Article # X-XXX.X

PART 1 - BACKGROUND

Tree Critical Root Zones (CRZ's) typically extend twice as far as the tree canopy and drip line. On a given site, the overlapping CRZ's of all the trees can cover a large portion of the ground within the Limits of Disturbance (LOD). Tree Protection Fence (TPF) is usually installed along the LOD on the perimeter of the site to protect the portion of the root zones that are outside the LOD. That still leaves a large portion of the CRZ's exposed to damage within the LOD.

Engineers attempt to mitigate roots being left inside the LOD by calling for Root Pruning to be performed as well as Silt Fence and TPF to be installed along the LOD. A typical tree outside the LOD can lose as much as 50% of its living root zone during the Root Pruning or the Silt Fence trenched-in installation. Despite common myth that Root Pruning helps the trees, in actuality, Root Pruning is causing injury to the trees. Most Root Pruning and Silt Fence on construction sites is performed with a ditch-witch type trenching machine or a mini-excavator with a narrow bucket. These methods of excavation rip and tear the tree roots and do not qualify as "Root Pruning". For more information on proper Root Pruning, see the TOL Spec on Root Pruning. Even a 25% loss of tree roots is considered a major impact to a tree and can directly lead to tree mortality. However, this decline can take 3-5 years to complete. As trees grow slowly, they can also die slowly. That is why many trees outside the LOD are found to be dead 3-5 years after construction, because of the root loss they incurred during construction.

The purpose of Root Protection Matting (RPM) is to protect the portions of tree root zones that remain within the LOD. RPM can reduce compaction, rutting and contamination of soils and root systems for specimen trees of high impact within the construction zone. Trees anticipated to receive temporary or repetitive materials staging, foot traffic or equipment access within the LOD shall receive Root Protection Matting prior to site disturbance. Materials and methods for this purpose were principally the development of Tree Preservation Experts working in collaboration with noted Geotechnical Specialists. There are many different grades and strengths of RPM, so it is important to use protection that is adequate for the anticipated loading and use. Wood chip mulch or stone is often incorporated with RPM systems.

In order for the RPM to do its job and keep tree roots alive within the LOD, the practice of Root Pruning of tree roots along the edges of the LOD adjacent to RPM must be omitted. Therefore, to maintain proper perimeter Erosion and Sediment Controls in these selected areas, another solution is required. Enter Trenchless Silt Fence (TSF) and Filter Sox (FSX). In lieu of Root Pruning on the LOD, TSF or FSX shall be used to prevent silt discharge from the site in these areas. See the TOL detail and spec section for Trenchless Silt Fence and Filter Sox for more information on these solutions.

PART 2 - SD-RPM

1 Ply Standard Duty Root Protection Matting (SD-RPM)

Standard Duty All Weather Root Protection Matting is composed of one layer of a nominally 1/2" thick geocomposite biplanar or triplanar drainage geonet. The purpose of the SD-RPM is to transfer and diffuse dynamic loading from construction activities thus preventing rutting and compaction of soils containing tree roots. The RPM also allows atmospheric gas exchange to topsoil and roots thereby maintaining tree health while allowing major construction access and stockpile across a root zone. SD-RPM is for use when the following are anticipated on the tree root zone:

- Pedestrians
- Wheelbarrows
- Concrete buggies
- Track loaders
- Light duty pneumatic tired trucks
- Soil stockpile

The SD-RPM shall be installed prior to and for the duration of construction. This matting will be pinned on the original ground surface using minimum 8" landscape nails or 8" sod staples. For heavier duty applications, SD-RPM can be paired with geogrid for added stabilization. The SD-RPM shall cover the entire Critical Root Zone that is exposed to traffic within the limits of disturbance and left unprotected by the Tree Protection Fence.

PART 3 - HD-RPM

2 Ply Heavy Duty Root Protection Matting with Wood Chips (HD-RPM)

Heavy-Duty All-Weather Root Protection Matting is composed of two layers of a nominally 1/2" thick geocomposite biplanar or triplanar drainage geonet covered with 6" of wood chips. The purpose of the HD-RPM is to transfer and diffuse dynamic loading from construction activities thus preventing rutting and compaction of soils containing tree roots. The RPM also allows atmospheric gas exchange to topsoil and roots thereby maintaining tree health while allowing major construction access and stockpile across a root zone. HD-RPM is for use when the following are anticipated on the tree root zone:

- Wheeled skid steers
- Mini excavators
- Medium duty trucks
- Scissor lifts
- Boring equipment
- Backhoes

The HD-RPM shall be installed prior to and for the duration of construction. This matting will be pinned on the original ground surface using minimum 8" landscape nails or 8" sod staples. For heavier duty applications, SD-RPM can be paired with geogrid for added stabilization. The HD-RPM shall cover the entire Critical Root Zone that is exposed to traffic within the limits of disturbance and left unprotected by the Tree Protection Fence.

PART 4 - EXD-RPM

3 Ply Extreme Duty Root Protection Matting with Stone (EXD-RPM)

Extreme Duty All Weather Root Protection Matting is composed of three layers of a nominally 1/2" thick geocomposite biplanar or triplanar drainage geonet covered with 6" of crushed aggregate. The purpose of the EXD -RPM is to transfer and diffuse dynamic loading from construction activities thus preventing rutting and compaction of soils containing tree roots. The EXD-RPM also allows atmospheric gas exchange to topsoil and roots thereby maintaining tree health while allowing major construction access and stockpile across a root zone. EXD-RPM is for use when the following are anticipated on the tree root zone:

- Medium and large excavators
- Extendable forklifts
- Heavy duty trucks
- Concrete trucks
- Dozers
- Cranes

The HD-RPM shall be installed prior to and for the duration of construction. This matting will be pinned on the original ground surface using minimum 8" landscape nails or 8" sod staples. For heavier duty applications, EXD-RPM can be paired with geogrid for added stabilization. The EXD-RPM shall cover the entire Critical Root Zone that is exposed to traffic within the limits of disturbance and left unprotected by the Tree Protection Fence.

Not To Scale

REVISIONS			
NO.	DATE:		
1	9/2023		

ROOT PROTECTION MATTING (RPM) SPECIFICATION

DRAWING **XX-1**

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