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201 General

All construction shall conform to the requirements and dimensions on the approved construction plans, Town Standard Details, the Code of the Town of Apex, or as stated in these Specifications. Any conflicting requirements or lack of information shall be brought to the attention of the TOWN prior to construction. Any deviations, or sections noting “as required by” a department, or department director, shall require submittal of an Exception Review Request for consideration by appropriate staff.

202 Abbreviations & Definitions

A. Abbreviations

AASHTO	- American Association of State Highway Transportation Officials
ANSI	- American National Standard Institute
ASTM	- American Society for Testing & Materials
AWWA	- American Water Works Association
NCDEQ	- North Carolina Department of Environmental Quality
NCDOT	- North Carolina Department of Transportation
NPDES	- National Pollutant Discharge Elimination System
OSHA	- Occupational Safety and Health Administration

B. Definitions

Where the word “ENGINEER” is used in these Specifications, it shall be the *Transportation and Infrastructure Development Director, Water Resources Director*, of the Town of Apex or duly authorized representative.

Where the word “INSPECTOR” is used in these Specifications, it shall be *Transportation and Infrastructure Development Department, Infrastructure Inspections* staff of the Town

of Apex or other duly authorized representative.

Where the word “TOWN” or “Apex” is used in these Specifications, it shall be the Town of Apex, North Carolina or an authorized representative.

Where the word “DEVELOPER” or “CONTRACTOR” is used in these Specifications, it shall be the developer of the project, or his authorized contractor performing work on the site. For purposes of these Specifications, these words are to be considered synonymous.

Where the words “PROJECT ENGINEER” are used in these Specifications, they shall mean the design engineer retained by the developer, and the person responsible for the preparation of the final construction drawings.

203 Earthwork

A. General

Earthwork shall be defined as the removal of soil (including rock) from its natural location and the depositing of such material into the proper fill areas as indicated on the plan.

B. Tree Protection

Tree protection shown on the construction plans approved by the TOWN shall be installed and inspected prior to earthwork within the area shown on the plans for protection. The protection fencing shall also be inspected on a regular basis. In the event that the tree protection fencing is not properly maintained or is in violation, the TOWN may issue a Notice of Violation, Stop Work Order, and/or assess a penalty which shall remain in effect until such time as the fencing is restored and agreements to replace damaged trees and/or vegetation have been resolved.

C. Rock Excavation - By Blasting

- 1) Permit - Where rock must be removed by blasting, a written permit must first be obtained from the Apex Fire Department.
- 2) Hours of Blasting - Blasting for rock removal shall be conducted only Monday through Friday between the hours of 8:00 AM to 5:00 PM.

D. Removal of Unstable Material

Where unstable and/or organic material (“muck”) is encountered in trenches or in roadways, the material shall be completely removed and replaced with suitable material and thoroughly compacted.

E. Placement of Fill

Fill material for roadway embankments shall be free from stones greater than 4 inches in size, construction debris, frozen, organic and/or other unstable material. Fill material placed in roadway embankments shall be placed in lifts of 8 inches or less, and compacted to a density of not less than 95% of maximum dry density as measured by the Standard Proctor Method. The 95% requirement shall apply for that portion of the roadway measured from the back of curb and extending outward on a slope of 1 to 1, measured perpendicular to the centerline. The remaining fill shall be compacted to a density of not less than 90% of maximum dry density as measured by the Standard Proctor Method.

Attention is called to Section 300 of this document for the inspection and testing requirements.

F. Compaction Tests

During roadway construction, the TOWN shall require the developer to provide compaction tests to demonstrate compliance with the compaction requirements outlined herein. Such tests may be required at any time that the TOWN believes the compaction to be less than the required density.

Backfilling of all trenches within the street right-of-way shall be thoroughly compacted to provide a minimum of 95% of the maximum density as determined by the Standard Proctor Method.

All backfilling of trenches outside the street right-of-way shall be compacted to provide a minimum of 90% of the maximum density as determined by the Standard Proctor Method.

204 Safety

The CONTRACTOR shall provide for and maintain safety measures necessary for the protection of all persons on the work site and shall fully comply with all laws, regulations, and building code requirements to prevent accident or injury to persons on or about the location of the work, **including all applicable provisions of OSHA regulations**. The CONTRACTOR shall protect all trees and shrubs designated to remain in the vicinity of the operations and barricade all walks, roads, and areas to keep the public away from the construction. All trenches, excavations, or other hazards in the vicinity of the work shall be well barricaded, and properly lighted at night.

The CONTRACTOR shall be responsible for the entire site and the necessary protection as required by the TOWN and by laws or ordinances governing such conditions. He/She shall be responsible for any damage to TOWN property, or that of others, by the CONTRACTOR, his/her employees, subcontractors or their employees, and shall correct and/or repair such damages to the satisfaction of the Town of Apex and/or other affected parties. He/She shall be responsible for and pay for any such claims against the TOWN.

The TOWN shall not be responsible for making the CONTRACTOR adhere to the Occupational Safety and Health Administration (OSHA) regulations or standards. However, the TOWN may report suspected violations of unsafe practices to the appropriate enforcement agency.

205 Work Within Right-of-Way of State Maintained Roads

A. General

No construction shall be initiated within the right-of-way of roads that are maintained by the NCDOT without the prior approval of the NCDOT. The NCDOT approval shall be evidenced by an appropriate Encroachment Agreement and/or Driveway Permit, as applicable.

A copy of the approved Encroachment Agreement and/or Driveway Permit shall be in the contractor's possession at the job site at all times that work is being performed.

The Contractor shall notify the NCDOT District Office and shall post any required Indemnity Bond prior to beginning work in the NCDOT right-of-way.

B. Utility Construction

The installation of public utilities within NCDOT right-of-way shall be accomplished in accordance with the Policies & Procedures for Accommodating Utilities on Highway Rights-of-Way, latest revision, as published by the NCDOT, Division of Highway, or those of the Town, whichever, in the opinion of the ENGINEER is more stringent.

C. Roadway Improvements - Pavement Widening, Curb & Gutter, and Storm Drainage

All improvements along existing NCDOT roadways, including pavement widening, curb and gutter, and storm drainage improvements, shall be accomplished in strict accordance with the Standard Specifications for Roads and Structures latest edition, as published by the NCDOT. The NCDOT specification shall supersede the construction specifications of the TOWN. The CONTRACTOR shall call for all inspections as required by the NCDOT District Office.

206 Maintenance of Traffic

Existing public streets or highways shall be kept open to traffic at all times by the CONTRACTOR unless permission to close the streets, or portions thereof, is granted by the ENGINEER. The Town of Apex Police Department must also be contacted by the CONTRACTOR a minimum of 24 hours before any streets are fully or partially closed. Proper and sufficient barricades, lights, signing, and other protective devices shall be

required to be installed when deemed necessary by the Police Department or ENGINEER.

207 Concrete

Concrete shall be only plant-mixed, transit-mixed, or mobile-mixed concrete conforming to ASTM C33 for aggregates and to ASTM C94 for ready-mixed concrete. Any concrete poured that has a slump over 4 inches as per ASTM C143, or has a batched time of more than 90 minutes, will be considered unacceptable. Periodic samples may be required at the expense of the owner to determine the strength of the material. Concrete shall not be deposited on frozen subgrade. Concrete shall not be poured when the air temperature is falling and below 40° degrees F, and/or the predicted low temperature for the succeeding 24-hour period is less than 32° degrees F. All concrete when placed in the forms shall have a temperature of between 50° and 90° degrees F and shall be maintained at a temperature of not less than 50° degrees F for at least 72 hours for normal concrete and 24 hours for high-early strength concrete, or for as much time as is necessary to insure proper rate of curing and designed compressive strength. Curing shall be accomplished in accordance with NCDOT specifications. Concrete shall be air entrained at 5% ($\pm 1\%$). Retarders and accelerators shall be used only upon approval of the ENGINEER.

208 Asphalt

Asphalt and tack coat shall be applied only when the surface to be treated is sufficiently dry and the atmospheric temperature in the shade away from artificial heat is 40° degrees F or above for base and intermediate course and 50° degrees F or above for surface course. Asphalt shall not be applied when the weather is foggy or rainy. The CONTRACTOR is responsible for seeing that these conditions exist prior to the application of tack coat or asphalt.

209 Electrical Power Service

A. General

The Town of Apex will provide electrical service to projects within the Town's ETJ, in accordance with North Carolina General Statute 160A. Electrical service facilities shall be designed, constructed and maintained by the TOWN, with the developer paying fees as may be prescribed in accordance with TOWN policy. These fees may include but are not limited to an aid-in-contribution of construction, pole relocation, and other reasonable and customary charges. The Town of Apex reserves the right to not install electrical service on any right of way, easement, or lot that has not been properly graded in accordance with these specifications.

B. Easements for Town Electric Power

Where electrical distribution facilities are required to cross private property, the DEVELOPER shall provide easements as follows:

Underground Primary Lines - 20-foot easement

Overhead Primary Lines - 30-foot easement. Easements shall be shown on the final plat for the project

NOTE: All easements shall be shown and properly labeled on the final plat.

C. Service Connections - Special Requirements

Electrical service connections to service pedestals or transformers shall be made in strict accordance with the Standard Detail.

210 Grease Traps/Interceptors

All establishments engaged in the preparation of food shall install a grease trap. The grease trap shall be located outside the building and shall intercept all kitchen wastes, floor drains, and car wash drains. Domestic waste from toilets and lavatories shall not be directed to the grease trap. The Town of Apex Code Enforcement Officer shall approve the design and construction of all grease traps as per N.C. State Building Code.

211 Dumpsters - Installation Requirements

All dumpsters shall be placed on a reinforced concrete pad conforming to the requirements shown in the Standard Detail and screened in accordance with the Apex Planning Department requirements.

212 Notification Prior to Beginning Work

The DEVELOPER or responsible contractor shall notify the TOWN not less than 24 hours prior to the commencement of any new construction activity. No new work shall commence without approval of the TOWN.

213 Materials

All materials incorporated in work to be accepted by the Town of Apex for maintenance shall be new, first quality material installed in accordance with the manufacturer's instructions or these Specifications, whichever, in the opinion of the ENGINEER, is more stringent or applicable.

It is the intent of this Specification to provide materials and construction methods of high

standard and quality and to provide materials free from defects in workmanship and product. Equal material not specified may be used provided documentation and samples are furnished to the ENGINEER not less than 14 days before their delivery to the construction site. The ENGINEER will issue written approval or disapproval of the alternate materials. Current Specifications and/or the latest revisions shall apply in all cases where materials are described.

214 Inspections

The presence of a TOWN employee at the work site shall not lessen the CONTRACTOR'S responsibility for conforming to the approved construction plans and/or specifications. Should the ENGINEER or INSPECTOR accept materials, or work that does not conform with the approved plans or specifications, whether from lack of discovery or for any other reason, it shall in no way prevent later rejection or corrections to materials or work when discovered.

The CONTRACTOR shall have no claim for losses suffered due to any necessary removals or repairs resulting from the unsatisfactory work. Any work that has been covered without the INSPECTOR'S approval, shall at the INSPECTOR'S request, be uncovered and be made available for inspection at the CONTRACTOR'S expense. After regular working hours or weekend work shall comply with the TOWN'S specifications and shall include only such work that does not require continuous observation by an INSPECTOR.

215 Public Utility Easements

A. General

All utility easements shall be clearly identified as PUBLIC or PRIVATE and labeled as per the requirements in Section 600, 700, or 800, as applicable.

Only one utility shall be installed per easement, unless as approved by exception request to the Water Resources Department.

Easements shall be acquired by the Developer (unless utility is designed as part of a Capital Improvement Project) prior to construction plan approval.

Access for the purpose of construction inspection shall be provided to the Town of Apex or designated representatives. All off-street water, sewer mains, and power lines, etc. to be operated and maintained by the TOWN shall be located in a public utility easement. Private easements for water and sewer service lines are not permitted.

Fill or cut slopes greater than 6:1 shall not extend into utility easements. Easements shall be graded to provide positive drainage in all directions, with a minimum grade of 0.5%. Easements shall be fully accessible by rubber-tired vehicles in their entirety and graded smooth, free from rocks, boulders, roots, stumps, and other debris to provide a maximum

6:1 grade parallel to the utility centerline and a maximum of 4% cross-slope and seeded and mulched upon completion of construction. Utility easements shall be accessible from a public right-of-way. If the easement is not accessible perpendicular from the right-of-way due to steep slope, environmental feature, or other obstacle, additional easement may be necessary, as deemed by the Water Resources Department.

All pre-existing or planned conditions as noted herein which may impact operations and maintenance within the utility easement shall be noted and disclosed during the site plan and construction drawing approval process. Pre-existing conditions not disclosed during the site plan and construction drawing approval process may nullify the approval and require relocating the utility easement, and underlying infrastructure, where no conflicts exist.

Where concentrated sources of runoff (e.g. SCM discharge, FES discharge outlets, natural drainage ways, etc.) convey across an existing or proposed utility easement, the applicant must design a rip rap lined channel across the full width of the easement, graded at a 4:1 slope, or a closed drainage system to move all runoff across the easement. In locations where the crossing of a natural drainage way is not-feasible, or not approved by the applicable regulatory agency, a turn-around shall be provided prior to the termination.

All retaining walls shall have a separation from the utility easement boundary of at least 1:1 horizontal to vertical. For example, if the retaining wall is 10 feet tall, it shall be placed no closer than 10 feet from the adjacent easement boundary. In no instance shall any footer or component of a retaining wall be within 5 feet of an easement boundary.

B. Encroachments

No part of any structure, including substructures and overhangs, equipment, private utility line (including water, irrigation, and/or sewer lines), retaining walls, embankments, impoundments, privately maintained greenways and paths, landscaping, or other elements, both temporary or permanent, which may inhibit maintenance operations shall be constructed within a utility easement and no grading may occur within any Apex utility easement prior to obtaining final construction plan approval, a building permit, or an encroachment agreement or prior approval from the Water Resources and/or Electric Utilities Department.

Any application for an encroachment agreement must include plans to facilitate access and maintenance of the utility and must include supporting documentation to confirm no damage will occur to the utility.

Proposed utility easement encroachments reviewed through construction plan review will not require a separate encroachment agreement application, but will require an approved exception request from the Water Resources Director.

Fences may be allowed to cross utility easements provided appropriate access gates have been installed to allow maintenance. Fences shall not be installed parallel to the

utility within the utility easement. Town of Apex staff shall have 24-hour access to secured access gates.

Any improvements encroaching within an Apex utility easement are subject to disturbance, damage, or removal during Apex's use of the easement. The Town of Apex will not repair or replace any improvements within a utility easement. Apex will not be held liable for damage to any encroaching improvements during the maintenance of the Apex facility or structure.

216 Water for Construction

The Town of Apex does not provide free or otherwise unmetered water for use on any construction project. CONTRACTORS or construction personnel shall not take water from hydrants, blow-offs, water meter boxes, etc. CONTRACTORS desiring to use TOWN water for construction purposes shall apply to the *Water Resources Department* for water service and shall pay for the water service in accordance with the Town of Apex policies and requirements.

Bulk water for construction or other water requirements may be obtained at the *Water Resources Department* located at 105-B Upchurch Street. Bulk water for construction may also be obtained from a fire hydrant using a Town approved meter with back flow preventer. Bulk water rates will be billed per load of water obtained. Bulk water rate is the current TOWN Outside Water Rate.

217 Street Lights

The Town of Apex will provide 1 street light at each intersection and 1 streetlight near the midpoint of each block or approximately every 300 feet in a residential area. The TOWN shall provide 1 streetlight at the midpoint of any cul-de-sac greater than 200 feet in length in residential areas. Additional public street lighting is provided only in areas where needed for public safety, such as major intersections, the downtown area, and in cases of clearly defined need.

218 Guarantee

The DEVELOPER shall provide a guarantee as per Town of Apex Unified Development Ordinance, on workmanship and materials for a period of at least the longer of 1 year after the date of acceptance by the Town of Apex or until 60% of the lots in the bonded phase have been issued a Certificate of Occupancy. Any defects observed within the guarantee period shall be repaired and/or replaced to the Town's satisfaction and the cost of such repairs shall be borne by the developer. The guarantee shall apply to street construction, sidewalks, water lines and appurtenances, sanitary sewers, storm sewers (including ditches, drainage channels, and appurtenances, etc.), pumping stations, force

mains and appurtenances.

219 Retaining Walls

Retaining wall structures shall meet NCDOT standards. Any deviation from NCDOT standards require pre-approval of the Transportation & Infrastructure Development Director. Retaining walls higher than 4 feet shall be designed by a licensed Professional Engineer in accordance with N.C. General Statute 89C and be required to obtain a building permit in accordance with the Town of Apex Unified Development Ordinance. Safety rails or fencing may also be required. Private retaining walls, including supports, foundations, reinforcement, geogrid, and any other wall appurtenances are not allowed within public right-of-way or easements.

Where private retaining walls are intended to retain public roadway infrastructure, the walls shall be laterally offset at a 1H:1V rate from the right-of-way to the top of concrete footer. Walls shall be designed for a typical highway live traffic surcharge load of 250 pounds per square foot (psf). A vehicle accessible maintenance easement of at least 10 feet in width with 6H:1V slopes shall be provided behind the wall for walls that exceed 4 feet in height.

220 Fire Department Access Roads

The CONTRACTOR shall provide a temporary access road prior to vertical construction or import of combustible materials to the project site. The specifications for temporary emergency access roads are as follows:

- Location: within 150 feet of all exterior walls of the first floor of all buildings constructed within the site; a turnaround is required on dead-end access roads in excess of 150 feet in length;
- Minimum width: 20 feet;
- Maximum grade: 10%
- Horizontal geometry, minimum turn radius, inside tire: 29 feet, outside tire: 52 feet;
- Vehicular weight capacity: 80,000 lbs;
- Materials: angular inch river rock, crushed granite, or other aggregate with 1-1.5" nominal size;
- Temporary Street Signs: Shall be posted at each intersection at the time the roadways are passible.

More than one access road may be required when it is determined that a single road may be impaired by vehicle congestion, climatic conditions, or other factors that could limit access. Access to buildings for the purpose of fire department vehicle access shall be provided at all times during construction. Construction vehicles and materials shall not block access to buildings, hydrants, or fire appliances. Site development managers and/or building construction superintendents shall have the responsibility to monitor emergency service access conditions on a daily basis. When conditions are such that emergency service access is diminished in minimum required width, capability of carrying imposed

loads and/or providing adequate traction, appropriate measures shall be taken to mitigate such conditions to once again provide adequate emergency service access.