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Appendix A5.1: Construction Information

1 Introduction

1.1.1 This appendix provides an overview of a potential construction scenario for the construction of the proposed scheme. This information was prepared based on the DMRB Stage 3 design to provide a set of assumptions for the purposes of assessing potential construction impacts as reported in the ES.

1.1.2 It should be noted that the detailed design of the proposed scheme, and the construction programme and methodology, will be determined by the appointed design & build (D&B) Contractor, within the constraints of the contract and the requirements of the ES (i.e. to achieve the stated residual impacts).

1.1.3 Information is set out under the following headings:

- General Site Operations;
- Construction Programme and Phasing;
- Typical Construction Methods;
- Land Requirements; and
- Public Access, Site Access, and Traffic Management.

1.1.4 Plant likely to be involved in the construction of the proposed scheme are typical for infrastructure projects of this type, and are likely to include:

- excavators;
- piling rigs;
- tracked vehicles, bulldozers and dump trucks;
- HGVs and concrete wagons;
- hand-operated machinery including compacting plant;
- portable generators for temporary lighting, pumps and similar;
- cranes and other lifting equipment; and
- motorised graders and pavement (road surface) rollers.

2 General Site Operations

Safety and Security

2.1.1 Throughout the course of the works the Contractor will manage the Health and Safety of the site in accordance with the requirements and principles of all current applicable Health and Safety legislation, including the Construction (Design and Management) Regulations 2015, the Health and Safety at Work etc. Act 1974, the Management of Health and Safety at Work Regulations 1999, and the Workplace (Health, Safety and Welfare) Regulations 1992, and will ensure the safety of the public, site personnel, site operators, and visitors.

Working Hours

2.1.2 Anticipated 'typical' working hours of the contractor will be agreed with Transport Scotland and the Perth & Kinross Council Environmental Health Officer (EHO), but for the purposes of assessment are assumed to be as set out below:

- 07:30 to 18:00 on weekdays (Monday to Friday);
- 08:00 to 13:00 on Saturdays; and
- no Sunday working.

2.1.3 The above range applies to summer hours, when it is likely to be necessary to maximise the available good weather conditions for carrying out earthworks activities (as poor weather can adversely affect the condition of the material being used and the condition of haul routes). Winter hours will generally be shorter, due to the seasonal restriction on activities that can be carried out efficiently and the length of daylight available.

2.1.4 It is anticipated that some work will be required outside the normal working hours for exceptional activities (such as those that can only take place when traffic flows are low), subject to agreement with Transport Scotland and Perth & Kinross Council. These include:

- weekend work to complete critical phases of road construction and surfacing;
- overnight closures for placing of bridge beams over existing carriageways or railways; and
- overnight work to facilitate temporary traffic management layouts; and
- non-disruptive railway possessions to complete structures.

Site Lighting

2.1.5 Temporary site lighting during construction will generally be required as follows:

- at the Contractor's compounds for security and safe movement of staff during winter mornings and evenings;
- along temporary access roads;
- at locations where there is currently no lighting, but lighting is required as a safety measure under temporary traffic management (e.g. at carriageway crossovers, contraflows etc); and
- for night time activities or winter afternoon activities.

2.1.6 Maintenance of road lighting at locations where the layout of construction areas is to be changed will be provided by mobile lighting towers or by use of columns in temporary locations.

3 Construction Programme and Phasing

Construction Programme

3.1.1 Construction of the proposed scheme is anticipated to commence in 1 August 2020 at the earliest with the works expected to take approximately 2.5 to 3 years.

3.1.2 The indicative construction programme is broken down into three phases to reduce the impact on road users and neighbouring communities. The anticipated phasing of the construction works is as follows:

- Phase 1 – A9 Southern Tie-in Interim Roundabout and Compensatory Flood Storage Areas;
- Phase 2 – Offline construction of the proposed southbound carriageway, Dunkeld – Rotmell (C502) Road Junction and Guay South Overbridge; and
- Phase 3 – Construction of the proposed online northbound carriageway, remaining sections of southbound mainline, final tie-ins and central reserve.

4 DMRB Stage 3 Engineering Drawings

4.1.1 DMRB Stage 3 engineering drawings showing plan (horizontal) and profile (vertical) alignment of the proposed scheme are contained in Annex A. These show the proposed scheme main alignment and side roads, earthwork slopes, structures and infrastructure features in plan and profile format.

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5 Typical Construction Methods

Establishment of Construction Compounds

5.1.1 Preliminary activities include the setting up of the site compounds and offices. This also includes cabins, stores, welfare facilities and car parking. The Contractor will determine the location of the main site compounds and seek all necessary approvals for its design and construction. Due to the length of the proposed scheme and proposed structures to be constructed, other smaller offices including welfare facilities and compounds are likely to be established along the route.

5.1.2 Preparatory works for the temporary site establishments will involve some site clearance work, minor earthworks operations to level the site, drainage and pavement works for the car park and services installation (e.g. electrical, communications, water and sewerage). The site compounds will be erected, maintained and subsequently removed in a manner that will aim to avoid or reduce impacts on the locality.

5.1.3 The initial actions will involve the construction of site access and egress points. Wherever practicable, haul routes will also be established to ensure that construction traffic is contained within the confines of the Compulsory Purchase Order (CPO), as far as possible. However, since the route intersects main roads, local roads and other obstructions, the limited use of other public roads is likely to be required and approval for this will be sought by the Contractor with the relevant authorities.

Temporary and Permanent Fencing

5.1.4 The land area to be occupied by the construction works will be identified accurately on the ground, by surveying and installing appropriate pegs and posts, prior to the works commencing. The area defined will be the land acquired for the permanent works and any other areas that the Contractor has acquired by agreement to facilitate construction of the works.

5.1.5 Any permanent fencing required to denote the permanent highway boundary will generally be a timber post and wire fence. There may however be sections of fencing designed to a higher specification for the exclusion of otters (see paragraph below) and other wildlife where required.

5.1.6 Where required, temporary fencing will be erected where it is not possible to install the permanent fence (e.g. areas where there is the potential for land to be returned to agriculture following completion of the works).

5.1.7 Other specific fencing that may be required temporarily will include higher security fences at compounds or where additional security of the works is required. Environmental fencing (e.g. otter fencing) extends below ground level and therefore requires an element of excavation which will be undertaken using a small excavator or by hand digging.

Site Clearance and Demolition

5.1.8 Site clearance and demolition works typically include the following:

- general clearance;
- demolition of buildings, walls and bridges;
- removal of pipelines, public and privately owned services or supplies; and
- tree felling and removal of stumps, removal of fencing, hedges, bushes and undergrowth.

5.1.9 Any material to be reused in the permanent works will be stockpiled or taken to store. Surplus and unsuitable materials arising from the site clearance operations will be recycled, or, if they cannot be recycled, disposed of at an appropriate, approved disposal facility in the area. Burning of materials on site will not be permitted, except when specifically required for which approvals will be required.

5.1.10 Materials for off-site recycling or disposal will be transported in appropriate wagons along prescribed main road routes, which are likely to include the A9, A90 and M90. Prescribed routes will be included in the main construction contract documents. The Contractor will be required to seek approval from the relevant authority should they wish to use any other routes.

5.1.11 The Contractor will be responsible for the timing of demolition and site clearance activities and will be required to take account of seasonal restrictions, such as bird breeding seasons and relocation of any species in the works programme. The detailed timetable for ecological constraints will comply with any requirements of the ES and the Report to Inform an Appropriate Assessment for the River Tay SAC.

Contaminated Materials

5.1.12 The treatment of any hazardous materials encountered in site clearance will comply with specific contract requirements and will require an assessment in accordance with current health and safety regulations including the Control of Substances Hazardous to Health Regulations (COSHH) Regulations. Contaminated materials may have to be disposed of at an appropriately licensed waste management facility.

Temporary Construction Drainage/SuDS

5.1.13 Temporary drainage measures, including temporary Sustainable Drainage Systems (SuDS), will be employed to control, treat and dispose of surface water runoff during construction works. The development of the construction drainage strategy will be the responsibility of the appointed Contractor; however, the typical drainage methods are discussed below. It is intended that the temporary construction SuDS will be separate from the proposed operational SuDS to reflect natural drainage patterns at the outset of construction and the likely requirement to treat significantly higher volumes of suspended sediment.

5.1.14 Clean or greenfield surface water runoff that has not passed over disturbed construction ground will be separated from construction drainage through the installation of upslope pre-earthwork drains. Temporary interception ditches will convey the potentially contaminated runoff from the construction area to the natural catchment low points. Treatment will be provided by silt traps during conveyance, and settlement ponds or soakaways prior to discharge.

5.1.15 Unlike operational pre-earthwork drains and SuDS, temporary pre-earthwork drains and construction SuDS will not discharge directly to watercourses as a vegetated filter strip (10m where practicable) would be provided between the outfall and any watercourse. This is intended to provide a final level treatment to remove any remaining suspended sediment prior to discharge. Erosion within cut-off and interception ditches will be avoided by minimising the gradient of these ditches, installing regular check dams/silt traps, and using geotextile membrane liners.

5.1.16 Temporary SuDS measures, as described above, will be constructed prior to any significant site stripping activities. Construction of the temporary SuDS will involve earthworks operations including excavation, placement of fill and compaction. Temporary SuDS measures will likely have to be modified and adapted as the work progresses, with drainage patterns likely to be altered by earthworks and operational SuDS becoming available. Maintenance of temporary SuDS will be required to remove accumulated sediment and ensure that they operate as intended.

5.1.17 The land that may be required for temporary construction SuDS has been assessed by reviewing indicative drainage catchments areas, estimating attenuation and treatment volume requirements and providing potential drainage solutions on a catchment-by-catchment basis. The land requirements for construction SuDS have been included within the CPO for the proposed scheme.

Service Diversions

5.1.18 It is possible that some service diversions will be undertaken in advance of the main construction works. However, other diversions are only likely to be possible once construction has reached a certain stage.

5.1.19 Existing services may require temporary diversions as a result of disruption to apparatus during the construction of the works. These temporary diversions will be in place to minimise any disruption to the services being affected by the proposed scheme.

5.1.20 Services are either located above or below ground. For works above ground, posts, towers or pylons will have to be delivered to the site and constructed. This will involve transport of materials and some excavation and concrete works for foundations or footings.

Topsoil Stripping and Storage

5.1.21 Topsoil will be stripped off areas occupied by the proposed roads, cuttings, embankments and associated structures to depths defined for each particular location in phases as required by the Construction Programme. The areas of topsoil strip will be undertaken in phases to limit areas of exposed soil. The topsoil will be removed if surplus to requirements or stockpiled outwith working areas, until such time as it is required for reuse. SuDS measures will be constructed prior to any significant site stripping activities. In addition, measures such as cut-off ditches and silt fencing will be required around stockpiles to prevent erosion and allow conveyance of any contaminated runoff to temporary SuDS ponds.

5.1.22 The plant potentially used for topsoil stripping includes rubber-tyred motorised scrapers, excavators etc, though more controlled procedures may be required in environmentally sensitive zones using smaller plant. Limits will be imposed on the maximum distance from the zone of excavation to the point of deposition of the topsoil to control invasive plant species and ensure that topsoil is reused close to the location it was stripped. During topsoil stripping, turves will be maintained, carefully handled and stored separately from subsoil to allow their utilisation for site restoration.

Pre-Earthworks Drainage

5.1.23 Pre-earthworks drainage generally comprises excavation of unlined ditches, or filter drains constructed at the top of cutting slopes or toe of embankments where required by the design. They are excavated prior to construction of the cutting or the embankment to prevent surface or ground water entering the works. Existing pre-earthworks ditches are known to exist at the top of existing cuttings and these will be cleared of any excess vegetation or other identified blockages as part of the site clearance works to ensure that they prevent run-off entering the construction works below. When placed at the top of cuttings, surface water carried by the pre-earthworks drainage can be transferred directly to watercourses unless the rate of discharge has to be controlled. When placed at the toe of embankments, surface water carried by the pre-earthworks drainage may contain sediment from runoff from the embankments being constructed and will be required to discharge water to temporary settlement ponds or enlarged cut-off ditches prior to it being discharged to a watercourse.

5.1.24 The material arising from the excavation of the pre-earthwork drainage will be transported for reuse within the works or off-site, or ultimately disposal off-site. It should be noted that some ditches will have to be lined depending on the nature of the subsoil to prevent erosion of the ditch. Other options in this instance would include use of filter drains.

Earthworks

5.1.25 The principal earthworks process involves layered excavations of soils in cuttings and transportation of the excavated soil to neighbouring zones where embankments are required. Deposition in the fill areas will be built up by depositing the material and using bulldozers to place it in layers which are then compacted by rollers. This process is repeated until embankments are built to the road formation level.

5.1.26 Generally, it is preferred to achieve a cut/fill balance and have short haul distances to minimise transport of earthworks materials along the site between cuttings where they are excavated and embankments where they are placed. Indicative lorry loads for volumes of cut, fill and import materials are shown in Table 1. This is based on preliminary ground investigations indicating that material is likely to have 90% suitability for reuse.

Table 1: Indicative Lorry Loads – Earthworks

Potential Earthwork Requirements	
Total Acceptable Cut Available (excl. Topsoil) (m^3)	568,000
Total Fill Required (excl. Topsoil) (m^3)	329,000
Potential import (m^3)	0
Potential export(m^3)	302,000
Potential Total Lorry Loads	53,000
Potential length of main earthworks activities (months)	25
Estimated weekly average lorry loads during main earthworks activities	530

5.1.27 The topography of the site and alignment standards to be provided complicate achievement of an earthworks quantities balance and long hauls of material may be required. Excavations in cutting will include the removal of the top layers of material which are likely to be unacceptable for use in the main road embankments. This material will likely be transported to stock piles to be reused as landscaping earthworks mitigation at a later date. The lower layers of the cuttings are likely to comprise material that is more acceptable for use in the main road embankments and this will be transported and compacted as described above.

5.1.28 Some excavations may encounter rock and this is harder to excavate. In some instances, rock may be ripped using a bulldozer with a blade attached to the rear. Another option where ripping of rock material is not feasible includes using a hydraulic breaker (also known as a rock hammer or pecker).

Operational Drainage/SuDS, Service Ducts and Chambers

5.1.29 Construction of carriageway drainage will involve laying filter drains, carrier drains, drainage channels and outfalls to transport surface water runoff from side slopes, carriageways and other paved areas. Drainage products will include pipes, gully pots, cover gratings, graded gravel for pipe bedding, gravel filter material, and other stone pieces for balancing ponds and open channels. Manholes and chambers will be built with in-situ concrete bases, precast concrete ring or brickwork walls and iron cover on precast concrete caps.

5.1.30 Construction of carriageway drainage will involve excavation of the drain, with material being deposited adjacent to the drain in the road verge or transported for reuse or disposal. Gravel bedding and filter material (crushed rock) is delivered to the works from either a local quarry or a source on site if extracted rock quality is suitable. The bedding material is placed at the bottom of the excavated trench and the drainage pipes are placed on top before being covered with the filter material. Some filter drains also have a geotextile surround to prevent sediment ingress into the filter material, and if the drainage pipe crosses the road carriageway, it will have a concrete surround which will be transported to the site and placed around the pipe in the trench.

5.1.31 The construction of SuDS basins will require earthworks in a similar manner to the temporary ponds described previously. An outflow pipe or ditch will transfer runoff from the carriageway drainage network to the permanent ponds, and to the receiving watercourse following treatment/attenuation. If a piped outfall is proposed, a headwall will be required at the point it discharges to the receiving watercourse. Headwalls are likely to be in situ concrete although they may have a stone facing or other finish applied. Headwall construction may require temporary diversion or damming of the watercourse during construction works. There are locations where the area is constrained and provision of a SuDS basin is not possible. In these instances, the carriageway drainage will be diverted into propriety SuDS systems to include vortex separator chambers and may also include geocellular storage.

5.1.32 Service ducts and chambers are constructed in a similar manner as carriageway drainage and catchpits/manholes. However, service chambers may be brick built involving transport of materials and on site manufacture and use of mortar.

Topsoiling and Seeding

5.1.33 Topsoiling and seeding will be undertaken as soon as possible after earthworks construction is completed. This will enable the subsoil to be sealed preventing sediment runoff. As described previously, topsoil will have been stripped and stored adjacent to the works. The topsoil will be transported from the topsoil storage locations to the works and will be placed by a tracked excavator. Grass seeding may be by hand or by machine spreading, undertaken in the relevant areas specified in the landscape design.

Pavement Construction

5.1.1 Pavement construction involves building the pavement up in layers.

5.1.2 The bottom layer (sub-base) is a crushed rock aggregate which will be delivered to the site from local quarries or crushed and graded on site from excavated rock, as described previously. Indicative lorry loads required for pavement construction are shown in Table 2. The material is deposited and then pushed into place and compacted.

5.1.3 The upper pavement layers will be specified in accordance with the requirements of the contract and will involve transport of material to the site either from local sources or from a batching plant on site.

Table 2: Pavement Construction

Parameter	Estimate
Estimated total lorry loads	15,000
Potential length of pavement construction activities (months)	12
Estimated weekly average lorry loads during pavement construction	290

Roadworks Finishes

5.1.4 Following pavement construction, safety barriers will be installed. Posts and barriers are delivered to the site and safety barrier installation then involves driving steel posts into the ground or excavating small footings and placing concrete into which the posts are set. The barriers are bolted to the posts and fixed to small concrete anchorages.

5.1.5 Sign installation will involve excavation for the concrete foundations, and setting the posts. The sign faces are then fixed to the sign posts. Some signs may be lit and will require cabling to be passed through the service ducts installed as described previously.

5.1.6 Variable message signs (VMS) and CCTV camera installation will involve excavation for the concrete foundations and these concrete foundations will extend above ground level in the case of the VMS. The supporting column is then fixed to the concrete foundation and the VMS display box is then attached to the supporting column. The CCTV cameras are typically mounted on a lattice support which is connected to the foundation. Associated cabinets and hard standing areas will be constructed at ground level at each location.

5.1.7 Road markings will be applied to the road surface using specialist lorry-mounted equipment.

Accommodation Works

5.1.8 Accommodation works will include access roads, fences and walls or other ancillary items agreed with landowners. Construction methods will be similar to those described for these items in this outline methodology.

Structures

5.1.9 Typical construction methods for bridges and retaining walls are described below and apply to most bridges and retaining walls to be constructed as part of the proposed scheme.

Retaining Walls

5.1.10 The DMRB Stage 3 design incorporates a number of retaining walls. These retaining walls are required to support soil where differences in ground levels are needed.

5.1.11 Retaining walls may be constructed by excavating to the required level whilst temporarily supporting the material to be retained. The retaining walls may comprise pre-cast or cast in-situ concrete panel walls supporting reinforced earth walls. Alternatively, contiguous piles may be installed to form the retaining wall before excavation to the required level.

5.1.12 There is one retaining wall as part of the proposed scheme that affects the River Tay SAC; River Tay (Dalmarnock) Retaining Wall. The HRA for the proposed scheme therefore provides more detail on the general arrangement and construction methods for this structure which is summarised below.

5.1.13 It is anticipated that River Tay (Dalmarnock) Retaining Wall will be a bored secant pile retaining wall however this is dependent on the results of the detailed GI.

5.1.14 To allow the retaining wall to be built, it is expected that a construction platform will be excavated in the existing carriageway to accommodate the heavy plant required for piling. The level of the platform will be at QMED level with a bund retained between the platform and the river so that there should be no in-watercourse works. Precautionary measures will be in place so that if a flood event occurs, the area can be made safe and any water entering the site will be taken, via the site drainage system, to an appropriate treatment system. Following the insertion of the piles, proposed stone revetment constructed and the ground will be remade up to carriageway level.

Bridges

5.1.15 The exact form and materials used on bridges will be dependent on the detailed design and is specific to individual locations depending on the nature of the bridge, the alignment of road it carries and span lengths.

5.1.16 The road surface on the bridge deck is normally a bituminous bound pavement laid on a waterproofing coat. Bridge deck waterproofing can either be a spray applied or sheet membrane system, and a metal (steel or aluminium) parapet is fixed to each side of the bridge deck.

5.1.17 Typical bridge construction procedures are summarised below.

Bridge Foundations

5.1.18 Foundations are required to support the abutments and piers. Foundations can be either concrete pad or piled with a pile cap.

5.1.19 Pad footings require excavation to a suitable founding soil strata, and then laying a concrete layer reinforced with steel rods/caging. Once abutments or piers have been cast, excavations are backfilled with acceptable material.

5.1.20 Piled foundations require preliminary excavations at foundation locations, and then installing foundation piles to a suitable load bearing soil strata - this can either be by driving precast concrete/steel piles to the required depth with a pile driver, or by using a boring machine to create the void for the pile. Piles are then trimmed to required level and a reinforced concrete pile cap is constructed to provide a base for piers or abutments.

Abutments and Bridge Piers

5.1.21 Abutments support the ends of the bridge deck, whilst piers support the deck on multi span structures. Bridge piers and abutments will be constructed of reinforced concrete, and can be cast in-situ using bespoke formwork. Exposed surfaces are treated and a waterproof membrane applied.

Overbridges

5.1.22 Overbridges accommodate roads which pass above the mainline. These are generally open structures requiring foundation construction; abutment and pier construction; deck construction; and finishes.

Underbridges

5.1.23 Underbridges accommodate watercourses, NMU routes or roads which pass below the mainline. These can be open structures (similar in appearance to overbridges), or underpasses which are more box-shaped. Both underbridges and underpasses require foundation construction; abutment, pier and wall construction; deck construction; and finishes.

5.1.24 Appendix A11.8 (Watercourse Crossings Report), provides more information on the design approach for underbridge structures while Figures A11.8.1-A11.8.26, part of Appendix A11.8 (Volume 2 of the ES), provides general arrangement drawings of each underbridge structure.

Culverts

5.1.25 Culverts accommodate watercourses which pass below the mainline and are generally box-shaped structures. Culverts require foundation construction; placement of pre-cast sections; headwall construction; and finishes.

5.1.26 Appendix A11.8 (Watercourse Crossings Report), provides more information on the design approach for culverts while Figures A11.8.1-A11.8.26, part of Appendix A11.8 (Volume 2 of the ES), provides general arrangement drawings of each underbridge structure.

5.1.27 There is one culvert as part of the proposed scheme that affects the River Tay SAC; Dowally Burn Culvert. The HRA for the proposed scheme therefore provides more detail on the general arrangement and construction methods for this structures which is summarised below.

5.1.28 The existing Dowally Burn Culvert requires to be extended at each end to accommodate the dualling and associated new side and access roads. It is anticipated that the existing twin cell box culvert will be retained, with new precast concrete box culvert units placed to extend the structure. The existing masonry arch part of the structure will be demolished.

5.1.29 To allow the work to be phased and to maintain the flow in the watercourse it is expected that a dry working area will be created over the length of watercourse affected by the works by fluming the flow through this area. The flume can be positioned within one of the culvert cells whilst the other is extended, then switched to the newly extended cell to allow the second cell to be extended. Bed reinstatement and scour protection works would be completed before the water flow is reintroduced to the culvert area. The in-watercourse works will need to be phased to accommodate any working restrictions associated with sensitive ecological receptors.

6 Land Requirements

Land Required During Construction

6.1.1 Land required during construction may be in addition to that required for the permanent footprint of the proposed scheme. The main requirements are described below.

Site Compounds for the Contractor and Others

6.1.2 Where possible these would be located close to the proposed works where there is suitable access. They would be used to accommodate offices for the contractor as well as workshops, stores, welfare facilities, etc. and parking for cars and plant.

Additional Works Areas

6.1.3 Land may be required to allow the contractor to gain safe access to the permanent works. This is usually where access is very restricted or where the works are adjacent to a live carriageway, such as when carrying out online widening works.

Temporary Diversions

6.1.4 In order to maintain traffic flows when undertaking works on the existing highway, such as a new bridge or carriageway tie-ins, the outline constructability review undertaken on the proposed scheme anticipates minor temporary diversions as traffic would be carried on the existing A9 carriageway and it would not require closures during construction, other than for activities such as the installation of beams on new bridges over roads. It is expected that the Dunkeld – Rotmell (C502) Road Junction may be closed for up to 12 weeks during construction to facilitate its construction and associated retaining walls.

Other Works

6.1.5 Other works requiring a licence, off-site planting etc. will require temporary land and will be identified as the detailed design is developed. A review to identify land requirements for the construction has been undertaken to ensure sufficient land is included in the CPO.

Clearance of Site on Completion

6.1.6 Clearance of the site on completion of the works will normally involve small dumpers, excavator/loaders and lorries to gather up and dispose of surplus material and generally tidy up.

Permanent Land

6.1.7 The main requirements for permanent land are as follows:

- land taken by footprint of the proposed scheme, including earthworks (i.e. land required to build embankments or excavate cuttings);
- land to allow adequate drainage of the proposed scheme and the area through which it passes. This includes land required for diversion of watercourses, drainage outfalls and SuDS features, arrangements for maintenance access, and any compensatory storage areas to accommodate potential watercourse flood events;
- land required for other environmental mitigation, such as landscape and ecological planting.

6.1.8 Other land not required for the permanent works may also be permanently acquired by the roads authority due to it becoming unusable or impractical to use as a direct result of the works.

7 Public Access, Site Access and Traffic Management

Access Routes for Construction Traffic

7.1.1 The proposed works are generally located on the main road network, so most construction traffic will be able to use the main highway network without restriction. However, the Contractor will be restricted as to the extent and purpose that the Contractor can use other roads for construction purposes. While it is desirable that all construction related access should be via the A9 it will be necessary to provide some access from the side road network. Routes not available to the Contractor will be as agreed with the relevant authority and stipulated in the contract.

Traffic Management Requirements

Introduction

7.1.2 During construction, temporary traffic management will be required to undertake the works, whilst minimising disruption to users of the active road network.

7.1.3 Temporary traffic management will be put in place during construction at works close to or on existing roads, and at site access and egress points. Examples of measures include traffic cones, temporary signs and lighting, temporary speed restrictions, temporary diversions and contraflows.

Lane Requirements

7.1.4 In general, construction phasing and temporary traffic management proposals have been prepared on the basis of keeping at least one lane in each direction available on the A9 at all times except for very specific short term restrictions. Where considered appropriate, the Contractor will be required to provide a vehicle recovery service to promptly remove any broken down vehicles within the temporary traffic management areas.

7.1.5 For the main routes, it is proposed to keep traffic on the normal carriageways, wherever possible, and if necessary using narrow lanes. It is also proposed to adopt a 40mph temporary speed limit through the main works areas.

7.1.6 It is generally proposed that other routes including slip roads at major junctions be kept open during construction of the proposed works. This will, in some cases require construction of extensive temporary alignments. The proposals in this appendix have been prepared on the basis of keeping all routes and accesses open throughout the works wherever feasible.

Working Restrictions

7.1.7 It is generally proposed that the network connection works be constructed within the typical working hours as set out in Section 1.2, with no requirement or intention for prolonged late night or 24 hour working. The only likely exceptions to this would be for activities such as the installation of beams on new bridges which could only be carried out during an overnight closure of the carriageways being spanned, or for critical tie-in works between existing and new carriageways or construction of structures adjacent to the railway requiring railway possessions to complete structures. Alternative diversion routes will be set up during such night time closures, together with advance warning and publicity to help drivers to avoid these locations/dates if possible.

7.1.8 Road closures and diversions are likely to require a Temporary Traffic Order and be subject to approval by Transport Scotland, Police Scotland, and the Maintaining Authority.

7.1.9 Where night work is required in the vicinity of residential areas, methods of construction should be adopted that keep noise levels to a practicable minimum.

Temporary or Permanent Road Closures or Diversions

7.1.10 Temporary road closures and diversions will be arranged through the relevant traffic authority following discussions with Transport Scotland, Perth & Kinross Council, Police Scotland and the Maintaining Authority. A Temporary Traffic Order giving the requisite notice will be prepared and a statutory notice placed in local newspapers.

7.1.11 Permanent road closures that occur as a consequence of the phasing for the construction of the proposed scheme, supported by the appropriate legal Orders, will be implemented following discussions with relevant parties and agreement of any temporary traffic arrangements.

Temporary Carriageway

7.1.12 Under the traffic management proposals in this appendix, there may be a requirement to construct some sections of temporary carriageway. The need for these will be dependent on the Contractor’s detailed design and his construction and traffic management methodology. Appropriate geometric and pavement construction standards for the design of temporary diversions will be set out in the contract.

Approvals

7.1.13 The Contractor’s detailed proposals for traffic management will only be confirmed after discussions with Transport Scotland, Police Scotland and the Maintaining Agents.

7.1.14 The Contractor will be required to appoint a Traffic Safety Officer who be responsible for submitting traffic management layout drawings, method statements, etc. within the requisite notice period for discussion at regular traffic management meetings. The Traffic Safety Officer will be responsible for ensuring that temporary traffic management operations are monitored and maintained.

Annex A: DMRB Stage 3 Plan and Profile Drawing

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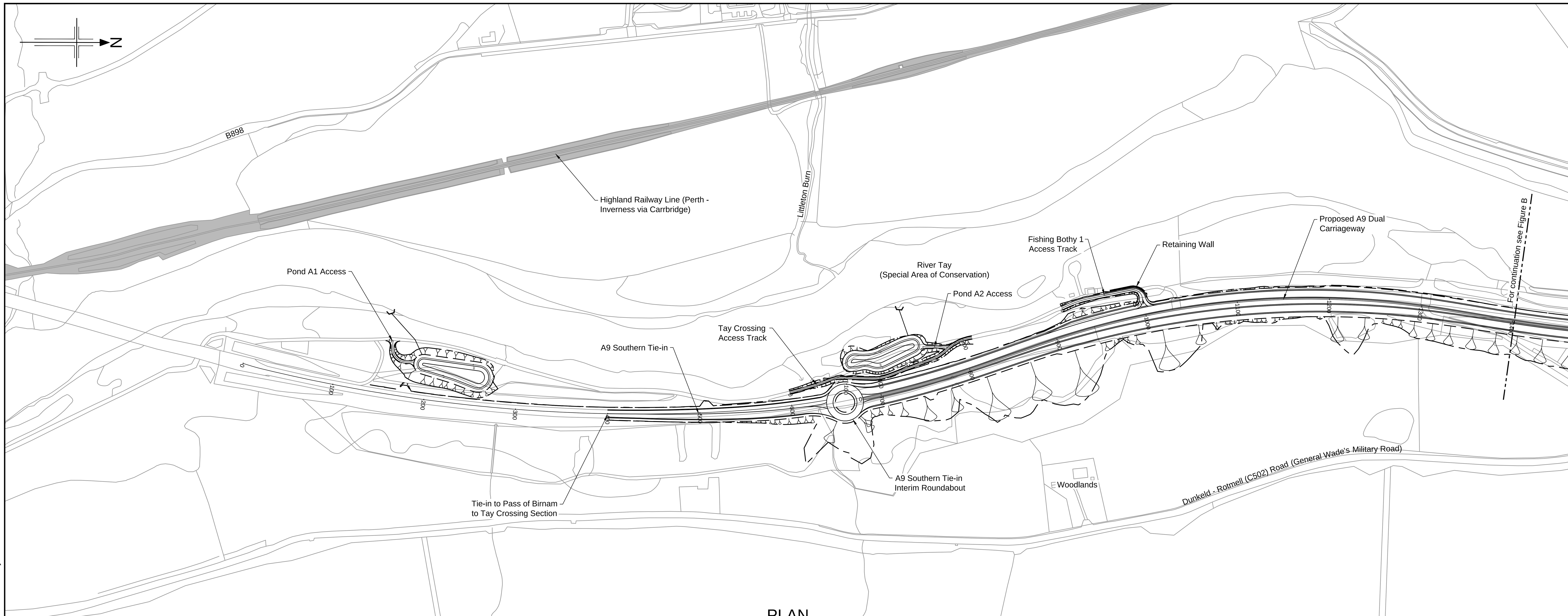
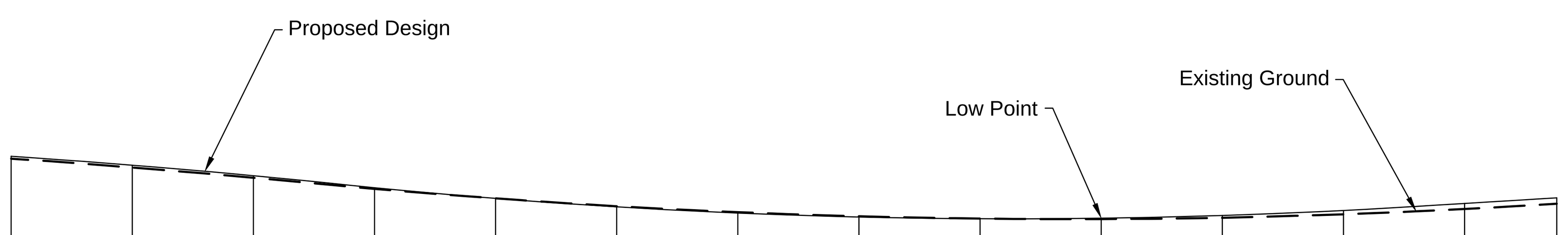


PLAN

Scale 1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



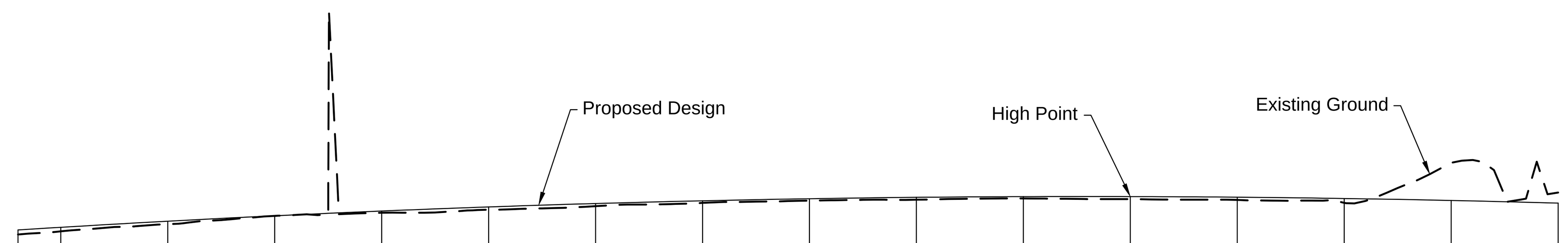
Datum=55.000

Existing	61.863	61.139	60.292	59.373	58.589	57.934	57.447	57.103	56.914	56.875	56.982	57.267	57.710	58.143
Proposed	62.063	61.331	60.461	59.470	58.586	57.887	57.374	57.046	56.903	56.945	57.173	57.586	58.166	58.629
Gradient	-1.300	-1.465	-1.739	-1.983	-1.767	-1.397	-1.027	-0.656	-0.286	0.085	0.455	0.825	1.160	1.217
Chainage	0.000	50.000	100.000	150.000	200.000	250.000	300.000	350.000	400.000	450.000	500.000	550.000	600.000	638.069

Vertical: L=266.699m R=-18200.000m; 134.584; R=13498.458m L=443.312m; 577.895; G=1.217% L=60.174m; 638.069

Horizontal: R=-1735.258m L=554.039m; 541.262; R=-1020.000m L=96.807m; 638.069

A9 Southern Tie-in



Datum=57.000

Existing	58.743	59.037	59.711	60.485	60.776	61.058	61.387	61.695	61.908	61.989	62.108	62.049	61.969	61.695	65.439	62.657
Proposed	59.169	59.414	59.984	60.491	60.935	61.316	61.635	61.890	62.083	62.213	62.280	62.285	62.226	62.105	61.921	61.674
Gradient		1.227	1.139	1.014	0.888	0.762	0.637	0.511	0.386	0.260	0.134	0.009	-0.117	-0.243	-0.368	-0.494
Chainage	680.000	700.000	750.000	800.000	850.000	900.000	950.000	1 000.000	1 050.000	1 100.000	1 150.000	1 200.000	1 250.000	1 300.000	1 350.000	1 400.000

Vertical: 680.000; L=1067.459m R=-39800.000m; 1400.000

Horizontal: 680.000; R=-1020.000m L=254.792m; 785.670; CL=60.461m; 846.131; CL=70.480m; 916.611; L=373.323m R=875.000m; 1289.933; CL=70.480m; 1360.413; CL=47.439; 1400.000

Proposed A9 Dual Carriageway

PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

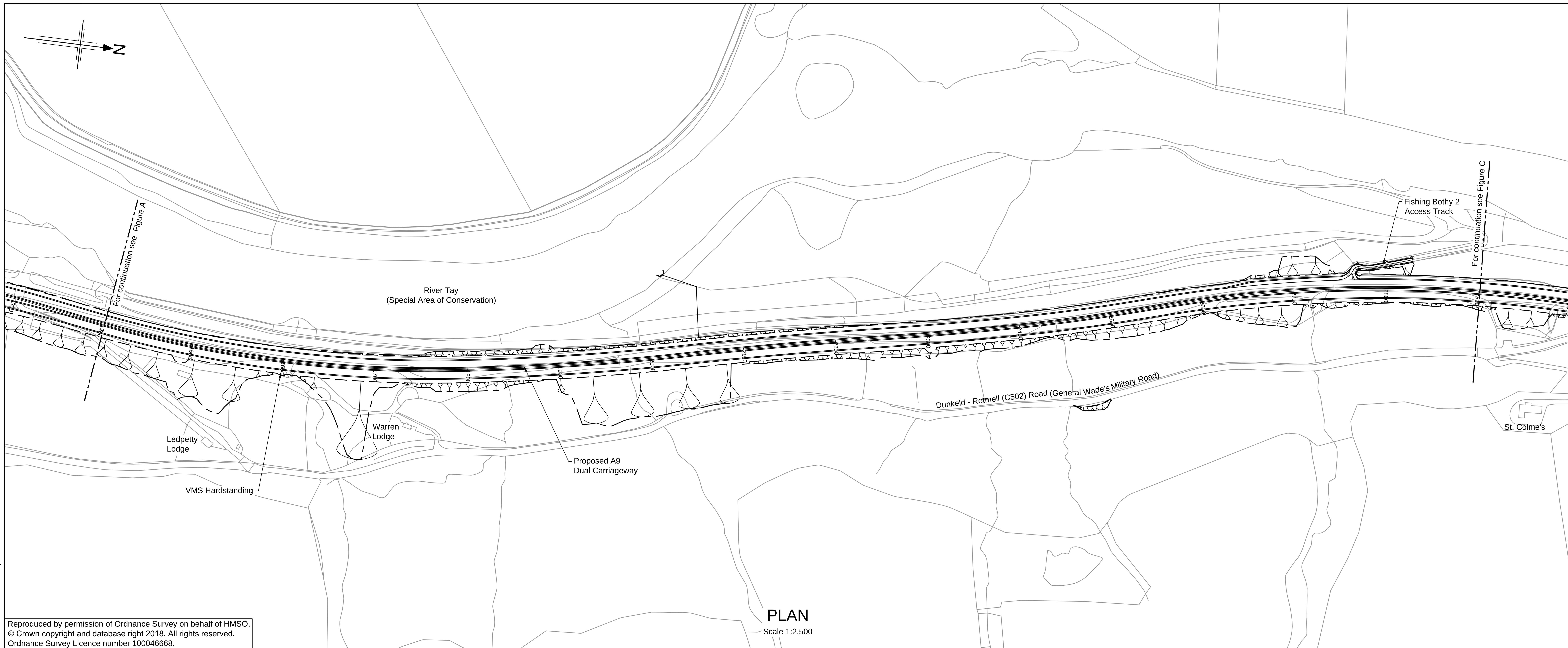
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG PLAN AND PROFILES CH. 0 - CH. 1400 SHEET 1 OF 6

Drawing status

FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE A	Rev P01

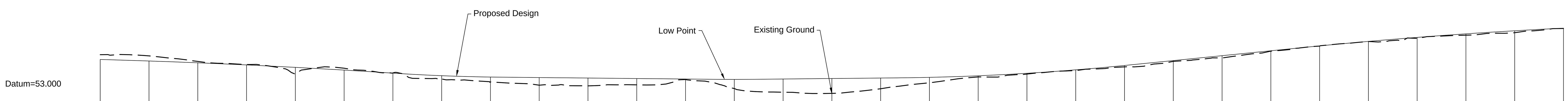
File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGA.dwg Date: Jun 13, 2018 - 10:19am Plotted by: aitkens



PLAN
Scale 1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



Chainage	Existing	Proposed	Gradient
1 400.000	62.657	61.674	-0.544
1 450.000	62.417	61.364	-0.619
1 500.000	61.277	60.992	-0.745
1 550.000	60.630	60.556	-0.871
1 600.000	58.674	60.058	-0.996
1 650.000	59.879	59.497	-1.122
1 700.000	58.912	58.873	-1.247
1 750.000	57.672	58.349	-1.049
1 800.000	57.081	58.075	-0.549
1 850.000	56.406	57.970	-0.210
1 900.000	56.267	57.870	-0.200
1 950.000	56.474	57.770	-0.200
2 000.000	57.566	57.670	-0.200
2 050.000	55.722	57.591	-0.158
2 100.000	54.962	57.672	0.162
2 150.000	54.725	57.772	0.200
2 200.000	55.670	57.872	0.200
2 250.000	56.896	58.012	0.280
2 300.000	58.099	58.332	0.641
2 350.000	58.692	58.845	1.025
2 400.000	59.419	59.550	1.410
2 450.000	60.161	60.447	1.795
2 500.000	61.286	61.451	2.008
2 550.000	61.996	62.456	2.009
2 600.000	63.382	63.460	2.009
2 650.000	64.424	64.459	1.998
2 700.000	65.365	65.382	1.845
2 750.000	66.000	66.206	1.648
2 800.000	66.654	66.932	1.452
2 850.000	67.160	67.560	1.256
2 900.000	68.028	68.090	1.060

Vertical: 1400.000 — L=1067.459m R=-39800.000m — 1699:071 — R=10000.000m L=110.806m — 1809:877 — L=219.596m G=-0.200% — 2029:473 — R=10000.000m L=40.000m — 2069:472 — G=0.200% L=148.242m — 2217:714 — R=13000.000m L=235.190m — 2452:904 — G=2.009% L=180.114m — 2633:018 — L=920.149m R=-25500.000m — 2900.000

Horizontal: 1400.000 — 1407.852 — R=-1300.000m L=365.167m — 1773.020 — CL = 26.026m — 1799.045 — R=-2880.000m L=237.128m — 2036.173 — L=197.990m R=5000.000m — 2234.163 — R=-5000.000m L=149.785m — 2383.949 — CL = 16.894m — 2400.842 — R=-2110.000m L=108.603m — 2509.445 — CL = 29.288m — 2538.673 — CL=42.827m — 2581.500 — L=543.020m R=1440.000m — 2900.000

PROFILE
Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client
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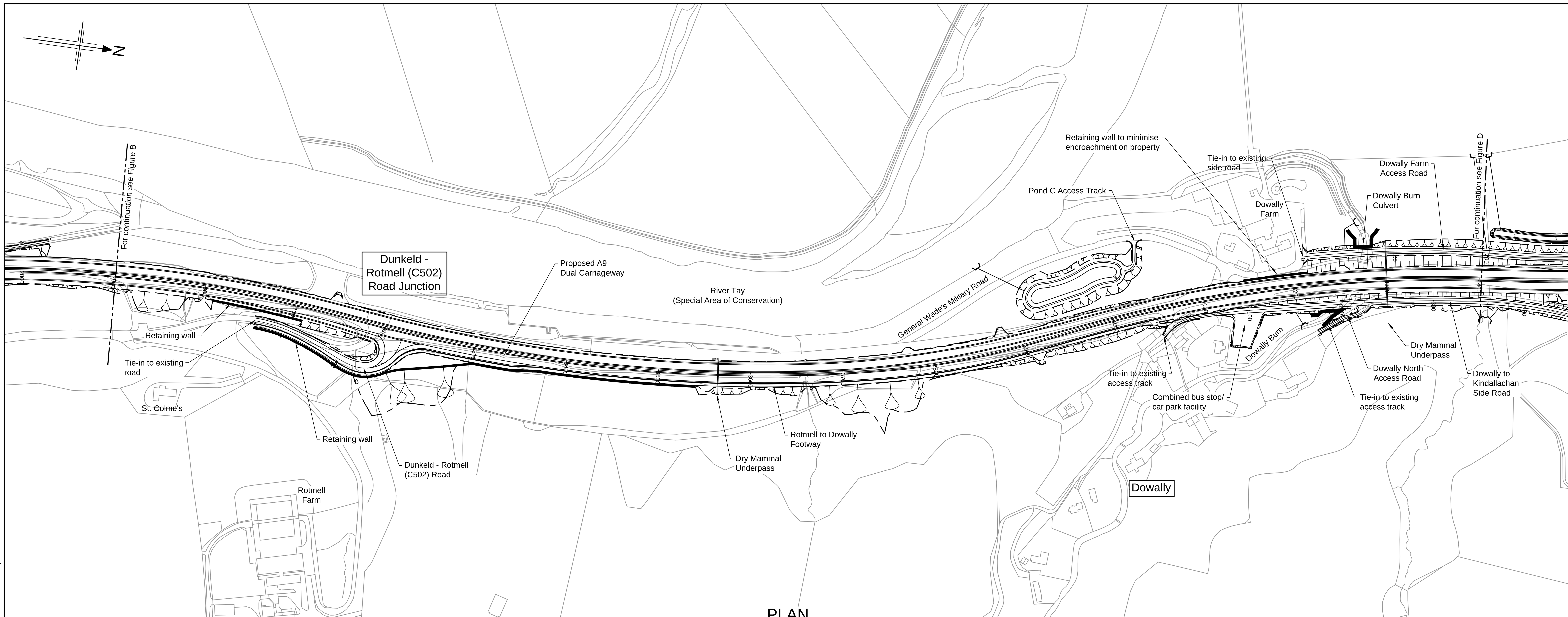
CÒMHDHAIL ALBA

Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG PLAN AND PROFILE CH. 1400 - CH. 2900 SHEET 2 OF 6

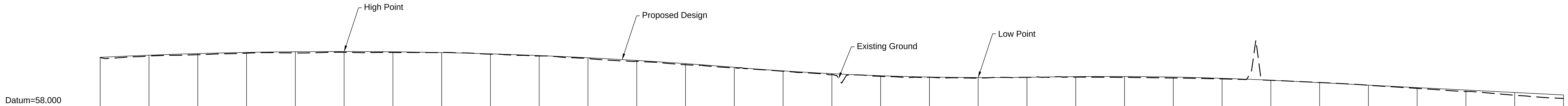
Drawing status
FOR INFORMATION

Scale	AS SHOWN @ A1 — DO NOT SCALE
Jacobs No.	B2140003
Drawing number	FIGURE B
Rev	P01



PLAN

Scale 1:2,500



Chainage	2 900.000	2 950.000	3 000.000	3 050.000	3 100.000	3 150.000	3 200.000	3 250.000	3 300.000	3 350.000	3 400.000	3 450.000	3 500.000	3 550.000	3 600.000	3 650.000
Existing	68.028	68.370	68.624	68.933	68.985	69.112	69.091	69.039	68.730	68.368	67.888	67.293	66.576	65.922	65.255	64.583
Proposed	68.090	68.522	68.856	69.092	69.230	69.270	69.212	69.056	68.802	68.449	67.999	67.451	66.804	66.060	65.329	64.754
Gradient	0.972	0.864	0.668	0.472	0.276	0.080	-0.116	-0.312	-0.508	-0.705	-0.901	-1.097	-1.293	-1.489	-1.462	-1.150

Chainage	3 700.000	3 750.000	3 800.000	3 850.000	3 900.000	3 950.000	4 000.000	4 050.000	4 100.000	4 150.000	4 200.000	4 250.000	4 300.000	4 350.000	4 400.000
Existing	64.190	64.039	63.852	64.001	64.060	64.001	63.879	63.685	63.404	62.957	62.394	61.755	61.130	60.354	59.702
Proposed	64.335	64.072	63.966	64.016	64.157	64.178	64.061	63.807	63.416	62.921	62.420	61.919	61.418	60.917	60.416
Gradient	-0.838	-0.525	-0.213	0.100	0.283	0.041	-0.233	-0.508	-0.783	-0.990	-1.002	-1.002	-1.002	-1.002	-1.002

Vertical

2900.000 – L=920.149m R=-25500.000m – 3553.166 – R=16000.000m L=313.655m – 3866.821 – L=248.059m R=-18200.000m – 4114.880 – L=391.387m G=-1.002% – 4400.000

Horizontal

2900.000 – L=543.020m R=1440.000m – 3124.520 – CL=42.827m – 3167.347 – CL=37.151m – 3204.498 – R=-1660.000m L=522.355m – 3726.853 – CL=45.076m – 3771.929 – R=-750.000m L=85.511m – 3857.440 – CL=82.227m – 3939.667 – CL=44.050m – 3983.717 – L=391.173m R=1400.000m – 4374.890 – CL=44.050m – 4400.000

PROFILE

Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

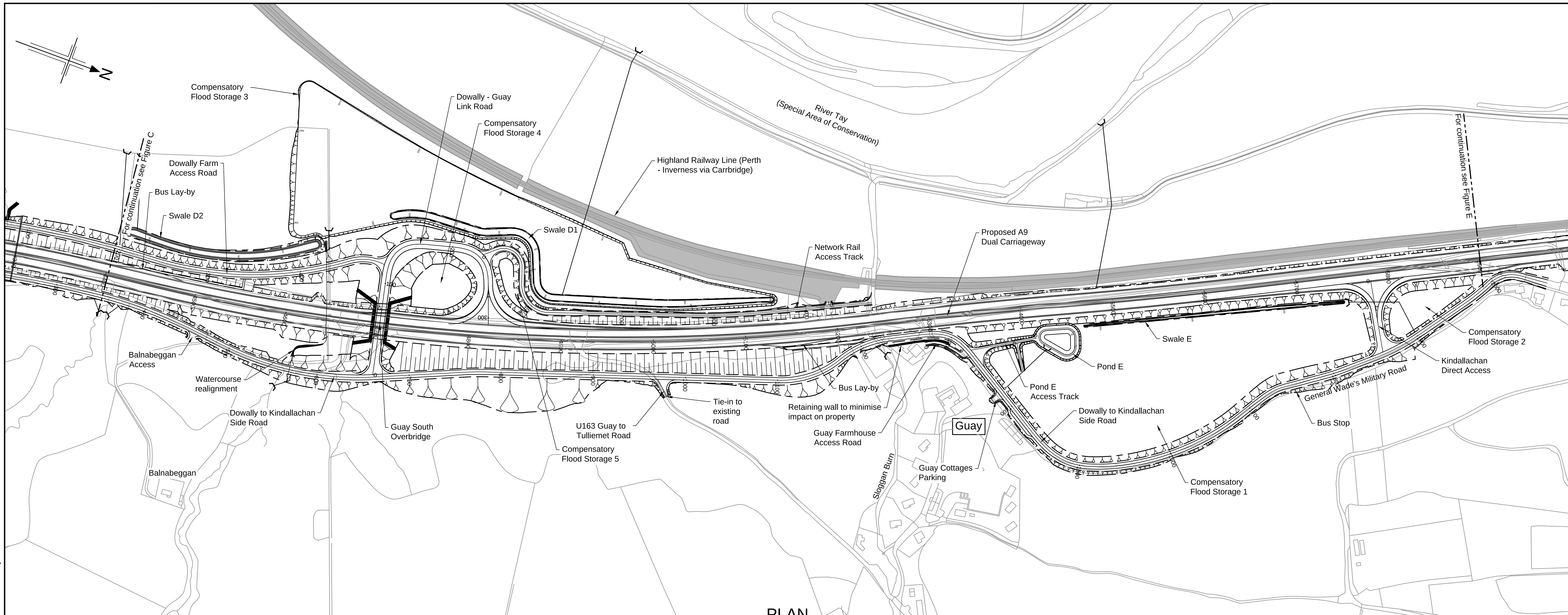
Drawing title

ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG PLAN AND PROFILE CH. 2900 - CH. 4400 SHEET 3 OF 6

Drawing status: FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE C	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGC.dwg Date: Jun 13, 2018 - 10:59am Plotted by: aitkens



PLAN
Scale 1:2,500

Legend:
- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
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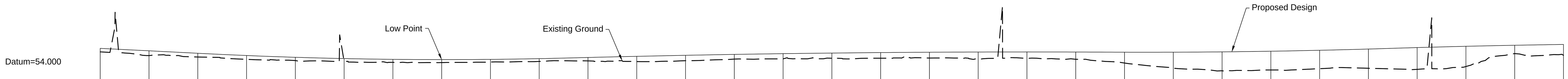

Existing	59.702	58.941	58.647	58.171	57.926	57.740	57.567	57.514	57.629	57.752	57.852	57.718	57.902	58.222	58.274	58.407	58.410	58.439	58.149	58.401	58.183	57.418	56.371	55.845	56.000	56.269	56.354	56.128	56.715	59.348	59.004
Proposed	60.416	59.915	59.414	58.952	58.591	58.333	58.176	58.121	58.168	58.317	58.554	58.791	58.999	59.180	59.333	59.458	59.556	59.626	59.668	59.682	59.668	59.631	59.635	59.702	59.831	60.022	60.276	60.576	60.838	61.049	61.211
Gradient	-1.002	-1.002	-1.002	-0.924	-0.722	-0.518	-0.314	-0.110	0.094	0.298	0.475	0.473	0.417	0.362	0.306	0.251	0.195	0.139	0.084	0.028	-0.027	-0.074	0.008	0.133	0.258	0.383	0.508	0.600	0.523	0.423	0.323
Chainage	4 400.000	4 450.000	4 500.000	4 550.000	4 600.000	4 650.000	4 700.000	4 750.000	4 800.000	4 850.000	4 900.000	4 950.000	5 000.000	5 050.000	5 100.000	5 150.000	5 200.000	5 250.000	5 300.000	5 350.000	5 400.000	5 450.000	5 500.000	5 550.000	5 600.000	5 650.000	5 700.000	5 750.000	5 800.000	5 850.000	5 900.000

Vertical: 4400.000; L=391.387m G=1.002%; 4506.266; R=24523.640m L=368.313m; 4874.580; 4900.567; L=533.962m R=-90000.000m; 5434.529; R=40000.000m L=288.380m; 5722.909; L=604.047m R=-50000.000m; 5900.000

Horizontal: 4400.000; 4418.940 C; 4441.491 C; R=-2160.000m L=765.732m; 5211.224; 5241.775; 5266.443; L=169.691m R=5000.000m; 5436.134; 5460.802; 5485.470; R=-5000.000m L=152.451m; 5637.921; 5662.589; L=265.391m R=41752.470m; 5900.000

G=0.500% L=25.986m; CL=28.551m; CL=24.668m; CL=24.668m; CL=24.668m; CL=24.668m

PROFILE
Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client: TRANSPORT SCOTLAND CÒMHDHAIL ALBA

Project: A9 DUALLING PERTH TO INVERNESS Tay Crossing to Ballinluig

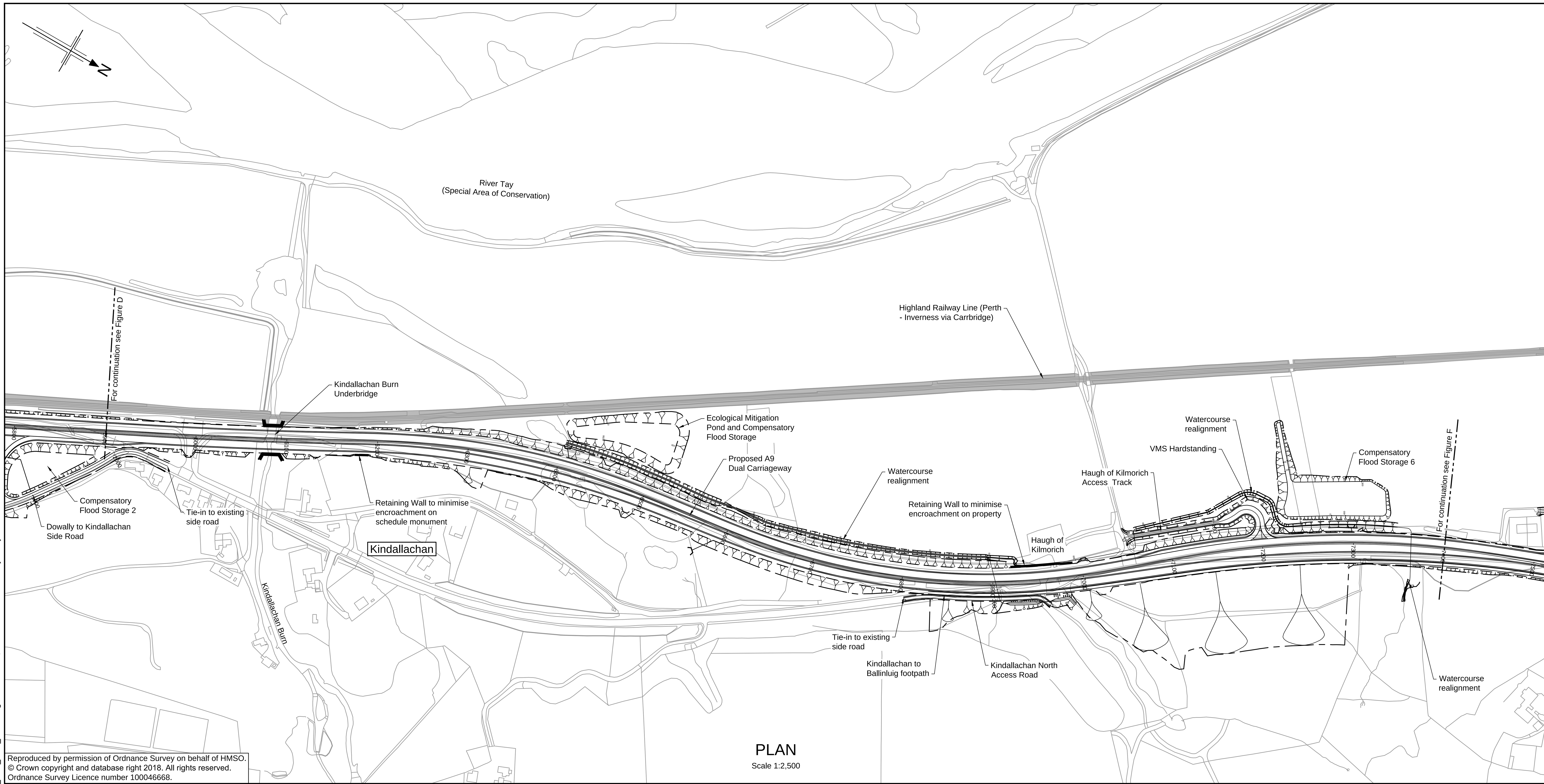
Drawing title
ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
PLAN AND PROFILE
CH. 4400 - CH. 5900
SHEET 4 OF 6

Drawing status: FOR INFORMATION
Scale: AS SHOWN @ A1 — DO NOT SCALE
Jacobs No.: B2140003
Drawing number: FIGURE D
Rev: P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGD.dwg Date: Jun 13, 2018 - 10:41am Plotted by: aitkens

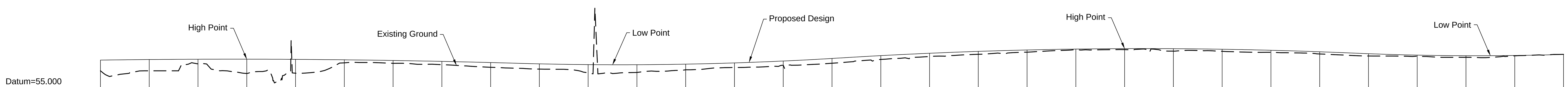
Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



PLAN

Scale 1:2,500



Chainage	Existing	Proposed	Gradient
5 900.000	59.004	61.211	0.278
5 950.000	59.000	61.323	0.223
6 000.000	60.428	61.384	0.123
6 050.000	58.447	61.396	0.023
6 100.000	58.514	61.358	-0.077
6 150.000	60.636	61.270	-0.177
6 200.000	60.548	61.131	-0.277
6 250.000	60.259	60.943	-0.377
6 300.000	59.728	60.705	-0.477
6 350.000	59.359	60.436	-0.537
6 400.000	58.582	60.278	-0.316
6 450.000	58.657	60.257	-0.042
6 500.000	59.215	60.374	0.233
6 550.000	59.695	60.628	0.508
6 600.000	60.155	61.019	0.782
6 650.000	60.561	61.547	1.057
6 700.000	61.346	62.132	1.169
6 750.000	61.953	62.620	0.976
6 800.000	62.408	63.008	0.776
6 850.000	62.836	63.296	0.576
6 900.000	63.369	63.484	0.376
6 950.000	63.369	63.572	0.176
7 000.000	63.060	63.560	-0.024
7 050.000	63.029	63.448	-0.224
7 100.000	62.819	63.236	-0.424
7 150.000	62.466	62.925	-0.624
7 200.000	62.054	62.527	-0.796
7 250.000	62.024	62.236	-0.581
7 300.000	61.782	62.115	-0.243
7 350.000	62.089	62.162	0.095
7 400.000	62.391	62.378	0.432

Vertical: 5900.000 — L=604.047m R=-50000.000m — 6326.956 — R=18200.000m L=331.643m — 6658.599 — L=525.199m R=-25000.000m — 7183.798 — R=14804.540m L=286.912m — 7400.000

Horizontal: 5900.000 L R — 5927.980 — 5930.725 C — 5955.393 — R=-5000.000m L=180.066m — 6135.459 C — 6160.127 — CL=73.417m — 6233.544 — L=247.754m R=840.000m — 6481.298 — CL=73.417m — 6554.715 — CL=83.338m — 6638.053 — R=-740.000m L=351.472m — 6989.525 — CL=83.338m — 7072.863 — CL=60.461m — 7133.324 — L=319.908m R=1020.000m — 7400.000

PROFILE

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client
TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

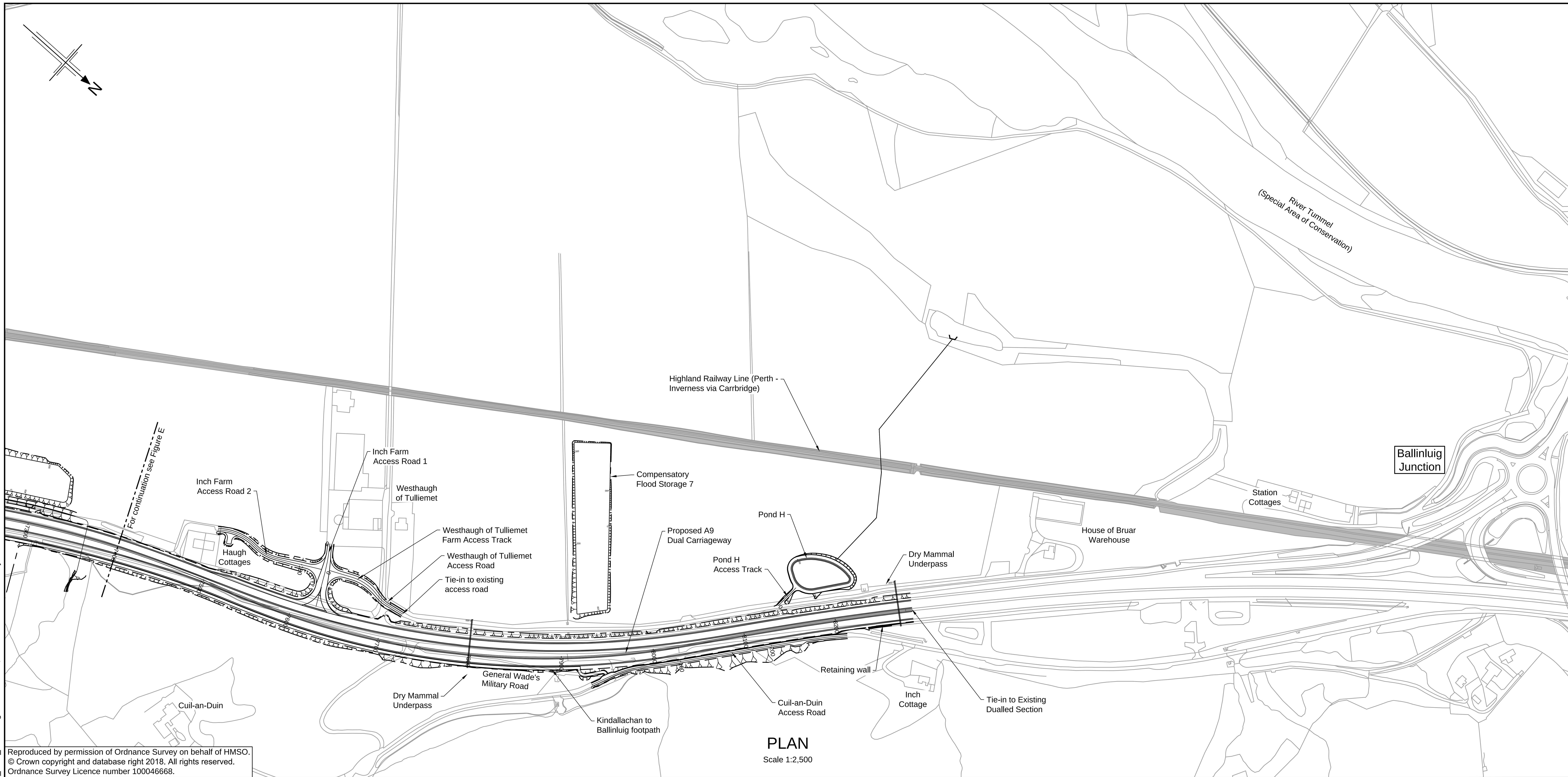
Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG PLAN AND PROFILE CH. 5900 - CH. 7400 SHEET 5 OF 6

Drawing status
FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE E	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGE.dwg Date: Jul 18, 2018 - 7:39am Plotted by: kellydb



PLAN

Scale 1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
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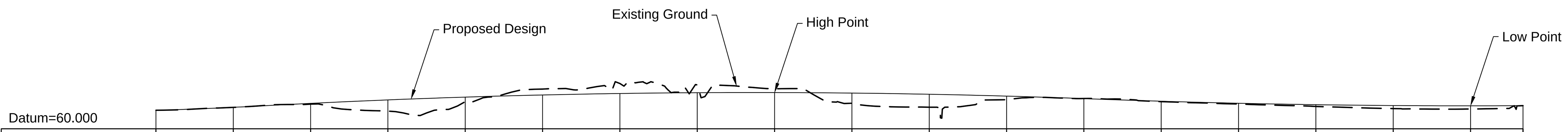

Existing	62.391	62.754	63.176	62.269	63.491	65.118	65.841	65.650	65.153	63.288	62.782	63.748	63.901	63.497	63.198	62.875	62.601	62.545	62.978
Proposed	62.378	62.764	63.274	63.720	64.081	64.357	64.546	64.650	64.669	64.602	64.449	64.211	63.887	63.550	63.288	63.102	62.993	62.958	62.978
Gradient	0.584	0.770	1.021	0.893	0.722	0.551	0.379	0.208	0.037	-0.134	-0.306	-0.477	-0.648	-0.674	-0.523	-0.371	-0.220	-0.068	0.059
Chainage	7 400.000	7 450.000	7 500.000	7 550.000	7 600.000	7 650.000	7 700.000	7 750.000	7 800.000	7 850.000	7 900.000	7 950.000	8 000.000	8 050.000	8 100.000	8 150.000	8 200.000	8 250.000	8 283.905

Vertical: 7400.000; R=14804.540m L=286.912m; 7470.709; L=531.857m R=-29201.980m; 8002.567; R=33000.000m L=281.338m; 8283.905

Horizontal: 7400.000; L=319.908m R=1020.000m; 7453.232; CL=60.461m; 7513.693; CL=72.553m; 7586.246; R=-850.000m L=410.814m; 7997.060; CL=72.553m; 8069.613; 8105.613; L=178.293m R=3425.000m; 8283.905

CL=36.000m

PROFILE

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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CÒMHDHAIL ALBA

Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

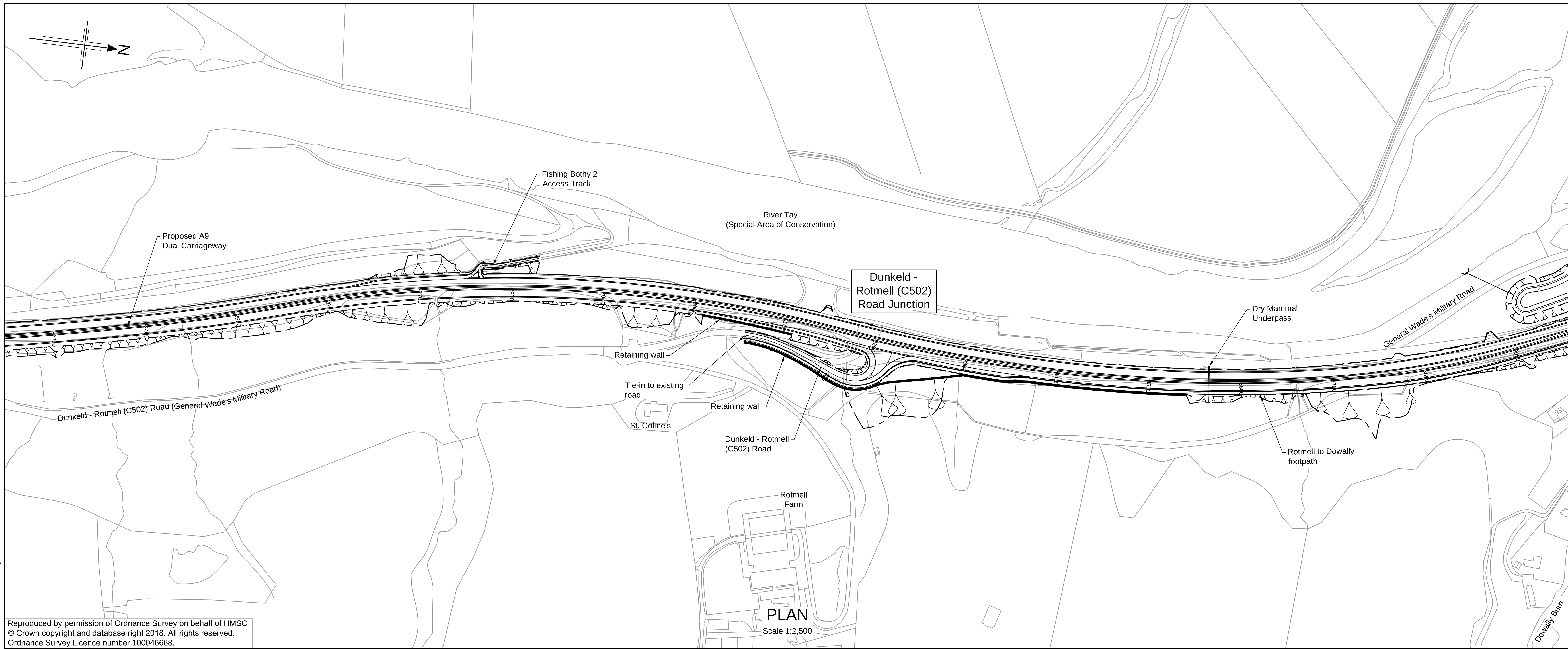
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG PLAN AND PROFILE CH. 7400 - END SHEET 6 OF 6

Drawing status

FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE F	Rev P01

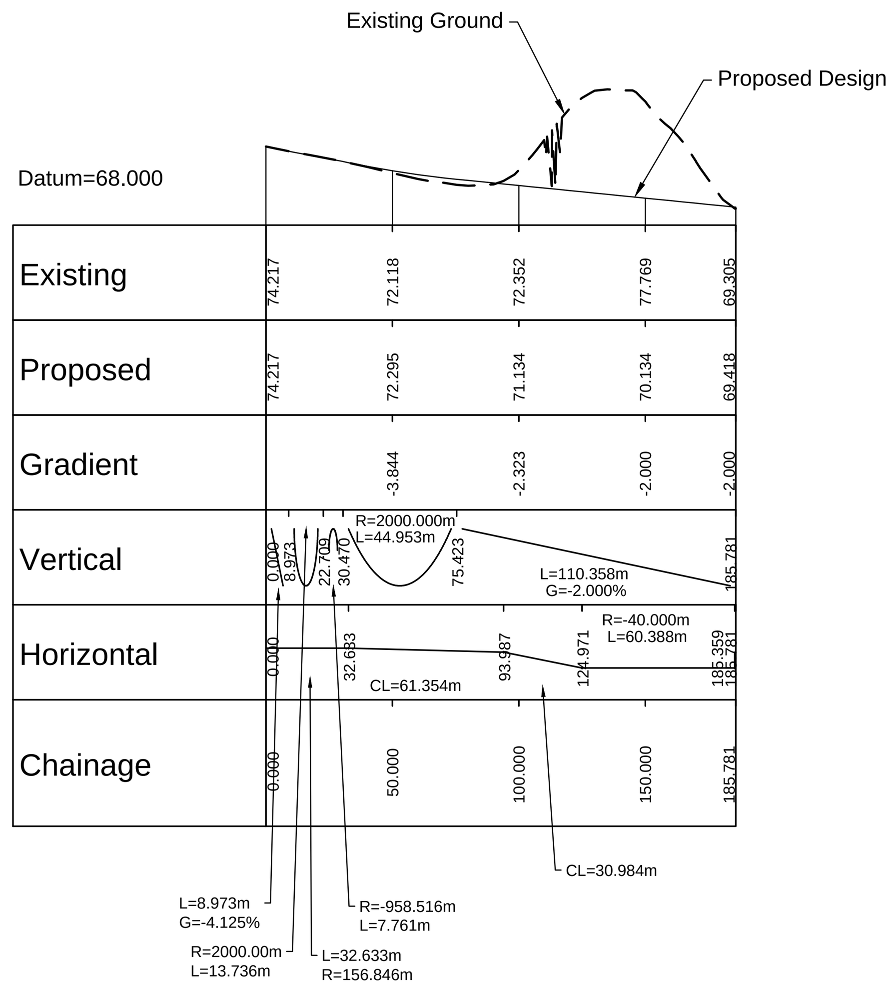
File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGF.dwg Date: Jun 13, 2018 - 10:46am Plotted by: aitkens



PLAN
Scale 1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



DUNKELD - ROTMELL (C502) ROAD JUNCTION

PROFILE
Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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CÒMHDHAIL ALBA

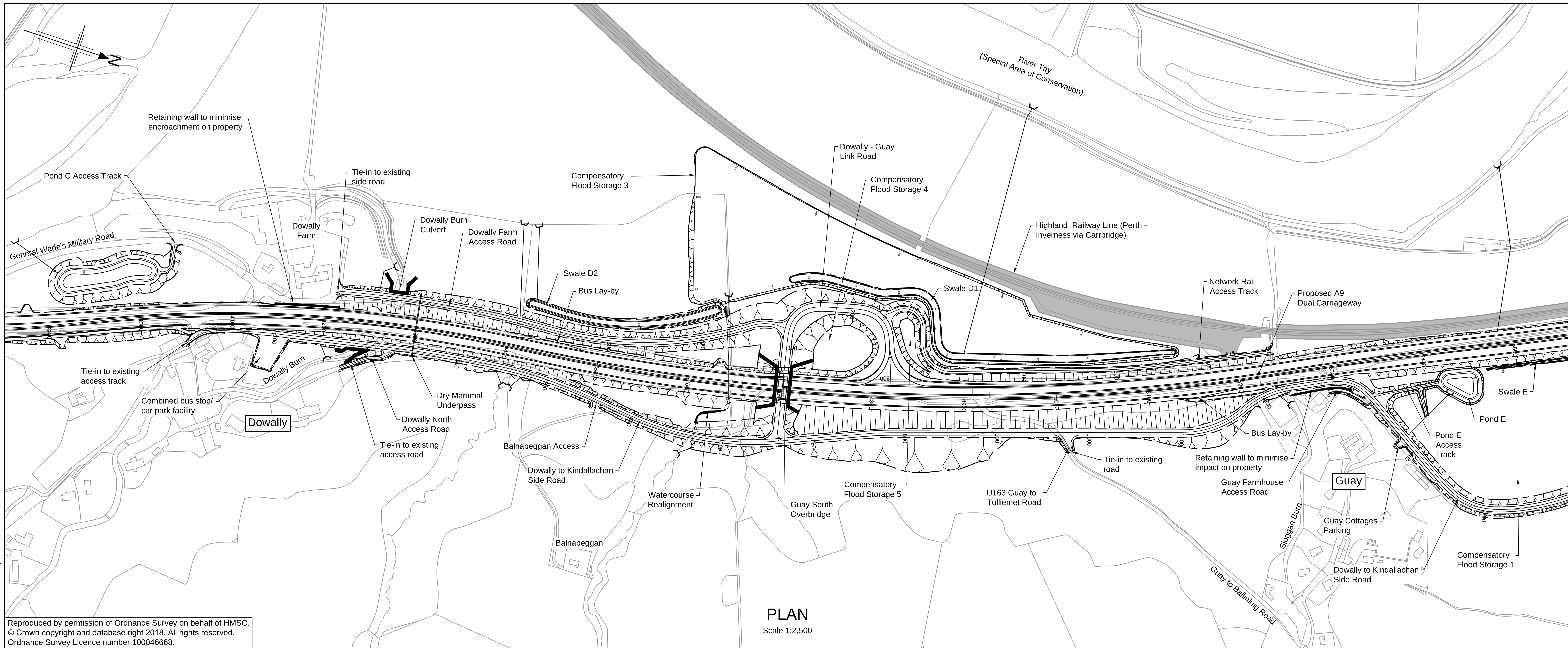
Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG DUNKELD TO ROTMELL (C502) ROAD JUNCTION PLAN AND PROFILE, SHEET 1 OF 1

Drawing status
FOR INFORMATION

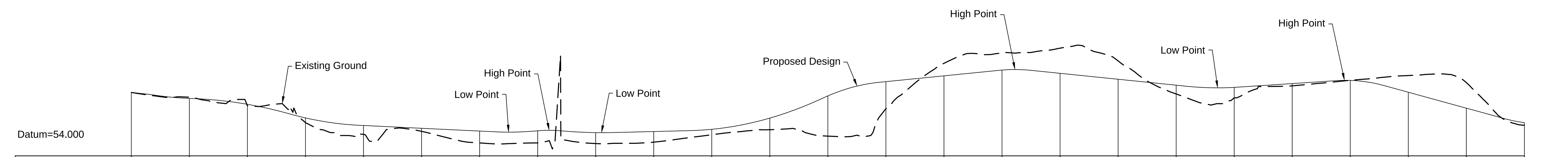
Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE G	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGG.dwg Date: Jun 13, 2018 - 11:05am Plotted by: aitkens



PLAN
Scale 1:2,500

Legend:
- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



Existing	64.934	64.111	62.641	59.712	57.710	58.227	56.226	56.234	56.122	56.356	57.638	58.498	57.400
Proposed	64.933	63.897	62.886	60.539	59.231	58.752	58.273	58.319	58.005	58.191	58.576	60.507	64.340
Gradient		-2.074	-2.021	-4.693	-2.618	-0.958	-0.958	0.093	-0.628	0.372	0.770	3.863	7.666
Chainage	0.000	50.000	100.000	150.000	200.000	250.000	300.000	350.000	400.000	450.000	500.000	550.000	600.000

Existing	62.129	69.954	71.845	72.566	70.369	64.669	64.000	66.069	67.020	67.844	66.630	59.262
Proposed	66.793	67.793	68.790	68.229	67.206	66.184	65.802	66.461	67.008	64.969	62.219	59.722
Gradient	4.906	2.000	1.994	-1.122	-2.045	-2.045	-0.762	1.317	1.094	-4.079	-5.500	-4.993
Chainage	650.000	700.000	750.000	800.000	850.000	900.000	950.000	1 000.000	1 050.000	1 100.000	1 150.000	1 200.000

Vertical: 5.054, 21.344, 51.524, L=84.489m R=-1700.000m, 136.013, R=1300.000m L=60.435m, 196.448, L=116.557m G=-0.958%, 313.605, 349.092, 370.609, 415.972, G=0.500% L=65.310m, 481.282, R=1300.000m L=114.355m, 595.637, 643.794, G=2.000% L=104.188m, 747.981, 774.680, L=134.481m G=-2.045%, 909.160, 952.959, G=1.324% L=85.299m, 1038.258, 1079.201, L=103.366m G=-5.500%, 1182.567, 1200.000

Horizontal: 0.000, 9.576, 20.710, 51.710, 61.740, 87.440, 97.766, STR=114.901m, 212.668, L=120.470m R=1397.448m, 333.138, 348.861, L=97.691m R=500.000m, 446.552, 471.035, 508.700, R=-325.000m L=153.213m, 661.913, STR=97.843m, 759.756, 784.230, STR=317.369m, 1101.599, R=-100.000m L=71.811m, 1173.410, 1200.000

L=5.054m G=-2.000%
L=16.920m R=-1700.000m
STR=9.576m
L=11.134m R=40.000m
CL=31.000m
L=30.180m R=1300.000m
STR=10.030m
CL=25.700m
L=10.326m R=300.000m
L=36.088m R=1300.000m
CL=15.723m
L=21.517m R=-600.000m
L=36.088m R=1300.000m
CL=24.483m
CL=37.665m
L=48.157m R=-660.000m
L=26.698m R=-660.000m
L=24.475m R=300.000m
L=43.798m R=1300.000m
L=40.943m R=-600.000m
L=56.871m R=100.000m
L=30.000m R=600.000m

DOWALLY TO KINDALLACHAN SIDE ROAD

PROFILES
Scale 1:2,500 Horizontal, 1:500 Vertical

P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.
Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd

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Client
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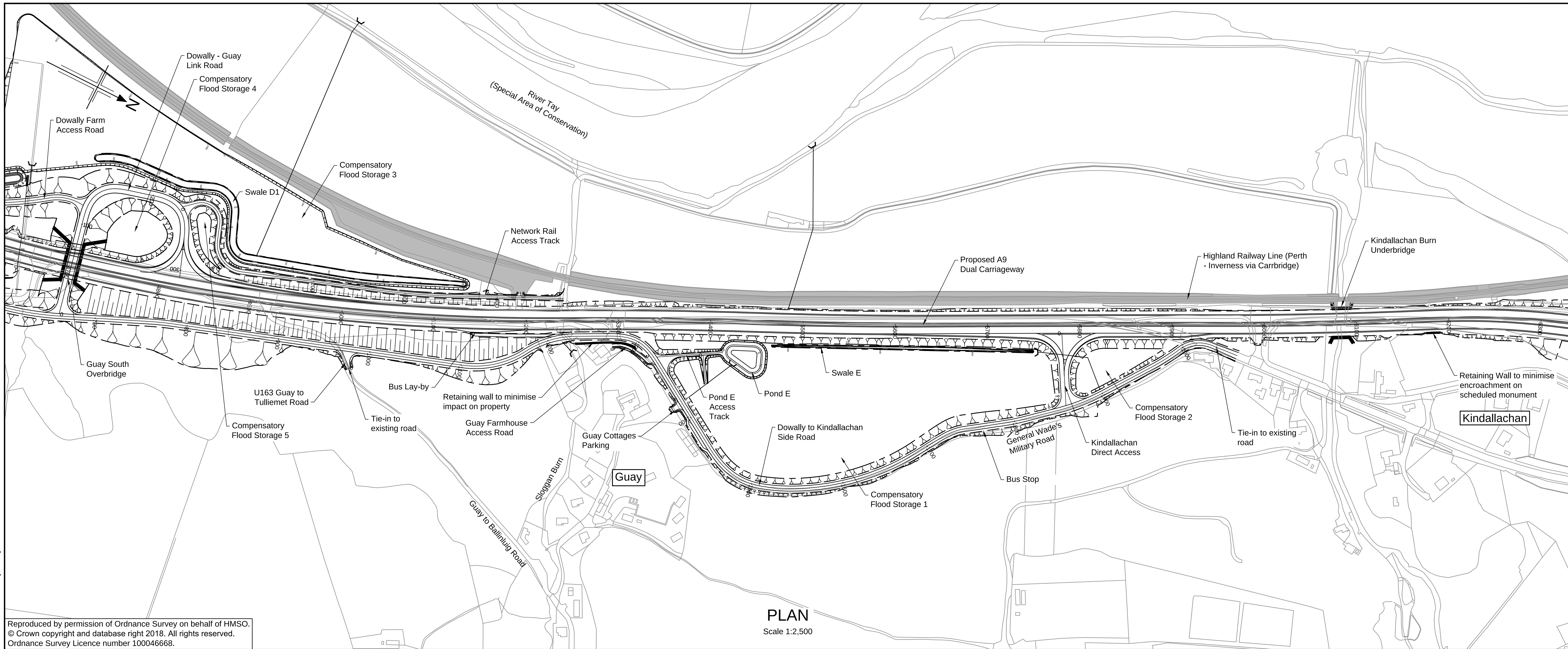
CÒMHDHAIL ALBA

Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG DOWALLY TO KINDALLACHAN SIDE ROAD, PLAN AND PROFILES SHEET 1 OF 3

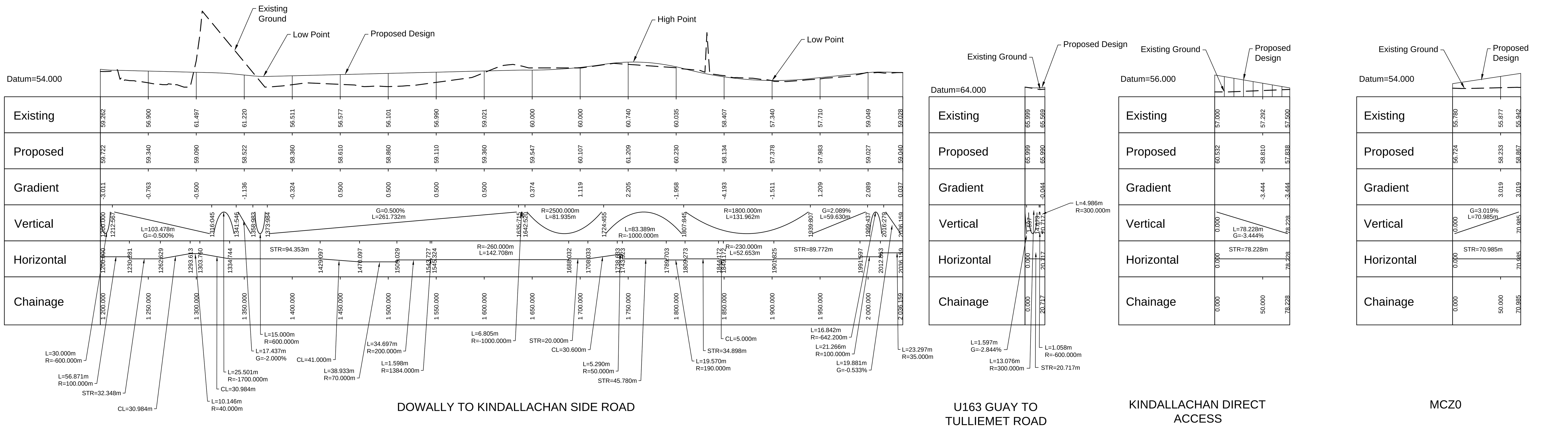
Drawing status
FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE H	Rev P01



PLAN

Scale 1:2,500



PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Appr'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG DOWALLY TO KINDALLACHAN SIDE ROAD, PLAN AND PROFILES SHEET 2 OF 3

Drawing status

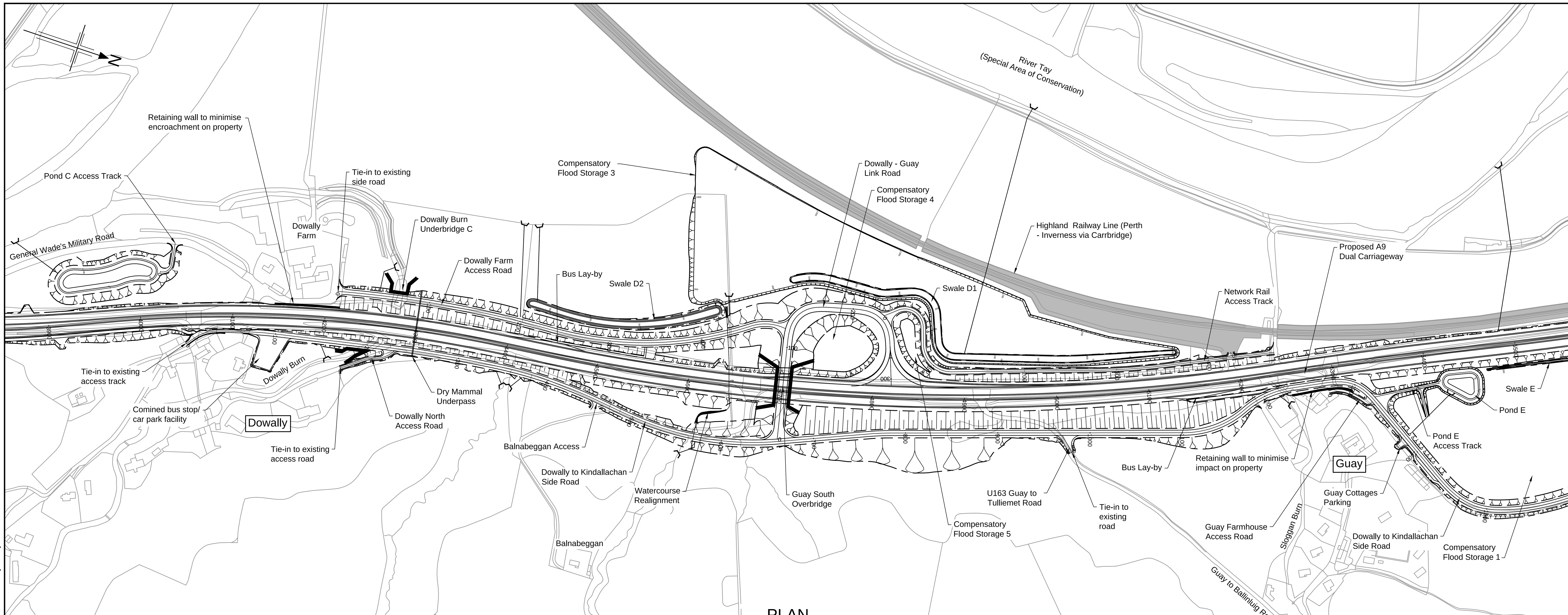
FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE I	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGI.dwg Date: Jul 18, 2018 - 7:39am Plotted by: kellydb

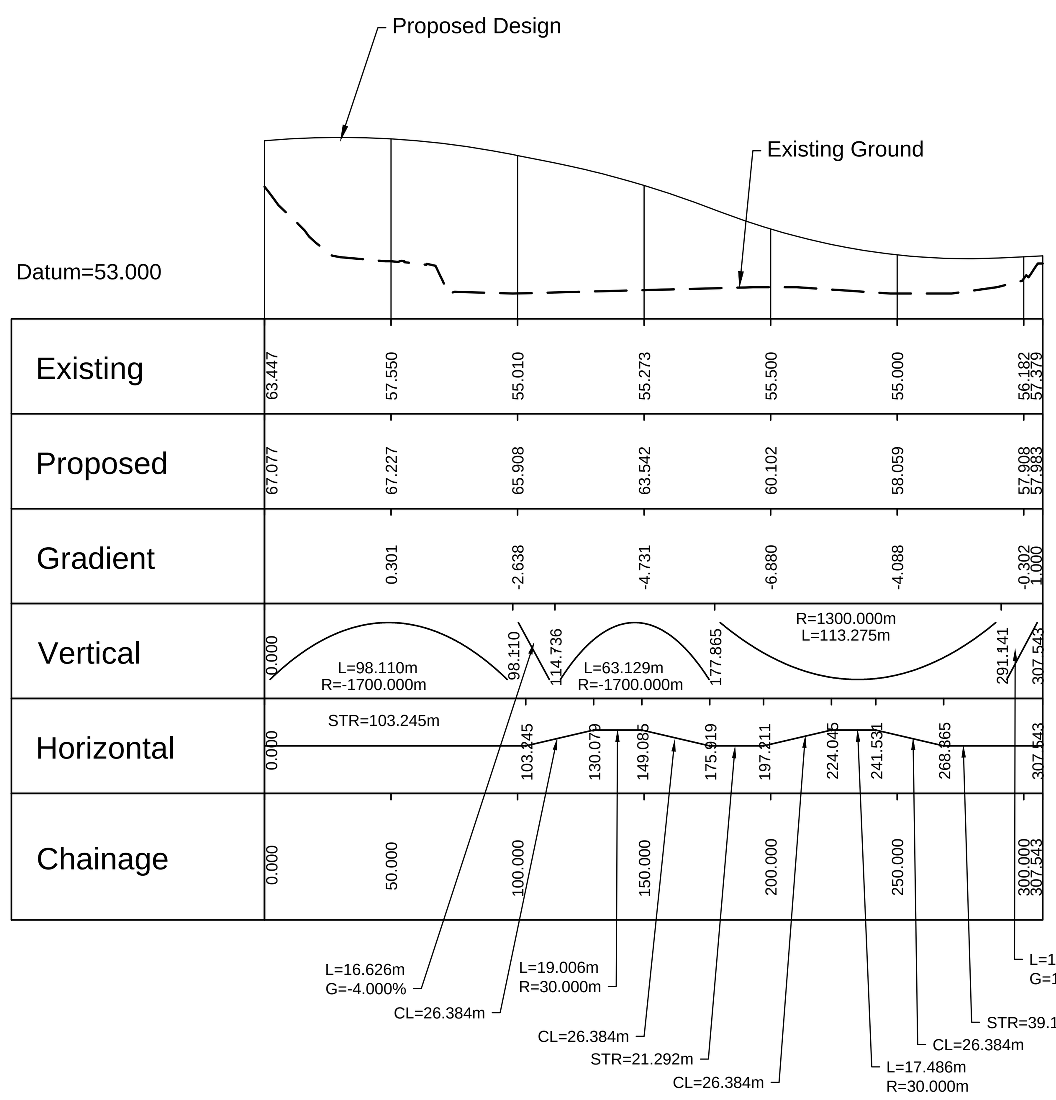
Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

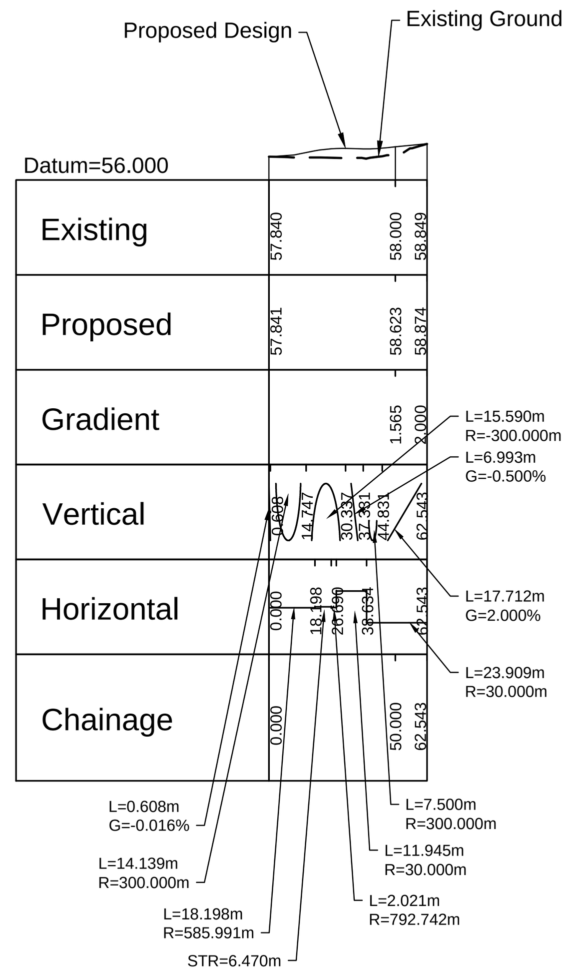


PLAN

Scale 1:2,500



DOWALLY TO GUAY LINK ROAD



DOWALLY NORTH ACCESS ROAD

PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG DOWALLY TO KINDALLACHAN SIDE ROAD, PLAN AND PROFILES SHEET 3 OF 3

Drawing status

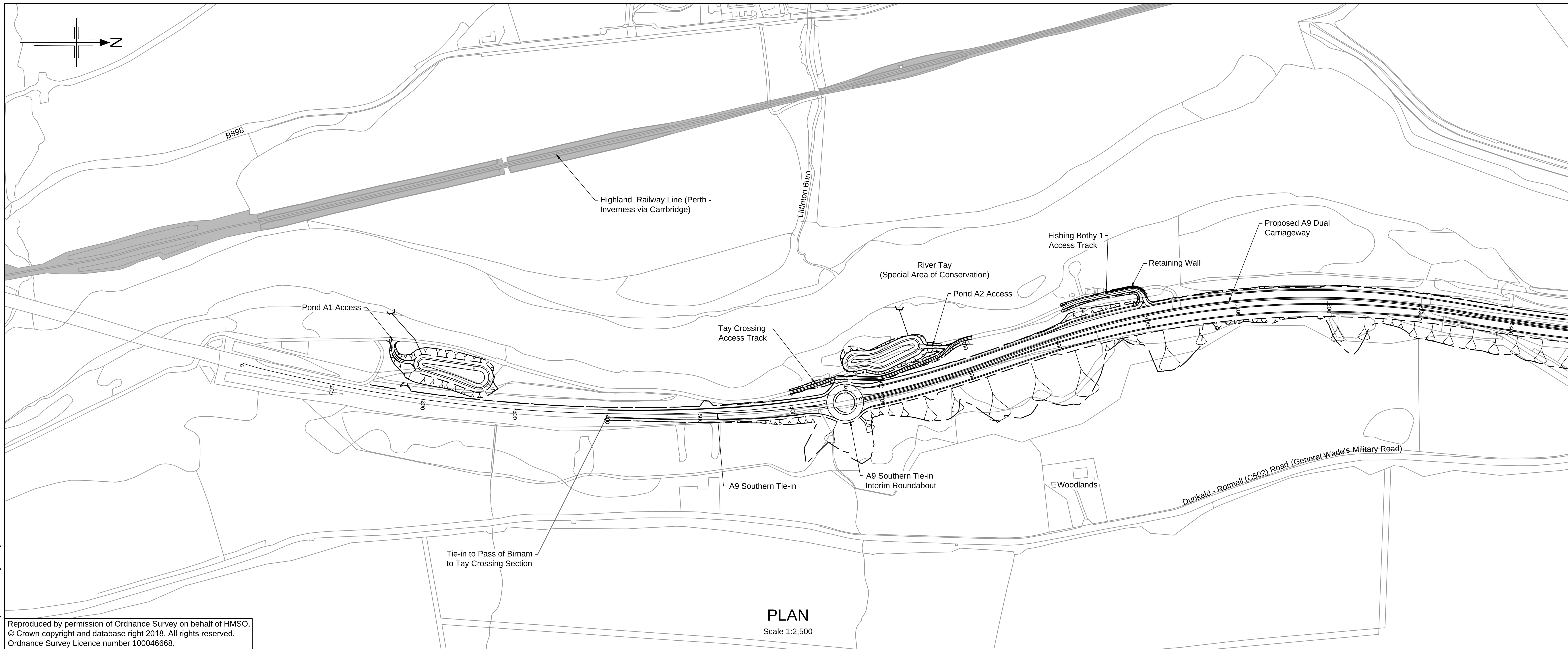
FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	

Drawing number: FIGURE J

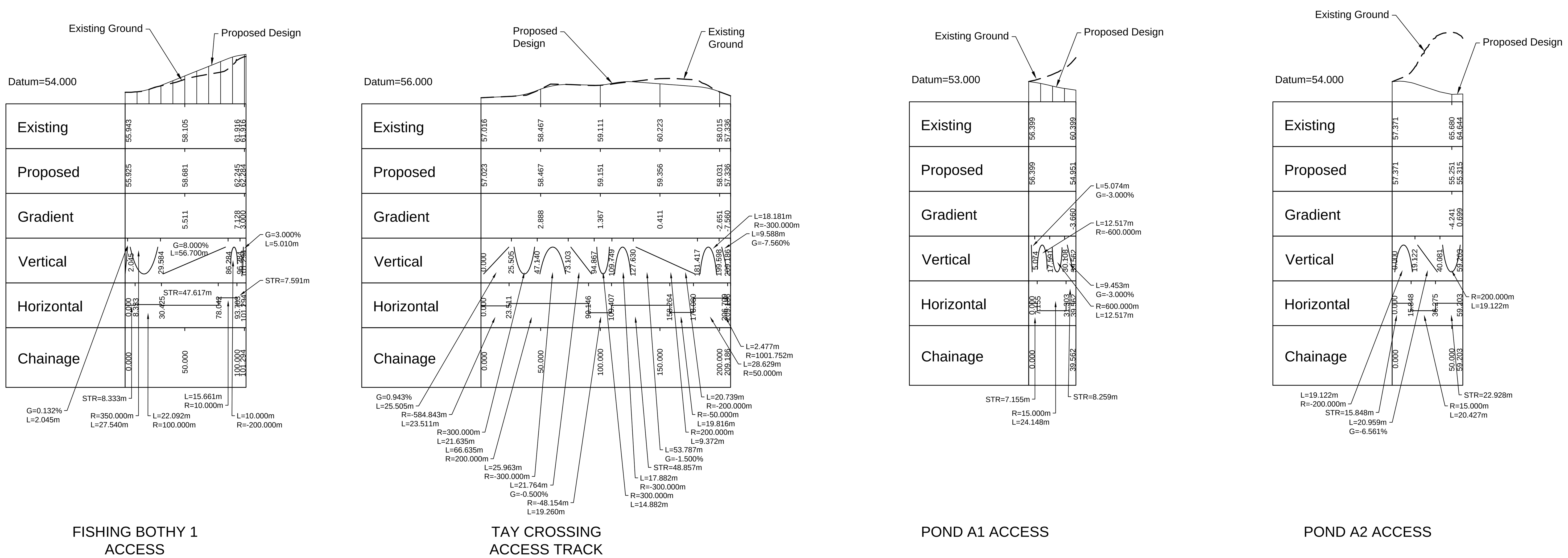
Rev: P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGJ.dwg Date: Jun 13, 2018 - 1:33pm Plotted by: kellydb



PLAN

Scale 1:2,500



PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

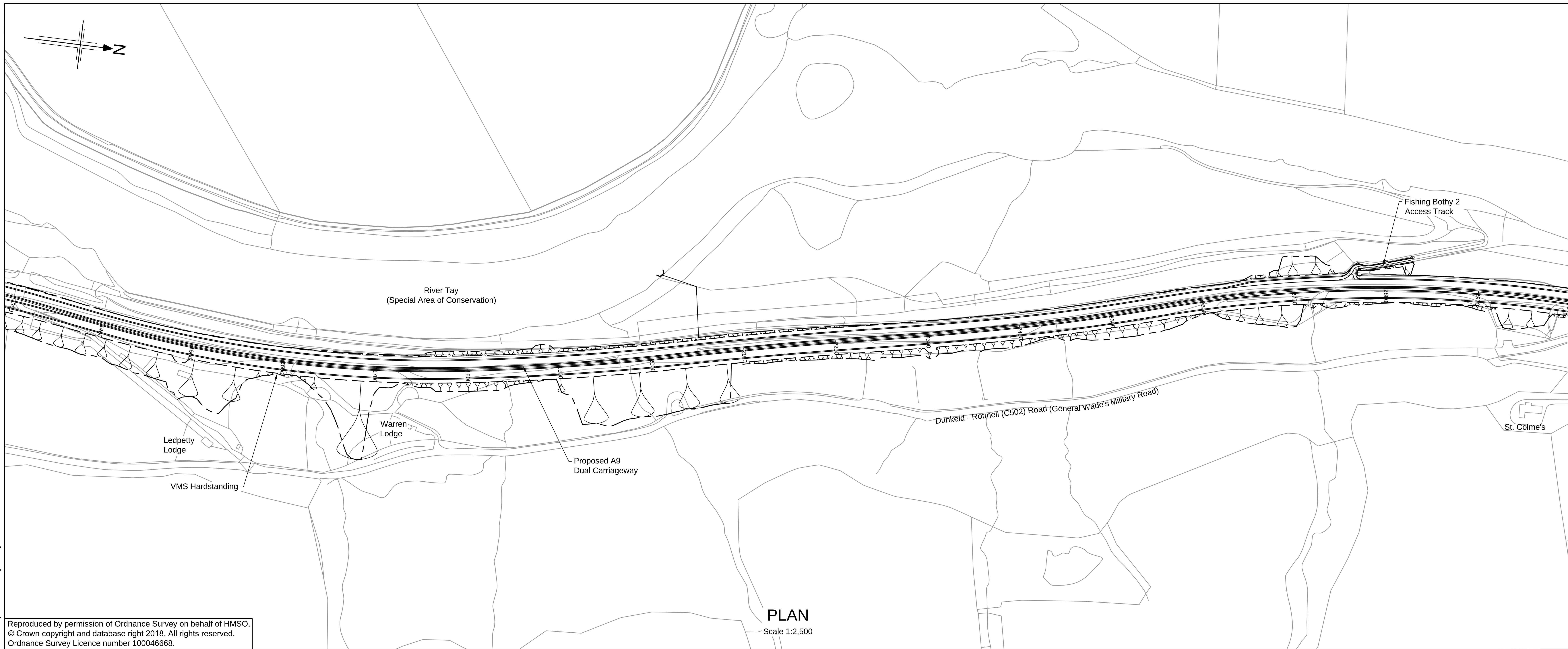
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG FISHING BOTHY 1 AND TAY CROSSING ACCESS TRACKS PLAN AND PROFILES, SHEET 1 OF 1

Drawing status

FOR INFORMATION

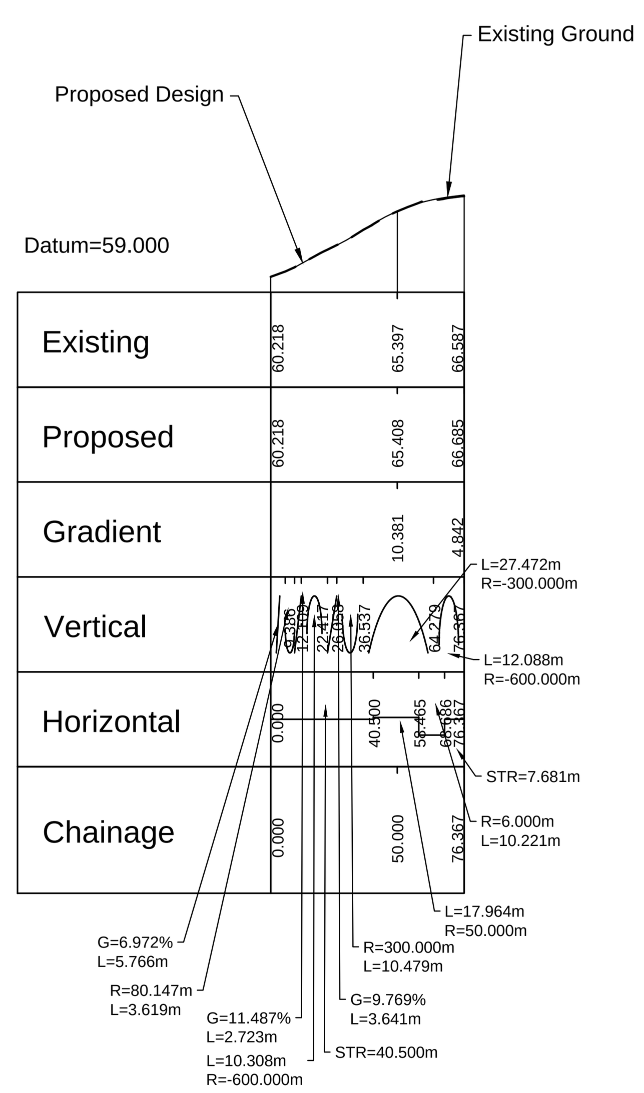
Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE K	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGL.dwg Date: Jun 13, 2018 - 1:47pm Plotted by: kellydb



PLAN

Scale 1:2,500



FISHING BOTHY
2 ACCESS

PROFILE

Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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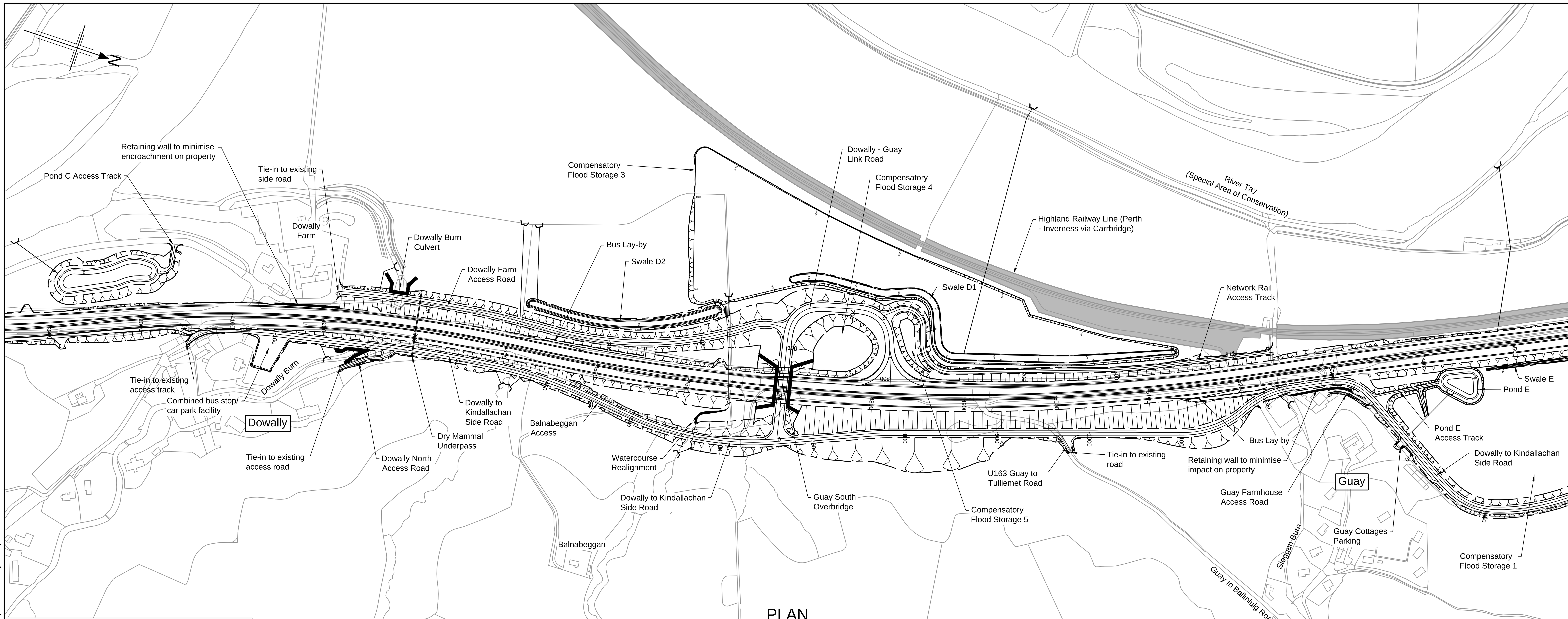
Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
FISHING BOTHY 2
ACCESS TRACK
PLAN AND PROFILE, SHEET 1 OF 1

Drawing status	FOR INFORMATION	
Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE L	Rev P01



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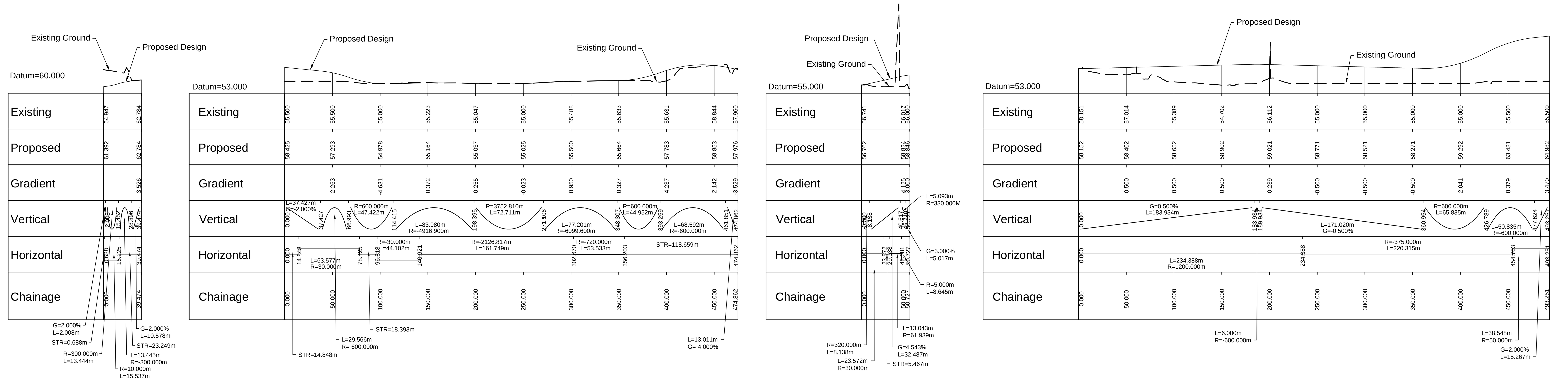
PLAN

Scale 1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



POND C ACCESS TRACK

NETWORK RAIL ACCESS TRACK

GUAY FARMHOUSE ACCESS ROAD

DOWALLY FARM ACCESS ROAD

PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client

TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Project

A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title

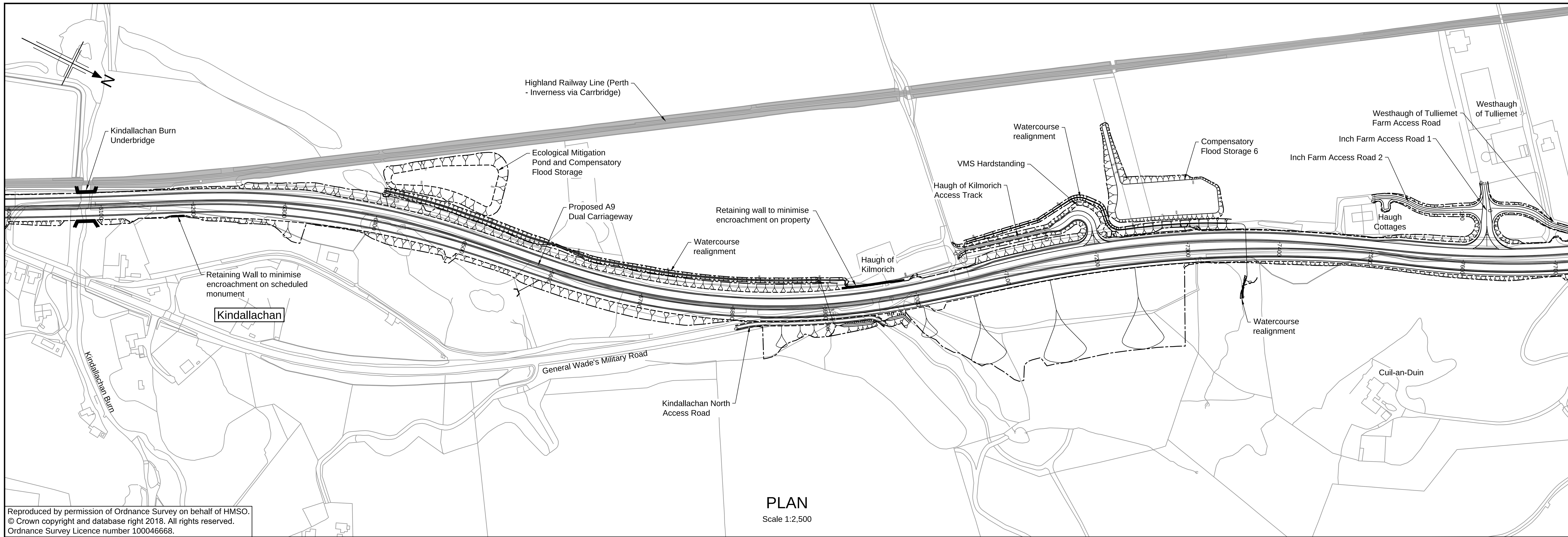
ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
NETWORK RAIL
ACCESS TRACK
PLAN AND PROFILES, SHEET 1 OF 1

Drawing status

FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE M	Rev P01

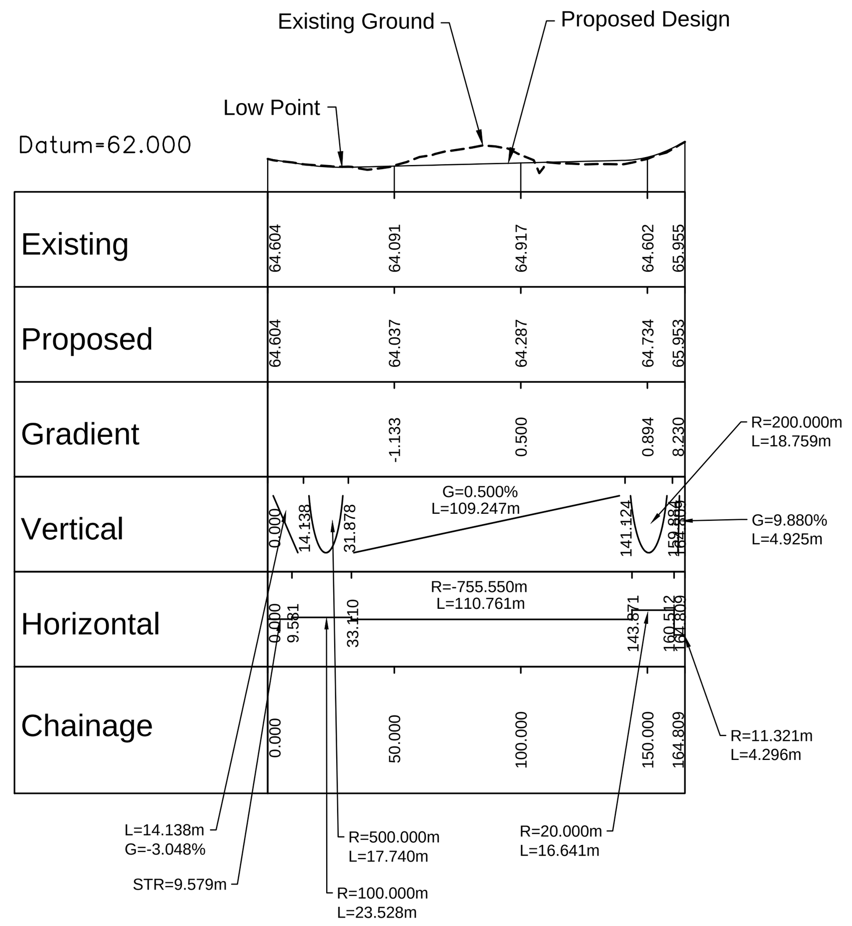
File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGM.dwg Date: Jun 13, 2018 - 1:47pm Plotted by: kellydb



PLAN

Scale 1:2,500

Legend:
- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



Existing	64.604	64.091	64.917	64.602	65.955
Proposed	64.604	64.037	64.287	64.734	65.953
Gradient		-1.133	0.500	0.894	8.230
Vertical	0.000, 14.138, 31.878			141.124	159.884, 164.809
Horizontal	0.000, 9.581, 33.110			143.571	160.512, 164.809
Chainage	0.000	50.000	100.000	150.000	164.809

KINDALLACHAN NORTH ACCESS ROAD

PROFILES

Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client: TRANSPORT SCOTLAND CÒMHDHAIL ALBA

Project: A9 DUALLING PERTH TO INVERNESS Tay Crossing to Ballinluig

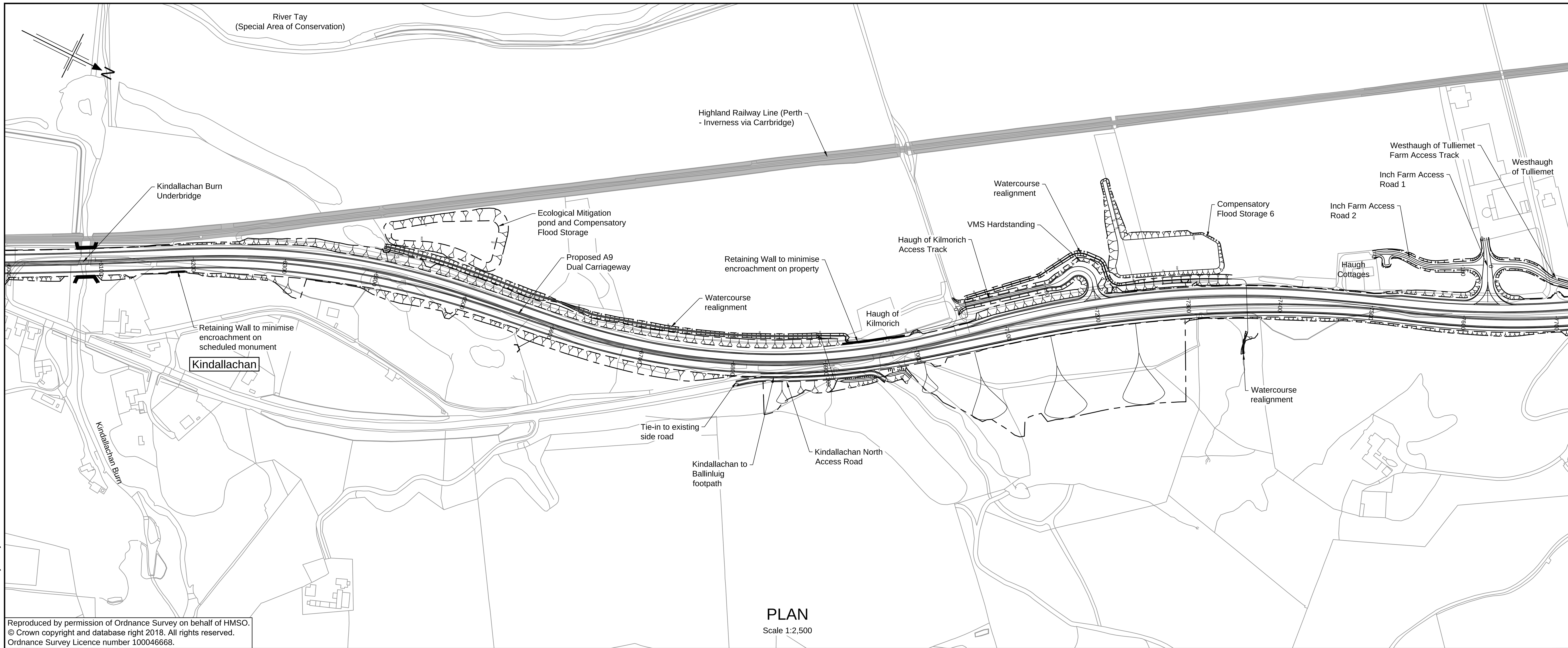
Drawing title
ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
KINDALLACHAN NORTH ACCESS TRACK
PLAN AND PROFILE, SHEET 1 OF 1

Drawing status: FOR INFORMATION

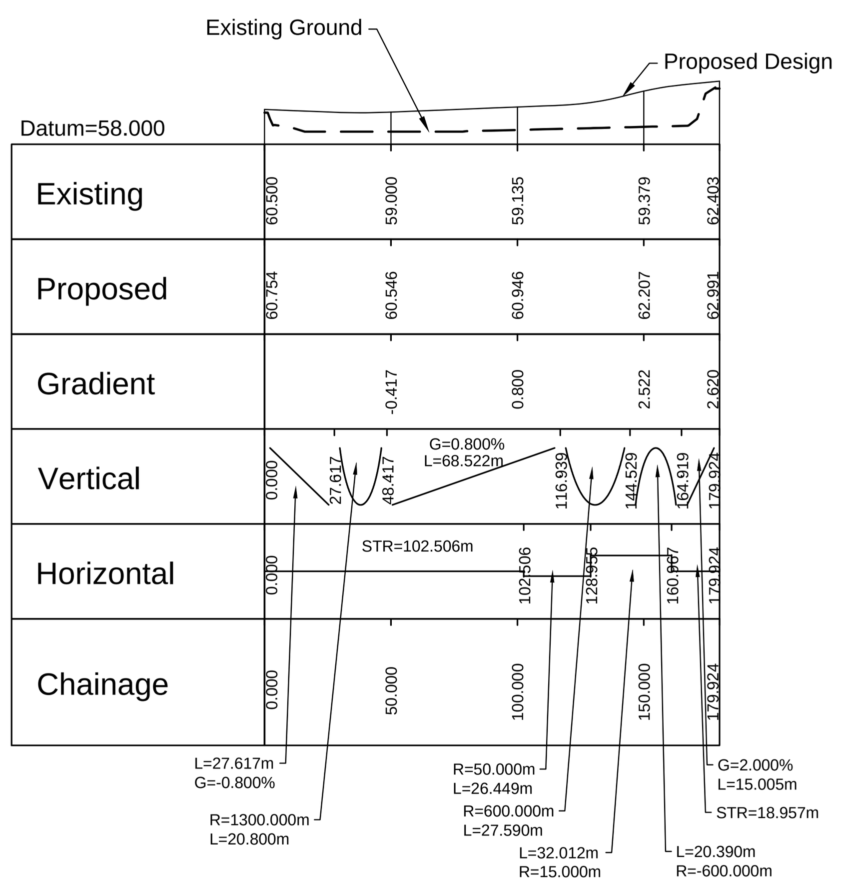
Scale: AS SHOWN @ A1 — DO NOT SCALE

Jacobs No.: B2140003

Drawing number: FIGURE N — Rev P01



PLAN
Scale 1:2,500



HAUGH OF KILMORICH ACCESS TRACK

PROFILE
Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:
- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Appr'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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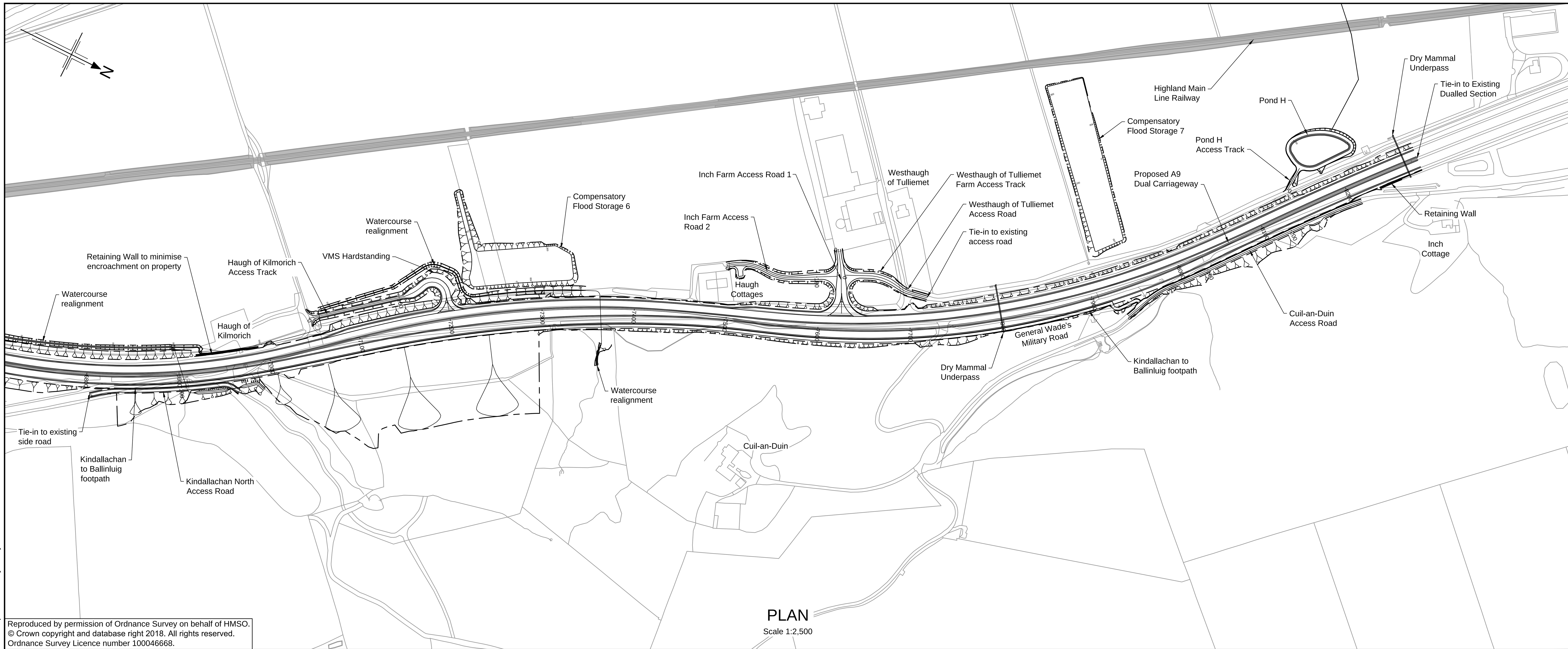
Client
TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

Drawing title
ENVIRONMENTAL STATEMENT TAY CROSSING TO BALLINLUIG HAUGH OF KILMORICH ACCESS TRACK PLAN AND PROFILE, SHEET 1 OF 1

Drawing status
FOR INFORMATION

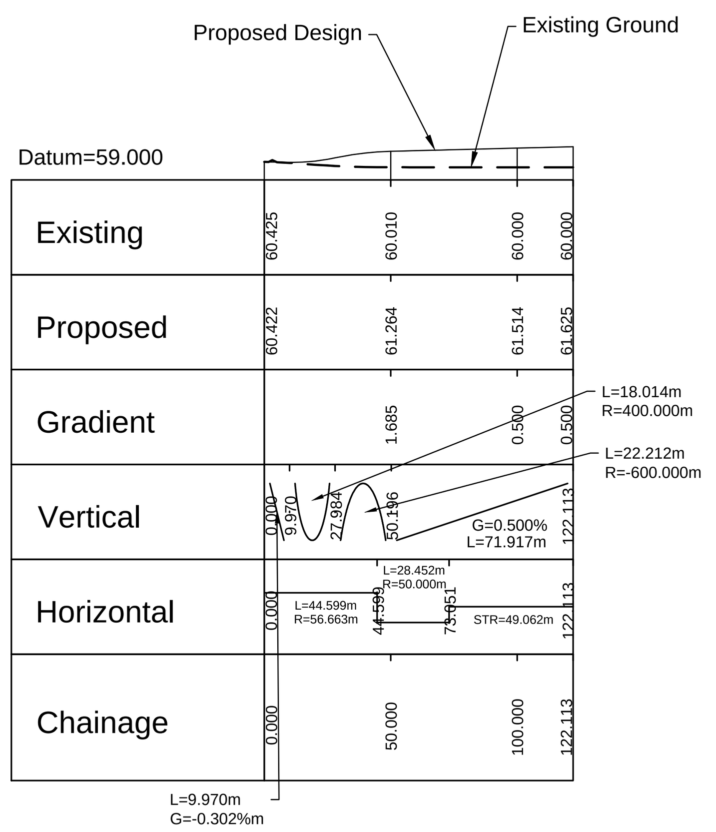
Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE O	Rev P01



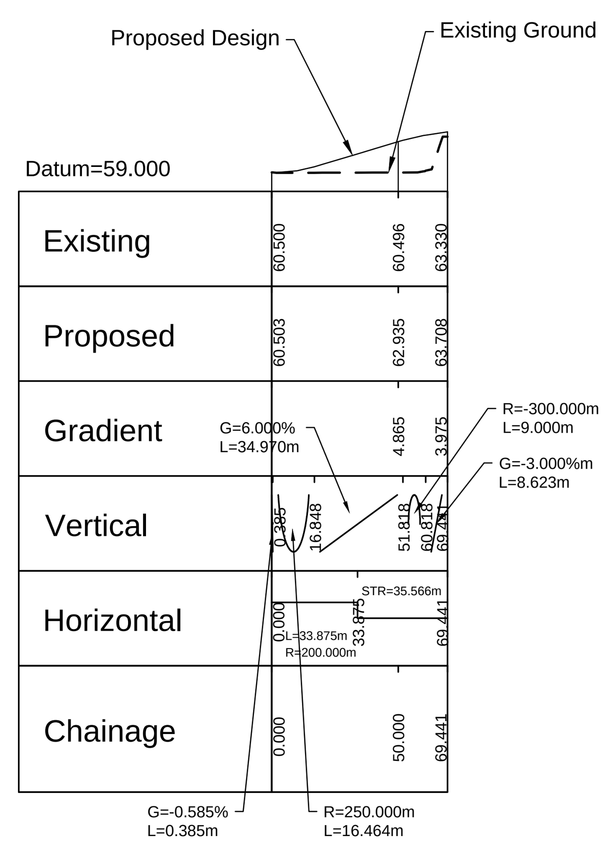
PLAN
Scale 1:2,500

Legend:

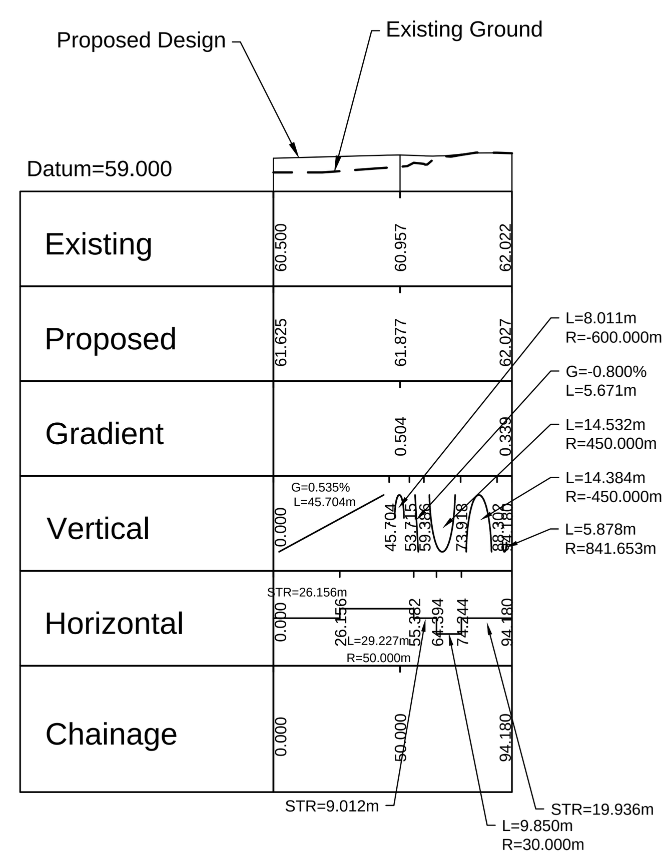
- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall



INCH FARM ACCESS ROAD 2



INCH FARM
ACCESS ROAD 1



WESTHAUGH OF TULLIEMET
FARM ACCESS TRACK

PROFILES
Scale 1:2,500 Horizontal, 1:500 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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Client
TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

Project
A9 DUALLING
PERTH TO INVERNESS
Tay Crossing to Ballinluig

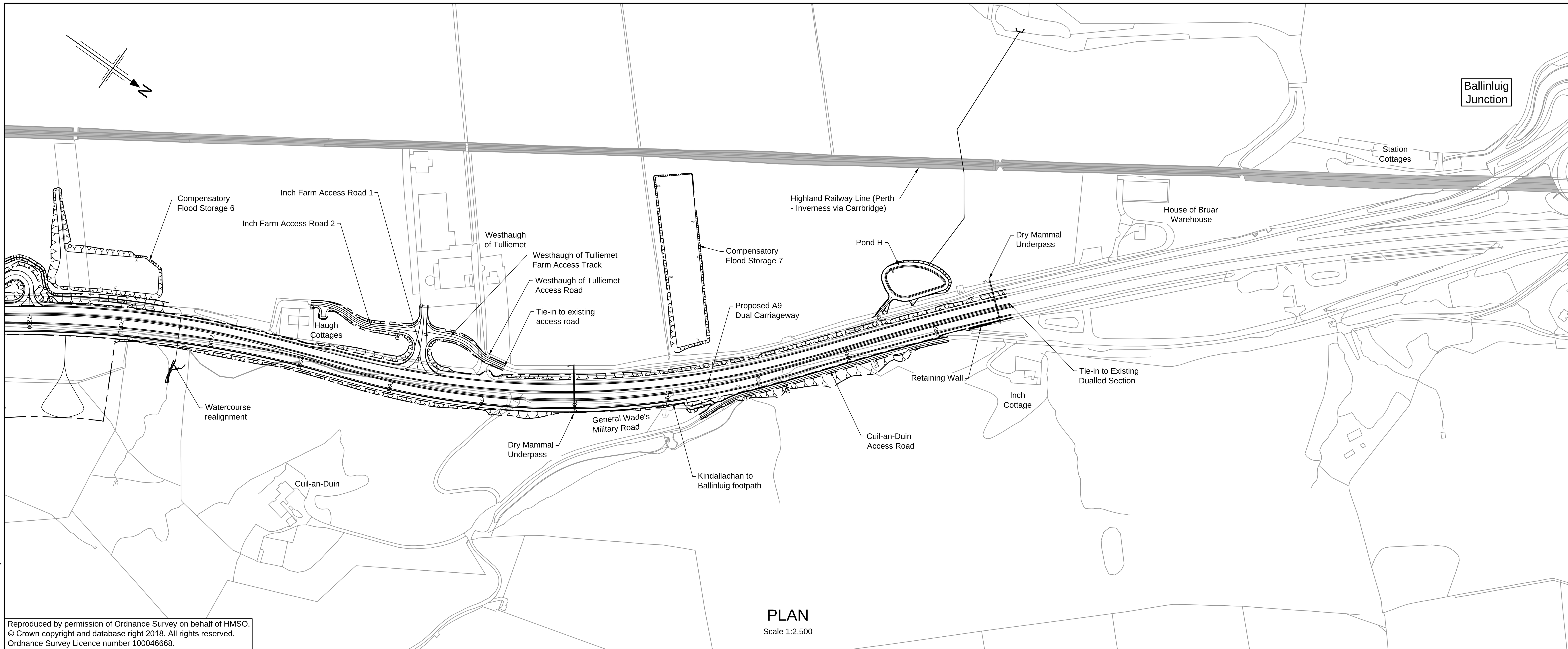
Drawing title
ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
INCH FARM ACCESS TRACK
PLAN AND PROFILES
SHEET 1 OF 1

Drawing status
FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	

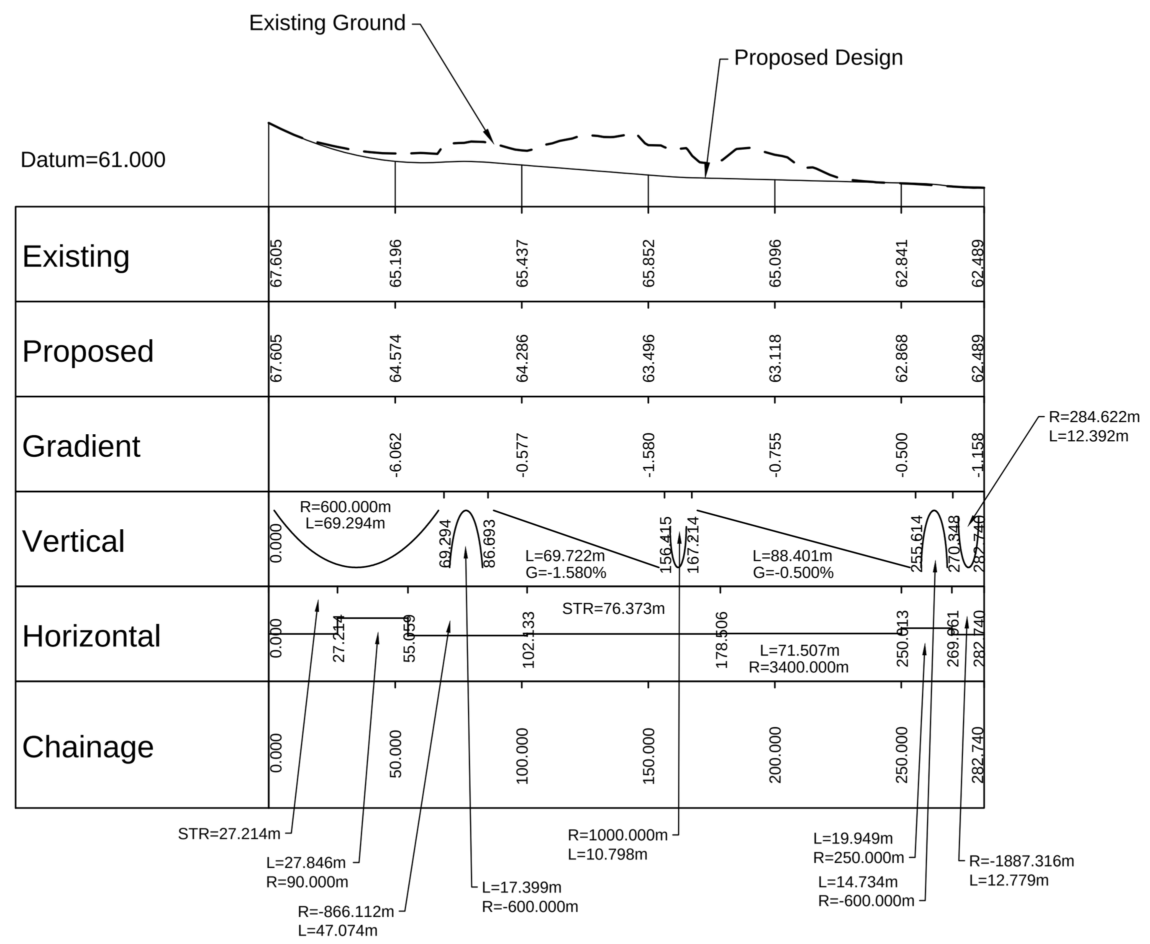
Drawing number: FIGURE P
Rev: P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGP.dwg Date: Jul 25, 2018 - 2:54pm Plotted by: kellydb



PLAN

Scale 1:2,500



CUIL-AN-DUIN
ACCESS ROAD

PROFILE

Scale 1:2,500 Horizontal, 1:500 Vertical

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Graded Earthwork Slope Between Verges
- Bridge Structure
- Retaining Wall Structure
- Highland Railway Line (Perth - Inverness via Carrbridge)
- Drainage Outfall

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	June 2018	Environmental Statement Issue	S.A.	D.B.K.	M.P.	K.L.P.S.

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ENVIRONMENTAL STATEMENT
TAY CROSSING TO BALLINLUIG
CUIL-AN-DUIN ACCESS TRACK
PLAN AND PROFILE
SHEET 1 OF 1

Drawing status

FOR INFORMATION

Scale	AS SHOWN @ A1	DO NOT SCALE
Jacobs No.	B2140003	
Drawing number	FIGURE Q	Rev P01

File: P:\Data3\B2140003 A9 Tay Crossing to Ballinluig\STAGE 3\EGN - Environmental General\A9P03-JAC-EGN-Z_ZZ1_ZZ-RP-EN-0005_APP_A5.1_FIGQ.dwg Date: Jun 13, 2018 - 11:01am Plotted by: aitkens