Llanwern Rail Facilities - Phase 1 Planning

Arboricultural Assessment

September 2018
## Issue and Revision Record

<table>
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Executive summary

Mott MacDonald has been commissioned by Transport for Wales (TfW) to support the development of a new railway station near to Llanwern, Newport, South Wales (hereafter referred to as ‘the Scheme’). As part of this, the Mott MacDonald arboricultural team has undertaken an arboricultural survey to identify and assess potential constraints associated with the Scheme. The Scheme involves the clearance of vegetation and diversion of drainage reens and the construction of 1.6km length of Major Event Stabling Line (MESL). This is referred to as Phase 1 of the wider Llanwern Rail Facilities project which includes an extension of the MESL by circa 2.4km east, and a new Llanwern railway station and passenger line (including Park & Ride and footbridge).

The survey and associated report have been undertaken in accordance with BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations, which is intended to assist decision making with regard to the existing trees in the context of the Scheme.

This survey is not, nor should be taken to be, a full or thorough assessment of the health and safety of trees on or adjacent to the Site. Therefore, it is recommended that detailed tree inspections are undertaken on a regular basis with the express purpose of complying with the land owner’s duty of care and satisfying health and safety requirements.

The trees on-Site cover a large, narrow area and have been classified as one group. The boundaries of the group were identified by the construction plus the required buffer between the retained trees and the proposed construction, the buffer is to ensure retained trees are a sufficient distance from the new rail line. The following tree retention category was assigned:

- Category A i.e. trees of high quality, 0 trees;
- Category B i.e. trees of moderate quality, 0 trees;
- Category C i.e. trees of low quality, 1 group; and,
- Category U i.e. trees to be removed for arboricultural reasons, 0 trees.

To facilitate construction, the following tree works are required:

- Removal of 1 group of Category C trees.

The trees identified for removal are predominately young and semi-mature trees located along the strip of land between a Tata steelworks service line and the South Wales Mainline. The existing vegetation is made up of planted trees, suckers and self-seeded trees. These trees are of limited arboricultural value due to their young age and species.

The Root Protection Areas (RPAs) of all retained trees are to be protected by temporary barrier during construction activities.

The trees on the Llanwern Site are located within a wider woodland area co-owned by Tata Steel and St Modwen. Any agreements required and defined by each land owner must be in place prior to any works being undertaken.

Newport City Council (NCC) has confirmed that the survey area for this Scheme does not contain any trees protected by a Tree Preservation Order (TPO), and the area is not situated within a Conservation Area (CA).
On completion of the Scheme, it is recommended that an arboriculturalist should inspect the retained trees to identify any:

- Signs of intolerance to the change in conditions and/or the effect of the Scheme; and
- Accidental damage that may have occurred during construction.
1 Introduction

1.1 Project Description
Mott MacDonald has been commissioned by Transport for Wales (TfW), on behalf of Welsh Government, to prepare and submit a planning application, seeking full planning permission for the design and construction of a 1.6km long Major Events Stabling Line (MESL) on land adjacent to the existing Tata Steelworks Service Lines in Llanwern, South Wales. This is Phase 1 of the Llanwern Rail Facilities Programme.

The MESL will be used for stabling of rolling stock for major events in the area, to enable flexibility for future train requirements, and proving of trains prior to use on the rail network. The MESL will be electrified in a future phase of work. This proposed 1.6km length of MESL to the west of Monks’ Ditch was formerly known as Option 6a.

The wider Llanwern Rail Facilities Programme will include an extension of the MESL by circa 2.4km east (to achieve a total length of circa 4km), electrification of the MESL, a new Llanwern railway station and passenger line (including Park & Ride and footbridge), and connections to the South Wales Main Line (Relief Lines). The further phases of the project will be the subject of a subsequent planning application.

The key parameters for the Scheme are listed below:

- Whole Site area is 3.1 hectares. This land is contained within the red line boundary shown on the Site Location Plan (Drawing number 367590-MMD-48-XX-DR-C-0001); and
- The Site length is approximately 1.6km long and 19m wide.

1.2 Scope of Works
The General Arrangement drawings (Drawing numbers 367590-MMD-48-XX-DR-C-0002 to 367590-MMD-48-XX-DR-C-0005) demonstrate the project scope which includes the design and construction of the following:

- A single track stabling line (MESL) circa 1.6km long;
- Associated earthworks and landscaping; and
- Drainage and other engineering works.

In order to obtain full planning permission for Phase 1, we have carried out the outline design and technical assessment of the above scope, as well as multiple assessments in terms of ecology, environment, heritage and archaeology.

1.3 Site Location
The proposed rail development Site is located approximately 8 miles east from the centre of Newport, South Wales (Figure 1.1).

The Site is aligned roughly west – east and bordered by the existing South Wales Mainline to the north and the Tata Steelworks to the south. Along the southern boundary of the steelworks site runs the A4810 which links the M4 from junction 23A at Magor with the A48 at Liswerry (a predominantly residential suburb on the south-eastern side of Newport. The site is more widely bordered by the M4 which runs approximately two and a half miles to the north and the Severn.
Estuary which lays approximately three miles to the south. The Gwent Levels to the south is a significant area of wetlands.

The existing South Wales Mainline passes north of the proposed Site and provides opportunity for transport links for both passengers and freight.

**Figure 1.1: Proposed Location Plan**

Source: OS Open Data

### 1.4 Purpose of Arboricultural Report

The objective of this report is to identify any necessary actions in relation to existing trees as a result of the Scheme, with the aim to achieve a harmonious and sustainable relationship between trees and structures.

This report categorises the trees on-Site, reviews the options for retaining these trees within the developed landscape, and provides a methodology for tree protection during construction.

### 1.5 Tree Assessment Methodology

The tree survey was carried out by a qualified Mott MacDonald arboriculturalist on 28 August 2018 to assess the quality and value of the principal trees within or adjacent to the Scheme footprint.

The survey was undertaken in accordance with the guidelines set out in 'BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations'.

The tree data contained within the Tree Survey Schedule (Appendix C) was recorded by visual survey from ground level and no invasive tree inspection measures were employed.

The survey process categorises the trees on-Site and selects those that may be considered appropriate for retention.

The full tree survey schedule and categorisation of the trees in their existing context is stated in Appendix C (to be read in conjunction with the “Key to Tree Survey Schedule”, Appendix B).
The root protection area (RPA) calculations are provided in Appendix D.

In accordance with BS 5837:2012, the following information was recorded for each tree:

- Sequential reference number (to be recorded on the tree constraints plan);
- Species listed by common name, with key provided to scientific name;
- Height (metres);
- Life stage recorded as:

Table 1.1: Life Stage Categories

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Life Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Young</td>
<td>Trees aged less than 1st quarter of their life expectancy</td>
</tr>
<tr>
<td>SM</td>
<td>Semi Mature</td>
<td>Trees within 2nd quarter of their life expectancy</td>
</tr>
<tr>
<td>EM</td>
<td>Early mature</td>
<td>Trees within 3rd quarter of their life expectancy</td>
</tr>
<tr>
<td>M</td>
<td>Mature</td>
<td>Trees aged within final quarter of their life expectancy</td>
</tr>
<tr>
<td>OM</td>
<td>Over Mature</td>
<td>Over-mature - declining or moribund trees of low vigour</td>
</tr>
<tr>
<td>V</td>
<td>Veteran</td>
<td>Specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned</td>
</tr>
</tbody>
</table>

- Crown spread (metres), taken as a minimum at the four cardinal points, to derive an accurate representation of the crown (plotted on the tree constraints plans);
- Existing height (metres) above ground level of:
  - First significant branch; and,
  - Canopy.
- Stem diameter (millimetres) in accordance with Annex C of BS 5837:2012. The stem diameters of single stemmed trees were measured at 1.5 metres above ground level and multi-stemmed trees measured in accordance with Annex C;
- The RPA calculated in accordance with Section 4.6 of BS 5837:2012. The two measurements provided are a 'Root Protection Radius (m)' (circle centred on the base of the stem) and an overall 'root protection area (m²)';
- General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations;
- Estimated remaining contribution, in years (<10, 10 +, 20+, 40+);
- Retention category recorded as A, B, C or U in accordance with BS 5837:2012 (see Table 1.2 below) to be recorded on the tree survey plan (Appendix A). This gives an indication as to each tree’s arboricultural, landscape and cultural value and significance as well as its suitability for retention in the context of the Scheme. The sub-categories [1 - Arboricultural values; 2 - Landscape values and 3 - Cultural values, including conservation] are included where considered necessary to clarify why a tree has been assigned to a retention category. These categorisation criteria are summarised below:

Table 1.2: Retention Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>Trees of high quality and value whose retention is most desirable (suggested minimum contribution 40 years)</td>
</tr>
<tr>
<td>Category B</td>
<td>Trees of moderate quality and value whose retention is desirable if practicable (suggested minimum contribution 20 years)</td>
</tr>
</tbody>
</table>
1.6 Limitations of Survey

The survey was undertaken using the alignment highlighted within the Tree Constraints and Protection Plan (drawing reference 367590-MMD-48-XX-DR-C-0100, Appendix A).

This report provides comment on the general quality of the trees on Site but is not, nor should be taken to be, a full or thorough assessment of the health and safety of trees on or adjacent to the Site. It is recommended that a full tree survey should be undertaken on a regular basis to satisfy health and safety requirements.

Previous management and/or surveys in relation to the health and safety of trees on this Site have not been considered as part of this report.

Distances were recorded using a standard metric tape measure where appropriate and stem diameter was recorded using a diameter tape. Tree height was estimated to the nearest metre.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category C</td>
<td>Trees of low quality and value or limited long-term potential, which could be retained if not in conflict with development proposals or young trees with a stem diameter of less than 150mm (suggested minimum contribution 10 years)</td>
</tr>
<tr>
<td>Category U</td>
<td>Trees requiring removal irrespective of any development proposals due to significant structural defects, irreversible decline or with a very short-term life expectancy of less than 10 years</td>
</tr>
</tbody>
</table>
2 Tree Summary

2.1 Summary of Existing Tree Coverage

The trees surveyed for this Scheme are predominantly young to semi-mature and are located in a narrow strip of land between the Tata Steelworks service line and the South Wales Mainline. The trees are located across land parcels belonging to Tata Steel, St Modwen and Network Rail. The South Wales Mainline is owned by Network Rail.

The trees within the Site are generally young and semi mature trees planted for amenity purposes. They are located within poor scrubland which includes Made Ground (predominantly railway ballast) in some areas. The area has a dense scrub understorey and is low lying and wet in places.

The trees located within the survey area are planted with even spacing and are predominantly crack willow (Salix fragilis), Common alder (Alnus glutinosa), Silver birch (Betula pendula), White poplar (Populus alba) with smaller self-seeded trees in amongst them, mainly common hawthorn (Crataegus monogyna) and Elder (Sambucus nigra).

All trees within the survey area have been categorised as Category C groups i.e. trees of low arboricultural quality. These trees do not have any particular landscape or amenity value within their current setting.

The following provides a summary of the quality and value of the trees present on-Site, as assessed in accordance with BS 5837:2012 (Table 2.1 – Cascade chart for tree quality assessment).

Table 2.1: Summary of BS 5837: 2012 Tree Categories Assigned to the Surveyed Trees

<table>
<thead>
<tr>
<th>Tree Category</th>
<th>Description</th>
<th>Total Number surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>Trees or groups of high quality and value</td>
<td>0 trees</td>
</tr>
<tr>
<td>Category B</td>
<td>Trees or groups of moderate quality</td>
<td>0 trees</td>
</tr>
<tr>
<td>Category C</td>
<td>Trees or groups of low quality</td>
<td>1 tree group</td>
</tr>
<tr>
<td>Category U</td>
<td>Trees or groups for removal</td>
<td>0 trees</td>
</tr>
</tbody>
</table>
2.2 Site Photos

Figure 2.1: Typical section of mixed species within G1a.

Figure 2.2: Image showing an example of the largest trees in the area.

Figure 2.3: A group of silver birch and Buddleia.

Figure 2.4: An area of mixed species showing the typical height within the area.
Figure 2.5: Showing a typical semi-mature tree with self set saplings.

Figure 2.6: An area of trees including a number of dead trees.

Source: Mott MacDonald, May 2018
3 Arboricultural Impact Assessment

3.1 Tree Preservation Orders (TPOs) and Conservation Areas (CAs)

The primary measures which provide statutory protection to trees are TPOs and CA status. Where present, these measures determine that either notification to the Local Planning Authority (LPA) for CA designations or consent from the LPA for TPO designations is required for any works that may affect trees or tree groups.

Newport City Council (NCC) tree officer (Shona Carle) has confirmed that the survey area for this Scheme does not contain any trees protected by a TPO, and that the Site is not located within a CA.

3.2 Recommended Actions

The construction of this Scheme must be undertaken in accordance with the Tree Constraints and Protection Plan 367590-MMD-48-XX-DR-C-0100 (see Appendix A) and the following recommendations in Table 3.1 to enable integration between the Scheme and the existing tree constraints on-Site.

Table 3.1: Recommended Actions for Existing Trees

<table>
<thead>
<tr>
<th>Tree Ref</th>
<th>Species</th>
<th>Retention Category</th>
<th>TPO</th>
<th>CA</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1a</td>
<td>Mixed</td>
<td>C</td>
<td>No</td>
<td>No</td>
<td>Remove – area in direct conflict with proposed scheme. Surrounding retained area to be protected with temporary barrier in accordance with BS537 during construction.</td>
</tr>
</tbody>
</table>

Within the survey area there were a number of fallen or uprooted trees, which could be attributed to the exposed Site location. In addition, the trees are rooted in soft ground, which is generally reclaimed natural marshland and made ground (predominantly railway ballast) where close to the Tata service lines. The proposed works are likely to undermine stability of trees immediately adjacent to the footprint and therefore a clearance of approximately 3m either side of the proposed construction has been set.

3.3 Tree Works

The above recommendations have been made considering the low retention category of the trees and the proximity of the trees to the proposed construction works. Retained trees adjacent to cleared areas may be compromised by increased wind exposure and disturbance to the ground. It is therefore recommended that any trees within the retained areas are inspected regularly post clearance works. Any agreements required and defined by each land owner must be in place prior to any works being undertaken.

No pruning works have been specified for this Site as the tree group will be felled.

All tree works associated with this Scheme must be carried out in accordance with BS 3998:2010 Tree Works – Recommendations.
3.4 Root Protection Areas (RPAs)

Working anywhere in the vicinity of trees is likely to cause some root damage due to the fact that in the order of 80% of the roots of any tree will occur within the upper 600mm of the soil. Roots will spread out for a considerable distance from a tree and may be encountered at a distance beyond the canopy spread of a tree.

Where construction activities are proposed within the rooting zone of trees, the potential for significant damage exists. Table 2 of BS 5837:2012 prescribes a methodology for the calculation of a RPA.

The RPA represents the minimum area that should be retained undisturbed around a tree or trees for the avoidance of an unacceptable degree of root disturbance. The required RPA of a tree is calculated, and typically plotted as a circle (or where appropriate as a square of equivalent area) to determine constraints or the location of protective fencing. In certain circumstances the actual shape of this area may then be adjusted to take account of local topography or any existing Site features that may serve as restrictions to 'normal' root development.

The RPA calculations are stated within Table D.1, Appendix D.

3.5 Temporary Protective Barriers

The surrounding retained trees are to be protected by temporary barrier during construction activities (see appendix A). The area within i.e. tree side of the protective barriers will be an ‘Construction Exclusion Zone (CEZ)’ for the duration of the works.

Protective fences must be constructed in accordance with BS 5837:2012 and be fit for the purpose of excluding any construction activity (refer to Appendix E). Any other fence/barrier used must be approved by the Arboriculturalist prior to installation.

All weather notices should be erected on the barrier with words such as:

“Tree Protection Area — Keep out”.

The following prohibitions shall apply within the area enclosed by the Tree Protection Barriers:

- No mechanical digging or scraping;
- No storage of plant, equipment or materials;
- No vehicular or plant access;
- No fire lighting within 10m of tree canopies;
- No handling, discharge or spillage of any chemical substance, including cement washings and vehicle washings within 10m;
- No action likely to cause localised water-logging;
- No alteration of ground levels;
- No construction of hard surfaces;
- No attachment of boards, hoarding, cables or notices or fencing to trees; and
- No storage of excavated materials.

Special care is to be taken on sloping ground where spillages could run towards the trees. A collecting channel dug along the outer line of the protective fencing would be one method of avoiding such damage.
If excavators are to be used during construction, at no time is the excavating arm to encroach over the position of the tree protection barriers.

3.6 RPA Infringement

No works should be required within the RPAs of any trees on-site.

Where excavation is required outside of a CEZ but close to trees, a “banksman” should supervise the excavation works, identify any tree roots (>25mm diameter), and prevent severance as the excavation progresses.

- Where roots are encountered, every effort should be made to avoid severance or damage to the root bark.
- Any exposed roots over 25mm in diameter, or bundles of several smaller roots must be protected to avoid drying or extremes of temperature. This is best achieved by immediately covering with damp Hessian or similar material.
- Should roots be severed they must be trimmed back using a sharp tool (pruning saw, secateurs or loppers), then protected as above.
- If roots larger than 25mm are identified, and are in direct conflict with construction works, then the advice of the Scheme Arboriculturalist should be sought prior to any severance or damage of the root.
- Infill around exposed or severed roots should comprise a clean, moist, sharp sand (not ‘builder’s’ sand) and good quality top soil. This fill should be gently firmed but must not be compacted. Backfilling should be undertaken as soon as possible.
- Soil levels around the base of retained trees are to be maintained as existing.
- The Site Agent or Manager is to be responsible for the day to day prevention and exclusion of all actions and operations near protected trees that are likely to cause damage to retained or protected trees, such as the use of cranes and excavators, transportation of equipment or hot works.

3.7 Arboricultural Inspection

On completion of the Scheme, an arboriculturalist must look for signs of intolerance to the change in conditions, the effect of the Scheme and any accidental damage to retained trees, to identify the need for further tree works in addition to those originally specified at the outset of the project.

3.8 Responsibilities

It will be the responsibility of the Contractor to ensure that any conditions attached to planning consent are adhered to at all times and that a monitoring regime in regard to tree protection is adopted on site.

The Contractor will be responsible for contacting the LPA and Scheme Arboriculturalist at any time issues are raised relating to the trees on-site.

The Contractor under the guidance of their Ecologist will be responsible for ensuring that protected species are considered during any tree works and the timing of tree works should be carefully considered. European protected species such as bats, dormice (*Muscjardinus avellanarius*) and great crested newts (*Triturus cristatus*) are protected under the Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2017). Other species that may be affected by tree works include breeding birds,
badgers and reptiles which are protected under the Wildlife and Countryside Act (1981) (as amended).

The Contractor under the guidance of their Ecologist is to ensure the build sequence is appropriate to avoid damage occurring to the trees during construction. Under the current design the retained trees should be protected with fencing in accordance with Appendix F. Protective barriers will need to remain in position until completion of all construction works on the Site.
4 Conclusions

There was 1 group of trees surveyed in relation to this Scheme.

To facilitate construction, the following tree works are required:

- Removal of 1 group of Category C trees.

The RPAs of all retained trees are to be protected by temporary barrier during construction activities.

NCC has confirmed and provided a written statement that the survey area for this scheme does not contain any trees protected by TPOs and the area is not situated within a CA.

Amendments to the current Scheme proposals that have an impact on the trees will require a visit from an arboriculturalist to identify any alterations that need to be made to the tree report.
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A. Drawings

A.1 Tree Constraints and Tree Protection Plan (367590-MMD-48-XX-DR-C-0100)
B. Key to Tree Survey Schedule
### Key to Tree Survey Schedule

<table>
<thead>
<tr>
<th>Tree Reference</th>
<th>Unique reference or Tree Tag number, identifying each tree and/or tree group on the accompanying plan/s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
<td>Tree species giving the vernacular and full botanic name.</td>
</tr>
<tr>
<td>Height</td>
<td>Recorded in metres, measured in m from the base of the tree.</td>
</tr>
<tr>
<td>Stem Diameter</td>
<td>Tree trunk diameter measured at 1.5m above ground level (on sloping ground above highest ground level) or immediately above root flare for multi-stemmed trees. Expressed in millimetres. (est) dimension estimated; (av) average or max maximum dimension used in groups.</td>
</tr>
<tr>
<td>Branch Spread</td>
<td>Tree canopy extent taken from centre of tree trunk to edge of general canopy line along the four principal points of the compass (note this distance is to the general canopy line in certain cases and that an exceptional or etiolated branch may extend beyond stated figure).</td>
</tr>
<tr>
<td>Crown Clearance</td>
<td>Existing height above ground level of 1) first significant branch and direction of growth (e.g. 2.4 N); and 2) canopy, to inform on ground clearance, crown/stem ratio and shading. Measured in m (rounded up to nearest half metre for dimensions up to 10m and up to nearest metre for dimensions over 10m).</td>
</tr>
</tbody>
</table>

#### Life Stage

- **Y** Young: within first quarter of normal life expectancy.
- **SM** Semi Mature: within second quarter of normal life expectancy.
- **EM** Early Mature: within third quarter of normal life expectancy.
- **M** Mature: within final quarter of normal life expectancy.
- **OM** Over Mature: senescent trees nearing end of their anticipated life expectancy.
- **V** Veteran: exhibiting features of biological, cultural or aesthetic value characteristic of individuals surviving beyond typical age range
- **D** Dead.

#### General Observations

Observations particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations.

#### Estimated Remaining Contribution

Relates to the potential life expectancy of the tree in its current setting, shown in years as one of the following categories: <10; 10+; 20+; and, 40+.

**Category Grading in accordance with Table 1 (BS 5837:2012)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>Trees of high quality and value; &gt; 40 years contribution remaining; marked light green on plan. Category is sub-divided as follows: 1 particularly good example; essential component of group e.g. in avenues; 2 screening value, particular visual importance; 3 significant conservation, historical, commemorative or other value (includes veteran or wood pasture trees). Tree retention is highly desirable: significant amendments to any proposed development should be considered before removing these trees.</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>Trees of moderate quality and value with a significant life expectancy; &gt; 20 years contribution remaining; marked mid-blue on plan. Category sub-divided as follows: 1 Trees that may be of impaired condition in relation to trees in category above; 2 Trees present in numbers/groups attracting higher collective rating; internal to site, of limited visual impact to locality; 3 Trees with clear conservation or cultural benefits. Tree retention is desirable: amendments to any proposed development should be considered before removing these trees.</td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>Trees of low quality and value; &gt;10 years contribution remaining; marked grey on plan. Includes young trees below 150mm diameter (to which consideration for transplanting should be given). Note that “C” trees will usually not be retained where they would impose a significant constraint on development. Category sub-divided as follows: 1 Trees not qualifying in higher categories; 2 Trees within groups of low landscape value, having limited screening value; 3 Trees with very limited conservation or other cultural benefits. Trees could be retained however the removal of some of these trees should be considered acceptable if required to facilitate any proposed development.</td>
</tr>
<tr>
<td><strong>U</strong></td>
<td>Trees for removal; those in such a condition that are dead, dying, dangerous, severely suppressed or where any existing value would be lost within 10 years; marked dark red on plan. These trees should be removed or treated in such a way as to make them safe where they have high ecological value or benefits.</td>
</tr>
</tbody>
</table>

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*Note: Figures provided in Arboricultural Association Leaflet No. 4 tree Management. These age classes may be pre-fixed with 'Early' or 'Late' in the Tree Survey Schedule to provide a more accurate indication of age.*
C. Tree Survey Schedule
### Table C.1: Llanwern Station Tree Survey Schedule

<table>
<thead>
<tr>
<th>Tag No</th>
<th>Tree Type</th>
<th>Life Stage</th>
<th>Crown Spread (m)</th>
<th>Crown Height (m)</th>
<th>No of Stems</th>
<th>Stem Diameter (mm)</th>
<th>Root Protection Area (RPA)</th>
<th>Condition</th>
<th>BS5837 Category</th>
<th>Useful remaining contribution (years)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1a</td>
<td>Mixed group</td>
<td>Young to Semi mature</td>
<td>8-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Group of mixed trees, white willow, Common alder, hawthorn and cherry.</td>
</tr>
</tbody>
</table>
D. Root Protection Areas (RPA)

<table>
<thead>
<tr>
<th>Tree</th>
<th>Species</th>
<th>Stem Diameter (mm)</th>
<th>*RPA Circle Radius (m)</th>
<th>*RPA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Mixed group</td>
<td>250av</td>
<td>3av</td>
<td>28av</td>
</tr>
</tbody>
</table>
E. TPO / CA Information
Hello Joe,

Good that more trees are being kept, still no TPOs.

Regards

Shona Carle
Swyddog Coed / Tree Officer (TPOs & Private Land)
Gwasanaethau Strydlun a’r Ddinas / Streetscene & City Services
Cyngor Dinas Casnewydd / Newport City Council
01633 210556
Shona.Carle@newport.gov.uk

---

From: Collett, Joe K [mailto:Joe.Collett@mottmac.com]
Sent: 09 May 2018 14:25
To: Shona Carle (Tree Officer (TPOs & Private Land))
Subject: RE: New Llanwern Station and TPO enquiry

Hi Shona

The plans for site have been altered to retain more trees could you confirm there are still no TPOs or conservation areas here please?

Thanks
Joe

---

From: Shona Carle (Tree Officer (TPOs & Private Land)) [mailto:Shona.Carle@newport.gov.uk]
Sent: 06 November 2017 15:14
To: Collett, Joe K <Joe.Collett@mottmac.com>
Subject: New Llanwern Station and TPO enquiry

Hello,

To confirm – there are no TPOs or Conservation Areas that affect the proposed Llanwern Station.

regards

Shona Carle
Swyddog Coed / Tree Officer (TPOs & Private Land)
Gwasanaethau Strydlun a’r Ddinas / Streetscene & City Services
Cyngor Dinas Casnewydd / Newport City Council
01633 210556
Shona.Carle@newport.gov.uk


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Pan fyddwch yn anfon e-bost at Gymgor Dinas Casnewydd, rydych yn cydysynio i’r Cyngor fonitro a darllen unrhyw e-byst o’r fath at ddibenion cydymffurfio â diogelwch ac â deddfwriaeth. I weld yr ymwadiad llawn ewch i http://www.newport.gov.uk/ymwadiad.


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F. Tree Protection Measures

Permission to reproduce extracts from British Standard BS 5837:2012 Trees in relation to design demolition and construction – Recommendations is granted by BSI. British Standards can be obtained in PDF or hard copy formats from the BSI online shop www.bsigroup.com/Shop or by contacting BSI Customer Services for hardcopies only: Tel +44 (0)20 8996 9001, Email: cservices@bsigroup.com.

F.1 Extract from BS5837:2012 Default specification for protection barrier

Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps
F.2 Extract from BS5837:2012 Examples of Ground Stabilising systems

a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray
F.3 Extract from BS5837:2012 Ground Protection during Demolition and Construction

6.2.3.2 Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.

6.2.3.3 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.

NOTE The ground protection might comprise one of the following:

a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;

c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

6.2.3.4 The locations of and design for temporary ground protection should be shown on the tree protection plan and detailed within the arboricultural method statement (see 6.1).

6.2.3.5 In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.
G. Glossary

**Adventitious Bud**
Adventitious buds develop from places other than a shoot at the tip of a stem e.g. along a branch, often formed as a result of stress e.g. after the stem is wounded or pruned.

**AGL (Above Ground Level)**
Terminology (prefixed by a measurement) stated within the Tree Survey Schedule to reference the location/height of a particular tree feature or tree part.

**Branchlet**
A subdivision of a branch that is near or at the tip of the branch.

**Crown Lift**
The removal of the lowest branches, usually to a specified height. It can be used to allow more residual light and greater clearance underneath the canopy for vehicles etc.

**Dieback**
Where branches are beginning to show signs of death usually at the tips of the crown.

**Epicormic Growth**
Small branches that grow in uncharacteristic clusters around the base of a tree, usually as a result of bad pruning or other stress factor.

**Etiolated**
Tall, thin tree which has extended vertically without substantial lateral development. Usually as a result of competition for light from other species.

**Tree-Group**
Used to identify trees that form cohesive aboricultural features either aerodynamically (e.g. tress that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture)

**‘Hung up’ branch**
A branch which has become detached from the tree but prevented from falling to the ground by the presence of other branches within the crown.

**Included Bark**
Where the bark on two adjoining branches or stems is growing tight together, forming a joint with limited physical strength.

**Ms**
A multi-stemmed tree

**Pendulous Branches**
Inclined or hanging down.
<table>
<thead>
<tr>
<th><strong>Occluded Wound</strong></th>
<th>The overgrowth of a wound with (callus) tissue produced subsequently.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RPA (Root Protection Area)</strong></td>
<td>The theoretical rooting area of a tree defined by BS5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.</td>
</tr>
<tr>
<td><strong>Topping</strong></td>
<td>Topping is a form of pruning that removes terminal growth leaving a ‘stub’ cut end. Topping causes serious health problems to a tree.</td>
</tr>
</tbody>
</table>