Charlotte Land Development Standards Manual (CLDSM)

Purpose Statement

The City of Charlotte ensures that new, improved, and modified infrastructure to be used by the public complies with adopted ordinances, meets technical requirements, and is suitable for City maintenance (where applicable). This manual provides standardized information to be used for design, review, approval, and implementation of construction plans. All design details provided in this manual are approved for use within the City of Charlotte and its extraterritorial jurisdiction unless otherwise noted.

The use of the term “standard” means the most common way to design a given feature, not a minimum performance requirement. Non-standard designs may be proposed, subject to the review and approval of appropriate City staff. The developer or designer must provide the supporting details and rationale that the non-standard design meets or exceeds the intent of the standard design(s).

This manual is frequently used as a design reference for the City’s Capital Improvement Program (CIP) projects to facilitate the design process. CIP projects frequently use a combination of standard and non-standard designs, subject to review by City staff, to best meet the needs of the public infrastructure implementation.

This manual is periodically updated to ensure that the provided standard construction details satisfy the City’s requirements.
## CLDSM REVISION LOG

The original effective date of the Charlotte Land Development Standards Manual is December 1, 2006. This log is a description of all standard revisions from that date forward.

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<td>1/1/2008</td>
<td>10.22</td>
<td>Concrete Sidewalks</td>
<td>Changed cross-slope label to 1/4&quot; per foot</td>
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<tr>
<td>1</td>
<td>1/1/2008</td>
<td>10.24A</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (2'-6&quot; Curb and Gutter)</td>
<td>Updated driveway width table, adjusted cut/fill slope percentages to match other DW details</td>
</tr>
<tr>
<td>1</td>
<td>1/1/2008</td>
<td>10.24B</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (8' X 18&quot; Vertical Curb)</td>
<td>Updated driveway width table, adjusted cut/fill slope percentages to match other DW details</td>
</tr>
<tr>
<td>1</td>
<td>1/1/2008</td>
<td>10.24C</td>
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<td>Updated driveway width table</td>
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<td>1/1/2008</td>
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<td>1</td>
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<td>11.01</td>
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</tr>
<tr>
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<td>1/1/2008</td>
<td>11.02</td>
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<td>Removed &quot;Marshall Mix&quot; pavement specifications, Intermediate course changed to S9.58 from S9.5A</td>
</tr>
<tr>
<td>1</td>
<td>1/1/2008</td>
<td>11.03</td>
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<td>Removed &quot;Marshall Mix&quot; pavement specifications, Intermediate course changed to S9.58 from S9.5A</td>
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<td>Removed &quot;Marshall Mix&quot; pavement specifications, Intermediate course changed to S9.58 from S9.5A</td>
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<td>Removed &quot;Marshall Mix&quot; pavement specifications, Intermediate course changed to S9.58 from S9.5A</td>
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<td>1</td>
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<td>Residential Collector Street Bitch Type Typical Section</td>
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<td>1/1/2008</td>
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<td>Limited Residential Collector Street Typic Section</td>
<td>Removed &quot;Marshall Mix&quot; pavement specifications, Intermediate course changed to S9.58 from S9.5A</td>
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<td>Residential Hammockhead Detail</td>
<td>Added H/W, sidewalk, and planting strip dimensions; added ramps</td>
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<td>1</td>
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<td>Oversized Residential Cul De-Sacs with Raised Planter Island</td>
<td>Added back of curb radius dimension for 2'-6&quot; C &amp; G; revised note #2</td>
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<td>1</td>
<td>1/1/2008</td>
<td>20.00B</td>
<td>NCDOT Standards Approved For Use in the City of Charlotte and Charlotte ETJ</td>
<td>Fixed 840.04 and 840.05 to list correct standard reference 840.54</td>
</tr>
<tr>
<td>1</td>
<td>1/1/2008</td>
<td>20.00C</td>
<td>NCDOT Standards Approved For Use in the City of Charlotte and Charlotte ETJ</td>
<td>Added note regarding waffle wall to 840.45</td>
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<td>1</td>
<td>1/1/2008</td>
<td>20.03</td>
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</tr>
<tr>
<td>1</td>
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<td>20.22</td>
<td>Flared End Section 12&quot; to 72&quot; Pipe</td>
<td>Renumbered - previously 20.23A, added 3:1 note on drawing in lieu of H:V column in data block; Minimum concrete PSI in note #3 changed from 4000 to 3600</td>
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<td>1</td>
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<td>20.34</td>
<td>Offset Catch Basin</td>
<td>Changed slope of flume under grate from 0.5% to 1'/ft</td>
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<tr>
<td>1</td>
<td>1/1/2008</td>
<td>30.00</td>
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<td>1</td>
<td>1/1/2008</td>
<td>30.05A</td>
<td>Temporary Silt Fence</td>
<td>Removed alternate installation detail; revised filter fabric anchor depth; 24&quot; filter fabric above ground</td>
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<tr>
<td>1</td>
<td>1/1/2008</td>
<td>30.06B</td>
<td>High Hazard Temporary Silt Fence</td>
<td>Removed alternate installation detail; revised filter fabric anchor depth; 24&quot; filter fabric above ground</td>
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<td>30.06C</td>
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<td>1</td>
<td>1/1/2008</td>
<td>30.12</td>
<td>Gravel and Rip Rlap Filter Berm Basin</td>
<td>Added data block; updated volume and surface area requirements. DA &lt;= 5 AC</td>
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<td>30.20</td>
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<td>Added notes #2 and #4</td>
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<td>1/1/2008</td>
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<td>Updated pit dimensions per City Arborist</td>
</tr>
<tr>
<td>1</td>
<td>1/1/2008</td>
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<td>Large and Small Maturing Tree Pit with Grate in Sidewalk (Section)</td>
<td>Updated pit dimensions per City Arborist</td>
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<tr>
<td>1</td>
<td>1/1/2008</td>
<td>40.03B</td>
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<td>1/1/2008</td>
<td>40.03C</td>
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<td>Updated pit dimensions per City Arborist</td>
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<tr>
<td>2</td>
<td>7/1/2008</td>
<td>20.31A/B</td>
<td>Best Management Practices Wet Pond details</td>
<td>These details are no longer needed - they replaced by new details 21.05 through 21.09</td>
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<td>2</td>
<td>7/1/2008</td>
<td>Specs</td>
<td>Removal of error</td>
<td>Revised text regarding posting of bonds; added CDDT Pavement Marking Stds to reference list</td>
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<td>Monolithic Concrete Curb and Sidewalk</td>
<td>Revised dimension &quot;A&quot;, added dimension &quot;B&quot;</td>
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<td>3</td>
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<td>10.32B</td>
<td>Accessible Ramp Sections without planting strip (2'6&quot; Curb &amp; Gutter)</td>
<td>Added 6&quot; sidewalk thickness dimension</td>
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<td>Removed &quot;20'R&quot;, &quot;IN ETJ&quot;, &quot;33' ETJ&quot; - now consistent with NCDOT details</td>
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<tr>
<td>3</td>
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<td>3</td>
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<td>30.02A</td>
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<td>Clarified Sediment Storage elevation &amp; dimensions at spillway.</td>
</tr>
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<td>30.03A</td>
<td>Sediment Basin</td>
<td>Clarified Sediment Storage elevation &amp; dimensions at spillway, add note #5 re: H; changed std to 30.03A</td>
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<td>3</td>
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<td>30.03B</td>
<td>General Notes - Sediment Basin</td>
<td>Inadvertently removed during previous revision. Added back in &amp; revised to match NCDENR manual</td>
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<td>3</td>
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<td>40.03A</td>
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<td>Changed top of planting mix to be a horizontal line; &quot;removed 12&quot; max at center&quot;</td>
</tr>
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<td>3</td>
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<td>40.08A</td>
<td>Median Greater than 120 Inches, Excavation, Drainage and Backfill</td>
<td>Changed top of planting mix to be a horizontal line; &quot;removed 12&quot; max at center&quot;</td>
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<tr>
<td>3</td>
<td>1/30/2009</td>
<td>40.08B</td>
<td>Median Greater than 120 Inches, Excavation, Drainage and Backfill</td>
<td>Changed top of planting mix to be a horizontal line; &quot;removed 12&quot; max at center&quot;</td>
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<td>4</td>
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<td>Temporary Silt Fence</td>
<td>Removed note #1, adjusted note numbering, adjusted bury depth to 8&quot;, post spacing to 6' Max</td>
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<td>4</td>
<td>7/1/2009</td>
<td>30.06B</td>
<td>High Hazard Temporary Silt Fence</td>
<td>Adjusted note #1 to read &quot;wire fencing&quot; instead of &quot;filter fabric fence&quot;, adjusted bury depth to 8&quot;</td>
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<td>4</td>
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<td>Removed (ER-1) from title, added notes 3 &amp; 4, added Connectivity sign / 50.08C, added OM4-3 note</td>
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<td>4</td>
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<td>TEXT pg 17-21</td>
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<tr>
<td>REVISION NO.</td>
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<td>5</td>
<td>7/1/2010</td>
<td>20.00B</td>
<td>NCDOT Standards for use in City of Charlotte and ETJ</td>
<td>Added reference to 20.05A &amp; B</td>
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<td>5</td>
<td>7/1/2010</td>
<td>20.00C</td>
<td>NCDOT Standards for use in City of Charlotte and ETJ</td>
<td>Removed reference to &quot;840.06 Manhole Frame and Cover&quot; - does not exist.</td>
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<td>5</td>
<td>7/1/2010</td>
<td>20.05A</td>
<td>Slab Type Catch Basin 15&quot; Thru 48&quot; Pipe</td>
<td>Added old std. detail back in CLDSM to provide details how to build slab type CB with 4&quot; deep MH cover</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>20.05B</td>
<td>Manhole Ring and Cover for Slab Type Catch Basin</td>
<td>Added old std. detail back in CLDSM to provide details how to build slab type CB with 4&quot; deep MH cover</td>
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<tr>
<td>5</td>
<td>7/1/2010</td>
<td>20.28</td>
<td>Subdrain Detail</td>
<td>Clarified PVC ratings, add reference to Type CP and SP HDPE. Allow Sched. 40 PVC under roadways.</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.00</td>
<td>Bioretention Plan</td>
<td>Added note regarding Post-Construction Controls Baseline (PCCE)</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.01</td>
<td>Bioretention Cross-section</td>
<td>Added PCCE note, clarified specs for stone curtain, underdrain, cleanouts, tree plantings, amended soil</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.02</td>
<td>Bioretention Planting Plan</td>
<td>Added note re: small maturing trees in amended soils</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.03</td>
<td>Bioretention Concrete Curb Spillway</td>
<td>Removed</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.06</td>
<td>Wetpond Profile</td>
<td>Added PCCE note, various drafting changes for clarity, moved outlet orifice to perm. pool elev.</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.08</td>
<td>Wetpond Liftstation Shelf and Berm detail</td>
<td>Moved outlet orifice to perm. pool elev.</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.11</td>
<td>Wetland Profile</td>
<td>Added PCCE note</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.16</td>
<td>Enhanced Grass Swale Details</td>
<td>Added PCCE note</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>21.17</td>
<td>Grass Channel</td>
<td>Added PCCE note</td>
</tr>
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<td>5</td>
<td>7/1/2010</td>
<td>21.19</td>
<td>Infiltration Trench</td>
<td>Added PCCE note</td>
</tr>
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<td>5</td>
<td>7/1/2010</td>
<td>21.23</td>
<td>Underground Sand Filter</td>
<td>Added PCCE note</td>
</tr>
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<td>5</td>
<td>7/1/2010</td>
<td>30.01</td>
<td>Temporary Sediment Trap</td>
<td>Removed misleading titles &quot;Cross-section&quot; and &quot;Plan View&quot;</td>
</tr>
<tr>
<td>5</td>
<td>7/1/2010</td>
<td>50.12</td>
<td>Emergency Vehicle Median Crossover</td>
<td>Added note #3 re: use at RIRO entrances only with CDOT approval</td>
</tr>
<tr>
<td>5</td>
<td>1/1/2011</td>
<td>TEXT pg 4-5</td>
<td>Section 1.B.1. &quot;Public Streets&quot;</td>
<td>Removed Min. Stopping Sight Distance values, added note.</td>
</tr>
<tr>
<td>5</td>
<td>1/1/2011</td>
<td>TEXT pg 9</td>
<td>Section 1.F.6. &quot;Sidewalks and Driveways&quot;</td>
<td>Added note re: measurement and payment of curb and gutter for drop curb driveways</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>TEXT pg 4, 5, 6</td>
<td>Section B. &quot;Standards of Street Design&quot;</td>
<td>Amended design criteria to match USDG</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>10.25F</td>
<td>Commercial Type IV Driveway Standard</td>
<td>Clarified dimensions on wings</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>10.27A</td>
<td>Residential Driveway (Type I) For 2'-0&quot; Valley Gutter</td>
<td>Added 4x4 wings, adjusted driveway with table to account for wings</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>11.16</td>
<td>Residential Cul-de-sac Detail</td>
<td>Removed S/W around bulb, removed short C-D-S, removed notes #1 &amp; 6, added #4</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>11.17</td>
<td>Office / Commercial / Industrial Cul-de-sac Detail</td>
<td>Adjusted Right-of-way outward to accommodate larger planting strip and sidewalk</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>11.18A</td>
<td>Residential Hammerhead Detail</td>
<td>Removed S/W around bulb, added note #3</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>11.21</td>
<td>Oversized Residential Cul-de-sac with raised Planter Island</td>
<td>Removed S/W around bulb, added note #7</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>20.00</td>
<td>NCDOT Standards for use in City of Charlotte and ETJ</td>
<td>Removed reference to 842.01, 842.02, 842.03 (Retaining Walls)</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>20.03</td>
<td>Brick Double Catch Basin 15&quot; thru 36&quot; Pipe</td>
<td>Removed previous note #1 that exempted this detail from use on ETJ streets. OK now per NCDOT</td>
</tr>
<tr>
<td>6</td>
<td>1/1/2011</td>
<td>U-01 through U-07</td>
<td>USDG typical street sections</td>
<td>Added new typical sections for USDG streets</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Added note re: option for depth of concrete gutter across entrance</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>10.36A</td>
<td>Culvert Crossings on Residential and Commercial Streets</td>
<td>Replaced &quot;Handrail&quot; reference with &quot;Safety Rail&quot;</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>10.36B</td>
<td>Culvert Crossings on Residential and Commercial Streets</td>
<td>Replaced &quot;Handrail&quot; reference with &quot;Safety Rail&quot;</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>20.05A</td>
<td>Slab Type Catch Basin 15&quot; Thru 48&quot; Pipe</td>
<td>Added option for using Drop Inlet Frame and Grate NCDOT standard 840.16</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>20.23</td>
<td>Rip Rap Aprons at Outfalls Other than SWIM</td>
<td>Added Thickness=10&quot; Min. to match Site Checklist</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>50.04A</td>
<td>Safety Rail</td>
<td>Changed name from &quot;Typical Handrail&quot; to &quot;Safety Rail&quot; to avoid confusion relating to ADA requirements</td>
</tr>
<tr>
<td>7</td>
<td>7/1/2011</td>
<td>50.04B</td>
<td>Safety Rail Warrants</td>
<td>Changed name, revised and updated the warrants. Added detailed exhibits.</td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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<td>-------------</td>
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</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>10.27A</td>
<td>Residential Driveway (Type I) For 2'-0&quot; Valley Gutter</td>
<td>Moved Section A-A to middle of apron to better illustrate 6&quot; thickness requirement</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>11.13</td>
<td>Private Street Typical Sections</td>
<td>Added note 4, re: section not to be used to meet connectivity requirements of Subdivision/Zoning ordinances</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>20.00C</td>
<td>NCDOT Standards for use in City of Charlotte and ETJ</td>
<td>Added clarifying note regarding 340.34, Traffic Bearing Junction Box</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>20.03</td>
<td>Brick Double Catch Basin 10&quot; thru 36&quot; Pipe</td>
<td>Added note 8, re: weep holes</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>20.17A</td>
<td>Concrete Wingwall With Splash Pad</td>
<td>Fixed Typo: Removed &quot;MIN.&quot; label over the &quot;H&quot; column</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>30.01</td>
<td>Temporary Sediment Trap</td>
<td>Changed Drainage Area max to 1 Ac, per DWG SW General Permit requirements</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>30.17A</td>
<td>Seeding Schedule</td>
<td>Removed notes 1 and 2, regarding seeding timeframes, see Site Checklist for new notes.</td>
</tr>
<tr>
<td>8</td>
<td>1/1/2012</td>
<td>50.09C</td>
<td>Parallel Parking Standards</td>
<td>Added info to note 5, re: stopping parking toward flow line only permitted if street grade is 2% or more.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>Text pgs 17-24</td>
<td>Section IV, Approved Plant Species</td>
<td>Update to the Approved Tree Species List, per Urban Forestry and LS Mgmt, adjust page #’s.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.24C</td>
<td>Commercial Type II and Res. Type I Drop Curb Driveway w/ SW abutting Curb (6x18&quot; vert curb)</td>
<td>Removed previously shown sidewalk width, adjusted to provide 4’ continuous passage</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.25A</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (2-6&quot; Curb and Gutter)</td>
<td>Added minimum vertical dimension of 4’ on flare</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.25C</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (8’x18” Vert curb)</td>
<td>Added minimum vertical dimension of 4’ on flare, drafting changes for clarity</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.25F</td>
<td>Commercial Type IV Driveway Standard</td>
<td>Added note 6” thickness through DW, removed “R/W” for clarity</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.26</td>
<td>Drop Curb Driveway Monolithic Curb and Sidewalk</td>
<td>Adjusted dimensions for 4’ Continuous Passage.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.32A</td>
<td>Accessible Ramp Standard without Planting Strip 2-6' Curb and Gutter</td>
<td>Adjusted dimensions for 4’ Continuous Passage.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.32B</td>
<td>Accessible Ramp Sections without planting strip (2’6” Curb &amp; Gutter)</td>
<td>Adjusted dimensions for 4’ Continuous Passage, added detectable warning mat in cross section</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.34A</td>
<td>Accessible Ramp Standard Monolithic Curb and Sidewalk</td>
<td>Adjusted dimensions for 4’ Continuous Passage.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>10.34B</td>
<td>Accessible Ramp Sections Monolithic Curb and Sidewalk</td>
<td>Adjusted dimensions for 4’ Continuous Passage, added detectable warning mat in cross section</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>20.25</td>
<td>Trench Detail For Storm Drain</td>
<td>Fixed Typo</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>20.29</td>
<td>Overlapping Storm Drain / Sanitary Sewer Easements</td>
<td>Revised diagram and adjusted note so ensured required trench width can be properly</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>30.00</td>
<td>Special Erosion Control Requirements &amp; Notes</td>
<td>Added reference to 6.11 Permanent Seeding, and added NCDOT Roadway Std. Dwgs as reference, along with NCDOT 1606.1 Special Sediment Fence.</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>30.17</td>
<td>Temporary Seeding Schedule</td>
<td>Revamped detail to match NCDENR ESCPDM requirements and LS Mgmt requirements</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.04A, B, C, D</td>
<td>Irrigation details</td>
<td>REMOVED details - similar details will be housed in separate Landscape Management standards doc</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.04</td>
<td>Typical Valve and Valve Box Installation</td>
<td>New detail - replaces previous 40.04D</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.05A</td>
<td>Shrub Planting Bed</td>
<td>Changed from 40.05 to 40.05A, &quot;Acceptable Plant Media&quot; note</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.05B</td>
<td>Individual Small Shrub / Tree Planting</td>
<td>New detail</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.08A</td>
<td>Median Greater than 120 Inches, Excavation, Drainage and Backfill</td>
<td>Note 3 revised to update pipe options, allowing HDPE as well as PVC</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.08B</td>
<td>73 to 120 Inch Median, Excavation, Drainage and Backfill</td>
<td>Note 3 revised to update pipe options, allowing HDPE as well as PVC</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.08C</td>
<td>48 to 72 Inch Median, Excavation, Drainage, and Backfill</td>
<td>Note 3 revised to update pipe options, allowing HDPE as well as PVC</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.09</td>
<td>Root Crown Depths</td>
<td>Changed title, changed wording to &quot;Root Flare&quot; instead of &quot;Root Crown&quot;</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>40.11</td>
<td>Bridging Tree Roots</td>
<td>Added &quot;Rebar Chairs&quot;, removed rebar embed detail, added diagonal groove joint</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.05A</td>
<td>Street Name Sign</td>
<td>Complete revision to match City’s current installation practice</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.05B</td>
<td>Street Name Sign</td>
<td>Complete revision to match City’s current installation practice</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.06</td>
<td>Street Name Sign Installation Locations</td>
<td>Detail of post installation moved to 50.05A</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.10A</td>
<td>Accessible Parking and Signage Standards</td>
<td>Update to match current MUTCD/CLDSM numbering, Changed table to ref ADA standards, added note 4, Changed sign for hatched spaces to &quot;No Parking Any Time&quot; MUTCD R7-1</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.10B</td>
<td>Supplemental Van Accessible Sign (R7-8P)</td>
<td>Changed title, adjusted notations to match current MUTCD Manual</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.10C</td>
<td>Supplemental Accessible Sign</td>
<td>Changed title, revised notations to match MUTCD</td>
</tr>
<tr>
<td>9</td>
<td>7/1/2012</td>
<td>50.14</td>
<td>Piano-style Crosswalk</td>
<td>New detail provided by CDOT</td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>11.09</td>
<td>Arterial Street Typical Sections</td>
<td>Updated Intermediate Course thickness from 2.25 to 2.5&quot; to match current SuperPave spec requirements</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>11.19A</td>
<td>Residential Alley Detail One-Way Operation</td>
<td>Clarified dimensions D3 and D4</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>11.19B</td>
<td>Residential Alley Detail Double-loaded with Two-Way Operation</td>
<td>Clarified dimensions D3 and D4</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>11.19C</td>
<td>Residential Alley Detail Single-loaded with Two-Way Operation</td>
<td>Clarified dimensions D3 and D4</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>20.00C</td>
<td>NCDOT Standards approved for use in City of Charlotte and ETJ</td>
<td>Changed 840.32 title to match current NCDOT manual title for same detail</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>21.24</td>
<td>Surface Sand Filter</td>
<td>New detail, same as Mecklenburg County's detail of same number</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>21.25</td>
<td>Surface Sand Filter Section</td>
<td>New detail, same as Mecklenburg County's detail of same number</td>
</tr>
<tr>
<td>10</td>
<td>1/1/2013</td>
<td>50.06</td>
<td>Street Name Sign Installation Locations</td>
<td>Moved street name signs and stop signs into planting strip for diagram with sidewalk shown.</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>10.34B</td>
<td>Accessible Ramp Sections 2'-0&quot; Valley Gutter</td>
<td>Added 6&quot; sidewalk thickness dimension</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>10.34C</td>
<td>Accessible Ramp Sections Monolithic Curb and Sidewalk</td>
<td>Added 6&quot; sidewalk thickness dimension</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>U-07</td>
<td>Local Collector Street Typical Section</td>
<td>Fixed curb transition to reflect 10.19; added note #2 re: 8' SW at back of curb if wide PS &amp; SW street</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>11.09</td>
<td>Arterial Street Typical Sections</td>
<td>Fixed R/W width dimension to be 36' ea. side - also added 26&quot; dim from CL to SW if Valley Gutter</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>20.00A</td>
<td>NCDOT Standards Approved For Use in the City of Charlotte and Charlotte ETJ</td>
<td>300.01 was previously included on this table, but this revision removed reference to &quot;Method A&quot;</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>20.25</td>
<td>Trench Detail For Storm Drain</td>
<td>Removed - reference to NCDOT 300.01 now included in 20.00A</td>
</tr>
<tr>
<td>11</td>
<td>7/1/2013</td>
<td>21.24</td>
<td>Surface Sand Filter</td>
<td>Detail re-drawn with different configuration so sand filter does not take up entire bottom of detention area &amp; swapped inset detail for rip-rap berm into plan view, and put stand/pipe as &quot;inset&quot; detail</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.25F</td>
<td>Type IV Driveway</td>
<td>Revised title of detail to &quot;Type IV Driveway&quot; from &quot;Commercial Type IV Driveway&quot;; added info re: residential dw application; added note re: end treatment; added driveway standard widths table</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.31B</td>
<td>Accessible Ramp Section with Planting Strip 2'-6&quot; Curb and Gutter</td>
<td>Drafting update for clarity; added detectable warning mat in section view</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.32B</td>
<td>Accessible Ramp Sections without Planting Strip 2'-6&quot; Curb and Gutter</td>
<td>Corrected dimension</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.33B</td>
<td>Accessible Ramp Sections 2'-0&quot; Valley Gutter</td>
<td>Added detectable warning mat in section view</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.34B</td>
<td>Accessible Ramp Sections Monolithic Curb and Sidewalk</td>
<td>Corrected dimension</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.35B</td>
<td>Truncated Domes Plan and Cross-section</td>
<td>Corrected dimensions, added reference to NCDOT 848.06</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.40A</td>
<td>Directional Accessible Ramp With Small/Medium Curb Radii</td>
<td>Due to NCDOT concerns, added note re: not for use in ETJ, removed ETJ from title block</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>10.40B</td>
<td>Directional Accessible Ramp With Large Curb Radius</td>
<td>Due to NCDOT concerns, added note re: not for use in ETJ, removed ETJ from title block</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.01</td>
<td>Local Residential Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.02</td>
<td>Local Residential Typical Ditch Type Street Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.03</td>
<td>Diced Residential Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.04</td>
<td>Local Limited Residential Street Typical Section</td>
<td>Removed note re: sidewalk only on one side of street; Added ETJ 1&quot; note</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.05</td>
<td>Local Limited Residential Typical Ditch Type Street Section</td>
<td>Removed note re: sidewalk only on one side of street; Added ETJ 1&quot; note</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.06</td>
<td>Residential Collector Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.07</td>
<td>Residential Collector Street Ditch Type Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.10</td>
<td>City Of Charlotte 45' Local Traditional Neighborhood Development Street</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>11.16</td>
<td>City of Charlotte and ETJ Residential Cul-de-sac Detail</td>
<td>Removed reference to ETJ; added note referencing NCDOT Subdivision Roads Minimum Construction Standards Manual; added cross section A-A showing grades at back of curb</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>20.28</td>
<td>Subdrain Detail</td>
<td>Added new detail views and notes regarding connections at storm structures</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.02A</td>
<td>Skimmer Sediment Basin</td>
<td>Skimmer length requirement added; added notes; adjust pond bottom to include 1&quot; sediment storage</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.02B</td>
<td>Skimmer</td>
<td>Skimmer length requirement added</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.03A</td>
<td>Sediment Basin</td>
<td>Skimmer length requirement added; added notes; adjust pond bottom to include 1&quot; sediment storage; changed 3rd baffle to be a typical baffle instead of Hardware Cloth as previously shown</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.11A</td>
<td>Stabilized Construction Entrance</td>
<td>Revised note #1 to read &quot;and&quot; instead of &quot;or&quot;; added note re: sweeping aggregate each night</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.11C</td>
<td>Construction Entrance - Single Family Lot</td>
<td>New Detail</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>30.16</td>
<td>Slope Stability</td>
<td>Added &quot;Alternative 2&quot; for 3' wide bench set on-contour</td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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<tr>
<td>12</td>
<td>7/15/2014</td>
<td>40.03</td>
<td>Large and Small Maturing Tree Pit With Grate in Sidewalk (PLAN)</td>
<td>Adjusted dimension location; show label curb &amp; gutter</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>40.03C</td>
<td>Large and Small Maturing Tree Pit With Grate in Sidewalk (SECTION)</td>
<td>Adjust 1'-6&quot; dimension and 5'-0&quot; dimension; show consistent soil hatch type</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>40.11</td>
<td>Reinforced Concrete Sidewalk (Bridging Tree Roots)</td>
<td>Revised title of detail to &quot;Reinforced Concrete Sidewalk (Bridging Tree Roots); added note</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>50.10A</td>
<td>Accessible Parking and Signage Standards</td>
<td>Updated Accessible VAN Parking requirements to match Section 1106 of NC State Building Code; added code reference</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-01</td>
<td>Local Residential Narrow Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-02</td>
<td>Local Residential Medium Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-03A</td>
<td>Local Residential Wide Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-03B</td>
<td>Local Residential Wide Street at Midblock with Curb Extension Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-03C</td>
<td>Local Residential Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>12</td>
<td>7/15/2014</td>
<td>U-07</td>
<td>Local Collector Street Typical Section</td>
<td>Added note re: ETJ Streets 1&quot; may be placed when approved by NCDOT</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>TEXT PG 9</td>
<td>Section I. F. (Sidewalks and Driveways)</td>
<td>Add note referring to WATCH manual and MUTCD, latest edition - for construction zone pedestrian routes and signalization and controls for actuator; revise I. F. 1, to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added table showing Example Construction Dimensions for sidewalks; included information regarding ramps at 7.5% (8.33% Max) slope; revised I. F. 3, to read 5 min. wide sidewalk instead of 4 min.</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>TEXT PG 10</td>
<td>Section II. A. (Storm Drainage)</td>
<td>Added note - no changes in storm pipe alignment except at structures, max length between access points is 300 LF</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>TEXT PG 24</td>
<td>References</td>
<td>Added references to MUTCD and PROWAG</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.22</td>
<td>Concrete Sidewalks</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added min. width of sidewalk on thoroughfares to be 6' instead of 5' per USDG; added note 7, 8 per ADA consultant report; added table showing Example Construction Dimensions</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.23</td>
<td>Monolithic Concrete Curb and Sidewalk</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.24A</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (2'-6&quot; Curb and Gutter)</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised 1:12 slope to read 7.5% (8.33% Max); removed dimension on wings and label &quot;varies&quot;; label sidewalk 5' min. width.</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.24B</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (6&quot;x 18&quot; Vertical Curb)</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised 1:12 slope to read 7.5% (8.33% Max); revised min. width of sidewalk on thoroughfares to be 6' instead of 5' per USDG; added note 7, 8 per ADA consultant report; added note 7 re: joint material</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.24C</td>
<td>Commercial and Residential Drop Curb Driveway with Sidewalk Abutting Curb</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; 1/12 Revised to read 7.5%; removed dimension on wings and labeled &quot;varies&quot;; added note 4 re: joint material</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25A</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (2'-6&quot; Curb and Gutter)</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; labeled sidewalk min. 5' width; Added note re: Fire access max 10%; added note 7 re: joint material</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25B</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (2'-6&quot; Curb and Gutter)</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25C</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (6&quot;x18&quot; Vertical Curb)</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised 1:12 slope to read 7.5% (8.33% Max); removed dimension on wings and label &quot;varies&quot;; label sidewalk 5' min. width.; added note 7 re: joint material</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25D</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (6&quot;x18&quot; Vertical Curb)</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised 1:12 slope to read 7.5% (8.33% Max); removed dimension on wings and label &quot;varies&quot;; label sidewalk 5’ min. width.; added note 7 re: joint material</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25E</td>
<td>Modified Type II Driveway Detail with Planting Strip</td>
<td>Show ex. sidewalk as dashed, label separation from curb taper to the sidewalk as &quot;Varies&quot;, 1' min.; label curb depth taper as 2:1 over one foot, fix size of sidewalk panels shown, and fix plan view to match cross-section better with separation between the curb and the edge of sidewalk</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.25F</td>
<td>Type IV Driveway</td>
<td>Change 1/4&quot;per foot to 1.5% (2.00% max); change dimension from EP to back of sidewalk to be 6' Total Minimum, to be consistent with 10.23 Monolithic Curb and Sidewalk; added note re: Fire Access Road 10% max grade; removed dimension on flares to read &quot;varies&quot;</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.26</td>
<td>Drop Curb Driveway Monolithic Concrete Curb and Sidewalk</td>
<td>Change 1/4&quot;per foot to 1.5% (2.00% max); change dimension from EP to back of sidewalk to be 6' Total Minimum, to be consistent with 10.23 Monolithic Curb and Sidewalk; added note re: Fire Access Road 10% max grade; removed dimension on flares to read &quot;varies&quot;</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.27A</td>
<td>Residential Driveway (Type I) Valley Gutter</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; Change label for the joint at back of valley gutter to be an expansion joint; label sidewalk 5’ min. width.; revised 1/4&quot; per foot to read 1.5% (2.00% max)</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.27B</td>
<td>Commercial Type II Driveway for 2'-0&quot; Valley Gutter</td>
<td>Added note re: Fire access max 10%; revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; Change label for the joint at back of valley gutter to be an expansion joint; label sidewalk 5’ min. width.; revised 1/4&quot; per foot to read 1.5% (2.00% max)</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Added callouts for expansion joints on both sides of driveway</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.31A</td>
<td>Accessible Ramp Standard with Planting Strip 2'-6&quot; Curb and Gutter (plan view)</td>
<td>Adjust construction joints on ACC ramps to run straight back, remove dimensions on wings, change slopes to be compliant with PROWAG/ADA consultant report; added notes 1 and 2.</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.31B</td>
<td>Accessible Ramp Section with Planting Strip 2'-6&quot; Curb and Gutter (section view)</td>
<td>Revised sidewalk slope of 1/4&quot; per foot to read 1.5% (2.00% max) and ramp run to be 7.5% (8.33% max); added 2' distance between truncated dome mat and back of curb</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>10.32A</td>
<td>Accessible Ramp Standard without Planting Strip 2'-6&quot; Curb and Gutter (plan view)</td>
<td>Adjust construction joints on ACC ramps to run straight back, remove dimensions on wings, change slopes to be compliant with PROWAG/ADA consultant report; added notes 1 and 2.</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
<td>Notes</td>
<td></td>
<td></td>
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<tr>
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</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Ramp Sections without Planting Strip 2'-4&quot; Curb and Gutter</strong></td>
<td>Revised sidewalk slope of 1/4&quot; per foot to read 1.5% (2.00% max) and ramp run to be 7.5% (8.33% max); added 2&quot; distance between truncated dome mat and back of curb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Ramp Standard 2'-0&quot; Valley Gutter</strong> (plan view)</td>
<td>Adjust construction joints on ACC ramps to run straight back, remove dimensions on wings, change slopes to be compliant with PROWAG/ADA consultant report; added notes 1 and 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Ramp Sections 2'-0&quot; Valley Gutter</strong> (section view)</td>
<td>Revised sidewalk slope of 1/4&quot; per foot to read 1.5% (2.00% max) and ramp run to be 7.5% (8.33% max); added 2&quot; distance between truncated dome mat and back of curb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Ramp Standard Monolithic Curb and Sidewalk</strong></td>
<td>Adjust construction joints on ACC ramps to run straight back, remove dimensions on wings, change slopes to be compliant with PROWAG/ADA consultant report; added notes 1 and 2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Ramp Sections Monolithic Curb and Sidewalk</strong></td>
<td>Revised sidewalk slope of 1/4&quot; per foot to read 1.5% (2.00% max) and ramp run to be 7.5% (8.33% max); added 2&quot; distance between truncated dome mat and back of curb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Standard Placement of Accessible Ramp and General Notes</strong></td>
<td>Label width of ramp to be covered with dome mat, width of truncated dome mat coverage must not match width of sidewalk, revise notes 2, 3, 5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Truncated Domes Plan and Cross-Section</strong></td>
<td>Updated 12:1 slope to read 7.5% (8.33% max) slope, and cross slope to 1.5% (2.00% max); added note clarifying 2&quot; width of dome mat in dir. of travel; changed &quot;curb&quot; to &quot;gutter&quot; in detail.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Directional Ramp (Small Radius)</strong></td>
<td>Include note re: distance between edge of truncated dome mat and the depressed curb; add note for 1.5% (2.00% max) cross-slope, added note clarifying width of dome mat in dir. Of travel; changed 12:1 to 7.5% (8.33% max) slope; changed &quot;curb&quot; to &quot;gutter&quot; in detail.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Street Typical Section</strong></td>
<td>REMOVED DETAIL - Street section superseded by USDG residential street section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Typical Ditch Type Street Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised min width of sidewalk to be 5' instead of 4'.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Division Residential Street Typical Section</strong></td>
<td>REMOVED DETAIL - Divided street section detail not needed, will be site specific.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Limited Residential Street Typical Section</strong></td>
<td>REMOVED DETAIL - Street section superseded by USDG residential street section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Limited Residential Typical Ditch Type Street Section</strong></td>
<td>REMOVED DETAIL - Limited street section no longer used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Residential Collector Street Typical Section</strong></td>
<td>REMOVED DETAIL - Limited street section superseded by USDG residential wide street section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Residential Collector Street Ditch Type Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; revised min width of sidewalk to be 5' instead of 4'.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Limited Residential Collector Street Type Typical Section</strong></td>
<td>REMOVED DETAIL - Limited street section no longer used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Arterial Street Typical Sections</strong></td>
<td>Revised SW X-slope to read 1.5% instead of 1/4&quot; per foot, revised to 8&quot; min Plant strip and 6&quot; min. sidewalk width.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>City of Charlotte 45' Local Traditional Neighborhood Development Street</strong></td>
<td>REMOVED DETAIL - Street section no longer used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Commercial Street Typical Sections</strong></td>
<td>REMOVED DETAIL - Street section superseded by USDG commercial street.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Commercial Street Divided Typical Section</strong></td>
<td>REMOVED DETAIL - Divided street section detail not needed, will be site specific.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>City of Charlotte Residential Cul-de-sac detail</strong></td>
<td>Adjusted width of detectable warning surface mats to match the width of ramps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Temporary Turnaround</strong></td>
<td>Adjusted width of detectable warning surface mats to match the width of ramps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Offset Catch Basin</strong></td>
<td>Add reference to 840.01 from NCDOT manual to detail max pipe size.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Skimmer Sediment Basin</strong></td>
<td>Remove 1&quot; dimension from the emergency spillway, adjust sediment cleanout depth to be labeled H2, and ensure H is shown to the elevation of the spillway over the berm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Sediment Basin</strong></td>
<td>Remove hatching for 3rd baffle for clarity, adjusted sed cleanout depth and H dimension to proper location; removed #5 stone layer from rock baffle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Catch Basin Inlet Protection</strong></td>
<td>Add notes regarding keeping tree grates out of Pedestrian Access Route.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Street Name Sign Installation Locations</strong></td>
<td>Show stop sign requirement and reference MUTCD; changed &quot;Street Name Sign Installation&quot; to &quot;Street Sign&quot; since it includes street name as well as stop sign locations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible On-street Parallel Parking</strong></td>
<td><strong>NEW DETAIL</strong> - Includes notes regarding tree planting locations, shows required items/design specs according to PROWAG/ADA.</td>
<td></td>
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</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Accessible Parking and Signage Standards</strong></td>
<td>Added notes 3 and 4; added accessible symbol on each parking space.</td>
<td></td>
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</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Emergency Vehicle Median Crossover Standards</strong></td>
<td>Include note referencing standard 20.28, &quot;Suburban Detail&quot; as applicable.</td>
<td></td>
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<tr>
<td>7/31/2015</td>
<td><strong>Wave Rack for Bicycle Parking</strong></td>
<td>Added note #4 re: cane detectable and outside of PAR.</td>
<td></td>
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</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Narrow Street Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Medium Street Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Wide Street Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Wide Street at Midblock with Curb Extension Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Residential Wide Street at Intersection with Curb Extension Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Office/Commercial Narrow Street Typical Section</strong></td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/31/2015</td>
<td><strong>Local Office/Commercial Wide Street Plan-View</strong></td>
<td>Adjusted width of detectable warning surface mats to match the width of ramps.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
</tr>
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</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>U-05A</td>
<td>Local Office/Commercial Wide Street Typical Section</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>U-05B</td>
<td>Local Office/Commercial Wide Street at Midblock with Curb Extension Typical</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>U-05C</td>
<td>Local Office/Commercial Wide Street at Intersection with Curb Extension Typical</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>U-06</td>
<td>Local Industrial Street Typical Section</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement</td>
</tr>
<tr>
<td>13</td>
<td>7/31/2015</td>
<td>U-07</td>
<td>Local Collector Street</td>
<td>Revised notation to read 1.5% (2.00% max) instead of 1/4&quot; per foot; added note re: setback measurement</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.25E</td>
<td>Type II-Modified Driveway Detail With Wide Planting Strip and Standard Curb</td>
<td>Added Note #9 re: driveway rise 6&quot; from gutter flow line</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Changed name to &quot;Perpendicular Curb Ramp&quot;; adjusted ramp plan and section for 8' planting strip; adjusted flowline depth to avoid non-accessible slope break previously shown</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.31A</td>
<td>Curb Ramp Standard with Planting Strip 2'-6&quot; Curb and Gutter (plan view)</td>
<td>Changed name to &quot;Perpendicular Curb Ramp&quot;; single detail 10.33 now supersedes previous 10.33A and B; added isometric view; adjusted flowline depth to avoid non-accessible slope break previously shown</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.31B</td>
<td>Accessible Ramp Section with Planting Strip 2'-6&quot; Curb and Gutter (section view)</td>
<td>Replaced previous detail with isometric views of perpendicular ramps</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.32A</td>
<td>Accessible Ramp Standard without Planting Strip 2'-6&quot; Curb and Gutter (plan view)</td>
<td>DETAIL REMOVED</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.32B</td>
<td>Accessible Ramp Sections without Planting Strip 2'-6&quot; Curb and Gutter (section view)</td>
<td>DETAIL REMOVED</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.33</td>
<td>Accessible Ramp Standard 2'-0&quot; Valley Gutter (plan view)</td>
<td>Changed name to &quot;Perpendicular Curb Ramp&quot;; single detail 10.33 now supersedes previous 10.33A and B; added isometric view; adjusted flowline depth to avoid non-accessible slope break previously shown</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.33A</td>
<td>Accessible Ramp Sections 2'-0&quot; Valley Gutter (section view)</td>
<td>DETAIL REMOVED</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.34A</td>
<td>Accessible Ramp Standard Monolithic Curb and Sidewalk</td>
<td>DETAIL REMOVED</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.34B</td>
<td>Accessible Ramp Sections Monolithic Curb and Sidewalk</td>
<td>DETAIL REMOVED</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.35A</td>
<td>Standard Placement of Accessible Ramp and General Notes</td>
<td>Clarified note re: turning space for both views; added in Slope &quot;A&quot; on landing space on both details; changed name to &quot;Curb Ramp&quot; instead of &quot;Accessible Ramp&quot;; added notes 8, 9, 10; included detail showing 4x4 crosswalk clear zone; added min. curb height at corners 2&quot;</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.35B</td>
<td>Truncated Domes Plan and Cross-Section</td>
<td>Revised notes 6 &amp; 7</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>10.38</td>
<td>Curb Repairs at Existing Bus Stops</td>
<td>Added note 5; adjusted asphalt lift thicknesses to be consistent with current arterial street section</td>
</tr>
<tr>
<td>14</td>
<td>7/29/2016</td>
<td>11.02</td>
<td>Local Residential Typical Ditch Type Street Section</td>
<td>Fixed typo in note 2</td>
</tr>
<tr>
<td>14</td>
<td>8/15/2016</td>
<td>30.01</td>
<td>Temporary Sediment Trap</td>
<td>Added note 2</td>
</tr>
<tr>
<td>14</td>
<td>8/15/2016</td>
<td>30.2A</td>
<td>Skimmer Sediment Basin</td>
<td>Added rip-rap mound under skimmer</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>Text, page 5</td>
<td>Standards of Street Design - Streets and Intersections</td>
<td>Added K-value for STOP condition, included new criteria for intersection design for PROWAG</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>10.22</td>
<td>Concrete Sidewalk</td>
<td>Adjusted note #22, 49&quot; intervals</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>10.35A</td>
<td>Standard Placement of Accessible Ramp and General Notes</td>
<td>Adjusted diagram for 4x4&quot; square at corner ramp</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>10.35B</td>
<td>Truncated Domes Plan and Cross-Section</td>
<td>Revised notes 6 &amp; 7</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>10.38</td>
<td>Curb Repairs at Existing Bus Stops</td>
<td>Added note 5; adjusted asphalt lift thicknesses to be consistent with current arterial street section</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>11.02</td>
<td>Local Residential Typical Ditch Type Street Section</td>
<td>Fixed typo in note 2</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.01</td>
<td>Temporary Sediment Trap</td>
<td>Added note 2</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.03A</td>
<td>Sediment Basin</td>
<td>Adjusted to provide sediment storage zone prior to rock berm</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.03B</td>
<td>General Notes - Sediment Basins</td>
<td>Adjusted note 16</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.06A</td>
<td>Temporary Silt Ditch</td>
<td>Show 6&quot; and 4&quot; dimensions on fabric bury - add note to anchor skirt</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.06B</td>
<td>High Hazard Temporary Silt Fence</td>
<td>Show 8&quot; and 4&quot; dimensions on fabric bury - add note to anchor skirt; adjust note 4; remove note 6</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.06C</td>
<td>Silt Fence Outlet</td>
<td>New Detail</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.10A</td>
<td>Temporary Rock Check Dam</td>
<td>Renumbered 30.10 to 30.10A</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.10B</td>
<td>Temporary Rock Check Dam With Matting and Optional PAM</td>
<td>New Detail</td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.10C</td>
<td>Temporary Wattle Check Dam With Matting and Optional PAM</td>
<td>New Detail</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.11A</td>
<td>Stabilized Construction Entrance</td>
<td>Adjusted note 1, note 6, added note 7; show ex. DW and SW in plan and section view</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.11B</td>
<td>Construction Entrance Tire Wash</td>
<td>Adjusted stone depth to 2-3&quot;</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.12</td>
<td>Gravel and Rip Rap Filter Berm Basin</td>
<td>Added notes for 36&quot; pipe diameter max</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.14</td>
<td>Temporary Stream Crossing</td>
<td>Fixed drafting on pipe; added surface flow diversion notes; added Note #4</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.18</td>
<td>Construction Within Creek Bank</td>
<td>Detail REMOVED - see new details 30.22A, B, C</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.19</td>
<td>Baffle Installation</td>
<td>Adjusted % area separation for each baffle to 25%; added note re: coir fabric</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.22A</td>
<td>Bypass Pumping</td>
<td>New Detail</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>30.22B</td>
<td>Suspended Bypass Pipe</td>
<td>New Detail</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>40.06</td>
<td>6’ Tree Planting Strip UMUD Only</td>
<td>Added note 4; removed ETJ from title block; removed &quot;If Required&quot; from Subdrain note</td>
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<tr>
<td>15</td>
<td>1/16/2017</td>
<td>40.11</td>
<td>Reinforced Concrete Sidewalk (Bridging Tree Roots)</td>
<td>Clarified where stone is to be placed; Added &quot;washed&quot; to #57 stone references; added notes 1 and 2</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>50.20</td>
<td>Inverted &quot;U&quot; Rack for Bicycle Parking</td>
<td>Added clarifying dimensions for placement and clearance; updated all notes</td>
</tr>
<tr>
<td>15</td>
<td>1/16/2017</td>
<td>50.21</td>
<td>Post and Ring Bike Rack</td>
<td>New Detail; replaces previous &quot;Wave Rack&quot; bike rack detail</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Concrete optional for apron area thru crosswall; adjusted ramp illustration &amp; 4' conc. Gutter illustration.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.31A</td>
<td>Perpendicular Curb Ramp with 2’-4” Curb and Gutter</td>
<td>Added &quot;Up to&quot; in slope key; revised notes re: slopes of landings, added note re: 13.33% alg. Diff.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.31B</td>
<td>Perpendicular Curb Ramp with 2’-6” Curb and Gutter</td>
<td>Added &quot;Up to&quot; in slope key; revised notes re: slopes of landings</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.33</td>
<td>Perpendicular Curb Ramp with 2’-0” Valley Gutter</td>
<td>Added &quot;Up to&quot; in slope key; revised notes re: slopes of landings, added note re: 13.33% alg. Diff.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.40A</td>
<td>Directional Curb Ramp with Small/Medium Curb Radii</td>
<td>Added &quot;Up to&quot; in slope key; revised notes re: slopes of landings; added diagram of max slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>10.40B</td>
<td>Directional Curb Ramp with Large Curb Radius</td>
<td>Added &quot;Up to&quot; in slope key; revised notes re: slopes of landings; added diagram of max slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>20.00C</td>
<td>NCDOT Standards Approved For Use in the City of Charlotte and Charlotte ETJ</td>
<td>Added notes for 840.52 and 840.53 re: if used as catchbasin, need 12&quot; vertical riser</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>50.04A</td>
<td>Safety Rail</td>
<td>added note re: alternative designs needing CDOT review, private maintenance</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>50.04B</td>
<td>Safety Rail Warrants</td>
<td>Added 1' dimension from railing post to start of dropoff.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>50.09D</td>
<td>Accessible On-street Parallel Parking</td>
<td>Added last bullet to note 7; added diagram of accessibility symbol position and orientation; Add note 15</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-01</td>
<td>Local Residential Narrow Street Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-02</td>
<td>Local Residential Medium Street Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-03A</td>
<td>Local Residential Wide Street Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-03B</td>
<td>Local Residential Wide Street at Midblock with Curb Extension Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-03C</td>
<td>Local Residential Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-04</td>
<td>Local Office/Commercial Narrow Street Typical Section</td>
<td>Added note re: planting strip slopes; Revised pave section for options showing correct lift thicknesses.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-05A</td>
<td>Local Office/Commercial Wide Street Plan View</td>
<td>Added note re: planting strip slopes; Revised pave section for options showing correct lift thicknesses.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-05B</td>
<td>Local Office/Commercial Wide Street Typical Section</td>
<td>Added note re: planting strip slopes; Revised pave section for options showing correct lift thicknesses.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-05C</td>
<td>Local Office/Commercial Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Added note re: planting strip slopes; Revised pave section for options showing correct lift thicknesses.</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-06</td>
<td>Local Industrial Street Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>16</td>
<td>7/31/2017</td>
<td>U-07</td>
<td>Local Collector Street Typical Section</td>
<td>Added note re: planting strip slopes</td>
</tr>
<tr>
<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD NO.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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<tr>
<td>17</td>
<td>7/31/2018</td>
<td>Text Pg 5</td>
<td>Standards of Street Design - Streets and Intersections</td>
<td>Added footnote re: 2% x 2% intersections use ramp standards, otherwise site specific detailed design needed</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>Text Pg 10-11</td>
<td>Storm Drainage - Standards for Design</td>
<td>Added Pipe Video notes, shifted text up one page</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>Text Pg 12</td>
<td>Storm Drainage - Reinforced Concrete</td>
<td>Remove notes 3 and 4; add new note 3 re: preformed joint sealer</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.23</td>
<td>Monolithic Concrete Curb and Sidewalk</td>
<td>Removed detail; no longer used</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.25B</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (2'-6&quot; Curb and Gutter)</td>
<td>Added note 8 re: planting strip &lt; 6&quot; use 10.25E</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.25D</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (6&quot;x18&quot; Vertical Curb)</td>
<td>Added note 8 re: planting strip &lt; 6&quot; use 10.25E</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.26</td>
<td>Drop Curb Driveway Monolithic Concrete Curb and Sidewalk</td>
<td>Removed detail; no longer used</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Added note to clarify both ramps can be 10.31A/B, 10.40A/B - the ramps are shown as 10.40A for illustration purposes.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.31A</td>
<td>Perpendicular Curb Ramp With 2'-0&quot; Curb and Gutter</td>
<td>Removed dimension 9 mm at toe of ramp; show “Match Sidewalk Width” instead</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.33</td>
<td>Perpendicular Curb Ramp with 2'-0&quot; Valley Gutter</td>
<td>Removed dimension 9 mm at toe of ramp; show “Match Sidewalk Width” instead</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.35A</td>
<td>Placement of Curb-Ramps at Obstructed or Small Corner Radius</td>
<td>Changed name; show typical landing space dimensions; removed 5-ft dim. On sidewalk; added 1&quot; curb reveal at corner</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.40A</td>
<td>Directional Curb-Ramp with Smal/Medium Curb Radii</td>
<td>Adjusted construction joint locations; added note 2; added note 5 re: SW Trans. Panel; clarified details/corrected slopes</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.40B</td>
<td>Directional Curb-Ramp with Large Curb Radius</td>
<td>Adjusted construction joint locations; added note 2; added note 5 re: SW Trans. Panel; clarified details/corrected slopes</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.40C</td>
<td>Directional Curb Ramp with Valley Gutter</td>
<td>New Detail</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.41A</td>
<td>Pedestrian Refuge (With 1'-6&quot; Curb &amp; Gutter)</td>
<td>Added Reflective Paddies</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>10.41B</td>
<td>Pedestrian Refuge (With Vertical Curb)</td>
<td>Added Reflective Paddies</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.02</td>
<td>Local Residential/Ditch Type Street Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.07</td>
<td>Residential Collector Street Ditch Type Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.09</td>
<td>Thoroughfare Street Typical Sections</td>
<td>Changed name from &quot;Artaral&quot; to &quot;Thoroughfare&quot; and revised pavement mix spec per NCDOT</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.13</td>
<td>Private Street Typical Sections</td>
<td>Revised Pavement Mix specs per NCDOT; also edited Guidelines for design note 2, to refer to text I.B.2.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.14</td>
<td>Divided Private Street Typical Sections</td>
<td>Revised Pavement Mix specs per NCDOT; also edited Guidelines for design note 2, to refer to text I.B.2.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.19A</td>
<td>Residential Alley Detail One-Way Operation</td>
<td>Revised Pavement Mix per NCDOT; added note 6 to accommodate fire apparatus access road as needed</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.19B</td>
<td>Residential Alley Detail Double Loaded w/ Two-Way Operation</td>
<td>Revised Pavement Mix per NCDOT; added note 5 to accommodate fire apparatus access road as needed</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>11.19C</td>
<td>Residential Alley Detail Single Loaded w/ Two-Way Operation</td>
<td>Revised Pavement Mix per NCDOT; added note 8 to accommodate fire apparatus access road as needed</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>20.27</td>
<td>Rip-Rap Ditches</td>
<td>Removed detail; no longer used</td>
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<tr>
<td>17</td>
<td>7/31/2018</td>
<td>20.35</td>
<td>Grading at Yard/Drop Inlet</td>
<td>Added &quot;YARD&quot; to name; added various data columns to data block; added note describing invert elevation</td>
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<tr>
<td>17</td>
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<td>50.15</td>
<td>Raised Crosswalk</td>
<td>New Detail</td>
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<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-01</td>
<td>Local Residential/Narrow Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
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<tr>
<td>17</td>
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<td>Local Residential/Medium Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
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<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-03A</td>
<td>Local Residential Wide Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-03B</td>
<td>Local Residential Wide Street at Midblock with Curb Extension Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-03C</td>
<td>Local Residential Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-04</td>
<td>Local Office/Commercial Narrow Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
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<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-05A</td>
<td>Local Office/Commercial Wide Street Plan View</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
<tr>
<td>17</td>
<td>7/31/2018</td>
<td>U-05B</td>
<td>Local Office/Commercial Wide Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
</tr>
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<td>17</td>
<td>7/31/2018</td>
<td>U-05C</td>
<td>Local Office/Commercial Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
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<td>Local Industrial Street Typical Section</td>
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<td>7/31/2018</td>
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<td>Local Collector Street Typical Section</td>
<td>Revised Pavement Mix specs for consistency with NCDOT pavement requirements. No change in lift thicknesses.</td>
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<td>REVISION NO.</td>
<td>REVISION DATE</td>
<td>STANDARD No.</td>
<td>NAME</td>
<td>DESCRIPTION OF REVISION</td>
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<td>18</td>
<td>1/31/2019</td>
<td>10.23</td>
<td>Sidewalk Transition</td>
<td>NEW DETAIL</td>
</tr>
<tr>
<td>18</td>
<td>1/31/2019</td>
<td>10.25E</td>
<td>Modified type II driveway detail with planting strip</td>
<td>Add note to match sidewalk width, or 5' min. across DW apron.</td>
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<tr>
<td>18</td>
<td>1/31/2019</td>
<td>10.42</td>
<td>Multi-Use Path</td>
<td>NEW DETAIL</td>
</tr>
<tr>
<td>18</td>
<td>1/31/2019</td>
<td>21.05</td>
<td>Wetpond Plan</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>1/31/2019</td>
<td>21.06</td>
<td>Wetpond Profile</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>1/31/2019</td>
<td>21.08</td>
<td>Wetpond Details</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail; renamed detail</td>
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<td>1/31/2019</td>
<td>21.09</td>
<td>Wetpond Planting Plan</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>21.10</td>
<td>Wetland Plan</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>Wetland Section</td>
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<td>Wetland Details</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>Wetland Planting Plan</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<td>18</td>
<td>1/31/2019</td>
<td>21.24</td>
<td>Surface Sand Filter</td>
<td>Add notes to match BMP manual typ. req/mts and address embankment specs, fix/clean up detail</td>
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<tr>
<td>18</td>
<td>1/31/2019</td>
<td>21.25</td>
<td>Surface Sand Filter Section</td>
<td>Added Surface treatment notes, removed 2' depth of sand option, since that doesn't meet typical 85% TSS removal goal</td>
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<tr>
<td>18</td>
<td>1/31/2019</td>
<td>30.02A</td>
<td>Skimmer Sediment Basin</td>
<td>Add note to clarify use of Turbidity Curtain as option for baffles</td>
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<tr>
<td>18</td>
<td>1/31/2019</td>
<td>30.03A</td>
<td>Sediment Basin</td>
<td>Add note to clarify use of Turbidity Curtain as option for baffles</td>
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<td>18</td>
<td>1/31/2019</td>
<td>30.06D</td>
<td>Super Silt Fence</td>
<td>NEW DETAIL</td>
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<td>18</td>
<td>1/31/2019</td>
<td>30.23A</td>
<td>Turbidity Curtain</td>
<td>NEW DETAIL</td>
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<td>18</td>
<td>1/31/2019</td>
<td>30.23B</td>
<td>Turbidity Curtain Notes</td>
<td>NEW DETAIL</td>
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<td>18</td>
<td>1/31/2019</td>
<td>50.10A</td>
<td>Accessible Parking and Signage Standards</td>
<td>Fixed note #1 to reference proper sign numbers (all signs, not just the 12&quot;x18&quot; signs)</td>
</tr>
<tr>
<td>18</td>
<td>1/31/2019</td>
<td>50.10B</td>
<td>Supplemental Van Accessible Sign (R7-8P)</td>
<td>Revise height of lowest sign for ADA clearance</td>
</tr>
<tr>
<td>18</td>
<td>1/31/2019</td>
<td>50.10C</td>
<td>Supplemental Accessible Sign</td>
<td>Revise height of lowest sign for ADA clearance</td>
</tr>
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<td>19</td>
<td>1/30/2020</td>
<td>10.25B</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (2'-6&quot; Curb &amp; Gutter)</td>
<td>Adjust dimension on tapered concrete sides to 5' min., to match sidewalk scoring</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>10.25D</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (6&quot; x 18&quot; Vertical Curb)</td>
<td>Adjust dimension on tapered concrete sides to 5' min., to match sidewalk scoring</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>10.28</td>
<td>Type III Driveway Entrance</td>
<td>Revised detail for clarity &amp; scale, adjusted dimensions from EP to face if CB, throat opening depth, slab thicknesses &amp; rebar</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>20.34</td>
<td>Offset Catch Basin</td>
<td>Removed data block, removed note &quot;that drain 5 ac. or less&quot;</td>
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<td>19</td>
<td>1/30/2020</td>
<td>30.12</td>
<td>Gravel and Rip Rap Filter Berm Basin</td>
<td>Adjust to clarify dimensions on rail placement and dim. From edge of sidewalk; changed E&amp;PM to include Planning and Engineering; removed previous note 4 re: &quot;where a pedestrian can be expected in the vicinity&quot;; removed definition of pedestrian clear zone</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>50.04B</td>
<td>Safety Rail Warrants</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; Adjusted tack coat note; removed surface course item 3 chop when approved by NCDOT</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-01</td>
<td>Local Residential Narrow Street Typical Section</td>
<td>Revised tack coat note, added notes to clarify 11&quot; lanes required if used in ETJ</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-02</td>
<td>Local Residential Medium Street Typical Section</td>
<td>Adjusted tack coat note, revised min. RW width to use even-number of 52' in ETJ only; exclude ETJ</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-03</td>
<td>Local Residential Wide Street Plan View</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; added notes to U-03B and U-03C since not for use in ETJ</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-03A</td>
<td>Local Residential Wide Street Typical Section</td>
<td>Adjusted tack coat note; revised min. RW width to use even-number of 52' in ETJ only; adjust note 5 and 6 to exclude ETJ</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-03B</td>
<td>Local Residential Wide Street at Midblock with Curb Extension Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note; removed surface course note 3&quot; /... when approved by NCDOT</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-03C</td>
<td>Local Residential Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note; removed surface course note 3&quot; /... when approved by NCDOT</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-04</td>
<td>Local Office/Commercial Narrow Street Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note</td>
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<td>19</td>
<td>1/30/2020</td>
<td>U-05</td>
<td>Local Office/Commercial Wide Street Plan View</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note</td>
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<td>19</td>
<td>1/30/2020</td>
<td>U-05A</td>
<td>Local Office/Commercial Wide Street Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-05B</td>
<td>Local Office/Commercial Wide Street at Midblock with Curb Extension Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note</td>
</tr>
<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-05C</td>
<td>Local Office/Commercial Wide Street at Intersection with Curb Extension Typical Section</td>
<td>Removed &quot;Includes ETJ&quot;/Added &quot;Not for use in ETJ&quot;; adjusted tack coat note</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-05D</td>
<td>Commercial Wide Street Typical Section (TOD ONLY)</td>
<td>Adjusted tack coat note, added notes to clarify pavement section for ETJ; revised min. RW width to use even-number of 52' in ETJ only</td>
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<tr>
<td>19</td>
<td>1/30/2020</td>
<td>U-06</td>
<td>Local Industrial Street Typical Section</td>
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<td>19</td>
<td>1/30/2020</td>
<td>U-07</td>
<td>Local Collector Street Typical Section</td>
<td>Adjusted tack coat note, revised min. RW width to use even-number of 52' in ETJ only</td>
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<tr>
<td>20</td>
<td>1/29/2021</td>
<td>10.17B</td>
<td>Curb and Gutter</td>
<td>Adjust 2&quot; dimension on mountable c&amp;g - fix drafting error; also add note re: 19&quot; median c&amp;g for city streets only</td>
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<tr>
<td>20</td>
<td>1/29/2021</td>
<td>10.22</td>
<td>Concrete Sidewalks</td>
<td>Add note re: joint spacing on wide sidewalks = width of sidewalk</td>
</tr>
<tr>
<td>20</td>
<td>1/29/2021</td>
<td>10.25F</td>
<td>Type IV Driveway</td>
<td>Add driveway slopes and breakovers to match other commercial driveways; add fire access notes to match; added dimension 4' MIN. to flare; removed confusing R/W line from detail</td>
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<tr>
<td>20</td>
<td>1/29/2021</td>
<td>10.31A</td>
<td>Perpendicular Curb Ramp With 2'-6&quot; Curb and Gutter</td>
<td>minor card drawing adjustment at &quot;varies&quot; dimension at end of flares</td>
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Specifications & Special Provisions

Standard Details:

1000 Series - Miscellaneous Infrastructure Standards

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<th>Standard</th>
<th>Description</th>
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<tr>
<td>10.17B</td>
<td>Curb and Gutter</td>
</tr>
<tr>
<td>10.17C</td>
<td>Curb and Gutter</td>
</tr>
<tr>
<td>10.18</td>
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<tr>
<td>10.19</td>
<td>Curb Transition 2'-6” To 2'-0” Valley</td>
</tr>
<tr>
<td>10.20</td>
<td>Curb Transition 2’-6” To 1’-6” Standard</td>
</tr>
<tr>
<td>10.22</td>
<td>Concrete Sidewalks</td>
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<tr>
<td>10.23</td>
<td>Sidewalk Transition</td>
</tr>
<tr>
<td>10.24A</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (2’-6” Curb and Gutter)</td>
</tr>
<tr>
<td>10.24B</td>
<td>Commercial Type II and Residential Drop Curb Type I Driveway with Sidewalk Abutting Curb (6”X18” Vertical Curb)</td>
</tr>
<tr>
<td>10.24C</td>
<td>Commercial and Residential Drop Curb Driveway with Sidewalk Abutting Curb</td>
</tr>
<tr>
<td>10.25A</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (2’-6” Curb and Gutter)</td>
</tr>
<tr>
<td>10.25B</td>
<td>Commercial Drop Curb Type II Driveway with Planting Strip (2’-6” Curb and Gutter)</td>
</tr>
<tr>
<td>10.25C</td>
<td>Residential Drop Curb Type I Driveway with Planting Strip (6”X18” Vertical Curb)</td>
</tr>
<tr>
<td>10.25D</td>
<td>Commercial Drops Curb Type II Driveway with Planting Strip (6”X18” Vertical Curb)</td>
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<td>10.25E</td>
<td>Modified Type II Driveway Detail with Planting Strip</td>
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10.25F Commercial Type IV Driveway Standard
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10.30 Catch Basin Placement in Valley Gutter
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10.31B Perpendicular Curb Ramp with 2’-6” Curb and Gutter
10.33 Perpendicular Curb Ramp with 2’-0” Valley Gutter
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10.36B Culvert Crossings on Residential and Commercial Streets
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10.38 Curb Repairs at Bus Stops
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10.40A Directional Curb Ramp with Small/Medium Curb Radii
10.40B Directional Curb Ramp with Large Curb Radius
10.40C Directional Curb Ramp with Valley Gutter
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10.41B Pedestrian Refuge (With Vertical Curb)
10.41C Pedestrian Refuge (Modified Monolithic)
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<td>U-03</td>
<td>Local Residential Wide Street Plan View</td>
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<td>U-07</td>
<td>Local Collector Street Typical Section</td>
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The following specifications and special provisions are intended to be used in conjunction with Charlotte Land Development Standard Drawings, NCDOT Roadway Standard Drawings, and NCDOT Standard Specifications for Roads and Structures for all development within the City of Charlotte and the City of Charlotte ETJ unless otherwise directed by the City Engineer.

I. STREETS

A. GENERAL NOTES

1. All work and materials shall conform to the latest edition of the North Carolina Department of Transportation Standard Specifications for Roads and Structures unless otherwise specified in this manual.

2. All asphalt cuts shall be made with a saw when preparing street surfaces for patching or widening strips.

3. Paper joints shall be used to seal the ends of an asphalt pour so that future extensions can be made without causing rough joints.

4. When placing asphalt against existing surfaces, a straight edge shall be used to prevent “humping” at that location.

5. Stone shall be primed if paving is not complete within seven days following stone base approval.

6. Surfaces shall be tacked when asphalt is being placed over existing asphalt streets or adjoining concrete, storm drain and sanitary sewer structures.
7. In rolling and hilly terrains, sweeping of the stone base and/or application of a tack coat may be required near intersections. These requirements will be established by the City Inspector based on field conditions.

8. ALL concrete used for streets, curb and gutter, sidewalks and drainage structures, etc. shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures. The contractor shall prepare concrete test cylinders in accordance with Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures at the direction of the project inspector. All equipment and cylinder molds shall be furnished by the contractor. It shall be the responsibility of the contractor to protect the cylinders until such time as they are transported for testing. Testing for projects shall be performed by an independent testing lab, at no cost to the City. The contractor shall provide equipment and perform tests on concrete for a maximum slump and air content as defined in Section 1000 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures. These tests shall be performed at a frequency established by the inspector. Materials failing to meet specifications shall be removed by the contractor.

9. All concrete shall be cured with 100% Resin Base, white pigmented curing compound which meets ASTM Specifications C-309, Type 1, applied at a uniform rate at one (1) gallon to 400 square feet within 24 hours of placement of the concrete.

10. All curb and gutter shall be backfilled with soil approved by the Inspector within 48 hours after construction to prevent erosion.

11. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and the material shall have no tendency to flow or behave in a plastic manner under the tamping blows or proof rolling.

12. Materials deemed by the Inspector as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
13. All trenches in the street right-of-way shall be backfilled with suitable material immediately after the pipe is laid. The fill around all pipe shall be placed in layers not to exceed six (6) inches and each layer shall be compacted thoroughly. For Storm Drainage see Backfill under Storm Drainage section.

14. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.

15. Compaction requirements shall be attained by the use of mechanical compaction methods. Each six (6) inch layer of backfill shall be placed loose and thoroughly compacted into place.

16. Straight forms shall not be used for forming curb and gutter in curves.

17. All excess concrete on the front edge (lip) of gutter shall be removed when curb and gutter is poured with a machine.

18. All subgrade shall be compacted to 100% of the maximum density obtainable with the Standard Proctor Test to a depth of eight (8) inches, and a density of 95% Standard Proctor for depths greater than eight (8) inches. All tests shall be performed by developer at no cost to the City.

19. A canvas cover or other suitable cover shall be required for transporting plant mix asphalt during cool weather when the following conditions are present:
   a. Air temperature is below 60 degrees F.
   b. Length of haul from plant to job is greater than five (5) miles.
   c. Other occasions at the Inspector’s discretion when a combination of factors indicates that material should be covered in order to assure proper placement temperature.

20. Concrete or asphalt shall not be placed until the air temperature measured at the location of the paving operation is at 35 degrees F and rising by 10:00 a.m. Concrete or paving operations should be suspended when the air temperature is 40 degrees F and descending. The contractor shall protect freshly placed concrete or asphalt in accordance with Sections 420 (Concrete Structures), 600 (Asphalt Bases and Pavements), and 700 (Concrete Pavements and Shoulders) of the North Carolina Department of Transportation Standard Specifications when the air temperature is at or below 35 degrees F and the concrete has not obtained an age of 72 hours.
21. The contractor shall maintain two-way traffic at all times when working within existing streets. The contractor shall place and maintain signs, danger lights, and barricades and furnish watchmen or flagmen to direct traffic in accordance with the latest edition Work Area Traffic Control Handbook (WATCH). Work in the right-of-way of State System Streets may require additional traffic control provisions.

22. The contractor shall do that which is necessary to control erosion and to prevent sedimentation damage to all adjacent properties and streams in accordance with the appropriate City of Charlotte Erosion and Sedimentation Control Ordinance.

B. STANDARDS OF STREET DESIGN

Note: Use of Hilly Terrain criteria is NOT permitted without PRIOR approval of the City Engineer.

Note: Design standards that apply for the ETJ are taken from the January 2010, edition of the NCDOT design manual Subdivision Roads. Any revisions to Subdivision Roads will supersede the design standards given in the Charlotte Land Development Standards for ETJ streets. However, under no circumstances shall an NCDOT/ETJ standard be less restrictive than what is required by the City of Charlotte.

1. STREETS (PUBLIC and PRIVATE):

<table>
<thead>
<tr>
<th></th>
<th>ALL LOCAL STREETS (Except Industrial &amp; Collector)</th>
<th>LOCAL INDUSTRIAL AND COLLECTOR ONLY</th>
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<tbody>
<tr>
<td></td>
<td>Level/Rolling</td>
<td>Hilly</td>
</tr>
<tr>
<td>a. Terrain Classification</td>
<td>0%-15%</td>
<td>15%+</td>
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<tr>
<td>b. Maximum Grade</td>
<td>10%</td>
<td>12%</td>
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<tr>
<td>c. Design Speed (mph)</td>
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<tr>
<td>d. Minimum Radius (ft.)</td>
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<td></td>
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### ALL LOCAL STREETS
(Except Industrial & Collector)

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<tr>
<td>f. K Value (CREST/SAG)</td>
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<td>15/20</td>
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<tr>
<td>K Value (STOP Condition)</td>
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<td>5</td>
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Note: K=Rate of Vertical Curvature for Minimum Sight Distance. Provisions of adequate stopping sight distance may require use of larger K values than the minimums listed above. The Charlotte Department of Transportation, under Section 19-245 of City Code, reserves the right to prescribe more stringent sight distance standards and/or means to achieve adequate sight distance than these listed above.

### LOCAL INDUSTRIAL AND COLLECTOR ONLY

<table>
<thead>
<tr>
<th></th>
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### INTERSECTIONS:

#### a. Maximum Street Grade at Intersections

STOP or YIELD Condition: Vertical alignment is 2% maximum through the crosswalk areas (marked or unmarked). Outside of the crosswalk areas the vertical alignment is 5% maximum within 100 feet of an intersection.

THROUGH MOVEMENT Condition: Vertical alignment is 5% maximum through the crosswalk areas. Where feasible, it is recommended that the vertical alignment for a through-movement street also be set at 2% maximum through the crosswalk areas (marked or unmarked). Outside of the crosswalk areas, see B.1.b for maximum grade.

#### b. Midblock Pedestrian Street Crossings:
At midblock crossings, the cross slope of the pedestrian street crossing is allowed to equal the street grade.

#### c. Minimum Angle of Intersection is 75 degrees

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**a** Preferred option: Design intersections with a max. 2% street grade through the crosswalk area of all legs of the intersection. This will provide a level intersection where the required sidewalks, curb ramps, and street crossings can be constructed with the use of CLDSM standard details included in the plans. Special attention to drainage design is warranted to ensure that these intersections drain properly. For intersections with street grades greater than 2% in any direction it is strongly recommended that the sidewalks, curb ramps, and street crossings be included as part of the design process and site-specific details of the designs and any alternate layouts shall be included in plans as appropriate.

**b** Refer to Subdivision Ordinance Section 20-23(d) regarding potential modification of required street spacing and stub street requirements in areas of steep slopes.

**c** 100’ is the standard for Level/Rolling Terrain. In areas classified as Hilly Terrain, 100’ is preferred length, but 40’ minimum may be approved by the City Engineer. This only applies within the City of Charlotte limits and not in the ETJ, where NCDOT vertical alignment criteria would govern.

(Please note: Modifications to standards as noted in **b** and **c** or the use of “Hilly Terrain” street alignment criteria are typically requested via a subdivision sketch plan submittal. The sketch plan submittal must contain sufficient information to support the request for modified standards. For example, modification requests based upon topographical constraints should include existing and proposed street profiles.)
d. Minimum Curb & R/W Radius = Taken from Appendix C (Curb Return Radii Guidelines) of USDG

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<th>R/Wide</th>
<th>C/Narrow</th>
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</table>

R = Residential
C = Commercial

3. Design criteria for arterial streets shall be established jointly by the City Engineer and the Director of the Department of Transportation on a case by case basis using the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highway and Streets and/or NCDOT Roadway Design Manual.

4. Intersection corner – A minimum 35’ x 35’ sight triangle (measured along right-of-way lines) shall be provided at each intersection corner. An additional 10’ x 70’ sight triangle shall be provided at intersections connecting to NCDOT maintained roadways. Other sight distance requirements may be required by the NCDOT or CDOT.

5. Refer to the NCDOT Subdivision Roads Minimum Construction Manual for development criteria for sites located within the City of Charlotte Extraterritorial Jurisdiction (ETJ) within these areas governed by Charlotte Land Development Standards Manual and the NCDOT Subdivision Roads Minimum Construction Standards Manual. The more restrictive standard shall apply.
C. GRADING

1. Proposed street rights-of-way shall be graded to their full width for ditch type streets and a minimum of eight (8) feet behind the curb for curb and gutter sections.

2. Fill embankments shall be formed of suitable material placed in successive layers not to exceed more than six (6) inches in depth for the full width of the cross-section, including the width of the slope area. No stumps, trees, brush, rubbish or other unsuitable materials or substances shall be placed in the embankment. Each successive six (6) inch layer shall be thoroughly compacted by the sheepsfoot tamping roller, 10-ton power roller, pneumatic-tired roller, or other methods approved by the City Engineer. Embankments over and around all pipe culverts shall be of select material, placed and thoroughly tamped and compacted as directed by the City Engineer or his representative.

D. ROADWAY BASE

1. All roadways shall be constructed with a base course as described on the appropriate Charlotte Land Development Standard Detail Drawing.

2. The material for stone base course shall conform to the requirements of Section 1010, Aggregate for Non-Asphalt Flexible Type Base, and Section 520, Aggregate Base course of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

3. The stone base shall be compacted to 100% of the maximum density obtainable with the Modified Proctor Test (AASHTO-T180) by rolling with ring or tamping roller or with a pneumatic tired roller with a minimum weight of ten tons. When completed, the base course shall be smooth, hard, dense, unyielding and well bonded.

4. A bituminous concrete base course, as specified on the Standard Detail Drawing may be substituted in lieu of a stone base course.

5. Asphalt base course will only be allowed within widening strips less than five (5) feet in width.
E. ROADWAY INTERMEDIATE AND SURFACE COURSE

1. All public roadways shall be constructed with an intermediate and surface course as described on the appropriate City of Charlotte Land Development Standard Detail Drawing.

2. Plant mixed asphalt shall conform in all respects to Section 610 of the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

3. The final (1) one inch lift of asphalt surface course for Residential Subdivision Streets shall be withheld until a minimum of (75%) Seventy-Five Percent of the Development is occupied (occupied means a certificate of occupancy has been issued) or at least (1) one year has lapsed from the application of the intermediate course layer (All documentation to be provided by the developer and approved by the City Inspector). All known base failures shall be repaired prior to application of the final one inch lift of asphalt surface course.

4. The City inspector shall be given a (24) twenty-four hour notification to inspect the intermediate course deficiencies. All deficiency repairs are to be monitored by a City Inspector and accepted prior to application of final layer.

5. City inspectors shall be notified prior to using recycled plant mixes.

6. Failure to meet the above requirements may result in the delay or prevention of street acceptance by the City of Charlotte or NCDOT.
F. SIDEWALKS, RAMPS, AND DRIVEWAYS

1. Where sidewalks and pedestrian routes within street crossings (including marked and unmarked crosswalks) are provided, they must be constructed so they are accessible to all potential users, including those with disabilities.

The July 26, 2011 “Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way” was written by the US Access Board and is also known as the Public Right-of-Way Accessibility Guidelines or PROWAG. PROWAG provides more specific information than the existing Americans with disabilities Act Accessibilities Guidelines (ADAAG) for transportation facilities within the right-of-way including pedestrian access routes, signals, and parking facilities. The PROWAG requirements are currently in the development and adoption process and have not been officially adopted by the Department of Justice; however, the Federal Highway Administration has issued guidance that the draft version of the PROWAG “are currently recommended best practices, and can be considered the state of the practice that could be followed for areas not fully addressed” in the existing ADAAG requirements.

Due to the widespread acceptance of the PROWAG, and their pending adoption in the future, the standards in this manual are based upon the PROWAG requirements. The designer is encouraged to reference the complete PROWAG document for additional information (www.accessboard.gov). Buildings and other structures not covered by PROWAG must comply with the applicable requirements of the ADAAG.

2. Sidewalks shall be constructed of not less than 3600 P.S.I. concrete and shall be four (4) inches thick, constructed on an adequately graded base, except where a sidewalk crosses a driveway it shall be six (6) inches thick. Subgrade shall be compacted to 95% of the maximum density obtainable with the Standard Proctor Test. The surface of the sidewalk shall be steel trowel and light broom finished and cured with an acceptable curing compound. Tooled joints shall be provided at intervals of not less than five (5) feet and expansion joints at intervals of not more than forty-five (45) feet. The sidewalk shall have a desired lateral slope of 1.5% (2.00% maximum).

| EXAMPLE SIDEWALK CONSTRUCTION DIMENSIONS: |
|---|---|---|
| WIDTH | RISE | CROSS-SLOPE |
| 4’ | ¾” | 1.56% |
| 5’ | 1” | 1.67% |
| 6’ | 1-1/8” | 1.56% |
| 8’ | 1-½” | 1.56% |

3. Planting strip adjacent to sidewalk shall be graded to ¼ inch per foot (min.) up to 1 ¼ inch per foot (max.), except where excessive natural grades make this requirement impractical. In such cases, the City Engineer may authorize a suitable grade.

4. Sidewalk widths shall be a minimum of five (5) feet unless otherwise specified. Where necessary, a 5’ x 5’ sidewalk is required at least every 200’ as required by PROWAG for a passing zone unless otherwise provided by residential driveways, intersecting sidewalk, etc.

5. Approval of sidewalk construction plans must be obtained as part of the plan review process. Except in unusual circumstances, sidewalk must be located a minimum of (8) eight feet from the back of the curb or at the back of the right-of-way. A recorded public sidewalk easement is required for all sidewalk located outside public right-of-way; the width shall be equal to the distance from the right-of-way line to the back of the sidewalk plus two feet or to the face of building, whichever is less. The sidewalk easement must be recorded with the Mecklenburg County Register of Deeds prior to issuance of a certificate of occupancy for the corresponding building(s).
6. Running slope of all ramps shall be up to 7.5% (8.33% maximum). Ramp length is not required to exceed 15’ regardless of the resulting slope, which shall be uniform for the length of the ramp. Curb ramps are required where sidewalks intersect curbing at any street intersection and at Type III driveway connections.

7. For City projects only: On CLDS# 10.24A/B/C, 10.25(A/B/C/D only), and 10.27A/B, the curb and gutter across the front of the driveway shall be measured and paid for separately under Curb and Gutter (either 2’-0” valley gutter, vertical curb, or standard 2’-6” curb and gutter as specified on the details). The curb and gutter is to be measured per linear foot along the surface of the top of the curb. The concrete driveway apron is to be measured per square yard.

8. Refer to the WATCH Manual, MUTCD (latest edition), and the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) for construction zone pedestrian routes and signalization and controls for actuators. Curb ramps shall be designed and constructed in accordance with the American Disability Act.

9. Where pedestrian routes are contained within a street or right-of-way, the grade of pedestrian access routes shall not exceed the general grade established for the adjacent street or highway.

II. STORM DRAINAGE

A. GENERAL NOTES

1. All work and materials shall conform to the latest edition of the NCDOT Standard Specifications unless otherwise specified in this manual. ALL concrete used for drainage structures shall have a minimum compressive strength of 3600 PSI at 28 days. This requirement shall be provided regardless of any lesser compressive strength specified in the North Carolina Department of Transportation Standard Specifications for Roads and Structures.

2. Prior approval shall be obtained to use pre-cast storm drainage structures in any street right-of-way by City Engineer.

3. Construct non-NCDOT Roadway Standard Drawing endwalls of reinforced concrete or as approved by the City.

4. Pipe shall have a minimum diameter of fifteen (15) inches (eighteen (18) inches minimum on cross drain culverts).

5. Reinforced concrete pipe may be used in all storm drain applications. High Density Polyethylene Pipe (HDPE) may be substituted for pipe diameters of 48 inches or less. Culverts 60 inches in diameter or greater may be Corrugated Aluminized Metal Pipe (CAMP) or Corrugated Aluminum Alloy Pipe (CAAP) with a minimum 14 gage metal.

6. All pipe shall be laid with the bell or groove upgrade and the joint entirely interlocking.

7. For all pipes, wrap geotextile (NCDOT Section 1056 - Type 2) around all pipe joints. Extend geotextile at least 12 inches beyond each side of the joint or band. Secure geotextile against the outside of the pipe by methods approved by the engineer.
8. Meet minimum and maximum cover requirements of NCDOT Standard Drawing 300.01. Special applications for less than two (2) feet of cover will be reviewed and approved by the City Engineer individually. Storm pipe design that exceeds these criteria may be approved at the discretion of the City Engineer.

9. All pipes in storm drain structures shall be flush with the inside wall.

10. All storm drain structures over three (3) feet and six (6) inches in height must have steps in accordance with standard details set forth in this manual.

11. The interior surfaces of all storm drainage structures shall be pointed up and smoothed to an acceptable standard using mortar mixed to manufacturer’s specifications.

12. Storm drainage piping shall be placed in a straight alignment at uniform grade. No changes in alignment shall be allowed except at catch basins, manholes, or other junctions that provide appropriate clean out access. The maximum length between access points is 300 linear feet.
   a. A pipe collar meeting NCDOT standards or standard junction structure is required where pipes from two manufacturers or materials are tied together. Pipes should be on the same grade and alignment and have the same internal diameter where a pipe collar is specified.

13. All frames, grates, rings, covers, etc., must conform to the standards set forth in this manual. Supply covers with a minimum of two and a maximum of six 1” diameter vent holes.

14. All graded creek banks and slopes shall be at a maximum of two (2) feet horizontal to one (1) foot vertical (2:1) and not to exceed 10’ without terracing or the slopes shall be designed by a Professional Geotechnical Engineer and approved by the City Engineer on a case by case basis.

15. PIPE VIDEO STANDARDS: Installation of pipes/culverts consisting of the following approved materials (concrete, high density polyethylene – HDPE, and corrugated aluminum or aluminized) used for the purpose of conveying stormwater runoff in and out of public rights-of-way, that are eligible for maintenance by the City, is subject to the following:

   a. All storm drainage system installation requires a Closed Circuit Television (CCTV) video as part of the inspection process after installation and prior to the approval process. Pipe larger than 48 inches may require manual entry and inspection (confined space regulations may be applicable). No acceptance of a street(s) or associated map phase(s) will be considered by the City until a CCTV video of the associated storm drainage system is provided to the applicable review agency and the agency has provided a written response noting acceptance. All CCTV video will be performed by a current National Association of Sewer Service Companies-Pipeline assessment and Certification Program (NASSCO-PACP) certified contractor and in compliance with NASSCO-PACP standards. All videos, reports, and repair methods will meet the most recent published version of City Standards. The City expects storm drainage systems to be clean, have good alignment, tight joints, no broken or cracked pipes, and built per the approved plans prior to submittal of CCTV video documentation. Any systems that do not meet the above may be rejected at the discretion of the City engineer.
b. The storm drainage system owner (developer, builder, property owner, etc.) will provide at their cost the following prior to final inspection and City acceptance:

i. Plat, map or drawing identifying each pipe segment being presented for acceptance with all inlet nodes labeled and corresponding to the accompanying video such that it is clear as to the pipe/culvert being accepted. For example, start of video is at inlet CB1 to JB2 as shown on accompany drawing. (video map segments should match the approved drawings.)

ii. A CCTV video performed by a NASSCO-PACP certified contractor for each pipe/culvert segment being considered for acceptance.

iii. A digital copy of report for each pipe/culvert segment that certifies the condition of pipe as installed is in compliance with the most recent version of NASSCO-PACP methodology and standards. All defects are to be coded and reported per NASSCO-PACP certification guidelines to the City for review, after all repairs have been made. Any repair or treatment to defects (prior to submittal of video or as observed by the City agency) will be corrected in compliance with Industry Standard approved methods. Example: by following the American Concrete Pipe Association acceptable methods and applicable material treatments associated with concrete pipe deficiency (broken concrete pipe will be repaired structurally by an approved method.)

iv. Deficiencies found/observed by City staff may require an additional CCTV video to document they have been corrected appropriately and repair or treatment followed Industry Standard approved methods. Deficiencies must exceed the ACPA standards for acceptable pipe variations.

v. The City reserves the right to randomly or at its discretion monitor, evaluate, and review videos and reports submitted by the owner or certified consultants as a quality assurance/quality control (QA/QC) practice. Any discrepancies between the report and the City review may constitute non-acceptance of the approval.

vi. The name of the contractor who installed the drainage system, and their contact information.

B. BACKFILL

1. Provide and install backfill per NCDOT standards. Layers shall not exceed six (6) inches loose and each layer shall be compacted thoroughly.

2. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Said material shall be capable of being compacted by mechanical means and the material shall have no tendency to flow or behave in a plastic manner under the tamping blows or proof rolling.

3. Materials deemed by the Engineer as unsuitable for backfill purposes shall be removed and replaced with select backfill material.

4. Backfilling of trenches shall be accomplished immediately after the pipe is laid. Do not operate heavy equipment over any pipe culvert until the pipe culvert has been properly backfilled, covered and compacted with at least three (3) feet of an approved material.
5. Compaction requirements shall be attained using mechanical compaction methods. Each layer of backfill shall be placed loose and thoroughly compacted in place.

6. Under no circumstances shall water be permitted to rise in un-backfilled trenches after the pipe has been placed.

C. REINFORCED CONCRETE PIPE (RCP) and Culverts

1. Concrete pipe used within the street right-of-way shall be a minimum of Class III Reinforced Concrete Pipe. Installation of Class IV or higher concrete pipe shall be identified on the As-Built Plan and the City inspector shall be given documentation and notification of this information prior to construction. All concrete shall be at least 3600 psi.

2. Joints shall consist of one of the following and should be specified by the Engineer for each respective project as applicable:
   a. Preformed joint sealant, which conforms to ASTM C 990 Section 6.2 “Butyl Rubber Sealant” and NCDOT 1032-6.F. Joints utilizing preformed joint sealant shall be used in combination with Type 2 filtration geotextile wrap around all RCP pipe joints.
   b. Rubber (elastomeric) gasket seals in accordance with ASTM C 443 which are in compliance with ASTM C 1619, Class C (unless otherwise required to exceed this specification, as specified by the engineer). Joints shall be produced with single offset spigot or with a confined O-ring groove. Rubber Gaskets may be pre-lubricated profile, profile rubber gaskets, or O-ring. Rubber gasket installation shall be per manufacturer’s recommendations. Where rubber gaskets meeting this section are specified, no filtration geotextile wrap is required around the joints for RCP.

3. Fill lift holes with a manufactured soil tight lift hole plug or as approved by the manufacturer. Provide the manufacturers approved method for filling lift holes upon request by the City.

4. The maximum pipe slope for reinforced concrete pipe is 10 percent. Provide a special design by a structural engineer for reinforced concrete pipe slopes exceeding 10 percent.

D. CORRUGATED ALUMINIZED METAL PIPE (CAMP) AND CORRUGATED ALUMINUM ALLOY PIPE (CAAP)

1. Testing requirements:
   a. Perform physical pH and resistivity tests on the soil and water at two or more locations along the proposed culvert alignment. Perform additional tests at the request of the pipe manufacturer. Perform pH and resistivity tests on backfill material prior to installation.
   b. Submit manufacturer specifications showing that the physically collected soil- and stream-side pH and resistivity values are appropriate for the selected CAMP or CAAP.
      i. At a minimum, for CAMP and CAAP to be considered, soil and water samples should have a pH within the range of $5.0 < \text{pH} < 9.0$ and resistivity of $r > 1500$ ohm-cm.

2. Hydraulic considerations:
   a. CAMP and CAAP can be used where velocities are less than 5 feet per second in the 2-year storm events.
b. Where velocities are greater than 5 feet per second in the 2-year event, field pave a 4-inch thick reinforced concrete invert 2/5 of the height of the culvert or to 0.5 feet above the flow height of the 2-year storm event, whichever is more restrictive. This requirement applies to both buried and non-buried culvert inverts. Field paving should not be completed until the pipe is backfilled.
   i. Where bottomless CAMP and CAAP culverts are proposed, the walls of the culvert should be protected from abrasion by reinforced concrete up to either 2/5 the height of the culvert or to 0.5 feet above the flow height of the 2-year storm event, whichever is more restrictive.

3. Metal end sections, pipe tees, elbows and reducers are not allowed.

E. HIGH DENSITY POLYETHYLENE PIPE (HDPE)

1. The Product used shall be corrugated exterior/smooth interior pipe (Type S), conforming to the requirements of AASHTO Specification M294 (latest edition) for Corrugated Polyethylene Pipe.

2. Bell and spigot joints shall be required on all pipes inside the right-of-way. Bells shall cover at least two full corrugations on each section of pipe. The bell and spigot joint shall have an O-ring gasket meeting ASTM F477 with the gasket factory installed, placed on the spigot end of the pipe. Pipe joints shall meet all requirements of AASHTO M294.

3. All HDPE pipe installed must be inspected and approved by the City’s Inspector prior to any backfill being placed. The City inspector must be present during the backfilling operation as well.

4. All backfill material shall be approved by the City inspector prior to placement of the material within the street right-of-way.

5. The minimum length of HDPE pipe permitted for use shall be four (4) feet. HDPE flared end sections are not allowed.

F. STANDARDS FOR DESIGN

1. All storm drainage design shall conform to the standards and specifications as provided in the Charlotte-Mecklenburg Storm Water Design Manual, North Carolina Department of Transportation Standards Specifications for Roads and Structures, Charlotte Land Development Standards Manual, or the more restrictive of any standards that conflict.

2. Adequate storm drainage shall be provided throughout the development by means of storm drainage pipes or properly graded channels. All pipes shall be of adequate size and capacity, as approved by the City Engineer, to carry all storm water in its drainage area.

3. In accordance with Section 12.603 of the City Zoning Ordinance, the City Engineer shall review the drainage plan for compliance with the standards contained in the current edition of the Charlotte Land Development Standards Manual and the Charlotte-Mecklenburg Storm Water Design Manual and all other relevant and appropriate standards established by the City Engineering Department.
4. Sub-surface drainage shall be provided where the ground water level is likely to be near the surface. In capillary soils, the water level should be four (4) to six (6) feet below the surface to prevent the rise of moisture into the subgrade. Subdrains shall be used to lower ground water in low areas in the street.

5. The NCDOT Standard Drawings have been accepted as approved standards to be specified for Land Development projects in the City of Charlotte and City of Charlotte ETJ. See standard #20.00A, B, and C of this manual for a table listing the standards accepted. These standard drawings shall be referenced by NCDOT number or shown on all plans submitted to the City of Charlotte for approval.
II. PLAN REQUIREMENTS

A. GENERAL NOTES

1. All erosion control measures shall conform to the standards set forth in the Charlotte Land Development Standards Manual, State of North Carolina Erosion and Sediment Control Planning and Design Manual, or the more restrictive of any standards that conflict.

2. All storm drainage design shall conform to the standards and specifications as provided in the Charlotte-Mecklenburg Storm Water Design Manual, Charlotte Land Development Standards Manual, or the more restrictive of any standards that conflict.

3. In areas where the Floodway Regulations are applicable, the Future Conditions Flood Fringe Line, FEMA Flood Fringe Line, Community Encroachment Line, and FEMA Encroachment Line shall be shown on the preliminary plan and the final plat. An application for a Floodlands Development Permit shall be submitted to Mecklenburg County Engineering in accordance with the requirements set forth in the City/County Floodway Regulations.

4. Cite all appropriate standard detail numbers for any structures or specifics used within the plans in reference to the most current copy of the Charlotte Land Development Standards Manual.

B. SUBDIVISIONS -PRELIMINARY PLAN

1. The preliminary plan must include, at a minimum, the information described in Section 20-16 of the City of Charlotte Subdivision Ordinance.
2. Storm Drainage Easements shall be provided for all storm drainage pipe and shown on site plans, construction plans and plats with widths specified below. The following note shall be placed on all grading plans and plats; "The purpose of the storm drainage easement (SDE) is to provide storm water conveyance. Buildings are not permitted in the easement area. Any other objects which impede storm water flow or system maintenance are also prohibited."

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Width</th>
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<tbody>
<tr>
<td>15’ – 24”</td>
<td>15’</td>
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<tr>
<td>30’ – 36”</td>
<td>20’</td>
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<td>42’ – 48”</td>
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<td>54’ +</td>
<td>30’</td>
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**CHANNELS**

<table>
<thead>
<tr>
<th>Drainage Area (Ac)</th>
<th>Channel</th>
<th>Easement Width (feet)</th>
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<tbody>
<tr>
<td>1 – 45</td>
<td>20’</td>
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</tr>
<tr>
<td>45 – 120</td>
<td>30’</td>
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</tr>
<tr>
<td>120 – 500</td>
<td>40’</td>
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<tr>
<td>500 +</td>
<td>see std. 20.30</td>
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</table>

3. Overlapping of storm drainage easements shall be approved by the City Engineer.

**C. BOND POLICY – SUBDIVISION IMPROVEMENTS**

1. Release of the final subdivision plat will not occur until the improvements required for the area of the final plat are constructed and a final inspection has been performed and found to be in conformance with the plans approved by the
Charlotte-Mecklenburg Planning Commission, or a security has been posted with the Land Development Bond Coordinator of the applicable department and all required documents are received in their entirety.

2. The security shall be posted and remain in force until the construction is complete and found to be in conformance with the plans approved by the Charlotte-Mecklenburg Planning Commission. The security will be reevaluated after one year from the date of posting.

3. The Applicant shall notify the City Engineer or his assigns that construction is complete according to the appropriate subdivision ordinance and the Charlotte Land Development Standards Manual before any security will be released. A final inspection will be made to check completeness of the project upon notification.

4. One type of security may be replaced by another type of security in certain situations. The amount of the replacement security will be based on the City’s Engineer Estimate of the work remaining. If the estimate of work results in a lower amount, the replacement security will be treated as a reduction. Certain situations will require an increase in a security and in such cases the replacement security shall be required to equal the higher amount.

5. A one-time reduction in security will be allowed if requested in writing by the principal party of the security. However, the security shall never be less than $10,000 for the City of Charlotte unless approved by the City Engineer.
IV. APPROVED PLANT SPECIES

The following list of trees and shrubs represent the approved plant species that may be used to comply with code sections 12.302 and 12.303 of the City of Charlotte Zoning Ordinance and Chapter 21 ("Tree Ordinance") of the City of Charlotte Code.

Other species may be allowed with staff approval

List subject to change

* - Not allowed for required city planting.
** - Not recommended for required city planting.
† - Cultivars under 15' tall only.
‡ - Trees <25' mature height can be planted directly under power lines.

Trees 25'- 40' mature height can be planted at least 20' from power lines.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>City Tree Ordinance Approved</th>
<th>CIP/ROW Approved</th>
<th>Duke Transmission Zone(T) Approved</th>
<th>Shade Tolerant</th>
<th>Tolerates Poor Drainage</th>
<th>Native</th>
<th>Blooming</th>
<th>Folage (Deciduous, Semi-deciduous, or Evergreen)</th>
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<tbody>
<tr>
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<td>Arborvitae, 'Green Giant'</td>
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<td>Baldcypress</td>
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<td>Birch, River</td>
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<td>Cedar, Eastern Red</td>
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<td>Cryptomeria, Japanese</td>
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## Trees

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<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>City Tree Ordinance Approved</th>
<th>CIP/ROW Approved</th>
<th>City Zoning Approved (Large or Small Maturing)</th>
<th>Duke Transmission Zone(T) or Distribution line(D) Approved</th>
<th>Shade Tolerant</th>
<th>Tolerates Poor Drainage</th>
<th>Native</th>
<th>Blooming</th>
<th>Foliage (Deciduous, Semi-deciduous, or Evergreen)</th>
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<td>Prunus caroliniana</td>
<td>S</td>
<td></td>
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<tr>
<td>Crabapple, Japanese Flowering †</td>
<td>Malus floribunda</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Crape Myrtle</td>
<td>Lagerstroemia</td>
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<tr>
<td>Dogwood, redtwig †</td>
<td>Cornus sericea f. baileyi</td>
<td>X</td>
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<td></td>
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<tr>
<td>Dogwood, Rutger’s Hybrid</td>
<td>Cornus kousa X florida</td>
<td>X</td>
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<tr>
<td>Filbert, American</td>
<td>Corylus americana</td>
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<tr>
<td>Fringetree</td>
<td>Chionanthus virginiana</td>
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<tr>
<td>Hawthorne, Washington</td>
<td>Crataegus phaenopyrum</td>
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</tr>
<tr>
<td>Holly, Foster</td>
<td>Ilex X attenuata ‘Fosteri’</td>
<td>X</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Holly, Yaupon</td>
<td>Ilex vomitoria</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Magnolia, Star †</td>
<td>Magnolia stellata</td>
<td>X</td>
<td></td>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Notes:**
- †: Native
- T, D: Tolerates Poor Drainage
- E: Evergreen
- S: Semi-deciduous
### Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>City Tree Ordinance Approved</th>
<th>CIP/ROW Approved</th>
<th>City Zoning Approved (Large or Small Maturing)</th>
<th>Duke Transmission Zone(T) or Distribution line(D)</th>
<th>Shade Tolerant</th>
<th>Tolerates Poor Drainage</th>
<th>Native</th>
<th>Blooming</th>
<th>Foliage (Deciduous, Semi-deciduous, or Evergreen)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SMALL MATURING (UP-25'H)</strong></td>
<td></td>
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<tr>
<td>Magnolia, Lily Flowered</td>
<td>Magnolia liliiflora</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x x x x E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia, ‘Little Gem’</td>
<td>Magnolia grandiflora ‘Little Gem’</td>
<td>x x</td>
<td></td>
<td>x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia, 'Merrill'</td>
<td>Magnolia x loebneri 'Merrill'</td>
<td>x</td>
<td>x</td>
<td>x x x D</td>
<td>x x x D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnolia, Saucer</td>
<td>Magnolia x soulangiana</td>
<td>x x S D</td>
<td></td>
<td>x x x D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maple, Armor 'Flame' †</td>
<td>Acer tataricum ginnala 'Flame'</td>
<td>x x D</td>
<td></td>
<td>x</td>
<td>d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maple, Japanese</td>
<td>Acer palmatum</td>
<td>x x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maple, Purplebow/Shantung</td>
<td>Acer truncatum</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plum, Purpleleaf</td>
<td>Prunus cerasifera ‘Atropurpurea’</td>
<td>x x S</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Redbud, Eastern</td>
<td>Cercis canadensis</td>
<td>x x S D</td>
<td></td>
<td>x x x x D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serviceberry</td>
<td>Amelanchier arborea</td>
<td>x x</td>
<td></td>
<td>x x x D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serviceberry, Shadbush †</td>
<td>Amelanchier canadensis</td>
<td>x x S T</td>
<td></td>
<td>x x x D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waxmyrtle</td>
<td>Myrica cerifera</td>
<td>x S</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E</td>
</tr>
</tbody>
</table>

22
## SHRUBS

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burford holly *</td>
<td>Ilex cornuta burfordi</td>
</tr>
<tr>
<td>Convex Japanese holly *</td>
<td>Ilex crenata 'convexa'</td>
</tr>
<tr>
<td>Dwarf burford holly *</td>
<td>Ilex cornuta burfordi nana</td>
</tr>
<tr>
<td>Emily brunner holly *</td>
<td>Ilex &quot;Emily Brunner&quot;</td>
</tr>
<tr>
<td>English holly *</td>
<td>Ilex aquifolium</td>
</tr>
<tr>
<td>Evergreen euonymus *</td>
<td>Euonymus japonicus</td>
</tr>
<tr>
<td>Flowering quince</td>
<td>Chaenomeles speciosa</td>
</tr>
<tr>
<td>Forsythia</td>
<td>Forsythia intermedia</td>
</tr>
<tr>
<td>Glenn dale azalea *</td>
<td>Azalea hybrida</td>
</tr>
<tr>
<td>Glossy abelia *</td>
<td>Abelia grandiflora</td>
</tr>
<tr>
<td>Hetzi Japanese holly *</td>
<td>Ilex crenata 'hetzi'</td>
</tr>
<tr>
<td>Hetzi jumper *</td>
<td>Jumperus chinesis hetzi</td>
</tr>
<tr>
<td>Indian azalea *</td>
<td>Azalea indica</td>
</tr>
<tr>
<td>Inkberry holly *</td>
<td>Ilex glabra</td>
</tr>
<tr>
<td>Japanese aucuba *</td>
<td>Aucuba japonica</td>
</tr>
<tr>
<td>Kaempferi azalea *</td>
<td>Azalea obtusum Kaempferi</td>
</tr>
<tr>
<td>Laurel *</td>
<td>Laurus nobilis</td>
</tr>
<tr>
<td>Loropetalum *</td>
<td>Loropetalum chinense</td>
</tr>
<tr>
<td>Lusterleaf holly *</td>
<td>Ilex latifolia</td>
</tr>
<tr>
<td>Oakleaf hydrangea</td>
<td>Hydrangea quercifolia</td>
</tr>
<tr>
<td>Perny holly *</td>
<td>Ilex pernyi</td>
</tr>
<tr>
<td>Pfitzer juniper *</td>
<td>Juniperus chinensis pfitzeriana</td>
</tr>
</tbody>
</table>

* denotes evergreen

Other species may be allowed with staff approval
List subject to change
A. REFERENCES

2’-0” VALLEY GUTTER

1’-6” MEDIAN CURB AND GUTTER**
TO BE USED IN MEDIAN WHEN LANES ARE SLOPED FROM ISLAND OR AS SPECIFIED BY THE APPROPRIATE CITY DEPT.
**ONLY FOR USE ON MEDIAN WITHIN CITY-MAINTAINED STREETS.

1’-6” MOUNTABLE CURB AND GUTTER
TO BE USED IN MEDIAN OR TRUCK APRONS ONLY; WHEN SPECIFIED BY THE APPROPRIATE CITY DEPT.
TRANSVERSE EXPANSION JOINT

NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. FOR VALLEY GUTTER, A 10-FOOT SPACING MAY BE USED WHEN A MACHINE IS USED. JOINT SPACING MAY BE ALTERED BY THE CITY ENGINEER TO PREVENT UNCONTROLLED CRACKING.

2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.

3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.

4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS.

5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.

6. TOP 6" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

7. FOR CURB AND GUTTER INSTALLATIONS THE ETJ, NCDOT REQUIRES THAT ALL JOINTS MUST BE FILLED WITH JOINT SEALER PER NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, SECTION 846-3 (C).
NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. DETAIL MAY BE USED FOR PRIVATE DRIVES, PARKING LOTS, AND INTERIOR CIRCULATION DRIVE.
PLAN VIEW

NOTES:
1. TRANSITION IS NOT TO BE LOCATED WITHIN THE CURB RADIUS.
PLAN VIEW

NOTES:
1. TRANSITION TO BE ALONG BACK OF CURB.
GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADIUS SHALL BE REQUIRED IN THE CONCRETE SIDEWALK WITH JOINT SPACING EQUAL TO THE WIDTH OF SIDEWALK, UP TO 10' WIDTH. WIDER THAN 10' REQUIRES SPECIAL DESIGN (SEE DETAIL #10.42 FOR MULTI-USE PATH).

2. ONE 1/2” EXPANSION JOINT WILL BE REQUIRED AT INTERVALS OF NOT MORE THAN 45’ AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2” EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

3. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6” THICK.

4. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 6’. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE CDOT.

5. WIDTH OF SIDEWALKS ON NON–THOROUGHFARE STREETS SHALL BE BASED ON TYPICAL STREET SECTION, A MINIMUM OF 5’. SIDEWALK TO BE Poured TO END OF RADIUS AT INTERSECTING STREETS.

6. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.

7. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.

8. LIDS FOR JUNCTION BOXES AND UTILITY VAULTS SHALL BE NON–SKID AS SPECIFIED BY ENGINEER.

9. JOINT MATERIALS SHALL LIMIT SHRINK/SWELL SO POST CONSTRUCTION INSTALLATION RESULTS IN A MAXIMUM OF 1/4” FROM FLUSH.

EXAMPLE SIDEWALK CONSTRUCTION DIMENSIONS:

<table>
<thead>
<tr>
<th>Width</th>
<th>Rise</th>
<th>Cross-Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’</td>
<td>1/2”</td>
<td>1.56%</td>
</tr>
<tr>
<td>5’</td>
<td>1”</td>
<td>1.67%</td>
</tr>
<tr>
<td>6’</td>
<td>1-1/4”</td>
<td>1.56%</td>
</tr>
<tr>
<td>8’</td>
<td>1-3/4”</td>
<td>1.56%</td>
</tr>
</tbody>
</table>

CONCRETE SIDEWALKS

DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

1/2” EXPANSION JOINT

PROPOSED CURB & GUTTER

PROPOSED 4” CONCRETE SIDEWALK

RIGID STRUCTURE

JOINT FILLER

1/8" RADIUS

1/8" TO 1/4"

1/8"

GROOVE JOINT IN SIDEWALK

TRANSVERSE EXPANSION JOINT IN SIDEWALK

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

NOT TO SCALE

STD. NO. REV.
10.22 20
SIDEWALK TRANSITION DETAIL AT BACK OF CURB
Not to scale

SIDEWALK TRANSITION DETAIL (PLANTING STRIP BOTH SIDES)
Not to scale

KEY

<table>
<thead>
<tr>
<th>D</th>
<th>R</th>
<th>r</th>
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</thead>
<tbody>
<tr>
<td>0'–2.9'</td>
<td>10'</td>
<td>4'</td>
</tr>
<tr>
<td>3'–7.9'</td>
<td>25'</td>
<td>19'</td>
</tr>
<tr>
<td>8'+</td>
<td>50'</td>
<td>44'</td>
</tr>
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</table>
### NOTES:

1. 1/2" EXPANSION JOINTS REQUIRE INSTALLATION OF ONE 1/2" THICK PIECE OF BITUMINOUS FIBER THROUGH THE ENTIRE SLAB. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

2. TO LIMIT STORM WATER FLOW DOWN DRIVEWAYS, USE STANDARD 10.24C FOR DRIVEWAYS NEAR LOW POINTS.

3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).

5. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING WHAT ARE SHOWN.

6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

### GENERAL NOTES:

- ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
- ALL CURB, CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED.
- SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT.
- SEE STD. NO 10.17B FOR DETAIL OF EXPANSION JOINT AND GROOVE JOINT.

### DRIVEWAY WIDTH

<table>
<thead>
<tr>
<th>TYPE DRIVeway</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE I-RESIDENTIAL: LOCAL/COLLECTOR THOROUGHFARE *</td>
<td>10'</td>
<td>30'</td>
</tr>
<tr>
<td>ONE-WAY TYPE II COMMERCIAL</td>
<td>20'</td>
<td>30'</td>
</tr>
<tr>
<td>TWO-WAY TYPE II COMMERCIAL</td>
<td>26'</td>
<td>50'</td>
</tr>
</tbody>
</table>

* MUST PROVIDE ON-SITE TURNAROUND

### COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB DRIVEWAY WITH SIDEWALK ABUTTING CURB (2'-6" CURB AND GUTTER)
NOTE:

1. 1/2" EXPANSION JOINTS REQUIRE INSTALLATION OF ONE 1/2" THICK PIECE OF BITUMINOUS FIBER THROUGH THE ENTIRE SLAB. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

2. TO LIMIT STORM WATER FLOW DOWN DRIVEWAYS, USE STANDARD 10.24C FOR DRIVEWAYS NEAR LOW POINTS.

3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).

5. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING WHAT ARE SHOWN.

6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

GENERAL NOTES:

- ALL CONCRETE TO BE 3600 P.S.I. COMpressive STRENGTH
- ALL CURB, CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED.
- SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT.
- SEE STD. NO 10.17B FOR DETAIL OF EXPANSION JOINT AND GROOVE JOINT.

---

### DRIVEWAY WIDTH

<table>
<thead>
<tr>
<th>TYPE/DRIVEWAY</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE I RESIDENTIAL:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCAL/COLLECTOR</td>
<td>10'</td>
<td>30'</td>
</tr>
<tr>
<td>THOROUGHFARE*</td>
<td>15'</td>
<td>30'</td>
</tr>
<tr>
<td>ONE WAY TYPE II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td>20'</td>
<td>30'</td>
</tr>
<tr>
<td>TWO WAY TYPE II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td>26'</td>
<td>50'</td>
</tr>
</tbody>
</table>

* MUST PROVIDE ON-SITE TURNAROUND

---

COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB

DRIVEWAY WITH SIDEWALK ABUTTING CURB

(6" X 18" VERTICAL CURB)
NOTES

1. USED AT LOW POINTS IN ROADWAYS WITH 2'–6" CURB AND GUTTER OR 6" X 18" CURB AS DIRECTED BY CITY ENGINEER.

2. SEE STANDARDS 10.24A & 10.24B FOR ADDITIONAL DETAILS.

3. ALL DRIVING AREAS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

4. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

NOT TO SCALE

COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB

DRIVeway WITH SIDEWALK AButting CURB

6" X 18" (VERTICAL CURB)
NOTES:
1. ALL CONCRETE TO BE 3600 P.S.I.
2. ALL CURB OR CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 10.17 FOR JOINT DETAIL.
3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND CDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).
5. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING WHAT ARE SHOWN.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

---

** Table: Drive Way Width **

<table>
<thead>
<tr>
<th>Drive Way Type</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local/Collector</td>
<td>10'</td>
<td>30'</td>
</tr>
<tr>
<td>Thoroughfare*</td>
<td>15'</td>
<td>30'</td>
</tr>
</tbody>
</table>

* MUST PROVIDE ON-SITE TURNAROUND

---

** Diagram: Residential Drop Curb Type I Drive Way with Planting Strip (2’-6” Curb and Gutter) **

---

** City of Charlotte Land Development Standards **
Includes Charlotte ETJ

** STD. ND. REV **
10.25A/13
NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I. COMpressive strength.

2. AT ALL DRIVEWAYS, SIDEWALKS TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 10.17 FOR JOINT DETAIL.

3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

4. "A" BREAKOVER SHALL BE 8% OR LESS (A=ALGEBRAIC DIFFERENCE).

5. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING THE GRADES ShOWN ON THIS DETAIL.

6. **PER NC IFC SECTION D103.2, FIRE APPARATUS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

8. THIS DETAIL IS ONLY FOR USE WHEN PLANTING STRIP IS 6’ OR LESS IN WIDTH. USE TYPE II—MODIFIED DRIVEWAY 10.25E WITH LARGER PLANTING STRIP.

---

**TABLE:**

<table>
<thead>
<tr>
<th>TYPE DRIVEWAYS</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE-WAY TYPE II — COMMERCIAL</td>
<td>20’</td>
<td>30’</td>
</tr>
<tr>
<td>TWO-WAY TYPE II — COMMERCIAL</td>
<td>26’</td>
<td>50’</td>
</tr>
</tbody>
</table>

* NEED MORE THAN ONE CONTRACTION JOINT IN CENTER.

---

SECTION A—A

SECTION B—B

NOT TO SCALE

COMMERCIAL DROP CURB TYPE II DRIVEWAY WITH PLANTING STRIP (2’—6” CURB AND GUTTER)

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. 10.25B REV. 19
NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I.
2. ALL CURB OR CURB AND GUTTER AND SIDEWALK ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 10.17 FOR JOINT DETAIL.
3. ALL DRAWDRAWS MUST MEET THE CURRENT CITY DRAWDRAWS REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS.
5. PRIOR APPROVAL IS REQUIRED BY CDDOT ON GRADES EXCEEDING WHAT ARE SHOWN.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

** TABLE 

<table>
<thead>
<tr>
<th>DRIVEWAY WIDTH</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL/COLLECTOR</td>
<td>10’</td>
<td>30’</td>
</tr>
<tr>
<td>THOROUGHFARE*</td>
<td>15’</td>
<td>30’</td>
</tr>
</tbody>
</table>

* MUST PROVIDE ON-SITE TURNAROUND

RESIDENTIAL DROP CURB TYPE I DRIVEWAY WITH PLANTING STRIP (6" X 18" VERTICAL CURB)
NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I.
2. ALL CURB OR CURB AND GUTTER AND SIDEWALK ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 10.17 FOR JOINT DETAIL.
3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS. (A-ALGEBRAIC DIFFERENCE)
5. PRIOR APPROVAL IS REQUIRED BY CDOT FOR GRADES EXCEEDING THE GRADES SHOWN ON THIS DETAIL
6. **PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE FLUSH WITH CONCRETE.
8. THIS DETAIL IS ONLY FOR USE WHEN PLANTING STRIP IS 8' OR LESS IN WIDTH. USE TYPE II--MODIFIED DRIVEWAY 10.25E WITH LARGER PLANTING STRIP.

DRIVEWAYS CLASSIFICATION

<table>
<thead>
<tr>
<th>TYPE DRIVEWAYS</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
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<tbody>
<tr>
<td>ONE-WAY TYPE II-- COMMERCIAL</td>
<td>20'</td>
<td>30'</td>
</tr>
<tr>
<td>TWO-WAY TYPE II-- COMMERCIAL</td>
<td>26'</td>
<td>50'**</td>
</tr>
</tbody>
</table>

* NEED MORE THAN ONE CONTRACTION JOINT IN CENTER

SECTION A--A (ALONG FLOW LINE)

SECTION B--B

NOT TO SCALE

COMMERCIAL DROP CURB TYPE II DRIVEWAY WITH PLANTING STRIP (6" X 18" VERTICAL CURB)
1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.

2. AT ALL DRIVEWAYS, SIDEWALKS TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUTOFF OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 10.17 FOR JOINT DETAIL. PAY LIMITS FOR WORK DONE UNDER CITY OF CHARLOTTE CONTRACTS ARE FROM EXPANSION JOINT TO EXPANSION JOINT, FROM LIP OF CURB TO BACK OF SIDEWALK.

3. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

4. ALGEBRAIC DIFFERENCE IN GRADE ("A") BETWEEN SLOPES SHALL BE 8% OR LESS.

5. RADIUS MUST BE MINIMUM 8 FEET OR THE WIDTH OF THE PLANTING STRIP, WHICHEVER IS GREATER. RADIUS GREATER THAN THESE MINIMUMS MAY BE REQUIRED BY CODE ON A CASE-BY-CASE BASIS. FOR RADIUS GREATER THAN 8 FEET, THE RADIUS ARE TO CONTINUE AS A BAND AT-GRADE THROUGH THE SIDEWALK.

6. PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

7. PAVERS USED IN DRIVEWAY MUST HAVE A THICKNESS OF 3 INCHES.

8. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

9. THE DRIVEWAY MUST RISE 6" FROM THE GUTTER LINE TO PREVENT RUNOFF FROM ENTERING DRIVEWAY.

### DRIVeway DIMENSIONS

<table>
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<th>OPERATION/RADIUS</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
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<tr>
<td>ONE-WAY WITH 6'-12' FT. RADIUS</td>
<td>20'</td>
<td>30'</td>
</tr>
<tr>
<td>ONE-WAY WITH 13'-20' FT. RADIUS</td>
<td>15'</td>
<td>25'</td>
</tr>
<tr>
<td>TWO-WAY WITH 6'-12' FT. RADIUS</td>
<td>26'</td>
<td>50'</td>
</tr>
<tr>
<td>TWO-WAY WITH 13'-20' FT. RADIUS</td>
<td>22'</td>
<td>40'</td>
</tr>
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### CITY OF CHARLOTTE LAND DEVELOPMENT STANDARDS

INCLUDES CHARLOTTE ETJ

TYPE II—MODIFIED DRIVEWAY DETAIL WITH WIDE PLANTING STRIP AND STANDARD CURB

NOT TO SCALE

STD. NO. REV.

10.25E 18
NOTES:

1. TO BE USED ON ROADS WITHOUT CURB AND GUTTER AND WHERE CURB AND GUTTER IS NOT BEING INSTALLED. (MUST MEET BOTH CRITERIA)
2. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
3. THIS STANDARD IS TYPICALLY FOR COMMERCIAL APPLICATION. FOR RESIDENTIAL DRIVEWAY CONSTRUCTION, USE AT THE DISCRETION OF THE CITY.
4. "A" BREAKOVER SHALL BE 8% OR LESS.
5. ALL CONCRETE TO BE 3600 P.S.I.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SITE DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
8. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING WHAT ARE SHOWN.
9. JOINT MATERIAL SHOULD BE PLACED Flush WITH CONCRETE.

SECTION A-A

15" MIN. DIAMETER DRIVEWAY CULVERT WITH STANDARD END TREATMENT (ENDWALL OR FLARED END SECTION). NCDOT TO APPROVE ON NCDOT SYSTEM ROAD
NOTES:

1. THE ELEVATION OF THE SIDEWALK SHALL BE NOT LESS THAN SIX INCHES OR MORE THAN EIGHTEEN INCHES ABOVE THE ROADWAY CROWN. THIS ELEVATION DIFFERENTIAL SHALL BE CONSISTENT WITHIN EACH BLOCK.

2. ALL CONCRETE TO BE 3500 PSI STRENGTH.

3. ALL CONSTRUCTION PRACTICES, INCLUDING COMPACTION, CURING, FINISHING, ETC. SHALL BE IN ACCORDANCE WITH THE CHARLOTTE LAND DEVELOPMENT STANDARDS.

4. PLANTING STRIP SHALL BE GRADED WITH A CROSS SLOPE BETWEEN 1/4 IN. PER FOOT AND 1 1/4 IN. PER FOOT EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

5. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS, INCLUDING BUT NOT LIMITED TO SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

6. **PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

7. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).

8. PRIOR APPROVAL IS REQUIRED BY CDOT ON GRADES EXCEEDING WHAT ARE SHOWN.

<table>
<thead>
<tr>
<th>DRIVeway WIDTH</th>
<th>X</th>
<th>Y</th>
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</thead>
<tbody>
<tr>
<td>TYPE I—RESIDENTIAL:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCAL/COLLECTOR</td>
<td>10' MIN.</td>
<td>30' MAX.***</td>
</tr>
<tr>
<td>THROUGHFARE *</td>
<td>15' MIN.</td>
<td>30' MAX.***</td>
</tr>
</tbody>
</table>

* MUST PROVIDE ON-SITE TURNAROUND
*** MAXIMUM WIDTH INCLUDES OPTIONAL WINGS

RESIDENTIAL DRIVEWAY (TYPE I) FOR 2'-0" VALLEY GUTTER

CITY OF CHARLOTTE
LANDEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. | REV.
10.27A | 13
NOTES:
1. The elevation of the sidewalk shall be not less than six inches or more than eighteen inches above the roadway crown. This elevation differential shall be consistent within each block.
2. All concrete to be 3600 psi strength.
3. All construction practices, including compaction, curing, finishing, etc. shall be in accordance with the Charlotte Land Development Standards.
4. Planting strip shall be graded with a cross slope between 1/4 in. per foot and 1 1/4 in. per foot except where excessive natural grades make this requirement impractical. In such cases, the City Engineer may authorize a suitable grade.
5. All driveways must meet the current City driveway regulations and NCODT requirements, including but not limited to spacing, sight distance, and offsets from property lines and intersections.
6. Per NC IFC Section D103.2, fire apparatus access roads shall not exceed 10 percent in grade.
7. "A" breakover shall be 8% or less (A=Algebraic difference).
8. Prior approval is required by CDOT on grades exceeding what are shown.

<table>
<thead>
<tr>
<th>DRIVeway WIDTH</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONE-WAY TYPE 2 COMMERCIAL</td>
<td>20'</td>
<td>30'</td>
</tr>
<tr>
<td>TWO-WAY TYPE 2 COMMERCIAL</td>
<td>26'</td>
<td>50'</td>
</tr>
</tbody>
</table>

CITY OF CHARLOTTE LAND DEVELOPMENT STANDARDS INCLUDES CHARLOTTE ETJ

COMMERCIAL TYPE II DRIVEWAY FOR 2'-0" VALLEY GUTTER

STD. NO. REV. 10.27B 21
NOTES:

1. WHERE A TYPE III DRIVEWAY IS APPROVED BY THE CHARLOTTE DEPARTMENT OF TRANSPORTATION (CDOT) THAT CONNECTS TO AN EXISTING SIGNALIZED INTERSECTION, OR AT A LOCATION WHERE A TRAFFIC SIGNAL INSTALLATION IS PROPOSED BY CDOT BASED ON A TRAFFIC IMPACT/SIGNAL WARRANT STUDY, A FULL DEPTH ASPHALT PAVEMENT IS REQUIRED. THIS PAVEMENT DESIGN IS REQUIRED IN THE DRIVEWAY EASEMENT (100-FOOT MINIMUM) TO MAINTAIN DETECTOR LOOPS AND PAVEMENT MARKINGS. A TRAFFIC SIGNAL WILL BE INSTALLED ONLY IF CDOT DETERMINES THAT ONE IS NECESSARY BASED ON A TRAFFIC STUDY OF CURRENT CONDITIONS.

2. A CONCRETE GUTTER IS TO BE USED EXCEPT AT EXISTING OR PROPOSED TRAFFIC SIGNAL LOCATIONS. AT THESE LOCATIONS ADDITIONAL DRAINAGE REQUIREMENTS WILL BE NECESSARY TO ELIMINATE THE NEED FOR GUTTER ACROSS THE DRIVEWAY CONNECTIONS.

3. THE DRIVEWAY MUST RISE 6" FROM THE GUTTER LINE TO PREVENT RUNOFF FROM ENTERING DRIVEWAY.

4. ALL DRIVEWAYS MUST MEET THE CURRENT CITY DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

5. TWO (2) CURB RAMPS PER CURB RETURN REQUIRED AT SIGNALIZED INTERSECTIONS.

6. FOUR (4) FOOT GUTTER AND WINGS ARE REQUIRED TO DIRECT WATER ACROSS DRIVE. GUTTER AND WINGS MAY NOT BE REQUIRED IF THE DRIVEWAY GUTTER SLOPE IS GREATER THAN 2%.

7. MAINTAIN UP TO 1.5% (MAX. 2%) CROSS-SLOPE ON THE PEDESTRIAN ACCESS ROUTE BETWEEN CURB RAMPS. CONCRETE IS OPTIONAL FOR THE CROSSWALK AREA IN THE DRIVEWAY.

SECTION A-A

* TRANSITION CONCRETE DEPTH FROM 7" AT LIP TO 10" AT 4'-0" CONCRETE GUTTER CONSTRUCTION JOINT. IF NO ASPHALT BASE INSTALLED, "7" CONCRETE DEPTH CAN BE CARRIED THROUGH THE 4'-0" CONCRETE GUTTER.

NOT TO SCALE
NOTE:
* TRANSITION FROM 2’-6” STANDARD CURB TO VALLEY CURB AT A DRAINAGE INLET ONLY.
SEE STANDARD 10.19 FOR CROSS SECTION GEOMETRY.
NOTE:
1. WHERE 2'-6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.
2. RADIUS AT INTERSECTION MAY VARY.
NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.

2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.

3. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.33%, THEN THE SLOPE FROM UP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE ALGEBRAIC DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.33%.
NOTES:

1. THIS DETAIL PRESENTS ALTERNATIVE TREATMENTS FOR THE SIDES OF THE RAMP — RETURNED CURBS, RECTANGULAR WINGS, AND ANGLED WINGS.

2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.

3. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.

4. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT TYPICALLY WALK ACROSS THE RAMP, THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE, OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.

ALTERNATIVE 1: RETURNED CURBS

ALTERNATIVE 2: RECTANGULAR FLARES

ALTERNATIVE 3: ANGLED FLARES

SLOPE "A" = UP TO 1.5% (2.00% MAX)
SLOPE "B" = UP TO 7.5% (8.33% MAX)
SLOPE "C" = UP TO 10% MAX

PERPENDICULAR CURB RAMP WITH 2’-6” CURB AND GUTTER

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. REV.
10.31B 20
NOTES:

1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. MAINTAIN POSITIVE DRAINAGE ALONG THE LIP OF GUTTER IN RAMP. IN FLAT AREAS, ADDITIONAL CATCH BASINS MAY BE REQUIRED ON THE SIDES OF THE RAMP TO MINIMIZE STANDING WATER AT THE RAMP LOCATION.
4. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.3%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.3%.
NOTES:

1. Maintain a minimum of 0.5% slope on all concrete surfaces to promote surface drainage toward curb.
2. Gutter flow line and plan profile shall be maintained through the ramp area.
3. The surface of the ramp shall be flush with the flowline of the curb and gutter.
4. The wing and ramp surfaces shall be 3600 PSI concrete with a sidewalk finish in accordance with current edition NCDDOT standard specifications for roads and structures.
5. Drainage structures, mast arms, light poles and other obstructions shall not be placed in line with ramps. Location of the ramp shall take precedence over location of obstructions except where existing obstructions are being utilized in the new construction.
7. See USDG intersection diagrams I-1 through I-3 for typical ramp placement and intersection layouts.
8. Curbs ramps shall have a segment of straight curb at least 24 inches long located on each side of the wing slope and within the crosswalk markings.
9. For all ramps at marked crosswalks the ramp opening (at the fully depressed curb) shall be located within the parallel boundaries of crosswalk markings.
10. If a single diagonal ramp is used (Typ. only in retros) the ramp centerline shall be located at the corner radius centerline unless otherwise directed by the Engineer. A min. 4'X4' clear space beyond the curb face must be wholly outside of the parallel vehicle travel lane (see diagram below).

**IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE DIMENSIONS OF TURNING SPACE MUST BE 5'X5' MINIMUM.**

**DEPRESSED 2'-6" CURB & GUTTER**

**CONCRETE (WALKABLE SURFACE) WHERE PERMITTED**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**DEPRESSED 2'-6" CURB & GUTTER**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**

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**CONCRETE**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**

**MIN. 1 FT. FULL DEPTH CURB & GUTTER**

**CONCRETE**
NOTES:
1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBRIZED PRODUCT APPROVED BY THE CITY ENGINEER. RETROFIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. RAMP AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NOT LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE PLACED SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT, DOME ORIENTATION IS LESS CRITICAL.
6. DETECTABLE WARNING AREA SHALL CONTRAST VISUALLY WITH ADJACENT GUTTER, STREET OR HIGHWAY, OR PEDESTRIAN ACCESS ROUTE SURFACE, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. ON THE TRYON STREET MALL, FRENCH GRAY IS TO BE USED.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE MINIMUM 8000 PSI CONCRETE WITH A 2-INCH MINIMUM THICKNESS, SET ON A THIN-SET MORTAR ON TOP OF 4" THICK 3600 PSI CONCRETE BASE.
8. MATS ARE TO BE RIGID WITH TURNED-DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06

NOT TO SCALE
CULVERT CROSSINGS ON RESIDENTIAL AND COMMERCIAL STREETS

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

NOTES:

1. SEE STD. NO. 10.36B FOR GENERAL NOTES AND CLEAR ZONE DISTANCES.

2. AN ALTERNATIVE FOR STREETS WITH WIDER PLANTING STRIPS AND SIDEWALKS: IN LIEU OF A PLANTING STRIP ALONG THE CULVERT CROSSING, PROVIDE A MINIMUM 8-FOOT WIDE SIDEWALK LOCATED AT THE BACK OF CURB, FOR LENGTH "LC1" ON EITHER SIDE OF THE CULVERT CENTERLINE.
GENERAL NOTES:

1. UNLESS OTHERWISE DETERMINED BY THE CITY ENGINEER, THE MEASURES ILLUSTRATED SHALL BE USED WHEN CULVERT DIAMETER, D, IS GREATER THAN OR EQUAL TO 24 INCHES AND WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE CULVERT INVERT AND THE TOP OF SLOPE, H, IS GREATER THAN OR EQUAL TO 5 FEET.

2. INSTALLATION OF 2"-6" CURB AND GUTTER MAY NOT BE REQUIRED WHEN AN ADEQUATE CLEAR ZONE IS PROVIDED FOR VEHICLES WITH A MAXIMUM OF 6:1 SLOPE (SEE TABLE 1).

3. INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 10-FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE SIDEWALK WITH A MAXIMUM OF 6:1 SLOPE. WHERE NO SIDEWALK IS REQUIRED, INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 15-FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.

4. FOR CULVERT CROSSINGS WITHOUT ENDWALLS, LH AND LC2 SHALL BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL.

5. FOR MULTIPLE BARREL CULVERT CROSSINGS, LC1 SHALL BE MEASURED FROM THE CENTERLINES OF THE OUTBOARD CULVERT BARRELS.

6. WHEN NECESSARY, AS DETERMINED BY THE CITY ENGINEER, ADDITIONAL MEASURES MAY BE REQUIRED.

7. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF STREET IF SIDEWALK IS REQUIRED ON BOTH SIDES.

8. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF STREET IF NO SIDEWALK IS REQUIRED EXCEPT WHEN A 15-FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.

9. INSTALLATION OF SAFETY RAIL IS REQUIRED ON THE SIDEWALK SIDE OF STREET IF SIDEWALK IS ONLY REQUIRED ON ONE SIDE OF STREET. INSTALL EITHER SAFETY RAIL OR 15-FT CLEAR ZONE ON SIDE WITHOUT SIDEWALK.

10. DESIGN ADT IS CALCULATED ASSUMING A TRIP GENERATION OF 10 DAILY TRIPS PER SINGLE FAMILY DWELLING UNIT.

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**TABLE 1. CLEAR ZONE DISTANCES**

<table>
<thead>
<tr>
<th>LOCAL, COLLECTOR, AND COMMERCIAL STREETS</th>
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</thead>
<tbody>
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<td><strong>DESIGN ADT</strong></td>
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<td></td>
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<tr>
<td>UNDRE 750</td>
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<tr>
<td>750 – 1500</td>
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<tr>
<td>1501 – 6000</td>
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<tr>
<td>OVER 6000</td>
</tr>
</tbody>
</table>

SEE STD. NO. 10.36A FOR PLAN AND CROSS SECTIONAL SCHEMATICS.
GENERAL NOTES:

1. All tapers are 20:1 and occur on both sides of the road to be tapered starting at the radius return after the intersection.

2. Centerline of local residential and local-limited residential is maintained. No shifting of the centerline shall occur.

3. Right of way and sidewalk behind tapered street section to taper over the same street taper length.

4. Detail also applies for transitions from residential collector streets (CLDSM #11.06) to residential local streets.
NOTES:
1. ACTUAL SITE CONDITIONS MAY REQUIRE ADDITIONAL LIMITS OF CONSTRUCTION TO BE DETERMINED BY THE CITY ENGINEER (MINIMUM SHOWN).
2. SEE APPROPRIATE CURB DETAIL FOR CURB INSTALLATION.
3. CONCRETE SHALL BE A MINIMUM OF 3800 PSI.
4. ASPHALT TYPE (*) TO MATCH SPECIFIED STREET DETAIL STANDARD PAVEMENT STRUCTURE OR AS DIRECTED BY CITY ENGINEER (SEE STREET TYPICAL DETAIL STANDARD).
5. RESURFACING LIMITS ON NCDOT—MAINTAINED ROADS TO BE DETERMINED BY NCDOT.
WARNING

GEOSTRUCTURE AREA

CDOT Encroachment Agreement 8 XX-XXX

WARNING SIGN
DETAIL
NOTES
1. THIS DRAWING ILLUSTRATES THE CONCEPTS TO BE USED FOR MODULAR WALL INSTALLATIONS REGARDING WARNING SIGN PLACEMENT, CLEAR SPACE REQUIREMENTS, GEOSTRUCTURE PROTECTION, AND THE NEED TO OBTAIN AN ENCROACHMENT AGREEMENT PRIOR TO CONSTRUCTION. THIS DETAIL DOES NOT CONSTITUTE A STRUCTURAL DESIGN. FULL CONSTRUCTION PLANS FOR RETAINING WALLS MUST BE SECURED BY A PROFESSIONAL ENGINEER LICENSED IN NORTH CAROLINA AND SUBMITTED TO THE CITY DURING THE PLAN REVIEW PROCESS.

2. PLACEMENT OF ANY PORTION OF A MODULAR RETAINING WALL IN THE RIGHT-OF-WAY (R/W) SHALL REQUIRE AN ENCROACHMENT AGREEMENT TO BE EXECUTED WITH CDOT PRIOR TO CONSTRUCTION.

3. SAFETY RAILS SHALL EXTEND THROUGH THE PROTECTED AREA AND WARNING SIGNS SHALL BE ATTACHED TO THE SAFETY RAIL AT EACH END OF THE PROTECTED AREA.

4. ADDITIONAL MEASURE(S) MAY BE REQUIRED BY CDOT.

5. THIS DETAIL APPLIES ONLY TO STREETS MAINTAINED (OR TO-BE-MAINTAINED) BY THE CITY OF CHARLOTTE. THIS DETAIL IS NOT PERMITTED FOR USE ON NEW OR EXISTING CDOT-MAINTAINED ROADWAYS.

6. CDOT PREFERENCES CAST-IN-PLACE REINFORCED CONCRETE WALLS WITH NO GEO-GRID OR TIEBACKS FOR WALLS IN OR NEAR THE PUBLIC RIGHT-OF-WAY.

7. CDOT PREFERENCES ALL RETAINING WALLS AND APPURTENANCES BE LOCATED OUTSIDE OF THE R/W IN ORDER TO PROVIDE ADEQUATE SPACE FOR UTILITIES (AERIAL AND UNDERGROUND), LANDSCAPING, SIDEWALKS, AND OTHER ITEMS.

8. GEOGRID IS NOT PERMITTED IN CLT WATER EASEMENTS, OR IN THE PROXIMITY OF WATER OR SEWER UTILITY LINES.

TYPICAL SECTION

PLAN VIEW

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

MODULAR RETAINING WALLS USING GEOGRID IN THE RIGHT-OF-WAY

STD. NO. REV.
10.39 22
DIRECTIONAL CURB RAMP
WITH SMALL/MEDIUM CURB RADII

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   - 5'-FOOT SIDEWALKS WITH CURB RADII OF 35 FEET OR LESS
   - 6'-FOOT SIDEWALKS WITH CURB RADII OF 30 FEET OR LESS
   - 8'-FOOT SIDEWALKS WITH CURB RADII OF 25 FEET OR LESS

2. DIRECTIONAL RAMP RADIUS WITH RETURN CURB AS SHOWN MAY BE USED WHEN A PLANTING STRIP (NON-WALK SURFACE) IS PROVIDED. DO NOT USE THIS DETAIL IF THERE IS HARDSCAPE (WALKABLE SURFACE) INSTEAD OF A PLANTING STRIP. IF A WALKABLE SURFACE IS ADJACENT TO RAMP CONSTRUCT CONCRETE FLARES WITH SLOPES UP TO 10% MAX, INSTEAD OF RETURN CURB.

3. ALL CONCRETE SHALL BE AT LEAST 3600 PSI.

4. ENSURE Flush CONDITIONS AT RAMP TO GUTTER TRANSITION.

5. SIDEWALK TRANSITION PANEL: PREFERRED DESIGN IS 1.5% (2.0% MAX) IN ALL DIRECTIONS IN FRONT OF GRADE BREAK & DRAIN TO FLOW LINE. RUNNING SLOPE OF THIS AREA MUST NOT EXCEED 2%. CROSS-SLOPE MAY MATCH STREET GRADE AT BACK OF CURB WHEN STREET GRADE > 2%. TRANSITION TO 1.5% (2.0% MAX) CROSS-SLOPE AT TOE OF RAMP.

NOTES:

THIS DETAIL IS NOT FOR USE IN ETJ, OR ON NCDOT—MAINTAINED STREETS.
**NOT TO SCALE**

**CITY OF CHARLOTTE**

**LAND DEVELOPMENT STANDARDS**

**DIRECTIONAL CURB RAMP WITH LARGE CURB RADIUS**

**NOTES:**
1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   - 5-FOOT SIDEWALKS WITH CURB RADIUS GREATER THAN 35 FEET
   - 6-FOOT SIDEWALKS WITH CURB RADIUS GREATER THAN 30 FEET
2. DIRECTIONAL RAMPS WITH RETURNED CURBS AS SHOWN MAY BE USED WHEN A PLANTING STRIP (NON-WALK SURFACE) IS PROVIDED. DO NOT USE THIS DETAIL IF THERE IS HARDSCAPE (WALKABLE SURFACE) INSTEAD OF A PLANTING STRIP. IF A WALKABLE SURFACE IS ADJACENT TO RAMP CONSTRUCT CONCRETE FLARES WITH SLOPES UP TO 10% MAX, INSTEAD OF RETURNED CURBS.
3. ALL CONCRETE SHALL BE AT LEAST 3600 PSI.
4. ENSURE FLUSH CONDITIONS AT RAMP TO GUTTER TRANSITION.
5. SIDEWALK TRANSITION PANEL: PREFERRED 1.5% (2.0% MAX) IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. RUNNING SLOPE OF THIS AREA MUST NOT EXCEED 2%. CROSS-SLOPE MAY MATCH STREET GRADE AT BACK OF CURB WHEN STREET GRADE > 2%. TRANSITION TO 1.5% (2.0% MAX) CROSS-SLOPE AT TOE OF RAMP.

**THIS DETAIL IS NOT FOR USE IN ETJ, OR ON NCDOT—MAINTAINED STREETS.**
CONC. FLARES AND GRASS STRIP AREA BEYOND RAMP SLOPE UP TO 7.5% (8.33% MAX)

1/2" EXPANSION JOINT

2’ MIN.

6”

VARYING 2” TO 5.0’

SEE DEPRESSED CURB DETAIL BELOW

SECTION A—A

CONCRETE FLARES OPTIONAL (10% MAX CROSS—SLOPE)

TRUNCATED DOME MAT PLACEMENT AND ALIGNMENT MAY VARY DEPENDING ON RADIUS OF CURB. SEE 10.40 A/B FOR TYPICAL PLACEMENT - SEE NOTE 2

CONCRETE SIDEWALK (OR TURNING SPACE IF INTERSECTING RAMP)

MATCH SIDEWALK WIDTH

RADIUS VARIES

VALLEY CURB PER CLDS 10.17B

UP TO 7.5% (8.33% MAX) SLOPE (INCLUDES DETECTABLE WARNING)

NON—WALK SURFACE

2” TO 5’

SEE NOTE 2

TRANSITION TO DEPRESSED CURB AT RAMP EACH SIDE (LENGTH VARIES)

FLOWLINE

SIDEWALK TRANSITION PANEL (SEE NOTE 5)

SIDEWALK TRANSITION PANEL SEE NOTE 5

1.5% (2.00% MAX)

MATCH SIDEWALK WIDTH

RADIUS VARIES

CONCRETE SIDEWALK (OR TURNING SPACE IF INTERSECTING RAMP)

1/2” EXPANSION JOINT (TYP.)

1.5% (2.00% MAX)

TOE OF RAMP

PERSPECTIVE

DEPRESSED CURB DETAIL MAXIMUM SLOPES FOR CURB AND GUTTER DEPRESSION AT RAMPS

NOTES:

1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   • 5—FOOT SIDEWALKS WITH CURB RADIi OF 35 FEET OR LESS
   • 6—FOOT SIDEWALKS WITH CURB RADIi OF 30 FEET OR LESS
   • 8—FOOT SIDEWALKS WITH CURB RADIi OF 25 FEET OR LESS

2. IF CURB RADIUS EXCEEDS THOSE LISTED ABOVE, REFER TO DETAIL 10.40B FOR DETECTABLE WARNING SURFACE MAT PLACEMENT.

3. ALL CONCRETE SHALL BE AT LEAST 3600 PSI.

4. ENSURE FLUSH CONDITIONS AT RAMP TO GUTTER TRANSITION.

5. SIDEWALK TRANSITION PANEL: PREFERRED 1.5% (2.00% MAX) IN ALL DIRECTIONS IN FRONT OF GRAGE BREAK AND DRAIN TO FLOW LINE. RUNNING SLOPE OF THIS AREA MUST NOT EXCEED 2% CROSS—SLOPE MAY MATCH STREET GRADE AT BACK OF CURB WHEN STREET GRADE >2%. TRANSITION TO 1.5% (2.00% MAX) CROSS—SLOPE AT TOE OF RAMP.

NOT TO SCALE

DIRECTIONAL CURB RAMP WITH VALLEY GUTTER

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. REV.
10.40C17
NOTE:
1. THIS DETAIL MAY BE USED ON NCDOT—MAINTAINED STREETS ONLY WITH APPROVAL FROM NCDOT.
2. PROPOSED ASPHALT PATCH LAYER THICKNESS WILL VARY AS REQUIRED BY CDDOT OR NCDOT.
3. ENSURE PEDESTRIAN PASS-THRU HAS ADEQUATE SLOPE DRAINAGE AND DOES NOT POND WATER.
4. STAMPED/COLORED CONCRETE PATTERN AND COLOR MAY BE ALTERED WITH CDDOT APPROVAL.
5. THIS DETAIL MAY BE PROVIDED TO PROVIDE A PEDESTRIAN REFUGE PASS-THRU IN AN EXISTING MEDIAN WITH 1'-6" CURB & GUTTER.
6. FOR 1'-6" CURB AND GUTTER, USE CLSDM 10.17A FOR CITY STREETS OR NCDOT 846.01 FOR NCDOT STREETS.
7. NCDOT REQUIRES MILLING AND OVERLAY TO SEAL JOINT AT SAWCUTS SHOWN. FOR CITY STREETS MILLING AND OVERLY MAY BE REQUIRED.
8. NCDOT REQUIRES 1' OFFSET FROM EDGE OF PAVEMENT ALONG CURBLINE TO LANE LINE.
9. NCDOT REQUIRES THAT ALL JOINTS IN THE ISLAND MUST BE SEALED PER NCDOT STANDARD. USE "QUIK KURB L104 REFLECTIVE YELLOW PADDLE" OR EQUIVALENT.

SECTION A-A

SECTION B-B

SECTION C-C

PEDESTRIAN REFUGE
(WITH 1'-6" CURB & GUTTER)
NOT TO SCALE

SECTION A–A

SECTION B–B

SECTION C–C

PEDESTRIAN REFUGE
(WITH VERTICAL CURB)
NOTES:
1. THIS DETAIL CAN ONLY BE USED WITH APPROVAL FROM CDOT OR NCDOT. 1"–6" CURB & GUTTER OR VERTICAL CURB PEDESTRIAN REFUGE DETAILS ARE PREFERRED.
2. PROPOSED ASPHALT PATCH LAYER THICKNESS WILL VARY AS REQUIRED BY CDOT OR NCDOT.
3. ENSURE PEDESTRIAN PASS-THRU HAS ADEQUATE SLOPE DRAINAGE AND DOES NOT POND WATER.
4. NCDOT REQUIRES MILLING AND OVERLAY TO SEAL JOINT AT SAWCUTS SHOWN. FOR CITY STREETS MILLING AND OVERLAY MAY BE REQUIRED.
5. NCDOT REQUIRES 1" OFFSET FROM EDGE OF PAVEMENT ALONG CURBLINE TO LANE LINE.
6. NCDOT REQUIRES THAT ALL JOINTS BE SEALED PER NCDOT STANDARD.
7. USE "QWICK KURB L104 REFLECTIVE YELLOW PADDLE" OR EQUIVALENT.

SECTION A–A

SECTION B–B

SECTION C–C

PLAN

APPROX. 1' SAWCUT AS NEEDED

DEPRESSED MEDIAN

2-4' WIDE DETECTABLE WARNING MATS PER 10.358
SET FLUSH WITH CONCRETE SURFACE

TOOLED JOINTS (TYP.)

REFLECTIVE PADDLE (SEE NOTE 7)

1' FROM FACE OF CURB

REFLECTIVE PADDLE

VARIABLE DEPTH CONCRETE

TOOLED JOINTS

6" CONCRETE

TOOL JOINTS

ASPHALT SURFACE

ASPHALT SURFACE

ASPHALT PAVEMENT

5" MODIFIED MONOLITHIC CONCRETE ISLAND

5" MODIFIED MONOLITHIC CONCRETE ISLAND

40d SPIKE STAGGERED ON 2" CENTER EACH WAY

3" RADIUS

40d SPIKE STAGGERED ON 2" CENTERS

6" MIN

6" MIN

10" 2' 10"

8'–4" 25' MIN

C

A

B

NOT TO SCALE

CITY OF CHARLOTTE LAND DEVELOPMENT STANDARDS INCLUDES CHARLOTTE ETJ

PEDESTRIAN REFUGE (MODIFIED MONOLITHIC)
NOTES:

1. At intersections with streets or driveways, ramp width must match multi-use path width.

2. If multi-use paths are not part of or parallel to a roadway, the pavement schedule ALT 1 shall be used.

3. Contractor must seal all joints. Seal must be non-shrinking and flush with finished grade of the concrete path.

4. All concrete shall be at least 3600 PSI compressive strength.

5. Joints must be sawcut a minimum of ⅛ depth of concrete depth, but no more than ½ of concrete depth.
   - Transverse joints must be sawcut every 6 feet when pavement schedule ALT 1 or ALT 3 are used.
   - Transverse joints must be sawcut every 10 feet for pavement schedule ALT 2.
   - Construction joints must be every 40 feet.

PAVEMENT SCHEDULE ALTERNATIVES

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT 1 (PREFERRED)</td>
<td>6&quot; CONCRETE</td>
</tr>
<tr>
<td>ALT 2</td>
<td>6&quot; CONCRETE</td>
</tr>
<tr>
<td>ALT 3</td>
<td>4&quot; CONCRETE</td>
</tr>
<tr>
<td></td>
<td>3&quot; COMPACTED AGGREGATE BASE COURSE (ABC)</td>
</tr>
<tr>
<td></td>
<td>COMPACTED SUBGRADE</td>
</tr>
<tr>
<td></td>
<td>3&quot; COMPACTED AGGREGATE BASE COURSE (ABC)</td>
</tr>
<tr>
<td></td>
<td>COMPACTED SUBGRADE</td>
</tr>
</tbody>
</table>

NOT TO SCALE
NOTES:

1. BIKE RAMP ALLOWS BICYCLE RIDERS TO TRANSITION FROM AN ON-STREET BICYCLE FACILITY TO/FROM AN OFF-STREET FACILITY.

2. FOR ONE-WAY FACILITIES, BIKE RAMP WIDTH IS 6'. FOR TWO-WAY BIKE FACILITIES, BIKE RAMP WIDTH SHALL MATCH THE WIDTH OF THE MULTI-USE PATH, WITH A MINIMUM WIDTH OF 10'.


4. ON CITY-MAINTAINED STREETS, INSTALL A RETURNED VERTICAL CURB ALONG THE SIDES OF THE BIKE RAMP AS SHOWN, TAPER TO 0" DEPTH AT MUP. ON NCDOT-MAINTAINED STREETS, INSTALL CONCRETE FLARES ALONG THE SIDES OF THE BIKE RAMP.

5. INSTALL 2 TACTILE GUIDE STRIP MODULES ALONG PEDESTRIAN FACILITY.

6. FOLLOW "NCHRP 672 ROUNDBOATS: AN INFORMATION GUIDE" (CURRENT EDITION) FOR BIKE RAMP PLACEMENT AT ROUNDBOATS.

SECTION A-A

BIKE RAMP GUTTER DETAIL

NOT TO SCALE
NOTES:

1. SUBMIT TACTILE GUIDE STRIP SHOP DRAWINGS TO CITY FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

2. INSTALL TACTILE GUIDE STRIP PER MANUFACTURER’S DIRECTIONS.

3. THE COLOR OF THE TACTILE GUIDE STRIP SHALL MEET PROWAG REQUIREMENTS FOR CONTRAST WITH THE SURROUNDING PAVEMENT/SIDEWALK. FEDERAL YELLOW #33538 PROVIDES THE REQUIRED LEVEL OF CONTRAST AND SHALL BE USED, UNLESS:
   3.A. THE PAVEMENT/SIDEWALK IS A COLOR THAT DOES NOT PROVIDE SUFFICIENT CONTRAST WITH FEDERAL YELLOW #33538, OR
   3.B. AN ADOPTED STREETSCAPE, PEDSCAPE, OR SIMILAR PLAN PRESCRIBES A COLOR PALETTE TO USE (E.G., TRYON STREET MALL)

4. SUBMIT SHOP DRAWINGS OF ANY COLOR OTHER THAN FEDERAL YELLOW #33538 TO THE CITY FOR REVIEW AND APPROVAL BY COOT PRIOR TO INSTALLATION. COMPLIANCE WITH THE COLOR—CONTRAST REQUIREMENTS OF PROWAG SHALL SUPERSEDE ANY CONFLICTING PROVISION IN A PRESCRIBED COLOR PALETTE.

5. MATERIAL SHALL BE FIBREGLASS—REINFORCED VITRIFIED POLYMER COMPOSITE.

6. IF CUTTING OF A TILE IS NECESSARY, CUT ONLY IN WHOLE ONE—FOOT INCREMENTS.

NOT TO SCALE
1. THIS DETAIL CAN BE USED ON NCDOT AND CITY OF CHARLOTTE STREETS WITH PRIOR NCDOT AND CDOT APPROVAL.

2. WIDTH OF THE TRUCK APRON SHALL ACCOMMODATE A DESIGN VEHICLE AS DETERMINED BY CDOT/NCDOT.

3. TRUCK APRON SHALL BE CONCRETE AND STAMPED WITH A BRICK PATTERN.

4. CONCRETE FOR TRUCK APRONS SHALL USE A BRICK RED ADMIXTURE. SURFACE STAINS SHALL NOT BE USED. COLOR SUBMITTALS AND FIELD SAMPLES WILL BE REQUIRED FOR COLOR APPROVAL BY CDOT AND/OR NCDOT.

5. ON NCDOT-MAINTAINED FACILITIES, INSTALL 1'-6" SPILL CURB AND GUTTER BEHIND THE TRUCK APRON INSTEAD OF VERTICAL CURB AS SHOWN. THE GUTTER SPILL SLOPE MUST MATCH THE SLOPE OF THE ADJACENT TRUCK APRON. ON CITY-MAINTAINED STREETS, INSTALL VERTICAL CURB AS ILLUSTRATED.

6. ENSURE POSITIVE DRAINAGE THROUGHOUT THE APRON. AVOID STORM DRAINAGE STRUCTURES WITHIN THE MOUNTABLE CURB AND GUTTER.

7. PROVIDE FLUSH TRANSITIONS THROUGHOUT CONCRETE DEPRESSION AREA AND ENSURE RUNNING SLOPE AND CROSS SLOPE OF 2% MAX.

8. AT SIGNALIZED INTERSECTIONS, ACCESSIBLE PEDESTRIAN SIGNALS (APS) WILL BE REQUIRED FOR ALL CROSSINGS TO & FROM CORNERS WITH TRUCK APRONS. ENGINEER TO COORDINATE WITH CDOT IMPLEMENTATION ON PLACEMENT, APS FEATURES, AND OPERATIONS.
NOTES:

1. THIS DETAIL CAN BE USED AT ROUNDABOUTS ON ALL NCDOT AND CITY OF CHARLOTTE STREETS WITH PRIOR NCDOT AND CITY APPROVAL.

2. WIDTH OF TRUCK APRON AND CIRCULATORY ROADWAY TRAVEL LANE SHALL BE IN ACCORDANCE TO CURRENT "NCHRP 672 ROUNDABOUTS: AN INFORMATION GUIDE" (CURRENT EDITION).

3. TRUCK APRON SHALL BE CONCRETE AND STAMPED WITH A BRICK PATTERN.

4. CONCRETE FOR TRUCK APRONS SHALL USE A BRICK RED ADMIXTURE. SURFACE STAINS SHALL NOT BE USED. COLOR SUBMITTALS AND FIELD SAMPLES WILL BE REQUIRED FOR COLOR APPROVAL BY CDOT AND/OR NCDOT.

5. ENSURE POSITIVE DRAINAGE THROUGHOUT THE APRON. AVOID STORM DRAINAGE STRUCTURES WITHIN THE MOUNTABLE CURB AND GUTTER.

LOCAL RESIDENTIAL STREET
(DITCH TYPE)

SURFACE COURSE
1" S9.5B
FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY,
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT,
3) FOR ETJ STREETS, FINAL 1" MAY BE PLACED WHEN APPROVED BY NCDOT.

INTERMEDIATE COURSE
1-1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" BCBC TYPE B25.0C
SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN
ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE
CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE (SEE CLDS SPECIFICATIONS AND SPECIAL PROVISIONS SECTION 1.A.18)

TYPICAL PAVEMENT SECTION

KEY
◎ = 4" CONCRETE SIDEWALK

NOTES:
1. SIDEWALK SHALL BE ON BOTH SIDES OF STREET AND LOCATED ON LOT SIDE OF DITCH.
2. SIDEWALK LOCATED OUTSIDE OF STREET RIGHT OF WAY SHALL HAVE BEEN LOCATED IN A PERMANENT SIDEWALK AND UTILITY EASEMENT (SUE) EXTENDING 2 FEET BEHIND BACK OF S/W.
3. APPROVAL BY THE CITY ENGINEER IS REQUIRED PRIOR TO USING DITCH TYPE SECTION.

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

LOCAL RESIDENTIAL
TYPICAL DITCH TYPE STREET SECTION
COMPREHENSIVE STREET CLASSIFICATION SYSTEM (CLASS VI)

STD. NO. REV.
11.02 20
RESIDENTIAL COLLECTOR STREET

SURFACE COURSE
1" S9.5B
FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY.
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT.
3) FOR ETO STREETS, FINAL 1" MAY BE PLACED WHEN APPROVED BY NCDOT.

TACK COAT
(SEE SECTION 1.E.4)

INTERMEDIATE COURSE
1 1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" BCBC TYPE B25.0C
SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN
ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE
CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE (SEE CLDS SPECIFICATIONS AND SPECIAL PROVISIONS SECTION 1.A.18)

TYPICAL MINIMUM PAVEMENT SECTION
(SEE NOTE 4.)

KEY

4" CONCRETE SIDEWALK

NOT TO SCALE

REFERENCES:
1. SIDEWALK SHALL BE ON BOTH SIDES OF STREET AND LOCATED ON LOT SIDE OF DITCH.
2. SIDEWALK LOCATED OUTSIDE OF STREET RIGHT OF WAY SHALL HAVE BEEN LOCATED IN A
PERMANENT SIDEWALK AND UTILITY EASEMENT (SUE) EXTENDING 2 FEET BEHIND BACK
OF S/W.
3. APPROVAL BY THE CITY ENGINEER IS REQUIRED PRIOR TO USING DITCH TYPE SECTION.
4. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY CDOT/NCDOT BASED ON
SPECIFIC TRAFFIC PARAMETERS.

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

RESIDENTIAL COLLECTOR STREET
DITCH TYPE STREET TYPICAL SECTION
COMPREHENSIVE STREET CLASSIFICATION SYSTEM (CLASS V)

Charlottesville, Virginia

STD. NO. REV.
11.07 20
MINOR THOROUGHFARE STREET

SLOPE 1/4" PER FT.

MAJOR THOROUGHFARE STREET

SLOPE 1/4" PER FT.

NOTES:
1. SIDEWALKS SHALL BE PROVIDED IN ACCORDANCE WITH THE APPLICABLE ORDINANCE(S).
2. DITCH TYPE STREET IS TO BE USED ONLY WHEN APPROVED BY CITY ENGINEER.
3. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY CDOT/NCDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
NOTES:
1. DETAILS SHOWN SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY STANDARDS.
2. DITCH TYPE STREET REQUIRES APPROVAL OF CITY ENGINEER.
3. MINIMUM CURB RADIUS ON INTERIOR DRIVES AND PARKING AREAS IS 10'
4. THIS DETAIL IS NOT TO BE USED TO MEET INTERNAL/EXTERNAL CONNECTIVITY REQUIREMENTS OF THE SUBDIVISION ORDINANCE AND ZONING ORDINANCE.

GUIDELINES FOR PRIVATE STREET DESIGN:
1. INTERNAL STREET ALIGNMENT:
   MAXIMUM CURVATURE “K” VALUES: 10/20 (CREST/SAG)
   MINIMUM HORIZONTAL CURVE CENTERLINE RADIUS: 50 FT.

2. INTERSECTION WITH PUBLIC STREET:
   SAME AS FOR PUBLIC STREET. SEE GENERAL NOTES,
   SECTION I.B.2.

   NOTE: VARIATIONS ON THESE GUIDELINES WILL BE REVIEWED ON A CASE BY CASE BASIS BY CITY STAFF.

PAVEMENT SCHEDULE
© 1.5” BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5B
© 6” COMPACTED AGGREGATE BASE COURSE OR 4” BITUMINOUS CONCRETE BASE COURSE, TYPE B25.0C
© CURB AND GUTTER (REFERENCE 10.17A AND B)

CURB AND GUTTER
2:1 CUT MAX.
3:1 FILL MAX.
1/4" PER FOOT
2:1 CUT MAX.
3:1 FILL MAX.
1/4" PER FOOT

DITCH TYPE
30’ CLEAR OF ALL OBSTRUCTIONS (MIN.)
4’-6" (MIN)
21’-0"
10’-0"
10’-0"
SLOPE 3/8" PER FT.
1" PER FT.

PRIVATE STREET TYPICAL SECTIONS

NOT TO SCALE
NOTES:
1. CURB RETURN RADIUS DIMENSIONS AT INTERSECTIONS may vary depending on median width and will be reviewed on a case by case basis.
2. FOR ADDITIONAL LANES ADD 10'(MINIMUM) OF PAVEMENT PER LANE.
3. 2'-0" VALLEY GUTTER MAY BE USED WITH APPROVAL OF APPROPRIATE CITY ENGINEER.
4. MONOLITHIC CONCRETE MEDIANS WITH BEVELED EDGES AND MINIMUM WIDTH OF 4 FEET CAN BE USED IN LIEU OF LANDSCAPE MEDIANS.

GUIDELINES FOR PRIVATE STREET DESIGN:
1. INTERNAL STREET ALIGNMENT:
   MAXIMUM GRADE: 10%
   MINIMUM CURVE "K" VALUES: 10/20 (CREST/SAG)
   MINIMUM CENTERLINE RADIUS: 50 FT.
2. INTERSECTION WITH PUBLIC STREET:
   SAME AS FOR PUBLIC STREET. SEE CLDS SPECIFICATIONS AND SPECIAL PROVISIONS SECTION I.B.2.
   NOTE: VARIATIONS ON THESE GUIDELINES WILL BE REVIEWED ON A CASE BY CASE BASIS BY CITY STAFF.

PAVEMENT SCHEDULE
© 1.5" BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5B
® 6" COMPACTED AGGREGATE BASE COURSE OR 4" BITUMINOUS CONCRETE BASE COURSE, TYPE B25.0C
© CURB AND GUTTER (REFERENCE 10.17A & B).
® 1'-6" MOUNTABLE CURB

DIVIDED PRIVATE STREET
(internal)

DIVIDED PRIVATE STREET
(at intersection with a public street
for 150' or length of median whichever is greater)

NOT TO SCALE
SECTION A–A

APPICLABLE WHEN NO SIDEWALK PRESENT.
PLEASE NOTE: DRIVEWAY STANDARD
MAX. SLOPES AND BREAKOVERS APPLY

NOTES:

1. ALTERNATIVE CUL–DE–SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE CITY ENGINEER AND CDOT FOR REVIEW AND APPROVAL.

2. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL–DE–SAC.

3. REFER TO NCDOT STANDARDS FOR DITCH TYPE STREETS IN ETJ.

4. SIDEWALK MAY BE REQUIRED TO EXTEND AROUND CUL–DE–SAC BULB WHERE PARKS OR SCHOOLS HAVE FRONTAGE TO THE END OF THE CUL–DE–SAC.

NOTE: THIS DETAIL IS NOT FOR USE IN ETJ, OR ON NCDOT–MAINTAINED STREETS. REFER TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS MANUAL.

STANDARD CUL–DE–SAC
NOTES:

1. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE CITY ENGINEER AND CDOT FOR REVIEW AND APPROVAL.

2. PAVEMENT SECTION SHALL CONFORM WITH THE DESIGN REQUIREMENTS FOR COMMERCIAL STREETS.

3. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.
NOTES

1. THIS DESIGN ACCOMMODATES SINGLE-UNIT TRUCK BUT NOT A CHARLOTTE FIRE DEPARTMENT LADDER TRUCK. TO DESIGN FOR A LADDER TRUCK REQUIRES A HAMMERHEAD OF 120 FEET IN LENGTH.

2. VARIATIONS ON THIS DESIGN (E.G., WYES, TURNAROUNDS IN THE STEM, ROTATION OF ENTRY POINT, ETC.) CAN BE SUBMITTED TO CDOT FOR REVIEW AND APPROVAL ON A CASE-BY-CASE BASIS.

3. SIDEWALK MAY BE REQUIRED TO EXTEND AROUND THE HAMMERHEAD WHERE PARKS OR SCHOOLS HAVE FRONTAGE TO THE END OF THE HAMMERHEAD.

NOTE: THIS DETAIL IS NOT FOR USE IN ETJ, OR ON NCDOT-MAINTAINED STREETS. REFER TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS MANUAL.

NOT TO SCALE
NOTES

1. TEMPORARY TURNAROUND MATERIAL SHALL BE MIN. 3600 PSI CONCRETE, 6" THICK.

2. TEMPORARY INSTALLATION ONLY — TO BE REMOVED WHEN FUTURE DEVELOPMENT CONNECTS TO STREET. "SIDEWALK" PORTION OF TURNAROUND MAY BE LEFT IN PLACE IF NOT DAMAGED.

3. NOT TO BE USED AS A PRIVATE DRIVEWAY.

4. DEAD END STREET BARRICADE AND END OF ROADWAY MARKER PER CLDSM #50.07A&B AND #50.08A, B, & C ARE REQUIRED.

SCALE 1" = 10'

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE EIJ

TEMPORARY TURNAROUND
LOCAL RESIDENTIAL STREET
(OPTIONAL)
NOTES:
1. SUBGRADE SHALL BE COMPACTED TO PUBLIC STREET STANDARDS.
2. STORM DRAINAGE (NOT SHOWN) SHALL BE PROVIDED AS NECESSARY.
3. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE CITY OF CHARLOTTE.
4. DRIVEWAYS SHALL BE SEPARATED BY AT LEAST 5 FEET, OR GREATER IF REQUIRED BY PLANNING (LOT SIZE) REQUIREMENTS AND/OR N.C. BUILDING CODE.
5. DETAIL APPLIES TO SINGLE- OR DOUBLE-LOADED ALLEYS. FOR SINGLE-LOADED ALLEYS, THERE SHALL BE A 20-FOOT CLEAR ZONE FREE OF CUT SLOPES, OBSTRUCTIONS, HEDGES, ETC. FROM THE LOADED SIDE EDGE OF PAVEMENT.
6. MINIMUM 20'-WIDE PAVEMENT REQUIRED IF ALLEY IS TO BE CONSIDERED A "FIRE APPARATUS ACCESS ROAD" PER NC FIRE CODE.

* WITH NO PARKING PAD, DIMENSION D3 IS REQUIRED TO BE MINIMUM 5' BUT NO GREATER THAN 7'. WITH PARKING PAD, DIMENSION D4 IS REQUIRED TO BE A MINIMUM OF 20'.
NOTES:
1. SUBGRADE SHALL BE COMPACED TO PUBLIC STREET STANDARDS.
2. STORM DRAINAGE (NOT SHOWN) SHALL BE PROVIDED AS NECESSARY.
3. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE CITY OF CHARLOTTE.
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NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

RESIDENTIAL ALLEY DETAIL
DOUBLE LOADED W/ TWO-WAY OPERATION

11.19B17
NOTES:
1. SUBGRADE SHALL BE COMPACTED TO PUBLIC STREET STANDARDS.
2. STORM DRAINAGE (NOT SHOWN) SHALL BE PROVIDED AS NECESSARY.
3. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE CITY OF CHARLOTTE.
4. NO CUT SLOPES, OBSTRUCTIONS, HEDGES, ETC. ON NON-LOADED SIDE OF ALLEY WITHIN 20 FEET OF LOADED SIDE EDGE OF PAVEMENT.
5. DRIVEWAYS SHALL BE SEPARATED BY AT LEAST 5 FEET, OR GREATER IF REQUIRED BY PLANNING (LOT SIZE) REQUIREMENTS AND/OR N.C. BUILDING CODE.
6. MINIMUM 20' WIDE PAVEMENT REQUIRED IF ALLEY IS TO BE CONSIDERED A "FIRE APPARATUS ACCESS ROAD" PER NC FIRE CODE.

* WITH NO PARKING PAD, DIMENSION D3 IS REQUIRED TO BE MINIMUM 5' BUT NO GREATER THAN 7'. WITH PARKING PAD, DIMENSION D4 IS REQUIRED TO BE A MINIMUM OF 20'.

PLAN

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

RESIDENTIAL ALLEY DETAIL
SINGLE LOADED W/ TWO-WAY OPERATION

11.19C17
1. SEE DETAILS 11.19A–B FOR ALLEY DESIGN STANDARDS.

2. HAMMERHEAD DETAILS APPLY ONLY FOR TWO-WAY ALLEYS. ONE-WAY ALLEYS MUST CONNECT TO A PUBLIC STREET OR ANOTHER ALLEY.

3. FOR INTERSECTIONS WITH A LEAST ONE (1) ONE-WAY ALLEY, THE BACK-OF-CURB TO BACK-OF-CURB WIDTH CAN BE 16 FEET ON THE APPROPRIATE LEG(S) INSTEAD OF THE 20 FEET SHOWN.

4. OTHER INTERSECTION DESIGNS WILL BE APPROVED BY CDOT ON A CASE-BY-CASE BASIS.

5. THIS DETAIL DOES NOT ACCOMMODATE COMMERCIAL VEHICLES OR CHARLOTTE FIRE DEPARTMENT DESIGN FIRE TRUCK.

6. ADEQUATE STOPPING SIGHT DISTANCE (SSD) SHALL BE PROVIDED AT EACH INTERSECTION. MINIMUM SSD SHALL BE 50 FEET ASSUMING AN OPERATIONAL SPEED OF 10 MPH.
NOTES:

1. THE CENTRAL ISLAND SHALL BE PUBLIC RIGHT-OF-WAY.

2. THE CENTRAL ISLAND WILL NOT BE MAINTAINED BY THE CITY OF CHARLOTTE. A PROPERTY OWNERS' ASSOCIATION OR PRIVATE ENTITY WILL BE RESPONSIBLE FOR MAINTENANCE OF THE ISLAND.

3. ONLY GRASS, FLOWERS, GROUND COVER, ETC., WITH A MATURE HEIGHT OF 30 INCHES OR LESS WILL BE ALLOWED TO BE PLANTED IN THE CENTRAL ISLAND WITHOUT AN ENCROACHMENT AGREEMENT. ANY NONSTANDARD ITEM, E.G., BENCHES, IRRIGATION, ETC., PLACED IN THE ISLAND REQUIRES AN ENCROACHMENT AGREEMENT PRIOR TO INSTALLATION. CDOT REVIEWS EACH ENCROACHMENT REQUEST ON A CASE-BY-CASE BASIS AND MAY NOT APPROVE ENCROACHMENTS FOR ALL ITEMS REQUESTED.

4. WHERE NECESSARY, A SIDEWALK EASEMENT SHALL BE PROVIDED FOR ALL SIDEWALK LOCATED OUTSIDE THE PUBLIC RIGHT-OF-WAY. THE EASEMENT SHALL EXTEND FROM THE RIGHT-OF-WAY LINE TO TWO (2) FEET BEHIND THE BACK OF SIDEWALK, OR TO THE FACE OF BUILDING, WHICHEVER IS LESS.

5. SIDEWALK SHALL BE PROVIDED AS REQUIRED BY APPLICABLE ORDINANCE(S).

6. CUL-DE-SAC CAN BE OFFSET LEFT, OFFSET RIGHT, OR SYMMETRIC.

7. SIDEWALK MAY BE REQUIRED TO EXTEND AROUND CUL-DE-SAC BULB WHERE PARKS OR SCHOOLS HAVE FRONTAGE TO THE END OF THE CUL-DE-SAC.

8. ALL CURB RADII SHOWN ARE DIMENSIONED TO BACK-OF-CURB.

NOTE: THIS DETAIL IS NOT FOR USE IN ETJ, OR ON NCDOT-MAINTAINED STREETS. REFER TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS MANUAL.
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**NCDOT STANDARDS**
APPROVED FOR USE IN THE CITY OF CHARLOTTE AND CHARLOTTE ETJ
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<td>840.53</td>
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<td>IF USED AS A CATCH BASIN SUPPORTING NCDOT 840.03 FRAME, GRATE, AND HOOD – THE FLAT TOP SLAB ONLY ACCEPTABLE WHEN A 12&quot; VERTICAL RISER CAN BE ACCOMMODATED ON TOP OF THE STRUCTURE (BETWEEN THE TOP OF FLAT TOP SLAB AND BOTTOM OF FRAME/GRATE)</td>
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<tr>
<td>840.54</td>
<td>MANHOLE FRAME AND COVER</td>
<td>ALL COVERS SHALL BE SUPPLIED WITH A MINIMUM OF TWO AND A MAXIMUM OF SIX 1-INCH DIAMETER VENT HOLES.</td>
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<td>840.60</td>
<td>DRAINAGE STRUCTURE STEPS</td>
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<td>840.71</td>
<td>CONCRETE PAVED DITCHES</td>
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<td>840.72</td>
<td>PIPE COLLAR</td>
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<td>CONCRETE PAVED DITCHES</td>
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<td>850.04</td>
<td>METHODS FOR PLACEMENT OF DROP INLETS IN GRASSED MEDIAN (USING 1&quot;-6&quot; CURB AND GUTTER)</td>
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<td>850.05</td>
<td>MEDIAN CURB FOR CATCH BASIN (FOR USE WITH 1&quot;-6&quot; CURB AND GUTTER)</td>
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<td>850.06</td>
<td>METHOD OF PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS</td>
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<td>876.01</td>
<td>RIP RAP IN CHANNELS</td>
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<td>876.03</td>
<td>DRAINAGE DITCHES WITH CLASS &quot;A&quot; RIP RAP</td>
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<tr>
<td>876.04</td>
<td>DRAINAGE DITCHES WITH CLASS &quot;B&quot; RIP RAP</td>
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<td>310.01</td>
<td>1998 DRAWINGS CONCRETE FLARED END SECTION</td>
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</table>
GENERAL NOTES:
1. NOT FOR USE ON NCDOT—MAINTAINED ROADWAYS OR WITHIN THE CITY OF CHARLOTTE ETJ.
2. SEE NCDOT STANDARD 840.01 FOR DETAILS BASED ON PIPE SIZE PER CROSS SECTION.
3. CONSTRUCT TWO SINGLE BASINS PER NCDOT STANDARD WITH DOUBLE INTERIOR WALL.
4. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
5. BASE SLAB SHALL BE MONOLITHIC.
6. SEE CLDSM STANDARDS #10.29 AND #10.30 FOR PLACEMENT OF CATCH BASIN.
7. PIPE SECTION D2 CONNECTING CATCH BASINS SHALL HAVE A MINIMUM DIAMETER SAME AS OUTLET PIPE D3.
8. ALL REINFORCING STEEL SHOWN ON NCDOT STANDARDS IS TO BE PROVIDED AS CONTINUOUS MEMBERS. (NO LAPS, USED AS A SINGLE CONTINUOUS BAR IN THE SLAB)
9. WEEP HOLES SHALL BE PLACED IN BACK WALL WITH FILTER FABRIC OR STONE ON BACK SIDE

SECTION Y-Y 15” TO 24”

SECTION J-J 30” TO 36” PIPE

NOT TO SCALE
GENERAL NOTES:
1. MORTAR JOINTS SHOULD BE BETWEEN 3/8" AND 5/8" THICK.
2. ALL CONCRETE TO BE 3600 P.S.I COMpressive STRENGTH.
3. THE 6" OPENING SHOWN MAY BE INCREASED TO 8" MAX. IF DEEMED TO BE NECESSARY BY THE ENGINEER.
4. ALL CATCH BASIN OVER 3’-6” IN DEPTH SHALL BE PROVIDED WITH STEPS 1’-2” ON CENTERs. STEPS SHALL BE IN ACCORDANCE WITH STD. 20.12.
5. CONCRETE BRICK MAY BE USED IN LIEU OF HARD COMMON CLAY BRICK.
6. JUMBO BRICK WILL BE PERMITTED.
7. FOR 8’-0” IN HEIGHT OR LESS USE 8” WALL. OVER 8’-0” IN HEIGHT USE 12” WALL TO 6’-0” FROM TOP OF WALL, AND 8” WALL FOR THE REMAINING 6’-0”.
8. ALL ExPOSED JOINTS WILL BE CONCAVE TOOLEd.
9. ALL PIPE IN STORM DRAIN STRUCTURE SHALL BE STRUCK EVEN WITH THE INSIDE WALL, GROUTED AND BRUSHED SMOOTH.
10. WEEP HOLES SHALL BE PLACED IN BACK WALL WITH FILTER FABRIC OR STONE ON BACK SIDE.
11. THIS CATCH BASIN IS NOT TO BE USED WITHIN STREET RIGHT OF WAY UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

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<tr>
<th>DIMENSIONS OF BOX AND PIPE</th>
<th>REINFORCING</th>
<th>COVER DIMENSION</th>
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<td>BARS – Y</td>
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<td>NO. LENGTH</td>
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<tr>
<td>18” 4’-0” 2’-8” 2’-11”</td>
<td>2 3’-9”</td>
<td>8 5’-1”</td>
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<tr>
<td>24” 4’-0” 2’-8” 3’-5”</td>
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<td>42” 4’-0” 3’-6” 4’-11”</td>
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<tr>
<td>48” 4’-6” 4’-0” 5’-5”</td>
<td>2 5’-1”</td>
<td>10 5’-7”</td>
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SLAB TYPE CATCH BASIN
15” THRU 48” PIPE
MINIMUM WEIGHT

RING  96 LBS
COVER  86 LBS

DIAMOND PATTERN SOLID COVER OR ROUND GRATE COVER

PLAN VIEW

SECTION A-A

MANHOLE RING AND COVER
FOR SLAB TYPE CATCH BASIN

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. 20.05B 5

REV. 5
### Concrete Pipe Dimensions

<table>
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<th>OUT DIA.</th>
<th>IN DIA.</th>
<th>H</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>E</th>
<th>F</th>
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### Reinforcing

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City of Charlotte
Land Development Standards
Includes Charlotte ETJ

Concrete Wingwall with Splash Pad

Not to Scale
GENERAL NOTES:

1. ALL CORNERS TO BE CHAMFERED 1” IF CONCRETE.
2. THE CONTRACTOR WILL BE REQUIRED TO PLACE 2-#6 BARS “Y” IN THE TOP OF ALL ENDWALL FOR PIPE CULVERTS 42” AND OVER WITH A MINIMUM 3” COVER AND A LENGTH OF 6” LESS THAN ENDWALL.
3. FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
4. WALL THICKNESS (T) SHOWN IS NOT TO BE INTERPRETED TO MEAN THE THICKNESS ACCEPTABLE, BUT IS USED ONLY IN COMPUTING ENDWALL QUANTITIES.
5. IF CONTRACTOR ELECTS TO USE CONSTRUCTION JOINT AT BOTTOM OF PIPE, AND POurses BASE SEPARATELY, THE TOP OF BASE SHALL BE LEFT ROUGH.
6. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
**TABLE OF DIMENSIONS**

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<tr>
<th>D</th>
<th>T</th>
<th>A</th>
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<th>E</th>
<th>L</th>
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**GENERAL NOTES:**

1. SEE FORMER NCDOT STANDARD 310.01 FOR DETAILS.
2. REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF REINFORCED CONCRETE PIPE OF LIKE DIAMETER PER AASHTO M170, TABLE 2, WALL B.
3. ALL CONCRETE TO BE 3600 P.S.I COMpressive STRENGTH.
4. PROVIDE TONGUE OR SPIGOT JOINT AT INLET END SECTION.
5. PROVIDE GROOVE OR BELL JOINT AT OUTLET END SECTION.
6. THE DIMENSIONS FOR END SECTIONS SHALL SUBSTANTIALLY AGREE WITH THE TABLE. MINOR VARIATIONS WILL BE PERMITTED BASED ON THE MANUFACTURER’S STANDARD FORMS AND TEMPLATES.
7. NOT TO BE USED IN NCDOT MAINTAINED RIGHT OF WAY.

**FLARED END SECTION**

12” THRU 72” PIPE
NOTES:

1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER.

2. REFER TO THE CHARLOTTE MECKLENBURG STORM WATER DESIGN MANUAL FOR RIPRAP APRON DESIGN STANDARDS.

3. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.


5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1

6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.

7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.

8. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.

9. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.

10. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.

USE USDA NOMOGRAM FROM NC SEDIMENT AND EROSION CONTROL MANUAL OR CHARLOTTE MECKLENBURG STORM WATER DESIGN MANUAL FOR DESIGN DATA.

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<th>W₁</th>
<th>W₂</th>
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* d₅₀ (see fig 8.05 "NC SEDIMENT AND EROSION CONTROL MANUAL"
  d₅₀ = 1.5 x d₅₀
  T = 1.5 X d₅₀
  T(min.) = 10"
1. This detail is to only be used when outfall has a continuous flow of water and with prior approval of the City Engineer.

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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<td>2'</td>
<td>1'</td>
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<td>5'</td>
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NOTE

18" INTERMEDIATE RIP RAP

6" GRAVEL ON FILTER FABRIC

SECTION A-A

FLARED END SECTION OR END WALL

PLAN

1'-6"
GENERAL NOTES:

IN THE 4" CONCRETE PAVED DITCHES PLACE 1/2" EXPANSION JOINT AT 30 FT INTERVALS AND AT ALL OTHER POINTS WHERE PROPOSED DITCHES ABUT RIGID OBJECTS. PLACE GROOVED JOINTS 1" DEEP AT 10' INTERVALS BETWEEN EXPANSION JOINTS.

WIDTH AND SHAPE OF PROPOSED 4" CONCRETE PAVED DITCHES SHALL BE AS SHOWN OR AS DIRECTED BY THE ENGINEER.

ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.

SLOPE DRAIN, BASE DITCH OR BERM DRAINAGE

OUTLET DITCH

BERM DITCH

MEDIAN DITCH

MEDIAN OR BERM DITCH

SHOULDER POINT

SIDE DITCH

SHOWING GROOVED JOINT

SHOWING EXPANSION JOINT

LONGITUDINAL SECTION OF PAVED DITCH

SHOWING 2'-0" CURTAIN WALL REQUIRED AT EACH END

NOT TO SCALE
NOTES:

1. A minimum of 6" from outside diameter of pipe to side of trench must be allowed for washed stone. The method of compacting backfill material is subject to approval by the city engineer. An approved filter fabric shall be placed around stone and overlapped 8" at top within street right of way.

2. Subdrain is to be a minimum 6" diameter perforated pipe; use schedule 40 PVC per ASTM D1785 or HDPE per AASHTO M252, type SP (single-wall, corrugated) or type SP (double-wall, smooth interior).

3. Outlet pipe from subdrain shall be non-perforated under paving (including sidewalks and driveways). See site plan for slope of subdrain and tie in to storm drainage.

4. The outlet pipes shall be schedule 40 (min.) PVC per ASTM D2665 or HDPE per AASHTO M252, type S (double wall, smooth interior) under roadways.

5. Filter fabric shall be an approved, type 2 water permeable, synthetic fabric.

6. A minimum 4" diameter subdrain may be used in planting areas as described in the CLDSM 4000 series.

7. Clean-outs are recommended at all pipe intersections and at a 100' maximum separation.

8. Subdrain invert at catch basins should be installed above the bottom to avoid surcharge of subdrain system.

9. All subdrains will tie into a standard drainage structure or daylight to the surface where appropriate, and not directly into a pipe.

10. Only remove necessary masonry units to install pipe into basin wall. Precast structures will be core drilled 2 inches larger than pipe diameter to provide for installation of pipe in wall.

11. All pipe in storm drain structure shall be struck even with the inside wall, grouted and brushed smooth.

12. Pipe installation per section 300 NCDOT standard specifications for roads and structures.

13. Subdrains will be installed at a drainage structure and this connection will need to be inspected by city staff prior to backfilling.

14. Schedule 40 PVC (non-perforated) shall be used to make the connection to the storm drainage system. Connection will be within the right-of-way unless otherwise approved by the city engineer.

15. Prefabricated drainage may be used with approval of city engineer.

16. Maximum of two subdrain penetrations per wall of drainage structure.

Connection at drainage structure

Note: structure shown for representation purposes only.

City of Charlotte
Land Development Standards
Includes Charlotte ETJ

Subdrain Detail

Std. No. Rev. 20.28.12
THE SANITARY SEWER AND STORM DRAINAGE RIGHTS OF WAY MAY OVERLAP; HOWEVER, THE PIPE AND ASSOCIATED STRUCTURES MUST NOT BE IN THE OTHER UTILITY’S RIGHT OF WAY. THE SANITARY SEWER RIGHT OF WAY WIDTHS SHALL BE AS OUTLINED IN C.M.U.D.’S DESIGN MANUAL. THIS DETAIL DOES NOT APPLY TO STORM DRAINAGE UTILIZING OPEN CHANNEL FLOW.

PLAN VIEW

THE VERTICAL SEPARATION GUIDELINE WILL BE USED UP TO THE POINT WHERE THE TWO RIGHTS OF WAY ADJOIN EACH OTHER.

PROFILE VIEW


NOT TO SCALE
GENERAL NOTES:

1. FOR STREAMS CARRYING 500 ACRES OR MORE OF SURFACE RUNOFF, THE EASEMENT REQUIREMENT IS TO BE THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP OF BANK, PLUS (+) 10’ ON EACH SIDE OF STREAM. (40’ MINIMUM WIDTH)

2. FOR OPEN CHANNELS THE MINIMUM EASEMENT MUST CONTAIN THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP OF BANK.

3. WIDER EASEMENT WIDTHS MAY BE REQUIRED FOR PIPE DEPTHS GREATER THAN TEN FEET.

4. PIPE SYSTEMS AND OPEN CHANNELS ON PRIVATE PROPERTY SHALL BE PLACED IN A STORM DRAINAGE EASEMENT.

---

**Easement Requirements for Open Storm Drainage Channels**

<table>
<thead>
<tr>
<th>Area in Acre</th>
<th>Easement Requirement</th>
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<tr>
<td>0–45 ac.</td>
<td>20’</td>
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<tr>
<td>45–120 ac.</td>
<td>30’</td>
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<tr>
<td>120–500 ac.</td>
<td>40’</td>
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<tr>
<td>500 ac.+</td>
<td>see note</td>
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**Easement Requirements for Storm Drain Pipe**

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<th>Pipe Size</th>
<th>Easement Requirement</th>
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<td>18”</td>
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<td>42”</td>
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<td>48”</td>
<td>25’</td>
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<tr>
<td>54”+</td>
<td>30’MIN (VARIATES)</td>
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**NOT TO SCALE**
NOTES:

1. PRIOR APPROVAL FROM THE CITY ENGINEER IS REQUIRED FOR USE.

2. THIS STRUCTURE IS TO ONLY BE USED ON CITY MAINTAINED STREETS AND ONLY ON NCDOT—MAINTAINED STREETS WITH SPECIAL NCDOT PERMISSION.

3. SEE NCDOT DETAIL 840.01 FOR MAXIMUM PIPE SIZE ALLOWABLE

OFFSET CATCH BASIN FOR USE W/ EXISTING UTILITY CONFLICT

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

OFFSET CATCH BASIN

STD. MANHOLE FRAME AND COVER NCDOT 840.54

STD. FRAME, GRATE AND HOOD

SEE APPROPRIATE ROADWAY SECTION

2" COVER

8" CLEAR

SLOPE 1'/FT.

2" COVER

8" CONC.

8" CONC.

12" MINIMUM COVER OR AS SPECIFIED BY UTILITY COMPANY.

EXISTING UTILITY LINE

SELECT BACKFILL OR SUITABLE STRUCTURAL FILL

#5 REBAR @ 8" CENTERS BOTH WAYS

SEE CATCH BASIN DETAIL PER NCDOT

#4 REBAR AT 8" CENTERS BOTH WAYS

SEE STEP DETAIL (CLDSM 20.12 OR NCDOT 840.66)

8" DOWELS AT 6" CENTERS

24" LONG #4 REBAR
MIN. 6" FREEBOARD

REQUIRED HEAD (H)

DESIGN STORM WSEL

INVERT ELEVATION OF OPEN THROAT YARD INLET
(OR TOP OF GRATE IF GRATE–TOP INLET USED)

CONTOUR ELEVATION

TOP OF BERM CONTOUR
SHOW AND LABEL ON PLAN

<table>
<thead>
<tr>
<th>INLET NO.</th>
<th>DRAINAGE AREA (AC)</th>
<th>OPENING INVERT ELEV</th>
<th>HEAD H (FT)</th>
<th>TOP OF BERM ELEV.</th>
<th>FREEBOARD (FT)</th>
<th>COMMENT</th>
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GRADING AT YARD/DROP INLET

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

NOT TO SCALE
NOTES:

1. ALL BIORETENTION SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.

2. ALL DRAINAGE AREAS TO A BIORETENTION FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF AMENDED SOILS, MULCH OR PLANTINGS.

3. AMENDED SOIL WILL ONLY BE PERMITTED WITH A VALID SOIL ANALYSIS REPORT.

4. INSTALL WIRE SCREENING AROUND ALL OUTLET OPENINGS TO PREVENT LOSS OF MULCH.
NOTES:

1. ALL BIORETENTION FACILITIES SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.

2. ALL DRAINAGE AREAS TO A BIORETENTION FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF AMENDED SOILS, MULCH OR PLANTINGS.

3. AMENDED SOIL WILL ONLY BE PERMITTED WITH A VALID SOIL ANALYSIS REPORT. NO AMENDED SOIL SHALL BE ALLOWED ON THE SIDE SLOPES.

4. INSTALL WIRE SCREENING AROUND ALL OUTLET OPENINGS TO PREVENT LOSS OF MULCH.

5. PVC UNDERDRAIN PIPE SHOULD HAVE 3/8" PERFORATIONS SPACED AT 6" CENTERS, MIN. 4 HOLES PER ROW. MAX SPACING OF UNDERDRAIN PIPE IS 10 FEET ON CENTER. HDPE SHALL ADHERE TO AASHTO M252 SPECS.

6. UNDERDRAIN CLEANOUTS SHOULD EXTEND A MIN. OF 6" ABOVE TOP SURFACE OF MULCH LAYER. CLEANOUTS MAY BE FLUSH WITH TOP OF SURFACE TO ALLOW DRAWDOWN.

7. ONLY SMALL MATURING TREES ARE ALLOWED TO BE PLANTED IN THE AMENDED SOILS.
NOTES:

1. PLANTING ZONES AND PLANT SELECTION PER THE BMP DESIGN MANUAL, CHAPTER 6 & APPENDICES.

2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.

3. IRRIGATION MAY BE PROVIDED FOR INITIAL ESTABLISHMENT AND DRY SEASONS.

4. ONLY SMALL MATURING TREES ARE ALLOWED TO BE PLANTED IN THE AMENDED SOILS.
NOTES:

1. ALL CONCRETE SHALL BE 3600 PSI.

2. ALL JOINTS ARE TO BE SEALED WATER TIGHT.

3. WEIR IS TO BE POURED-IN-PLACE CONCRETE.

4. REFER TO NCDOT STANDARD DRAWINGS FOR BOX CONSTRUCTION.

5. NOT ACCEPTABLE FOR USE IN STREET RIGHT OF WAY WITHOUT CDOT/NCDOT APPROVAL.

FLOW SPLITTER STRUCTURE

BMP FIG. 4.1.11
NOTES:

1. 4–6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED ON LITTORAL SHELF AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN BMP DESIGN MANUAL)

2. PROVIDE 20 ACCESS EASEMENT TO CONNECT WETPOND EASEMENT TO DEDICATED RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS–SLOPE 5%.

3. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS BY A LICENSED PROFESSIONAL ENGINEER SHALL BE REQUIRED FOR EMBANKMENT SLOPES STEEPER THAN 3:1.

4. WATER–TIGHT SEAL MUST BE PROVIDED BETWEEN ALL RISER AND PIPE JOINT CONNECTIONS.

WETPOND PLAN

NOT TO SCALE
NOTES:

1. 4–6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED ON LITTORAL SHELF AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN BMP DESIGN MANUAL)

2. PROVIDE 20' ACCESS EASEMENT TO CONNECT WETPOND EASEMENT TO DEDICATED RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.

3. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS BY A LICENSED PROFESSIONAL ENGINEER SHALL BE REQUIRED FOR EMBANKMENT SLOPES STEEPER THAN 3:1.

4. WATER–TIGHT SEAL MUST BE PROVIDED BETWEEN ALL RISER AND PIPE JOINT CONNECTIONS.
NOTES:

1. PLANTINGS ZONES AND PLANT SELECTION PER THE BMP DESIGN MANUAL, CHAPTER 6 & APPENDICES.

2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.

3. IRRIGATION MAY BE PROVIDED FOR INITIAL ESTABLISHMENT AND DRY SEASONS.
1. 4-6 INCH LAYER OF AMENDED SOIL IS REQUIRED ON ANY MARSH AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN BMP DESIGN MANUAL)

2. PROVIDE 20' ACCESS EASEMENT TO CONNECT WETLAND EASEMENT TO DEDICATED RIGHT OF WAY.

3. ALL WETLANDS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.

4. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS BY A LICENSED PROFESSIONAL ENGINEER SHALL BE REQUIRED FOR EMBANKMENT SLOPES STEEPER THAN 3:1.

4. WATER-TIGHT SEAL MUST BE PROVIDED BETWEEN ALL RISER AND PIPE JOINT CONNECTIONS.
NOTES:

1. 4-6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN BMP DESIGN MANUAL)

2. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOTECHNICAL ANALYSIS BY A LICENSED PROFESSIONAL ENGINEER SHALL BE REQUIRED FOR EMBANKMENT SLOPES STEEPER THAN 3:1.

3. WATER-TIGHT SEAL MUST BE PROVIDED BETWEEN ALL RISER AND PIPE JOINT CONNECTIONS.

DUCTILE IRON MAINTENANCE DRAIN PIPE WITH SLUICE GATE OR VALVE. (TYP. ON-LINE WITH OUTLET AND LOCATE VALVE SO IT IS ACCESSIBLE VIA THE OUTLET STRUCTURE) 0.5% SLOPE MIN.
EMERGENCY SPILLWAY DETAIL

SPILLWAY MUST BE LINED AND STABILIZED TO RESIST EROSION (CONCRETE PREFERRED)

DEPTH FOR EMERGENCY OVERFLOW + 6" FREEBOARD

WATER QUALITY ORIFICE DETAIL

STRUCTURE

PERMANENT POOL

1'-0"

WATER QUALITY ORIFICE
NOTES
1. PLANTINGS ZONES AND PLANT SELECTION PER THE BMP DESIGN MANUAL, CHAPTER 6 & APPENDICES.
2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.
3. IRRIGATION MAY BE PROVIDED FOR INITIAL ESTABLISHMENT AND DRY SEASONS.
NOTES

1. PLANTING ZONES AND PLANT SELECTION PER THE BMP DESIGN MANUAL, CHAPTER 6 & APPENDICES.
2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.
3. IRRIGATION MAY BE PROVIDED FOR INITIAL ESTABLISHMENT AND DRY SEASONS.
NOTES:
1. ALL ENHANCED GRASS SWALES SHALL HAVE A MINIMUM 20-FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.
NOTES:
1. CONNECT GRASS SWALE EASEMENT TO A DEDICATED PUBLIC RIGHT OF WAY WITH A 20-FOOT ACCESS EASEMENT(114,597),(474,748)
NOTES:

1. CONNECT INFILTRATION TRENCH EASEMENT TO A DEDICATED PUBLIC RIGHT OF WAY WITH A 20-FOOT ACCESS EASEMENT.

2. 5 ACRE MAXIMUM DRAINAGE AREA.
2" PEA GRAVEL LAYER
FILTER FABRIC

3'-0"

REMOVABLE WELL CAP

UNDISTURBED SUBSOIL

PERFORATION HOLES TO BE 1/2 INCH DIAMETER
AT 3 INCH MINIMUM VERTICAL SPACING

4-6 INCH DIAMETER PIPE

16 INCH LONG 1/2-INCH DIAMETER REBAR ANCHOR

DEPTH VARIES FILLED WITH 1.5"-2.5" CLEAN STONE

14 INCH X 14 INCH 1/8-INCH STAINLESS STEEL FOOT PLATE

6" LAYER OF CLEAN, WASHED SAND

NOT TO SCALE
NOTES:

1. MAXIMUM SLOPE 2% FOR FILTER STRIP AND 5% FOR BUFFER STRIP.

2. 5 ACRE MAXIMUM DRAINAGE AREA.

3. ALL FILTER/BUFFER STRIPS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.

---

PLAN

STONE CURTAIN 6"X12" PEA GRAVEL PER ASTM D-448, SIZE #6 (1/8-3/8"") WRAPPED WITH FILTER FABRIC.

IMPERVIOUS PARKING FLOW

FLOW

UNIFORM GRADE GRASS FILTER

FOREST FILTER

NOT TO SCALE

---

BUFFER STRIP
BMP FIG. 4.7.3

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

21.21 2
NOTES:

1. ALL SAND FILTERS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. 1000' LONG, GRADE OF 15%, MAX. CROSS-SLOPE 5%. IN ADDITION, A 10-FOOT WIDE PERMANENT MAINTENANCE ACCESS EASEMENT MUST BE PROVIDED AROUND THE PERIMETER OF ALL BMP'S TO ALLOW FOR ADEQUATE MAINTENANCE AND REPAIR.

2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.

3. CLEAN OUTS IN THE UNDERDRAIN SYSTEM ARE TO BE PROVIDED EVERY 50' MINIMUM. CLEAN OUTS SHALL HAVE WATER TIGHT, VANDAL PROOF CAPS AND EXTEND 6" ABOVE THE SURFACE.

4. DEMONSTRATION OF APPROPRIATE SAFETY FACTORS AGAINST FAILURE THROUGH GEOFEDRAL ANALYSIS BY A LICENSED PROFESSIONAL ENGINEER SHALL BE REQUIRED FOR EMBANKMENT SLOPES STEEPER THAN 3:1.

5. WATER-TIGHT SEAL MUST BE PROVIDED BETWEEN ALL RISER AND PIPE JOINT CONNECTIONS.

---

**OVERFLOW SPILLWAY AS NEEDED**

**POST-CONSTRUCTION CONTROLS EASEMENT (PCCE)**

**UNDERDRAIN COLLECTION SYSTEM**

**SAND FILTER BED**

**PRETREATMENT SEDIMENTATION CHAMBER (FOREBAY)**

**INFLOW**

**OUTFLOW**

---

**CITY OF CHARLOTTE**

**LAND DEVELOPMENT STANDARDS**

**INCLUDES CHARLOTTE ETJ**

**SURFACE SAND FILTER**

---

**NOT TO SCALE**

21.24 20
THE TOP OF THE SAND FILTER MEDIA
MUST BE PROTECTED.
USE WASHED BERMUDA SOD, OR A
FILTER FABRIC WITH A LAYER OF
WASHED #2 STONE ON TOP.

NOTES:
1. "CONCRETE" SAND REFERS TO SAND THAT
   IS COMMONLY USED IN CONCRETE MIXES.
2. ALL DRAINAGE AREAS TO A SAND FILTER
   FACILITY ARE TO BE STABILIZED PRIOR
   TO INSTALLATION OF SAND.
3. UNDERDRAIN PIPES SHOULD BE MIN. 6"
   PERFORATED SCHEDULE 40 PVC (PER
   AASHTO M278) OR DOUBLE WALL HDPE
   (PER AASHTO M252). PERFORATIONS
   SHOULD BE ¾" SPACED 3" ON CENTER
   ALONG 4 LONGITUDINAL ROWS SPACED
   90° APART.
<table>
<thead>
<tr>
<th>STD. &amp; SPEC. #</th>
<th>TITLE</th>
<th>SPECIAL REQUIREMENTS &amp; NOTES</th>
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<tbody>
<tr>
<td>6.11</td>
<td>PERMANENT SEEDING</td>
<td>—</td>
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<td>6.17</td>
<td>ROLLED EROSION CONTROL PRODUCTS</td>
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<td>6.51</td>
<td>HARDWARE CLOTH &amp; GRAVEL INLET PROTECTION</td>
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<tr>
<td>6.60</td>
<td>TEMPORARY SEDIMENT TRAP</td>
<td>WEIR TOP WIDTH 10’ MIN., BOTTOM 7’ MIN.</td>
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<tr>
<td>6.61</td>
<td>SEDIMENT BASIN</td>
<td>FLASH BOARD RISER NOT PERMITTED</td>
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<td>6.64</td>
<td>SKIMMER SEDIMENT BASIN</td>
<td>1ST BAFFLE: RIP RAP &amp; WASHED STONE BERM</td>
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<td>2ND BAFFLE: STANDARD BAFFLE</td>
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<td>3RD BAFFLE: STANDARD BAFFLE</td>
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<tr>
<td>NCDOT 1606.1</td>
<td>SPECIAL SEDIMENT CONTROL FENCE</td>
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The standards & specifications shown are from the "North Carolina Erosion and Sediment Control Planning and Design Manual" (NCESCPDM) prepared by NC Dept. of Environment and Natural Resources (NCDENR); also reference NCDOT "Roadway Standard Drawings," latest edition.

The City of Charlotte has adopted the specific standards & specifications shown on this detail as mandatory minimum design standards & specifications. "Special Requirements & Notes" are included when the City of Charlotte's criteria are more stringent than the NCESCPDM or NCDOT standards.
**NOTES:**

1. REFER TO NCESC/CPDM SECTIONS 6.60 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING TEMPORARY SEDIMENT TRAPS.

2. REFER TO CLD'S STANDARD #30.19 FOR BAFFLE SPACING

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**DATA BLOCK**

<table>
<thead>
<tr>
<th>TRAP NO.</th>
<th>DRAINAGE AREA (ACRES)</th>
<th>DENUDED AREA (ACRES)</th>
<th>Q₁₀</th>
<th>TRAP VOLUME</th>
<th>TRAP SURFACE AREA</th>
<th>CLEANOUT DEPTH (FT.)</th>
<th>H (FEET)</th>
<th>L (FEET)</th>
<th>T (FEET)</th>
<th>W (FEET)</th>
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CITY OF CHARLOTTE

LAND DEVELOPMENT STANDARDS

INCLUDES CHARLOTTE ETJ

TEMPORARY SEDIMENT TRAP

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"H" refers to the height from invert of flexible hose on skimmer to the invert of the primary spillway.

NOT TO SCALE

City of Charlotte
Land Development Standards
Includes Charlotte ETJ
GENERAL NOTES:

1. Area under embankment shall be cleared, grubbed, and stripped of any vegetation and root material. The basin area shall be cleared.

2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while being constructed. Spillways should not be constructed through fill sections. All spillways should be lined and/or ripraped.

3. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to depth shown on standard. Removed sediment shall be deposited in a suitable area in such a manner that it will not erode.

4. The trap shall be inspected after each rain and repairs made as necessary.

5. Construction operation shall be carried out in such a manner that erosion and water pollution is minimized.

6. All cut and fill slopes shall be 2:1 or flatter, unless certified by registered geotechnical engineer.

7. Sediment basin embankments should be provided with erosion control and stabilization.

8. Storage area may be constructed in any shape provided the minimum storage volume requirement is met. The basin should also be oriented such that the filter and the main flow of water and sediment are on opposite ends on the longer basin dimensions.

9. The length of the stone outlet (spillway) is to be based on a 10 year storm.

10. Whenever topography allows, the basin length should be twice (2x) the basin width, to allow for settling. Baffles shall be installed in all basins.

11. Cleanout stakes shall be placed in all sediment basins at the low point in the basin. The stakes shall be marked showing the half full, cleanout point, of the basin.

12. Safety fencing 3' high should be placed around all sediment basins.


14. For slopes greater than 10° in length and protected by silt fence at the toe of the slope, slope terracing will be required.

15. The berm on sediment basins shall be seeded once final grade has been reached. The silt fence may be removed if permission has been granted by the city land development inspector after the grass has germinated and stable ground has been established.

16. Washed stone and wire backing shall be used with silt fence whenever silt fence is placed at the toe of a slope >10° vertical or along any channel or water course.
CONSTRUCTION SPECIFICATIONS:

1. THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1.5 FEET HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.

2. THE PIPE SHALL BE FLEXIBLE WITH WATER TIGHT CONNECTING BANDS. FLEXIBLE PIPE SHOULD BE STAKED ON EITHER SIDE.

3. A RIP RAP APRON SHALL BE PROVIDED AT THE OUTLET, IF EMPTYING INTO A DISTURBED AREA.

4. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPELED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.

5. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH STORM BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT.

6. OUTLET PIPE SHOULD BE TAKEN OVER OR THROUGH ANY SILT FENCE, TAKING CARE NOT TO VOID THE EFFECTIVENESS OF THE SILT FENCE.

UNLESS THEY ARE INDIVIDUALLY DESIGNED, SIZE THE DRAINS AS follows:

<table>
<thead>
<tr>
<th>MAXIMUM DRAINAGE AREA PER PIPE (ACRES)</th>
<th>PIPE DIAMETER (INCHES)</th>
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<tbody>
<tr>
<td>0.5</td>
<td>12</td>
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<tr>
<td>0.75</td>
<td>15</td>
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<tr>
<td>1.00</td>
<td>18</td>
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<tr>
<td>&gt;1.00</td>
<td>AS DESIGNED</td>
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NOT TO SCALE
NOTES:

1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM.
3. DITCHES SHOULD BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION REQUIREMENTS OF THE NGC010000 PERMIT.
4. WHERE DESIGN VELOCITIES EXCEED 2 FT/SEC, A CHANNEL LINER IS NECESSARY TO PREVENT DITCH EROSION.

<table>
<thead>
<tr>
<th>DITCH NO.</th>
<th>AREA (AC.)</th>
<th>DEPTH*</th>
<th>W (FT)</th>
<th>B (FT)</th>
<th>VELOCITY10</th>
<th>ROLLED EROSION CONTROL PRODUCT / LINING TYPE</th>
</tr>
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* = DEPTH INCLUDES 6" FREEBOARD
W = WIDTH AT TOP OF DITCH
B = WIDTH AT BOTTOM OF DITCH

NOT TO SCALE
GENERAL NOTES:
1. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
2. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF–FASTENER ANGLE STEEL TYPE.
3. TURN SILT FENCE UP SLOPE AT ENDS.
4. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
5. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
6. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
7. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:
1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH APPROX. HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
GENERAL NOTES:
1. WIRE FENCING SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 6" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.
6. WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
7. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
8. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
9. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
10. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:
1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED UsABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

HIGH HAZARD
TEMPORARY SILT FENCE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

NOT TO SCALE
GENERAL NOTES:
1. SEDIMENT FILTER OUTLET HARDWARE CLOTH SHALL BE 24" HIGH AND STONE SHALL BE A MINIMUM OF 12" HIGH.

2. HARDWARE CLOTH SHALL BE ANCHORED TO THE STEEL POSTS SECURELY USING APPROPRIATE ANCHORS. HARDWARE CLOTH SHALL BE KEYED IN A MINIMUM OF 12 INCHES IN LENGTH AND BACKFILLED PROPERLY AS SHOWN IN ABOVE DETAIL. HARDWARE CLOTH TO BE SAME AS STD. #30.09 (19 GAUGE, 1/4" SPACING).

3. POSTS SHALL BE NO MORE THAN 4 FEET APART.

4. SITE OUTLETS AT LOW AREAS IN CONJUNCTION WITH AND ALONG LONG RUNS OF Silt FENCE AT INTERVALS NO CLOSER THAN 100 FEET. DRAINAGE AREA TO OUTLETS SHALL NOT EXCEED 1/4 ACRE.

5. EQUIVALENT ALTERNATIVES MAY BE USED WITH PRIOR CITY APPROVAL.

MAINTENANCE NOTES:
1. FILTER OUTLETS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.

2. THE STONE SHALL BE REPLACED PROMPTLY AFTER ANY EVENT THAT HAS CLOGGED OR REMOVED IT.

3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE Silt FENCE OUTLET IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
GENERAL NOTES:

1. SUPER SILT FENCE MAY BE USED IN CRITICAL AREAS IN LIEU OF DOUBLE ROW HIGH HAZARD SILT FENCE.

2. INSTALL MINIMUM 2 INCH DIAMETER GALVANIZED STEEL POSTS, SIX FOOT LENGTH, SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.

3. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 3/8 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HOG RINGS.

4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BYPASS.

5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.

6. WASHED STONE (#5 OR #57) SHALL BE USED IN THE SILT FENCE TRENCH AND COMPACTED.

7. ORANGE SAFETY FENCE IS REQUIRED WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.

8. DRAINAGE AREA CANNOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.

9. SLOPE LENGTHS CANNOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

10. DO NOT INSTALL SUPER SILT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

MAINTENANCE NOTES:

1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.

2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
SPECIFIC APPLICATION:

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

BLOCK AND GRAVEL
STONE INLET PROTECTION

NOT TO SCALE
GENERAL NOTES:

1. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP.

2. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

3. THE STRUCTURE SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT AFTER EACH STORM EVENT AND REPAIRS MADE AS NECESSARY.

4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.

5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE BASIN HAS BEEN PROPERLY STABILIZED.

6. ON LARGER DRAINAGE AREAS RIP RAP MAY BE REQUIRED UNDER THE WASHED STONE.
GENERAL NOTES:

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.

2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.

3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.

4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.

5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.

6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.
GENERAL NOTES:

1. RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
2. CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.

A AND B ARE AT EQUAL ELEVATIONS

CROSS SECTION

PLAN

NOT TO SCALE

TEMPORARY ROCK CHECK DAM
GENERAL NOTES:

1. CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
3. COIR MATTING SHALL BE SUBSTITUTED FOR EXCELSIOR MATTING IN HIGH FLOW AREAS.
4. INITIALLY APPLY 3.50 OUNCES OF POLYACRYLAMIDE (PAM) TO THE FACE AND TOP OF THE CHECK DAM AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.
5. ONLY PAMs THAT PASS THE CHRONIC TOXICITY TESTING REQUIREMENTS, ESTABLISHED BY NCDWQ, MAY BE USED.
6. A SEDIMENT BASIN OR SIMILAR STRUCTURE BETWEEN THE APPLICATION POINT OF PAMs AND SURFACE WATERS IS REQUIRED.
7. SUPPLIER TO DETERMINE APPROPRIATE PAM BASED ON SOIL TYPE.

A AND B ARE AT EQUAL ELEVATIONS

TEMPORARY ROCK CHECK DAM WITH MATTING AND PAM
GENERAL NOTES:

1. USE MINIMUM 12 INCH DIAMETER FIBER WATTLE.
2. USE 2 FT. WOODEN STAKES WITH A 2 IN. X 2 IN. NOMINAL CROSS SECTION.
3. ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
4. INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
5. PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
6. INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
7. INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE NCDOT STANDARD SPECIFICATIONS.
8. PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.
9. INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.
NOTES:

1. A STABILIZED ENTRANCE PAD OF 2–3" OF WASHED STONE AND/OR RAILROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.

2. FILTER FABRIC OR COMPACTED CRUSHER RUN STONE SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.

3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEEPED BACK ON SITE ON A NIGHTLY BASIS.

5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN SEE STD. NO. 30.11B.

6. CDOT MAY REQUIRE A STANDARD COMMERCIAL DRIVEWAY (STD. 10.24 & 10.25) TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE, OR ON ANY STREET WITH AN EXISTING SIDEWALK TO REMAIN OPEN DURING CONSTRUCTION.

7. FOLLOW WORK AREA TRAFFIC CONTROL HANDBOOK (WATCH) FOR SIDEWALK CLOSURE OR DETOUR/DIVERSION.
SHEET FLOW DIVERSION (BERM OR DITCH)

NOTES:
1. PROVIDE 6” MINIMUM STONE DEPTH
2. USE #5 WASHED STONE AND RAILROAD BALLAST MIX
3. INSTALL SOIL STABILIZATION FABRIC OR 4” COMPACTED ABC STONE UNDER ENTRANCE
4. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEEP BACK ON SITE ON A NIGHTLY BASIS
5. MINIMUM LENGTH OF ENTRANCE = 25’

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

CONSTRUCTION ENTRANCE
SINGLE FAMILY LOT
GENERAL NOTES:

1. GRAVEL AND RIP RAP FILTER BERM BASIN SHOULD BE USED TO PROTECT EXISTING PIPE INVERTS.

2. DIMENSIONS SHOWN ARE THE MINIMUM ACCEPTED UNLESS OTHERWISE NOTED.

3. CLEANOUT PRIOR TO SEDIMENT REACHING HALF OF BERM HEIGHT.

4. MAY BE USED AT PIPES WITH MAX. DIAMETER OF 36".

VOLUME = 3600 FT³ PER ACRE DISTURBED TO TOP OF BERM ELEVATION.
SURFACE AREA REQ'D = 435 SQ. FT. PER CFS Q10

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

GRAVEL AND RIP RAP FILTER BERM BASIN
NOTE:
1. PRIOR TO INSTALLATION, MANUFACTURER SPECIFICATIONS OF FILTER MEDIA SHALL BE PROVIDED TO THE EROSION CONTROL INSPECTOR FOR APPROVAL AND USE. DISCHARGE FROM FILTER MEDIA SHALL MEET OR EXCEED THE PROVISIONS OF THE CLEAN WATER ACT.
2. ENSURE THAT PUMP PRESSURE DOES NOT EXCEED FILTER MEDIA PRESSURE RATING.
3. FILTER MEDIA MAY BE, BUT NOT LIMITED TO, SAND MEDIA FILTRATION DEVICES, RATED FILTER FABRIC BAGS OR POLYMER BASED DEWATERING PRACTICES.
4. PUMP STRAINER SHALL NOT BE IN CONTACT WITH BOTTOM OF POND.
NOTES:

1. REMOVE THE STRUCTURE WHEN NO LONGER NEEDED. (NOT TO EXCEED 1 YEAR).

2. AS A MINIMUM, DESIGN THE STRUCTURE TO PASS 2 YEAR PEAK FLOW WITHOUT OVERTOPPING.

3. ENSURE THAT DESIGN FLOW VELOCITY AT THE OUTLET OF THE CROSSING STRUCTURE IS NON-EROSSIVE FOR THE RECEIVING STREAM CHANNEL.

4. ADDITIONAL MEASURES MAY BE REQUIRED BY THE EROSION CONTROL COORDINATOR OR CITY ENGINEER BASED ON SITE SPECIFIC CONDITIONS.
NOTES:
1. INLET MAINTENANCE SHALL BE DOCUMENTED IN PROJECT LOG BOOK.
2. FILTER TYPES SHALL BE APPROVED BY THE CITY INSPECTOR PRIOR TO INSTALLATION.
3. FILTER BAGS MAY BE REMOVED WHEN SITE IS STABILIZED AT THE DIRECTION OF THE ENGINEER.
4. FILTER BAGS SHALL BE REMOVED PRIOR TO STREET ACCEPTANCE AND/OR CLOSE OUT OF GRADING PERMIT.
5. FILTER BAGS SHALL BE CLEANED OR REPLACED ON A REGULAR BASIS (NOT BE MORE THAN HALF FULL AT ANY TIME).
6. FILTER BAGS MAY BE INSTALLED IN EXISTING CITY OR NCDOT ROADS AS LONG AS STORM DRAINAGE IS NOT IMPEDED.
ALTERNATIVE 1:

NOTES:
1. IF DIVERSION DITCH USED, IT SHOULD FLOW INTO SEDIMENT BASIN ROCK CHECK DAM, OR SLOPE DRAIN
2. BENCH SHOULD BE GRADED AT 0% LONGITUDINAL SLOPE (ON-CONTOUR)

ALTERNATIVE 2:

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

SLOPE STABILITY
FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE
ANNUAL LESPEDEZA (KOE) – 50 LB/ACRE
OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE

SEEDING DATES:
JAN. 1 – MAY 1

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10–10–10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER:

SEEDING MIXTURE:
GERMAN MILLET – 40 LB/ACRE
(A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE)

SEEDING DATES:
MAY 1 – AUG. 15

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10–10–10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE

SEEDING DATES:
AUG. 15 – DEC 30

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10–10–10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10. FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11 AND THE CHARLOTTE LANDSCAPE CONSTRUCTION STANDARDS SECTION 04200 SEEDING AND SODDING OF TURFGRASS.
NOTES:

1. TEMPORARY BERMS ARE INSTALLED TO ACHIEVE DESIGNED DRAINAGE AREAS PRIOR TO FINAL ASPHALT LIFT BEING INSTALLED ON ROAD SURFACE.

2. CONTRACTOR TO INSTALL TEMPORARY BERMS ON INTERMEDIATE COURSE, ON HIGH SIDE OF CURB INLETS FOR STRUCTURES ALONG THE STREET SLOPE.

3. REMOVE BERM PRIOR INSTALLING FINAL ASPHALT LIFT, FINISHING ROAD SURFACE.

4. REMOVE ACCUMULATED SEDIMENT FROM ABOVE BERM WEEKLY AND AFTER RAINFALL, AS NEEDED TO MAINTAIN FUNCTION.

5. CATCH BASIN INLET PROTECTION MAY BE OMITTED IF APPROVED BY EROSION CONTROL COORDINATOR.
GENERAL NOTES:

1. DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.

2. USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FILTER FABRIC TO THE WIRE FENCE.

3. PROVIDE 4 TREATMENT ZONES, 25% OF SURFACE AREA IN EACH ZONE (3 BAFFLES). FOR BASINS LESS THAN 40 FEET LONG, PROVIDE 3 TREATMENT ZONES, 33% OF SURFACE AREA EACH ZONE (2 BAFFLES)

4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.

5. REFER TO NCSCPDM SECTION #6.65 FOR ADDITIONAL SPECIFICATIONS.
**GENERAL NOTES:**

1. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

2. DIMENSIONS SHOWN ARE MINIMUM, MANUFACTURED PRODUCTS MAY HAVE ADDITIONAL REQUIREMENTS THAT MUST BE MET.

3. SLOPE SURFACE SHALL BE FREE OF ROCKS, SOIL CLODS, STICKS, GRASS. MAT/BLANKETS SHALL HAVE GOOD SOIL CONTACT.

4. THE DETAIL SHOWN IS FOR SLOPE MATTING. FOR CHANNEL OR PIPE OUTFALL MATTING SPECIFICATIONS, PLEASE REFER TO NCESC PDM STANDARD #6.17 AND MANUFACTURER’S GUIDELINES.

5. ALL MATTING SHALL BE 100% BIODEGRADABLE WITH ORGANIC NETTING. PLASTIC OR NON-BIODEGRADABLE NETTING WILL NOT BE ALLOWED. PLEASE NOTE TURF REINFORCED MATTING (TRM) IS PERMITTED WHERE DESIGN CRITERIA WARRANTS ITS USE.

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**NOT TO SCALE**

**EMBANKMENT MATTING DETAIL**
GENERAL NOTES:
1. SEE APPROPRIATE STANDARD FOR CATCH BASIN, MANHOLE, JUNCTION BOX USED.
2. ALL PIPE IN STORM DRAIN STRUCTURES SHALL BE STRUCK EVEN WITH THE INSIDE WALL, GROUTED AND BRUSHED SMOOTH.

PLAN

SELECT BACKFILL AROUND RCP
OUTLET END OF PIPE

INSIDE FACE OF STRUCTURE.
SEE NCDOT STD. 840.71 CONCRETE AND BRICK PIPE PLUG.
PLACE PIPE PLUG FLUSH WITH INSIDE WALL OF STRUCTURE AND AT OUTLET END OF PIPE OR USE FLOWABLE FILL AS DIRECTED BY CITY ENGINEER.

SECTION X-X
ACTIVE SYSTEM

PIPE PLUG DETAIL
AFTER REMOVAL OF TEMPORARY PIPE

PERMANENT STORM PIPE

STUB 4 FEET MINIMUM RCP TO MAKE CONNECTION WITH TEMPORARY PIPE.
(RCP TO REMAIN IN STRUCTURE)

NCDOT STD. 840.72 PIPE COLLAR
(TO BE REMOVED WITH TEMP. PIPE)
TEMPORARY OUTLET PIPE SIZED FOR 10 YEAR EVENT SHALL BE REMOVED AS DIRECTED BY THE CITY ENGINEER.
NOTE:
ANCHOR ALL PUMPS AND PIPES SECURELY

ANCHOR PIPE SECURELY

SUCTION HOSE TO DEWATERING DEVICE

SEAL AROUND PIPE

FLOW
NOTE:
ANCHOR ALL PUMPS AND PIPES SECURELY
TURBIDITY CURTAIN (IN BASIN):

1. TURBIDITY CURTAINS MAY BE USED IN LIEU OF BAFFLES IN SEDIMENT OR SKIMMER BASINS WHERE THE TEMPORARY OR PERMANENT POOL ELEVATION WILL CONSISTENTLY BE ABOVE 3 FT (I.E. ABOVE TYPICAL INSTALLED BAFFLE HEIGHT).

2. A MINIMUM OF ONE TURBIDITY CURTAIN SHALL BE USED IN SKIMMER BASINS (30.02A) AND A MINIMUM OF ONE ROCK BAFFLE AND ONE TURBIDITY CURTAIN SHALL BE USED IN SEDIMENT BASINS (30.03A).

3. TYPE 1 TURBIDITY CURTAINS (FOR CALM WATERS) AT A MINIMUM SHALL BE USED, CONSTRUCTED OF MINIMUM SPECIFICATIONS OF 13 OZ. PVC FABRIC, 4 IN. FLOAT, AND A 3/16 IN. BOTTOM BALLAST CHAIN. THE MAXIMUM SPAN BETWEEN JOINTS IS 100 FT.


5. ACCUMULATED SEDIMENT SHALL BE REMOVED BEHIND THE TURBIDITY CURTAIN(S) TO RESTORE BASIN CAPACITY ONCE 50% CAPACITY IS REACHED.

6. WHEN THE CURTAIN IS NO LONGER REQUIRED, THE CURTAIN AND COMPONENTS SHALL BE REMOVED IN SUCH A MANNER AS TO MINIMIZE TURBIDITY. REMAINING SEDIMENT SHALL BE SUFFICIENTLY SETTLED BEFORE REMOVING THE CURTAIN. SEDIMENT MAY NEED TO BE REMOVED TO ACHIEVE THE PERMANENT PLANNED ELEVATION AND SPOILS PROPERLY DISPOSED OR STABILIZED.

TURBIDITY CURTAIN (IN POND/COVE):

1. TURBIDITY CURTAINS MAY BE USED IN PONDS OR COVES (WITH REQUISITE APPROVAL) WHERE UPLAND DISTURBANCES/CONSTRUCTION WILL OCCUR TO REDUCE SEDIMENT TRANSPORT TO A LIMITED AREA IN THE RECEIVING WATERCOURSE.

2. TYPE 1 TURBIDITY CURTAINS SHALL BE USED IN PROTECTED AREAS WHERE THERE IS NO CURRENT AND THE AREA IS SHELTERED FROM WIND AND WAVES, CONSTRUCTED OF MINIMUM SPECIFICATIONS OF 13 OZ. PVC FABRIC, 4 IN. FLOAT, AND A 3/16 IN. BOTTOM BALLAST CHAIN. THE MAXIMUM SPAN BETWEEN JOINTS IS 100 FT. SHOULD TYPE 2 OR TYPE 3 TURBIDITY CURTAINS BE NEEDED (WHERE THERE MAY BE SMALL TO CONSIDER CURRENT AND/OR WIND AND WAVE ACTION), ENGINEERED SPECIFICATIONS SHALL BE PROVIDED WITH THE PLAN SUBMISSION. TURBIDITY CURTAINS SHOULD NOT BE PLACED ACROSS THE MAIN FLOW OF A SIGNIFICANT BODY OF MOVING WATER.

3. THE TURBIDITY CURTAIN SHOULD BE ANCHORED TO THE SHORELINE ABOVE THE NORMAL HIGH WATER MARK, TOWED TO THE DESIRED LOCATION, AND ANCHORED (IF NEEDED) TO MAINTAIN THE DESIRED LOCATION WITHIN THE WATERCOURSE. THE TURBIDITY CURTAIN SHOULD EXTEND TO 1 FT ABOVE THE BOTTOM OF THE WATERCOURSE.

4. WHEN THE CURTAIN IS NO LONGER REQUIRED, THE CURTAIN, ANCHORS, AND COMPONENTS SHALL BE REMOVED AND IN SUCH A MANNER AS TO MINIMIZE TURBIDITY. REMAINING SEDIMENT SHALL BE SUFICIENTLY SETTLED BEFORE REMOVING THE CURTAIN. SEDIMENT MAY NEED TO BE REMOVED TO ACHIEVE THE ORIGINAL DEPTH OF THE WATERCOURSE AND SPOILS PROPERLY DISPOSED OR STABILIZED.
NOTES:

1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.

3/4" NYLON STRAP

ROOT CROWN TO BE AT FINISH GRADE

KEEP MULCH AWAY FROM TRUNK 1" TO 2"

3" SLIP KNOT WITH STOP KNOT, 6" LARGER THAN TREE DIAMETER

4" MAXIMUM LAYER OF MULCH

FINISH GRADE

BACKFILL AS SPECIFIED

REMOVE TYPICAL EXCESS SOIL FROM ROOT CROWN

REMOVE TOP 1/3 BURLAP AND ANY NAILS/PINS, ETC.

REMOVE TOP 1/3 OF WIRE BASKET WHERE PRESENT

RAISE PIT BOTTOM TO SET ROOT CROWN AT THE CORRECT HEIGHT. FIRM SOIL UNDER ROOT BALL.

3 - 1"x2"x18" WOOD STAKES WITH CENTERED 3/8" HOLE DRIVEN IN LINE WITH STRAP EQUALLY SPACED AROUND TREE

4" HIGH / 6" WIDE MAXIMUM BURN OUTSIDE OF ROOTBALL

ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

FOR EXAMPLE:

<table>
<thead>
<tr>
<th>CALIPER</th>
<th>HEIGHT (RANGE)</th>
<th>MAX. HEIGHT</th>
<th>MIN. ROOT BALL DIA.</th>
<th>MIN. ROOT BALL DEPTH</th>
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<tbody>
<tr>
<td>2&quot;</td>
<td>12'-14'</td>
<td>16'</td>
<td>24&quot;</td>
<td>16&quot;</td>
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<tr>
<td>3&quot;</td>
<td>14'-16'</td>
<td>18&quot;</td>
<td>32&quot;</td>
<td>21&quot;</td>
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NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

TREE PLANTING
(FOR SINGLE AND MULTI-STEM TREES)

STD. NO. 40.01 REV.
SEE APPROVED TREE PRESERVATION PLAN FOR REQUIRED RADIUS OF TREE BARRIER

PLAN VIEW OF ROOT ZONE

NOTES:
1. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
2. LANDSCAPING PLANS SHALL SHOW THE LOCATIONS OF ALL TREE PROTECTION FENCES.
3. REFER TO CITY OF CHARLOTTE LANDSCAPE CONSTRUCTION STANDARDS SECTION 01000 FOR GENERAL SPECIFICATION REGARDING TREE PROTECTION.

FOR PRUNING SEE INTERNATIONAL SOCIETY OF ARBORICULTURE SPECS.

DEAD TREES AND SCRUB OR UNDERGROWTH SHALL BE CUT FLUSH WITH ADJACENT GRADE. NO GRUBBING ALLOWED UNDER DRIPLINE.

2"x4" STANDARDS + 1"x4" RAILS OR ORANGE SAFETY FENCING MAY BE USED.

ONE FOOT FOR EACH INCH OF TRUNK DIAMETER OR 1/2 HEIGHT OF TREE WHICHEVER IS GREATER

6" BARK MULCH, PLACE BARK MULCH AT AREAS NOT PROTECTED BY BARRIER.

6" MINIMUM WIDTH FOR 2" CAL TREES OR SMALLER
SECTION A

LARGE AND SMALL MATURING TREE PIT WITH GRATE IN SIDEWALK (SECTION)

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

STD. NO. 40.03A REV. 3
NOTE:
W = 17'-6" FOR LARGE MATURING TREE.
W = 12'-6" FOR SMALL MATURING TREE.
TREE PITS MAY BE CONTIGUOUS

SECTION B
NOTE
A DRAINAGE SYSTEM IS REQUIRED AS SHOWN FOR ALL IRRIGATED PLANTING AREAS LOCATED ADJACENT TO STREET.

GENERAL NOTES:
1. EXPANSION JOINTS ARE PERMITTED AT 40' MIN. SPACING AND NOT LESS THAN 12'-6" FROM CENTER OF TREE GRATE.
2. SEE STANDARD NUMBER 10.22 FOR DETAIL OF GROOVE JOINT.
3. CONCRETE SHALL BE 3600 PSI IN 28 DAYS.
4. ALL REINFORCING STEEL SHALL BE GRADE 60.
5. USE REINFORCED STEEL BAR SUPPORTS IN COMPLIANCE WITH N.C.D.O.T. STANDARD SPECIFICATION 970-4.

SECTION C

LARGE AND SMALL TREE PIT WITH GRATE IN SIDEWALK (SECTION)
NOTES:

1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINISHED GRADE.
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.

TYPICAL BED CROWNING

CROWN HEIGHT IN INCHES EQUALS MEDIAN WIDTH IN FEET TO 12" MAX.

TYPICAL PLANTING BED DETAIL

SPACING VARIES SEE LANDSCAPE PLAN

TYPICAL PLANTING BED PLAN

TYPICAL PLANTING BED

CATION CLAY MIN. 2" HT.
4" LAYER OF APPROVED MULCH
"V" TRENCH AROUND ENTIRE PLANTING BED
EDGE OF PLANTING BED
ACCEPTABLE PLANT MEDIA
TAMP SOIL MIX UNDER EACH PLANT BALL TO MINIMIZE SETTLEMENT

CITY OF CHARLOTTE LAND DEVELOPMENT STANDARDS INCLUDES CHARLOTTE ETJ

SHRUB PLANTING BED

STU. NO. REV. 40.05A 9
NOTES:

1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINISHED GRADE.
3. TAMPER PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
NOTES:
1. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB-BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES
2. REMOVE COMPACTED SOIL AND ADD 36" NEW TOPSOIL WITH PLANT MIX OR UNCOMPACT AND AMMEND TO 36" OF EXISTING SOIL TO MEET TOPSOIL WITH PLANTING MIX STANDARDS FOR TREES. (SEE DETAIL)
3. IF PLANTING STRIP IS LESS THAN 8 FT WIDE IRRIGATION AND SUBDRAIN ARE REQUIRED.
4. IRRIGATION AND SUBDRAIN ARE NOT APPROVED FOR USE ON NCDOT-MAINTAINED STREETS.

IRREGULATION LINE
(If Required)

2'-6' CURB AND GUTTER

EXCAVATE AT 1:1 SLOPE
SO AS NOT TO DISTURB STREET SUBGRADE

LAWN (SOD) AREA

MULCH RING

MIN. CALIPER 3'-3 1/2"

CONCRETE SIDEWALK

COMPACTED SUBGRADE

36" TOTAL TOPSOIL OR PLANTING MIX

36" TREE PLANTING STRIP UMUD ONLY
(WITH IRRIGATION AND DRAINAGE)
NOTES:

1. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB-BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.

2. REMOVE SOIL TO A DEPTH OF 18". SCARIFY, TILL OR OTHERWISE LOOSEN THE REMAINING SOIL TO A DEPTH OF 18". ADD NEW PLANTING MIX AS SPECIFIED.

3. SUBSURFACE DRAINAGE SHALL BE INSTALLED IN ALL MEDIANs AND TIED INTO EXISTING STORM DRAIN SYSTEM. A 4 INCH PERFORATED CORRUGATED PVC DRAIN OR HDPE PER AASHTO M252, TYPE CP (SINGLE-WALL, CORRUGATED) SHALL BE INSTALLED IN EACH MEDIAN AT THE BOTTOM OF THE EXCAVATED AREA. DRAIN SHALL BE COVERED WITH A MINIMUM 6 INCHES OF #57 WASHED STONE, THEN WRAPPED WITH A SPECIFIED NON-WOVEN GEOFABRIC. SPECIAL CARE SHALL BE EXERCISED WHEN FILLING MEDIANs WITH SOIL SO NOT TO CRUSH OR DAMAGE THE DRAINAGE SYSTEM.
NOTES:

1. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB-BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.

2. REMOVE SOIL TO A DEPTH OF 18". SCARIFY, TILL OR OTHERWISE LOOSEN THE REMAINING SOIL TO A DEPTH OF 18". ADD NEW PLANTING MIX AS SPECIFIED.

3. SUBSURFACE DRAINAGE SHALL BE INSTALLED IN ALL MEDIANs AND TIED INTO EXISTING STORM DRAIN SYSTEM. A 4 INCH PERFORATED CORRUGATED PVC DRAIN OR HOPE PER AASHTO M292, TYPE CP (SINGLE-WALL, CORRUGATED) SHALL BE INSTALLED IN EACH MEDIAN AT THE BOTTOM OF THE EXCAVATED AREA. DRAIN SHALL BE COVERED WITH A MINIMUM 6 INCHES OF #57 WASHED STONE, THEN WRAPPED WITH A SPECIFIED NON-WOVEN GEOTEXTILE FABRIC. SPECIAL CARE SHALL BE EXERCISED WHEN FILLING MEDIANs WITH SOIL SO NOT TO CRUSH OR DAMAGE THE DRAINAGE SYSTEM.
NOTES:

1. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB-BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.

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4. WIDTH VARIES

- SCARIFIED SOIL
  18"-36" DEPTH
  90% COMPACTED

- IRRIGATION LINE (IF REQUIRED)

- 1'-6" CURB AND GUTTER

- NEW PLANTING MIX TO 18" DEPTH
  90% COMPACTED

- SLOPE AT 2" PER FOOT MAX.
  WITH UNCOMPACTED PLANTING MIX.

- 1'-6" CURB AND GUTTER

- 4" SUBDRAIN
  (SEE CLDS 20.28)

- 100% COMPACTED SUBGRADE

- SLOPE TO PROVIDE POSITIVE DRAINAGE
  (4% MINIMUM)
NOTE:
A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE CITY ARBORIST TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF CITY ARBORIST DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.
PLANTINGS IN STREET RIGHT-OF-WAY

GENERAL NOTES

1. TREE CRATES AND ASSOCIATED IRRIGATION SYSTEMS ARE REQUIRED AT VARIOUS LOCATIONS IN THE UPTOWN AREAS TO COMPLY WITH THE UPTOWN STREETSCAPE GUIDELINES AND OTHER ZONING REQUIREMENTS. ALL OTHER INSTALLATIONS OF IRRIGATION SYSTEMS WITHIN THE RIGHT-OF-WAY OF CITY OR STATE MAINTAINED STREETS REQUIRE AN ENCROACHMENT AGREEMENT EXECUTED THROUGH CDOT OR NCDOT. THE CITY’S ENCROACHMENT AGREEMENT REVIEW/APPROVAL PROCESS MAY INCLUDE ADDITIONAL REQUIREMENTS. CONTACT CDOT OR NCDOT FOR ADDITIONAL INFORMATION REGARDING COST, SUBMITAL, AND LIABILITY INSURANCE COVERAGE REQUIREMENTS.

2. A DRAINAGE SYSTEM IS REQUIRED AS SHOWN FOR ALL IRRIGATED PLANTING AREAS LOCATED ADJACENT TO STREETS. ALL IRRIGATION/DRAINAGE SYSTEMS NOT REQUIRED BY THE UPTOWN STREET GUIDELINES REQUIRE AN ENCROACHMENT AGREEMENT EXECUTED BY CDOT OR NCDOT FOR CITY OR STATE-MAINTAINED ROADS, RESPECTIVELY. CONTACT CDOT OR NCDOT FOR ADDITIONAL INFORMATION REGARDING COST, SUBMITAL AND LIABILITY INSURANCE COVERAGE REQUIREMENTS.

3. AN INSPECTION SCHEDULE IS NEEDED FOR TREES THAT WILL BE PLANTED IN THE STREET RIGHT OF WAY DUE TO ZONING OR OTHER REQUIREMENTS. LANDSCAPE INSPECTION INCLUDE THE FOLLOWING:

   SUBDRAINAGE INSPECTION
   TREE PIT/WELL OR PLANTING STRIP INSPECTION
   SOIL MIX APPROVALS/INSPECTIONS
   TREE APPROVALS/INSPECTIONS — PRIOR TO PURCHASING THE TREES, TO BE MADE BY THE CITY ARBORIST OR ASSISTANT CITY ARBORIST — 336-4262.
   THIS MAY INCLUDE PHOTO APPROVAL OR PARTICIPATION IN TAGGING THE TREES.
   TREE PLANTING INSPECTION
   IRRIGATION INSPECTION
   FINAL WALK THROUGH

ALL OF THE ABOVE INSPECTIONS WILL BE PERFORMED BY THE CITY LAND DEVELOPMENT DIV. (URBAN FORESTRY SECTION) EXCEPT FOR THE TREE APPROVALS AS NOTED.
NOTES:

1. BRIDGING LENGTH IS A MINIMUM OF 1 LINEAR FOOT OF BRIDGING PER INCH OF TREE CALIPER. BASED ON FIELD CONDITIONS, MAY BE LONGER AS NEEDED.

2. NOT TO BE USED WHEN LESS THAN 4" WIDE PLANTING STRIP BETWEEN SIDEWALK AND BACK OF CURB.
NOTES:

1. THIS TREE BUMPER DETAIL SHALL BE USED WHEN WORKING WITHIN 10' OF AN EXISTING TREE TO BE PROTECTED.

2. ALL TREES SHALL BE SAVED UNLESS NOTED OTHERWISE ON THE PLANS OR DIRECTED BY THE ENGINEER.

3. LUMBER, WIRE, AND SANDBAGS MAY BE REUSED AT OTHER TREES.

4. THE INTENT OF THIS DETAIL IS TO PROTECT EXISTING TREES FROM DAMAGED DURING CONSTRUCTION ESPECIALLY FROM BACKHOE ARM SWING. AN ALTERNATE APPROACH MAY BE USED IF APPROVED IN WRITING BY THE ENGINEER AFTER CONSULTATION WITH THE CITY ARBORIST OR HIS DULY AUTHORIZED REPRESENTATIVE.

SCRAP 2" X 4" LUMBER MAY BE USED TO SUPPORT WIRE ON BACK SIDE OF TREE

* SPACING AS NEEDED TO SUPPORT WIRE WITHOUT CUTTING TREE BARK

PLAN VIEW

6" TYP.

ELEVATION VIEW

STEEL WIRE TO TIE LUMBER TO TREE

USE A COMBINATION OF EXTENDED 2X4's AND SAND BAGS TO PROTECT THE BUTTRESS SAND BAGS & BUTTRESS ROOTS, (TYP.)

2" X 4" X 6' LUMBER, (TYP.)
NOTES:
1. CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR EXISTING TREES.
2. WHERE EXISTING TREES ARE WITHIN 4' OF THE PROPOSED BACK OF CURB, THE PROPOSED CURB SHALL END A MINIMUM OF 12" FROM THE TREE'S BUTTRESS ROOTS.
3. CONTRACTOR SHALL COORDINATE WITH THE CITY ARBORIST TO IDENTIFY TREES FOR WHICH THIS DETAIL APPLIES PRIOR TO CONSTRUCTION NEAR THE TREE(S).
4. NO TREES SHALL BE REMOVED UNLESS CLEARLY SPECIFIED ON THE PLANS OR IDENTIFIED BY THE ENGINEER.
5. AVOID FILL PLACEMENT NEAR TREE.
6. FOR ADDITIONAL SPECS., SEE SECTION 1000 PART 03. B AND C
NOTES:

1. NOT TO SCALE.

2. APPLICATION DESIGNED FOR TREES NO LESS THAN 12" IN DIAMETER.

3. FILL – SEE CLDSM – PLANTING MIX. APPLY TO A DEPTH OF FOUR (4) INCHES AT BASE OF TREE, TAPER TO GRADE. SEED AND MULCH ACCORDING TO CLDSM.

4. STONE – #5, WASHED. MAINTAIN EXPOSED SIX (6) INCH WIDTH AT TRUNK OF TREE. PLACE TO MINIMUM DEPTH OF TWELVE (12) INCHES AND A MAXIMUM OF TWENTY-FOUR (24) INCHES AT THE BASE OF THE TREE AND TAPER OUTWARD TO NO LESS THAN TEN (10) FEET.

5. FABRIC – NON-WOVEN GEOTEXTILE FABRIC, SUCH AS MIRAFI OR EQUIVALENT, PLACED BETWEEN STONE AND FILL. IT IS NOT TO COVER STONE EXPOSED AT TRUNK OF TREE.
NOTES:
1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. TYPE OF PIPE TO BE USED IS 1-5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE OR GALVANIZED.
3. ALL JOINTS TO HAVE A 1/2" FILLET WELD AT ALL JOINTS.
4. AFTER INSTALLATION PAINT ASSEMBLY WITH BLACK ALL WEATHER ENAMEL.
5. SEE DETAIL 50.04-B FOR WARRANTS
6. ALTERNATIVE DESIGNS SHALL BE SENT TO CDOT FOR APPROVAL. ANY ALTERNATE DESIGN WILL BE PRIVATELY MAINTAINED.
WARRANTS

STANDARD SAFETY RAIL (STD. #50.04A) SHALL BE INSTALLED UNDER ANY OF THE FOLLOWING CIRCUMSTANCES IN BOTH NEW CONSTRUCTION AND IN RETROFITTING OR RECONSTRUCTION OF EXISTING ROADWAYS OR SITES:

1. WHEN THE CULVERT CROSSING DETAIL (STD. #10.36A–B) APPLIES.

2. IF THERE IS A TWO FOOT OR GREATER DROP-OFF WITHIN 2 FEET OF THE EDGE OF THE SIDEWALK (SEE DIAGRAM A).

3. IF THERE IS A 1-FOOT OR LARGER DROP-OFF DIRECTLY ADJACENT TO THE SIDEWALK EDGE (SEE DIAGRAM B).

4. AT THE DIRECTION OF CDO, PLANNING, OR ENGINEERING STAFF BASED ON FIELD CONDITIONS.

DEFINITIONS

- DROP-OFF -- A SLOPE OF 2:1 OR STEEPER. EXAMPLES INCLUDE HEADWALLS, RETAINING WALLS, AND CULVERTS.

- SIDEWALK -- FOR PURPOSES OF THIS STANDARD, THE TERM "SIDEWALK" IS USED GENERICALLY AND SHALL MEAN ANY PATH OR SURFACE TO BE USED FOR BICYCLE AND/OR PEDESTRIAN TRANSPORTATION. EXAMPLES INCLUDE, BUT ARE NOT LIMITED TO, SIDEWALKS, BIKE PATHS, SHARED-USE PATHS, PEDESTRIAN PATHS, AND GREENWAYS.
**KEY TO FASTENERS:**

A. #10-24 x 1/2" HEX HEAD MACHINE, ZINC—DEAD END
   #10-24 FLANGE NUT, ZINC—DEAD END

B. 3/8" #16 X 3" CARRIAGE BOLT, ZINC
   3/8" #16 HEX NUT, STEEL

C. 5/8" #16 X 2-1/2" CORNER BOLT (BREAKAWAY), ZINC
   5/8" #16 HEX NUT, STEEL

**NOTES:**

1. POST SHALL BE 14-GAUGE GALVANIZED STEEL, QUIK-PUNCH, 5/8" HOLES, 1" ON CENTER, ALIGNED ON ALL SIDES, AND 2" SQUARE, 10 FEET IN LENGTH.

2. THE SLEEVE SHALL BE 12-GAUGE GALVANIZED STEEL, 5/8" HOLES, 1" ON CENTER, ALIGNED ON ALL SIDES, AND 2.25" SQUARE, 30" IN LENGTH.

3. ALL STREET NAME SIGNS ARE SUBJECT TO THE APPROVAL OF THE DIRECTOR OF THE CHARLOTTE DEPARTMENT OF TRANSPORTATION AND THE CITY ENGINEER.

**NOT TO SCALE**
NOTES:

1. STREET NAME MARKERS (SNM) SHALL BE ALUMINUM, FLAT, AND HAVE DIMENSIONS AS SHOWN ON THIS DETAIL. MINIMUM LENGTH OF 24"; MAXIMUM LENGTH OF 60". THE SNM'S SHALL BE COVERED WITH WHITE HIGH INTENSITY PRISMATIC (HAPI) RETRO-REFLECTIVE SHEETING (3M SERIES 3930 OR EQUIVALENT) WITH PRESSURE SENSITIVE ADHESIVE (OR EQUIVALENT TYPE IV OR HIGHER).

2. THE LETTERS SHALL BE REVERSE CUT FROM TRANSPARENT GREEN OVERLAY FILM (3M #1177 EC FILM OR EQUIVALENT MEETING FEDERAL SPECIFICATION FP-96, SECTION 178.01(A) AND ASTM D4956). THE TRANSPARENT GREEN OVERLAY FILM MUST BE PLACED ON THE SNM TO PROVIDE AN EXPOSED 0.5" BORDER OF THE UNDERLAY WHITE HIP RETRO-REFLECTIVE SHEETING.

3. THE STREET NAME SHALL BE COMPOSED OF INITIAL UPPER CASE LETTERS 6" IN HEIGHT AND CORRESPONDING LOWER CASE LETTERS 4.5" IN HEIGHT, IN FHWA "HIGHWAY B" FONT. THE STREET NAME SHALL BE LEFT-JUSTIFIED AND PLACED 0.5" FROM THE SIGN BORDER. ANY STREET NAME WITH 3 OR FEWER LETTERS SHALL BE CENTERED IN THE SIGN TEXT AREA.
   - PREFIX/SUFFIX NAMES SHALL BE COMPOSED OF INITIAL UPPER CASE LETTERS 3" IN HEIGHT AND CORRESPONDING LOWER CASE LETTERS 2.25" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - BLOCK NUMBERS SHALL BE 3" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - SUFFIX NAMES AND BLOCK NUMBERS SHALL BE RIGHT-JUSTIFIED AND PLACED 0.5" FROM THE RIGHT-SIDE SIGN BORDER AND 0.25" FROM THE TOP AND BOTTOM SIGN BORDERS. PREFIX LETTERS (N, S, E, AND W) SHALL BE CENTERED AND PLACED 0.5" FROM THE LEFT-SIDE SIGN BORDER WITH 2.5" SPACING TO BEGINNING OF STREET NAME.

4. SUPPLEMENTAL SNM WORDING ON YELLOW HIP RETRO-REFLECTIVE SHEETING WITH BLACK VINYL LETTERS SHALL BE PLACED ADJACENT TO THE GREEN OVERLAY FILM/BORDER TO INDICATE STREETS THAT DEAD END, HAVE NO OUTLET, ETC. OR ARE PRIVATE STREETS (PVT). THE YELLOW HIP RETRO-REFLECTIVE SHEETING MUST BE PLACED ON THE SNM TO MAINTAIN AN EXPOSED 0.5" BORDER OF THE UNDERLAY WHITE HIP RETRO-REFLECTIVE SHEETING.
   - NO OUTLET WITH ARROW (RIGHT OR LEFT) – PLACED ON SNM AT ENTRANCE TO A STREET OR STREET NETWORK FROM WHICH THERE IS NO OTHER EXIT. USE UPPER CASE LETTERS 2" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - PVT – PLACED ON SNM AT ENTRANCE TO PRIVATE STREET, USE UPPER CASE LETTER 4" IN HEIGHT AND CORRESPONDING LOWER CASE LETTERS 3" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - DEAD END WITH ARROW (RIGHT OR LEFT) – PLACED ON SNM AT ENTRANCE TO A SINGLE STREET THAT TERMINATES IN A DEAD END OR CUL-DE-SAC. USE UPPER CASE LETTERS 2" IN HEIGHT, IN FHWA "HIGHWAY C" FONT. IF STUB STREET IS LESS THAN OR EQUAL TO 200 FEET, THEN DEAD END IS NOT NECESSARY.

5. ALL SNMs ARE SUBJECT TO THE APPROVAL OF THE DIRECTOR OF THE CHARLOTTE DEPARTMENT OF TRANSPORTATION AND THE CITY ENGINEER.
NOTES

1. TWO STREET NAME MARKERS ARE REQUIRED IF THE MAJOR STREET HAS 3 OR MORE LANES.

2. ANY VARIANCE FROM THIS STANDARD MUST BE APPROVED BY THE CHARLOTTE DEPARTMENT OF TRANSPORTATION.

3. ENSURE STOP SIGN SIZE AND INSTALLATION PER MUTCD STANDARDS.
DEAD-END STREET BARRICADE

NOTE
THIS DETAIL IS NOT A GUARDRAIL DETAIL. FOR ROADSIDE GUARDRAIL, SEE NCDOT STANDARD DRAWINGS 862.01–862.03
GENERAL NOTES:

1. STEEL BEAM TYPE GUARD RAILS SHALL BE INSTALLED AT THE END OF ALL DEAD-END STREETS, EXCEPT CUL-DE-SAC STREETS WHICH HAVE BEEN IMPROVED WITH A PERMANENT TURN-AROUND.

2. FOR STREETS 26' IN WIDTH THE GUARD RAIL SHALL CONSIST OF TWO (2) 12'-6" SECTIONS OR ONE (1) 25' SECTION, THREE (3) STEEL POSTS, AND TWO (2) TERMINAL SECTIONS. FOR STREETS GREATER THAN 25' IN WIDTH THE GUARD RAIL SHALL SPAN THE ENTIRE WIDTH OF THE STREET.

3. GUARD RAIL SHALL CONSIST OF RAIL ELEMENTS FABRICATED TO DEVELOP CONTINUOUS BEAM STRENGTH AND INSTALLED AS SHOWN.

4. MINIMUM THICKNESS OF GUARD RAIL SHALL BE 12 GAUGE U.S. STANDARD.
   THE RAIL ELEMENT INCLUDING SPLICES, SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 80,000 LBS.
   GUARD RAIL PARTS FURNISHED SHALL BE INTERCHANGEABLE WITH SIMILAR PARTS REGARDLESS OF THE SOURCE OF MANUFACTURER.
   THE HOLES FOR CONNECTING BOLTS SHALL BE PUNCHED OF DRILLED, BURNING WILL NOT BE PERMITTED.

5. THE GUARD, BOLTS, NUTS, STEEL POSTS. AND ALL OTHER METAL PARTS SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS FOR THE COATING CLASS, (2.50 OUNCES PER SQUARE FOOT) OF THE CURRENT SPECIFICATIONS FOR ZINC-FOATED (GALVANIZED) IRON, AND STEEL SHEETS, COILS, AND CUT LENGTHS, IN ACCORDANCE WITH ASTM 123A.

6. IF THE AVERAGE SPELTER COATING AS DETERMINED FROM THE REQUIRED SAMPLES IS LESS THAN TWO (2) OUNCES OF SPELTER PER SQUARE FOOT, OR IF ANY ONE SPECIMEN HAS LESS THAN 1.8 OUNCES OF SPELTER PER SQUARE FOOT OF DOUBLE EXPOSED SURFACE, THE LOT SAMPLED SHALL BE REJECTED, THE FINISHED SHEETS SHALL BE OF FIRST CLASS COMMERCIAL QUALITY, FREE FROM INJURIOUS DEFECTS, SUCH AS BLISTERS, FLUX, AND UNCOATED SPOTS.

7. THE GUARD RAIL SHALL BE INSPECTED TO DETERMINE THAT THE MATERIAL, DIMENSIONS, AND WORKMANSHP ARE IN ACCORDANCE WITH THIS PLAN.

8. WHERE A DEAD-END STREET REQUIRES GUARD RAIL, END OF ROADWAY MARKER SIGNS SHALL ALSO BE REQUIRED. (SEE STD. 50.08A & 50.08B) (ER-1).
NOTES:

1. WHEN A DEAD-END OR STUBBED STREET REQUIRE A GUARDRAIL SECTION, END-OF-ROADWAY MARKER SIGNS (OM4-3, 24"x24", SOLID RED) SHALL BE PROVIDED.

2. SIGNS ARE TO BE PLACED BEHIND THE BARRICADE (SEE DETAILS 50.07A-B), EVENLY SPACED WITH ONE SIGN PLACED AT THE CENTERLINE LOCATION AND ADDITIONAL SIGNS AT 6' O.C. (MINIMUM OF 3 SIGNS, MAXIMUM OF 5 SIGNS).

3. WHEN BARRICADE IS USED ON A STREET STUB, THE SIGN AT THE CENTERLINE SHALL BE SUPPLEMENTED WITH A STREET CONNECTIVITY SIGN. SEE DETAIL 50.08C.

4. ALL SIGNS/MARKERS SHALL MEET OR EXCEED MUTCD STANDARDS FOR RETROREFLECTIVITY.

CROSS SECTION OF POST (2 LB./FT.)

CONNECTIVITY SIGN SEE NOTE #3

BASE (SLEEVE)

END OF ROADWAY MARKER
FUTURE DEVELOPMENT WILL EXTEND THIS STREET

NOTES:
1. SIGN SHALL MEET OR EXCEED MUTCD STANDARDS FOR RETROREFLECTIVITY
2. SIGN MATERIAL SHALL BE 0.080" THICK ALUMINUM
3. ALL LETTERS SHALL BE SERIES B–2000 FROM THE 2004 STANDARD HIGHWAY SIGNS MANUAL (AND ANY REVISION THERETO) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
PARKING ANGLE 90°
(TWO WAY OPERATION ONLY)

PARKING ANGLE 60°
(ONE WAY OPERATION ONLY)

PARKING ANGLE 45°
(ONE WAY OPERATION ONLY)

NOTES:
1. FOR ACCESSIBLE PARKING STANDARDS/SIGNAGE SEE STDS. 50.10A, B, AND C.
2. PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT.
3. ALTERNATIVE PARKING ANGLES, AISLE WIDTHS, AND OPERATION (TWO-WAY ANGLED PARKING OR REVERSE-ANGLE PARKING) WILL BE CONSIDERED BY CDOT ON A CASE-BY-CASE BASIS.

NOT TO SCALE
NOTES:

1. A 2-FOOT-WIDE PLANTING STRIP LOCATED AT THE BACK OF CURB CAN BE USED IN LIEU OF 2 FEET OF SIDEWALK WIDTH.

2. PARKING AT ANY ANGLE OTHER THAN PARALLEL SHALL BE SUBJECT TO THIS STANDARD.

3. IF MONOLITHIC CURB & SIDEWALK IS USED, ADD 6" TO ALL DIMENSIONS (1’ IF PARKING ON BOTH SIDES).

4. WHEELSTOPS SHALL ONLY BE USED IN LIEU OF 2 FEET OF SIDEWALK WITH THE APPROVAL OF THE CITY AND WHEN EXISTING CONDITIONS PREVENT CONSTRUCTION OF A 7-FOOT/9-FOOT SIDEWALK. WHEELSTOPS SHALL BE 6" HIGH, MADE OUT OF 3600-PSI REINFORCED CONCRETE, AND ANCHORED WITH #5 OR GREATER REBAR (2’ MINIMUM LENGTH). REBAR HOLES SHALL BE GROUTED UPON INSTALLATION. WHEELSTOPS SHALL BE PLACED AT 2 FEET FROM THE EDGE OF SIDEWALK OR OBSTRUCTION.
NOTES:
1. REVERSE CURVES/CHAMFERS NOT NECESSARY IF ADEQUATE DRAINAGE CAN BE PROVIDED THAT WILL ENSURE THAT SEDIMENT, WATER, DEBRIS, ETC., DOES NOT COLLECT IN 90-DEGREE CORNERS.
2. PARALLEL ACCESSIBLE SPACES AND LOADING ZONES TO BE REVIEWED BY CDOT ON A CASE-BY-CASE BASIS.
3. FOR PARKING BAYS THAT ARE 8 FEET IN WIDTH OR GREATER, THE PAVEMENT MARKINGS SHALL BE SET AT ONE (1) FOOT LESS THAN THE STALL WIDTH.
4. GREATER SEPARATION FROM INTERVENING STREETS THAN THE DISTANCES PROVIDED IN THE MATRIX MAY BE REQUIRED AT CDOT’S DISCRETION.
5. POSITIVE DRAINAGE SHALL BE PROVIDED EITHER BY INSTALLATION OF APPROPRIATE DRAINAGE STRUCTURES OR SLOPE PARKING AREA TO STREET FLOW LINE. SLOPING PARKING AREA TO STREET FLOW LINE ONLY PERMITTED IF ROAD GRADE IS GREATER THAN 2%.
6. IF A BIKE LANE IS REQUIRED ADJACENT TO PARALLEL PARKING, THE MINIMUM WIDTH OF BIKE LANE IS 6’.

<table>
<thead>
<tr>
<th>PARALLEL PARKING BAY LOCATED ON</th>
<th>DRIVeway</th>
<th>LOCAL/Collector</th>
<th>TH’FAre</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL/Collector</td>
<td>20’</td>
<td>20’</td>
<td>20’</td>
</tr>
<tr>
<td>THOROUGHFARE</td>
<td>20’</td>
<td>20’</td>
<td>50’</td>
</tr>
</tbody>
</table>
1. An access aisle shall be provided at street level for on-street parallel parking with 5' min. width and shall extend the full length of the parking space.

2. Accessible space and access aisle shall be obstruction-free.

3. All concrete to be 3600 p.s.i.

4. See STD No 10.18 for detail of 18” vertical curb.

5. See STD. No 10.17B for detail of expansion joint and groove joint.

6. Gutter flow line shall be maintained through the access aisle.

7. Accessible pavement marking detail:
   - Install International Symbol of Accessibility Parking Space Markings, including white symbol with blue background and white border. Symbol shall have min. height of 28 inches and min. width of 24 inches (exclusive of blue background and white border).
   - Stroke width shall be min. 3 inches.
   - White pavement markings placed on concrete shall be shadowed with black border.
   - Typical symbol location and orientation per "Diagram A" below

8. Proposed trees must be planted 6–8’ away from the back of access aisle curb.

9. Specify STD No. 40.11, "Bridging tree roots" if encroaching on growing space of tree.

10. Locate in most level area of block (recommended practice) to maximize usability.

11. Curb line shifts toward right-of-way to accommodate access aisle.

12. Space and access aisle should have smooth surface for lift deployment. Minimize cross slope for lift operation.

13. Parking meter for accessible space — provide a clear approach area where parking meters are required. Coordinate with CDOT for meter locations.

14. For more information see section R309 of "Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way" (PROWAG).

15. Use sign "C" as shown on STD. 50.10A for on-street parking.

### On-Street Parking Spaces Required

<table>
<thead>
<tr>
<th>Total Number of Marked or Metered Parking Spaces on the Block Perimeter</th>
<th>Minimum Required Number of Accessible Parking Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 TO 25</td>
<td>1</td>
</tr>
<tr>
<td>26 TO 50</td>
<td>2</td>
</tr>
<tr>
<td>51 TO 75</td>
<td>3</td>
</tr>
<tr>
<td>76 TO 100</td>
<td>4</td>
</tr>
<tr>
<td>101 TO 150</td>
<td>5</td>
</tr>
<tr>
<td>151 TO 200</td>
<td>6</td>
</tr>
<tr>
<td>201 AND OVER</td>
<td>4% of total</td>
</tr>
</tbody>
</table>

(Based on Table R214 of PROWAG)

**Diagram A**

---

**City of Charlotte Land Development Standards**

Includes Charlotte ETJ

---

STD. No. REV.

50.09D 16
### Accessible Parking Requirements

<table>
<thead>
<tr>
<th>Total Parking Spaces Provided</th>
<th>Minimum Number of Accessible Spaces Required</th>
<th>Minimum Number of Accessible Spaces Required to Be Van Accessible</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>26 to 50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>51 to 75</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>76 to 100</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>101 to 150</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>151 to 200</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>201 to 300</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>301 to 400</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>401 to 500</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>501 to 1000</td>
<td>2% of Total (20 Plus 1 for Each 100 Over 1000)</td>
<td>1 in Every 6 Accessible Spaces</td>
</tr>
<tr>
<td>1001 and Over</td>
<td>1 in Every 6 Accessible Spaces</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. All accessible signs (R7-8P, R7-8, R7-1, and 50.10C) shall be mounted at 7 feet from grade to bottom edge of sign face (per MUTCD). Mounting height can be reduced to 5 feet if placed in an area between sidewalk and building face in which pedestrians are not expected to use.

2. If accessible route is a raised sidewalk area, then ramps are required at loading zone area. Maintain min. 4' wide continuous passage.

3. Vertical clearance for vans must be greater than 98-inches.

4. This detail is to provide general guidance for parking layout and design; refer to manual on uniform traffic control devices (MUTCD) U.S. Department of Transportation and North Carolina Department of Transportation supplement and NC Building Code for additional information.

---

**Accessible Parking and Signage Standards**

**Not to Scale**
SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7–8P)

LEGEND AND BORDER – GREEN
BACKGROUND – WHITE

DIMENSIONS (INCHES)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>6</td>
<td>3/8</td>
<td>3/8</td>
<td>1</td>
<td>1/2</td>
<td>1/2</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

* INCREASE SPACING 50%  
D—FHWA (FEDERAL HIGHWAY ADMINISTRATION/USDOT)  
SERIES D LETTERS

SIGN R7–8P
SIGN R7–8
SIGN CLDSM #50.10C

5 FT. OR 7 FT.  
(SEE STD. NO. 50.10A, NOTE 1)

FINISHED GRADE

NOT TO SCALE
MAXIMUM PENALTY $250
GS20-37.6

NOTE:
SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7-8P) USED IF THERE IS ONLY
ONE REQUIRED ACCESSIBLE PARKING SPACE (MUST BE VAN ACCESSIBLE)
AND AT EACH ADDITIONAL REQUIRED VAN ACCESSIBLE SPACE. (SEE STD.
NO. 50.10B)

LEGEND AND BORDER - GREEN
BACKGROUND - WHITE

SIGN APPROVED FOR USE UNDER GENERAL STATUTE 20-37.6

THIS PENALTY SIGN IS REQUIRED TO ACCOMPANY ALL R7-8
PARKING SIGNS ERECTED AFTER DECEMBER 31, 1990
NOTES:

1. PAVEMENT MARKINGS TO BE PER LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

2. SIGNS TO BE LOCATED/SPACED PER MUTCD REQUIREMENTS.

3. "CIRCULAR INTERSECTION" AND "TRAFFIC CIRCLE" SUBPLATE SIGNS, AND YELLOW TUBULAR MARKERS, ARE REQUIRED ON THOROUGHFARES. CDOT WILL DETERMINE IF ONE OR MORE OF THESE ARE NECESSARY ON LOCAL OR COLLECTOR STREETS.

4. "PEDESTRIAN CROSSING" AND ARROW SUBPLATE SIGNS ARE REQUIRED WHEREVER THERE IS A MARKED CROSSWALK OR ON A THOROUGHFARE.

5. "YIELD" SIGNS ARE ALWAYS REQUIRED.

6. PAVEMENT MARKINGS, SPLITTER ISLAND DESIGNS, CROSSWALK, ETC., ARE SHOWN FOR CONTEXT ONLY. REFER TO THE MUTCD AND/OR THE FEDERAL HIGHWAY ADMINISTRATION'S MANUAL ROUNDABOUTS: AN INFORMATIONAL GUIDE FOR MORE DETAIL OR DESIGN INFORMATION.

7. ADDITIONAL SIGNS MAY BE NEEDED ON A CASE-BY-CASE BASIS, TO BE EVALUATED BY CDOT.

8. ALL PAVEMENT MARKING SHALL BE THERMOPLASTIC.
CHECKER BLOCK PAVER SYSTEM CAPABLE OF SUPPORTING 80,000 LB. TRUCK WEIGHT

ZONE OF INSTALLATION OF BASE COURSE UNDERNEATH CURB & GUTTER (TYP.)

10' (TYP.)

SIDE STREET OR DRIVEWAY

PLAN

MEDIAN WIDTH VARIES

4' VERTICAL CURVE (K=1)

2%

2%

6" TYP.

SUBGRADE COMPACTED TO 100% OF MAXIMUM STANDARD PROCTOR DENSITY

1'-6" MOUNTABLE CURB & GUTTER TYP.

ASPHALT BASE COURSE UNDER CURB

CROSS-SECTION X-X

NOT TO SCALE

EMERGENCY VEHICLE

MEDIAN Crossover

CITY OF CHARLOTTE

LAND DEVELOPMENT STANDARDS

INCLUDES CHARLOTTE ETJ

NOTES:

1. CROSSOVER TO BE OFFSET 10' FROM ANY INTERSECTING STREET OR DRIVEWAY OTHER THAN A FIRE DEPARTMENT DRIVEWAY.

2. ASPHALT BASE COURSE UNDERNEATH MOUNTABLE CURB AND GUTTER SHALL EXTEND AT LEAST 10 FEET BEYOND CROSSOVER.

3. ONLY FOR USE AT RIGHT-IN/RIGHT-OUT (RI/RO) ENTRANCES TO RESIDENTIAL SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS WITH PRIOR APPROVAL FROM CHARLOTTE DEPARTMENT OF TRANSPORTATION (CDOT).

4. INCLUDE SUBDRAIN AS NECESSARY PER CLDSM 20.28.

A "NO LEFT TURN" (R3-2, 24"x24")

B YELLOW/YELLOW RAISED PVMT. MARKER 1" O.C. SEE NCDOT STD. #1250.01.
SIGN LEGEND

A ONE WAY (R6–2R, 18”x24”)
B DO NOT ENTER (R5–1, 30”x30”)
C DOUBLE–DOWN ARROW (W12–1, 30”x30”)
D NO U–TURN (R3–4, 24”x24”)*
E STOP (R1–1, 30”x30”)
* IF NECESSARY

NOTES:

1. ADDITIONAL PAVEMENT MARKINGS (EDGE LINES, GORES, ETC.) ARE NOT SHOWN BUT ARE REQUIRED. SEE CDOT PAVEMENT MARKING STANDARDS.
2. FOR DIVIDED SIDE STREETS, MEASURE THE 12 FOOT DIMENSION FROM THE FACE OF MEDIAN INSTEAD OF FACE OF CURB ON APPROACHING LANE.
3. ALL SIGNS SHALL BE MUTCD STANDARD SIGNS.

NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

DIRECTIONAL CROSSOVER
WITH RAISED MEDIANS

STD. NO. 50.13 REV.
NOTES:
1. PER MUTCD STANDARDS, WHEN CROSSWALK LINES ARE USED THEY SHALL CONSIST OF SOLID WHITE LINES THAT MARK THE CROSSWALK. THEY SHALL BE NOT LESS THAN 150 MM (6 IN) NOR GREATER THAN 600 MM (24 IN) IN WIDTH.

2. IF TRANSVERSE LINES ARE USED TO MARK A CROSSWALK, THE GAP BETWEEN THE LINES SHOULD NOT BE LESS THAN 1.8 M (6 FT). IF DIAGONAL OR LONGITUDINAL LINES ARE USED WITHOUT TRANSVERSE LINES TO MARK A CROSSWALK, THE CROSSWALK SHOULD NOT BE LESS THAN 1.8 M (6 FT) WIDE.

3. IF USED, THE DIAGONAL OR LONGITUDINAL LINES SHOULD BE 300 TO 600 MM (12 TO 24 IN) WIDE AND SPACED 300 TO 1500 MM (12 TO 60 IN) APART. THE MARKING DESIGN SHOULD AVOID THE WHEEL PATHS, AND THE SPACING SHOULD NOT EXCEED 2.5 TIMES THE LINE WIDTH.
HIGH VISIBILITY PIANO STYLE CROSSWALK MARKINGS (OR EQUIVALENT) SHALL BE INSTALLED ON THE TABLE PART OF THE RAISED CROSSWALK PER CLDSM 50.14.

NOTES:

1. THIS DETAIL IS TO BE USED ONLY WITH PRIOR APPROVAL BY CDOT AND CHARLOTTE FIRE DEPARTMENT.

2. ADJACENT CURB RAMPS SHALL BE INSTALLED PER CLDSM 10.31, MODIFIED TO A 1 1/2" DEPRESSION AT BACK OF CURB.

3. PROVIDE APPROPRIATE STORM DRAINAGE MEASURES TO ENSURE WATER DOES NOT POND AT ANY POINT ALONG THE SURFACE CROSSWALK OR AT THE BASE OF THE RAISED CROSSWALK.

4. THE CROSSWALK SURFACE RUNNING SLOPE AND CROSS SLOPE SHALL NOT EXCEED THAT OF THE EXISTING ROADWAY.

5. STORM GRATES SHALL NOT BE Installed INTO THE TAPERS OR TABLE PORTION OF THE RAISED CROSSWALK.

6. THIS DETAIL IS NOT PERMITTED FOR USE ON NCDOt—MAINTAINED ROADWAYS.

SECTION A—A

PROF. APPROX. 4" OF ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
NOTES:

1. BIKE RACK GENERAL REQUIREMENTS:
   - SHOULD SUPPORT THE BICYCLE UPRIGHT WITHOUT PUTTING STRESS ON THE WHEELS
   - SHOULD ACCOMMODATE A VARIETY OF BICYCLES AND ATTACHMENTS
   - SHOULD ALLOW LOCKING OF FRAME AND AT LEAST ONE WHEEL WITH U-LOCK
   - SHOULD PROVIDE SECURITY AND LONGEVITY FEATURES APPROPRIATE FOR THE INTENDED LOCATION
   - SHOULD BE INTUITIVE

2. BIKE RACKS SHOULD BE INSTALLED PER MANUFACTURER’S RECOMMENDED INSTALLATION PROCEDURES.

3. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL OF THE CHARLOTTE DEPT. OF TRANSPORTATION.

4. ALL DIMENSIONS SHOWN ARE MINIMUM.

5. RACK MUST BE CAE DETECTABLE. RACK AND CLEARANCES SHOWN ARE TO BE OUTSIDE THE PEDESTRIAN ACCESSIBLE ROUTE.

TYPICAL MOUNT OPTIONS:

- SURFACE PLATE BASE WITH ANCHORS (NOT PERMITTED IN PAVER BRICK SURFACE)
- IN-GROUND EMBED INTO CONCRETE BASE

* 5' MINIMUM SEPARATION FROM CURB FACE WHEN INSTALLED ADJACENT TO A CURB WITH "HEAD-IN" AUTOMOBILE PARKING

** MEASURED FROM NEAREST VERTICAL COMPONENT OF NEIGHBORING RACK

INVERTED "U" RACK FOR BICYCLE PARKING
POST AND RING BIKE RACK

NOTES:
1. BIKE RACK GENERAL REQUIREMENTS:
   • SHOULD SUPPORT THE BICYCLE UPRIGHT WITHOUT PUTTING STRESS ON THE WHEELS
   • SHOULD ACCOMODATE A VARIETY OF BICYCLES AND ATTACHMENTS
   • SHOULD ALLOW LOCKING OF FRAME AND AT LEAST ONE WHEEL WITH U-LOCK
   • SHOULD PROVIDE SECURITY AND LONGEVITY FEATURES APPROPRIATE FOR THE
     INTENDED LOCATION
   • SHOULD BE INTUITIVE
2. BIKE RACKS SHOULD BE INSTALLED PER MANUFACTURER’S RECOMMENDED INSTALLATION
   PROCEDURES.
3. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL OF
   THE CHARLOTTE DEPT. OF TRANSPORTATION.
4. ALL DIMENSIONS SHOWN ARE MINIMUM.
5. RACK MUST BE CAKE DETECTABLE. RACK AND CLEARANCES SHOWN ARE TO BE OUTSIDE
   THE PEDESTRIAN ACCESSIBLE ROUTE.

INSTALLATION PLAN VIEW:

WALL, BUILDING FACE, OR CURB

2' CLEAR

8''

3'-6''

4' TO POST

3''

2'-4'' CLEAR

WALL, BUILDING FACE, OR CURB

2' CLEAR

8''

3'-6''

4' TO POST

3''

2'-4'' CLEAR

* 5’ MINIMUM SEPARATION FROM CURB FACE WHEN INSTALLED ADJACENT TO
  A CURB WITH “HEAD-IN” AUTOMOBILE PARKING
** MEASURED FROM NEAREST VERTICAL COMPONENT OF NEIGHBORING RACK

TYPICAL MOUNT OPTIONS:

SURFACE
PLATE BASE WITH ANCHORS
(NOT PERMITTED IN
PAVER BRICK SURFACE)

IN-GROUND
EMBED INTO
CONCRETE BASE
NOTES:

1. BIKE LOCKERS SHOULD BE INSTALLED AS PER MANUFACTURER’S RECOMMENDED INSTALLATION PROCEDURES.

2. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL BY THE CHARLOTTE DEPARTMENT OF TRANSPORTATION.

3. ALL DIMENSIONS SHOWN ARE MINIMUM.

4. ALLOW FOR POSITIVE DRAINAGE AWAY FROM LOCKERS.
LOCAL RESIDENTIAL NARROW STREET
TYPICAL SECTION

NOT FOR USE IN ETJ
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

NOTES:
1. VALLEY GUTTER IS ALLOWED ONLY WITH PRIOR APPROVAL FROM CDOT AND CITY ENGINEERING.
2. DETAIL CAN BE USED ONLY UNDER THE CIRCUMSTANCES PRESCRIBED IN THE USDG ON CITY–MAINTAINED STREETS ONLY. SEE CLD SM SPECIFICATIONS AND SPECIAL PROVISION NOTES: "USDG TYPICAL SECTION ALTERNATIVES" NOTE C AND TABLE 1 FOR MORE INFORMATION.
3. BACK OF CURB TO BACK OF CURB DIMENSION OF 21' SHALL BE USED REGARDLESS OF CURB TYPE.
4. FOR EXPLANATION OF RIGHT–OF–WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20–22(d).
5. ZONING SETBACKS MEASURED FROM TOTAL R/W
6. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 3/8" PER FOOT (MIN.) UP TO 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

LOCAL RESIDENTIAL MEDIUM STREET
TYPICAL SECTION

KEY

R  2'-6" STANDARD CURB AND GUTTER OR 2'-0" VALLEY GUTTER
S  4" CONCRETE SIDEWALK

NOTES:
1. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
2. ZONING SETBACKS MEASURED FROM TOTAL R/W
3. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.
4. MIN. 11" LANES REQUIRED IF USED IN ETJ.

SURFACE COURSE
1" S9.5B
FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY,
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT,
3) FOR ETJ STREETS, FINAL 1" MAY BE PLACED WHEN APPROVED BY NCDOT.

INTERMEDIATE COURSE
1 1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" BCBC TYPE B25.0C. SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE (SEE SECTION 1.A.18)

APPLY TACK COAT PER NCDOT "STD. SPECS. FOR ROADS AND STRUCTURES." SECTION 605

SLOPE 3/8" PER FT.

PLANTING STRIP SEE NOTE 3

2:1 CUT MAX.
3:1 FILL MAX.

21' (MIN) 42' R/W (MINIMUM) 21' (MIN)
28' 10'-6" (11' IF VALLEY CURB, OR IF ETJ)
10'-6"
8'-0"
5'-0"
1'-0"

1.5% (2.00% MAX)

2:1 CUT MAX.
3:1 FILL MAX.
NOTES:
1. REFER TO U-03A FOR TYPICAL SECTION, U-03B FOR MID-BLOCK SECTION, AND U-03C FOR INTERSECTION SECTION.
2. SHADOW PARKING WITH CURB EXTENSIONS, SHOWN AT U-03B. IF CURB EXTENSION IS ONLY ON ONE SIDE OF ROAD, A 24' PAVEMENT WIDTH WILL BE REQUIRED AS SHOWN ABOVE.
3. SIDEWALK IS 6' MIN. WHEN LESS THAN 12 DWELLINGS PER ACRE (D.U.A.). SIDEWALK IS 8' MIN. WHEN 12 D.U.A. OR GREATER.
4. PAVEMENT WIDTH DIMENSIONS SHOWN ARE FOR STREETS THAT USE 2'-6" STD. CURB & GUTTER. ADJUST WIDTHS ACCORDINGLY IF 2'-0" STD. CURB & GUTTER OR VALLEY GUTTER ARE USED (SEE DETAILS U-03 A, B, AND C FOR MORE INFO.)

*SEE NOTE 3

**SEE I-2A FOR INTERSECTION

NOT TO SCALE
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

LOCAL RESIDENTIAL WIDE STREET
TYPICAL SECTION

SURFACE COURSE
1" S9.5B
FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY,
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT,
3) FOR ETJ STREETS, FINAL 1" MAY BE PLACED WHEN APPROVED BY NCDOT.

INTERMEDIATE COURSE
1 1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" BCBC TYPE B25.0C. SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE (SEE SECTION 1A.18)

KEY
R 2'-6" STANDARD CURB AND GUTTER,
   2'-0" STANDARD CURB AND GUTTER, OR
   2'-0" VALLEY GUTTER (SEE NOTE 1)
S 4" CONCRETE SIDEWALK

NOTES:
1. VALLEY GUTTER IS ALLOWED ONLY WITH PRIOR APPROVAL FROM CDOT AND CITY ENGINEERING.
2. SIDEWALK IS 6' MIN. WHEN LESS THAN 12 DWELLING UNITS PER ACRE (D.U.A.). SIDEWALK IS 8' MIN. WHEN 12 D.U.A. OR GREATER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT/NCDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.
5. SEE PARKING STANDARD DETAILS #50.09A, B, & C FOR INFORMATION REGARDING ON-STREET "HEAD-IN" PARKING, EXCEPT IN ETJ WHERE NO HEAD-IN PARKING IS PERMITTED BY NCDOT.
6. ON STREETS WITH FREQUENT DRAIWAYS THAT PRECLUDE ON-STREET PARKING, USE DETAIL #U-03C, EXCEPT IN ETJ. NO BUMPOUTS PERMITTED IN ETJ.
7. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
8. ZONING SETBACK MEASURED FROM TOTAL R/W.
9. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO ¼" PER FOOT (MIN.) UP TO ¾" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.
NOT FOR USE IN ETJ
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

LOCAL RESIDENTIAL WIDE STREET AT MIDDLEBLOCK
WITH CURB EXTENSION TYPICAL SECTION

NOTES:
1. VALLEY GUTTER IS ALLOWED ONLY WITH PRIOR APPROVAL FROM CDOT AND CITY ENGINEERING.
2. SIDEWALK IS 6' MIN. WHEN LESS THAN 12 DWELLING UNITS PER ACRE (D.U.A.). SIDEWALK IS 8' MIN. WHEN 12 D.U.A. OR GREATER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.
5. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
6. ZONING SETBACKS MEASURED FROM TOTAL R/W.
7. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 3/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

KEY:
- R 2'-6" STANDARD CURB AND GUTTER,
- S 4" CONCRETE SIDEWALK
- GUTTER, OR
- 2'-0" STANDARD CURB AND GUTTER, OR
- 2'-0" VALLEY GUTTER (SEE NOTE 1)
- 1" S9.5B
- FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
  1) 75% DEVELOPMENT OCCUPANCY
  2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT
- INTERMEDIATE COURSE
- 1-1/2" S9.5C OR S9.5B
- BASE COURSE
- 8" COMPACTED AGGREGATE BASE COURSE, OR 4" BCB TYPE B25.0C. SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
- SUBGRADE COMPACTED SUBGRADE (SEE SECTION 1.A.18)
TYPICAL PAVEMENT SECTION

SURFACE COURSE
1" S9.5B
FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUENCY
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT

INTERMEDIATE COURSE
1 1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" RCBC TYPE B25.CC. SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE (SEE SECTION 1.A.18)

NOT TO SCALE

NOT FOR USE IN ETJ

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
LOCAL RESIDENTIAL WIDE STREET AT INTERSECTION WITH CURB EXTENSION TYPICAL SECTION

NOTES:
1. VALLEY GUTTER IS ALLOWED ONLY WITH PRIOR APPROVAL FROM CDOT AND CITY ENGINEERING.
2. SIDEWALK IS 6' MIN. WHEN LESS THAN 12 DWELLING UNITS PER ACRE (D.U.A.). SIDEWALK IS 8' MIN. WHEN 12 D.U.A. OR GREATER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.
5. THIS DETAIL IS FOR USE ON STREETS WITH FREQUENT DRIVeways THAT PRECLUDE ON-STREET PARKING.
6. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
7. ZONING SETBACKS MEASURED FROM TOTAL R/W.
8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO ¼" PER FOOT (MIN.) UP TO 1¼" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.
EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:

SURFACE COURSE
3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5C
TO BE PLACED IN TWO 1.5" LIFTS EACH

INTERMEDIATE COURSE
2.5" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE T19.0C

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE
(USE 6.5" COMPACTED ABC UNDER CURB & GUTTER)

TYPICAL PAVEMENT SECTION WITH STONE BASE

SURFACE COURSE
3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5C
TO BE PLACED IN TWO 1.5" LIFTS EACH

INTERMEDIATE COURSE
4" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE T19.0C

BASE COURSE
3" BITUMINOUS CONCRETE BASE COURSE, TYPE B325.0C.

TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION

NOTES:
1. USE OF VALLEY GUTTER PROHIBITED.
2. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
5. ZONING SETBACKS MEASURED FROM TOTAL R/W.
6. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1¼" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

KEY
R 2'-6" STANDARD CURB AND GUTTER (SHOWN)
OR 2'-0" STANDARD CURB AND GUTTER
S 4" CONCRETE SIDEWALK

NOT FOR USE IN ETJ
NOT TO SCALE
NOTES:

1. REFER TO U-05A FOR TYPICAL SECTION, U-05B FOR MID-BLOCK SECTION, AND U-05C FOR INTERSECTION SECTION.

2. SHADOW PARKING WITH CURB EXTENSIONS, SHOWN AT U-03B. IF CURB EXTENSION IS ONLY ON ONE SIDE OF ROAD, A 30' PAVEMENT WIDTH WILL BE REQUIRED AS SHOWN ABOVE.

NOT FOR USE IN ETJ

LOCAL OFFICE/COMMERCIAL WIDE STREET
PLAN VIEW

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

NOT TO SCALE

STD. NO. REV. U-05 19
EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:

**Surface Course**
- 3" Bituminous Concrete Surface Course, Type S9.5c to be placed in two 1.5" lifts each

**Intermediate Course**
- 2.5" Bituminous Concrete Intermediate Course, Type 119.0C

**Base Course**
- 8" Compacted Aggregate Base Course (Use 8.5" Compacted ABC Under Curb & Gutter)

**Compacted Subgrade**

**Typical Pavement Section with Stone Base**

**Surface Course**
- 3" Bituminous Concrete Surface Course, Type S9.5c to be placed in two 1.5" lifts each

**Intermediate Course**
- 4" Bituminous Concrete Intermediate Course, Type 119.0C

**Base Course**
- 3" Bituminous Concrete Base Course, Type B25.0C

**Compacted Subgrade**

**Typical Full-Depth Asphalt Pavement Section**

NOTES:
1. USE OF VALLEY GUTTER PROHIBITED.
2. WIDER SIDEWALKS MAY BE REQUIRED UNDER CIRCUMSTANCES AS IDENTIFIED IN THE USDG.
3. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.
4. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
5. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.
6. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
7. ZONING SETBACKS MEASURED FROM TOTAL R/W.
8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1½" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

**KEY**
- 2'-6" STANDARD CURB AND GUTTER ONLY
- 4" THICK CONCRETE SIDEWALK 3600 PSI AT 28 DAYS

**NOT FOR USE IN ETJ**

**NOT TO SCALE**

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS

LOCAL OFFICE/COMMERCIAL WIDE STREET
TYPICAL SECTION

**STANDARD NO.**

**REV.**

U-05A-19
EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:

- **Surface Course**: 3" Bituminous Concrete Surface Course, Type 59.5C to be placed in two 1.5" lifts each
- **Intermediate Course**: 2.5" Bituminous Concrete Intermediate Course, Type 119.0C
- **Base Course**: 8" Compacted Aggregate Base Course (USE 6.5" Compacted ABC under Curb & Gutter)
- **Compacted Subgrade**

**TYPICAL PAVEMENT SECTION WITH STONE BASE**

- **Surface Course**: 3" Bituminous Concrete Surface Course, Type 59.5C to be placed in two 1.5" lifts each
- **Intermediate Course**: 4" Bituminous Concrete Intermediate Course, Type 119.0C
- **Base Course**: 3" Bituminous Concrete Base Course, Type B25.0C
- **Compacted Subgrade**

**TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION**

**NOTES:**

1. USE OF VALLEY GUTTER IS PROHIBITED.
2. WIDER SIDEWALKS MAY BE REQUIRED UNDER CIRCUMSTANCES AS IDENTIFIED IN THE USDG.
3. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.
4. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
5. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.
6. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
7. ZONING SETBACKS MEASURED FROM TOTAL R/W.
8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1¾" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

**KEY**

- **R** 2'-6" STANDARD CURB AND GUTTER ONLY
- **S** 4" CONCRETE SIDEWALK

**NOT FOR USE IN ETJ**

**NOT TO SCALE**
NOTES:

1. USE OF VALLEY GUTTER IS PROHIBITED.

2. WIDER SIDEWALKS MAY BE REQUIRED UNDER CIRCUMSTANCES AS IDENTIFIED IN THE USDG.

3. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.

4. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.

5. AMENITY ZONE (HARDCORE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT, AND PLANNING.

6. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20.22(d).

7. ZONING SETBACKS MEASURED FROM TOTAL R/W.

8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRATED TO ¼" PER FOOT (MIN.) UP TO 1¼" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPractical. In SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

KEY

R 2'-6" STANDARD CURB AND GUTTER ONLY
S 4" CONCRETE SIDEWALK

NOT FOR USE IN ETJ

NOT TO SCALE
EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:

- **SURFACE COURSE**
  - 3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE 59.5C
  - TO BE PLACED IN TWO 1.5" LIFTS EACH
- **INTERMEDIATE COURSE**
  - 2.5" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE 119.0C
- **BASE COURSE**
  - 8" COMPACTED AGGREGATE BASE COURSE
  - (USE 6.5" COMPACTED ABC UNDER CURB & GUTTER)
- **COMPACTED SUBGRADE**

TYPICAL PAVEMENT SECTION WITH STONE BASE

- **SURFACE COURSE**
  - 3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE 59.5C
  - TO BE PLACED IN TWO 1.5" LIFTS EACH
- **INTERMEDIATE COURSE**
  - 4" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE 119.0C
- **BASE COURSE**
  - 3" BITUMINOUS CONCRETE BASE COURSE, TYPE B25.0C
- **COMPACTED SUBGRADE**

TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION

NOTES:

1. USE OF VALLEY GUTTER PROHIBITED.
2. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. ZONING SETBACKS MEASURED FROM BACK OF CURB.
5. HARDSCAPED AMENITY ZONE WITH TREES IN GRATES IS TYPICAL. SEE TOD ORDINANCE FOR APPLICABILITY OF PLANTING STRIP.
6. FOR 8' WIDE SIDEWALK ZONE WITHIN HARDSCAPE, CROSS SLOPE IS 1.5% (DESIGN). HARDSCAPED AMENITY ZONES SHOULD MATCH SIDEWALK CROSS SLOPE TO ALLOW FOR ITEMS TYPICAL IN THIS AREA.

* TO BE APPLIED PER TOD ORDINANCE ADOPTED 4/15/19

KEY:

- **R** 2'-6" STANDARD CURB AND GUTTER ONLY

[NOT FOR USE IN ETJ]

NOT TO SCALE
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

LOCAL INDUSTRIAL STREET
TYPICAL SECTION

NOTES:
1. USE OF VALLEY GUTTER IS PROHIBITED.
2. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT SECTION DESIGN TO CITY ENGINEER.
3. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE REQUIRED BY CDOT/NCDOT BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION 20-22(d).
5. ZONING SETBACKS MEASURED FROM TOTAL R/W
6. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO ¼ PER FOOT (MIN.) UP TO 1¼ PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE CITY ENGINEER MAY AUTHORIZE A SUITABLE GRADE.
7. IF USED IN ETJ, FULL-DEPTH ASPHALT PAVEMENT SECTION REQUIRED.

KEY
- 2'-6" STANDARD CURB AND GUTTER
- 4" CONCRETE SIDEWALK

TYPICAL PAVEMENT SECTION WITH STONE BASE (CITY ONLY)
(IN ETJ, USE FULL DEPTH ASPHALT SECTION BELOW)

SURFACE COURSE
- 3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5C TO BE PLACED IN TWO 1.5" LIFTS EACH

INTERMEDIATE COURSE
- 2.5" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE I19.0C

BASE COURSE
- 8" COMPACTED AGGREGATE BASE COURSE (USE 6.5" COMPACTED ABC UNDER CURB & GUTTER)

COMPACTED SUBGRADE

TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION (CITY OR ETJ)

SURFACE COURSE
- 3" BITUMINOUS CONCRETE SURFACE COURSE, TYPE S9.5C TO BE PLACED IN TWO 1.5" LIFTS EACH

INTERMEDIATE COURSE
- 1.5" BITUMINOUS CONCRETE INTERMEDIATE COURSE, TYPE I19.0C

BASE COURSE
- 3" BITUMINOUS CONCRETE BASE COURSE, TYPE B25.0C

COMPACTED SUBGRADE

APPLY TACK COAT PER NCDOT "STD. SPECS. FOR ROADS AND STRUCTURES," SECTION 605
NOT TO SCALE

CITY OF CHARLOTTE
LAND DEVELOPMENT STANDARDS
INCLUDES CHARLOTTE ETJ

LOCAL COLLECTOR STREET
TYPICAL SECTION

SURFACE COURSE
1" S9.5B

FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY,
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT,
3) FOR ETJ STREETS, FINAL 1" MAY BE PLACED WHEN APPROVED BY NCDOT.

INTERMEDIATE COURSE
1 1/2" S9.5C OR S9.5B

BASE COURSE
8" COMPACTED AGGREGATE BASE COURSE, OR 4" DC3C TYPE 825.0C.
SHOULD ENTIRE DEVELOPMENT HAVE A CBR OF 6 OR GREATER, THEN AN
ALTERNATIVE BASE COURSE PAVEMENT DESIGN MAY BE SUBMITTED TO
THE CITY ENGINEER FOR APPROVAL.

SUBGRADE
COMPACTED SUBGRADE

NOTES:
1. SIDEWALK IS 5' MIN. WHEN LESS THAN 8 DUA. SIDEWALK
IS 6' MIN. WHEN 8 DUA OR GREATER BUT LESS THAN 12
DUA. SIDEWALK IS 8' MIN. WHEN 12 DUA OR GREATER.

2. AN ALTERNATIVE PAVEMENT SECTION DESIGN MAY BE
REQUIRED BY CDOT/NCDOT BASED ON SPECIFIC TRAFFIC
PARAMETERS.

3. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING
STRIP WITH PRIOR APPROVAL FROM ENGINEERING, CDOT,
AND PLANNING.

4. FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO
CITY OF CHARLOTTE SUBDIVISION ORDINANCE SECTION
20–22(d).

5. ZONING SETBACKS MEASURED FROM TOTAL R/W.

6. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED
TO 1/4" PER FOOT (MIN.) UP TO 1/8" PER FOOT (MAX.),
EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS
REQUIREMENT IMPractical. In SUCH CASES, THE CITY
ENGINEER MAY AUTHORIZE A SUITABLE GRADE.

KEY
R 2'-6" STANDARD CURB AND GUTTER (SHOWN) OR 2'-0" VALLEY GUTTER
S 4" CONCRETE SIDEWALK