



Lime Down

Solar Park

Cable Route Avoidance Areas – Preliminary Geotechnical Risk Register

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Cable Route Avoidance Areas - Preliminary Geotechnical Risk Register Lime Down Solar Farm

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The geotechnical risk register presented is preliminary and high level only. Additional refinement of the risk register including mitigation will be required as the project progresses. Interpretations and conclusions determined from this report are subject to final design, loads, settlement tolerances, depth and construction method of the project infrastructure. The ground conditions and limiting hazards should be reviewed once design information is finalised

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TABLE OF CONTENTS

| | | |
|-----|--|----|
| 1 | INTRODUCTION..... | 1 |
| 1.1 | General | 1 |
| 1.2 | Scheme Description | 1 |
| 1.3 | Avoidance Areas..... | 1 |
| 2 | SOURCES OF INFORMATION | 2 |
| 3 | GROUND MODEL..... | 2 |
| 3.1 | Structural Geology..... | 8 |
| 3.2 | Hydrogeology..... | 8 |
| 3.3 | Summary of BGS Boreholes..... | 9 |
| 3.4 | Desk Study Identified Geohazards..... | 13 |
| 4 | PRELIMINARY GEOTECHNICAL RISK REGISTER..... | 14 |
| 5 | SUMMARY OF PRELIMINARY GEOTECHNICAL RISKS..... | 22 |
| 6 | REFERENCES | 24 |

TABLES

| | | |
|------------|--|----|
| Table 1.1, | Avoidance Areas..... | 2 |
| Table 3.1, | Ground Model..... | 3 |
| Table 3.2, | Geological Faults..... | 8 |
| Table 3.3, | Groundwater Strike Summary..... | 9 |
| Table 3.4, | Borehole Summary | 10 |
| Table 3.5, | Desk Study Identified Geohazards..... | 13 |
| Table 4.1, | Qualitative Assessment of Hazards and Risks | 14 |
| Table 4.2, | Preliminary Geotechnical Risk Register | 15 |
| Table 5.1, | Preliminary Total Risk Rating per Avoidance Area | 23 |

APPENDICES

Appendix A - Drawings

| Drawing Number | Description |
|---------------------------------|--|
| 26008710-GEOS-LDSF-HDD-D-G-2001 | Exploratory Hole Location Plan |
| 26008710-GEOS-LDSF-HDD-D-G-2002 | Northern Railway Section |
| 26008710-GEOS-LDSF-HDD-D-G-2003 | The Street Section |
| 26008710-GEOS-LDSF-HDD-D-G-2004 | Neeld Court Section |
| 26008710-GEOS-LDSF-HDD-D-G-2005 | M4 Section |
| 26008710-GEOS-LDSF-HDD-D-G-2006 | Tributary to Avon and Corston Section |
| 26008710-GEOS-LDSF-HDD-D-G-2007 | Rodbourne Brook Section |
| 26008710-GEOS-LDSF-HDD-D-G-2008 | BGS 1:50,000 Superficial and Bedrock Geology |

1 INTRODUCTION

1.1 General

Geosyntec have been commissioned by Lime Down Solar Park Ltd (the “Client”) to prepare a Preliminary Geotechnical Risk Register (PGRR) for the Avoidance Areas (AA) along the ‘Cable Route Corridor’ (“the Site”), which connects the proposed Lime Down solar farm with the Existing National Grid Melksham Substation. The purpose of the PGRR is to inform the Client of areas of potential concern with respect to geotechnical hazards beneath or within influencing distance of the Site. The PGRR will seek to provide an assessment of the impact of geotechnical hazards at the avoidance areas.

1.2 Scheme Description

The proposed scope of works is the development of a new solar farm with ancillary infrastructure and associated cable route to feed into the existing National Grid Melksham Substation. A full description of the proposed Scheme can be found in **Environmental Statement Volume 1, Chapter 3 The Scheme [APP-055]**. The cable is anticipated to be trenched at shallow depths (understood to be up to 2m of excavation) apart from key crossings at the Avoidance Areas, which are locations where trenchless technologies rather than open cut trenches will be used to avoid key crossings and engineering constraints. These areas are presented in **Environmental Statement Volume 2, Figure 3-2 Key Construction Phase Features [APP-082]**. It is understood the preferred method is horizontal directional drilling (HDD) whereby a pilot horizontal hole is drilled and the cable/duct is pulled back through using a backreamer.

1.3 Avoidance Areas

The PGRR will assess the geotechnical risks at the Avoidance Areas presented in Table 1.1 below. The reference numbers and names have been taken from the Lime Down Solar Park Data Viewer, this online WebGIS application hosts all the pertinent information for the project in a visual map format. Note that Gauze Brook has been differentiated into A and B for clarity.

Table 1.1, Avoidance Areas

| Avoidance Area Reference Number | Name |
|---------------------------------|------------------------------|
| 1 | Northern Railway (ELR:SWB) |
| 2 | Gauze Brook A |
| 3 | The Street |
| 4 | Neeld Court |
| 5 | M4 |
| 6 | A420 |
| 7 | Pudding Brook |
| 8 | A4 and Pudding Brook |
| 9 | Tributary to Avon at Easton |
| 10 | Southern Railway (ELR:MLN1) |
| 11 | Tributary to Avon at Corston |
| 12 | Rodbourne Brook |
| 13 | Gauze Brook B |

2 SOURCES OF INFORMATION

Geosyntec has consulted with numerous sources of information presented in Section 6. The interpretation and conclusions drawn by Geosyntec are based on the acceptance of accurate information provided by third parties. Geosyntec does not accept liability for any inaccurate information supplied by third parties.

3 GROUND MODEL

A high-level ground model is provided as Table 3.1 and is based on the information supplied in the data listed in Section 2 and the desk study reports. Soil and engineering descriptions were developed using British Geological Survey (BGS) data and borehole logs, these descriptions/depths/thicknesses are indicative only and will require updating after intrusive investigations.

An exploratory hole location plan is available in Appendix A, drawing 26008710-GEOS-LDSF-HDD-D-G-2001. Depth ranges were derived using BGS data. Where strata are not encountered on available boreholes, depths were established using publicly available geological maps. Cross sections can be found within Appendix A, drawings 26008710-GEOS-LDSF-HDD-D-G-2002 to 26008710-GEOS-LDSF-HDD-D-G-2007. It is noted that for the thirteen (13) avoidance areas, only six cross sections have been generated. This is due to a lack of pertinent information available for A420, Pudding Brook, A4 and Pudding Brook, Tributary to Avon and Easton, Southern Railway, Gauze Brook A and Gauze Brook B. A superficial and solid geology plan is also accessible in Appendix A, drawing 26008710-GEOS-LDSF-HDD-D-G-2008. This shows the key superficial and bedrock geology per avoidance area.

Project: 26008710

Cable Route and Avoidance Areas

Table 3.1, Ground Model

| Group | Formation | Description | Engineering Description | Depth Range (m BGL) |
|----------------|-----------------------------|--|---|------------------------|
| Superficial | Topsoil | Soft silty sandy slightly gravelly clay. | | 0-0.3 |
| Superficial | Alluvium | Slightly gravelly sandy clay/ silt. With varying proportions of gravel and sand. Soft to firm heterogeneous consolidated and compressible and possibly prone to shrink swell behaviour. Confined locally to the existing river system. | Slightly gravelly sandy clay/ silt. | 0.3-2.5 |
| Ancholme Group | Oxford Clay Formation (OXC) | The formation comprises slightly silty silicate mudstone with beds of limestone nodules, occurring in the south of Site. It is typically recovered as, or weathers to, a stiff, low-permeability clay – very stiff clay to very weak mudstone in less weathered zones – with hard limestone nodules and a variable weathering profile that can induce anisotropic strength conditions. The material generally contains low smectite content and may include very weak siltstone and calcareous types. Permeability is generally very low to low, with groundwater flow predominantly occurring through discontinuities or fissures. Up to 185m in thickness. | Very stiff clay to very weak mudstone. Weathers to fissured soft to stiff clay, typically with low smectite content. Permeability is generally very low to low with flow most commonly occurring through discontinuities / fissures. Includes very weak siltstone and calcareous types. Considered to be over-consolidated. | 0-20 |

| Group | Formation | Description | Engineering Description | Depth Range (m BGL) |
|----------------|-----------------------------|--|--|------------------------|
| Ancholme Group | Kellaways Sand Member (KLS) | Silicate sandstone and silicate siltstone with calcareous cement and interbeds of sandy and silty mudstone. Localised to the west of the Melksham area of Site. Strata typically 3-5m thick. | <p>Sandstone: Loose sand to weak sandstone. Weathers to loose gravelly sand. Low to high permeability flow mainly through discontinuities but also through matrix.</p> <p>Mudstone: Very stiff clay to very weak mudstone. Weathers to fissured soft to stiff clay. Stratum is susceptible to shrink-swell clay minerals. Permeability is generally very low to low with flow most commonly occurring through discontinuities / fissures. Includes very weak siltstone and calcareous types. Considered to be over-consolidated.</p> | 0-8.2.0 |

| Group | Formation | Description | Engineering Description | Depth Range (m BGL) |
|--------------------|-----------------------------|---|--|------------------------|
| Ancholme Group | Kellaways Clay Member (KLC) | <p>The unit comprises mid- to dark-grey weak mudstone or very stiff clay, weathering to a smooth pale grey clay, and is commonly silty or sandy with lenticular beds of calcareous siltstone and sandstone, as well as thin beds of siltstone and sandstone with argillaceous limestone nodules. It is localised to the eastern extent of the site, including the Melksham area and land adjacent to the south of the A4, with a typical thickness of 21–25 m.</p> <p>The high clay content renders the material susceptible to shrink–swell behaviour, while silty and sandy lenses may contain perched water. Permeability is generally very low to low, with groundwater flow mainly occurring through fissures and other discontinuities. The formation also includes very weak siltstone and calcareous types and is considered to be over-consolidated.</p> | Very stiff clay to very weak mudstone. Weathers to fissured soft to stiff clay. Stratum is susceptible to shrink-swell clay minerals. Permeability is generally very low to low with flow most commonly occurring through discontinuities / fissures. Includes very weak siltstone and calcareous types. Considered to be over-consolidated. | 0.8-2.0 |
| Great Oolite Group | Cornbrash Formation (CB) | Bioclastic fine to medium grained limestone, typically wackestone or packstones with argillaceous interbeds or calcareous mudstone. Commonly observed within the central most areas of Site. Typically, 2-4m in thickness. | Very weak to strong thickly to thinly bedded shelly fine to medium-grained oolitic limestone may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability flow mainly through discontinuities but also through matrix. | 1.8-2.7 |

| Group | Formation | Description | Engineering Description | Depth Range (m BGL) |
|--------------------|--|--|--|------------------------|
| Great Oolite Group | Forest Marble Formation - Mudstone (FMB) | <p>Interbedded silicate mudstone with ooidal limestone and sandstone at the base of the succession. Silicate mudstone is greenish grey with sandy lenticular, typically cross-bedded limestone. The Ooidal Limestone is variably sandy medium to coarsely bioclastic grainstone.</p> <p>The formation is approximately 20m thick and underlies most of the Site.</p> | <p>Mudstones: Very stiff clay to very weak mudstone. Weathers to fissured soft to stiff clay. Stratum is susceptible to shrink-swell clay minerals. Permeability is generally very low to low with flow most commonly occurring through discontinuities / fissures. Includes very weak siltstone and calcareous types. Considered to be over-consolidated.</p> <p>Limestones: Very weak to strong thickly to thinly bedded shelly medium to coarse grained oolitic limestone may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability flow mainly through discontinuities but also through matrix.</p> | 0.4-50 |
| Great Oolite Group | Corsham Limestone Formation (CSHF) | Variably sandy limestone, presenting both ooidal and bioclastic types as-well-as grainstone, packstone and wackestone textures. Deposits are lenticular and up to 9m in thickness. | Very weak to strong thickly to thinly bedded shelly medium to coarse grained oolitic limestone may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability flow mainly through discontinuities but also through matrix. | 9.1-13.4 |

| Group | Formation | Description | Engineering Description | Depth Range (m BGL) |
|--------------------|------------------------------------|--|--|------------------------|
| Great Oolite Group | Chalfield Oolite (CHO) Formation | Present at depth. Comprises Bath Oolite Member, Twinhoe Member and Coombe Down Oolite Member. Ranging from stiff clay (~mudstone) to hard rock (limestone) locally crystallised (~high unconfined compressive strength). Thick beds of highly fractured Oolite and limestone (~high transmissivity). Gull caves (caves formed by mass movement and solution induced expansion of joints) are common within the Great Oolite group. | Very weak to strong thickly to thinly bedded shelly medium to coarse grained oolitic limestone may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability flow mainly through discontinuities but also through matrix. | 8-96 |
| Great Oolite Group | Combe Down Oolite (CODO) Formation | Calcareous fine to coarse grained ooid grainstones with significant bioclastic material. Commonly interbedded with calcareous mudstone beds in the lower part of the succession. The unit is approximately 10m thick. | <p>Mudstones: Very stiff clay to very weak mudstone. Weathers to fissured soft to stiff clay. Stratum is susceptible to shrink-swell clay minerals. Permeability is generally very low to low with flow most commonly occurring through discontinuities / fissures. Includes very weak siltstone and calcareous types. Considered to be over-consolidated.</p> <p>Limestones: Very weak to strong thickly to thinly bedded shelly medium to coarse grained oolitic limestone may contain sandstone or very stiff clay/very weak mudstone beds. Weathers to gravelly, calcareous sand. Low to very high permeability flow mainly through discontinuities but also through matrix.</p> | 18-65 |

3.1 Structural Geology

There are three geological faults intersecting the avoidance areas of the Site as presented in Table 3.2 below. BGS 1:50,000 Sheet 265 indicates the north of Site has an unspecified dip to the southeast direction. The south of Site has varying dip directions. No cross sections are available for either avoidance area due to a lack of available borehole records.

Table 3.2, Geological Faults

| Avoidance Area | Grid Reference | Orientation | Throw Direction | Comment |
|----------------------|-------------------|-------------|-----------------|-----------------------------|
| Pudding Brook | 388374, 172557 | NW/SE | SW | Conjectured |
| A4 and Pudding Brook | 389129, 171953 | NE/SW | SE | Corsham Fault. Conjectured. |
| A4 and Pudding Brook | 389303, 171693 | NE/SW | NW | Conjectured |

3.2 Hydrogeology

Localised Alluvium deposits across the site are designated as a Secondary A reflecting their ability to yield groundwater locally and support surface watercourses. The Ancholme Group including the Oxford Clay Formation and Kellaways Formation are classified as unproductive strata, comprising predominantly low-permeability mudstones and clays that do not typically yield significant groundwater resources.

The Great Oolite Group (the Corsham Limestone Formation, Chalfield Oolite Formation and Combe Down Oolite Formation) forms the Principal Aquifer, consisting of fractured and locally karstified oolitic limestones. Groundwater within the Great Oolite is typically unconfined at outcrop and becomes confined beneath lower-permeability units, with well-developed spring lines commonly occurring at lithological boundaries, particularly where permeable limestones overlie mudstone formations. As a result, perched groundwater conditions may be present.

The Forest Marble Formation and Cornbrash Formation comprise interbedded limestones and mudstones, these are classified as Secondary A Aquifers, reflecting a reduced hydraulic productivity. The basal limestone unit of the Forest Marble Formation is inferred to be part of the Principal Aquifer of the Great Oolite Group, or at least within hydraulic conductivity.

The Site also contains multiple surface water features including ponds and streams. Gauze Brook and Rodbourne Brook are the two significant groundwater features associated with the HDD avoidance areas.

Table 3.3, Groundwater Strike Summary

| Borehole ID | Groundwater Strike Depth (m BGL) |
|-------------|----------------------------------|
| ST87NE23/A | 1.5 |
| ST87NE24 | 0.9 |

3.3 Summary of BGS Boreholes

Geosyntec has reviewed client supplied information as well as the publicly available boreholes available on BGS GeoIndex Viewer within 500m of the Avoidance Areas. Pertinent boreholes are summarised within Table 3.4 and copies of Borehole logs are available online at BGS GeoIndex Viewer. Selected boreholes taken from the available BGS mapping listed above have been included where appropriate. It should be noted that engineering rockhead has been inferred from the available logs.

Table 3.4, Borehole Summary

| Borehole ID | Source | Total Depth (m BGL) | Depth to Engineering Rockhead (m BGL) | Comments |
|-------------|-----------------------------|---------------------|---------------------------------------|--|
| GRANGE-BH01 | 4364-VED-00-XX-RP-CV-010001 | 18.2 | 0.35 - FMB | |
| GRANGE-BH02 | 4364-VED-00-XX-RP-CV-010001 | 18.3 | 0.30 - FMB | |
| ST86NE23 | BGS Geindex | 46.2 | 5 - CHO | No geology descriptions available between 0-5m BGL. Total water loss at 7.2m bGL. Weathered limestones and locally clayey zones present throughout the Great Oolite Group. Minor lignite recorded between 43-46.2m BGL. |
| ST86NE30 | BGS Geindex | 31.1 | 0.3 - FMB | Clay with rock bands within the Forest Marble. |
| ST87NE10 | BGS Geindex | 2.2 | 0.28 - FMB | |
| ST87NE11 | BGS Geindex | 1.6 | 0.25 - FMB | |
| ST87NE12 | BGS Geindex | 1.2 | 0.3 - FMB | |
| ST87NE13 | BGS Geindex | 1.2 | 0.2 -FMB | |
| ST87NE23/A | BGS Geindex | 2.00. | 0.3 - FMB | |

| Borehole ID | Source | Total Depth (m BGL) | Depth to Engineering Rockhead (m BGL) | Comments |
|-------------|--------------|---------------------|---------------------------------------|---|
| ST87NE23/B | BGS Geoindex | 21.0 | 1.5 – FMB | No geology descriptions available between 0-1.5m BGL. Hard marl layers within the Corsham Limestone Formation. |
| ST87NE24 | BGS Geoindex | 10.0 | 0.3 – FMB | Alternating bands of grey limestone and hard blue shelly clay from 9.1m BGL. SPT refusal at 10.3m BGL. |
| ST87NE28 | BGS Geoindex | 3.2 | 0.3 – FMB | |
| ST87NE29 | BGS Geoindex | 3.3 | 0.28 – FMB | |
| ST87NE38 | BGS Geoindex | 169.5 | 0.3 – FMB | |
| ST87NE41 | BGS Geoindex | 5.0 | Unable to ascertain | Borehole was commenced for pumping, no in-depth geological log provided. |
| ST88SE13 | BGS Geoindex | 27.0 | Unable to ascertain | Borehole was commenced for pumping, no in-depth geological log provided. |
| ST88SE14 | BGS Geoindex | 45.7 | 0.3 – FMB | |
| ST88SE24 | BGS Geoindex | 4.3 | Unable to ascertain | Borehole was commenced for pumping, no in-depth geological log provided. |
| ST88SE34 | BGS Geoindex | 20.0 | 0.3 – FMB | |
| ST88SE38 | BGS Geoindex | 60 | Unable to ascertain | Borehole was commenced for pumping, no in-depth geological log provided. |
| ST88SE8 | BGS Geoindex | 8.2 | 0.3 – FMB | |
| ST98SW13/A | BGS Geoindex | 98.0 | Unable to ascertain | Borehole was commenced for pumping, no in-depth geological log provided. |

| Borehole ID | Source | Total Depth (m BGL) | Depth to Engineering Rockhead (m BGL) | Comments |
|-------------|--------------|---------------------|---------------------------------------|---|
| ST98SW13/B | BGS Geoindex | 98.0 | 0.3 - FMB | Marl bed between 6m and 36m BGL. Alternating bands of limestone and clay from 28m and 98m BGL. |
| ST98SW16 | BGS Geoindex | 98.0 | 0.5 - FMB | Marl bed between 6m and 36m BGL. Alternating bands of limestone and clay from 28m and 98m BGL. |

3.4 Desk Study Identified Geohazards

Geosyntec has completed a desk study review of the **Environmental Statement Volume 3, Appendices 19-1 to 19-8 [APP-247 to APP-254]**. Based on this review a range of potential geohazards have been identified along the avoidance areas and wider site. Table 3.5 details the hazards summarised in the lime down solar park desk study reports (Geosyntec, 2025). Additional mining risks are noted within Monks Park however no avoidance areas are associated with this region. Please refer to document **Environmental Statement Volume 3, Appendix 19-11 [APP-257]** for a complete mining risk assessment.

Table 3.5, Desk Study Identified Geohazards

| Geohazard | Risk Level | Comments |
|-----------------------------|-----------------------|---|
| Collapsible ground | Very low | No geology identified on the Site is strongly associated with collapsible ground. |
| Compressible ground | No hazard to moderate | Locally associated with Alluvium. |
| Ground dissolution | No hazard to moderate | Associated with limestone and calcareous deposits. |
| Karst features | No hazard to very low | No Karst features noted within avoidance areas but are reported within the wider Site. |
| Landslide / slope stability | Very low to moderate | Associated with existing railway cuttings and localised water features. |
| Running sands | No hazard to low | Associated with Alluvium. |
| Shrink-swell clays | No hazard to moderate | Associated with Alluvium, the Kellaway's Mudstone Member and weathered mudstones of the Great Oolite Group. |
| Backfilled ponds | No hazard to very low | No features present within avoidance areas but are reported within the wider Site. |
| Backfilled quarry | Moderate | One historical backfilled quarry is noted within the Pudding Brook avoidance area. |
| Additional mining risks | Low | Associated with the South of the Site however it is not envisaged these will be a risk to the HDD. |

4 PRELIMINARY GEOTECHNICAL RISK REGISTER

From undertaking the geotechnical interpretation of the data presented in Section 3, the main risks identified for the proposed works are listed below. The probability and impact of a hazard have been judged on a qualitative scale as set out in Table 4.1 below. The degree of risk (R) is determined by combining the assessment of the probability (P) of the hazard occurring with an assessment of the consequences (C) of the hazard and associated mitigation it will require if it occurs ($R = P \times C$). This preliminary risk register, Table 4.2, should be reviewed and updated throughout the project life cycle.

Table 4.1, Qualitative Assessment of Hazards and Risks

| P = Probability | | C = Consequence | | R = Risk Rating (P x I) | |
|-----------------|---------------|-----------------|-----------|-------------------------|-------------------|
| 1 | Very unlikely | 1 | Very Low | 1 - 4 | None / negligible |
| 2 | Unlikely | 2 | Low | 5 - 9 | Minor |
| 3 | Plausible | 3 | Medium | 10 - 14 | Moderate |
| 4 | Likely | 4 | High | 15 - 19 | Substantial |
| 5 | Very Likely | 5 | Very High | 20 - 25 | Severe |

Table 4.2, Preliminary Geotechnical Risk Register

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|--|----------|---------------------|----------------------------|---|------------------------|---|----|
| | | | | | P | C | R |
| Lack of historical ground investigation data | Sitewide | All avoidance areas | Contractor | <ul style="list-style-type: none"> Poor understanding of site-specific ground conditions including made ground and superficial deposits. Poor understanding of the Sites hydrogeological conditions. No geotechnical information for the Site to inform upon HDD design. | 5 | 4 | 20 |
| Loose/soft soils/ weathered bedrock | Sitewide | All avoidance areas | Contractor, Infrastructure | Difficult drilling conditions (blowing sand) and collapse of bore resulting in possible settlement of the ground or infrastructure above the proposed HDD. | 4 | 4 | 16 |
| Heterogeneous soils | Sitewide | All avoidance areas | Contractor, Infrastructure | Difficult drilling conditions, settlement or heave. Settlement or heave can affect the ground or infrastructure overlying the proposed HDD due to either physical displacement of the ground by the methods employed or by pressures in drilling fluids. | 4 | 4 | 16 |
| Deep granular obstructive layers including: Dense sand Hard marl layers Interbedded rock layers | Sitewide | All avoidance areas | Contractor, Infrastructure | Difficult drilling conditions which may result in increased wear/failure of drilling equipment, slow progress and steering deviations. | 3 | 5 | 15 |

Project: 26008710

Cable Route Avoidance Areas

Preliminary Geotechnical Risk Register

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|--|----------|---------------------|----------------------------|--|------------------------|---|----|
| | | | | | P | C | R |
| Shallow groundwater and groundwater flooding | Sitewide | All avoidance areas | Contractor, Infrastructure | <ul style="list-style-type: none"> Delay to programme. Difficult drilling conditions resulting in settlement or heave due to pressures in drilling fluids exceeding the overburden pressure at the proposed crossing level. Settlement or heave can affect the ground or infrastructure overlying the proposed HDD. Groundwater also increases risk of bore collapse resulting in possible settlement of the ground or infrastructure above the proposed HDD. | 4 | 3 | 12 |
| Buried obstructions | Sitewide | All avoidance areas | Contractor | Difficult drilling conditions which may result in increased wear/failure of drilling equipment, slow progress and steering deviations. | 3 | 3 | 9 |
| High sulphur content | Sitewide | All avoidance areas | Contractor | Aggressive ground can degrade and corrode machinery leading to increased wear/failure of drilling equipment. | 3 | 3 | 9 |

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|-------------------------------------|----------|---------------------|----------------------------|---|------------------------|---|----|
| | | | | | P | C | R |
| Shrink swell properties of Clay | Sitewide | All avoidance areas | Infrastructure | <ul style="list-style-type: none"> Difficult drilling conditions which may result in increased wear of drilling equipment, slow progress and steering deviations. The swelling pressure of the clay combined with the drilling fluid pressure can cause ground heave. Ground heave and settlement may damage ground or infrastructure above the HDD. | 3 | 3 | 9 |
| Ground Dissolution of Soluble Rocks | Sitewide | All avoidance areas | Contractor, Infrastructure | <ul style="list-style-type: none"> Loss of drilling fluid where fluid escapes into underground voids may lead to difficult drilling conditions including but not limited to steering deviations, stuck drill bit and bore collapse. Washout of soft clay/sand due to drilling pressure may lead voiding and settlement of the ground or infrastructure. | 3 | 4 | 12 |

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|--------------------|---------------------------------------|---|----------------------------|---|------------------------|---|---|
| | | | | | P | C | R |
| Underground Mining | Southern area of Cable Route Corridor | (No underground mining works have been identified at any avoidance area. Risk is noted due to potential of unrecorded mines/workings) | Contractor, Infrastructure | <ul style="list-style-type: none"> Historic mining poses a risk to existing ground stability and existing voids within the subsurface. Vibrations as a result of the HDD can result in the collapse of mine shafts, development of crown holes and settlement of the ground or infrastructure. Loss of drill fluid to existing voids within the subsurface and historic workings may lead to increased wear/failure of drilling equipment and tunnelling obstructions. The HDD may mobilise new contaminant pathways and enable ground gases to be dispersed during drilling. Both pose a health and safety risk. Whilst the risk remains, it is understood the mining hazards are localised to the south of Site and away from the Avoidance Areas. | 1 | 4 | 4 |

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|--------------------------|----------|---------------------|---------------------------------|--|------------------------|---|----|
| | | | | | P | C | R |
| Surface Mining | Sitewide | Pudding Brook | Contractor, Infrastructure, HDD | <ul style="list-style-type: none"> Historic quarry noted within the Pudding Brook avoidance area may contain unrecorded voids, partially collapsed faces and/or heterogenous backfill materials. Difficult drilling conditions may result in increased wear of drilling equipment, slow progress, steering deviations, sudden loss of drilling fluid and possible bore collapse. | 2 | 4 | 8 |
| Fractures | Sitewide | All avoidance areas | Contractor | Difficult drilling conditions which may result in increased wear/failure of drilling equipment, slow progress and steering deviations. | 4 | 3 | 12 |
| Springs / Artesian Water | Sitewide | All avoidance areas | Contractor | <ul style="list-style-type: none"> Inflow of natural groundwater can flood and collapse the bore and/or lead to continuous surface discharge (where the bore acts as a conduit for artesian water to reach the surface) forming erosional/piping surfaces. Dewatering methods may be required at surface. | 3 | 4 | 12 |

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|--|---------------------------------|--|----------------------------|--|------------------------|---|----|
| | | | | | P | C | R |
| Compressible ground | Sitewide | Gauze Brook A Gauze Brook B A4 and Pudding Brook | Contractor, Infrastructure | Difficult drilling conditions resulting in settlement due to pressures in drilling fluids exceeding the overburden pressure at the proposed crossing level. Settlement can affect the ground or infrastructure overlying the proposed HDD. | 3 | 4 | 12 |
| Possible contaminants of Potential Concern | Sitewide | All avoidance areas | Contractor | <ul style="list-style-type: none"> Area previously utilised for farming, possible contamination including asbestos may be present and is yet to be defined. This may pose a health and safety risk. HDD boring could present a contamination pathway to the Principal Aquifer if bored through the limestone. | 3 | 4 | 12 |
| Slope Instability | Made Ground Forest Marble | Northern Railway (SWB Line) Gauze Brook A M4 Southern Railway Gauze Brook B Rodbourne Brook | Contractor | <ul style="list-style-type: none"> HDD may temporarily modify groundwater regimes and interject potential shear planes/planes of weakness such as weathered limestone beds which may lead to slope instability. Drilling fluid may increase pore pressures within the soil. Vibrations as a result of the HDD may also worsen instability and mobilise small slope failures. | 3 | 5 | 15 |

| Hazard | Location | Avoidance Area | Who is at Risk | Consequence | Risk Before Mitigation | | |
|-----------------|----------|------------------------------------|-----------------------------------|---|------------------------|---|----|
| | | | | | P | C | R |
| Historic Faults | Sitewide | Pudding Brook A4 and Pudding Brook | Contractor | Difficult drilling conditions which may result in increased wear/failure of drilling equipment, slow progress, steering deviations and groundwater ingress due to preferential fluid pathways resulting in bore instability and collapse. | 4 | 4 | 16 |
| Buried services | Sitewide | All avoidance areas | Contractor, Construction workers. | Injury / death, loss of service supply. Time and cost of repair. | 5 | 5 | 25 |

5 SUMMARY OF PRELIMINARY GEOTECHNICAL RISKS

Limited available data results in reduced certainty regarding the ground model and associated hazards at each of the proposed HDD crossings. A targeted ground investigation is recommended to confirm the ground model, structure, groundwater regimes, and the presence of contaminants, obstructions, mining features, or fractures. Pre-construction utility surveys should be completed to locate and protect buried services and contaminant risks should be assessed during a ground investigation prior to commencement so appropriate PPE and method statements can be adopted.

Alluvium and the Great Oolite Group present a likely risk due to heterogenous soils and clay with shrink swell potential which introduces the risk of volumetric instability, including heave due to pressurised fluids or shrinkage following dissipation. Granular obstructions such as dense sands, hard marl layers, or interbedded rock horizon are likely to reduce drilling efficiency, increase wear on tooling, and lead to steering deviations. Where compressible, loose or heterogenous soils are likely, HDD design should consider adjusting bore depths, drilling fluid pressures and adopt appropriate drilling methods such as pilot hole steering. Real-time monitoring of drilling fluid pressures is essential to prevent heave or settlement, particularly in areas of potential voids, dissolution features or fractures. Where bores are likely to collapse bentonite grouting may be required to stabilise the excavation.

Table 5.1 summarises the pre-mitigation risk ratings assigned to each avoidance area, derived from the cumulative individual risks identified in Table 4.2. Gauze Brook A, Gauze Brook B and A4 and Pudding Brook present the highest risk which is associated with soft/loose alluvium deposits. Following this, avoidance areas containing embankments or cuttings are considered the next highest-risk locations due to slope stability risks. The remaining areas exhibit comparable levels of site-wide risk that cannot be further refined without undertaking a targeted ground investigation. Table 5.1 also includes the depth of the Principal Aquifer (where known). The groundwater supply will be impacted by the HDD if boring through the bedrock and could create a contamination risk to the groundwater source if not managed correctly through appropriate risk assessments and method statements. The majority of the locations have an unknown depth to the Principal Aquifer due to the lack of ground investigation information. Once the depth of the Principal Aquifer is confirmed, the depth of the HDD can be reviewed. Where interaction with sensitive groundwater is unavoidable, mitigation measures like careful management of drilling fluid pressures and the use of temporary or permanent casings. In all instances of use, the materials used and practices undertaken in HDD activity will be selected to be protective of water resources. This will include the selection of drilling fluids (where used) and the use of engineered mitigation techniques such as silt fences.

Table 5.1, Preliminary Total Risk Rating per Avoidance Area

| Avoidance Area | Approximate Depth to Principal Aquifer (m BGL) | Total Risk Rating Before Mitigation ¹ |
|------------------------------|--|--|
| Northern Railway (ELR:SWB) | 9.0 | 194 |
| Gauze Brook A | Unknown | 206 |
| The Street | 3.0 | 179 |
| Neeld Court | 8.20 | 179 |
| M4 | 9.10 | 194 |
| A420 | Unknown | 179 |
| Pudding Brook | Unknown | 194 |
| A4 and Pudding Brook | Unknown | 207 |
| Tributary to Avon at Easton | Unknown | 179 |
| Southern Railway (ELR:MLN1) | Unknown | 194 |
| Tributary to Avon at Corston | 5.00 | 179 |
| Rodbourne Brook | >50.00 | 194 |
| Gauze Brook B | Unknown | 206 |

¹ The Total Risk Rating Before Mitigation score is the total of all the risk scores (presented in Column R of 4.2) for each Avoidance Area

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Project

Lime Down Solar Park
Project Number - 26008710




Client

Lime Down Solar Park Limited

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4. Drawing to be read in line with Geosyntec report 26008710-GEOS-LDSF-BESS-R-G-2001.

Legend

-  Historic Borehole
-  Trenchless Solution Locations
-  Cable Route/Corridor

Details

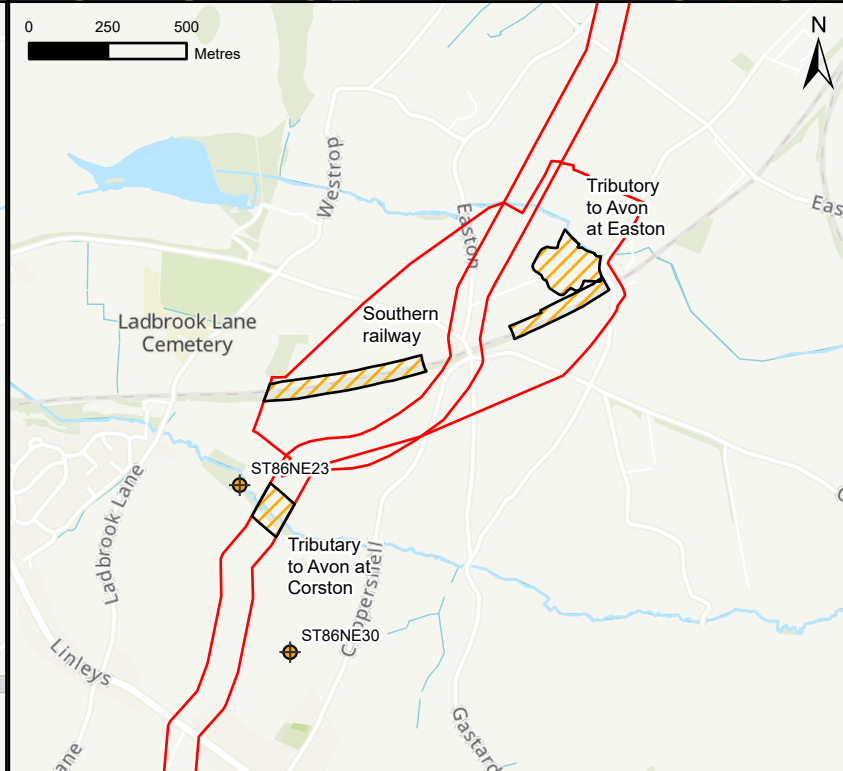
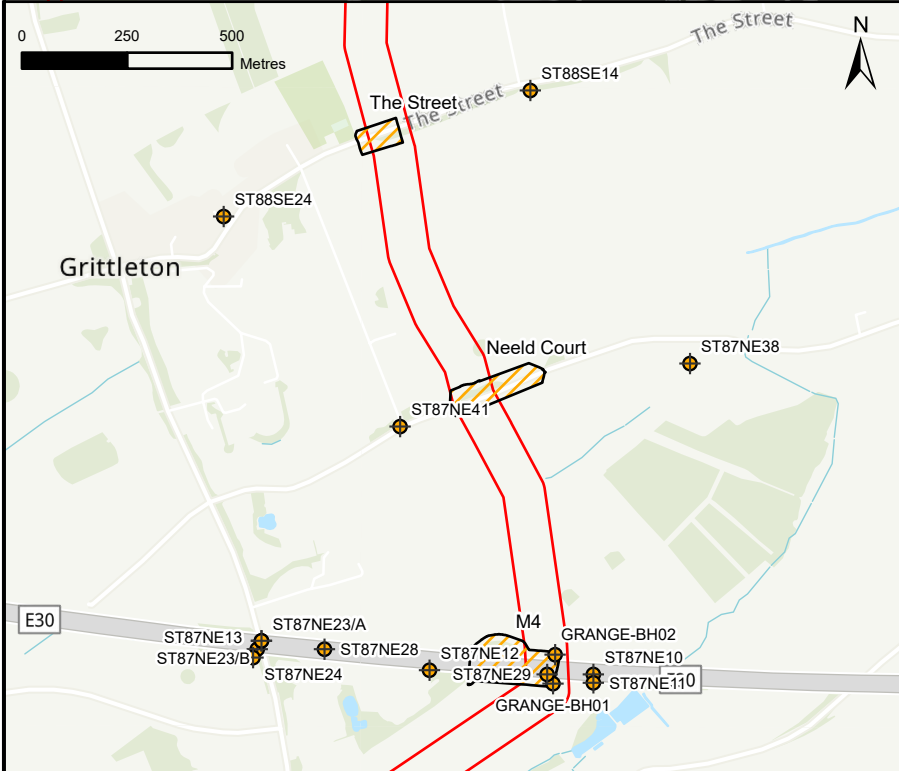
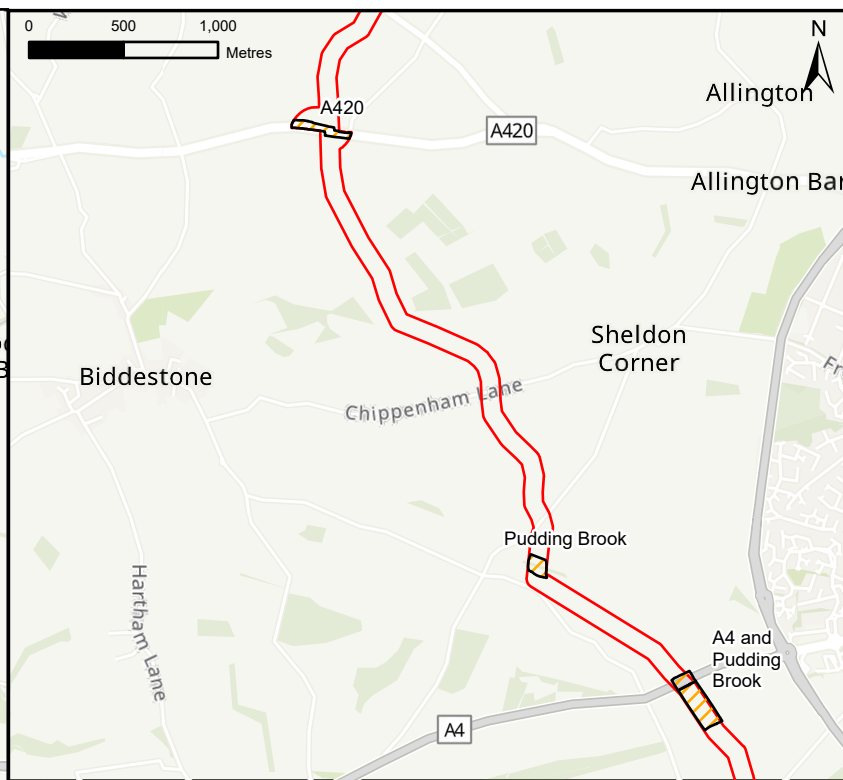
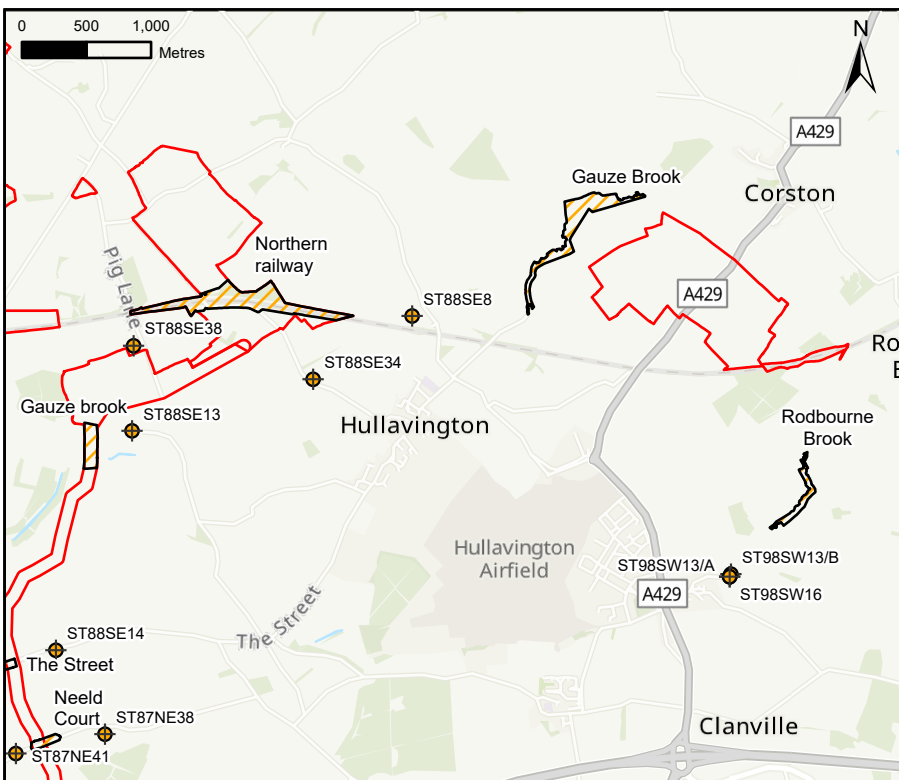
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Borehole Location Plan Per Avoidance Area

Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2001



Project

Lime Down Solar Park
Project No: 26008710





Client

Lime Down Solar Park Limited

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Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

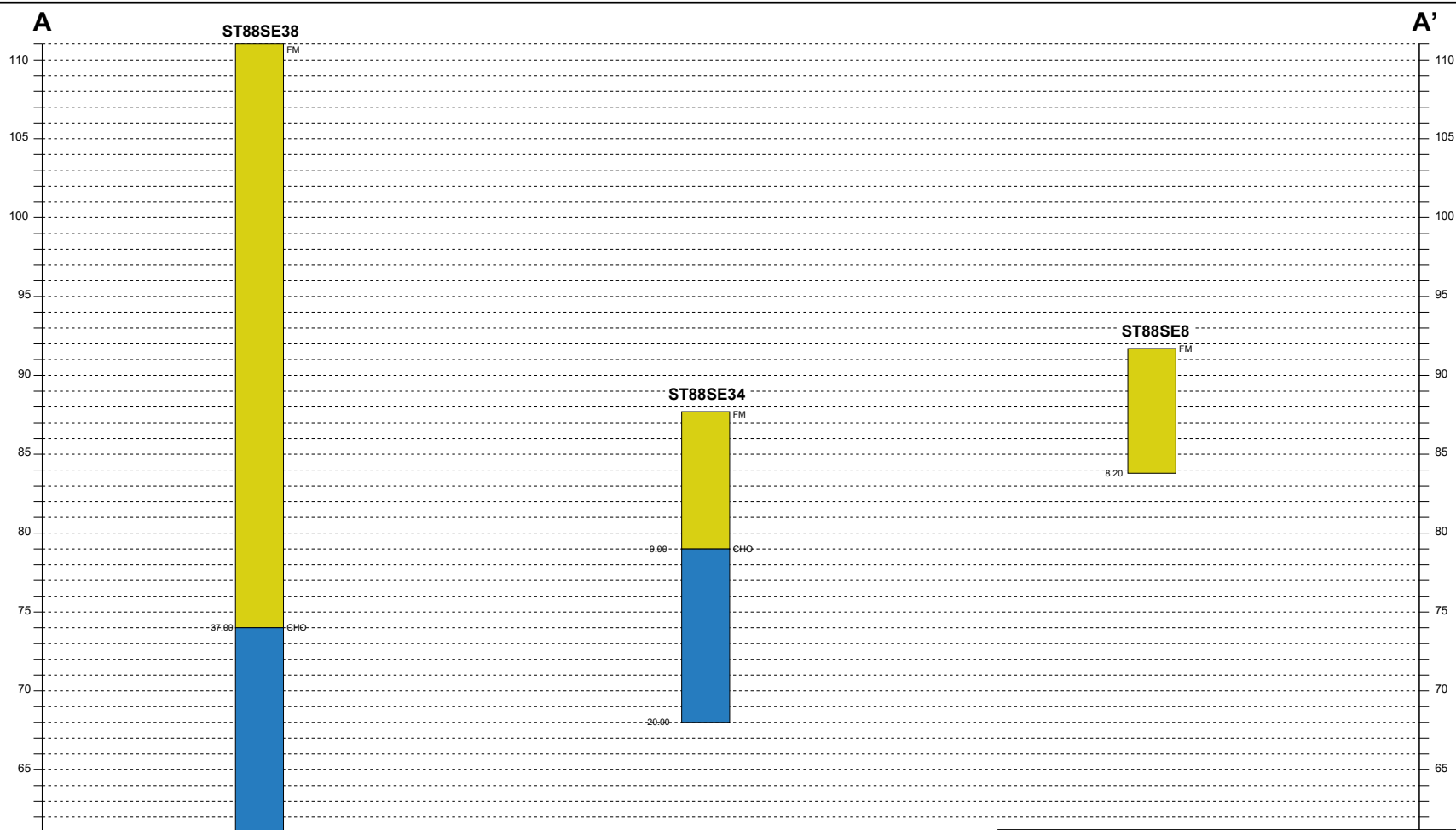
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Drawing Title

Northern Railway Section A-A'

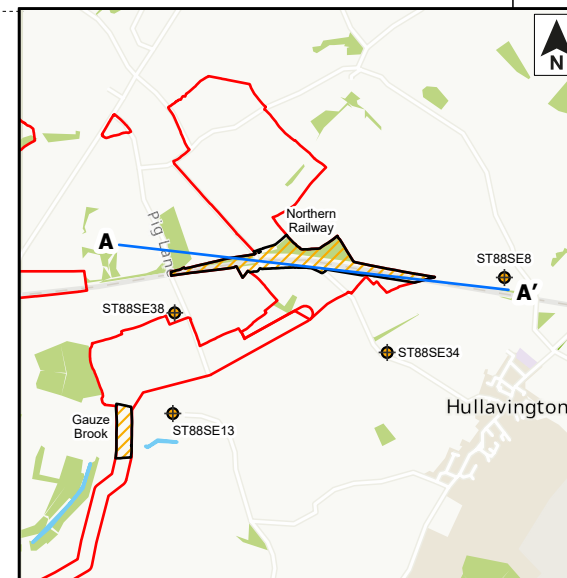
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26008710-GEOS-LDSF-BESS-D-G-2002



Legend Key

-  Made Ground
-  Forest Marble
-  Chalfield Oolite Formation
-  Combe Down Oolite



Project

Lime Down Solar Park
Project No: 26008710





Client

Lime Down Solar Park
Limited

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Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

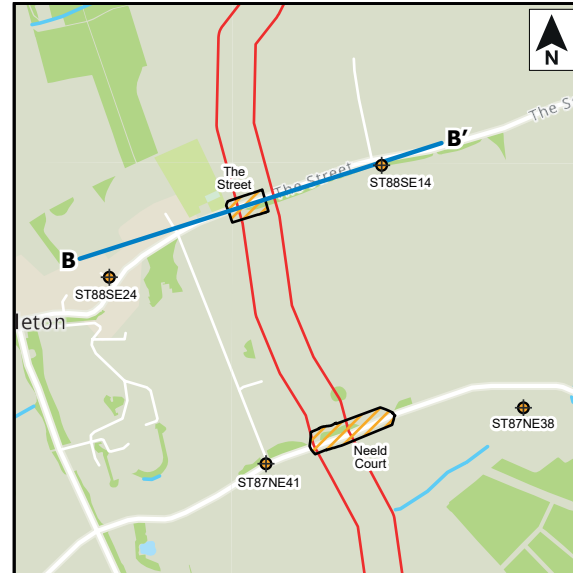
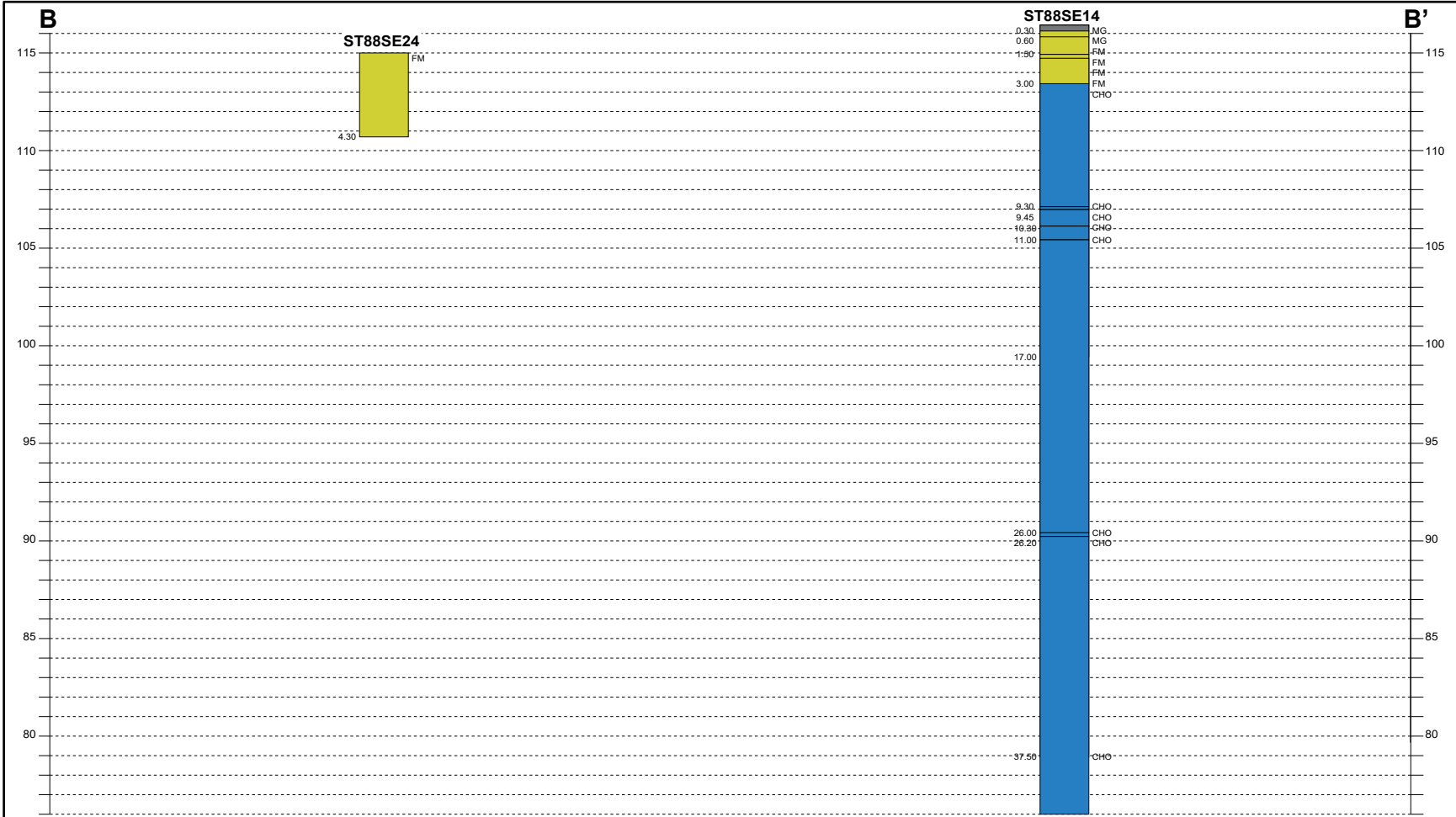
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Drawing Title


The Street Section B-B'

Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2003



Legend Key

-  Made Ground
-  Forest Marble
-  Chalfield Oolite Formation
-  Combe Down Oolite

Project

Lime Down Solar Park
Project No: 26008710





Client

Lime Down Solar Park Limited

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Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

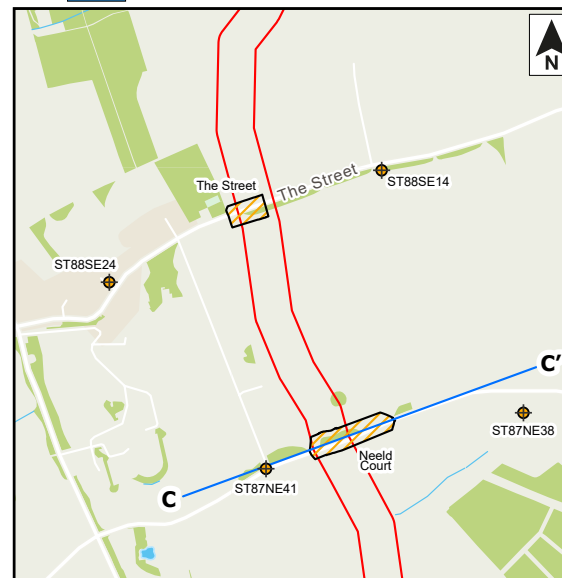
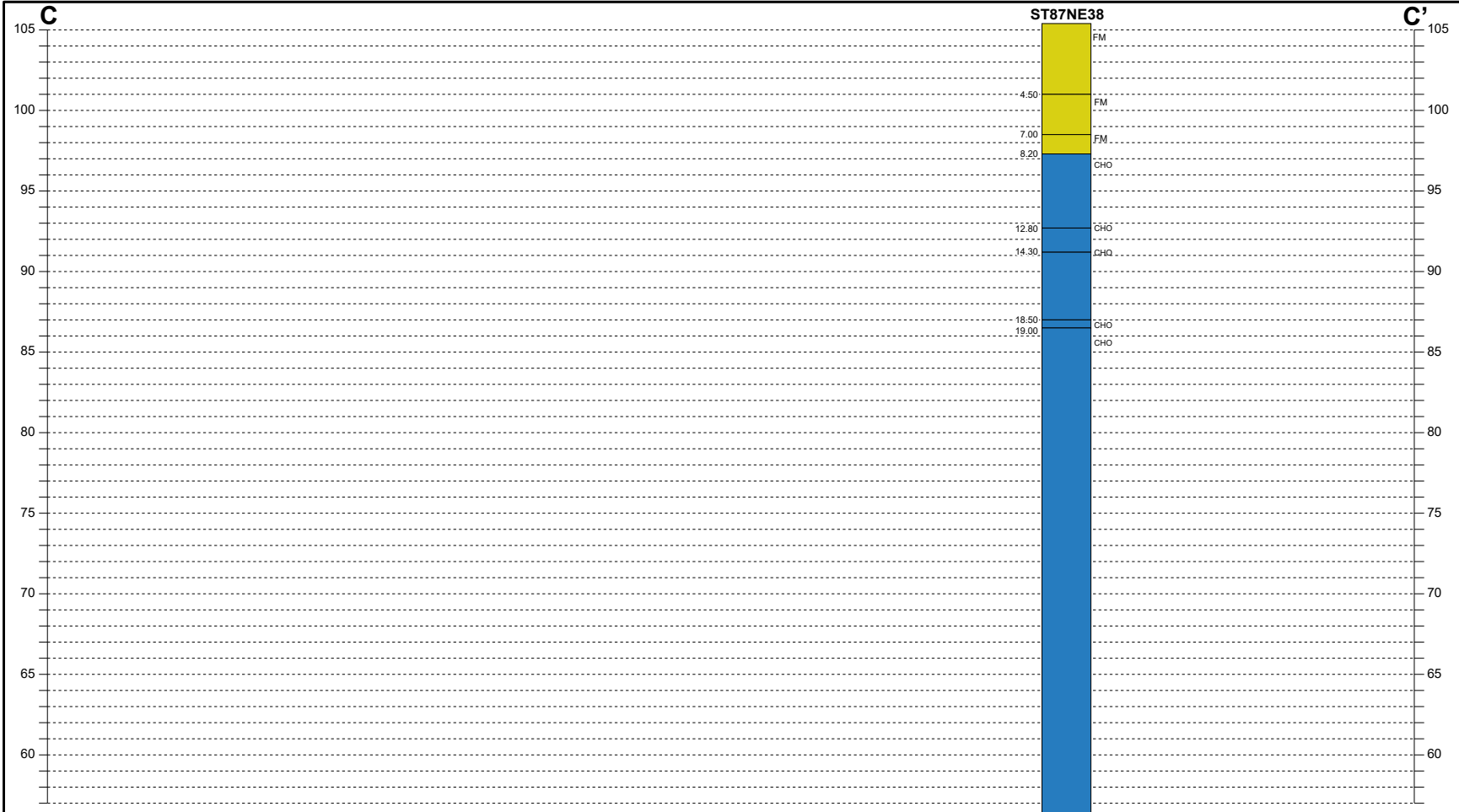
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Drawing Title

Needl Court Section C-C'

Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2004



Legend Key

-  Made Ground
-  Forest Marble
-  Chalfield Oolite Formation
-  Combe Down Oolite

Project

Lime Down Solar Park
Project No: 26008710


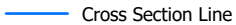
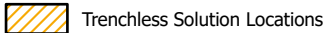
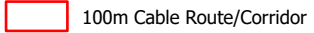
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5. Drawing to be read in line with Geosyntec report 26008710-GEOS-LDSF-BESS-R-G-2001.

Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

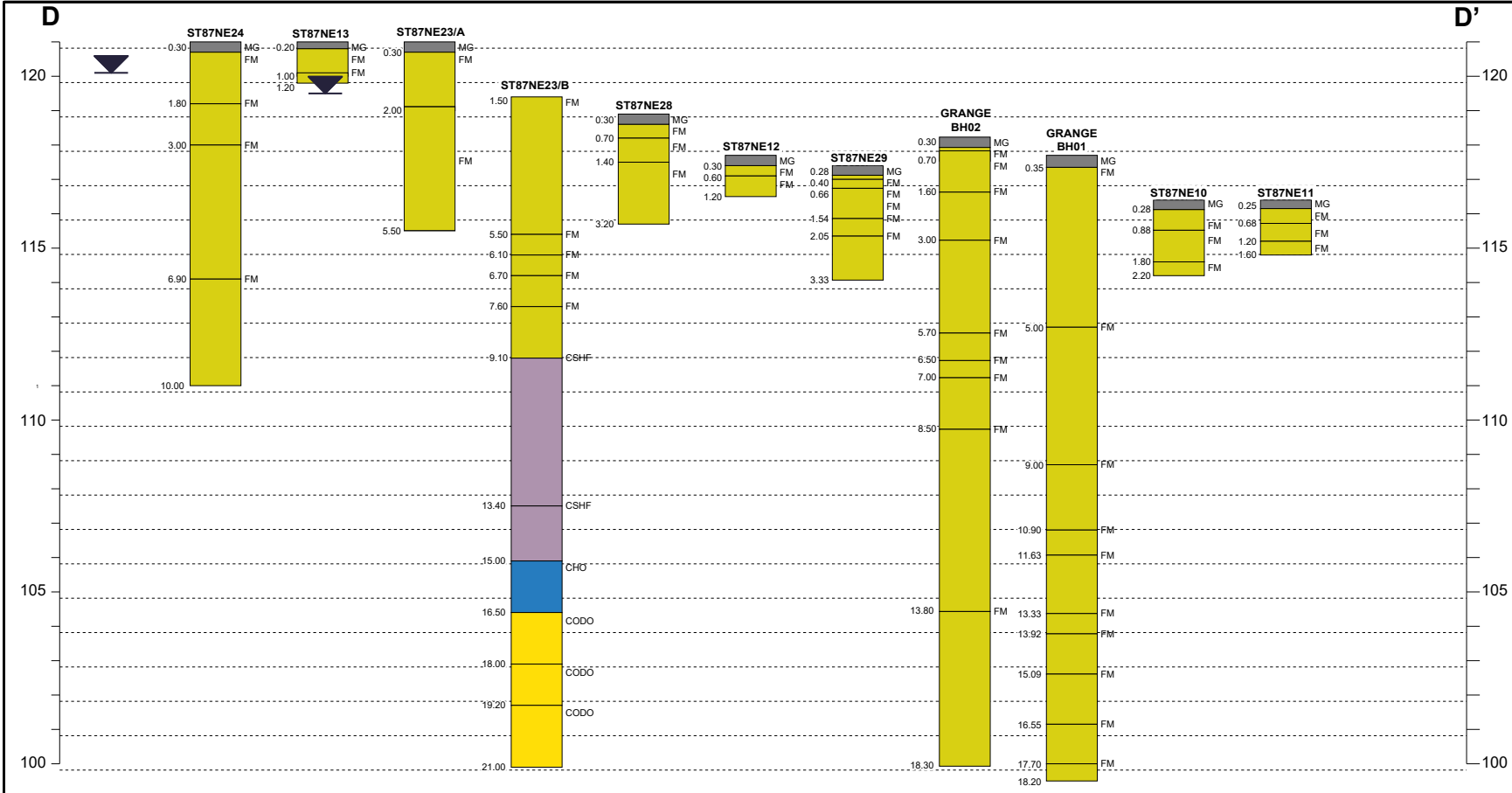
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Drawing Title

M4 Crossing Section D-D'

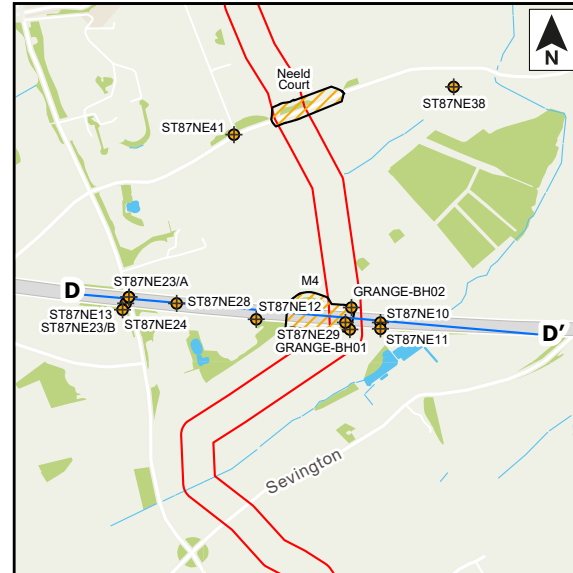
Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2005



Legend Key

-  Made Ground
-  Forest Marble
-  Corsham Limestone Formation
-  Chalfield Oolite Formation
-  Combe Down Oolite



Project

Lime Down Solar Park
Project No: 26008710


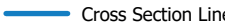


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Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

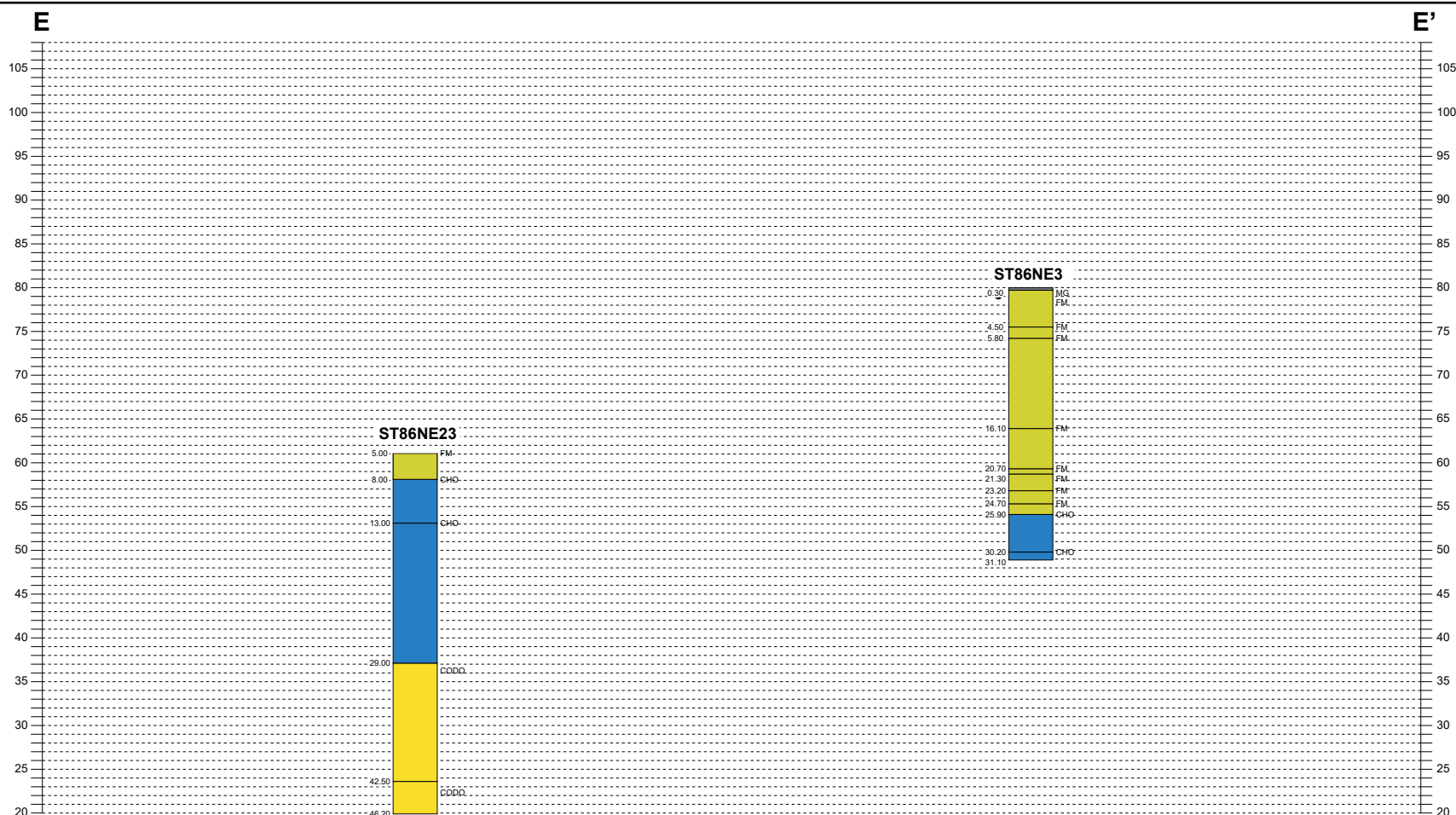
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Revision: S0
Date: 16/03/2026

Drawing Title

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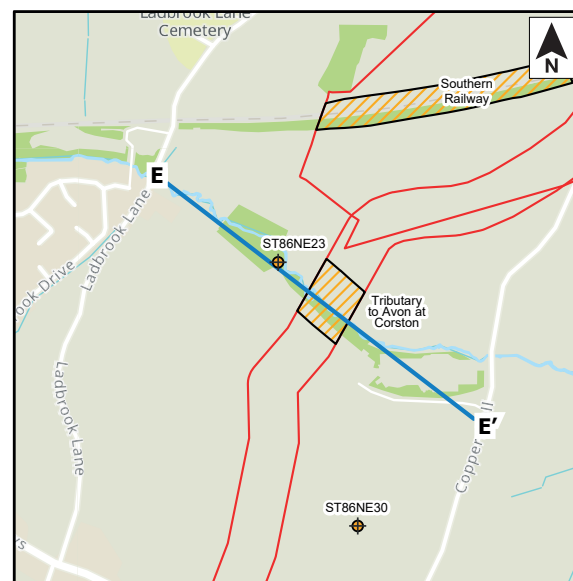
Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2006



Legend Key

-  Made Ground
-  Forest Marble
-  Chalfield Oolite Formation
-  Combe Down Oolite



Project

Lime Down Solar Park
Project No: 26008710





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Lime Down Solar Park Limited

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Legend

-  Historic Borehole
-  Cross Section Line
-  Trenchless Solution Locations
-  100m Cable Route/Corridor

Details

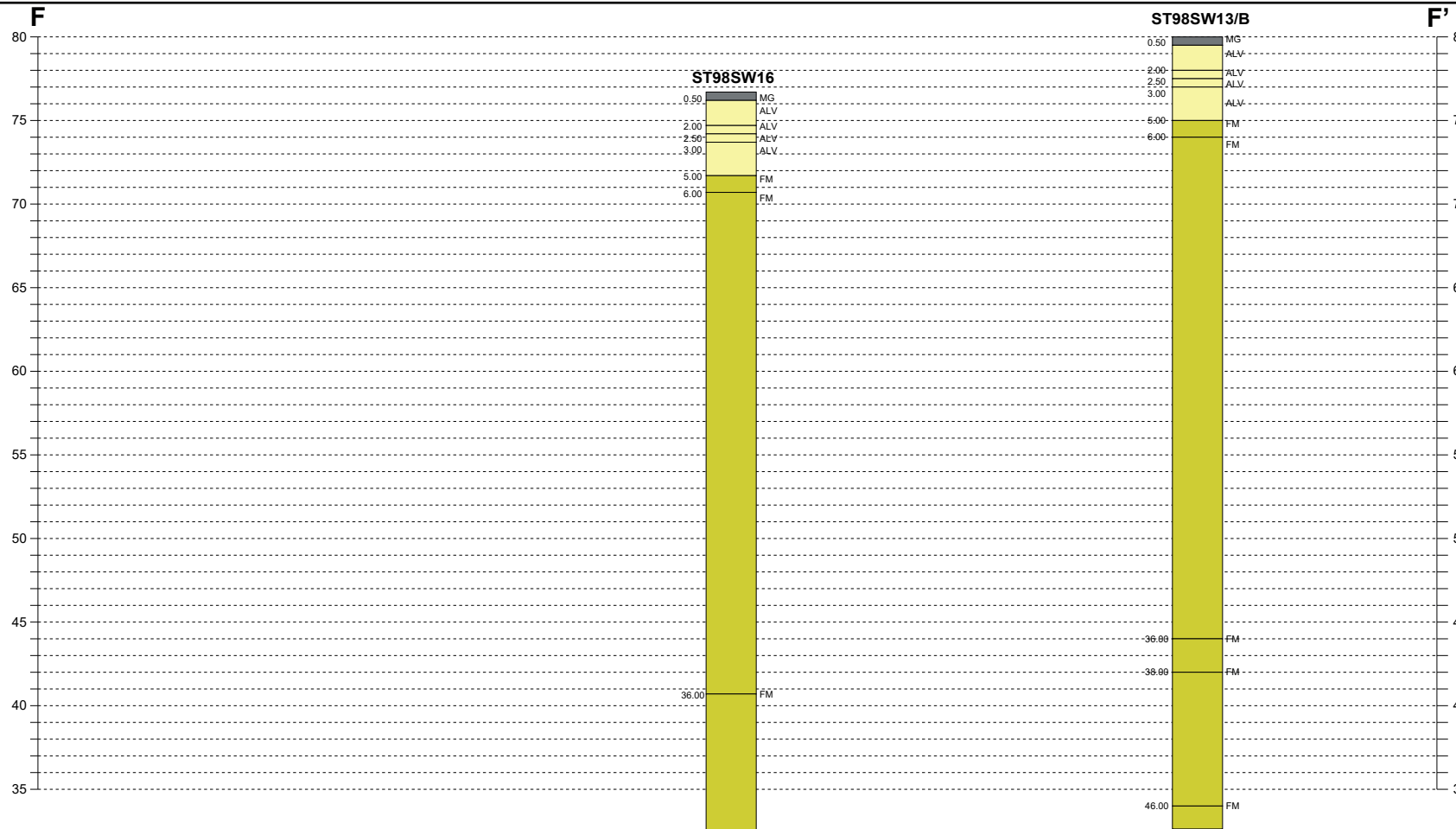
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Checked:
Approved:
Status: P01
Revision: S0
Date: 19aa/03/2026

Drawing Title





Rodbourne Brook Section F-F'

Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2007



Legend Key

-  Made Ground
-  Alluvium
-  Forest Marble
-  Chalfield Oolite Formation



Project

Lime Down Solar Park
Project Number - 26008710











Client

Lime Down Solar Park Limited

Notes

1. This drawing and its contents have been prepared and are intended solely as information for Lime Down Solar Park Limited. Geosyntec Limited assumes no responsibility to any other party in respect or arising out of or in connection with this drawing and/or its contents.
2. Superficial and bedrock geology has been obtained from publicly available data sources, including the British Geological Survey (BGS) GeoIndex and related datasets. Geosyntec holds no liability for the accuracy, completeness, or suitability of this third-party information.
3. Drawing to be read in line with Geosyntec report 26008710-GEOS-LDSF-BESS-R-G-2001.

Legend

-  Cross Section Line
-  Trenchless Solution Locations
-  Cable Route/Corridor
-  Alluvium
-  Kellaways Formation - Mudstone
-  Cornbrash Formation
-  Forest Marble Formation - Mudstone
-  Forest Marble Formation - Limestone
-  Chalfield Oolite Formation
-  BGS Inferred Fault

Details

Drawn: NA
Checked:
Approved:
Status: P01
Revision: S0
Date: 12/03/2026

Drawing Title

Solid Geology Per Avoidance Area

Drawing Number

26008710-GEOS-LDSF-BESS-D-G-2008

