Appendix A6.1: Construction Information

1.1 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 EIAR.

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 Contractor, within the constraints of the contract and the requirements of the EIAR (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.

1.2 General Site Operations

Safety and Security

1.2.1 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

1.2.2 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.

1.2.3 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. Bulk earthworks operations usually stop during the winter months (November to March).

1.2.4 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 work for placing of bridge beams over existing carriageways or railways to minimise disruption due to closure;
- overnight work to facilitate temporary traffic management layouts; and
- non-disruptive railway possessions to complete structures.

Site Lighting

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

- at the Contractor's compounds for security and safe movement of staff outwith daylight hours;
- along temporary construction 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
- task lighting for nighttime activities or winter afternoon activities.

1.2.6 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.

1.3 Construction Programming and Phasing

Construction Programme

1.3.1 Construction of the proposed scheme is anticipated to commence in Winter of 2028/29 with the construction phase expected to take approximately three to four years, and the proposed scheme operational by the end of 2032.

1.3.2 The indicative construction programme assumes the works will be split into three sections, anticipated to run generally concurrently. Within each section the works will be phased to reduce the impact on road users and neighbouring communities. The anticipated phase and section durations are detailed as follows:

- Advanced Works of up to 12 months on-site.
- Construction Works of 37 months of which:
  - site establishment and enabling works;
  - southern section construction works of 35 months between Murthly and Dunkeld & Birnam Station (ch576 to ch3200);
  - central section construction of 30 months between Dunkeld & Birnam Station and Inver Rail Bridge (ch3200 to ch5700) and including works associated with Dunkeld & Birnam Station (replacement car park and pedestrian underpass) with section split into two sub-sections – Dunkeld & Birnam Station area (ch3200 to ch3500) and Dunkeld Roundabout and River Braan area (ch3500 to ch5700); and
  - northern section construction works of 30 months between Inver Rail Bridge and north of the Tay Crossing (ch5700 to ch8421).

1.4 DMRB Stage 3 Engineering Drawings

1.4.1 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.

1.5 Typical Construction Methods

Establishment of Construction Compounds

1.5.1 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 their design and construction. Due to the length of the proposed scheme and proposed structures to be constructed, other smaller satellite offices, welfare facilities and compounds are likely to be established along the route.

1.5.2 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.

1.5.3 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

1.5.4 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 proposed scheme and any other areas that the Contractor has acquired by agreement to facilitate construction of the works.

1.5.5 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 1.5.7) and other wildlife where required.

1.5.6 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).

1.5.7 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

1.5.8 Site clearance and demolition works typically include the following:

- general clearance;
- demolition of buildings, walls and bridges including any temporary works needed to facilitate the demolition activity;
- removal of pipelines, public and privately owned services or supplies; and
- tree felling and removal of stumps, removal of fencing, hedges, bushes and undergrowth.

1.5.9 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.

1.5.10 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.

1.5.11 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 EIAR and the Report to Inform an Appropriate Assessment for the River Tay Special Area of Conservation (SAC).

Contaminated Materials

1.5.12 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

1.5.13 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, 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.

1.5.14 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.

1.5.15 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.

1.5.16 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.

1.5.17 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

1.5.18 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.

1.5.19 Existing services may require temporary diversion to minimise any disruption to apparatus and services during the construction of the works.

1.5.20 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. For all works, transport of materials and some excavation and concrete works will be required, including for for foundations or footings for above ground structures.

Topsoil Stripping and Storage

1.5.21 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 from site 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.

1.5.22 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 transfer of 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

1.5.23 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.

1.5.24 The material arising from the excavation of the pre-earthwork drainage will be transported for reuse within the works 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

1.5.25 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. Depending on the size of embankments the fill may be subject to a settlement period during which the road construction cannot commence. This is to allow for any further settlement of the embankment prior to the road construction.

1.5.26 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 the following list. This is based on preliminary ground investigations indicating that material is likely to have 90% suitability for reuse and export/disposal of unacceptable material is not included.

- Total acceptable cut of 994,593m^3 available (excluding topsoil).
- Total fill of 672,809m^3 is required (excluding topsoil).
- Potential import is not required.
- Potential export of 420,080m^3 is required (including topsoil).
- Potential for 80 HGV loads of potential export materials taken off-site each working day over three consecutive earthworks seasons.

1.5.27 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.

1.5.28 Some excavations may encounter rock and this is harder to excavate. Depending on rock strength the method of removal will differ. For weathered rock the use of a proprietary rock breaker attached to an excavator may be used. For competent rock the use of rock ripping equipment may be used. For hard rock to be removed in large volumes drill and blast techniques may be used.

Operational Drainage/SuDS, Service Ducts and Chambers

1.5.29 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.

1.5.30 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.

1.5.31 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.

1.5.32 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

1.5.33 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

1.5.34 Pavement construction involves building the pavement up in layers.

1.5.35 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. It is estimated that 3,400 lorry loads would be required over a period of 18 months with estimated weekly average of 45 lorry loads during pavement construction. The material is deposited and then distributed into place and compacted.

1.5.36 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.

Roadworks Finishes

1.5.37 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.

1.5.38 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. Similarly, where lighting is required (for example at Dunkeld Junction), lighting columns would be installed and cabling passed through any required service ducts.

1.5.39 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.

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

Accommodation Works

1.5.41 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

1.5.42 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

1.5.43 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.

- Dunkeld & Birnam Station Retaining Wall (ch3280 to ch3380) extending to approximately 100m and which retains the southbound mainline carriageway and includes access to the Dunkeld & Birnam Station Pedestrian Underpass.
- Dunkeld & Birnam Station Replacement Car Park Retaining Wall extending to approximately 40m which retains the lowered replacement car park from properties on Birnam Terrace that back on to the car park.
- A923 Dunkeld Junction Retaining Wall extending to approximately 70m which retains material between the A923 (northbound lane) and Birnam Walk.
- A822 Dunkeld Junction Retaining Wall extending to approximately 75m which retains material between the realigned A822 and habitat on the Ancient Woodland Inventory (AWI).
- Birnam Retaining Wall (ch3500 to ch3850) extending to approximately 350m which retains material between the northbound mainline carriageway and the Highland Main Line railway.
- River Braan Retaining Wall (ch4360 to ch4510) extending to approximately 150m and which retains material between the southbound mainline carriageway and footpath for WCH.
- Inver Mill Lade Culvert Retaining Wall (ch4870 to ch4980) extending to approximately 110m and forming part of the Inver Mill Lade Culvert extension and which also provides footpath access for WCH.

1.5.44 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.

Bridges

1.5.45 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.

1.5.46 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.

1.5.47 Typical bridge construction procedures are summarised as follows.

Bridge Foundations

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

1.5.49 Pad footings require excavation to a suitable founding soil strata, and then laying a concrete layer reinforced with steel. The abutment or piers can then be constructed with reinforced concrete. Once abutments or piers have been cast, excavations are backfilled with acceptable material.

1.5.50 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 to be cast in reinforced concrete. 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

1.5.51 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.

1.5.52 The River Tay crossing will require bespoke temporary works to construct. The method used will most likely be incremental launch method (ILM) which pushes the new superstructure from one end to the other using hydraulic equipment. The foundations and sub structure are constructed using traditional methods for reinforced concrete. The launching side will most likely be on the North pushing to the South. This is due to availability of working room on the North side. A sizeable cutting will be required on the North side to establish the temporary works needed to erect the bridge using this method.

1.5.53 The South pier of the Tay crossing is close to the River Tay SAC boundary and as such the Contractor will need to ensure that the works do not encroach into the River Tay SAC. To achieve this the Contractor will be required to setup a River Tay SAC buffer zone to provide separation from the River Tay SAC boundary within which no works can take place.

1.5.54 The location of the South pier will require extensive earthworks to gain access to it to allow construction equipment such as piling rigs to reach the works. Once the pier has been constructed the access route can be reinstated to original levels and landscaped.

Overbridges and Underbridges

1.5.55 Overbridges accommodate roads which pass above the mainline. These are generally open structures requiring foundation construction; abutment and pier construction; deck construction; and finishes. No overbridges are included in the proposed scheme.

1.5.56 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. Underbridges are included in the proposed scheme.

1.5.57 Overbridges and underbridges are not differentiated in this EIA with all such structures referred to as bridges.

Murthly Estate Bridge

1.5.58 This new structure will carry the A9 dual carriageway over a new road providing access to Murthly Estate from the B867.

1.5.59 As the new structure is to be located beneath the existing alignment, it is proposed to divert A9 traffic onto a temporary carriageway to the west of the existing alignment to enable a more efficient construction method to be utilised. The temporary diversion is likely to require the installation of a temporary sheet piled wall to retain the temporary alignment during excavation.

1.5.60 It is expected that the majority of construction of the Murthly Estate structure would be undertaken within the proposed footprint of the A9 and associated Sustainable Urban Drainage Scheme (SuDS) pond, with small additional areas required for working room. However, measures should be put in place to avoid any damage to the existing tree lined track during construction.

1.5.61 Following installation of the temporary retaining wall, excavation to formation level of the structure will commence. If a piled a foundation is required, the piles will need to be installed prior to excavation of the area for pile cap construction. The remaining sections of this arch structure are to be constructed using precast elements which can be lifted straight into position. Following the arch construction, the permanent retaining walls across the arch can be installed. Upon completion of the structure, and following backfill operations, the A9 can be re-aligned over the new structure and the access road to the underpass completed.

1.5.62 While the Murthly Estate underbridge is beginning construction, the associated SuDS pond can be constructed in parallel.

Birnam Junction

1.5.63 This new structure will carry the A9 dual carriageway over the realigned B867/Perth Road.

1.5.64 To enable a safe working area for the construction of the new bridge, the existing A9 is proposed to be diverted onto a temporary alignment to the west of the proposed bridge location. It is also proposed that access between Perth Road and the A9 is maintained during construction of the bridge via a temporary junction south of the existing Perth Road junction onto the southbound carriageway.

1.5.65 It is anticipated that the majority of the construction of Birnam Junction could be undertaken within the proposed footprint of the junction. However, additional land would be required for the temporary road diversion and compound areas.

1.5.66 Excavation to formation level will be into rock for this structure. The rock strength and volumes to be removed will dictate the methodology required to remove it. Further ground investigation works are needed to determine rock head levels and competency.

1.5.67 On completion of the excavation to formation level, foundation works can commence on the intermediate pier bases and the abutments simultaneously. It has been assumed that a spread foundation would be required for the new structure. Construction of the abutments and the structural steelwork for the superstructure and the raking leg piers would then be completed.

1.5.68 The next stage of construction involves temporary works to support the raking leg pier steelwork and the following sequence of deck girder installation. It is anticipated that due to the size of the girders, they will need to be brought to site in shorter lengths and joined on site to achieve suitable lengths for installation. Tandem lifts will be used and with a crane being required to lift them into place. Temporary or permanent formwork will be needed between structural girders to form the bridge deck. Utilising permanent formwork allows for an in-situ concrete deck to be formed without the use of supporting falsework. Temporary shuttering will be required for the deck edge outstands.

Birnam Glen and Inchewan Burn Bridge

1.5.69 The existing A9 bridge crossing over Birnam Glen Road and Inchewan Burn is to be demolished and a new structure constructed to carry the A9 dual carriageway over them.

1.5.70 The site is significantly constrained, and Birnam Glen Road is the only vehicular access to the Birnam Glen community. During construction of the new bridge it is expected that vehicular access to Birnam Glen can be maintained, except for a series of overnight closures to enable the existing bridge beams to be removed and new girders installed.

1.5.71 The proposed construction sequence would be to build the new structure in two phases. This first phase would involve construction of the offline northbound section of the structure with A9 traffic in narrow lanes pushed towards the southbound verge over the existing structure. On completion of this section, the existing traffic flow would be transferred to the northbound lanes of the new structure. The existing bridge would then be demolished to allow construction of the southbound section of the new structure. The phasing of these works will need to be linked to the construction of Dunkeld & Birnam Station pedestrian underpass.

1.5.72 The construction of the abutments may require a temporary retaining wall adjacent to the southern edge of the existing bridge abutments to retain the embankment and allow excavation for the new abutment. Installation of a temporary retaining wall would likely require a closure of the northbound lane to provide adequate working area. Standard construction methods are proposed for the reinforced concrete abutments. Once the abutments are constructed, they can be backfilled, and the temporary retaining walls removed.

1.5.73 During construction of the substructure, primary access would likely be along Birnam Glen Road, which may impose limitations on the size of plant which can be used, with lifting support provided by cranes located in the station car park.

1.5.74 To construct the bridge deck, a series of steel plate girders are proposed to be lifted into position by a crane. Once the girders are installed and the formwork is fitted, the deck pours can be completed with minimal impact to the road network or train station.

1.5.75 Once the northbound section of the structure is complete, traffic can be diverted onto the new bridge to allow the demolition of the existing structure and construction of the southbound section of new structure to be completed. The exact method of demolition would be determined by a specialist contractor. Upon completion of the demolition works, the construction of the new southbound side of the bridge can commence alongside the construction of the southbound side of the new station underpass. The method of construction for this section of the new structure would be largely similar to that used for the northbound side.

River Braan Bridge

1.5.76 The existing A9 bridge and associated footbridge crossing over the River Braan, which is a tributary of the River Tay and forms part of the River Tay SAC, are to be demolished and a new structure constructed to carry the A9 dual carriageway over the river.

1.5.77 The new structure is to be built on the existing alignment, but raised 4m above the existing carriageway level to ensure it is above the 1 in 200 year flood level. Due to this elevation change, it is considered that the safest and most efficient construction methodology would be to divert the existing A9 onto a new temporary road bridge south of the existing bridge position. The phasing of this operation should be completed in conjunction with the construction of the Dunkeld roundabout and associated works.

1.5.78 One the existing traffic flow is transferred onto the temporary diversion, the demolition of the existing structure would be undertaken. Temporary closures/diversions of the existing pedestrian routes passing below the existing structure are likely to be required during demolition activities.

1.5.79 As this section of the River Braan forms part of the River Tay SAC, ensuring the demolition works do not harm the river is a critical concern. The likely method of demolition would be to strip all possible surfacing and street furniture from the bridge deck and cut out the deck in sections. The segments can then be lifted clear using a crane operating from the existing carriageway. These operations can produce a notable quantity of slurry and debris so a suitable encapsulated temporary crash deck which has a clear span over the river would be required to contain the waste and prevent debris falling into the river.

1.5.80 With the existing western abutment set back from the river, the demolition of this abutment is expected to be achievable working from the riverbank. The embankment would need to be excavated out behind the abutment or retained with a sheet pile wall before the abutment could be broken down. During these works there would need to be suitable measures in place to prevent waste/debris entering the river.

1.5.81 The eastern abutment is situated within the river, so to enable access to the abutment and contain the debris and slurry it is assumed that a temporary cofferdam would be required to encircle the abutment and extend into the river bank. This would need to be installed after the beams are removed. The method of demolition of should then be similar to the western abutment.

1.5.82 In addition to the road bridge the remaining abutments of the pedestrian bridge which was washed away to the south of the existing A9 structure requires removal.

1.5.83 Once the bridges have been demolished the construction of the new bridge abutments can commence. Following this, five pairs of braced steel girders are currently proposed to be installed to support the reinforced concrete deck. Due to their size, It is anticipated that the beams will be delivered in shorter sections for assembly at the installation site. The optimum installation procedure for the beams would be to lift them into place as a braced pair, with the permanent and temporary formwork attached to minimise working at height requirements and lifting carried out over the river.

1.5.84 The proposed deck is currently proposed as in-situ reinforced concrete. However, the use of precast deck units or parapet stringcourses to construct the deck is considered advantageous to remove the need for formwork and mitigate the risk of concrete leakage into the River Braan.

Dalguise Junction

1.5.85 This new structure will carry the A9 dual carriageway and northbound merge slip road over the realigned B898.

1.5.86 The majority of the footprint of the structure is offline, however, to obtain sufficient working room, it is proposed to divert the existing A9 onto a temporary alignment to the east of the proposed bridge location. By diverting the traffic flow, it is anticipated that the construction could be undertaken within the footprint of the permanent works, and will allow the majority of the Dalguise Junction layout to be constructed at the same time without the implementation of multiple traffic management arrangements.

1.5.87 Once excavation to formation level is completed, works on the substructure can commence. It is proposed that full height reinforced concrete walls on spread footings are used to form the substructure.

1.5.88 Following completion of the substructure, it is anticipated that the roof beams would be lifted into position using a crane. The deck will then be constructed.

River Tay Bridge

1.5.89 The existing structure across the River Tay is to be retained to carry the proposed northbound A9 dual carriageway over the River Tay SAC, with only minor works required to this structure.

1.5.90 The new structure will be structurally separate from the existing structure and will carry the proposed southbound A9 dual carriageway over the River Tay SAC. The River Tay and areas of the adjacent bank are within the River Tay SAC, meaning the central span must be constructed without any interaction with the river channel.

1.5.91 During construction of the new structure, narrow lanes towards the northbound side of the existing structure may be required with occasional lane closures to maintain safe working zones during certain adjacent construction activities.

1.5.92 Prior to the construction of the abutments, a contiguous pile wall would need to be installed in order to retain the existing A9 embankment. Construction of the abutments would then likely be undertaken using standard plant and methodology.

1.5.93 As the piers are close to the river channel, a cofferdam may be required to enable construction.

1.5.94 The southern bank is significantly constrained, so gaining access to construct the abutment and pier structures may be challenging, and as diverting the core path does not seem feasible in this area, the route will need to be maintained as far as practicable during construction. The northern bank does not have the same level of constraints, allowing easier access and better working area.

1.5.95 Following construction of the abutments and piers, the girders will need placed. The preferred option for this is via an incremental launch method (ILM) to launch the girders into position in three segments. The first segment would be between the northern abutment and northern pier, the second would be between the two piers, and the third would be between the southern pier and southern abutment. The temporary works required to set up the fabrication yard on the northern side of the structure will be extensive, however, undertaking the launch in three segments minimises the required temporary works.

1.5.96 It is anticipated that a series of strand jacks could be used to facilitate an incremental launch with a hydraulic skid system where the entire bridge is lifted and moved forward in small increments. To mitigate the deflection of the girders during the launch, a kingpost system could be utilised. There may also be a requirement to construct part of the reinforced concrete bridge deck to increase the counterweight further.

1.5.97 The construction of the reinforced concrete deck could be completed using either precast or in-situ construction. The use of precast deck panels could provide temporary ballast for the cantilevered section during the launch. Another notable advantage of precast deck panels is they could be constructed progressively from the abutments and would provide a working platform for crane lifts as the deck progresses to the centre of the main span with reduced curing times required. This also minimises the number of concreting operations to be carried out over the River Tay SAC. If in-situ construction was used, progressive construction from each end of the bridge would likely to be required due to difficulty accessing the central span and proximity of the existing A9 structure.

Dunkeld & Birnam Station Pedestrian Underpass

1.5.98 The Dunkeld & Birnam Station Pedestrian Underpass will include lift/stair cores providing access to Platform 1 and Platform 2 with above platform enclosures housing the lift and stairs on each platform.

1.5.99 The Dunkeld & Birnam Station Pedestrian Underpass will be constructed under the main alignment providing pedestrian access from the Dunkeld & Birnam Station Replacement Car Park to Dunkeld & Birnam Station. The underpass will comprise precast concrete box sections and due to the interface with the existing A9, will need to be constructed in stages.

1.5.100 The first phase of construction would be to construct the replacement station car park to allow vehicular access to the station during the underpass works. The replacement station car park works includes a contiguous piled retaining wall adjacent to residential properties. The second phase starts on the western section of the pedestrian underpass within the existing station car park. Excavation to formation level would require temporary sheet piles to be installed between the existing A9 and the existing railway. Precast box sections would then be lifted into position, the area would then be backfilled, and the new road construction completed on top. Similarly for the lift/stair cores, excavation support will be needed.

1.5.101 The pedestrian underpass is proposed to service both Platform 1 and Platform 2 and so the section to Platform 2 requires an agreed possession/blockade of the Highland Main Line railway and would likely involve the temporary removal of the tracks, excavation, and placement of the pre-cast units before backfilling, replacing the track and handing back into operation.

1.5.102 During construction a temporary pedestrian footbridge will be required between the Dunkeld & Birnam Station Replacement Car Park and Platform 1 of Dunkeld & Birnam Station to maintain access for pedestrians to the station.

Culverts

1.5.103 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.

1.5.104 Appendix A19.3 (Watercourse Crossings Report), provides more information on the design approach for culverts and provides sketches of each culvert structure. The proposed scheme crosses 16 watercourses of which 13 will be culverted, the other three being traversed by bridges (Inchewan Burn (WF08), River Braan (WF11) and River Tay (WF06). In summary, these are:

- WF01: Existing 1.8m diameter culvert to be extended upstream.
- WF02: Existing 0.72m diameter culvert to be unchanged.
- WF05: Existing 0.6m diameter culvert to be extended upstream.

- WF05A: Existing A9 1.0m culvert to be extended upstream and downstream, existing 1.0m rail and side road culvert extended and existing access track culvert unchanged. Creation of open channel sections.
- WF07: Replacement of existing culvert with a 1.8m diameter culvert and creation of open channel section.
- WF09: Proposed 1.8m diameter culvert and existing 0.6m diameter culvert to be retained and extended upstream. Provision of a box culvert (1.5m x 1.0m) to act as a flood relief culvert.
- WF12 (Mill Lade): Existing box culvert (2.0m x 3.5m) unchanged. New outlet headwall.
- WF12A: Existing 1.05m diameter culvert unchanged.
- WF12B: Existing 1.2m diameter culvert to be replaced with realigned 1.8m diameter culvert and extended upstream.
- WF13: Replacement of existing 1.0m diameter culvert with realigned and extended (upstream and downstream) box culvert (1.8m x 2.7m).
- WF14: Upstream extension of existing 1.2m diameter culvert.
- WF16: Replacement and extension (upstream and downstream) of existing 1.1m diameter culvert with 1.2m diameter culvert.
- WF18: Replacement of existing 0.77m diameter culvert with box culvert (1.5m x 1.8m).

1.5.105 The proposed 14 flood relief culverts north of the River Braan crossing will most likely be precast 3.6m x 1.2m box sections spaced 5m apart founded on structural fill and then backfilled at an invert level of 52.1mAOD. The end sections of the culverts will be precast structures providing a suitable finish and appearance which will be exposed. The construction of these culverts will be offline as a temporary diversion route will have been established to bypass the construction of the River Braan crossing. A further three flood relief culverts are included at Inver which convey additional floodwater within the Inver floodplain through the A9 carriageway into the River Tay. These are likely to be 1.5m diameter culverts.

1.5.106 The Habitats Regulations Appraisal (HRA) for the proposed scheme (Jacobs 2025) provides more detail on the general arrangement, construction methods and proposed mitigation for watercourse structures that have the potential to impact the River Tay SAC and protected species to ensure that there are no implications for the conservation objectives and no Adverse Effects on Site Integrity for the River Tay SAC identified from the proposed scheme, either alone or in-combination with other plans and projects.

1.6 Land Requirements

Land Required During Construction

1.6.1 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

1.6.2 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. It is expected that a main compound would be used for all three sections with smaller offices established within each section and further satellite compounds setup at larger areas of works such as the Tay crossing.

Additional Works Areas

1.6.3 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

1.6.4 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 existing A9 may be diverted at various points along the route for up to 100 weeks during construction to facilitate its construction and associated structures.

Other Works

1.6.5 Other works may require temporary land and will be identified by the appointed Contractor as their detailed design is developed. A review to identify land requirements for the construction of the proposed scheme has been undertaken to ensure sufficient land is included in the Boundaries of the Site.

Clearance of Site on Completion

1.6.6 Clearance of the site on completion of the works will normally involve small dumpers, excavator/loaders and lorries to remove and dispose of surplus material and generally make good any work areas.

Land Required for the Permanent Footprint

1.6.7 The main requirements for land required for the permanent footprint 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; and

- land required for other environmental mitigation, such as landscape and ecological planting.

1.6.8 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.

1.7 Public Access, Site Access and Traffic Management

Access Routes for Construction Traffic

1.7.1 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 for which they 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

1.7.2 During construction, temporary traffic management will be required to undertake the works, whilst minimising disruption to users of the active road network. The Contractor will produce a traffic management plan that will include measures to avoid or reduce disruption to the road traffic. The plan will include consideration of the timing of works, the location of haul roads to reduce site traffic on the public roads and a well-maintained traffic management system with sweeping of roads to reduce construction debris on the carriageway.

1.7.3 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.

<u>Lane Requirements</u>

1.7.4 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.

1.7.5 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.

1.7.6 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 Including Temporary or Permanent Road Closures or Diversions

1.7.7 It is generally proposed that the network connection works be constructed within the typical working hours as set out in paragraph 1.2.2, 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.

1.7.8 An example of where overnight closure and alternative access is required during bridge construction is at Birnam Glen road. The construction of the Birnam Glen and Inchewan Burn Bridge will require limited temporary overnight closure of access to the Birnam Glen community during works such as demolition of existing structure and placing of bridge decks. The Contractor will be obligated through the contract to ensure access for emergency services to the Birnam Glen community during these times.

1.7.9 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. Areas such as Station Road adjacent to Dunkeld & Birnam Railway Station will require the noise levels to be monitored and may be time restricted due to the proximity to residential properties.

1.7.10 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 Trunk Road Operating Company. A Temporary Traffic Order giving the requisite notice will be prepared and a statutory notice placed in local newspapers.

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

Temporary Carriageway

1.7.12 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 their 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

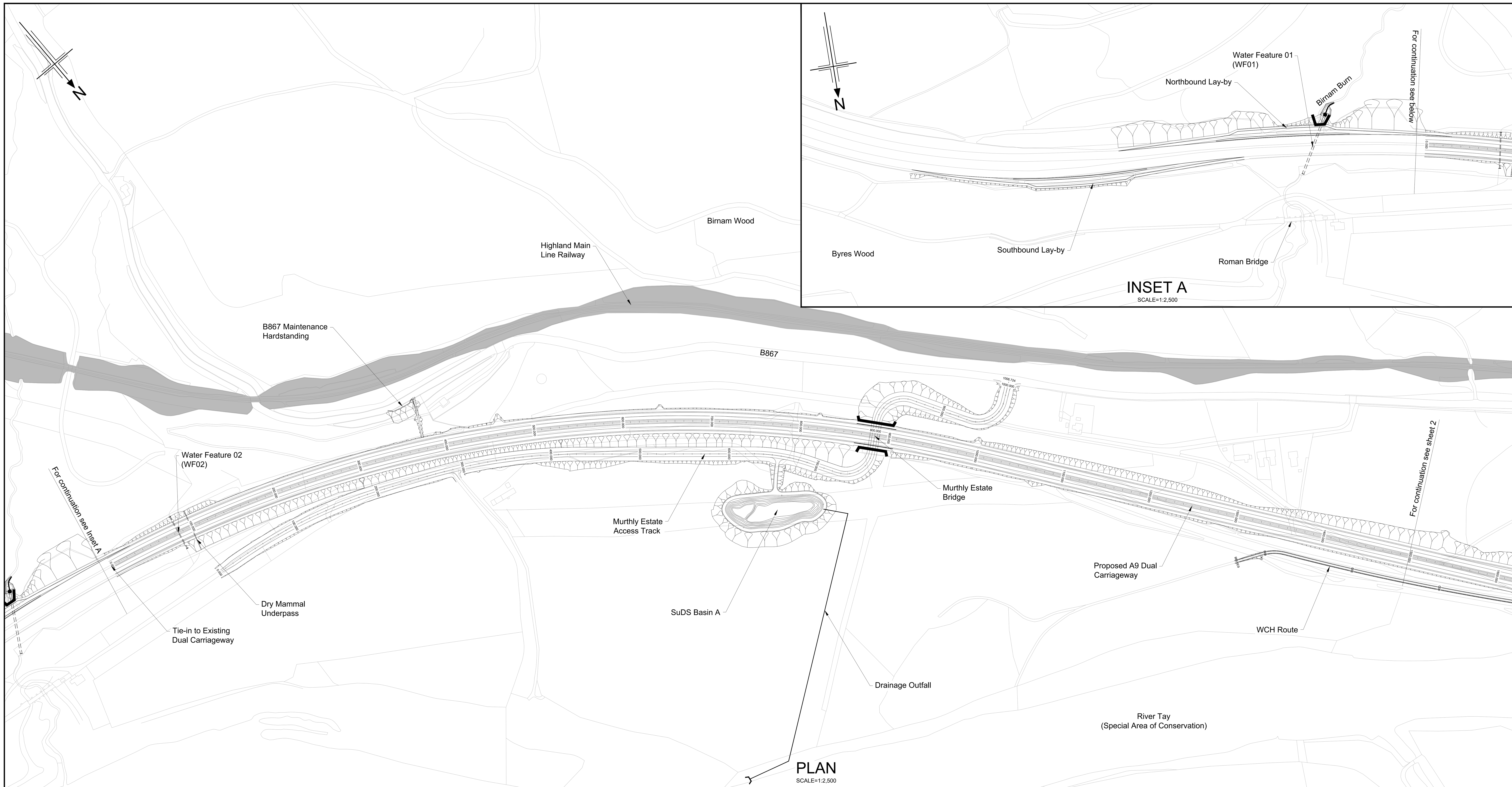
1.7.13 The Contractor's detailed proposals for traffic management will only be confirmed after discussions with Transport Scotland, Police Scotland, where applicable Perth and Kinross Council, and the relevant Road Operating Company.

1.7.14 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.

1.8 References

Jacobs (2025). A9 Dualling Pass of Birnam to Tay Crossing Habitats Regulations Assessment.

Annex A: DMRB Stage 3 Plan and Profile Drawings



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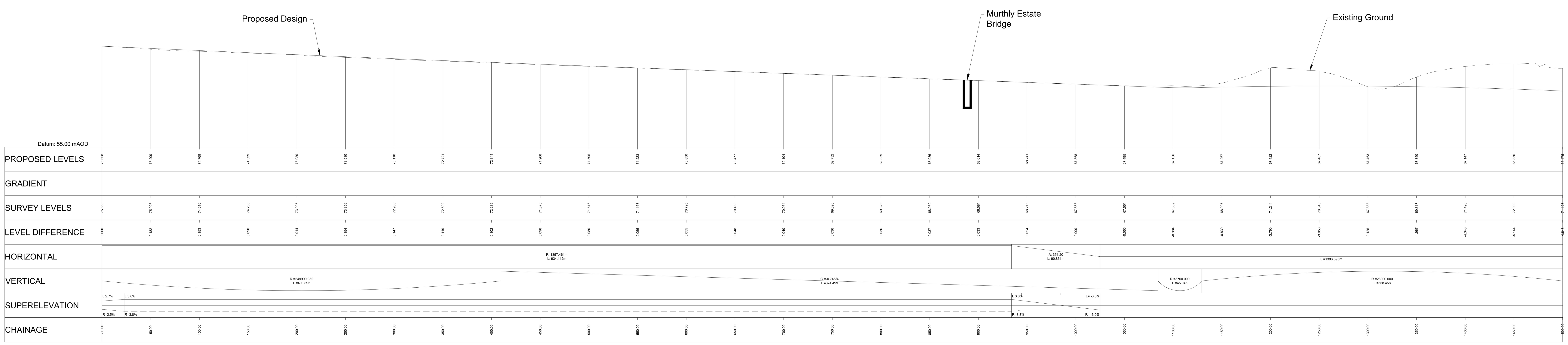
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



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P05	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P06	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3 PASS OF BIRNAM TO TAY CROSSING PLAN AND PROFILE CH. 0 - CH. 1500

Drawing status: S4 - ISSUED FOR STAGE APPROVAL

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Jacobs No.	B2140002
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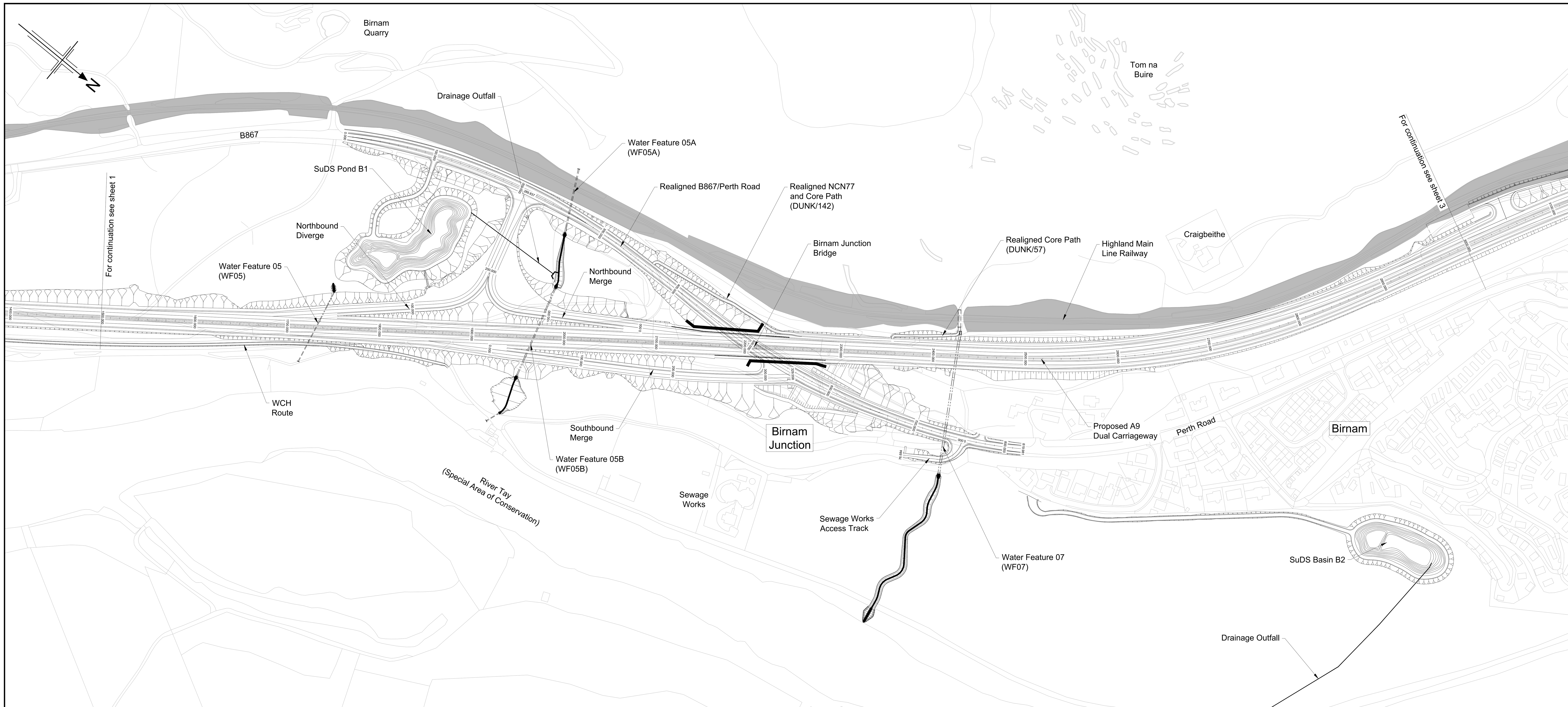

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- Retaining Wall Structure
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- Highland Main Line Railway

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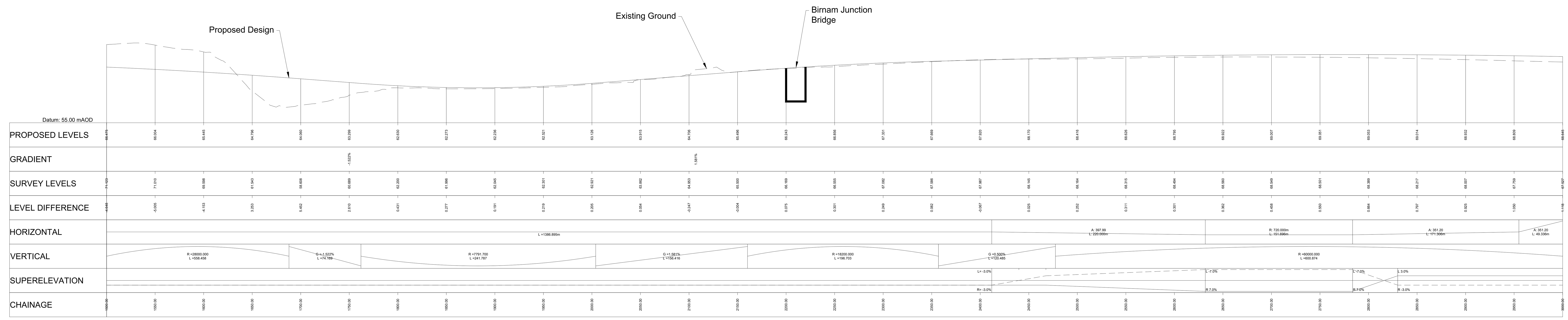

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Client

TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project

A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
CH. 1500 - CH. 3000

Drawing status

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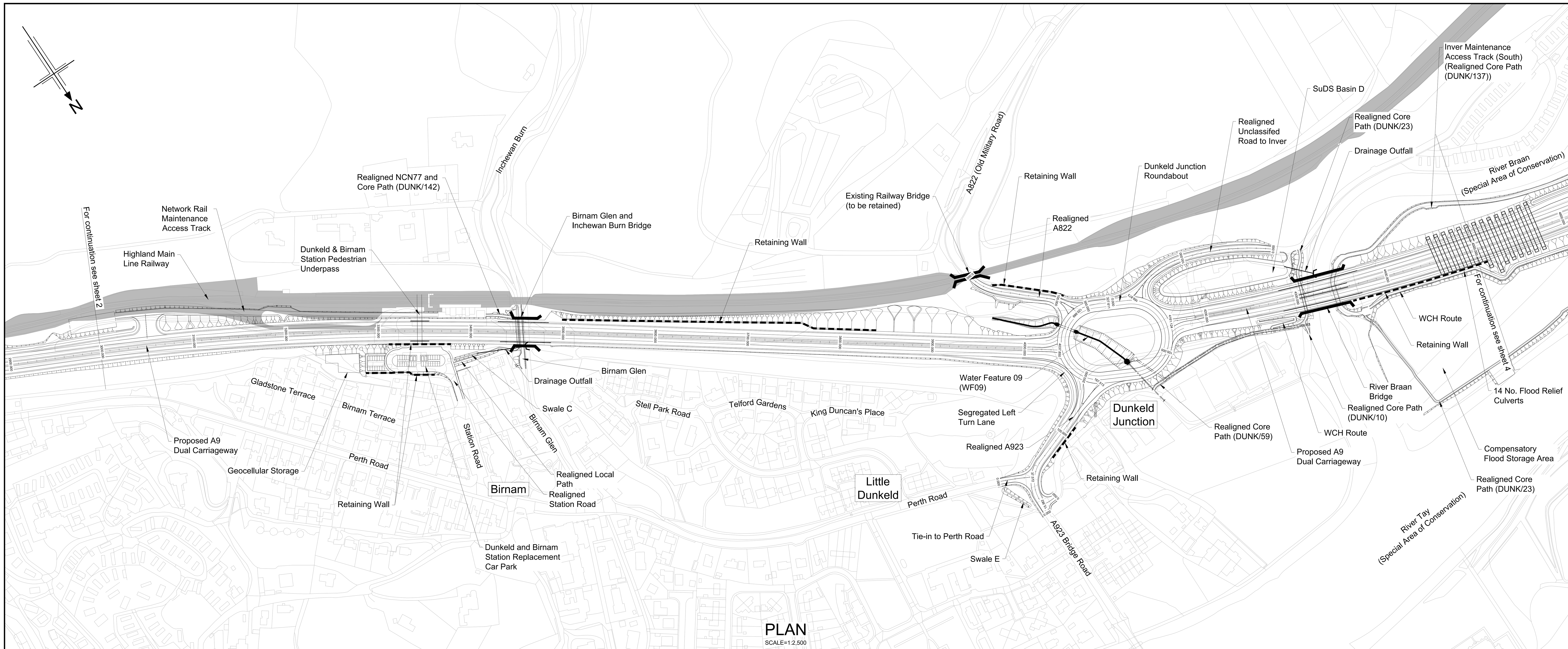

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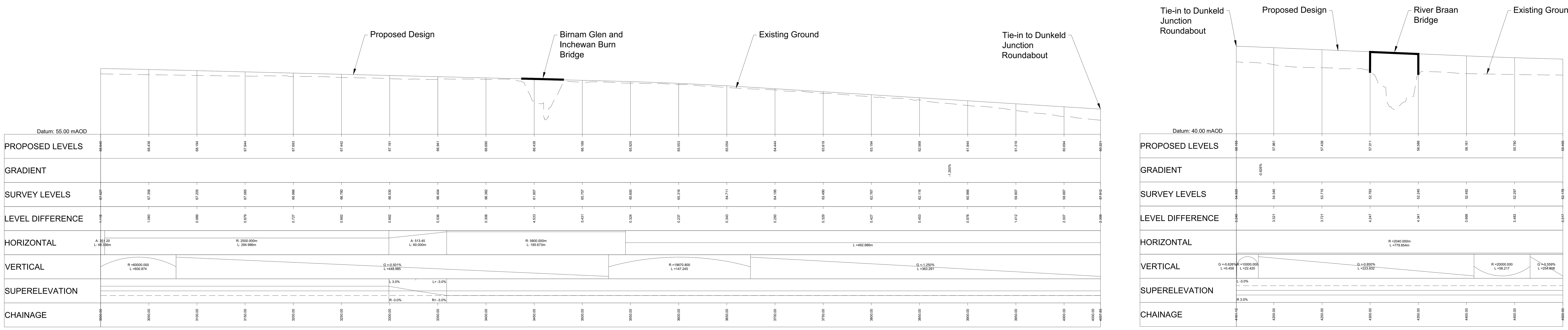

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Designer: Jacobs

Client: Transport Scotland / Còmhdhail Alba

Project: A9 Dualling – Pass of Birnam to Tay Crossing

Drawing title

DMRB STAGE 3 PASS OF BIRNAM TO TAY CROSSING PLAN AND PROFILES CH. 3000 - CH. 4500

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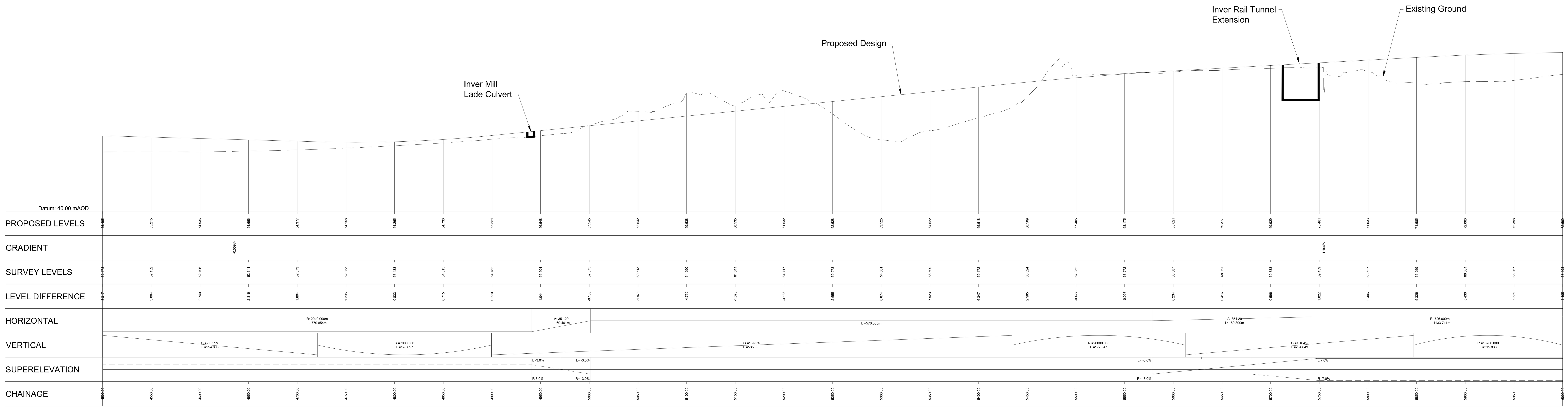

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Designer: Jacobs

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Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
CH. 4500 - CH. 6000

Drawing status: S4 - ISSUED FOR STAGE APPROVAL

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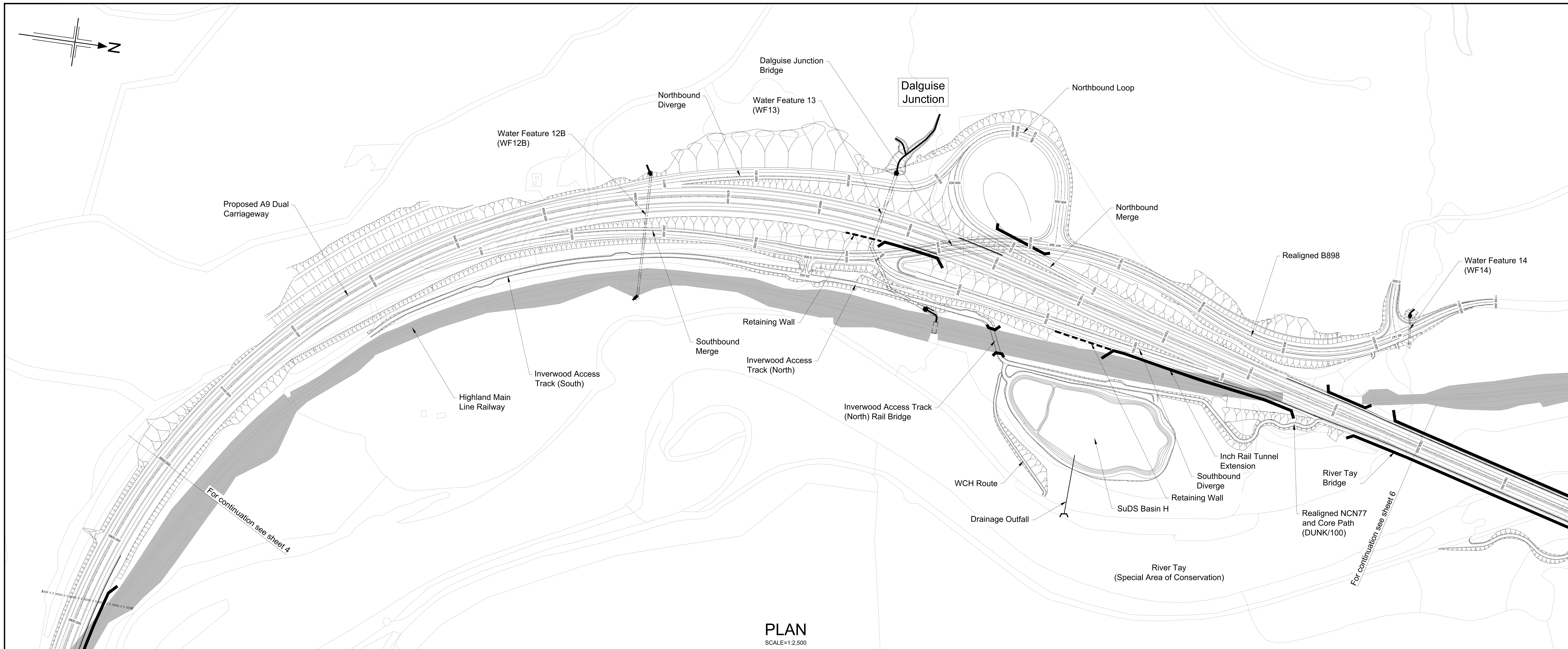

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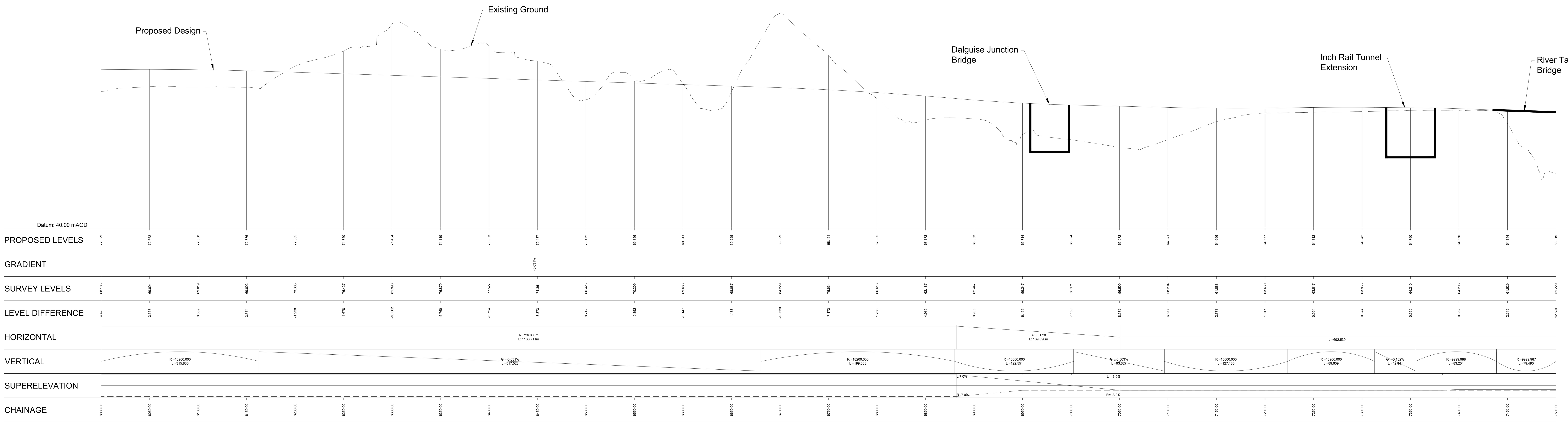

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Designer:
Jacobs

Client
TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project
A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title
DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
CH. 6000 - CH. 7500

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Drawing number
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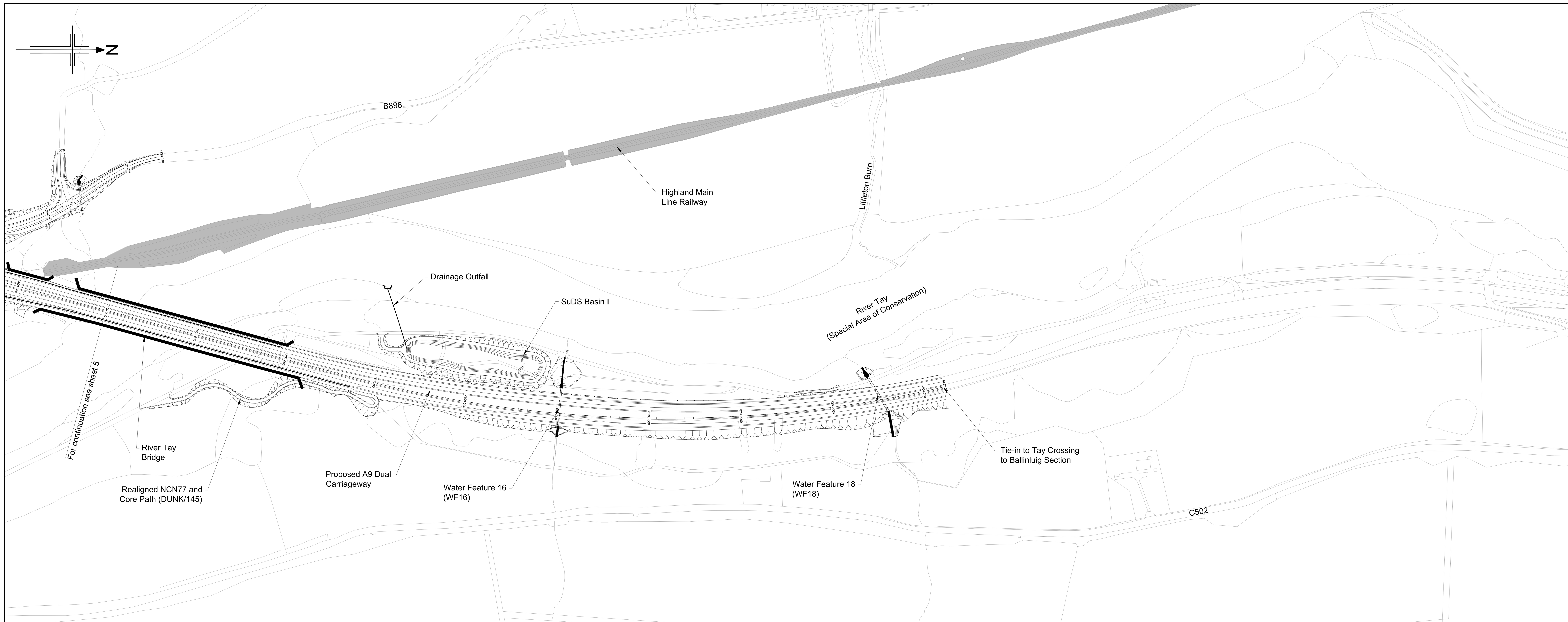
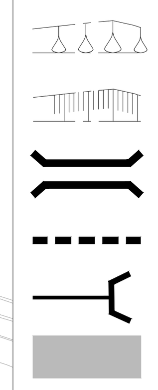
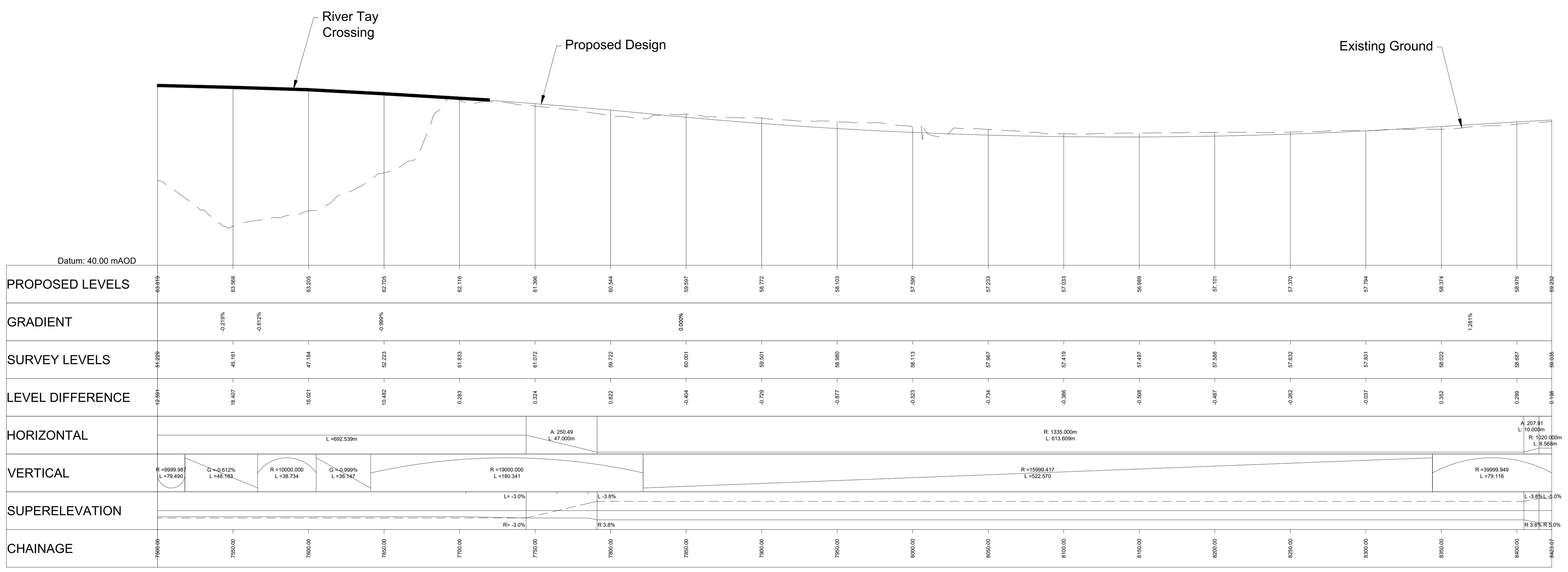


PLAN
SCALE=1:2,500

Legend:





PROFILE
HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	23/11/18	ISSUED FOR INFORMATION	SA	LW	AB	AB
P02	26/08/19	ISSUED FOR INFORMATION	SA	DM	AB	AB
P03	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P04	02/05/25	ISSUED FOR INFORMATION	CK	AB	MP	MP
P05	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P06	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

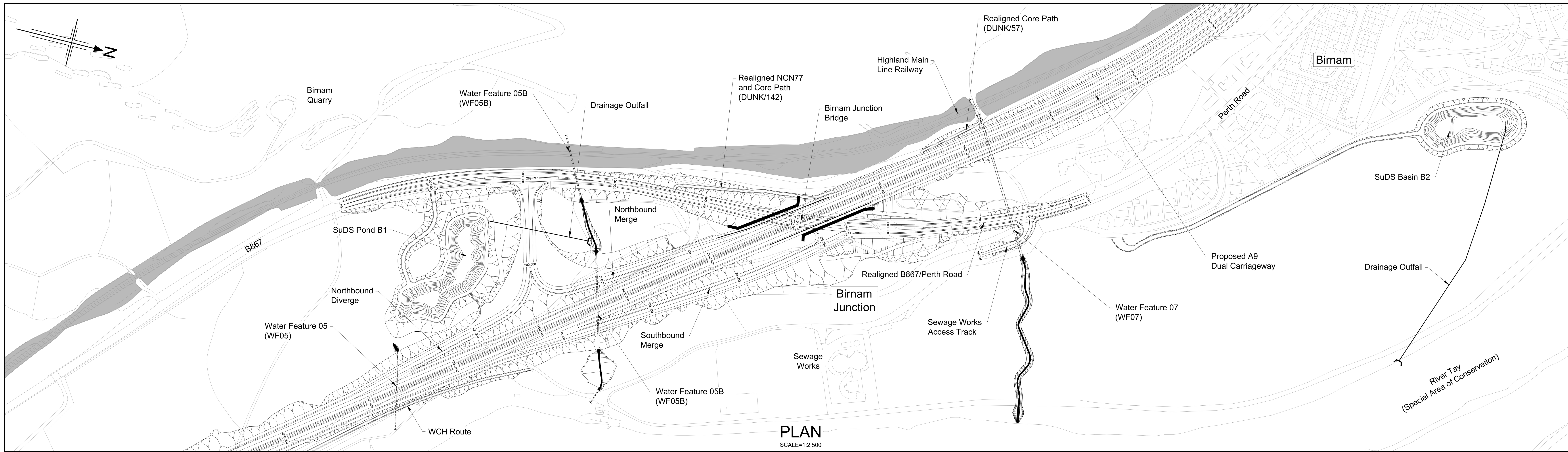
Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
CH. 7500 - END

Drawing status
S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary	DO NOT SCALE
Scale	AS SHOWN	
Jacobs No.	B2140002	Rev P06
Client no.	TS/MTRIPS/SER/2013/03	

Drawing number
PIN A9P02 - Originator JAC - Volume HML-
Location D_ML075_ML - Type DR - Role RD - Number 0006

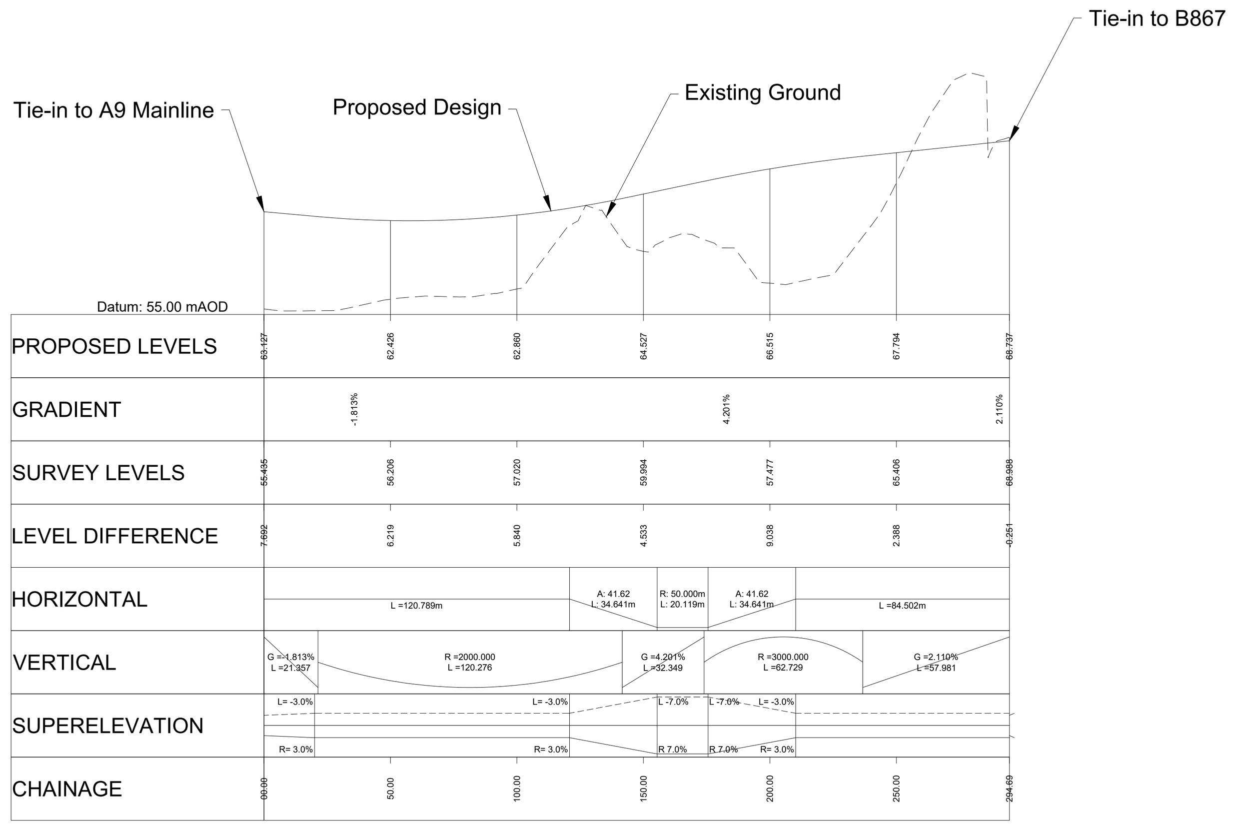


PLAN

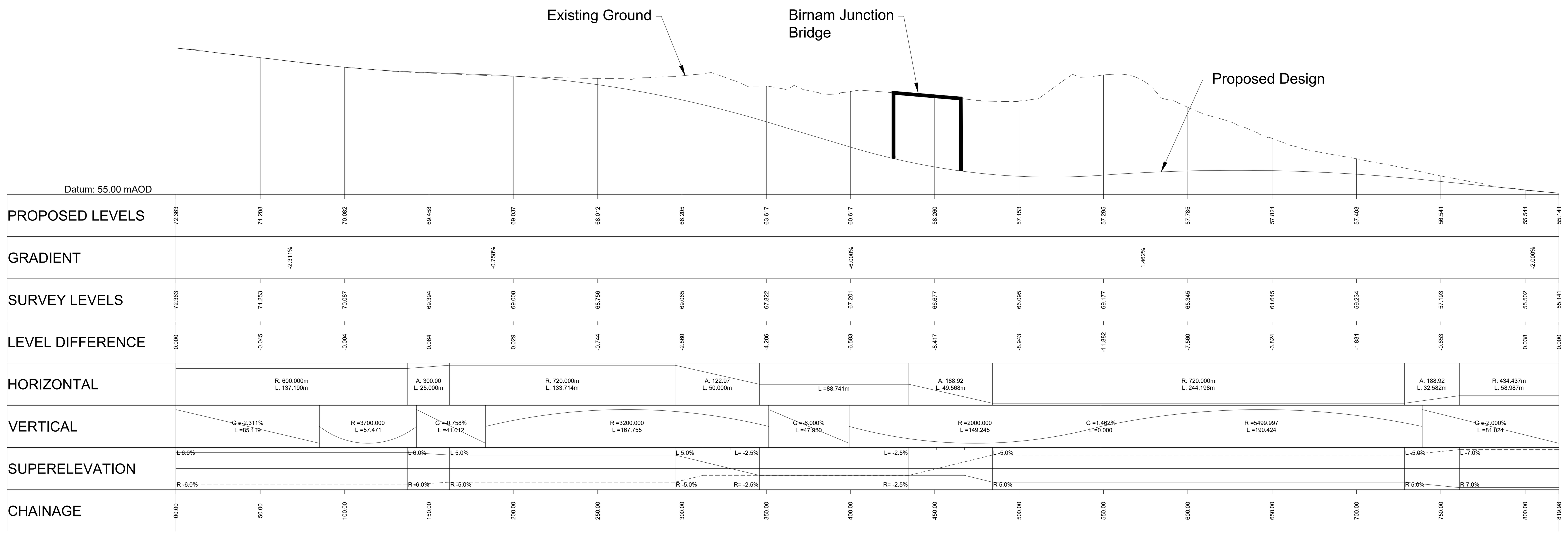
SCALE=1:2,500

Legend:

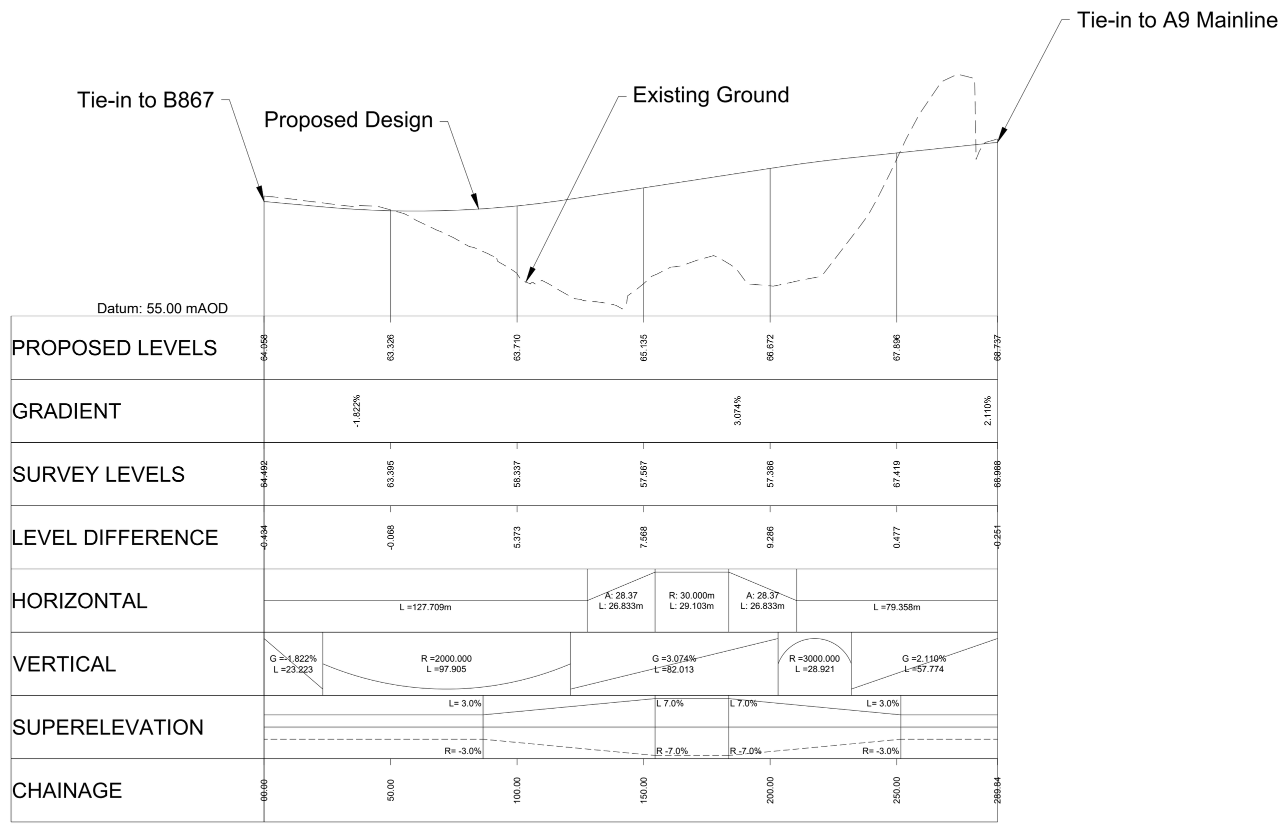
- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



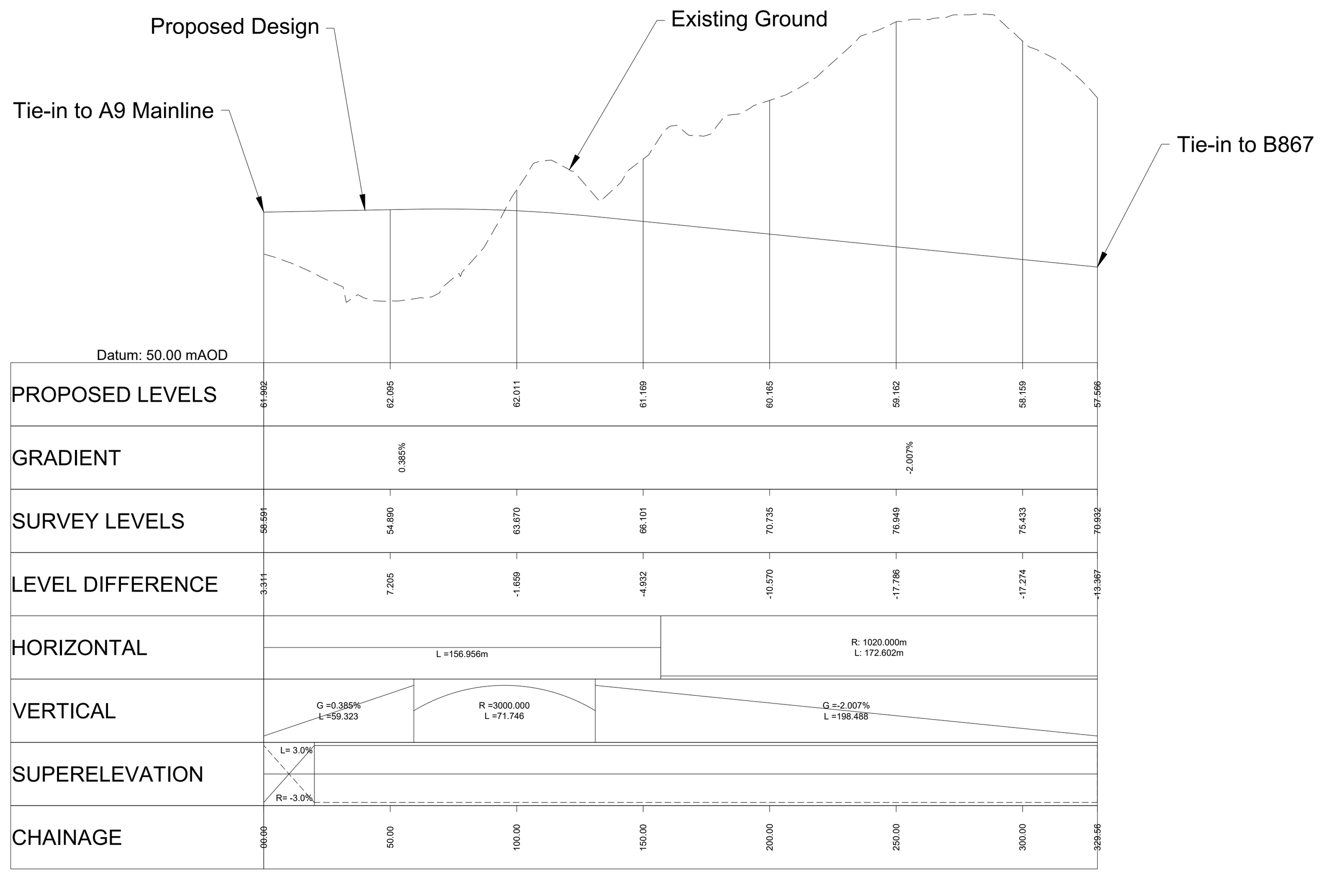
Birnam Junction
Northbound Diverge



Birnam Junction
Realigned B867/Perth Road



Birnam Junction
Northbound Merge



Birnam Junction
Southbound Merge

PROFILES

HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	02/05/25	ISSUED FOR INFORMATION	CK	AB	MP	MP
P03	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P04	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer:

Jacobs

Client

TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project

A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILES
BIRNAM JUNCTION

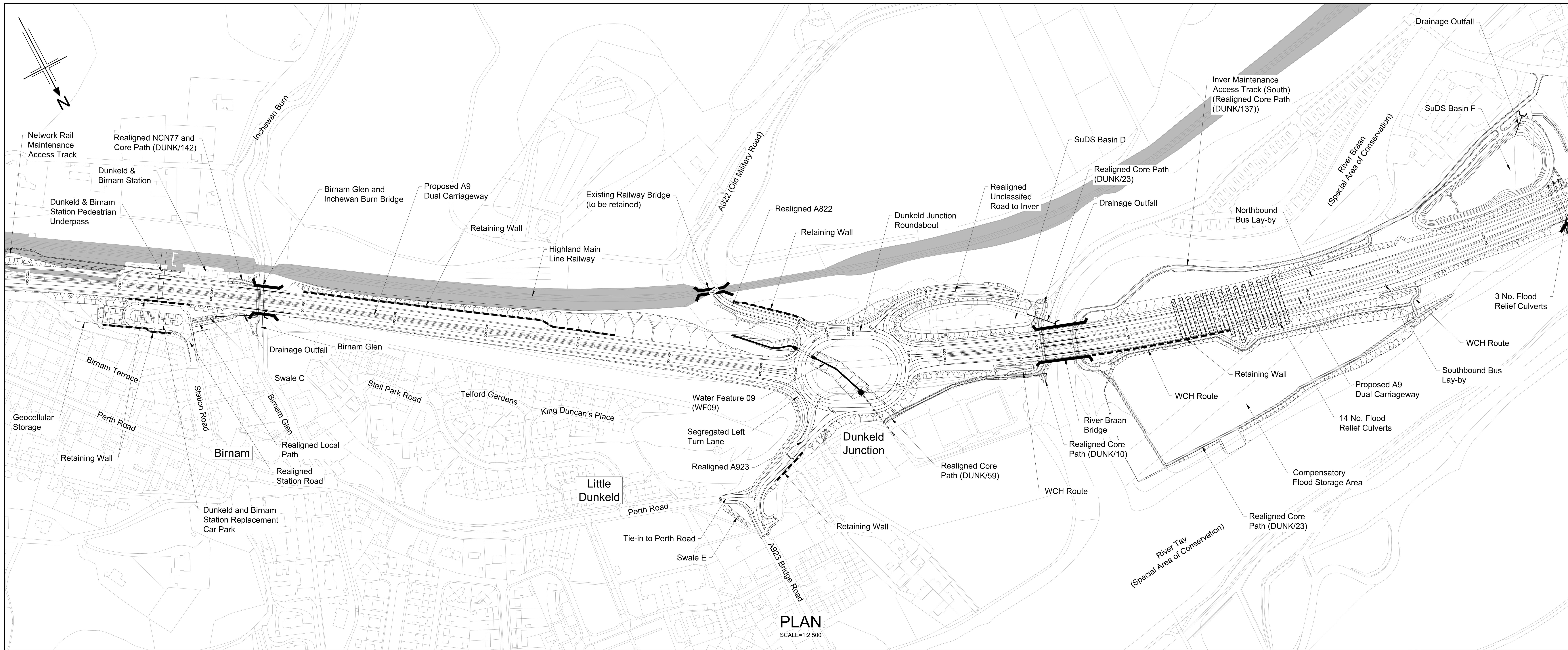
Drawing status

S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary	DO NOT SCALE
Scale	AS SHOWN	
Jacobs No.	B2140002	Rev P04
Client no.	TS/MTRIPS/SER/2013/03	

Drawing number

PIN A9P02 - Originator JAC - Volume HML - Location D_JC01A_JC - Type DR - Role RD - Number 0001

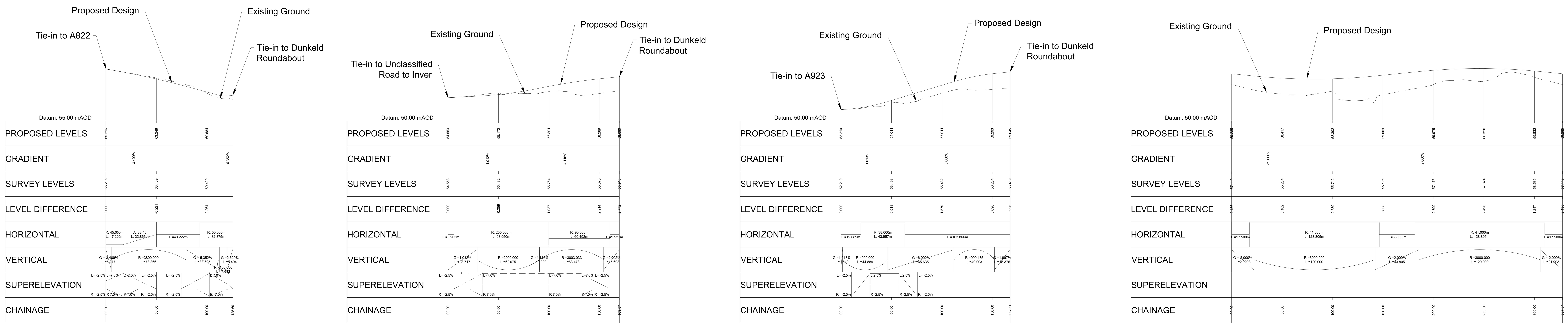


PLAN

SCALE=1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



Dunkeld Junction
Realigned A822

Dunkeld Junction
Realigned Unclassifed Road to Inver

Dunkeld Junction
Realigned A923

Dunkeld Junction
Roundabout

PROFILES

HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	02/05/25	ISSUED FOR INFORMATION	CK	AB	MP	MP
P03	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P04	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer:

Jacobs.

Client

TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project

A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILES
DUNKELD JUNCTION

Drawing status

S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

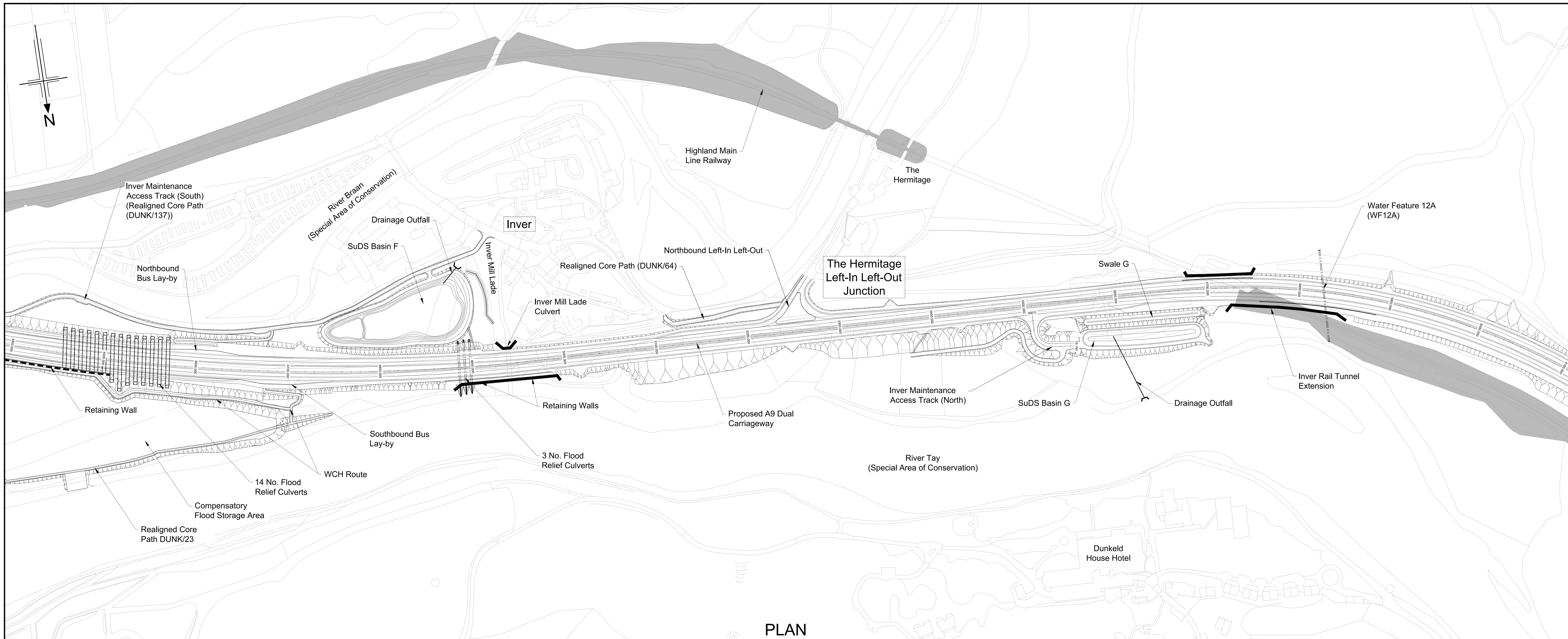
DO NOT SCALE

Rev P04

Drawing number

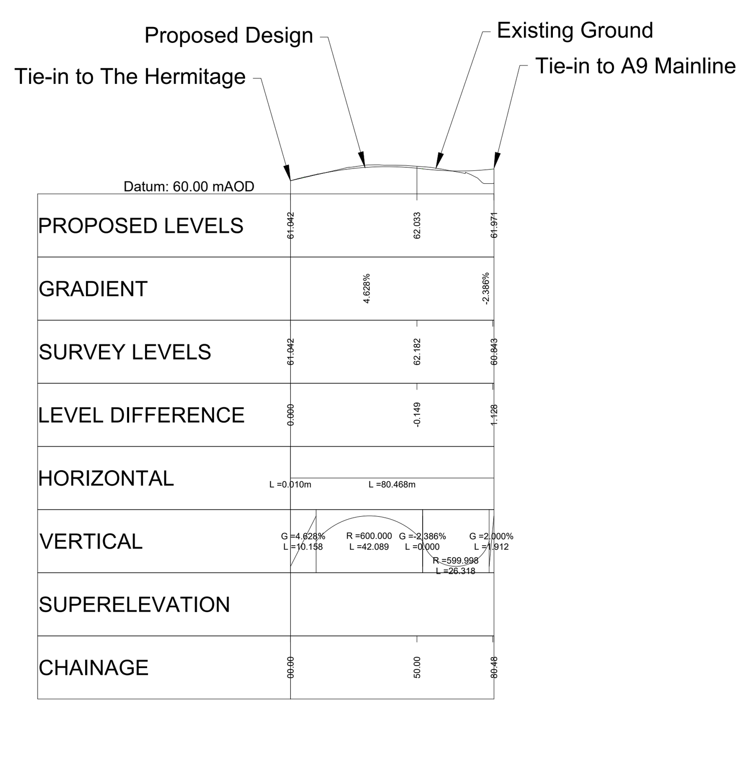
PIN | Originator | Volume | Location | Type | Role | Number

A9P02 - JAC - HML- D_JC02A_JC -DR-RD-0001



PLAN

SCALE=1:2,500



The Hermitage Junction

PROFILE

HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	02/05/25	ISSUED FOR INFORMATION	CK	AB	MP	MP
P03	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P04	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: Transport Scotland

Project: A9 Dualling – Pass of Birnam to Tay Crossing

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
THE HERMITAGE JUNCTION

Drawing status

S4 - ISSUED FOR STAGE APPROVAL

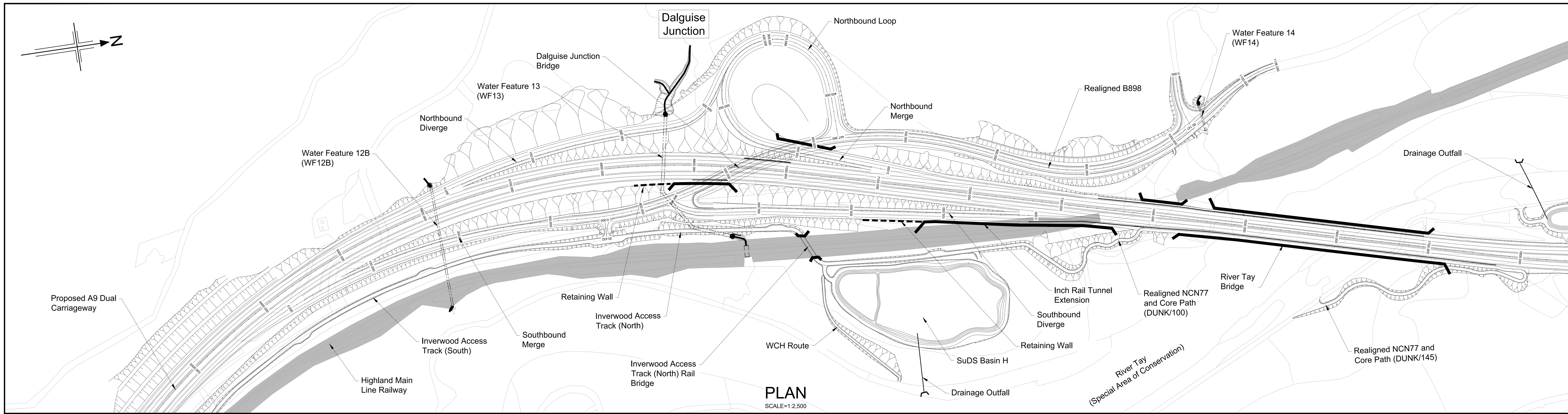
State	Preliminary
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

DO NOT SCALE

Rev P04

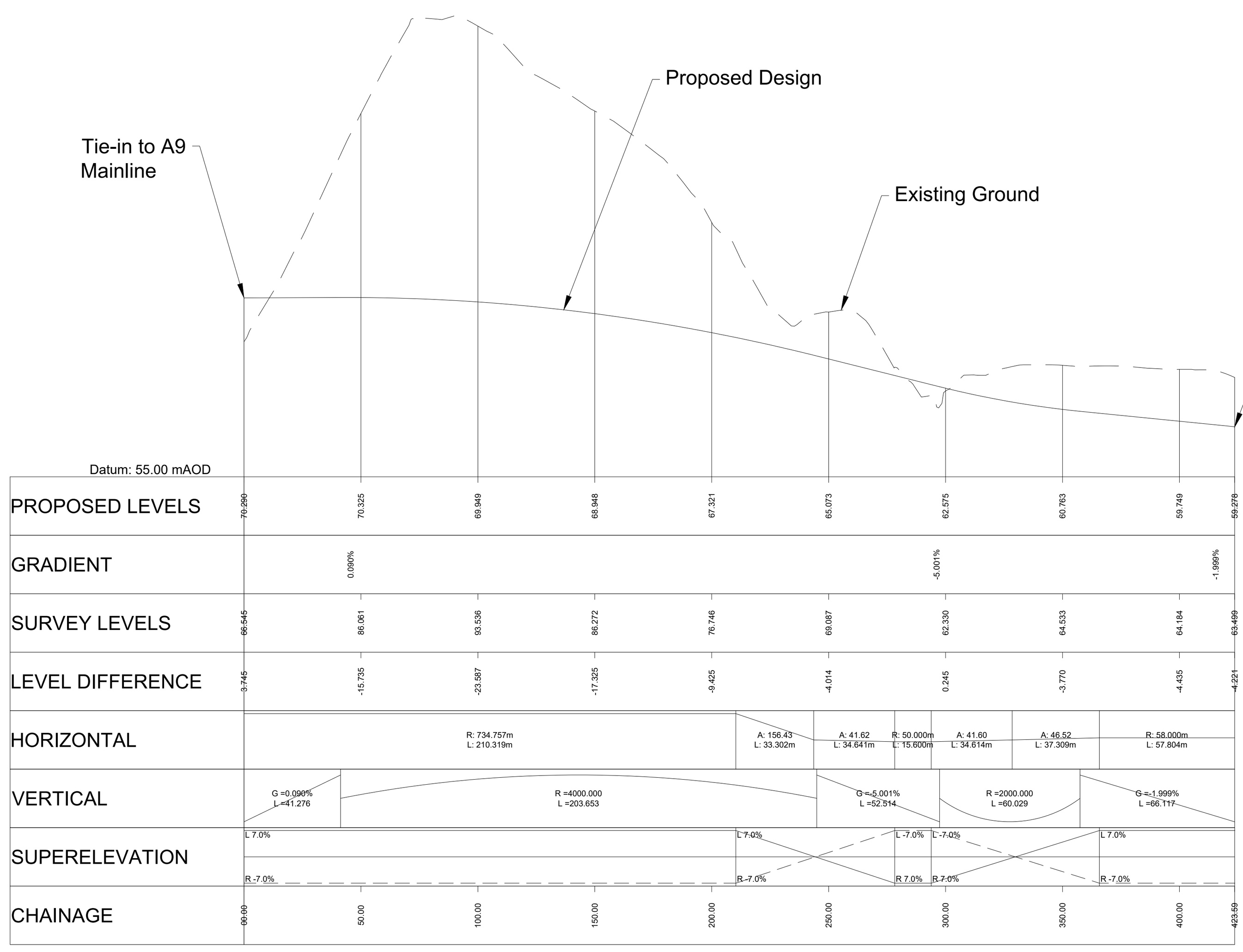
Drawing number

A9P02 - JAC - HML - D_JC03A_JC -DR-RD-0001

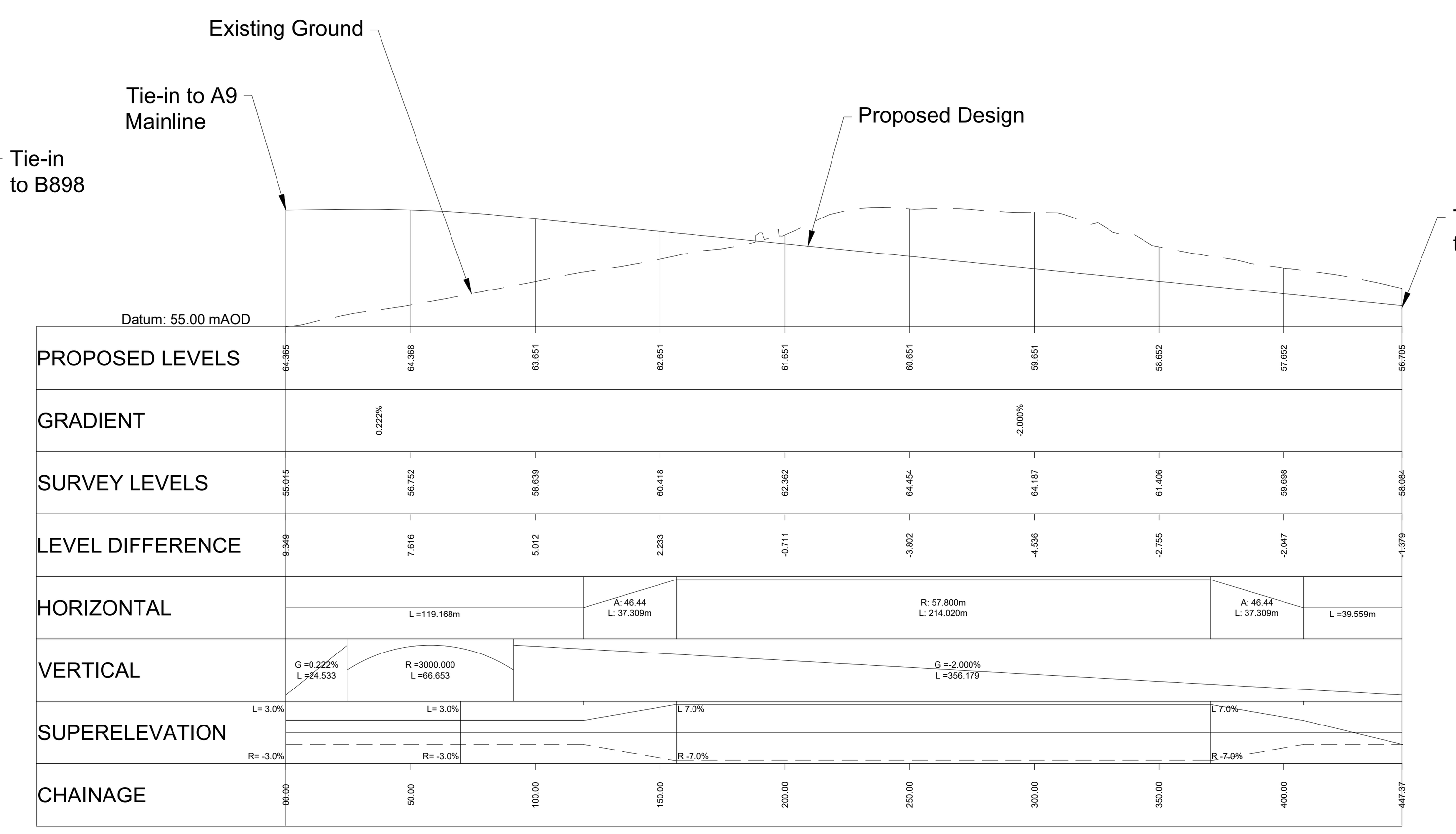


Legend:

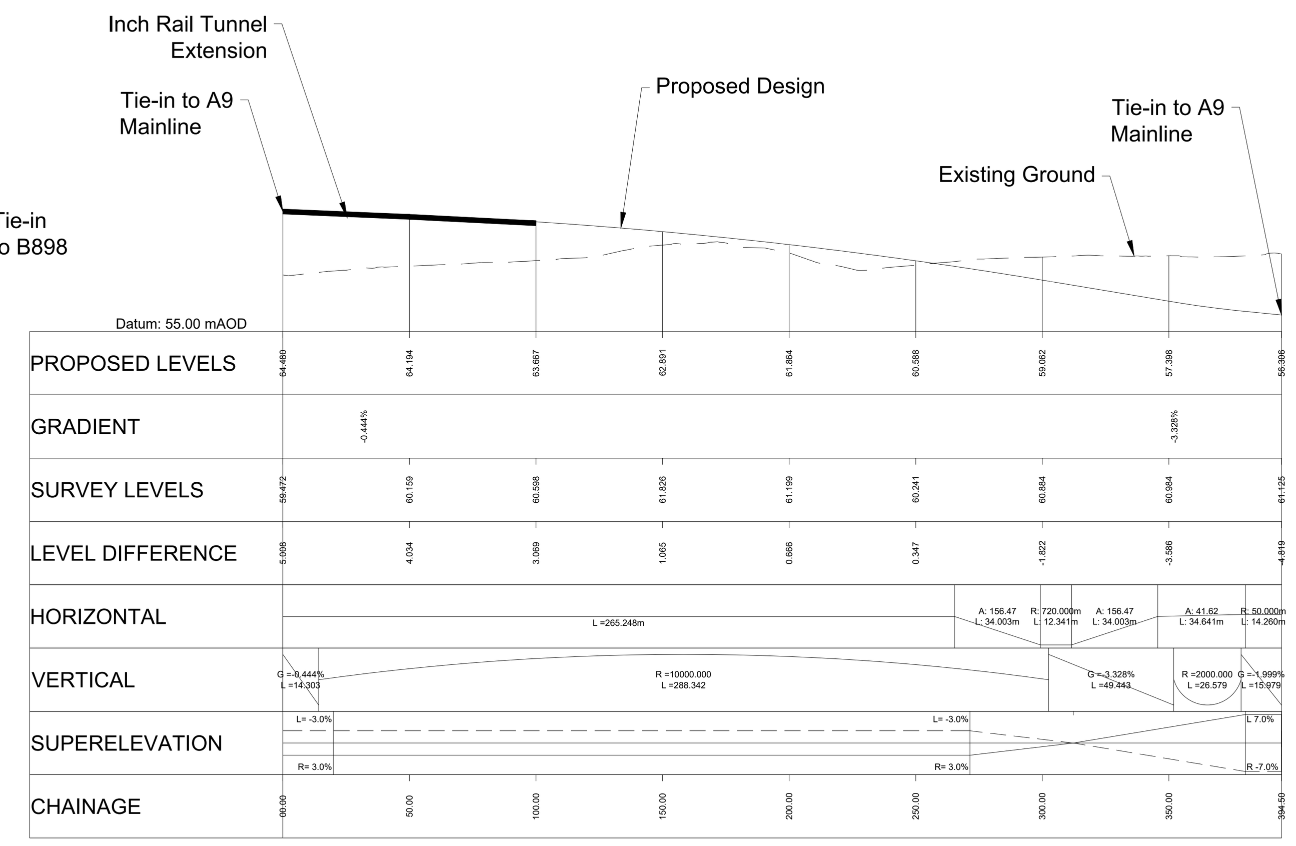
- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



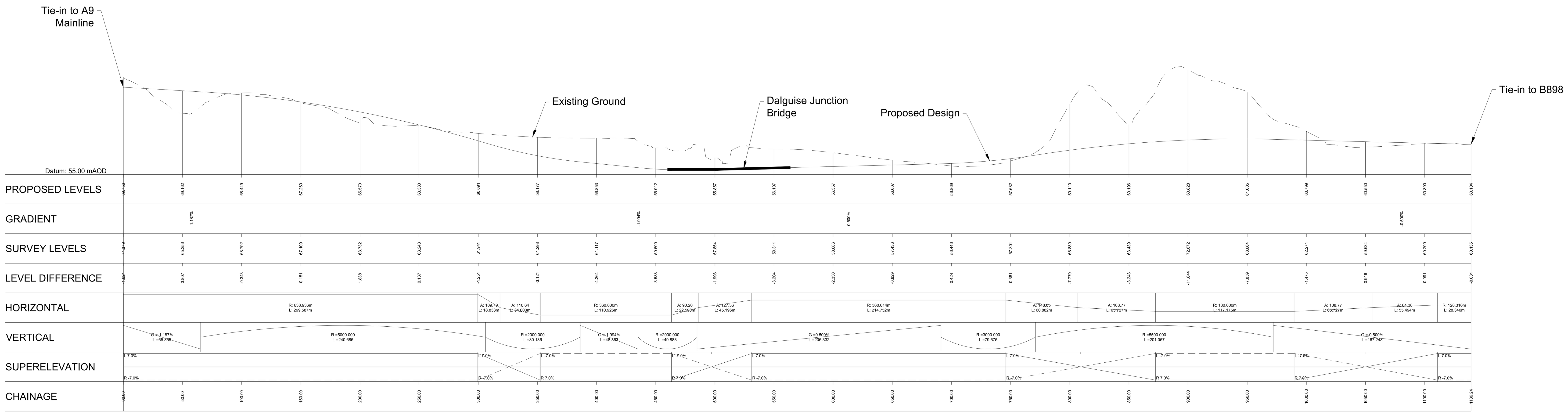
Dalguise Junction
Northbound Diverge



Dalguise Junction
Northbound Merge



Dalguise Junction
Southbound Diverge



Dalguise Junction Southbound Merge (Ch. 0 - Ch. 227)
and B898 (Ch. 227 - End)

PROFILES
HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	02/05/25	ISSUED FOR INFORMATION	CK	AB	MP	MP
P03	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P04	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

Drawing title
DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILES
DALGUISE JUNCTION

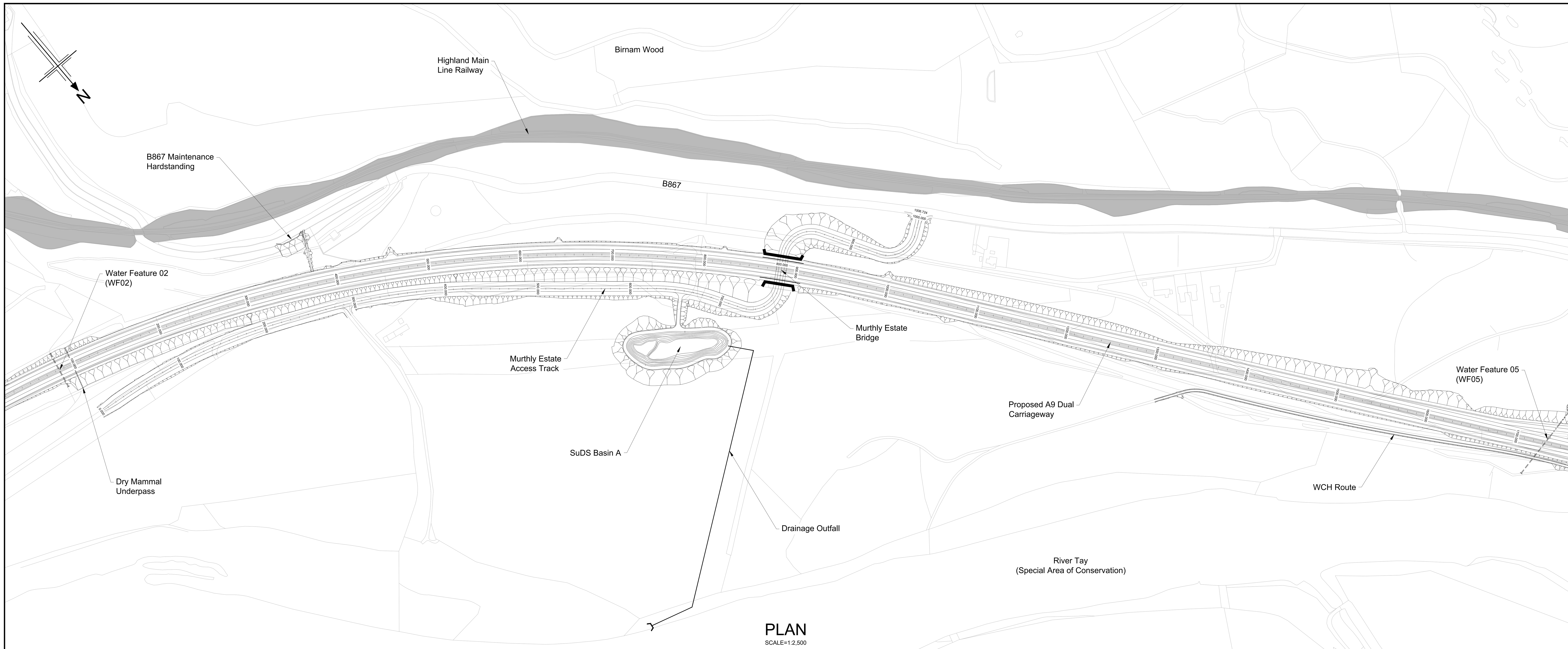
Drawing status
S4 - ISSUED FOR STAGE APPROVAL

State	Construction
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

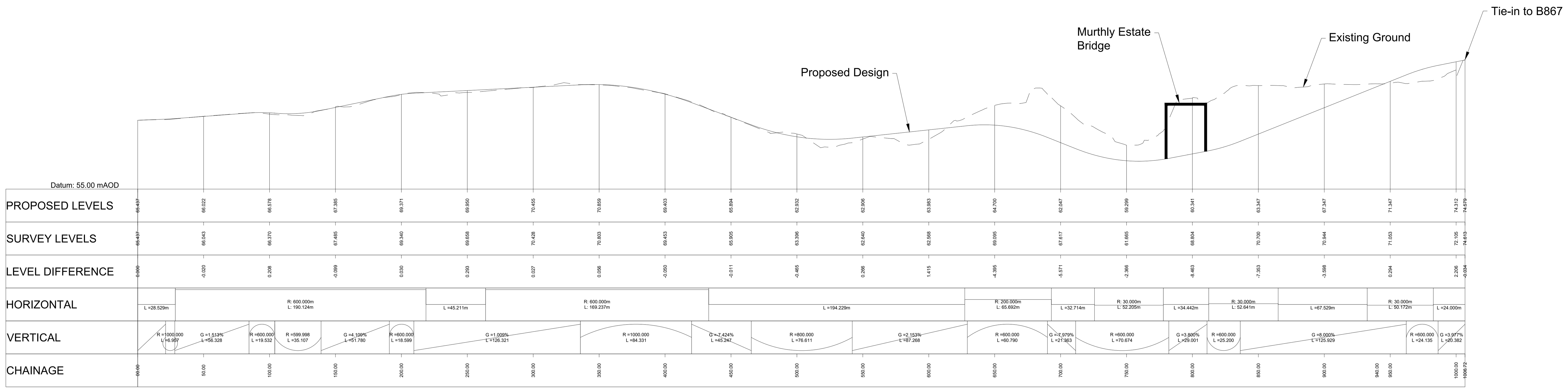
DO NOT SCALE

Rev P04

Drawing number
PIN A9P02 - Originator JAC - Volume HML - Location D_JC04A_JC - Type DR - Role RD - Number 0001



PLAN
SCALE=1:2,500



Murthly Estate Access Track

PROFILE
HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P03	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer:
Jacobs

Client
TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project
A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title
DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
MURTHLY ESTATE ACCESS TRACK

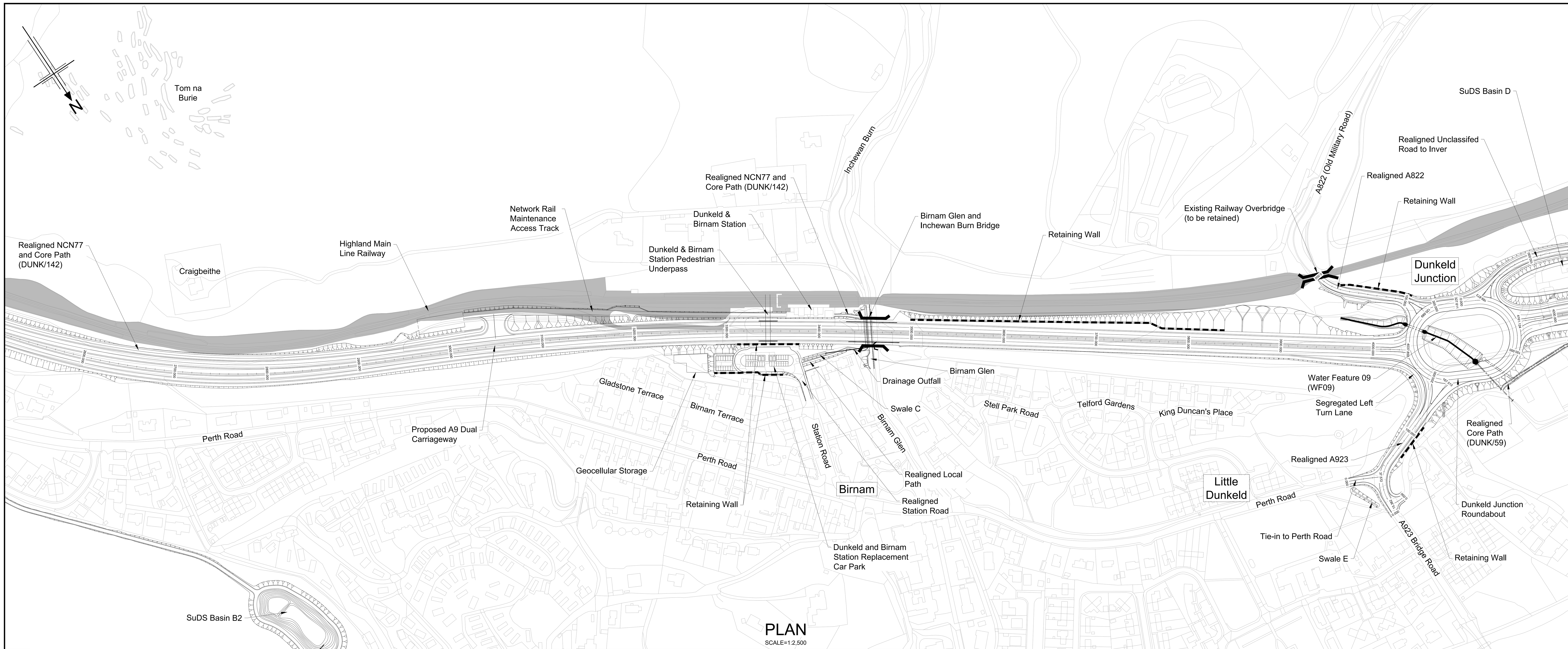
Drawing status
S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

DO NOT SCALE

Rev P03

Drawing number
PIN A9P02 - Originator JAC - Volume HSR - Location D_SR001_AC - Type DR - Role RD - Number 0001

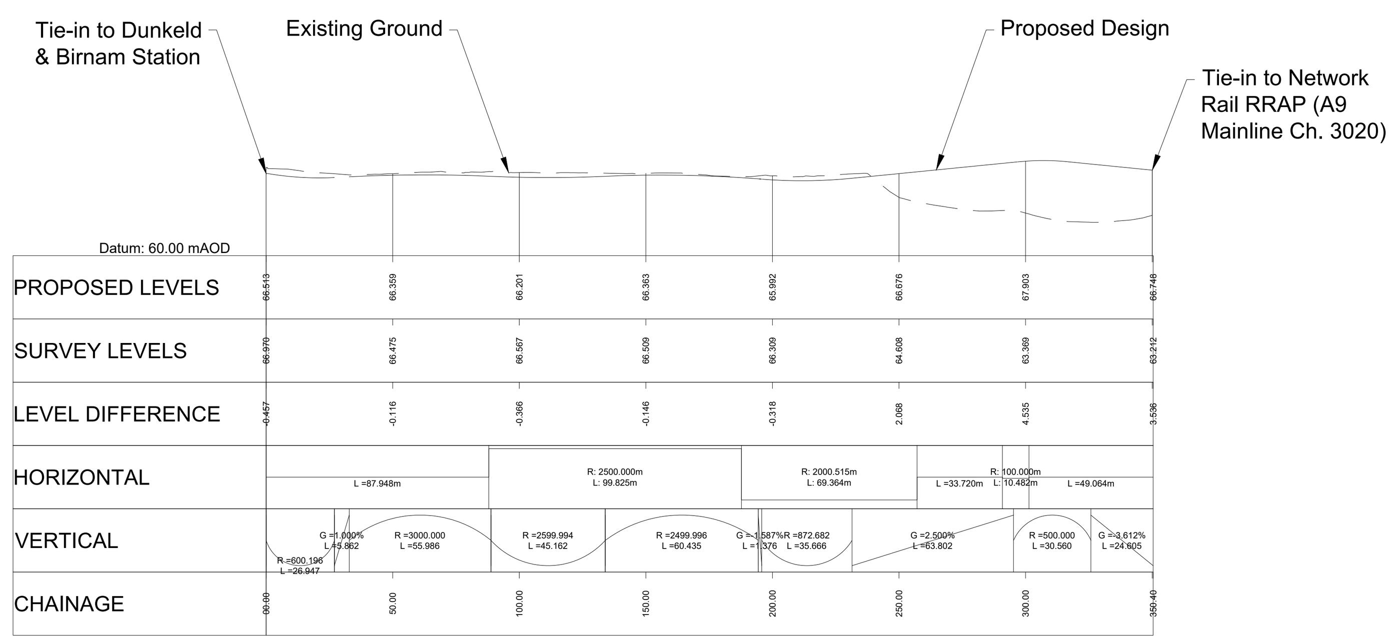


PLAN

SCALE=1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



Network rail Maintenance Access Track

PROFILE

HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P02	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3

PASS OF BIRNAM TO TAY CROSSING

PLAN AND PROFILE

NETWORK RAIL MAINTENANCE ACCESS TRACK

Drawing status

S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

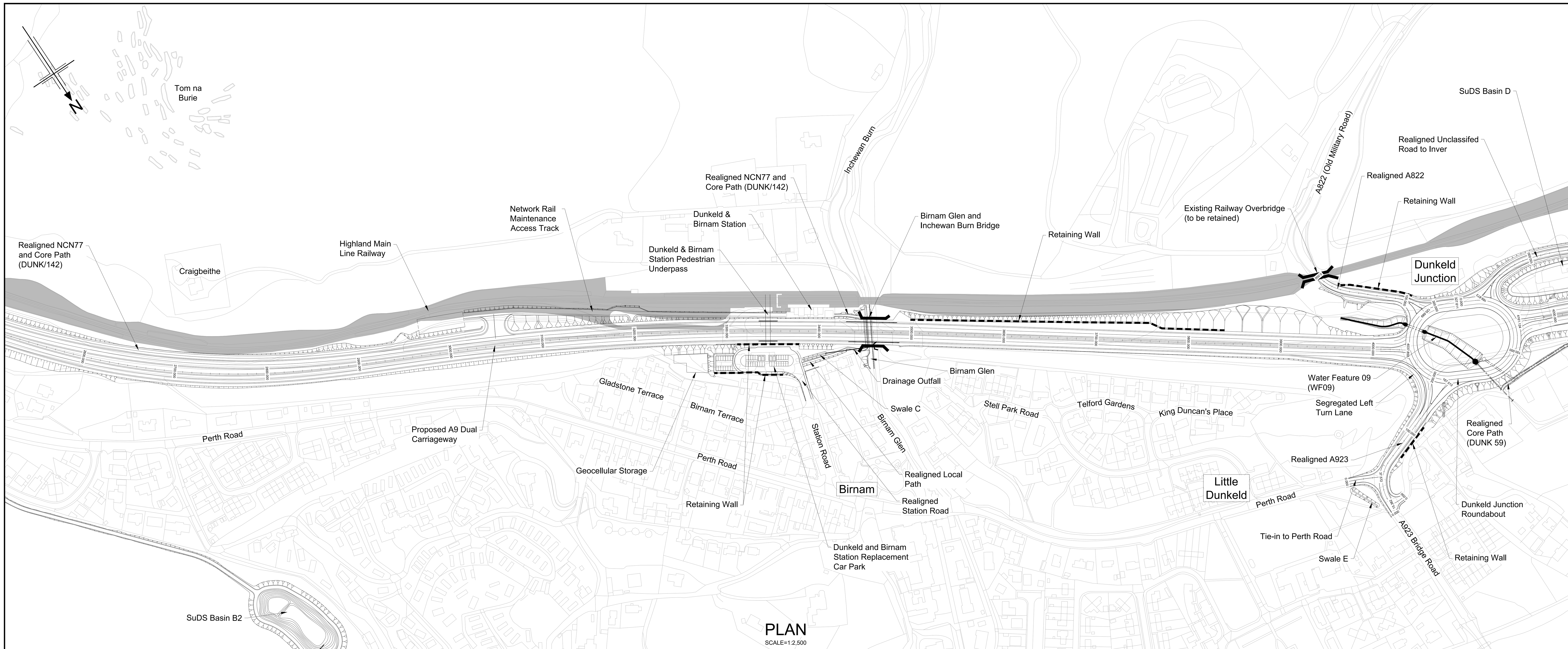
DO NOT SCALE

Rev P02

Drawing number

PIN A9P02 - Originator JAC - Volume HSR - Location D_SR034_AC - Type DR - Role RD - Number 0001

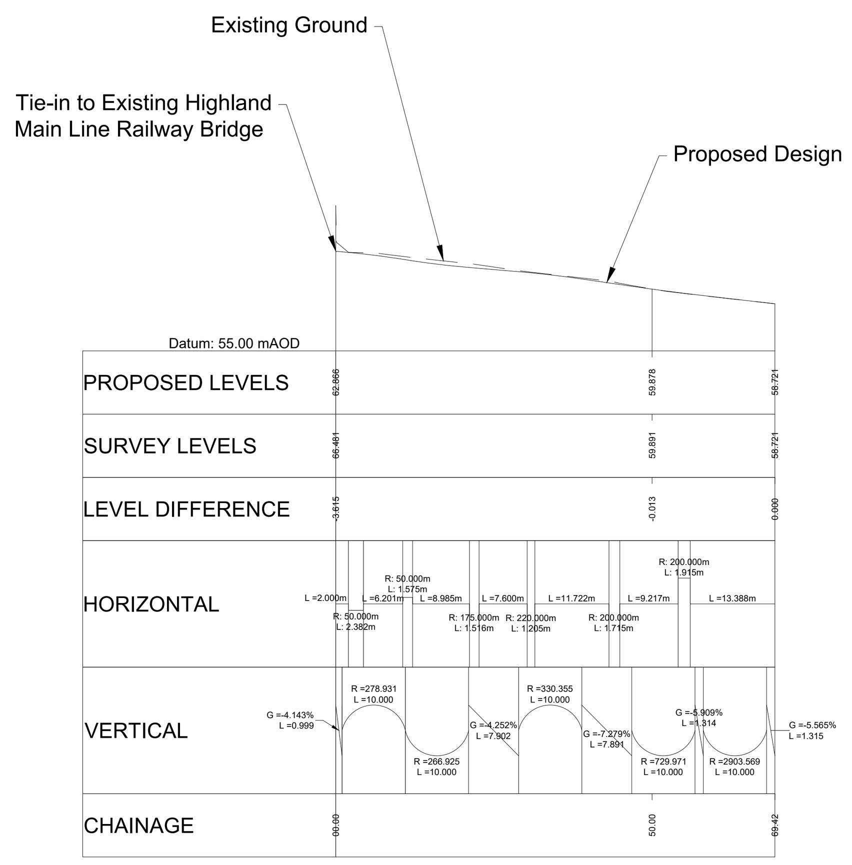
A9P02 - JAC - HSR - D_SR034_AC -DR-RD-0001



PLAN
SCALE=1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



Birnam Glen

PROFILE
HORIZONTAL SCALE = 1:1000
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P03	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer:
Jacobs

Client
TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project
A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title
DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
BIRNAM GLEN

Drawing status
S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary
Scale	AS SHOWN
Jacobs No.	B2140002
Client no.	TS/MTRIPS/SER/2013/03

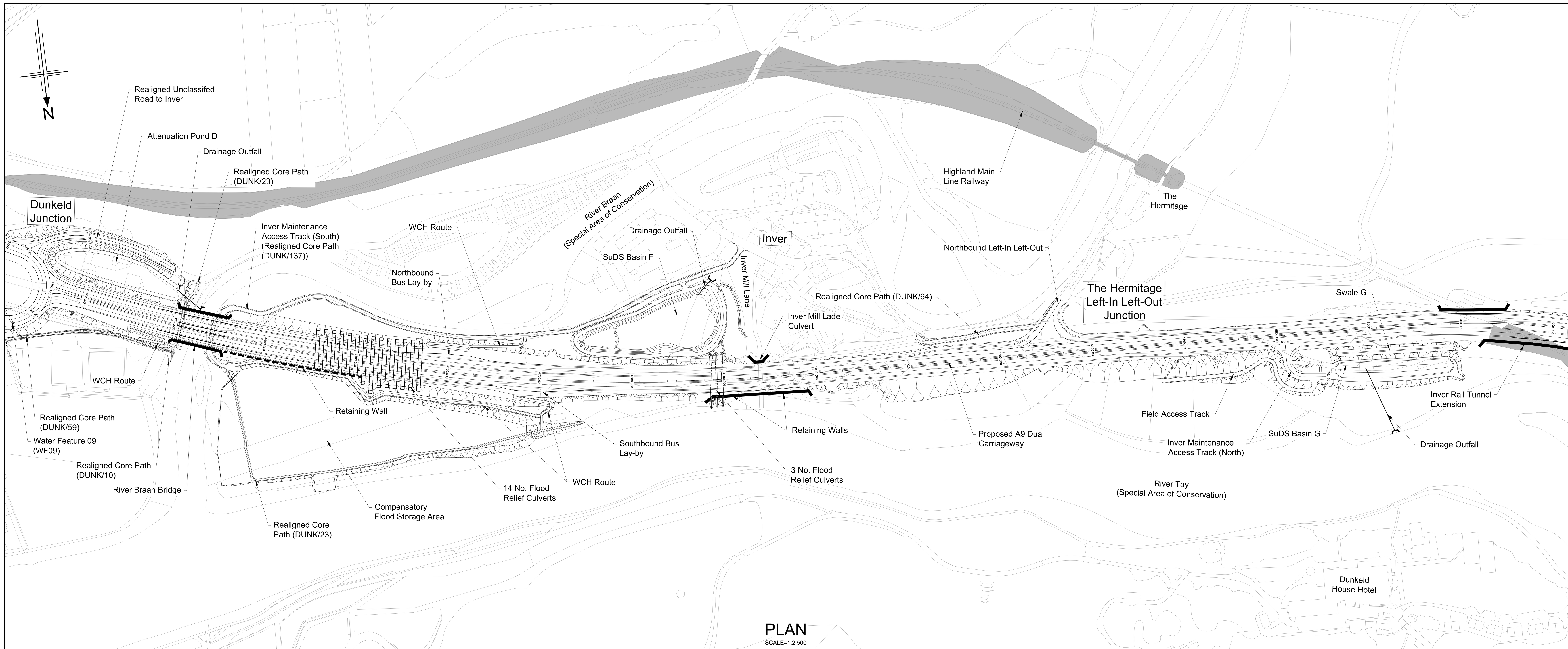
DO NOT SCALE

Rev P03

Drawing number
PIN | Originator | Volume
A9P02 - JAC - HSR -
Location | Type | Role | Number
D_SR034_SR -DR-RD-0001

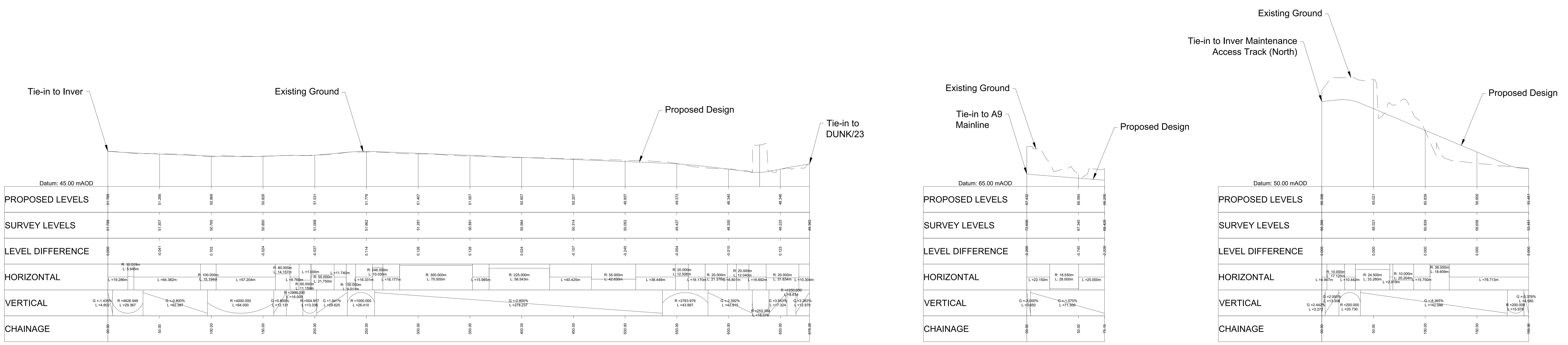
Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



PLAN

SCALE=1:2,500



Inver Maintenance Access Track (South)

Inver Maintenance Access Track (North)

Field Access Track

PROFILE

HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P01	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P02	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer:

Jacobs

Client

TRANSPORT SCOTLAND
COMHDHAIL ALBA

Project

A9 DUALLING
PASS OF BIRNAM TO TAY CROSSING

Drawing title

DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILES
INVER MAINTENANCE ACCESS TRACK

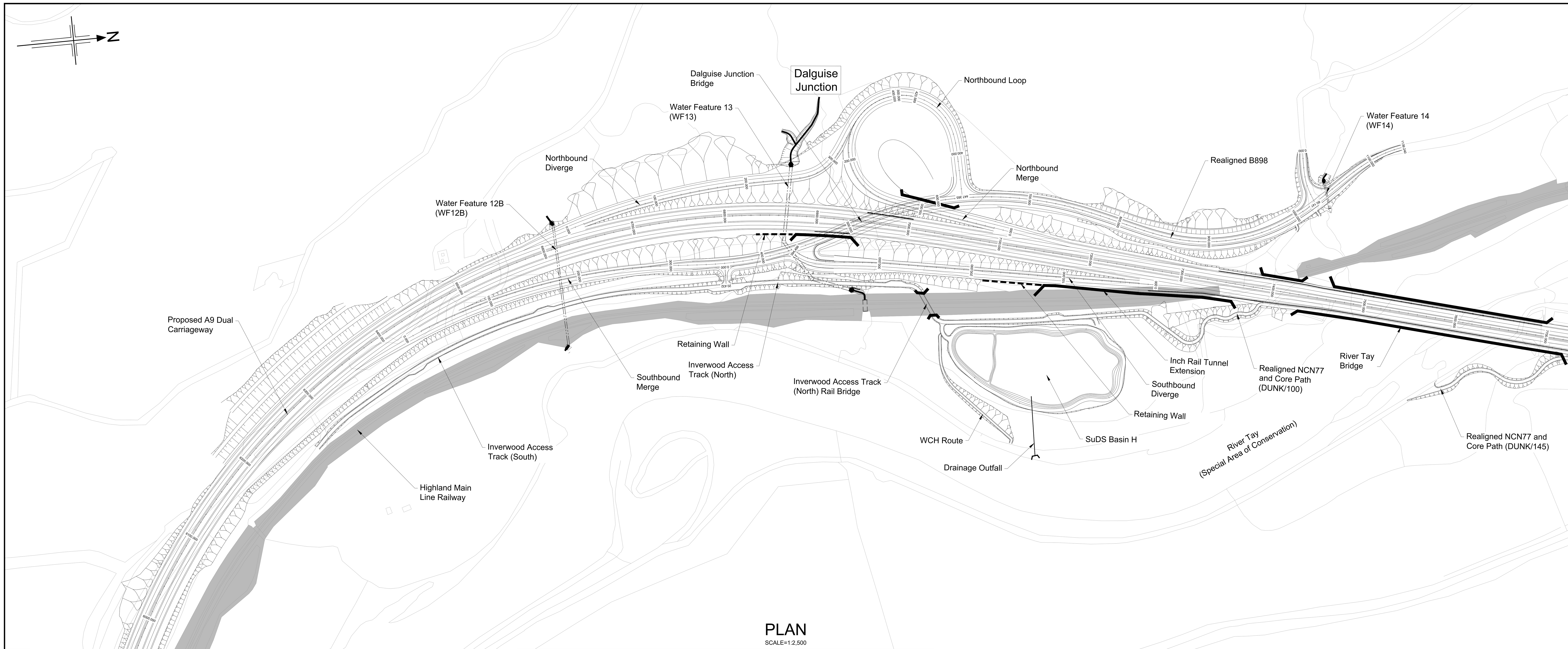
Drawing status

S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary	DO NOT SCALE
Scale	AS SHOWN	
Jacobs No.	B2140002	Rev P02
Client no.	TS/MTRIPS/SER/2013/03	

Drawing number

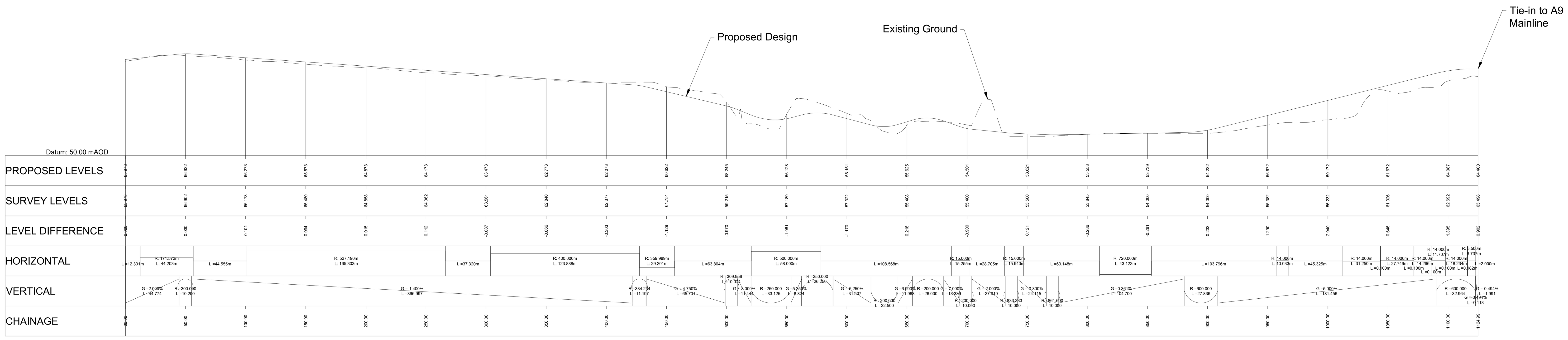
PIN A9P02 - Originator JAC - Volume HSR -
Location D_SR050_AC Type -DR Role -RD Number -0001



PLAN
SCALE=1:2,500

Legend:

- Natural Earthwork Slope (1:2 or shallower)
- Reinforced Earthwork Slope (steeper than 1:2)
- Bridge Structure
- Retaining Wall Structure
- Outfall Headwall
- Highland Main Line Railway



Inverwood Access Track (South) (Ch. 0 - Ch. 590)
and (North) (Ch. 590 - End)

PROFILE
HORIZONTAL SCALE = 1:2,500
VERTICAL SCALE = 1:500

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	20/08/24	ISSUED FOR INFORMATION	AW	AB	DK	MP
P02	19/05/25	FOR REVIEW AND COMMENT	DE	AB	DK	MP
P03	28/05/25	DMRB STAGE 3 REPORT - FINAL	DE	AB	DK	MP

Designer: Jacobs

Client: TRANSPORT SCOTLAND COMHDHAIL ALBA

Project: A9 DUALLING PASS OF BIRNAM TO TAY CROSSING

Drawing title
DMRB STAGE 3
PASS OF BIRNAM TO TAY CROSSING
PLAN AND PROFILE
INVERWOOD ACCESS TRACK

Drawing status
S4 - ISSUED FOR STAGE APPROVAL

State	Preliminary	DO NOT SCALE
Scale	AS SHOWN	
Jacobs No.	B2140002	Rev P03
Client no.	TS/MTRIPS/SER/2013/03	

Drawing number
PIN A9P02 - Originator JAC - Volume HSR - Location D_SR070_AC - Type DR - Role RD - Number 0001