Article # X-XXX.X

PART 1 - BACKGROUND

Traditional utility trenching techniques allow indiscriminate excavation which causes ripping and tearing of tree roots during the excavation. Traditional mechanical trenching is appropriate when excavated areas have no tree roots in them. For instances when trees exist in the path of a proposed utility trench, another trenching technique is necessary. An established alternative to indiscriminate trenching is known as Supersonic Air Tool Utility Trenching (SSAT-UT). The purpose of SSAT-UT is to non-invasively excavate a utility trench so that underground utilities can be installed without harming the tree or it's root zone. SSAT-UT utilizes a high pressure / high volume air from a standard 185 cfm or 375 cfm air compressor. This high pressure / high volume is focused through a hose and tool consisting of a valve, handle, barrel and venturi tip. These devises are manufactured by various companies such as Air Spade, Air Knife, etc. The venturi tip allows the air to reach speeds in excess of 1400 mph. This stream of air is powerful enough to dislodge all but the most stubborn soil particles. As the soil particles are loosened, they are blown out of the utility trench and then they fall back down on the waiting Root Protection Matting. For extremely compacted soils, pre-watering is often incorporated in the days leading up to the excavation to aid in trenching. SSAT-UT shall be performed directly by an ISA Certified Arborist or by a crew directly overseen by an ISA Certified Arborist who has documented experience in air excavation around tree roots.

PART 2 - SAFETY

Establish a safety zone for each trench to be air excavated to protect pedestrians, vehicles, and structures. Initiate the following precautions within each safety zone: safety cones, flagman for pedestrians or vehicles, Root Protection Matting on the ground within 6 feet of both sides of the proposed trench, a drop-cloth tarp attached to the temporary 4-foot welded wire fence to block airborne debris from immovable targets, and safety cones for hoses crossing pedestrian walkways. Pedestrians or vehicles entering the safety zone with no personal protective equipment shall result in temporary cessation of airflow by the supersonic air tool operator. Compressed air hose connections shall have safety clips or whip-checks installed to prevent unwanted hose disconnection. The supersonic air tool operator will wear personal safety protection while performing air tool operations including hardhad, ear plugs, safety glasses, face shield or goggles, long sleeve shirt and pants or Tyvek suit, gloves, chain saw chaps and safety toe work boots.

PART 3 - EXECUTION

SSAT-UT excavation for underground utilities within critical root zones shall follow the following procedures:

1. Supersonic Air Tool Non-invasive utility trench excavation (SSAT-UT) shall be performed by or directly overseen by an ISA Certified Arborist "Arborist" with documented experience in Supersonic Air tool (SSAT) work within critical root zones (CRZ's).
2. The proposed utility trench layout shall be painted on the ground and the route should avoid trees as much as practicable.
3. Tree protection fence shall be installed 6 feet away from proposed trench on each side of work area.
4. The first layer of silt fabric is attached to both fences with hog rings and lapped on grade toward the proposed trench, leaving 9" of fabric laying flat on ground (not trenched in) and secured with landscape nails every 24" O.C.
5. A 6 foot wide strip of Standard Duty Root Protection Matting (SD-RPM) shall be installed on both sides of proposed trench, extending all the way from the proposed excavation to the base of the fence and covering the first 9" of the silt fabric which is laying on the ground horizontally. Secure the SD-RPM with 12" landscape nails every 24" O.C.
6. A Second layer of silt fabric is installed on the fence and draped down so that 9" of it lays horizontally over the SD-RPM. Secure the silt fabric to the fence with hog rings every 24" O.C. and secure the fabric to the ground using 12" landscape nails every 24" O.C.
7. Wearing proper PPE, use a 185 CFM or 375 CFM air compressor and SSAT to begin excavating soil in between the 2 strips of SD-RPM being careful not to damage tree roots and any unforeseen underground utilities. The excavated spoils will be blown out of the hole under air pressure and fall back down on the waiting SD-RPM.
8. Continue excavating until the specified depth is achieved.
9. Tree roots typically only exist in the first 18" of soil, therefore a void shall exist under the root zone, which is where the subsequent conduits or pipes will be placed.
10. Perform root pruning of any roots that were damaged during the excavation process. Perform root pruning of fine hairlike fibrous roots as needed. Preserve all roots 1/2" and larger.
11. Wrap all remaining exposed roots with pre-slit, self-seal foam or rubber pipe insulation to protect them from damage from the subsequent trades.
12. Allow the plumber, electrician or other trade to enter the tree protection area and install their conduits, pipes, etc under the roots. Stone dust or other base material can be shoveled into the trench to support the pipes which will follow. Conduits and pipes are then slipped under the roots from each end of the trench. Pipe connections are made and the trades leave.
13. The Arborist returns to inspect the roots for additional damage that may have occurred during the trade work. The open trench is photographed to document the covered roots and installed pipes. Any damaged roots are pruned.
14. The spoils are shoveled back into the trench in 6" lifts and watered-in to achieve relative compaction during the backfilling. Do not hand tamp or over-compact soil. Mound any excess soil along the top of the trench to allow future settling.
15. Install grass seed and straw over top of trench.
17. Take up the first layer of silt fence and dispose.
18. Roll up the SD-RPM matting so it can be reused again.
19. Collect all landscape nails to be reused again.
20. Take up the second layer of silt fence and dispose.
21. Remove the welded wire fence and t-posts and save for reuse again.
22. If tree roots were pruned during the SSAT-UT operation, then a Paclobutrazol based tree growth regulator shall be applied according to the label as a basal drench.
23. Also if roots were pruned, a soil injection probe and fertilizer spray rig shall be used to mix and inject a root stimulator containing Mycorrhizae inoculants on a 3 foot O.C. spacing within the dripline of the tree to a depth of 12" below grade.

Not To Scale

REVISIONS				NON-INVASIVE SSAT UTILITY TRENCHING (SSAT-UT) SPECIFICATION	DRAWING XX-1
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