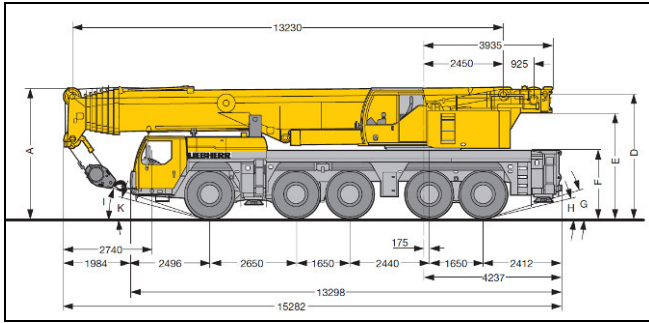


Figure 9 200t crane schematic (elevation)

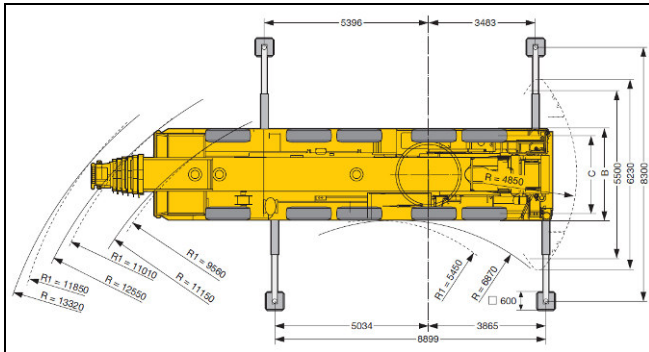


Figure 10 200t crane schematic (plan)

5. Mobile Elevated Working Platforms (MEWPs)

Reliance on MEWPs to access pylons is a new concept to National Grid, therefore great consideration has been taken to work up good ground determination information, access requirements and maintenance activities.

A MEWP with a 40m (minimum) reach will be required. This is due to the height of the pylon. Working with MEWPs has been trailed before, and seen as successful. MEWP access is also safer than current pylon climbing activities.

For the T-pylons requirements it is envisaged that a track mounted size MEWP would be of sufficient size. The use of easements in place of way leaves will mean greater access to structures. However, due to pylons often being located in rural areas, often in fields, a tracked vehicle will have to be used to displace the need for a made up stone road. Rubber 'Enviro-tracks' would be used to lower the effective ground pressure to 5 psi, lowering damage to grantors produce.

Landing a 6m platform on to the conductors and transferring from MEWP to a work area outside of the MEWP platform are methodologies which have already been developed by 'Blade Access' with Balfour Beattys for a lattice pylon. These methodologies have since been approved by IPAF. These methods would need further development for use with a T-pylon, which would be achieved using the Eakring test line.



Figure 11 - MEWP

6. Ground determination

The current contractual arrangement for the hire of heavy field plant, such as a crane and MEWP, is that the geotechnical surveys are undertaken by the hire company. The hire company will then specify and set up the load spreading plates required. The responsibility of the vehicle is then passed on to National Grid. This arrangement is currently under review. A possible method of National Grid reducing the risk of overturning would be to insist the any hire company use an additional factor of safety when specifying load spreading plates.

For emergency situations a contract shall be drawn up for a geotechnics company to provide fast response in order for a MEWP to arrive and be ready to work on site in such a situation.

7. Trench crossing and track way

In order for the MEWP to traverse culverts and trenches in the rural setting, quick bridging techniques are needed.

A number of bridges are available, these are:

Quick Bridge	12m crane required
Bailey Bridge	1 panel, cranes needed
K-Panel Bridge	Large
Medium Gurder	Large
Trench Crossing Kit	3m – 12m

The trench crossing kit can be supplied by 'speedy hire'. Speedy hire will undertake all ground assessment, installation and removal of such equipment.



Figure 12 - Trench crossing solution

From the initial call from National Grid to Speedy Hire it would normally take 1 week lead time to allow for transport and crew availability. This time could be greatly reduced if the beams and deck are already in stock. The bridge can be installed on a temporary foundation of heavy duty track panels with very little impact on the ground, alleviating the need for groundwork.

National Grid

Appendix 3H: T-pylon Construction Information

4. T-pylon Mobile Elevated Work Platform Method Statement and Specification

Client / Contractor / Designer *Blade Access and Balfour Beatty Utility Solutions*

Project *Mobile Elevated Work Platform (MEWP) Transfer.*

Method Statement Title & Number *MEWP Transfer, 2450612*

Revision Number *0*

Revision Date *-- / -- / --*

Location *Overhead Lines sites*

Description of the Works *Safely transfer operatives in the MEWP basket to and from the tower at height*

Interface *Ongoing communication with operatives.*

Prepared by [REDACTED] **Date** *21/08/12*

Reviewed by [REDACTED] **Date**

Date Valid **From** *21/08/12* **To** *Unspecified*

Supporting Documentation Required	
<i>Document Ref</i>	
<i>Risk Assessment</i>	
<i>Permits</i>	
<i>Temporary Works</i>	
<i>Utility Prints</i>	
<i>Lifting Plans</i>	
<i>Drawings</i>	
<i>COSHH</i>	

Resources, Plant & Equipment Required	
BBUS/Contractor Supervision	
Temporary Works	
Lifting Operations	• <i>N/A</i>
Manpower:	• <i>MEWP Vehicle Driver (1) – Must coordinate with the MEWP Basket Operator, when the engine is turned on, to operate the MEWP Basket.</i> • <i>Ground Crew (2) – Under strict supervision from (1) assist in setting up the MEWP. Training/toolbox talk provided by (1)</i> • <i>Tower Rescue Team – In the event of an incident on the</i>

	<i>tower, responsible for assessing the situation and safely getting the team off the tower, safely to ground.</i>
Sub-Contractor	<i>Blade Access Specialist Ltd</i>
Plant:	<i>MEWP T100</i>
Materials:	<i>N/A</i>
Security	<i>Site Demarcation</i>
Welfare	<i>To be provided</i>
PPE:	<i>Standard PPE for tower climbing plus:</i> <i>Lanyards</i> <i>Self Retracting Lanyard 2m (Nano-lok type)</i>
Training:	<i>Appropriate IPAF training for the Operator/Driver and all associated supervisory personnel. MEWP supplier shall provide essential training in specific details of attachment points, access/egress arrangements into the basket and emergency procedures</i> <i>Trained tower climbers to WI S1/01 & WIS1/03(rescue)</i>
Compliance:	<i>Ongoing RAMS and Toolbox talk</i>

Key Risks	
Key Risks:	<i>MEWP Failure</i> <i>MEWP Overturn/collapse</i> <i>Entrapment between basket and structure</i> <i>Falling Objects</i> <i>Fall from height</i> <i>Struck by moving objects e.g. vehicles</i>
Access / Egress:	<i>See induction procedures</i> <i>Via MEWP</i>
Utilities	<i>N/A</i>
Excavations	<i>N/A</i>
COSHH	<i>Assessment to be available at site office.</i>
Environmental:	<i>Potential Oil Spill – Oil Spill kits provided</i>
Traffic / Plant Movements	<i>Liaise with site office.</i>
Public interface	<i>N/A</i>

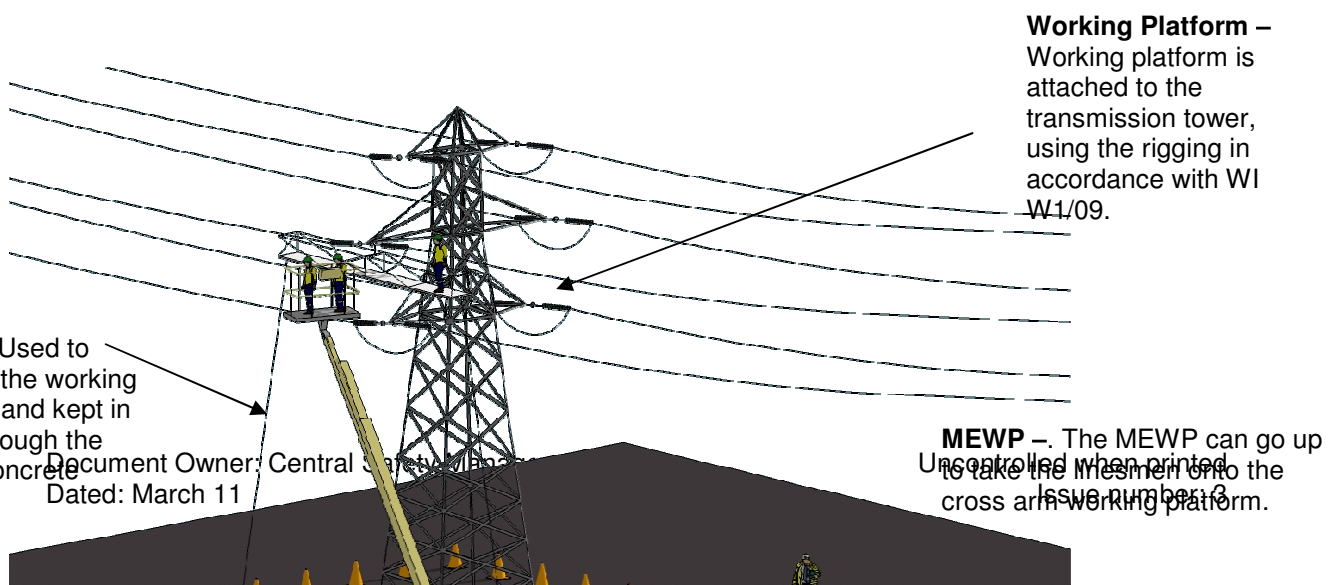
Method of Work	
1	<i>All personnel involved with the trial must be inducted under the site procedures before entering.</i>
2	<i>Induct operatives with Toolbox Talk and RAMS, signing the document to confirm understanding.</i>
3	<i>Work in compliance with temporary works procedures i.e outriggers to stabilise MEWP with help from ground crew and pads correctly deployed.</i>

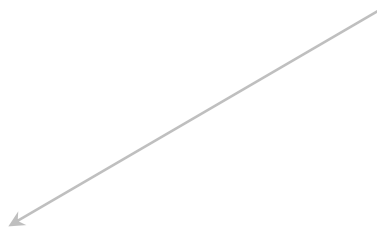
4	Check the working area to see if it is safe for the MEWP to commence work.
5	Demarcate work area.
6	The MEWP Operator must demonstrate emergency lowering procedures to ground staff, at ground level and appoint nominated personnel to be competent in performing the lowering procedure. The Automatic self-collapse feature of MEWP is <u>NOT to be used at any point</u> due to the confines of the environment in which the MEWP is working. This feature is preferably to be disabled or at least not accessible from the control pad.
7	The MEWP operator enters the MEWP basket, attaching his lanyard to the harness point according to the colour coded system. He will then demonstrate how the MEWP operates and instructs ground staff, where it is safe to stand when the MEWP is in operation.
8	Two operatives enter the MEWP basket and ensure that they are securely positioned. They will confirm to the MEWP operator to proceed at his discretion and signal to ground staff that they are about to proceed with the lifting of the MEWP arm.
9	The MEWP extends and rises towards the tower crossarm. MEWP operator to always maintain a safe distance from the arm and a minimum of 1m to any conductor.
10	Tower attachment from basket procedure: - MEWP basket rises to crossarm with operative(s) securely attached to the designated attachment point(s). - MEWP basket is positioned at a suitable location from which a 2m Self Retracting Lanyard (SRL) can be attached above where the operative is to get on to the structure. - Operative then secures the SRL to the tower structure from the basket at a point above where they will exit the MEWP basket onto the tower. - With the operative holding the attachment carabiner, the MEWP basket lowers a distance of roughly 1m to the exiting location adjacent to the crossarm. This allows the SRL to extend slightly. - Operative attaches carabiner at other end of SRL to front D on their harness then immediately disconnects from the MEWP basket. - Operative exits basket through gate onto tower structure. - Operative is now free to attach to tower using standard twin leg fall arrest carabiner and detach SRL from the front D if required but must leave SRL attached to tower. Tower attachment to basket procedure: - MEWP moves to resting position adjacent to tower - With SRL attached to D at front of harness, operative detaches fall arrest carabiner - Operative enters MEWP basket through gate and attaches to designated attachment point in basket then immediately detaches SRL from front D. - MEWP rises slightly to a point where the SRL can be easily

	detached from the tower. MEWP can now safely proceed to next function <u>CRUCIAL: The time spent attached to both the basket and the tower at the same time is to be kept to an absolute minimum.</u>
11	Transferral of Operatives to ground: MEWP descends and the operatives unclip and exit the basket once it is grounded.
Reference: Work Instruction WI W1/09 Work Instruction WI W1/03	



Instruction: MEWP Raises operatives to tower cross arm or erected working platform





Emergency Arrangements Required	
First aid	• <i>Designated site first aiders</i> • <i>Designated Health and Safety stations</i>
Fire	• <i>Designated fire Wardens</i> • <i>In event of fire, go to the designated fire assembly point.</i>
Rescue	• <i>Tower rescue kit</i> • <i>Tower rescue team</i>
Environmental	• <i>In the event of an oil spill, an oil spill kit is to be available.</i>
Specialist equipment required	• <i>MEWP T100</i>
Accident /Incident Reporting	• <i>All Accidents, Incidents, Near Misses must be reported to the immediate Supervisor, Engineer, Safety Advisor & the BBUS Helpline 0800 121 4444.</i>

Briefing Record	
Method Statement Title & Number	<i>MEWP Transfer</i>
Toolbox Talk	
Site Plan	
Other Method Statements	<i>Blade Access</i>

This record is to certify that the method statement including risk assessment and all other relevant documentation has been briefed to the working party

Briefed by:

Name	Signature	Date	Designation

Before work can commence the working party must sign the record below, confirming that they have received the briefing and that they fully understand the method statement including the risk assessment and all other relevant documentation.

[illegible]

Management of Change				
If during the course of the works it is found that there is a need to carry out works other than those detailed on the method statement.				
The team must stop TAKE 5 and assess the situation.				
Significant Changes:				
If there is a significant change required to the method statement the works must stop and the method statement must be revised.				
Minor Changes:				
If during the course of the works there is a need to make minor changes to the method statement the following section(s) must be completed. The relevant section must be marked on the original document.				
All changes MUST be re-briefed to all relevant persons. Signatures must be given to confirm re-briefing.				
Minor Changes:	This method statement, and associated risks, should only be changed in consultation with the Author and Reviewer as noted on the front page.			
Section	<i>Details of changes</i>			
Change Agreed by:	Name	Signature	Date	Time
Change re-briefed by:	Name	Signature	Date	Time

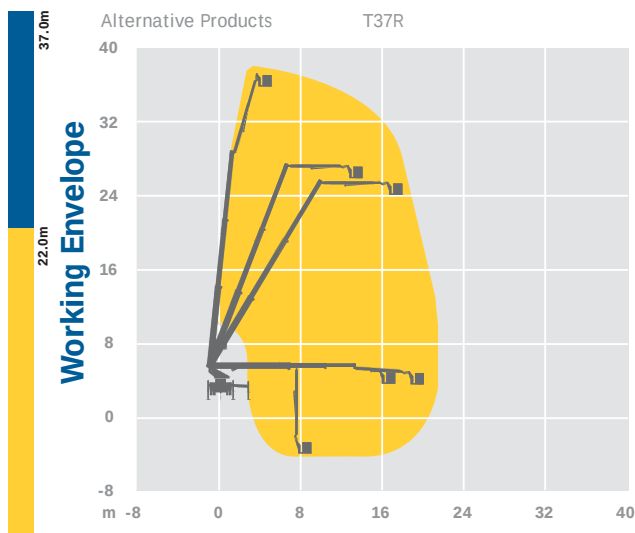
T37B

Truck mounts

Working Height **37.0m**
Horizontal Outreach* **22.0m**



Reach Below 0m 5.0m
Closed Length 9.7m
Closed Height 3.7m
Closed Width 2.5m
Platform Size 2.3m x 1.05m
Rotation 360°
Max SWL 700kg
Weight 18000kg
Operational Full Width 6.64m
Minimum Operational Width 4.5m
(reduces SWL/height/outreach)



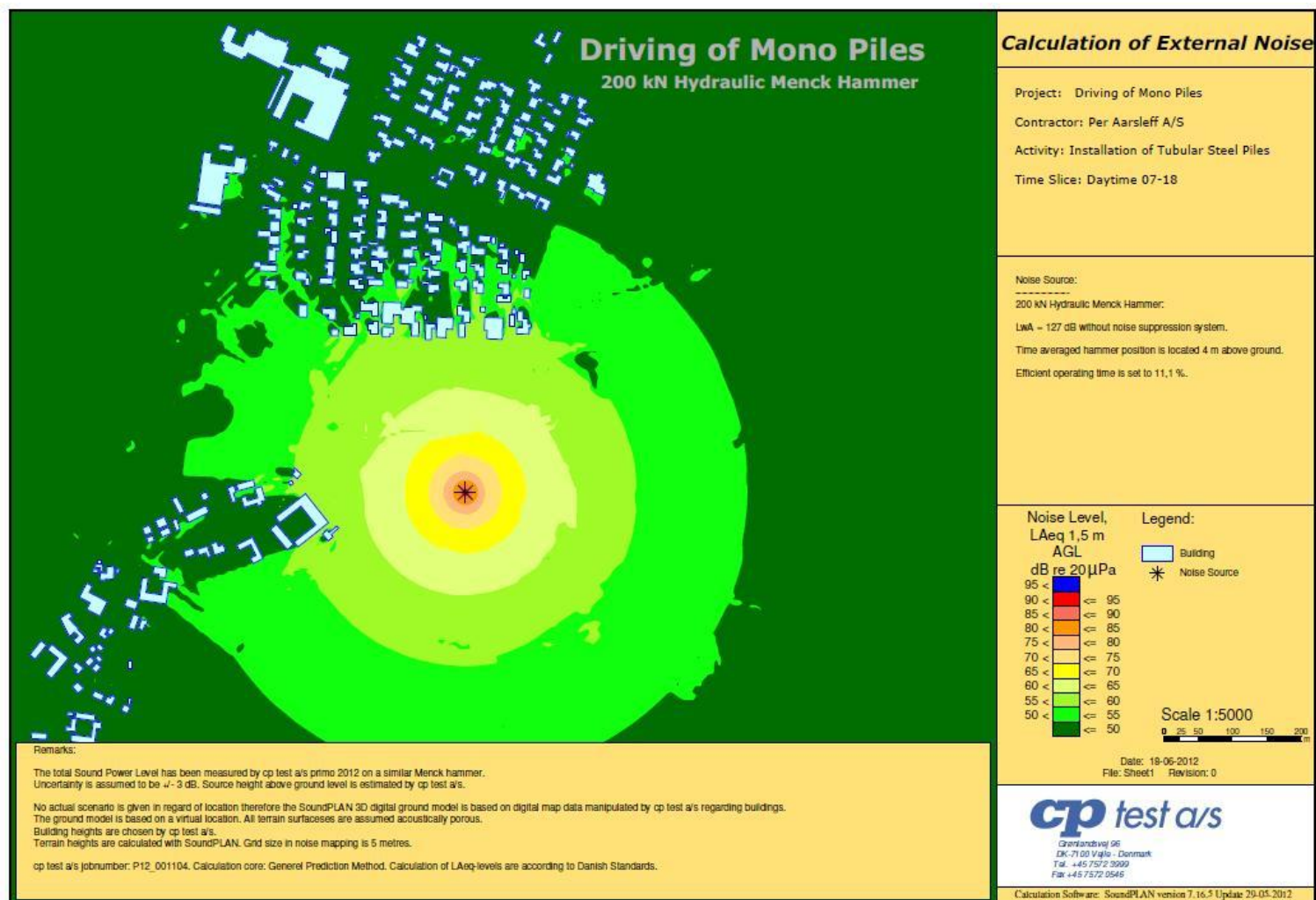
 **0845 745 0000**
www.nationwideplatforms.co.uk

National Grid

Appendix 3H: T-pylon Construction Information

5. T-pylon Calculation of Mono Pile Noise

The noise from the installation of the monopile is typical of any pile driving activity this only takes 2-3hrs per pile and is a one off activity. All other constructions noises are expected to be as lattice construction with reduced duration i.e. normal vehicle movement, crane etc.



National Grid

Appendix 3H: T-pylon Construction Information

6. T-pylon Maintenance/Access Note



T-pylon Maintenance/Access Note

Introduction

Maintenance Delivery Electricity MD(E) overhead lines are responsible for routine maintenance, defect rectification and emergency repairs on National Grid overhead lines. The T-pylon will require new techniques and equipment to facilitate these works using non climbing access and live line techniques on de-energised circuits.

There will be instances where local drain earthing will be required to provide safety from induced voltage and induced current however it is envisaged that the majority of the maintenance work will be carried out without the need for local drain earthing using live line access techniques and insulated tools.

Scope of maintenance work

- Replacement of tension and suspension insulator strings, horizontal compression member in the insulator unit and connecting the insulator unit to the mast (Flying Angle)
- Replacement of dowel pins, cotter pins and landing bolts
- Replacement of suspension clamps and fittings on phase and earthwire
- Repair hot joints
- Repair conductor damage
- Replacement of spacers and vibration dampers
- Insulator testing
- Conductor sag adjustment

Undertaking maintenance work

1. Emergency determination

An emergency situation is defined as a situation where there is a threat of danger to members of the public and the environment as a result of fault of a National Grid asset. During this time a solution is expedited as fast as reasonably possible whilst maintaining health and safety practices as far as possible. Once the threat has been mitigated normal working practices resume.

In the case of a fallen live conductor, the 'emergency situation' would continue till isolation earthing at substations and removal the risk of contact via protective fences had been carried out. After this, normal working and maintenance procedures would follow. Local drain earths would need to be applied as soon as practicable to reduce the risk of electrocution from circulating currents from the other circuit.

2. Maintenance inspection

It would be extremely costly and inefficient to carry out tower inspections using a MEWP, which would require individual sites to be made safe (e.g. ground investigation etc).

Current practice (Q2 2013) for inspection of lattice pylons involves the use of helicopters. These vehicles are able to travel swiftly between structures and hold steady during tower inspection. They are able to inspect the lowest phase of the T-pylon. Through using high resolution optics at a stand off distance of 20m any degradation and movement of components can be assessed. The use of helicopters also negates the requirement of negotiating access with landholders.

If a more detailed inspection is required then the robot climber proposed as a method to maintain surface finish could be used. Such a device would also be capable of carrying out more specific inspections at height using a high resolution camera.

The inspection of bolts on internal flanges may also be required in the long term. The provision of access holes will allow endoscope cameras to be inserted so that observations can be made of the bolt condition.

Where optics are used to assess loosening of bolts the initial alignments of the components should be marked up. This will allow those conducting maintenance to more readily assess any loosening.

3. Access

A tracked Mobile Elevated Work Platform (MEWP) with an insulated boom will be the primary means of access to the T-pylon structure and conductor systems.

The tracked MEWP will be transported to site on a 13m wagon. The enlarged dedicated gate access, installed during T-pylon construction would be used. For all new overhead line routes an easement will be arranged with the grantor to allow a permanent agreement. Where culverts are an access issue temporary solutions such as prefabricated bridge solutions can be rapidly deployed, without the need for ground remediation.

At the time of construction the geotechnical report will be recorded and the ground utilised for the crane pad will be compacted. It is being considered if a geogrid membrane solution can be installed at depths below 450mm to reinforce the top soil. By virtue of the construction activity the area around the T-pylon would be levelled although it is recognised that it would be ploughed.

From consultation with geotechnical specialists, it is envisaged that maintenance conducted in the short-medium term (15-25 years) post-construction would not require the topsoil to be excavated as the ground conditions will not be significantly different from construction data. Third party services would be contracted for determining the ground condition and the safe operation of the tracked MEWP.

4. Drain earthing

If an insulated boom MEWP is not available then cascade drain earths will be used. The drained earths will be connected to one of the two pan handles located on the mast. The cascading procedure will be carried out via a normal MEWP. It is recognised that the lateral loading capacity of the MEWP needs to be reviewed with suppliers since MEWPs are currently only designed for personnel and tool transport.

5. Maintenance equipment/tools

It is being explored whether a MEWP can be used for landing a conductor trolley on to the line or whether it needs to be raised using conventional methods.

Existing equipment and tools will be used where possible to undertake pylon furniture replacement activities. These activities are similar to lattice pylons including suspension, tension and terminal.

Rigging attachment points are being incorporated into the T-pylon design for lowering the entire insulator unit and square rigging.

Robotic solutions are being considered to reduce the requirement for personnel to work at height where possible (e.g. LineScout and ICM climber).