

BERWICK BANK WIND FARM ONSHORE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

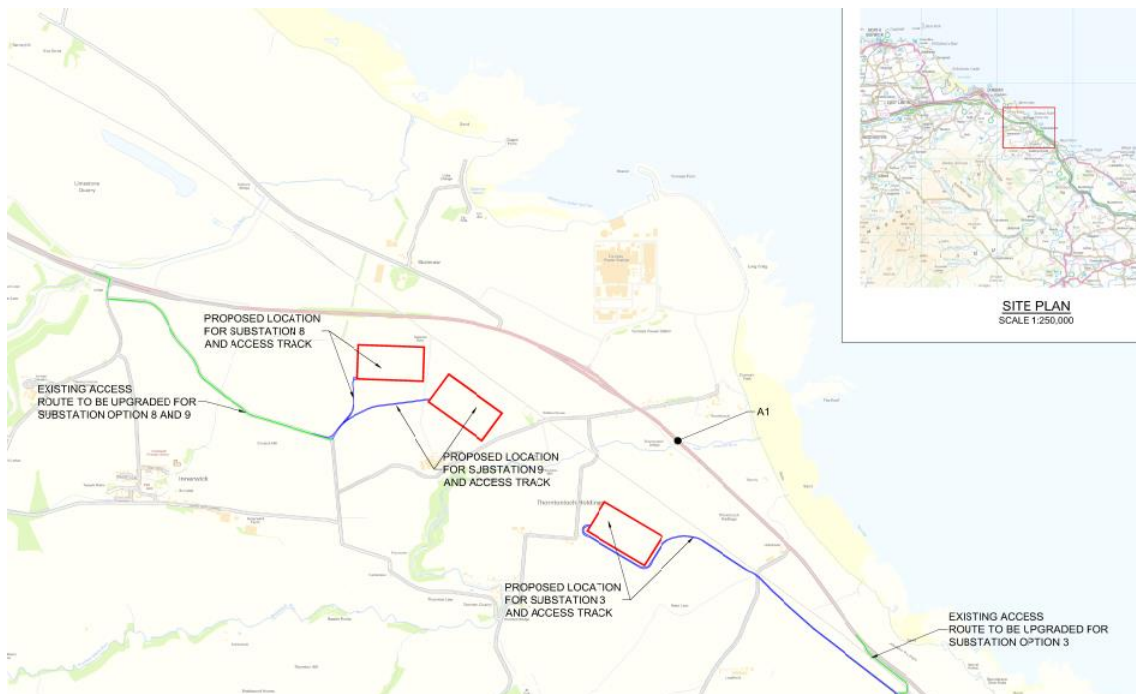
Appendix 12.2: Abnormal Load Route Assessment

Report

Abnormal Load Route Assessment Report

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Seagreen Substation and Trenched Cable Access



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[3]	06/10/20	FOR APPROVAL	MA 06/10/20	AM 05/10/20	SB 06/10/20

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- Appendix E – Permanent Access Road Cost Estimate

1 Executive Summary

Sweco has been instructed by SSE to carry out an assessment of delivery routes for abnormal transformer loads for three substation locations and HGV access to two trenched section access points.

The aim of the assessment is to identify any potential obstructions and areas of over-run and over-hang for the safe delivery of abnormal indivisible loads along the existing roads and provide proposals for the permanent access roads to the given locations. For the purpose of this report the routes have been termed as below:

- Substation Location 3
- Substation Location 8 and 9
- HGV - Cable Road Crossing 1
- HGV - Cable Road Crossing 2

A swept path analysis using Auto Track has been undertaken for each delivery route. A walkover survey has been undertaken to identify additional obstructions and record any measurements where applicable. Results from the swept path analysis and walkover survey have been recorded on drawings and summarised within this report. In addition, the walkover survey was recorded using dashcam equipment and issued to SSE separately.

No topographical data was available during the assessment. This should be obtained and used to ensure there is no risk of grounding for the preferred delivery route. Note, the walkover survey did not highlight any obvious locations where grounding would be a concern.

It is recommended the following structural assessments are undertaken to fully evaluate each route.

Substation Location 3

Structural assessment of road bridge crossing railway before proposed permanent access road. Railway bridge west parapet also to be dismantled. Initial approvals from Network Rail and Transport Scotland will be required.

Substation Location 8 and 9

Structural assessment of culvert crossing below road approaching substation location. Note that no information was determined on the details of the culvert due to overgrown bushes and limited access.

HGV - Cable Road Crossing 1

Structural assessment of road bridge crossing railway before trenched cable road crossing location.

HGV - Cable Road Crossing 2

Structural assessment of road bridge crossing watercourse before trenched cable road crossing location. Note that limited details and dimensions of the bridge were obtained due to restricted access.

The capacity of manholes along each route should be confirmed. Additionally, any bridge or culvert crossing along the A1 should also be confirmed (out with the boundary limits of this report). Note Sweco have been advised not to consult with local roads authority, network rail etc. at this stage.

For undersized or unclassified manhole covers, a temporary steel plate rated to D400 loading in accordance with BS EN 124 should be designed as a minimum during the temporary work stage.

A cost estimate (+25%/-15%) for the new access road construction and improvements to current infrastructure has been assessed using values calculated from Spon's Civil Engineering and Highways Work Price Book, the Estimator's Pocket Book and information provided to Sweco by contractors.

A summary of the cost estimate for each substation route is presented below.

Substation Access Road Construction Cost Estimate

Substation	Estimated Construction Cost Range	
Substation Location 3	£506,243	£862,806
Substation Location 8	£187,111	£278,978
Substation Location 9	£225,646	£348,842

It is advised to obtain a more detailed cost estimate from several contractors once topographical data and ground investigation information are made available. Note prices will vary between contractors and are subject to market conditions.

2 Introduction

Seagreen Charlie Wind Energy Limited and Seagreen Delta Wind Energy Limited are developing the Seagreen 2 and Seagreen 3 Offshore Windfarms respectively, in the Firth of Forth.

It has been identified the export cable from Seagreen 2 will make landfall south of Dunbar and connect to the grid at Branxton.

A previous study into the preferred location for the substation was undertaken which identified sites primarily on the basis of topography to minimise ground works requirements.

Since the initial study, the footprint of the substation has increased and locations 8 & 9 are currently the preferred options when utilising Landfall 3 considering topography, access, impact on local residents and other constrains such as historic monuments.

When considering the cable route from Landfall 5, the preferred substation is at Location 3. Given the restrictions with topography at location 3, the required construction lay-down area will need to be situated approximately 500m away, a new access road would be required.

The three proposed substation locations and abnormal delivery routes are shown in Figure 2-1. The proposed delivery route for substation 8 and 9 is similar. As such it be considered as one within the context of this report.



Figure 2-1 Substation Location and Access Routes

2.1 Scope of Document

Sweco has been instructed to carry out an assessment of the delivery route for the three proposed substation locations and two trenched section access points on behalf of SSE. The purpose of this report is to evaluate substation delivery routes for abnormal and HGV access from the A1.

The routes consider the existing roads and include proposals for the permanent access roads to the substation location for delivery of the transformer.

In addition, access to trenched sections of the cable route from Substation 8 and 9 via HGV (44 tonnes) is included. The locations of the trenched cable crossings are presented in Figure 2-2.

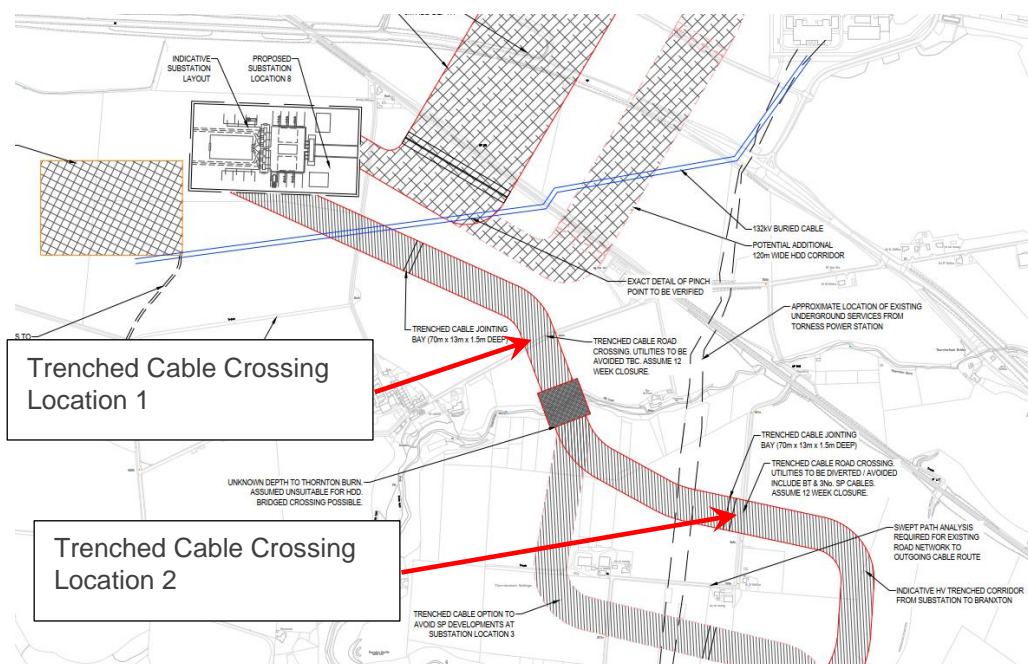


Figure 2-2 Trenched Cable Road Crossing Locations

2.2 Methodology

The study used Auto Track to provide a swept path analysis of all potential access routes along existing and proposed roads. Identified areas of concern were then investigated by two Sweco engineers during a route walkover survey to obtain further information and measurements where required.

The swept path analysis identifies the road edges and areas of over-run and over-hang for the given vehicle dimensions outlined in Section 2.4.

The walkover survey identified additional obstacles including locations of overhead lines, trees, bridge parapets, manholes, potholes and steep embankment batter. Vehicle clearance checks were also performed on structures such as bridges.

Photographs taken during the walk over survey are presented in Appendix C. Where appropriate clearances have been recorded and highlighted on the swept path analysis drawings. Locations where alterations are required have also been identified. A tabulated summary of each route and the required improvements is presented in Section 3.

At the time of the swept path analysis, topographical data was not provided, and therefore a vertical clearance check has not been carried out. However, the walkover survey did not indicate any obvious locations where grounding would be a concern. It is still advised that a check is performed to ensure there is no risk of grounding for the preferred delivery route at a later stage.

A video survey of each proposed route was recorded during the walkover survey and has been issued to SSE separately.

2.3 Delivery Routes and boundary limits

The boundary limits of this report are described in Table 1 and illustrated in Figure 2-3 to Figure 2-5.

It has been assumed that all sections of the A1 are suitable for abnormal loads including transformer components. However, it should be confirmed that any bridge or culvert crossing is suitable for the given delivery loads.

Table 1 – Delivery Route Boundary Limits

Route	Start	Finish
Substation Location 3	Bilmean Junction A1 southbound	Substation 3 site entrance
Substation Location 8 & 9	Innerwick Junction A1 southbound	Substation 8 & 9 site entrance
HGV - Cable Road Crossing 1	Thorntonloch Junction A1 southbound	Trenched cable road crossing 1
HGV - Cable Road Crossing 2	Thorntonloch Junction A1 southbound	Trenched cable road crossing 2

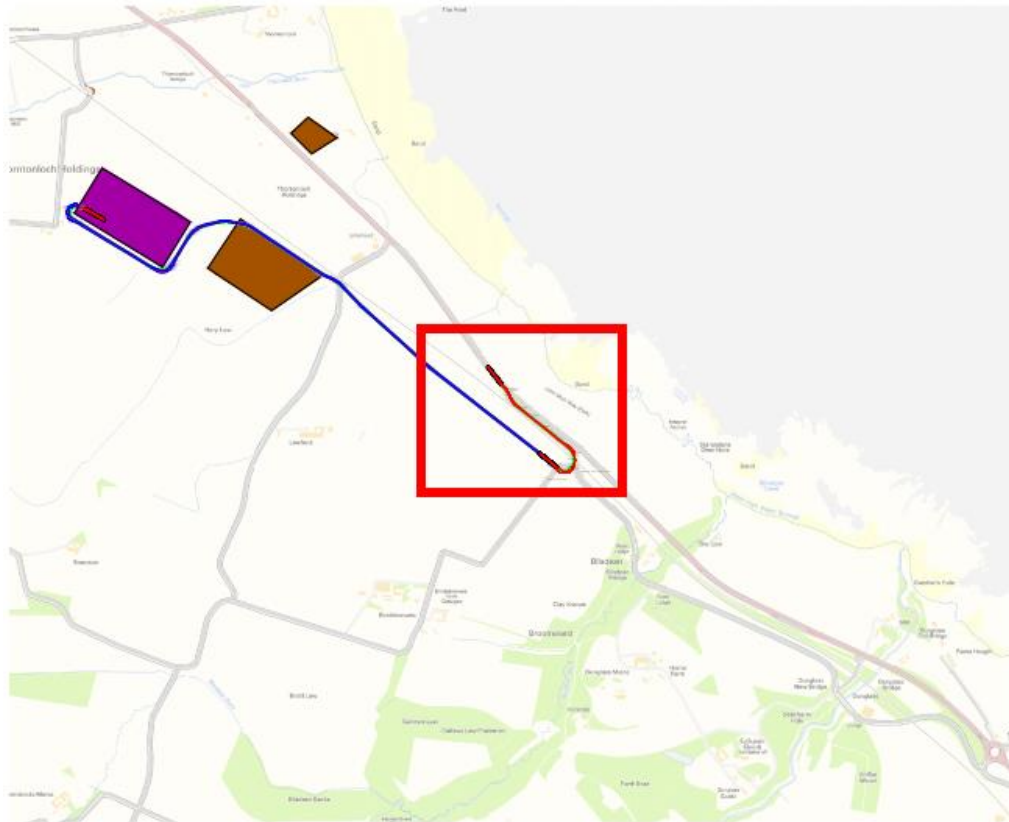


Figure 2-3 Substation 3 Delivery Route

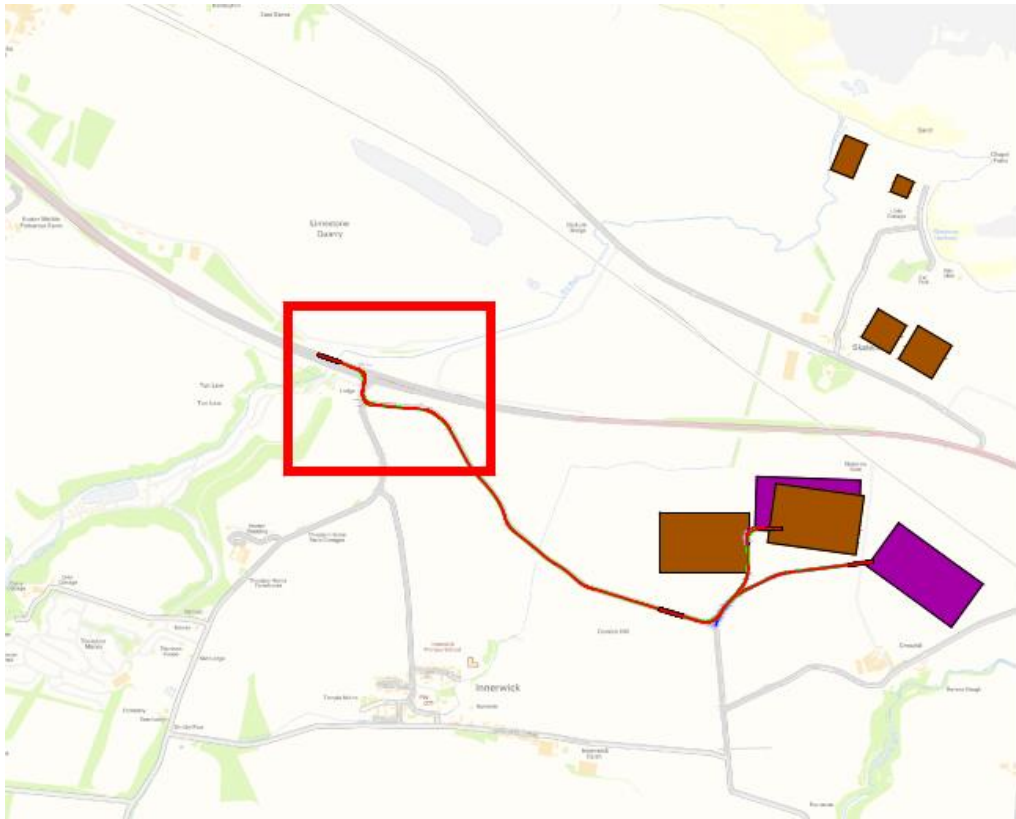


Figure 2-4 Substation 8 & 9 Delivery Route

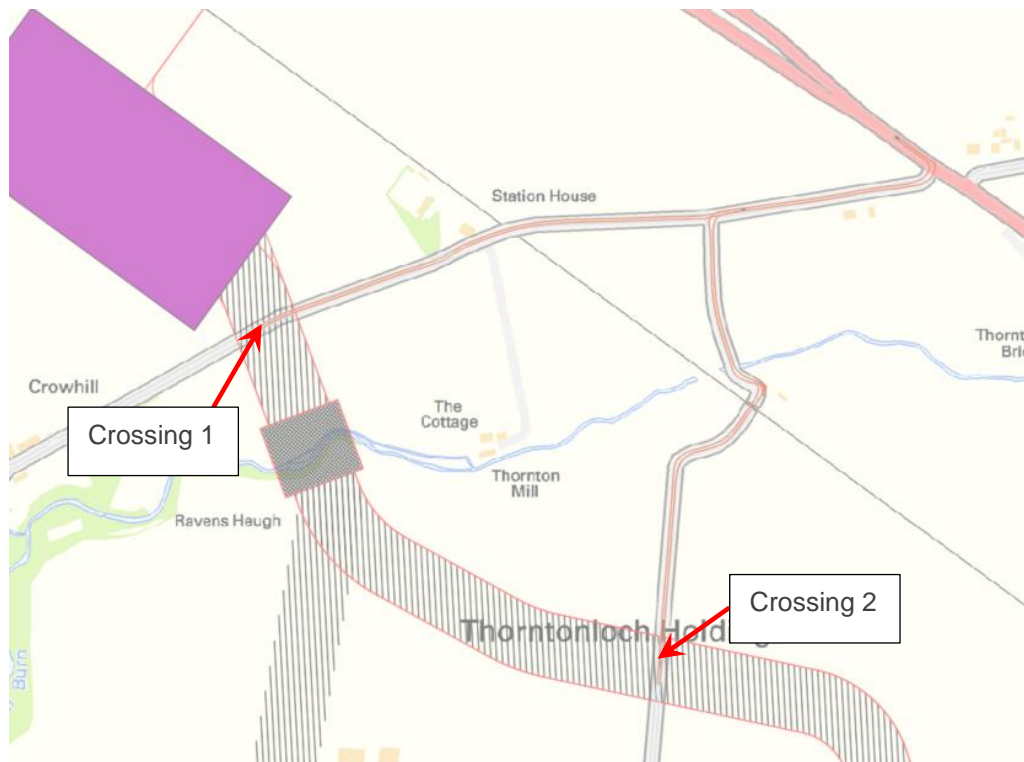


Figure 2-5 HGV - Cable Road Crossing 1 and 2 Delivery Route

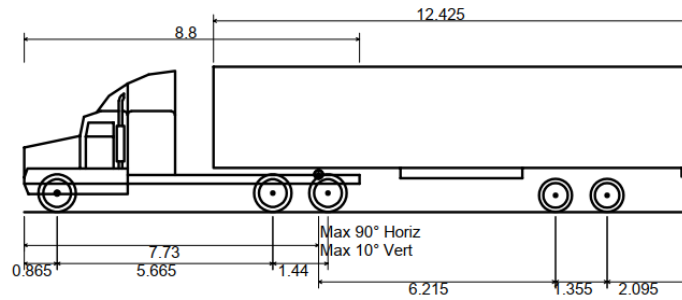
2.4 Delivery Vehicles

2.4.1 Transformer Delivery Vehicle

Specific details for the transformer delivery vehicle have been provided by SSE. This includes vehicle dimensions and axel loadings. The specific details have been used as input to the swept path analysis in Auto Track. Details of the vehicle provided by SSE are presented in Appendix A.

2.4.2 HGV (44 tonnes)

Details for a 44 tonnes HGV have been extracted from the Auto Track library. This has been used as input to the swept path analysis along the HGV delivery routes. Details of the proposed HGV are presented in Figure 2-6.



Truck Tractor + Trailer	
Overall Length	17.395m
Overall Width	2.830m
Overall Body Height	3.810m
Min Body Ground Clearance	0.475m
Max Track Width	2.830m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.000m

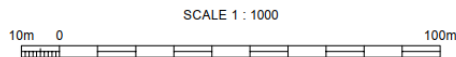


Figure 2-6 HGV (44 Tonnes) Details

3 Swept Path Analysis Results

The swept path analysis highlighted physical obstructions and areas of over-run and over-hang for each delivery route. These areas have been dimensioned on drawings in Appendix B.

A summary of drawing included in Appendix B are listed in Table 2.

Table 2 - Drawing List

Drawing Title	Drawing Number
Location Plan	65201721-DRG-101
Substation 8 & 9 Existing Road Improvement Plan Sheet 1	65201721-DRG-102
Substation 8 & 9 Existing Road Improvement Plan Sheet 2	65201721-DRG-103
Substation 8 & 9 Existing Road Improvement Plan Sheet 3	65201721-DRG-104
Substation 8 Proposed Road Improvement Plan	65201721-DRG-105
Substation 9 Proposed Road Improvement Plan	65201721-DRG-106
Substation 3 Existing Road Improvement Plan Sheet 1	65201721-DRG-107
Substation 3 Proposed Road Improvement Plan Sheet 2	65201721-DRG-108
Substation 3 Proposed Road Improvement Plan Sheet 3	65201721-DRG-109
Substation 3 Proposed Road Improvement Plan Sheet 4	65201721-DRG-110
44 Tonne HGV Existing Road Improvement Plan Sheet 1	65201721-DRG-112
44 Tonne HGV Existing Road Improvement Plan Sheet 2	65201721-DRG-113
44 Tonne HGV Existing Road Improvement Plan Sheet 3	65201721-DRG-114

The physical obstructions and constraints along each route including indicative details of measures required to mitigate against each are presented in Table 3 to Table 6.

For clarity, photographs taken during the walkover survey of each obstruction or constraint are referenced and included in Appendix C.

3.1 Substation Location 3

Table 3 - Substation Location 3 Delivery Route Summary

Ref	Drawing	Chainage [m]	Description	Photo (Appendix 3)
3.1.1	62501721-DRG-107	60	Manhole load capacity to be confirmed.	1
3.1.2	62501721-DRG-107	80	Signposts/bollard need to be removed and reinstated post delivery	2
3.1.3	62501721-DRG-107	370	Stone wall to be removed prior to delivery	3
3.1.4	62501721-DRG-107	400	Railway bridge to be structurally assessed	4
3.1.5	62501721-DRG-107	400	Railway bridge west parapet to be dismantled prior to delivery. Assessment of bridge and initial approvals from Network Rail and Transport Scotland required.	5
3.1.6	62501721-DRG-107	420	Armco barrier to be removed prior to delivery	6
3.1.7	62501721-DRG-107	440	Route enters private property. Road make up to be determined based on geotechnical survey of land. Existing fenceline at entrance/exit to be removed.	
3.1.8	62501721-DRG-107	440	Old Signpost to be removed. May be of local interest given its age.	7
3.1.9	62501721-DRG-107	Circa 450	Bustop/Sign/wall to be dismantled prior to delivery	8
3.1.10	62501721-DRG-108	960	Proposed X-road with existing road would involve substantial earthworks in comparison to alternative routes. Recommend redirecting route to have this junction south of mature trees due to steep embankment at proposed crossover.	9/10

3.2 Substation Location 8 & 9

Table 4 - Substation Location 8 & 9 Delivery Route Summary

Ref	Drawing	Chainage	Description	Photo (Appendix 3)
3.2.1	62501721-DRG-102	100	Right Turn of A1. Fenceline to be removed.	1
3.2.2	62501721-DRG-102	100	Right turn off A1, temporary overrun area required over central reservation	2
3.2.3	62501721-DRG-102	100	Right Turn off A1, Road sign/Island to be removed	3
3.2.4	62501721-DRG-102	200	Left Turn to main access route, large overrun area to be built up.	4/5
3.2.5	62501721-DRG-102	200	Left turn to main access route, Manhole load capacity to be check	6
3.2.6	62501721-DRG-102	450	Existing fenceline to be removed	9
3.2.7	62501721-DRG-102	450	Overrun area to be granular surfaced	/
3.2.8	62501721-DRG-102	700	Overhead lines ok	10
3.2.9	62501721-DRG-103	760	Manhole load capacity to be checked	/
3.2.1 1	62501721-DRG-103	770	Fenceline to be removed to accommodate overhang	11
3.2.1 2	62501721-DRG-103	880	Overrun area to be granular surfaced	12
3.2.1 3	62501721-DRG-103	1040	Culvert to be structurally assessed. No information was determined on the details of the culvert due to limited access.	13
3.2.1 4	62501721-DRG-103	1070	Overrun area to be granular surfaced	/
3.2.1 5	62501721-DRG-103	1180	Overrun area to be granular surfaced	/
3.2.1 6	62501721-DRG-103	1200	Manhole load capacity to be checked	14
3.2.1 7	62501721-DRG-103	1230	Fenceline to be removed to accommodate overswhang	15
3.2.1 8	62501721-DRG-104	1650	overhead lines avoided	16

3.3 HGV – Cable Road Crossing 1

Table 5 - HGV - Cable Road Crossing 1

Ref	Drawing	Chainage	Description	Photo (Appendix 3)
3.3.1	62501721-DRG-112	490	Road over railway bridge to be structurally assessed for HGV	1/2

3.4 HGV – Cable Road Crossing 2

Table 6 - HGV - Cable Road Crossing 2

Ref	Drawing	Chainage	Description	Photo (Appendix 3)
3.4.1	62501721-DRG-112	175	Road over water crossing to be structurally assessed for HGV. Limited details and dimensions of the bridge due to restricted access.	1
3.4.2	62501721-DRG-112	200	Stone wall to be removed and earthworks required for vehicle over run	2
3.4.3	62501721-DRG-112	225	Road below railway bridge suitable for HGV	3/4

4 Structural Constraints

For each proposed delivery route, a structural assessment is required to ascertain the suitability of the structures along the route prior to delivery. The structures include bridges, culverts and watercourse crossings. Capacity of manholes highlighted in Section 3 along each route should also be confirmed. Note Sweco have been advised not to consult with local roads authority, network rail etc. at this stage.

The following sections highlight each structure that requires an assessment for the given route.

4.1 Substation Location 3

The delivery route to the proposed substation location 3 will require the delivery vehicle to traverse a stone railway bridge. The location of the railway bridge is shown in Figure 4-1.

Railway bridge west parapet to be dismantled prior to delivery in addition to assessment of the bridge for the abnormal loads. Initial approvals from Network Rail and Transport Scotland will be required.

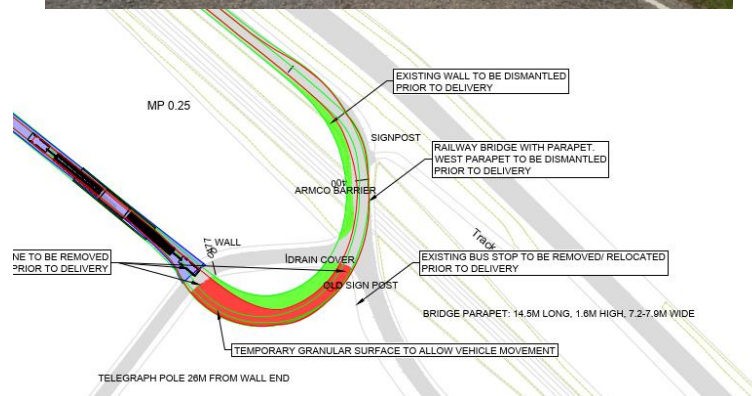


Figure 4-1 Railway bridge Crossing for Delivery to Substation Location 3

4.2 Substation Location 8 & 9

The delivery route to the proposed substation location 8 and 9 will require the delivery vehicle to traverse a culvert. The location of the culvert is shown in Figure 4-2. The make-up of the culvert could not be confirmed due to dense and overgrown vegetation.

An assessment of the culvert for the abnormal load is required. Note that no information was determined on the details of the culvert due to overgrown bushes and limited access.

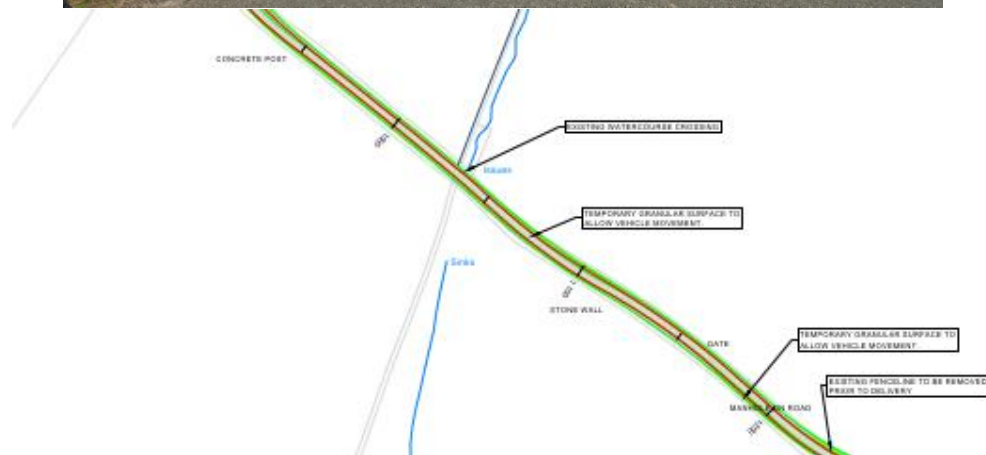


Figure 4-2 Culvert Road Crossing for Deliver to Substation 8 & 9

4.3 HGV - Cable Road Crossing 1

The delivery route to the trenched cable road crossing 1 will required the HGV to cross a railway bridge. The location of the bridge is shown in Figure 4-3.

An assessment of the railway bridge crossing for the HGV is required.

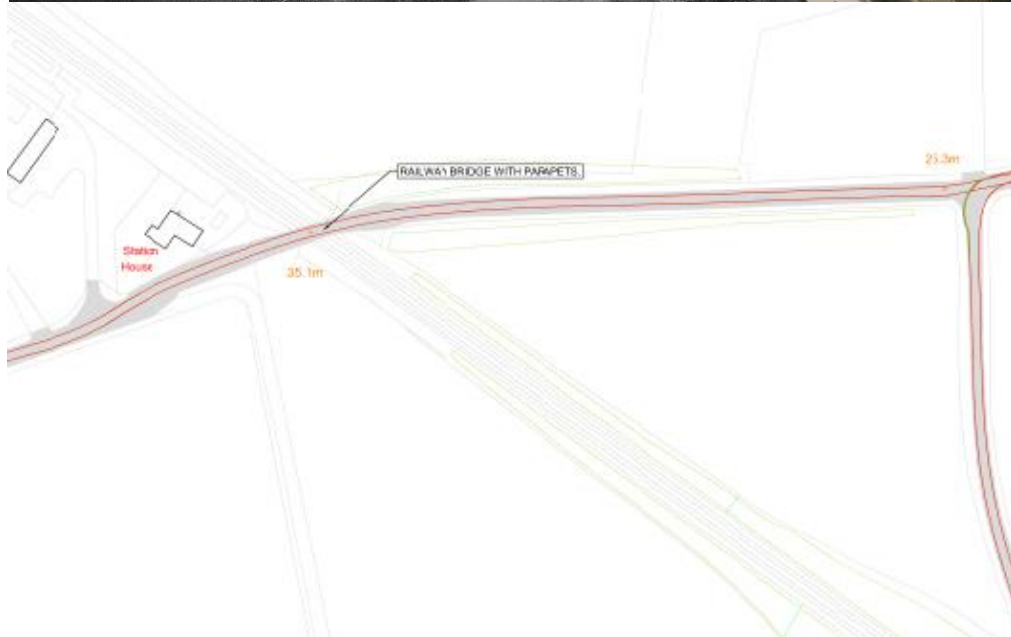


Figure 4-3 Railway Bridge Crossing for Cable Road Crossing 1

4.4 HGV - Cable Road Crossing 2

The delivery route to the trenched cable road crossing 2 will require the HGV to cross a watercourse crossing. The location of the crossing is shown in Figure 4-4.

An assessment of the watercourse crossing for the HGV is required. Note that limited details and dimensions of the bridge were obtained due to restricted access.

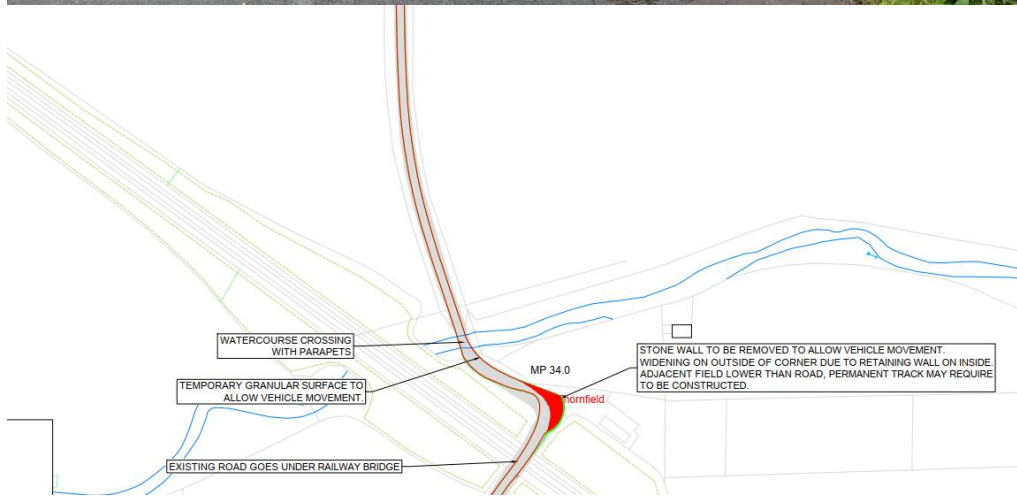


Figure 4-4 Watercourse Crossing for Cable Road Crossing 2

5 Permanent Access Road Proposal

No ground investigation reports have been provided at this stage with respect to design of the permanent access roads. Therefore, proposals for the following road make-up have been provided in appendix D:

- Floating access track (level or gently sloping topography);
- Founded access track (level or gently sloping topography);
- Founded access track – Track Construction Benched (on sloping topography).

6 Construction Cost Estimate

A cost estimate (+25%/-15%) for the new access road construction and improvements to current infrastructure has been assessed using values calculated from Spon's Civil Engineering and Highways Work Price Book, the Estimator's Pocket Book and information provided by contractors.

A preliminary assessment of the permanent access road was undertaken in lieu of ground investigation information. This assessment considered data from British Geological Survey maps. Given the road construction cost is sensitive to change and accounts for most of the overall cost, a lower and upper bound cost was used in the estimations.

Areas of temporary granular fill are based on vehicle overrun only. Earthwork requirements are subject to more detailed review as part of route temporary works design.

An estimate of the costs for each substation route is presented in Table 7 with the detailed estimate presented in Appendix E.

Table 7 - Substation Access Road Construction Cost Estimate

Substation	Estimated Construction Cost Range	
Substation Location 3	£506,243	£862,806
Substation Location 8	£187,111	£278,978
Substation Location 9	£225,646	£348,842

It is advised to obtain a more detailed cost estimate from several contractors once topographical data and ground investigation information are made available. Note prices will vary between contractors and are subject to market conditions.

7 Conclusion and Recommendations

7.1 Conclusions

It can be concluded from the swept path analysis that all substation / crossing locations are suitable, given the capacity of the railway bridges, culverts and watercourse crossings are assessed and the capacity is confirmed for the given loads. All proposed routes require widening for areas of over-run and improvements to remove obstacles for over-hang.

Substation location 3 may be less favourable given the extensive works required for access. This includes:

- 2145m of permanent access road which accounts for the majority of construction costs
- assessment of bridge deck and initial approvals from Network Rail and Transport Scotland required
- removal of the westerly parapet on the road bridge over the railway
- removal of street furniture including bus stop and signposts
- additional land purchase to accommodate wide swing required by access vehicle as identified in the swept path analysis

The proposed access route to Substation 3, running parallel to the railway track, would require significant amounts of cut material for the intersection to join the existing road at an appropriate level. This material then needs to be transported offsite. An alternative route has been indicated on the drawings which avoids the large cut volume. However, this alternative route may require additional land.

Substation location 8 and 9 are the preferred options given the lower cost of road improvements and permanent access road. Costs for substation location 8 and 9 are lower than Substation location 3 as the new access roads are shorter. Excluding the new access road, the largest anticipated cost for location 8 & 9 would be the widening at approximately chainage 200, where fill material is required to accommodate over-run.

Substation location 8 is less expensive than location 9 as the permanent access road is shorter at 384m compared to 597m.

An estimate of the costs for each substation delivery route is presented in Table 8.

Table 8 - Substation Access Road Construction Cost Estimate

Substation	Estimated Construction Cost Range	
Substation Location 3	£506,243	£862,806
Substation Location 8	£187,111	£278,978
Substation Location 9	£225,646	£348,842

HGV delivery to cable road crossing 1 and 2 both require a structural assessment of the road bridge crossing over the railway and the watercourse crossing respectively. If satisfactory, both routes will be suitable for HGV delivery to the cable road crossings.

7.2 Recommendations

From the swept path analysis and walkover survey the following recommendations have been made to ensure safe delivery along each route:

- Topographical data and ground investigation information is required to refine the cost estimate for the proposed permanent access roads for each substation location.
- Ensure there is no risk of grounding for the preferred delivery route using topographical data.
- Confirm that any bridge or culvert crossing along the A1 (out with the boundary limits of this report) is suitable for the given delivery loads.
- An abnormal load assessment of the road bridge crossing the railway for substation location 3 is required.
- An abnormal load assessment of the culvert for substation location 8 and 9 is required.
- As part of the temporary works design, a steel plate rated to D400 loading in accordance with BS EN 124 should be designed for undersized or unclassified manhole covers as a minimum.
- A HGV load assessment of the road bridge crossing the railway for cable road crossing 1 is required.
- A HGV load assessment of the road bridge crossing the watercourse for cable road crossing 2 is required.

Appendix A – Vehicle Loads and Dimensions

Appendix B – Swept Path Analysis Drawings



LOCATION PLAN
SCALE 1:10,000



SITE PLAN
SCALE 1:250,000

NOTES

1. CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2020.
2. ACCURACY OF MAP IMAGE NOT GUARANTEED DUE TO REPRODUCTION METHODS.

LEGEND

- PROPOSED ACCESS ROUTE TO SUBSTATION
- PROPOSED NEW ACCESS TRACK
- PROPOSED LOCATION OF SUBSTATION OPTIONS

Rev.	Date	Amendment Details	Drawn	Chk'd	App'd

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Client



Drawing Status

DRAFT

Project Title

**SEAGREEN CHARLIE
SUBSTATION ACCESS**

Drawing Title

LOCATION PLAN

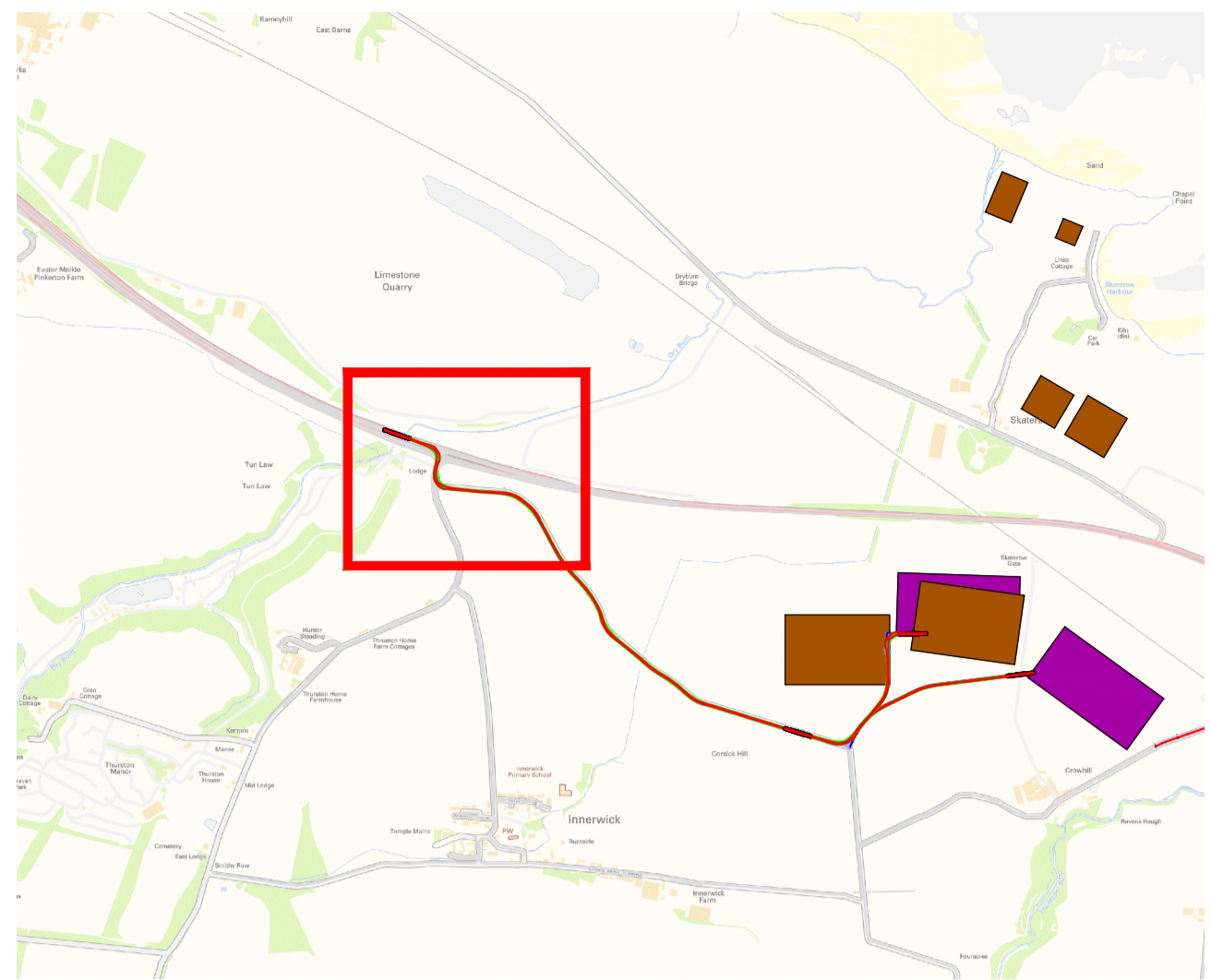
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Drawing Number

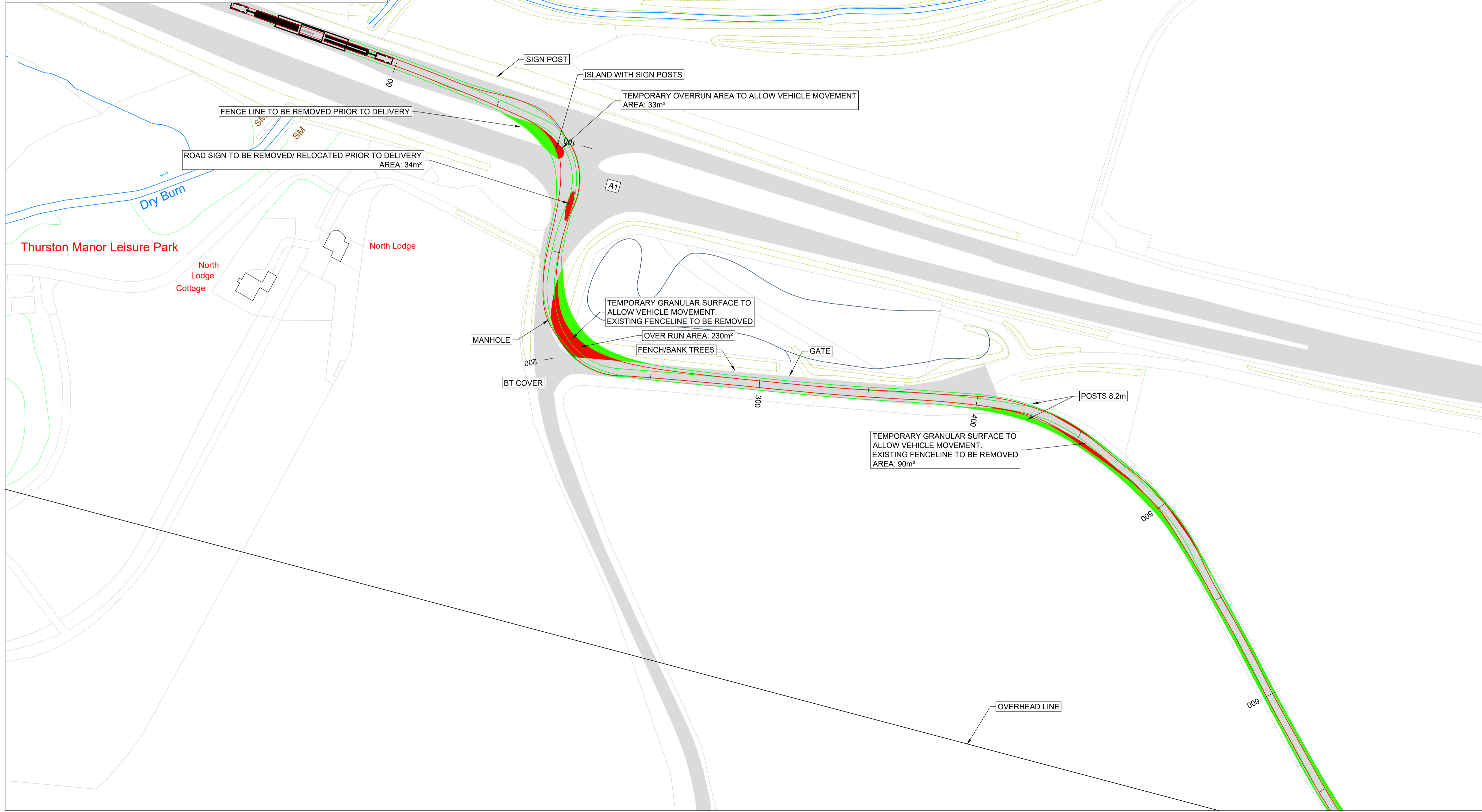
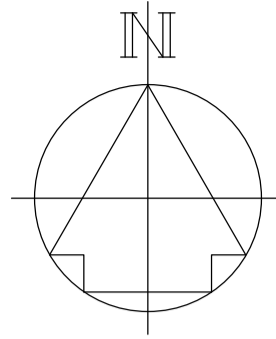
62501721-DRG-101

Revision

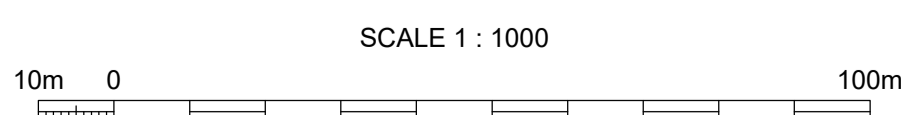
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KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000



NOTES

1. CONTAINS ORDNANCE SURVEY DATA © CROWN COPYRIGHT AND DATABASE RIGHT 2020
2. ACCURACY OF MAP IMAGE NOT GUARANTEED DUE TO REPRODUCTION METHODS.
3. MASTERMAP INFORMATION PROVIDED BY SSE 21/04/2020
4. SWEEP PATH ANALYSIS BASED ON TRANSFORMER VEHICLE SUPPLIED BY SSE 21/04/2020
5. CONSULTATION WITH THE LOCAL AUTHORITY AND NETWORK RAIL IS REQUIRED TO DEFINE CONDITION AND WEIGHT BEARING CAPACITY OF EXISTING RAILWAY BRIDGE.
6. DIAMETER, CONDITION AND WEIGHT BEARING CAPACITY OF EXISTING CULVERTS TO BE DEFINED.
7. EXISTING UTILITIES IN THE AREA TO BE DEFINED.
8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
9. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.
10. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTOVS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
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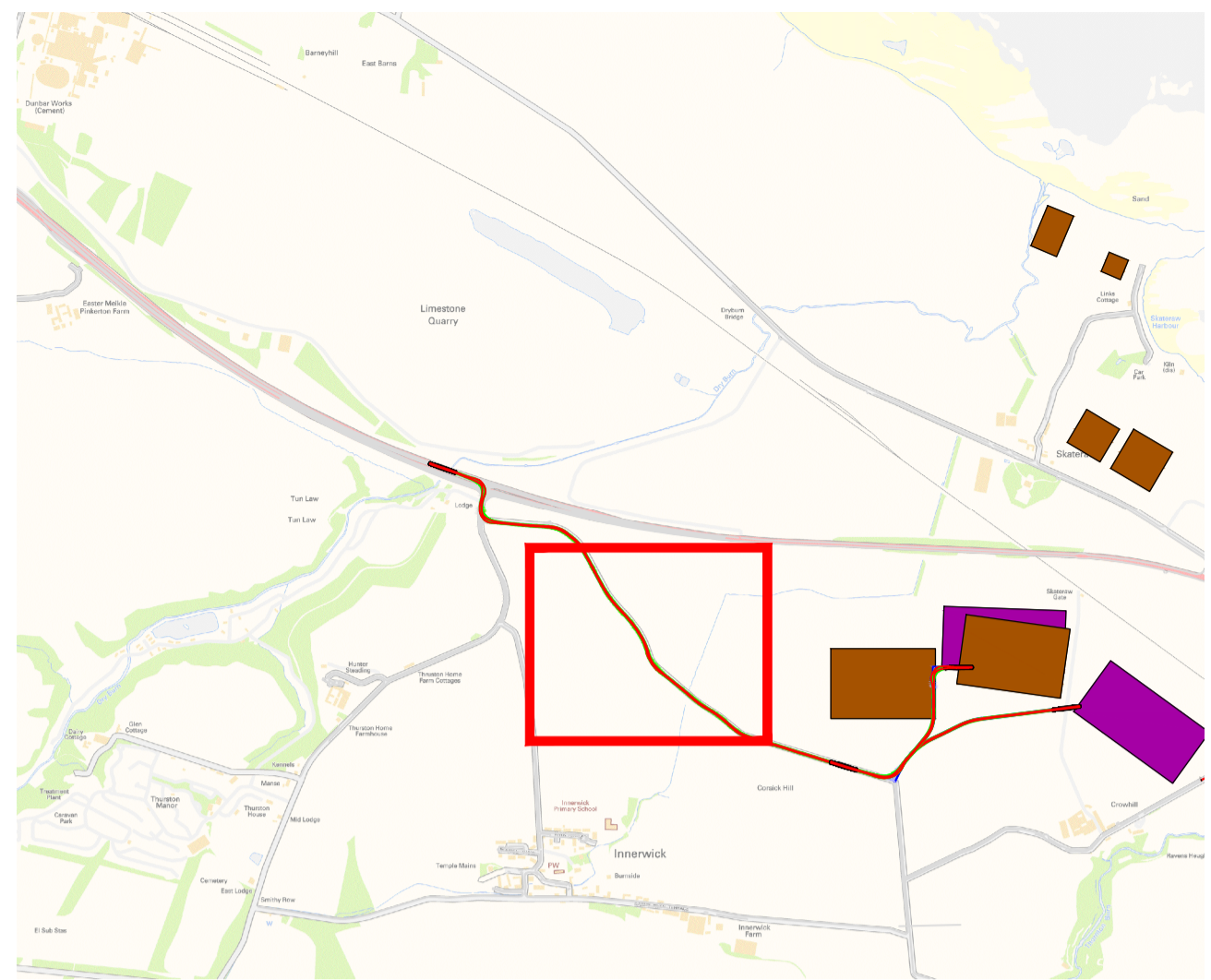


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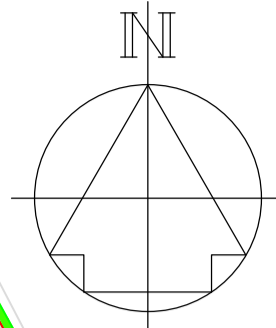
Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

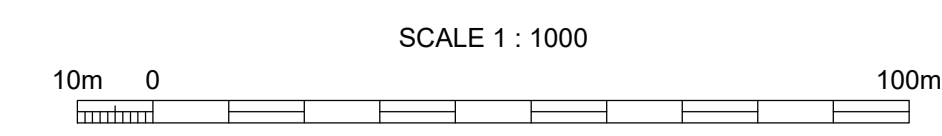
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Scale 1:1,000	Designed CK	Drawn CK	Checked DS	Approved SDB
Original Size A1	Date 22.05.20	Date 22.05.20	Date 26.05.20	Date 04.09.20
Drawing Number 62501721-DRG-102				Revision 2



KEY PLAN
SCALE 1:20,000



1m



IMPROVEMENT PLAN
SCALE 1:10,000

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7. EXISTING UTILITIES IN THE AREA TO BE DEFINED.
8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
9. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON OVERRUN ONLY. EARTHWORK REQUIREMENTS ARE SUBJECT TO MORE DETAILED REVIEW AS PART OF ROUTE TEMPORARY WORKS DESIGN.
10. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL

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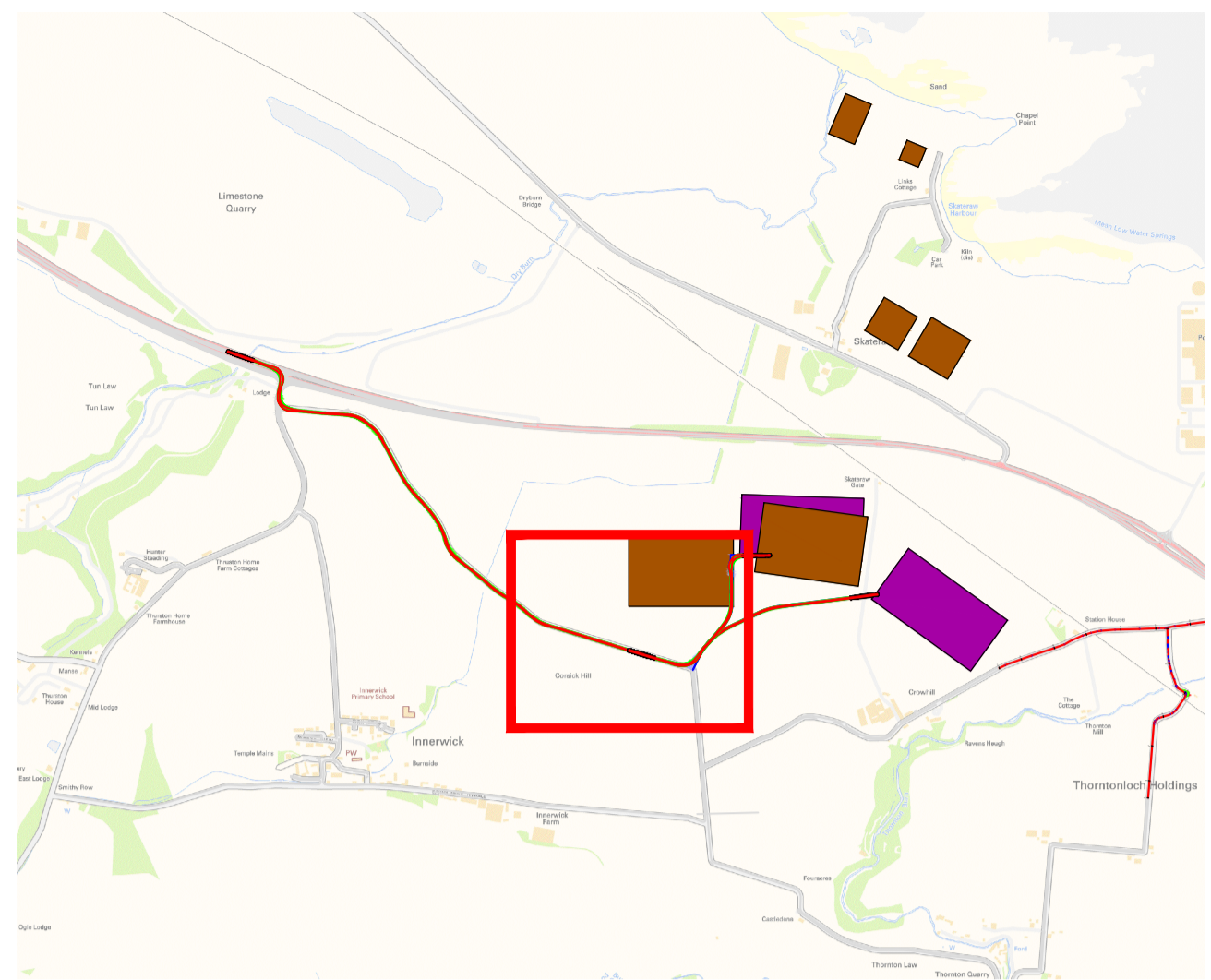


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FOR COMMENT

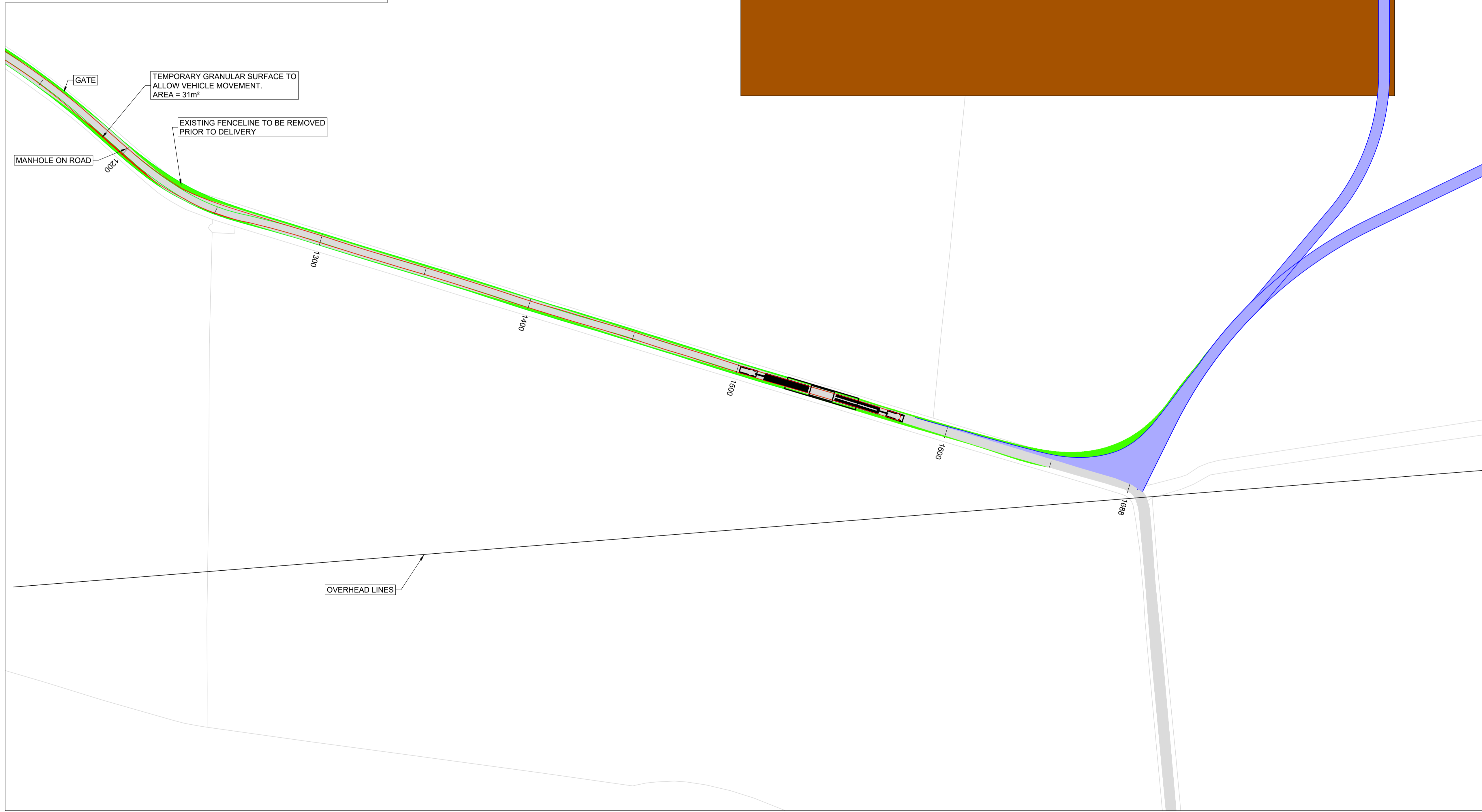
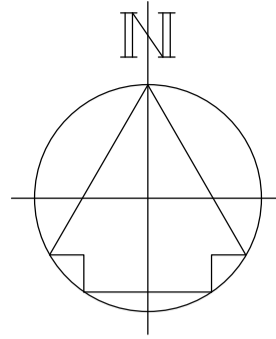
Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

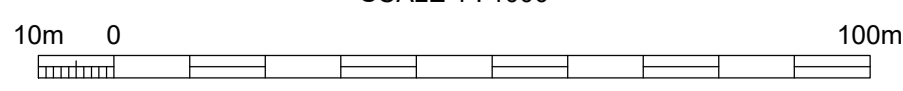
Drawing Title SUBSTATION 8 & 9 EXISTING ROAD IMPROVEMENT PLAN SHEET 2				
Scale 1:1,000	Designed CK	Drawn CK	Checked DS	Approved SDB
Original Size A1	Date 22.05.20	Date 22.05.20	Date 26.05.20	Date 04.09.20
Drawing Number 62501721-DRG-103	Revision 2			



KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000



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7. EXISTING UTILITIES IN THE AREA TO BE DEFINED.
8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
9. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON OVERRUN ONLY. EARTHWORK REQUIREMENTS ARE SUBJECT TO MORE DETAILED REVIEW AS PART OF ROUTE TEMPORARY WORKS DESIGN.
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LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
1	04/09/20	FIRST ISSUE	CB	AM	SDB

Rev. Date Amendment Details Drawn Chk'd App'd

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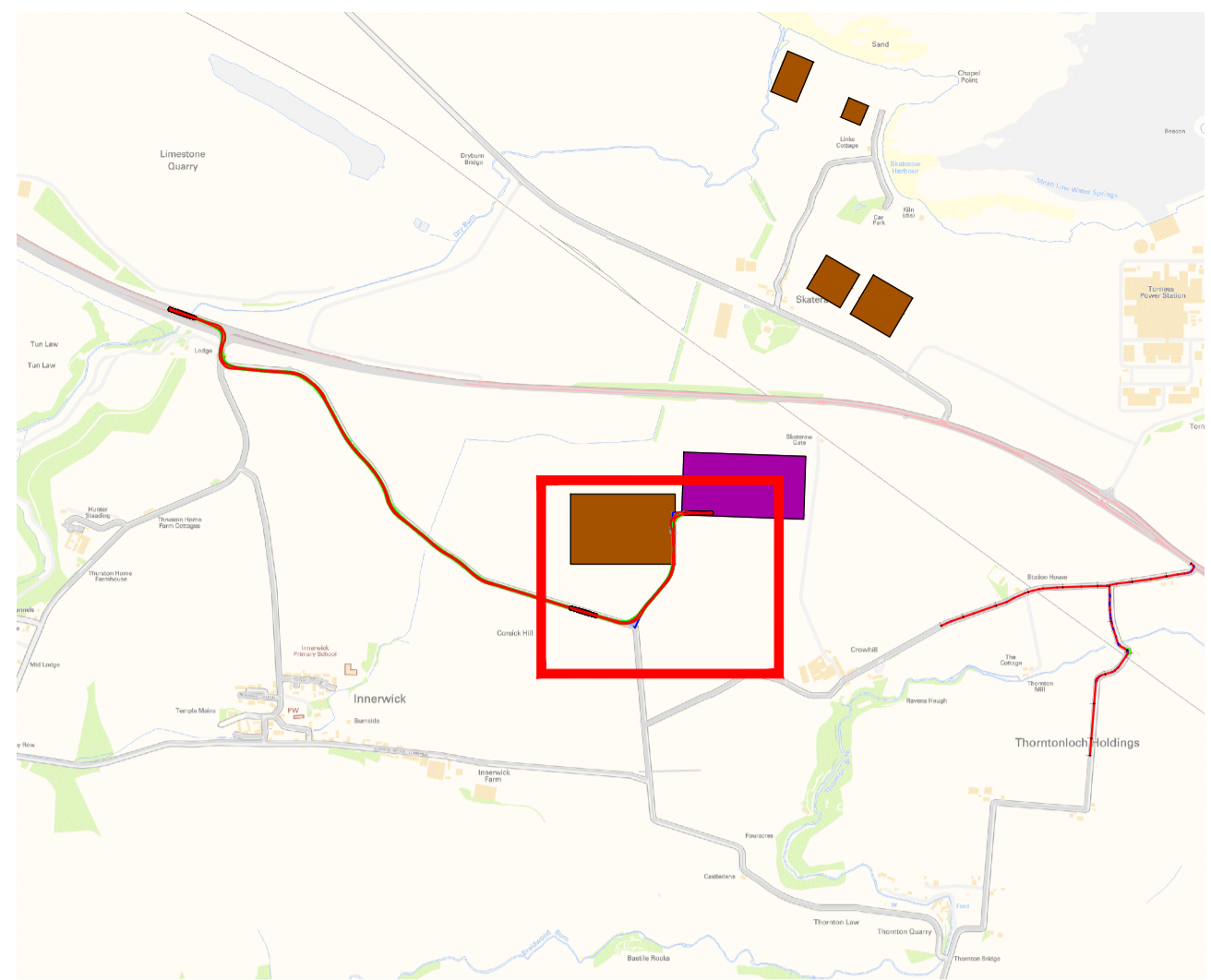


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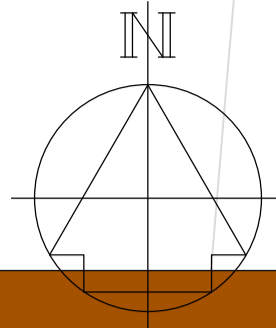
Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

Drawing Title SUBSTATION 8 & 9 EXISTING ROAD IMPROVEMENT PLAN SHEET 3				
Scale 1:1,000	Designed CK	Drawn CK	Checked DS	Approved SDB
Original Size A1	Date 22.05.20	Date 22.05.20	Date 26.05.20	Date 04.09.20
Drawing Number 62501721-DRG-104				Revision 2



KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000

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7. EXISTING UTILITIES IN THE AREA TO BE DEFINED.
8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
9. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON OVERRUN ONLY. EARTHWORK REQUIREMENTS ARE SUBJECT TO MORE DETAILED REVIEW AS PART OF ROUTE TEMPORARY WORKS DESIGN.
10. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
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Client



Drawing Status

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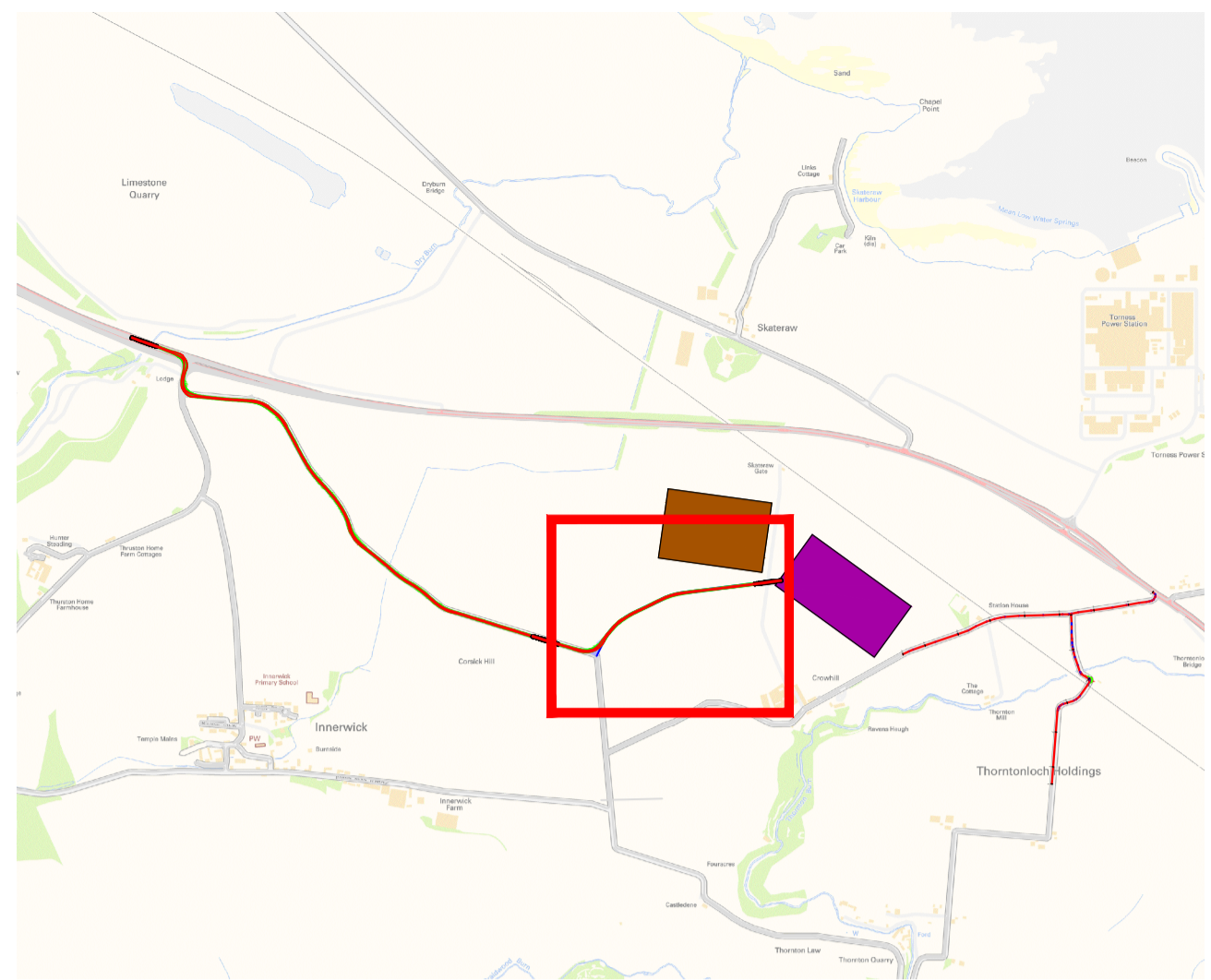
Project Title

**SEAGREEN CHARLIE
SUBSTATION ACCESS**

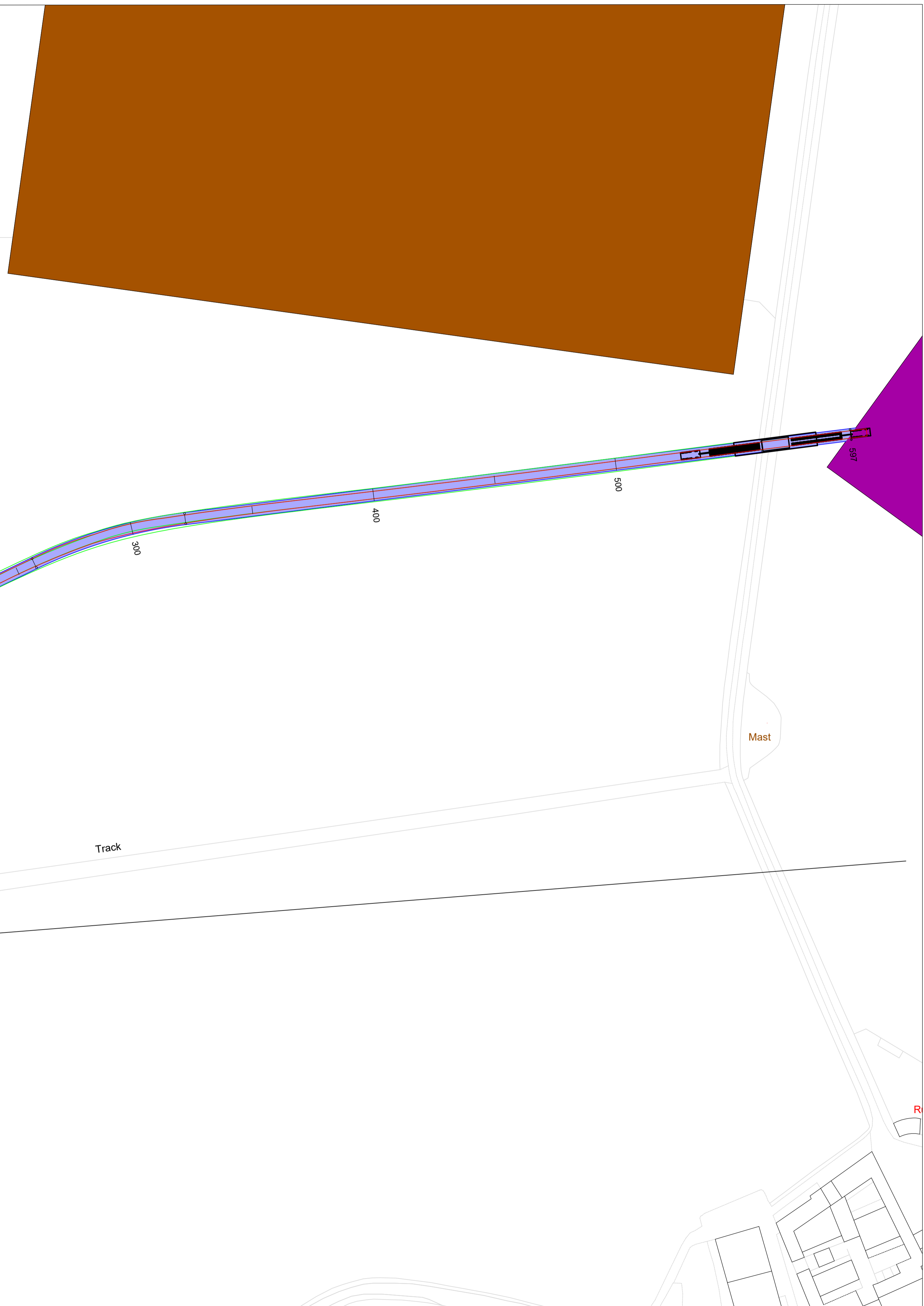
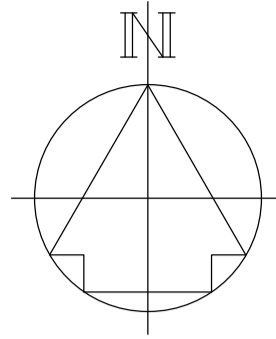
Drawing Title

**SUBSTATION 8
PROPOSED ROAD
IMPROVEMENT PLAN**

Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-105								Revision	2



KEY PLAN
SCALE 1:20,000



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7. EXISTING UTILITIES IN THE AREA TO BE DEFINED.
8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
9. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON OVERRUN ONLY. EARTHWORK REQUIREMENTS ARE SUBJECT TO MORE DETAILED REVIEW AS PART OF ROUTE TEMPORARY WORKS DESIGN.
10. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
1	04/09/20	FIRST ISSUE	CB	AM	SDB

Rev.	Date	Amendment Details	Drawn	Chk'd	App'd
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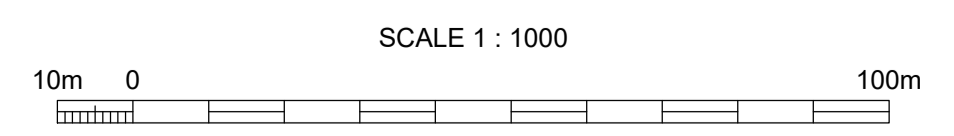
Client

Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

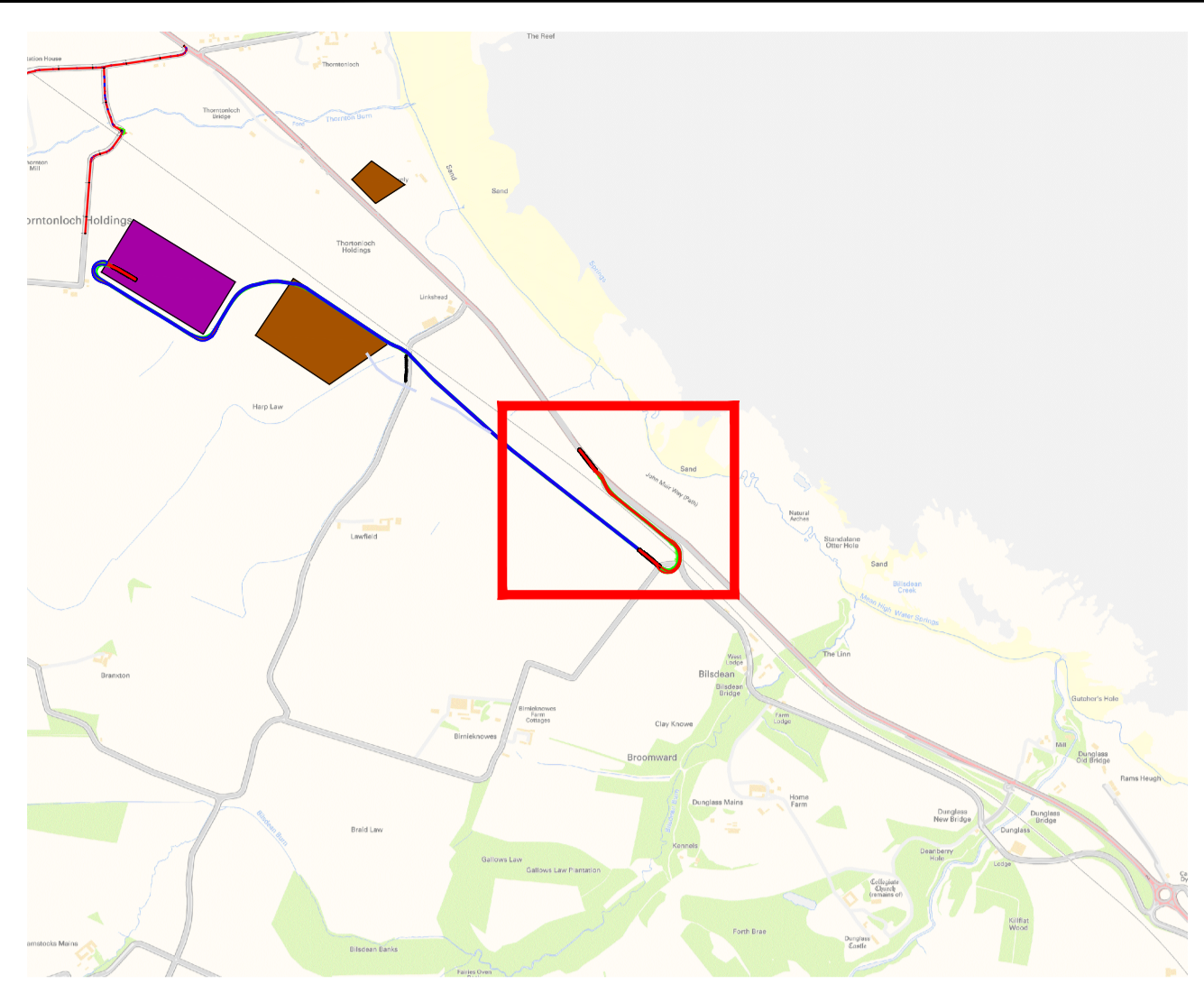
Drawing Title
SUBSTATION 9 PROPOSED ROAD IMPROVEMENT PLAN

Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-106								Revision	2

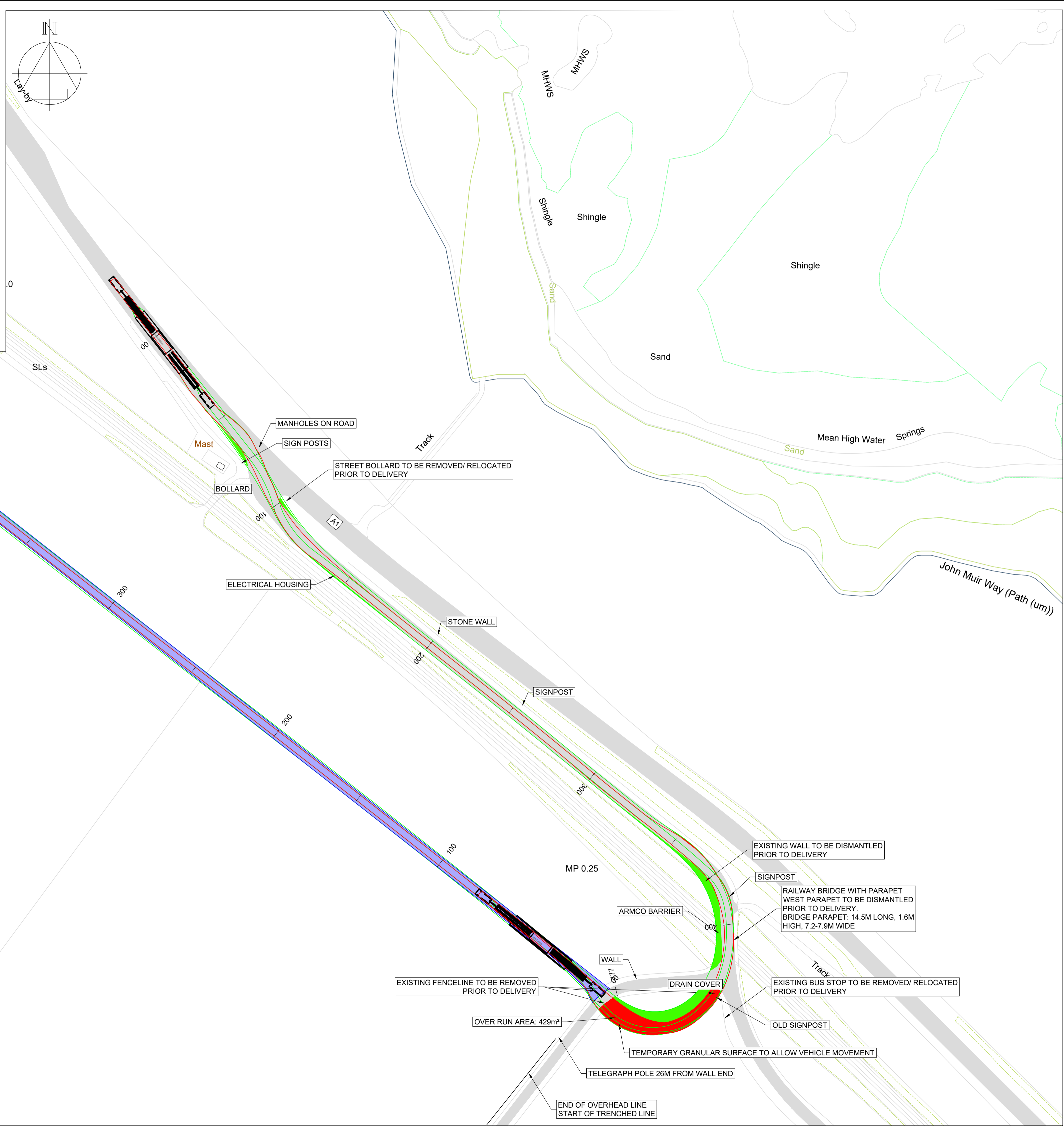


SCALE 1 : 1000

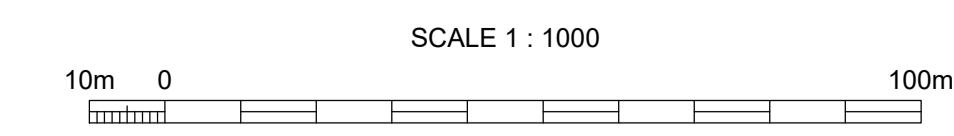
IMPROVEMENT PLAN
SCALE 1:10,000



KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000



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LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

3	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
2	30/09/20	SPA AMENDED	CB	AM	SDB
1	04/09/20	FIRST ISSUE	CB	AM	SDB
Rev.	Date	Amendment Details	Drawn	Chk'd	App'd

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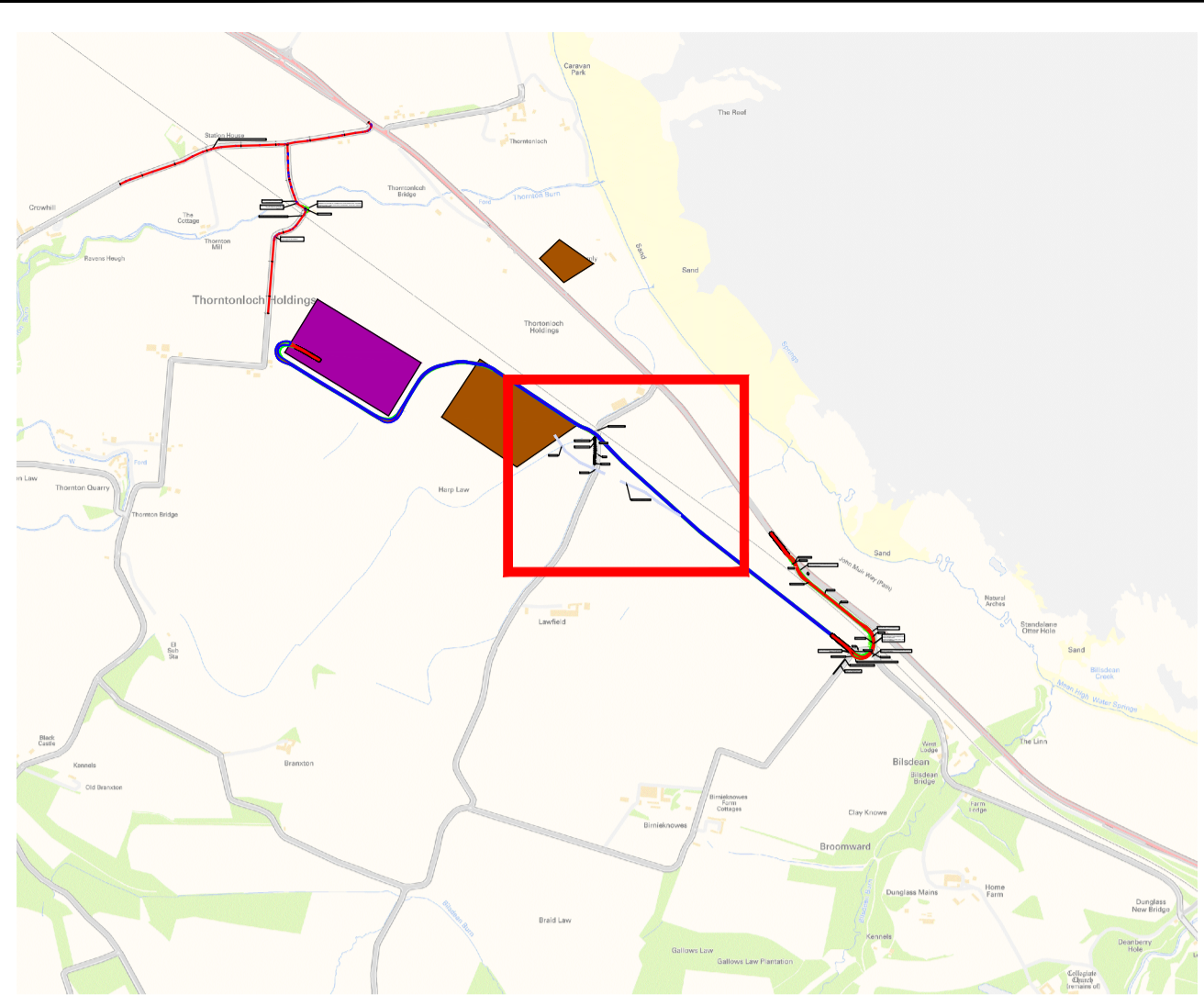
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Drawing Status: **FOR COMMENT**

Project Title: **SEAGREEN CHARLIE SUBSTATION ACCESS**

Drawing Title: **SUBSTATION 3 EXISTING ROAD IMPROVEMENT PLAN SHEET 1**

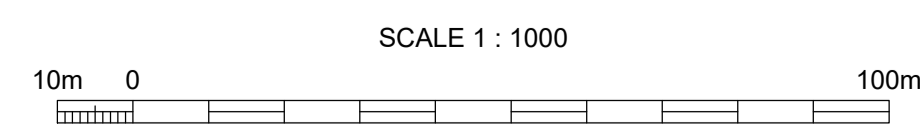
Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-107								Revision	3



KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000



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LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
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Rev.	Date	Amendment Details	Drawn	Chk'd	App'd

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Drawing Status

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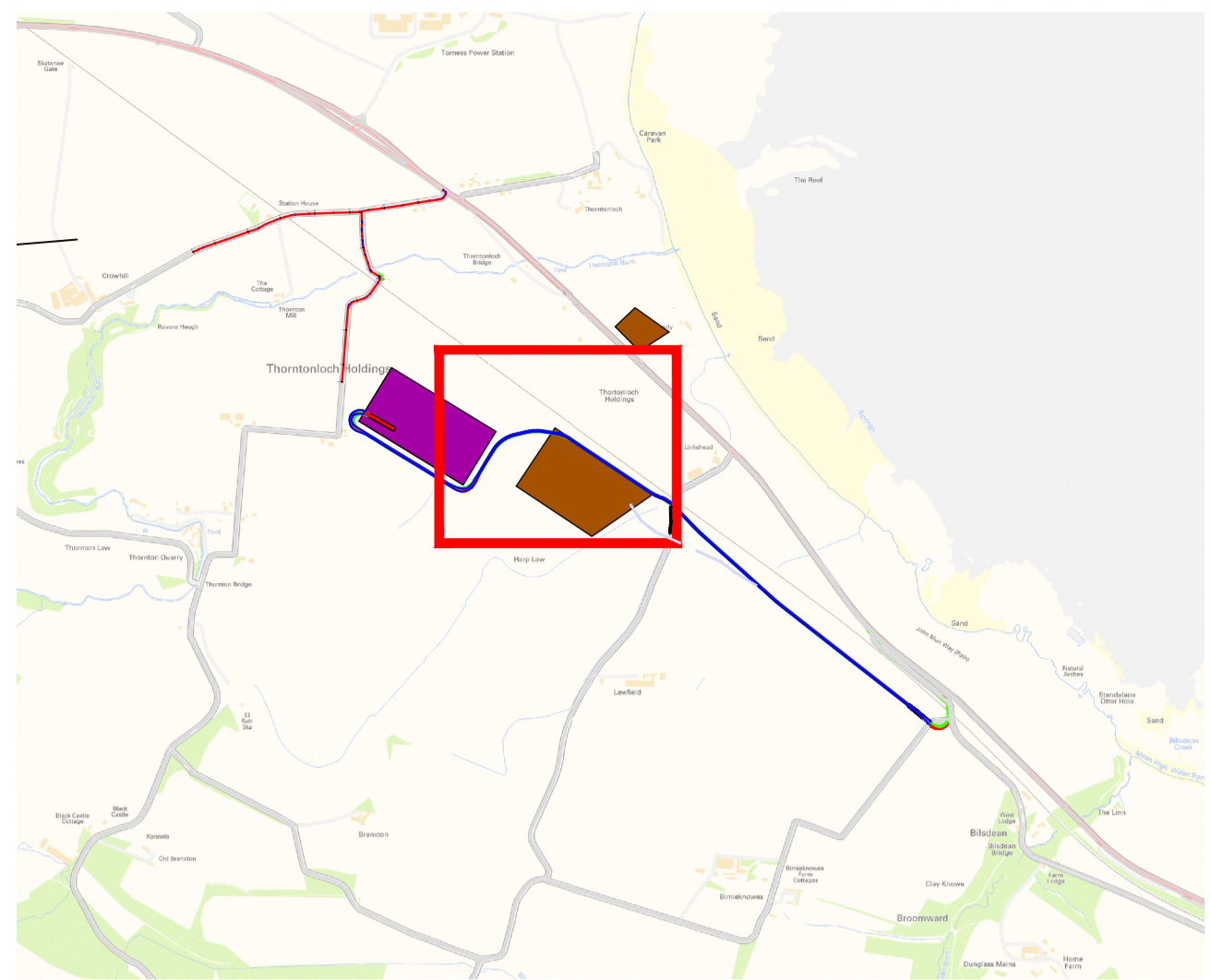
Project Title

**SEAGREEN CHARLIE
SUBSTATION ACCESS**

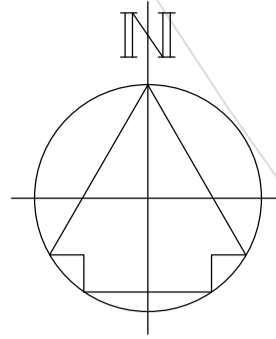
Drawing Title

**SUBSTATION 3
PROPOSED ROAD
IMPROVEMENT PLAN
SHEET 2**

Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-108								Revision	2



KEY PLAN
SCALE 1:20,000



IMPROVEMENT PLAN
SCALE 1:10,000

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LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
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Rev. Date Amendment Details Drawn Chk'd App'd

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Drawing Status

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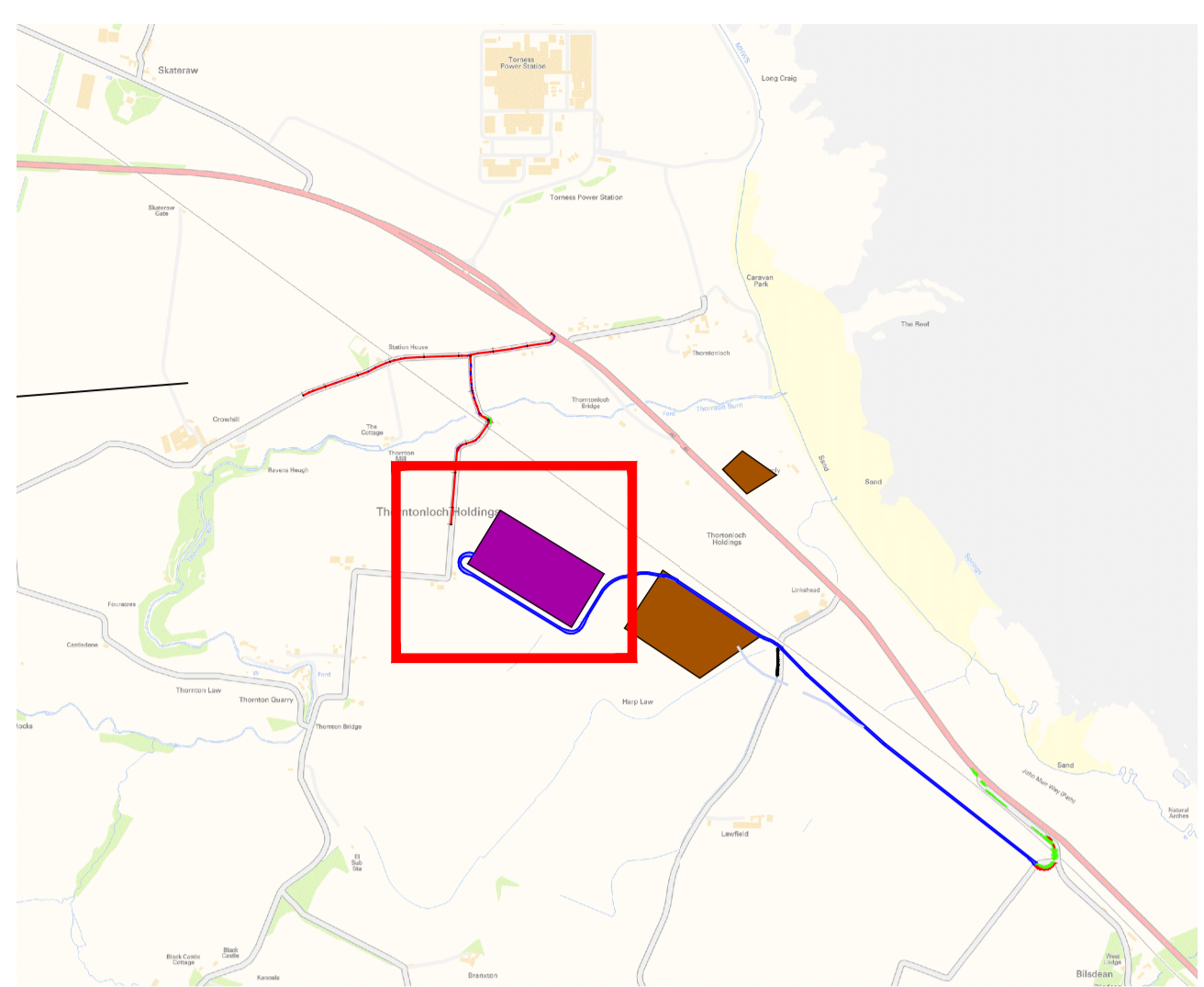
Project Title

**SEAGREEN CHARLIE
SUBSTATION ACCESS**

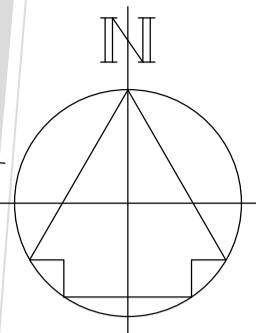
Drawing Title

**SUBSTATION 3
EXISTING ROAD
IMPROVEMENT PLAN
SHEET 3**

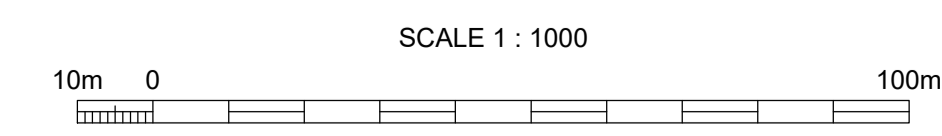
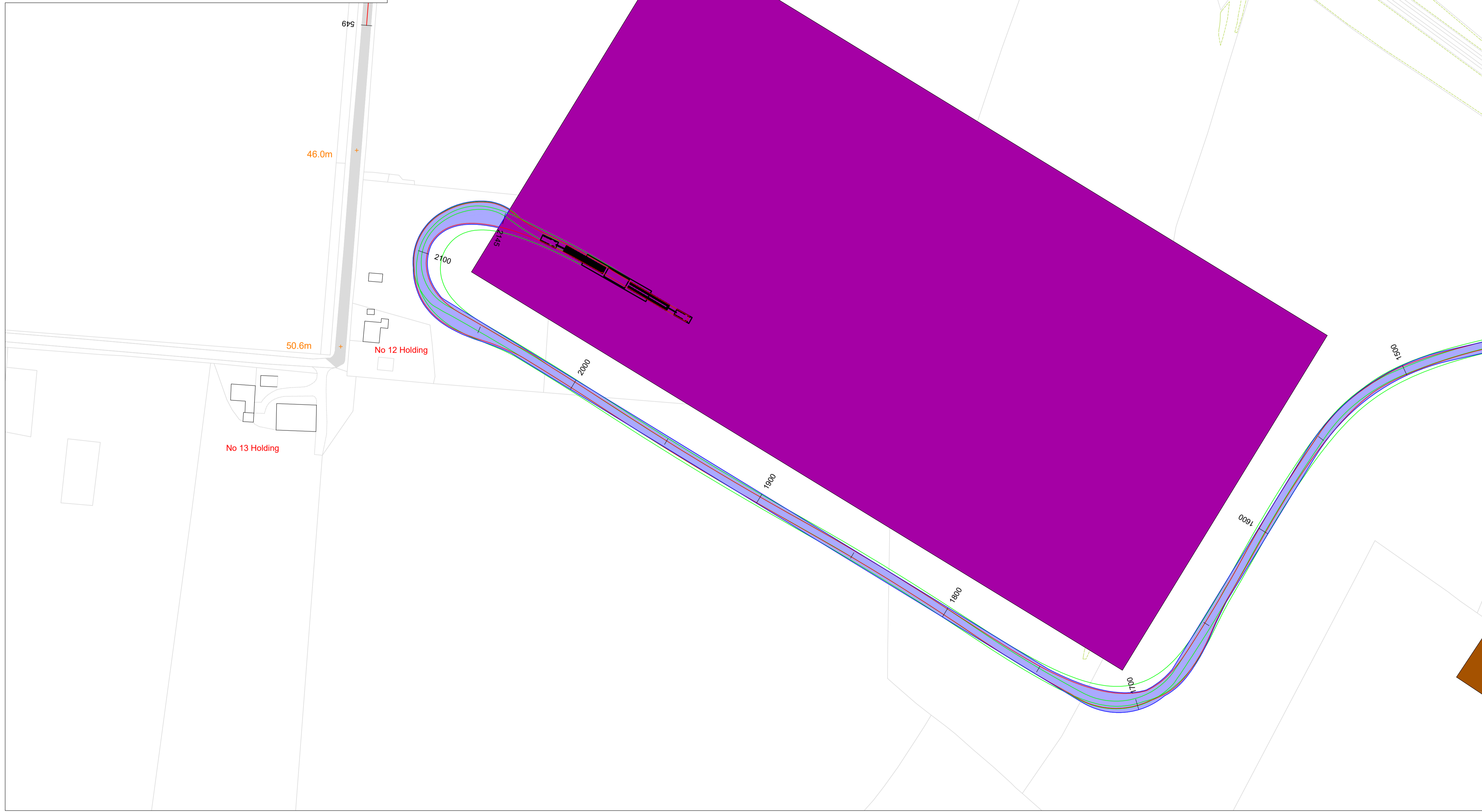
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Drawing Number	62501721-DRG-109								Revision	2



KEY PLAN
SCALE 1:20,000



Thorntonloch Holdings



SCALE 1 : 1000

IMPROVEMENT PLAN
SCALE 1:10,000

NOTES

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8. REFER TO DRAWING 65201721-DRG-101 FOR LOCATION PLAN.
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10. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL
- PROPOSED ACCESS TRACK
- PROPOSED CONSTRUCTION COMPOUND
- PROPOSED SUBSTATION

2	05/10/20	UPDATED AS PER COMMENTS	CB	AM	SDB
1	04/09/20	FIRST ISSUE	CB	AM	SDB
Rev.	Date	Amendment Details	Drawn	Chk'd	App'd

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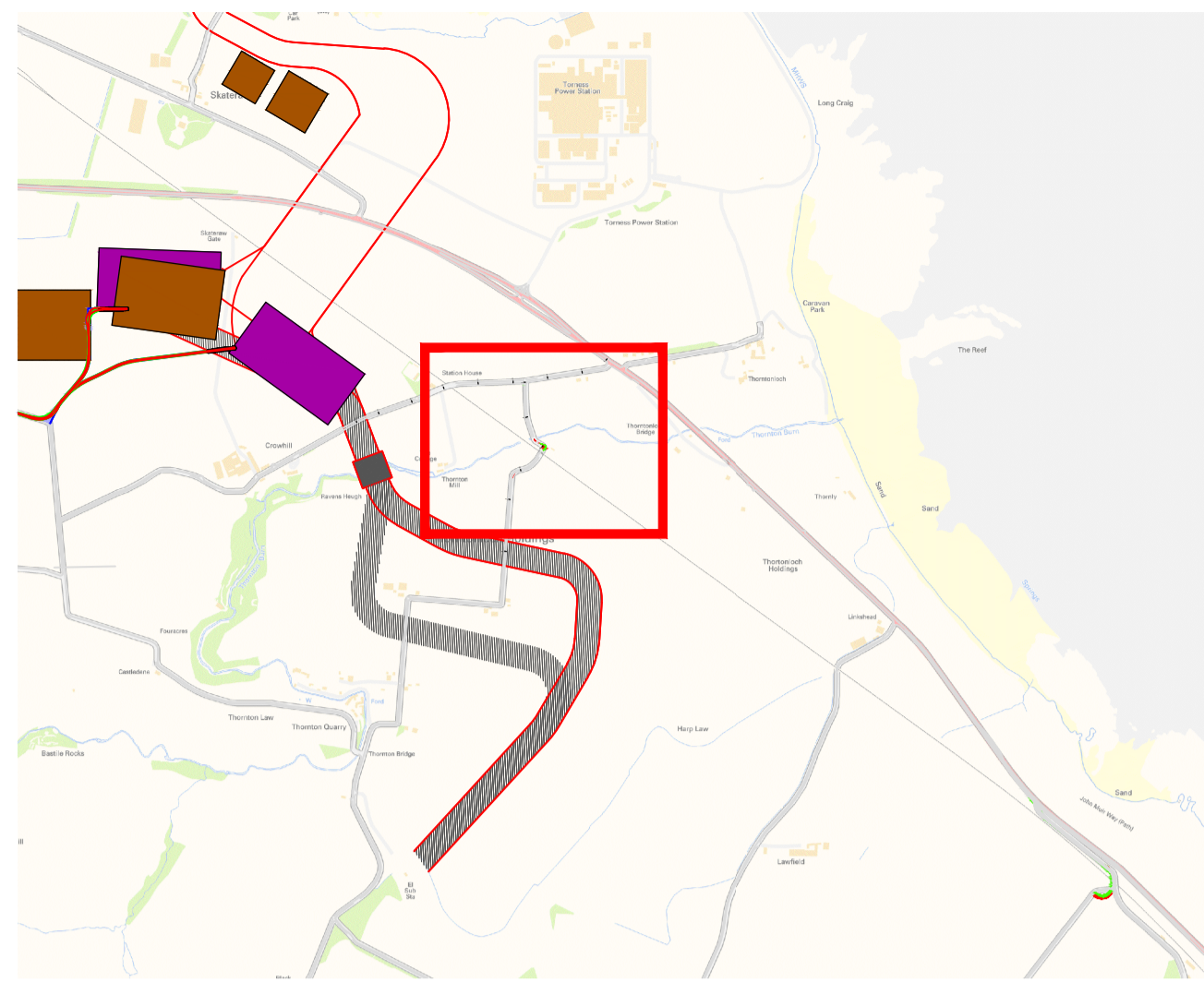


Client
FOR COMMENT

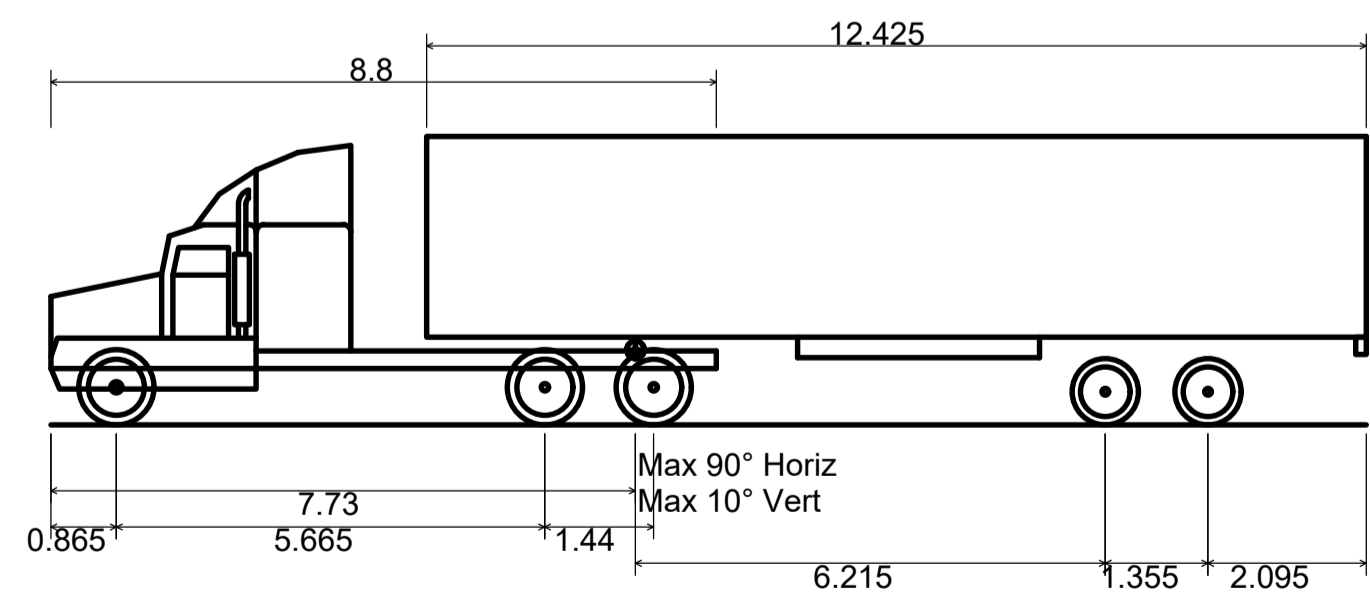
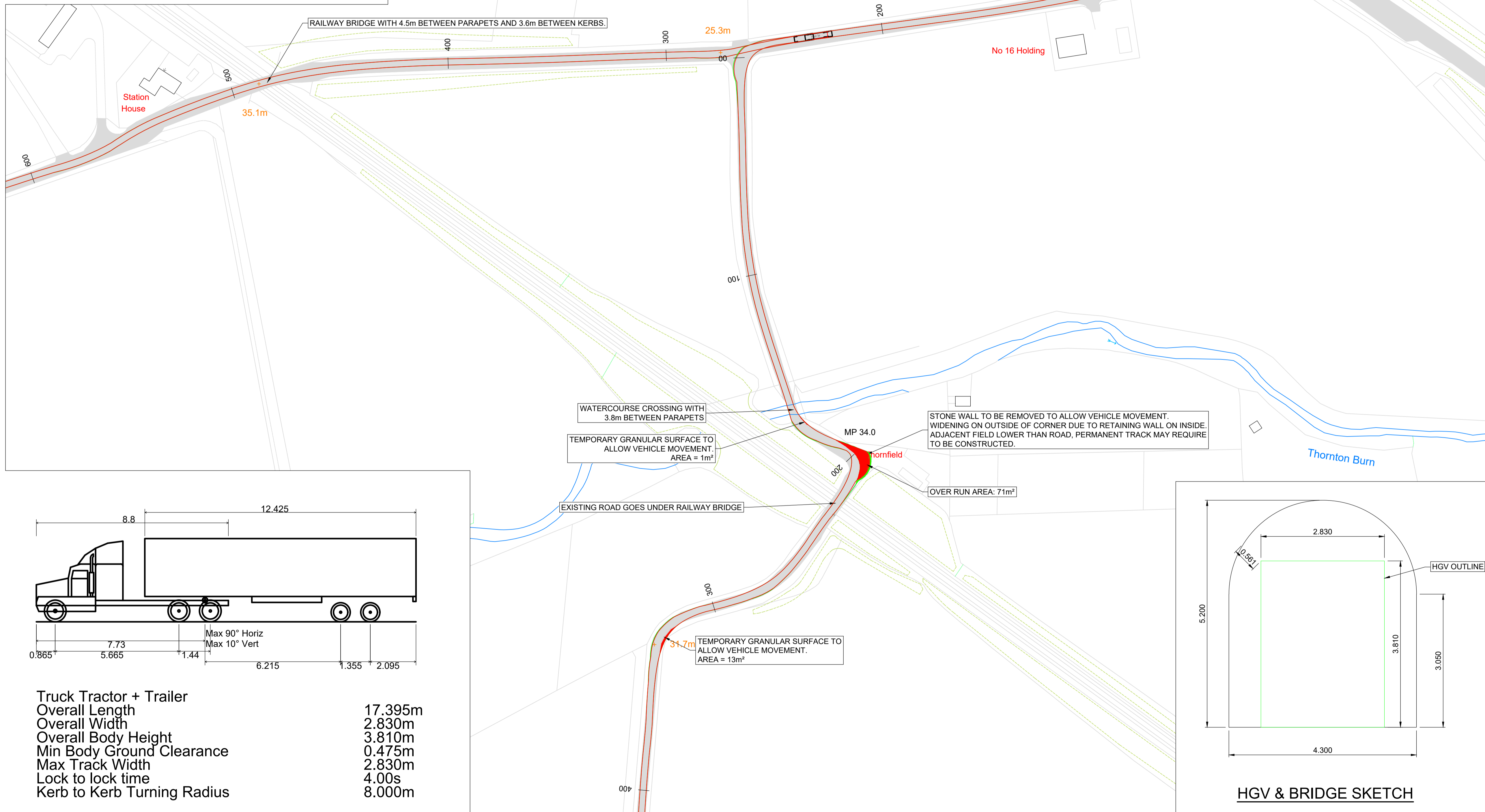
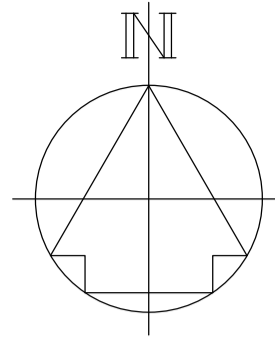
Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

Drawing Title
SUBSTATION 3 PROPOSED ROAD IMPROVEMENT PLAN SHEET 4

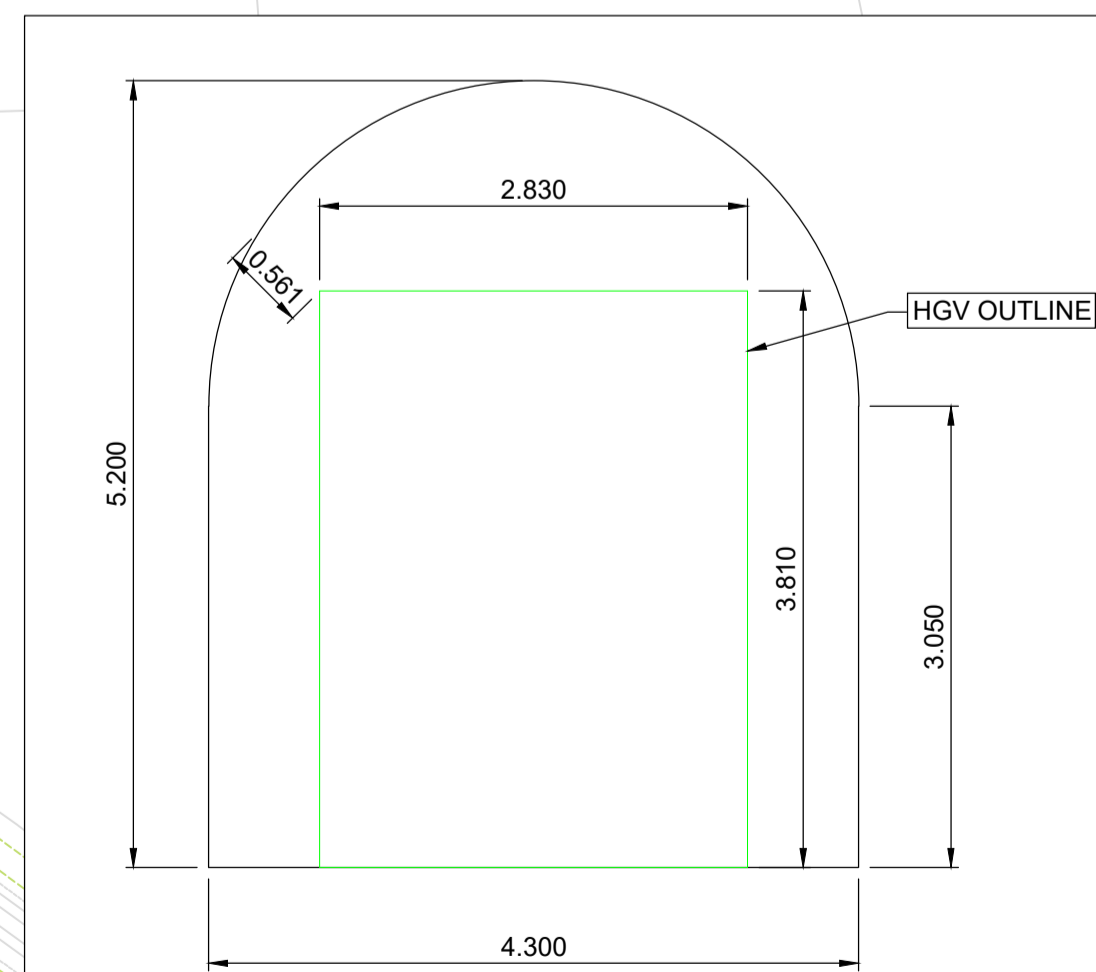
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Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-110								Revision	2



KEY PLAN
SCALE 1:20,000



Truck Tractor + Trailer
 Overall Length 17.395m
 Overall Width 2.830m
 Overall Body Height 3.810m
 Min Body Ground Clearance 0.475m
 Max Track Width 2.830m
 Lock to lock time 4.00s
 Kerb to Kerb Turning Radius 8.000m



HGV & BRIDGE SKETCH

IMPROVEMENT PLAN
SCALE 1:10,000

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8. AREAS OF TEMPORARY GRANULAR FILL ARE BASED ON OVERRUN ONLY. EARTHWORK REQUIREMENTS ARE SUBJECT TO MORE DETAILED REVIEW AS PART OF ROUTE TEMPORARY WORKS DESIGN.
9. FOR UNDERSIZED OR UNCLASSIFIED MANHOLE COVERS, A TEMPORARY STEEL PLATE DESIGNED TO CLASS D400 IN ACCORDANCE WITH BS EN 124 SHOULD BE PROVIDED AS A MINIMUM DURING THE TEMPORARY WORK DESIGN.

LEGEND

- EXISTING ROAD
- EX TENTES OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL

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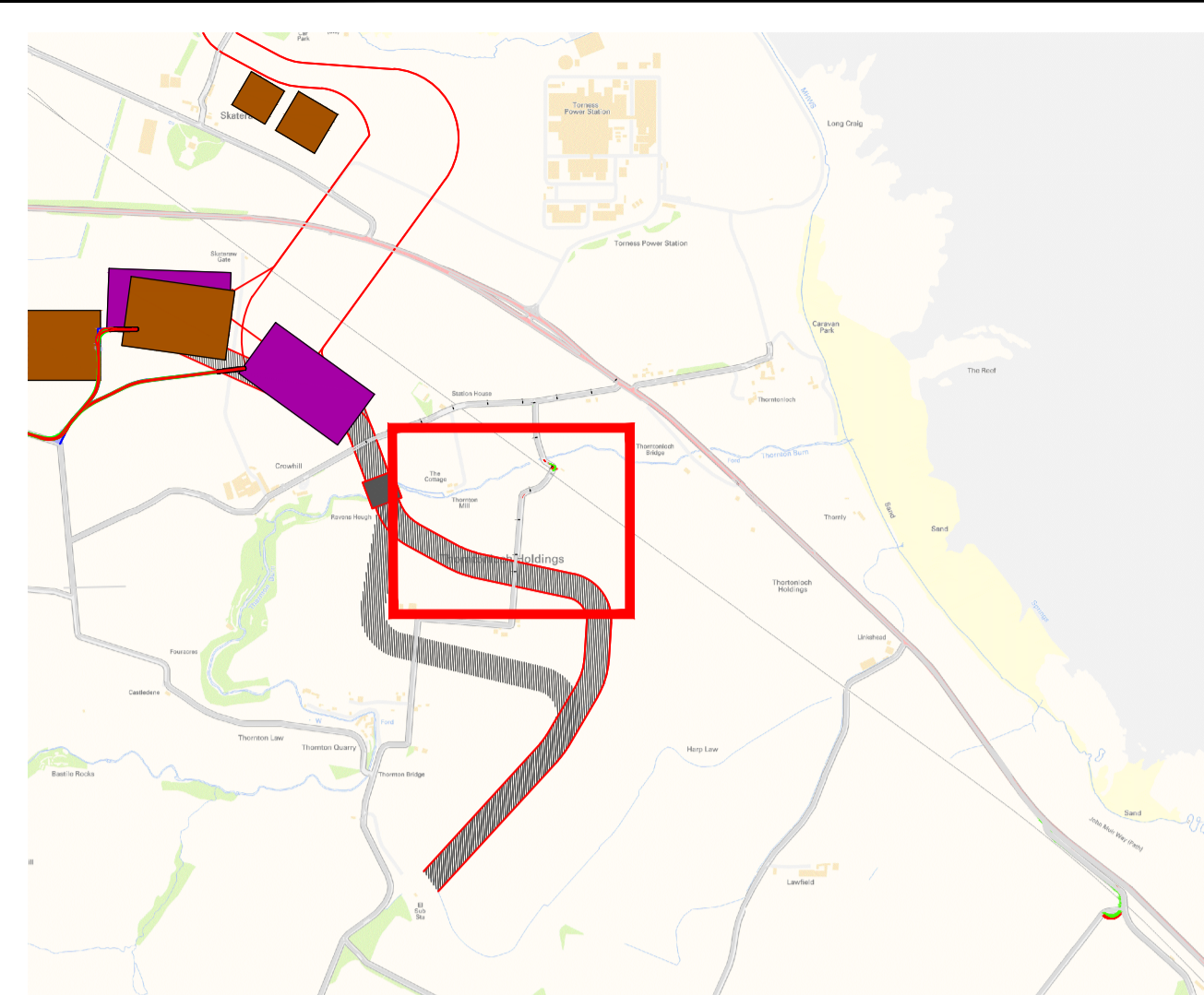
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Drawing Status
FOR COMMENT

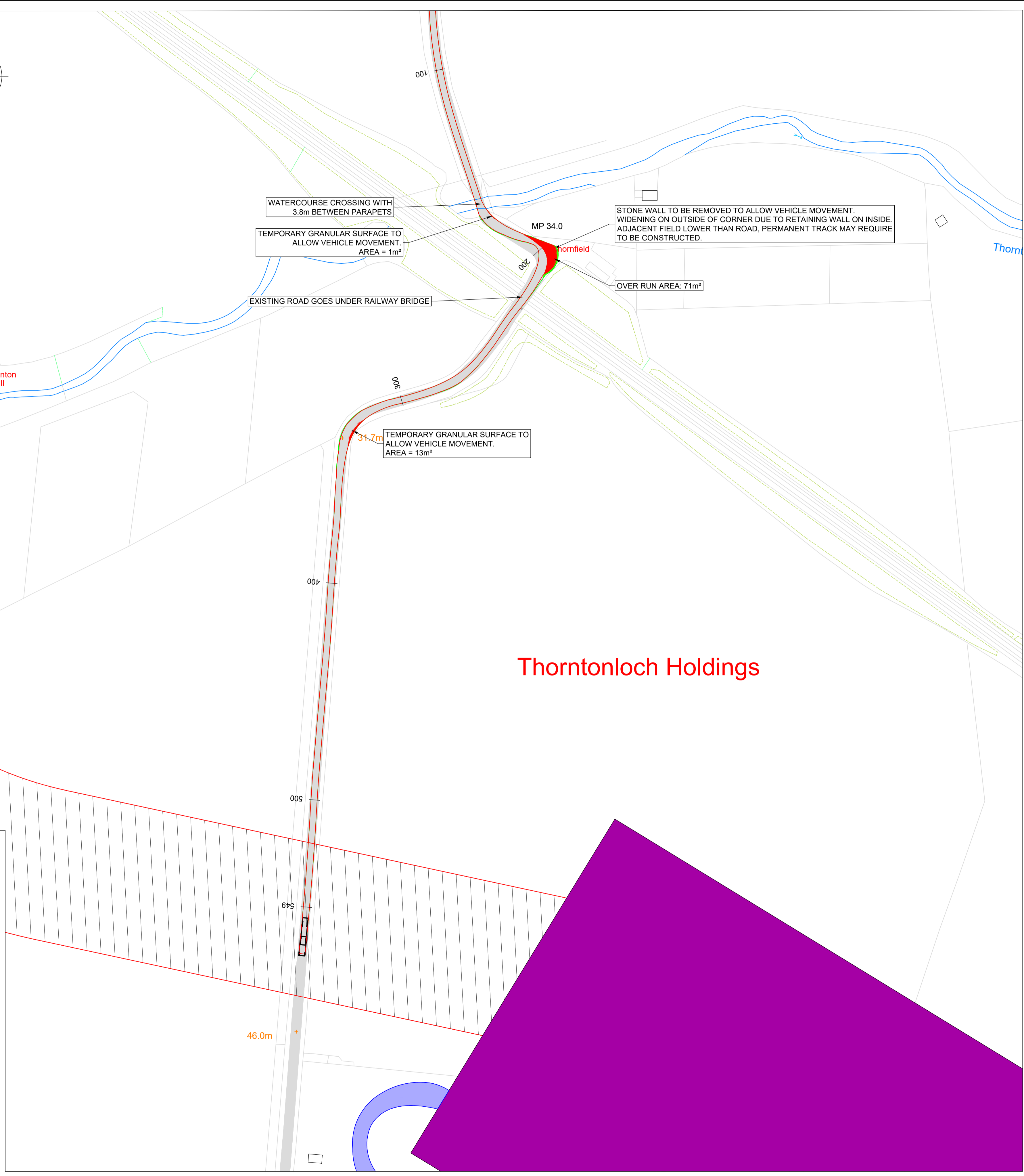
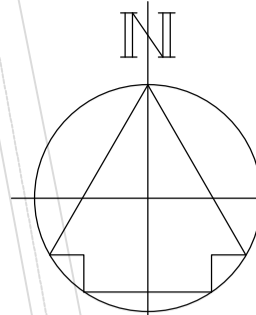
Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

Drawing Title
44 TONNE HGV EXISTING ROAD IMPROVEMENT PLAN SHEET 1

Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-112								Revision	2



KEY PLAN
SCALE 1:20,000



WATERCOURSE CROSSING WITH 3.8m BETWEEN PARAPETS

TEMPORARY GRANULAR SURFACE TO ALLOW VEHICLE MOVEMENT. AREA = 1m²

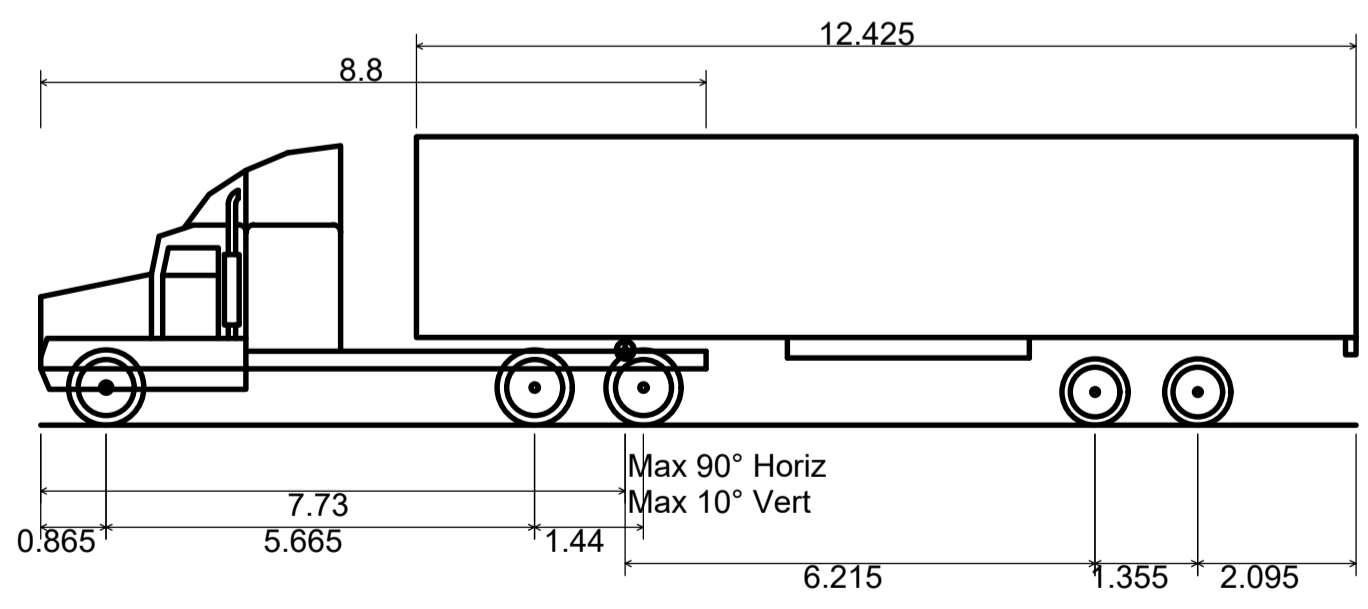
EXISTING ROAD GOES UNDER RAILWAY BRIDGE

STONE WALL TO BE REMOVED TO ALLOW VEHICLE MOVEMENT. WIDENING ON OUTSIDE OF CORNER DUE TO RETAINING WALL ON INSIDE. ADJACENT FIELD LOWER THAN ROAD, PERMANENT TRACK MAY REQUIRE TO BE CONSTRUCTED.

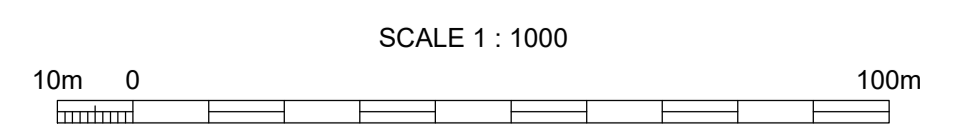
OVER RUN AREA: 71m²

TEMPORARY GRANULAR SURFACE TO ALLOW VEHICLE MOVEMENT. AREA = 13m²

Thorntonloch Holdings



Truck Tractor + Trailer	
Overall Length	17.395m
Overall Width	2.830m
Overall Body Height	3.810m
Min Body Ground Clearance	0.475m
Max Track Width	2.830m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.000m



IMPROVEMENT PLAN
SCALE 1:10,000

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- EXISTING ROAD
- EX TENTS OF VEHICLE WHEEL OVER RUN
- EXTENTS OF VEHICLE CHASSIS OVERSAIL
- AREA OF VEHICLE OVER RUN
- AREA OF VEHICLE OVERSAIL

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1	04/09/20	FIRST ISSUE	CB	AM	SDB

Rev. Date Amendment Details Drawn Chk'd App'd

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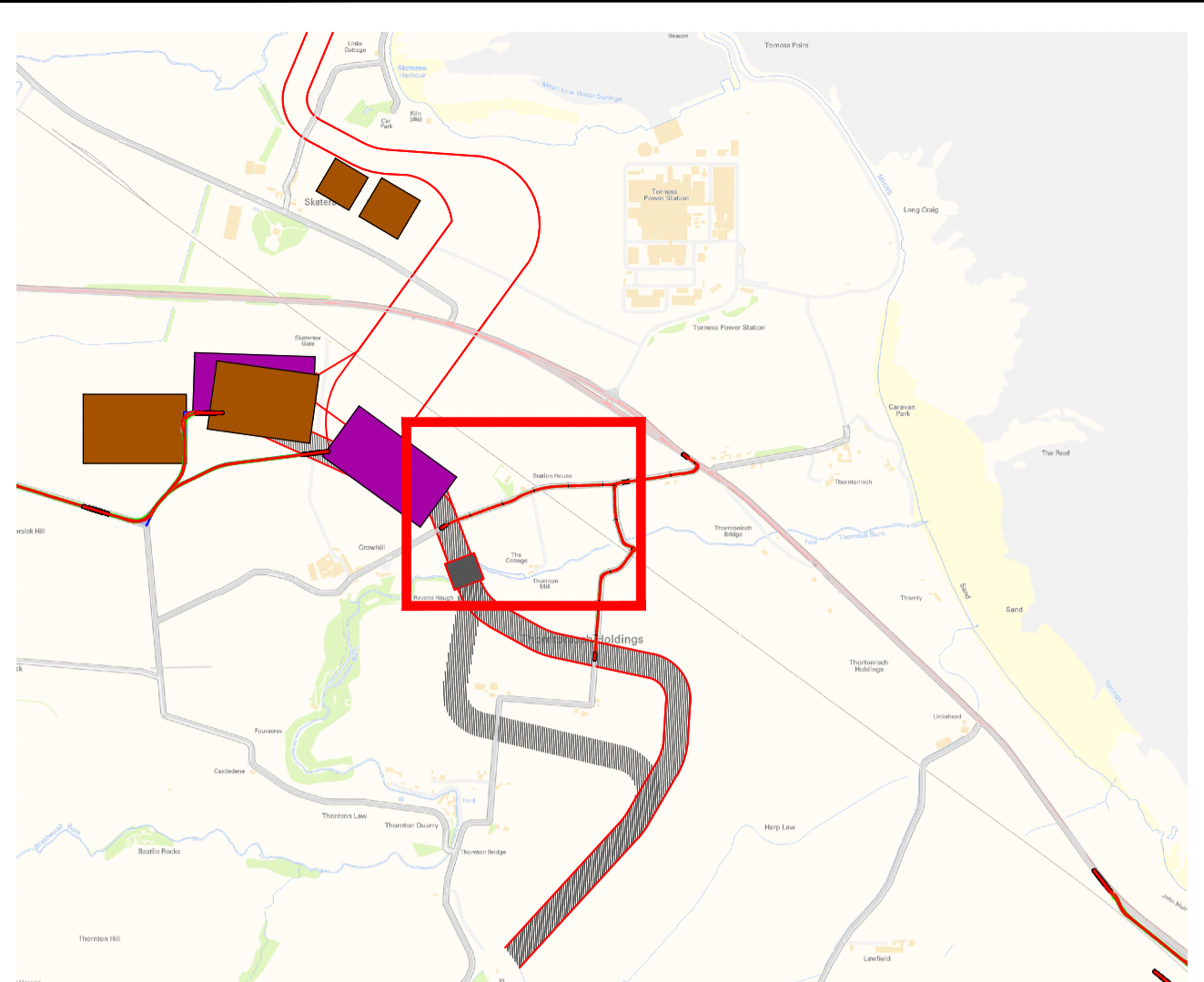


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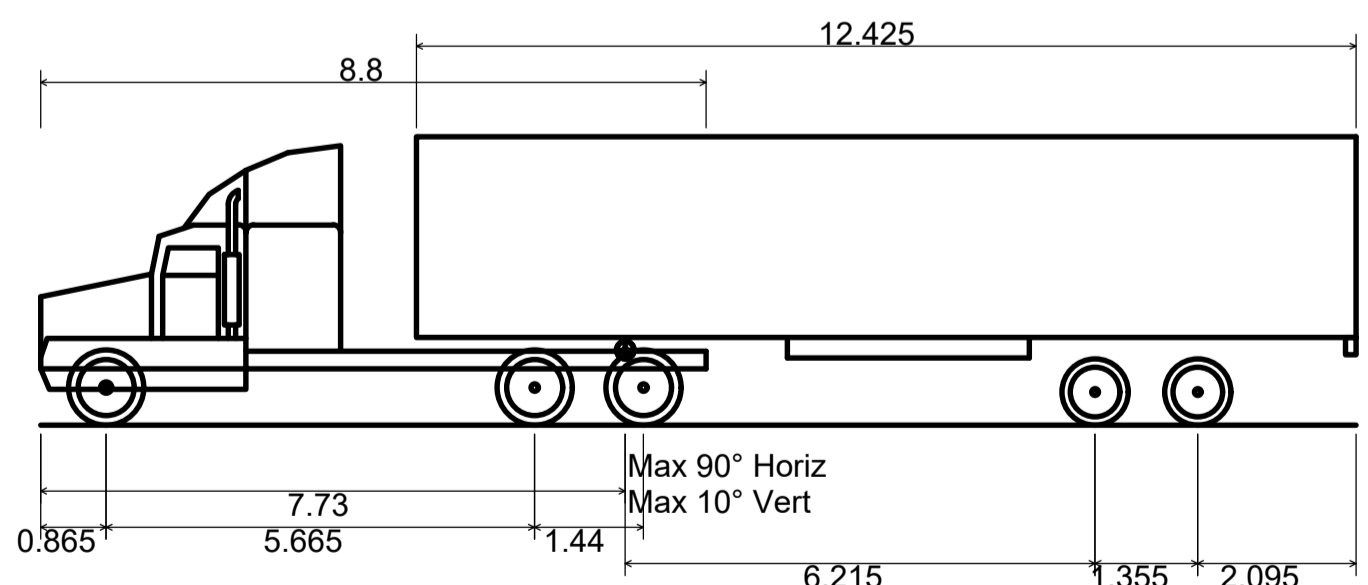
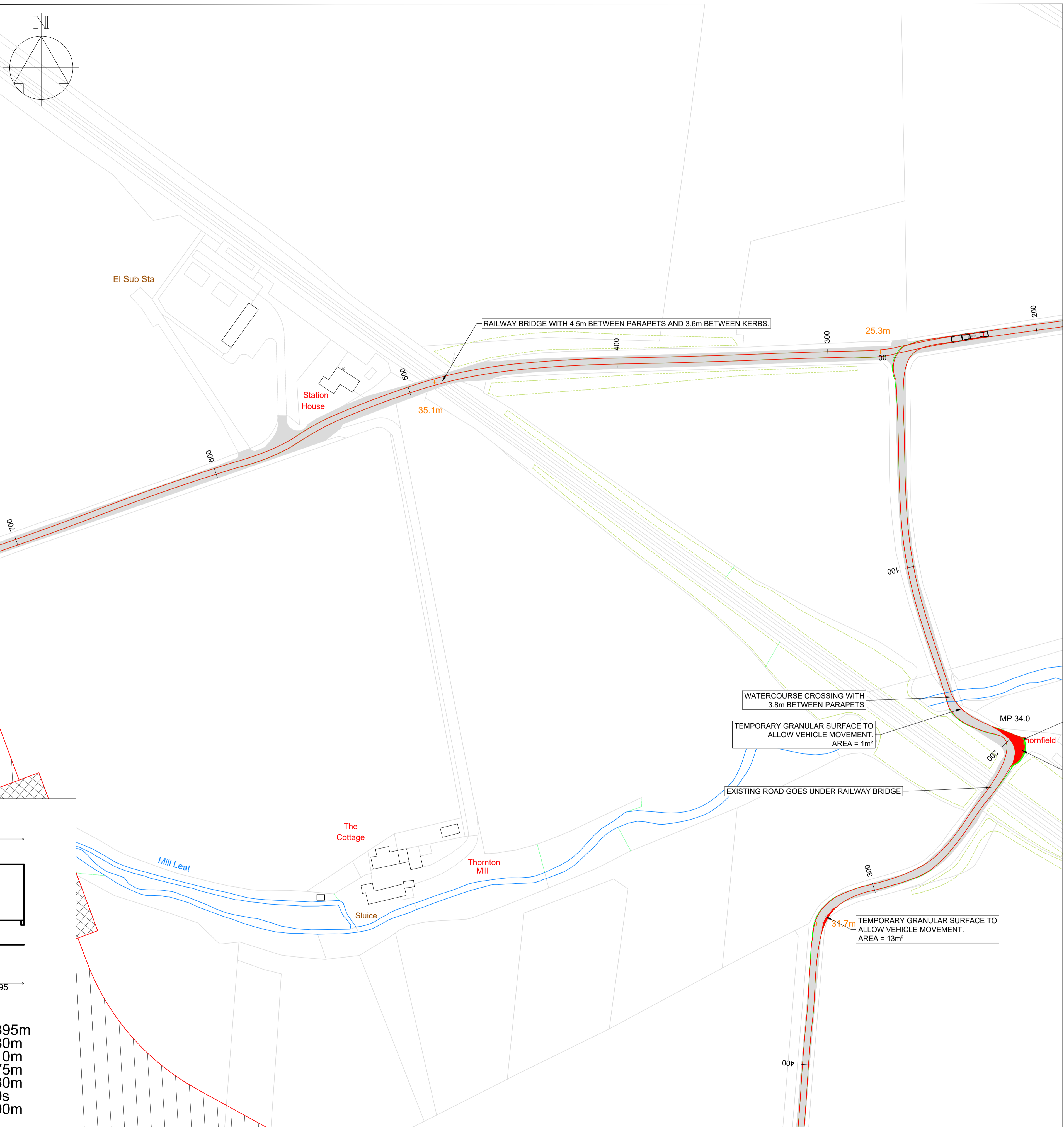
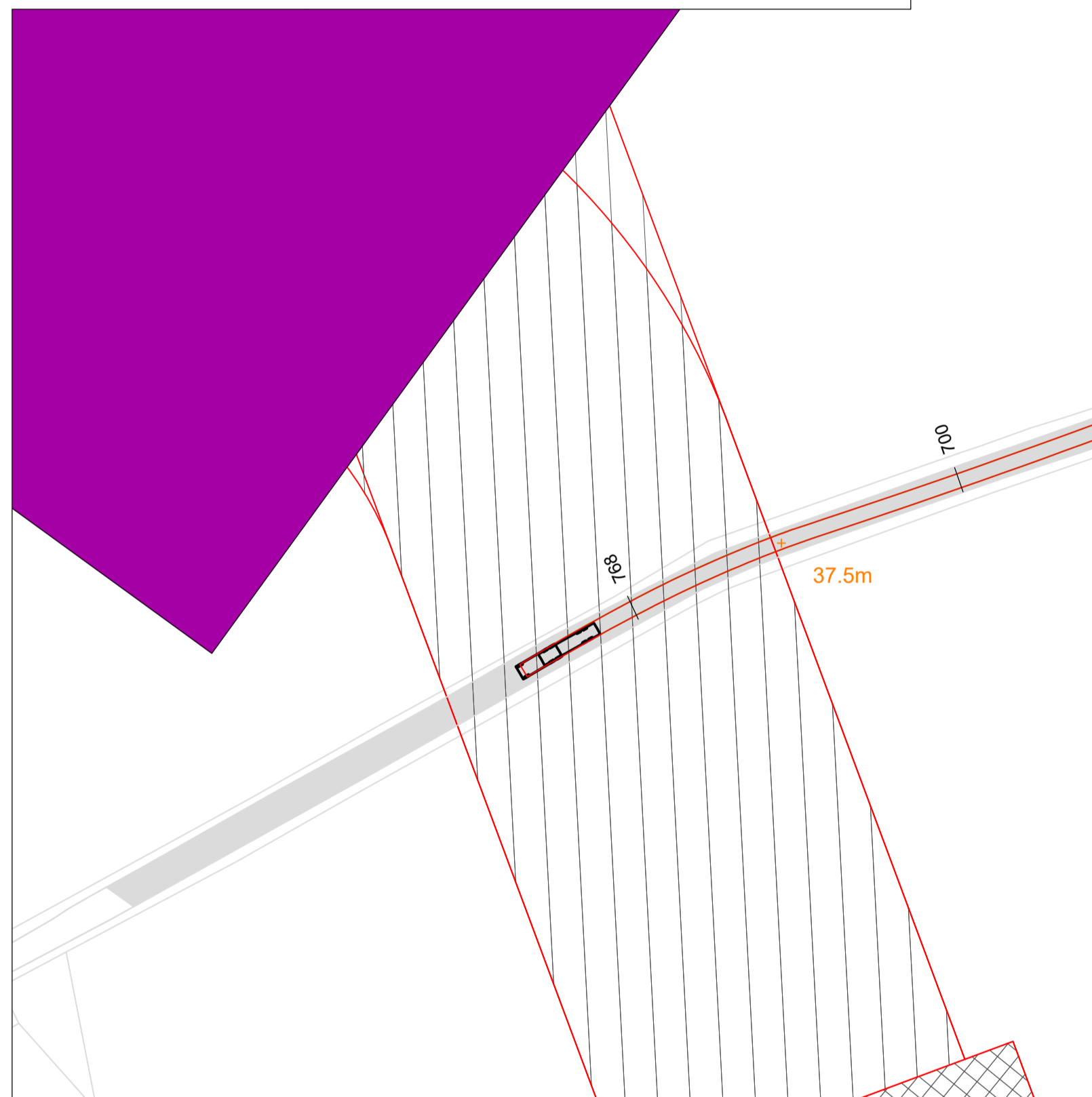
Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

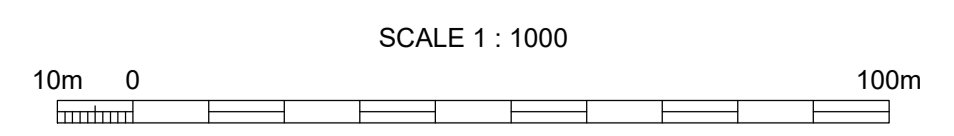
Drawing Title 44 TONNE HGV EXISTING ROAD IMPROVEMENT PLAN SHEET 2				
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1:1,000	CK	CK	DS	SDB
Original Size	Date	Date	Date	Date
A1	22.05.20	22.05.20	26.05.20	04.09.20
Drawing Number	Revision			
62501721-DRG-113				2



KEY PLAN
SCALE 1:20,000



Truck Tractor + Trailer	
Overall Length	17.395m
Overall Width	2.830m
Overall Body Height	3.810m
Min Body Ground Clearance	0.475m
Max Track Width	2.830m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.000m



IMPROVEMENT PLAN
SCALE 1:10,000

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- AREA OF VEHICLE OVERSAIL

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Client

Drawing Status
FOR COMMENT

Project Title
SEAGREEN CHARLIE SUBSTATION ACCESS

Drawing Title
44 TONNE HGV EXISTING ROAD IMPROVEMENT PLAN SHEET 3

Scale	1:1,000	Designed	CK	Drawn	CK	Checked	DS	Approved	SDB	
Original Size	A1	Date	22.05.20	Date	22.05.20	Date	26.05.20	Date	04.09.20	
Drawing Number	62501721-DRG-114								Revision	2

Appendix C – Route Walkover Photographs

Substation Location 3



Photo 1 - Manhole on A1 capacity to be checked



Photo 2 – Bollard/signpost to be removed



Photo 3 – Stonewall to be removed prior to delivery



Photo 4 – Railway bridge for structural assesment



Photo 5 – Railway bridge parapet to be removed



Photo 6 – Armco Barrier to be removed



Photo 7 – Old signpost to be removed



Photo 8 – Bus stop/signpost/stone wall to be removed



Photo 9 – View down toward railway bridge/ x-road location. Note steep embankment on RHS and mature trees LHS.



Photo 10 – Proposed relocation of x-road upslope of mature trees.

Substation Location 8 & 9



Photo 1 – Barrier to be removed at A1 Junction



Photo 2 – Signpost to be removed/central reservation overrun area



Photo 3 – Central island/road sign to be removed.



Photo 4 – Area of overrun to be built up



Photo 5 – Another view over overrun area



Photo 6 – Manhole/drain cover to be inspected for load capacity



Photo 7 – View up access route after left turn



Photo 8 – Bend at Chainage 400 Drawing 102



Photo 9 – Fenceline/Foliage to be removed



Photo 10 – Overhead lines chainage 700 Drawing 103



Photo 11 – Fenceline to be removed



Photo 12 – Approaching overrun area



Photo 13 – Overgrowth at culvert outlet



Photo 14 – manhole cover to be checked for loading capacity



Photo 15 – Foliage/fenceline to be removed to accommodate overswing



Photo 16 – Overhead lines at junction to New track

HGV - Cable Road Crossing 1



Photo 1 – Railway bridge to be structurally assessed for HGV



Photo 2 – Approach to Railway bridge (looking from bridge)

HGV - Cable Road Crossing 2



Photo 1 – Water crossing to be structurally assessed for HGV



Photo 2 – Stone wall to be removed for vehicle over-run



Photo 3 – Railway bridge crossing



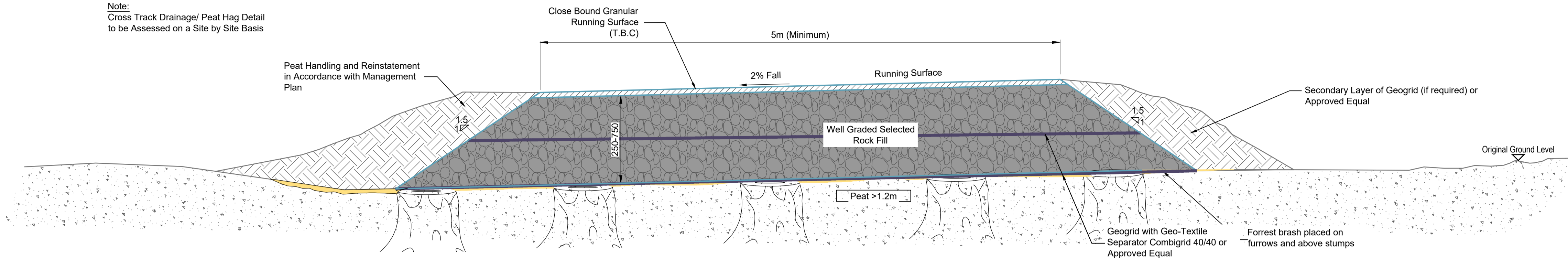
Photo 4 – Railway bridge crossing (looking back through towards stone wall)

Appendix D – Permanent Road Access Proposal

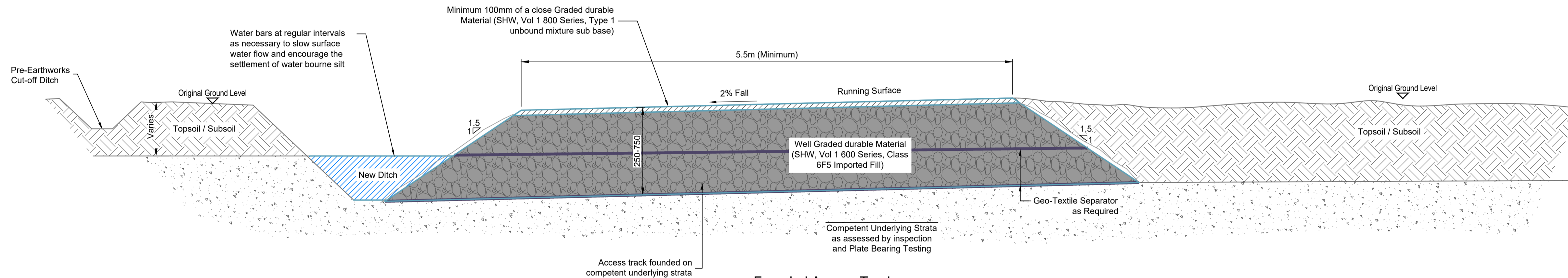
NOTES

1. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS IN METRES AOD UNLESS SHOWN OTHERWISE.
2. ACCESS TRACK FORMATION TO BE CONTINUALLY ASSESSED DURING CONSTRUCTION BY A COMPETENT ENGINEER.
3. ALL SOFT SPOTS TO BE DUG OUT AND BACK FILLED WITH SELECTED SITE WON CRUSHED ROCK FILL OR SUITABLE ALTERNATIVE TO THE SATISFACTION OF A COMPETENT ENGINEER.
4. REINFORCED GRANULAR ACCESS TRACK CONSTRUCTION MAKE-UPS TO BE DETERMINED BY RJ MCLEODS APPOINTED GEO-GRID SUPPLIER.
5. FINAL DESIGN TO BE BASED UPON EMPLOYERS REQUIREMENTS AND SPECIFICATION.
6. CONTRACTOR TO CONTINUALLY MONITOR/ MAINTAIN ACCESS TRACK DURING CONSTRUCTION.
7. FLOATING ACCESS TRACKS TO BE RESTRICTED TO AREAS WHERE CROSSING SLOPES ARE LESS THAN 5%.
8. ALL ACCESS TRACK MATERIALS SHALL BE TESTED, LAID AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATION FOR HIGHWAYS WORKS.

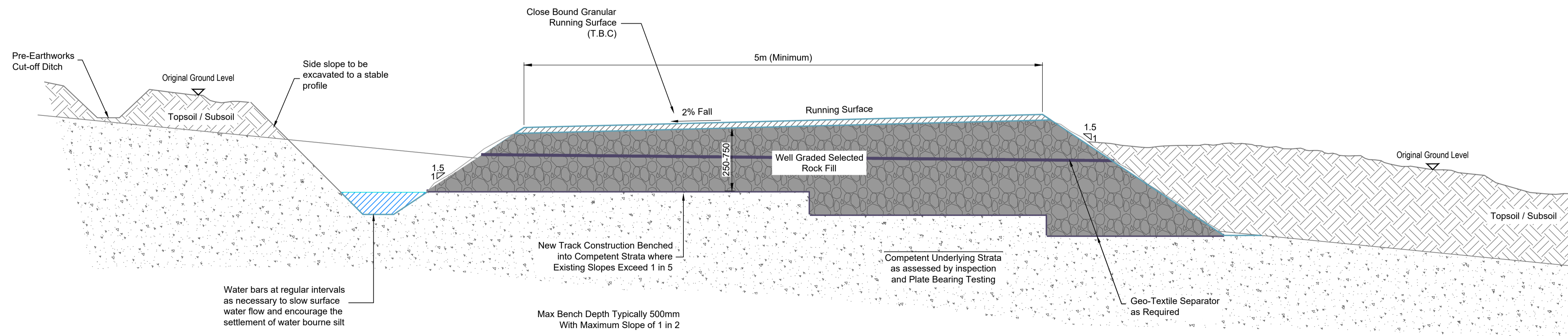
Note:
Cross Track Drainage/ Peat Hag Detail
to be Assessed on a Site by Site Basis



Floating Access Track
(Level or Gently Sloping Topography - See Note 7)



Founded Access Track
(Level or Gently Sloping Topography)



Founded Access Track - Track Construction benched
(On Sloping Topography)

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1	04/09/20	FIRST ISSUE	CB	AM	SDB
Rev.	Date	Amendment Details	Drawn	Chk'd	App'd

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Drawing Status

FOR COMMENT

Project Title

SEAGREEN CHARLIE SUBSTATION ACCESS

Drawing Title

TYPICAL ACCESS TRACK CONSTRUCTION DETAILS

Scale	1:25	Designed	AM	Drawn	CB	Checked	AM	Approved	SDB	
Original Size	A1	Date	04.09.20	Date	04.09.20	Date	04.09.20	Date	04.09.20	
Drawing Number	62501721-DRG-200								Revision	2

Appendix E – Permanent Access Road Cost Estimate

Substation 3 - Lower Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Manhole cover	75	107	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	107	42 per post	1 posts	£42	Estimated from Estimators Pocket Book Second Edition
Dismantle wall and reinstate	350-375	107	420 £/m	25 m	£10,500	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	375	102	42 per post	1 posts	£42	Estimated from Estimators Pocket Book Second Edition
Dismantle railway bridge parapet and reinstate	400-415	102	420 £/m	14.5 m	£6,090	Assumes this is viable without strengthening of bridge deck and based on same price as dismantling wall from Estimators pocket book.
Remove Armco barrier and reinstate	375	102	42 £/m	15 m	£630	Estimated from Estimators Pocket Book Second Edition
Manhole cover	450	107	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Remove sign post	450	107	42 per post	1 posts	£42	Estimated from Estimators Pocket Book Second Edition
Move bus stop	450	107	168 per stop	1 stop	£168	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	450-477	107	152 £/m2	429 m2	£65,208	Estimated from SPONS Civil Engineering and Highway Works Price Book
Fence line to be removed	450	107	110 £/m	10 m	£1,100	Estimated from Estimators Pocket Book Second Edition
Fence line to be removed	477	107	110 £/m	10 m	£1,100	Estimated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-2145	107-110	195 £/m	2145 m	£418,275	Estimated from discussions with contractor
					£506,243	

Substation 8 - Lower Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Remove and replace A1 central reservation barrier	50-75	102	210 £/m	25 m	£5,250	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	102	42 per post	2 posts	£84	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	100	102	152 £/m2	33 m2	£5,016	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	125	102	152 £/m2	34 m2	£5,168	Estimated from SPONS Civil Engineering and Highway Works Price Book
Remove sign post and reinstate	125	102	42 per post	1 posts	£42	Estimated from Estimators Pocket Book Second Edition
Manhole cover	175	102	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	150-250	102	152 £/m2	230 m2	£34,960	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	425-500	102	152 £/m2	90 m2	£13,680	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	750	103	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	750-800	103	210 £/m	50 m	£10,500	Calculated from Estimators Pocket Book Second Edition
Temporary granular surface	850-950	103	152 £/m2	65 m2	£9,880	Estimated from SPONS Civil Engineering and Highway Works Price Book
Culvert crossing	1040	103	3046 £/culvert	1 Culvert	£3,046	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	1075	102	152 £/m2	12 m2	£1,824	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	1175-1225	102	152 £/m2	31 m2	£4,712	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	1200	103	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	1225-1275	103	210 £/m	50 m	£10,500	Calculated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-384	105	195 £/m	384 m	£74,880	Estimated from discussions with contractor
					£184,111	

Substation 9 - Lower Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Remove and replace A1 central reservation barrier	50-75	102	210 £/m	25 m	£5,250	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	102	42 per post	2 posts	£84	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	100	102	152 £/m2	33 m2	£5,016	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	125	102	152 £/m2	34 m2	£5,168	Estimated from SPONS Civil Engineering and Highway Works Price Book
Remove sign post and reinstate	125	102	42 per post	1 posts	£42	Estimated from Estimators Pocket Book Second Edition
Manhole cover	175	102	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	150-250	102	152 £/m2	230 m2	£34,960	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	425-500	102	152 £/m2	90 m2	£13,680	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	750	103	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	750-800	103	210 £/m	50 m	£10,500	Calculated from Estimators Pocket Book Second Edition
Temporary granular surface	850-950	103	152 £/m2	65 m2	£9,880	Estimated from SPONS Civil Engineering and Highway Works Price Book
Culvert crossing	1040	103	3046 £/culvert	1 Culvert	£3,046	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	1075	102	152 £/m2	12 m2	£1,824	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	1175-1225	102	152 £/m2	31 m2	£4,712	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	1200	103	1523 per cover	1 cover	£1,523	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	1225-1275	103	210 £/m	50 m	£10,500	Calculated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-597	106	195 £/m	597 m	£116,415	Estimated from discussions with contractor
					£225,646	

Substation 3 - Upper Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Manhole cover	75	107	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	107	59 per post	1 posts	£59	Estimated from Estimators Pocket Book Second Edition
Dismantle wall and reinstate	350-375	107	588 £/m	25 m	£14,700	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	375	102	59 per post	1 posts	£59	Estimated from Estimators Pocket Book Second Edition
Dismantle railway bridge parapet and reinstate	400-415	102	588 £/m	14.5 m	£8,526	Assumes this is viable without strengthening of bridge deck and based on same price as dismantling wall from Estimators pocket book.
Remove Armco barrier and reinstate	375	102	59 £/m	15 m	£885	Estimated from Estimators Pocket Book Second Edition
Manhole cover	450	107	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Remove sign post	450	107	59 per post	1 posts	£59	Estimated from Estimators Pocket Book Second Edition
Move bus stop	450	107	235 per stop	1 stop	£235	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	450-477	107	213 £/m2	429 m2	£91,377	Estimated from SPONS Civil Engineering and Highway Works Price Book
Fence line to be removed	450	107	154 £/m	10 m	£1,540	Estimated from Estimators Pocket Book Second Edition
Fence line to be removed	477	107	154 £/m	10 m	£1,540	Estimated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-2145	107-110	328 £/m	2145 m	£703,560	Estimated from discussions with contractor
					£826,806	

Substation 8 - Upper Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Remove and replace A1 central reservation barrier	50-75	102	294 £/m	25 m	£7,350	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	102	59 per post	2 posts	£118	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	100	102	213 £/m2	33 m2	£7,029	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	125	102	213 £/m2	34 m2	£7,242	Estimated from SPONS Civil Engineering and Highway Works Price Book
Remove sign post and reinstate	125	102	59 per post	1 posts	£59	Estimated from Estimators Pocket Book Second Edition
Manhole cover	175	102	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	150-250	102	213 £/m2	230 m2	£48,990	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	425-500	102	213 £/m2	90 m2	£19,170	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	750	103	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	750-800	103	294 £/m	50 m	£14,700	Calculated from Estimators Pocket Book Second Edition
Temporary granular surface	850-950	103	213 £/m2	65 m2	£13,845	Estimated from SPONS Civil Engineering and Highway Works Price Book
Culvert crossing	1040	103	4265 £/culvert	1 Culvert	£4,265	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	1075	102	213 £/m2	12 m2	£2,556	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	1175-1225	102	213 £/m2	31 m2	£6,603	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	1200	103	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	1225-1275	103	294 £/m	50 m	£14,700	Calculated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-384	105	328 £/m	384 m	£125,952	Estimated from discussions with contractor
					£278,978	

Substation 9 - Upper Estimate						
Item	Chainage	Drawing Reference	Cost per Unit	Units Required	Cost	Notes
Remove and replace A1 central reservation barrier	50-75	102	294 £/m	25 m	£7,350	Estimated from Estimators Pocket Book Second Edition
Remove sign post and reinstate	100	102	59 per post	2 posts	£118	Estimated from Estimators Pocket Book Second Edition
Temporary granular surface	100	102	213 £/m2	33 m2	£7,029	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	125	102	213 £/m2	34 m2	£7,242	Estimated from SPONS Civil Engineering and Highway Works Price Book
Remove sign post and reinstate	125	102	59 per post	1 posts	£59	Estimated from Estimators Pocket Book Second Edition
Manhole cover	175	102	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	150-250	102	213 £/m2	230 m2	£48,990	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	425-500	102	213 £/m2	90 m2	£19,170	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	750	103	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	750-800	103	294 £/m	50 m	£14,700	Calculated from Estimators Pocket Book Second Edition
Temporary granular surface	850-950	103	213 £/m2	65 m2	£13,845	Estimated from SPONS Civil Engineering and Highway Works Price Book
Culvert crossing	1040	103	4265 £/culvert	1 Culvert	£4,265	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Temporary granular surface	1075	102	213 £/m2	12 m2	£2,556	Estimated from SPONS Civil Engineering and Highway Works Price Book
Temporary granular surface	1175-1225	102	213 £/m2	31 m2	£6,603	Estimated from SPONS Civil Engineering and Highway Works Price Book
Manhole cover	1200	103	2133 per cover	1 cover	£2,133	Estimated from Lakeland Steel and Estimators Pocket Book Second Edition
Fence line to be removed and reinstated	1225-1275	103	294 £/m	50 m	£14,700	Calculated from Estimators Pocket Book Second Edition
Permanent access road including passing places	0-597	106	328 £/m	597 m	£195,816	Estimated from discussions with contractor
					£348,842	