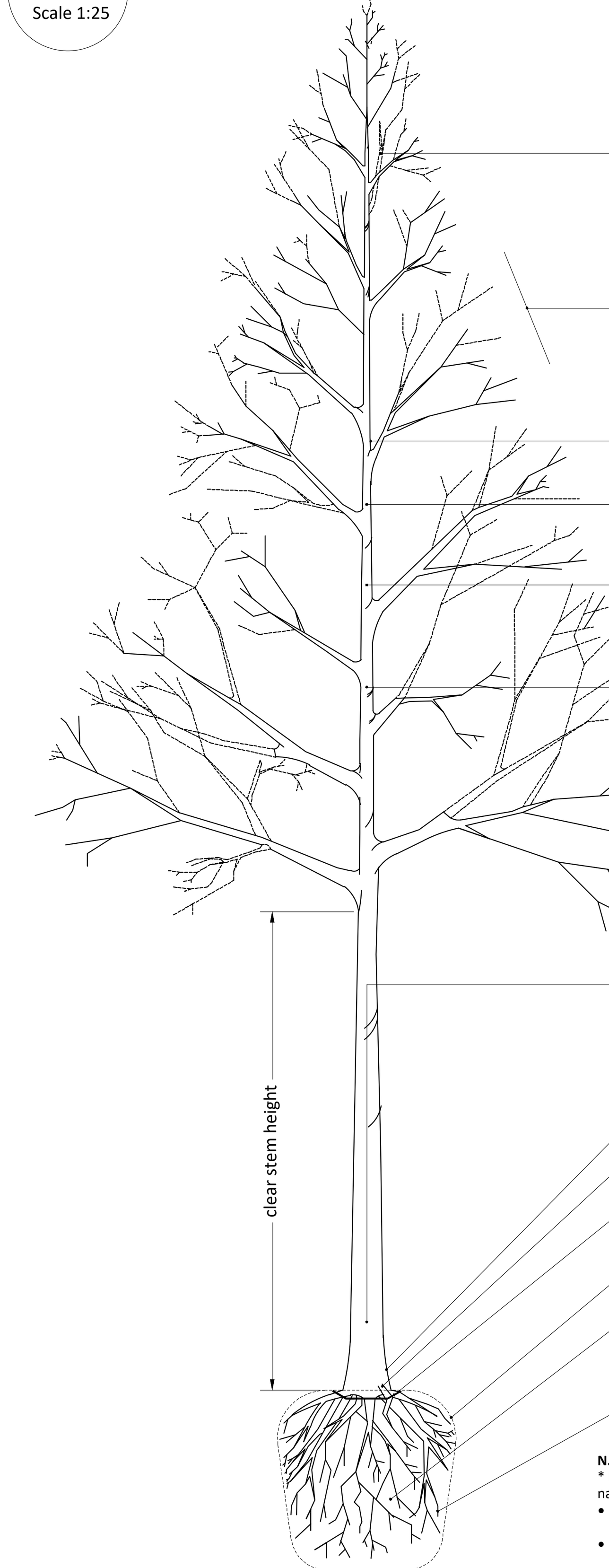
1. TREE STOCK, GENERALLY

Scale 1:25



N.B. Tree shown for illustrative purposes only.
* Does not apply to weeping trees, trees produced as multi-stemmed specimens or other trees where a straight leader is not a natural characteristic.

- decurrent tree = tree exhibiting natural growth habit characterized by strong lateral or branch dominance that eventually produces a rounded or spreading tree crown
- excurrent tree = tree exhibiting natural growth habit characterized by strong apical dominance that eventually produces an upright crown form dominated by one or a few central leading shoots

2. GENERAL TREE PLANTING PRINCIPLES IN OPEN GROUND

Scale 1:25

TREE SUPPORT SYSTEMS & IRRIGATION MEASURES OMITTED FOR CLARITY

TREE PIT: PLAN VIEW

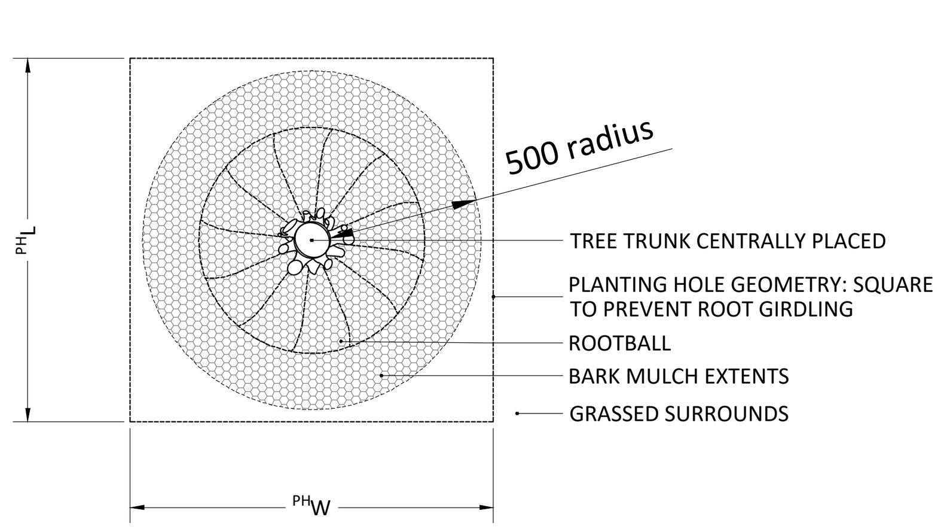


Table 1: TREE PIT DIMENSIONS

FORM	GIRTH	ROOTBALL DIMENSIONS ($^{RB}Ø$)	(^{RB}Dp)	PLANTING HOLE DIMS (^{PH}L)	(^{PH}W)	(^{PH}D)
LS	6-8	400	300	700	700	300
S	8-10	400	300	700	700	300
SSe	10-12	400	400	700	700	400
H	12-14	500	400	800	800	400
EH	14-16	600	500	900	900	500
	16-18	600	500	900	900	500
	18-20	600	500	900	900	500
SM	20-25	750	750	1050	1050	750
	30-35	1000	1000	1300	1300	1000

based on: **BS 4428: 1989** & **BS 8545: 2014**, together with: **suppliers (James Coles) stated rootball dimensions**

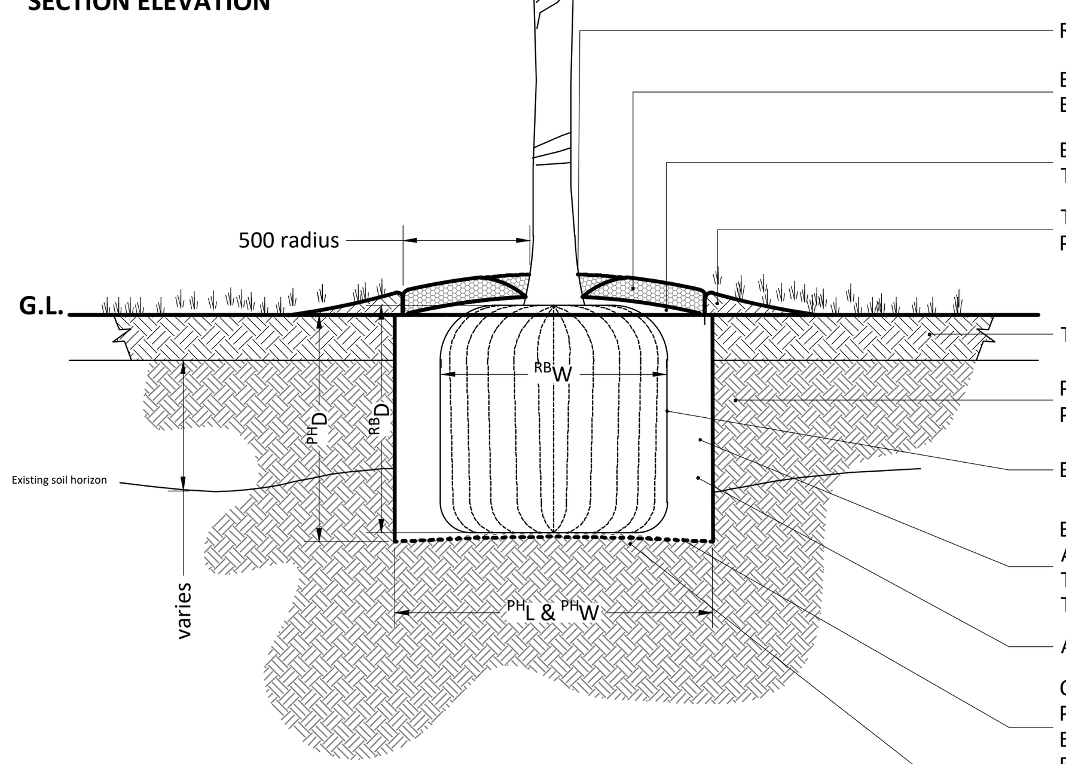
where: $^{RB}Ø$ = Rootball diameter, ^{RB}Dp = Rootball depth,
&: ^{PH}L = Planting Hole length, ^{PH}W = Planting Hole width, ^{PH}D = Planting Hole depth
&: LS = Light Standard, S = Standard, SSe = Selected Standard, H = Heavy Standard, EH = Extra Heavy Standard, SM = Semi Mature

N.B. Stated tree planting hole dimensions to accomodate the rootball are a minimum. Rootball dimensions can, & do, vary: some variance is to be expected naturally between species, tree stock, suppliers and season. In the event that the rootball exceeds the stated dimensions, the contractor shall seek advice from the Landscape Architect before commencing further. Thereafter, the Landscape Contractor shall excavate the hole (in Open Ground) to the advice given in BS 8545: 2014 with the exception of tree pit dimensions which shall be varied to achieve a minimum dimension of 150mm greater** than the rootball. Tree planting hole depth shall generally be no greater than the existing rootball or container depth. The Landscape Contractor shall take care not to damage any underground utilities &/or services.

* where root spread is taken to be rootball size.

**Section 10.5.10 of BS 8545:2014 states that, "Tree pits should have a diameter at least 75mm greater than that of the root system." However, this does not allow adequate space for firming in around the rootball by footfall.

SECTION ELEVATION



N.B. tree pit dimensions are a function of rootball size. Rootball dimensions are dependant on size of tree specified. Refer to Table 1.

N.B.

- BS 8545: 2014 states that, "*Sensible tree pit design begins with the intention of doing as little as possible other than digging a pit, planting the tree, and using the existing soil, separated as subsoil and topsoil, as backfill. Each additional level of complexity added to the basic pit design can be related to the amelioration of a particular constraint*".
- Tree shown planted in open ground in optimal conditions with minimal site constraints.
- Tree support systems are omitted for clarity.
- Tree pit dimensions are a function of rootball size. Rootball dimensions are dependant on size of tree specified. Refer to table.

Notes
Information regarding '*Tree Planting in Open Ground, Generally*' on this sheet is derived from "*BS 8545: 2014 Trees: from nursery to independence in the landscape - recommendations*".

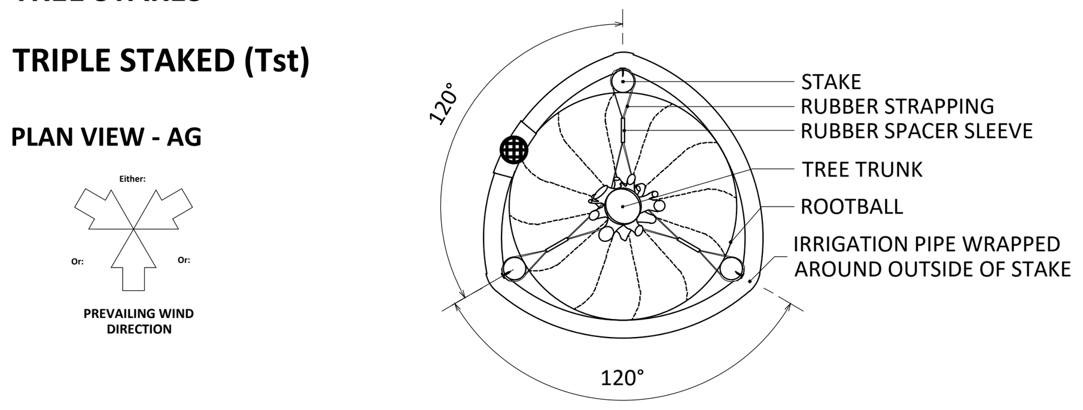
While every attempt is made to address the most salient points raised [within the BS], this list should not be considered exhaustive as it is presented in summary format only. For further information, the reader is referred back to the relevant British Standard.

3. ABOVE GROUND SUPPORT TREE STAKES

Scale 1:25

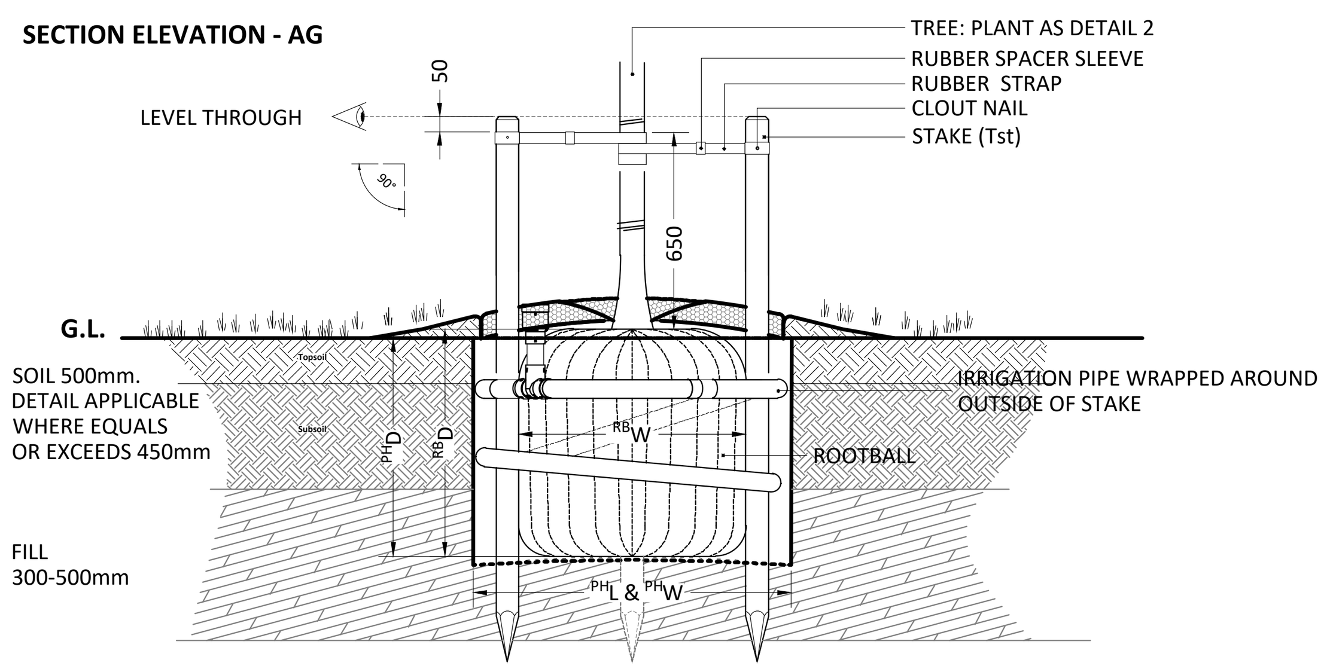
TRIPLE STAKED (Tst)

PLAN VIEW - AG



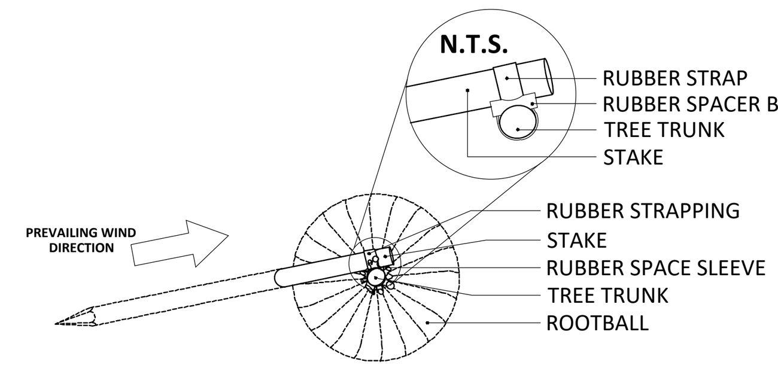
N.B. tree pit dimensions are a function of rootball size. Rootball dimensions are dependant on size of tree specified. Refer to Table 1, detail 2

SECTION ELEVATION - AG

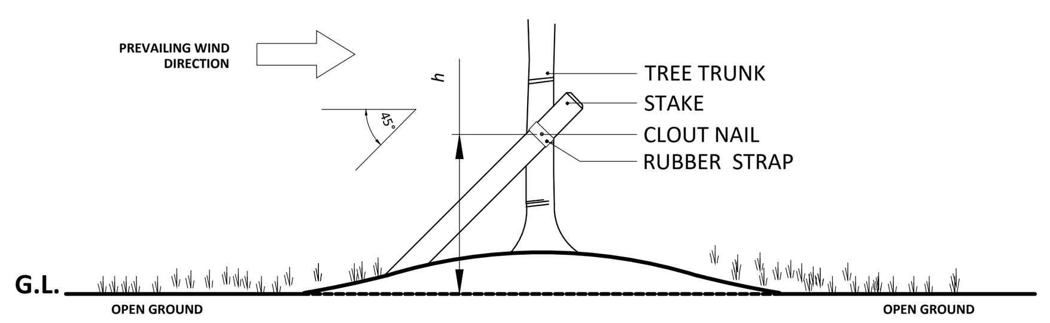


SINGLE STAKE - (Sst) TO REAR GARDENS

PLAN VIEW



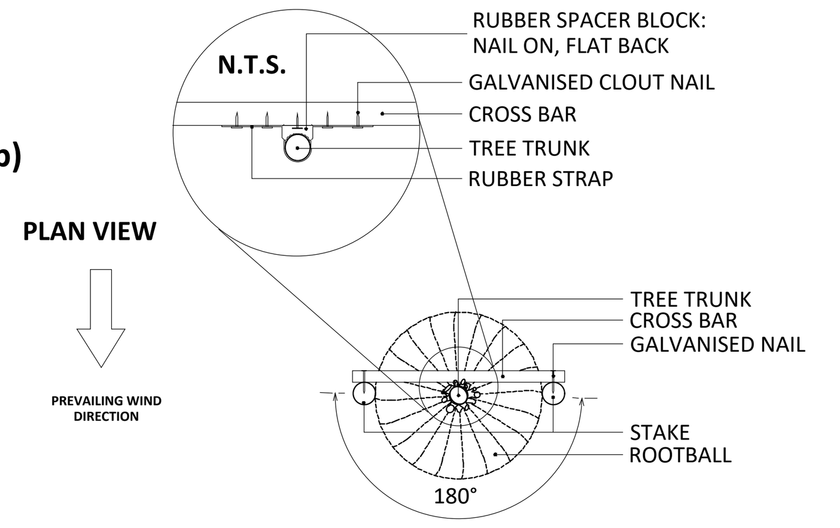
SECTION ELEVATION



BELOW GROUND CONDITIONS AS PER TRIPLE STAKED TREE

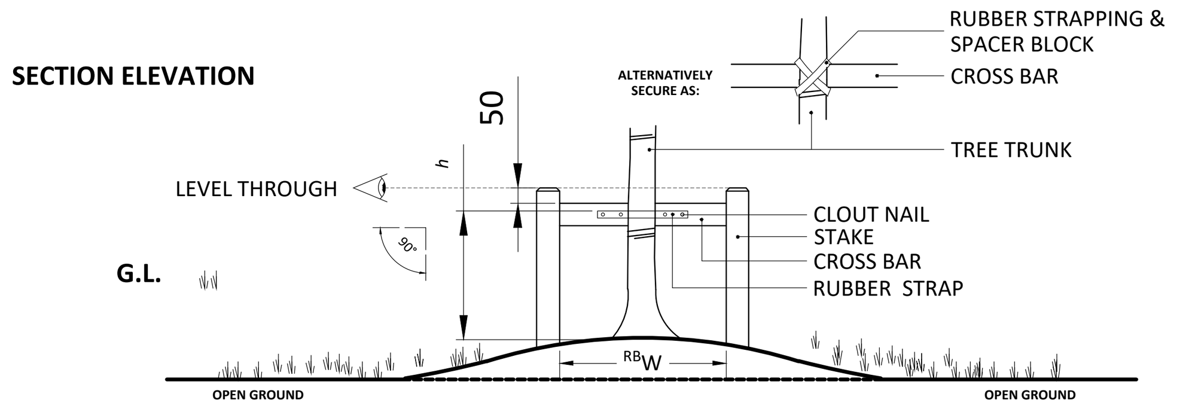
DOUBLE STAKE & CROSS BAR - (DstXb)

PLAN VIEW



IN AREAS SUBJECT TO: HIGH WIND LOADING / VANDALISM; TRIPLE STAKED TREES MAY BE SUBSTITUTED FOR A DOUBLE STAKE & CROSS BAR

SECTION ELEVATION



BELOW GROUND CONDITIONS AS PER TRIPLE STAKED TREE

Table 2. TREE SUPPORT HEIGHTS

CLEAR STEM HEIGHT (mm)	SUPPORT HEIGHT (*h*) (mm)
1500	500
1750	600
2000	650
2500	850
>2500	ASK

Tree Support Height Notes

- Tree support height* is dependant on the size (cmg), the overall height [of the stock specified], canopy spread, and prevailing conditions, locally.
- Stock size (cmg), together with overall height, and the need for access under the canopy, helps inform the clear stem height*.
- Tree support height needs to strike a balance between allowing the trunk to sway below the support [to promote correct stem taper down to the root flare] & the need to prevent rootball movement [to allow root establishment].
- For this reason, above ground tree support design life should last no more than the establishment phase (c.2yrs) and be removed thereafter.
- For SM trees exceeding 5m tall, possibly in the 30-35cmg+ category, or in the 20-30cmg category but with broad crowned canopies, below ground earth anchoring may be the most suitable tree support system.

4. ABOVE GROUND SUPPORT TREE STAKES

Scale 1:25

STAKE TYPE ORIENTATION IN PROXIMITY TO TRANSPORT CONDUITS / AVENUE / SPINE ROAD PLANTING / ETC.

PLAN VIEW

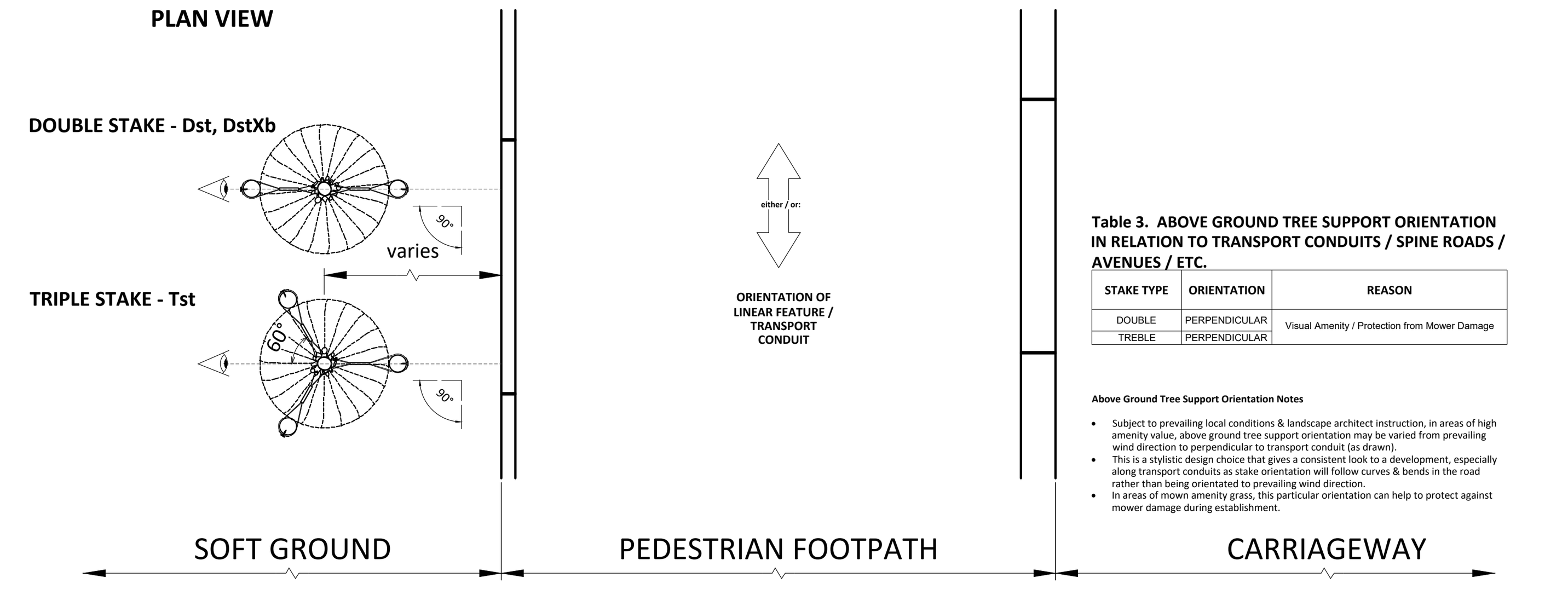


Table 3. ABOVE GROUND TREE SUPPORT ORIENTATION IN RELATION TO TRANSPORT CONDUITS / SPINE ROADS / AVENUES / ETC.

STAKE TYPE	ORIENTATION	REASON
DOUBLE	PERPENDICULAR	Visual Amenity / Protection from Mower Damage
TREBLE	PERPENDICULAR	

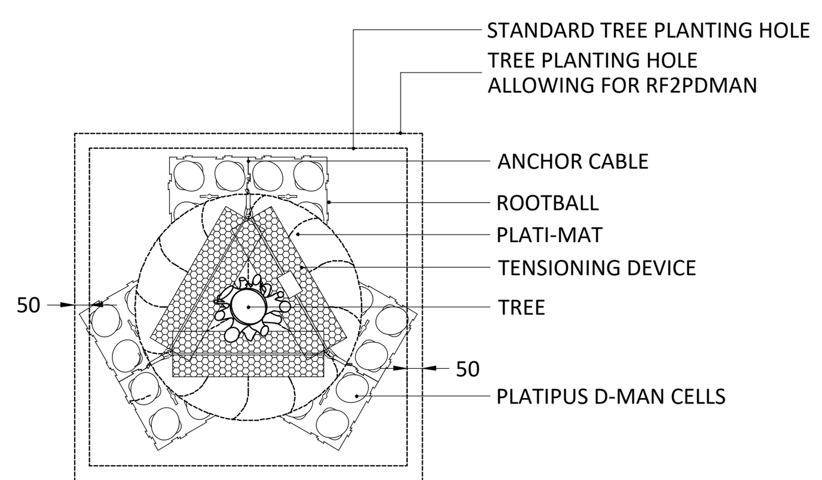
Above Ground Tree Support Orientation Notes

- Subject to prevailing local conditions & landscape architect instruction, in areas of high amenity value, above ground tree support orientation may be varied from prevailing wind direction to perpendicular to transport conduit (as drawn).
- This is a stylistic design choice that gives a consistent look to a development, especially along transport conduits as stake orientation will follow curves & bends in the road rather than being orientated to prevailing wind direction.
- In areas of mown amenity grass, this particular orientation can help to protect against mower damage during establishment.

5. BELOW GROUND TREE SUPPORT UNDERGROUND GUYED (UG) TREES

Scale 1:25

PLAN VIEW - UG



SECTION ELEVATION - UG

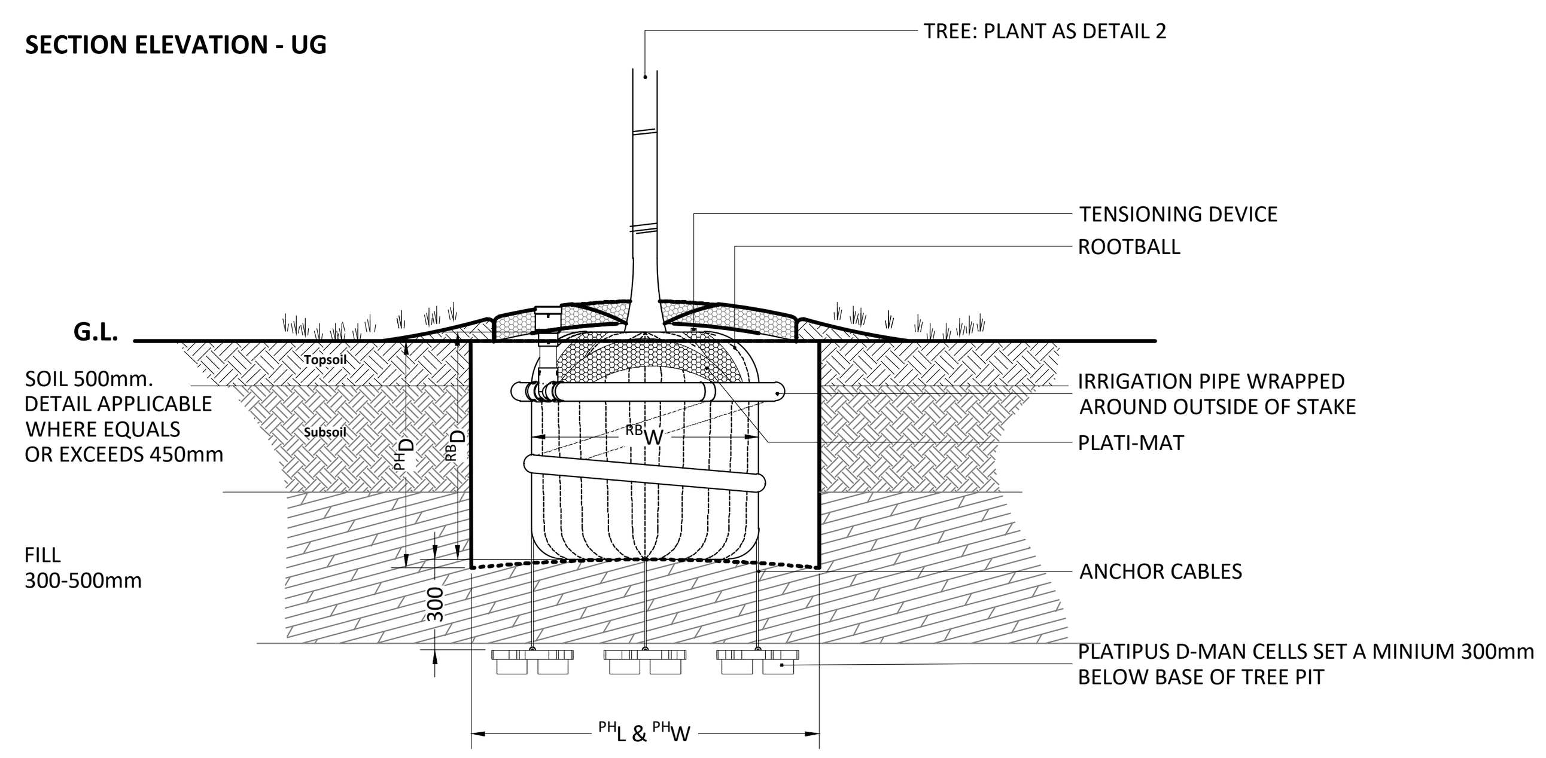


TABLE 4: UNDERGROUND GUYING SCHEDULE

ITEMS	SPECIFICATION
EARTH ANCHORING SYSTEM:	UNDERGROUND GUYED
MANUFACTURER:	PLATIPUS
MODEL:	D-MAN
D-MAN CELL DIMENSIONS:	270x270x80mm (LxWxD)
CODE:	RF2PDMAN
SUITABLE FOR:	12-45cmg TREES
SYSTEM COMPRISING:	3no. Wire Chokes, 5m galvanised wire, 1no. ratchet tensioner, 3no. Plati-Mats, 6no. D-MAN cells (3 x 2no. cells connected).

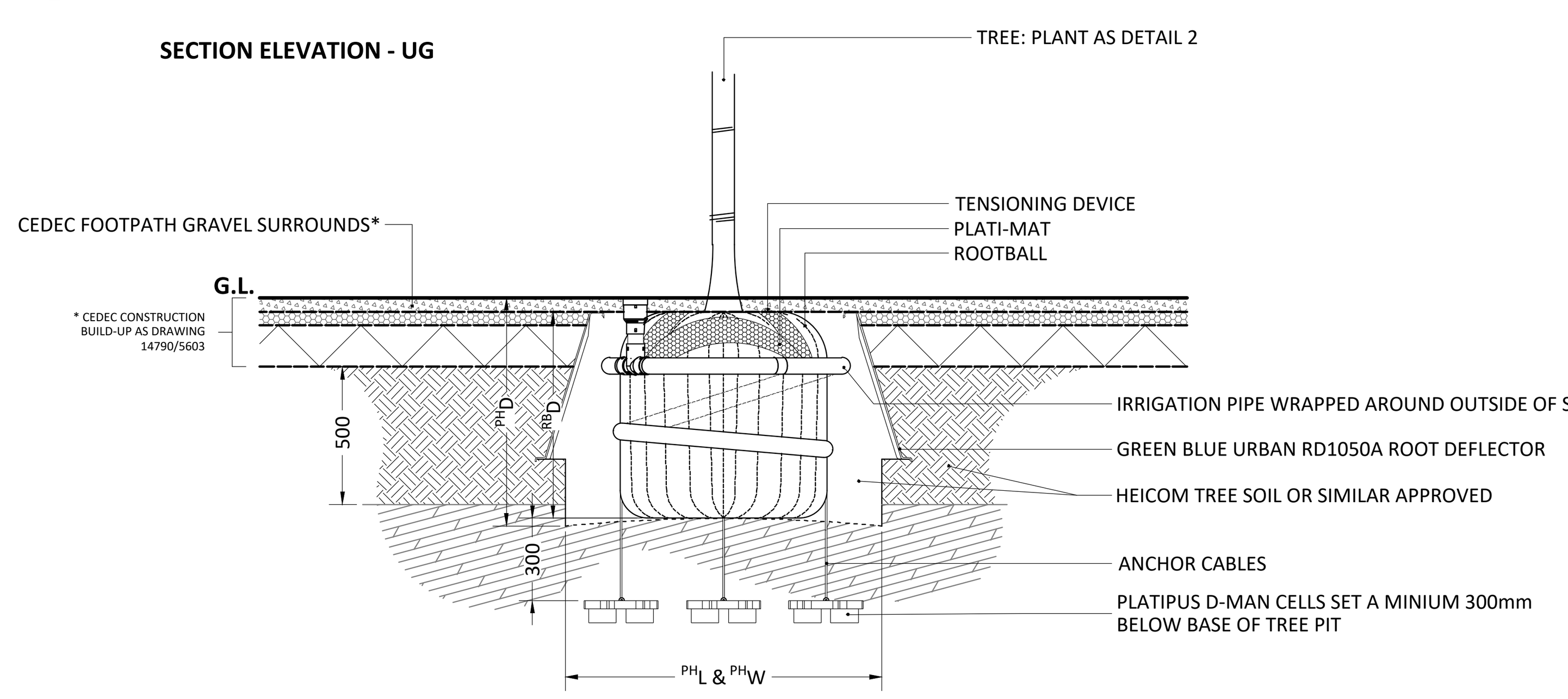
N.B. Earth Anchoring Systems are to be installed to manufacturer's recommendations & requirements with a minimum of 3no. earth anchors & associated cables to be fitted per tree.

The RF2PDMAN system has been preferentially selected over the RF1PDMAN system b/c of adverse site conditions (exposure, wind & ground conditions).

6. PROPOSED TREE PLANTING IN HARD SURFACES OPEN SPACE CEDEC GRAVEL PATHS

Scale 1:25

SECTION ELEVATION - UG



0 500mm 1000mm 2000mm

GENERAL TREE PIT PLANTING NOTES:

1. **SPECIFIED MATERIALS:** all to be installed in accordance with the manufacturer's recommendations and/or instruction.
2. **PLANTING GENERALLY:** Correct planting depth is critical for transplanting success, with over-deep planting identified as a common cause of failure. The Contractor shall therefore ensure that the natural root flare of the tree is clearly visible at proposed finished soiling surface. To ensure that correct final planting position / depth is achieved, the Contractor shall therefore take care to remove all:
   - soil placed above natural root flare during nursery packaging & production - rootballing, containerization, etc.
   - adventitious roots above the root flare,
   - wire encircling the main stem,
   - wire cage & burlap where possible. Otherwise, peel back and remove once the tree is in the planting pit.
3. **BACKFILL MATERIAL:** *Open ground & Verges*: select 'as dug' material to be reused taking care to match adjacent soil horizons (where suitability assured for tree growth); TBC onsite by Contractor. All 'as dug' material to conform to BS 3882:2007 General Purpose Topsoil). Remove all deleterious material arising (weeds, broken brick & large stones, etc). Backfill & lift in layers no greater than 150-230mm deep. Compact to between 1.5 - 2.0 mega pascals: tread down using footfall, paying particular attention to the planting hole edges and rootball extents to eliminate voids. Avoid over compaction. *Hard Paved Surfacing*: Use Heicom Tree Soil within primary rooting zone to manufacturers instruction. Compact to manufacturer's recommendations. Backfill loose & dry (as approx. 20% is lost by volume upon compaction) into the tree pit. Lift in layers no greater than 250-300mm deep, and compact to between 1.5 - 2.0 mega pascals making sure the material is dry as proper compaction cannot be achieved when wet, paying special attention to the edges of the tree pit. A calibrated Penetograph can be used by a specialist approved by the soil supplier, and employed by the Contractor who installed the soil, to assess and confirm the level of compaction. The corresponding graph should be supplied to both the Project Structural Engineer, the Landscape Contractor & the Contract Administrator for information, before tree planting commences. **N.B.** In the event that trees are to be installed into the root director post completion of surfacing & construction build-up; the contractor shall take care to install the root director to the correct line, form and level, and ensure that the root director void is filled and compacted with the specified tree soil *prior to* the commencement of associated surfacing and construction build up. Reason: to prevent the root director from being crushed during the construction build-up process. This temporary fill can then be dug-out at tree planting to accomodate the rootball.
4. **BACKFILL SOIL AMELIORANTS:** the Contractor shall satisy himself of the general suitability of the topsoil supplied for long term tree growth. Reason: to ensure the long term longevity of the tree supplied. Thereafter: to suit site conditions. Typically, this may comprise 0.5kg of broadleaf p4 or similar (pre-hydrated with water) thoroughly mixed with the topsoil until the medium is homogeneous.
5. **ARISINGS:** all deleterious material arising, shall be removed offsite to a licensed tip by the Contractor.
6. **TREE SUPPORT SYSTEMS:** Unless otherwise stated, all trees within public open spaces shall be supported as identified on the Softworks drawings which use both the Triple Stake (Tst) & Underground Guyed (UG) method of tree support. In the case of high wind loading / vandalism, the Triple Stake & Crossbar method may be substituted for the Double Stake & Crossbar (DstXb) method. In rear gardens the Single stake (Sst) method shall be used.
   - Tree support stakes along transport conduits are to be orientated in accordance w/t Detail 3 opposite.
   - Tree support stakes to butt up against the rootball to help stabilise it.
   - Tree support height above ground shall be as identified on Detail 3.
   - Stakes to be removed to a minimum 150mm below ground level with no sharp edges as soon as the developing root system is self-supporting & root firmness is proven.
   - Irrigation pipes to be installed around the AG tree support system & on top of the the UG tree support system.
7. **ROOT PROTECTION MEASURES:** supply & install permeable rootbarriers (Terram RootGuard, or equal & approved) to a min. depth of 600mm below ground. *Installation*: as per manufacturer's instruction. *Finished level*: top of barrier to be 10mm above G.L. *Zone of Deployment*: protection of hard surfacing / services lying within a min. 5m radius of the proposed tree and or as dictated on plan.
8. **IRRIGATION:** *Open ground & Verges*: Create topsoil chaucer as Detail 2. Water at frequence necessary to ensure establishment & survival.
9. **DRAINAGE:** the contractor shall satisy himself that the tree pit is free draining. The contractor shall notify the Contract Administrator of any problem areas and await further instruction before proceeding further. Reason: to ensure the longevity & viability of the tree supplied. TBC onsite.
10. **BARK MULCH:** Amenity, 8-40mm particle size, mid dark brown, Rolawn (or equal & approved). *Coverage:* 75mm deep, 1m Ø around base of tree.

Notes

Related Drawings: This is a composite drawing based on information received from other consultants.

Issue: Drawn by David Jarvis Associates Limited (CROWN COPYRIGHT. ALL RIGHTS RESERVED 2015 LICENCE NUMBER 0100031). This drawing is for Planning purposes only - Do not use this drawing for Construction. The information contained in the drawing should be used as a guide to the final forms and finishes of the landscape scheme. Any revisions to be approved by the Client and Local Authority

Scaling: Do not scale this drawing. Use given dimensions only.

Setting out: refer to Engineers for information regarding setting out. In the event of discrepancy refer to Engineers in the first instance.

Survey: Original survey provided by the Client.

Services: Where possible these are identified on the drawings but, for the avoidance of doubt all service/utility locations should be considered indicative until identified on site. To ensure those services / utilities shown are current refer to the original survey provider or utilities designer or Client for confirmation and further information regarding easements. In the event of new services being installed refer to the appointed Engineer. It is recommended that hazard warning tape 'danger electric cable'/'danger services' to be installed over all service routes (to remain on site) to current BS guidelines (BS7671).

Construction Information: all detailed design (including, but not necessarily limited to), bond patterns, kerbing, edging, tactile crossing demarkation, construction build-up, levels, drainage etc., to be provided by an appropriately qualified structural/highways/civil engineer to be appointed by the client for presentation to [and subsequent discharge from] the relevant supervising authority and/or body.

Lighting: Refer to lighting engineers drawings.

Planting: Plant species are selected and located in line with consideration of the site conditions, NHBC guidelines and discussions with the Local Authority and design team. All plants and planting procedure to conform to the David Jarvis Associates Limited Landscape Specification that will accompany the Construction issue drawings. No species or plant location is to be varied without prior consent of the Landscape Architect.

Tree Root Protection Measures: supply & install permeable rootbarriers (Terram RootGuard, or equal & approved) to a min. depth of 600mm below ground. Installation: as per manufacturer's instruction. Finished level: top of barrier to be 10mm above G.L. Zone of Deployment: protection of hard surfacing / services lying within a min. 5m radius of the proposed tree. To be increased to 1000mm depth where services / utilities require this - to be determined at Construction.

Foundations: Developers / Contractors to ensure that all foundations (buildings and external walling) are designed and constructed so as to take into account, at the time of maturity, any existing or proposed trees, hedgerows or other vegetation on the application site or existing vegetation on land adjoining the site at the time of construction and any trees felled or hedgerows removed on or adjacent to the site during the previous 15 years. For this purpose the developer / contractors will submit all relevant details to the authority dealing with the Building Regulations Certificate.

Design Levels: Refer to Engineers where design levels are not shown.

CDM: Drawings to be read in conjunction with Designers risk assessment. Potential risks above that of those associated with the general construction typical to the drawing are identified below;

Drawing Revision

Rev.	Date	Description	Drawn	Checked
C1	04/12/2017	First issue.	GR	BS

Status

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Project
ELMSBROOK, BICESTER PHASES 3 & 4

Drawing Title
TYPICAL TREE PLANTING DETAILS

Scale	Sheet Size	Date
1:25	A1	04/12/2017

Drawing No.	Revision
14790/5500	P1