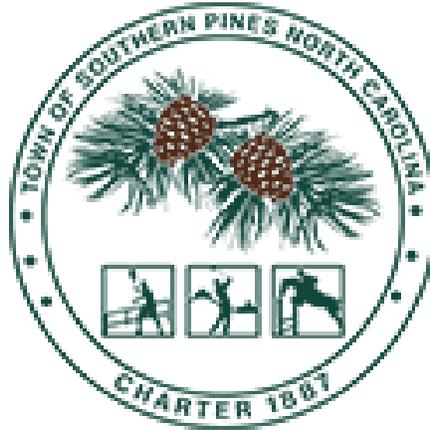


APPENDIX B: ENGINEERING AND CONSTRUCTION STANDARDS MANUAL



SOUTHERN PINES
North Carolina

**Engineering and Construction
Standards Manual
October 2020**

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CHAPTER 1: SPECIFICATIONS AND SPECIAL PROVISIONS

1. GENERAL NOTES

- A. The Town of Southern Pines Engineering and Construction Standards Manual has been adopted by the Town of Southern Pines to define the minimum standards for the design and construction of new infrastructure within the Town limits of Southern Pines and the ETJ. Additional requirements may be deemed necessary by the Director of Public Services or Town Engineer depending on the proposed improvement. There are supporting specifications from multiple agencies listed in Chapter 6 – REFERENCES. All specifications used and noted will be the most current revision for the respective specification and publication. The more restrictive specification shall be enforced.
- B. No work associated with excavations, tie-ins to existing utilities, lane or road closures requiring observation by Town personnel will be allowed outside of the hours of 7:00AM to 5:00PM on weekdays, or on weekends and holidays unless written authorization is obtained from the Director of Public Services.
- C. No work will be permitted outside of the hours of 7:00AM to 9:00PM on weekdays and 8:00AM to 9:00PM on Saturday without authorization from the Director of Public Services.
- D. Contractors performing work in the Town of Southern Pines shall have a North Carolina Contractor License with the appropriate classification for the work being performed.
- E. No land disturbing activities shall be allowed until an erosion control permit has been obtained from the Town. Land disturbing activities include, but are not limited to, grubbing, grading and utility installations.
- F. Prior to grading operations, a grading permit shall be obtained from the Town of Southern Pines.
- G. Prior to beginning construction in the Town of Southern Pines, a preconstruction meeting with the Town Inspector shall be held, and submittals (shop drawings) shall be approved. The submittals should include all materials (roadway, storm and utilities) to be used during construction. Please allow 2 weeks for the review.
- H. Erosion control measures shall be installed as required by the erosion control and sediment permit. Maintenance and documentation as required by the erosion control and sediment permit is the responsibility of the contractor and erosion control measures shall not be removed without the permission of the Town Engineer. Sediment leaving a site, regardless of size of project, shall have corrective actions taken immediately by the financially responsible person to avoid further loss of sediment from the site. Methods of conveyance of sediment from the site include water, air, gravity or ice.
- I. The use of Town water to perform construction activities shall be metered. The Town has 1 fire hydrant for obtaining non-potable water for construction located at the Town's Public Works Annex, 801 SE Service Road, Southern Pines, NC 28387. Prior to obtaining water from the hydrant, a permit application shall be submitted to the Utilities Superintendent. In lieu of using the fire hydrant at the Town's OC, a fire hydrant meter may be obtained from the Town for specific locations. For details to obtain a fire hydrant meter, contact Town of Southern Pines Public Works Department at 910-692-1983. The meter applicant is responsible for backflow prevention at the meter and payment for water used.

2. **ACRONYMS**

AASHTO – American Association of State Highway and Transportation Officials
ACI – American Concrete Institute
ANSI – American National Standards Institute
ASTM – American Society for Testing and Materials
CIP – Capital Improvement Projects
CTP – Comprehensive Transportation Plan (Developed by the TARPO)
DIP – Ductile Iron Pipe
DWQ – North Carolina Department of Environmental Quality, Division of Water Quality
FHA – Federal Highway Administration
IFC – International Fire Code
MUTCD – Manual for Uniform Traffic Control Devices
NACTO – National Association of Town Transportation Officials
NCAC – North Carolina Administrative Code
NCDEQ – North Carolina Department of Environmental Quality
NCDOT – North Carolina Department of Transportation
NPDES – National Pollutant Discharge Elimination System
PROWAG – Public Right of Way Accessibility Guidelines
PVC – Polyvinyl Chloride
RCP – Reinforced Concrete Pipe
SCM – Stormwater Control Measure
TARPO – Triangle Area Rural Planning Organization
UDO – Unified Development Ordinance
USACE – United States Army Corps of Engineers
USGS – United States Geological Survey

CHAPTER 2: STREETS

1. GENERAL NOTES

- A. All work and materials shall conform to the latest edition of the NCDOT Standard Specifications for Roads and Structures unless otherwise specified in this manual.
- B. Depending on the proposed construction activities, a bond may be required for possible damages to Town streets and, shall be in an amount established by the Town.
- C. The contractor shall maintain two-way traffic at all times when working within existing streets in accordance with the latest edition Manual for Uniform Traffic Control Devices (MUTCD) and NCDOT.
- D. Street cuts and sidewalks should be completely repaired in an expedient manner. Unless otherwise noted in construction documents, cuts must be filled per Standard Details, with flowable fill or suitable material to within 1.5" of finished grade within 3 days of initial work. Finished roadway surfaces, sidewalks and curbs must be restored within 15 days of initial work.
- E. Trench Backfill Requirements:
1. All backfill shall be non-plastic in nature, free from roots, vegetative matter, waste, construction material or other objectionable material. Materials deemed by the Inspector as unsuitable for backfill purposes shall be removed and replaced with select backfill material.
 2. All trenches in the street right-of-way shall be backfilled immediately after the pipe is laid. No more trench shall be opened in advance of pipe laying than is necessary to expedite the work. One block or 200' (whichever is less) shall be the maximum length of open trench on any line under construction.
 3. All trench backfill shall be compacted to 8" below the finished surface to a 100% density in accordance with AASHTO T 99 as modified by NCDOT. All trench backfill greater than 8" below the finished surface shall be compacted to 95% density in accordance with AASHTO T 99 as modified by NCDOT.
 4. All trench backfill shall be compacted in maximum 6" lifts.
- F. All subgrade shall be compacted to a depth of 8" below the finished surface to a 100% density in accordance with AASHTO T 99 as modified by NCDOT. All embankment shall be compacted to 95% density in accordance with AASHTO T 99 as modified by NCDOT for depths greater than 8".
- G. All trench backfill, subgrade, embankment fill, and ABC shall require density tests be performed at a frequency as follows. Test reports shall be conveyed to the Town on a weekly basis.
- | | |
|------------------|---|
| Road subgrade | 1 test group for every 500' |
| Parking subgrade | 1 test group for every 10,000 square feet |
| Trenches | 1 test group for every 500' |
| Embankment Fill | 1 test group for every 10,000 square feet |
- *A test group shall consist of 1 test for every 2' of fill in the test location
- H. All manholes, junction boxes, water valve boxes and other appurtenances shall be covered at subgrade level with a steel plate until the first lift of surface course asphalt is placed. At that time, the utility may be raised to the finished grade.
- I. A tolerance for grading the subgrade shall be +/- 1/2" from the established grade will be permitted after the subgrade has been graded to a uniform surface. A tolerance of +/- 1/4" will be permitted under concrete pavement mainline lanes. Perform the grading operation such that the maximum difference between the established grade and the graded subgrade within any 100' section is 1/2" for normal subgrade and 1/4" for subgrade for concrete pavement.

- J. A proof roll witnessed by an accredited testing firm and the Town Inspector shall be required prior to placing curb and gutter, ABC, and asphalt. A report of the proof roll shall be provided to the Town Engineer. Equipment to be used for the proof rolls shall be a loaded tandem dump truck. Proof rolls shall not occur more than 10 days prior to the placement of the associated work.
1. Proof rolls will not be performed on frozen subgrades and inclement weather will void any proof roll if the associated work has not been completed.
 2. A motor grader may be used in some circumstances for a proof roll on curb and gutter only. Prior approval by the Town Engineer is required for use of a motor grader.
 3. Weight requirements for equipment:

Motor Grader	30,000 lbs
Tandem Truck	45,000 lbs
- K. Upon completion of the subgrade proof rolling, a report from an accredited testing laboratory shall be provided to the Town Engineer. The report shall present the results of a Proctor analysis demonstrating that the subgrade compaction is acceptable in accordance with standard requirements of NCDOT in all the significant fill areas. The testing firm shall also inspect the subgrade to verify conformance with the pavement design report and provide a report of the findings to the Town Engineer. Upon acceptance and approval, the stone base course may be placed. However, no stone base may be placed prior to backfilling behind the curb. The stone base course materials should be placed and compacted to grade. Compaction and thickness testing shall be performed at a rate of 1 set of tests/ 500 linear feet with a minimum of three tests. Once the thickness and density of the ABC stone has been verified, and prior to the placement of concrete or asphalt, another proof roll of the ABC stone shall be performed under the supervision of the accredited testing laboratory and the Town Engineer. Once a passing proof roll is achieved, concrete and/or asphalt should be placed as soon as possible. In the event that inclement weather occurs after the ABC stone proof roll and before the placement of concrete or asphalt, or if a period of greater than 10 days lapses before paving, another proof roll of the ABC stone will be required. The contractor shall bear the cost of laboratory testing and inspections.
- L. Concrete or asphalt shall not be placed in inclement weather. The contractor shall protect freshly placed concrete or asphalt in accordance with Section 420 (Concrete Structures), Division 6 (Asphalt Pavements), and Division 7 (Concrete Pavements and Shoulders) of NCDOT Standard Specifications. Prior to any concrete being placed, a pre-pour meeting shall be required. Schedule the pre-pour meeting with the inspector.
- M. All concrete used for streets, curb and gutter, sidewalks and drainage structures, etc. shall be approved NCDOT mixes, unless otherwise directed by the Town Engineer or project special provisions. Concrete testing shall follow requirements and frequency set forth by NCDOT and ACI.
- N. The concrete temperature at the time of placement shall be between 50°F and 95°F except where other temperatures are required by NCDOT Specifications, Section 420. Do not place concrete without permission when the air temperature measured at the location of the concrete operation in the shade away from artificial heat is below 35°F. When such permission is granted, uniformly heat the aggregates and/or water to a temperature not higher than 150°F. Heated concrete shall be between 55°F and 80°F at the time of placement.
- O. All excess concrete on the front edge (lip) of gutter shall be removed when curb and gutter is poured with a machine.
- P. Straight forms shall not be used for forming curb and gutter in curves.
- Q. Contraction joints, expansion joints and joint sealer shall follow NCDOT Specifications and Town Standard Details.

- R. All concrete shall be cured with curing compound. Use white pigmented curing compound which meets ASTM C 309, as required by NCDOT Section 825 and Section 1026, applied at a uniform rate per manufacturer's instructions. Apply the membrane curing compound after the surface finishing is complete and immediately after the free surface moisture disappears, but at no point, more than 24 hours of after placement of the concrete.
- S. All curb and gutter shall be backfilled with soil approved by the Town Engineer within 7 days after construction, but not before 3 curing days has elapsed. Do not place ABC or pavement adjacent to the curb before the 3 curing days has elapsed.
- T. Prior to any asphalt being placed, a pavement coordination meeting shall be required. Schedule the pavement coordination meeting with the Town Inspector. All testing reports shall be provided to the Town Engineer prior to scheduling the pavement coordinateion meeting.
- U. Asphalt shall not be placed unless the minimum temperatures are met in NCDOT Specifications, Section 610. Do not place plant mix base course that will not be covered with surface or intermediate course during the same calendar year or within 15 days of placement if the plant mix is placed in January or February. The asphalt supplier and/or paving contractor shall perform all required field and laboratory testing in accordance with the current NCDOT standards during the production and installation of the paving materials. The results of the field and laboratory testing data will be provided to the Town Engineer for review and for final approval of the paving materials.
- V. When delaying the installation of the final lift of asphalt, drainage shall be maintained on the streets between the first lift of S9.5A and the second lift of S9.5A when the street is accepted. Use Southern Pines Standard Details to accommodate drainage in low areas.
- W. Surfaces shall be tacked when asphalt is being placed over existing asphalt streets or adjoining concrete, storm drain and sanitary sewer structures. In the event more than 1 lift of asphalt is placed in a single day, tack is still required between lifts.
- X. All asphalt cuts shall be made with a saw when preparing street surfaces for patching or widening strips. Milling is an acceptable alternative to saw cuts when applicable.
- Y. Paper joints shall be used to seal the ends of an asphalt pour so that future extensions can be made without causing rough joints.
- Z. When placing asphalt against existing surfaces, a straight edge shall be used to provide a smooth and consistent transition between the two surfaces at that location.
- AA. Dead-end streets without cul-de-sacs shall be required to install object signs designating the dead-end.
- BB. Fire apparatus access road shall be capable of supporting the imposed load of fire apparatus weighing at least 75,000 lbs in any weather condition, including during development construction. Furthermore, the access road minimum unobstructed width shall be 20', exclusive of shoulders, with a 13'-6" unobstructed vertical height (IFC Section 503.2.1) and shall not exceed a 10% grade. In the event a fire hydrant is located on the access road, the minimum width of the road shall be 26', exclusive of shoulders (IFC Appendix D). Grades steeper than 10% as approved by the fire chief. See Appendix A for dead-end access road turnarounds.
- CC. During phasing of residential developments temporary turnarounds are required for fire apparatus access. The temporary turnaround is required for streets 150' + from the intersecting street without a designed cul-de-sac.
- DD. All permanent striping shall conform to NCDOT Specifications, and MUTCD standards and specifications. Temporary striping may be paint and conform to NCDOT specifications for the duration of time in which the striping can be installed prior to installing the permanent striping.

EE. Traffic Calming Devices shall be prohibited unless approved by the fire code official (2018 NC Fire Code 5.3.4.1).

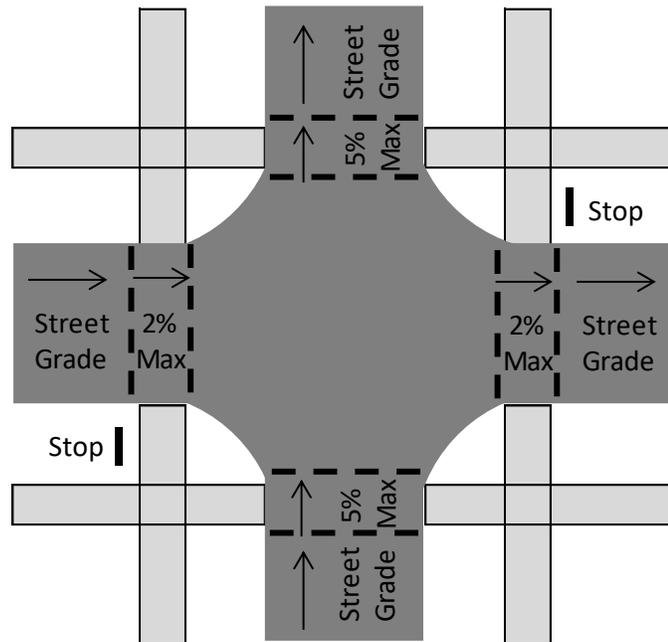
3. STANDARDS OF STREET DESIGN

A. **Streets** (Public and Private): Refer to Appendix A for Street Classifications.

B. Intersections:

1. Maximum Street Grade at Intersections (See Diagram 2-1):
 - a. 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' of an intersection.
 - b. 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).
 - c. Insofar as practical, streets shall intersect at an angle of 90° for a minimum of 50' from the roadway intersection. In no case shall the angle be less than 75°. Intersections having more than 4 corners shall be prohibited. Proposed streets which intersect opposite sides of another street (either existing or proposed) shall be laid out to intersect directly opposite each other.

DIAGRAM 2-1: INTERSECTION GRADES



C. Intersection Sight Distance:

1. Minimum sight triangles will be provided at each intersection corner.
2. Sight triangles shall contain no fence, structure, earth bank, hedge, planting, wall or other obstruction between a height greater than 2' above the property line grade as established by the Town Engineer. The following are exempted from this provision:
 - a. Existing public utility poles.
 - b. Existing trees trimmed (to the trunk) to a height at least 9' above the level of the intersection.

- c. Other plant species of open growth habit that are not planted in the form of a hedge and which are so planted and trimmed as to leave in all seasons a clear and unobstructed cross-view.
- d. A supporting member or appurtenance to a permanent building lawfully existing on the effective date of this ordinance.
- e. Official warning signs or signals.

D. **Stopping Sight Distance:** Intersections designs shall account for stopping sight distances in accordance with Tables 2-1 and 2-2.

TABLE 2-1: STOPPING SIGHT DISTANCE

MINIMUM STOPPING SIGHT DISTANCE (ft)							
Vehicle Speed (mph)	UPGRADES			FLAT	DOWNGRADES		
	9 %	6 %	3 %	0 %	-3 %	-6 %	-9 %
25	140	145	150	155	160	165	175
30	180	185	200	200	205	215	230
35	225	230	240	250	260	275	290
40	270	280	290	305	315	335	355
45	320	330	345	360	380	400	430
50	375	390	405	425	450	475	510

TABLE 2-2: DESIGN INTERSECTION SIGHT DISTANCE, LEFT TURN FROM STOP

Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Passenger Cars	
		Calculated (ft)	Design (ft)
15	80	165.4	170
20	110	220.5	225
25	155	275.6	280
30	200	330.8	335
35	250	385.9	390
40	305	441.0	445
45	360	496.1	500
50	425	551.3	555

E. **Cul-de-sac Streets:**

1. Shall not exceed a more than 500 feet of length from the connection to the intersecting street to the furthest paved point. Temporary cul-de-sacs on stub streets shall not exceed one-thousand (1,000) feet unless no other practicable alternative is available.
 - a. The preliminary and final site plan shall show a stub connecting the cul-de-sac to adjoining areas or parcels where future roadways are delineated on a recorded subdivision or site plan (provided reasonable connection can be achieved without the need for a bridge or other feature to negate substantial topography). The stub shall be improved as pedestrian walkway, trail, or bikeway.
 - b. The radius for the circular terminus, or turnaround, shall be not less than 43’.

F. **A Traffic Impact Analysis (TIA) and Traffic Design Analysis (TDA):** Are required per section 4.11 Transportation/Traffic Analyses of the UDO.

- G. **Pavement Design:** The pavement designs presented in Table A-1 shall be considered the minimum design requirements. A pavement design report produced and certified by a professional engineer, using AASHTO methodology shall be provided to the Town Engineer during the Engineering Plan review. The report shall be based on field and lab testing of in place subgrade materials by a qualified geotechnical firm and shall incorporate the following criteria: 25-year design life, 4% annual growth rate, and appropriate traffic projections with truck factor. The traffic projections shall account for offsite areas that the road will, or is planned to connect to, based on the current zoning or land use. If the design structural coefficient exceeds that of the standard, the design structure shall be used.
- H. **Driveways**
1. Refer to Southern Pines Standard Details for driveway layout and separation requirements.
 2. Driveway Permits and inspections are required per UDO.
- I. **Design Vehicles**
1. Site designs and/or street designs shall evaluate the minimum turning radius for the vehicular traffic intended for use to support the proposed improvement. The evaluation of the vehicular turning radius shall include, but not be limited to, parcel delivery trucks, garbage trucks, semi-truck and trailers and current Southern Pines Fire Department fire apparatus vehicles. See Appendix A for appropriate design vehicles.
 2. Regardless of the street classification or design vehicle, radii may need to be adjusted to meet the requirements of the proposed usage and vehicle. The Town Engineer may request the additional requirements based on the proposed usage warrants.

TABLE 2-3: STANDARDS OF STREET DESIGN

Street Type	Alley	Local	Collector	Arterial
Average Daily Traffic (ADT)	100	200 Sub-Collector 800	more than 800	
Longitudinal Grade ⁽⁴⁾ Min Max: level/rolling hilly (stop/yield) at intersection (thru movement) at intersection Within 100' of an intersection	1%	1%	1%	See NCDOT Roadway Design Standards
	10 %	10 %	8 %	
	10 %	10 %	10 %	
	5 %	2 %	2 %	
	5 %	5 %	5 %	
Minimum vertical curvature, K (L/A) crest sag	12	20	30 (residential) 44 (non-residential)	
	26	30	50 (residential) 64 (non-residential)	
Min Horizontal Centerline Curve Radius		150'	230'	
Crown/Cross Slope	2%	2%	2%	
Min Tangent between Reverse Curves		50'	100'	
Street Intersection Radius ⁽²⁾	20'	30'	30'	
Design Speed Min Max	15 mph	25 mph ⁽³⁾	40 mph	
	15 mph	40 mph	40 mph	
Design Vehicle Residential Non-Residential	SU-30	SU-30		WB-62
			SU-30	
			WB-62 or WB-40	
Driveway and Intersection Dimensions	See details for typical dimensions and separations			
Pavement Schedule ⁽¹⁾ surface course (S9.5A) intermediate course (I19.0C) base course	2"	1.5"	2"	See NCDOT Roadway Design Standards
	0"	1.5"	3"	
	8" ABC or 4" B25.0C			
Dead-End Fire Apparatus Access Roads Length Width Vertical clearance Maximum grade Turnaround required	0-150'	150'-500'	500'-750'	750'+
	20'	20'	20'	Special Approval Required
	13.5'	13.5'	13.5'	
	10 %	10 %	10 %	
	None	86' ø Cul-De-Sac 120' Hammerhead (Temporary)		

Notes:

1. Prior to substituting B25.0C, approval shall be obtained from the Town Engineer.
2. Radius measured from edge of pavement.
3. Design speeds are 5 MPH over the speed limit. Town wide speed limit is 35MPH unless otherwise posted. Design speeds less than 40 MPH must be approved by Council.
4. Maximum grade on roads without curb and gutter shall be 5%.

4. GRADING

- A. The maximum slope for cuts and fill embankments is 3:1. Fill embankment materials shall be placed and thoroughly compacted in successive layers $\leq 10''$ 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.
- B. Longitudinal grades shall have a minimum grade of 1% and a maximum grade of 10%. Grades shall not exceed 5% on roads without curb and gutter.
- C. Transverse grade or crown shall be 2% with +/- 0.5% tolerance unless otherwise approved by the Town Engineer.

5. ROADWAY BASE

- A. Stone base course shall conform in all respects to Section 520 (Aggregate Base Course), Section 1006 (Aggregate Quality Control/Quality Assurance), Section 1010 (Aggregate for Non-Asphalt Type Bases) of the NCDOT Standard Specifications for Roads and Structures.
- B. The stone base shall be compacted to 100% in accordance with AASHTOT180 as modified by NCDOT when conventional density test #3 is used. When nuclear density testing is performed, a nuclear target density of at least 98% shall be obtained. In addition, the nuclear density of any single test location shall be at least 95% of the nuclear target density.
- C. ABC will not be allowed within widening strips less than 5' in width.
- D. Prior to the placement of base material, all subgrade testing shall be completed and provided to the Town.

6. ROADWAY INTERMEDIATE AND SURFACE COURSE

- A. Plant mixed asphalt shall conform in all respects to Section 610 (Asphalt Concrete Plant Mix Pavements) of the NCDOT Specifications for Roads and Structures.
- B. A pavement coordination meeting shall be required prior to placing any asphalt. All testing reports shall be provided to the Town prior to scheduling of the meeting.
- C. An approved NCDOT Job Mix Formula shall be required to be submitted prior to paving.
- D. The contractor shall have a third party QMS Roadway Technician on-site during the paving operation. A report of the Technician's inspections and testing shall be provided to the Town.
- E. The contractor may elect to leave the final lift of asphalt surface course, for residential subdivision streets, withheld until the portion platted is occupied (occupied means a certificate of occupancy has been issued) and no conflicts exist between the water and sewer services and the proposed driveways. A subdivision improvement agreement will be required for the final lift of asphalt.
- F. Roadway Final Lift Inspection Procedures:
 - 1. Contractor puts down intermediate course and/or first lift of surface course and raises structures to final grade (including concrete collars 1" to 1.5" below final grade). Asphalt is to be placed around structures to prevent damage.
 - 2. Contractor submits Record Drawings to the Town Engineer.
 - 3. Upon approval by the Town Engineer, Contractor may request final inspection for water and/or sanitary sewer. Owner, along with the Town Inspector, shall then verify the water services and/or sanitary sewer laterals are not in conflict with driveways and/or other proposed infrastructure.
 - 4. The final asphalt must be placed before 2 years have lapsed since the approval of the intermediate asphalt layer. The Town must approve surety to cover the 2-yr period.

5. After placement of the final asphalt, the Contractor may request final inspection for the roadway, and upon approval, the 1-yr warranty of the roadway begins.
- G. In the event construction traffic must be routed on newly paved streets, a bond shall be provided to the Town until construction activities are completed.
- H. Prior to placing the final layer of surface course asphalt, the Town inspector shall be given a 48 hr notification to inspect the roadway for deficiencies. All deficiency repairs are to be completed prior to application of final layer.
- I. Cores or nuclear density may be used on base, intermediate and first lift of surface course mixes. Cores will not be permitted on the final lift of surface course. Only nuclear density testing shall be used on the final lift of surface course.
- J. Access must be maintained during the paving operation. Residents, emergency vehicles, solid waste collection and mail delivery will need to be addressed during the pavement coordination meeting.

7. SIDEWALKS AND RAMPS

- A. 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 and conform to the Americans with Disability Act.
- B. Sidewalks shall be constructed of not less than NCDOT, Class B concrete, and shall be 4" thick, constructed on an adequately graded base, except where a sidewalk crosses a driveway it shall be 6" thick. Subgrade shall be compacted to 95% of the maximum density obtainable in accordance with AASHTO T 99 as modified by NCDOT. 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 5', and ½" expansion joints at intervals of not more than 50'. ½" expansion joints will be required where the sidewalk joins any rigid structure. The sidewalk shall have a maximum lateral slope of 2% toward the street.
- C. All expansion joints shall be filled with joint sealer.
- D. Planting strip adjacent to sidewalk shall be graded to ¼"/ft, except where excessive natural grades make this requirement impractical. In such cases, the Town Engineer may authorize a suitable grade.
- E. Sidewalk widths shall be a minimum of 5' unless otherwise specified.
- F. Approval of sidewalk construction plans must be obtained as part of the plan review process. Except in unusual circumstances, the sidewalk must be located a minimum of 6' 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 Moore County Register of Deeds prior to issuance of a certificate of occupancy for the corresponding building(s).
- G. Running slope of directional ramps shall be from 7.5% to 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.
- H. Truncated domes shall be Federal Standard Color Code number 20109, "Red Brown."

- I. Refer to the MUTCD (latest edition) for construction zone pedestrian routes and signalization and controls for actuators. Curb ramps shall be designed and constructed in accordance with the Americans with Disability Act.
- J. 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.

8. DRIVEWAYS

- A. All driveway entrances and other openings onto town-maintained streets shall, at a minimum, conform to the requirements set forth in this section. Driveway entrances to state-maintained streets shall also conform to the standards contained herein as well as those of the North Carolina Department of Transportation. In the event of a conflict between the two sets of standards, the most restrictive standard shall apply.
- B. A Driveway Permit from the Town of Southern Pines is required prior to making connection to a Town street. Refer to the Land Development details for driveway layout requirements.
- C. The Town requires inspections of the street connections. Provide a minimum notice of 48 hours to schedule the inspection.
- D. Depending on the type of connection to streets or roadways, additional right of way, dedicated to the Town, may be required for improvements to the existing roadway. The cost of the right of way acquisition and street improvements is the responsibility of the Developer.
- E. Medians or islands may be permitted for street type driveways and private street entrances only, upon approval of the Town Engineer and subject to the following conditions:
 - 1. The raised median or island shall be constructed on private property to the rear of the right-of-way line.
 - 2. The minimum width of the median or island as measured nearest the right-of-way line (excluding the nose) shall be 15', the minimum length shall be 50'.
 - 3. For street type driveways with a median or island, the combined width of pavement of the separated driveway segments shall not exceed 48'.
- F. The standards for driveway spacing delineated in this section are intended as general guidelines for driveways with low and moderate traffic volumes. Spacing for high volume driveways (such as shopping centers, major apartment complexes, etc.) shall be determined by the Town Engineer based upon actual traffic conditions and needs.
- G. The number of permissible driveways on an individual property shall be determined as follows in Table 2-4:

TABLE 2-4: MAXIMUM NUMBER OF DRIVEWAYS BY STREET

Maximum Number of Driveways by Street		
Frontage	Arterial	All Other
<50'	1	1
51'-150'	1	2
151'-500'	2	3
>500'	3	4
See UDO Section 3.6.5 for additional limitations on the number of driveways for property located within highway corridor overlay district.		

- H. Applicants for driveways may be required to dedicate right-of-way for and construct or reimburse the cost of constructing medians, acceleration and deceleration lanes and traffic storage lanes to connect a driveway to a street. The need for these improvements will be determined by the Town Engineer and in cases involving driveway connections onto state-maintained roads, the consent of the North Carolina Department of Transportation must also be obtained. The need for the improvements must be reasonably attributable to the traffic utilizing the driveway and the improvements must be designed to serve the driveway traffic.

9. PARKING

- A. Off-street parking spaces shall be provided in accordance with the requirements in Chapter 4.5 Off Street Parking and Loading of the Southern Pines UDO. The Planning Department reviews and approves the parking requirements and the Planning Director shall be authorized to approve any alternate parking plans for developments.
- B. A pavement design report produced and certified by a professional engineer, using AASHTO methodology shall be provided to the Town Engineer during the Engineering Plan review. The report shall be based on field and lab testing of in place subgrade materials by a qualified geotechnical firm and shall incorporate the following criteria: 25-year design life, 4% annual growth rate, and appropriate traffic projections with truck factor. The traffic projections shall account for offsite areas that the parking lot will connect to or is planned to connect to, based on the current zoning or land use. The minimum structure shall be the equivalent to an Alley in Table A-1.
- C. Concrete parking areas shall be designed and constructed the same as pavement except that the concrete surface shall be a minimum of six (6) inches in thickness.
- D. When justified, the Town Engineer may allow other paving materials to be used so long as a design report is produced and certified by a professional engineer that an equivalent level of stability is achieved.
- E. When parking areas are not required to be paved with asphalt, concrete, or other paving material in accordance with Chapter 4.5 Off Street Parking and Loading of the UDO, the parking areas shall be designed and constructed the same as pavement with a minimum depth of six (6) inches of base stone and two (2) inches of surface stone.

10. NCDOT COORDINATION

- A. Any connection or potential impact to a NCDOT roadway shall require approval by NCDOT. It is recommended coordination meetings take place early in the development process with the developer, NCDOT and Town of Southern Pines discussing potential requirements for roadway improvements, access to the site and right of way dedications. NCDOT has the ultimate authority for any work in NCDOT right of way.

- B. It is the sole responsibility of the requesting party to determine if a street is State maintained or not.
- C. Plan submittals, review and approvals should be coordinated concurrently with both, NCDOT and the Town of Southern Pines, to avoid conflicting requirements. The coordination should account for the review process of the two agencies may not coincide and communication of submittals from the requesting party is essential in avoiding delays. In situations where an agency's regulation differs from that of the other agency, the more restrictive of the two shall govern.
- D. NCDOT and the Town of Southern Pines require approvals for connections to existing roadways. The Town of Southern Pines will approve any connections to Town streets. Prior to obtaining Site Plan approval or Town driveway permit, the requesting party shall provide the Town of Southern Pines an approved driveway permit from NCDOT allowing access to the site from a NCDOT street.
- E. During construction of the project, both NCDOT and the Town of Southern Pines have enforcement authority to ensure safety in the right of way is not being compromised. Both agencies have the ability to affect the project's progress if there is reason to believe proper construction practices are not being adhered to and/or if unsuitable materials are being used in the right of way. Failure to comply with permits and the approved plans may result in revocation of permits.

11. BRIDGES

- A. The use of a bridge for a publicly maintained project shall require prior approval by the Town Engineer.
- B. The layout and design of bridges shall follow the current applicable NCDOT policies and manuals and shall be designed under the responsible charge of a registered design professional.
- C. The bridge shall be designed to include support for lighting, public water lines and other public utilities. Private utility lines are not allowed to be attached to the structure.
- D. Design submittals shall include copies of foundation reports, design load assumptions, and bridge design calculations for structural components.
- E. The developer shall be responsible for providing geotechnical testing, engineering oversight and construction observation of the bridge and associated structures by a qualified individual. Copies of the inspection reports and the design engineer's as-built certification shall be provided with the as-built drawings for the bridge.

12. GREENWAYS

- A. Greenways constructed in the jurisdiction of the Town of Southern Pines shall follow current guidelines by NCDOT, NCDOT Greenway Specification Z-200, MUTCD, AASHTO, FHWA, ADA and this manual.
- B. Construction of greenways and trails shall require permits be obtained from each agency having jurisdiction within the construction area. Potential agencies requiring permits for greenway construction are: NCDOT, FEMA Conditional Letter of Map Revision (CLOMR/LOMR), U. S. Army Corps of Engineers, DWQ and NCDEQ.
- C. Minimum stopping sight distance for various design speeds, vertical and horizontal curves, and grades need to be considered to ensure safe braking distance on a shared use path. The AASHTO Guide for the Development of Bicycle Facilities provides methodologies, tables and graphs of stopping sight distance for various combinations of grade and design speed.
- D. Horizontal radii shall be a minimum 90' centerline radius.

- L. Rest areas shall be greater than 5' in length, have a width greater than the width of the trail segment to and from the rest area, have a grade less than 5%, have a cross-slope that exceeds 2%, have a minimal change of grade and cross-slope on the segment connecting the rest area with the main pathway and have accessible designs for amenities such as benches, where provided.
- M. The typical section for greenways shall include:
 - 1. Geotextile fabric for soil stabilization placed on subgrade compacted to a density of 92% in accordance with AASHTO T99 as modified by NCDOT.
 - 2. ABC shall be placed at a 6" compacted depth with a density of 92% in accordance with AASHTO T180 as modified by NCDOT for both nuclear and ring test.
 - 3. Asphalt option: place asphalt, 2" of S9.5A placed in one lift, in accordance with Section 610 of the Standard Specifications, compacted to at least 85%. Coring of the final surface course will not be allowed.
- N. Provide a 54" safety rail when the following is within 6' of the edge of pavement:
 - 1. Slope \geq 3:1 & drop of 6'.
 - 2. Slope \geq 2:1 & drop of 4'.
 - 3. Slope \geq 1:1 & drop of 1'.
- O. The current North Carolina Building Code requires handrails for instances where the distance from the top of a boardwalk deck to the bottom of the creek or top of ground is 30" or more. For instances where the distance is less than 30", a 6" toe board shall be used to prevent falls.
- P. Bridges shall have at least 10' clear inside dimensions. For bridges 10' in width, a design load of H5 shall be required. For bridges 12' in width, a design load of H10 shall be required.
- Q. Overhead clearance shall be 8' minimum of vertical height for pedestrian trails and 10' of vertical height for multi-use trails.
- R. During paving operations, dump truck loads shall be prohibited to 15 tons to prevent damage to the compacted ABC.
- S. In environmentally sensitive areas, alternative seeding specifications may be required.

CHAPTER 3 STORM DRAINAGE

1. GENERAL NOTES

- A. All work and materials shall conform to the latest edition of the NCDOT Standard Specifications for Roads and Structures, NCDOT Standard Drawings and the Southern Pines Engineering and Construction Standards.
- B. Prior to beginning construction in the Town of Southern Pines, a preconstruction meeting with the Town shall be held, and submittals (shop drawings) shall be approved. The submittals should include all materials (roadway, storm, and utilities) to be used during construction.
- C. Storm Drainage Pipe Cover
 - 1. Minimum cover is 2' measured from the final surface. Less than 2' requires prior approval by the Town Engineer.
 - 2. Maximum cover: reference NCDOT Highway Design Branch Roadway Design Manual.
- D. In areas where downstream impoundments will create a tailwater that backs water up into the pipe system, culverts shall be constructed with O-ring seals in the joints, which may require testing of the system. The Town Engineer shall determine locations of the system testing.
- E. Storm Drainage Pressure Testing. When pipe testing is required, the storm structures shall also be tested as required. Vacuum testing may be used as outlined in ASTM C1244. Exfiltration tests may also be performed as follows:
 - 1. Plug the inlet and outlet and fill the manhole with water to within 6" of the top of the manhole.
 - 2. Allow the water to stabilize for 1/2 hr and refill the manhole to the original elevation.
 - 3. Mark the initial depth of water, and after 1 hr record the drop in the water level in the manhole.
 - 4. The maximum allowable drop in vertical water height in the manhole shall be ¼" for all diameter sizes of manholes. If the water level in the manhole drops below the allowable drop amount, the Contractor shall repair the leak and retest.
- F. 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 400'.
- G. 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.
- H. All pipes in storm drain structures shall be flush with the inside wall. The floor of all storm drain structures shall be filled with concrete to an elevation flush with the downstream invert.
- I. All storm drain structures over 3'-0" in height must have steps in accordance with standard details set forth in NCDOT Standard Specifications for Roads and Structures.
- J. Catch basins with frame, grates and hoods installed in curb and gutter sections less than 2'-6" wide shall offset the frame, grate and hood to the back of the structure to maintain a consistent width of roadway.
- K. Frames, grates and hoods shall not be offset from the catch basin more than 4", front to back.
- L. Density tests shall be required on trench backfill at a frequency established in Chapter 2 of the Town Engineering and Construction Standards.

- M. Precast waffle boxes may not be used in areas with traffic bearing loads. Pipe shall enter precast waffle boxes in the area provided for knock outs, the corner or supporting wall section of a waffle box shall not be cut.
- N. All graded creek banks and slopes shall be at a maximum 2:1 and not to exceed 10' without terracing, otherwise the slopes shall be designed by a Professional Geotechnical Engineer and approved by the Town Engineer on a case-by-case basis.
- O. Acceptance of the storm requires: 2 videos (the 1st video is prior to the first proof roll, the 2nd video is after the installation of dry utilities, but prior to acceptance of the streets); as-built drawings; and certification by the design engineer using the Certification Form in Appendix A.

2. STANDARDS FOR STORM DRAINAGE & DETENTION DESIGN

- A. All storm drainage design shall conform to the standards and specifications as provided herein and the UDO. The more restrictive of any standards that conflict, shall apply.
- B. Site grading shall not increase the flow rate of runoff onto downstream properties.
- C. **Storm Drainage Design**
 - 1. Minimum pipe size is 15" to an inlet and 18" for open cross pipe culverts.
 - 2. Storm system pipes and swales shall be designed for non-pressure conditions using the rational method for the 10-yr storm event.
 - 3. Cross-drainage storm sewers shall be designed using the rational method for a 25-yr storm event.
 - 4. Minimum pipe slope is 0.5% or that which produces a velocity of 2.5 fps when flowing full.
 - 5. Maximum pipe slope is 10% unless special anchoring is provided.
 - 6. Maximum pipe velocities shall not exceed 20 fps.
 - 7. Maximum discharge velocities at pipe outlets is 10 fps.
 - 8. Maximum headwater $HW/D \leq 1.2$.
 - 9. Minimum freeboard:
 - a. 12" for pipes $\leq 3'$.
 - b. 18" for pipes $> 3'$.
 - c. 6" at yard inlets.
 - 10. Driveway pipes for subdivisions shall be sized for the 10 year storm. The pipe sizes shall be labeled on the plans and final plat.
 - 11. Storm pipes installed outside of the ROW shall be provided with a dedicated private easement meeting the minimum dimensions in Table 3-1.

TABLE 3-1: STORM PIPE EASEMENT DIMENSIONS

STORM PIPE									
Pipe Inner Diameter (in)	Wall Thickness (in)	Pipe Outer Diameter (ft)	Min. Bottom Width (ft)	Max. depth to bottom of pipe @ Esmt Width (ft.)					
				20'	25'	30'	35'	40'	50'
15	2.25	1.63	3.63	8.19	10.69	13.19	15.69	18.19	20.91
18	2.50	1.92	3.92	8.04	10.54	13.04	15.54	18.04	20.98
24	3.00	2.50	4.50	7.75	10.25	12.75	15.25	17.75	21.13
30	3.50	3.08	5.08	7.46	9.96	12.46	14.96	17.46	21.27
36	4.00	3.67	5.67	7.17	9.67	12.17	14.67	17.17	21.42
42	4.50	4.25	6.25	6.88	9.38	11.88	14.38	16.88	21.56
48	5.00	4.83	6.83	6.58	9.08	11.58	14.08	16.58	21.71
54	6.25	5.54	7.54	6.23	8.73	11.23	13.73	16.23	21.89
60	6.75	6.13	8.13	5.94	8.44	10.94	13.44	15.94	22.03
66	7.25	6.71	8.71	5.65	8.15	10.65	13.15	15.65	22.18
72	7.00	7.17	9.17	5.42	7.92	10.42	12.92	15.42	22.29

* - Depth beyond those shown on this chart shall require additional easement width to the nearest 5' increment.

D. Inlet Design

1. Inlets shall be designed in accordance with the NCDOT Guidelines for Drainage Studies and Hydraulics.
2. Inlet placement will be determined using Table 3-2 but shall not exceed a maximum 400' spacing.
3. Bypass shall be limited to less than 0.10-cubic feet per second (cfs) into an intersection.
4. Sag points shall be designed with a 50% clogging factor and shall be a minimum of a double catch basin.

TABLE 3-2: DESIGN FREQUENCY AND SPREAD CRITERIA FOR INLET PLACEMENT

Roadway Classification	Design speed (on grade) or Sag (low point) ¹	Design Frequency (yr)	Intensity (in/hr)	Allowable Spread (ft)
Arterials	≤ 45 mph	10	4	Shoulder ¹ + 3
	> 45 mph	10	4	Shoulder ¹
	Sag (low point) ²	50	4	Shoulder ¹ + 3
Collectors, Sub-Collector, and Local Streets	≤ 45 mph	10	4	½ travel lane
	> 45 mph	10	4	Shoulder ¹
	Sag (low point) ²	25	4	½ travel lane

1. Applies to shoulder width 6 ft or greater; for narrower shoulder widths, design spread should not exceed 6 ft.
2. Sag (low point) criteria is applicable where there is no overland relief.

E. Site Stormwater Design

1. In accordance with UDO 4.14 Drainage, Erosion Control, Stormwater Management, the post-development runoff rate shall be equal to or less than the pre-development rate from the design storm or a ten (10) year storm event.
2. Detention facilities shall be designed, in accordance with the most recent NCDEQ guidance, to maintain the pre-developed runoff rate for 1-yr & 10-yr, 24-hr storm events.
3. Emergency spillways shall accommodate the 100-yr, 24-hr storm event with a minimum of 6" freeboard.

3. REINFORCED CONCRETE PIPE

- A. All concrete shall meet the minimum specifications set forth in Section 1032 of the NCDOT Standard Specifications for Roads and Structures.
- B. Concrete pipe used within the street right-of-way shall be a minimum of Class III Reinforced Concrete Pipe, with a minimum diameter of 15" (18" minimum on cross drain culverts within the ETJ and open-ended culverts under a road). Installation of Class IV or higher concrete pipe shall be identified on the As-Built Plan and the Town inspector shall be given documentation and notification of this information prior to construction.
- C. Use flexible plastic joint material except when material of another type is specified in the contract documents. Joint material of another type may be used when permitted.
- D. RCP < 42" in diameter, NCDOT Section 300 shall be used for installation.
- E. RCP ≥ 42" in diameter:
 1. Wrap filtration geotextile fabric around all pipe joints. Extend geotextile at least 12" beyond each side of the joint. Secure geotextile against the outside of the pipe by methods approved by the Engineer.
 2. #57 stone shall be used as bedding. Bedding shall consist of a minimum of 7" in depth under the pipe, continuing up to the spring line of the pipe.
- F. ASTM C969 and ASTM C1103 are acceptable methods of testing concrete pipe when testing is required by the Town Engineer.

4. POLYPROPYLENE PROFILE WALL PIPE

- A. The Town Engineer may approve the use of Polypropylene Profile Wall Pipe for use outside the right-of-way.
- B. Polypropylene Profile Wall 15" – 60" dual wall pipe shall have a smooth interior and annular exterior corrugations; 30" – 60" triple wall pipe shall have smooth interior and exterior surfaces with the exterior having minor annular corrugations.
- C. Polypropylene Profile Wall pipe of the sizes shown or specified shall conform to:
 1. ASTM F2736 Standard Specification for 6" - 30" Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
 2. ASTM F2764 Standard Specification for 30" - 60" Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
- D. Submittals shall include:
 1. Manufacturer's product information including details of installation, joints and pipe/manhole connections; properties and strengths of pipes; and instructions on storage, handling, transporting and installation.

2. Pipe design load calculations (suggested if deep burial is an issue).
 3. Factory test reports.
- E. Pipe shall be joined with a gasketed integral bell and spigot joint meeting the requirements of ASTM F2736.
- F. Pipe diameters 15" - 60" shall be watertight according to the requirements of ASTM D3212, with the addition of a 15-psi requirement. Spigot shall have 2 gaskets meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gaskets are free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.
- G. 15" - 60" diameters shall have a reinforced bell with a polymer composite band installed by the manufacturer.
- H. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.
- I. Fittings shall not be allowed. Any change in direction and/or additional pipes shall have a catch basin, manhole or junction box installed at the necessary location.
- J. Polypropylene pipe shall be installed within 6 months of delivery to project site unless written approval is granted from the manufacturer and approved by the Town Engineer. Approval of an extension in storage time must be requested in writing and accompanied by inspection within 2 weeks prior to installation by an authorized representative of the manufacturer.
- K. Long-term above ground storage of polypropylene pipe and fittings shall conform to the following procedure:
1. Pipe shall be stored on flat timber supports to facilitate placement and removal of lifting slings around pipe. All pipes shall be chocked to prevent rolling in high winds.
 2. If stacked, minimum 3" wide timber supports shall be used and placed at the quarter points with chocks. Pipe shall not be stacked higher than 10' above the ground.
 3. Pipe and Fitting laydown should be relatively flat and free of other potentially damaging debris. Laydown area should have proper drainage. At no time, shall any portion of pipe or fittings be stored in standing water for more than 24 hrs.
- L. Pipe shall be handled using textile slings or other means recommended by manufacturer. Chains and cables in direct contact shall not be allowed.
- M. Installation
1. Shall be in accordance with NCDOT Specifications, Section 300, and ASTM D2321 and manufacturer recommended installation guidelines.
 2. Minimum cover in traffic areas for $\leq 48''$ shall be 1'
 3. Minimum cover in traffic areas for $\geq 60''$ shall be 2'.
 4. Maximum cover for polypropylene pipe shall be per Table 3-3.

TABLE 3-3: MAXIMUM COVER FOR POLYPROPYLENE PIPE

Diameter	Class 1	Class 2			Class 3		Class 4
	Compacted	95%	90%	85%	95%	90%	95%
15"	42	29	21	10	22	12	11
18"	36	25	18	9	19	12	11
24"	31	22	16	7	16	11	10
30"	33	23	17	9	17	11	10
36"	32	22	16	7	16	11	10
42"	32	22	15	7	16	11	10
48"	31	21	15	6	15	10	9
60"	34	23	16	6	16	11	10

5. Backfill material for minimum cover situations shall consist of:

- a. Class 1.
- b. Class 2 95-85% SPD.
- c. Class 3 95-90%.
- d. Class 4 95%.

N. Jointing:

1. Clean ends of pipe and coupling components.
2. Apply joint lubricant to pipe ends and elastomeric seals of coupling. Use only lubricants approved by the pipe manufacturer.
3. Use suitable equipment and end protection to push or pull the pipes together.
4. Do not exceed forces recommended by the manufacturer for coupling pipe.
5. Join pipes in straight alignment. Do not allow any deflection angle or pipe misalignment to exceed the maximum permitted by the manufacturer.

O. Backfill

1. Use non-cohesive materials include gravels, gravel-sand mixtures, sands, and gravelly sands.
2. Accomplish immediately after the pipe is laid.
3. The fill around the pipe shall be placed in layers not to exceed 8".
4. Compacted to 95% of the maximum density with the AASHTO T 99 Modified Proctor Test.
5. A density of 100% AASHTO T 99 Modified Proctor is required for the top 8".

P. Testing Polypropylene Profile Wall Pipe

1. Water tightness test (if required by the Town Engineer) may be accomplished in accordance with ASTM F1417 or ASTM F2487.
2. Deflection shall be checked using a mandrel no sooner than 30 days after installation of the final backfill. The mandrel size shall not be more than 5% of the inside diameter of the pipe, see Appendix A for dimensions of mandrel.

Q. Provide properly trained manufacturer's service technician employed by the manufacturer to ensure proper installation of Polypropylene Profile Wall Pipe.

5. CORRUGATED ALUMINIZED METAL PIPE (SPECIAL DESIGN)

- A. Corrugated Aluminized Steel Type 2 pipe, Corrugated Aluminum Alloy Structural Plate pipe, or Corrugated Aluminum Alloy Structural pipe arches may be used in special locations for culverts \geq

60" in diameter with approval by the Town Engineer. Type 1A Corrugated Metal Pipe shall not be allowed. The metal pipe shall be a minimum of 14-gauge metal. All pipe must be supplied by NCDOT approved manufacturers.

- B. Bedding, installation and backfill of CAMP piping shall follow NCDOT specifications for flexible pipe in Section 300.
- C. The minimum cover for CAMP piping shall follow NCDOT specifications and manufacturer recommended specifications, whichever is the more restrictive.
- D. Corrugated aluminum alloy culvert pipe shall meet AASHTO M 196, except that Type IA pipe will not be permitted.
- E. When a pipe is proposed to be installed in a stream with high velocity (>15 fps) runoff and with heavy bed load (especially angular rocks with sharp corners), the design and pipe gage must be evaluated for abrasion.
- F. The soil water environment shall have a pH range between 4.0 to 9.0 and a resistivity of 500 ohm-cm or greater.
- G. Galvanized steel, asphalt coated, and polymer coated pipe shall not be permitted.

6. SPECIAL STRUCTURES

- A. Bridges, arch culverts, retaining walls, box culverts bottomless culverts, large headwalls, etc. shall be reviewed on a case by case basis depending on the intended use and environmental impacts associated with the project. The Town Engineer shall set forth guidelines for the design of Special Structures.
- B. All Special Structures shall be designed by a licensed professional with credentials to support the intended design and work.
- C. All Special Structures shall follow the specifications, certifications and approval processes associated with Federal, State, and Local agencies, along with the requirements of this manual.

CHAPTER 4 WATER DISTRIBUTION SYSTEM

RESERVED FOR FUTURE USE

CHAPTER 5 SEWER COLLECTION SYSTEM

RESERVED FOR FUTURE USE

CHAPTER 6 CONSTRUCTION DRAWINGS CHECKLIST

Instructions: All Construction Plan submissions shall at a **minimum** contain the requirements stated within. Any construction plan submissions with missing or incomplete information may be rejected and not reviewed until all necessary information has been provided. It should be noted that not all items contained within will necessarily be required for every project. **This list is intended to give general guidelines only and is not to be considered all-inclusive. Checklist may change; website should be checked to insure most current version is being used.**

The Engineer shall place a check mark in one of the boxes (as appropriate) on each item:

provided or **(N/A)** not applicable

Note: The following checklist is provided to assist the design engineer in developing a complete plan set to expedite our review process. Compliance with the checklist in no way is meant to relieve the design professional of his or her responsibility for project design. All construction plans submitted for review are to include a copy of this checklist signed by a NC registered Professional Engineer and/or Architect. Project submittals without a completed checklist will not be reviewed. Forms are available at: www.southernpines.net

PROJECT NAME: _____

ENGINEER: _____ ENGINEERING COMPANY: _____

COMPANY ADDRESS: _____

COMPANY PHONE: _____ EMAIL: _____

PROJECT PROPERTY OWNER: _____ EMAIL: _____

PROJECT ADDRESS/LOCATION _____

DATE SUBMITTED: ____/____/____

The Following Are the Minimum Plan Sheets to be Provided

		Applicant	
		Provided	N/A
1	Title/Cover Sheet	<input type="checkbox"/>	<input type="checkbox"/>
2	Existing Conditions\Demolition Plan	<input type="checkbox"/>	<input type="checkbox"/>
3	Overall Site Plan	<input type="checkbox"/>	<input type="checkbox"/>
4	Road Plan & Profile	<input type="checkbox"/>	<input type="checkbox"/>
5	Storm Drainage Layout Sheet	<input type="checkbox"/>	<input type="checkbox"/>
6	Storm Drain Plan and Profile(s)	<input type="checkbox"/>	<input type="checkbox"/>
7	Drainage Area map	<input type="checkbox"/>	<input type="checkbox"/>
8	Grading and Erosion Control Plan(s).	<input type="checkbox"/>	<input type="checkbox"/>
9	Utility Layout Sheet.	<input type="checkbox"/>	<input type="checkbox"/>
10	Water Plan & Profile	<input type="checkbox"/>	<input type="checkbox"/>
11	Sewer Plan & Profiles	<input type="checkbox"/>	<input type="checkbox"/>
12	Landscaping Plans	<input type="checkbox"/>	<input type="checkbox"/>
13	Details	<input type="checkbox"/>	<input type="checkbox"/>

1. General Plan Requirements

		Provided	N/A
1	Download latest Town Cover Sheet Requirements from: https://nc-southernpines2.civicplus.com/501/7447/Requirements?activeLiveTab=widgets	<input type="checkbox"/>	<input type="checkbox"/>
2	Each page is signed, sealed and dated by a NC Registered Professional Engineer and/or Architect.	<input type="checkbox"/>	<input type="checkbox"/>
3	All drawings in a set of construction plans are the same size sheet, 36 in. wide by 24 in. high. See folding instructions town stamp-final approval.dwg	<input type="checkbox"/>	<input type="checkbox"/>
4	North arrow with horizontal and vertical datum provided on each plan sheet.	<input type="checkbox"/>	<input type="checkbox"/>
5	Plans and Profiles contain sufficient vertical and horizontal references and information to allow stakeout and construction of proposed work by reference to the plans alone.	<input type="checkbox"/>	<input type="checkbox"/>
6	Plans have a horizontal scale not less than 1in. = 50ft. and a vertical scale of 1in. = 5ft. or to a scale clearly marked.	<input type="checkbox"/>	<input type="checkbox"/>
7	Profiles are located under the corresponding plans on the same sheet.	<input type="checkbox"/>	<input type="checkbox"/>
8	Profiles for all water and sewer mains are shown. (include all utility crossings)	<input type="checkbox"/>	<input type="checkbox"/>
9	Stationing is shown on plans. Stationing on plans should increase from left to right across the drawing. (Road centerline stationing can be used when water/sewer lines are located in/along roads).	<input type="checkbox"/>	<input type="checkbox"/>
10	All public right-of-ways and easements are shown and dimensioned.	<input type="checkbox"/>	<input type="checkbox"/>
11	All lot lines, setback and buffers are clearly shown.	<input type="checkbox"/>	<input type="checkbox"/>
12	All specifications, design data and calculations, are provided on an 8 ½ x 11 in. sheet, bound in a folder suitable for filing, and labeled for identification by the title.	<input type="checkbox"/>	<input type="checkbox"/>
13	Woodpecker and Environmental Impact Study included, if applicable.	<input type="checkbox"/>	<input type="checkbox"/>
14	Turn around area provided for emergency and maintenance vehicles, where required.	<input type="checkbox"/>	<input type="checkbox"/>
15	Grading in buffer and setbacks areas must be approved by Planning Department (692-4003)	<input type="checkbox"/>	<input type="checkbox"/>
16	Plans shall be folded to approximately 8.5" x 11" in size with the project title showing in the lower right-hand corner and the Town Approval Stamp in upper right corner.	<input type="checkbox"/>	<input type="checkbox"/>
17	A .pdf copy of all plan and calculation submittals shall be provided for all submittals.	<input type="checkbox"/>	<input type="checkbox"/>
18	Upon approval of construction drawings (3) full size sets and one 1/2 size set of plans shall be submitted to the town for signature. A pdf version of the final signed plans, calculations and required documentation shall also be submitted prior to any permits being issued.	<input type="checkbox"/>	<input type="checkbox"/>

2. Title Sheet/Overall Site Plan

		Provided	N/A
1	Vicinity Map minimum scale 1 in. = 2000 ft., with clearly labeled intersecting roadway names major streams, towns, north arrow, etc. and the site location. Shade site to be constructed.	<input type="checkbox"/>	<input type="checkbox"/>
2	Site Plan shows overall subdivision/site layout to scale, section limits, phases, right-of-ways, adjacent subdivisions, property owners, existing and proposed street names, and at least two (2) permanent bench mark locations and descriptions. The section to be constructed is clearly labeled	<input type="checkbox"/>	<input type="checkbox"/>
3	Provide an Index map with match lines for multiple sheets for all plans as needed.	<input type="checkbox"/>	<input type="checkbox"/>
4	Title Information – Development/site name, type of plan, section number, and phase is provided.	<input type="checkbox"/>	<input type="checkbox"/>
5	A legend is provided of the specific graphic special symbols applicable to the project. Standard symbols are used to the fullest extent possible.	<input type="checkbox"/>	<input type="checkbox"/>
6	List of abbreviations applicable to the project is provided.	<input type="checkbox"/>	<input type="checkbox"/>
7	Revision block includes the date and reference of each revision.	<input type="checkbox"/>	<input type="checkbox"/>
8	Sheet index is provided.	<input type="checkbox"/>	<input type="checkbox"/>
9	Provide Site Data table as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
10	Table showing public and private improvement quantities for water, sewer, streets, sidewalk, curb & gutter. Contact PW to obtain .dwg format	<input type="checkbox"/>	<input type="checkbox"/>
11	Water Application Summary table as shown as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
12	Sewer Application Summary table as shown as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
13	Provide Traffic Data Table as shown as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
14	Provide Watershed Data Table as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
15	Town standard notes as shown in Town Title Block	<input type="checkbox"/>	<input type="checkbox"/>
16	Town approval signature blocks (upper right corner)	<input type="checkbox"/>	<input type="checkbox"/>
17	Indicate 100 yr flood plain (reference FEMA panel #, date) or make reference that site is not located w/in 100 yr flood plain	<input type="checkbox"/>	<input type="checkbox"/>

3. Existing Conditions/Demolition

		Provided	N/A
1	Provide note requiring contractor to contact the NC One-Call Center prior to any construction activity.	<input type="checkbox"/>	<input type="checkbox"/>
2	Trees to be removed shown and clearly labeled. Trees being removed within Town rights of way require Tree Removal Permit. Contact the B&G superintendent at 910-692-1983	<input type="checkbox"/>	<input type="checkbox"/>
3	Tree protection fence shown around trees to remain	<input type="checkbox"/>	<input type="checkbox"/>
4	Show and label all topography with a maximum of two-foot contour intervals for the development.	<input type="checkbox"/>	<input type="checkbox"/>
5	Show all water lines, sanitary sewer lines, services, cleanouts, valves, hydrants within 500', water meters vaults, backflow preventers, storm sewer systems, catch basins, headwall, junction boxes and other structures, ditches and swale, all other utilities, buildings, parking, mail boxes, etc.	<input type="checkbox"/>	<input type="checkbox"/>
6	Clearly label any structures, utilities etc to be removed	<input type="checkbox"/>	<input type="checkbox"/>
7	Flood plain boundaries (100 yr, 500 yr)	<input type="checkbox"/>	<input type="checkbox"/>
8	Horizontal and vertical control references are specified (State plane, U.S. Coast & Geodetic Surveys, etc.). Hydrants and manholes are not acceptable control.	<input type="checkbox"/>	<input type="checkbox"/>
9	Source of the topography used for the preparation of the plans is provided.	<input type="checkbox"/>	<input type="checkbox"/>
10	Show and label all buffers, overlay district, easements etc, as defined by planning and zoning	<input type="checkbox"/>	<input type="checkbox"/>
11	Adjacent property owner information	<input type="checkbox"/>	<input type="checkbox"/>

4. General Water/Sewer and Utility Layout Requirements

		Provided	N/A
Utility Layout Sheet			
1	The utility layout sheet shall be produced with a horizontal scale of 1"=100' or larger (i.e., 1"= 50') to indicate the new layout/extension and the relationship to other proposed or existing utilities, roadways, and other pertinent structures	<input type="checkbox"/>	<input type="checkbox"/>
2	Legend of sanitary sewer, water, and other utilities, structures; either proposed or existing.	<input type="checkbox"/>	<input type="checkbox"/>
3	Construction Notes	<input type="checkbox"/>	<input type="checkbox"/>
4	Overall plan of the water and/or sewer extension layout, indexed to sheet numbers	<input type="checkbox"/>	<input type="checkbox"/>
5	Existing utilities to include water and/or sewer labeled with size and material type, if known.	<input type="checkbox"/>	<input type="checkbox"/>
6	"Composite" of all information contained in the plan view of the individual plan/profile sheets.	<input type="checkbox"/>	<input type="checkbox"/>
Sewer Permitting			
7	NCDENR fast track sewer application http://ncdenr.gov/web/wq/swp/ps/cs/ext	<input type="checkbox"/>	<input type="checkbox"/>
8	Flow acceptance letter from Moore County	<input type="checkbox"/>	<input type="checkbox"/>
9	Analysis of receiving gravity sewer, lift station, force main etc.	<input type="checkbox"/>	<input type="checkbox"/>
10	Confirm proposed gravity laterals meet 15A NCAC 02T .0305 when crossing water mains	<input type="checkbox"/>	<input type="checkbox"/>
11	Provide calculations showing sewer is designed to carry the total peak tributary flow at 1/2 of full depth (50% capacity) for 16" and smaller pipes. Include all calculations and assumptions used to show design meets NCDENR design standards for gravity sewer.	<input type="checkbox"/>	<input type="checkbox"/>
12	Min. flow velocity under design conditions shall be at least 2.5 feet per second. Max velocity shall not be greater than 10 fps.	<input type="checkbox"/>	<input type="checkbox"/>
13	Collecting sewers are a minimum of 8 inches in diameter and are designed to carry present and projected future flows for natural drainage basin. Provide calculations	<input type="checkbox"/>	<input type="checkbox"/>
Water Permitting			
14	NCDENR –Public Water Supply Section water extension application	<input type="checkbox"/>	<input type="checkbox"/>
15	Engineers Report (Report shall include requirements listed in items 12,13,15 above)	<input type="checkbox"/>	<input type="checkbox"/>
16	Application for Water-Sewer New Installation of Service Application submitted	<input type="checkbox"/>	<input type="checkbox"/>
17	System demand shall include: fire flow, peak domestic demand, sprinkler demand, and any other flow demand on the system.	<input type="checkbox"/>	<input type="checkbox"/>
18	The following water main data and design calculations are enclosed: average day, maximum day, and peak hour demands, fire flow requirements (ISO calculations, future requirements, probable pressures, losses, and computations for determining pipe sizes. Provide a written report summarizing the water design calculations, include junction/pipe node report and diagram clearly indicating each node and pipe, summary table showing each hydrant is capable of providing required flow, and indicate all assumptions and methods used for design.	<input type="checkbox"/>	<input type="checkbox"/>
19	Mains sized to provide a minimum system pressure of 20 psi at all points of the system during fire flow conditions with peak system demands and 40 psi at average daily demand conditions.	<input type="checkbox"/>	<input type="checkbox"/>
20	Fire sprinkler design and calculation as required by the Fire Marshal.	<input type="checkbox"/>	<input type="checkbox"/>

5. Gravity Sewers Plan and Profile Requirements

	Provided	N/A
Proposed and existing water utilities are accurately and clearly shown on the plan and profiles using standard symbols and proposed utilities are accentuated by bold, heavy line weight to distinguish it from other utilities.	<input type="checkbox"/>	<input type="checkbox"/>
Pipe sizes and material type is shown on plans (SDR 35 or D.I.P.)	<input type="checkbox"/>	<input type="checkbox"/>
All sewer main crossings with other utilities are properly shown and called-out (include material) with minimum clearance dimensioned. Minimum vertical clearance of 24-inches from other utilities and/or storm drains is shown.	<input type="checkbox"/>	<input type="checkbox"/>
Manhole number, depth, inverts, pipe slope, length and material, flow angles between main lines and manholes	<input type="checkbox"/>	<input type="checkbox"/>
Call-out locations (sta #) are provided for manholes, clean-outs, connections, etc.	<input type="checkbox"/>	<input type="checkbox"/>
Gravity sewer is placed at a minimum of 0.5% grade and a maximum of 10%. (Grades greater than 10% may be approved on a case-by-case basis only.)	<input type="checkbox"/>	<input type="checkbox"/>
Minimum cover on gravity sewer is 3 ft from the top of pipe to finished grade.	<input type="checkbox"/>	<input type="checkbox"/>
A 4 in. water tight clean-out is provided at the Right of Way or easement for each sewer service connection. A road bearing clean-out is provided in areas of vehicular traffic.	<input type="checkbox"/>	<input type="checkbox"/>
50 ft maximum clean-out spacing on 4 inch service line. 6 inch service lines may have clean outs spaced at 75 feet intervals.	<input type="checkbox"/>	<input type="checkbox"/>
A terminal manhole is provided at the end of each line.	<input type="checkbox"/>	<input type="checkbox"/>
Show flow deflection angle at all manholes (max deflection angle per manhole = 90 degrees for 8"-10" pipe diameter)	<input type="checkbox"/>	<input type="checkbox"/>
Pipes greater than 6" must tie into a manhole.	<input type="checkbox"/>	<input type="checkbox"/>
All terminal reaches of sewer shall have a minimum slope of 1% .	<input type="checkbox"/>	<input type="checkbox"/>
Maximum distance between manholes is 400 feet or less	<input type="checkbox"/>	<input type="checkbox"/>
No service connections within the cone section of the manhole	<input type="checkbox"/>	<input type="checkbox"/>
Pipe diameter and or material changes must occur at manholes.	<input type="checkbox"/>	<input type="checkbox"/>
Pipe crowns matched with minimum drop of 0.20 feet between the inverts within the manhole.	<input type="checkbox"/>	<input type="checkbox"/>
Meets all other design requirements as specified by NCDENR	<input type="checkbox"/>	<input type="checkbox"/>
Provide SS Manhole Chart (Chart available in AutoCAD format from PW Dept.)	<input type="checkbox"/>	<input type="checkbox"/>
Sewer mains shall be a minimum of 24-inches below water main to prevent conflicts with service laterals and crossings.	<input type="checkbox"/>	<input type="checkbox"/>
Manholes out of roadway, pavement or in low lying areas are a minimum of 18-inches above grade.	<input type="checkbox"/>	<input type="checkbox"/>
Mains must be 100 feet from any private or public water supply source, including wells, WS-1 waters or Class I or II impounded reservoirs used as a source of drinking water	<input type="checkbox"/>	<input type="checkbox"/>
Mains a minimum of 50 feet from any waters classified WS-II, WS-III, B,SA, ORW, HQW or SB (and meet any NCDENR requirements)	<input type="checkbox"/>	<input type="checkbox"/>
Sewer mains are 25 feet from private wells	<input type="checkbox"/>	<input type="checkbox"/>
Mains shall be deep enough to serve the adjoining property and allow for sufficient slope in lateral lines	<input type="checkbox"/>	<input type="checkbox"/>
Add shading to all ductile iron pipe sewer lines in profiles to distinguish from PVC material	<input type="checkbox"/>	<input type="checkbox"/>
A minimum 20 ft. utility easement width centered over the main is clearly shown and identified.	<input type="checkbox"/>	<input type="checkbox"/>

6. Water Plan and Profile Requirements

		Provided	N/A
1	Proposed and existing water utilities are accurately and clearly shown on the plan and profiles using standard symbols and proposed utilities are accentuated by bold, heavy line weight to distinguish it from other utilities.	<input type="checkbox"/>	<input type="checkbox"/>
2	Water main sizes and materials (C900 or DIP) are indicated.	<input type="checkbox"/>	<input type="checkbox"/>
3	Call-out locations (sta #) are provided for fire hydrants, meter settings, blow-offs, manholes, clean-outs, tees, bends, valves, reducers, connections, etc.	<input type="checkbox"/>	<input type="checkbox"/>
4	Existing and proposed grade over the mains are indicated on the profile.	<input type="checkbox"/>	<input type="checkbox"/>
5	Minimum of 10ft. of horizontal separation between sanitary sewer and water lines is maintained.	<input type="checkbox"/>	<input type="checkbox"/>
6	Minimum 10ft. horizontal separation from storm drain structures or other utility structures is maintained.	<input type="checkbox"/>	<input type="checkbox"/>
7	Minimum vertical clearance from all crossing utilities is maintained.	<input type="checkbox"/>	<input type="checkbox"/>
8	Main line valves on straight runs between intersection shall be spaced at not less than 600' for 6" lines and 900' for 8" lines	<input type="checkbox"/>	<input type="checkbox"/>
9	All Transitions in pipe material shall have restrained joints.	<input type="checkbox"/>	<input type="checkbox"/>
10	Single water services are provided to each dwelling, business, warehouse or proposed lots, buildings and parcels. Backflow devices shall be installed at approved locations.	<input type="checkbox"/>	<input type="checkbox"/>
11	Fire hydrants spacing shall be approved by Town. The bury depth is provided on the profile.	<input type="checkbox"/>	<input type="checkbox"/>
12	Location of FDC, within 50 feet of fire hydrant	<input type="checkbox"/>	<input type="checkbox"/>
13	Water lines that serve hydrants shall be at least six-inch lines, and unless no other practicable alternative is available, no such lines shall be dead-end lines.	<input type="checkbox"/>	<input type="checkbox"/>
14	Minimum of 3 feet clearance around all fire hydrants.	<input type="checkbox"/>	<input type="checkbox"/>
15	Where a water main is in a casing under a roadway or crosses under a stream bed, valves are placed on each side.	<input type="checkbox"/>	<input type="checkbox"/>
16	All valves, tees, bends, fire hydrants, etc. are shown with a symbol and called-out with size, type and station	<input type="checkbox"/>	<input type="checkbox"/>
17	No 90-degree bends shown on any water main.	<input type="checkbox"/>	<input type="checkbox"/>
18	Minimum cover of 3-ft. for water mains is maintained as measured from top of pipe to finished grade.	<input type="checkbox"/>	<input type="checkbox"/>
19	Three (3) valves are provided at each water main tee and four (4) valves at each water main cross.	<input type="checkbox"/>	<input type="checkbox"/>
20	All details are provided. Town details shall be used when available	<input type="checkbox"/>	<input type="checkbox"/>
21	Location, make and model of Back flow preventer.	<input type="checkbox"/>	<input type="checkbox"/>
22	Irrigation system must have privately maintained reduced pressure principal backflow prevention installed in accordance with the NC Plumbing Code. RPZ must be installed above ground and within an insulated box.	<input type="checkbox"/>	<input type="checkbox"/>
23	BFP must be installed within 10' of the water meter.	<input type="checkbox"/>	<input type="checkbox"/>
24	No service connections are to be made on fire hydrant branches or fire lines.	<input type="checkbox"/>	<input type="checkbox"/>
25	Direct service connection shall be allowed on mains 16" and smaller.	<input type="checkbox"/>	<input type="checkbox"/>
26	Services connections are perpendicular to main.	<input type="checkbox"/>	<input type="checkbox"/>
27	Provide the appropriate backflow prevention notes from the Town Cover Sheet requirements.	<input type="checkbox"/>	<input type="checkbox"/>
28	Provide an above ground enclosure for the RPZ for all commercial, industrial and institutional developments (both domestic and fire lines)	<input type="checkbox"/>	<input type="checkbox"/>

7. Erosion Control Plans

		Provided	N/A
1	General plan requirements as noted above.	<input type="checkbox"/>	<input type="checkbox"/>
2	General Site Features (plan elements)	<input type="checkbox"/>	<input type="checkbox"/>
3	Existing and planned drainage patterns (include OFF-SITE areas that drain through project)	<input type="checkbox"/>	<input type="checkbox"/>
4	Limits of disturbed area (provide acreage total, delineate limits, and label)	<input type="checkbox"/>	<input type="checkbox"/>
5	Existing contours and Existing conditions (buildings, roads etc) including any demo	<input type="checkbox"/>	<input type="checkbox"/>
6	Proposed contours	<input type="checkbox"/>	<input type="checkbox"/>
7	Proposed building and road locations and elevations	<input type="checkbox"/>	<input type="checkbox"/>
8	Land use of surrounding areas.	<input type="checkbox"/>	<input type="checkbox"/>
9	Rock outcrops	<input type="checkbox"/>	<input type="checkbox"/>
10	Seeps or springs	<input type="checkbox"/>	<input type="checkbox"/>
12	Wetland limits	<input type="checkbox"/>	<input type="checkbox"/>
13	Easements	<input type="checkbox"/>	<input type="checkbox"/>
14	Streams, lakes, ponds, drainage ways, dams	<input type="checkbox"/>	<input type="checkbox"/>
15	Stockpiled topsoil or subsoil locations	<input type="checkbox"/>	<input type="checkbox"/>
16	Property lines of total tract	<input type="checkbox"/>	<input type="checkbox"/>
17	Erosion control legend	<input type="checkbox"/>	<input type="checkbox"/>
18	Location of temporary and permanent measures	<input type="checkbox"/>	<input type="checkbox"/>
19	Construction drawings and details for temporary and permanent measure	<input type="checkbox"/>	<input type="checkbox"/>
20	Maintenance requirements during construction	<input type="checkbox"/>	<input type="checkbox"/>
21	Borrow Source or waste destination.	<input type="checkbox"/>	<input type="checkbox"/>
22	Size and location of culverts and sewers	<input type="checkbox"/>	<input type="checkbox"/>
23	Name and classification of receiving water course or name of municipal operator	<input type="checkbox"/>	<input type="checkbox"/>
24	Construction sequence related erosion and sediment control (include critical measures prior to the initiation of the land-disturbing activity & removal of measures after areas they serve and permanently stabilized)	<input type="checkbox"/>	<input type="checkbox"/>
25	Vegetative Stabilization	<input type="checkbox"/>	<input type="checkbox"/>
26	Area and acreage to be vegetatively stabilized	<input type="checkbox"/>	<input type="checkbox"/>
27	Method of soil preparation	<input type="checkbox"/>	<input type="checkbox"/>
28	Seed type and rates (temp. and permanent)	<input type="checkbox"/>	<input type="checkbox"/>
29	Mulch and fertilizer type and rates	<input type="checkbox"/>	<input type="checkbox"/>
30	Watering Requirements	<input type="checkbox"/>	<input type="checkbox"/>
31	Is there flood plain associated with project? State on plan if there is or is not and give elevation and location on plans. (if not state in narrative that it is not required)	<input type="checkbox"/>	<input type="checkbox"/>
32	Add NPDES ground cover requirements to plans	<input type="checkbox"/>	<input type="checkbox"/>

8. Erosion Control Permitting

		Provided	N/A
1	Financial Responsibility/Ownership Form	<input type="checkbox"/>	<input type="checkbox"/>
2	Review fee See FRO: http://www.southernpines.net/DocumentCenter/Home/View/110	<input type="checkbox"/>	<input type="checkbox"/>
3	Certificate of assumed named, if partnership	<input type="checkbox"/>	<input type="checkbox"/>
4	Name of Registered Agent	<input type="checkbox"/>	<input type="checkbox"/>
5	Copy of the most current Deed for the site	<input type="checkbox"/>	<input type="checkbox"/>
6	Narrative describing the nature and purpose of the construction activity.	<input type="checkbox"/>	<input type="checkbox"/>
7	Color copy of USGS Quadrangle map with site indicated	<input type="checkbox"/>	<input type="checkbox"/>
8	Copy of County Soils map	<input type="checkbox"/>	<input type="checkbox"/>
9	Required Army Corps 404 permit and Water Quality 401 certification (stream disturbances over 150 linear feet) (if not needed state in narrative that it is not required)	<input type="checkbox"/>	<input type="checkbox"/>
10	Soil info: type, special characteristics	<input type="checkbox"/>	<input type="checkbox"/>
11	Design calculation and construction details for culverts and storm sewers	<input type="checkbox"/>	<input type="checkbox"/>
12	Design calculations cross sections, and method of stabilization of existing and planned channels (including temporary linings)	<input type="checkbox"/>	<input type="checkbox"/>
13	Discharge and velocity calculations for open channel and ditch flows	<input type="checkbox"/>	<input type="checkbox"/>
14	Design calculations for peak discharges of runoff (including the construction phase and final runoff coefficients of the site) for each outlet point on the site.	<input type="checkbox"/>	<input type="checkbox"/>
15	Design calculations and construction details of energy dissipaters below culverts and storm sewer outlets (for riprap aprons, include stone sizes and apron dimensions)	<input type="checkbox"/>	<input type="checkbox"/>
16	Design calculations and construction details to control groundwater, i.e. seeps, high water table, etc.	<input type="checkbox"/>	<input type="checkbox"/>
17	Design calcs and dimension of sediment basins and traps. (include pre and post drainage area maps, surface area requirements and volume requirements)	<input type="checkbox"/>	<input type="checkbox"/>
18	Design calcs for other erosion control measures.	<input type="checkbox"/>	<input type="checkbox"/>

9. Streets

		Provided	N/A
Plans			
1	Street design meets NCDOT and Town minimum requirements for CL grades, cut/fill slopes sight distance etc. based on classification type	<input type="checkbox"/>	<input type="checkbox"/>
2	Define with details typical roadway cross-sections for all proposed public or private streets/alleys. Details should include typical pavement structure, size of curbing, shoulders, sidewalks, pavement widths and right-of-way widths as applicable.	<input type="checkbox"/>	<input type="checkbox"/>
3	Sight distance triangles at intersections and driveways (include any landscaping, signs etc. that may interfere with sight triangles)	<input type="checkbox"/>	<input type="checkbox"/>
4	Label proposed street classification as dictated per Planning Department	<input type="checkbox"/>	<input type="checkbox"/>
5	Dumpster location, size and access (show turning radii)	<input type="checkbox"/>	<input type="checkbox"/>
6	Fire access to all units and/or fire lanes as required-Provide fire truck turning radius sheet.	<input type="checkbox"/>	<input type="checkbox"/>
7	Sidewalk within public right of way	<input type="checkbox"/>	<input type="checkbox"/>
8	Pavement marking and street signage included.	<input type="checkbox"/>	<input type="checkbox"/>
9	Show Center line road data (include data for all fire lanes as well)	<input type="checkbox"/>	<input type="checkbox"/>
10	Heavy Duty Pavement design minimum: per Geotechnical Report or minimum per Town Engineering and Construction Standards	<input type="checkbox"/>	<input type="checkbox"/>
11	Light Duty Pavement design minimum: per Geotechnical Report or minimum 2" SF 9.5 (A or B), 8" Aggregate Base Course	<input type="checkbox"/>	<input type="checkbox"/>
12	Reference State road numbers and street names of connecting roads	<input type="checkbox"/>	<input type="checkbox"/>
13	Provide road profile sheets. May be comined with Storm profiles but not water and sewer profiles.		
14	Label all grades on profiles to demonstrate compliance with Table 2-1 of the Engineering and Construction Standards.	<input type="checkbox"/>	<input type="checkbox"/>
Submittals			
15	Provide Geotechnical Report for the design of pavement cross sections	<input type="checkbox"/>	<input type="checkbox"/>
16	Traffic study as required See section 4.12 of the current UDO	<input type="checkbox"/>	<input type="checkbox"/>
17	NCDOT right of way encroachment (two party)	<input type="checkbox"/>	<input type="checkbox"/>
18	NCDOT right of way encroachment (three party)- four (4) originals must be provided)	<input type="checkbox"/>	<input type="checkbox"/>
19	NCDOT driveway permit	<input type="checkbox"/>	<input type="checkbox"/>
20	Town of Southern Pines - Construction on Town ROW	<input type="checkbox"/>	<input type="checkbox"/>

10. Stormwater

		Provided	N/A
Plans			
1	Storm drain discharges shall be released to an existing storm collection system or surface water system	<input type="checkbox"/>	<input type="checkbox"/>
2	Label junction boxes, manholes, and inlets with rim and inverts.	<input type="checkbox"/>	<input type="checkbox"/>
3	In no instance shall the load plane of a building or structure come within 5-feet of the outside edge of a storm pipe	<input type="checkbox"/>	<input type="checkbox"/>
4	Minimum pipe size is 15" to an inlet and 18" for open cross pipe culverts.	<input type="checkbox"/>	<input type="checkbox"/>
5	All storm pipes within the Public Right of Way shall be RCP. Private storm pipes shall be per the Town Engineering and Construction Standards	<input type="checkbox"/>	<input type="checkbox"/>
6	Note on plans: All stormwater management facilities shall be maintained by the property owner.	<input type="checkbox"/>	<input type="checkbox"/>
7	Provide stormwater summary results table found in the Town AutoCAD requirements.	<input type="checkbox"/>	<input type="checkbox"/>
8	Provide stormwater drainage schedule table found in the Town AutoCAD requirements.	<input type="checkbox"/>	<input type="checkbox"/>
9	Profiles to include HGL and all water and sewer crossings.		
10	O-ring culverts are required for pressurized systems.		
11	Min slope on Storm sewer is 0.50% or slope to obtain 2.5 fps. Max slope is 10% w/o special anchoring	<input type="checkbox"/>	<input type="checkbox"/>
Calculations			
1	Provide a stormwater engineering report including written narrative describing stormwater control method and calculations. Include summary of method used, steps taken and results showing requirements are met.	<input type="checkbox"/>	<input type="checkbox"/>
2	Provide stormwater pipe system calculations for the 10 yr storm. HGL calculations shall follow methods as describe by NCDOT.		
3	Provide culvert calculations. 25yr design storm for any road crossings. Check both inlet & outlet control.	<input type="checkbox"/>	<input type="checkbox"/>
4	Provide drainage area maps.		
5	HGL calculations shall take into account and show all head losses, friction factors and bypass flows. Tailwater conditions must identified.	<input type="checkbox"/>	<input type="checkbox"/>
6	Pre-construction runoff calculations for each outlet from the site (at peak discharge points)	<input type="checkbox"/>	<input type="checkbox"/>
7	Provide calculations for maintaining the pre-development runoff rate.	<input type="checkbox"/>	<input type="checkbox"/>
8	Submittals shall include: full Analysis & Justification for determination of the following pre and post construction: composite C factors, TC , DA (on and off-site) & other data used in the development of the computations.	<input type="checkbox"/>	<input type="checkbox"/>
9	Pre and Post development drainage area maps provided (scale no smaller than 1"=100') (include flow paths, Analysis points and Drainage areas in acres)	<input type="checkbox"/>	<input type="checkbox"/>
10	Provide riprap or approved alternative outlet protection calculations for all storm drain outlets	<input type="checkbox"/>	<input type="checkbox"/>
11	Provide permanent channel design calculations.	<input type="checkbox"/>	<input type="checkbox"/>
12	Provide inlet spread/capture computations	<input type="checkbox"/>	<input type="checkbox"/>
13	All flow rates shall be provided in cfs to the nearest hundredth of a cfs.	<input type="checkbox"/>	<input type="checkbox"/>
14	All bypass flows shall be accounted for in gutter spread calculations	<input type="checkbox"/>	<input type="checkbox"/>
15	All bypasses shall be noted. This note shall include the inlet that it will be directed to.	<input type="checkbox"/>	<input type="checkbox"/>

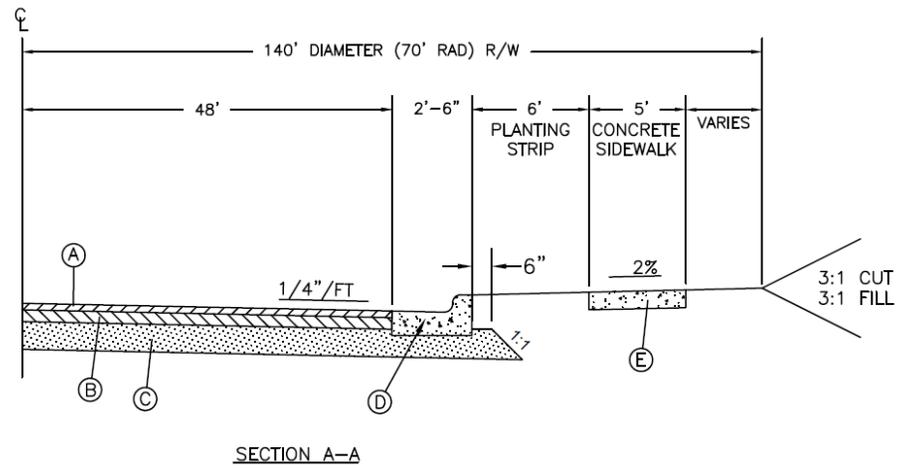
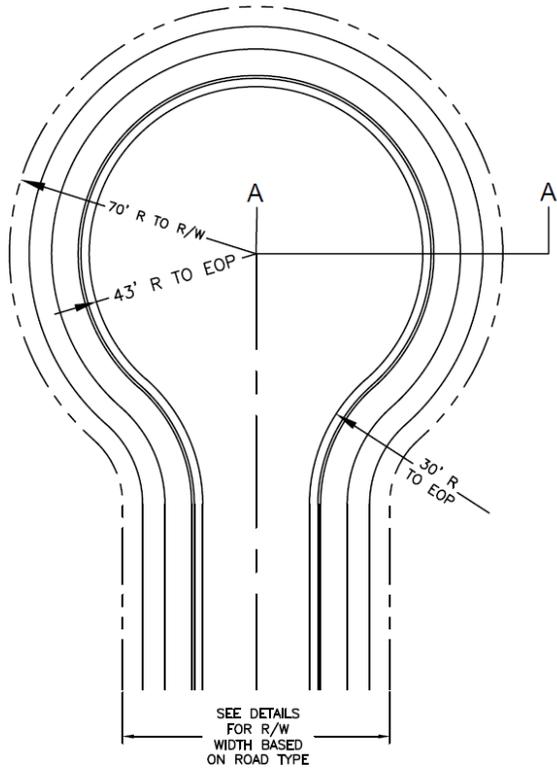
CHAPTER 7 REFERENCES

1. American Association of State Highway and Transportation Officials most recent edition, A Policy on Geometric Design of Highways and Streets
2. Contech – CMP Design Guide, 2017
3. Federal Highway Administration, Manual on Uniform Traffic Control Devices (MUTCD)
4. International Fire Code
5. National Association of City Transportation Officials, Urban Bikeway Design Guide
6. National Bridge Inspection Standards – Code of Federal Regulations
7. North Carolina Building Code
8. North Carolina Department of Environmental Quality, Minimum Design Criteria for the Permitting of Pump Stations and Force Mains
9. North Carolina Department of Environmental Quality, Stormwater Control Measures
10. North Carolina Department of Environment and Natural Resources, Erosion and Sediment Control Planning and Design Manual
11. North Carolina Department of Transportation, Asphalt Quality Management System Manual
12. North Carolina Department of Transportation, Complete Streets Planning and Design Guidelines
13. North Carolina Department of Transportation, Greenway Design Guidelines
14. North Carolina Department of Transportation, Policy on Street and Driveway Access
15. North Carolina Department of Transportation, Roadway Design Manual
16. North Carolina Department of Transportation, Roadway Standards Drawings
17. North Carolina Department of Transportation, Standard Specifications for Roads and Structures
18. Raleigh – Capital Area Greenway Planning and Design Guide
19. Raleigh Street Design Manual
20. Roundabouts: An Informational Guide (FHWA Publication No. RD-00-067)

CHAPTER 8 STANDARD DRAWINGS

1. DRAWINGS

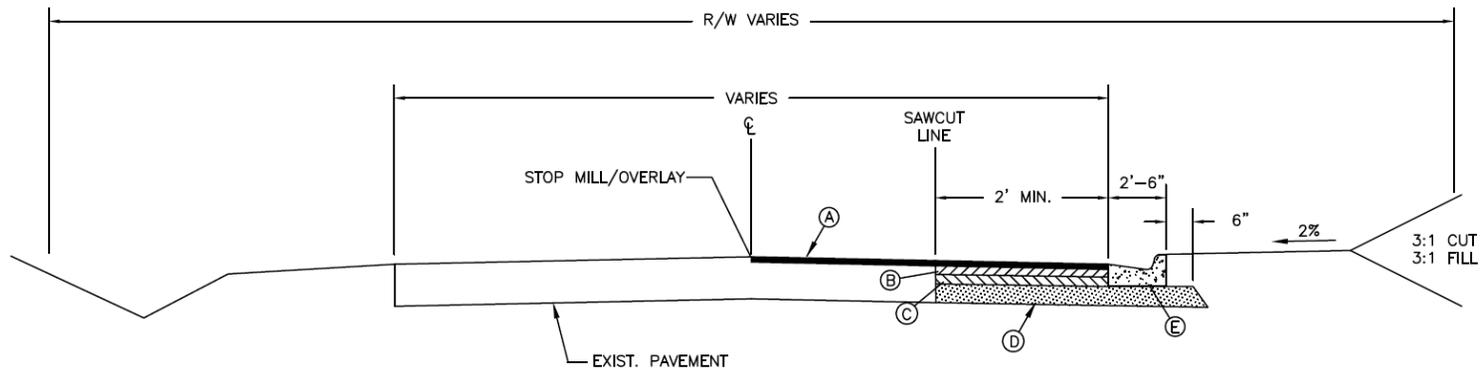
The Town's Standard Drawings shown are to be used for design and construction for projects in the Town of Southern Pines. For construction activities not shown by the Standard Drawings, NCDOT Standard Drawings shall be used.



PAVEMENT SCHEDULE

- A. 1.5" S9.5a SURFACE COURSE
- B. 2.5" I19.0C INTERMEDIATE COURSE
- C. 8" AGGREGATE BASE COURSE (w/7.5" UNDER CURB)
OR 4" B25.0C BASE COURSE (w/4" UNDER CURB)
- D. 2'-6" CURB & GUTTER
- E. 4" CONCRETE SIDEWALK

NOT TO SCALE
DATE: OCTOBER 2020



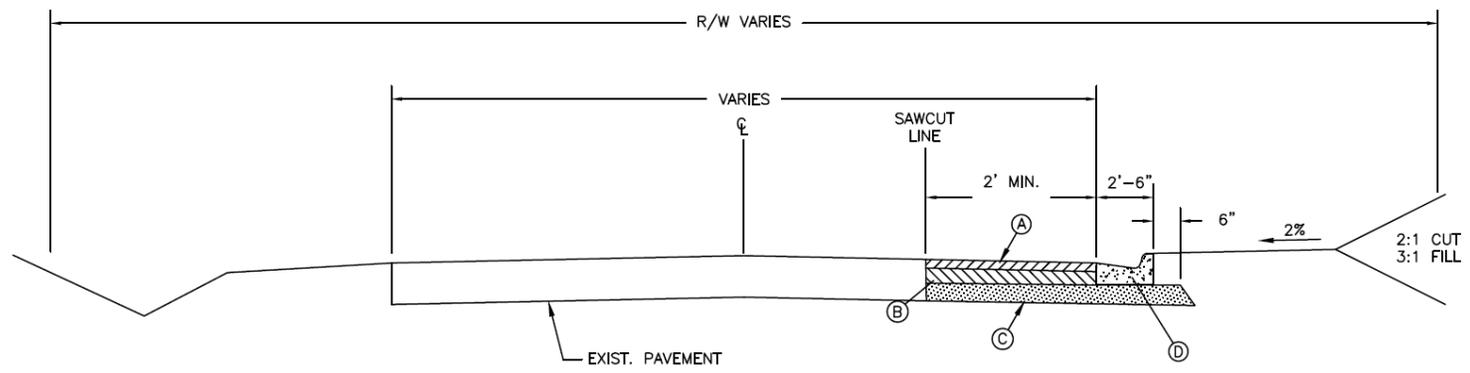
NOTES:

1. SIDEWALK, PLANTING STRIP AND CURB & GUTTER LOCATIONS SHALL BE DETERMINED BY THE APPLICABLE CROSS-SECTION DETAIL
2. ALL WORK TO BE DONE ON EXISTING NCDOT MAINTAINED STREETS SHALL REQUIRE NCDOT ENCROACHMENT/ACCESS APPLICATIONS, SUBMITTED TO THE CITY ENGINEER.
3. SAW CUT LOCATION TO BE DETERMINED IN FIELD.

PAVEMENT SCHEDULE

- A. 1.5" S9.5A OR S9.5B SURFACE COURSE
- B. 1.5" S9.5A OR S9.5B SURFACE COURSE
- C. 4" 119.0C INTERMEDIATE COURSE
- D. 4" B25.0C BASE COURSE
- E. 2'-6" CURB & GUTTER

NOT TO SCALE
DATE: OCTOBER 2020



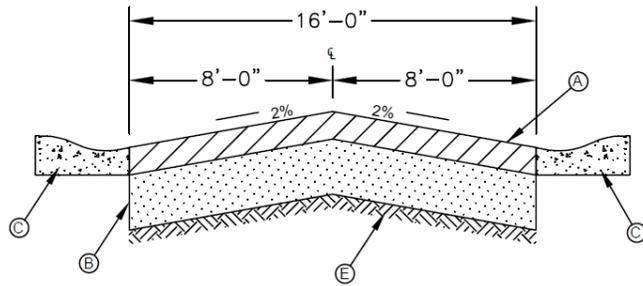
NOTES:

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2. ALL WORK TO BE DONE ON EXISTING NCDOT MAINTAINED STREETS SHALL REQUIRE NCDOT ENCROACHMENT/ACCESS APPLICATIONS, SUBMITTED TO THE CITY ENGINEER.
3. SAW CUT LOCATION TO BE DETERMINED IN FIELD.

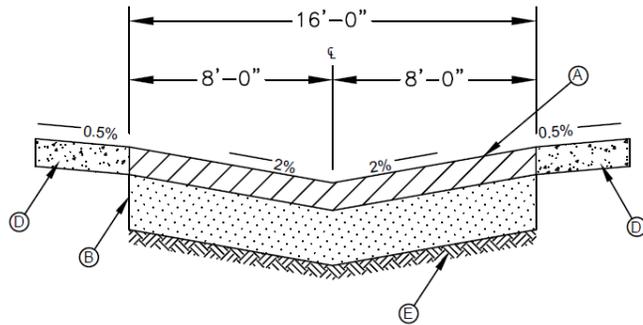
PAVEMENT SCHEDULE

- A. 3" S9.5A OR S9.5B SURFACE COURSE (PLACED IN 2-1.5" LIFTS)
- B. 4" 119.0C INTERMEDIATE COURSE
- C. 4" B25.0C BASE COURSE
- D. 2'-6" CURB & GUTTER

NOT TO SCALE
DATE: OCTOBER 2020



ALLEY WITH NORMAL CROWN



ALLEY WITH INVERSE CROWN

PAVEMENT SCHEDULE

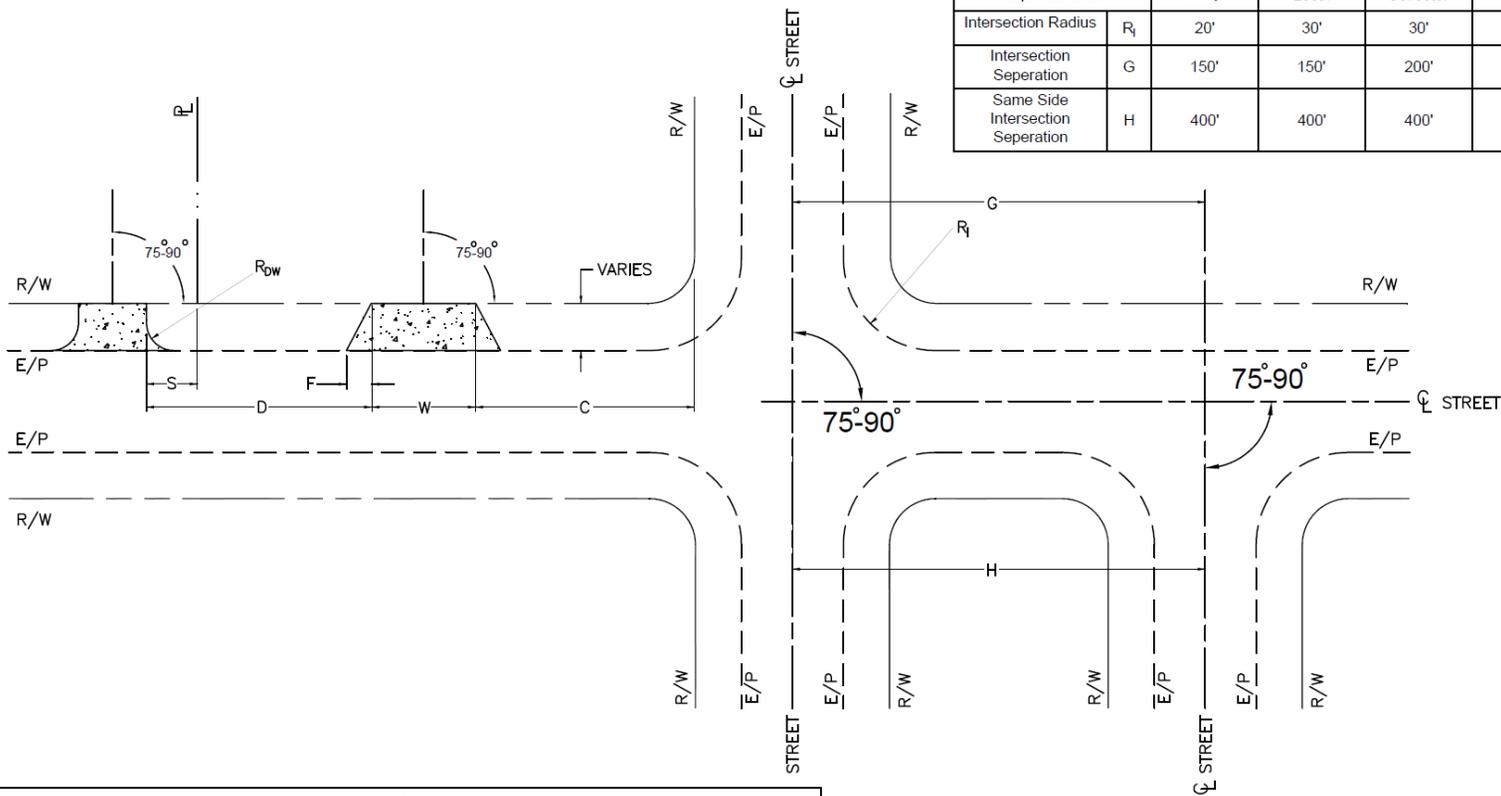
- A. 2" S9.5C SURFACE COURSE
- B. 8" AGGREGATE BASE COURSE OR 4" B25.0C BASE COURSE
- C. 2'-0" VALLEY GUTTER
- D. 1'-0" CONCRETE STRIP
- E. SUBGRADE COMPACTED TO PUBLIC STREET STANDARDS

NOTES:

1. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE TOWN.
2. TYPICAL SECTION 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.

NOT TO SCALE
DATE: OCTOBER 2020

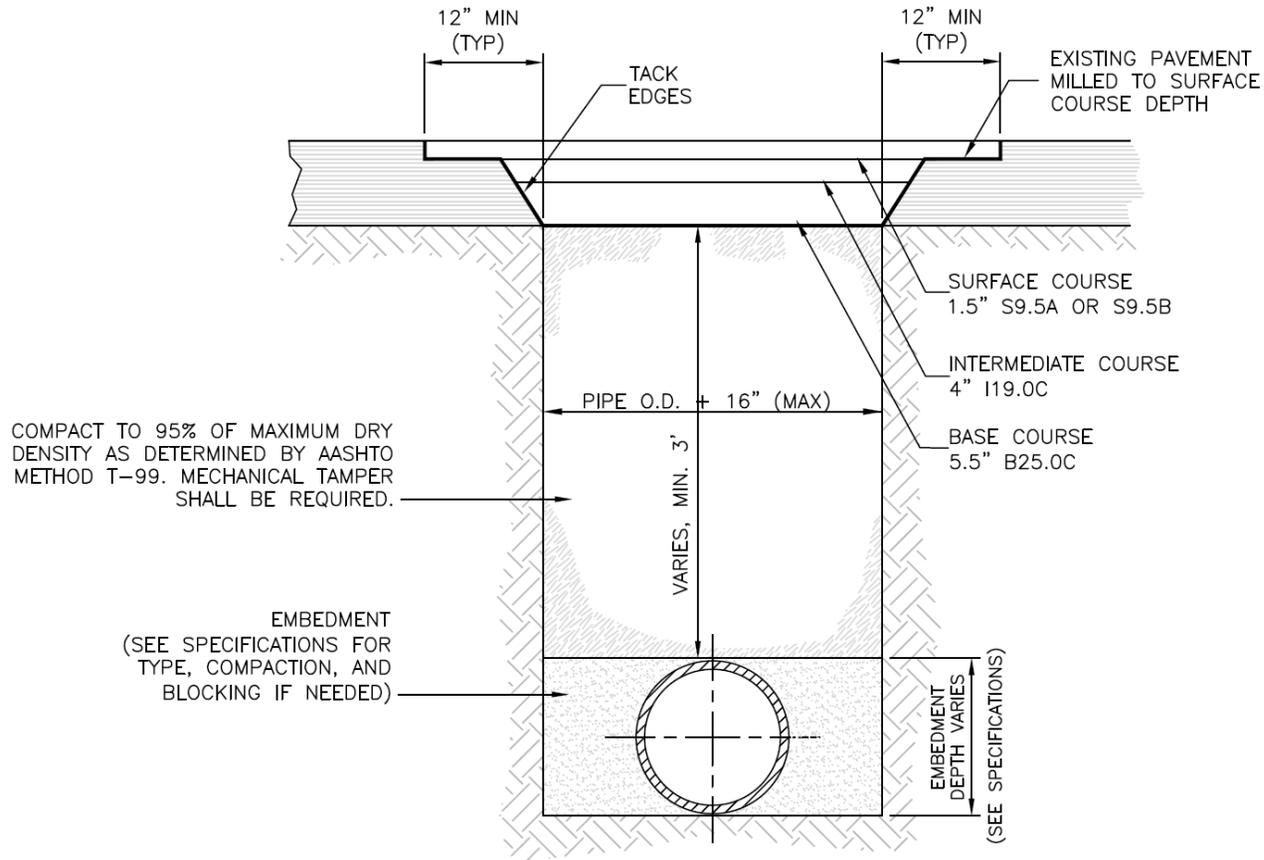
Intersection Dimensions					
Map Reference		Alley	Local	Collector	Arterial
Intersection Radius	R_i	20'	30'	30'	30'
Intersection Separation	G	150'	150'	200'	600'
Same Side Intersection Separation	H	400'	400'	400'	1,000'



m				
Map Reference		1 and 2 Family Residential	Multi-Family Residential and Commercial	Industrial
Width ⁽¹⁾				
One-Way	W	10'-15'	15'-18'	20'-25'
Two-Way		10'-15'	30'-36'	40'-50'
Driveway Radius ⁽²⁾	R_{DW}	5'	15'-30'	15'-30'
Driveway Flare	F	1'-3'	1'-3'	1'-3'
Minimum Spacing				
From Property Line	S	0' - Collector Road 20' - Arterial Road	10' - Collector Road 120' - Arterial Road	50'
From Intersection R/W	C	5' - Collector Road 50' - Arterial Road	25' - Collector Road 120' - Arterial Road	120'
Between Driveways	D	3'	40'	120'

1. Multi-lane driveway widths to be determined by the Town Engineer based upon the number of lanes, the type of land use served and the use of channelizing islands.
 2. The radii for major generator driveways to be determined by the Town Engineer.

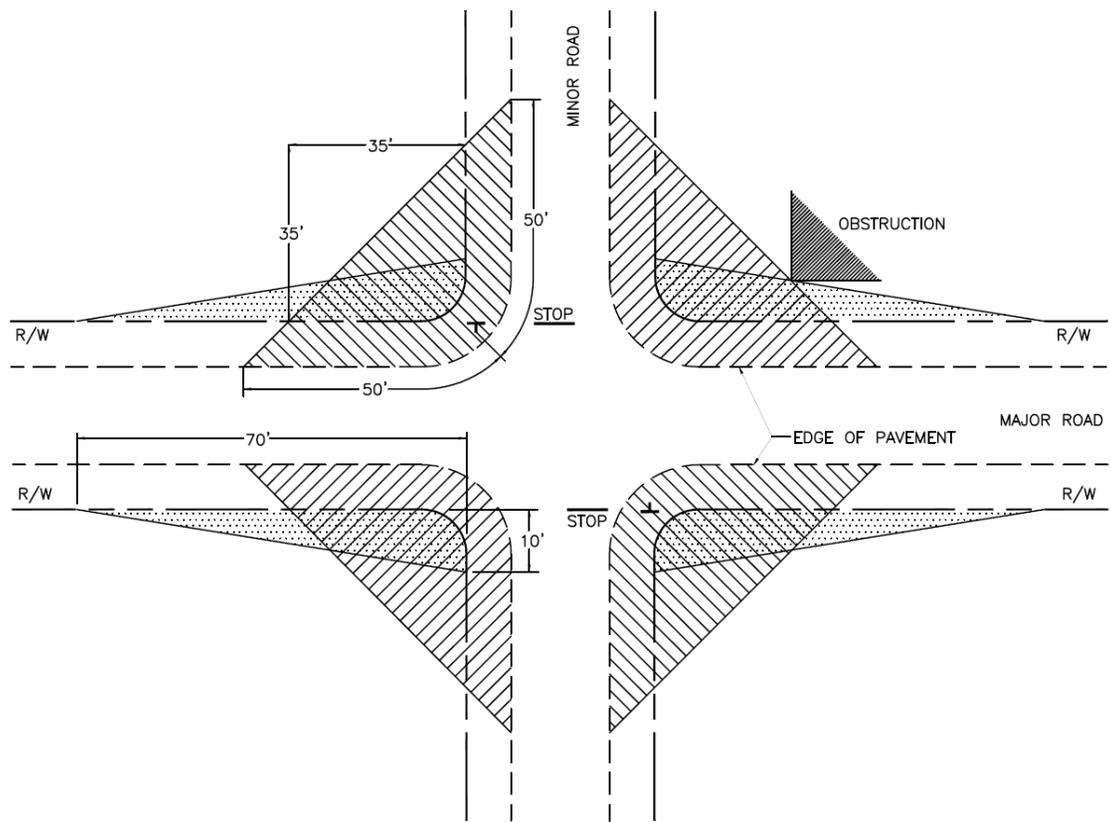
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DATE: OCTOBER 2020



NOTES:

1. ASPHALT SHALL BE CUT WITH CUTTING WHEEL.

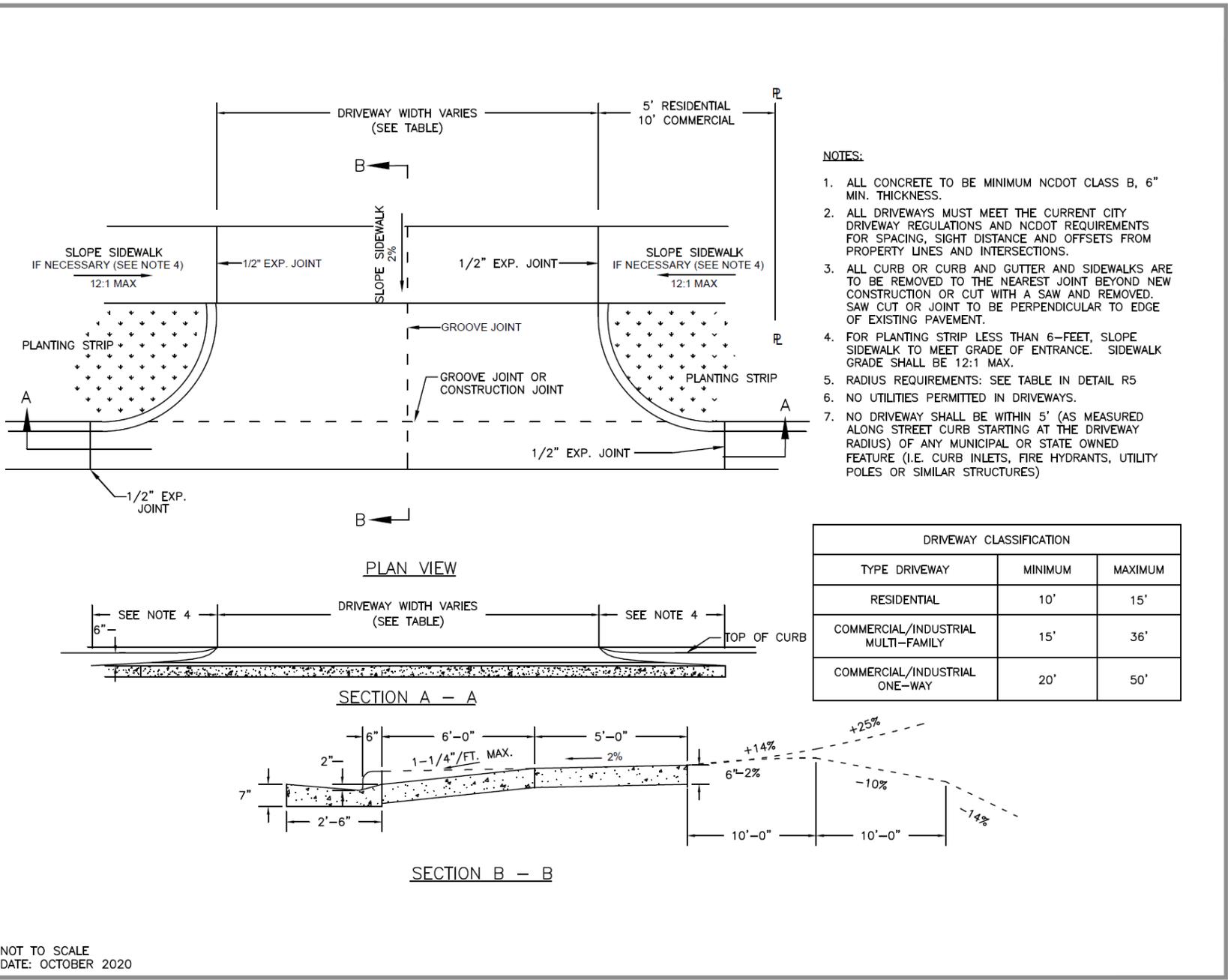
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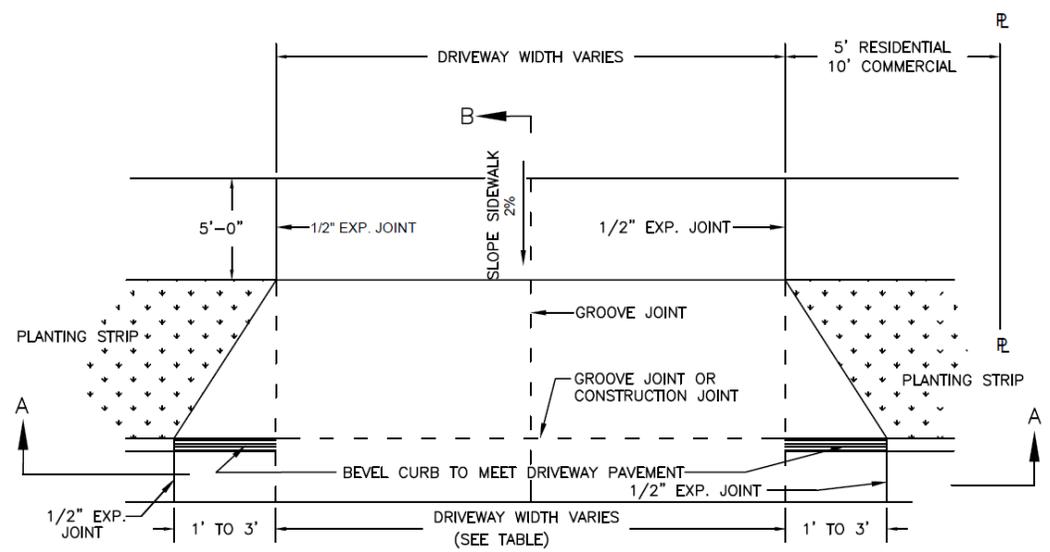


NOTES:

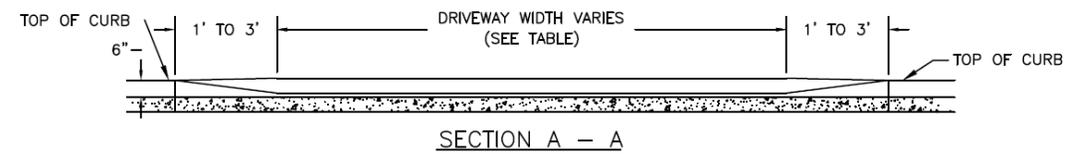
1. SIGHT TRIANGLES SHALL BE PROVIDED AT ALL STREET INTERSECTIONS AND SHALL CONTAIN NO OBSTRUCTION GREATER THAN 2' ABOVE THE GROUND.
2. REFERENCE THE LATEST EDITION OF AASHTO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" FOR ADDITIONAL REQUIREMENTS/RECOMMENDATIONS.

NOT TO SCALE
DATE: OCTOBER 2020

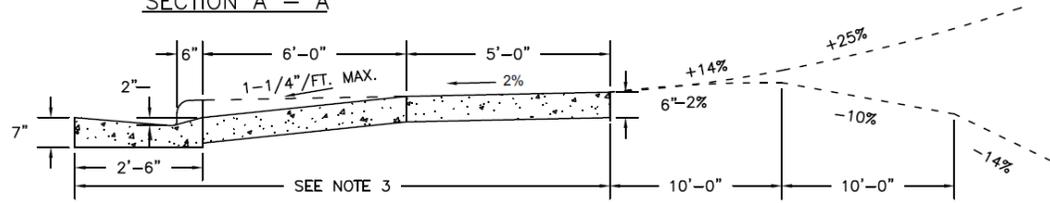




PLAN VIEW



SECTION A - A



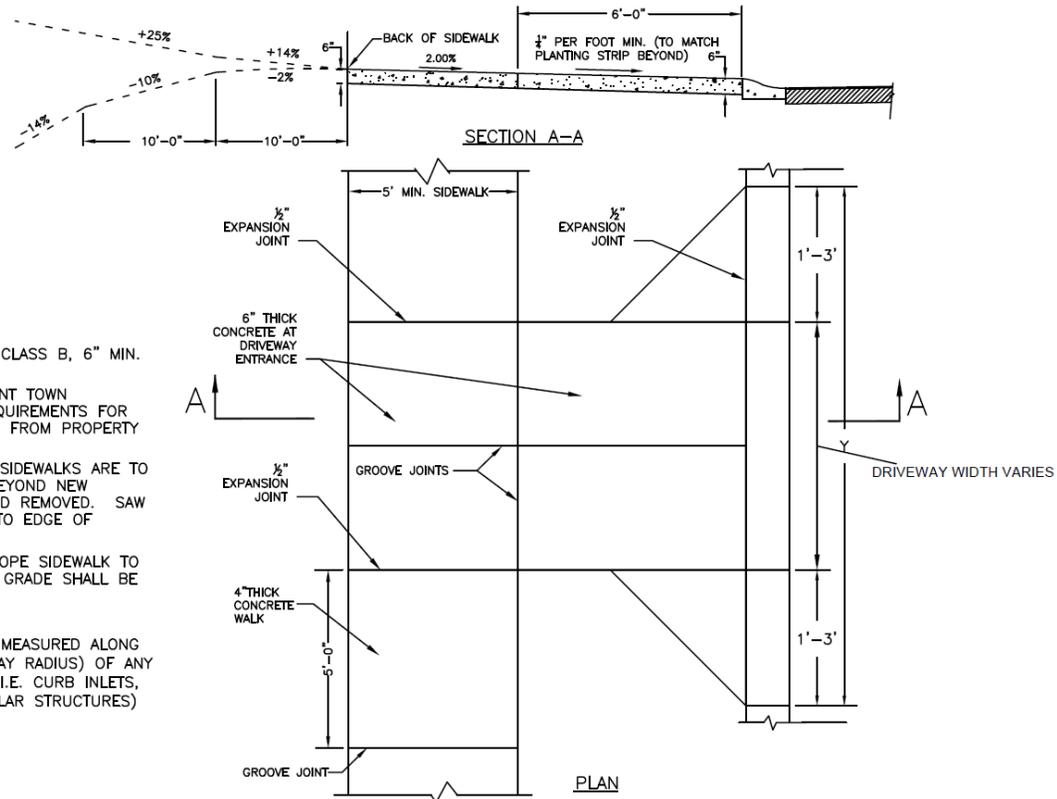
SECTION B - B

NOTES:

1. ALL CONCRETE TO BE MINIMUM NCDOT CLASS B, 6" MIN. THICKNESS.
2. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
3. 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.
4. FOR PLANTING STRIP LESS THAN 6- FEET, SLOPE SIDEWALK TO MEET GRADE OF ENTRANCE. SIDEWALK GRADE SHALL BE 12:1 MAX.
5. NO UTILITIES PERMITTED IN DRIVEWAYS.
6. NO DRIVEWAY SHALL BE WITHIN 5' (AS MEASURED ALONG STREET CURB STARTING AT THE DRIVEWAY RADIUS) OF ANY MUNICIPAL OR STATE OWNED FEATURE (I.E. CURB INLETS, FIRE HYDRANTS, UTILITY POLES OR SIMILAR STRUCTURES)

DRIVEWAY CLASSIFICATION		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
RESIDENTIAL	10'	15'
COMMERCIAL/INDUSTRIAL MULTI-FAMILY	15'	36'
COMMERCIAL/INDUSTRIAL ONE-WAY	20'	50'

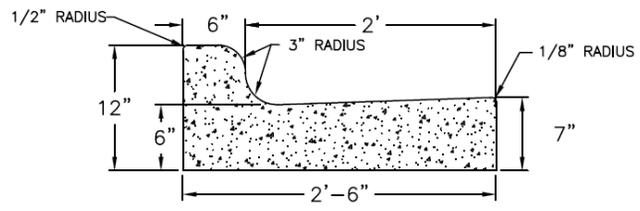
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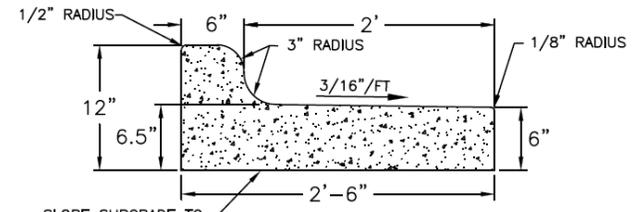
NOTES:

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2. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
3. 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.
4. FOR PLANTING STRIP LESS THAN 6', SLOPE SIDEWALK TO MEET GRADE OF ENTRANCE. SIDEWALK GRADE SHALL BE 12:1 MAX.
5. NO UTILITIES PERMITTED IN DRIVEWAYS.
6. NO DRIVEWAY SHALL BE WITHIN 5' (AS MEASURED ALONG STREET CURB STARTING AT THE DRIVEWAY RADIUS) OF ANY MUNICIPAL OR STATE OWNED FEATURE (I.E. CURB INLETS, FIRE HYDRANTS, UTILITY POLES OR SIMILAR STRUCTURES)

NOT TO SCALE
DATE: OCTOBER 2020

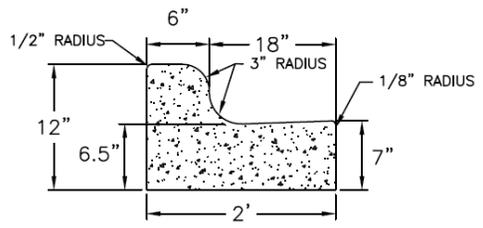


STANDARD 2'-6" CURB & GUTTER

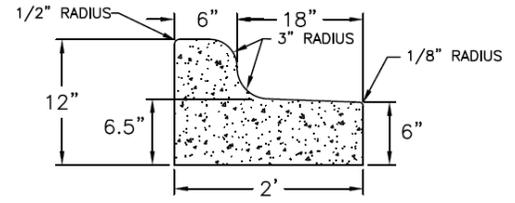


SLOPE SUBGRADE TO PROVIDE 3/16" / FT FALL WITHIN CURB

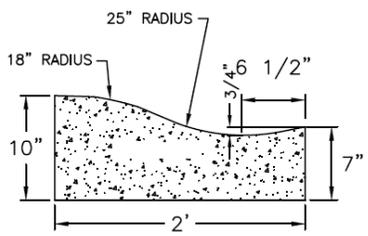
STANDARD 2'-6" SPILL CURB & GUTTER



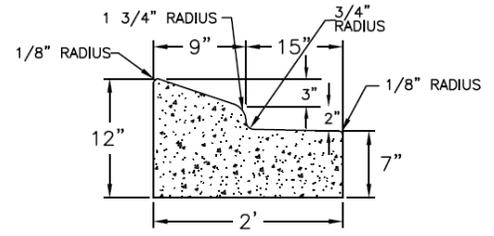
2'-0" CURB & GUTTER



2'-0" SPILL CURB & GUTTER

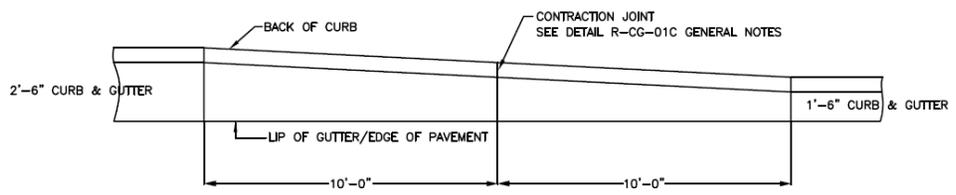


2'-0" VALLEY GUTTER

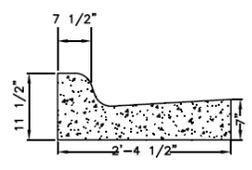


2'-0" MOUNTABLE CURB & GUTTER

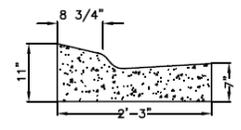
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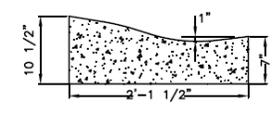
PLAN VIEW
CURB TRANSITION
2'-6" CURB & GUTTER TO 1'-6" CURB & GUTTER



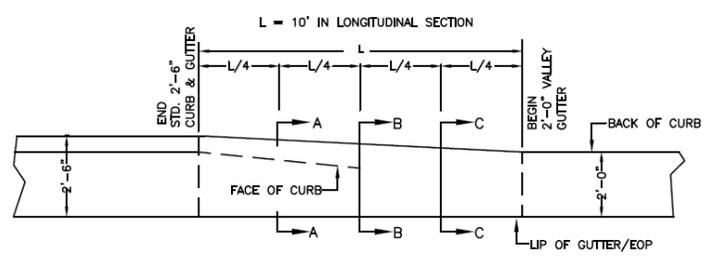
SECTION A-A



SECTION B-B

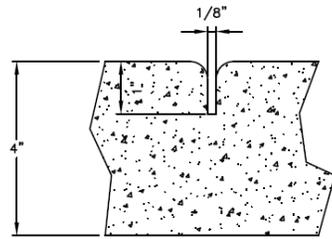


SECTION C-C

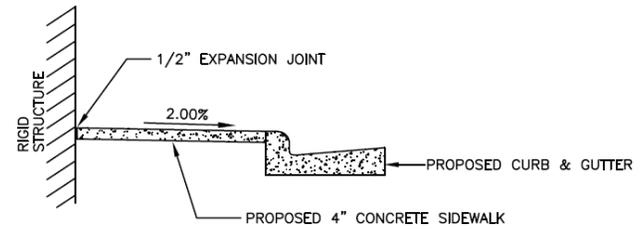


PLAN VIEW
CURB TRANSITION
2'-6" CURB & GUTTER TO 2'-0" VALLEY GUTTER

NOT TO SCALE
DATE: OCTOBER 2020



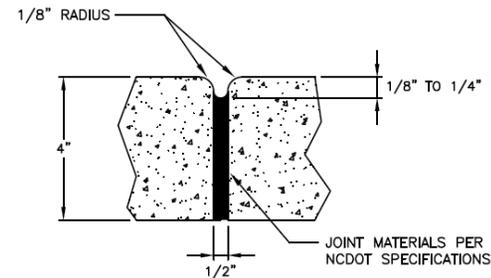
GROOVE JOINT IN SIDEWALK



DETAILS SHOWING EXPANSION JOINTS
IN CONCRETE SIDEWALK

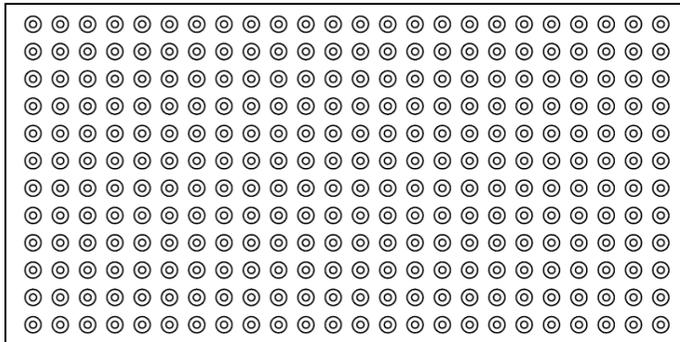
NOTES:

1. CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.
2. CONSTRUCT SIDEWALK 5' WIDE AND 6" THICK AT DRIVEWAY ENTRANCES.
3. CONSTRUCT SIDEWALK WITH A MAXIMUM 2.00% CROSS SLOPE.
4. PLACE A GROOVE JOINT 1" DEEP WITH 1/8" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE. ALL EXPANSION JOINTS SHALL BE FILLED WITH JOINT SEALER.
5. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.



TRANSVERSE EXPANSION
JOINT IN SIDEWALK

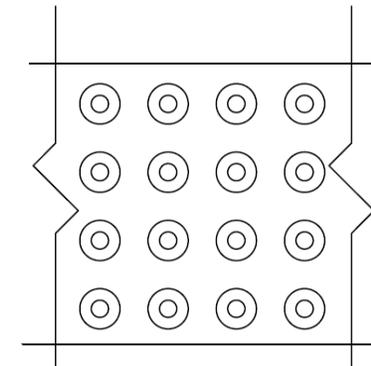
NOT TO SCALE
DATE: OCTOBER 2020



PLAN VIEW

NOTES:

1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE CITY ENGINEER. RETRO FIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE CITY ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. WIDTH OF DETECTABLE WARNING AREA SHALL MATCH THE WIDTH OF THE RAMP. IN NO CASES SHALL THE WIDTH OF THE WARNING AREA BE LESS THAN 4'.
3. LENGTH OF DETECTABLE WARNING AREA SHALL BE 2 FEET REGARDLESS OF SECTION WIDTH.
4. DETECTABLE WARNING DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
5. DETECTABLE WARNING AREA SHALL BE COLORED FS 20109 RED BROWN IN ALL LOCATIONS.
6. MATS ARE TO BE RIGID WITH TURN DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.



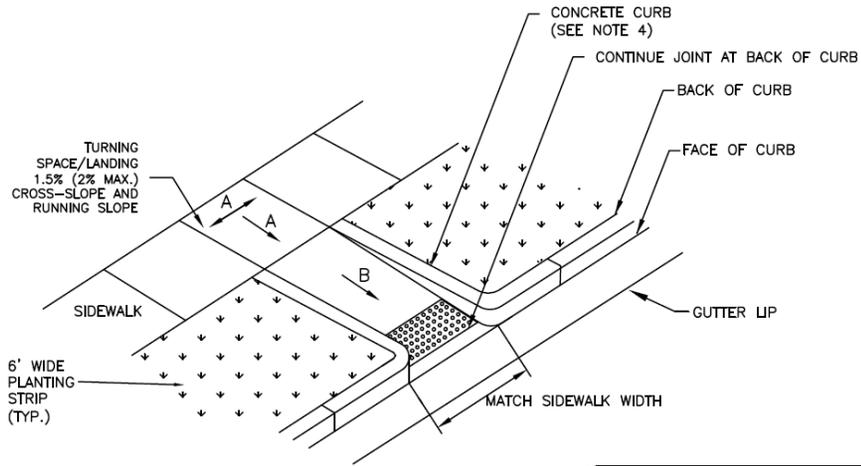
TRUNCATED DOME SPACING



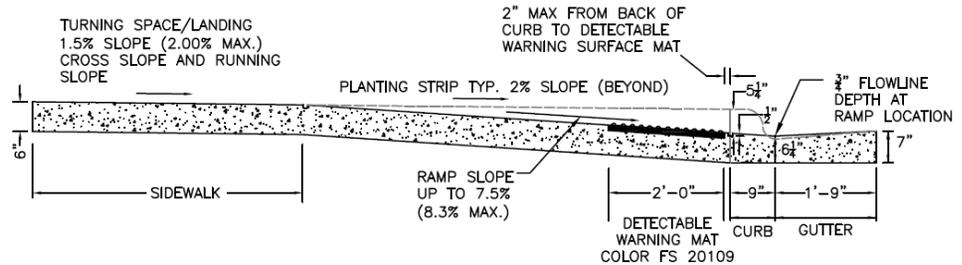
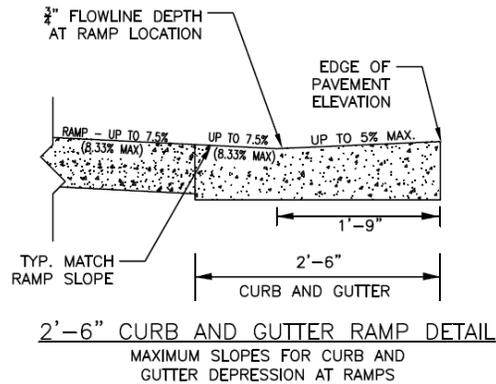
TRUNCATED DOME SECTION

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 LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE ALGEBRAIC DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.33%.
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.



PLAN VIEW

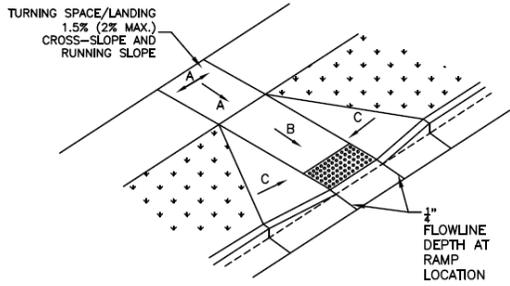


TYPICAL RAMP SECTION AT CENTERLINE

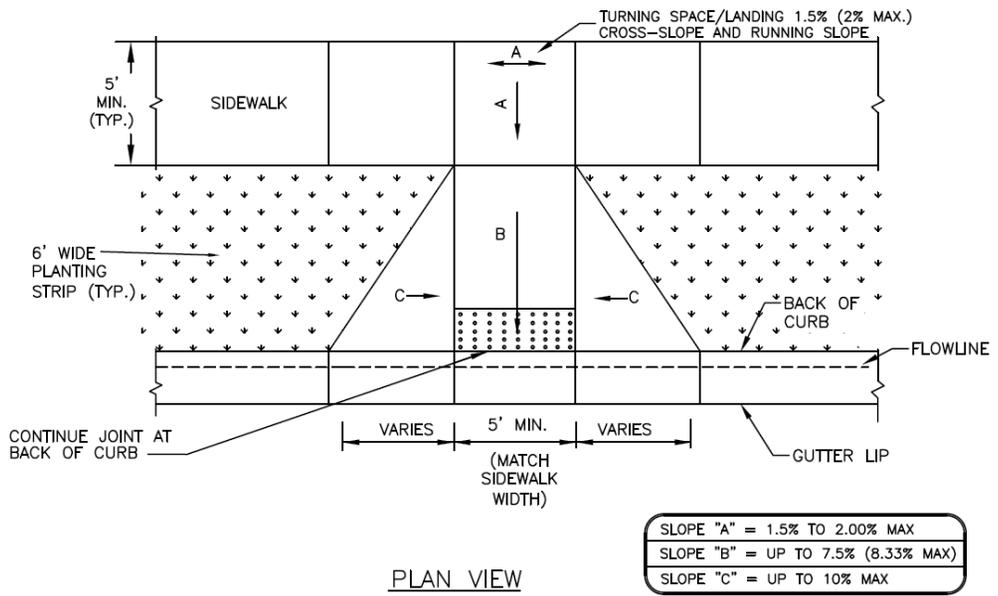
NOT TO SCALE
DATE: OCTOBER 2020

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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%.

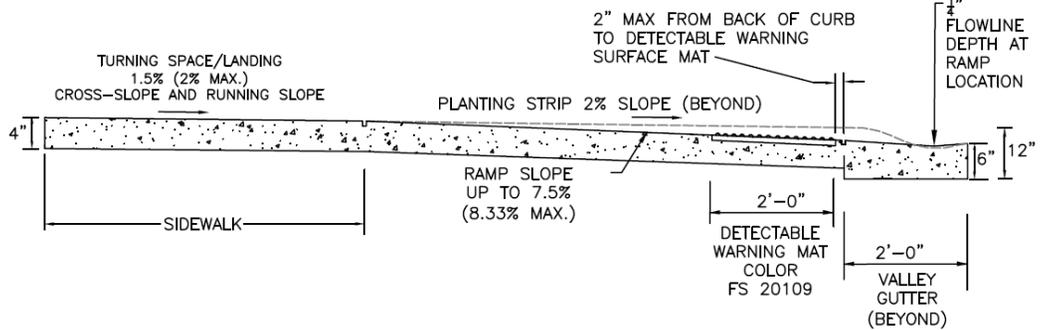


ISOMETRIC VIEW



PLAN VIEW

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

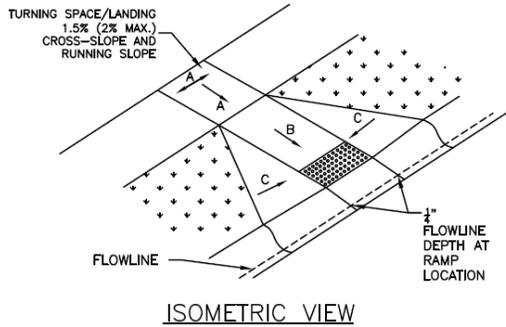


TYPICAL RAMP SECTION AT CENTERLINE

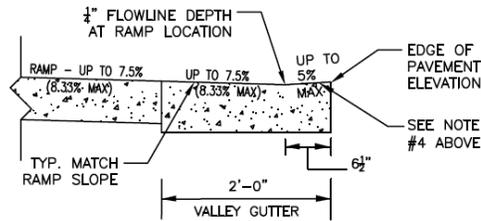
NOT TO SCALE
DATE: OCTOBER 2020

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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%.

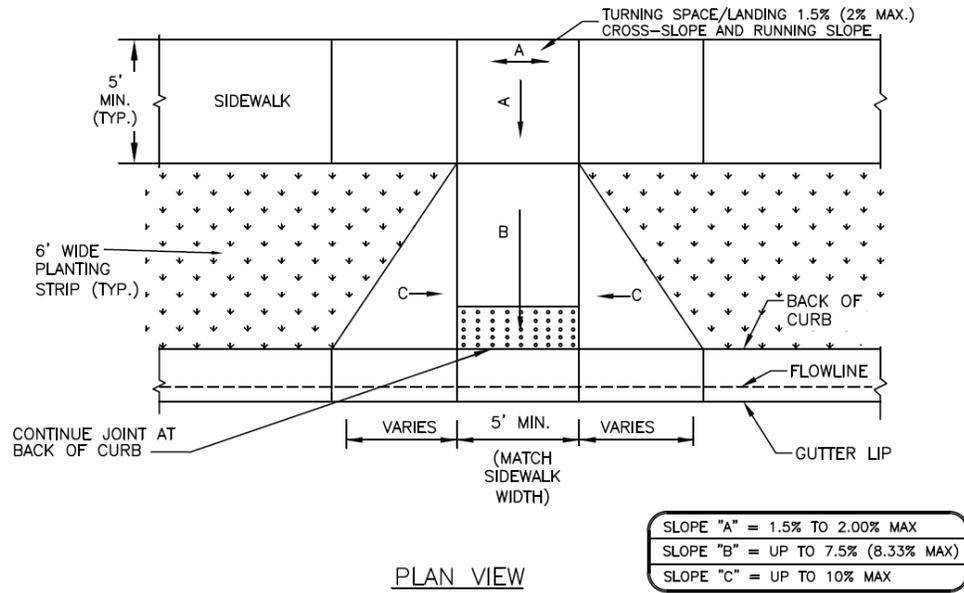


ISOMETRIC VIEW

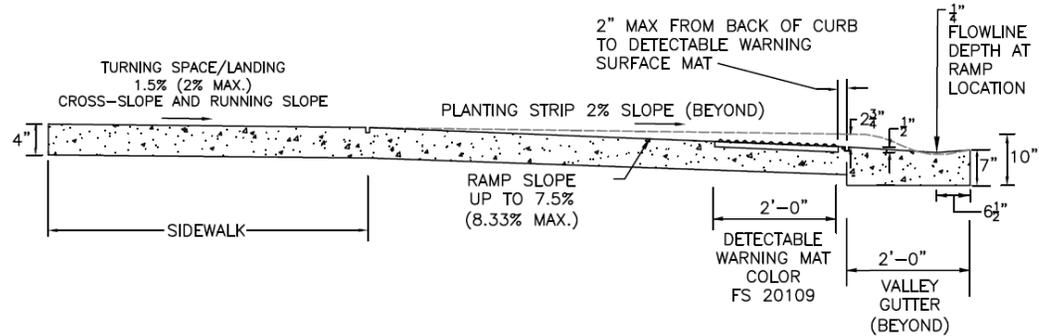


2'-0" VALLEY GUTTER RAMP DETAIL
MAXIMUM SLOPES FOR VALLEY GUTTER DEPRESSION AT RAMPS

NOT TO SCALE
DATE: OCTOBER 2020



PLAN VIEW

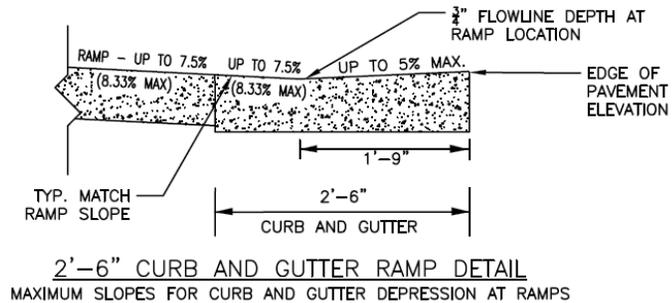
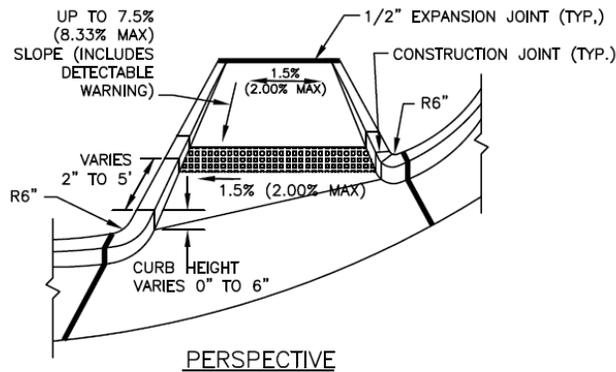
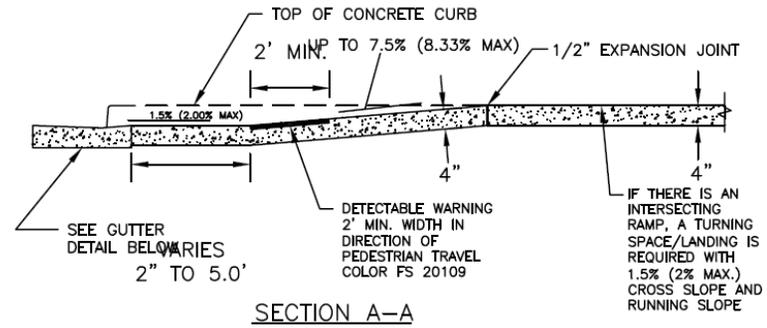
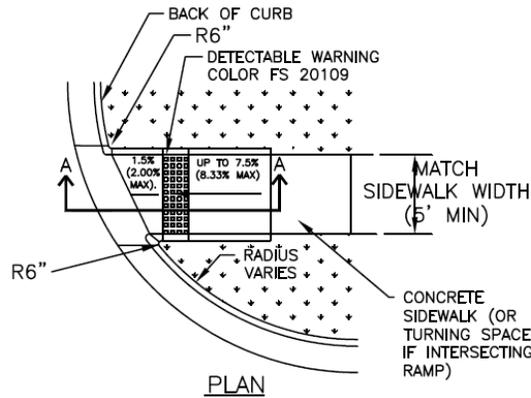


TYPICAL RAMP SECTION AT CENTERLINE

TOWN OF
SOUTHERN PINES

PERPENDICULAR CURB RAMP WITH 2'-0"
VALLEY CURB & GUTTER

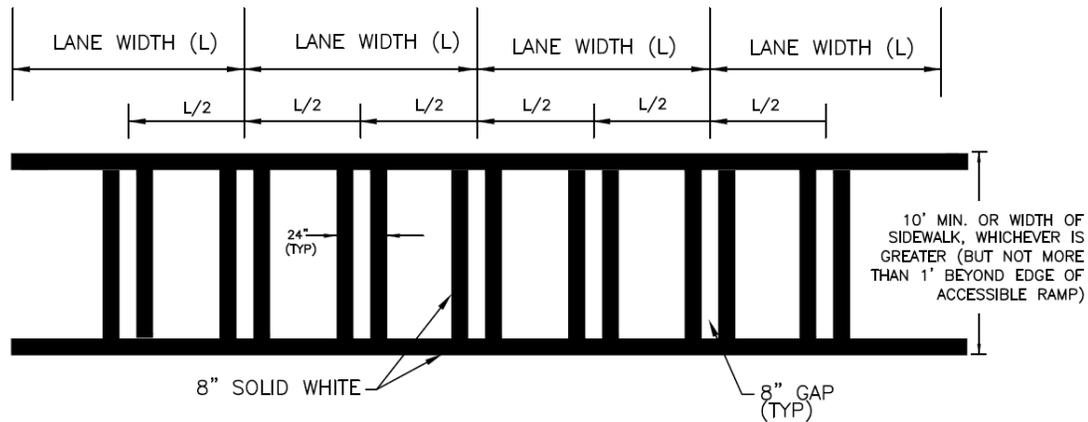
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NOTES:

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. DIRECTIONAL RAMPS MAY BE USED WHEN AN 6-FOOT PLANTING STRIP IS PROVIDED. DO NOT USE THIS DETAIL IF THERE IS HARDSCAPE INSTEAD OF A PLANTING STRIP.
3. ALL CONCRETE SHALL BE AT LEAST NCDOT CLASS B.
4. ENSURE FLUSH CONDITIONS AT RAMP TO GUTTER TRANSITION.

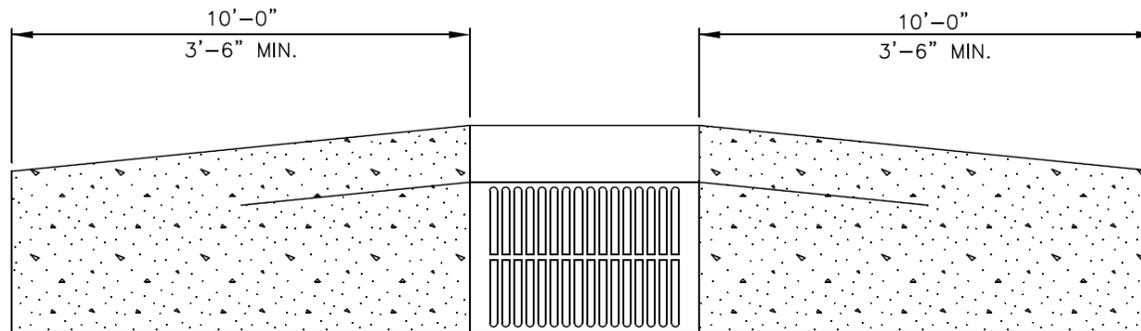
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NOTES:

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.

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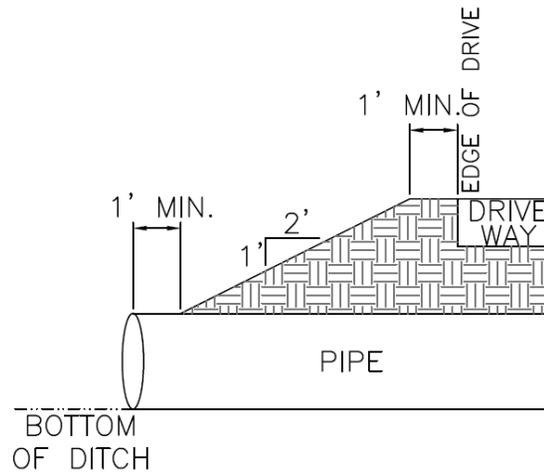


PLAN

NOTE:

1. TRANSITION FROM 2'-6" STANDARD CURB TO VALLEY CURB AT A DRAINAGE INLET ONLY.
2. TRANSITIONS SHORTER THAN 10' SHALL BE APPROVED BY THE TOWN ENGINEER. UNDER NO CIRCUMSTANCE SHALL A TRANSITION BE SHORTER THAN 3'-6".

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RESIDENTIAL DRIVEWAY PIPE DETAIL

NOTES:

1. THE PIPE SHALL BE A MINIMUM DIAMETER OF 15" REINFORCED CONCRETE AND A MINIMUM LENGTH OF 20'.
2. A LARGER PIPE SIZE MAY BE REQUIRED IF DETERMINED BY A PROFESSIONAL ENGINEER OR THE TOWN ENGINEER.
3. THE LENGTH OF PIPE REQUIRED SHALL BE THE AMOUNT NEEDED TO EXTEND (1') BEYOND THE TOE OF A 2:1 SLOPE. SEE SECTION DETAIL.
4. NO UTILITIES IN DRIVEWAY, MUST BE MIN. 3' FROM DRIVEWAY.
5. DITCH SHALL BE INSPECTED BY PUBLIC WORKS BEFORE PIPE IS INSTALLED.

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TOWN OF
SOUTHERN PINES

RESIDENTIAL DRIVEWAY PIPE DETAIL
RIBBON PAVEMENT

R21

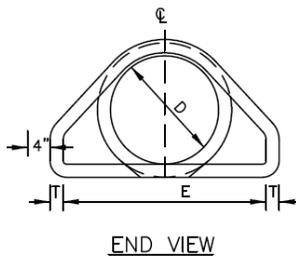
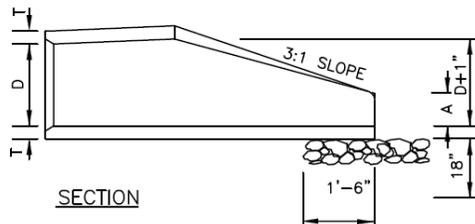
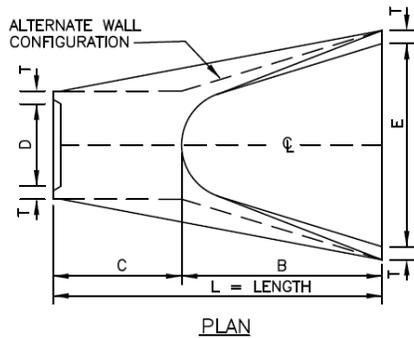


TABLE OF DIMENSIONS							
D	T	A	B	C	E	L	WT.
15"	2-1/4"	6"	2'-3"	3'-10"	2'-0"	6'-1"	730
18"	2-1/2"	9"	2'-3"	3'-10"	3'-0"	6'-1"	1190
24"	3"	10"	3'-8"	2'-6"	4'-0"	6'-2"	1770
30"	3-1/2"	1'-0"	4'-6"	1'-8"	5'-0"	6'-2"	2380
36"	4"	1'-3"	5'-3"	2'-11"	6'-0"	8'-2"	5320
42"	4-1/2"	1'-9"	5'-3"	2'-11"	6'-6"	8'-2"	5920
48"	5"	2'-0"	6'-0"	2'-2"	7'-0"	8'-2"	7470
54"	5-1/2"	2'-3"	5'-6"	2'-10"	7'-6"	8'-4"	8810
60"	6"	2'-6"	5'-0"	3'-3"	8'-0"	8'-3"	11180
66"	6-1/2"	3'-0"	6'-0"	2'-3"	8'-6"	8'-3"	12530
72"	7"	3'-0"	6'-6"	1'-9"	9'-0"	8'-3"	13980

NOTES:

1. REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF REINFORCED CONCRETE PIPE OF LIKE DIAMETER PER AASHTO M170, TABLE 2, WALL B.
2. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
3. PROVIDE TONGUE OR SPIGOT JOINT AT INLET END SECTION.
4. PROVIDE GROOVE OR BELL JOINT AT OUTLET END SECTION.
5. 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.
6. NOT TO BE USED IN NCDOT MAINTAINED RIGHT OF WAY.

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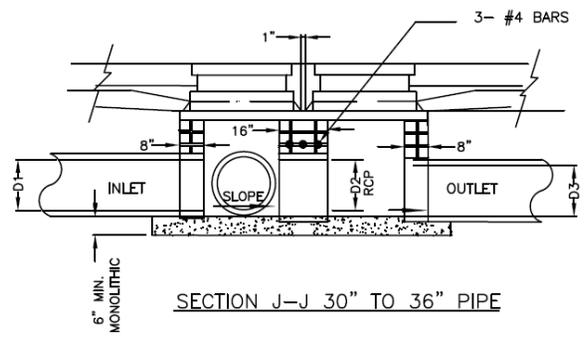
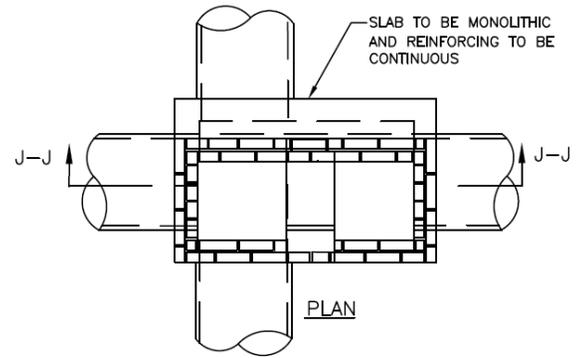
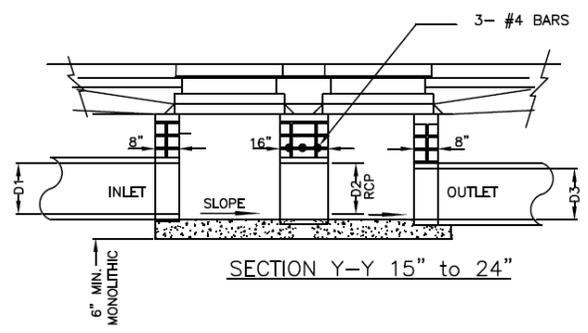
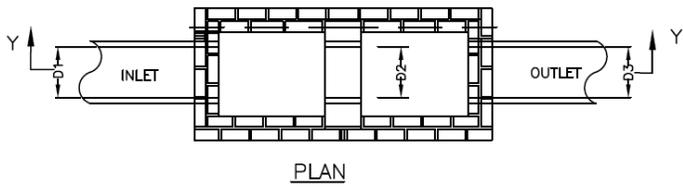
TOWN OF
SOUTHERN PINES

FLARED END SECTION
15" THRU 72" PIPE

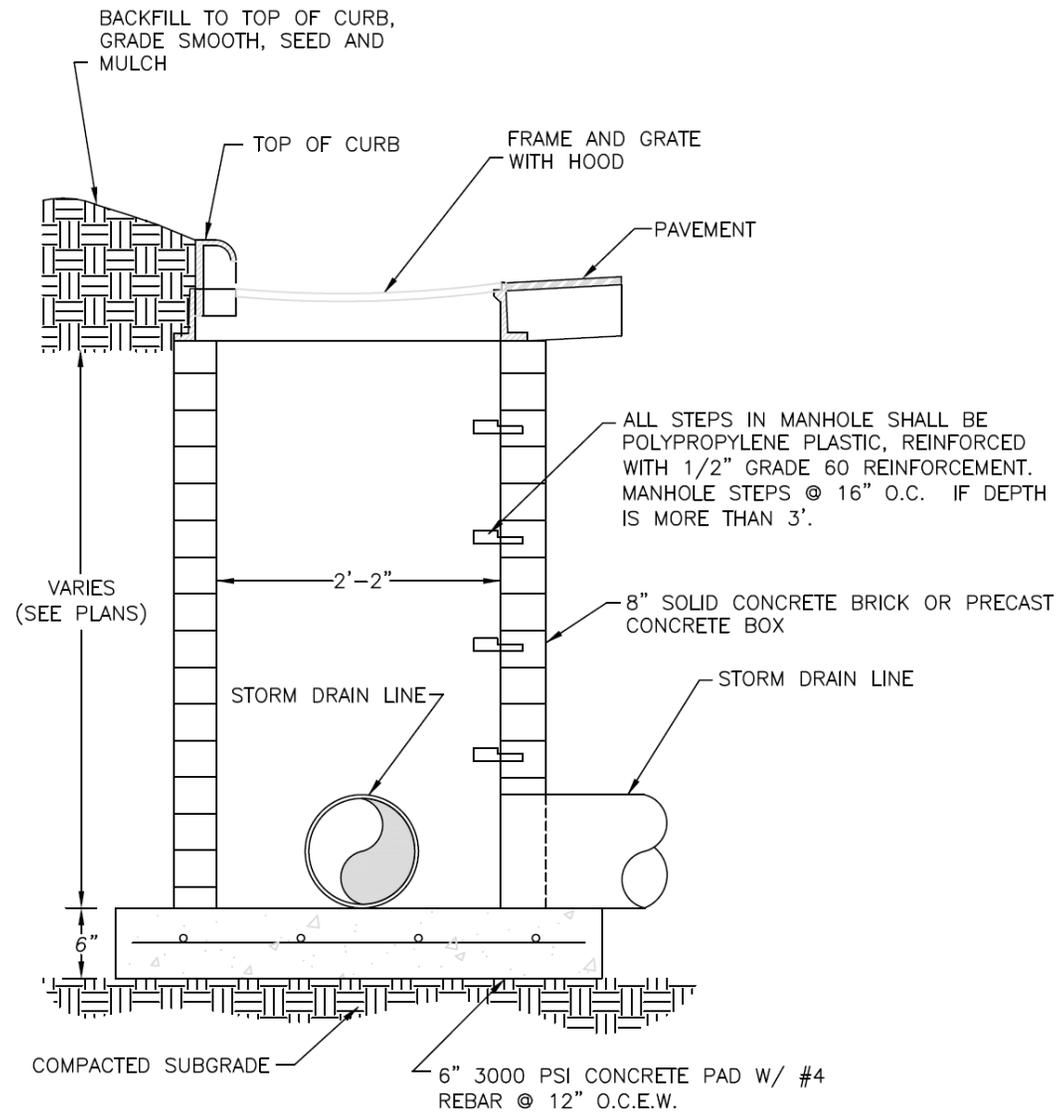
R22

NOTES:

1. SEE NCDOT STANDARD 840.01 FOR DETAILS BASED ON PIPE SIZE PER CROSS SECTION.
2. CONSTRUCT TWO SINGLE BASINS PER NCDOT STANDARD WITH DOUBLE INTERIOR WALL.
3. ALL CONCRETE TO BE NCDOT CLASS B CONCRETE.
4. BASE SLAB SHALL BE MONOLITHIC.
5. PIPE SECTION D2 CONNECTING CATCH BASINS SHALL HAVE A MINIMUM DIAMETER SAME AS OF OUTLET PIPE D3.
6. 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)
7. WEEP HOLES SHALL BE PLACED IN BACK WALL WITH FILTER FABRIC OR STONE ON BACK SIDE



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NOTE:
NCDOT STD. #840.01 #840.02 MASONRY OR CONCRETE INLET BOXES

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EROSION CONTROL CONSTRUCTION SEQUENCE (REVISE AS NECESSARY TO ADDRESS SITE SPECIFIC ISSUES)

1. INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
2. INSTALL TEMPORARY EROSION CONTROL MEASURES AT LOCATIONS SHOWN ON PLAN.
3. CALL FOR ON-SITE INSPECTION BY TOWN OF SOUTHERN PINES CONSTRUCTION INSPECTOR.
4. INITIATE GRUBBING AND TOPSOIL STRIPPING OF THE SITE.
5. AS CONSTRUCTION PROGRESSES, REMOVE SILT AND SEDIMENT BUILDUPS AT ALL MEASURES TO MAINTAIN ADEQUATE EROSION CONTROL.
6. WITHIN 7 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING AND ON SLOPES GREATER THAN 3:1, GROUND COVER SHALL BE PROVIDED ON EXPOSED SLOPES AND PERMANENT GROUND COVER SHALL BE PROVIDED FOR ALL DISTURBED AREAS WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
7. CONTINUE WITH FINE GRADING OF SITE.
8. WHEN CONSTRUCTION ACTIVITIES ARE COMPLETE AND ALL SOIL AREAS STABILIZED, CALL FOR ON-SITE INSPECTION BY TOWN OF SOUTHERN PINES CONSTRUCTION INSPECTOR.
9. IF SITE IS APPROVED, REMOVE TEMPORARY EROSION CONTROL MEASURES AS DIRECTED, SEED, FERTILIZE AND MULCH RESULTING DISTURBED AREAS. CLEAR ALL DEBRIS AND SEDIMENT ACCUMULATION. ESTABLISH PERMANENT STABILIZING VEGETATION DURING THE APPROPRIATE TIME OF YEAR.
10. UPON ESTABLISHED AND STABILIZED VEGETATION, CALL FOR FINAL INSPECTION BY TOWN OF SOUTHERN PINES CONSTRUCTION INSPECTOR.

SEED BED PREPARATION

1. RIP THE ENTIRE AREA TO 6 INCH DEPTH.
2. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
3. APPLY AGRICULTURAL LIME, FERTILIZER AND SUPERPHOSPHATE IN ACCORDANCE WITH "SEEDING SCHEDULE" AND MIX WITH SOIL.
4. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEED BED IS PREPARED 4 TO 6 INCHES DEEP.
5. SEED ON A FRESHLY PREPARED SEED BED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING. SEED ACCORDING TO "SEEDING SCHEDULE".
6. MULCH IN ACCORDANCE WITH "SEEDING SCHEDULE" IMMEDIATELY AFTER SEEDING.
7. INSPECT ALL SEEDING FOR COMPLIANCE WITH THE REQUIREMENTS OF THE "SEEDING SCHEDULE". MAKE NECESSARY REPAIRS AND RESEED WITHIN THE PLANTING SEASON, IF POSSIBLE, OR THE DAMAGED AREA SHALL BE REESTABLISHED FOLLOWING THE ORIGINAL LIME, FERTILIZER AND SEEDING REQUIREMENTS.

SEEDING SCHEDULE

NOTE:

TEMPORARY SEED MIX SHALL BE USED FOR ALL AREAS EXPOSED GREATER THAN ONE WEEK AND SUBJECT TO FURTHER DISTURBANCE.

PERMANENT SEED MIX SHALL BE CHECKED FOR ADEQUACY ON JULY 15.

AN ADEQUATE COVER SHALL HAVE 50 SPRIGS OF BERMUDA OR SERICEA LESPEDEZA PER ONE SQUARE FOOT.

TEMPORARY SEEDING RECOMMENDATION for SUMMER (TO BE FOLLOWED BY PERMANENT FALL SEED MIX)

SPECIES RATE (LB / ACRE)

APR. 15 - AUG. 15 GERMAN MILLET 40

SOIL AMENDMENTS

APPLY 2,000 LB / ACRE GROUND AGRICULTURAL LIMESTONE and 750 LB / ACRE 10-10-10 FERTILIZER OR FOLLOW RECOMMENDATIONS OF SOIL TESTS.

MULCH

APPLY 4,000 LB / ACRE GRAIN STRAW OR EQUIVALENT COVER.

ANCHOR STRAW BY ROVING, NETTING OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 400 GAL / ACRE.

MAINTENANCE

RE-FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, RE-FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

TOWN OF
SOUTHERN PINES

EROSION CONTROL AND SEQUENCE AND
SEEDING NOTES

E1

TEMPORARY SEEDING RECOMMENDATION for FALL (TO BE FOLLOWED BY PERMANENT FALL SEED MIX)

SPECIES RATE (LB / ACRE)
AUG. 15 – DEC. 15 WINTER RYE (GRAIN) 120

SOIL AMENDMENTS
APPLY 2,000 LB / ACRE GROUND AGRICULTURAL LIMESTONE and 1,000 LB/ACRE 10–10–10 FERTILIZER OR FOLLOW RECOMMENDED SOIL TESTS.

MULCH
APPLY 4,000 LB / ACRE GRAIN STRAW OR EQUIVALENT COVER.
ANCHOR STRAW BY ROVING, NETTING OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 400 GAL / ACRE.

MAINTENANCE
REPAIR AND RE–FERTILIZE 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.

TEMPORARY SEEDING RECOMMENDATION for LATE WINTER and EARLY SPRING (TO BE FOLLOWED BY PERMANENT FALL SEED MIX)

SPECIES RATE (LB / ACRE)
DEC. 1 – APR. 15 WINTER RYE (GRAIN) 120
ANNUAL KOBE LESPEDEZA 50
OMIT LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE.

SOIL AMENDMENTS
APPLY 2,000 LB / ACRE GROUND AGRICULTURAL LIMESTONE and 750 LB / ACRE 10–10–10 FERTILIZE OR FOLLOW RECOMMENDATIONS OF SOIL TESTS.

MULCH
APPLY 4,000 LB / ACRE GRAIN STRAW OR EQUIVALENT COVER.
ANCHOR STRAW BY ROVING, NETTING OR BY TACKING WITH ASPHALT EMULSION AT A RATE OF 400 GAL / ACRE.

MAINTENANCE
RE–FERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, RE–FERILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.

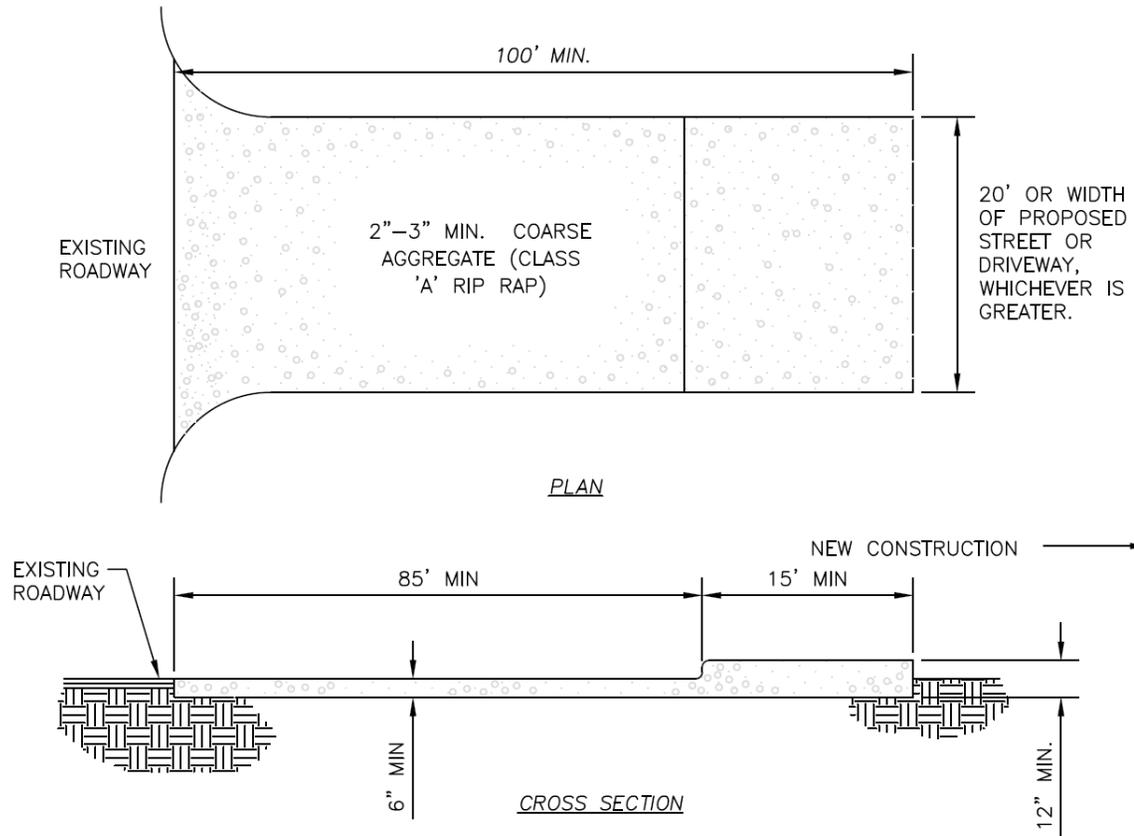
PERMANENT SPRING SEED MIX
SPECIES RATE (LB / ACRE)
MARCH 1 – JULY 1 COMMON BERMUDA 30
SERICEA LESPEDEZA 30

PERMANENT SPRING SEED MIX
SPECIES RATE (LB / ACRE)
SEPT. 1 – NOV. 1 COMMON BERMUDA 30
SERICEA LESPEDEZA (UNSCARIFIED) 30
KOBE LESPEDEZA 10

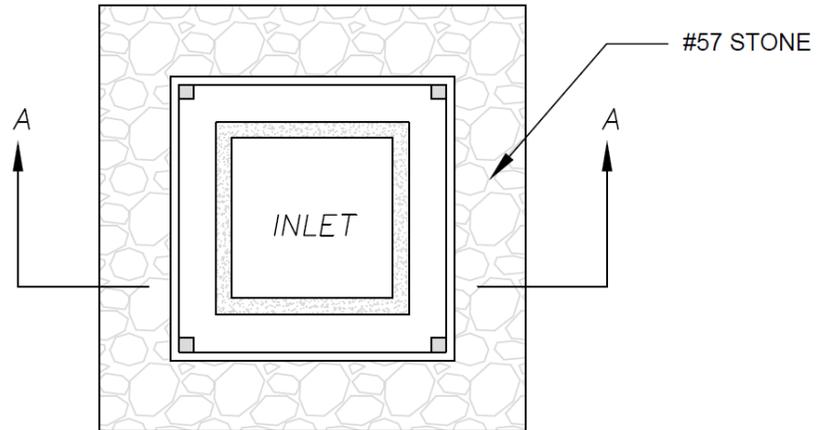
WATER
MINIMUM OF 1 INCH OF RAINFALL A WEEK (IF NOT SUPPLIED NATURALLY, CONTRACTOR SHALL SUPPLY THE REMAINING AMOUNT UNTIL GROUND COVER HAS BEEN ESTABLISHED.

NOTES & MAINTENANCE:

1. ENTRANCE(S) SHALL BE LOCATED TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
2. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS IS TO BE PROVIDED.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH 2" STONE WILL BE NECESSARY. CONTRACTOR SHALL MAINTAIN AS NECESSARY.
4. ANY MATERIAL WHICH STILL MAKES IT ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
5. FREQUENT CHECKS OF THE ENTRANCE(S) AND TIMELY MAINTENANCE SHALL BE PROVIDED.
6. NOTES ARE APPLICABLE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED.



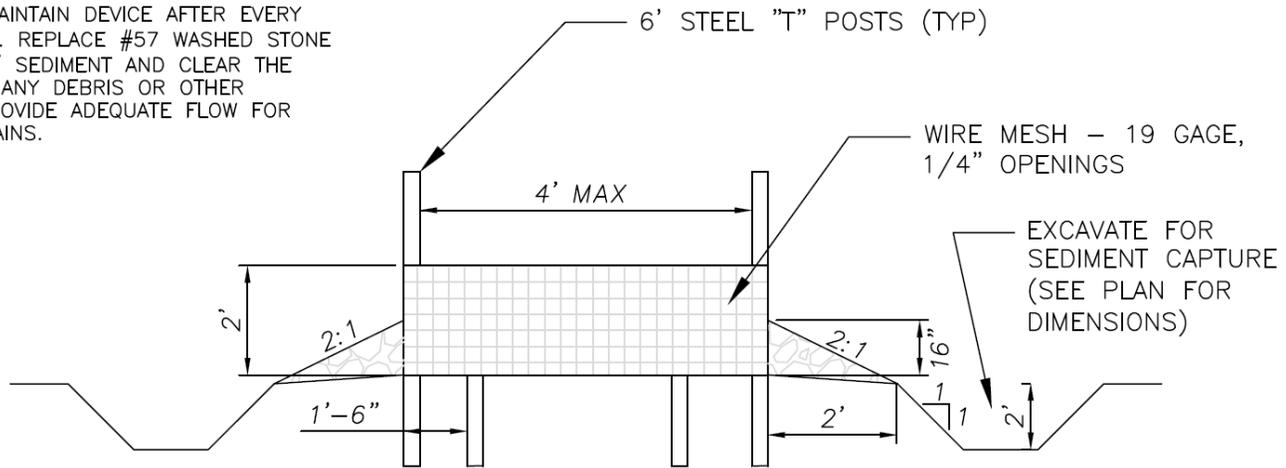
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PLAN

NOTES:

1. FRAMES AND GRATES TO REMAIN OFF INLET STRUCTURES WHILE INLET PROTECTION IS IN PLACE.
2. INSPECT AND MAINTAIN DEVICE AFTER EVERY RAINFALL EVENT. REPLACE #57 WASHED STONE IF IT CLOGS W/ SEDIMENT AND CLEAR THE MESH WIRE OF ANY DEBRIS OR OTHER OBJECTS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAINS.

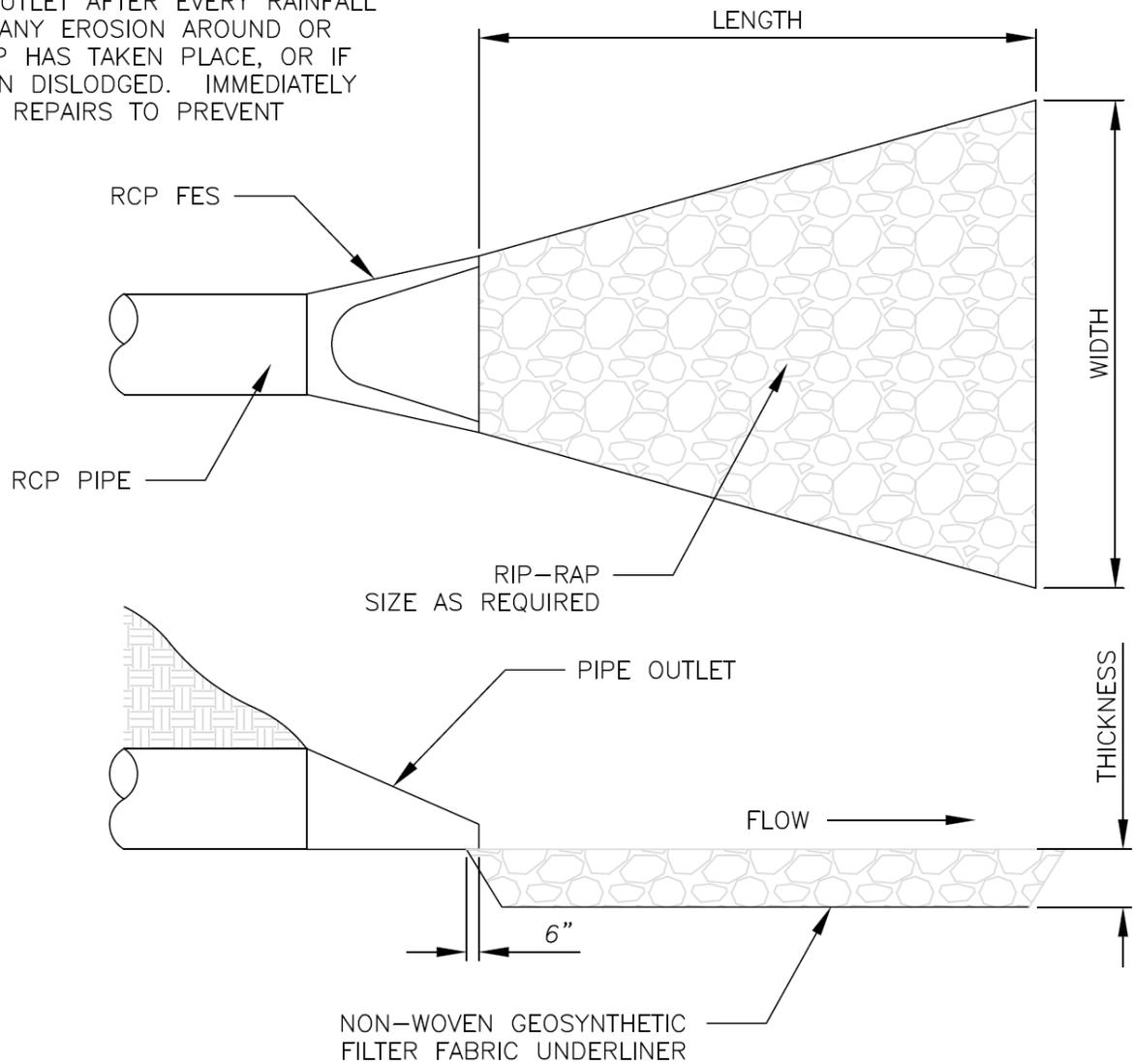


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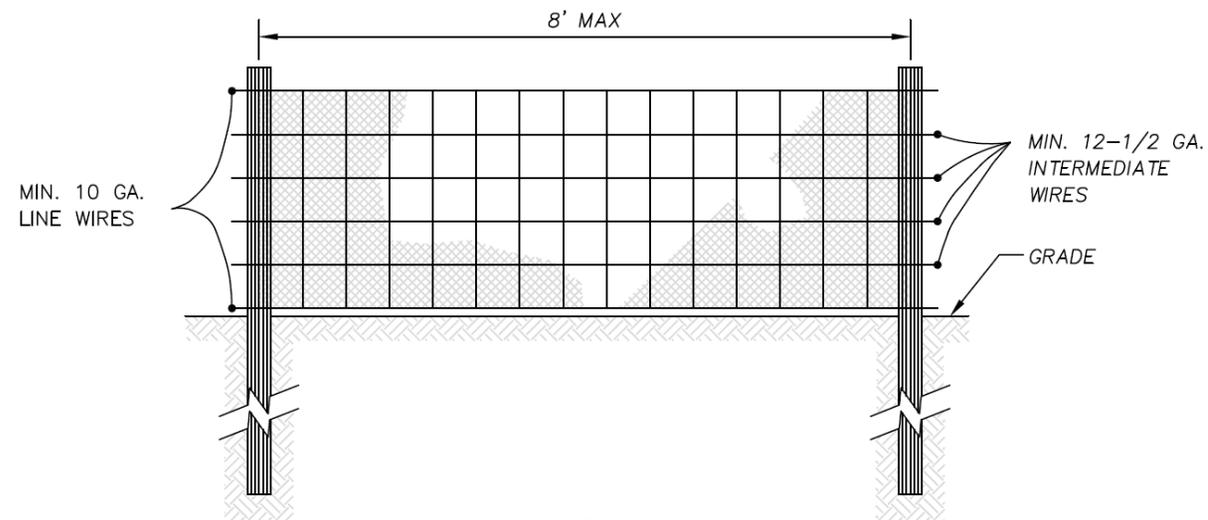
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NOTES AND MAINTENANCE:

1. MINIMUM LENGTH, WIDTH AND STONE DIAMETER TO BE DETERMINED BY DESIGN CRITERIA.
2. INSPECT RIPRAP OUTLET AFTER EVERY RAINFALL EVENT TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.



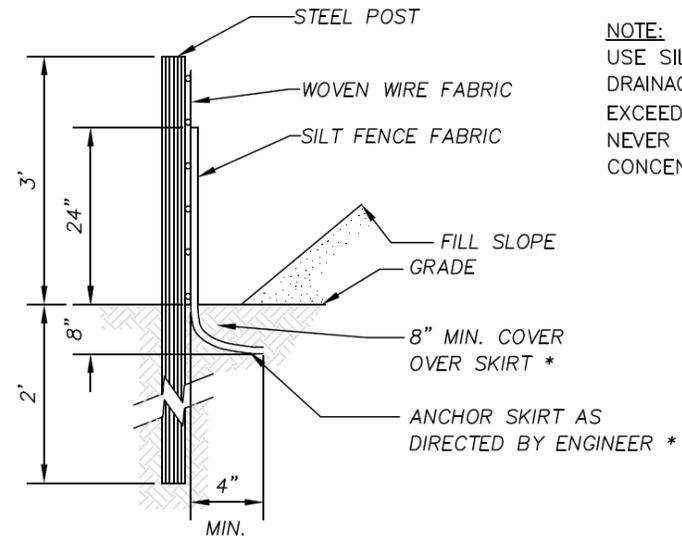
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FRONT VIEW

NOTES & MAINTENANCE:

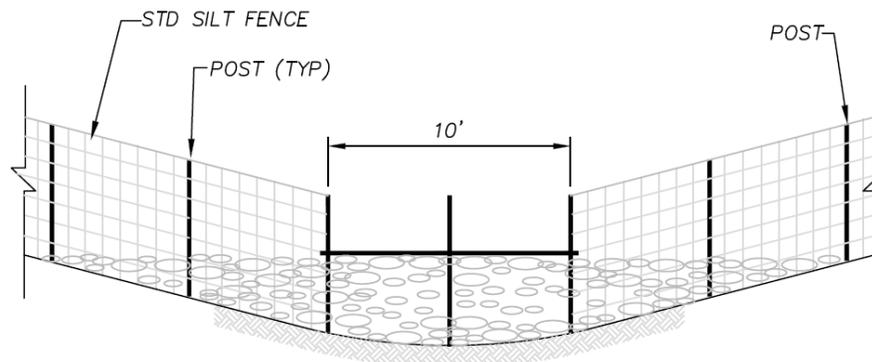
1. INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
4. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
5. REMOVE SEDIMENT DEEPER THAN 12".
6. FOR REPAIR OF SILT FENCE FAILURES, USE No. 57 WASHED STONE. FOR ANCHOR WHEN SILT FENCE IS PROTECTING CATCH BASIN.



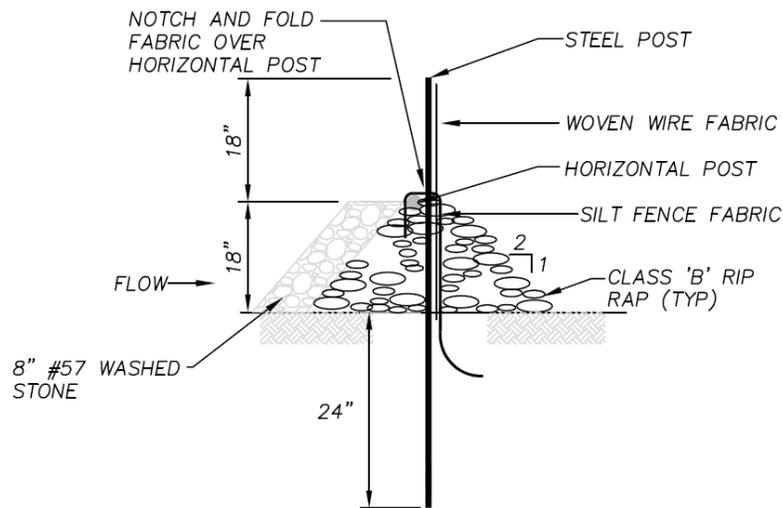
SIDE VIEW

NOTE:
USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.

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ELEVATION



SECTION

NOTES & MAINTENANCE

1. INSTALL SILT FENCE PER STD. SILT FENCE DETAIL.
2. INSPECT REINFORCED SILT FENCE OUTLETS AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO ENSURE STONE FILTER IS FUNCTIONING PROPERLY.
4. LOCATE REINFORCED OUTLET AT LOW POINTS OF SILT FENCE.
5. REMOVE RIP RAP STONE CAREFULLY AND ENSURE SILT FENCE IS NOT TORN. REPLACE ANY TORN SECTIONS.

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CHAPTER 9 CERTIFICATIONS, FORMS, AND PERMITS

Certifications

DESIGN CERTIFICATION REQUIREMENTS AND DEVIATIONS REQUEST

STORM DRAINAGE AS-BUILT CERTIFICATION

STORMWATER CONTROL MEASURE (SCM) CERTIFICATION

Permits

CONSTRUCTION ON TOWN RIGHT-OF-WAY

FINANCIAL RESPONSIBILITY/OWNERSHIP FORM

APPLICATION FOR MINOR SEDIMENTATION & EROSION CONTROL PLAN

EROSION COMPLIANCE FORM

INSTALLATION OF WATER/SEWER SERVICE APPLICATION

Forms

PAVEMENT COORDINATION MEETING REQUEST CHECKLIST

UTILITY CLOSEOUT DOCUMENTATION SUBMITTAL CHECKLIST

ENGINEERING SITE PLAN CLOSEOUT DOCUMENTATION SUBMITTAL CHECKLIST

DESIGN CERTIFICATION REQUIREMENTS AND DEVIATIONS REQUEST

The Town of Southern Pines Engineering and Construction Standards contained herein are to be utilized as a minimum standard for construction within the jurisdiction of the Town of Southern. The purpose of these specifications is to present typical standards for typical conditions encountered. This manual may also be subject to periodic change by the Town. It is not the intent of these standard specifications and details to relieve the Owner of any responsibility for the correct adaptation of these standards to the actual site conditions encountered on any project. The Owner's engineer preparing detailed drawings for a specific project must review the applicable portions of these specifications and details and satisfy himself or herself that these minimum standards will function correctly for the Owner's project. There may be circumstances in which the Owner's engineer will wish to increase the material strengths, stone bedding requirements, reinforcing, etc. In situations where these modifications occur, the Town shall be consulted regarding these proposed changes prior to plan submittal to the Town. This will help insure that plan review takes a minimum amount of time. To ensure good engineering design, the Town may occasionally require more stringent standards than those presented herein. Where the Owner and/or their engineer believes that conformance with this manual would create an unreasonable hardship or where an alternative design may be more appropriate, those items must be submitted to the Town for written authorization from the Town Engineer, or designee prior to inclusion on construction documents presented for review by the Town. In addition, any proposed deviations from these specifications must be listed below and clearly shown on the construction drawings. All deviations will be subject to approval by the Town Engineer, or designee. Any proposed exceptions or deviations from either the standards are listed below: (The professional engineer shall then list such deviations).

1. _____
2. _____
3. _____

Signature & Seal of Professional Engineer

Owner's Printed Name, Title, and Company Name

Owner's Signature

Date

STORM DRAINAGE CONVEYANCE SYSTEM CERTIFICATION

As-Built Certification

I, _____, attest that this certification, for the _____ Project, has been reviewed by me and is accurate, complete and consistent with the information supplied in the plans, specifications, engineering calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the Storm Drainage As-Built Plans have been prepared based on an accurate account of the stormwater piping and appurtenances installed during construction and any deviations from the approved construction plans shall not adversely impact the drainage system, discharge points, and/or adjacent properties analyzed during the approval process of the construction plans. Although other professionals may have developed certain portions of this submittal package, inclusion of these materials under my signature and seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design.

SEAL:

(Date)

(Signature)

Engineer:
Firm:
Firm License #:
Address:

STORMWATER CONTROL MEASURE (SCM) CERTIFICATION

As-Built Certification

I, _____, attest that this certification, for the _____ Project, has been reviewed by me and is accurate, complete and consistent with the information supplied in the plans, specifications, engineering calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the As-Built Plans have been prepared based on an accurate account of the SCM and appurtenances installed during construction and any deviations from the approved construction plans were analyzed and verified to not adversely impact the performance of the SCM during the approval process of the construction plans. Although other professionals may have developed certain portions of this submittal package, inclusion of these materials under my signature and seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design.

SEAL:

(Date)

(Signature)

Engineer:
Firm:
Firm License #:
Address:



Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

CONSTRUCTION ON TOWN RIGHT-OF-WAY

PERMIT VOID IF WORK NOT BEGUN WITHIN 30 DAYS OF APPROVAL

Call Before you Dig-NC811---800.632.4949

Site Address: _____

Applicant Information

Name: _____ Address: _____

Phone #: _____ Email: _____

Property Owner

Name: _____ Address: _____

Phone #: _____ Email: _____

Contractor Information

Name: _____ Address: _____

Phone #: _____ Email: _____

DESCRIPTION OF WORK (check all that apply)

Pavement Cut Driveway Storm Drainage Tree Removal in R/W Sidewalk

Driveway Pipe Installation by Town of Southern Pines Other

Description: Attach a separate lot drawing depicting location of driveway, home and any trees proposed to be removed within the Town right-of-way. Include dimensions of driveway and distance from site features such as trees or property lines:

***Note:** Applicant shall physically mark the driveway location on the lot using paint, flags, stakes, or similar prior to submitting this form for review. Provide picture-showing location as marked.

Applicant Signature: _____ Date: _____

Approved By: _____ Date: _____

Applicant must contact the Town of Southern Pines to perform a driveway inspection prior to certificate of occupancy failure to arrange for an inspection from the Town could result in applicant being responsible for reinstalling the driveway.

INITIAL INSPECTION APPROVALS

Inspection Request Date: _____

Inspection Date: _____

By: _____

Comments:

- | | |
|---|--|
| <input type="checkbox"/> Driveway Pipe Required; See APP. B of the UDO | <input type="checkbox"/> Tree Removal Permit Required |
| <input type="checkbox"/> No Pipe Required | <input type="checkbox"/> Install Per Approved Site Plan |
| <input type="checkbox"/> NCDOT Road, Contact NCDOT at 910-944-7621 | <input type="checkbox"/> Invoice Paid |
| <input type="checkbox"/> Private Road, Contact owner of road for approval | <input type="checkbox"/> Install 6" Thick Sidewalk through Drive |

FINAL INSPECTION APPROVALS

Inspection request Date: _____

Inspection Date: _____

By: _____

Comments:

- | | |
|---|---|
| <input type="checkbox"/> Installed Per Approved Plans | <input type="checkbox"/> Re-inspection Required Date: _____ |
| <input type="checkbox"/> Installed Incorrectly, Reinstall per Plans | |

The Property owner accepts responsibility for any repair and or replacement of new infrastructure for one year from the date of Certificate of Occupancy. Failure to repair damage within 30 day of Town notice will result in necessary work being completed and then billed to property owner.



Public Works Department
 140 Memorial Park Court Southern Pines, NC 28387
 Telephone: 910-692-1983 Fax: 910-692-1085

FINANCIAL RESPONSIBILITY/OWNERSHIP FORM SEDIMENTATION POLLUTION CONTROL ACT

No person may initiate any land-disturbing activity greater than 30,000 sq. ft. as covered by the Town's Code of Ordinances before this form and an acceptable erosion and sedimentation control plan have been completed and approved by the Town of Southern Pines and the Land Quality Section, NC. Department of Environmental Quality. (Please type or print and, if the question is not applicable or information unavailable, place N/A in the blank.)

Part A.

1. Project Name _____
2. Location of land-disturbing activity: Highway/Street/Address: _____
 Latitude _____ Longitude _____ County **Moore** City: _____
3. Approximate date land-disturbing activity will commence _____
4. Percent Impervious _____
5. Purpose of development (residential, commercial, industrial, institutional, etc.): _____
6. Total acreage disturbed or uncovered (**including off-site borrow and waste areas**): _____
7. Amount of fee enclosed: \$ _____.
The application fee of \$300.00 per acre plus \$150.00 for each additional acre, or part thereof, and is assessed without a ceiling amount. Any substantial revision to a previously approved, active plan is \$50 per acre, or part thereof.
8. Has an erosion and sediment control plan been filed? Yes _____ No _____ Enclosed _____
9. Person to contact should erosion and sediment control issues arise during land-disturbing activity:
 Name _____ E-mail Address _____
 Telephone _____ Cell _____ Fax _____
10. Landowner(s) of Record (attach accompanied page to list additional owners):

Name	Telephone	Fax Number
Current Mailing Address	Current Street Address	
City	State	Zip
City	State	Zip

11. Deed Book No. _____ Page No. _____ **Provide a copy of the most current deed.**

Part B.

1. Person(s), Company(ies), or firm(s) who are financially responsible for the land-disturbing activity (**Provide a comprehensive list of all responsible parties on an attached sheet.**) *If the company or firm is a sole proprietorship the name of the owner or manager may be listed as the financially responsible party.*

_____			_____		
Name			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____			_____		
City	State	Zip	City	State	Zip
_____			_____		
Telephone _____			Fax _____		

2. (a) If the Financially Responsible Party is not a resident of North Carolina, give name and street address of the designated North Carolina Agent:

_____			_____		
Name			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____			_____		
City	State	Zip	City	State	Zip
_____			_____		
Telephone _____			Fax _____		

- (b) If the Financially Responsible Party is a Partnership or other person engaging in business under an assumed name, **attach a copy of the Certificate of Assumed Name.** If the Financially Responsible Party is a Corporation, give name and street address of the Registered Agent:

_____			_____		
Name of Registered Agent			E-mail Address		
_____			_____		
Current Mailing Address			Current Street Address		
_____			_____		
City	State	Zip	City	State	Zip
_____			_____		
Telephone _____			Fax Number _____		

The above information is true and correct to the best of my knowledge and belief and was provided by me under oath (This form must be signed by the Financially Responsible Person if an individual or his attorney- in-fact, or if not an individual, by an officer, director, partner, or registered agent with the authority to execute instruments for the Financially Responsible Person). I agree to provide corrected information should there be any change in the information provided herein.

Type or print name Title or Authority

Signature Date

I, _____, a Notary Public of the County of _____

State of North Carolina, hereby certify that _____ appeared personally before me this day and being duly sworn acknowledged that the above form was executed by him.

Witness my hand and notarial seal, this _____ day of _____, 20 _____

Notary

Seal

My commission expires _____

FOR TOWN USE ONLY:

Covered by 5/70 Provision: Yes No

REVISED: December 17, 2020



Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

APPLICATION FOR MINOR SEDIMENTATION & EROSION CONTROL PLAN APPROVAL

Projects that will disturb less than 30,000 square feet of but are part of a larger Common Plan of Development in which the total disturbance will exceed 30,000 square feet.

PROPERTY INFORMATION

1. Project Name: _____
2. Project Description: _____
3. Address: _____
4. Pin #: _____ Recorded: Book of Maps No. _____ Page No. _____
5. River Basin: _____ (Cape Fear/Lumber)
6. Watershed Classification: _____ (WS-III, HQW, etc) use [NCDEQ Stormwater Maps & GIS Resources](#)
7. Total area to be disturbed in acres: _____
8. Lot Number(s) _____
9. Total Number of Lots _____

DOCUMENTS SUBMITTED TO TOWN PERMITTING PORTAL:

1. Copy of this application _____
2. Erosion Control Site Plans (standard plan or custom plan) _____
3. Lot Plan (Recorded Plat or Plot Plan showing lots) _____
4. Checklist _____
5. S&E Calculations _____
6. Proof of Ownership/Consent Letter _____
7. Signed and notarized Financial Responsibility/Ownership Form: _____

GENERAL INFORMATION

1. **Property Owner** (s) (specify the name of the corporation, individual, etc., who owns the property):

Name: _____

Street Address: _____

Mailing Address: _____

E-Mail Address: _____

Phone#: (____) _____ Cell#: (____) _____ Fax#: (____) _____

2. **Applicant*** (Person to whom all correspondence will be sent):

Name: _____

Firm/other: _____

Street Address: _____

Mailing Address: _____

E-Mail Address: _____

Phone#: (____) _____ Cell#: (____) _____ Fax#: (____) _____

Relationship to Owner: _____

****If not a resident of North Carolina, a North Carolina agent must be designated for the purpose of receiving correspondences.***

APPLICANT'S CERTIFICATION

PRINT NAME _____

SIGNATURE _____ **DATE** _____

OWNER/PERSON FINANCIALLY RESPONSIBLE

SOIL EROSION AND SEDIMENTATION CONTROL PLAN OPTIONS

The Town of Southern Pines Soil Erosion and Sedimentation Control Chapter requires that the minimum erosion control measures, as outlined in Section 154.07 (A), be installed when the disturbed area on a tract of land is less than thirty- thousand square feet (30,000 SF), *unless otherwise exempt from installation of measures/devices or ESC Plan Approval is required.* Furthermore, no person shall initiate any land-disturbing activity on a tract if more than thirty-thousand square feet (30,000 SF) is to be uncovered unless, thirty (30) days or more prior to initiating the activity; a Plan for such activity is filed with and approved by the Town. Failure to install and/or maintain erosion control measures/devices may result in penalties of up to \$5,000.00 per day.

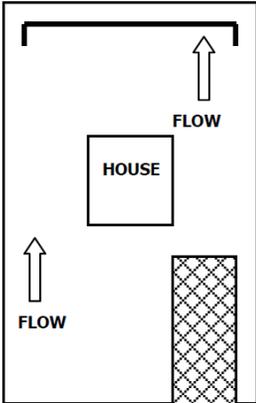
INSTRUCTIONS:

Identify One or Any Combination of Letters for the Schematic That Best Describes the Erosion Control Measures That Will be Used at Your Site During Construction.

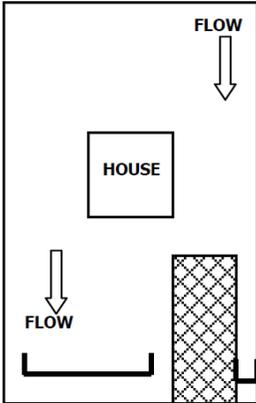
LEGEND:

- SILT FENCE
- CONSTRUCTION ENTRANCE
- DIRECTION OF FLOW (POINT DOWNHILL)

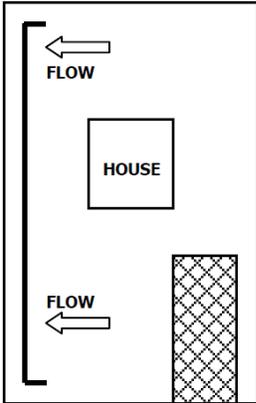
A. Flow to the Rear



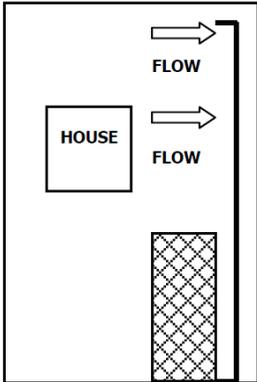
B. Flow to the Front



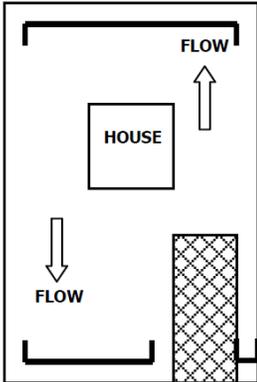
C. Flow to the Left



D. Flow to the Right



E. Flow to the Front & Rear





Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE FORM

Tracts less than thirty-thousand square feet (30000 SF) land disturbance
Residential and Commercial Not Part of a Larger Common Plan of Development

Minimum Erosion Control Measures Required, Unless Otherwise Approved

The approved and minimum required erosion control measures to be placed on an individual residential or commercial construction site that is less than thirty-thousand square feet (30,000 SF) in surface area are:

- (1) A construction entrance,
- (2) Silt fencing on all lower elevation perimeters, and
- (3) Established groundcover.

The site must comply with the Town’s Soil Erosion and Sedimentation Control Chapter by installing and maintaining all required controls measures as indicated on permit approval.

The only land disturbing activity to take place before the erosion control measures are completed is the cutting of trees and/or vegetation necessary to install the erosion control measures and/or devices.

If it is determined that: a significant risk of accelerated erosion exist; off-site sedimentation may occur as a result of the land-disturbing activity; and/or other conditions exist that require the preparation and approval of a Plan and that a grading permit be secured for land-disturbing activity of areas less than thirty-thousand square feet (30,000 SF), the Compliance Form is not valid.

Compliance Procedure

The property owner shall notify the Town of Southern Pines Construction Inspector to schedule an inspection of the ESC measures required. If the erosion control measures are not installed by the scheduled footing inspection and/or the Construction Inspector observes any erosion control problems on the site, including, but not limited to, failure to install erosion control measures, a written Notice of Violation will be issued in accordance with Section 154.17 (C). The footing inspection or any subsequent inspection approval will not be rendered until all control measures are in place and functioning.

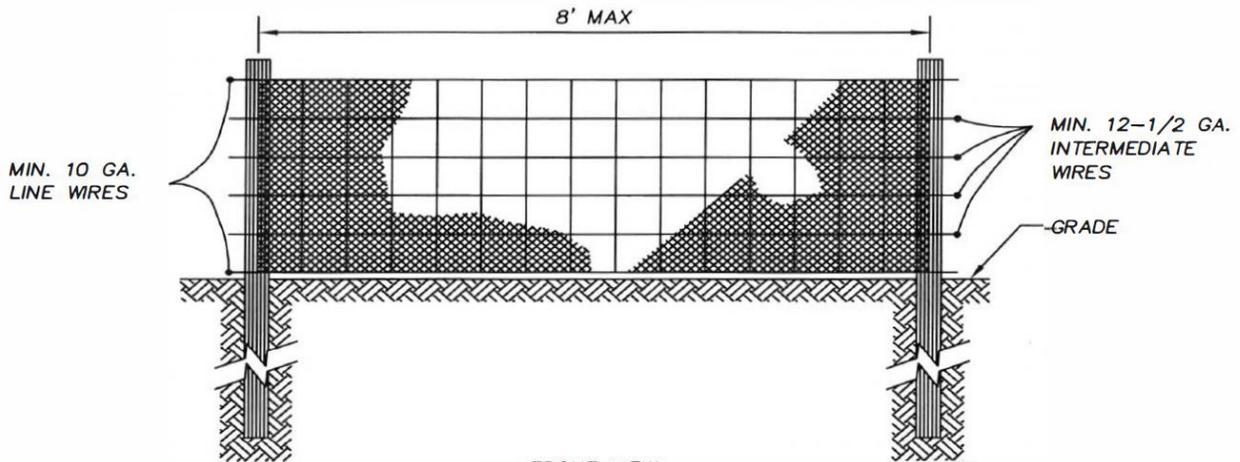
Final Inspections

When all construction on the project is complete, call the Construction Inspector to schedule an inspection. The inspection will evaluate the site and all permanent erosion control features and off-site impacts to other properties, if applicable. If found to be in compliance, the Building Inspector will be advised, giving approval for the Certificate of Occupancy.

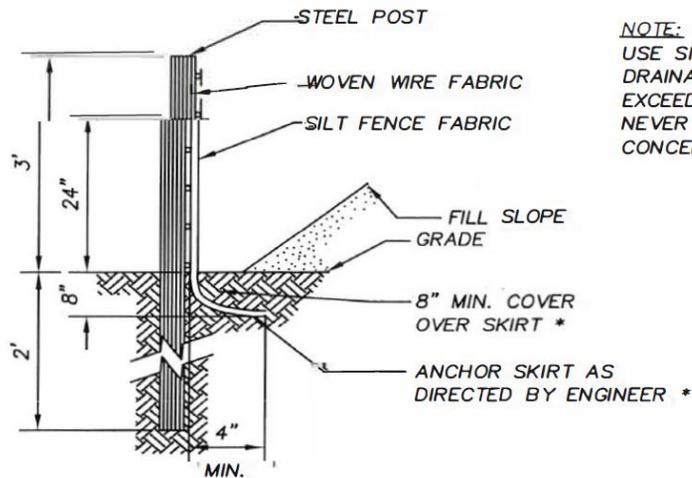
A Soil Erosion and Sedimentation Control Compliance Form, indicating the minimum control measures to be installed at the site, must be completed before a building permit can be issued, unless otherwise approved.

APPROVAL PROCESS:

- 1. Obtain an ESC Compliance Form, along with other application forms such as Water and/or Sewer Service and Driveway Permit, at Town offices or web site www.southernpines.net.
- 2. Complete and submit to the Town through the On-line Permitting Portal.
- 3. The Public Works Department will review / approve / comment on the application.
- 4. The approved ESC Compliance Form will be returned to the applicant or construction manager.
- 5. The Building Permit holder shall prominently display the approved ESC Compliance Form at the entrance to the construction site until the project is complete.
- 6. Attachments:
 - ESC Compliance Form.
 - Construction Details for installation of Temporary Construction Entrance & Temporary Silt Fence.



FRONT VIEW



SIDE VIEW

NOTE:
USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.

* FOR REPAIR OF SILT FENCE FAILURES, USE No. 57 WASHED STONE. FOR ANCHOR WHEN SILT FENCE IS PROTECTING CATCH BASIN.

8" MIN. COVER OVER SKIRT *

ANCHOR SKIRT AS DIRECTED BY ENGINEER *

NOTES & MAINTENANCE:

1. INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
4. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
5. REMOVE SEDIMENT DEEPER THAN 12".

NOT TO SCALE

TOWN OF SOUTHERN PINES

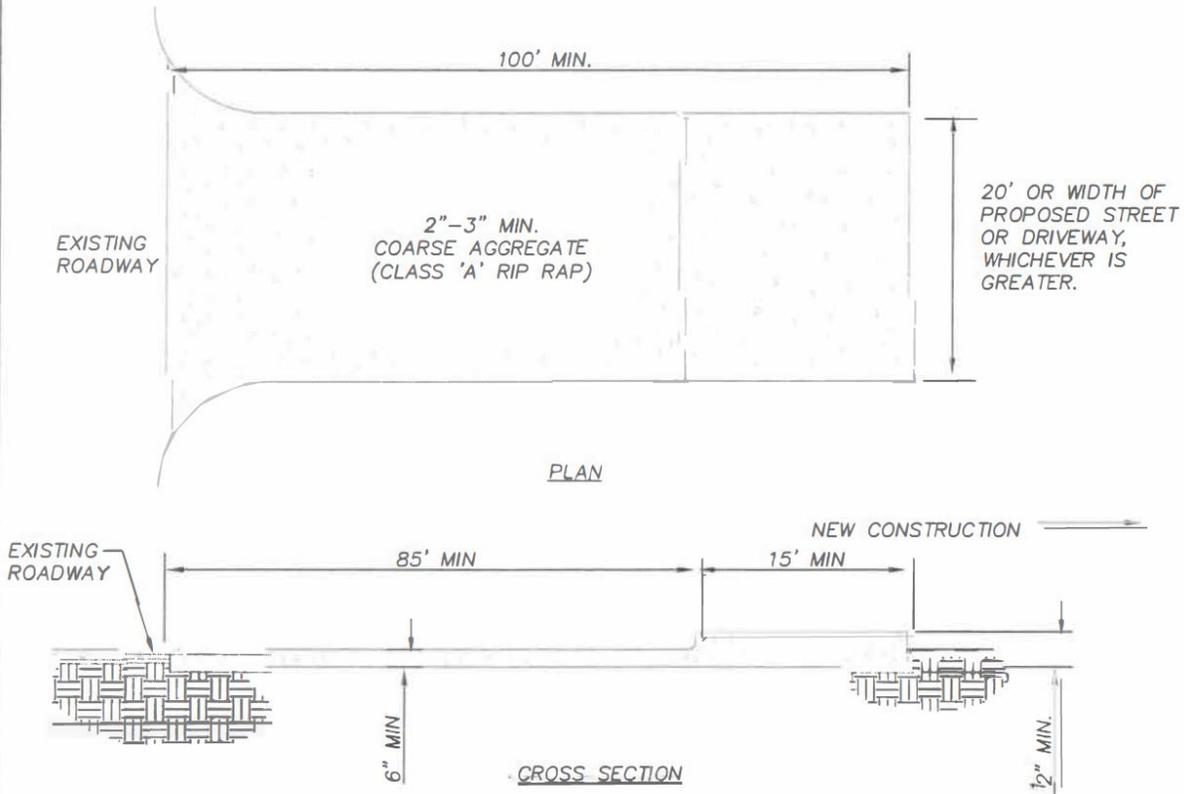
TEMPORARY SILT FENCE
DETAIL

E-6

DATE: JANUARY 2009

NOTES & MAINTENANCE:

1. ENTRANCE(S) SHALL BE LOCATED TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
2. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS IS TO BE PROVIDED.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH 2" STONE WILL BE NECESSARY. CONTRACTOR SHALL MAINTAIN AS NECESSARY.
4. ANY MATERIAL WHICH STILL MAKES IT ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
5. FREQUENT CHECKS OF THE ENTRANCE(S) AND TIMELY MAINTENANCE SHALL BE PROVIDED.
6. NOTES ARE APPLICABLE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED.



NOT TO SCALE

TOWN OF SOUTHERN PINES

DATE: JANUARY 2009

TEMPORARY GRAVEL CONSTRUCTION
ENTRANCE DETAIL

E-3



Public Works Department
 140 Memorial Park Court, Southern Pines, NC 28387
 Phone: 910-692-1983 Fax: 910-692-1085

INSTALLATION OF WATER/SEWER SERVICE PERMIT APPLICATION

Today's Date _____ Lot # _____ LRK / Parcel ID / PIN _____
 Applicant's Name _____ Email _____
 Phone Numbers: Cell _____ Other _____
 Service Address _____ City _____
 Property Owner _____ Phone _____

Type of Account

- Single Family Detached
- Multi-Family
- Commercial
- Other

Service & Meter Size Requested

- Water 3/4" 1" 1-1/2" 2"
- Sewer 4" 6"
- Irrigation 3/4" 1" 1-1/2" 2"
- Other

OFFICE USE

Date Paid _____ In Town Yes No _____ \$ _____
 Account # _____ \$ _____
 Work Order # _____ \$ _____
 Route & Sequence # _____ \$ _____
 _____ \$ _____
 _____ \$ _____
TOTAL AMOUNT PAID \$ _____

	<u>WATER</u>	<u>SEWER</u>	<u>IRRIGATION WATER</u>	<u>FIRE CONTROL WATER</u>	<u>MC SEWER</u>
Service Available	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Pre-Installed	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Size	_____ "	_____ "	_____ "	_____ "	
Tap Fee	\$ _____	\$ _____	\$ _____	\$ _____	
System Development Fee	\$ _____	\$ _____	\$ _____	\$ _____	
Street Cut	\$ _____	\$ _____	\$ _____	\$ _____	
Sub Totals	\$ _____	\$ _____	\$ _____	\$ _____	
Total	\$ _____				

*Backflow Preventer required - see memo
 Yes No

Fee schedules are updated annually, October 1st, according to CPI-U. Applications are subject to current fees at time of payment
 Delinquent Water Bill Yes No Quoted by _____ (signature) Date Quoted _____

UTILITY BILLING OFFICE
 TOWN OF SOUTHERN PINES
 180 SW BROAD STREET
 SOUTHERN PINES, NORTH CAROLINA 28387
ub@southernpines.net PH: 910-692-2206 FAX: 910-692-1652 www.southernpines.net



Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

Pavement Coordination Meeting Request Checklist

Submittal Date: _____
Submitted By: _____
Project: _____
ZP : _____

The Town of Southern Pines requires that the following information be provided to the Town prior to scheduling a pavement coordination meeting. No asphalt work may occur prior to receipt of the below items and attendance at the meeting. By checking the items below the developer or his/her representative acknowledges that they have provided the follow documentation. If an item is not applicable mark as such:

1. Geotechnical reports with testing results from compaction testing

Road subgrade	1 test group for every 500'
Parking subgrade	1 test group for every 10,000 square feet
Trenches	1 test group for every 500'
Embankment Fill	1 test group for every 10,000 square feet

*A test group shall consist of 1 test for every 2' of fill in the test location

2. Geotechnical reports for inspection of subgrade to verify conformance with the asphalt design report.
3. Geotechnical reports for stone base compaction and thickness testing. Testing shall be performed at a rate of 1 set of tests/ 500 linear feet with a minimum of three tests.
4. Geotechnical reports for subgrade and base proof roll. Proof rolls shall not occur more than 10 days prior to the placement of the associated work.
5. Pavement Job Mix Submittals

Owner/Owner's Representative

Printed Name and Title and Company Name

Email address

Signature

Date



Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

Utility Closeout Documentation Submittal Checklist

Submittal Date: _____

Submitted By: _____

Project: _____

ZP : _____

If this is a partial phase then it shall be noted as such. The requested items to be certified with exact lengths and locations shall be noted below (an overall map may be used):

The Town of Southern Pines requires that the following information be provided prior to its acceptance of any public utility or item for a project before those system(s) may be put into service. By checking the items below the developer or his/her representative acknowledges that they have provided the follow documentation. If an item is not applicable mark as such:

1. Hold utility walkthrough with Town Inspector, Town Engineer, and Utility Superintendent and complete all punchlist items.
2. A copy of any required easements and/or plats
3. One (1) Mylar As-built drawing showing: Water lines and appurtenances, Sewer lines and appurtenances. As-Built conditions shall be surveyed by a PLS and certified by the design engineer.
4. As-built information shall be provided for all of the following:
 - o Water lines and appurtenances (including valves, meters and BFP's)
 - o Sewer lines and appurtenances (including cleanouts at the public right of way's or easements)
 - o Public lift stations and force mains---include all independent test results as well as O&M manuals
 - o Storm drain systems and appurtenances
 - o All items including sidewalks, landscaping, street lights, etc. within 10' of the utility lines
5. A CD/USB memory stick or email to the Town GIS department (email from: _____ dated: _____ containing the GIS information in a comma delimited text file that contains survey points with the following data:
 - o Point #
 - o X (even if assumed)
 - o Y (even if assumed)
 - o Elevation (even if assumed)
 - o Point description (MH, CB, DI, WM, HYD, GV, etc.)
 - o Depth of manhole
 - o Depth to pipe for manholes or other feature

- Material type
 - Tie point (a point on a nearby street intersection, existing hydrant, existing manhole, property corner, etc.)
6. PDF file of As-built drawings & final construction drawings
 7. DWG file of As-built drawing (Non-Civil 3D)
 8. PDF file with all contact information (Engineer, Surveyor, Owner, Developer, etc.)
 9. Provide Hydrant flow test documentation from a Registered Professional that states the fire flow meets design criteria as presented by original fire flow calculations. A table showing the design flow vs. actual flow shall be provided for each node.
 10. Water line testing documentation
 11. Sewer line testing documentation
 12. Geotechnical reports for trench backfill.
 13. Utility Electronic Location Testing Results.
 14. Electronic copy of CCTV of all sewer lines
 15. Engineer's Certification(s) water
 16. Engineer's Certification(s) sewer
 17. A copy of the official well and/or septic abandonment letter
 18. Back flow preventer test result submitted to town and to the company below:
 BSI Online
 PH: 1-800-414-4990
 FAX: 1-888-414-4990
 EMAIL: bsionline@backflow.com
 19. No New Food Service Establishments will be allowed to initiate operations until grease handling facilities are installed and approved by the Town Engineer. Written records are to be maintained and sent to Public Works. Contact the Town of Southern Pines Public Works to obtain Registration Form and Documentation. (1989 Code, § 50.59) (Ord. passed 3-13-1984; Am. Ord. 209, passed 2-12-1991; Am. Ord. passed 9-13-1994; Am. Ord. 1201, passed 4-11-2006; Am. Ord. 1507, passed 6-11-2013)
 20. A digital copy (PDF) of all required acceptance package documents.
 21. Written warranty letter (1yr) to the Town of Southern Pines for all public utilities.

Owner/Owner's Representative

Printed Name and Title and Company Name

Email address

Signature

Date

Office use:

Confirmation of all documents received.

Reviewer: _____



Public Works Department
140 Memorial Park Court, Southern Pines, NC 28387
Phone: 910-692-1983 Fax: 910-692-1085

Engineering Site Plan Closeout Documentation Submittal Checklist

Submittal Date: _____

Submitted By: _____

Project: _____

ZP : _____

If this is a partial phase, then it shall be noted as such. The requested items to be certified with exact lengths and locations shall be noted below (an overall map may be used):

The Town of Southern Pines requires that the following information be provided prior to the approval of a Final Plat. By checking the items below the developer or his/her representative acknowledges that they have provided the follow documentation. If an item is not applicable mark as such:

1. Hold final walkthrough with Town Inspector, Town Engineer, Utility Superintendent, and Street Superintendent, and complete all punchlist items.
2. A copy of any required recorded easements and/or plats
3. One (1) Mylar As-built drawing showing: Water lines and appurtenances, Sewer lines and appurtenances, Storm drain lines and appurtenances, street trees, street lights and required landscaping.
4. As-built information shall be provided for all of the following:
 - o Water lines and appurtenances (including valves, meters and BFP's)
 - o Sewer lines and appurtenances (including cleanout's at the public right of way's or easements)
 - o Public lift stations and force mains---include all independent test results as well as O&M manuals
 - o Storm drain systems and appurtenances
 - o Sidewalks
 - o Street lights
 - o Street signs
 - o Street pavement markings
 - o Identify pavement cross section on all streets—Curb& Gutter, ribbon etc.
 - o Traffic islands on public streets
 - o Gates blocking required Emergency Access
 - o Other site-specific items as required

5. A CD/USB memory stick or email to the Town GIS department (email from: _____ dated: _____) containing the GIS information in a comma delimited text file, shapefiles, or geodatabase that contains survey points with the following data:
- Point #
 - X (even if assumed)
 - Y (even if assumed)
 - Elevation
 - Point description (MH, CB, DI, WM, HYD, GV, etc.)
 - Depth of manhole/junction box
 - Depth to pipe for manholes/junction box or other features
 - Material type
 - Tie point (a point on a nearby street intersection, existing hydrant, existing manhole, property corner, etc.)
6. PDF file of As-built drawings & final construction drawings
7. DWG file of As-built drawing (Non-Civil 3D)
8. PDF file with all contact information (Engineer, Surveyor, Owner, Developer, etc.)
9. Provide Hydrant flow test documentation from a Registered Professional that states the fire flow meets design criteria as presented by original fire flow calculations. A table showing the design flow vs. actual flow shall be provided for each node.
10. Documentation of asphalt paving inspections from a third party QMS Roadway Technician.
11. Documentation from a qualified professional stating the fire lanes have been independently tested and that the lanes meet TOSP requirements.
12. Electronic copy of CCTV inspection for all storm lines.
13. Engineer's Certification(s) Stormwater Conveyance
14. Engineer's Certification(s) Stormwater Control Measures
15. Engineer's Certification(s) Roadway
16. Back flow preventer test result submitted to town and to the company below:
 BSI Online
 PH: 1-800-414-4990
 FAX: 1-888-414-4990
 EMAIL: bsionline@backflow.com
17. Surety (cash, letter of credit, or bond) for outstanding public improvements, if applicable. Surety information to be coordinated through Planning prior to request for final inspection. Surety provide for the following: _____
-
18. A digital copy (PDF) of all required acceptance package documents.

19. All Federal, State or local Government final approval letter(s) as applicable listed below:

- Water Permit # _____
- Sewer Permit # _____
- Storm Water # _____
- DOT Permit # _____
- _____
- _____

20. Written warranty letter (1yr) to the Town of Southern Pines for all public utilities, streets and street trees. List of warranties below:

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-
-

Owner/Owner's Representative

Printed Name and Title and Company Name

Email address

Signature

Date

Office use:

Confirmation of all documents received.

Reviewer: _____