

Administrative Site Review Application

Planning and Development Customer Service Center • One Exchange Plaza, Suite 400 | Raleigh, NC 27601 | 919-996-2500



This form is required when submitting site plans as referenced in Unified Development Ordinance (UDO) Section 10.2.8. Please check the appropriate building types and include the plan checklist document when submitting.

Office Use Only: Case #: _____ Planner (print): _____

Please review UDO Section 10.2.8. to determine the site plan tier. If assistance determining a Site Plan Tier is needed a Site Plan Tier Verification request can be submitted online via the [Permit and Development Portal](#). (Note: There is a fee for this verification service.)

Site Plan Tier: Tier Two Site Plan Tier Three Site Plan

Building and Development Type (Check all that apply)		Site Transaction History
<input type="checkbox"/> Detached <input type="checkbox"/> Attached <input type="checkbox"/> Townhouse <input type="checkbox"/> Apartment <input type="checkbox"/> Tiny house <input type="checkbox"/> Open lot	<input checked="" type="checkbox"/> General <input type="checkbox"/> Mixed use <input type="checkbox"/> Civic <input type="checkbox"/> Cottage Court <input type="checkbox"/> Frequent Transit Development Option	Subdivision case #: _____ Scoping/sketch plan case #: _____ Certificate of Appropriateness #: _____ Board of Adjustment #: _____ Zoning Case #: _____ Design Alternate #: _____

GENERAL INFORMATION

Development name: ICE Raleigh Office Building

Inside City limits? Yes No

Property address(es): 4220 & 4300 BLAND ROAD

Site P.I.N.(s): 1716404376 , 1716404479

Please describe the scope of work. Include any additions, expansions, and uses (UDO 6.1.4).

Construction of a 3-story office building & surface parking lot.

Current Property Owner(s): RDU OFFICE PARTNERS, LLC.

Company: RDU OFFICE PARTNERS, LLC. Title: _____

Address: 110 MIDLANDS CT WEST COLUMBIA SC 29169-3456

Phone #: _____ Email: _____

Applicant Name (If different from owner. See "who can apply" in instructions):

Relationship to owner: Lessee or contract purchaser Owner's authorized agent Easement holder

Company: _____ Address: _____

Phone #:	Email:
NOTE: please attach purchase agreement or contract, lease or easement when submitting this form.	
Developer Contact: Peter Graf	
Company: Infrastructure Consulting & Engineering	Title: Executive Vice President
Address: 4505 Falls of Neuse, Suite 110, Raleigh, NC 27609	
Phone #: 919-812-7776	Email: peter.graf@ice-eng.com
Applicant Name: Peter Graf	
Company: Infrastructure Consulting & Engineering	Address: 4505 Falls of Neuse, Suite 110, Raleigh, NC 27609
Phone #: 919-812-7776	Email: peter.graf@ice-eng.com

DEVELOPMENT TYPE + SITE DATA TABLE
(Applicable to all developments)

SITE DATA	BUILDING DATA
Zoning district(s) (please provide the acreage of each): CX-3	Existing gross floor area (not to be demolished): 0
Gross site acreage: 1.361	Existing gross floor area to be demolished: 0
# of parking spaces proposed: 58	New gross floor area: 20,895
Max # parking permitted (7.1.2.C): 111	Total sf gross (to remain and new): 20,895
Overlay District (if applicable):	Proposed # of buildings: 1
Existing use (UDO 6.1.4): Vacant	Proposed # of stories for each: 3
Proposed use (UDO 6.1.4): Office building	Proposed # of basement levels (UDO 1.5.7.A.6)

STORMWATER INFORMATION

Imperious Area on Parcel(s): Existing (sf) <u>0</u> Proposed total (sf) <u>34,150</u>	Impervious Area for Compliance (includes ROW): Existing (sf) <u>0</u> Proposed total (sf) <u>1,907</u>
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RESIDENTIAL & OVERNIGHT LODGING DEVELOPMENTS

Total # of dwelling units:	Total # of hotel bedrooms:
# of bedroom units: 1br _____ 2br _____ 3br _____ 4br or more _____	
# of lots:	Is your project a cottage court? <input type="radio"/> Yes <input type="radio"/> No
	A frequent transit development? <input type="radio"/> Yes <input type="radio"/> No

Continue to Applicant Signature Block on Page 4.

APPLICANT SIGNATURE BLOCK

Pursuant to state law (N.C. Gen. Stat. § 160D-403(a)), applications for development approvals may be made by the landowner, a lessee or person holding an option or contract to purchase or lease land, or an authorized agent of the landowner. An easement holder may also apply for development approval for such development as is authorized by the easement.

Acting as an authorized agent requires written permission from the property owner for the purposes of making this development approval and/or permit application. Written permission from the property owner to act as an authorized agent must be made available to the City of Raleigh upon request.

By submitting this application, the undersigned applicant acknowledges that they are either the property owner or one of the persons authorized by state law (N.C.G.S. 160D-403(a)) to make this application, as specified in the application. The undersigned also acknowledges that the information and statements made in the application are correct and the undersigned understands that development approvals are subject to revocation for false statements or misrepresentations made in securing the development approval, pursuant to N.C. Gen. Stat. § 160D-403(f).

The undersigned indicates that the property owner(s) is aware of this application and that the proposed project described in this application will be maintained in all respects in accordance with the plans and specifications submitted herewith, and in accordance with the provisions and regulations of the City of Raleigh Unified Development Ordinance.

The undersigned hereby acknowledges that, pursuant to state law (N.C.G.S. 143-755(b1)), if this permit application is placed on hold at the request of the applicant for a period of six consecutive months or more, or if the applicant fails to respond to comments or provide additional information requested by the City for a period of six consecutive months or more, then the application review is discontinued, and a new application is required to proceed and the development regulations in effect at the time permit processing is resumed shall apply to the new application.

Signature: 	Date: 12/6/2024
Printed Name: Peter Graf	
Signature:	Date:
Printed Name:	

CHAPTER 2 TREE PLANTING AND MAINTENANCE

THIS CHAPTER OUTLINES THE STANDARDS FOR PLANTING AND MAINTAINING TREES ON PROPERTY OWNED OR CONTROLLED BY THE CITY OF RALEIGH.

B. TREE PLANTING ON CITY PROPERTY

THE PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT IS RESPONSIBLE FOR PLAN REVIEW, INSPECTION, MONITORING AND ENFORCEMENT ASSOCIATED WITH TREE PLANTING AND MAINTENANCE ON PROPERTY OWNED OR CONTROLLED BY THE CITY.

1. DEVELOPMENT, PRIVATE CITIZEN OR CONTRACTOR PLANTING ON CITY OWNED OR CONTROLLED PROPERTY BY ANY INDIVIDUAL, OR UNDERTAKING OTHER THAN THE CITY. THESE PROJECTS ARE AT THE EXPENSE OF THE REQUESTOR AND REQUIRE A TREE IMPACT PERMIT.
2. PARTNERSHIP PLANTING UNDERTAKEN BY NON-PROFIT ORGANIZATIONS, PUBLIC-PRIVATE PARTNERSHIPS, AND CIVIC GROUPS. UNLESS WORK IS DONE UNDER STRICT GUIDANCE AND OVERSIGHT BY THE URBAN FORESTER, THESE PROJECTS ARE AT THE EXPENSE OF THE REQUESTOR AND REQUIRE A TREE IMPACT PERMIT.

C. REQUESTS FOR TREE PLANTING

1. REQUESTS FOR TREE PLANTING AND TREE IMPACT PERMITS ARE EVALUATED IN THE ORDER IN WHICH THEY ARE RECEIVED.
2. TREE PLANTING IS CONTINGENT ON THE PLANTING SEASON, AVAILABILITY OF PLANT MATERIAL, SITE SUITABILITY, STAFFING, AND FUNDING.
3. THE URBAN FORESTER OR DESIGNEE WILL PRIORITIZE TREE PLANTING REQUESTS ACCORDING TO THE FOLLOWING CRITERIA:
 - A. NEEDS BASED: AREAS IDENTIFIED WITH THE GREATEST TREE CANOPY DEFICITS
 - B. PRE-IDENTIFIED LOCATIONS: AREAS earmarked FOR BEAUTIFICATION IMPROVEMENTS
 - C. ON DEMAND: CITY DEPARTMENTS, VOLUNTEER GROUPS, NEIGHBORHOODS, CITIZENS, AND DEVELOPMENT

D. TREE QUALITY STANDARDS

1. GENERAL: FURNISH NURSERY-GROWN PLANTS TRUE TO GENUS, SPECIES, VARIETY, CULTIVAR, STEM FORM, SHEARING, AND OTHER FEATURES INDICATED ON DRAWINGS AND COMPLYING WITH ANSI Z60.1, WITH HEALTHY ROOT SYSTEMS DEVELOPED BY TRANSPLANTING OR ROOT PRUNING AND A VISIBLE ROOT FLARE. PROVIDE WELL-SHAPED, FULLY BRANCHED, HEALTHY, VIGOROUS STOCK FREE OF DISEASE, INSECTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT.
2. TREES WITH MULTIPLE LEADERS, UNLESS SPECIFIED, WILL BE REJECTED. TREES WITH DAMAGED OR CROOKED LEADERS, BARK ABRASIONS, SUNSCALD, DISFIGURING KNOTS, INSECT DAMAGE, OR CUTS ON LIMBS OVER 1/2 IN. IN DIAMETER THAT ARE NOT COMPLETELY CLOSED, OR ROOT FLARE MORE THAN 2" BELOW SURFACE OF ROOT BALL WILL BE REJECTED.
3. SPECIES SELECTION
 - A. SELECTED TREE SPECIES SHALL BE OF A CULTIVAR THAT IS SUPERIOR IN FORM AND DISEASE RESISTANCE. PREFERENCE WILL BE GIVEN TO STREET TREES GROWN SPECIFICALLY FOR URBAN CONDITIONS.
 - B. EXOTIC INVASIVE SPECIES ARE NOT PERMITTED.
 - C. TREES TO BE INSTALLED UNDER OVERHEAD POWERLINES SHALL HAVE A MATURE HEIGHT OF NO GREATER THAN 30FT.
 - D. ALL SPECIES SELECTIONS SHALL BE REVIEWED BY THE URBAN FORESTER OR DESIGNEE.
 - E. SPECIES DIVERSITY IS ENCOURAGED TO IMPROVE OVERALL URBAN FOREST HEALTH.
 - F. ALL PLANT MATERIAL AND INSTALLATION WORK SHALL CONFORM TO THE STANDARDS DETAILED IN THIS MANUAL, THE AMERICAN NATIONAL STANDARDS FOR TREE CARE OPERATIONS, ANSI A300 AND NURSERY STOCK, ANSI Z60.1 AND APPROVED CITY STANDARD DETAILS.

4. ALL PLANT MATERIAL SHALL BE FREE OF ALL PESTS, DISEASES, AND CANCKERS, IN HEALTHY CONDITION, AND FREE OF MECHANICAL DAMAGE AT THE TIME OF PLANTING AS DETERMINED BY URBAN FORESTRY STAFF.
5. PROVIDE PLANTS OF SIZES, GRADES, AND BALL OR CONTAINER SIZES COMPLYING WITH ANSI Z60.1 FOR TYPES AND FORM OF PLANTS REQUIRED. PLANTS OF LARGER SIZE MAY BE USED IF ACCEPTABLE TO URBAN FORESTER, WITH A PROPORTIONATE INCREASE IN SIZE OF ROOTS OR BALLS.
6. LABEL EACH PLANT OF EACH VARIETY AND CULTIVAR WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF BOTANICAL AND COMMON NAME, INCLUDE NOMENCLATURE FOR HYBRID, VARIETY, OR CULTIVAR, IF APPLICABLE.
7. WHEN MORE THAN ONE PLANT OF ANY SPECIES IS PLANTED, ALL PLANT MATERIAL SHALL BE UNIFORM IN SIZE AND SHAPE WHEN POSSIBLE. ALL PLANT MATERIAL SHALL HAVE FULL FORM WITH EVEN-SPACED BRANCHING. ONE-SIDED PLANTS OR TIGHT ROOT PLANTS ARE NOT ACCEPTABLE IF THE GROWTH HABIT IS ADVERSELY AFFECTED.
8. TREE AND SHRUB MEASUREMENTS
 - A. MEASURE ACCORDING TO ANSI Z60.1 WITH BRANCHES AND TRUNKS OR CANES IN THEIR NORMAL POSITION. DO NOT PRUNE TO OBTAIN REQUIRED SIZES.
 - B. INSTALLATION SIZE FOR RIGHT OF WAY TREES:
 - SHADE TREES SHALL BE A MINIMUM OF 3" CALIPER AND 10' TALL.
 - UNDERSTORY TREES SHALL BE A MINIMUM OF 1.5" CALIPER FOR SINGLE STEM AND 8" TALL FOR BOTH SINGLE AND MULTI-STEMMED TREES.

9. BALLED AND BURLAP (B&B), CONTAINER AND BARE ROOT PLANT MATERIALS
 - A. TREES DESIGNATED B&B SHALL BE PROPERLY DUG WITH FIRM, NATURAL BALLS OF SOIL WITH BALL SIZE NOT LESS THAN DIAMETER AND DEPTH RECOMMENDED BY ANSI Z60.1 FOR TYPE AND SIZE OF TREE, RETAINING AS MANY FIBROUS ROOTS AS POSSIBLE. BALLS SHALL BE FIRMLY WRAPPED WITH BIODEGRADABLE BURLAP AND SECURED WITH NAILS AS RECOMMENDED BY ANSI Z60.1.
 - B. THE ROOT FLARE SHALL BE APPARENT AT THE SURFACE OF THE ROOT BALL OR THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING EXCESS SOIL FROM THE TOP OF THE ROOT BALL IN ORDER TO ESTABLISH THE CORRECT GRADE. TREES SHALL BE REJECTED IF THE ROOT FLARE HAS BEEN BURIED LONG ENOUGH FOR THE STEM TO SPROUT ADVENTITIOUS ROOTS. TREES WITH LOOSE, BROKEN, PROCESSED, OR MANUFACTURED ROOT BALLS WILL NOT BE ACCEPTED.
 - C. CONTAINER-GROWN STOCK SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED EXTERIOR PLANTS GROWN IN A CONTAINER WITH WELL-ESTABLISHED ROOT SYSTEM REACHING SIDES OF CONTAINER AND MAINTAINING A FIRM BALL WHEN REMOVED FROM CONTAINER. THE ROOT FLARE SHALL BE APPARENT AT SURFACE OF BALL, OR THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING EXCESS SOIL FROM THE TOP OF THE ROOT BALL IN ORDER TO ESTABLISH THE CORRECT GRADE. CONTAINER SHALL BE RIGID ENOUGH TO HOLD BALL SHAPE AND PROTECT ROOT MASS DURING SHIPPING AND BE SIZED ACCORDING TO ANSI Z60.1 FOR KIND, TYPE, AND SIZE OF EXTERIOR PLANT REQUIRED.
 - D. BARE ROOT MATERIAL SHALL BE GROWN IN THE GROUND IN THE NURSERY WITHOUT ARTIFICIAL ROOT RESTRICTION DEVICES, SUCH AS CONTAINERS OR FABRIC BAGS, UNDER FAVORABLE GROWING CONDITIONS AND WHICH HAVE RECEIVED THE PROPER CULTURAL TREATMENT TO LEVEL OF A WELL-BRANCHED ROOT SYSTEM. AFTER HARVEST, THE SOIL IS REMOVED FROM THE ROOTS.

10. DELIVERY, STORAGE AND HANDLING
 - A. DO NOT PRUNE TREES AND SHRUBS BEFORE DELIVERY. PROTECT BARK, BRANCHES, AND ROOT SYSTEMS FROM SUN SCALD, DRYING, SWEATING, WHIPPING, AND OTHER HANDLING AND TRYING DAMAGE. DO NOT BEND OR BIND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DESTROY THEIR NATURAL SHAPE. PROVIDE PROTECTIVE COVERING OF EXTERIOR PLANTS DURING DELIVERY. DO NOT DROP EXTERIOR PLANTS DURING DELIVERY.
 - B. HANDLE PLANTING STOCK BY ROOT BALL. HEAVIER MATERIAL SHALL BE HANDLED WITH STRAPS ON THE ROOT BALL AND APPROPRIATE EQUIPMENT SUCH AS A SMALL SKID STEER LOADER.
 - C. DELIVER BARE-ROOT STOCK PLANTS FRESHLY DUG, IMMEDIATELY AFTER DIGGING UP BARE-ROOT STOCK, PACK ROOT SYSTEM IN WET STRAW, HAY, OR OTHER SUITABLE MATERIAL TO KEEP ROOT SYSTEM MOIST UNTIL PLANTING.
 - D. DELIVER EXTERIOR PLANTS AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND INSTALL IMMEDIATELY. IF PLANTING IS DELAYED MORE THAN SIX HOURS AFTER DELIVERY, SET EXTERIOR PLANTS IN THEIR APPROPRIATE ASPECT (SUN, FILTERED SUN, OR SHADE), PROTECT FROM WEATHER AND MECHANICAL DAMAGE, AND KEEP ROOTS MOIST.
 - SET BALLED STOCK ON GROUND AND COVER BALL WITH SOIL, PEAT MOSS, SANDWUST, OR OTHER ACCEPTABLE MATERIAL.

11. NURSERY
 - A. PLANTS SHALL BE GROWN WITHIN ONE COLD HARDINESS ZONE OF THE PROJECT SITE.
 - B. PROVIDE DIGITAL PHOTOS FROM THE NURSERY WITH HEIGHT IDENTIFIED FOR REVIEW BY THE URBAN FORESTER OR DESIGNEE PRIOR TO DIGGING OR SHIPPING. ALL TREES SHALL ALSO BE REVIEWED AND APPROVED PRIOR TO INSTALLATION EITHER AT PLACE OF PURCHASE, NURSERY, HOLDING YARD OR WORK SITE BY THE URBAN FORESTER OR DESIGNEE.
12. OBSERVATION AND REJECTION
 - A. URBAN FORESTER OR DESIGNEE MAY OBSERVE TREES AT PLACE OF PURCHASE, NURSERY HOLDING YARD, OR AT SITE BEFORE PLANTING FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, SIZE, AND QUALITY. URBAN FORESTER RETAINS RIGHT TO OBSERVE TREES FURTHER FOR SIZE AND CONDITION OF BALLS AND ROOT SYSTEMS, INSECTS, INJURIES, AND LATENT DEFECTS AND TO REJECT UNSATISFACTORY OR DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF WORK. REMOVE REJECTED TREES IMMEDIATELY FROM PROJECT SITE.
 - B. IF FOR ANY REASON TREES CANNOT BE INSTALLED ACCORDING TO THE PLANS A REQUEST SHALL BE MADE TO THE URBAN FORESTER IN WRITING. THE CONTRACTOR SHALL INFORM THE CITY AND ALTERNATE PLANTING LOCATIONS SHALL BE SELECTED FOR APPROVAL BY THE URBAN FORESTER.
13. SUBSTITUTIONS
 - A. REQUESTS FOR SUBSTITUTION FOR THE LISTED PLANT MATERIAL MUST BE MADE TO THE URBAN FORESTER IN WRITING. THE REQUEST SHALL INCLUDE A MINIMUM OF 5 NURSERY ATTEMPTS FOR LOCATION AND CONTACT INFORMATION. SUBSTITUTIONS WILL BE CONSIDERED IF THE LISTED MATERIAL CANNOT BE LOCATED OR CONFIRMED BY KNOWN SUPPLIERS. PLANT SUPPLIERS MUST BE RESEARCHED AND LOCATED PRIOR TO SUBMITTAL. IF PLANT MATERIAL SUBSTITUTIONS ARE TO BE MADE AFTER AWARD OF THE CONTRACT OR PERMIT, THE SUBSTITUTION MUST BE OF SIMILAR GROWTH HABIT, FORM, AND CHARACTERISTICS, SIMILAR IN SPECIFIED SIZE, AND EQUAL IN PRICE AND SUBJECT TO APPROVAL OR REJECTION BY THE URBAN FORESTER.
 - B. IF FOR ANY REASON TREES CANNOT BE INSTALLED ACCORDING TO THE PLANS A REQUEST SHALL BE MADE TO THE URBAN FORESTER IN WRITING. THE CONTRACTOR SHALL INFORM THE CITY AND ALTERNATE PLANTING LOCATIONS SHALL BE SELECTED FOR APPROVAL BY THE URBAN FORESTER.

14. EXECUTION
 - A. TREE AND SHRUB EXCAVATION
 - PLANTING HOLE: EXCAVATE CIRCULAR PITS WITH SIDES SLOPED INWARD. TRIM BASE LEAVING CENTER AREA RAISED SLIGHTLY TO SUPPORT ROOT BALL AND ASSIST IN DRAINAGE. DO NOT FURTHER DISTURB BASE. SCARP SIDES OF PLANT PIT SWEARED OR SMOOTHED DURING EXCAVATION.
 - EXCAVATE APPROXIMATELY THREE TIMES AS WIDE AS BALL DIAMETER FOR ALL PLANT MATERIAL.
 - PLANTING HOLES SHALL BE NO DEEPER THAN THE ROOT FLARE OF THE TREE OR PLANT WHICH SHALL BE INSTALLED AT GRADE, A MAXIMUM OF 2 INCHES ABOVE GRADE, AND NEVER BELOW GRADE.
 - SOIL REMOVED FROM EXCAVATIONS MAY BE USED AS BACKFILL PROVIDED IT MEETS THE SPECIFIED PLANTING SOIL MIX REQUIREMENTS.
 - OBSTRUCTIONS: NOTIFY URBAN FORESTER IF UNEXPECTED ROCK OR OBSTRUCTIONS DETRIMENTAL TO TREES OR SHRUBS ARE ENCOUNTERED IN EXCAVATIONS.
 - DRAINAGE: PLANTING HOLES NOT ASSOCIATED WITH A DRAIN SYSTEM SHALL DRAIN FULLY WITHIN A 12-HOUR PERIOD. NOTIFY URBAN FORESTER IF SUBSOIL CONDITIONS EVIDENCE UNEXPECTED WATER SEEPAGE OR RETENTION IN TREE OR SHRUB PITS.
 - B. TREE AND SHRUB PLANTING
 - BALL AND BURLAP
 - a. SET BALLED AND BURLAPPED STOCK PLUMB AND IN CENTER OF PIT OR TRENCH WITH ROOT FLARE AT GRADE. A MAXIMUM OF 2 INCHES ABOVE ADJACENT FINISH GRADES, AND NEVER BELOW GRADE. DO NOT MANUEVER BY TRUNK. HANDLE BY ROOT BALL ONLY.
 - b. REMOVE BURLAP AND WIRE BASKETS FROM THE TOP 1/2 OF ROOT BALL, CUT OFF AND DISCARD FROM HOLE, BUT DO NOT REMOVE FROM UNDER ROOT BALLS. REMOVE PALLETS, IF ANY, BEFORE SETTING. DO NOT USE PLANTING STOCK IF ROOT BALL IS CRACKED OR BROKEN BEFORE OR DURING PLANTING OPERATION.
 - c. PLACE PLANTING SOIL MIX AROUND ROOT BALL IN LAYERS, TAMPING GENTLY TO SETTLE MIX AND ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY ONE-HALF BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE WATER IS ABSORBED. WATER AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF PLANTING SOIL MIX.
 - CONTAINER
 - a. SET CONTAINER-GROWN STOCK PLUMB AND IN CENTER OF PIT OR TRENCH WITH ROOT FLARE AT GRADE. A MAXIMUM OF 2 INCHES ABOVE ADJACENT FINISH GRADES, AND NEVER BELOW GRADE. DO NOT MANUEVER BY TRUNK. HANDLE BY ROOT BALL ONLY.
 - b. CAREFULLY REMOVE ROOT BALL FROM CONTAINER WITHOUT DAMAGING ROOT BALL OR PLANT. GENTLY LOOSEN THE ROOTS AND CUT ANY GIRDLING ROOTS IN AT LEAST TWO PLACES.
 - c. PLACE PLANTING SOIL MIX AROUND ROOT BALL IN LAYERS, TAMPING TO SETTLE MIX AND ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY ONE-HALF BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE WATER IS ABSORBED. WATER AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF PLANTING SOIL MIX.
 - BARE ROOT
 - a. FOLLOW THE METHOD FOR CONTAINER PLANTING. STAKING REQUIRED.
 - C. TREES IN SIDEWALKS, PITS, GRATES AND TREE LAWNS
 - TREE GRATES
 - a. 4' X 8' GRAY IRON, ADA COMPLIANT
 - b. TREE GRATES SHALL HAVE A PROVISION FOR TRUNK EXPANSION OF THE TREE, SUCH AS POP OUT CONCENTRIC RINGS IN THE GRATE AROUND THE TRUNK.

15. MAINTENANCE AND WARRANTY STANDARDS
 - A. TREE PROTECTION PLAN IS REQUIRED FOR ANY ACTIVITY IMPACTING CITY TREES INTENDED TO REMAIN.
 1. TREE PROTECTION PLAN
 - A. SUBMIT PROJECT PLANS SHOWING TREE PROTECTION WITH THE TREE IMPACT PERMIT REQUEST.
 - B. TREE PROTECTION PLAN SHALL INCLUDE ALL THAT APPLY
 - EXISTING TREES ON SITE
 - CRITICAL ROOT ZONES OF PROTECTED TREES
 - TREE PROTECTION FENCING DELINEATION AND SPECIFICATION
 - OTHER PROTECTIONS FOR PROTECTION (MULCH/MATTING/ETC.)
 - REMEDIATION
 2. TREE PROTECTION FENCING SHALL BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE (CRZ) OF TREES (CRZ DEFINED AS RADIUS 1.25 FEET PER CALIPER INCH AT DBH FROM TRUNK OF TREE).
 3. TREE PROTECTION SIGNAGE REQUIRED EVERY 50 FEET.
 4. IF CONSTRUCTION OCCURS WITHIN THE CRZ AT LEAST 1/2" OF MULCH SHALL BE PLACED AND/OR LOGGING MATS WHERE MACHINERY MANEUVERS TO REDUCE SOIL COMPACTION IN THIS ZONE AND IDENTIFY ON PLAN.
 5. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
 6. THERE WILL BE ZERO TOLERANCE FOR STORING OR PARKING VEHICLES, SUPPLIES, OR EQUIPMENT UNDER PROTECTED TREES.
 7. REMEDIATION INCLUDES BUT IS NOT LIMITED TO REPLACEMENT, PRUNING, SUPPLEMENTAL WATER, MULCH, NUTRITION (FERTILIZER, ORGANIC MATTER, ETC.), INSECT/DISEASE CONTROL, STAKING AND COMPACTION MITIGATION
 8. AFTER CONSTRUCTION OR IMPACT PROTECTION DEVICES SHALL BE REMOVED. MULCH OR OTHER MATERIALS USED FOR A ROOT BUFFER SHALL BE REMOVED BY HAND WITHIN THE CRITICAL ROOT ZONE. IT MAY BE REMOVED MECHANICALLY BEYOND THIS ZONE. THERE SHALL BE 3" OF MULCH LEFT ON SITE AS DESCRIBED IN SECTION F.3 OF THIS CHAPTER.

16. WATERING INSTRUCTIONS
 - A. PROVIDE AND MAINTAIN TEMPORARY PIPING, HOSES, AND WATERING EQUIPMENT TO CONVEY WATER FROM SOURCES.
 - B. SCHEDULE WATERING TO COMPLY WITH THE CITY OF RALEIGH WATER CONSERVATION ORDINANCE.
 - C. WATERING VOLUMES SHOULD BE BASED UPON DELIVERY OF 1/2 INCH OF MOISTURE PER WEEK TO THE PLANT IF PRECIPITATION DOES NOT MEET THAT AMOUNT DURING THE ACTIVE GROWING SEASON DEFINED AS APRIL 1 THROUGH NOVEMBER 1.
 - D. SUPPLEMENTAL WATER SHALL BE APPLIED DURING THE ESTABLISHMENT PERIOD AS FREQUENTLY AS 3 TIMES PER WEEK AND DURING PERIODS OF DROUGHT OR EXCESSIVE HEAT.
 - E. USE A SLOW FLOW HOSE END DEVICE AND WATER EACH TREE AT THE BASE FOR SEVERAL MINUTES. COMMERCIALY AVAILABLE WATER BAGS ARE ACCEPTABLE. AT EACH VISIT MAKE SURE THE BAG IS EMPTY, THOROUGHLY SOAK THE ROOT BALL, THEN REFILL THE BAG CHECKING THE EMITTERS ALLOW FREE FLOW OF WATER TO ENSURE THE BAG WILL DRAIN. ALL WATERING BAGS SHALL BE REMOVED FROM TREES STARTING NOVEMBER 1 UNTIL APRIL 1 OF FOLLOWING YEAR.

17. MULCH
 - A. MAINTAIN A 3-INCH AVERAGE THICKNESS OF ORGANIC MULCH EXTENDING 12 INCHES BEYOND EDGE OF PLANTING PIT OR TRENCH. TYPICAL MATERIAL IS SHREDED HARDWOOD, PINE BARK, WOOD CHIPS OR PINE STRAW (NOT PERMITTED WITHIN 10' OF STRUCTURES).
 - B. MULCH TO THE DRIP LINE OF MATURE TREES.

- DO NOT REMOVE CONTAINER-GROWN STOCK FROM CONTAINERS BEFORE TIME OF PLANTING.
- WATER ROOT SYSTEMS OF EXTERIOR PLANTS STORED ON-SITE WITH A FINE-MIST SPRAY. WATER AS OFTEN AS NECESSARY TO MAINTAIN ROOT SYSTEMS IN A MOIST, BUT NOT OVERLY-WET CONDITION.
- HEEL-IN BARE-ROOT STOCK, SOAK ROOTS THAT ARE IN DRY CONDITION IN WATER FOR TWO HOURS, REMOVE DRIED-TOP PLANTS.

11. NURSERY
 - A. PLANTS SHALL BE GROWN WITHIN ONE COLD HARDINESS ZONE OF THE PROJECT SITE.
 - B. PROVIDE DIGITAL PHOTOS FROM THE NURSERY WITH HEIGHT IDENTIFIED FOR REVIEW BY THE URBAN FORESTER OR DESIGNEE PRIOR TO DIGGING OR SHIPPING. ALL TREES SHALL ALSO BE REVIEWED AND APPROVED PRIOR TO INSTALLATION EITHER AT PLACE OF PURCHASE, NURSERY, HOLDING YARD OR WORK SITE BY THE URBAN FORESTER OR DESIGNEE.

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13. SUBSTITUTIONS
 - A. REQUESTS FOR SUBSTITUTION FOR THE LISTED PLANT MATERIAL MUST BE MADE TO THE URBAN FORESTER IN WRITING. THE REQUEST SHALL INCLUDE A MINIMUM OF 5 NURSERY ATTEMPTS FOR LOCATION AND CONTACT INFORMATION. SUBSTITUTIONS WILL BE CONSIDERED IF THE LISTED MATERIAL CANNOT BE LOCATED OR CONFIRMED BY KNOWN SUPPLIERS. PLANT SUPPLIERS MUST BE RESEARCHED AND LOCATED PRIOR TO SUBMITTAL. IF PLANT MATERIAL SUBSTITUTIONS ARE TO BE MADE AFTER AWARD OF THE CONTRACT OR PERMIT, THE SUBSTITUTION MUST BE OF SIMILAR GROWTH HABIT, FORM, AND CHARACTERISTICS, SIMILAR IN SPECIFIED SIZE, AND EQUAL IN PRICE AND SUBJECT TO APPROVAL OR REJECTION BY THE URBAN FORESTER.
 - B. IF FOR ANY REASON TREES CANNOT BE INSTALLED ACCORDING TO THE PLANS A REQUEST SHALL BE MADE TO THE URBAN FORESTER IN WRITING. THE CONTRACTOR SHALL INFORM THE CITY AND ALTERNATE PLANTING LOCATIONS SHALL BE SELECTED FOR APPROVAL BY THE URBAN FORESTER.

14. EXECUTION
 - A. TREE AND SHRUB EXCAVATION
 - PLANTING HOLE: EXCAVATE CIRCULAR PITS WITH SIDES SLOPED INWARD. TRIM BASE LEAVING CENTER AREA RAISED SLIGHTLY TO SUPPORT ROOT BALL AND ASSIST IN DRAINAGE. DO NOT FURTHER DISTURB BASE. SCARP SIDES OF PLANT PIT SWEARED OR SMOOTHED DURING EXCAVATION.
 - EXCAVATE APPROXIMATELY THREE TIMES AS WIDE AS BALL DIAMETER FOR ALL PLANT MATERIAL.
 - PLANTING HOLES SHALL BE NO DEEPER THAN THE ROOT FLARE OF THE TREE OR PLANT WHICH SHALL BE INSTALLED AT GRADE, A MAXIMUM OF 2 INCHES ABOVE GRADE, AND NEVER BELOW GRADE.
 - SOIL REMOVED FROM EXCAVATIONS MAY BE USED AS BACKFILL PROVIDED IT MEETS THE SPECIFIED PLANTING SOIL MIX REQUIREMENTS.
 - OBSTRUCTIONS: NOTIFY URBAN FORESTER IF UNEXPECTED ROCK OR OBSTRUCTIONS DETRIMENTAL TO TREES OR SHRUBS ARE ENCOUNTERED IN EXCAVATIONS.
 - DRAINAGE: PLANTING HOLES NOT ASSOCIATED WITH A DRAIN SYSTEM SHALL DRAIN FULLY WITHIN A 12-HOUR PERIOD. NOTIFY URBAN FORESTER IF SUBSOIL CONDITIONS EVIDENCE UNEXPECTED WATER SEEPAGE OR RETENTION IN TREE OR SHRUB PITS.
 - B. TREE AND SHRUB PLANTING
 - BALL AND BURLAP
 - a. SET BALLED AND BURLAPPED STOCK PLUMB AND IN CENTER OF PIT OR TRENCH WITH ROOT FLARE AT GRADE. A MAXIMUM OF 2 INCHES ABOVE ADJACENT FINISH GRADES, AND NEVER BELOW GRADE. DO NOT MANUEVER BY TRUNK. HANDLE BY ROOT BALL ONLY.
 - b. REMOVE BURLAP AND WIRE BASKETS FROM THE TOP 1/2 OF ROOT BALL, CUT OFF AND DISCARD FROM HOLE, BUT DO NOT REMOVE FROM UNDER ROOT BALLS. REMOVE PALLETS, IF ANY, BEFORE SETTING. DO NOT USE PLANTING STOCK IF ROOT BALL IS CRACKED OR BROKEN BEFORE OR DURING PLANTING OPERATION.
 - c. PLACE PLANTING SOIL MIX AROUND ROOT BALL IN LAYERS, TAMPING GENTLY TO SETTLE MIX AND ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY ONE-HALF BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE WATER IS ABSORBED. WATER AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF PLANTING SOIL MIX.
 - CONTAINER
 - a. SET CONTAINER-GROWN STOCK PLUMB AND IN CENTER OF PIT OR TRENCH WITH ROOT FLARE AT GRADE. A MAXIMUM OF 2 INCHES ABOVE ADJACENT FINISH GRADES, AND NEVER BELOW GRADE. DO NOT MANUEVER BY TRUNK. HANDLE BY ROOT BALL ONLY.
 - b. CAREFULLY REMOVE ROOT BALL FROM CONTAINER WITHOUT DAMAGING ROOT BALL OR PLANT. GENTLY LOOSEN THE ROOTS AND CUT ANY GIRDLING ROOTS IN AT LEAST TWO PLACES.
 - c. PLACE PLANTING SOIL MIX AROUND ROOT BALL IN LAYERS, TAMPING TO SETTLE MIX AND ELIMINATE VOIDS AND AIR POCKETS. WHEN PIT IS APPROXIMATELY ONE-HALF BACKFILLED, WATER THOROUGHLY BEFORE PLACING REMAINDER OF BACKFILL. REPEAT WATERING UNTIL NO MORE WATER IS ABSORBED. WATER AGAIN AFTER PLACING AND TAMPING FINAL LAYER OF PLANTING SOIL MIX.
 - BARE ROOT
 - a. FOLLOW THE METHOD FOR CONTAINER PLANTING. STAKING REQUIRED.
 - C. TREES IN SIDEWALKS, PITS, GRATES AND TREE LAWNS
 - TREE GRATES
 - a. 4' X 8' GRAY IRON, ADA COMPLIANT
 - b. TREE GRATES SHALL HAVE A PROVISION FOR TRUNK EXPANSION OF THE TREE, SUCH AS POP OUT CONCENTRIC RINGS IN THE GRATE AROUND THE TRUNK.

15. MAINTENANCE AND WARRANTY STANDARDS
 - A. TREE PROTECTION PLAN IS REQUIRED FOR ANY ACTIVITY IMPACTING CITY TREES INTENDED TO REMAIN.
 1. TREE PROTECTION PLAN
 - A. SUBMIT PROJECT PLANS SHOWING TREE PROTECTION WITH THE TREE IMPACT PERMIT REQUEST.
 - B. TREE PROTECTION PLAN SHALL INCLUDE ALL THAT APPLY
 - EXISTING TREES ON SITE
 - CRITICAL ROOT ZONES OF PROTECTED TREES
 - TREE PROTECTION FENCING DELINEATION AND SPECIFICATION
 - OTHER PROTECTIONS FOR PROTECTION (MULCH/MATTING/ETC.)
 - REMEDIATION
 2. TREE PROTECTION FENCING SHALL BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE (CRZ) OF TREES (CRZ DEFINED AS RADIUS 1.25 FEET PER CALIPER INCH AT DBH FROM TRUNK OF TREE).
 3. TREE PROTECTION SIGNAGE REQUIRED EVERY 50 FEET.
 4. IF CONSTRUCTION OCCURS WITHIN THE CRZ AT LEAST 1/2" OF MULCH SHALL BE PLACED AND/OR LOGGING MATS WHERE MACHINERY MANEUVERS TO REDUCE SOIL COMPACTION IN THIS ZONE AND IDENTIFY ON PLAN.
 5. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
 6. THERE WILL BE ZERO TOLERANCE FOR STORING OR PARKING VEHICLES, SUPPLIES, OR EQUIPMENT UNDER PROTECTED TREES.
 7. REMEDIATION INCLUDES BUT IS NOT LIMITED TO REPLACEMENT, PRUNING, SUPPLEMENTAL WATER, MULCH, NUTRITION (FERTILIZER, ORGANIC MATTER, ETC.), INSECT/DISEASE CONTROL, STAKING AND COMPACTION MITIGATION
 8. AFTER CONSTRUCTION OR IMPACT PROTECTION DEVICES SHALL BE REMOVED. MULCH OR OTHER MATERIALS USED FOR A ROOT BUFFER SHALL BE REMOVED BY HAND WITHIN THE CRITICAL ROOT ZONE. IT MAY BE REMOVED MECHANICALLY BEYOND THIS ZONE. THERE SHALL BE 3" OF MULCH LEFT ON SITE AS DESCRIBED IN SECTION F.3 OF THIS CHAPTER.

16. WATERING INSTRUCTIONS
 - A. PROVIDE AND MAINTAIN TEMPORARY PIPING, HOSES, AND WATERING EQUIPMENT TO CONVEY WATER FROM SOURCES.
 - B. SCHEDULE WATERING TO COMPLY WITH THE CITY OF RALEIGH WATER CONSERVATION ORDINANCE.
 - C. WATERING VOLUMES SHOULD BE BASED UPON DELIVERY OF 1/2 INCH OF MOISTURE PER WEEK TO THE PLANT IF PRECIPITATION DOES NOT MEET THAT AMOUNT DURING THE ACTIVE GROWING SEASON DEFINED AS APRIL 1 THROUGH NOVEMBER 1.
 - D. SUPPLEMENTAL WATER SHALL BE APPLIED DURING THE ESTABLISHMENT PERIOD AS FREQUENTLY AS 3 TIMES PER WEEK AND DURING PERIODS OF DROUGHT OR EXCESSIVE HEAT.
 - E. USE A SLOW FLOW HOSE END DEVICE AND WATER EACH TREE AT THE BASE FOR SEVERAL MINUTES. COMMERCIALY AVAILABLE WATER BAGS ARE ACCEPTABLE. AT EACH VISIT MAKE SURE THE BAG IS EMPTY, THOROUGHLY SOAK THE ROOT BALL, THEN REFILL THE BAG CHECKING THE EMITTERS ALLOW FREE FLOW OF WATER TO ENSURE THE BAG WILL DRAIN. ALL WATERING BAGS SHALL BE REMOVED FROM TREES STARTING NOVEMBER 1 UNTIL APRIL 1 OF FOLLOWING YEAR.

17. MULCH
 - A. MAINTAIN A 3-INCH AVERAGE THICKNESS OF ORGANIC MULCH EXTENDING 12 INCHES BEYOND EDGE OF PLANTING PIT OR TRENCH. TYPICAL MATERIAL IS SHREDED HARDWOOD, PINE BARK, WOOD CHIPS OR PINE STRAW (NOT PERMITTED WITHIN 10' OF STRUCTURES).
 - B. MULCH TO THE DRIP LINE OF MATURE TREES.

18. ORGANIC MULCHING
 - APPLY 3 INCH AVERAGE THICKNESS OF ORGANIC MULCH EXTENDING 12 INCHES BEYOND EDGE OF PLANTING PIT OR TRENCH. DO NOT PLACE MULCH WITHIN 3 INCHES OF TRUNKS OR STEMS. ROOT FLARE SHALL BE VISIBLE AT BASE OF ALL PLANT MATERIAL.
 - MULCH SHALL BE THE RESPONSIBILITY OF THE ADJACENT PROPERTY OWNER TO REFRESH AS NEEDED AND KEEP FREE OF DEBRIS AND TRASH.

19. SOIL
 - BACKFILL DIRECTLY IN TREE PIT OR PLANTING AREA SHALL BE HIGH-QUALITY PLANTING SOIL SUITABLE FOR SUCCESSFUL GROWTH.
 - IF SOIL ON SITE IS SUITABLE IT MAY BE MIXED AT A RATE OF 50% WITH HIGH-QUALITY PLANTING SOIL.
 - SOIL MUST BE FREE OF SUBSOIL, HARD CLODS, STONE, RESIDUES OR UNDESIRABLE MATERIALS, STICKS, WEED SEED AND UNIFORM IN QUALITY.
 - THE URBAN FORESTER OR DESIGNEE MAY REJECT UNSUITABLE SOIL.

20. GUYING AND STAKING
 - DO NOT STAKE UNLESS THE TREE BECOMES UNSTABLE OR IT IS A HIGH WIND AREA.
 - REMOVE ALL STAKING MATERIAL AFTER 1 YEAR.
 - LEAVE SLIGHT SLACK IN TIE TO PROMOTE TRUNK TAPER.
 - UPRIGHT STAKING AND TYING: WHEN REQUIRED USE A MINIMUM OF 3 STAKES. SET VERTICAL STAKES AND SPACE TO AVOID PENETRATING ROOT BALLS OR ROOT MASSES. SUPPORT TREES WITH TWO STRANDS OF THE WIRE ENCASED IN HOSE SECTIONS OR ARBORIST TAPE AT CONTACT POINTS WITH TREE TRUNK. ALLOW ENOUGH SLACK TO AVOID RIGID RESTRAINT OF TREE. SPACE STAKES EQUALLY AROUND TREES AND ATTACH FLAGS TO EACH GUY WIRE FOR VISIBILITY.

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 5. THE TREE PROTECTION FENCING SHALL NOT BE VIOLATED FOR THE DURATION OF THE PROJECT WITHOUT APPROVAL FROM URBAN FORESTRY STAFF.
 6. THERE WILL BE ZERO TOLERANCE FOR STORING OR PARKING VEHICLES, SUPPLIES, OR EQUIPMENT UNDER PROTECTED TREES.
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 - D. SUPPLEMENTAL WATER SHALL BE APPLIED DURING THE ESTABLISHMENT PERIOD AS FREQUENTLY AS 3 TIMES PER WEEK AND DURING PERIODS OF DROUGHT OR EXCESSIVE HEAT.
 - E. USE A SLOW FLOW HOSE END DEVICE AND WATER EACH TREE AT THE BASE FOR SEVERAL MINUTES. COMMERCIALY AVAILABLE WATER BAGS ARE ACCEPTABLE. AT EACH VISIT MAKE SURE THE BAG IS EMPTY, THOROUGHLY SOAK THE ROOT BALL, THEN REFILL THE BAG CHECKING THE EMITTERS ALLOW FREE FLOW OF WATER TO ENSURE THE BAG WILL DRAIN. ALL WATERING BAGS SHALL BE REMOVED FROM TREES STARTING NOVEMBER 1 UNTIL APRIL 1 OF FOLLOWING YEAR.

23. MULCH
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 - B. MULCH TO THE DRIP LINE OF MATURE TREES.

24. UTILITIES OR ELECTRICAL CONDUITS ARE PERMITTED WITHIN THE TREE PIT OR GRATE. UTILITIES MAY RUN BELOW AND THROUGH THE SUBSURFACE ROOT EXPANSION INFRASTRUCTURE.
 - TREES SHALL BE CENTERED IN THE PIT
 - TREE PITS SHALL ACCOMMODATE A DEPTH OF 3' OF PLANTING SOIL.
 - HIGH QUALITY PLANTING SOIL SHALL BE USED IN THE PIT DIRECTLY BELOW THE GRATE
 - DRAINAGE SHALL BE PROVIDED.

25. TREE LAWN
 - MINIMUM 6 FEET WIDE TREE LAWN.
 - TREE CENTERED IN AREA.
 - 600 CUBIC FEET OF HIGH-QUALITY PLANTING SOIL IN THE IMMEDIATE AREA WHERE TREE IS TO BE PLACED.

26. REQUIRED SUBSURFACE ROOT EXPANSION
 - HIGH-QUALITY PLANTING SOIL OR STRUCTURAL SOIL SHALL BE USED TO ACCOMPLISH THE SOIL VOLUME REQUIREMENT.
 - 600 CUBIC FEET OF SUBSURFACE ROOT EXPANSION AREA REQUIRED PER TREE.
 - a. STRUCTURAL SOIL
 - b. SUBSURFACE SOIL CONTAINMENT STRUCTURE
 - c. ROOT PATHWAYS
 - c1. MAY ONLY BE USED IN COMBINATION WITH OTHER OPTIONS OR IN CASES WHERE CONNECTIONS TO AVAILABLE SOIL SPACE ACHIEVES THE 600 CUBIC FEET REQUIREMENT.
 - c2. 20-FOOT MINIMUM EXTENSION FOR EACH PATH. CONNECT TO ADJACENT ROOT PATHS WHEN POSSIBLE.
 - c3. WHEN ROOT EXPANSION PATHS EXTEND UNDER THE SIDEWALK ENSURE MINIMUM DENSITY REQUIREMENTS ARE MET.
 - d. SUSPENDED PAVEMENT

27. EXCEPTIONS AND DESIGN ALTERNATIVES ARE ENCOURAGED TO ACHIEVE SOIL VOLUME. URBAN FORESTER REVIEW REQUIRED DESIGNS THAT GROUP TREES AND CONNECT ROOT SPACES WILL BE FAVORED AS WELL AS THE INTRODUCTION OF LID MATERIALS AND TECHNOLOGY.
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