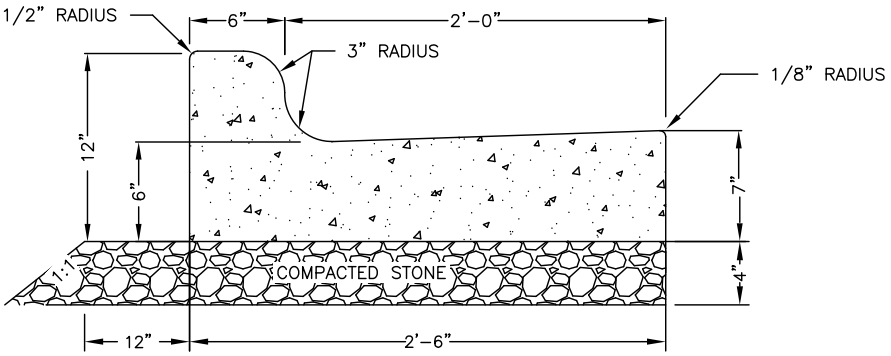
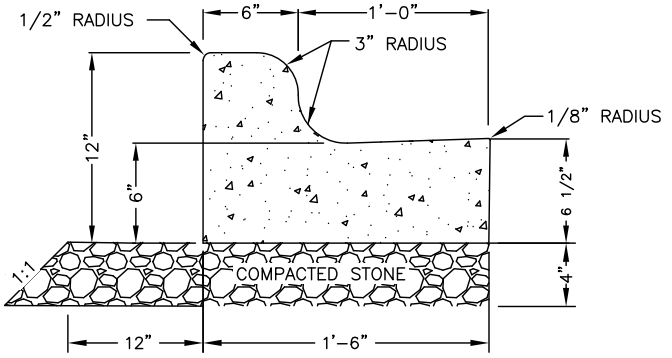
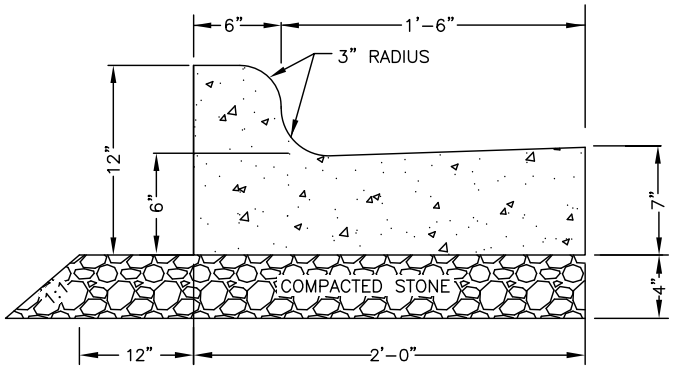


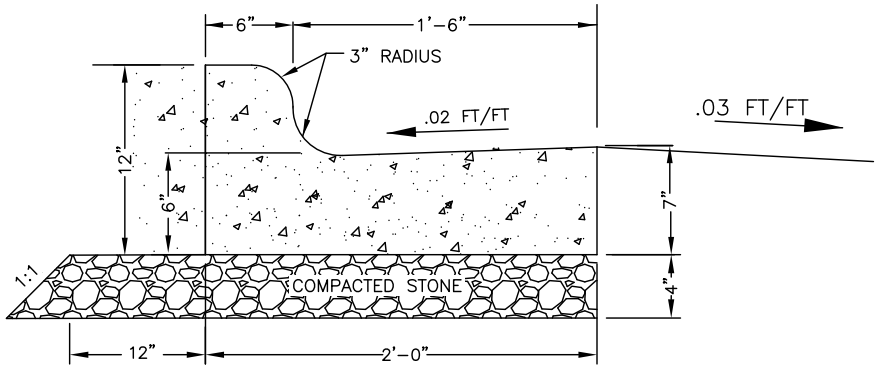
STANDARD 2'-6" CURB AND GUTTER



1'-6" STANDARD CURB AND GUTTER



2'-0" STANDARD CURB & GUTTER

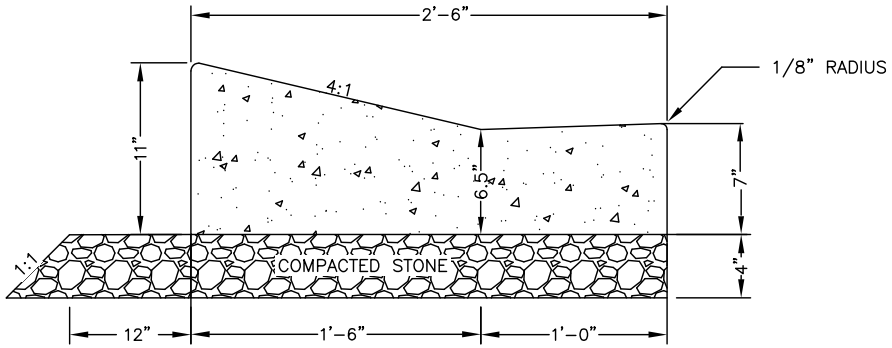


SLOPE FOR VARIABLE
SUPERELEVATION RATES

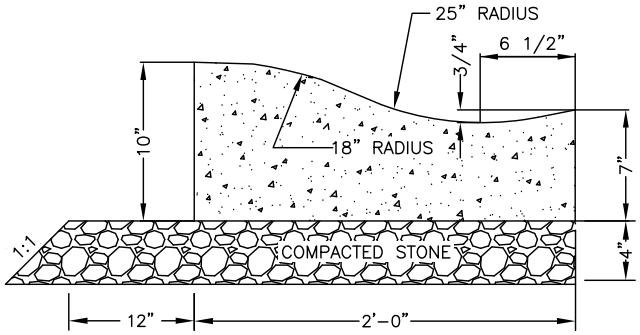
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	STANDARD CURB AND GUTTER

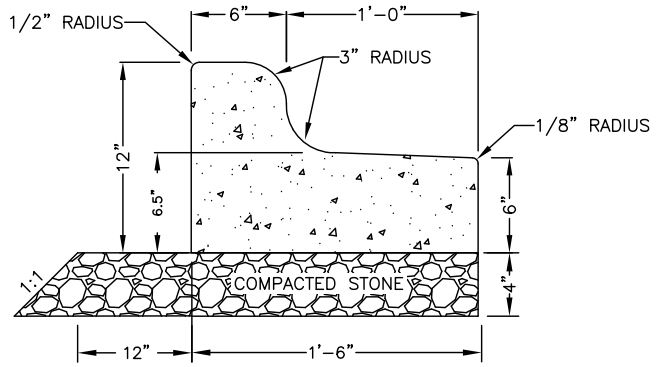
STD. NO.	REV.
100.1	1/22



2'-6" VALLEY GUTTER

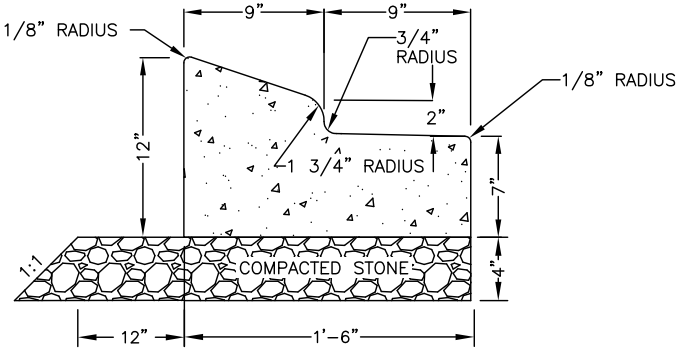


2'-0" ROLL GUTTER



1'-6" MEDIAN CURB AND GUTTER

TO BE USED IN MEDIANS WHEN LANES ARE SLOPED FROM ISLAND OR AS SPECIFIED BY THE DEVELOPMENT SERVICES DEPARTMENT.



1'-6" MOUNTABLE CURB AND GUTTER

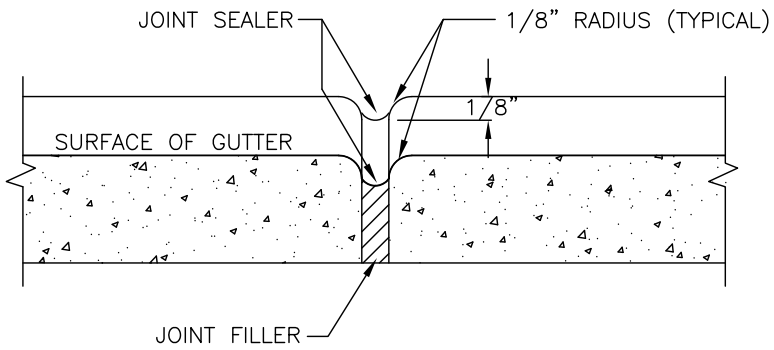
TO BE USED IN MEDIANS ONLY: WHEN SPECIFIED BY THE DEVELOPMENT SERVICES DEPARTMENT.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CURB AND GUTTER

STD. NO.	REV.
101.1	1/22



TRANSVERSE EXPANSION JOINT

NOTES:

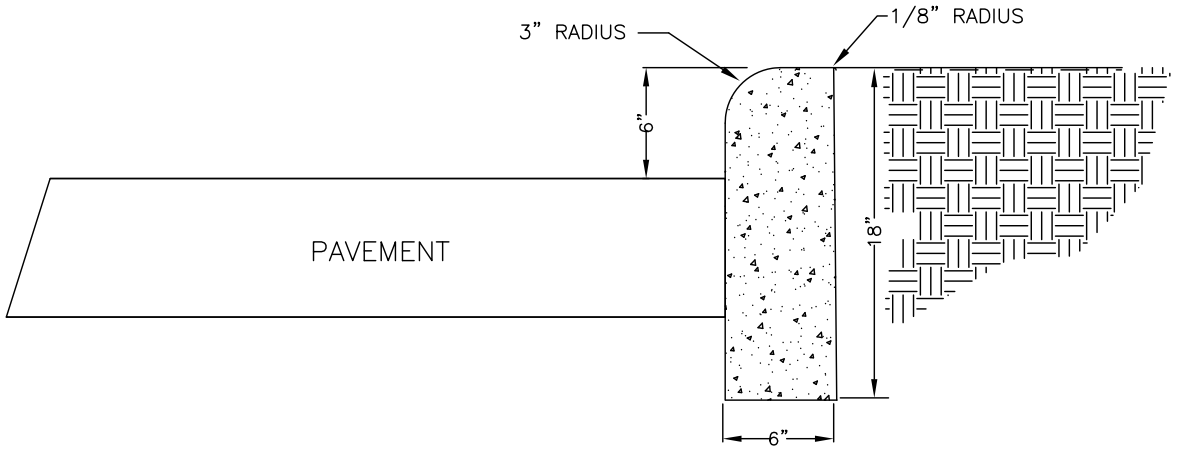
1. CONTRACTION JOINTS SHALL BE SPACED AT 10–FOOT INTERVALS. FOR ALL GUTTERS, A 15–FOOT SPACING MAY BE USED WHEN A MACHINE IS USED. JOINT SPACING MAY BE ALTERED BY THE TOWN ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT A MAXIMUM 50–FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS WITH A 4–INCH MAXIMUM SLUMP.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. SEE ALSO 106.1

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TRANSVERSE EXPANSION JOINT	STD. NO. 102.1	REV. 1/22

NOTES:

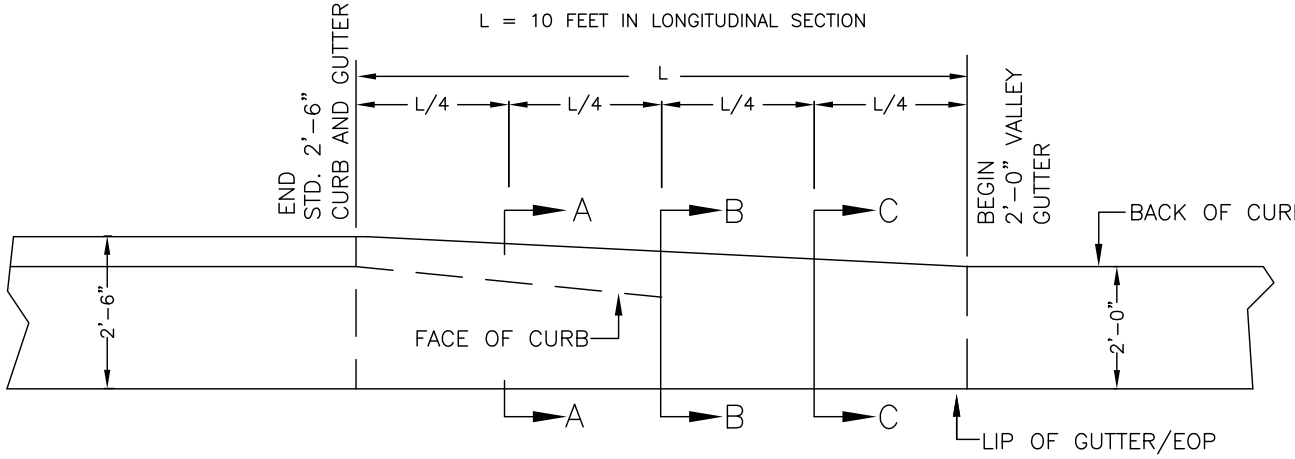
1. CONTRACTION JOINTS SHALL BE SPACED AT 10–FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1 1/2" SHALL BE OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 50–FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 P.S.I. IN 28 DAYS, WITH 4–INCH MAXIMUM SLUMP.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
7. DETAIL MAY BE USED FOR PRIVATE DRIVES, PARKING LOTS, AND INTERIOR CIRCULATION DRIVE.



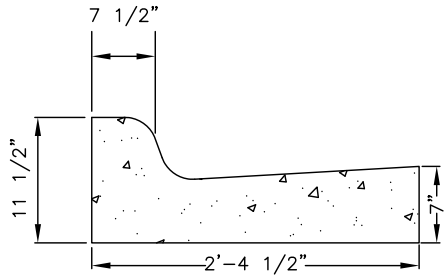
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	18" VERTICAL CURB

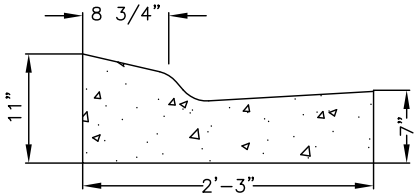
STD. NO.	REV.
103.1	1/22



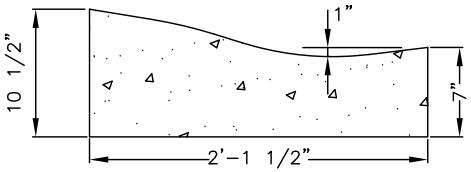
PLAN VIEW



SECTION A–A



SECTION B–B



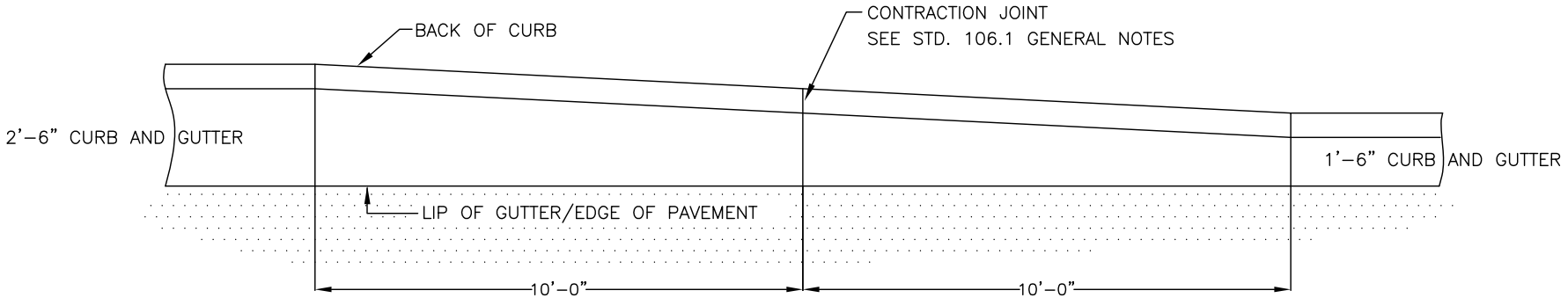
SECTION C–C

NOTES:

1. TRANSITION IS NOT TO BE LOCATED WITHIN THE CURB RADIUS.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CURB TRANSITION 2'6" CURB AND GUTTER TO 2'-0" ROLL GUTTER	STD. NO. 104.1 / REV.



PLAN VIEW

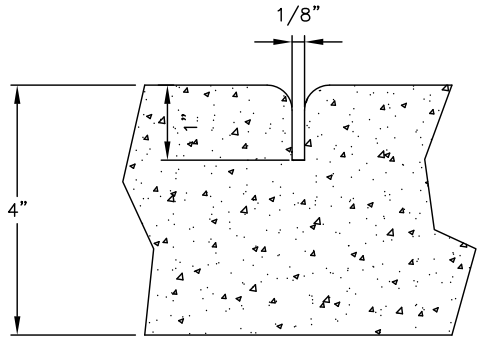
NOTES:

1. TRANSITION TO BE ALONG BACK OF CURB.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CURB TRANSITION 2'–6" CURB AND GUTTER TO 1'–6" CURB AND GUTTER

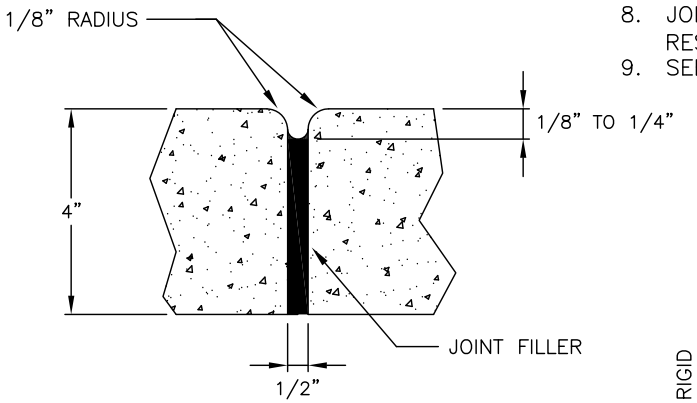
STD. NO.	REV.
105.1	



GROOVE JOINT IN SIDEWALK

GENERAL NOTES:

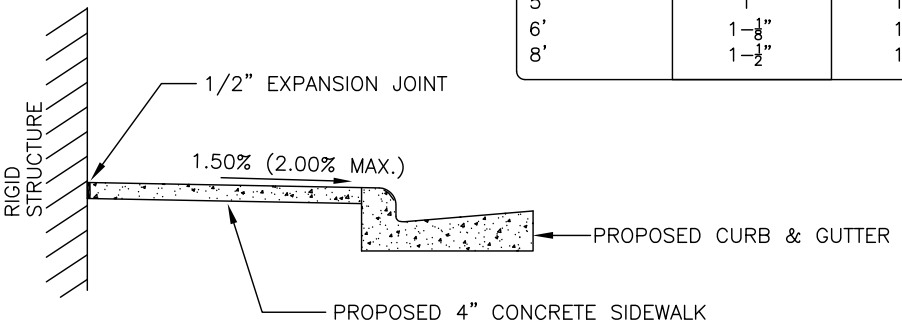
1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 6'. WIDTH OF SIDEWALKS IN THE CERTAIN DISTRICTS WILL BE DETERMINED BY THE DEVELOPMENT SERVICES.
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE BASED ON TYPICAL STREET SECTION, A MINIMUM OF 5'. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
5. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI. IN 28 DAYS.
6. ZONING CONDITIONS MAY REQUIRE ADDITIONAL WIDTH SIDEWALKS WHICH SHALL SUPERSEDE THESE STANDARD DIMENSIONS SHOWN.
7. LIDS FOR JUNCTION BOXES AND UTILITY VAULTS SHALL BE NON-SKID AS SPECIFIED BY ENGINEER.
8. JOINT MATERIALS SHALL LIMIT SHRINK/SWELL SO POST CONSTRUCTION INSTALLATION RESULTS IN A MAXIMUM OF 1/4" FROM FLUSH.
9. SEE ALSO 102.1



TRANSVERSE EXPANSION JOINT IN SIDEWALK

EXAMPLE SIDEWALK CONSTRUCTION DIMENSIONS:

WIDTH	RISE	CROSS-SLOPE
4'	3/4"	1.56%
5'	1"	1.67%
6'	1-1/8"	1.56%
8'	1-1/2"	1.56%



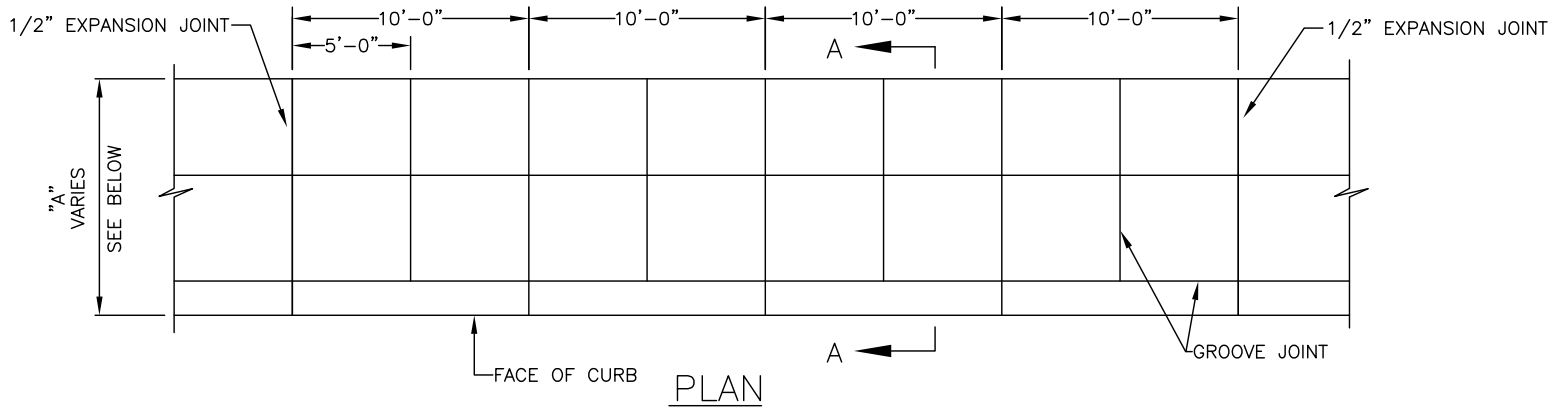
DETAILS SHOWING EXPANSION JOINTS IN CONCRETE SIDEWALK

NOT TO SCALE

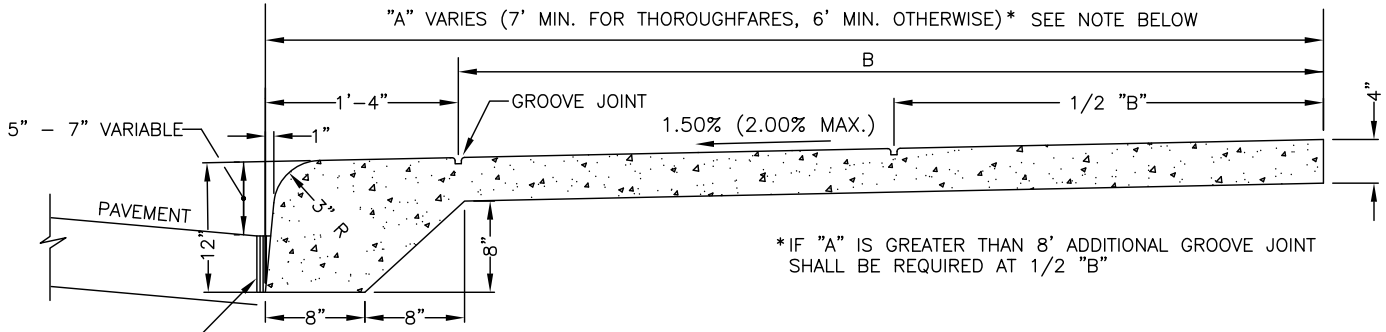
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CONCRETE SIDEWALKS

STD. NO.	REV.
106.1	8/19



PLAN



SECTION A-A

TWO 1/2" THICK PIECES BITUMINOUS FIBER REQUIRED IF SUBBASE IS CONCRETE. MUST BE SEALED WITH APPROVED JOINT SEALER.

GENERAL NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/3" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 40' INTERVALS. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
3. SEE STANDARD 106.1 FOR DETAIL OF EXPANSION JOINT AND GROOVE JOINT.
4. SEE STANDARD 108.1 FOR DETAIL OF DRIVEWAY.
5. MONOLITHIC CURB AND SIDEWALK TO BE CONSTRUCTED ONLY WHEN REPLACING GRANITE CURB OR AT LOCATIONS APPROVED BY THE TOWN ENGINEER.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

MONOLITHIC CONCRETE CURB AND SIDEWALK

STD. NO.	REV.
107.1	

NOTES:

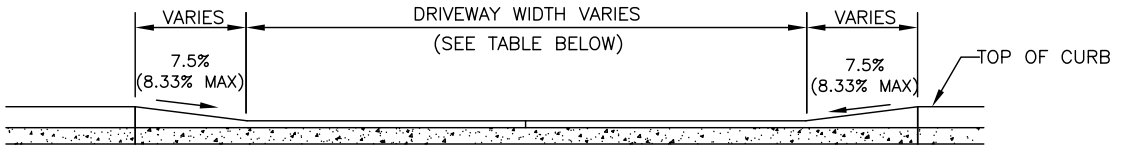
1. 1/2" EXPANSION JOINTS REQUIRE INSTALLATION OF ONE 1/2" THICK PIECE OF BITUMINOUS FIBER THROUGH THE ENTIRE SLAB. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.
2. TO LIMIT STORM WATER FLOW DOWN DRIVEWAYS, USE STANDARD 110.1 FOR DRIVEWAYS NEAR LOW POINTS.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).
5. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

GENERAL NOTES:

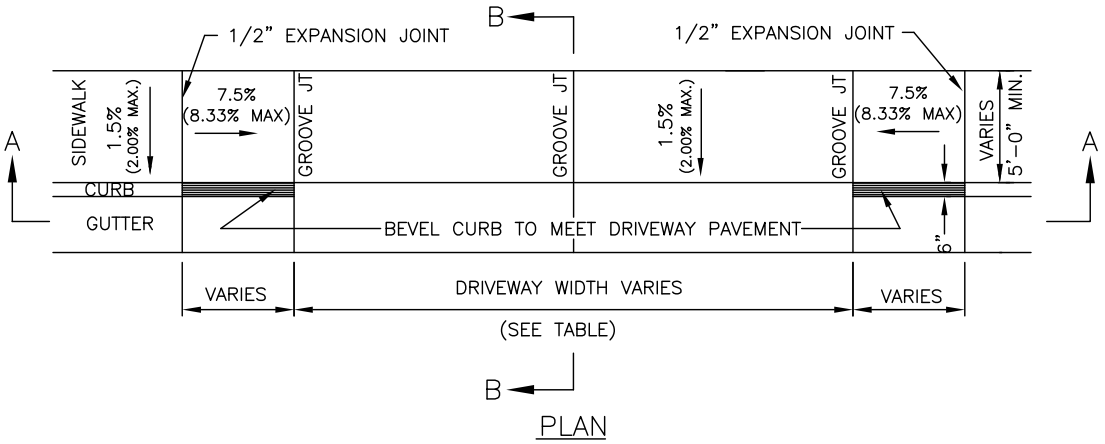
- ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
- ALL CURB, CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED.
- SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT.
- SEE STD. NO 106.1 FOR DETAIL OF EXPANSION JOINT AND GROOVE JOINT.

DRIVEWAY WIDTH		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
TYPE I–RESIDENTIAL:		
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE *	15'	30'
ONE–WAY TYPE II COMMERCIAL	20'	30'
TWO–WAY TYPE II COMMERCIAL	26'	50'

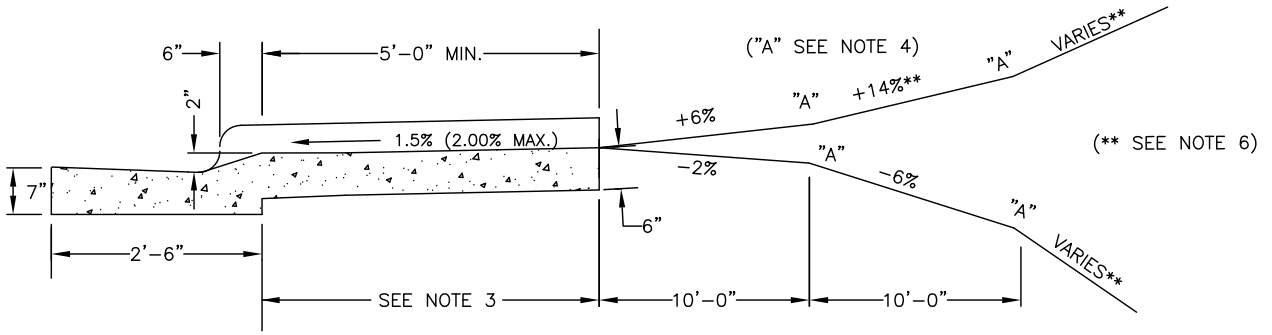
* MUST PROVIDE ON–SITE TURNAROUND



SECTION A – A



PLAN



SECTION B – B

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB DRIVEWAY WITH SIDEWALK ABUTTING CURB (2'–6" CURB AND GUTTER)

STD. NO.	REV.
108.1	

NOTE:

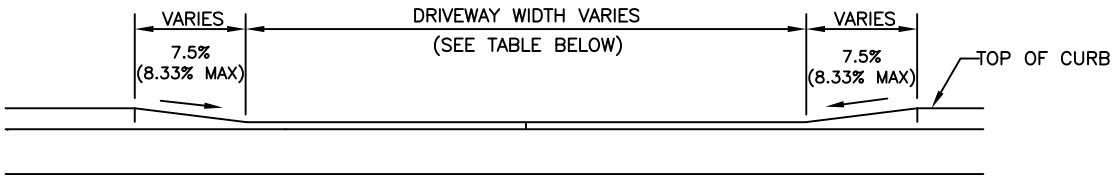
1. 1/2" EXPANSION JOINTS REQUIRE INSTALLATION OF ONE 1/2" THICK PIECE OF BITUMINOUS FIBER THROUGH THE ENTIRE SLAB. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.
2. TO LIMIT STORM WATER FLOW DOWN DRIVEWAYS, USE STANDARD 110.1 FOR DRIVEWAYS NEAR LOW POINTS.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).
5. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.

GENERAL NOTES:

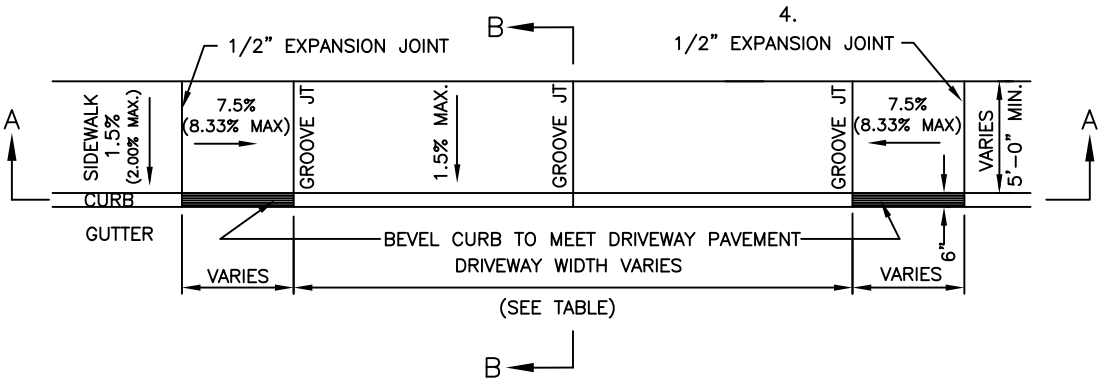
- ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
- ALL CURB, CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED.
- SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT.
- SEE STD. NO 106.1 FOR DETAIL OF EXPANSION JOINT AND GROOVE JOINT.

DRIVEWAY WIDTH		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
TYPE I–RESIDENTIAL:		
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'
ONE–WAY TYPE II COMMERCIAL	20'	30'
TWO–WAY TYPE II COMMERCIAL	26'	50'

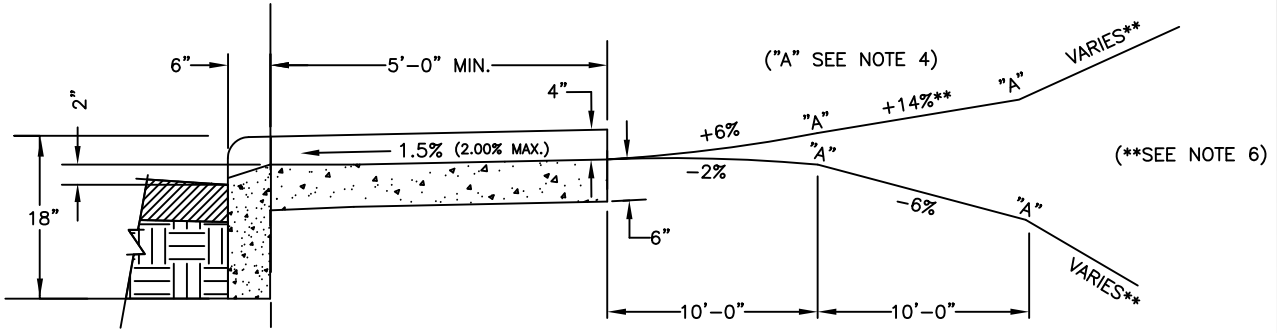
* MUST PROVIDE ON–SITE TURNAROUND



SECTION A – A



PLAN



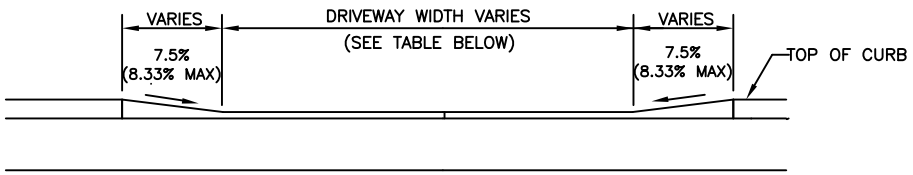
SECTION B – B

NOT TO SCALE

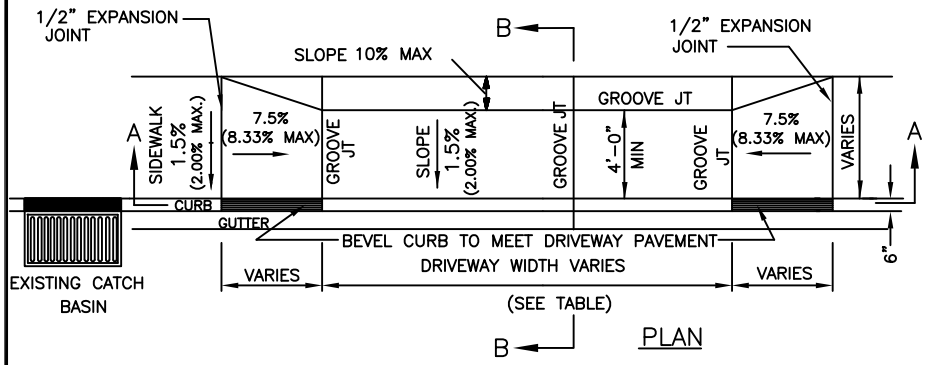
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB DRIVEWAY WITH SIDEWALK ABUTTING CURB (6" X 18" VERTICAL CURB)

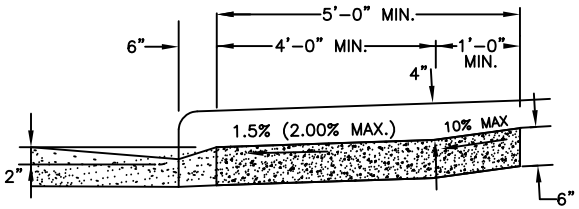
STD. NO.	REV.
109.1	



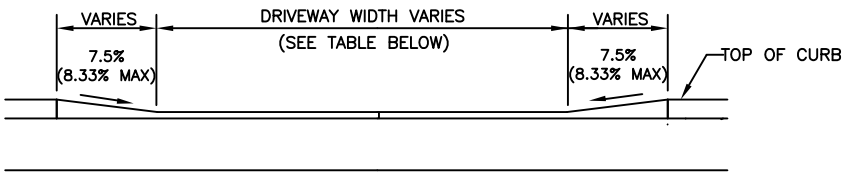
SECTION A – A 2'x 6"



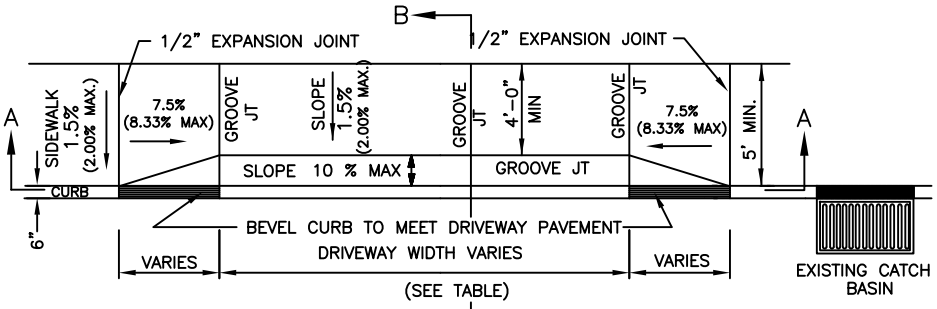
PLAN



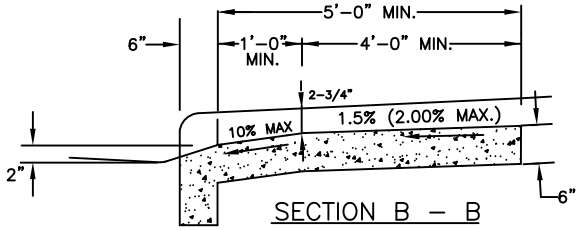
SECTION B – B



SECTION A – A 6"x18"



PLAN



SECTION B – B

DRIVEWAY WIDTH		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
TYPE I–RESIDENTIAL:		
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'
ONE–WAY TYPE II COMMERCIAL	20'	30'
TWO–WAY TYPE II COMMERCIAL	26'	50'

* MUST PROVIDE ON–SITE TURNAROUND

NOTES

1. USED AT LOW POINTS IN ROADWAYS WITH 2'–6" CURB AND GUTTER OR 6" X 18" CURB AS DIRECTED BY TOWN ENGINEER.
2. SEE STANDARDS 108.1 FOR ADDITIONAL DETAILS.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

COMMERCIAL TYPE II AND RESIDENTIAL TYPE I DROP CURB DRIVEWAY WITH SIDEWALK ABUTTING CURB NEAR LOW POINTS

STD. NO.	REV.
110.1	

NOTES:

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

2. ALL CURB OR CURB AND GUTTER AND SIDEWALKS ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 102.1 FOR JOINT DETAIL.

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

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

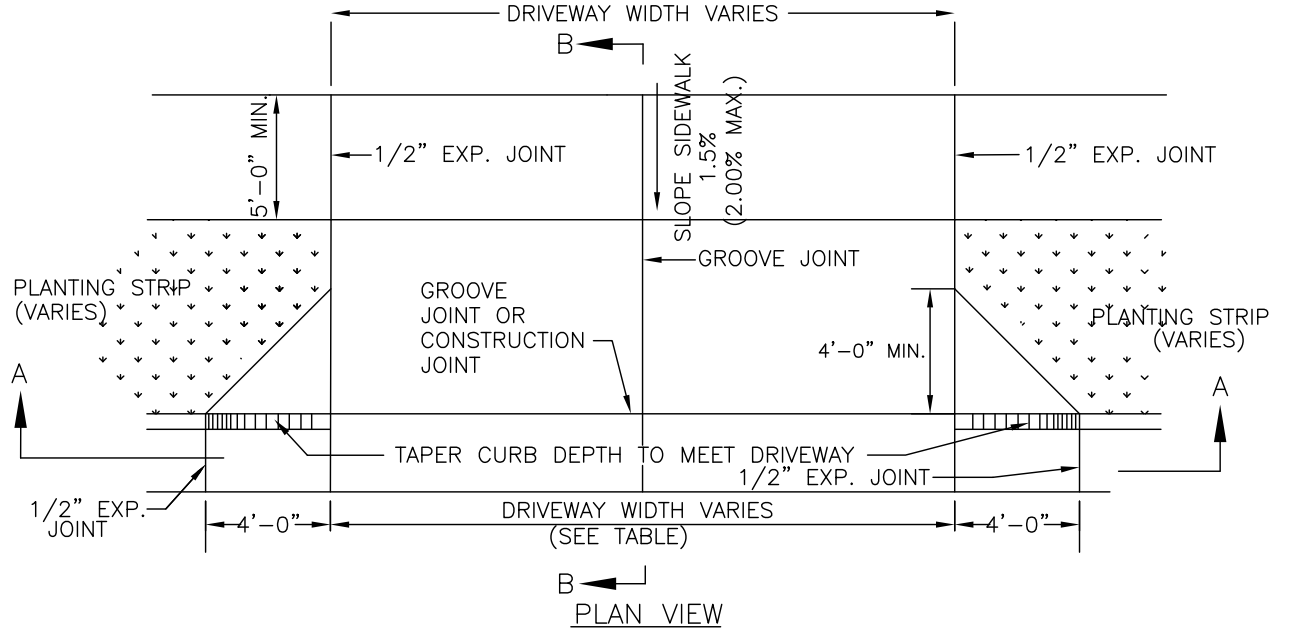
5. PRIOR APPROVAL IS REUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.

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

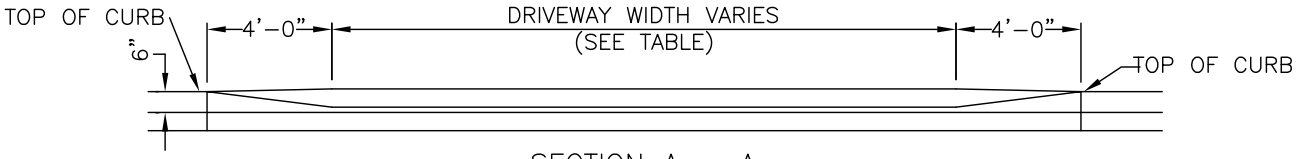
7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

DRIVEWAY WIDTH		
DRIVEWAY TYPE	MINIMUM	MAXIMUM
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'

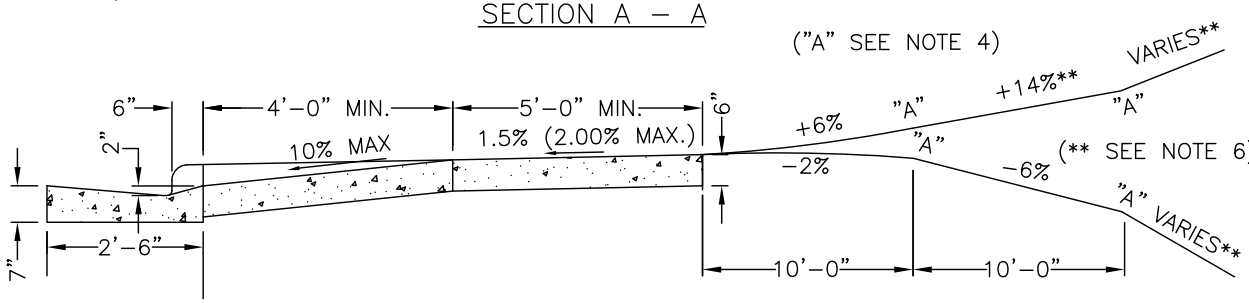
* MUST PROVIDE ON-SITE TURNAROUND



PLAN VIEW



SECTION A – A



SECTION B – B

NOT TO SCALE

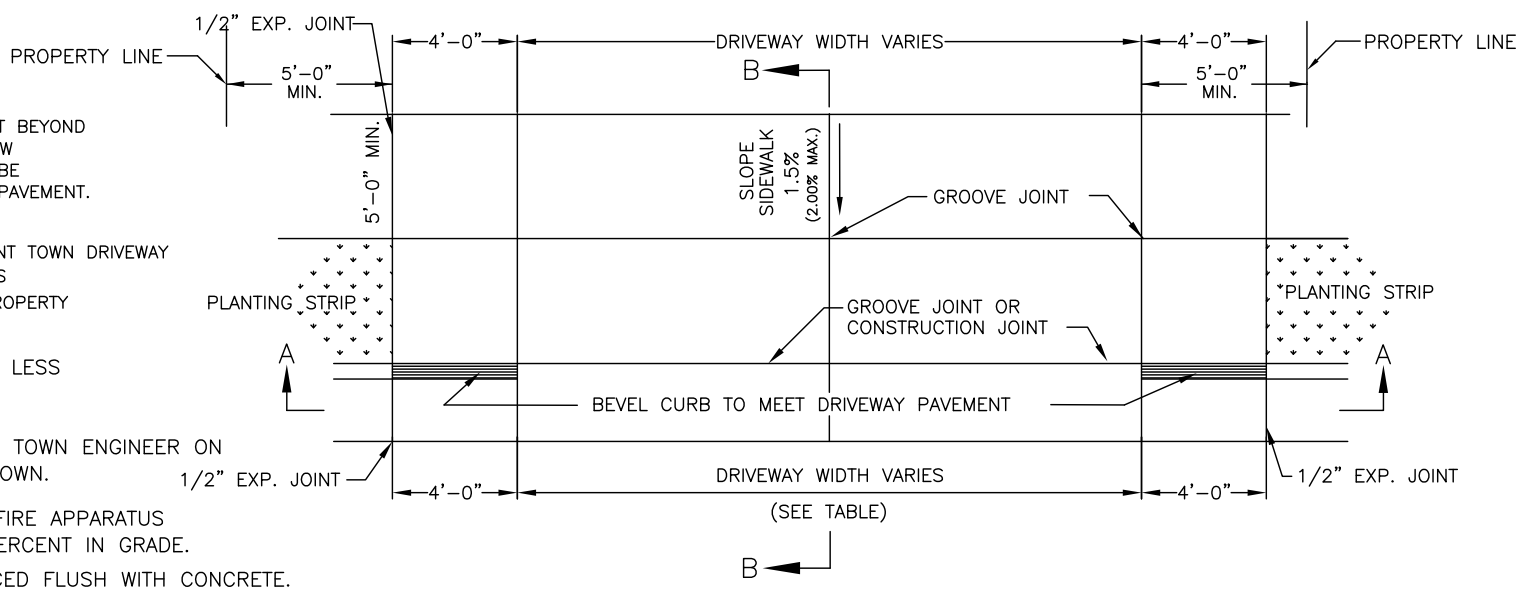
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

RESIDENTIAL DROP CURB TYPE I DRIVEWAY WITH PLANTING STRIP (2'-6" CURB AND GUTTER)

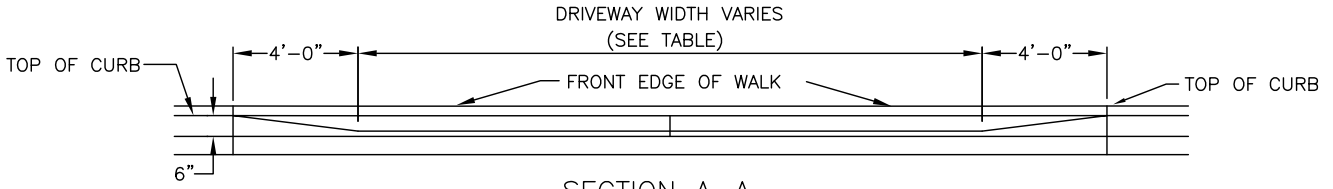
STD. NO.	REV.
111.1	8/19

NOTES:

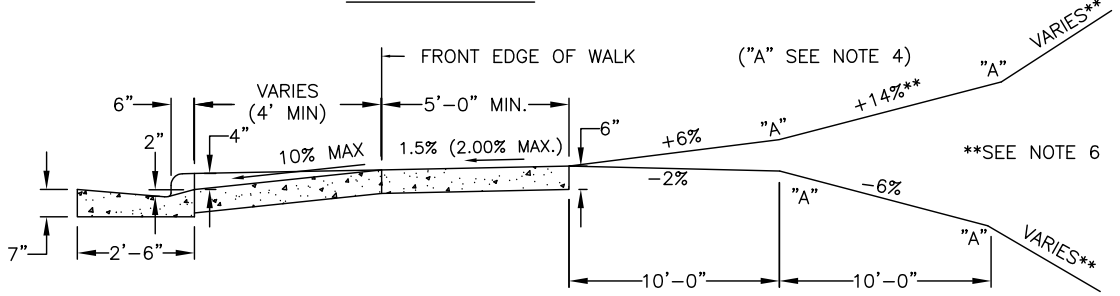
1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. AT ALL DRIVEWAYS, SIDEWALKS TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 102.1 FOR JOINT DETAIL.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS SIGHT DISTANCE AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL BE 8% OR LESS (A = ALGEBRAIC DIFFERENCE).
5. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.
6. **PER NC IFC SECTION D103.2, FIRE APPARATUS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.



PLAN VIEW



SECTION A–A



SECTION B–B

NOT TO SCALE

DRIVEWAYS CLASSIFICATION		
TYPE DRIVEWAYS	MINIMUM	MAXIMUM
ONE–WAY TYPE II – COMMERCIAL	20'	30'
TWO–WAY TYPE II – COMMERCIAL	26'	50'*

* NEED MORE THAN ONE CONTRACTION JOINT IN CENTER.

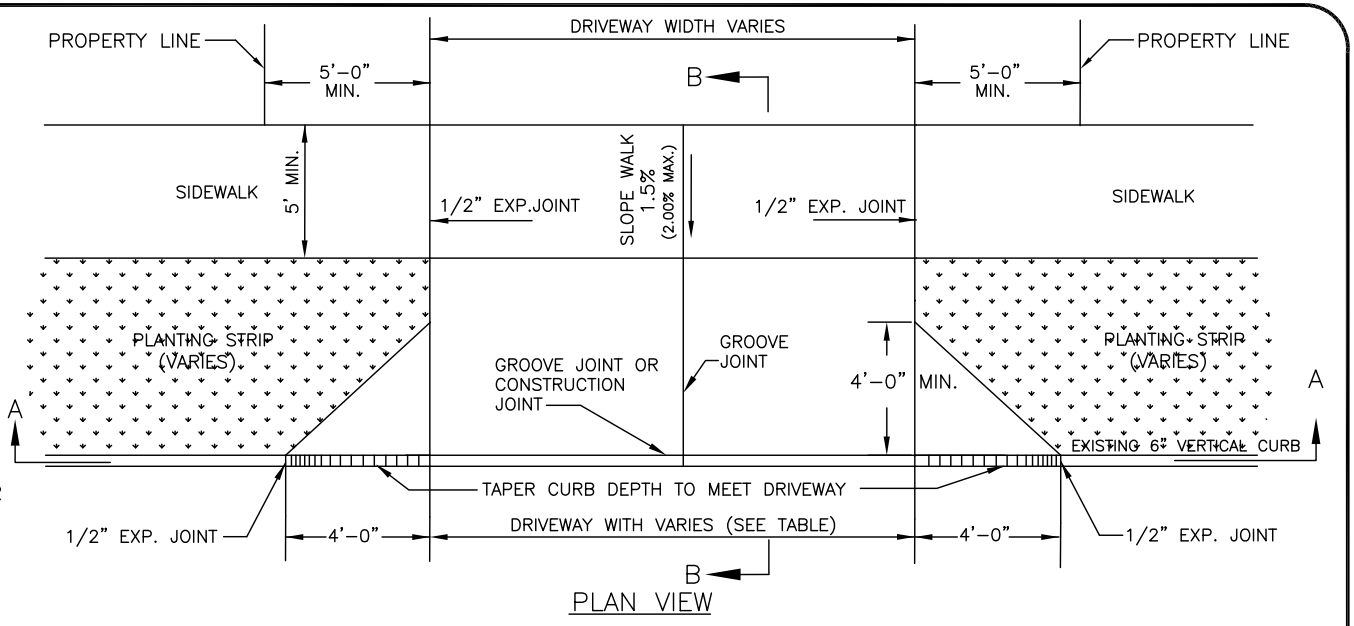
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

COMMERCIAL DROP CURB TYPE II DRIVEWAY WITH PLANTING STRIP (2'–6" CURB AND GUTTER)

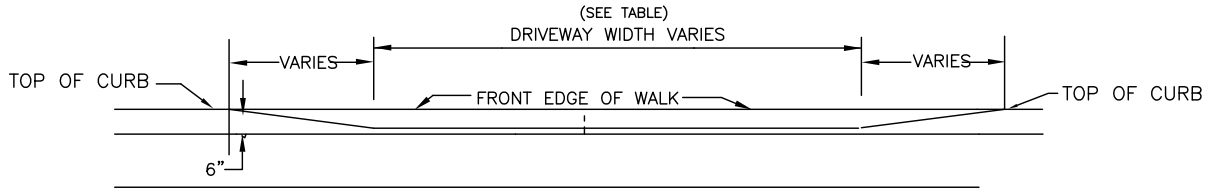
STD. NO.	REV.
112.1	

NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I.
2. ALL CURB OR CURB AND GUTTER AND SIDEWALK ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 102.1 FOR JOINT DETAIL.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL NOT EXCEED 8%.
5. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.
6. ** PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.



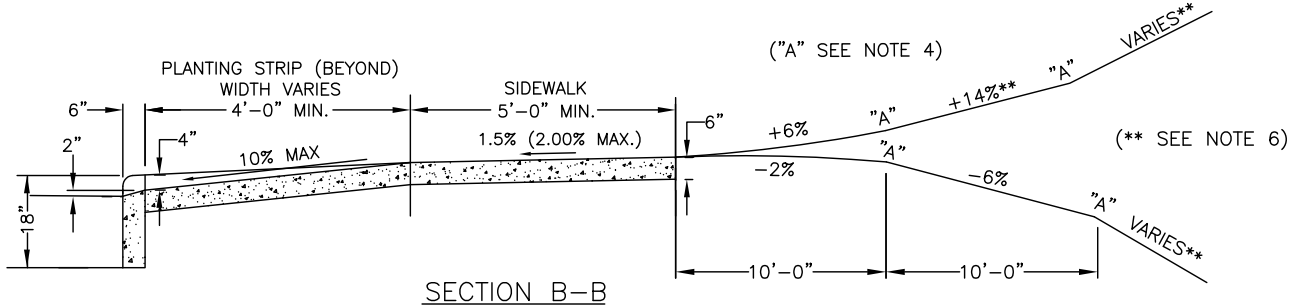
PLAN VIEW



SECTION A–A (ALONG FLOW LINE)

DRIVEWAY WIDTH		
DRIVEWAY TYPE	MINIMUM	MAXIMUM
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'

* MUST PROVIDE ON-SITE TURNAROUND



SECTION B–B

NOT TO SCALE

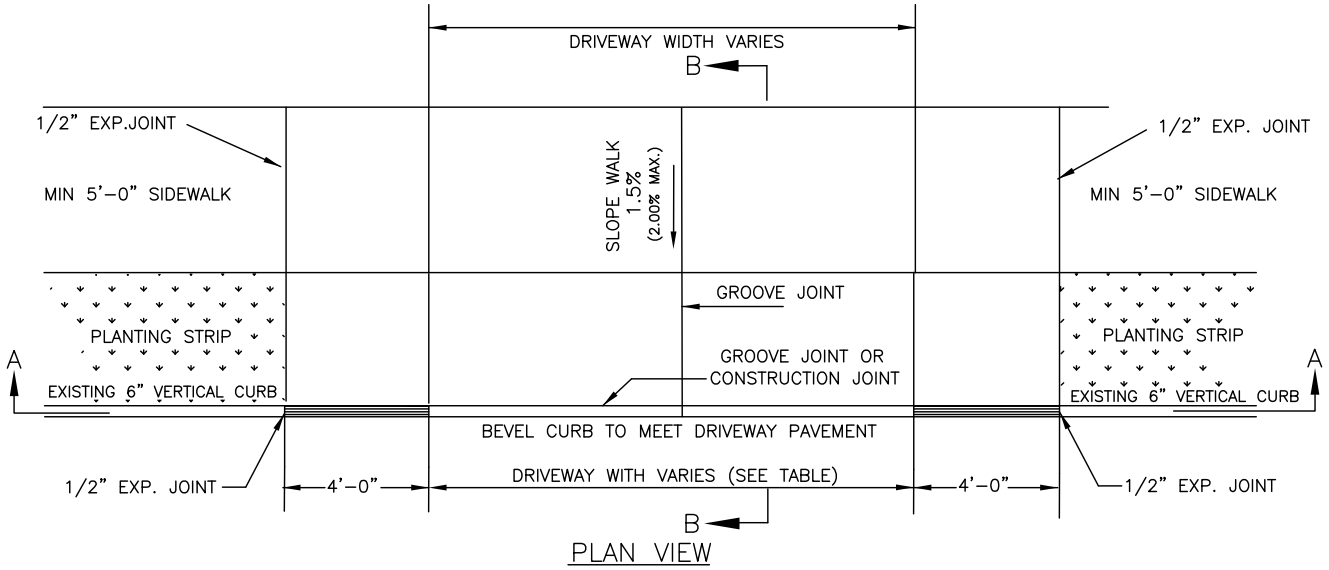
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

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

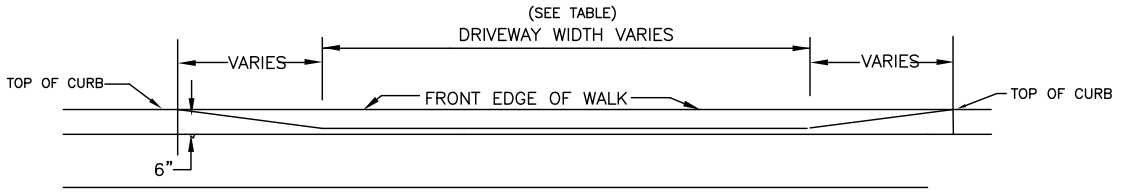
STD. NO.	REV.
113.1	1/22

NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I.
2. ALL CURB OR CURB AND GUTTER AND SIDEWALK ARE TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 102.1 FOR JOINT DETAIL.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING,SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. "A" BREAKOVER SHALL NOT EXCEED 8%.
5. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.
6. PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. JOINT MATERIAL SHOULD BE FLUSH WITH CONCRETE.



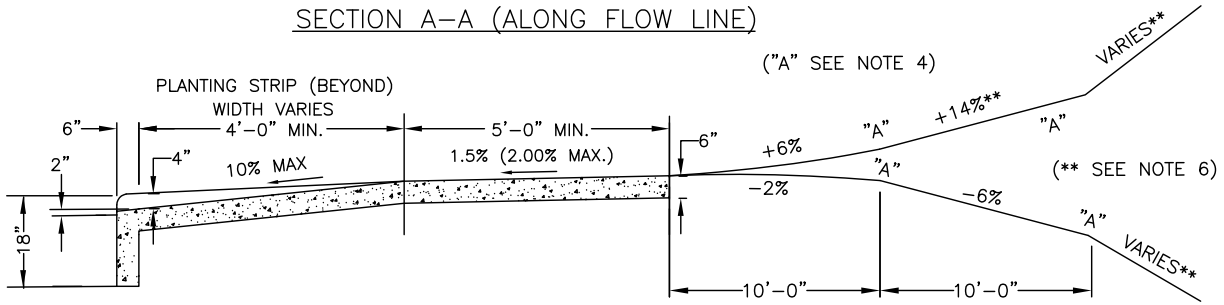
PLAN VIEW



SECTION A–A (ALONG FLOW LINE)

DRIVEWAYS CLASSIFICATION		
TYPE DRIVEWAYS	MINIMUM	MAXIMUM
ONE–WAY TYPE II–COMMERCIAL	20'	30'
TWO–WAY TYPE II–COMMERCIAL	26'	50'*

* NEED MORE THAN ONE CONTRACTION JOINT IN CENTER



SECTION B–B

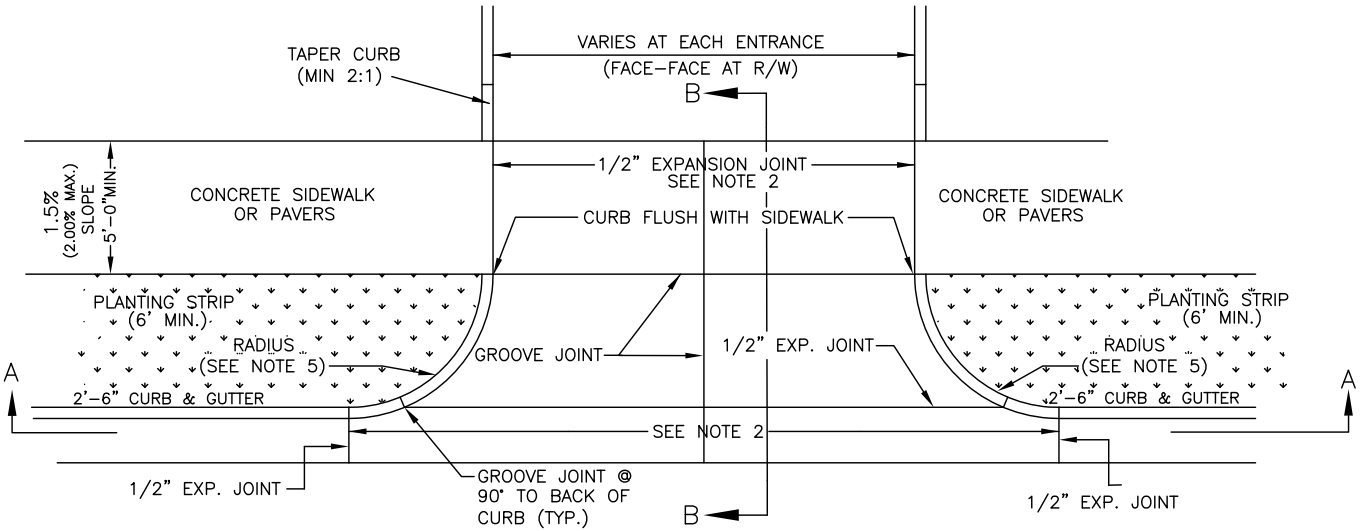
NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	COMMERCIAL DROP CURB TYPE II DRIVEWAY WITH PLANTING STRIP (6" X 18" VERTICAL CURB)	STD. NO. 114.1	REV.

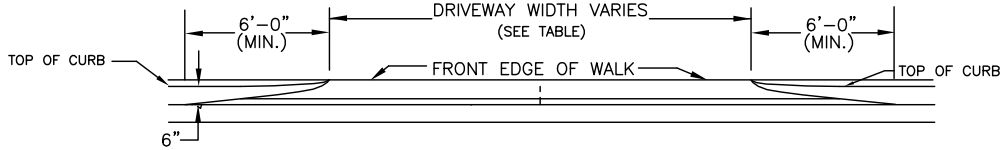
NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. AT ALL DRIVEWAYS, SIDEWALKS TO BE REMOVED TO THE NEAREST JOINT BEYOND NEW CONSTRUCTION OR CUT WITH A SAW AND REMOVED. SAW CUT OR JOINT TO BE PERPENDICULAR TO EDGE OF EXISTING PAVEMENT. SEE STD. NO. 102.1 FOR JOINT DETAIL. PAY LIMITS FOR WORK DONE UNDER TOWN OF WAXHAW CONTRACTS ARE FROM EXPANSION JOINT TO EXPANSION JOINT, FROM LIP OF CURB TO BACK OF SIDEWALK.
3. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
4. ALGEBRAIC DIFFERENCE IN GRADE ("A") BETWEEN SLOPES SHALL NOT EXCEED 8%.
5. RADII MUST BE MINIMUM 6 FEET OR THE WIDTH OF THE PLANTING STRIP, WHICHEVER IS GREATER. RADII GREATER THAN THESE MINIMUMS MAY BE REQUIRED BY NCDOT ON A CASE-BY-CASE BASIS. FOR RADII GREATER THAN 6 FEET, THE RADII ARE TO CONTINUE AS A BAND AT-GRADE THROUGH THE SIDEWALK.
6. PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. PAVERS USED IN DRIVEWAY MUST HAVE A THICKNESS OF 3 INCHES.
8. JOINT MATERIAL SHOULD BE PLACED FLUSH WITH CONCRETE.

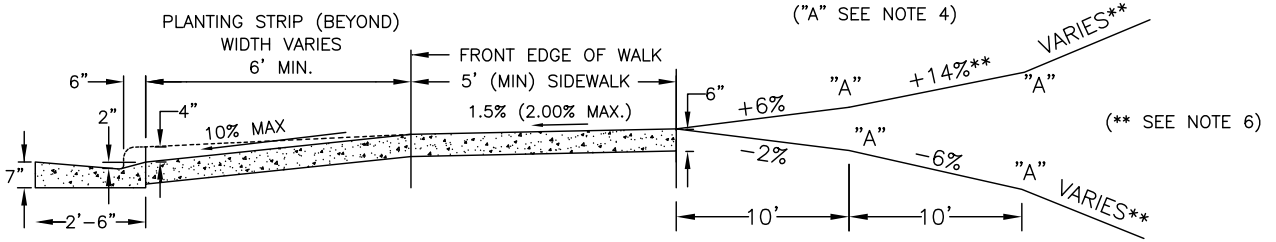
DRIVEWAY DIMENSIONS		
OPERATION/RADIUS	MINIMUM	MAXIMUM
ONE-WAY WITH 6-12 FT. RADII	20'	30'
ONE-WAY WITH 13+ FT. RADII	15'	25'
TWO-WAY WITH 6-12 FT. RADII	26'	50'
TWO-WAY WITH 13+ FT. RADII	22'	40'



PLAN VIEW



SECTION A-A (ALONG FLOW LINE)



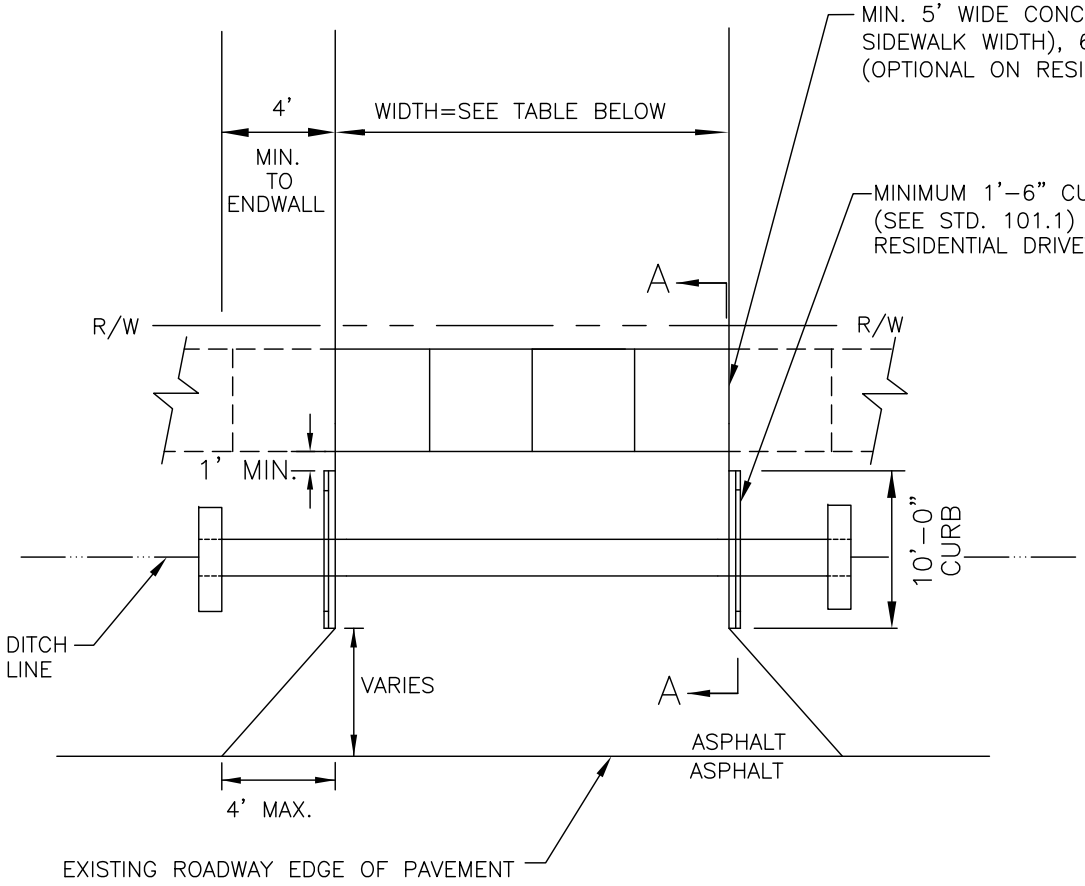
SECTION B-B

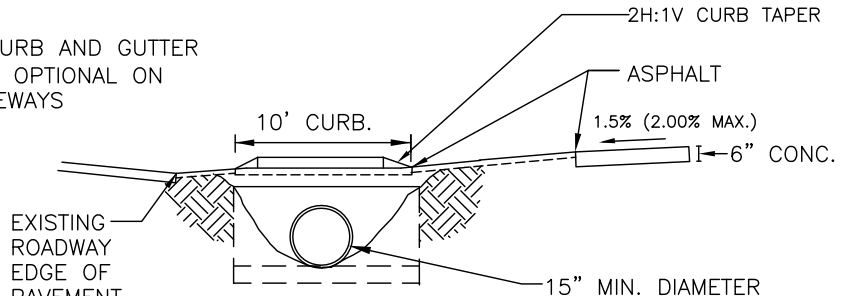
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

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

STD. NO.	REV.
115.1	8/19





SECTION A–A

** NCDOT TO APPROVE ON NCDOT SYSTEM ROAD **

DRIVEWAY WIDTH		
DRIVEWAY TYPE	MINIMUM	MAXIMUM
RESIDENTIAL:		
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'
ONE–WAY COMMERCIAL	20'	30'
TWO–WAY COMMERCIAL	26'	50'

* MUST PROVIDE ON–SITE TURNAROUND

NOTES:

1. TO BE USED ON ROADS WITHOUT CURB AND GUTTER AND WHERE CURB AND GUTTER IS NOT BEING INSTALLED. (MUST MEET BOTH CRITERIA)
2. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
3. THIS STANDARD IS TYPICALLY FOR COMMERCIAL APPLICATION. FOR RESIDENTIAL DRIVEWAY CONSTRUCTION, USE AT THE DISCRETION OF THE TOWN ENGINEER ONLY.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

TYPE IV DRIVEWAY
ROADS WITHOUT CURB & GUTTER

STD. NO.	REV.
116.1	

GENERAL NOTES:

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

A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE. SEE STANDARD 102.1

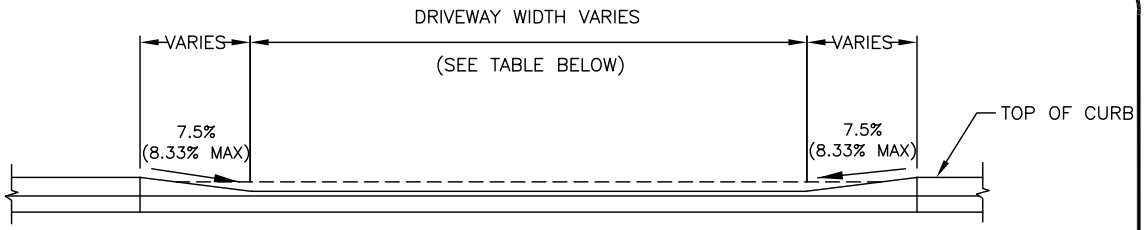
THIS DETAIL TO BE USED ONLY IN CONJUNCTION WITH MONOLITHIC SIDEWALK AS ON STANDARD NO. 107.1

NOTES:

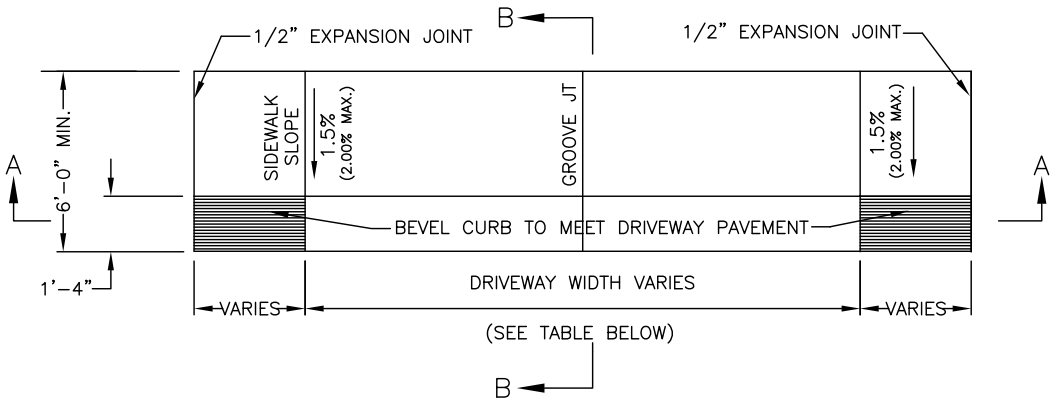
1. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCES, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.

DRIVEWAY WIDTH		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
TYPE I–RESIDENTIAL:		
LOCAL/COLLECTOR	10'	30'
THOROUGHFARE*	15'	30'
ONE–WAY TYPE II COMMERCIAL	20'	30'
TWO–WAY TYPE II COMMERCIAL	26'	50'

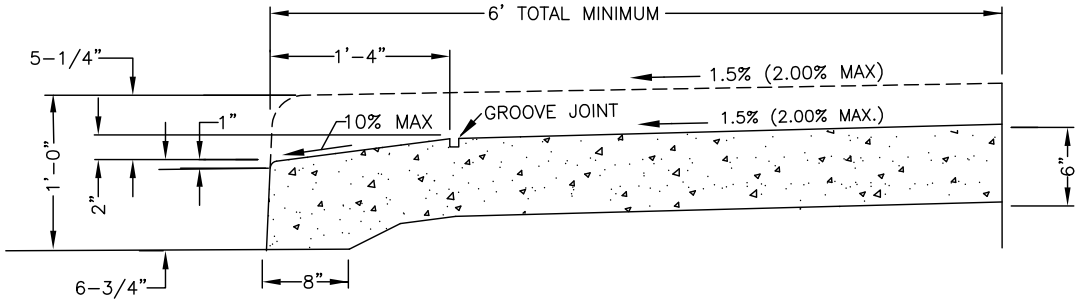
* MUST PROVIDE ON–SITE TURNAROUND



SECTION A–A



PLAN



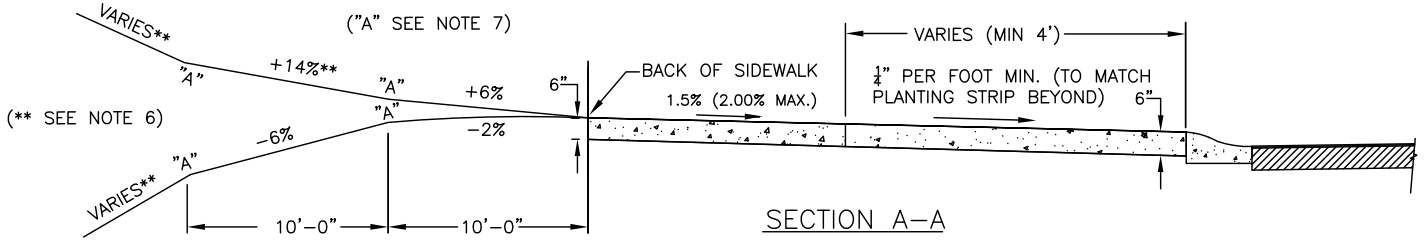
SECTION B–B

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

DROP CURB DRIVEWAY MONOLITHIC CONCRETE CURB AND SIDEWALK

STD. NO.	REV.
117.1	



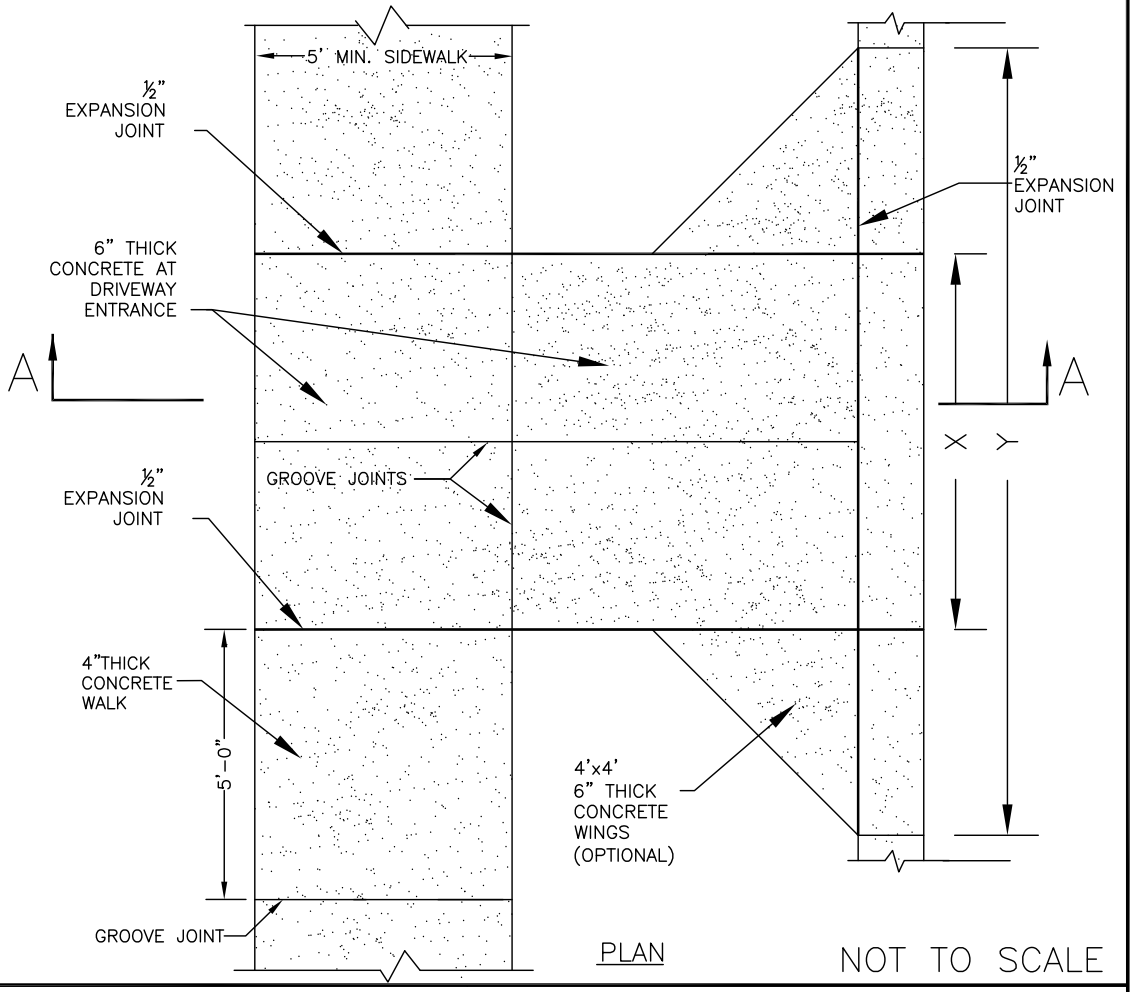
SECTION A–A

NOTES:

1. THE ELEVATION OF THE SIDEWALK SHALL BE NOT LESS THAN SIX INCHES OR MORE THAN EIGHTEEN INCHES ABOVE THE ROADWAY CROWN. THIS ELEVATION DIFFERENTIAL SHALL BE CONSISTENT WITHIN EACH BLOCK.
2. ALL CONCRETE TO BE 3600 PSI STRENGTH.
3. ALL CONSTRUCTION PRACTICES, INCLUDING COMPACTION, CURING, FINISHING, ETC. SHALL BE IN ACCORDANCE WITH THE TOWN OF WAXHAW'S SPECIAL PROVISIONS SECTION OF THE LAND DEVELOPMENT STANDARDS.
4. PLANTING STRIP SHALL BE GRADED WITH A CROSS SLOPE BETWEEN 1/4 IN. PER FOOT AND 1 1/4 IN. PER FOOT EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN ENGINEER MAY AUTHORIZE A SUITABLE GRADE
5. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS, INCLUDING BUT NOT LIMITED TO SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
6. **PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. "A" BREAKOVER SHALL NOT EXCEED 8%. (A = ALGEBRAIC DIFFERENCE).
8. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.

DRIVEWAY WIDTH		
	X	Y
TYPE I–RESIDENTIAL:		
LOCAL/COLLECTOR	10' MIN.	30' MAX.***
THOROUGHFARE *	15' MIN.	30' MAX.***

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



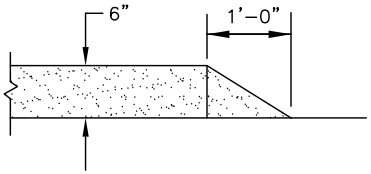
PLAN

NOT TO SCALE

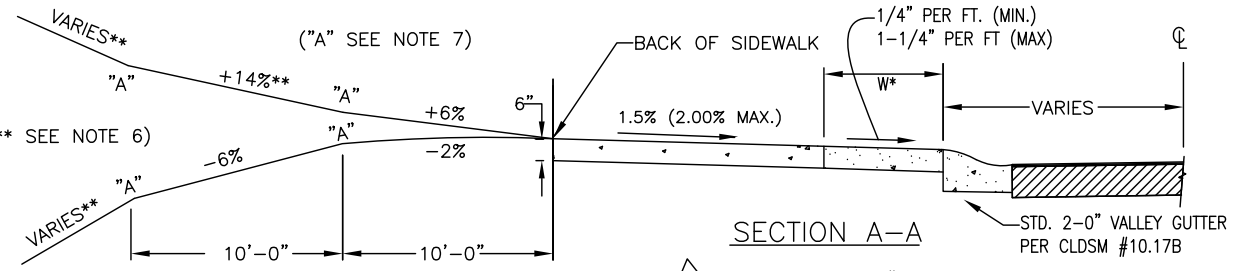
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

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

STD. NO.	REV.
118.1	



SECTION B-B

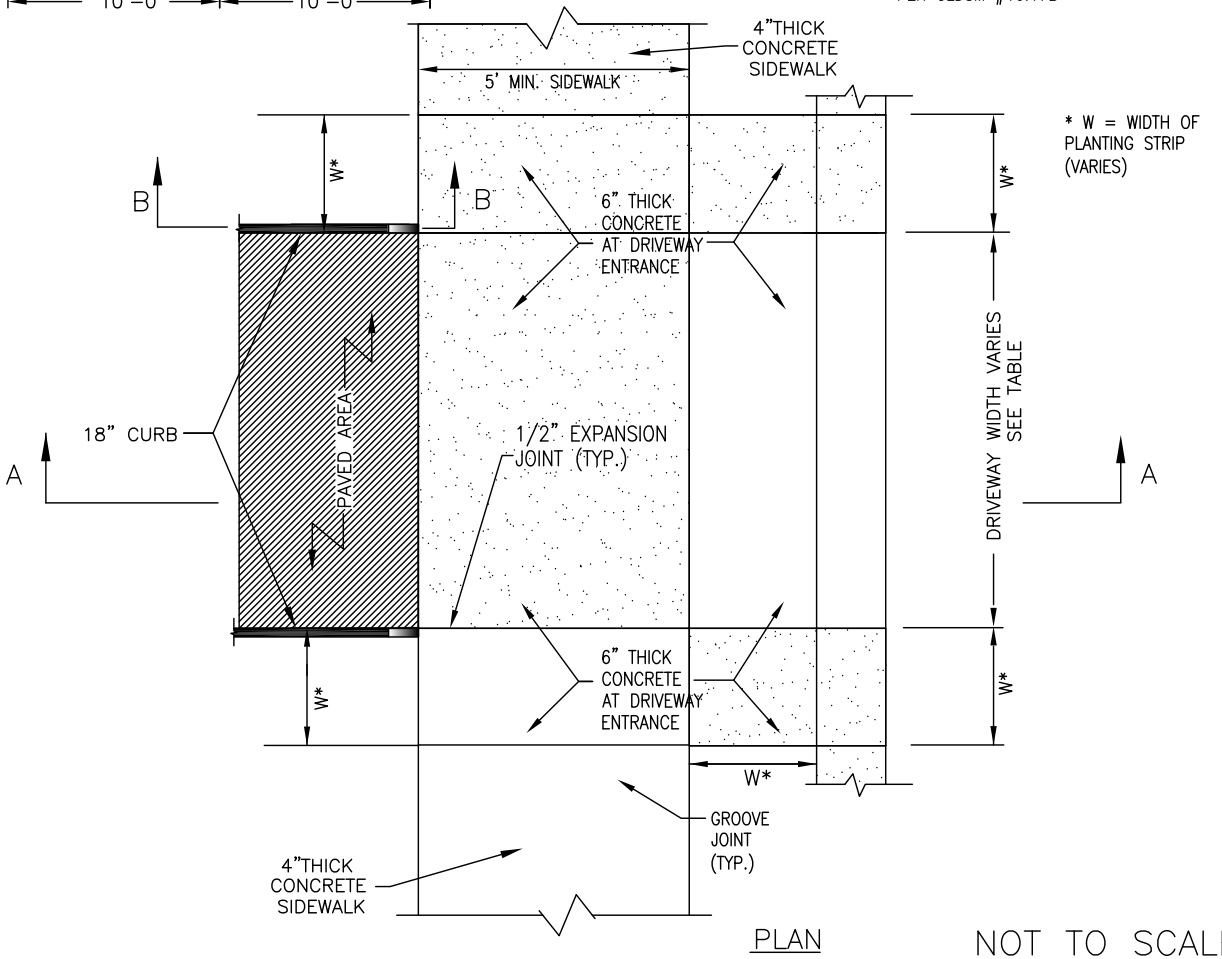


SECTION A-A

NOTES:

1. THE ELEVATION OF THE SIDEWALK SHALL BE NOT LESS THAN SIX INCHES OR MORE THAN EIGHTEEN INCHES ABOVE THE ROADWAY CROWN. THIS ELEVATION DIFFERENTIAL SHALL BE CONSISTENT WITHIN EACH BLOCK.
2. ALL CONCRETE TO BE 3600 PSI STRENGTH.
3. ALL CONSTRUCTION PRACTICES, INCLUDING COMPACTION, CURING, FINISHING, ETC. SHALL BE IN ACCORDANCE WITH THE TOWN OF WAXHAW ENGINEEERING DESIGN AND CONSTRUCTION STANDARDS PROCEDURES MANUAL.
4. PLANTING STRIP SHALL BE GRADED WITH A CROSS SLOPE BETWEEN 1/4 IN. PER FOOT AND 1 1/4 IN. PER FOOT EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN ENGINEER MAY AUTHORIZE A SUITABLE GRADE
5. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS, INCLUDING BUT NOT LIMITED TO SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
6. PER NC IFC SECTION D103.2, FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 10 PERCENT IN GRADE.
7. "A" BREAKOVER SHALL NOT EXCEED 8% OR LESS (A=ALGEBRAIC DIFFERENCE).
8. PRIOR APPROVAL IS REQUIRED BY TOWN ENGINEER ON GRADES EXCEEDING WHAT ARE SHOWN.

DRIVEWAY WIDTH		
TYPE DRIVEWAY	MINIMUM	MAXIMUM
ONE-WAY TYPE II COMMERCIAL	20'	30'
TWO-WAY TYPE II COMMERCIAL	26'	50'



PLAN

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

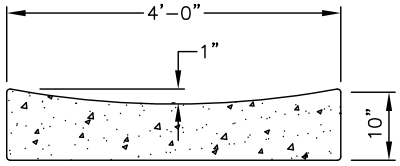
COMMERCIAL TYPE II DRIVEWAY FOR 2'-0" VALLEY GUTTER

STD. NO.	REV.
119.1	

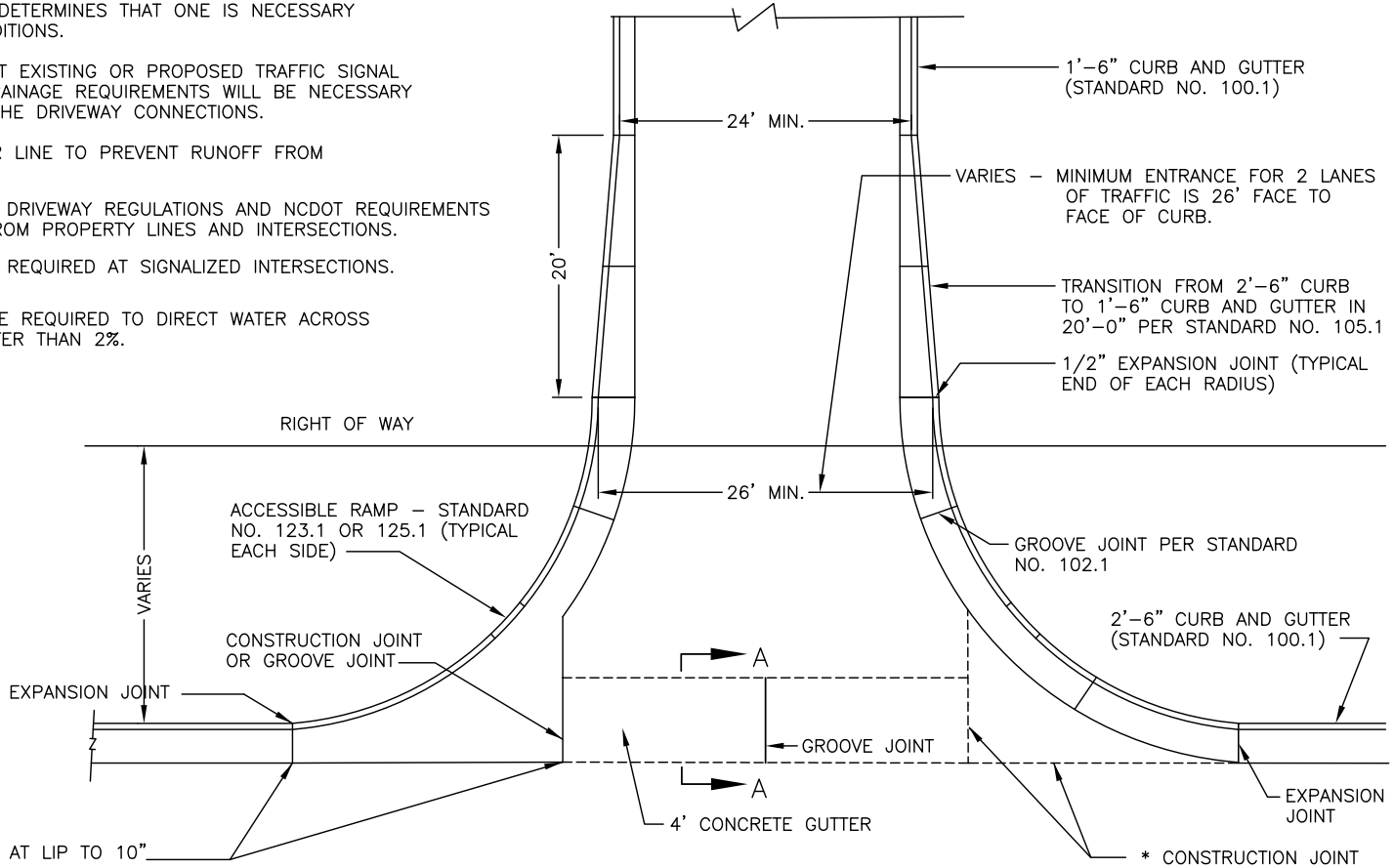
NOTES:

1. WHERE A TYPE III DRIVEWAY IS APPROVED BY THE TOWN DEVELOPMENT SERVICES DEPARTMENT THAT CONNECTS TO AN EXISTING SIGNALIZED INTERSECTION, OR AT A LOCATION WHERE A TRAFFIC SIGNAL INSTALLATION IS PROPOSED BY THE TOWN BASED ON A TRAFFIC IMPACT/SIGNAL WARRANT STUDY, A FULL DEPTH ASPHALT PAVEMENT (2–1/2" S–9.5 B/C AND 6" B–25.0 B/C) IS REQUIRED. THIS PAVEMENT DESIGN IS REQUIRED IN THE DRIVEWAY EASEMENT (100–FOOT MINIMUM) TO MAINTAIN DETECTOR LOOPS AND PAVEMENT MARKINGS. A TRAFFIC SIGNAL WILL BE INSTALLED ONLY IF THE TOWN DETERMINES THAT ONE IS NECESSARY BASED ON A TRAFFIC STUDY OF CURRENT CONDITIONS.
2. A CONCRETE GUTTER IS TO BE USED EXCEPT AT EXISTING OR PROPOSED TRAFFIC SIGNAL LOCATIONS. AT THESE LOCATIONS ADDITIONAL DRAINAGE REQUIREMENTS WILL BE NECESSARY TO ELIMINATE THE NEED FOR GUTTER ACROSS THE DRIVEWAY CONNECTIONS.
3. THE DRIVEWAY MUST RISE 6" FROM THE GUTTER LINE TO PREVENT RUNOFF FROM ENTERING DRIVEWAY.
4. ALL DRIVEWAYS MUST MEET THE CURRENT TOWN DRIVEWAY REGULATIONS AND NCDOT REQUIREMENTS FOR SPACING, SIGHT DISTANCE, AND OFFSETS FROM PROPERTY LINES AND INTERSECTIONS.
5. TWO (2) ACCESSIBLE RAMPS PER CURB RETURN REQUIRED AT SIGNALIZED INTERSECTIONS.

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



SECTION A–A



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

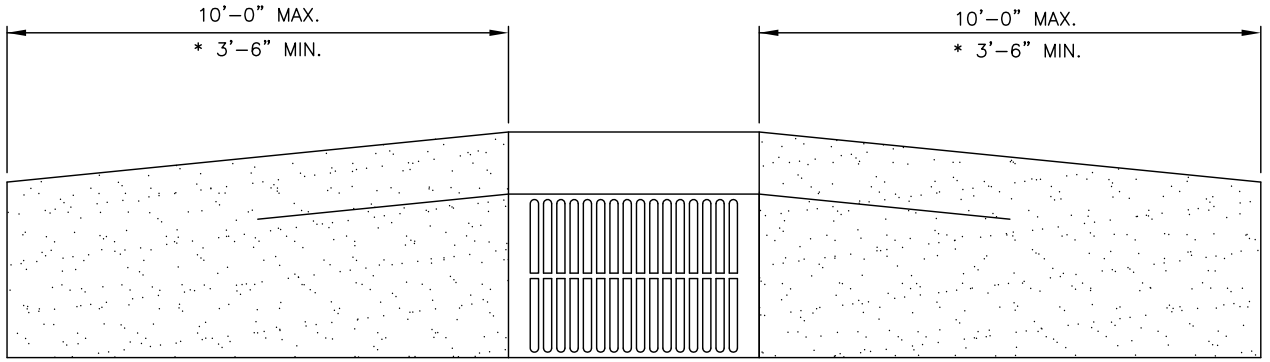
PLAN

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

TYPE III DRIVEWAY ENTRANCE

STD. NO.	REV.
120.1	



PLAN

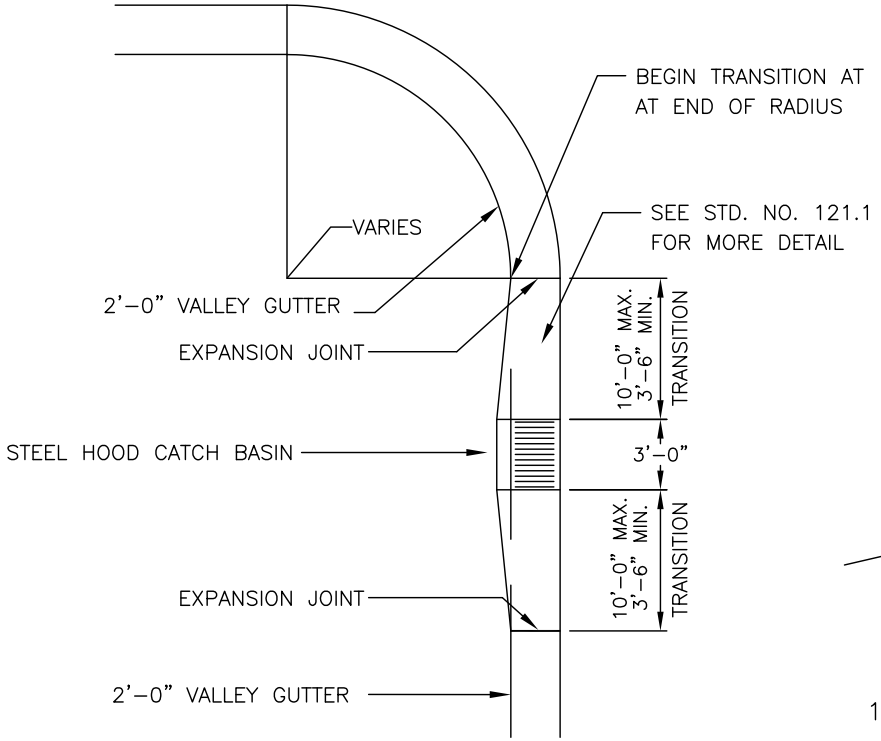
NOTE:

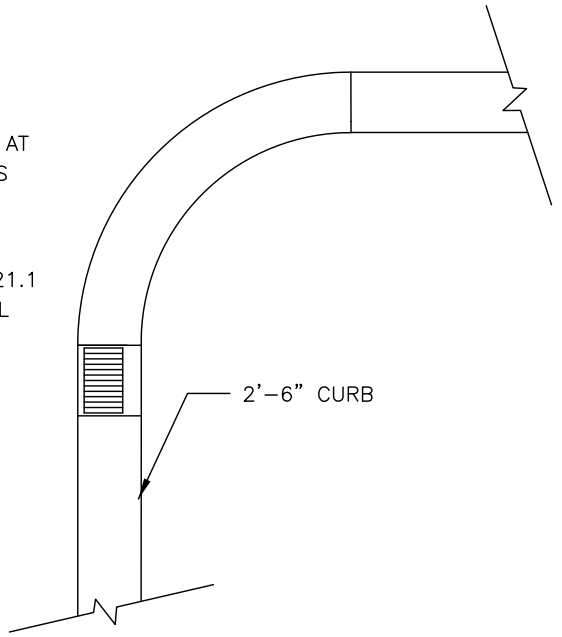
* TRANSITION FROM 2'–6" STANDARD CURB TO VALLEY CURB AT A DRAINAGE INLET ONLY.
SEE STANDARD 104.1 FOR CROSS SECTION GEOMETRY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CATCH BASIN FRAME IN VALLEY GUTTER

STD. NO.	REV.
121.1	





NOTE:

1. WHERE 2'–6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.

2. RADII AT INTERSECTIONS:
   RESIDENTIAL LOCAL STREET – 20 FEET
   RESIDENTIAL LOCAL STREET TO ALLEY – 10 FEET
   RESIDENTIAL COLLECTOR – 25 FEET
   RETAIL/MIXED–USE LOCAL – 25 FEET
   RETAIL/MIXED–USE COLLECTOR – 25 FEET
   INDUSTRIAL LOCAL AND COLLECTOR – 35 FEET

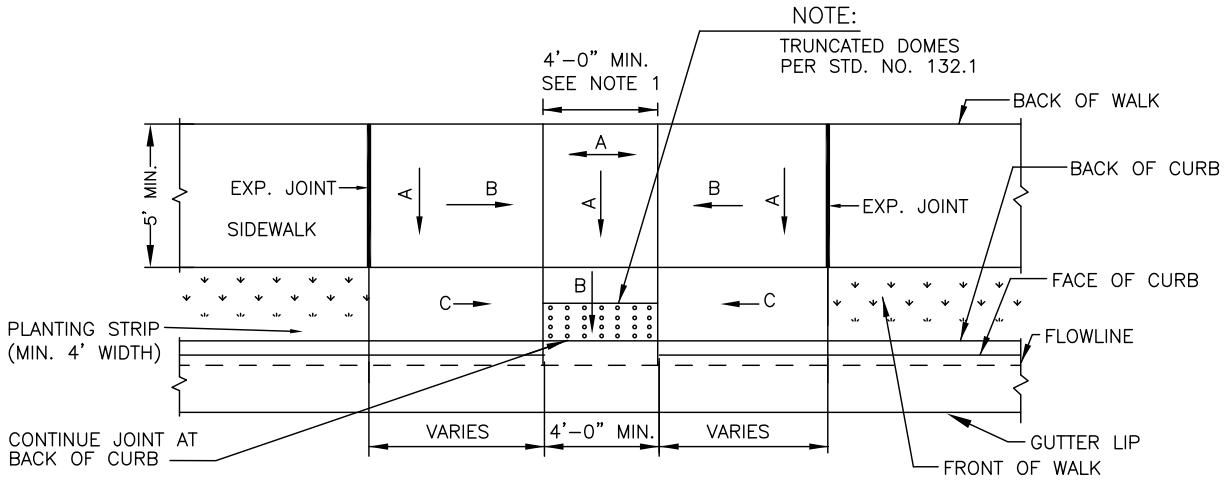
NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CATCH BASIN PLACEMENT AT INTERSECTIONS	STD. NO. 122.1	REV. 3/24

NOTES:

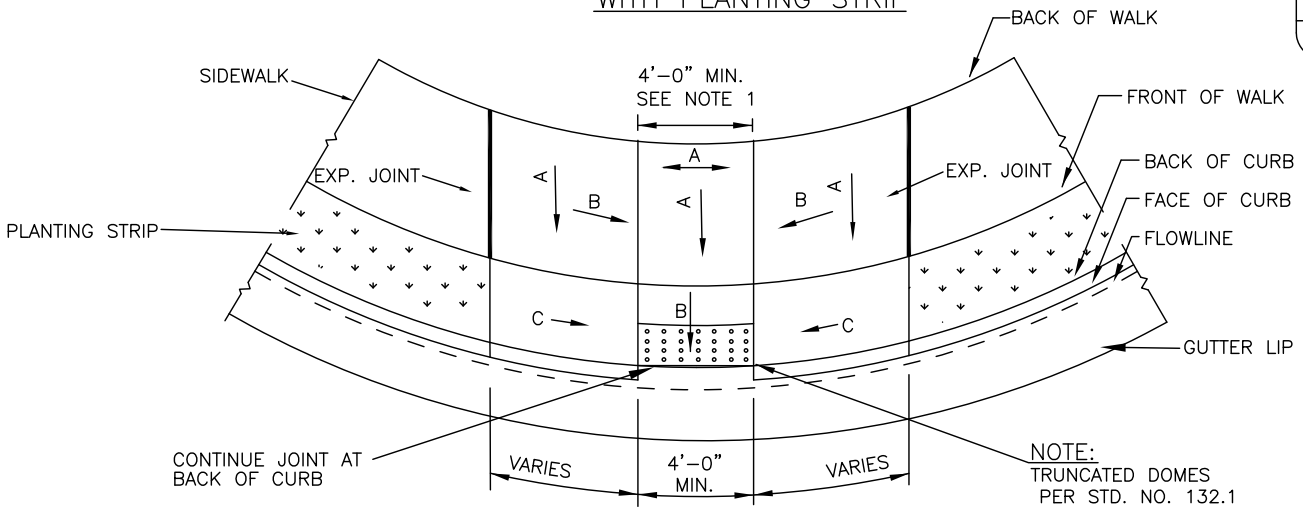
1. IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE MINIMUM WIDTH MUST INCREASE TO 5'–0" MIN.

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



PLAN VIEW–PARALLEL RAMP
WITH PLANTING STRIP

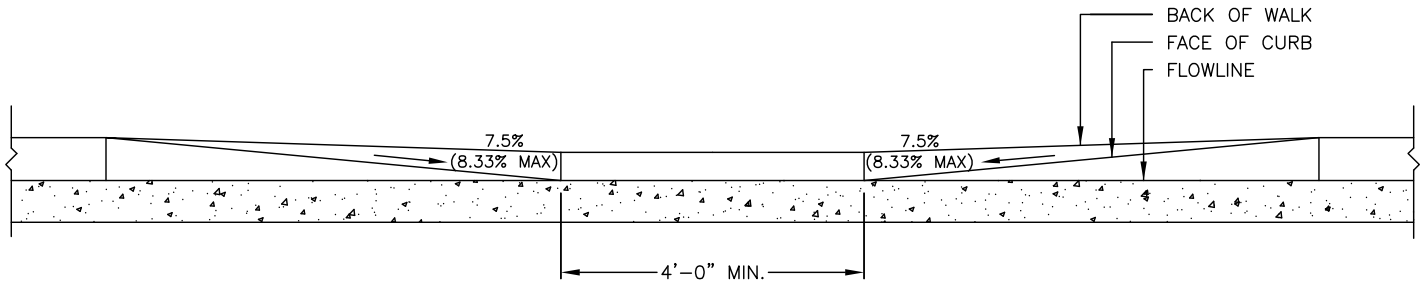
SLOPE "A" 1.5% (2.00% MAX)
SLOPE "B" 7.5% (8.33% MAX)
SLOPE "C" 10% MAX



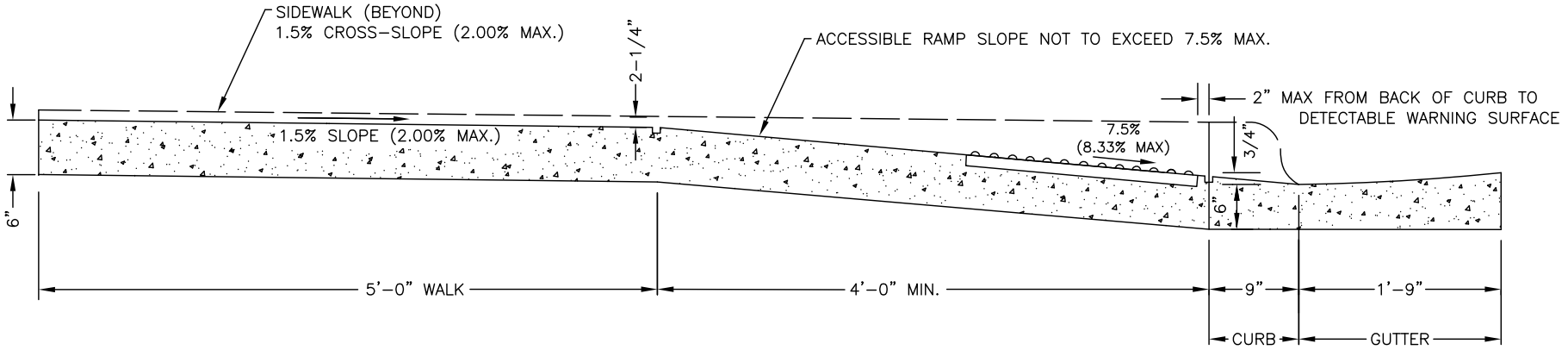
PLAN VIEW–DIAGONAL RAMP WITH PLANTING STRIP

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP STANDARD WITH PLANTING STRIP 2'–6" CURB AND GUTTER	STD. NO. 123.1	REV. 8/19



ELEVATION



TYPICAL RAMP ℄ SECTION

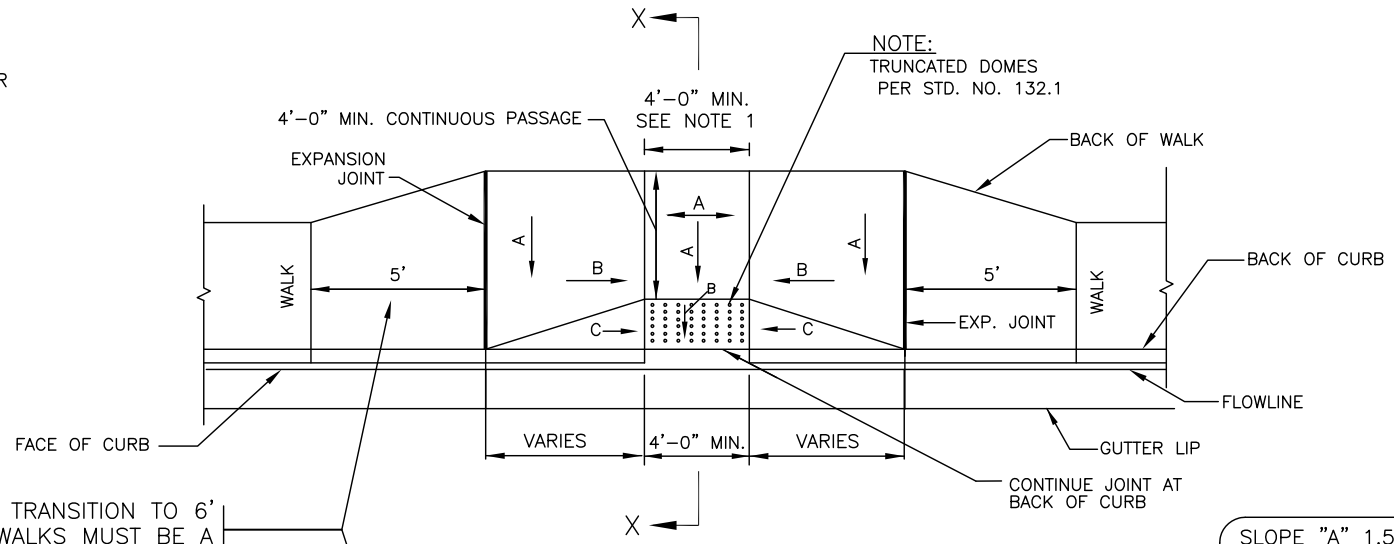
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP SECTIONS WITH PLANTING STRIP 2–6" CURB AND GUTTER

STD. NO.	REV.
124.1	

NOTES:

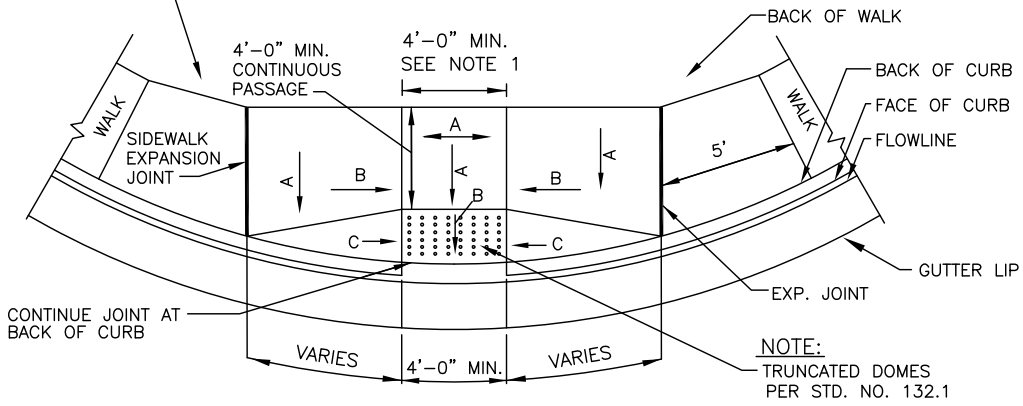
1. IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE MINIMUM WIDTH MUST INCREASE TO 5'–0" MIN.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.



PROVIDE 5' LONG TRANSITION TO 6' WIDE WALK. ALL WALKS MUST BE A MIN. 6' WIDTH AT RAMP.

PLAN VIEW–PARALLEL RAMP
WITHOUT PLANTING STRIP

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

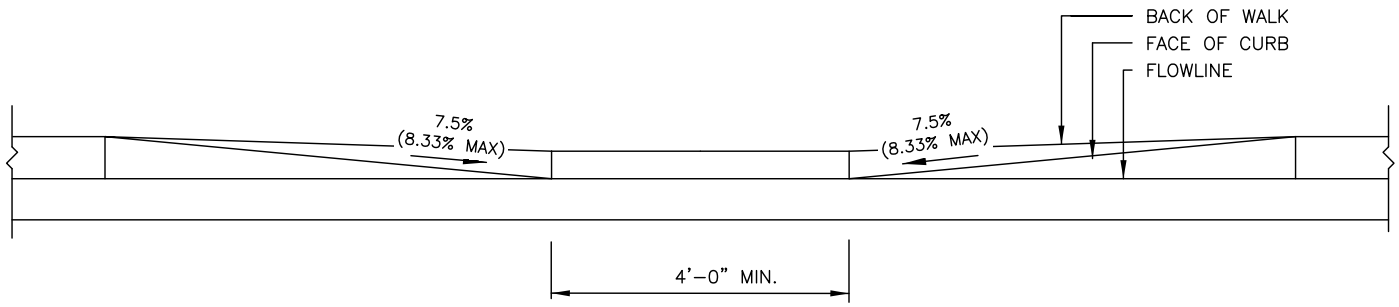


PLAN VIEW–DIAGONAL RAMP WITHOUT PLANTING STRIP

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP STANDARD WITHOUT PLANTING STRIP 2'–6" CURB AND GUTTER

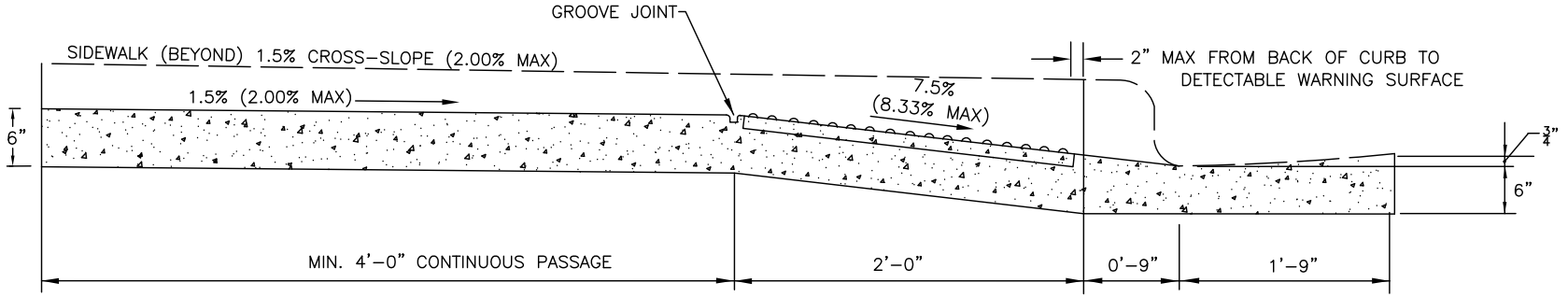
STD. NO.	REV.
125.1	



SECTION THROUGH FLOWLINE

NOTE:

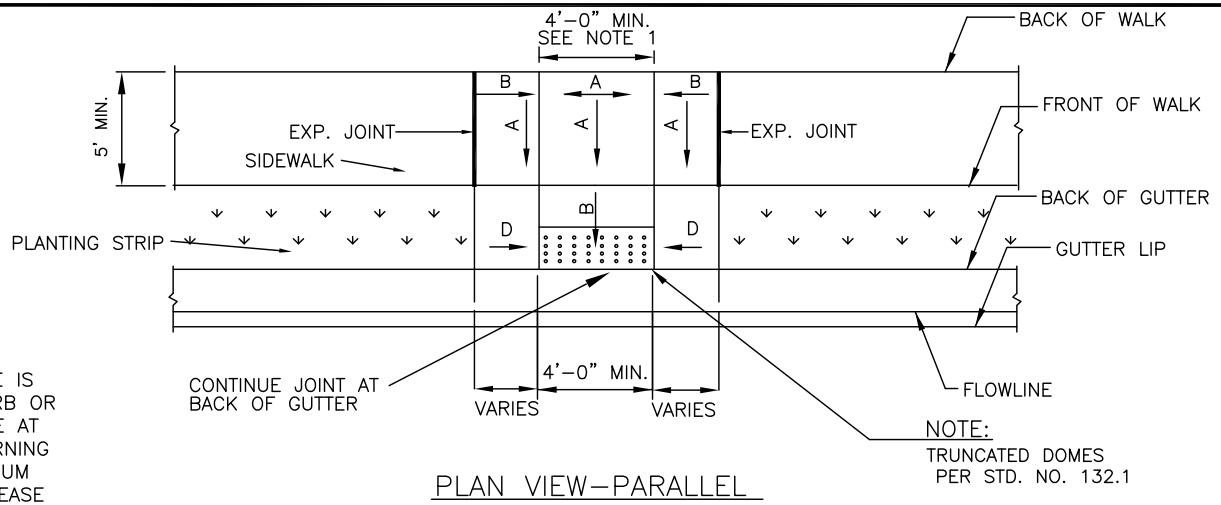
ALL WALKS MUST BE A MIN. 6' WIDTH AT RAMPS.



TYPICAL RAMP ℄ SECTION X–X

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP SECTIONS WITHOUT PLANTING STRIP (2'–6" CURB AND GUTTER)	STD. NO. 126.1	REV. 8/19

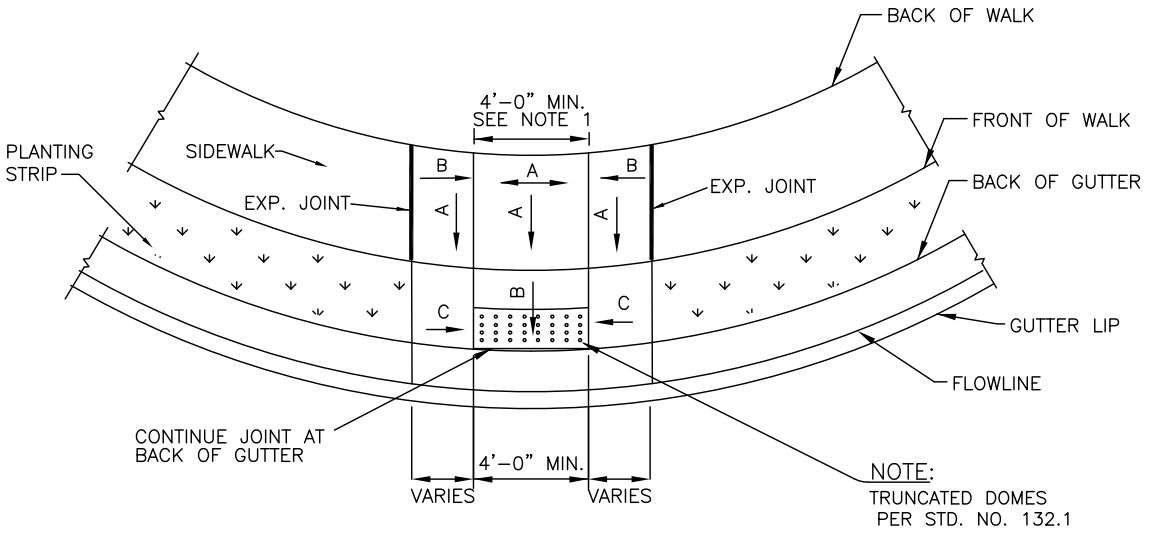


PLAN VIEW–PARALLEL
RAMP WITH PLANTING STRIP

NOTES:

1. IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE MINIMUM WIDTH MUST INCREASE TO 5'–0" MIN.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.

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



PLAN VIEW–DIAGONAL RAMP
WITH PLANTING STRIP

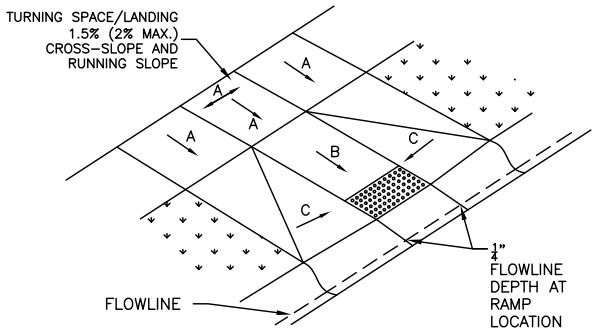
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP STANDARD 2'–0" VALLEY GUTTER

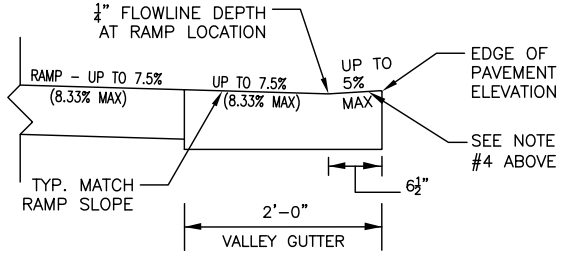
STD. NO.	REV.
127.1	

NOTES:

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

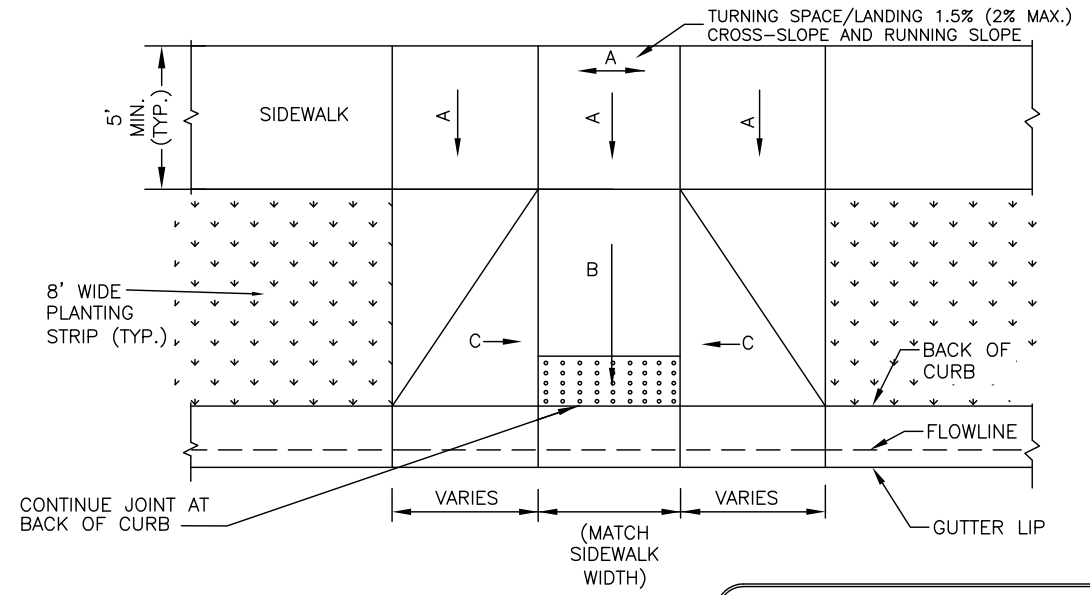


ISOMETRIC VIEW



2'-0" VALLEY GUTTER RAMP DETAIL

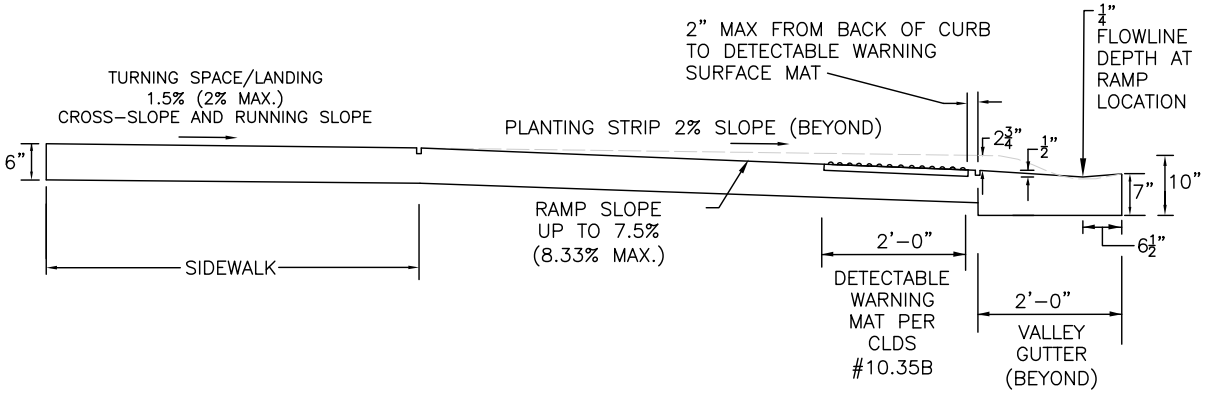
MAXIMUM SLOPES FOR VALLEY GUTTER DEPRESSION AT RAMPS



PLAN VIEW

NOT TO SCALE

SLOPE "A" = UP TO 1.5% (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

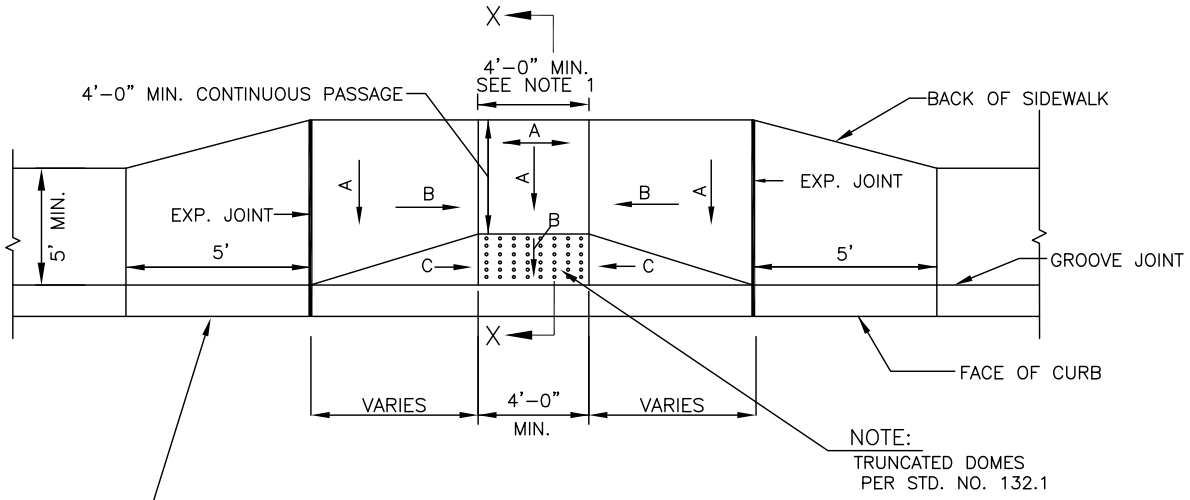
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

PERPENDICULAR CURB RAMP WITH 2'-0" VALLEY GUTTER

STD. NO.	REV.
128.1	7/14

NOTES:

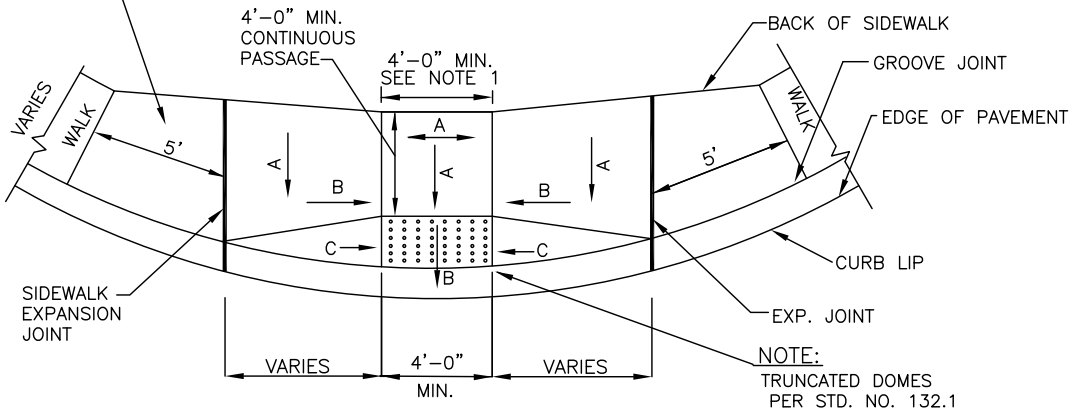
1. IF TURNING SPACE IS CONFINED BY CURB OR VERTICAL SURFACE AT BACK OF THE TURNING SPACE, THE MINIMUM WIDTH MUST INCREASE TO 5'–0" MIN.
2. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.



PLAN VIEW–PARALLEL RAMP

PROVIDE 5' LONG TRANSITION TO 6' WIDE WALK. ALL WALKS MUST BE A MIN. 6' WIDTH AT RAMP.

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



PLAN VIEW–DIAGONAL RAMP

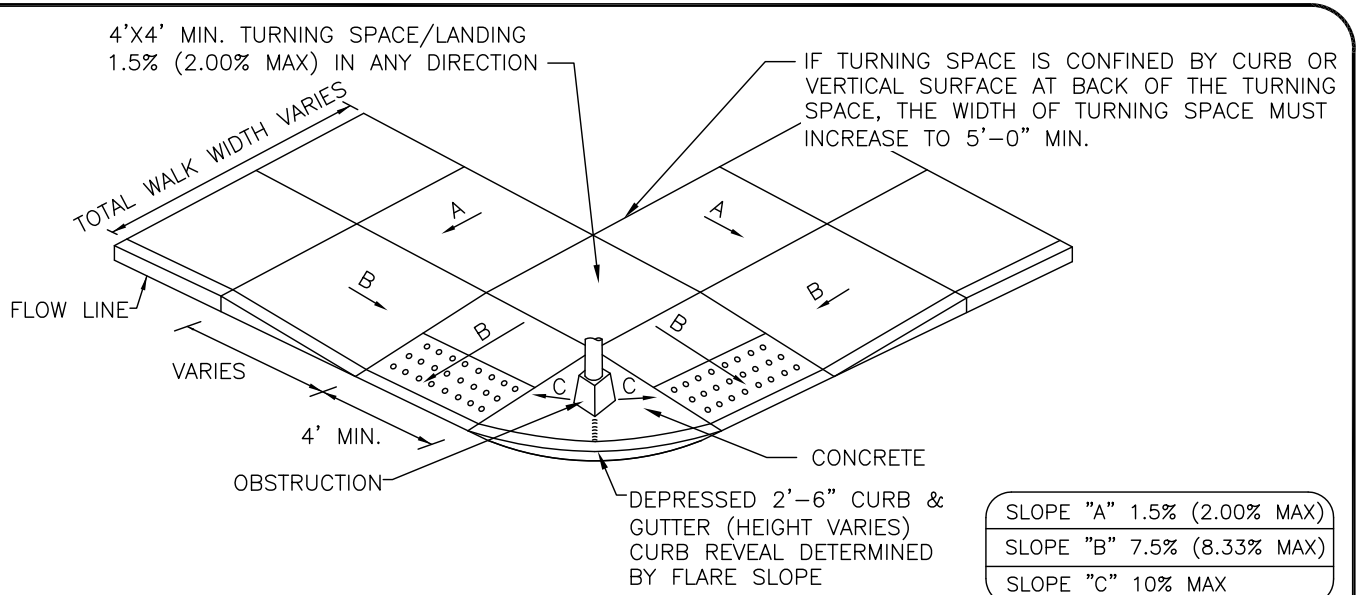
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP STANDARD MONOLITHIC CURB AND SIDEWALK

STD. NO.	REV.
129.1	

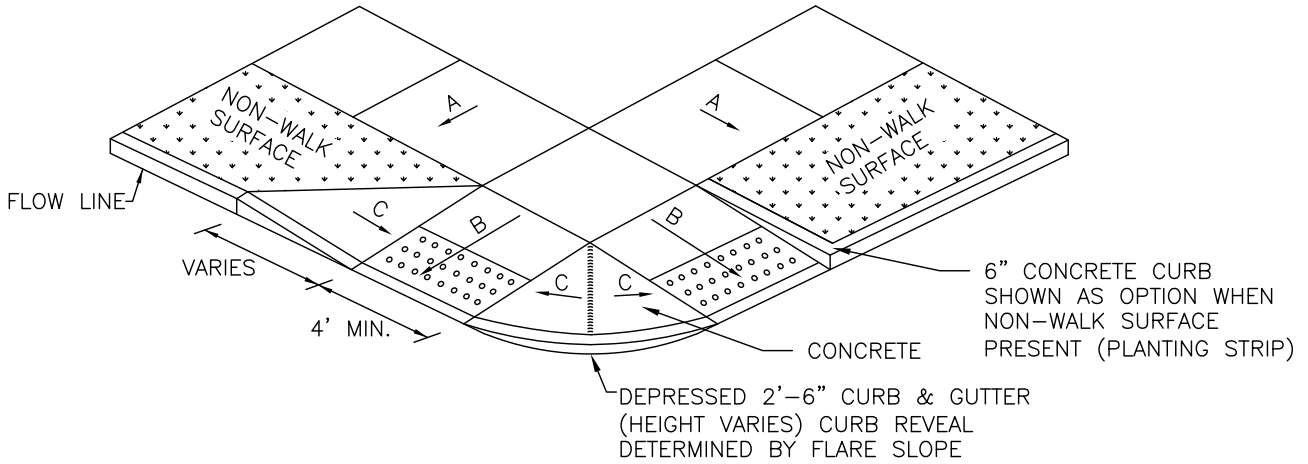
NOTES:

1. MAINTAIN A MINIMUM OF 0.5% SLOPE ON ALL CONCRETE SURFACES TO PROMOTE SURFACE DRAINAGE TOWARD CURB.
2. GUTTER FLOW LINE AND PLAN PROFILE SHALL BE MAINTAINED THROUGH THE RAMP AREA. MAX GUTTER SLOPE IS 2%.
3. THE SURFACE OF THE RAMP SHALL BE FLUSH WITH THE FLOWLINE OF THE CURB AND GUTTER.
4. THE RAMP OPENING (AT THE FULLY DEPRESSED CURB) SHALL BE LOCATED WITHIN THE PARALLEL BOUNDARIES OF THE CROSSWALK MARKINGS. THE RAMP CENTERLINE SHALL BE LOCATED AT THE CORNER RADIUS CENTERLINE UNLESS OTHERWISE DIRECTED BY THE ENGINEER. DIAGONAL CURB RAMPS SHALL HAVE A SEGMENT OF STRAIGHT CURB AT LEAST 24 INCHES LONG LOCATED ON EACH SIDE OF THE WING SLOPE AND WITHIN THE CROSSWALK MARKINGS.
5. THE WING AND RAMP SURFACES SHALL BE 3600 PSI CONCRETE WITH A SIDEWALK FINISH IN ACCORDANCE WITH CURRENT EDITION NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. DRAINAGE STRUCTURES, MAST ARMS, LIGHT POLES AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN LINE WITH RAMPS. LOCATION OF THE RAMP SHALL TAKE PRECEDENCE OVER LOCATION OF OBSTRUCTIONS EXCEPT WHERE EXISTING OBSTRUCTIONS ARE BEING UTILIZED IN THE NEW CONSTRUCTION.
7. SEE STANDARD DRAWING 132.1 FOR DETECTABLE WARNING INSTALLATION.



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

PLACEMENT FOR OBSTRUCTED CORNER RADIUS

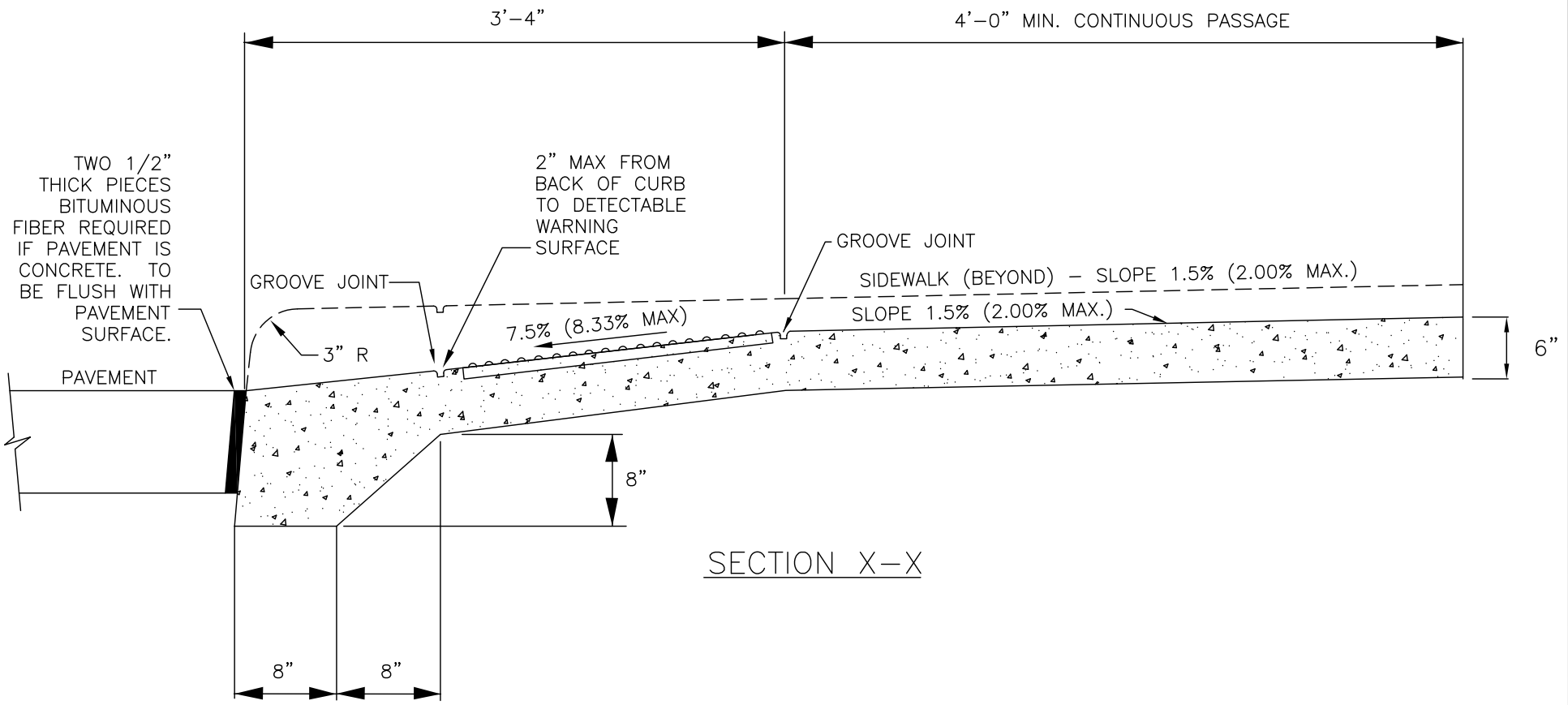


PLACEMENT FOR SMALL CORNER RADIUS

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	STANDARD PLACEMENT OF ACCESSIBLE RAMP AND GENERAL NOTES

STD. NO.	REV.
131.1	

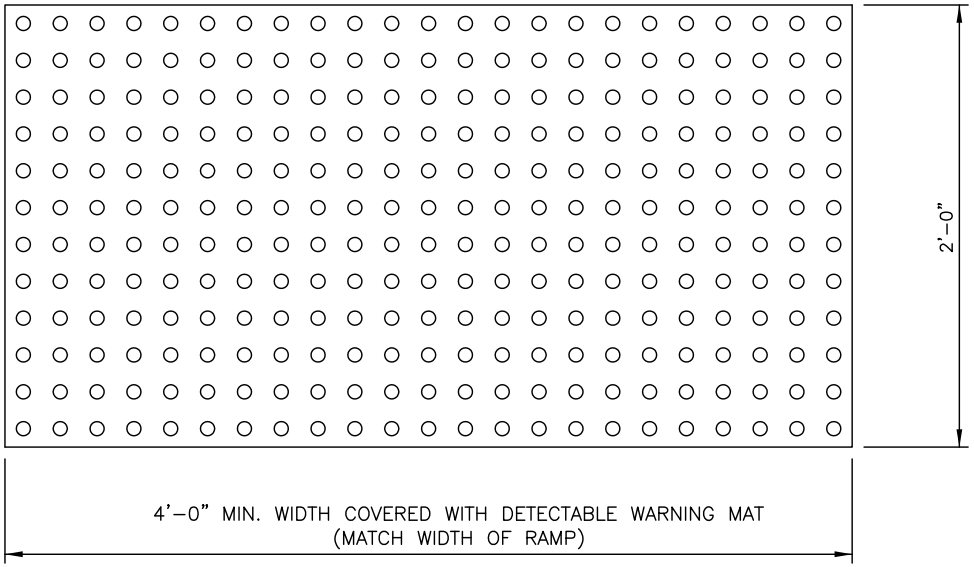


SECTION X–X

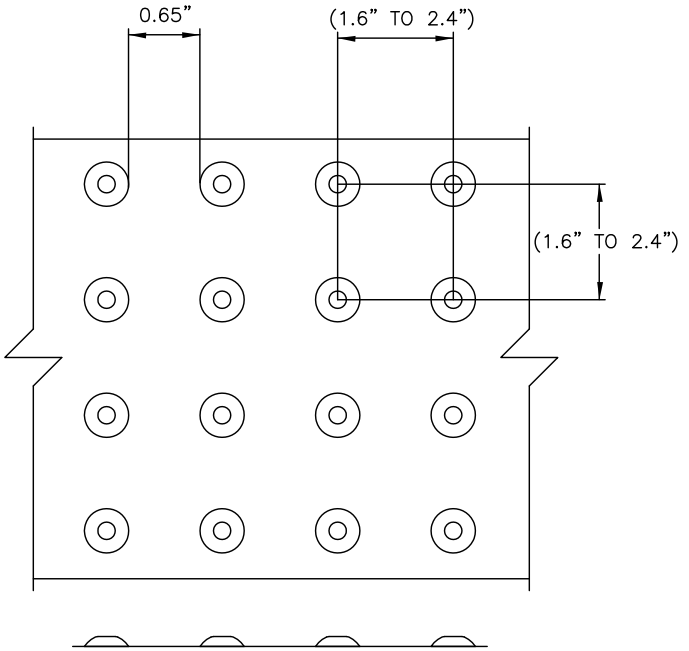
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ACCESSIBLE RAMP SECTIONS MONOLITHIC CURB AND SIDEWALK

STD. NO.	REV.
130.1	



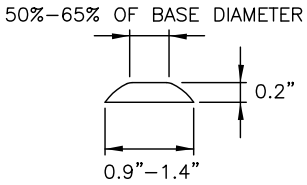
TRUNCATED DOME PLAN VIEW



TRUNCATED DOME SPACING

NOTES:

1. ALL DETECTABLE WARNING DEVICES USED IN NEW CONSTRUCTION SHALL BE OF A RIGID PRECAST OR EMBEDDED PRODUCT APPROVED BY THE TOWN ENGINEER. RETRO FIT MATS WILL ONLY BE ALLOWED ON EXISTING RAMPS WITH PRIOR APPROVAL OF THE TOWN ENGINEER FOR MATERIAL TYPE AND INSTALLATION (IE. RESURFACING).
2. RAMP AND DETECTABLE WARNING AREA SHALL BE A MINIMUM OF 4 FEET IN WIDTH, BUT NOT BE LESS THAN THE WIDTH OF SIDEWALK LEADING TO BACK OF RAMP.
3. DETECTABLE WARNING SURFACES SHALL EXTEND 2.0 FT MINIMUM IN THE DIRECTION OF PEDESTRIAN TRAVEL.
4. DETECTABLE WARNING AREA CAN BE SQUARE WHERE USED IN A CURB RADIUS.
5. THE ROWS OF TRUNCATED DOMES IN DETECTABLE WARNING SURFACES SHOULD BE ALIGNED PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. WHERE DETECTABLE WARNING SURFACES ARE PROVIDED ON A SURFACE WITH A SLOPE THAT IS LESS THAN 5 PERCENT, DOME ORIENTATION IS LESS CRITICAL.
6. DECTECTABLE WARNING AREA SHALL BE COLORED BLACK IN ALL LOCATIONS.
7. IF PAVERS ARE TO BE USED, PAVERS SHALL BE 6" THICK AND CAST FROM 5000 psi CONCRETE.
8. MATS ARE TO BE RIGID WITH TURN DOWN EDGES EMBEDDED IN CONCRETE TO ELIMINATE TRIP HAZARD.
9. DIMENSIONS PER NCDOT 848.06



TRUNCATED DOME SECTION

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TRUNCATED DOMES PLAN AND CROSS-SECTION	STD. NO. 132.1	REV. 8/19

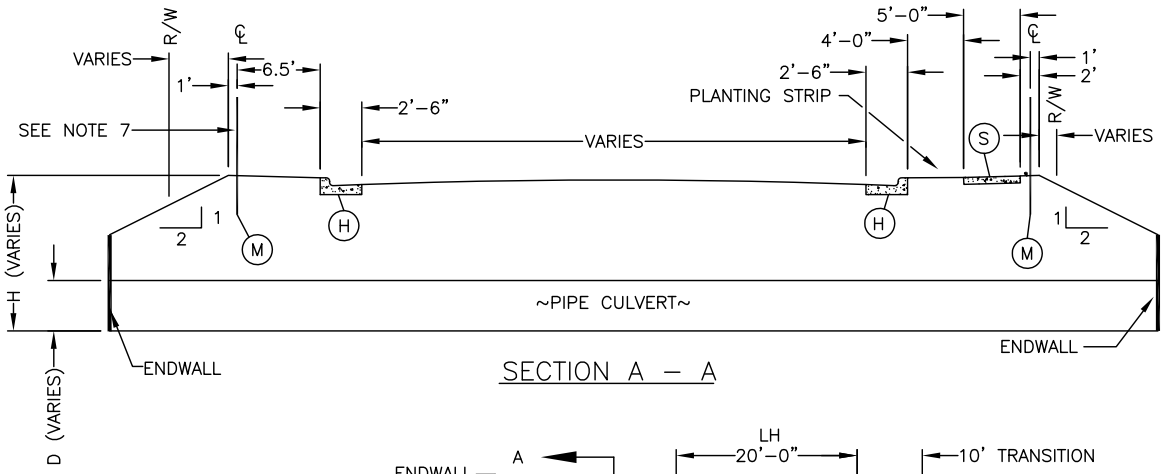
(H) 2'–6" CURB AND GUTTER, STD. 100.1

(M) SAFETY RAIL, STD. 700.1 & 701.1

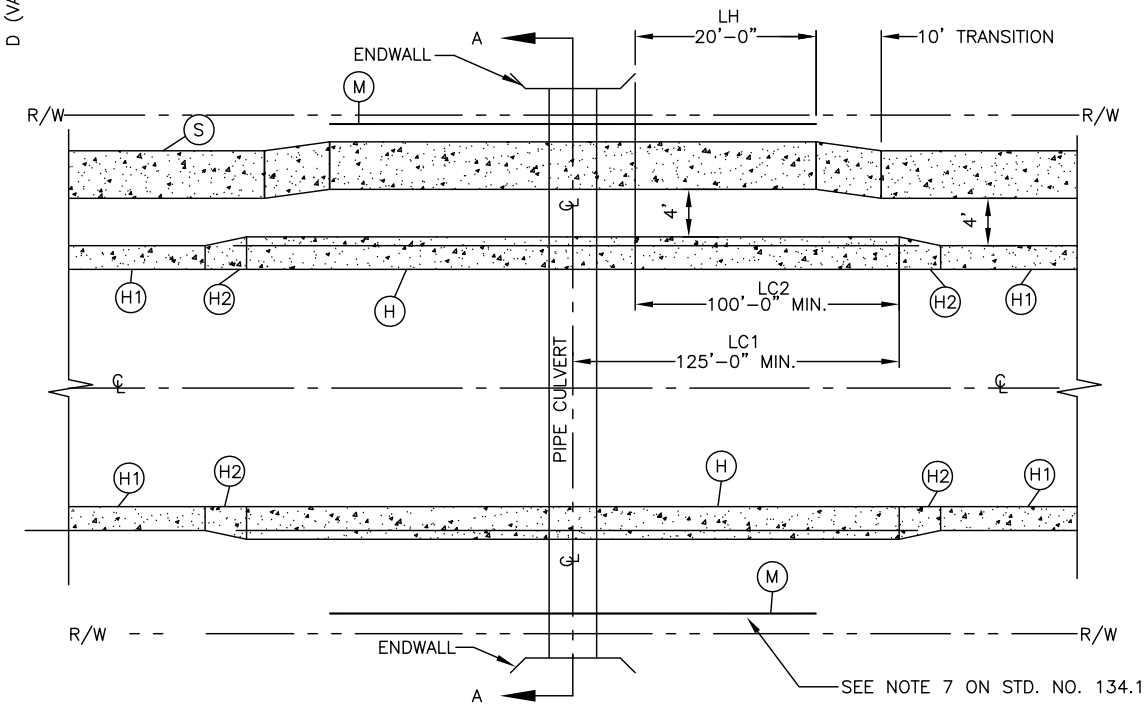
(S) 5'–0" SIDEWALK, STD. 106.1

(H1) 2'–0" VALLEY GUTTER. STD. 101.1

(H2) CURB TRANSITION 2'–6" CURB AND GUTTER TO 2'–0" VALLEY GUTTER, STD. 104.1



SECTION A – A



LH = DISTANCE FROM END OF WINGWALL TO END OF SAFETY RAIL.

LC1 = DISTANCE FROM ℄ OF CULVERT TO END OF 2'–6" CURB AND GUTTER GUTTER.

LC2 = DISTANCE FROM END OF WINGWALL TO END OF 2'–6" CURB AND GUTTER.

NOTES:

1. SEE STD. NO. 134.1 FOR GENERAL NOTES AND CLEAR ZONE DISTANCES

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

CULVERT CROSSINGS ON RESIDENTIAL AND COMMERCIAL STREETS

STD. NO.	REV.
133.1	8/19

GENERAL NOTES:

1. UNLESS OTHERWISE DETERMINED BY THE TOWN ENGINEER, THE MEASURES ILLUSTRATED SHALL BE USED WHEN CULVERT DIAMETER, D, IS GREATER THAN OR EQUAL TO 24 INCHES AND WHEN THE DIFFERENCE IN ELEVATION BETWEEN THE CULVERT INVERT AND THE TOP OF SLOPE, H, IS GREATER THAN OR EQUAL TO 5 FEET.
2. INSTALLATION OF 2'–6" CURB AND GUTTER MAY NOT BE REQUIRED WHEN AN ADEQUATE CLEAR ZONE IS PROVIDED FOR VEHICLES WITH A MAXIMUM OF 6:1 SLOPE (SEE TABLE 1).
3. INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 10–FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE SIDEWALK WITH A MAXIMUM OF 6:1 SLOPE. WHERE NO SIDEWALK IS REQUIRED, INSTALLATION OF SAFETY RAIL MAY NOT BE REQUIRED WHEN A 15–FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.
4. FOR CULVERT CROSSINGS WITHOUT ENDWALLS, LH AND LC2 SHALL BE MEASURED FROM THE OUTSIDE OF THE NEAREST WALL OF THE CULVERT BARREL.
5. FOR MULITIPLE BARREL CULVERT CROSSINGS, LC1 SHALL BE MEASURED FROM THE CENTERLINES OF THE OUTBOARD CULVERT BARRELS.
6. WHEN NECESSARY, AS DETERMINED BY THE TOWN ENGINEER, ADDITIONAL MEASURES MAY BE REQUIRED.
7. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF STREET IF SIDEWALK IS REQUIRED ON BOTH SIDES.
8. INSTALLATION OF SAFETY RAIL IS REQUIRED ON BOTH SIDES OF STREET IF NO SIDEWALK IS REQUIRED EXCEPT WHEN A 15–FOOT PEDESTRIAN CLEAR ZONE IS PROVIDED BEHIND THE CURB WITH A MAXIMUM OF 6:1 SLOPE.
9. INSTALLATION OF SAFETY RAIL IS REQUIRED ON THE SIDEWALK SIDE OF STREET IF SIDEWALK IS ONLY REQUIRED ON ONE SIDE OF STREET. INSTALL EITHER SAFTEY RAIL OR 15–FT CLEAR ZONE ON SIDE WITHOUT SIDEWALK.
10. DESIGN ADT IS CALCULATED ASSUMING A TRIP GENERATION OF 10 DAILY TRIPS PER SINGLE FAMILY DWELLING UNIT.

TABLE 1.
CLEAR ZONE DISTANCES
LOCAL, COLLECTOR, AND COMMERCIAL STREETS

DESIGN ADT	CLEAR ZONE FROM EDGE OF PAVEMENT	
	TANGENT SECTION	CURVE (WITHIN 125' OF CULVERT)
UNDER 750	10'	15'
750 – 1500	12'	18'
1501 – 6000	14'	21'
OVER 6000	16'	24'

SEE STD. NO. 133.1 FOR PLAN AND CROSS SECTIONAL SCHEMATICS.

NOT TO SCALE

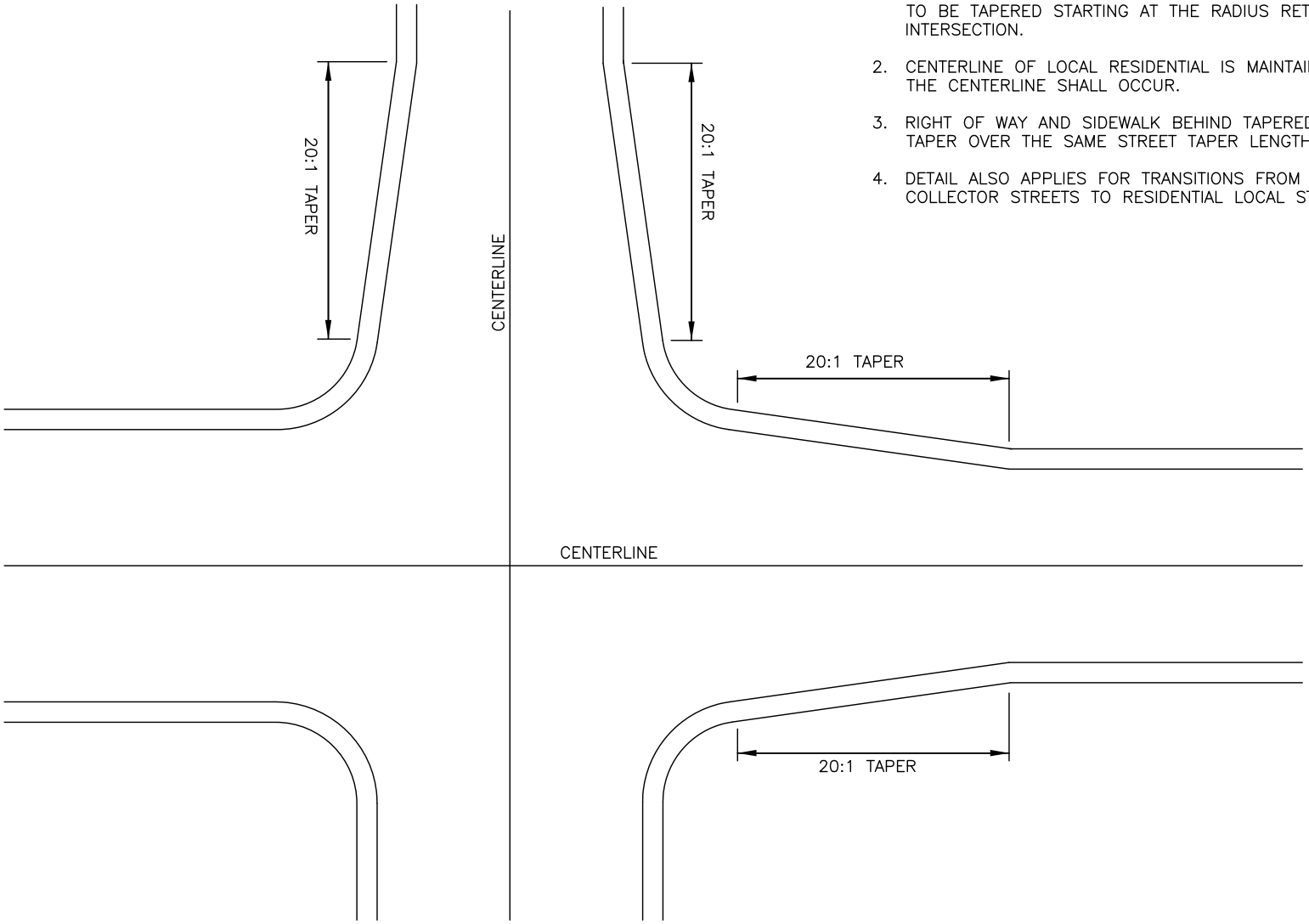
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CULVERT CROSSINGS ON RESIDENTIAL AND COMMERCIAL STREETS

STD. NO.	REV.
134.1	

GENERAL NOTES:

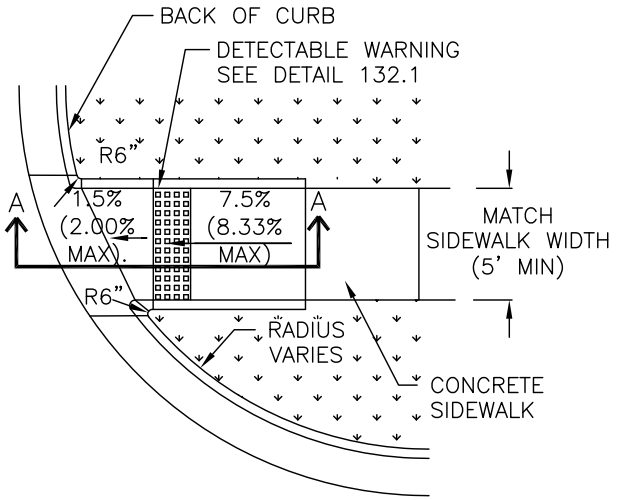
1. ALL TAPERS ARE 20:1 AND OCCUR ON BOTH SIDES OF THE ROAD TO BE TAPERED STARTING AT THE RADIUS RETURN AFTER THE INTERSECTION.
2. CENTERLINE OF LOCAL RESIDENTIAL IS MAINTAINED. NO SHIFTING OF THE CENTERLINE SHALL OCCUR.
3. RIGHT OF WAY AND SIDEWALK BEHIND TAPERED STREET SECTION TO TAPER OVER THE SAME STREET TAPER LENGTH.
4. DETAIL ALSO APPLIES FOR TRANSITIONS FROM RESIDENTIAL COLLECTOR STREETS TO RESIDENTIAL LOCAL STREETS.



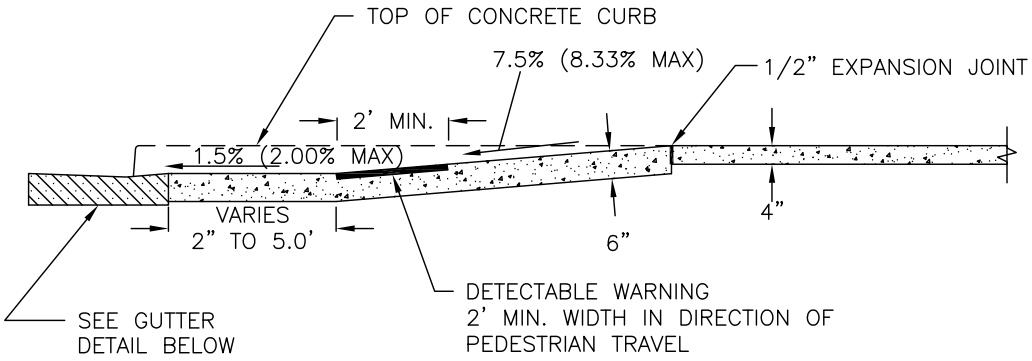
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TYPICAL LOCAL RESIDENTIAL TO LOCAL LIMITED RESIDENTIAL STREET TAPER

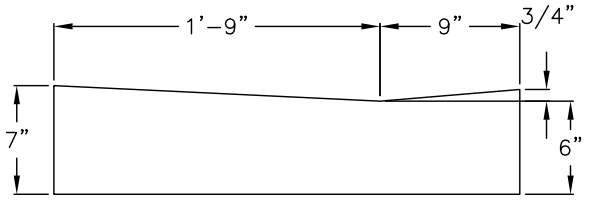
STD. NO.	REV.
135.1	



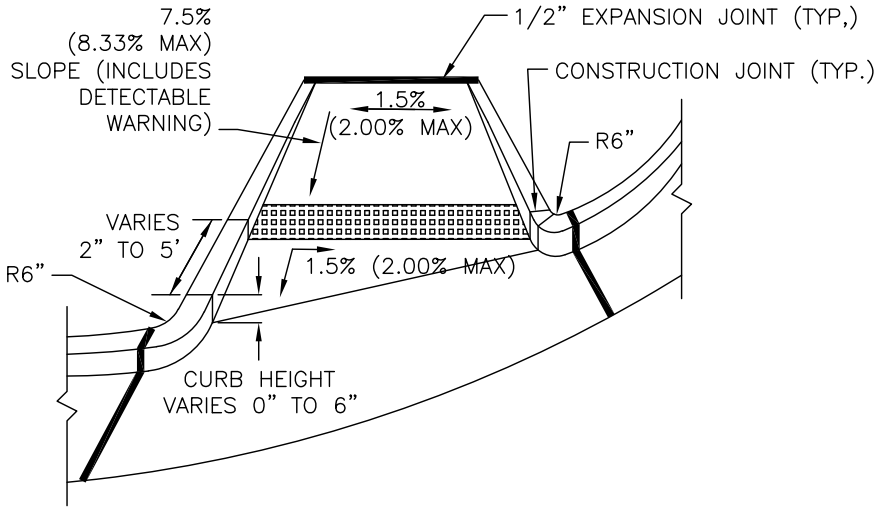
PLAN



SECTION A–A



GUTTER DETAIL



PERSPECTIVE

NOTES:

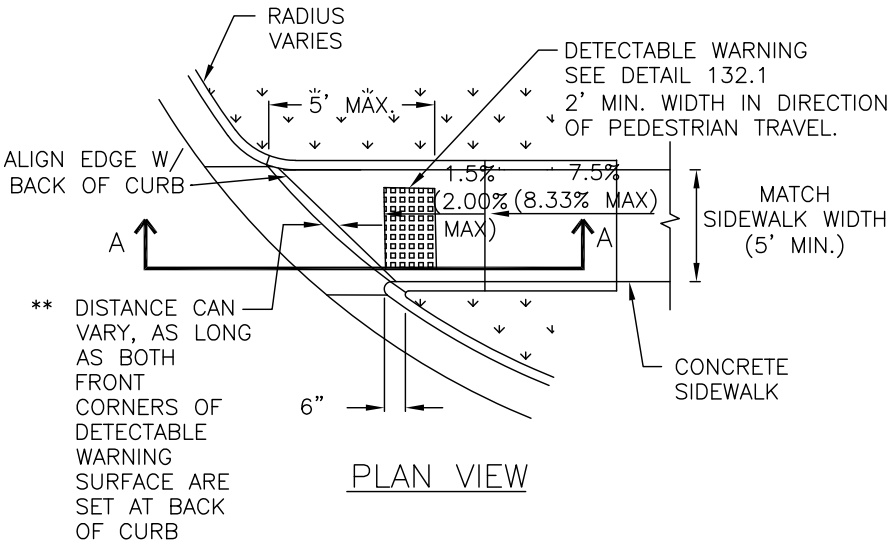
1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   - 5–FOOT SIDEWALKS WITH CURB RADII OF 35 FEET OR LESS
   - 6–FOOT SIDEWALKS WITH CURB RADII OF 30 FEET OR LESS
   - 8–FOOT SIDEWALKS WITH CURB RADII OF 25 FEET OR LESS
2. DIRECTIONAL RAMPS MAY BE USED WHEN AN 8–FOOT PLANTING STRIP IS PROVIDED. DO NOT USE THIS DETAIL IF THERE IS HARDSCAPE INSTEAD OF A PLANTING STRIP.
3. ALL CONCRETE SHALL BE AT LEAST 3600 PSI.

NOT TO SCALE

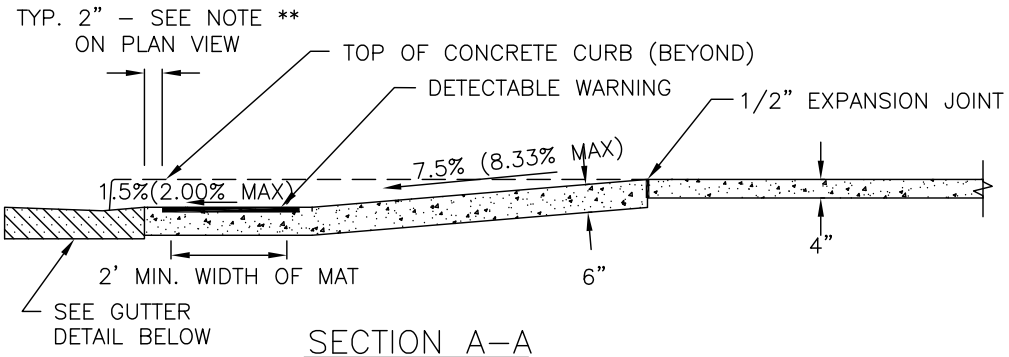
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

DIRECTIONAL ACCESSIBLE RAMP WITH SMALL/MEDIUM CURB RADII

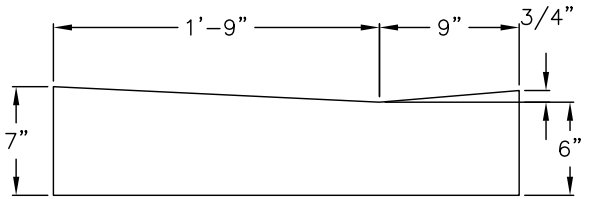
STD. NO.	REV.
136.1	3/24



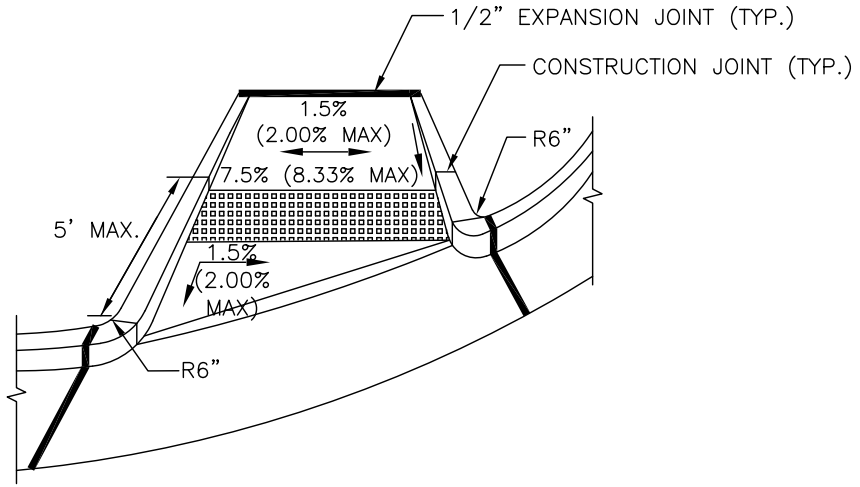
PLAN VIEW



SECTION A–A



GUTTER DETAIL



PERSPECTIVE

NOTES:

1. USE THIS DETAIL ONLY UNDER THE FOLLOWING CIRCUMSTANCES:
   - 5–FOOT SIDEWALKS WITH CURB RADII GREATER THAN 35 FEET
   - 6–FOOT SIDEWALKS WITH CURB RADII GREATER THAN 30 FEET
   - 8–FOOT SIDEWALKS WITH CURB RADII GREATER THAN 25 FEET
2. DIRECTIONAL RAMPS MAY BE USED WHEN A MIN. 8–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 3600 PSI.

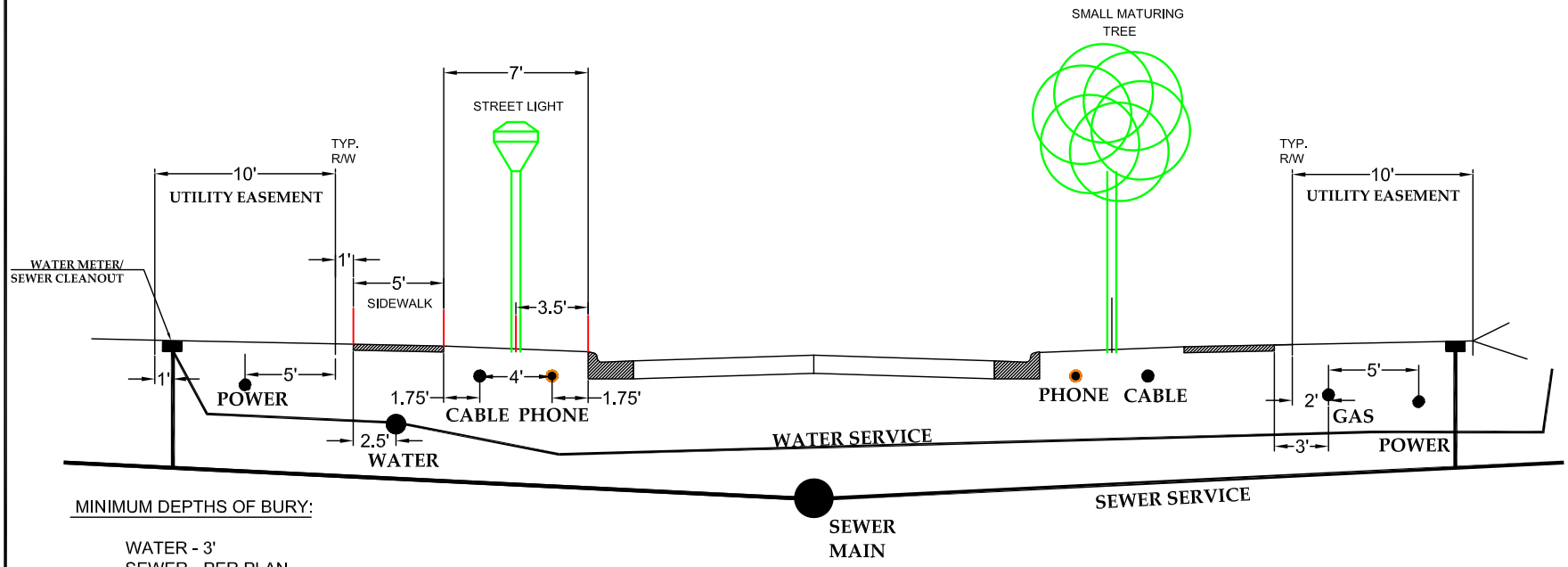
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	DIRECTIONAL ACCESSIBLE RAMP WITH LARGE CURB RADIUS

STD. NO.	REV.
137.1	3/24

A. THIS DETAIL IS A REFERENCE FOR UTILITY PLACEMENT ONLY, REFER TO RESIDENTIAL STREET TYPICAL DETAILS 200.1-210.4 FOR RIGHT OF WAY AND PAVEMENT SECTION INFORMATION BASED ON TYPE OF STREET BEING CONSTRUCTED.
B. STREET LIGHTS AND TREES SHOWN ON OPPOSITE SIDE OF STREET FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO SITE PLAN FOR ACTUAL LOCATIONS.
C. REFER TO SECTION "H" OF DESIGN CRITERIA FOR PLACEMENT OF CLUSTER MAILBOX UNITS, AS WELL AS DETAILS 720.1-723.1.

1. GAS MAIN SHALL BE ON OPPOSITE SIDE OF STREET FROM WATER MAIN.
2. STREET TREES SHALL BE SMALL MATURING SPECIES 2" CALIPER
3. STREET TREES TO MAINTAIN A MINIMUM OFFSET DISTANCE OF 20' FROM STREET LIGHTS AND STOP SIGNS.
4. LIGHT POLES AND STREET TREES SHALL MAINTAIN A MINIMUM OFFSET DISTANCE OF 5' FROM WATER AND SEWER SERVICE LINES.
5. CABLE AND TELEPHONE PEDESTALS SHALL BE LOCATED WITHIN THE UTILITY EASEMENT, ALONG THE SIDE LOT LINES.

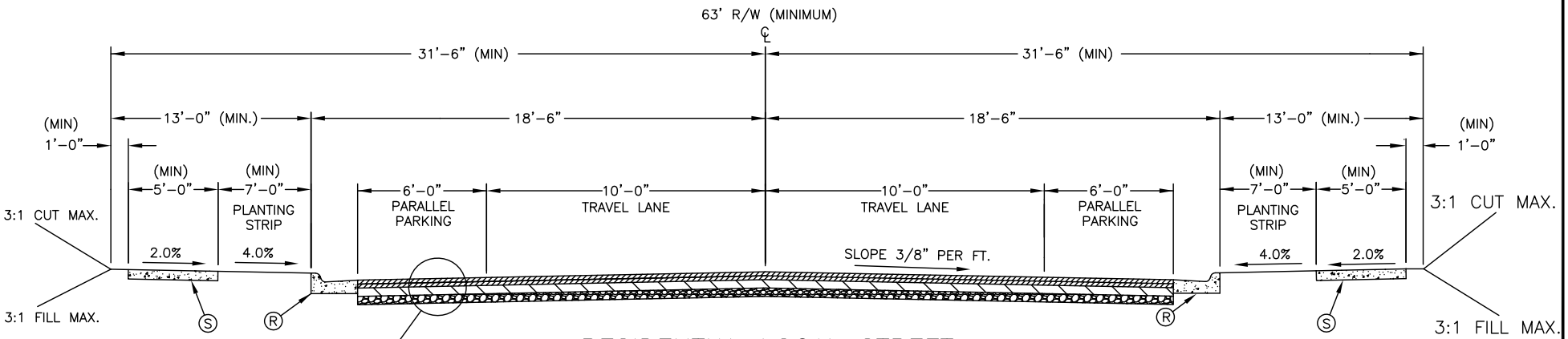


MINIMUM DEPTHS OF BURY:

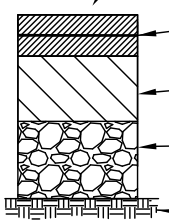
WATER - 3'
SEWER - PER PLAN
GAS - 2.5'
POWER - 3'
CABLE - 1.5'
PHONE - 1.5'

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL SUBDIVISION UTILITY LAYOUT TYPICAL SECTION	REV. DATE 1/22 STD. NO. 200.0



RESIDENTIAL LOCAL STREET



SURFACE COURSE
2 – 1.5" S9.5C – LIFTS

INTERMEDIATE COURSE
4" I19.0C

BASE COURSE
8" ABC OR 5.5" B25.0C

SUBGRADE
TOP 8" SUBGRADE LIFT
COMPACTED TO 100%

TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. REFER TO STANDARD DRAWING 710.1 & 711.1 FOR PARALLEL PARKING LAYOUT.

4. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

KEY

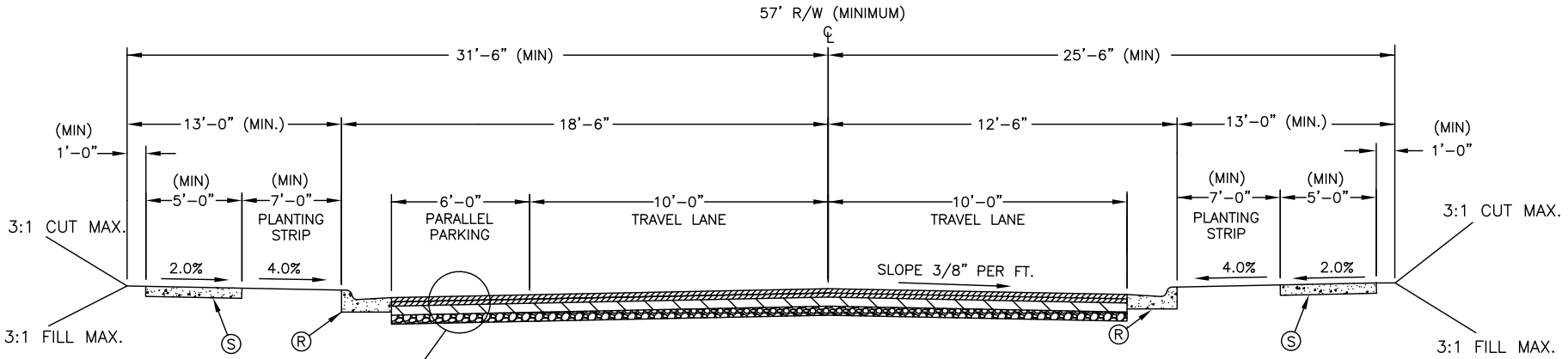
Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK

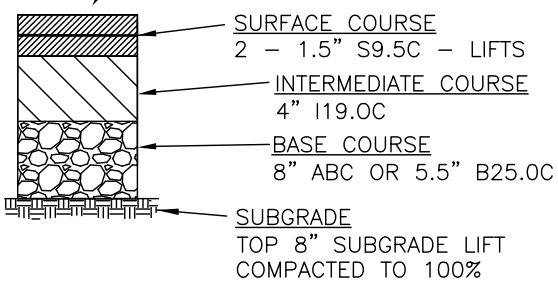
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET PARKING ON BOTH SIDES OF STREET TYPICAL SECTION

REV. DATE
3/24
STD. NO.
200.1



RESIDENTIAL LOCAL STREET



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

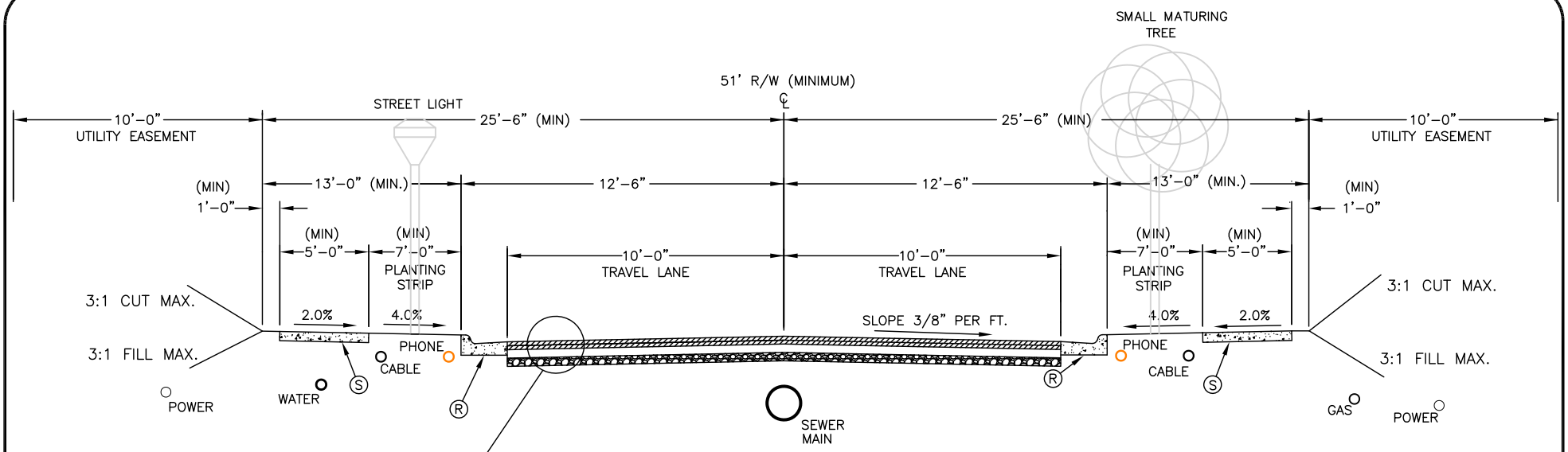
3. 2'–0" VALLEY GUTTER MAY BE SUBSTITUTED FOR 2'–6" CURB AND GUTTER ON THE SIDE OF THE STREET WITHOUT PARALLEL PARKING. THIS REDUCES THE MINIMUM RIGHT–OF–WAY BY SIX INCHES. 2'–0" VALLEY GUTTER MAY NOT BE SUBSTITUTED FOR 2'–6" CURB AND GUTTER ON THE SIDE OF THE STREET WITH PARALLEL PARKING.

4. REFER TO STANDARD DRAWING 710.1 & 711.1 FOR PARALLEL PARKING LAYOUT.

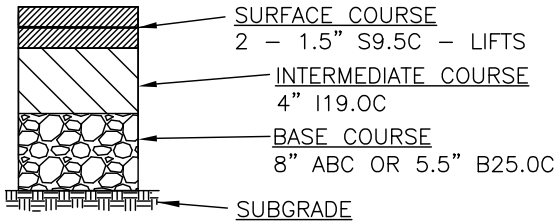
5. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET PARKING ON ONE SIDE OF STREET TYPICAL SECTION	REV. DATE 3/24 STD. NO. 200.2



RESIDENTIAL LOCAL STREET



SURFACE COURSE
2 – 1.5" S9.5C – LIFTS

INTERMEDIATE COURSE
4" I19.0C

BASE COURSE
8" ABC OR 5.5" B25.0C

SUBGRADE
TOP 8" SUBGRADE LIFT COMPACTED TO 100%

TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'-6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

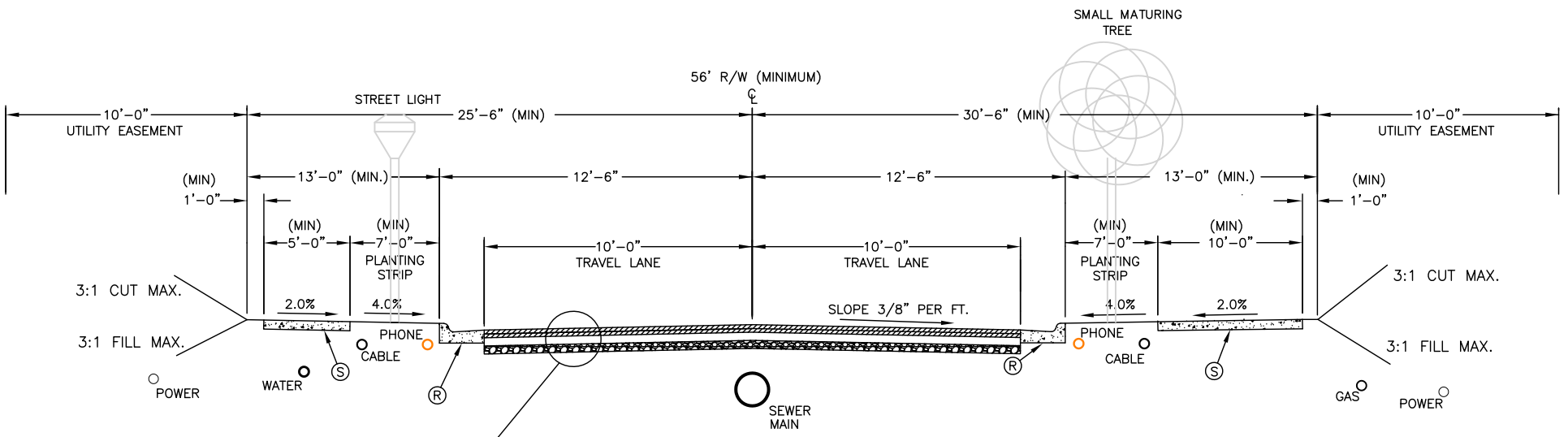
2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. 2'-0" VALLEY GUTTER MAY BE SUBSTITUTED FOR 2'-6" CURB AND GUTTER.

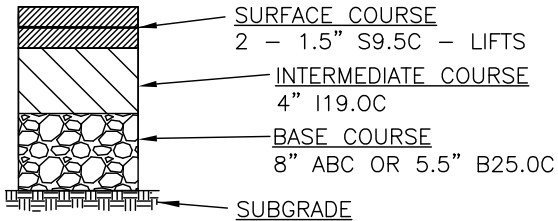
4. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET NO ON STREET PARKING TYPICAL SECTION	REV. DATE 3/24 STD. NO. 200.3



RESIDENTIAL LOCAL STREET



SURFACE COURSE
2 – 1.5" S9.5C – LIFTS

INTERMEDIATE COURSE
4" I19.0C

BASE COURSE
8" ABC OR 5.5" B25.0C

SUBGRADE
TOP 8" SUBGRADE LIFT COMPACTED TO 100%

TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON ONE SIDE OF STREET AND MULTI–USE PATH (MUP) ON THE OTHER. TYPICAL CROSS SECTION SHALL BE INCREASED 5 FEET TO ALLOW FOR ADDITIONAL WIDTH OF MUP.

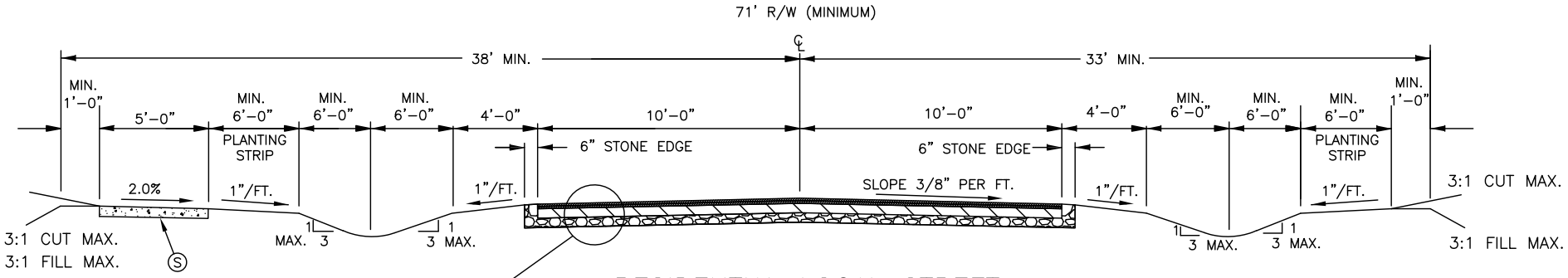
2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. 2'–0" VALLEY GUTTER MAY BE SUBSTITUTED FOR 2'–6" CURB AND GUTTER.

4. THIS IS THE MUP RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

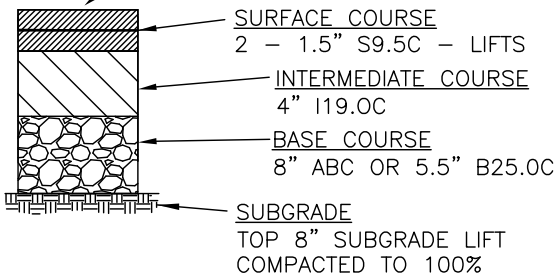
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET NO ON STREET PARKING MUP SECTION	REV. DATE 3/24
			STD. NO. 200.3A



RESIDENTIAL LOCAL STREET

(DITCH TYPE)



TYPICAL PAVEMENT SECTION

NOTES:

1. APPROVAL BY THE TOWN ENGINEER IS REQUIRED PRIOR TO USING DITCH TYPE SECTION.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. TREES TO BE PLACED IN THE GREEN ZONE 3.5 FEET FROM EDGE OF SIDEWALK.

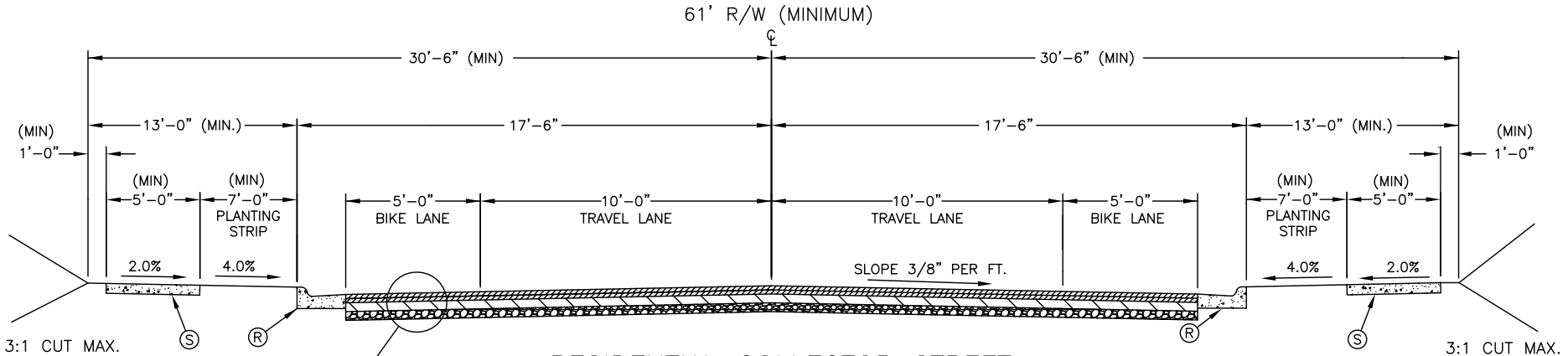
4. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

KEY

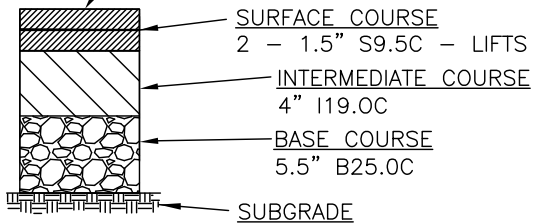
Ⓢ 4" CONCRETE SIDEWALK

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET DITCH TYPE TYPICAL SECTION	REV. DATE 3/24 STD. NO. 200.4



RESIDENTIAL COLLECTOR STREET



TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. BIKE LANE TO BE STRIPED.

4. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

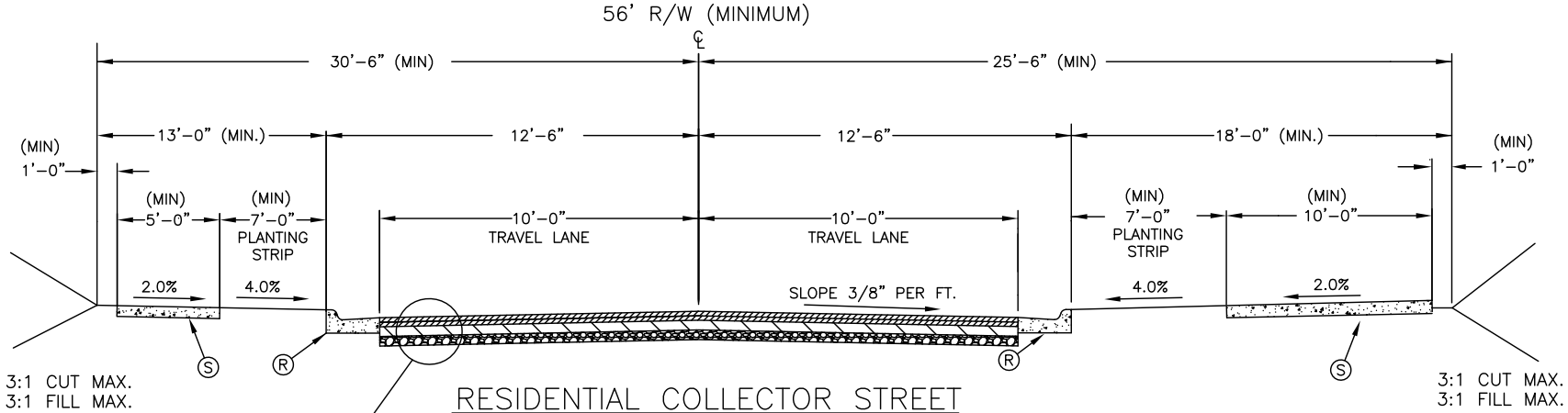
KEY

Ⓡ 2'-6" STD. CURB AND GUTTER

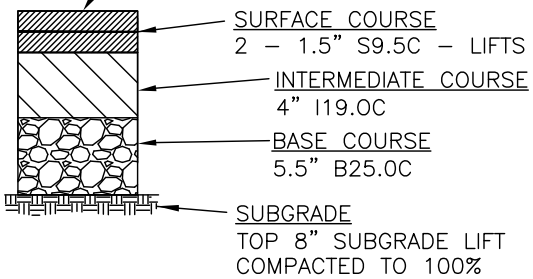
Ⓢ 4" CONCRETE SIDEWALK

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL COLLECTOR STREET WITH BIKE LANES TYPICAL SECTION	REV. DATE 3/24 STD. NO. 210.1



RESIDENTIAL COLLECTOR STREET



TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON ONE SIDE OF STREET AND MULTI–USE PATH (MUP) ON THE OTHER. TYPICAL CROSS SECTION SHALL BE MODIFIED FOR ADDITION OF MUP AND REMOVAL OF BIKE LANES

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. THIS IS A MODIFIED RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

KEY

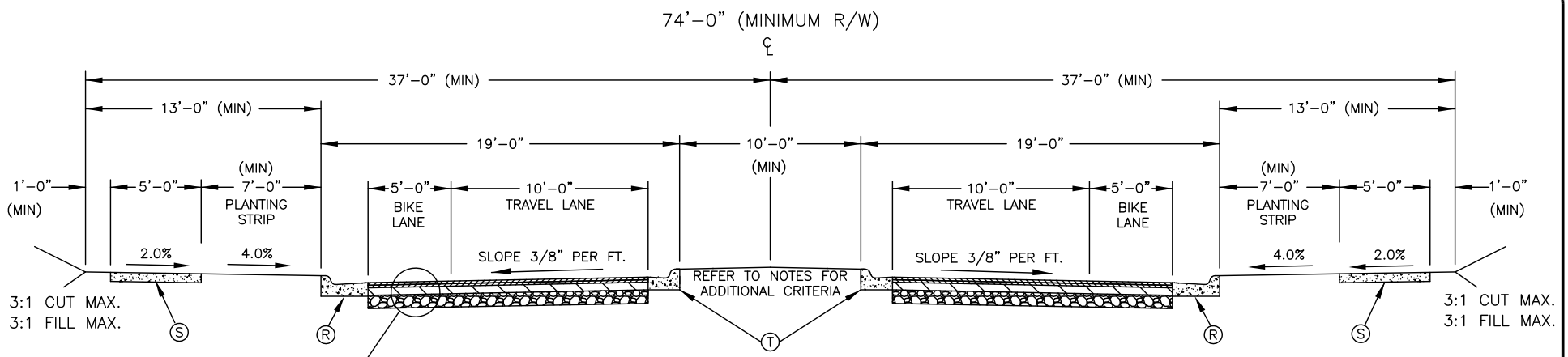
Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

NOT TO SCALE

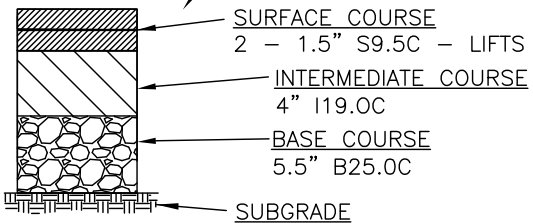
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL COLLECTOR STREET MUP SECTION

REV. DATE
3/24
STD. NO.
210.1A



RESIDENTIAL DIVIDED COLLECTOR STREET

(TWO LANE SECTION)



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'-6" STD. CURB AND GUTTER
Ⓢ 4" CONCRETE SIDEWALK
Ⓣ 1'-6" MEDIAN CURB AND GUTTER

NOTES:

1. CURB RETURN RADIUS DIMENSIONS AT INTERSECTIONS MAY VARY DEPENDING ON MEDIAN WIDTH AND WILL BE APPROVED ON A CASE BY CASE BASIS.

2. SUBDRAINS ARE REQUIRED ON ALL MEDIANS. (TO BE TIED INTO STORM DRAINAGE SYSTEM.) REFER TO 312.1.

3. MEDIAN PLANTINGS SHALL NOT OBSTRUCT INTERSECTION SIGHT DISTANCE REQUIREMENTS.

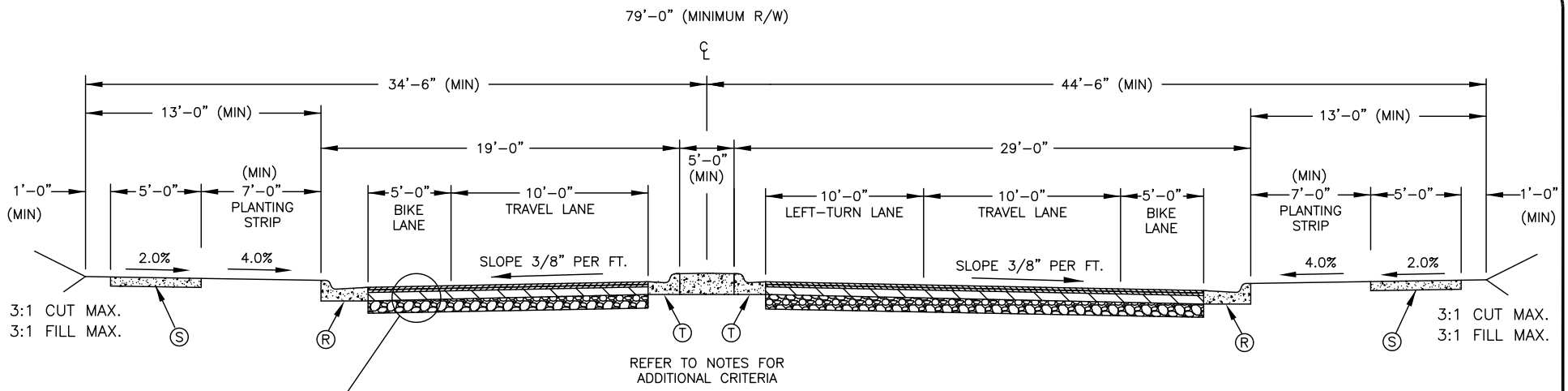
4. A TEN (10) FOOT WIDE MEDIAN IS REQUIRED FOR SMALL MATURING TREES. A TWENTY (20) FOOT WIDE MEDIAN IS REQUIRED FOR LARGE MATURING TREES.

5. BIKE LANE TO BE STRIPED.

6. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

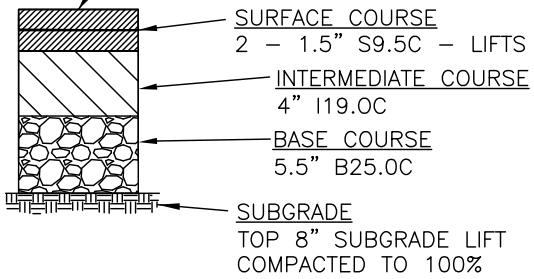
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL DIVIDED COLLECTOR STREET TYPICAL SECTION	REV. DATE 3/24 STD. NO. 210.2



RESIDENTIAL DIVIDED COLLECTOR STREET

(TWO LANE SECTION)



TYPICAL PAVEMENT SECTION

KEY

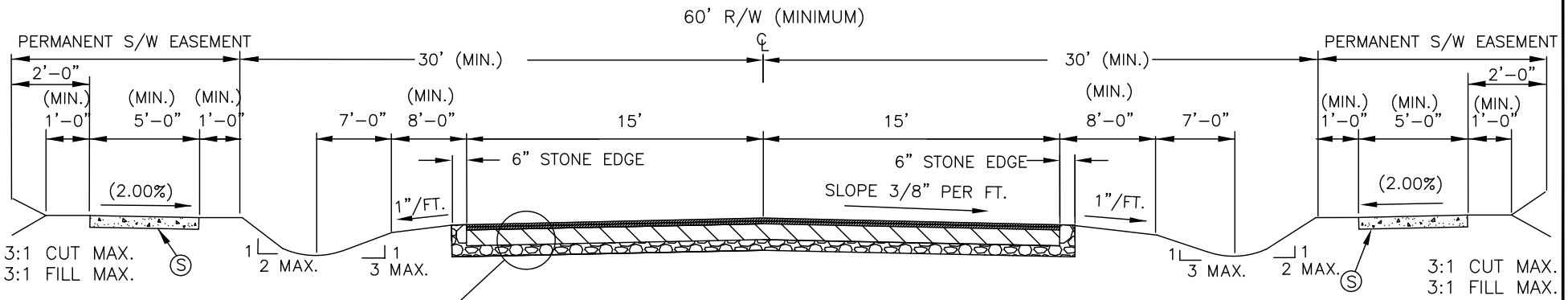
- Ⓡ 2'-6" STANDARD CURB AND GUTTER
- Ⓢ 4" CONCRETE SIDEWALK
- Ⓣ 1'-6" MEDIAN CURB AND GUTTER

NOTES:

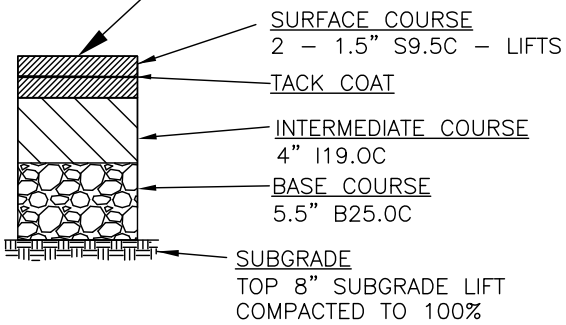
1. CURB RETURN RADIUS DIMENSIONS AT INTERSECTIONS MAY VARY DEPENDING ON MEDIAN WIDTH AND WILL BE APPROVED ON A CASE BY CASE BASIS.
2. SUBDRAINS ARE REQUIRED ON ALL MEDIANS. (TO BE TIED INTO STORM DRAINAGE SYSTEM.) REFER TO SUBDRAIN STANDARD DETAIL 312.1.
3. MEDIAN PLANTINGS SHALL NOT OBSTRUCT INTERSECTION SIGHT DISTANCE REQUIREMENTS.
4. TEN (10) FOOT WIDE MEDIANS CAN ACCOMMODATE SMALL MATURING TREES. TWENTY (20) FOOT WIDE MEDIAN IS REQUIRED FOR LARGE MATURING TREES.
5. MONOLITHIC CONCRETE MEDIANS WITH BEVELED EDGES AND A MINIMUM WIDTH OF 6 FEET CAN BE USED IN LIEU OF LANDSCAPED MEDIANS.
6. BIKE LANE TO BE STRIPED.
7. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.
8. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.
9. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL DIVIDED COLLECTOR STREET WITH LEFT-TURN LANE TYPICAL SECTION	REV. DATE 3/24 STD. NO. 210.3



RESIDENTIAL COLLECTOR STREET



TYPICAL MINIMUM PAVEMENT SECTION
(SEE NOTE 4.)

KEY

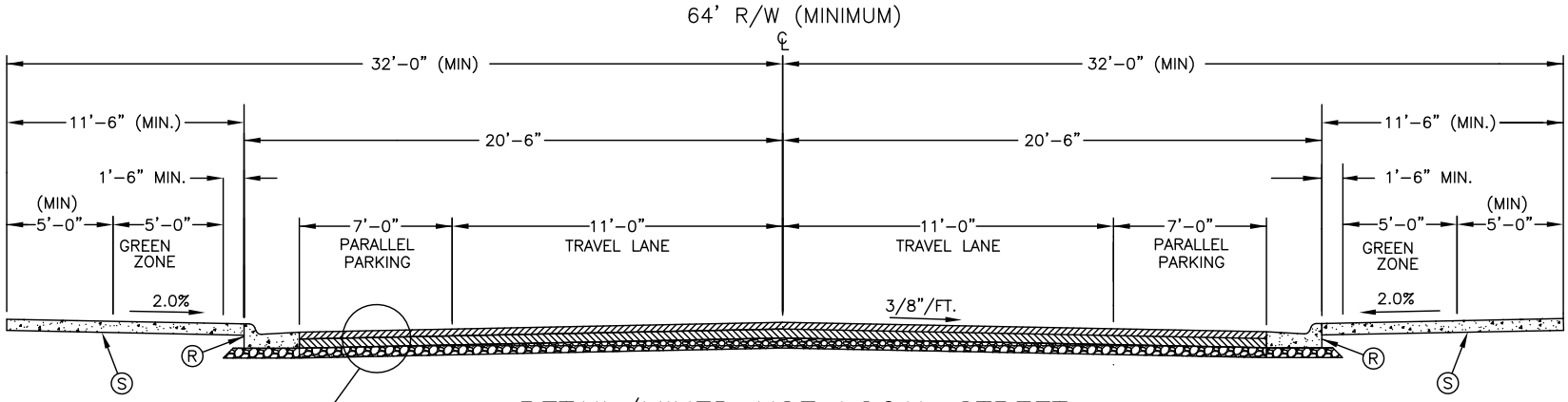
Ⓢ 4" CONCRETE SIDEWALK/MUP

NOTES:

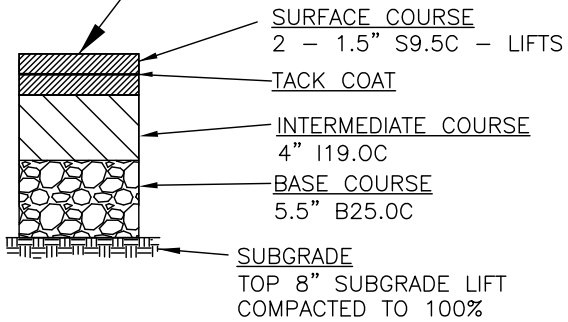
1. SIDEWALK SHALL BE ON BOTH SIDES OF STREET AND LOCATED ON LOT SIDE OF DITCH.
2. SIDEWALK LOCATED OUTSIDE OF STREET RIGHT OF WAY SHALL HAVE A 5 FOOT PERMANENT SIDEWALK EASEMENT.
3. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.
4. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.
5. APPROVAL BY THE TOWN ENGINEER IS REQUIRED PRIOR TO USING DITCH TYPE SECTION.
6. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY TOWN ENGINEER BASED ON SPECIFIC TRAFFIC PARAMETERS.
7. THIS IS THE TYPICAL RESIDENTIAL CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL COLLECTOR STREET DITCH TYPE STREET TYPICAL SECTION COMPREHENSIVE STREET CLASSIFICATION SYSTEM (CLASS V)	STD. NO. 210.4	REV. 3/24



RETAIL/MIXED USE LOCAL STREET



TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. REFER TO STANDARD DRAWINGS 602.1 – 605.1 REGARDING SIDEWALK AROUND TREE GRATES. TREE GRATES SHALL BE PROVIDED WHEN TREES ARE LOCATED IN THE GREEN ZONE.

5. BASE COURSE TO EXTEND SIX INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.

6. REFER TO STANDARD DRAWING 285.1 FOR PARALLEL PARKING LAYOUT.

7. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

KEY

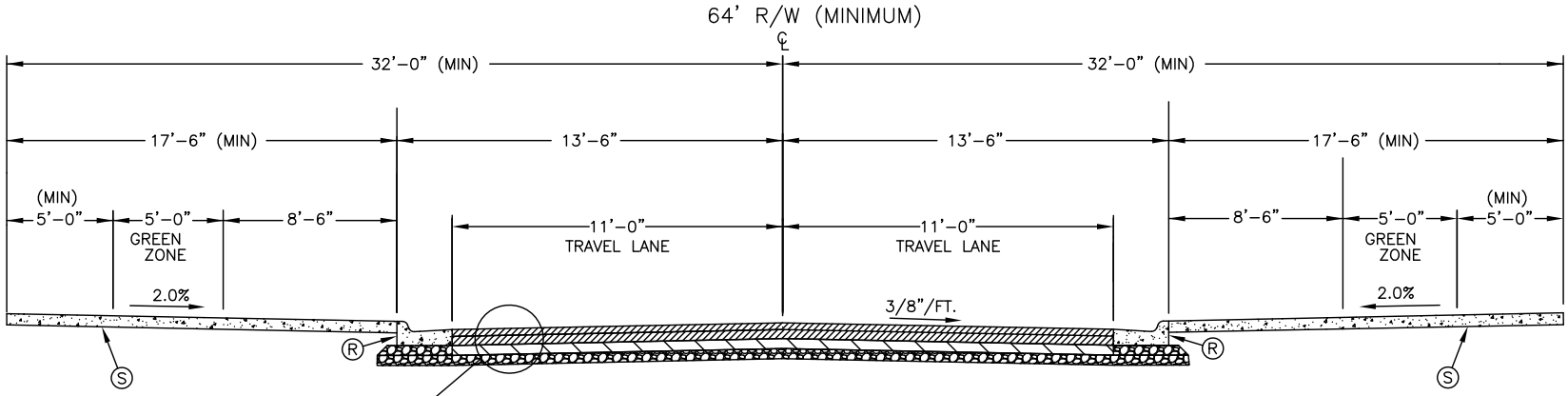
Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

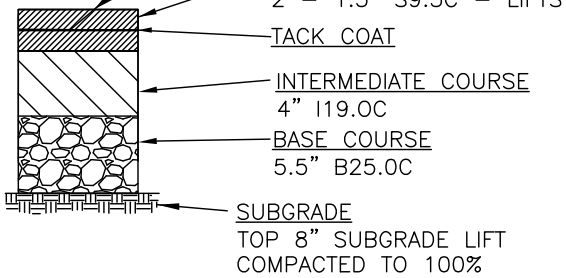
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE LOCAL STREET PARKING ON BOTH SIDES OF STREET TYPICAL SECTION

REV. DATE
3/24
STD. NO.
220.1



RETAIL/MIXED USE LOCAL STREET



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. REFER TO STANDARD DRAWINGS 602.1 – 605.1 REGARDING SIDEWALK AROUND TREE GRATES. TREE GRATES SHALL BE PROVIDED WHEN TREES ARE LOCATED IN THE GREEN ZONE.

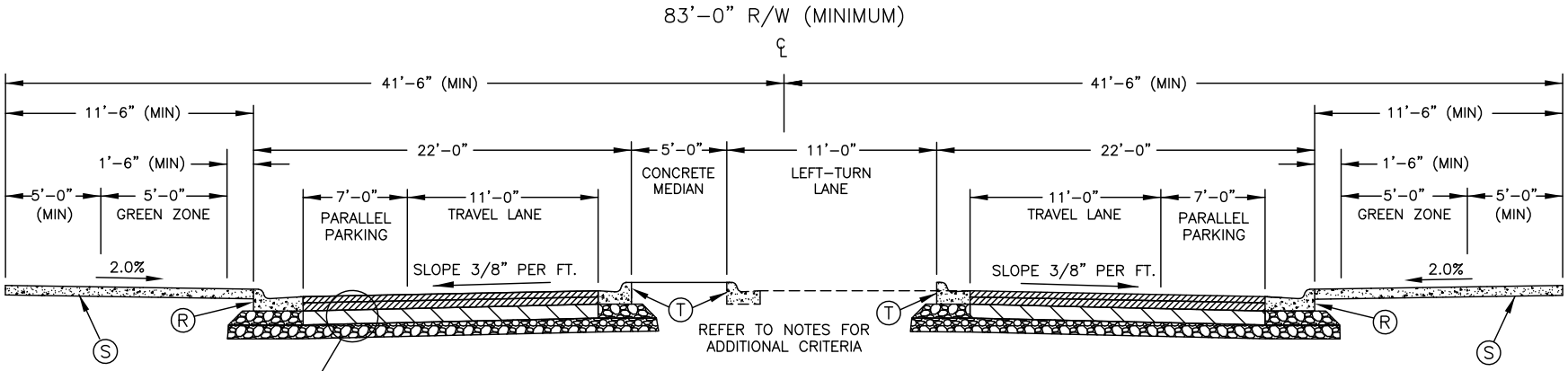
5. BASE COURSE TO EXTEND SIX INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.

6. DRAWING TO BE USED IN CONJUNCTION WITH STANDARD 220.1 AND 285.1.

7. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

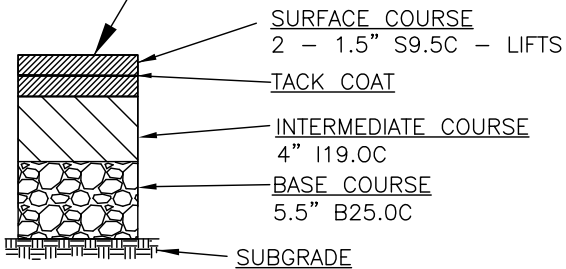
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE LOCAL STREET NO PARKING TYPICAL SECTION	REV. DATE 3/24 STD. NO. 220.2



RETAIL/MIXED USE LOCAL STREET

(TWO LANE SECTION)



TYPICAL PAVEMENT SECTION

KEY

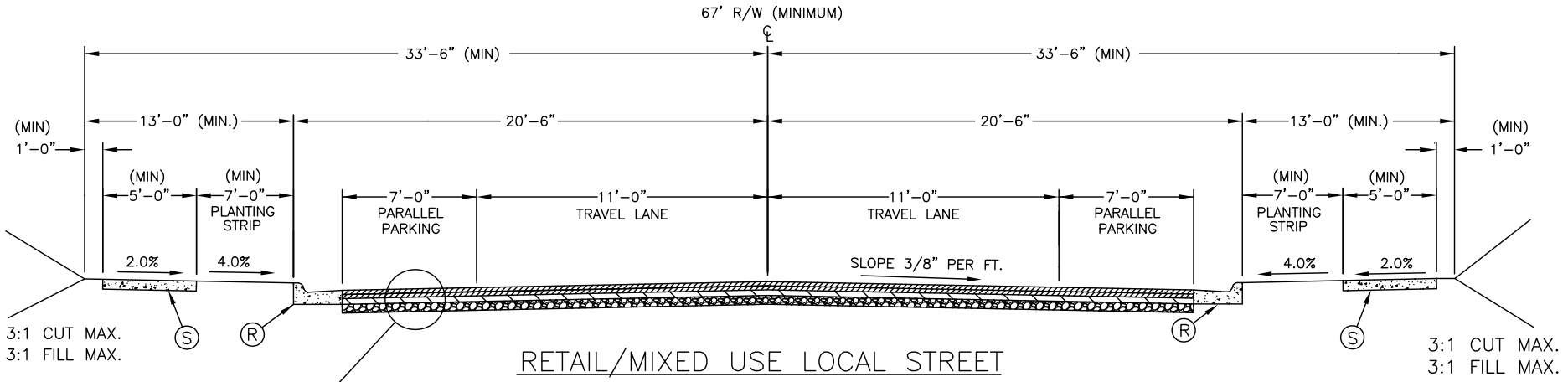
- (R) 2'–6" STANDARD CURB AND GUTTER
- (S) 4" CONCRETE SIDEWALK/MUP
- (T) 1'–6" MEDIAN CURB AND GUTTER

NOTES:

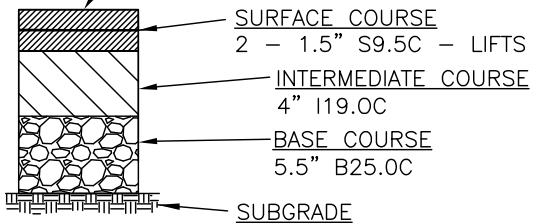
1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.
2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.
3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.
4. REFER TO STANDARD DRAWINGS 602.1 – 605.1 REGARDING SIDEWALK AROUND TREE GRATES. TREE GRATES SHALL BE PROVIDED WHEN TREES ARE LOCATED IN THE GREEN ZONE.
5. FOR MEDIAN DIVIDED FACILITIES, A MINIMUM SIXTEEN (16) FOOT WIDE MEDIAN WITH ONE FOOT SIX INCH CURB AND GUTTER IS NEEDED. WHERE A LEFT–TURN LANE IS NOT INSTALLED, THE MEDIAN SHALL BE LANDSCAPED.
6. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.
7. REFER TO STANDARD DRAWING 285.1 FOR PARALLEL PARKING LAYOUT.
8. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE LOCAL STREET WITH MEDIAN AND PARKING TYPICAL SECTION	REV. DATE 3/24 STD. NO. 220.3



RETAIL/MIXED USE LOCAL STREET



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'–6" STD. CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

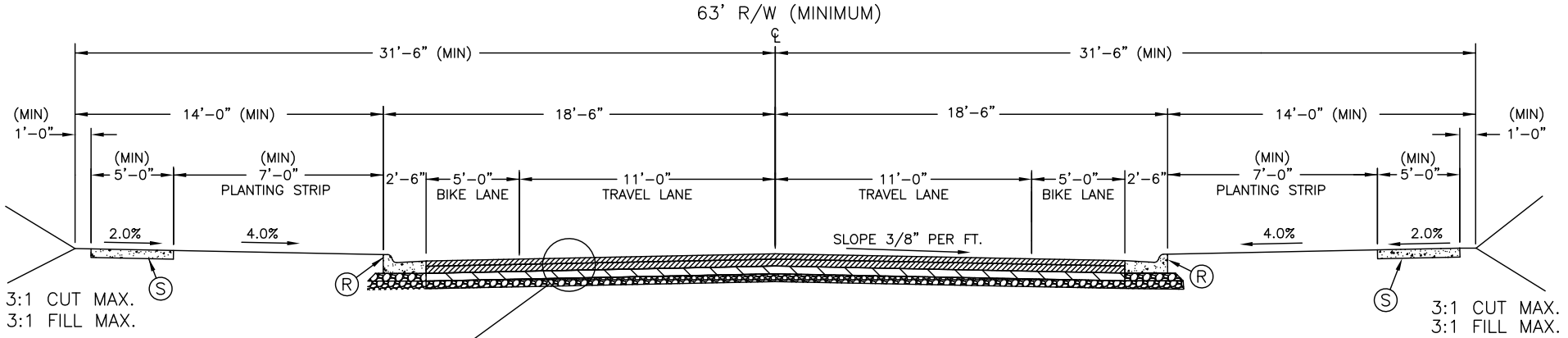
4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FOURTY–FIVE DEGREE ANGLE.

5. REFER TO STANDARD DRAWING 285.1 FOR PARALLEL PARKING LAYOUT.

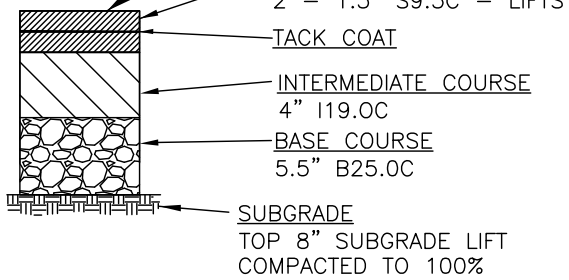
6. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE LOCAL STREET PARKING AND GREEN ZONE ON BOTH SIDES TYPICAL SECTION	REV. DATE 3/24
			STD. NO. 220.4



RETAIL/MIXED USE COLLECTOR STREET



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'-6" STANDARD CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 210.1A FOR ALTERNATIVE MUP DESIGN.

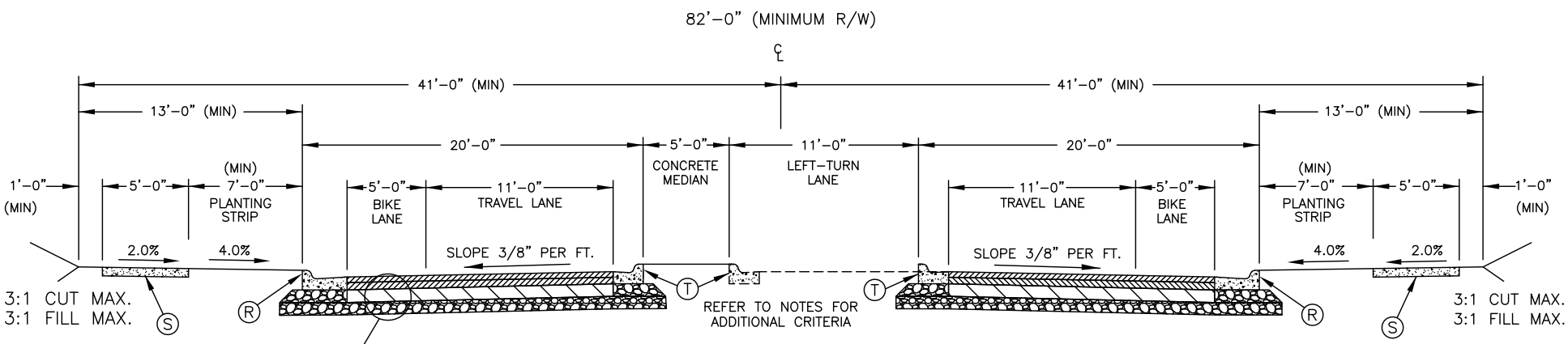
4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY-FIVE DEGREE ANGLE.

5. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

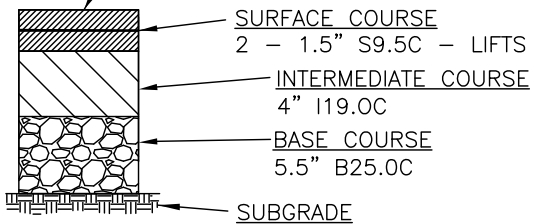
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE COLLECTOR STREET WITH BIKE LANES TYPICAL SECTION

REV. DATE
3/24
STD. NO.
230.1



RETAIL/MIXED USE COLLECTOR STREET

(TWO LANE SECTION)



TYPICAL PAVEMENT SECTION

KEY

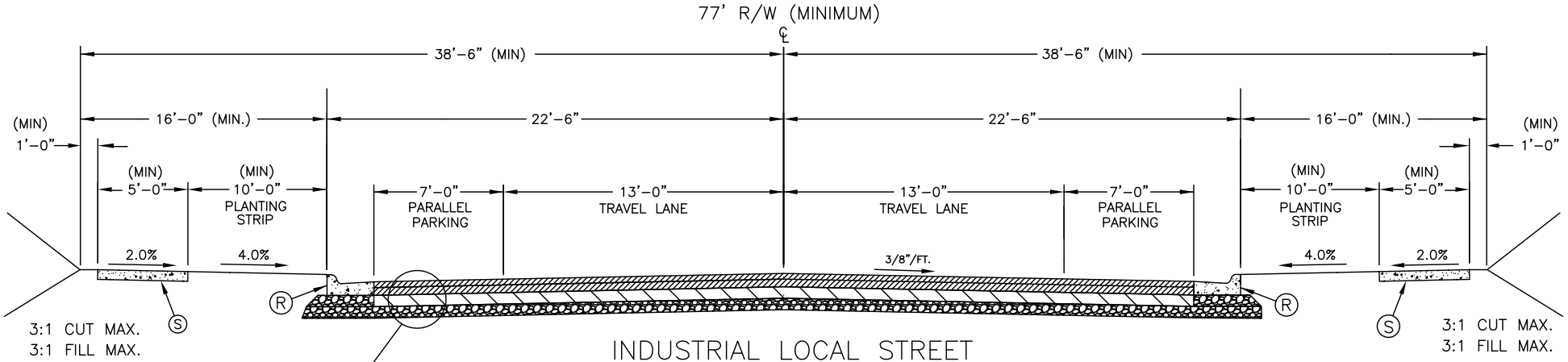
- (R) 2'–6" STANDARD CURB AND GUTTER
- (S) 4" CONCRETE SIDEWALK/MUP
- (T) 1'–6" MEDIAN CURB AND GUTTER

NOTES:

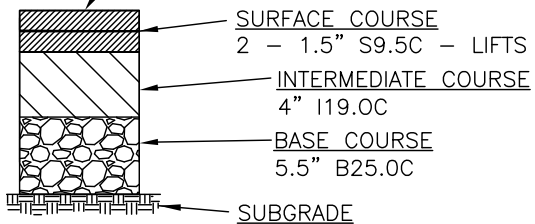
1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.
2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.
3. SEE DETAIL 210.1A FOR ALTERNATIVE MUP DESIGN.
4. FOR MEDIAN DIVIDED FACILITIES, A MINIMUM SIXTEEN (16) FOOT WIDE MEDIAN WITH ONE FOOT SIX INCH CURB AND GUTTER IS NEEDED. IF A LEFT–TURN LANE IS NOT NEEDED, THE MEDIAN SHALL BE LANDSCAPED.
5. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.
6. THIS IS THE TYPICAL RETAIL/MIXED USE LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RETAIL/MIXED USE COLLECTOR STREET WITH MEDIAN AND BIKE LANES TYPICAL SECTION	REV. DATE 3/24 STD. NO. 230.2



INDUSTRIAL LOCAL STREET



TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.

5. TREE TO BE PLANTED FOUR FEET FROM SIDEWALK.

6. THIS IS THE TYPICAL INDUSTRIAL LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

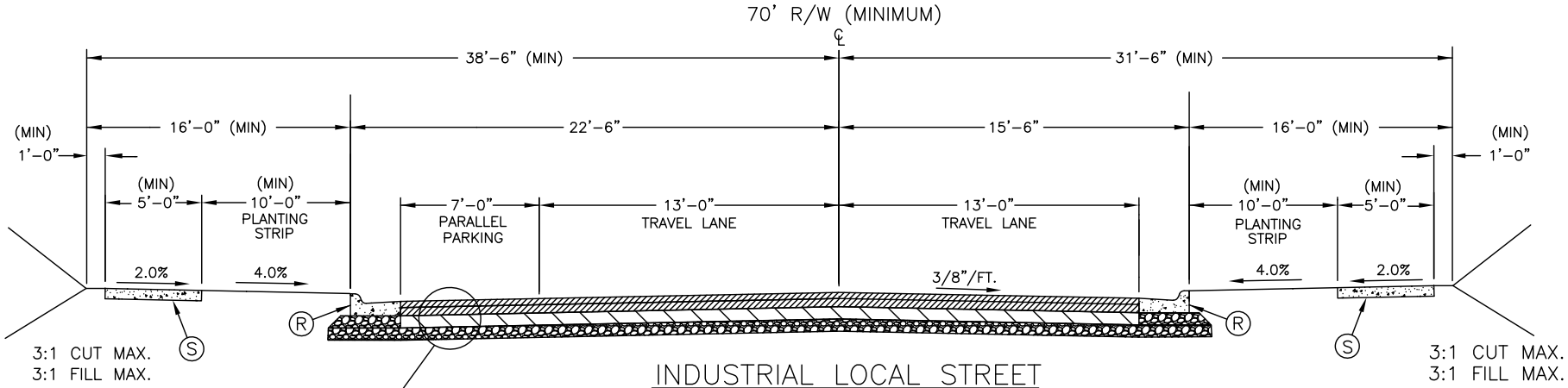
KEY

(R) 2'–6" STANDARD CURB AND GUTTER

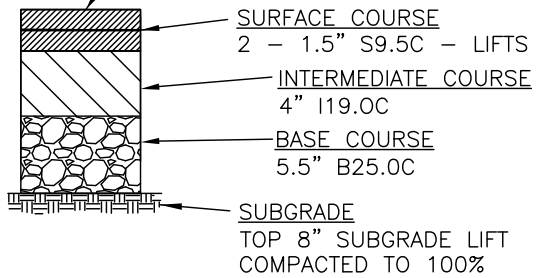
(S) 4" CONCRETE SIDEWALK/MUP

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INDUSTRIAL LOCAL STREET PARKING ON BOTH SIDES OF STREET TYPICAL SECTION	REV. DATE 3/24 STD. NO. 240.1



INDUSTRIAL LOCAL STREET



TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.

5. TREE TO BE PLANTED FOUR FEET FROM SIDEWALK.

6. THIS IS THE TYPICAL INDUSTRIAL LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

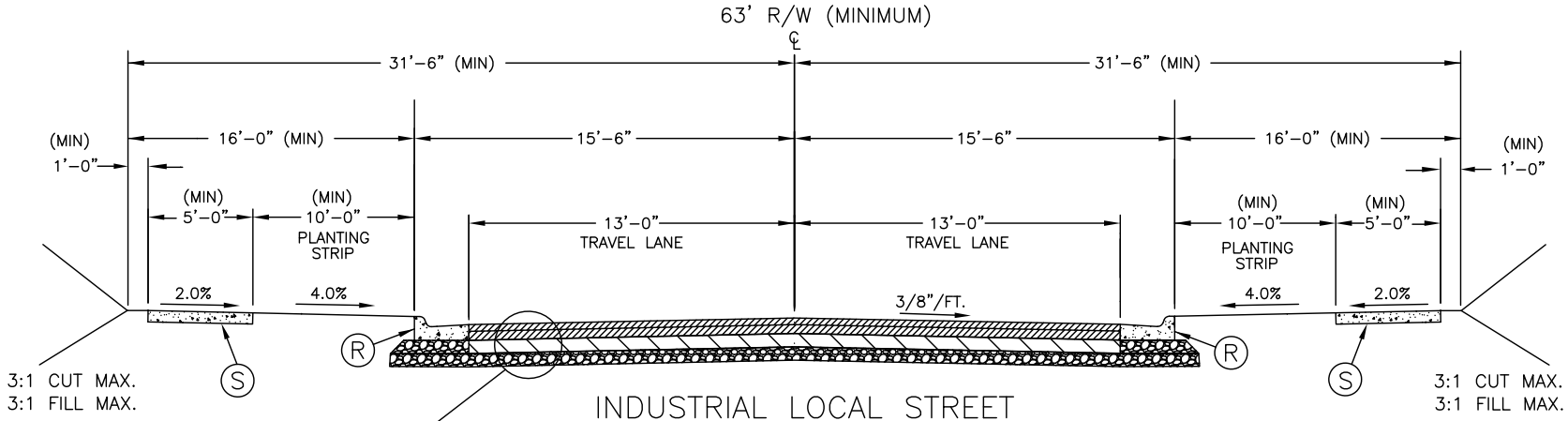
KEY

Ⓡ 2'–6" STANDARD CURB AND GUTTER

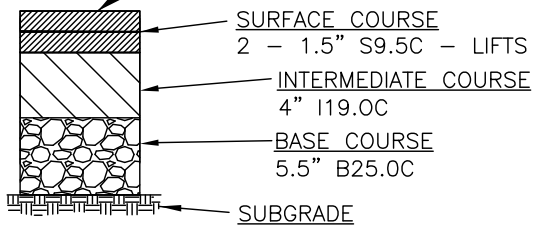
Ⓢ 4" CONCRETE SIDEWALK/MUP

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INDUSTRIAL LOCAL STREET PARKING ON ONE SIDE OF STREET TYPICAL SECTION	REV. DATE 3/24 STD. NO. 240.2



INDUSTRIAL LOCAL STREET



SURFACE COURSE
2 – 1.5" S9.5C – LIFTS

INTERMEDIATE COURSE
4" I19.0C

BASE COURSE
5.5" B25.0C

SUBGRADE
TOP 8" SUBGRADE LIFT
COMPACTED TO 100%

TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY–FIVE DEGREE ANGLE.

5. TREES TO BE PLANTED FOUR FEET FROM SIDEWALK.

6. THIS IS THE TYPICAL INDUSTRIAL LOCAL STREET CROSS SECTION. THE APPROVED PLANS MAY INCLUDE ALTERNATIVE SECTIONS THAT ARE CONSISTENT WITH THE TOWN OF WAXHAW TRAFFIC CALMING POLICY.

KEY

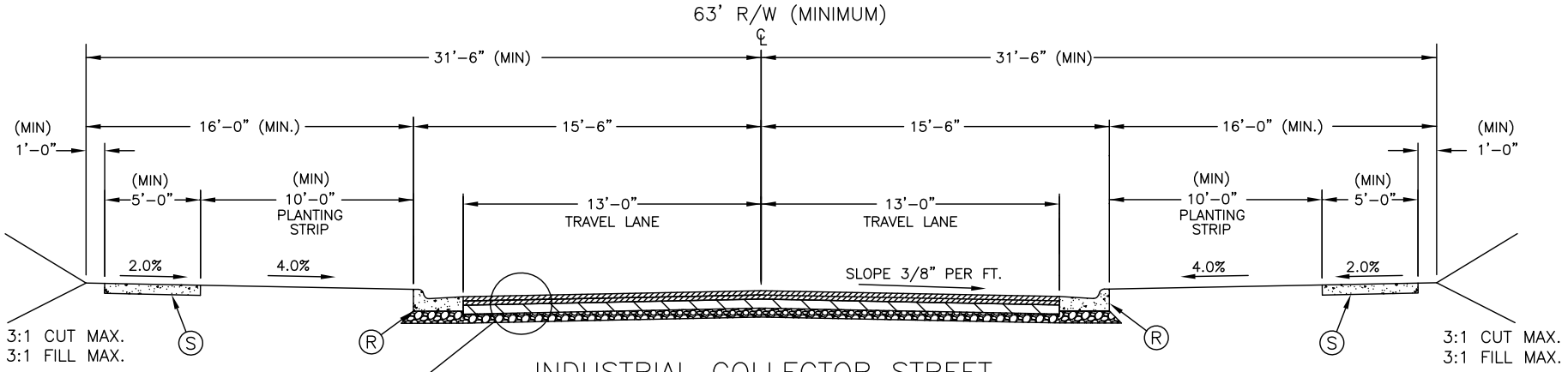
Ⓡ 2'–6" STANDARD CURB AND GUTTER

Ⓢ 4" CONCRETE SIDEWALK/MUP

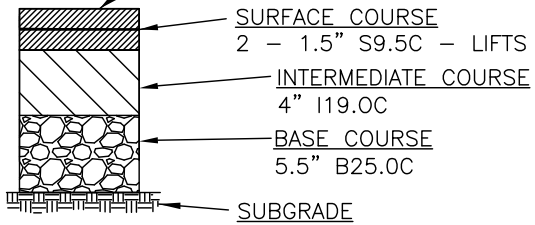
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INDUSTRIAL LOCAL STREET NO PARKING TYPICAL SECTION

REV. DATE
3/24
STD. NO.
240.3



INDUSTRIAL COLLECTOR STREET



SURFACE COURSE
2 – 1.5" S9.5C – LIFTS

INTERMEDIATE COURSE
4" I19.0C

BASE COURSE
5.5" B25.0C

SUBGRADE
TOP 8" SUBGRADE LIFT
COMPACTED TO 100%

TYPICAL PAVEMENT SECTION

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY-FIVE DEGREE ANGLE.

5. TREES TO BE PLANTED FOUR FEET FROM SIDEWALK.

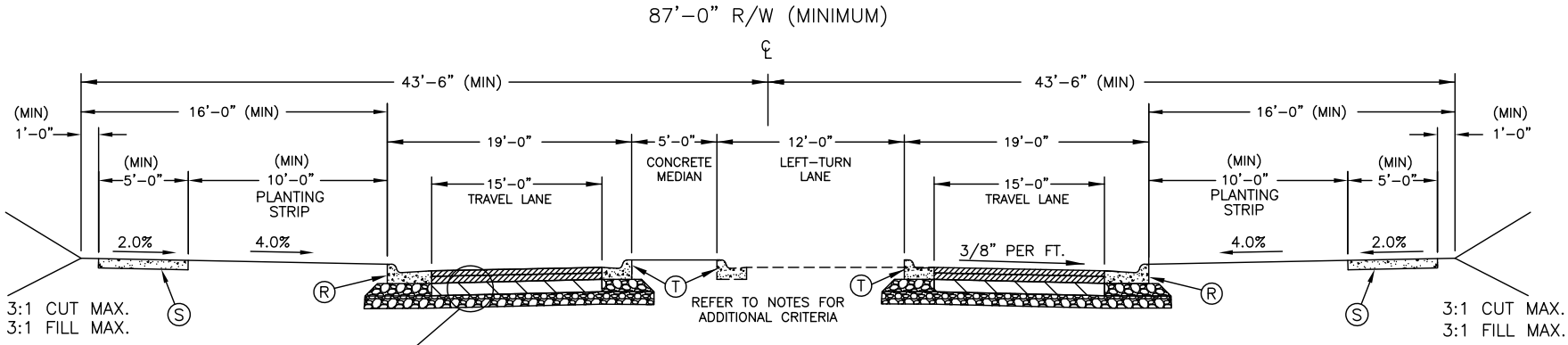
KEY

(R) 2'-6" STANDARD CURB AND GUTTER

(S) 4" CONCRETE SIDEWALK/MUP

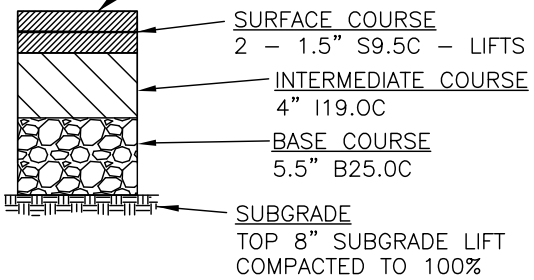
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INDUSTRIAL COLLECTOR STREET NO ON-STREET PARKING TYPICAL SECTION	REV. DATE 3/24 STD. NO. 250.1



INDUSTRIAL COLLECTOR STREET

(TWO LANE SECTION)



TYPICAL PAVEMENT SECTION

KEY

Ⓡ 2'-6" STANDARD CURB AND GUTTER
Ⓢ 4" CONCRETE SIDEWALK/MUP
Ⓣ 1'-6" MEDIAN CURB AND GUTTER

NOTES:

1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.

2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.

3. SEE DETAIL 200.3A FOR ALTERNATIVE MUP DESIGN.

4. FOR MEDIAN DIVIDED FACILITIES, A MINIMUM TWENTY (20) FOOT WIDE MEDIAN WITH ONE FOOT SIX INCH CURB AND GUTTER IS NEEDED. IF A LEFT-TURN LANE IS NOT NEEDED, THE MEDIAN SHALL BE LANDSCAPED.

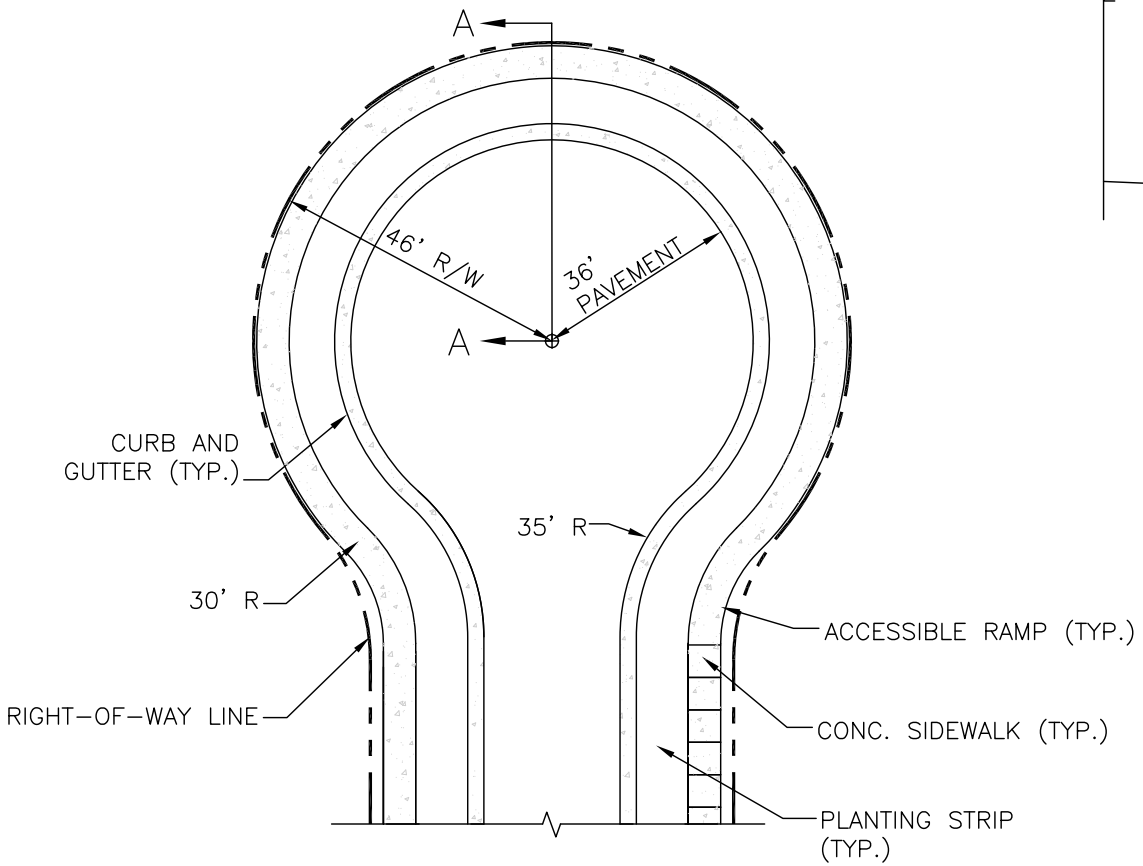
5. BASE COURSE TO EXTEND 12 INCHES BEYOND BACK OF CURB THEN TAPER OUT AT A FORTY-FIVE DEGREE ANGLE.

6. TREE TO BE PLANTED FOUR FEET FROM SIDEWALK.

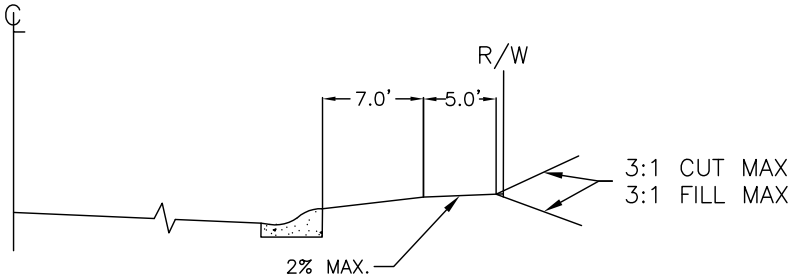
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INDUSTRIAL COLLECTOR STREET WITH MEDIAN AND NO PARKING TYPICAL SECTION

REV. DATE
3/24
STD. NO.
250.2



STANDARD CUL-DE-SAC



SECTION A-A

PLEASE NOTE: DRIVEWAY STANDARD MAX. SLOPES AND BREAKOVERS APPLY

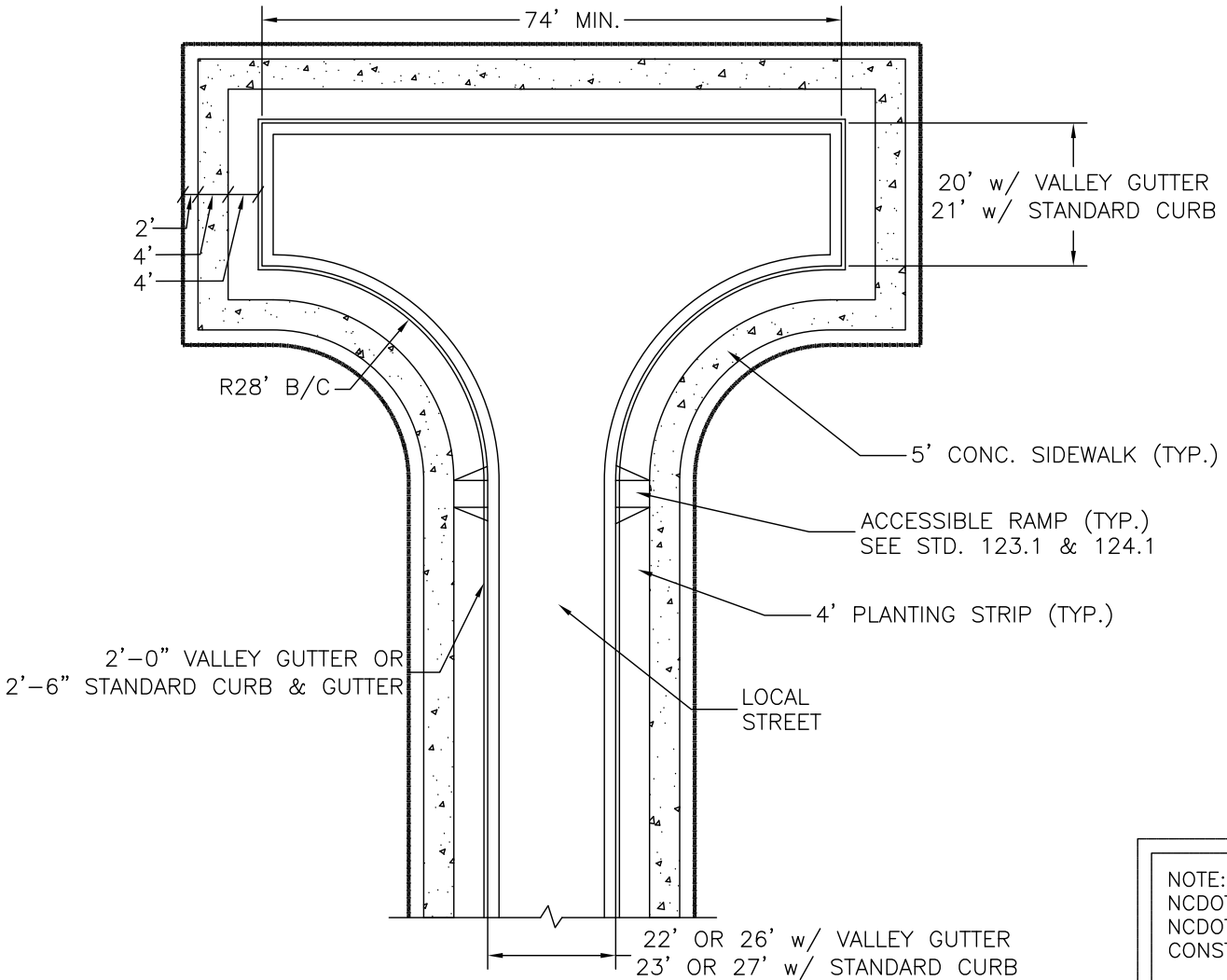
NOTES:

1. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR REVIEW AND APPROVAL.
2. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.
3. REFER TO NCDOT STANDARDS FOR DITCH TYPE STREETS.

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

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET CUL-DE-SAC DETAIL	STD. NO. 280.1	REV. 1/22



NOTES

1. THIS DESIGN ACCOMMODATES SINGLE-UNIT TRUCK BUT NOT A FIRE DEPARTMENT LADDER TRUCK. TO DESIGN FOR A LADDER TRUCK REQUIRES A HAMMERHEAD OF 120 FEET IN LENGTH.
2. VARIATIONS ON THIS DESIGN (E.G., WYES, TURNAROUNDS IN THE STEM, ROTATION OF ENTRY POINT, ETC.) CAN BE SUBMITTED TO TOWN ENGINEER FOR REVIEW AND APPROVAL ON A CASE-BY-CASE BASIS.

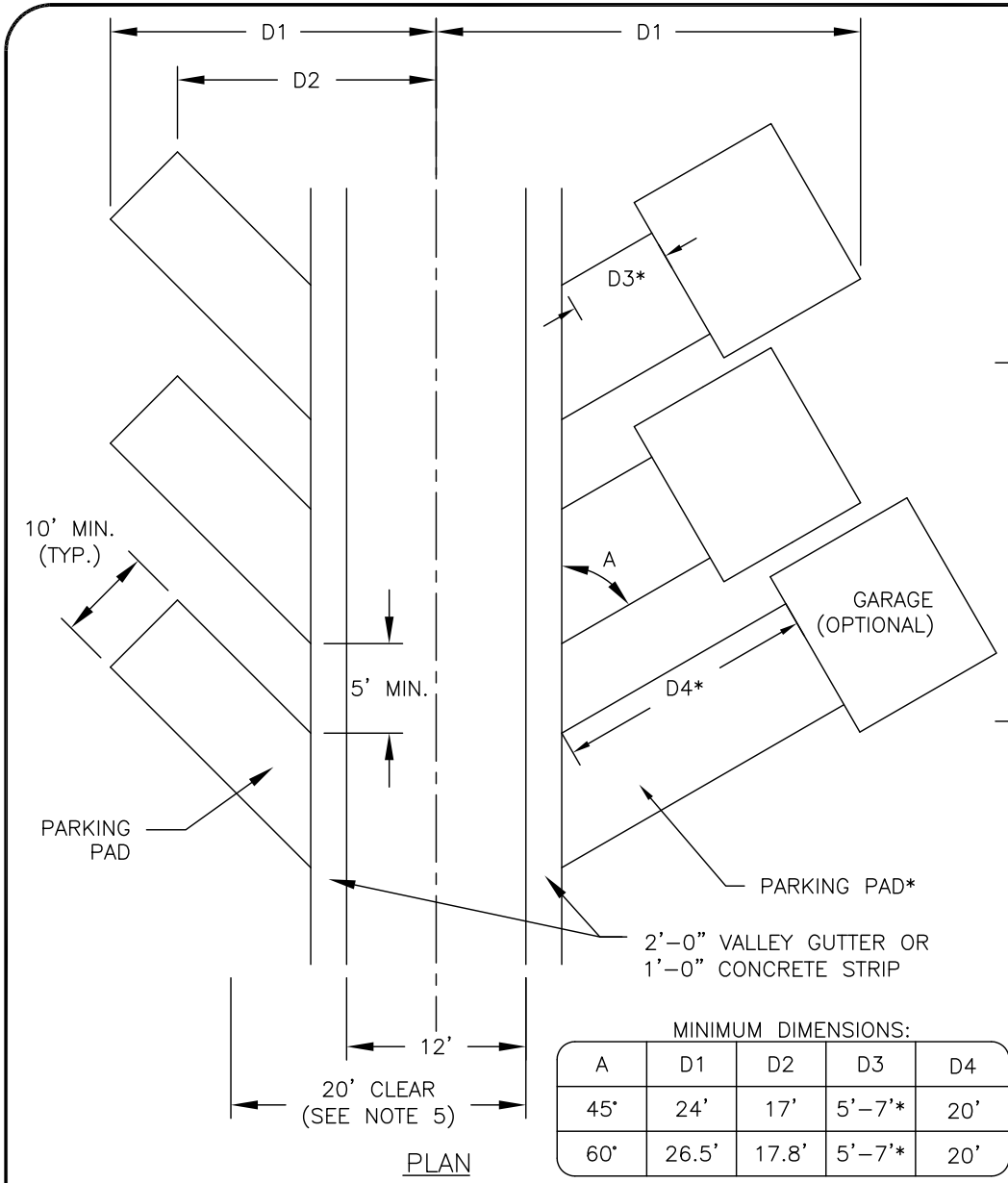
NOTE: THIS DETAIL IS NOT FOR USE ON NCDOT-MAINTAINED STREETS. REFER TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS MANUAL.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

RETAIL/MIXED USE LOCAL STREET HAMMERHEAD DETAIL

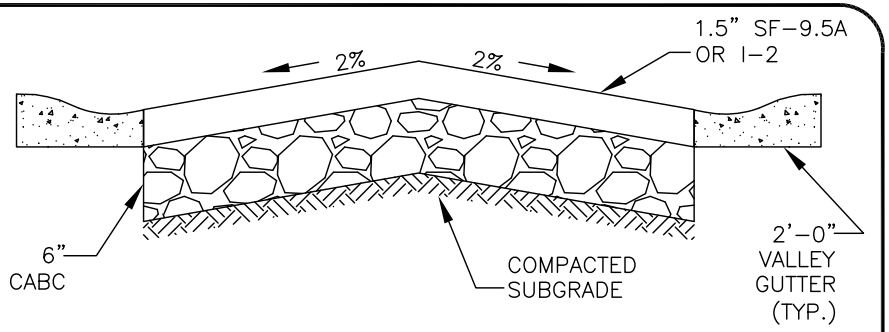
STD. NO.	REV.
280.2	8/19



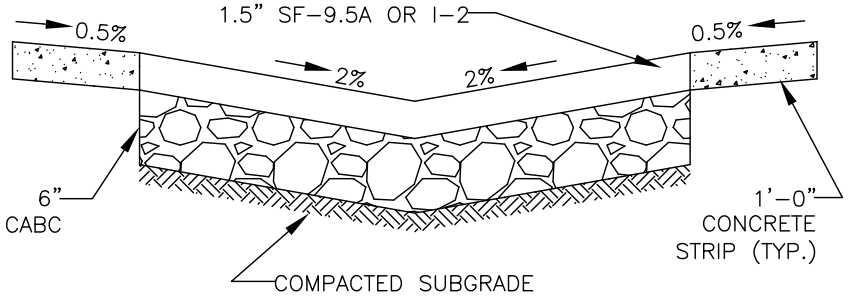
PLAN

MINIMUM DIMENSIONS:

A	D1	D2	D3	D4
45°	24'	17'	5'–7'*	20'
60°	26.5'	17.8'	5'–7'*	20'



ALLEY WITH NORMAL CROWN



ALLEY WITH INVERSE CROWN

NOTES:

1. SUBGRADE SHALL BE COMPACTED TO PUBLIC STREET STANDARDS.
2. STORM DRAINAGE (NOT SHOWN) SHALL BE PROVIDED AS NECESSARY.
3. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE TOWN OF WAXHAW.
4. DRIVEWAYS SHALL BE SEPARATED BY AT LEAST 5 FEET, OR GREATER IF REQUIRED BY PLANNING (LOT SIZE) REQUIREMENTS AND/OR N.C. BUILDING CODE.
5. DETAIL APPLIES TO SINGLE– OR DOUBLE–LOADED ALLEYS. FOR SINGLE–LOADED ALLEYS, THERE SHALL BE A 20–FOOT CLEAR ZONE FREE OF CUT SLOPES, OBSTRUCTIONS, HEDGES, ETC. FROM THE LOADED SIDE EDGE OF PAVEMENT.

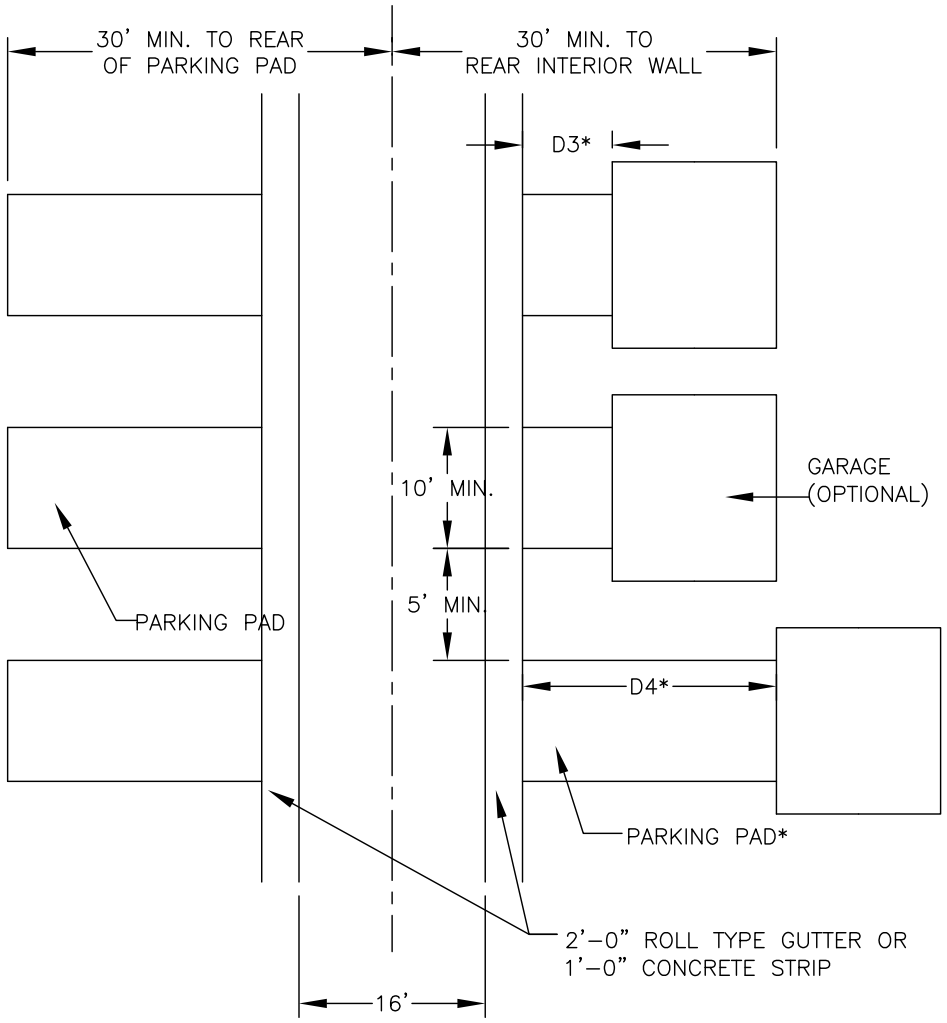
* WITH NO PARKING PAD, DIMENSION D3 IS REQUIRED TO BE MINIMUM 5' BUT NO GREATER THAN 7'. WITH PARKING PAD, DIMENSION D4 IS REQUIRED TO BE A MINIMUM OF 20'.

NOT TO SCALE

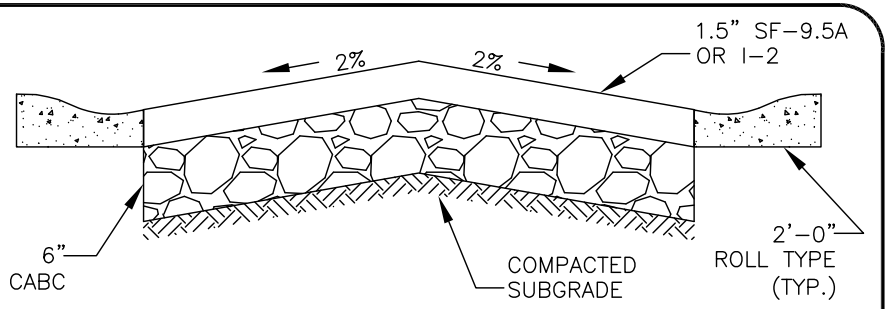
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

RESIDENTIAL ALLEY DETAIL
ONE–WAY OPERATION

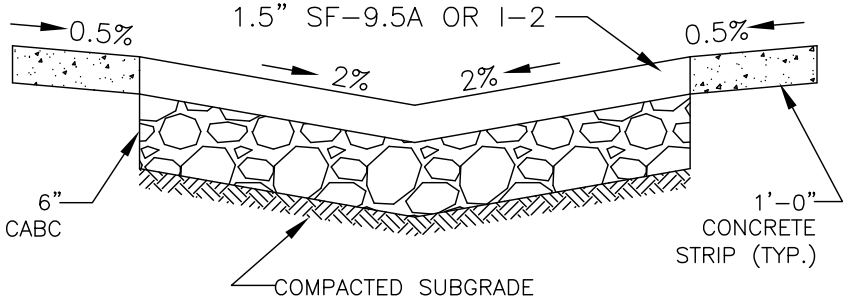
STD. NO.	REV.
280.3	3/24



PLAN



ALLEY WITH NORMAL CROWN



ALLEY WITH INVERSE CROWN

NOTES:

1. SUBGRADE SHALL BE COMPACTED TO PUBLIC STREET STANDARDS.
2. STORM DRAINAGE (NOT SHOWN) SHALL BE PROVIDED AS NECESSARY.
3. ALLEYS SHALL BE CONSIDERED PRIVATE EASEMENTS AND WILL NOT BE ACCEPTED FOR MAINTENANCE BY THE TOWN OF WAXHAW.
4. DRIVEWAYS SHALL BE SEPARATED BY AT LEAST 5 FEET, OR GREATER IF REQUIRED BY PLANNING (LOT SIZE) REQUIREMENTS AND/OR N.C. BUILDING CODE.

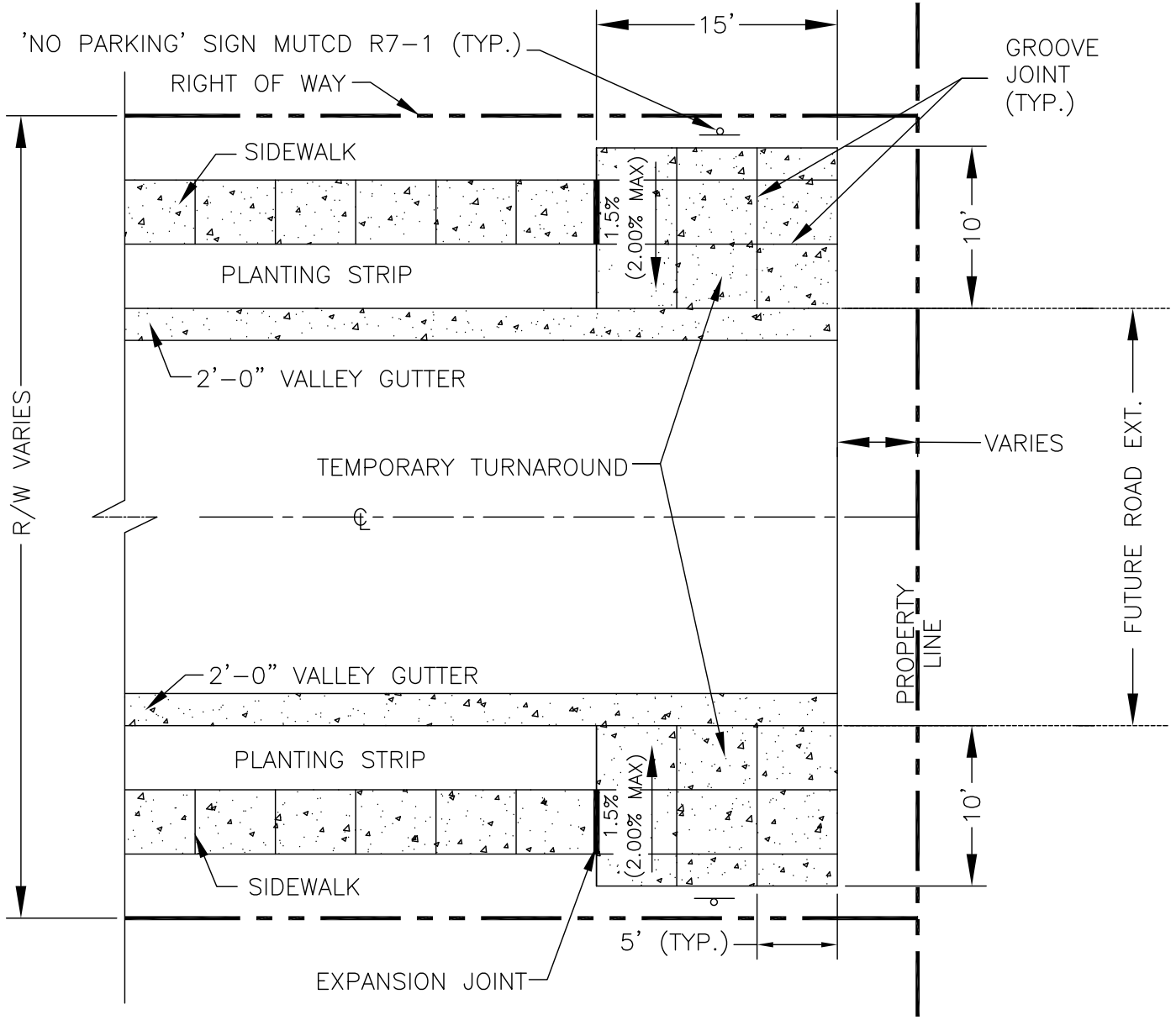
* WITH NO PARKING PAD, DIMENSION D3 IS REQUIRED TO BE MINIMUM 5' BUT NO GREATER THAN 7'. WITH PARKING PAD, DIMENSION D4 IS REQUIRED TO BE A MINIMUM OF 20'.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

RESIDENTIAL ALLEY DETAIL
DOUBLE LOADED W/ TWO-WAY OPERATION

STD. NO.	REV.
280.4	8/19



NOTES

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

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

3. NOT TO BE USED AS A PRIVATE DRIVEWAY.

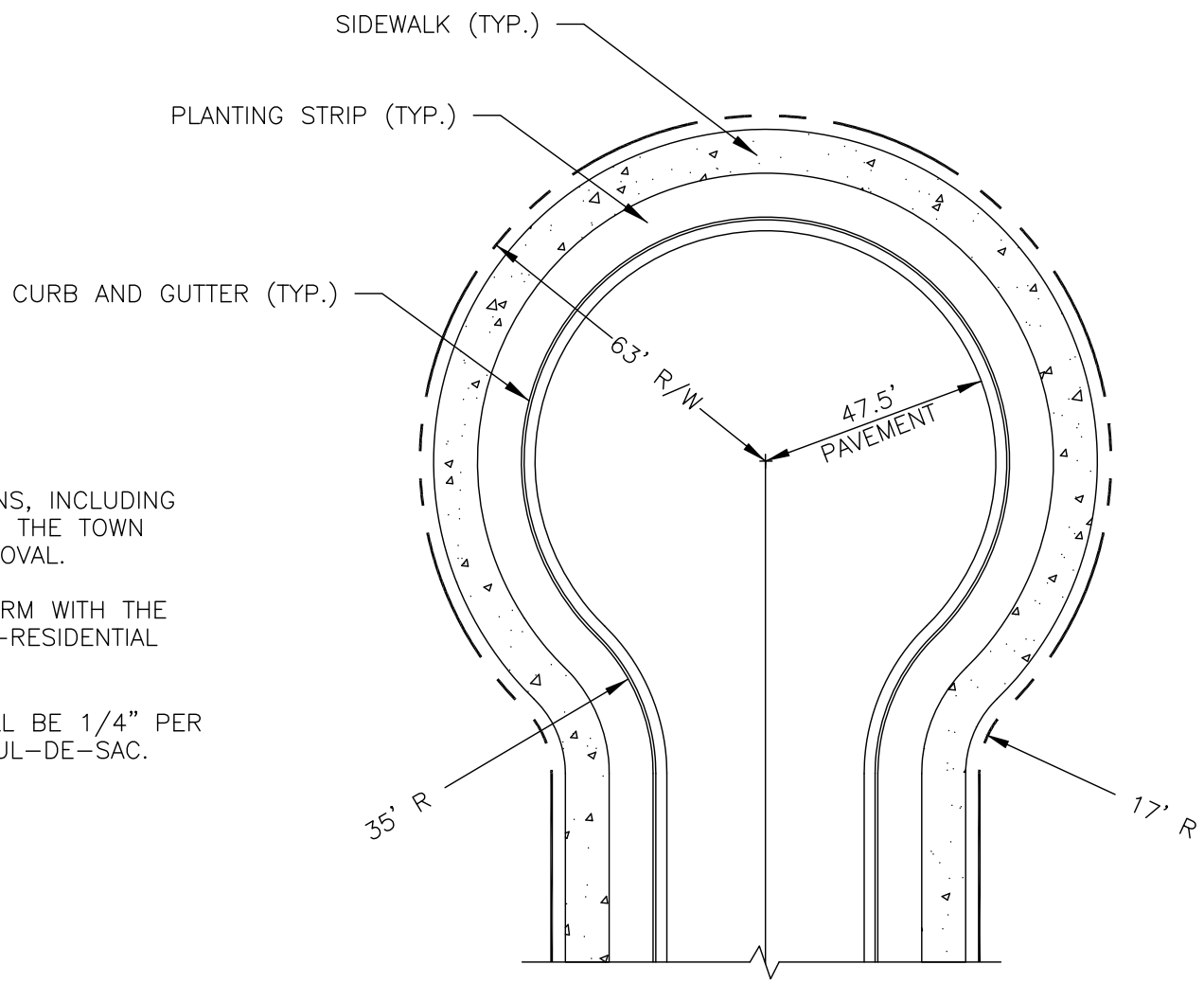
4. DEAD END STREET BARRICADE AND END OF ROADWAY MARKER PER DETAILS 705.1 THRU 709.1 ARE REQUIRED.

SCALE 1"=10'

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

TEMPORARY TURNAROUND
LOCAL RESIDENTIAL STREET (OPTIONAL)

STD. NO.	REV.
280.5	



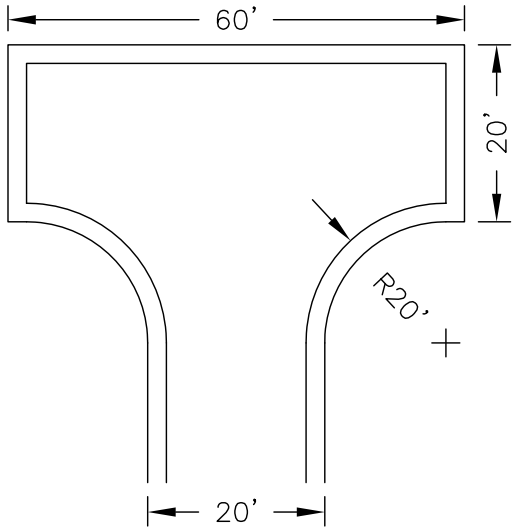
NOTES:

1. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR REVIEW AND APPROVAL.
2. PAVEMENT SECTION SHALL CONFORM WITH THE DESIGN REQUIREMENTS FOR NON-RESIDENTIAL STREETS.
3. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.

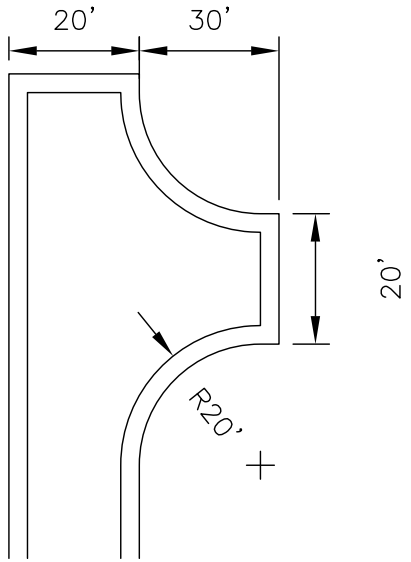
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	NON-RESIDENTIAL CUL-DE-SAC DETAIL

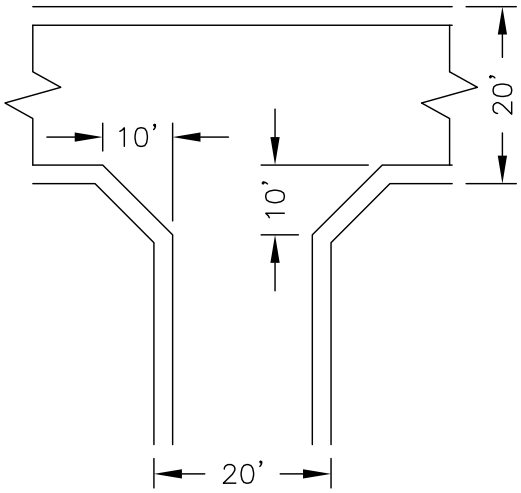
STD. NO.	REV.
280.6	8/19



STANDARD HAMMERHEAD



ROTATED HAMMERHEAD



STANDARD INTERSECTION

NOTES:

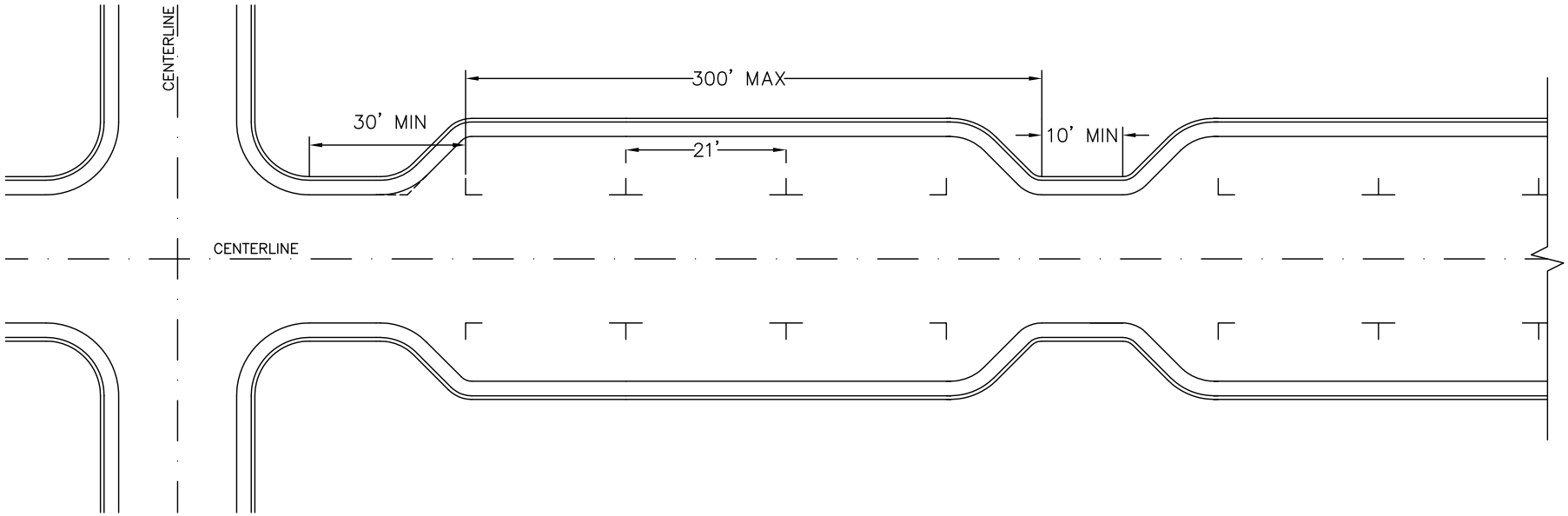
1. SEE DETAILS 280.3 & 280.4 FOR ALLEY DESIGN STANDARDS.
2. HAMMERHEAD DETAILS APPLY ONLY FOR TWO-WAY ALLEYS. ONE-WAY ALLEYS MUST CONNECT TO A PUBLIC STREET OR ANOTHER ALLEY.
3. FOR INTERSECTIONS WITH A LEAST ONE (1) ONE-WAY ALLEY, THE BACK-OF-CURB TO BACK-OF-CURB WIDTH CAN BE 16 FEET ON THE APPROPRIATE LEG(S) INSTEAD OF THE 20 FEET SHOWN.
4. OTHER INTERSECTION DESIGNS WILL BE APPROVED BY DEVELOPMENT SERVICES ON A CASE-BY-CASE BASIS.
5. THIS DETAIL DOES NOT ACCOMMODATE COMMERCIAL VEHICLES OR FIRE TRUCKS.
6. ADEQUATE STOPPING SIGHT DISTANCE (SSD) SHALL BE PROVIDED AT EACH INTERSECTION. MINIMUM SSD SHALL BE 50 FEET ASSUMING AN OPERATIONAL SPEED OF 10 MPH.

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL ALLEY HAMMERHEADS AND INTERSECTIONS

STD. NO.	REV.
280.7	

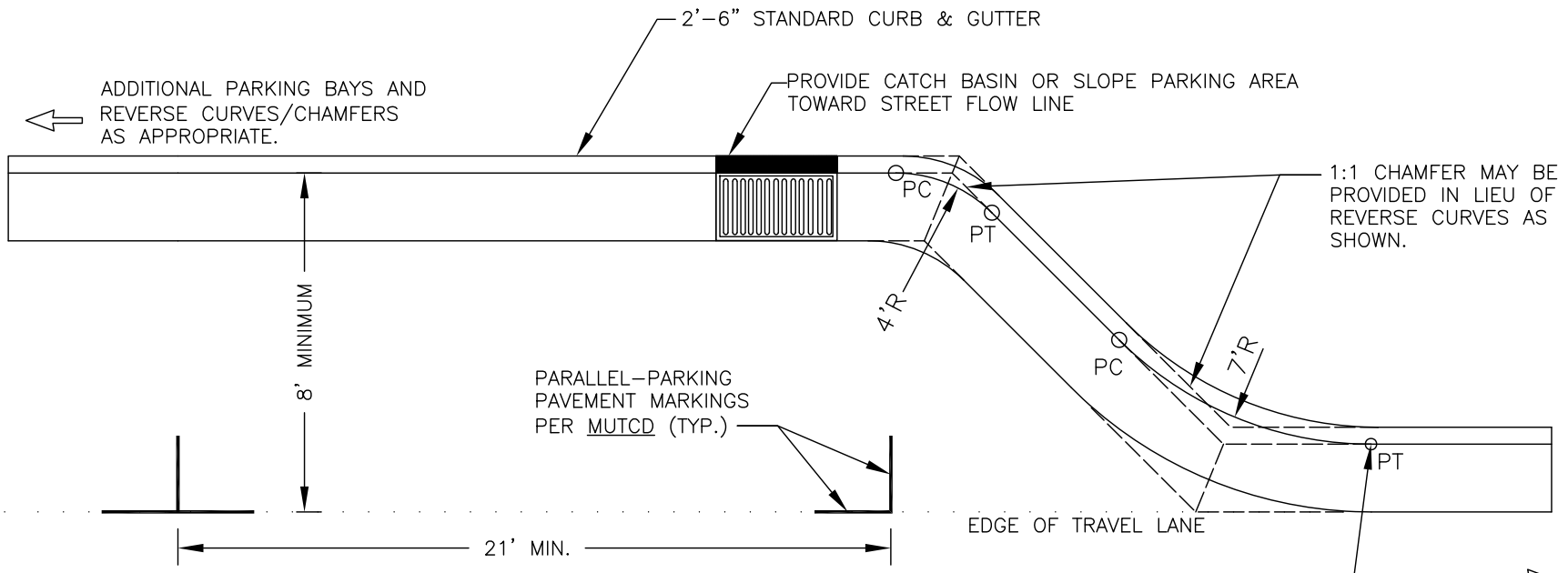
NOTES:

1. REFER TO STANDARD DRAWINGS 285.2, 285.3, AND 285.4 FOR ADDITIONAL INFORMATION.
2. PARKING STALLS MAY BE ON ONE OR BOTH SIDES OF THE STREET.
3. PAVEMENT MARKINGS TO BE THERMOPLASTIC ON RETAIL/OFFICE/MIXED-USE STREETS.
4. 30' MINIMUM DISTANCE TO FIRST PARKING STALL TO BE MEASURED FROM END OF INTERSECTION RADIUS POINT.



NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	LOCAL STREET PARALLEL PARKING LAYOUT	REV. DATE 3/18/19 STD. NO. 285.1



NOTES:

1. REVERSE CURVES/CHAMFERS NOT NECESSARY IF ADEQUATE DRAINAGE CAN BE PROVIDED THAT WILL ENSURE THAT SEDIMENT, WATER, DEBRIS, ETC., DOES NOT COLLECT IN 90–DEGREE CORNERS.
2. FOR PARKING BAYS THAT ARE 8 FEET IN WIDTH OR GREATER, THE PAVEMENT MARKINGS SHALL BE SET AT ONE (1) FOOT LESS THAN THE STALL WIDTH.
3. GREATER SEPARATION FROM INTERVENING STREETS THAN THE DISTANCES PROVIDED IN THE MATRIX MAY BE REQUIRED AT THE TOWN ENGINEER'S DISCRETION.
4. POSITIVE DRAINAGE SHALL BE PROVIDED EITHER BY INSTALLATION OF APPROPRIATE DRAINAGE STRUCTURES OR SLOPE PARKING AREA TO STREET FLOW LINE. SLOPING PARKING AREA TO STREET FLOW LINE ONLY PERMITTED IF ROAD GRADE IS GREATER THAN 2%.

MINIMUM DISTANCE TO NEXT INTERVENING STREET

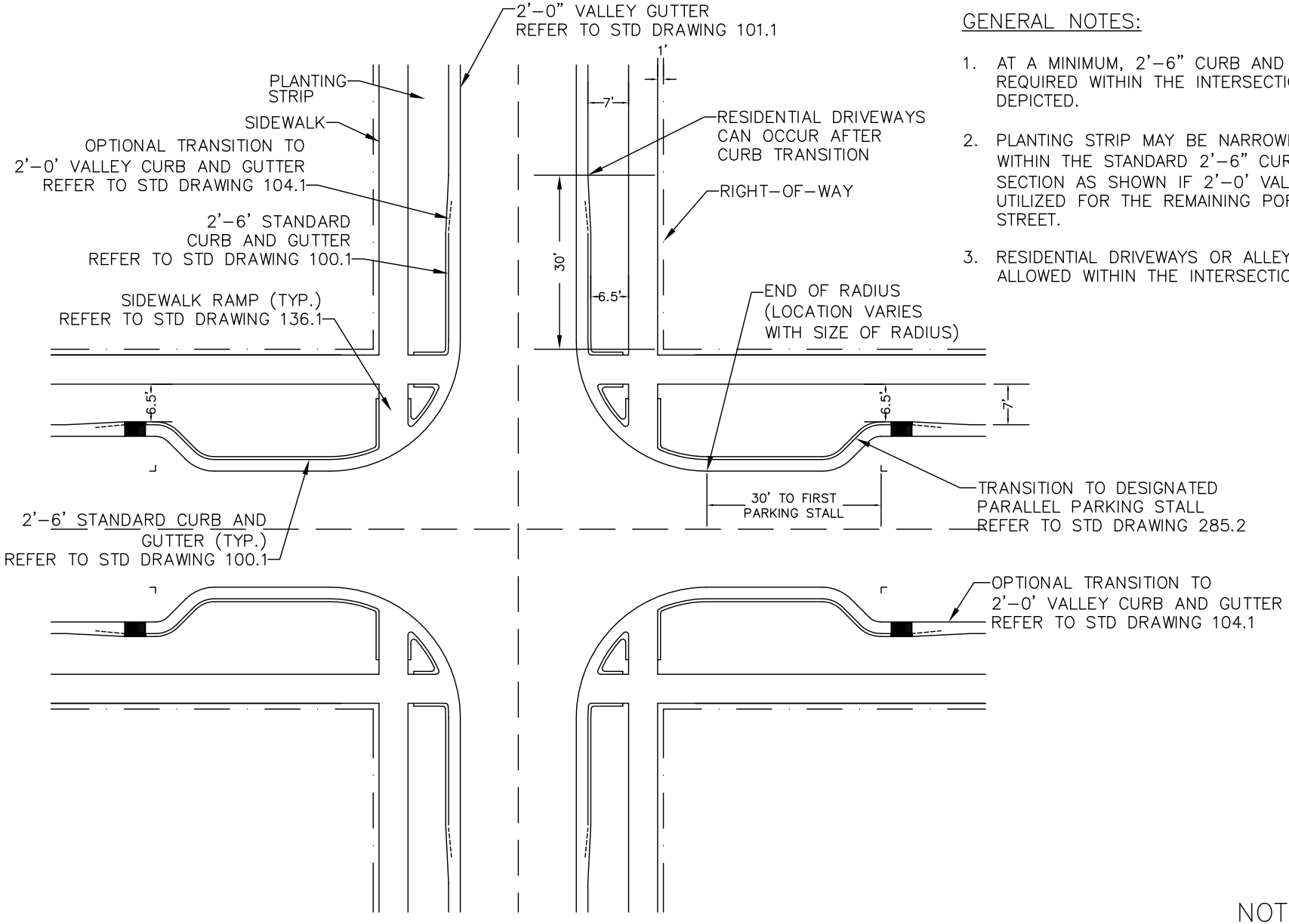
PARALLEL PARKING BAY LOCATED ON	DRIVEWAY	LOCAL/ COLLECTOR	TH'FARE
LOCAL	20'	20'	20'

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

PARALLEL PARKING STANDARDS

STD. NO.	REV.
285.2	8/19

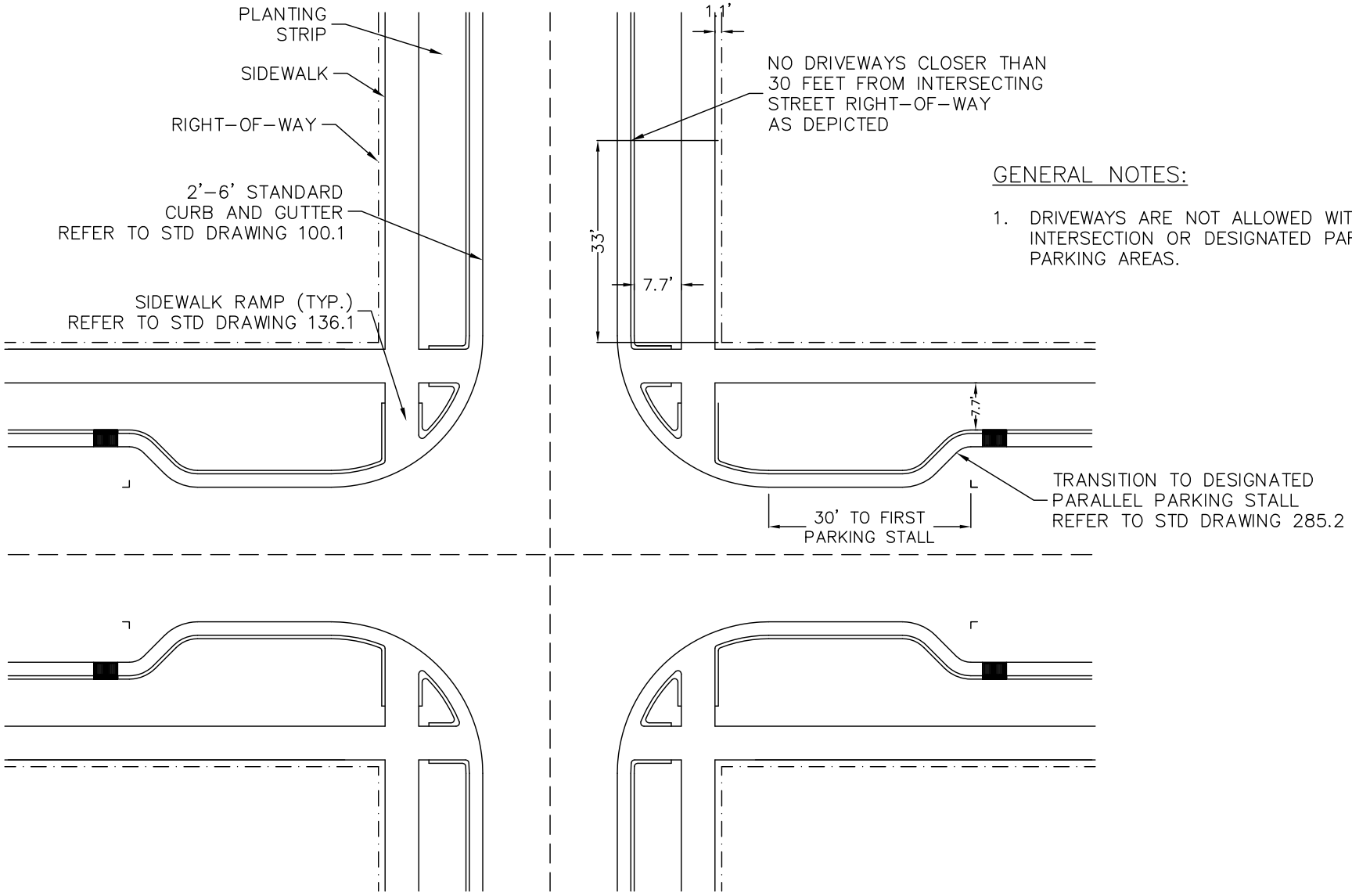


GENERAL NOTES:

1. AT A MINIMUM, 2'–6" CURB AND GUTTER IS REQUIRED WITHIN THE INTERSECTION AS DEPICTED.
2. PLANTING STRIP MAY BE NARROWED TO 6.5' WITHIN THE STANDARD 2'–6" CURB AND GUTTER SECTION AS SHOWN IF 2'–0' VALLEY GUTTER IS UTILIZED FOR THE REMAINING PORTION OF THE STREET.
3. RESIDENTIAL DRIVEWAYS OR ALLEYS ARE NOT ALLOWED WITHIN THE INTERSECTION.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	PARKING, SIDEWALK, AND CURB AND GUTTER TRANSITIONS AT RESIDENTIAL INTERSECTIONS	REV. DATE STD. NO. 285.3

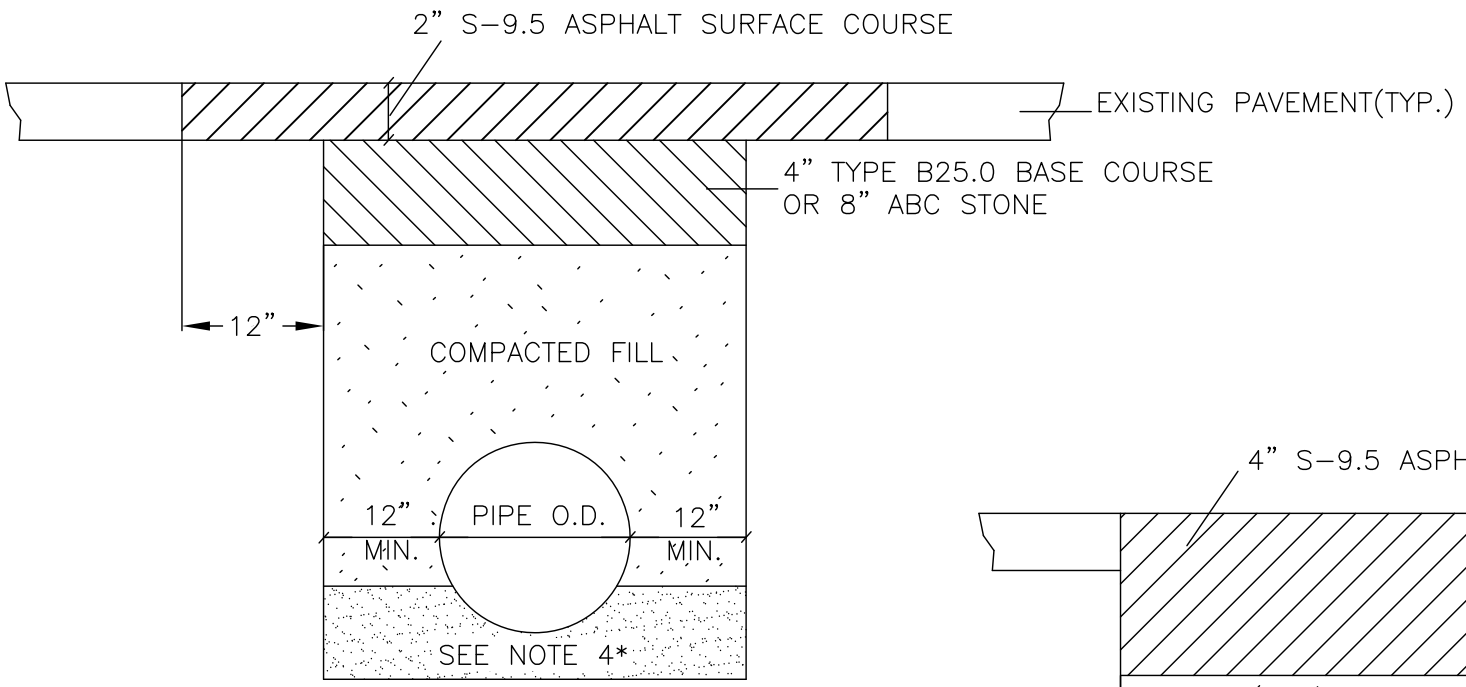


GENERAL NOTES:

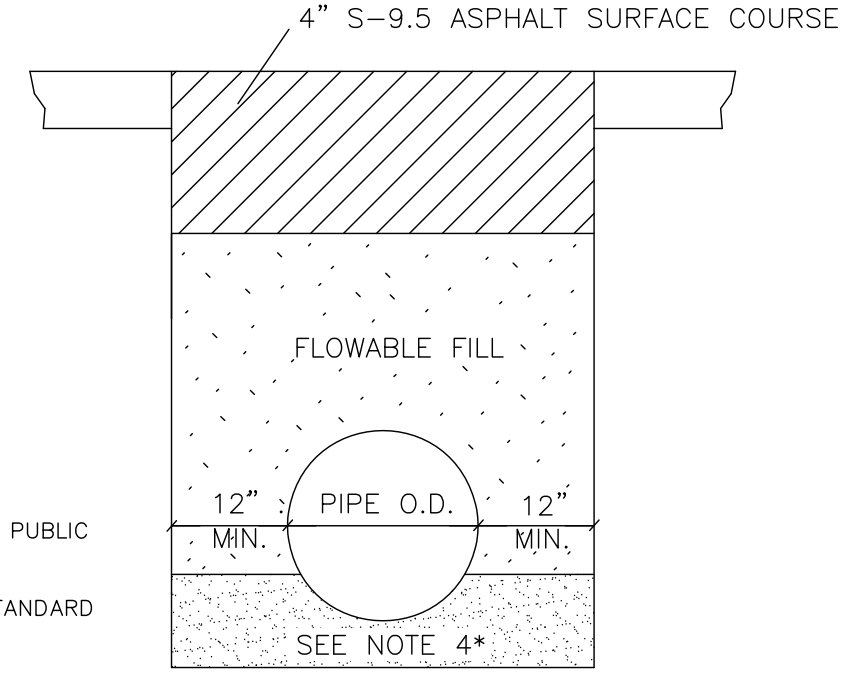
1. DRIVEWAYS ARE NOT ALLOWED WITHIN THE INTERSECTION OR DESIGNATED PARALLEL PARKING AREAS.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	PARKING, SIDEWALK, AND CURB AND GUTTER TRANSITIONS AT RETAIL/MIXED USE INTERSECTIONS	REV. DATE STD. NO. 285.4



STANDARD REPAIR



ALTERNATE REPAIR

GENERAL NOTES:

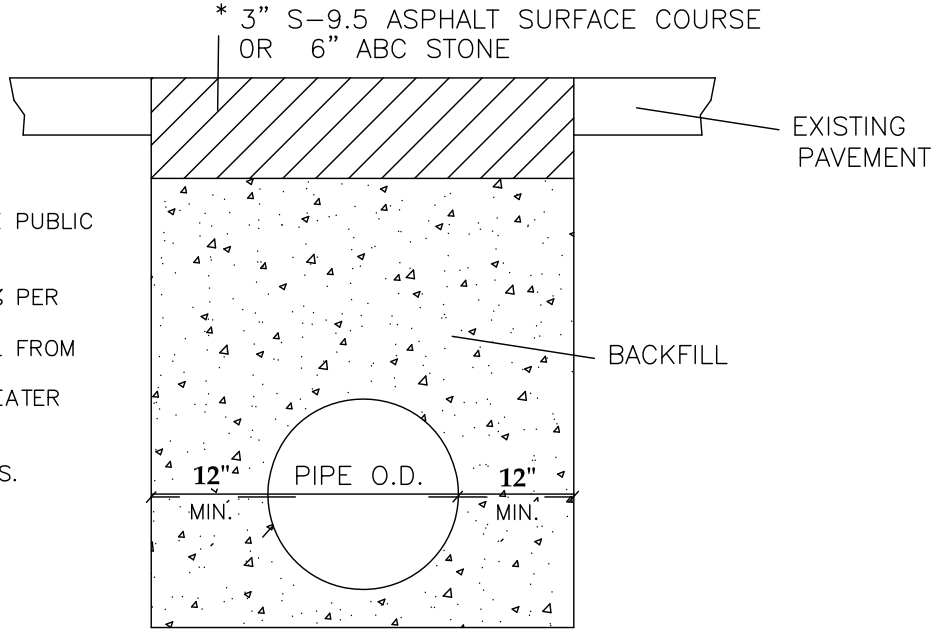
1. AN ENCROACHMENT PERMIT MUST BE OBTAINED PRIOR TO WORKING IN THE PUBLIC RIGHT OF WAY.
2. ALL PAVEMENT SHALL BE SAWCUT.
3. BACKFILL SHALL BE PLACED IN 8" LIFTS MAX, COMPACTED TO 95% PER STANDARD PROCTOR, THE FINAL LIFT SHALL BE 100% COMPACTED.
4. PIPE SHALL BE BEDDED PER MANUFACTURERS SPECIFICATIONS.
5. ASPHALT JOINTS MUST BE TACKED.
6. TRENCH SHALL BE CONSTRUCTED IN ACCORDANCE WITH OSHA REGULATIONS.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	FINAL PAVEMENT REPAIR OF UTILITY CUTS TYPICAL SECTION	REV. DATE 8/19 STD. NO. 290.1

GENERAL NOTES

1. AN ENCROACHMENT PERMIT MUST BE OBTAINED PRIOR TO WORKING IN THE PUBLIC RIGHT OF WAY.
2. ALL PAVEMENT SHALL BE SAWCUT.
3. BACKFILL SHALL BE CLEAN, PLACED IN 8" LIFTS MAX, COMPACTED TO 95% PER STANDARD PROCTOR. THE FINAL LIFT SHALL BE 100% COMPACTED.
4. NO TRENCHES SHALL BE LEFT OPEN OVERNIGHT WITHOUT PRIOR APPROVAL FROM THE TOWN ENGINEER OR HIS DESIGNEE.
5. THE FINISHED SURFACE OF THE REPAIR SHALL BE LEVEL WITH, OR NO GREATER THAN ½ INCH ABOVE THE ADJACENT STREET GRADE.
6. PIPE SHALL BE BEDDED PER MANUFACTURERS SPECIFICATIONS.
7. TRENCH SHALL BE CONSTRUCTED IN ACCORDANCE WITH OSHA REGULATIONS.



* STONE MAY BE USED FOR TEMPORARY REPAIRS OF LOCAL STREETS FOR A PERIOD NOT TO EXCEED FIVE DAYS. PUBLIC SERVICES SHALL BE NOTIFIED IN ADVANCE AND STONE SHALL BE REFRESHED EACH DAY AS NEEDED.

ASPHALT SHALL BE USED ON ALL NCDOT STREETS, AND FOR TEMPORARY REPAIRS LASTING OVER FIVE DAYS.

UNDER NO CIRCUMSTANCES SHALL TEMPORARY REPAIRS LAST OVER 14 DAYS OR 10 WORK DAYS BEFORE FINAL REPAIR IS COMPLETED.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY PAVEMENT REPAIR OF UTILITY CUTS TYPICAL SECTION	REV. DATE 8/19 STD. NO. 290.2

DWG	SHEET TITLE	SPECIAL REQUIREMENTS AND NOTES
300.01	METHOD OF PIPE INSTALLATION	
310.02	PARALLEL PIPE END SECTION–PRECAST CONCRETE FOR 15" TO 24" PIPE	REQUIRED IN RIGHT OF WAY
310.03	CROSS PIPE END SECTION–PRECAST CONCRETE FOR 18" TO 30" PIPE	REQUIRED IN RIGHT OF WAY
310.10	DRIVEWAY PIPE CONSTRUCTION USING NO SPECIAL END SECTIONS	ONLY AT LOCATIONS APPROVED BY THE TOWN ENGINEER
815.03	PIPE UNDERDRAIN AND BLIND DRAIN	
816.03	GEOCOMPOSITE SHOULDER DRAIN	
838.01	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS	NOTE 1
	15" THRU 48" PIPE 90' SKEW	NOTE 1
838.02	CONCRETE ENDWALL AND SLUICE GATE 15" THRU 36" PIPE–90' SKEW	NOTE 1
838.04	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS	NOTE 1
	17"X13"THRU 71"X47" PIPE ARCH 90' SKEW	NOTE 1
838.05	CONCRETE "L" ENDWALL FOR SINGLE PIPE CULVERTS 15" THRU 48" PIPE	NOTE 1
838.06	CONCRETE "L" ENDWALL FOR SINGLE PIPE CULVERTS 17"X13" THRU 71"X47"	NOTE 1
	71"X47" ARCH PIPE	NOTE 1
838.07	CONCRETE ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS	NOTE 1
	40"X31" THRU 66"X51" PIPE ARCH 90'SKEW	NOTE 1
838.08	CONCRETE "L" ENDWALL FOR SINGLE PIPE CULVERTS 40"X32"	NOTE 1
	THRU 66"X51" PIPE ARCH	NOTE 1
838.10	CONCRETE ENDWALL FOR OUTFALL 4'–6" OR 8" PIPE	NOTE 1
838.11	BRICK ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS	NOTE 1
	15" THRU 48" 90' SKEW	NOTE 1
838.14	BRICK ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 17"X31"	NOTE 1
	THRU 71"X47" 90' SKEW	NOTE 1
838.15	BRICK "L" ENDWALL FOR SINGLE PIPE CULVERTS 15" THRU 48" PIPE	NOTE 1
838.16	BRICK "L" ENDWALL FOR SINGLE PIPE CULVERTS 17"X13" THRU	NOTE 1
	71"X47" PIPE ARCH	NOTE 1
838.17	BRICK ENDWALL FOR SINGLE AND DOUBLE PIPE CULVERTS 40"X31"	NOTE 1
	THRU 66"X51" PIPE ARCH 90'SKEW	NOTE 1
838.18	BRICK ENDWALL FOR SINGLE PIPE CULVERTS 40"X31" THRU	NOTE 1
	66"X51" PIPE ARCH 90' SKEW	NOTE 1
838.20	BRICK ENDWALL FOR OUTFALL 4", 6" AND 8" PIPE	NOTE 1
838.21	REINFORCED CONCRETE ENDWALL FOR SINGLE 54" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.22	REINFORCED CONCRETE ENDWALL FOR DOUBLE & TRIPLE 54" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.27	REINFORCED CONCRETE ENDWALL FOR SINGLE 60" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.28	REINFORCED CONCRETE ENDWALL FOR DOUBLE & TRIPLE 60" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.33	REINFORCED CONCRETE ENDWALL FOR SINGLE 66" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.34	REINFORCED CONCRETE ENDWALL FOR DOUBLE & TRIPLE 66" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.39	REINFORCED CONCRETE ENDWALL FOR SINGLE 72" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.40	REINFORCED CONCRETE ENDWALL FOR DOUBLE & TRIPLE 72" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD

NOTE 1: FOR ALL STRUCTURES – NCDOT REQUIRES CLASS B CONCRETE (2500PSI). THE TOWN REQUIRES 3600 PSI CONCRETE STRENGTH @ 28 DAYS. 3600 PSI CONCRETE SHALL BE USED IN ALL TOWN PROJECTS.

DWG	SHEET TITLE	SPECIAL REQUIREMENTS AND NOTES
838.45	NOTES FOR REINFORCED CONCRETE ENDWALL STANDARD DRAWINGS	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
	838.21 THRU 838.40	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.51	REINFORCED BRICK ENDWALL FOR SINGLE 54" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.52	REINFORCED BRICK ENDWALL FOR DOUBLE & TRIPLE 54" PIPE 90'SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.57	REINFORCED BRICK ENDWALL FOR SINGLE 60" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.58	REINFORCED BRICK ENDWALL FOR DOUBLE & TRIPLE 60" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.63	REINFORCED BRICK ENDWALL FOR SINGLE 66" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.64	REINFORCED BRICK ENDWALL FOR DOUBLE & TRIPLE 66" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.69	REINFORCED BRICK ENDWALL FOR SINGLE 72" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.70	REINFORCED BRICK ENDWALL FOR DOUBLE & TRIPLE 72" PIPE 90' SKEW	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.75	NOTES FOR REINFORCED BRICK ENDWALL STANDARD DRAWINGS 838.51 THRU 838.70	NOTE 1 SEE 304.1 & 305.1, THIS SECTION FOR SPLASH PAD
838.80	PRECAST CONCRETE ENDWALL FOR SINGLE 12" THRU 72" PIPE 90' SKEW	
840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES	
840.01	BRICK CATCH BASIN 15" THRU 54" PIPE	
840.02	CONCRETE CATCH BASIN 12" THRU 54" PIPE	
840.03	FRAME, GRATE BASIN 12" THRU 54" PIPE	TYPE F AND G GRATES ARE OPTIONAL WITHIN THE TOWN LIMITS
840.04	CONCRETE OPEN THROAT CATCH BASIN 12" THRU 48" PIPE	NOTE 1; OPENINGS PERMITTED IN 4 SIDES OUTSIDE OF STREET R/W MANHOLE RING AND COVER REQUIRED IN TOP SLAB
840.05	BRICK OPEN THROAT CATCH BASIN 15" THRU 48" PIPE	NOTE 1; OPENINGS PERMITTED IN 4 SIDES OUTSIDE OF STREET R/W MANHOLE RING AND COVER REQUIRED IN TOP SLAB
840.14	CONCRETE DROP INLET 12" THRU 30" PIPE	NOTE 1
840.15	BRICK DROP INLET 12" THRU 30' PIPE	NOTE 1
840.16	DROP INLET FRAME AND GRATE FOR USE WITH DWGS. 840.14 & 840.15	NOTE 1
840.17	CONCRETE GRATED DROP INLET TYPE "A" 12" THRU 72" PIPE	NOTE 1
840.18	CONCRETE GRATED DROP INLET TYPE "B" 12" THRU 36" PIPE	NOTE 1
840.19	CONCRETE GRATED DROP INLET TYPE "D" 12" THRU 36" PIPE	NOTE 1
840.20	FRAMES AND WIDE SLOT FLAT GRATES	NOT FOR USE IN PEDESTRIAN AREAS
840.22	FRAMES AND WIDE SLOT SAG GRATES	NOT FOR USE IN PEDESTRIAN AREAS
840.24	FRAMES AND NARROW SLOT SAG GRATES	
840.25	ANCHORAGE FOR FRAMES BRICK OR CONCRETE	
840.26	BRICK GRATED DROP INLET TYPE "A" 12" THRU 72" PIPE	
840.27	BRICK GRATED DROP INLET TYPE "B" 12" THRU 36" PIPE	
840.28	BRICK GRATED DROP INLET TYPE "D" 12" THRU 36" PIPE	
840.29	FRAMES AND NARROW SLOT FLAT GRATES	
840.30	DRIVEWAY DROP INLET	

NOTE 1: FOR ALL STRUCTURES – NCDOT REQUIRES CLASS B CONCRETE (2500PSI). THE TOWN REQUIRES 3600 PSI CONCRETE STRENGTH @ 28 DAYS. 3600 PSI CONCRETE SHALL BE USED IN ALL TOWN PROJECTS.

DWG	SHEET TITLE	SPECIAL REQUIREMENTS AND NOTES
840.31	CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE	NOTE 1; OPTIONAL MANHOLE IS REQUIRED
840.32	BRICK JUNCTION BOX 12" THRU 66" PIPE	NOTE 1; OPTIONAL MANHOLE IS REQUIRED
840.34	TRAFFIC BEARING JUNCTION BOX FOR USE WITH PIPES 42" AND UNDER	NOTE 1; OPTIONAL MANHOLE IS REQUIRED; AS MEASURED FROM BOTTOM OF TOP SLAB -- FOR JUNCTION BOX HEIGHT 0'-4'8" USE 8" THICK WALL, FROM 4'8" HEIGHT TO 10' HEIGHT, USE 12" THICK WALL. IF PROPOSED STRUCTURE EXCEEDS 12'-0" HEIGHT A SPECIAL DESIGN WILL BE REQUIRED
840.35	TRAFFIC BEARING DROP INLET FOR CAST IRON DOUBLE FRAME AND GRATES	
840.36	TRAFFIC BEARING DROP INLET FOR STEEL (840.37) DOUBLE FRAME AND GRATES	NOT FOR USE IN PEDESTRIAN AREAS
840.37	STEEL GRATE AND FRAME	NOT FOR USE IN PEDESTRIAN AREAS
840.41	SPRING BOX CONCRETE OR BRICK	
840.45	PRECAST DRAINAGE STRUCTURE (SOLID AND WAFFLE WALL)	WAFFLE WALL IS NOT PERMITTED IN ROADWAY, PLANTING STRIPS, OR MEDIANS. ALL OPENINGS SHALL BE PRE-CAST
840.46	TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE	
840.51	BRICK MANHOLE 12" 36" PIPE	
840.52	PRECAST MANHOLE 4', 5' AND 6' DIAMETER 12" THRU 42" PIPE	
840.53	PRECAST MANHOLE WITH MASONRY BASE 12" THRU 42" PIPE	
840.54	MANHOLE FRAME AND COVER	
840.60	DRAINAGE STRUCTURE STEPS	
840.71	CONCRETE PAVED DITCHES	
840.72	PIPE COLLAR	
850.01	CONCRETE PAVED DITCHES	
852.04	METHODS FOR PLACEMENT OF DROP INLETS IN GRASSED MEDIAN (USING 1'-6" CURB AND GUTTER)	
852.05	MEDIAN CURB FOR CATCH BASIN (FOR USE WITH 1'-6" CURB AND GUTTER)	
852.06	METHOD OF PLACEMENT OF DROP INLETS IN CONCRETE ISLANDS	
876.01	RIP RAP IN CHANNELS	
876.03	DRAINAGE DITCHES WITH CLASS "A" RIP RAP	
876.04	DRAINAGE DITCHES WITH CLASS "B" RIP RAP	
310.01	1998 DRAWINGS CONCRETE FLARED END SECTION	

NOTE 1: FOR ALL STRUCTURES – NCDOT REQUIRES CLASS B CONCRETE (2500PSI). THE TOWN REQUIRES 3600 PSI CONCRETE STRENGTH @ 28 DAYS. 3600 PSI CONCRETE SHALL BE USED IN ALL TOWN PROJECTS.

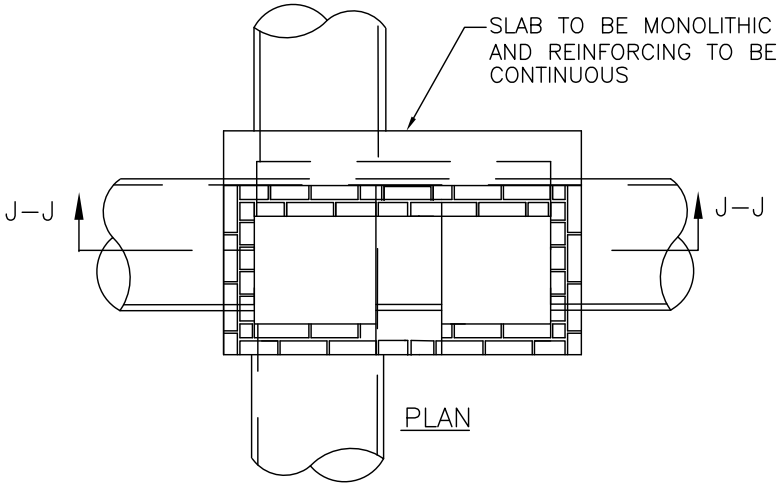
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

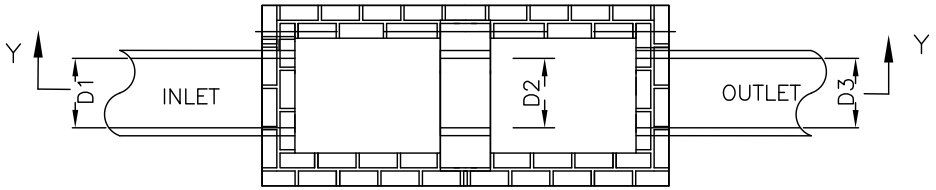
NCDOT STANDARDS
APPROVED FOR USE IN THE TOWN OF WAXHAW

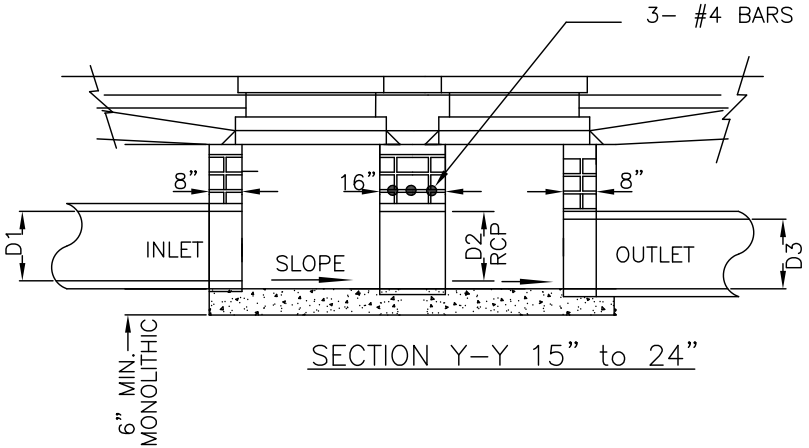
STD. NO.	REV.
302.1	

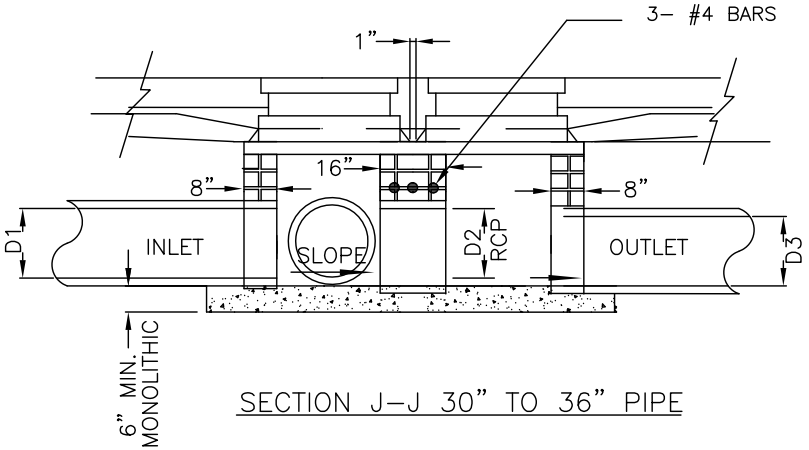
GENERAL NOTES:

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 3600 P.S.I COMPRESSIVE STRENGTH.
4. BASE SLAB SHALL BE MONOLITHIC.
5. SEE STANDARDS 121.1 AND 122.1 FOR PLACEMENT OF CATCH BASIN.
6. PIPE SECTION D2 CONNECTING CATCH BASINS SHALL HAVE A MINIMUM DIAMETER SAME AS OF OUTLET PIPE D3.
7. 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)
8. WEEP HOLES SHALL BE PLACED IN BACK WALL WITH FILTER FABRIC OR STONE ON BACK SIDE









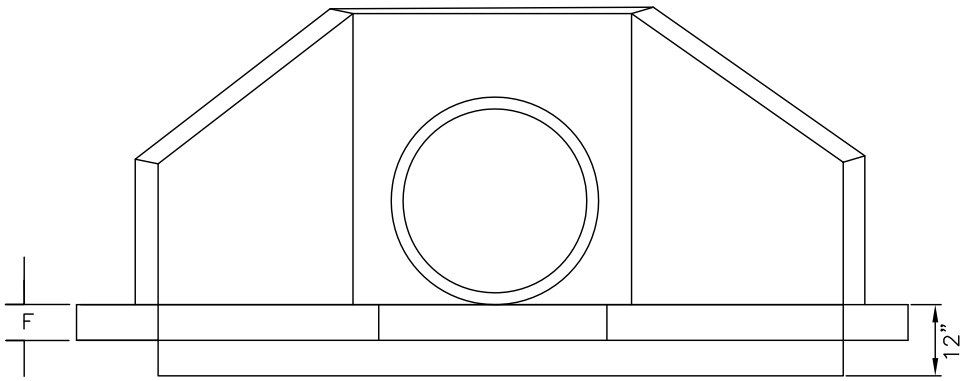
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

BRICK DOUBLE CATCH BASIN
15" THRU 36" PIPE

STD. NO.	REV.
303.1	

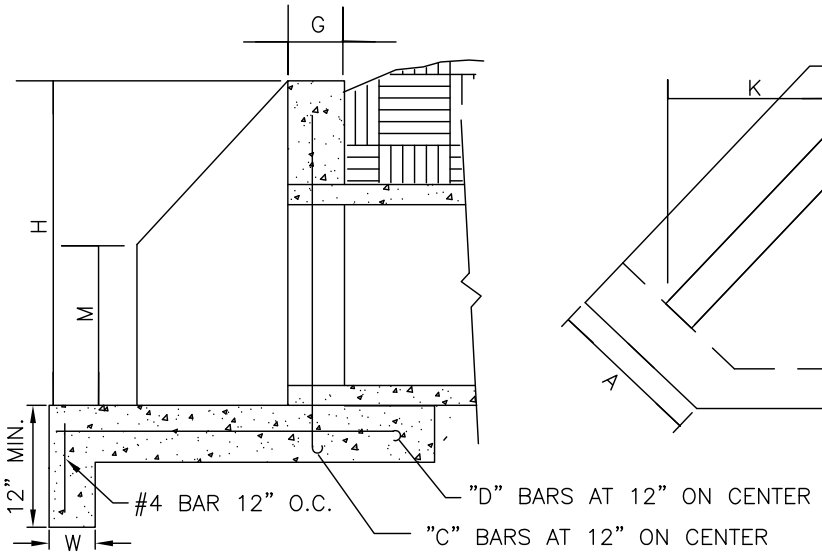
CONCRETE PIPE			DIMENSIONS									
WALL THK.	OUT DIA.	IN DIA.	H	A	B	C	E	F	G	W	K	M
2 1/4"	19 1/2"	15"	27 1/2"	20"	24"	8"	7 1/2"	4"	4"	8"	17"	10"
2 1/2"	23"	18"	31"	20"	24"	8"	9"	4"	4"	8"	17"	12"
3"	30"	24"	38"	20"	30"	8"	12"	4"	4"	8"	21"	15"
3 1/2"	37"	30"	45"	20"	44"	12"	15"	6"	8"	8"	31"	18"
4"	44"	36"	52"	32"	44"	12"	18"	6"	8"	8"	31"	22"
4 1/2"	51"	42"	59"	32"	48"	12"	21"	6"	8"	8"	34"	26"
5"	58"	48"	66"	32"	48"	12"	24"	6"	8"	8"	34"	29"
5 1/2"	65"	54"	73"	32"	54"	12"	27"	6"	8"	8"	38"	33"
6"	72"	60"	80"	36"	66"	12"	30"	8"	12"	12"	46"	36"
6 1/2"	79"	66"	87"	36"	72"	12"	33"	8"	12"	12"	51"	40"
7"	86"	72"	94"	36"	78"	12"	36"	8"	12"	12"	56"	43"



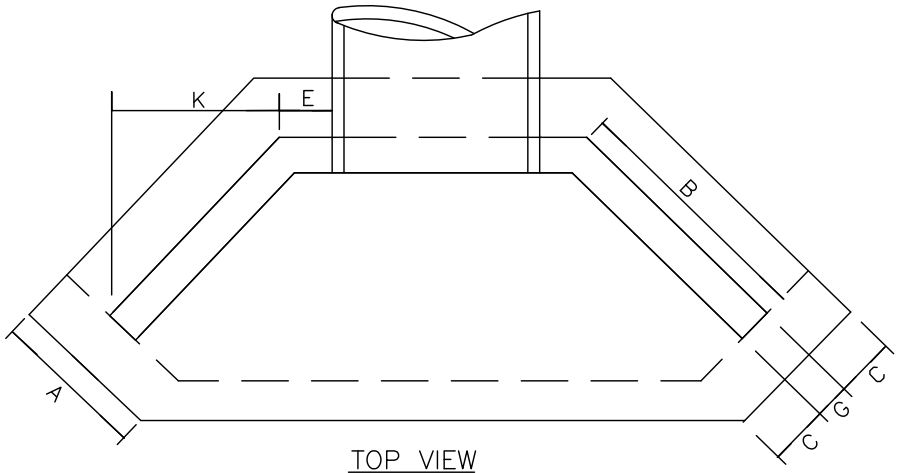
FRONT VIEW

REINFORCING

DIA.	"C" BAR		"D" BAR	
	NO.	LGT.	NO.	LGT.
15"	4	2'-0"	4	1'-11"
18"	4	2'-3"	4	2'-2"
24"	4	2'-9"	4	2'-8"
30"	4	3'-3"	4	3'-2"
36"	4	3'-9"	4	3'-8"
42"	4	4'-3"	4	4'-2"
48"	4	4'-9"	4	4'-8"
54"	4	5'-3"	4	5'-2"
60"	4	5'-9"	4	5'-8"
66"	4	6'-3"	4	6'-2"
72"	4	6'-9"	4	6'-8"



SIDE VIEW



TOP VIEW

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CONCRETE WINGWALL WITH SPLASH PAD

STD. NO.	REV.
304.1	

GENERAL NOTES:

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

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CONCRETE WINGWALL WITH SPLASH PAD

STD. NO.	REV.
305.1	

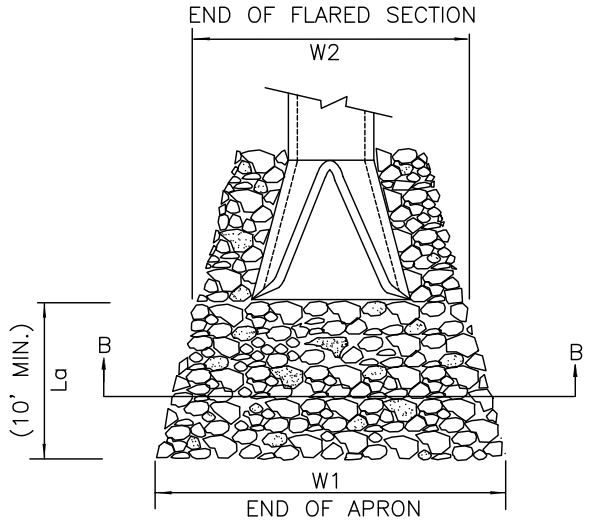
NOTES:

1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER.
2. REFER TO THE TOWN OF WAXHAW STORM WATER DESIGN MANUAL FOR RIPRAP APRON DESIGN STANDARDS.
3. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 3:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
4. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1
6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
8. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.
9. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
10. ANY DISTURBED AREA FROM END OF APRON TO RECIEVING CHANNEL MUST BE STABILIZED.

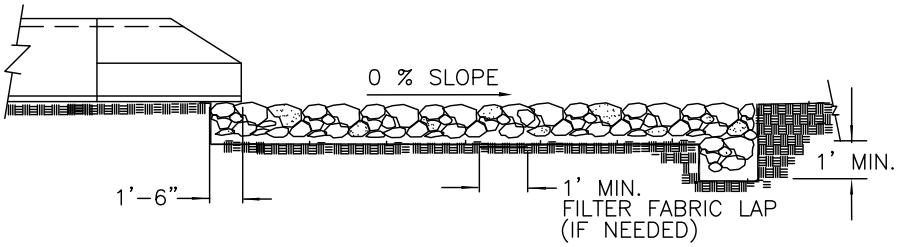
USE USDA NOMOGRAPH FROM NC SEDIMENT AND EROSION CONTROL MANUAL OR THE TOWN OF WAXHAW STORM WATER DESIGN MANUAL FOR DESIGN DATA.

OUTLET	La	W1	W2	*T	H	V	Q

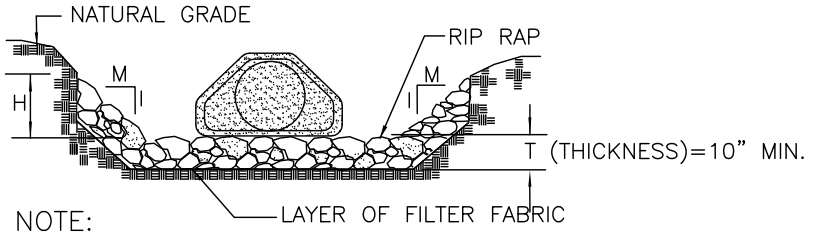
* d50 (see fig 8.06 a&b "NC SEDIMENT AND EROSION CONTROL MANUAL"
dmax = 1.5 x d50
T = 1.5 X dmax.
T(min.)=10"



PLAN



ELEVATION



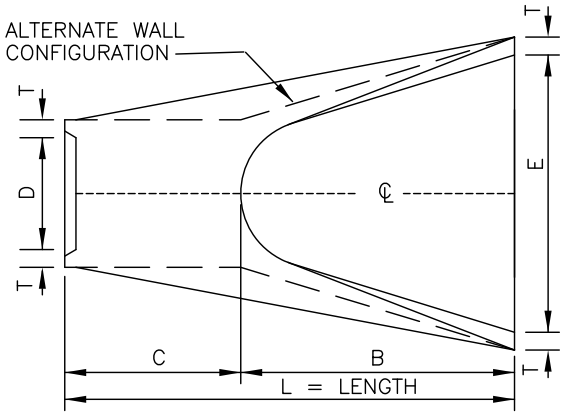
NOTE:
MINIMUM H=2/3 PIPE DIAMETER

SECTION B-B

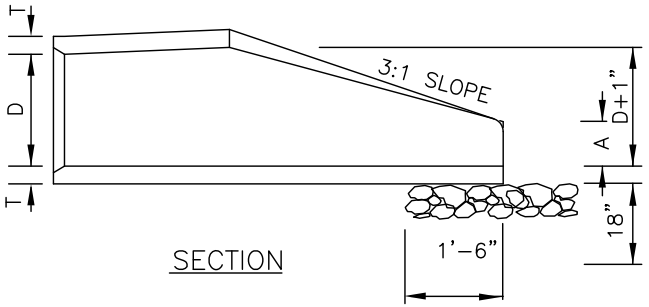
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

RIPRAP APRON AT PIPE OUTFALLS OTHER THAN AT SWIM

STD. NO.	REV.
306.1	3/24

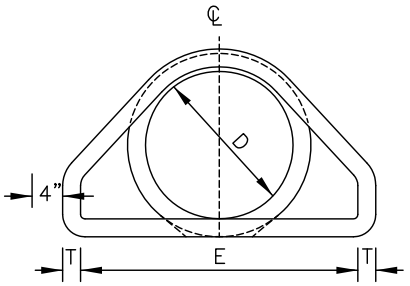


PLAN



SECTION

SEE STD. 306.1 AND 308.1



END VIEW

TABLE OF DIMENSIONS							
D	T	A	B	C	E	L	WT.
12"	2-1/4"	4"	2'-0"	4'-1"	2'-0"	6'-1"	730
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

GENERAL NOTES:

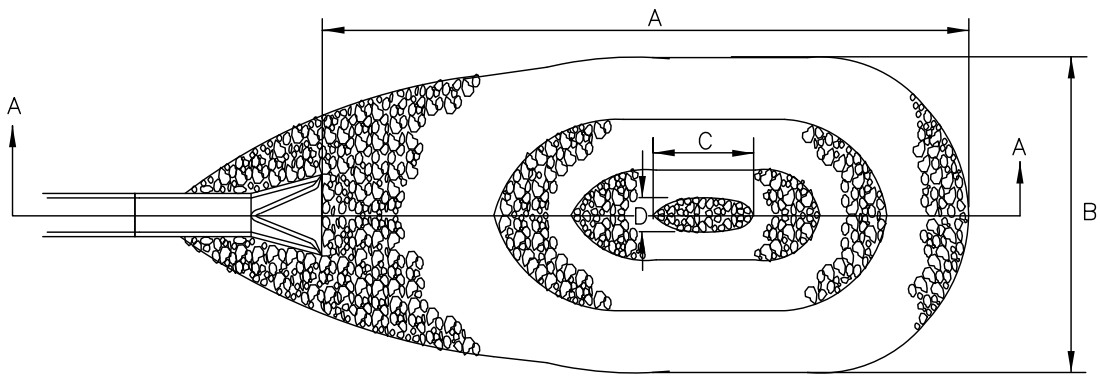
1. SEE FORMER NCDOT STANDARD 310.01 FOR DETAILS.
2. REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF REINFORCED CONCRETE PIPE OF LIKE DIAMETER PER AASHTO M170, TABLE 2, WALL B.
3. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
4. PROVIDE TONGUE OR SPIGOT JOINT AT INLET END SECTION.
5. PROVIDE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

NOT TO SCALE

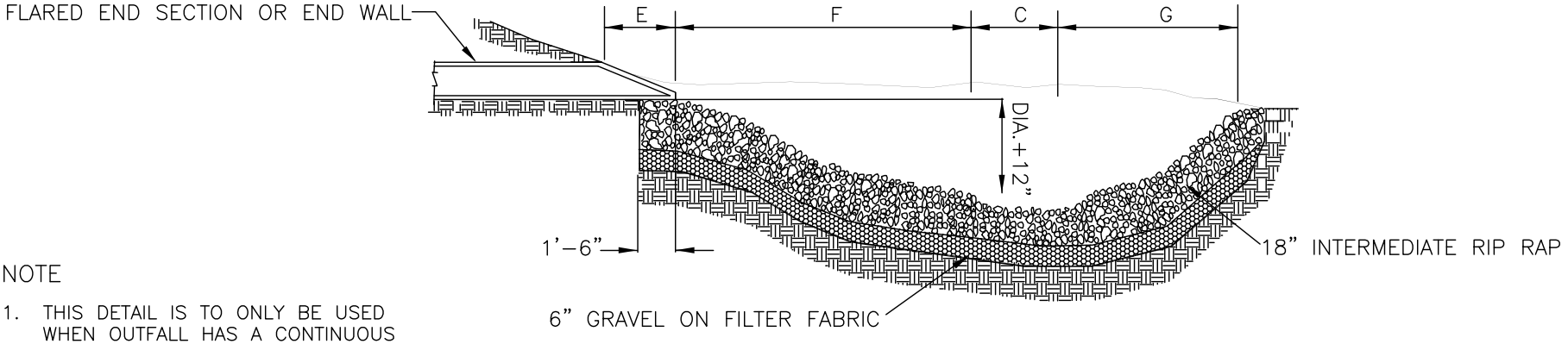
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

FLARED END SECTION
12" THRU 72" PIPE

STD. NO.	REV.
307.1	



PLAN



SECTION A–A

NOTE

1. THIS DETAIL IS TO ONLY BE USED WHEN OUTFALL HAS A CONTINUOUS FLOW OF WATER AND WITH PRIOR APPROVAL OF THE TOWN ENGINEER.

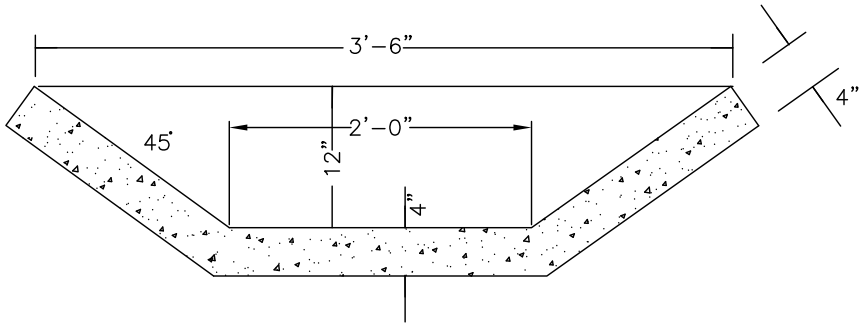
PIPE SIZE	A	B	C	D	E	F	G	WT. RIP RAP IN TONS
15"	10'	7'	1 1/2'	1'	1'	4 1/2'	3'	6
18"	12'	8'	2'	1'	1'	5'	4'	8
21"	15'	9'	2 1/2'	1 1/2'	1'	7'	4 1/2'	12
24"	17'	10'	2 1/2'	1 1/2'	1'	8'	5 1/2'	15
30"	20'	13'	3'	2'	2'	9'	6'	22
36"	24'	16'	3 1/2'	2'	2'	9 1/2'	7'	33

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

RIP RAP PLUNGE POOL

STD. NO.	REV.
308.1	



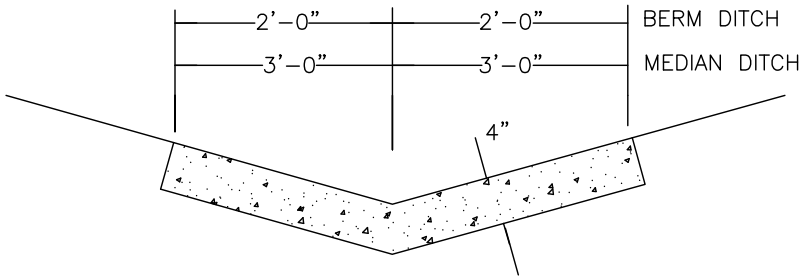
SLOPE DRAIN, BASE DITCH OR BERM DRAINAGE OUTLET DITCH

GENERAL NOTES:

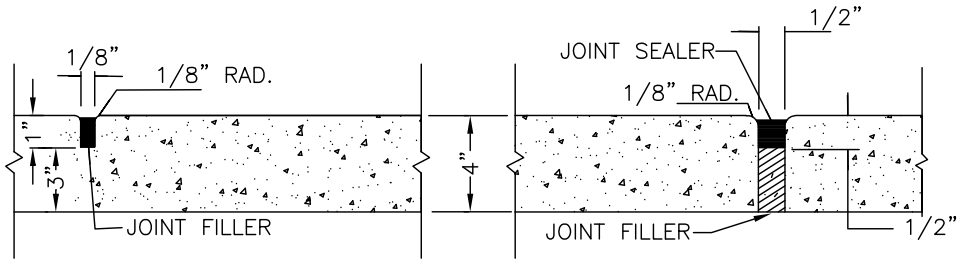
IN THE 4" CONCRETE PAVED DITCHES PLACE 1/2" EXPANSION JOINT AT 30 FT INTERVALS AND AT ALL OTHER POINTS WHERE PROPOSED DITCHES ABUT RIGID OBJECTS. PLACE GROOVED JOINTS 1" DEEP AT 10' INTERVALS BETWEEN EXPANSION JOINTS.

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

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

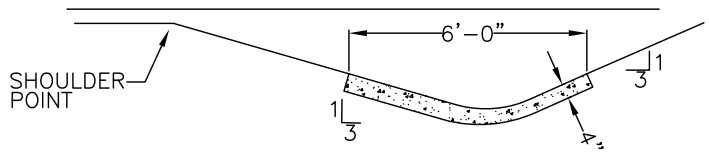


MEDIAN OR BERM DITCH

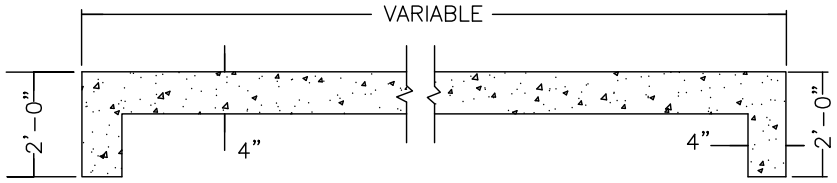


SHOWING GROOVED JOINT

SHOWING EXPANSION JOINT



SIDE DITCH



LONGITUDINAL SECTION OF PAVED DITCH

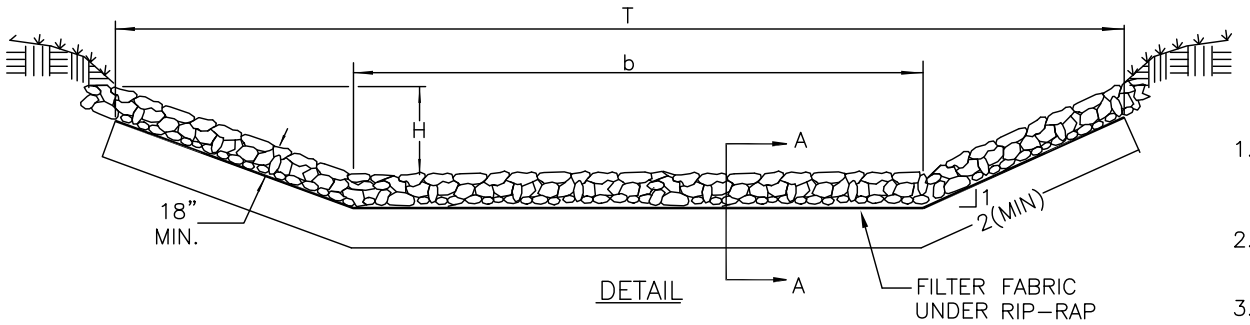
SHOWING 2'-0" CURTAIN WALL REQUIRED AT EACH END

NOT TO SCALE

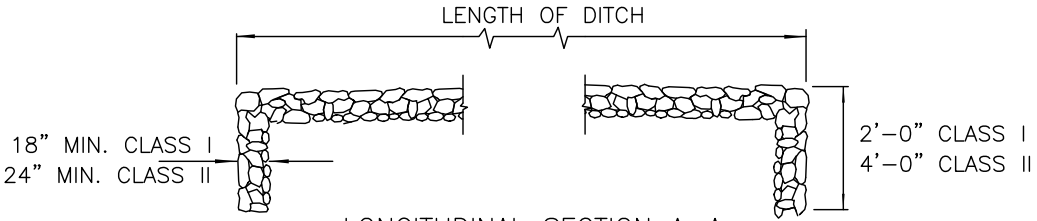
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CONCRETE PAVED DITCHES

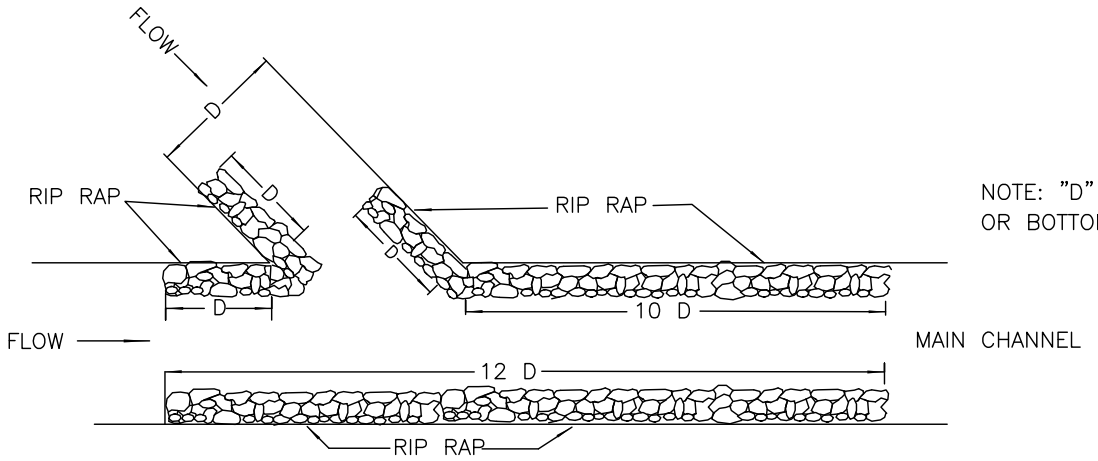
STD. NO.	REV.
310.1	



DETAIL



LONGITUDINAL SECTION A–A



CHANNEL INTERSECTIONS

GENERAL NOTES:

1. IF BEDROCK IS ENCOUNTERED WITHIN THE LIMITS OF THE TOEWALL, BEGIN TOEWALL ON THE BEDROCK OR AS DIRECTED BY THE ENGINEER.
2. WHERE ONLY ONE SIDE REQUIRES RIP RAP CLASS I OR II, LIST STATION AND SIDE OF SAME.
3. CHANNEL AND RIP RAP SIZE TO BE DESIGNED BY THE ENGINEER.
4. DEPENDING ON SOIL CONDITIONS, WASHED STONE AND FILTER FABRIC MAY BE NECESSARY UNDER RIP RAP.
5. CHANNEL DEPTH "H" SHALL INCLUDE A MINIMUM 6" OF FREEBOARD.

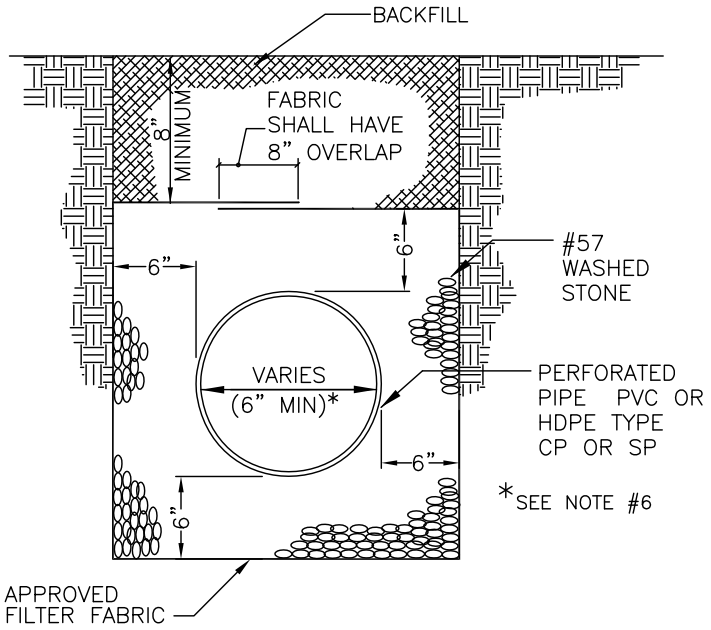
NOTE: "D" EQUALS DIAMETER OF PIPE OR BOTTOM WIDTH OF CHANNEL.

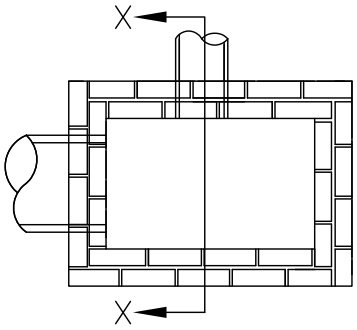
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

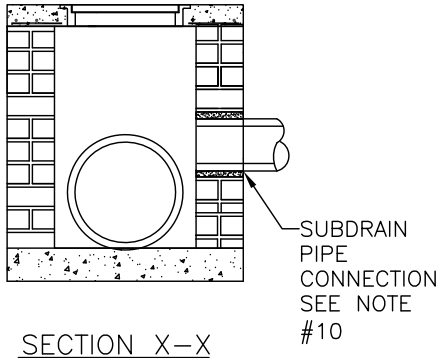
RIP RAP DITCHES

STD. NO.	REV.
311.1	





PLAN VIEW



SECTION X–X

CONNECTION AT DRAINAGE STRUCTURE

NOTE: STRUCTURE SHOWN FOR REPRESENTATION PURPOSES ONLY.

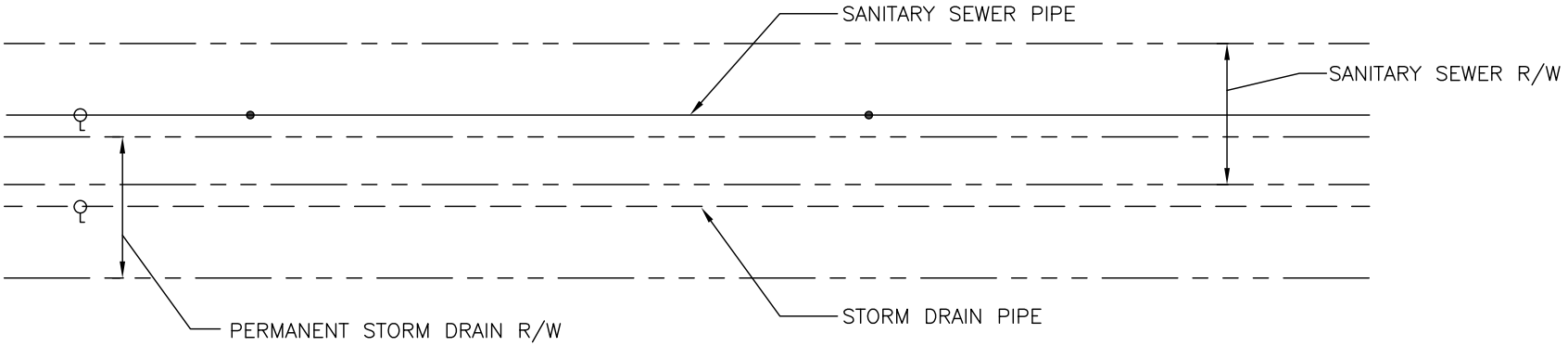
NOTES:

1. A MINIMUM OF 6" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR WASHED STONE. THE METHOD OF COMPACTING BACKFILL MATERIAL IS SUBJECT TO APPROVAL BY THE TOWN ENGINEER. AN APPROVED FILTER FABRIC SHALL BE PLACED AROUND STONE AND OVERLAPPED 8" AT TOP WITHIN STREET RIGHT OF WAY.
2. SUBDRAIN IS TO BE A MINIMUM 6" DIAMETER PERFORATED PIPE; USE SCHEDULE 40 PVC PER ASTM D1785 OR HDPE PER AASHTO M252, TYPE CP (SINGLE–WALL, CORRUGATED) OR TYPE SP (DOUBLE–WALL, SMOOTH INTERIOR).
3. OUTLET PIPE FROM SUBDRAIN SHALL BE NON–PERFORATED UNDER PAVEMENT (INCLUDING SIDEWALKS AND DRIVEWAYS). SEE SITE PLAN FOR SLOPE OF SUBDRAIN AND TIE IN TO STORM DRAINAGE.
4. THE OUTLET PIPES SHALL BE SCHEDULE 40 (MIN.) PVC PER ASTM D2665 OR HDPE PER AASHTO M252, TYPE S (DOUBLE WALL, SMOOTH INTERIOR) UNDER ROADWAYS.
5. FILTER FABRIC SHALL BE AN APPROVED, TYPE 2 WATER PERMEABLE, SYNTHETIC FABRIC.
6. A MINIMUM 4" DIAMETER SUBDRAIN MAY BE USED IN PLANTING AREAS.
7. CLEAN–OUTS ARE RECOMMENDED AT ALL PIPE INTERSECTIONS AND AT A 100' MAXIMUM SEPARATION.
8. SUBDRAIN INVERTS AT CATCH BASINS SHOULD BE INSTALLED ABOVE THE BOTTOM TO AVOID SURCHARGE OF SUBDRAIN SYSTEM.
9. ALL SUBDRAINS WILL TIE INTO A STANDARD DRAINAGE STRUCTURE OR DAYLIGHT TO THE SURFACE WHERE APPROPRIATE, AND NOT DIRECTLY INTO A PIPE.
10. ONLY REMOVE NECESSARY MASONRY UNITS TO INSTALL PIPE INTO BASIN WALL. PRECAST STRUCTURES WILL BE CORE DRILLED 2 INCHES LARGER THAN PIPE DIAMETER TO PROVIDE FOR INSTALLATION OF PIPE IN WALL.
11. ALL PIPE IN STORM DRAIN STRUCTURE SHALL BE STRUCK EVEN WITH THE INSIDE WALL, GROUTED AND BRUSHED SMOOTH.
12. PIPE INSTALLATION PER SECTION 300 NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
13. SUBDRAINS WILL BE INSTALLED AT A DRAINAGE STRUCTURE AND THIS CONNECTION WILL NEED TO BE INSPECTED BY TOWN STAFF PRIOR TO BACKFILLING.
14. SCHEDULE 40 PVC (NON–PERFORATED) SHALL BE USED TO MAKE THE CONNECTION TO THE STORM DRAINAGE SYSTEM. CONNECTION WILL BE WITHIN THE RIGHT–OF–WAY UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
15. PREFABRICATED DRAINAGE MAY BE USED WITH APPROVAL OF TOWN ENGINEER
16. MAXIMUM OF TWO SUBDRAIN PENETRATIONS PER WALL OF DRAINAGE STRUCTURE.

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

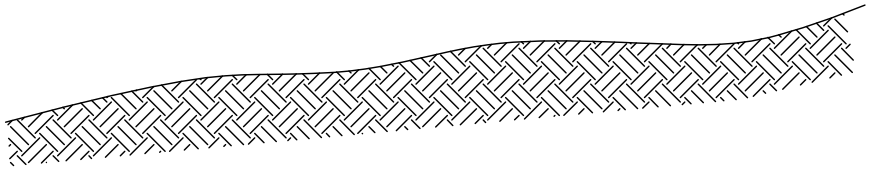
SUBDRAIN DETAIL

STD. NO.	REV.
312.1	

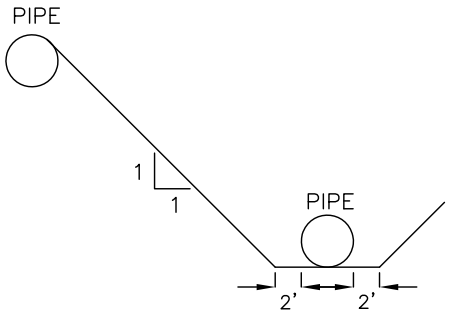


THE SANITARY SEWER AND STORM DRAINAGE RIGHTS OF WAY MAY OVERLAP; HOWEVER THE PIPE AND ASSOCIATED STRUCTURES MUST NOT BE IN THE OTHER UTILITY'S RIGHT OF WAY. THE SANITARY SEWER RIGHT OF WAY WIDTHS AND SEPARATION SHALL BE AS OUTLINED IN UNION COUNTY PUBLIC WORKS SANITARY SEWER & WATER SPECIFICATIONS DESIGN MANUAL. THIS DETAIL DOES NOT APPLY TO STORM DRAINAGE UTILIZING OPEN CHANNEL FLOW.

PLAN VIEW



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



THE SANITARY SEWER AND STORM DRAINAGE PIPES MUST BE NO CLOSER TOGETHER HORIZONTALLY THAN THE VERTICAL DISTANCE BETWEEN THE TOP OF THE HIGHER PIPE AND THE BOTTOM OF THE LOWER PIPE. A MAINTENANCE CREW MUST BE ABLE TO DIG DOWN TO THE LOWER PIPE SLOPING THE DITCH ON A 1:1 SLOPE UP FROM THE REQUIRED TRENCH BOTTOM WIDTH AND NOT EXPOSE THE HIGHER PIPE.

PROFILE VIEW

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	OVERLAPPING STORM DRAINAGE/SANITARY SEWER EASEMENTS	STD. NO. 313.1 / REV.

GENERAL NOTES:

1. FOR STREAMS CARRYING 500 ACRES OR MORE OF SURFACE RUNOFF, THE EASEMENT REQUIREMENT IS TO BE THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP OF BANK, PLUS (+) 10' ON EACH SIDE OF STREAM. (40' MINIMUM WIDTH)
2. FOR OPEN CHANNELS THE MINIMUM EASEMENT MUST CONTAIN THE WIDTH OF THE STREAM FROM TOP OF BANK TO TOP BANK.
3. WIDER EASEMENT WIDTHS MAY BE REQUIRED FOR PIPE DEPTHS GREATER THAN TEN FEET.
4. EASEMENTS WIDTHS FOR ELLIPTICAL OR IRREGULAR PIPE SIZES SHALL BE APPROVED BY THE TOWN ENGINEER.
5. PIPE SYSTEMS AND OPEN CHANNELS ON PRIVATE PROPERTY SHALL BE PLACED IN A STORM DRAINAGE EASEMENT.

EASEMENT REQUIREMENTS FOR
OPEN STORM DRAINAGE CHANNELS

AREA IN ACREAGE	EASEMENT REQUIREMENT
0–45 ac.	20'
45–120 ac.	30'
120–500 ac.	40'
500 ac.+	SEE NOTE

EASEMENT REQUIREMENTS FOR STORM DRAIN PIPE

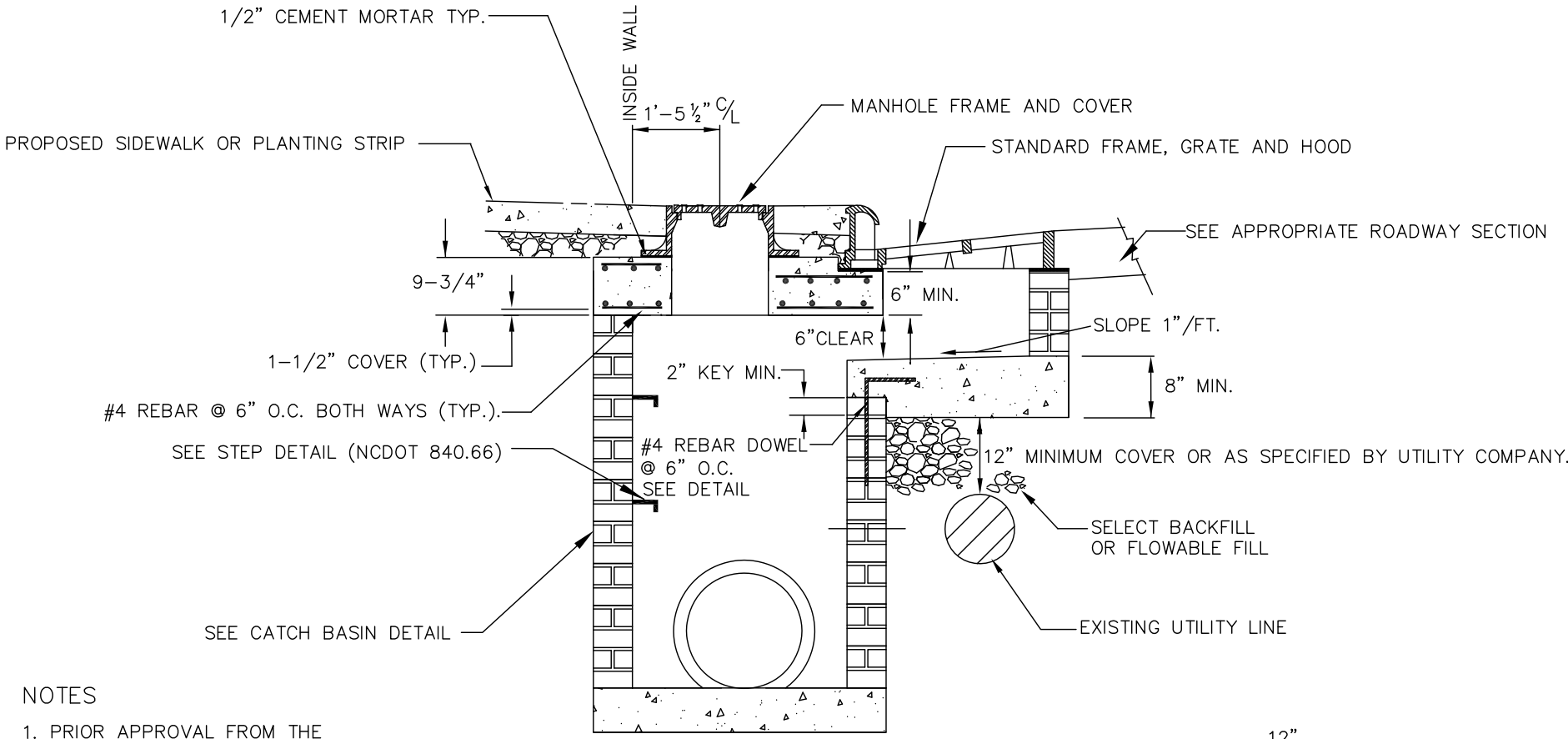
PIPE SIZE	EASEMENT REQUIREMENT
15" – 36"	20'
42" – 48"	25'
54"+	30'MIN (VARIES)

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

MINIMUM DRAINAGE EASEMENT REQUIREMENTS FOR STORM DRAIN PIPES AND OPEN CHANNELS

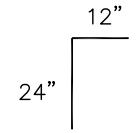
STD. NO.	REV.
314.1	



NOTES

1. PRIOR APPROVAL FROM THE TOWN ENGINEER IS REQUIRED.
2. THIS STRUCTURE IS TO ONLY BE USED ON TOWN MAINTAINED STREETS AND NOT ON NCDOT STREETS WITHOUT THEIR PERMISSION.

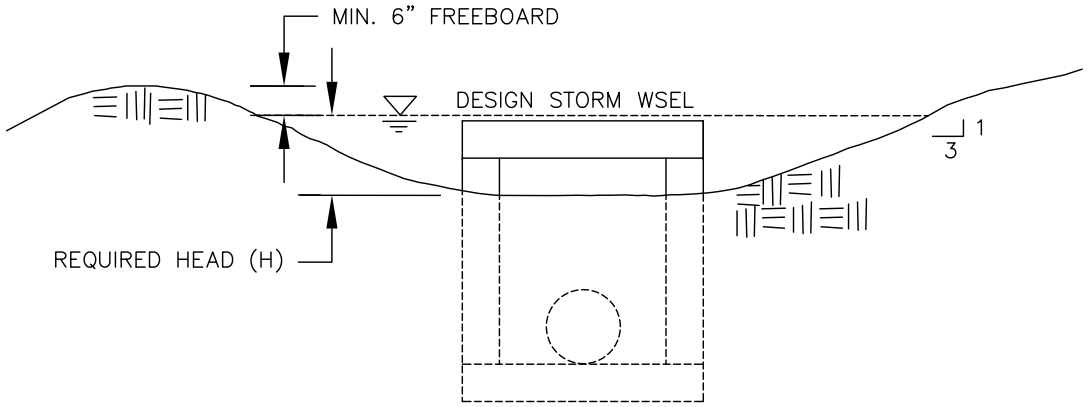
OFFSET CATCH BASIN EXISTING UTILITY CONFLICT

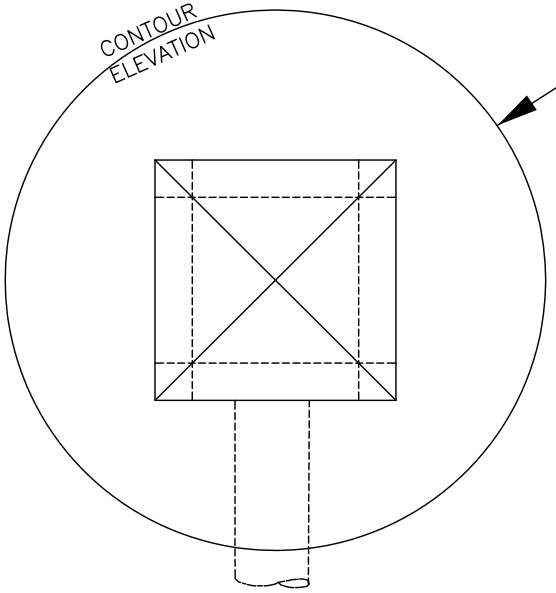


DOWEL DETAIL

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	OFFSET CATCH BASIN	STD. NO. 315.1 / REV.





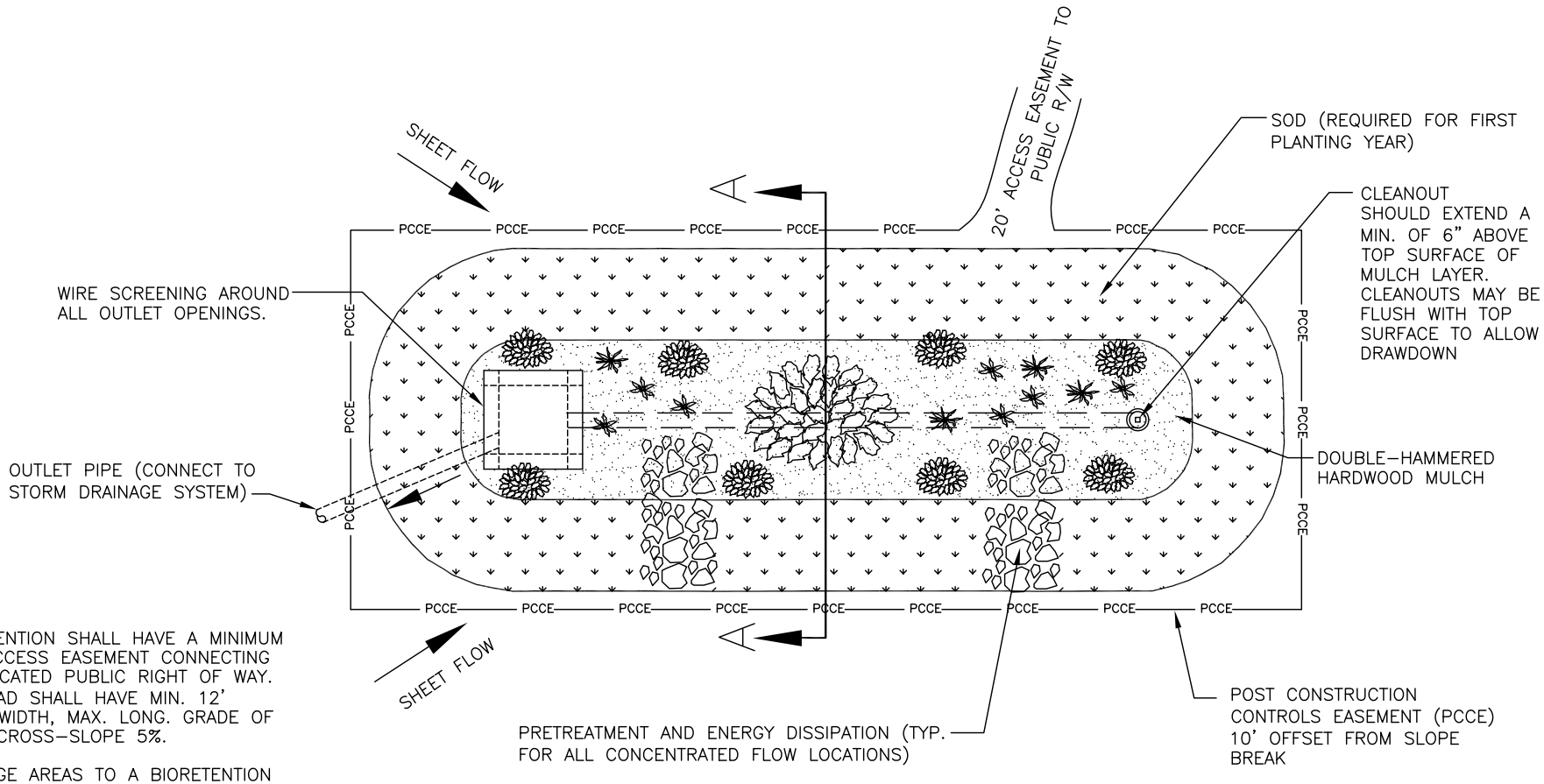
YARD INLET	AREA (AC)	CFS	HEAD H (FT)	COMMENT

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

GRADING AT DROP INLET

NOT TO SCALE

STD. NO.	REV.
316.1	8/19



PLAN

NOTES:

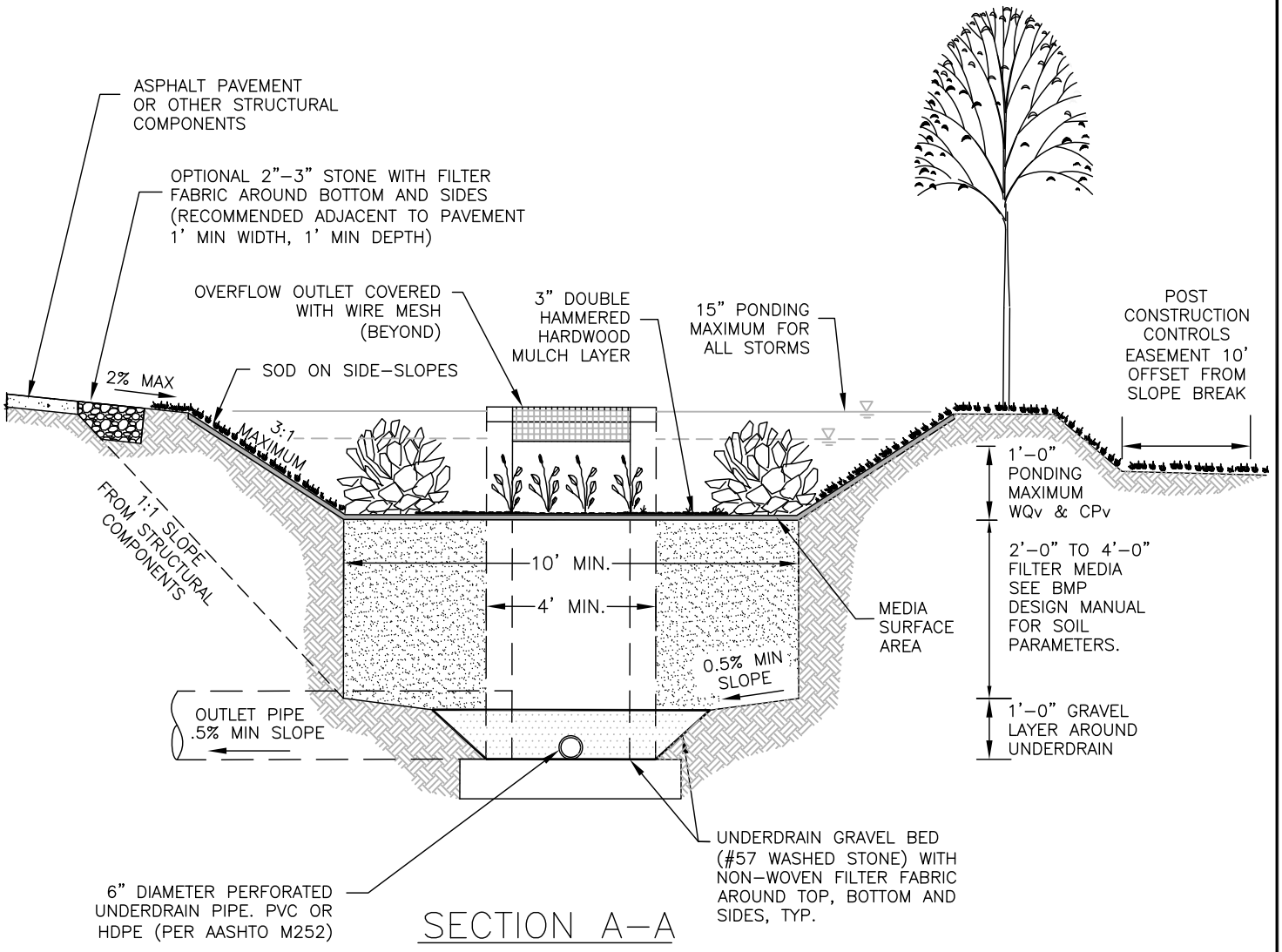
1. ALL BIORETENTION SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.
2. ALL DRAINAGE AREAS TO A BIORETENTION FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF AMENDED SOILS, MULCH OR PLANTINGS.
3. AMENDED SOIL WILL ONLY BE PERMITTED WITH A VALID SOIL ANALYSIS REPORT.
4. INSTALL WIRE SCREENING AROUND ALL OUTLET OPENINGS TO PREVENT LOSS OF MULCH.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BIORETENTION PLAN	STD. NO. 400.1	REV.

NOTES:

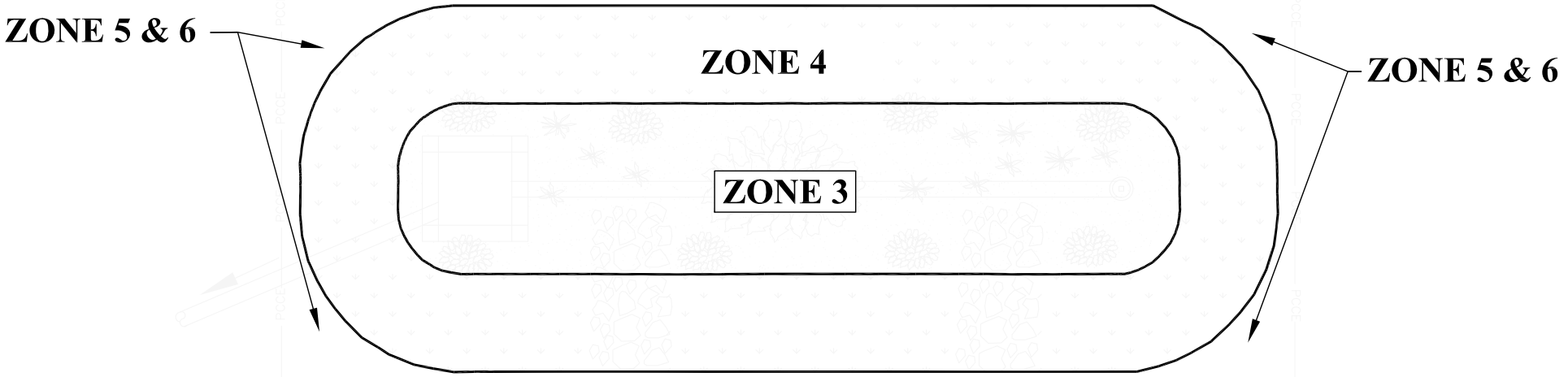
1. ALL BIORETENTION FACILITIES SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.
2. ALL DRAINAGE AREAS TO A BIORETENTION FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF AMENDED SOILS, MULCH OR PLANTINGS.
3. AMENDED SOIL WILL ONLY BE PERMITTED WITH A VALID SOIL ANALYSIS REPORT. NO AMENDED SOIL SHALL BE ALLOWED ON THE SIDE SLOPES.
4. INSTALL WIRE SCREENING AROUND ALL OUTLET OPENINGS TO PREVENT LOSS OF MULCH.
5. PVC UNDERDRAIN PIPE SHOULD HAVE 3/8" PERFORATIONS SPACED AT 6" CENTERS, MIN. 4 HOLES PER ROW. MAX SPACING OF UNDERDRAIN PIPE IS 10 FEET ON CENTER. HDPE SHALL ADHERE TO AASHTO M252 SPECS.
6. UNDERDRAIN CLEANOUTS SHOULD EXTEND A MIN. OF 6" ABOVE TOP SURFACE OF MULCH LAYER. CLEANOUTS MAY BE FLUSH WITH TOP OF SURFACE TO ALLOW DRAWDOWN.
7. ONLY SMALL MATURING TREES ARE ALLOWED TO BE PLANTED IN THE AMENDED SOILS.



SECTION A–A

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BIORETENTION CROSS-SECTION	STD. NO. 401.1	REV.



PLAN

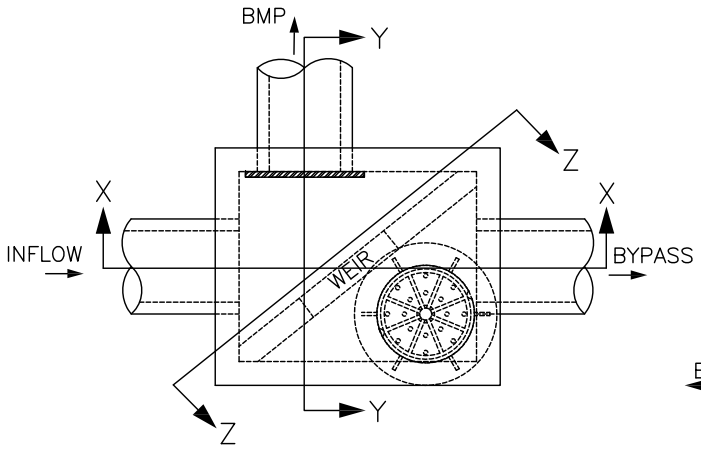
NOTES:

1. PLANTING ZONES AND PLANT SELECTION PER THE NCDEQ STORMWATER BMP MANUAL, CHAPTER 6 & APPENDICES.
2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.
3. IRRIGATION MAY BE PROVIDED FOR INITIAL ESTABLISHMENT AND DRY SEASONS.
4. ONLY SMALL MATURING TREES ARE ALLOWED TO BE PLANTED IN THE AMENDED SOILS.

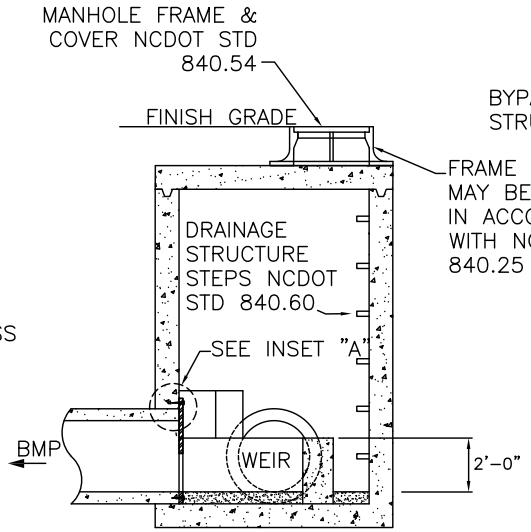
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BIORETENTION PLANTING PLAN

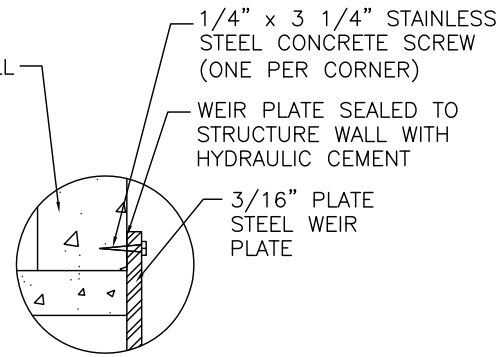
STD. NO.	REV.
402.1	



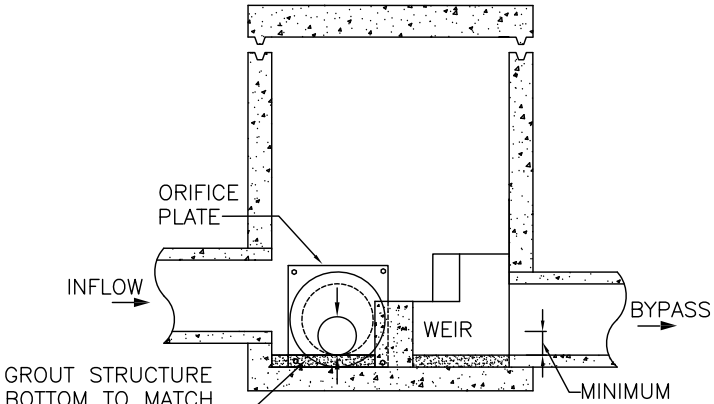
PLAN



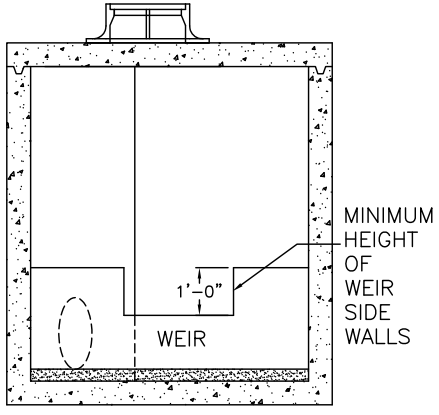
SECTION Y–Y



INSET "A"



SECTION X–X



SECTION Z–Z

NOTES:

1. ALL CONCRETE SHALL BE 3600 PSI.
2. ALL JOINTS ARE TO BE SEALED WATER TIGHT.
3. WEIR IS TO BE POURED–IN–PLACE CONCRETE.
4. REFER TO NCDOT STANDARD DRAWINGS FOR BOX CONSTRUCTION.
5. NOT ACCEPTABLE FOR USE IN STREET RIGHT OF WAY WITHOUT TOWN/NCDOT APPROVAL.

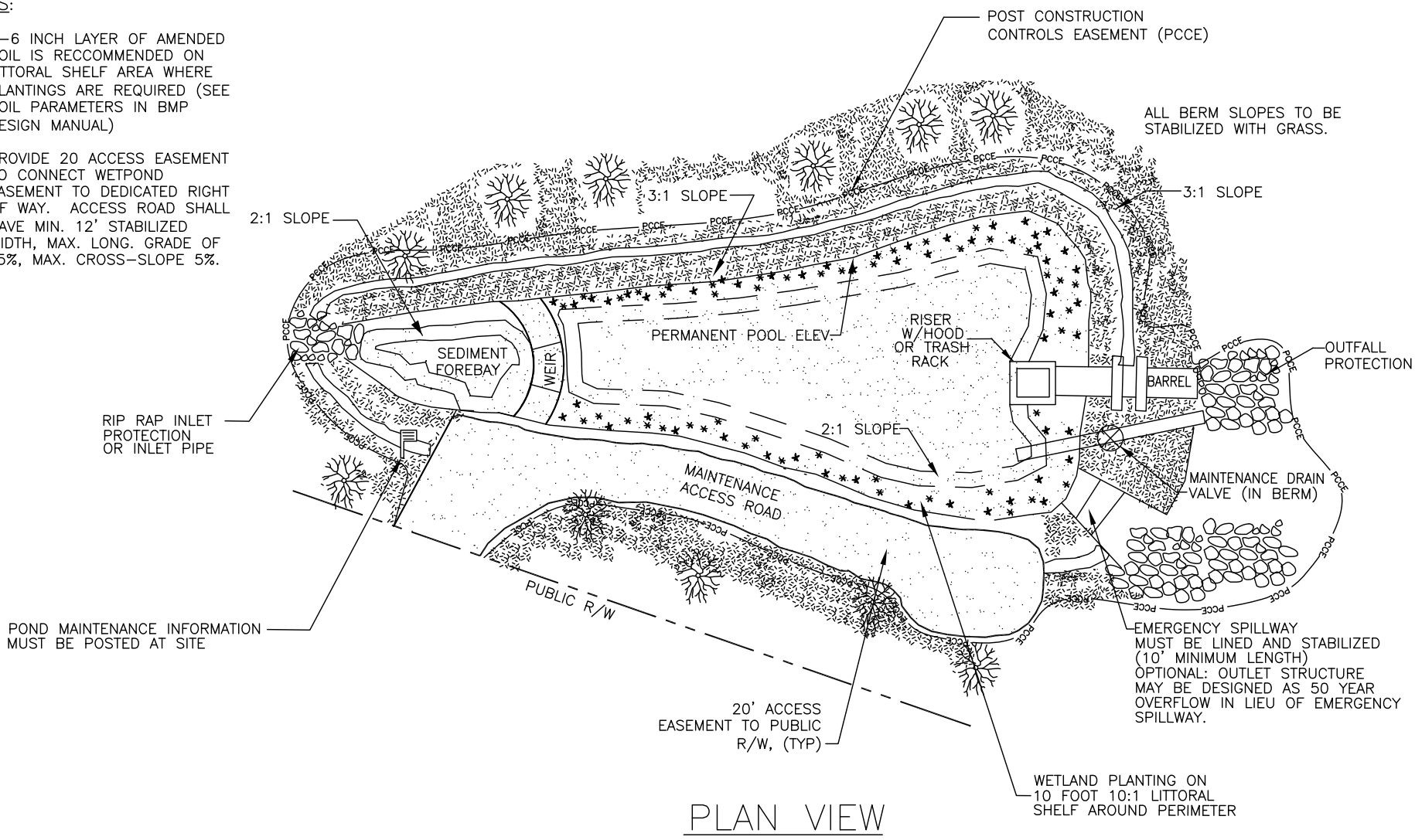
NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	FLOW SPLITTER STRUCTURE	STD. NO. 404.1	REV.

NOTES:

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

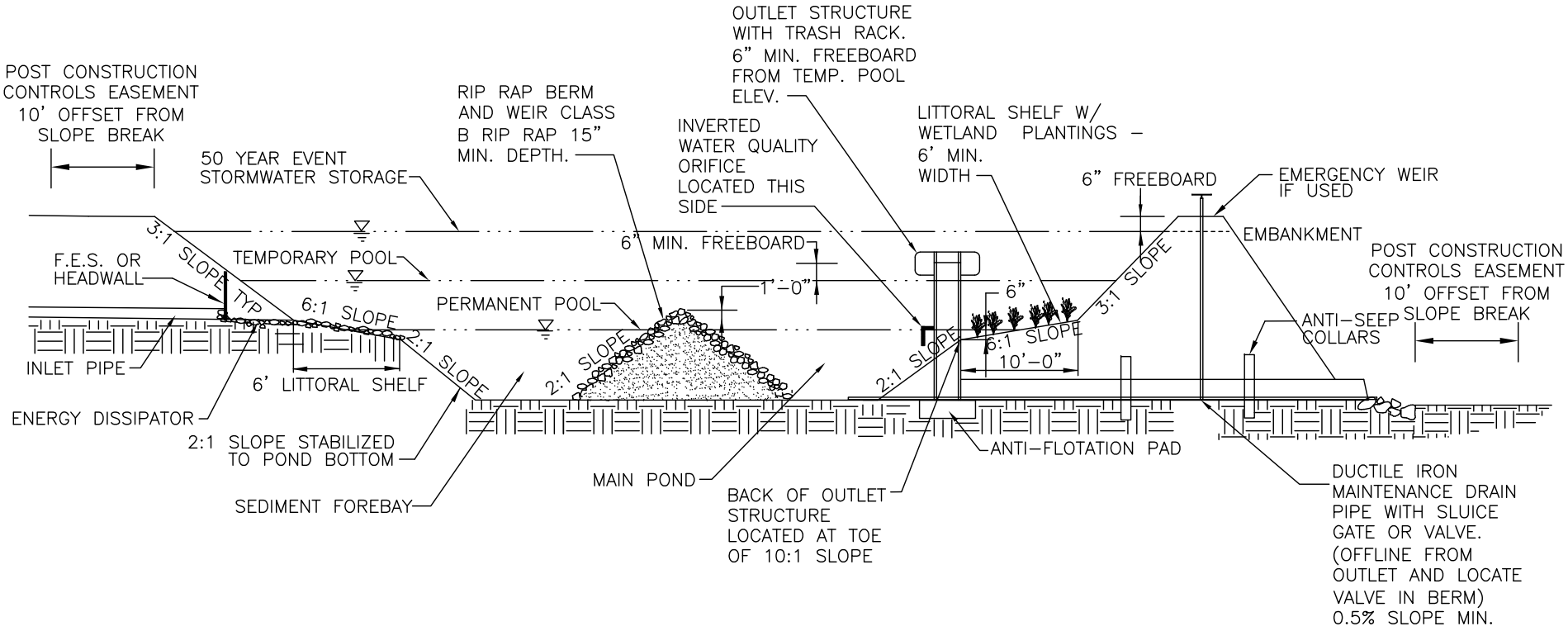
2. PROVIDE 20 ACCESS EASEMENT TO CONNECT WETPOND EASEMENT TO DEDICATED RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS–SLOPE 5%.



PLAN VIEW

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETPOND PLAN	STD. NO. 405.1 REV.

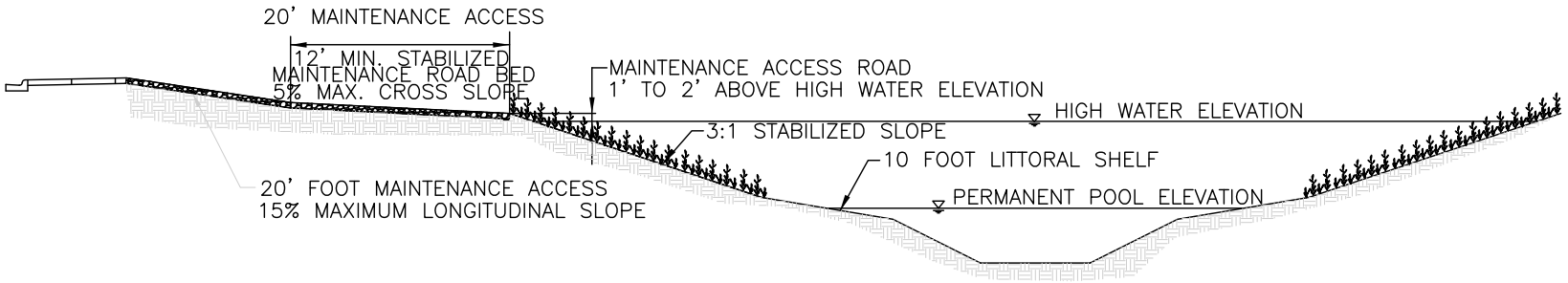


NOTES:

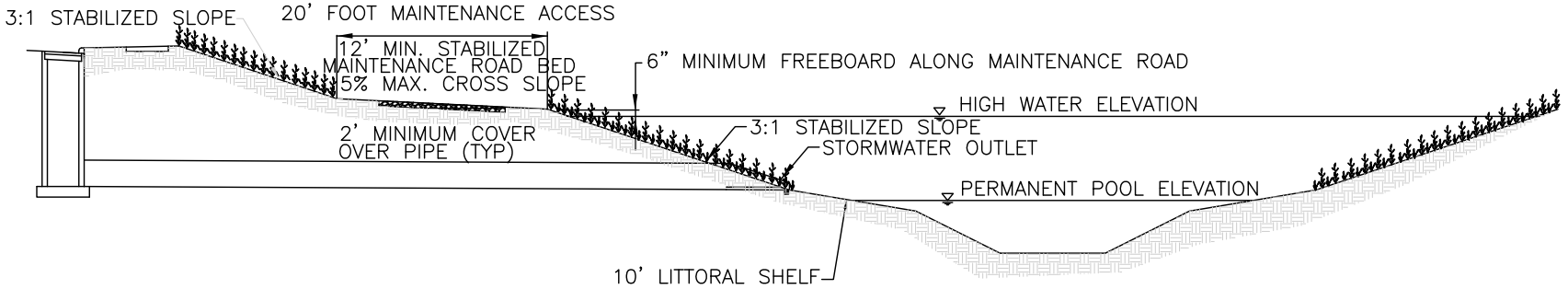
1. 4–6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE NCDEQ STORMWATER BMP MANUAL).

NOT TO SCALE

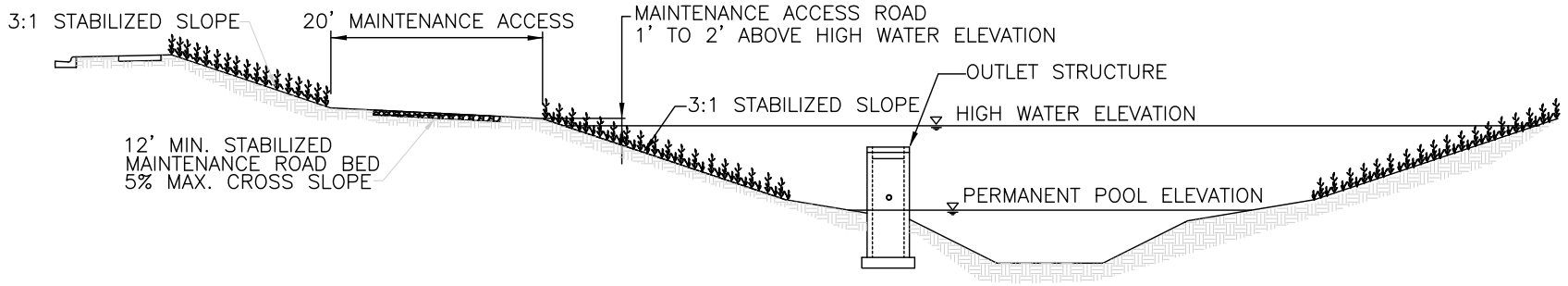
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETPOND PROFILE	STD. NO. 406.1	REV. 3/24



SECTION AT MAINTENANCE ROAD ACCESS AND FOREBAY



SECTION AT STORMWATER OUTFALL

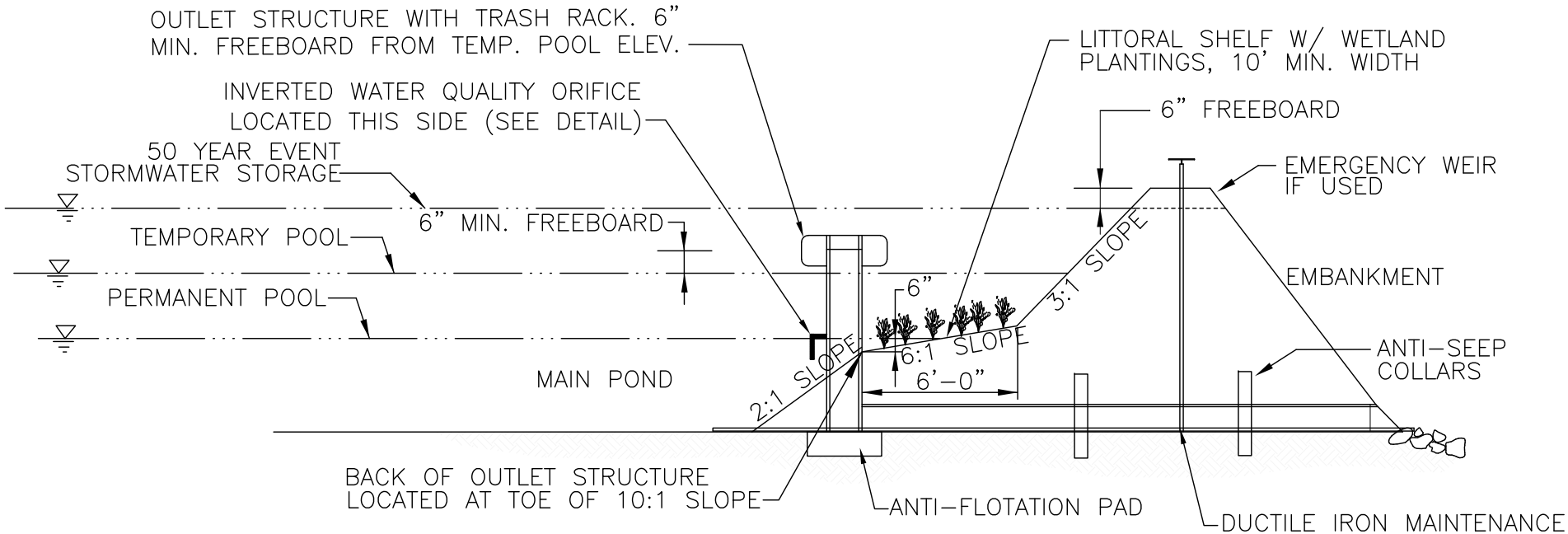


SECTION AT OUTLET STRUCTURE

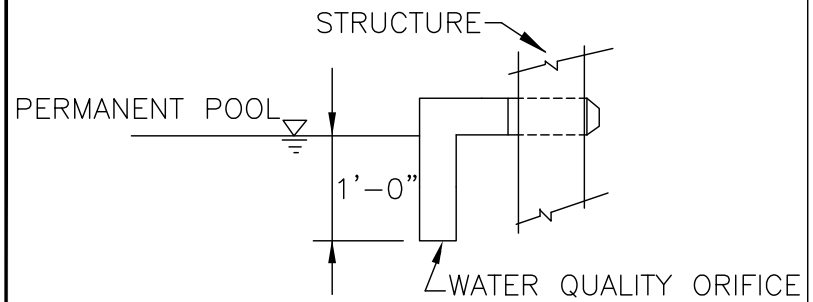
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETPOND CROSS SECTIONS

STD. NO.	REV.
407.1	



POND PROFILE



WATER QUALITY ORIFICE DETAIL

NOT TO SCALE

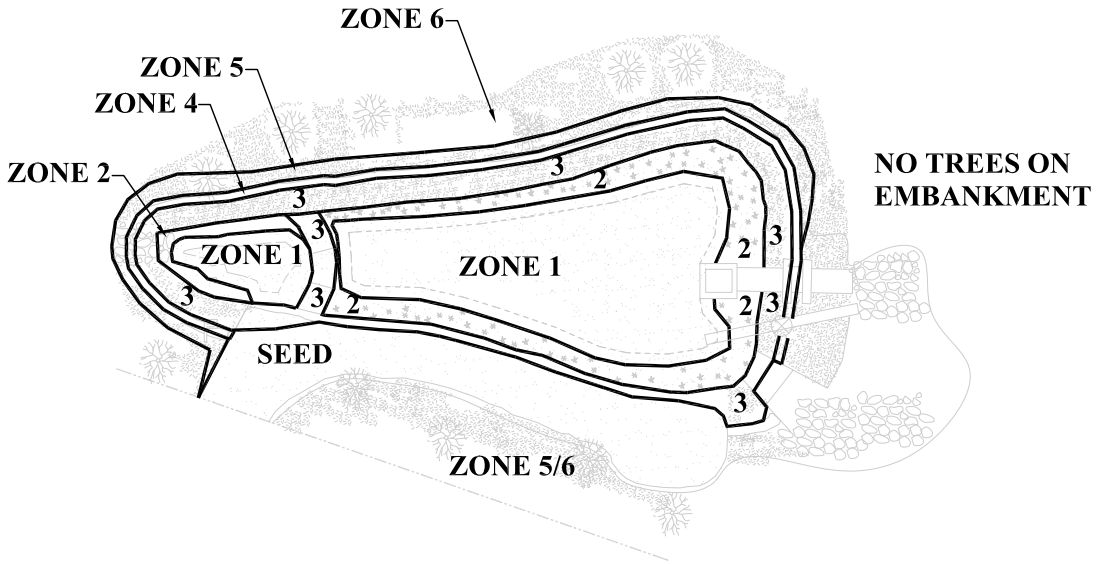
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETPOND LITTORAL SHELF AND BERM DETAIL	STD. NO. 408.1 / REV. 3/24

NOTES:

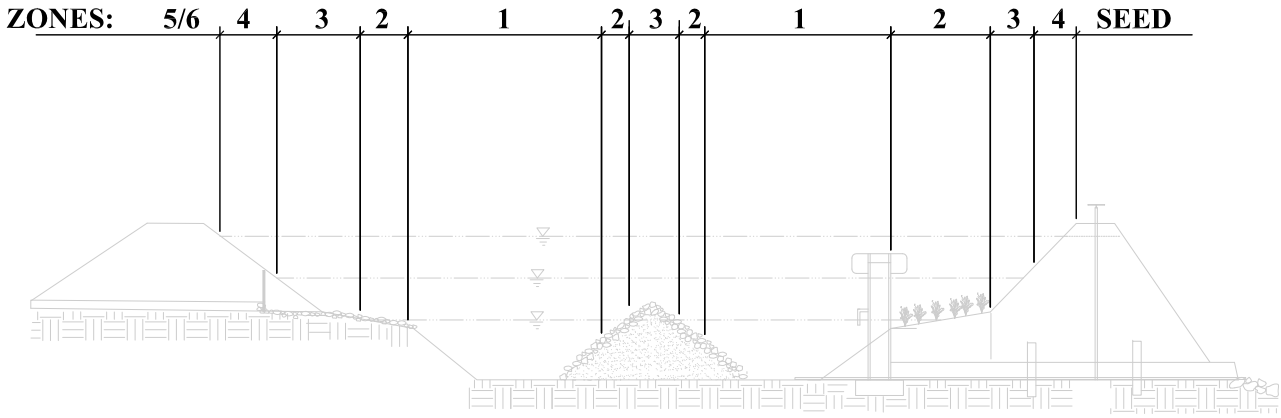
1. PLANTINGS ZONES AND PLANT SELECTION PER THE NCDEQ STORMWATER BMP MANUAL, CHAPTER 6 & APPENDICES.

2. ALL PLANTINGS SHALL BE LOCAL NATIVE SPECIES.

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



PLAN VIEW
NOT TO SCALE



POND CROSS SECTION
NOT TO SCALE

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETPOND PLANTING PLAN

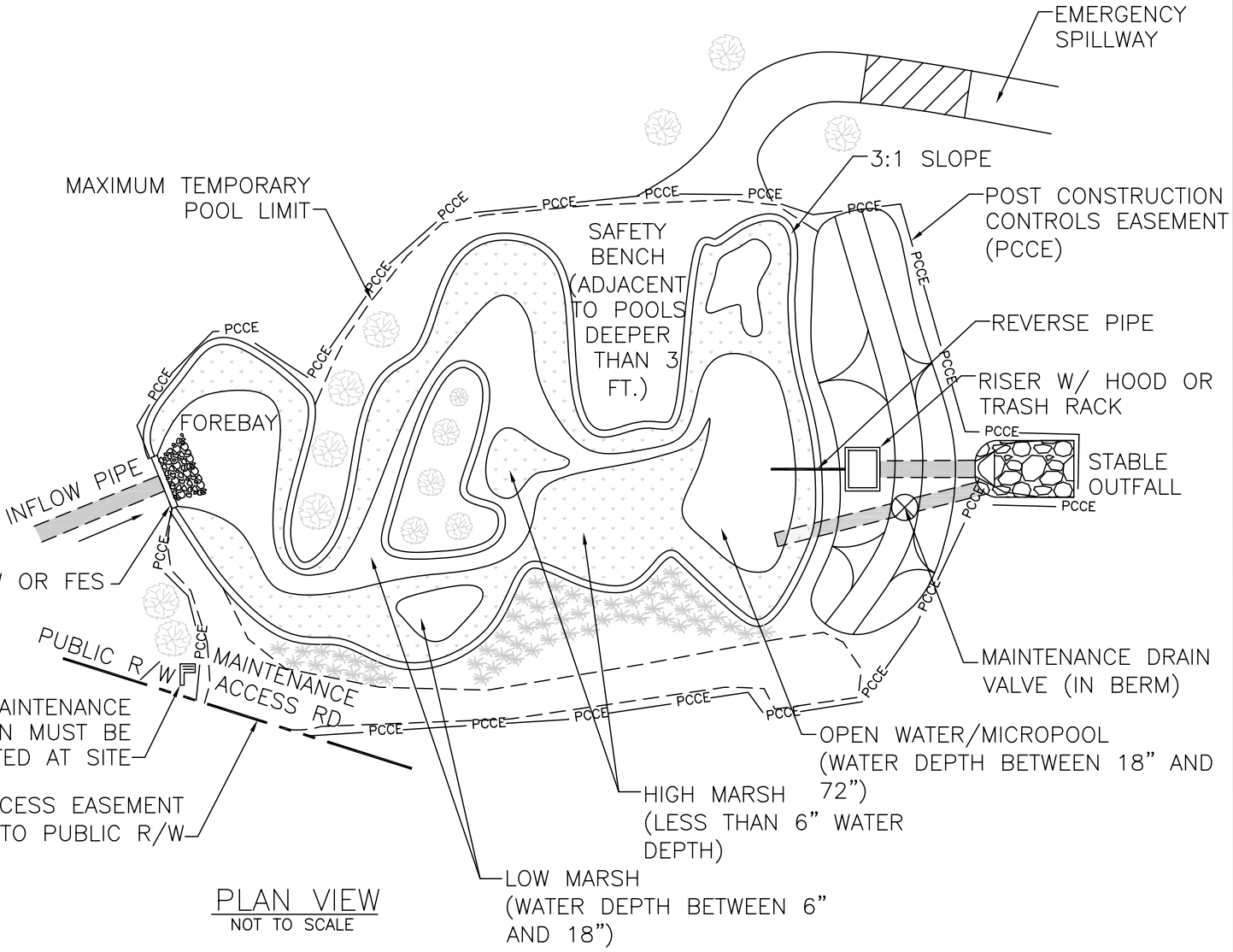
STD. NO. 409.1 | REV.

NOTES:

1. 4–6 INCH LAYER OF AMENDED SOIL IS REQUIRED ON ANY MARSH AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN (SEE NCDEQ STORMWATER BMP MANUAL)

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

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



PLAN VIEW
NOT TO SCALE

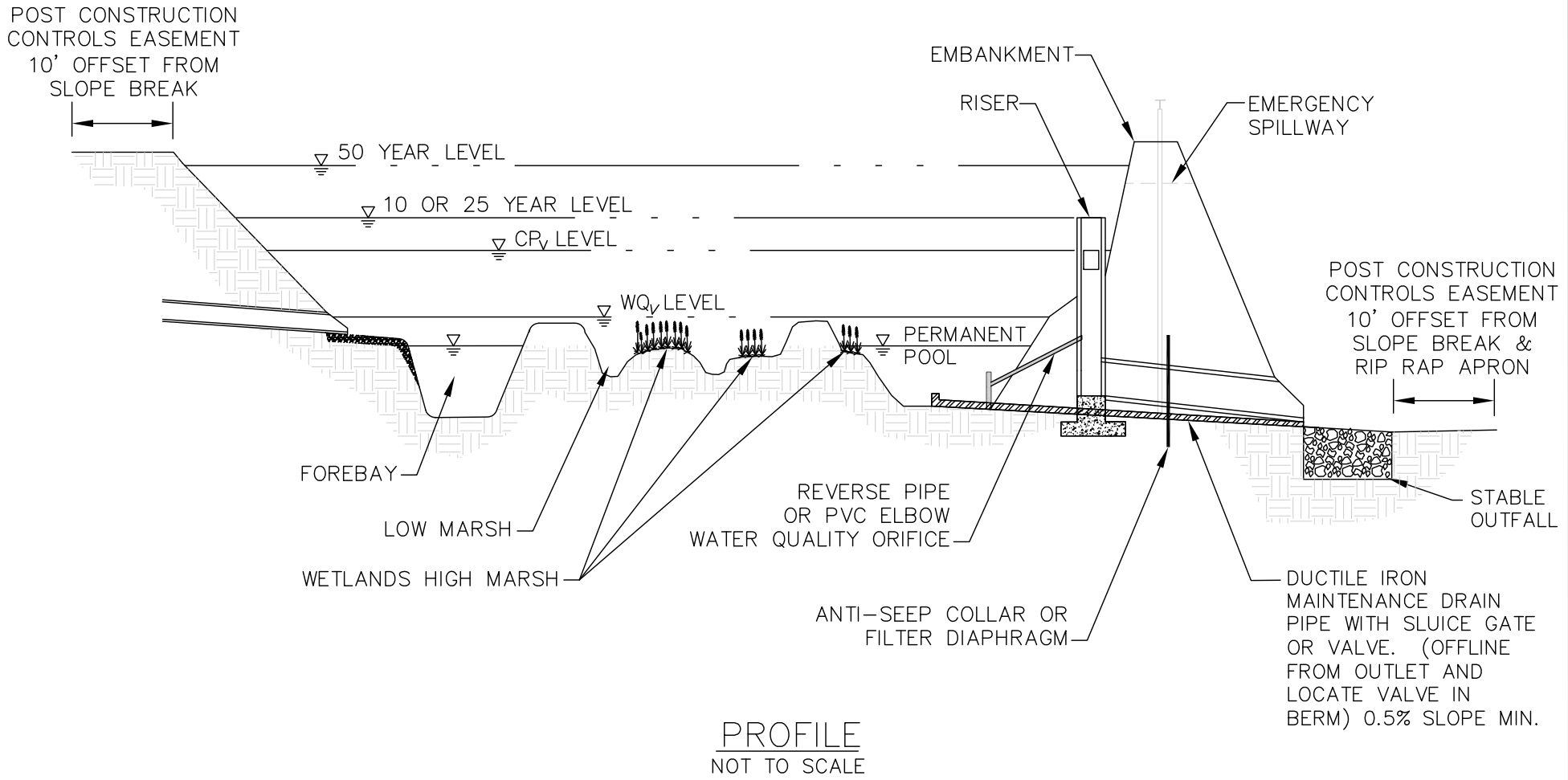
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETLAND PLAN

STD. NO. 410.1 | REV.

NOTE:

A 4–6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE SOIL PARAMETERS IN NCDEQ STORMWATER BMP MANUAL.)

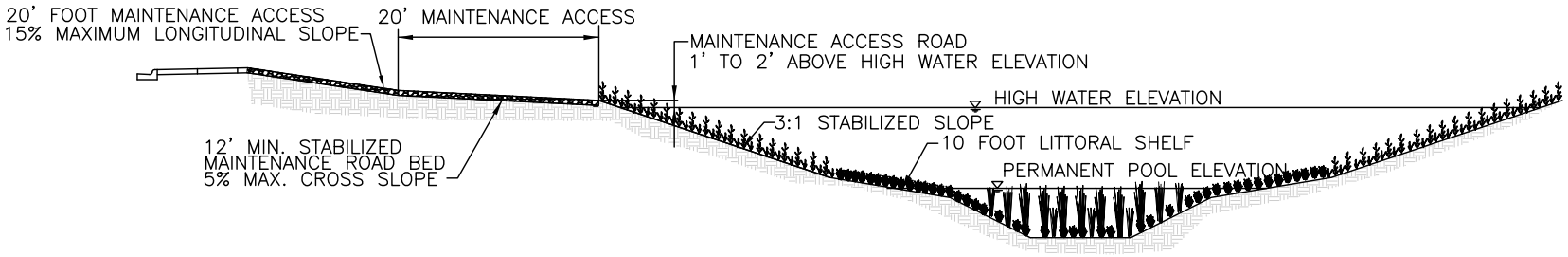


PROFILE

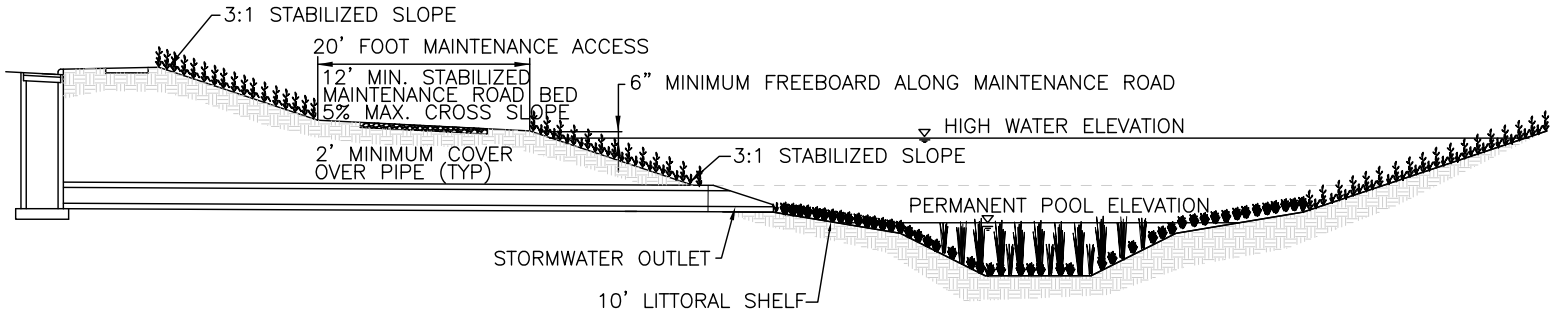
NOT TO SCALE

NOT TO SCALE

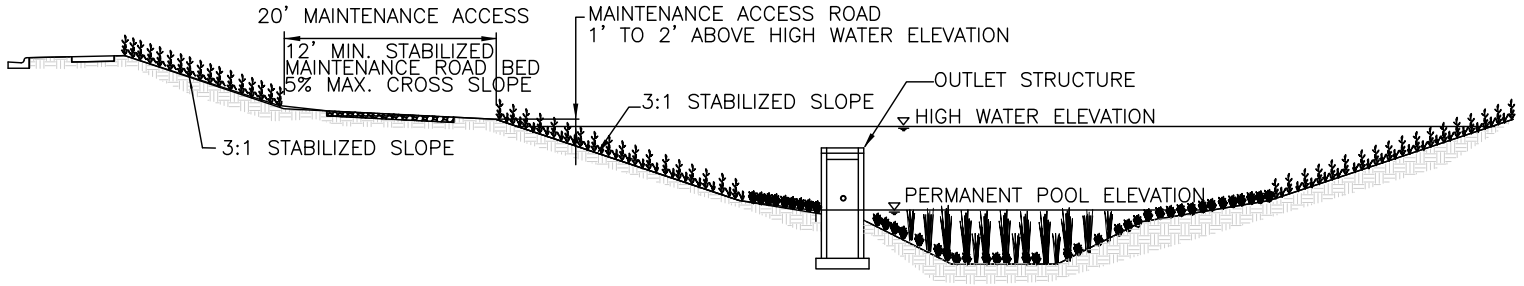
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETLAND PROFILE	STD. NO. 411.1	REV. 8/19



SECTION AT MAINTENANCE ROAD ACCESS AND FOREBAY



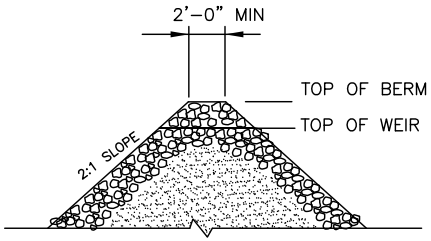
SECTION AT STORMWATER OUTFALL



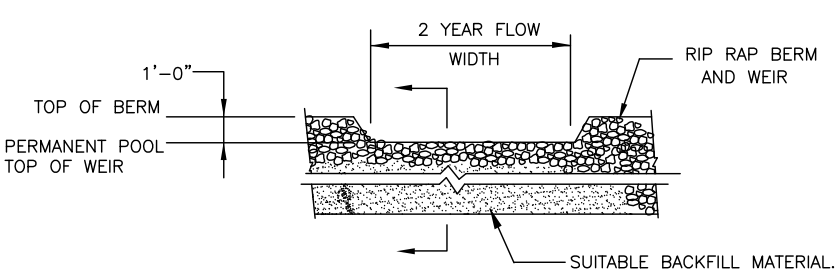
SECTION AT OUTLET STRUCTURE

NOT TO SCALE

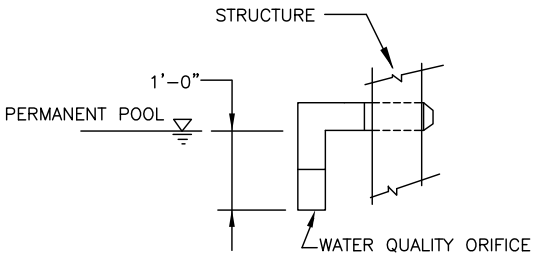
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETLAND CROSS SECTIONS	STD. NO. 412.1 / REV.



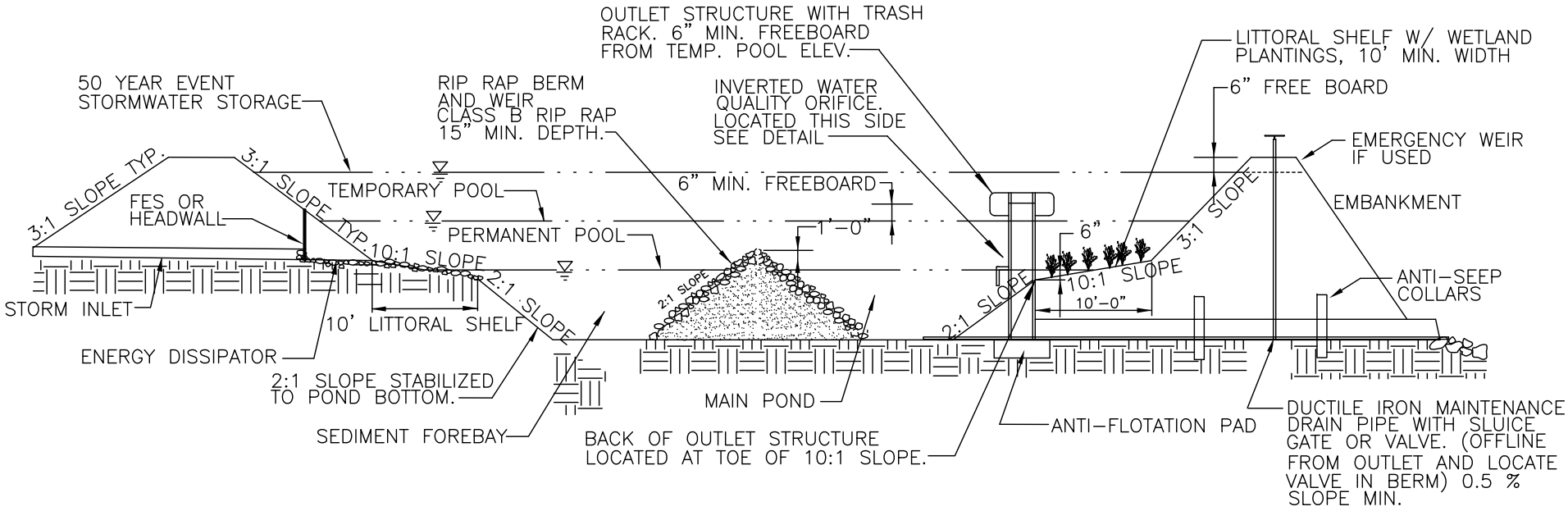
BERM AND WEIR SECTION



BERM AND WEIR DETAIL



WATER QUALITY ORIFICE DETAIL



CROSS SECTION
NOT TO SCALE

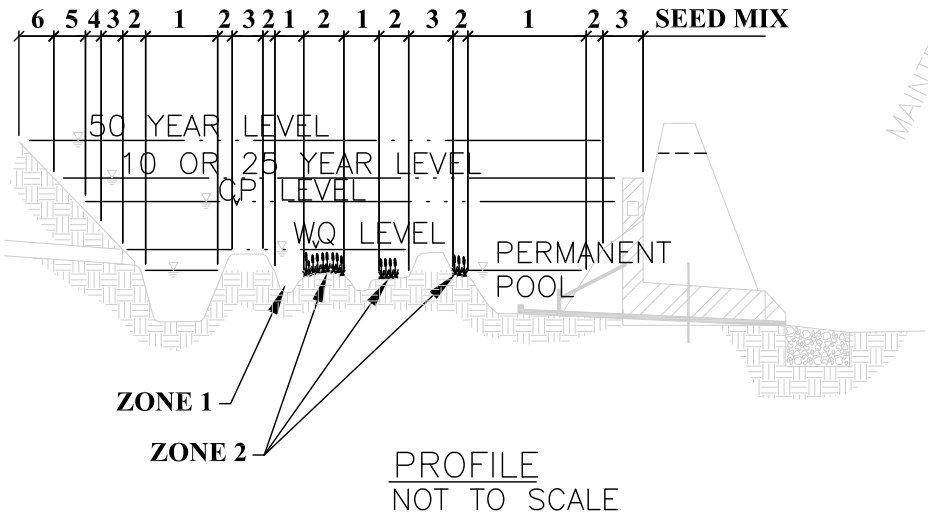
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETLAND DETAILS

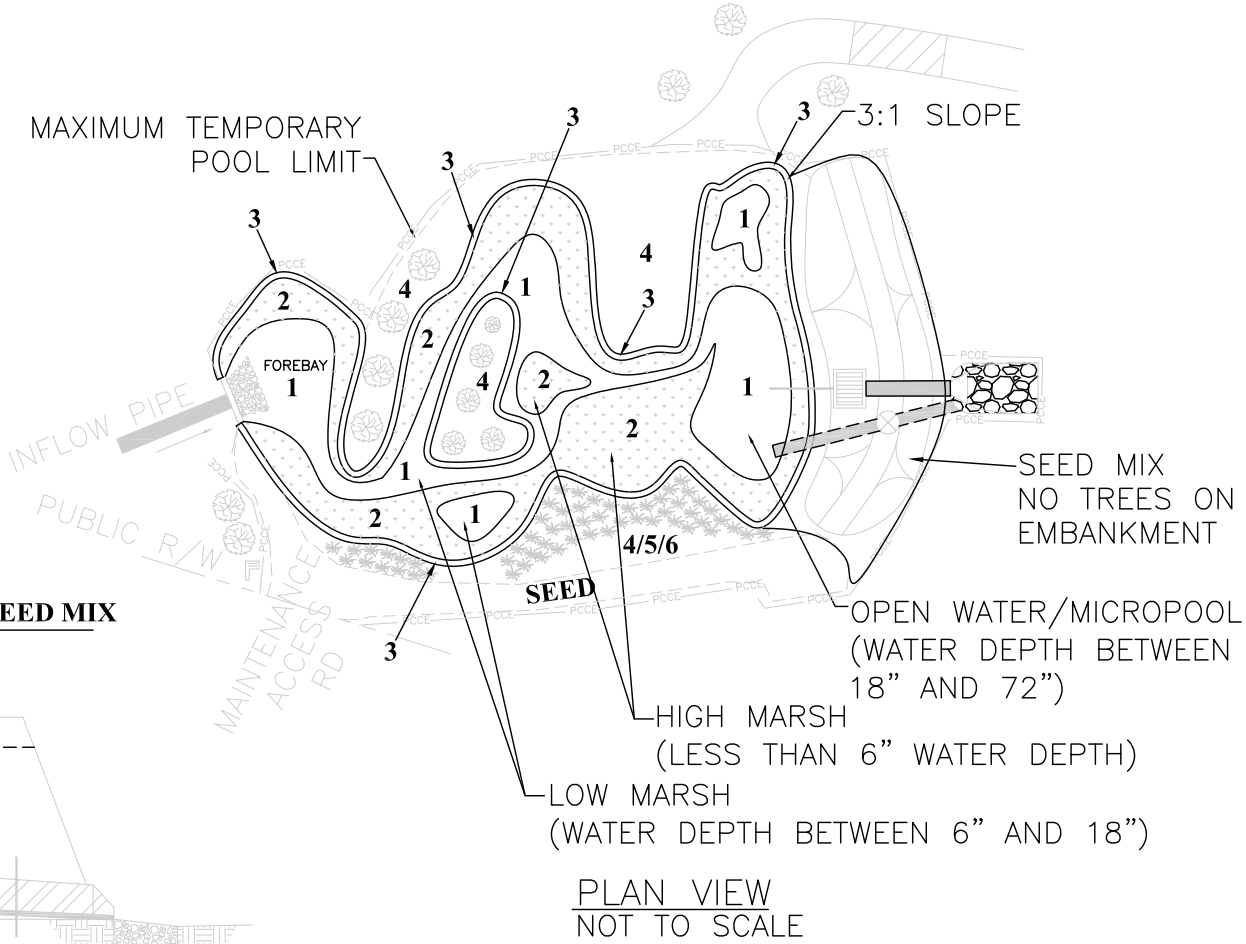
STD. NO.	REV.
413.1	

NOTES

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



PROFILE
NOT TO SCALE

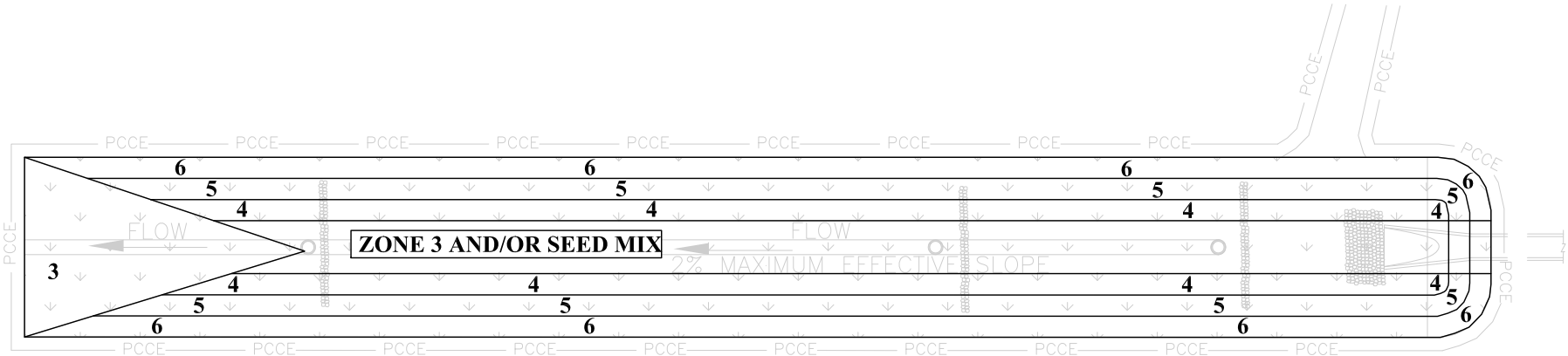


PLAN VIEW
NOT TO SCALE

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WETLAND PLANTING PLAN

STD. NO. 414.1 | REV.



PLAN VIEW

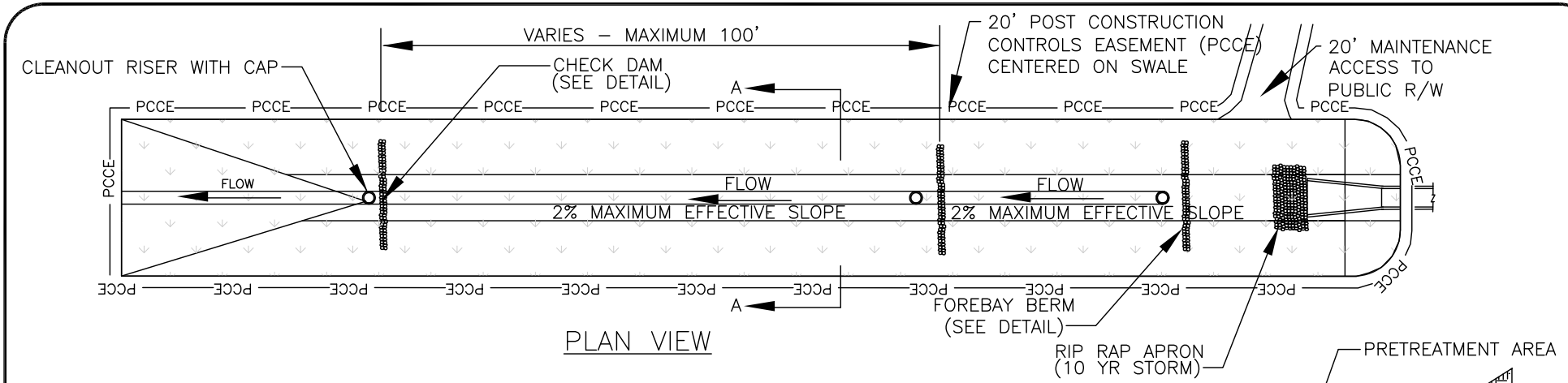
NOTES

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

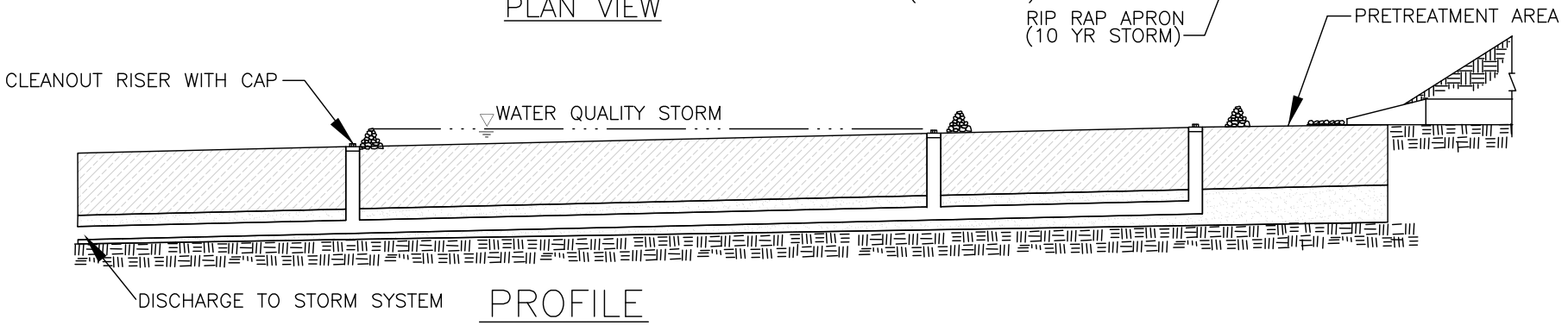
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ENHANCED GRASS SWALE PLANTING PLAN

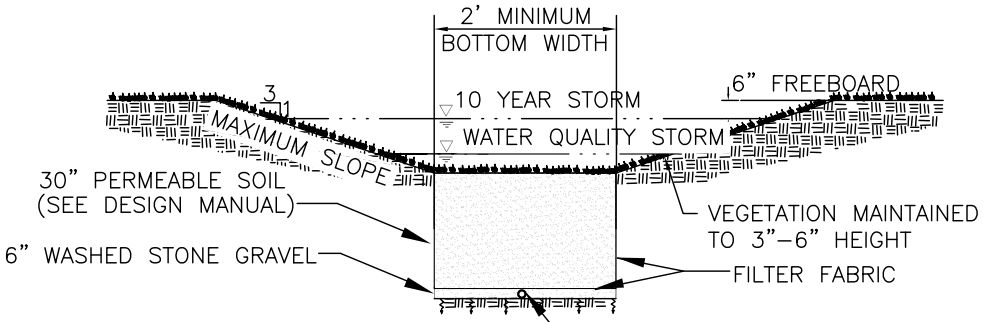
STD. NO.	REV.
415.1	



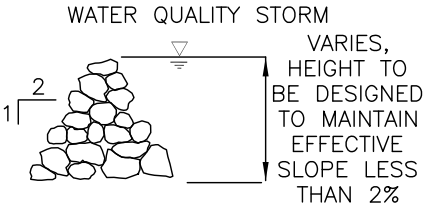
PLAN VIEW



PROFILE



SECTION A–A



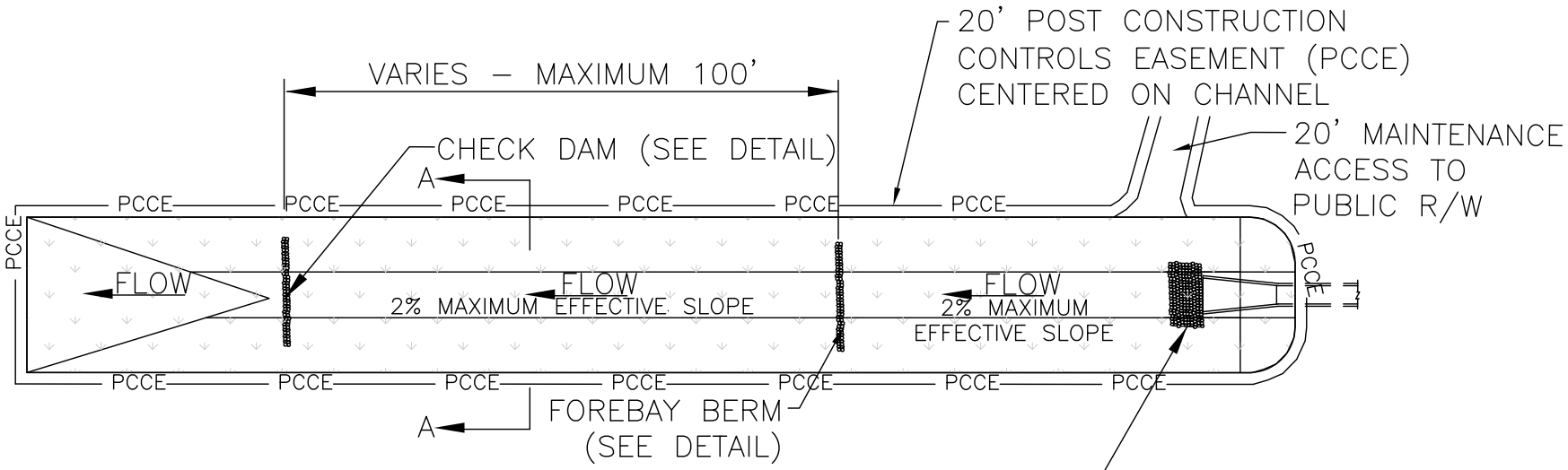
CHECK DAM AND
FOREBAY BERM DETAIL

NOTES:

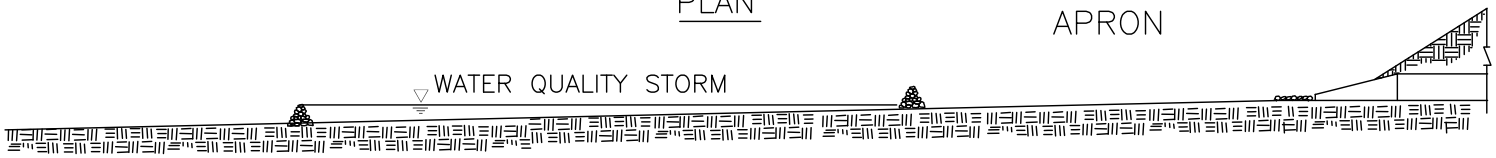
1. ALL ENHANCED GRASS SWALES SHALL HAVE A MINIMUM 20–FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS–SLOPE 5%.

NOT TO SCALE

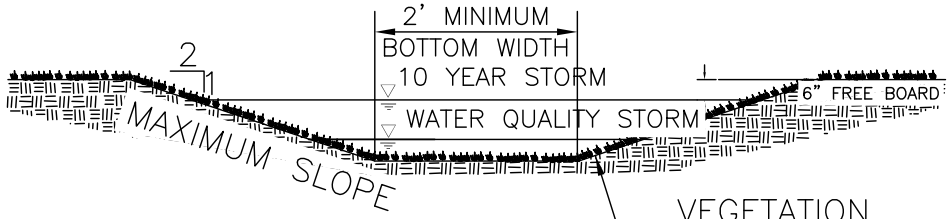
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ENHANCED GRASS SWALE DETAILS STD. NO. 416.1 REV.



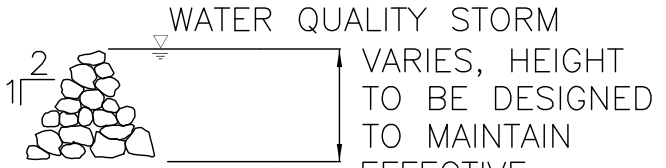
PLAN



PROFILE



SECTION A–A



CHECK DAM AND FOREBAY BERM DETAIL

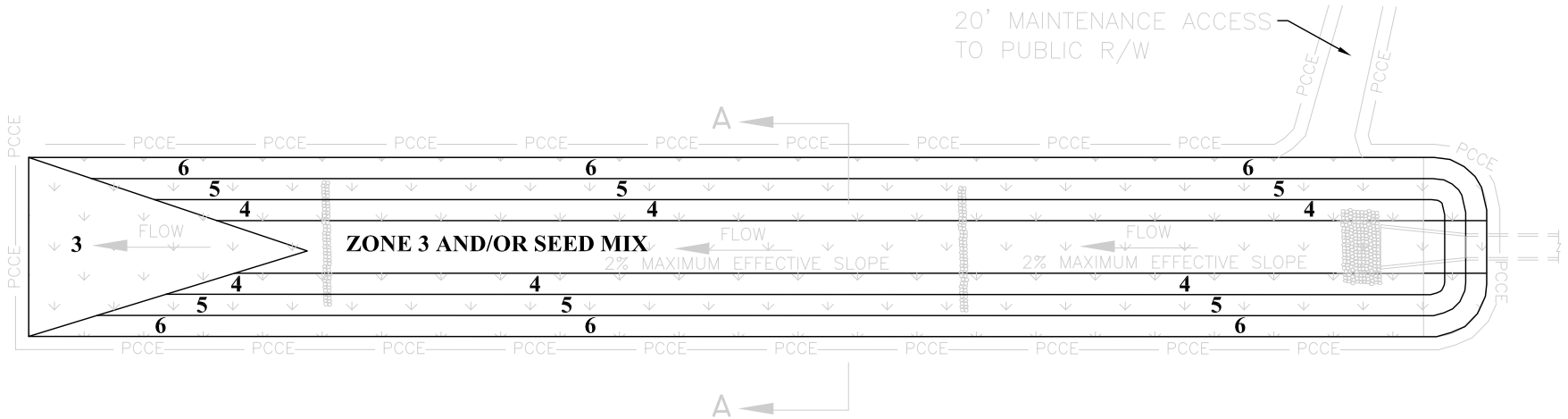
NOTES:

1. CONNECT GRASS SWALE EASEMENT TO A DEDICATED PUBLIC RIGHT OF WAY WITH A 20–FOOT ACCESS EASEMENT.

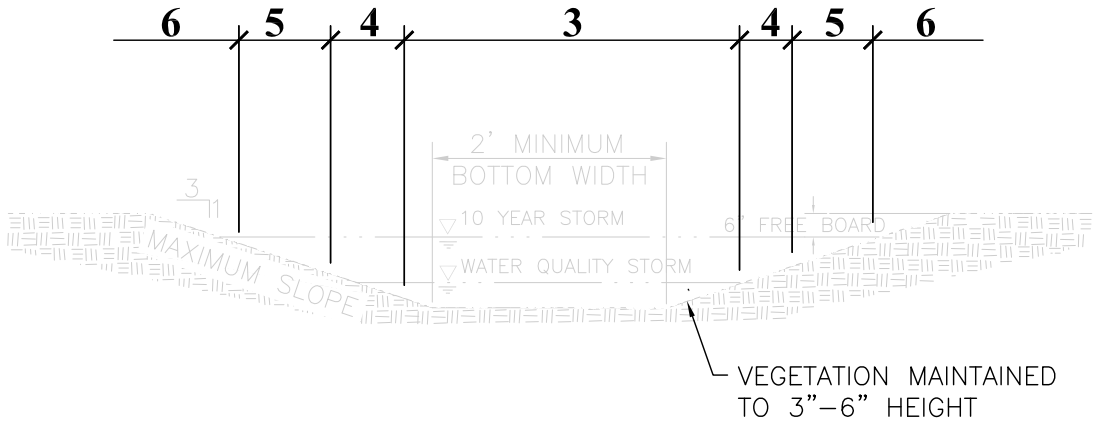
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	GRASS CHANNEL

STD. NO.	REV.
417.1	



PLAN VIEW
NOT TO SCALE

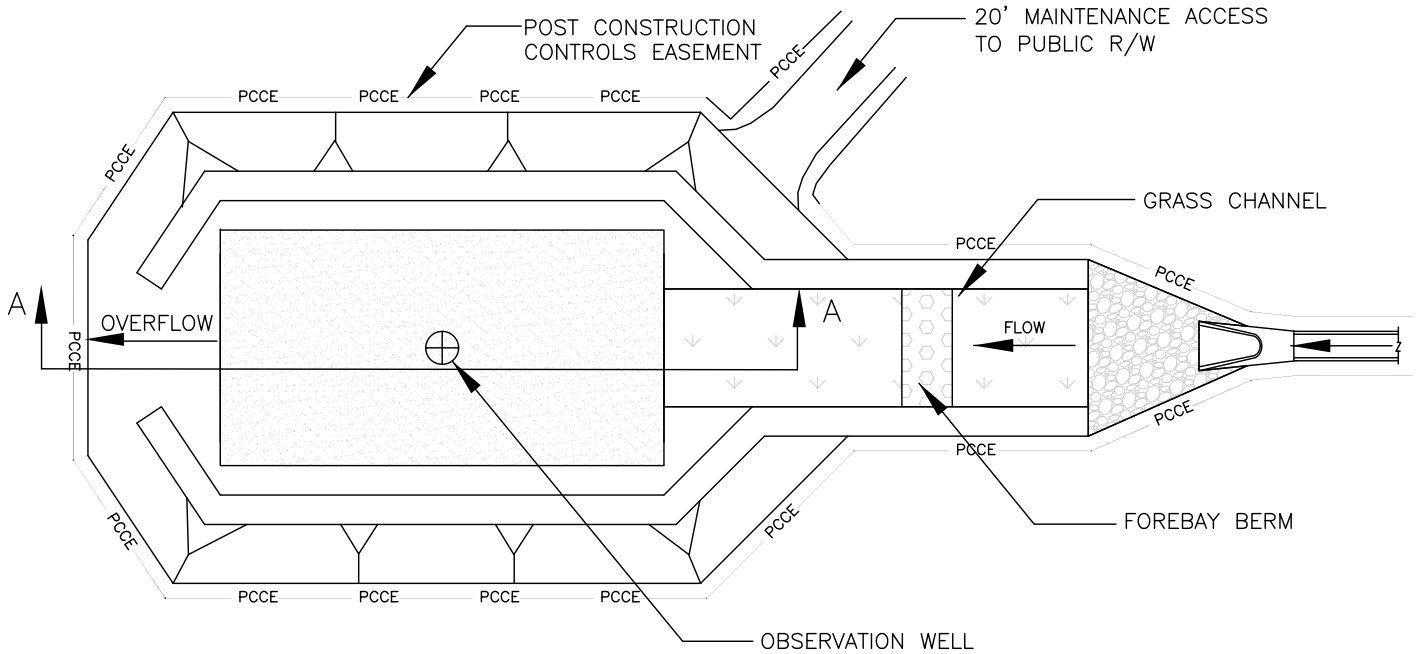


SECTION A–A
NOT TO SCALE

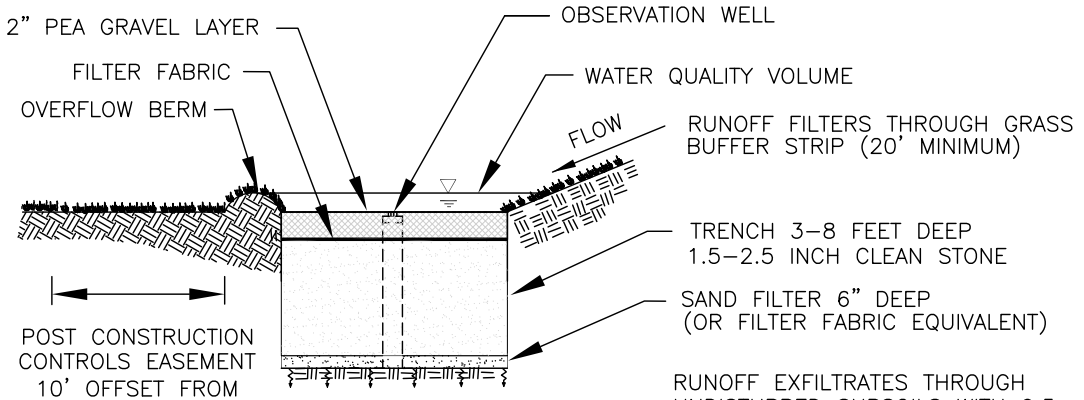
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	GRASS CHANNEL PLANTING PLAN

STD. NO.	REV.
418.1	



PLAN
NOT TO SCALE



SECTION A–A
NOT TO SCALE

NOTES:

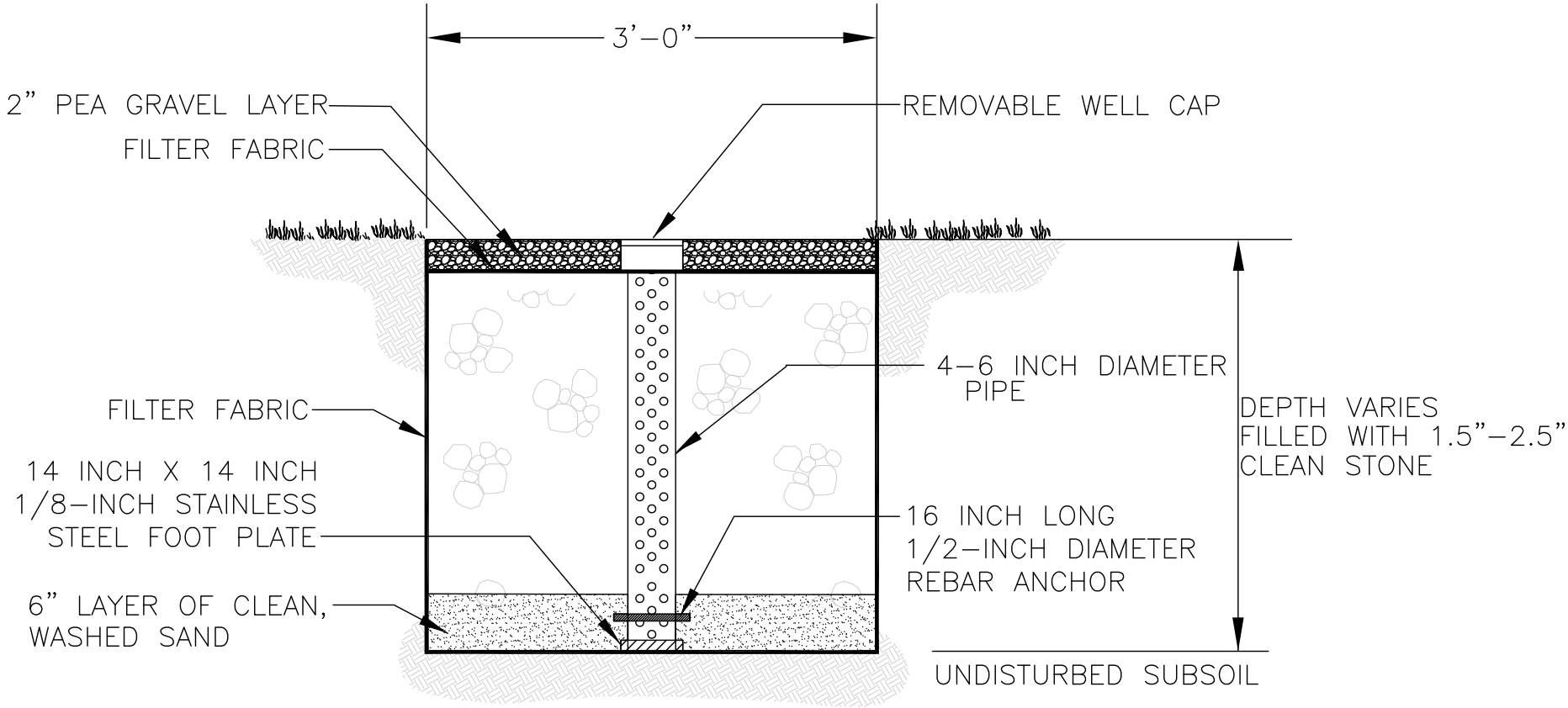
1. CONNECT INFILTRATION TRENCH EASEMENT TO A DEDICATED PUBLIC RIGHT OF WAY WITH A 20–FOOT ACCESS EASEMENT.
2. 5 ACRE MAXIMUM DRAINAGE AREA.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

INFILTRATION TRENCH

STD. NO.	REV.
419.1	



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

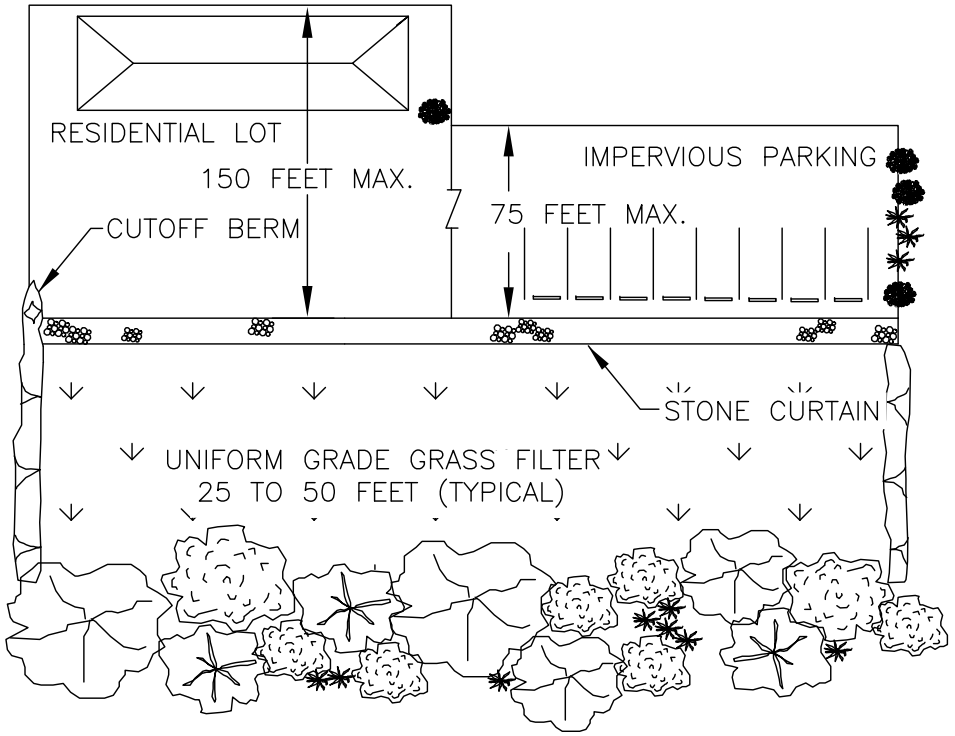
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	OBSERVATION WELL

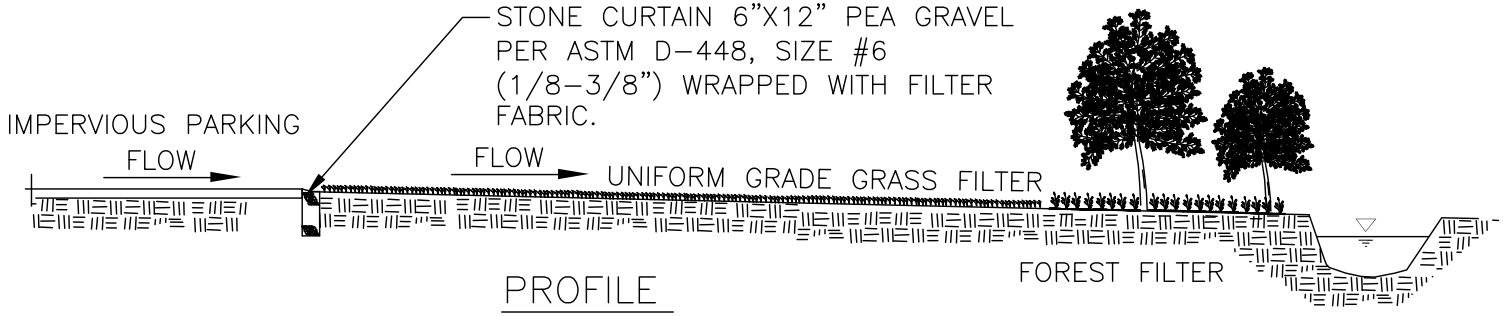
STD. NO.	REV.
420.1	

NOTES:

1. MAXIMUM SLOPE 2% FOR FILTER STRIP AND 5% FOR BUFFER STRIP.
2. 5 ACRE MAXIMUM DRAINAGE AREA.
3. ALL FILTER/BUFFER STRIPS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%.



PLAN

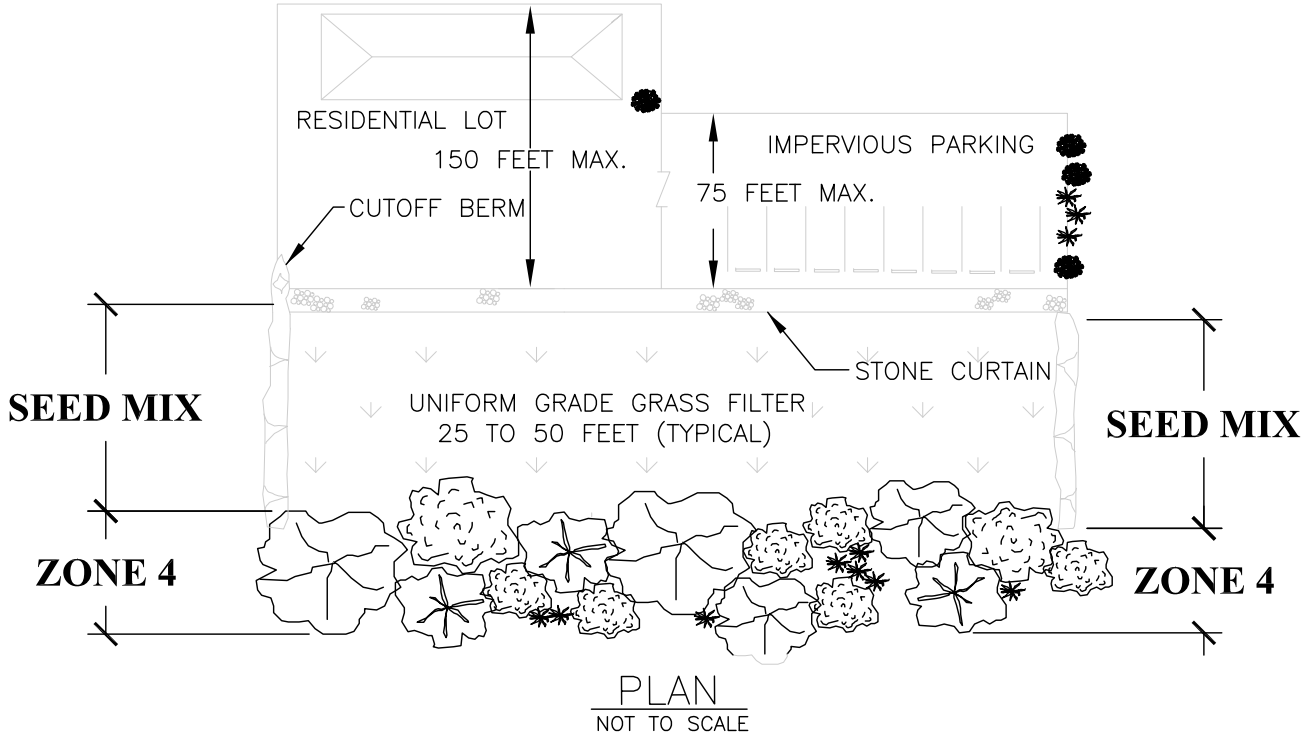


PROFILE

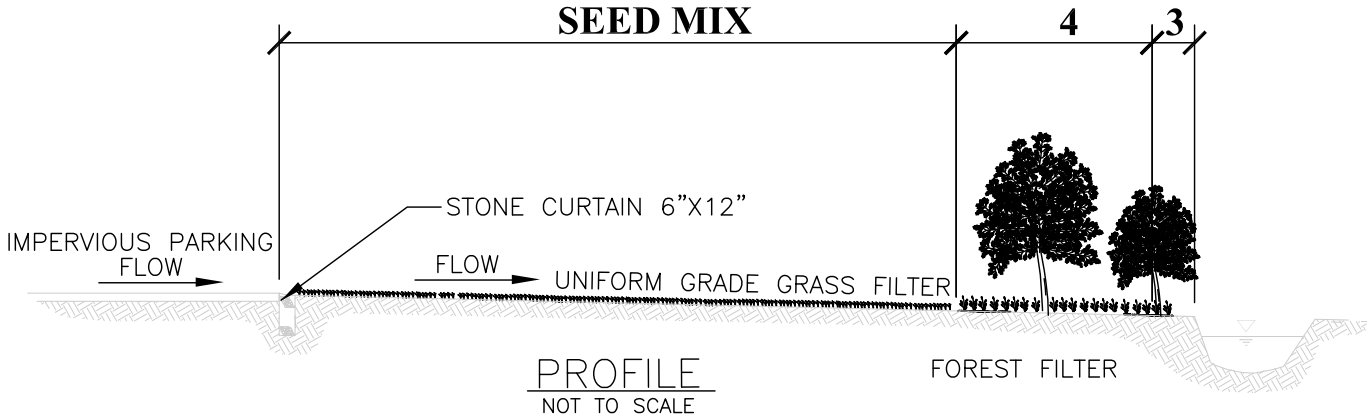
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BUFFER STRIP

STD. NO.	REV.
421.1	



PLAN
NOT TO SCALE

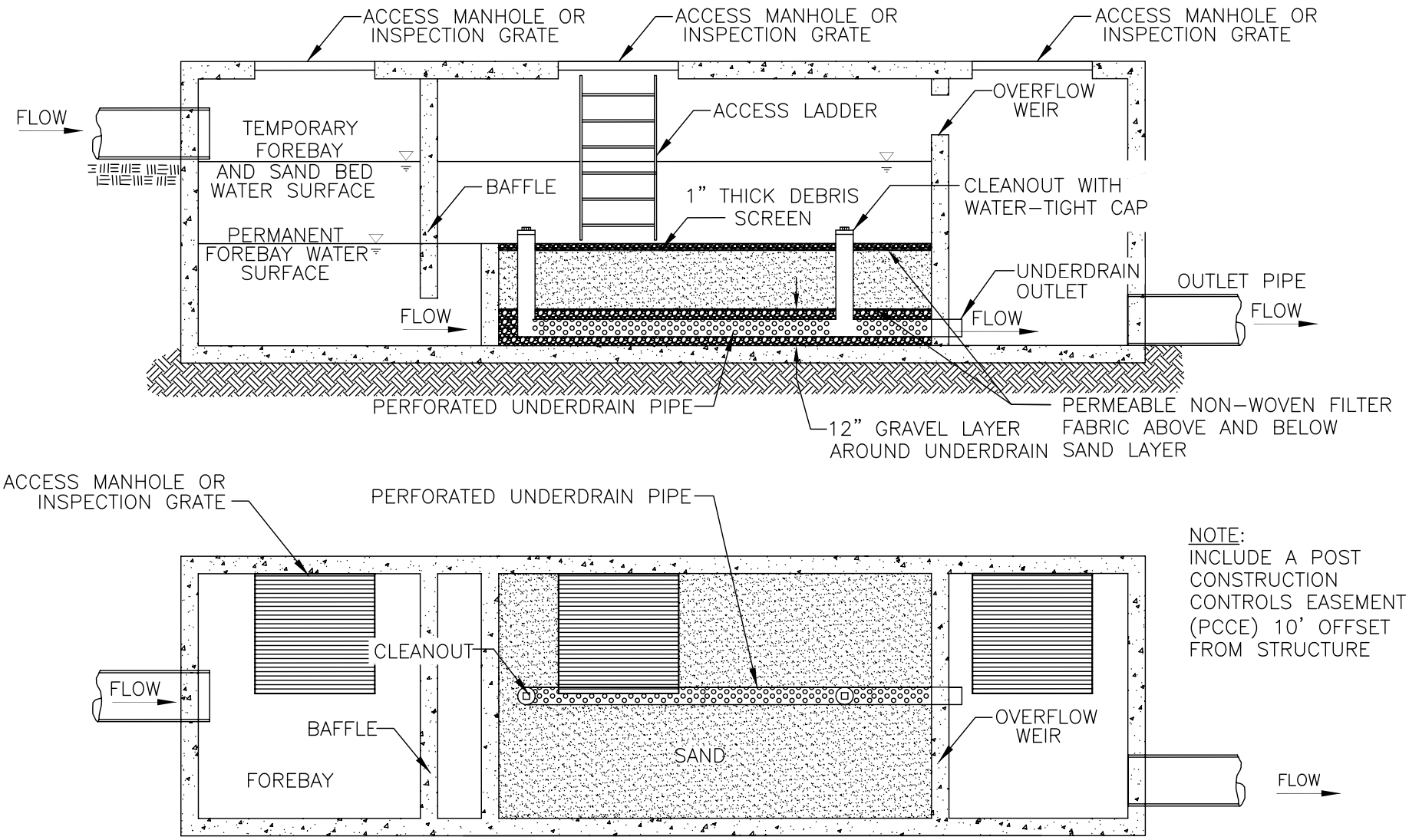


PROFILE
NOT TO SCALE

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BUFFER STRIP PLANTING PLAN

STD. NO.	REV.
422.1	

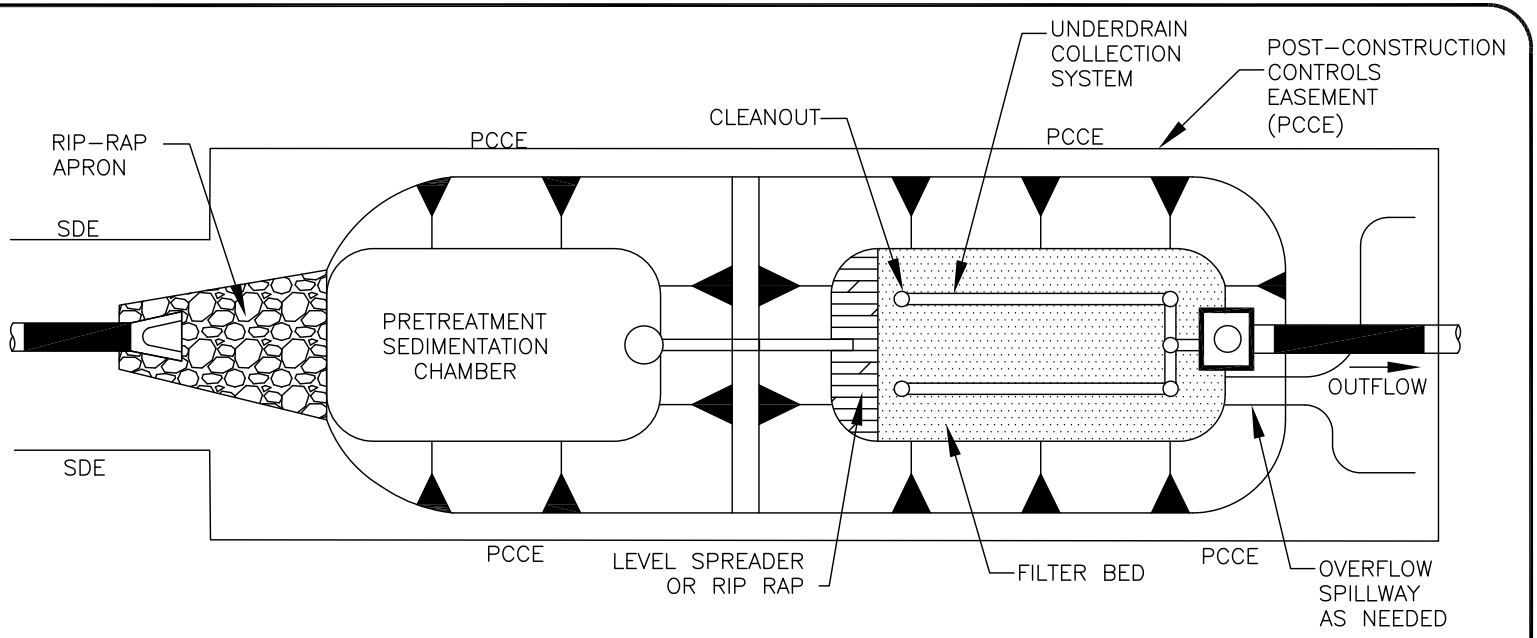


NOTE:
INCLUDE A POST CONSTRUCTION CONTROLS EASEMENT (PCCE) 10' OFFSET FROM STRUCTURE

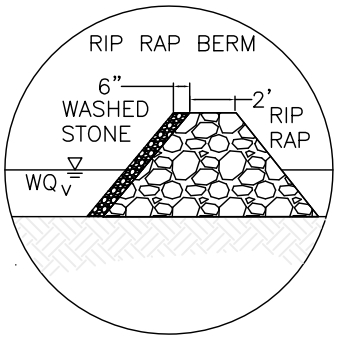
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	UNDERGROUND SAND FILTER	STD. NO. 423.1	REV.

NOTES:

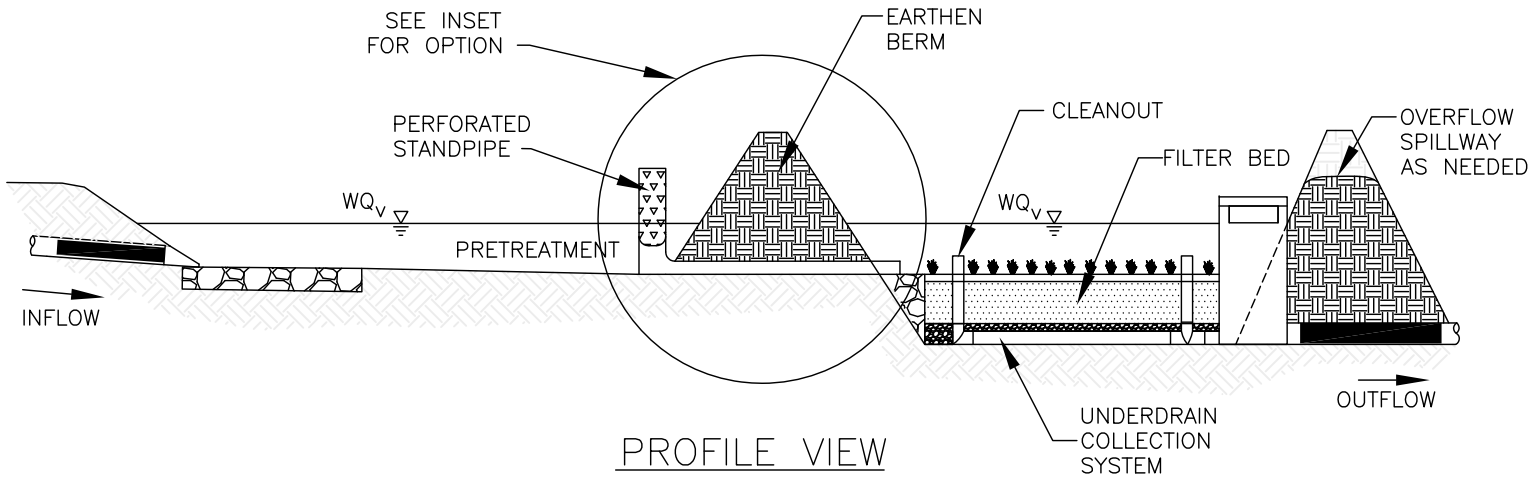
1. ALL SAND FILTERS SHALL HAVE A MINIMUM 20 FOOT ACCESS EASEMENT CONNECTING TO A DEDICATED PUBLIC RIGHT OF WAY. ACCESS ROAD SHALL HAVE MIN. 12' STABILIZED WIDTH, MAX. LONG. GRADE OF 15%, MAX. CROSS-SLOPE 5%. IN ADDITION, A 10-FOOT WIDE PERMANENT MAINTENANCE ACCESS EASEMENT MUST BE PROVIDED AROUND THE PERIMETER OF ALL BMPS TO ALLOW FOR ADEQUATE MAINTENANCE AND REPAIR.
2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
3. CLEAN OUTS IN THE UNDERDRAIN SYSTEM ARE TO BE PROVIDED EVERY 50' MINIMUM. CLEAN OUTS SHALL HAVE WATER TIGHT, VANDAL PROOF CAPS AND EXTEND 6" ABOVE THE SURFACE.



PLAN VIEW



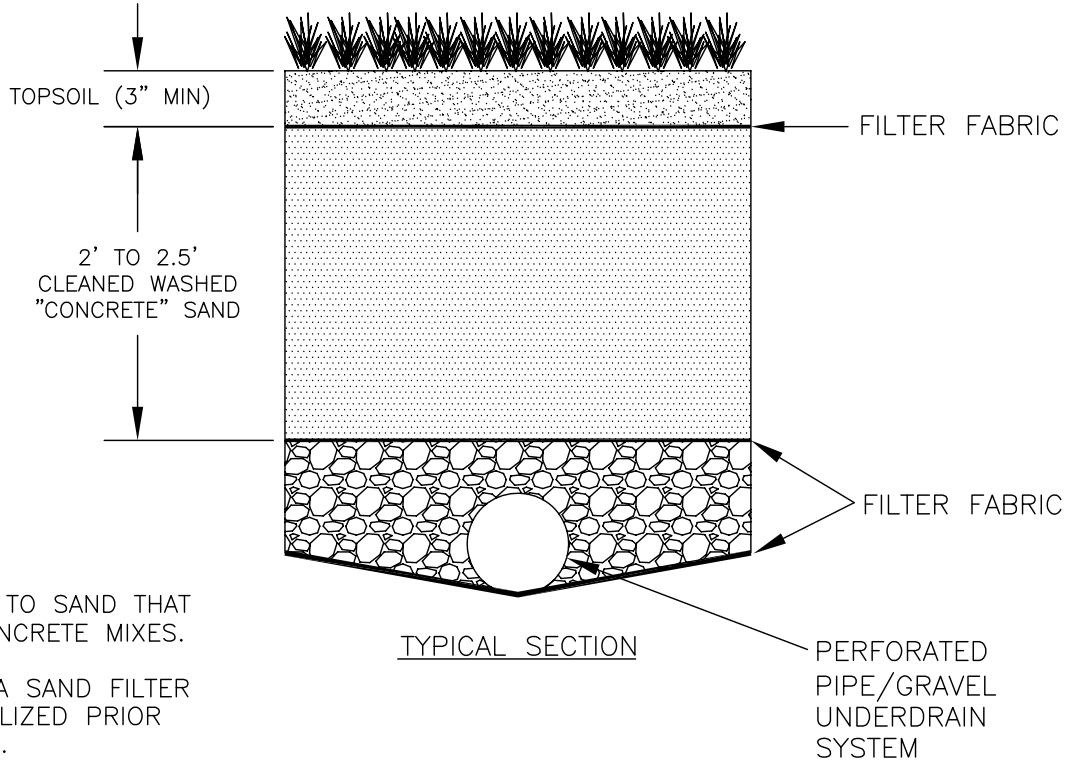
INSET



PROFILE VIEW

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SURFACE SAND FILTER	STD. NO. 424.1	REV.



TYPICAL SECTION

NOTES:

1. "CONCRETE" SAND REFERS TO SAND THAT IS COMMONLY USED IN CONCRETE MIXES.
2. ALL DRAINAGE AREAS TO A SAND FILTER FACILITY ARE TO BE STABILIZED PRIOR TO INSTALLATION OF SAND.
3. UNDERDRAIN PIPES SHOULD BE MIN. 6" PERFORATED SCHEDULE 40 PVC (PER AASHTO M278) OR DOUBLE WALL HDPE (PER AASHTO M252). PERFORATIONS SHOULD BE ⅜" SPACED 3" ON CENTER ALONG 4 LONGITUDINAL ROWS SPACED 90° APART.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SURFACE SAND FILTER SECTION	STD. NO. 425.1 / REV.

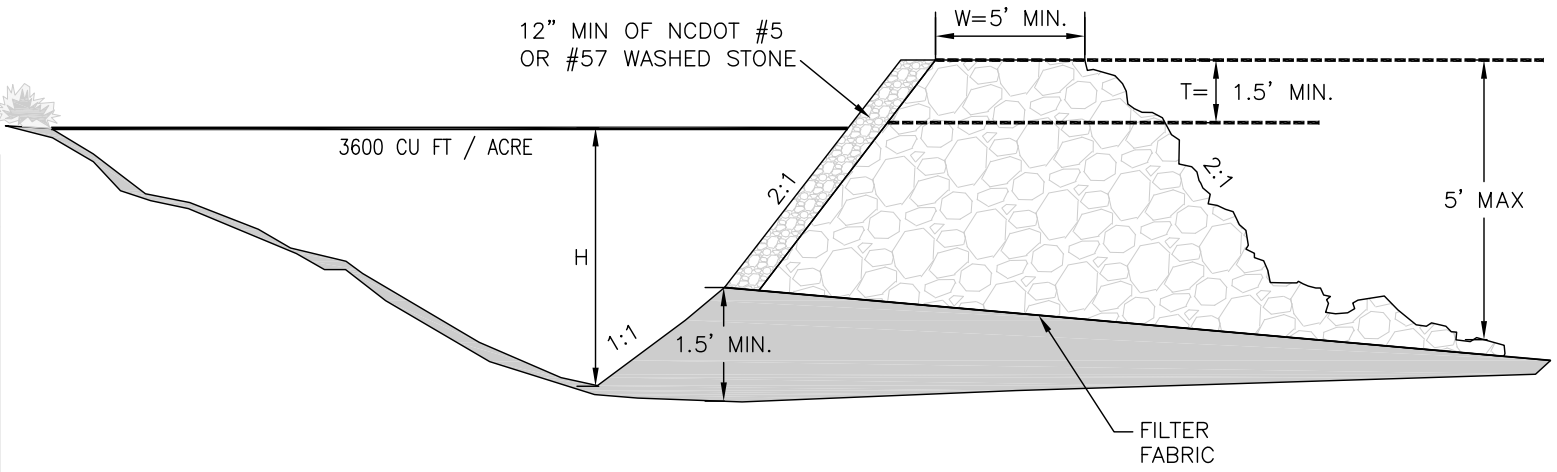
STD. & SPEC. #	TITLE	SPECIAL REQUIREMENTS & NOTES
6.11	PERMANENT SEEDING	—
6.17	ROLLED EROSION CONTROL PRODUCTS	—
6.51	HARDWARE CLOTH & GRAVEL INLET PROTECTION	—
6.60	TEMPORARY SEDIMENT TRAP	WEIR TOP WIDTH 10' MIN., BOTTOM 7' MIN.
6.61	SEDIMENT BASIN	FLASH BOARD RISER NOT PERMITTED
6.64	SKIMMER SEDIMENT BASIN	1ST BAFFLE: RIP RAP & WASHED STONE BERM 2ND BAFFLE: STANDARD BAFFLE 3RD BAFFLE: HARDWARE CLOTH SURROUNDING THE SKIMMER
NCDOT 1606.1	SPECIAL SEDIMENT CONTROL FENCE	—

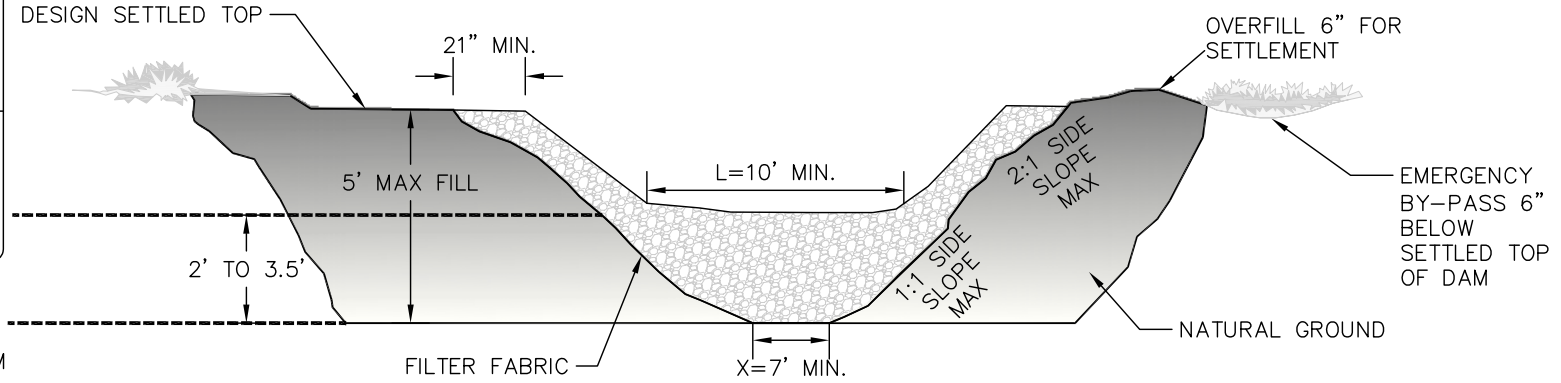
THE STANDARDS & SPECIFICATIONS SHOWN ARE FROM THE "NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" (NCESCPDM) PREPARED BY NC DEPT. OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR); ALSO REFERENCE NCDOT "ROADWAY STANDARD DRAWINGS," LATEST EDITION.

THE TOWN OF WAXHAW HAS ADOPTED THE SPECIFIC STANDARDS & SPECIFICATIONS SHOWN ON THIS DETAIL AS MANDATORY MINIMUM DESIGN STANDARDS & SPECIFICATIONS.

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SPECIAL EROSION CONTROL REQUIREMENTS & NOTES	STD. NO. 500.1 / REV.

TEMPORARY SEDIMENT TRAP DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	< 1 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MIN. VOLUME REQUIRED	3600 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	435 (SQ. FT. PER CFS Q10)





NOTE:

PLEASE REFER TO NCESCPDM SECTION #6.60 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING TEMPORARY SEDIMENT TRAPS.

NOT TO SCALE

DATA BLOCK

TRAP NO.	DRAINAGE AREA (ACRES)	DENUDED AREA (ACRES)	Q_{10}	TRAP VOLUME REQUIRED (CUBIC FT.)	TRAP VOLUME PROVIDED (CUBIC FT.)	TRAP SURFACE AREA REQUIRED (SQ FT.)	TRAP SURFACE AREA PROVIDED (SQ FT.)	CLEANOUT DEPTH (FT.) H/2	H (FEET)	L (FEET)	T (FEET)	W (FEET)	X (FEET)

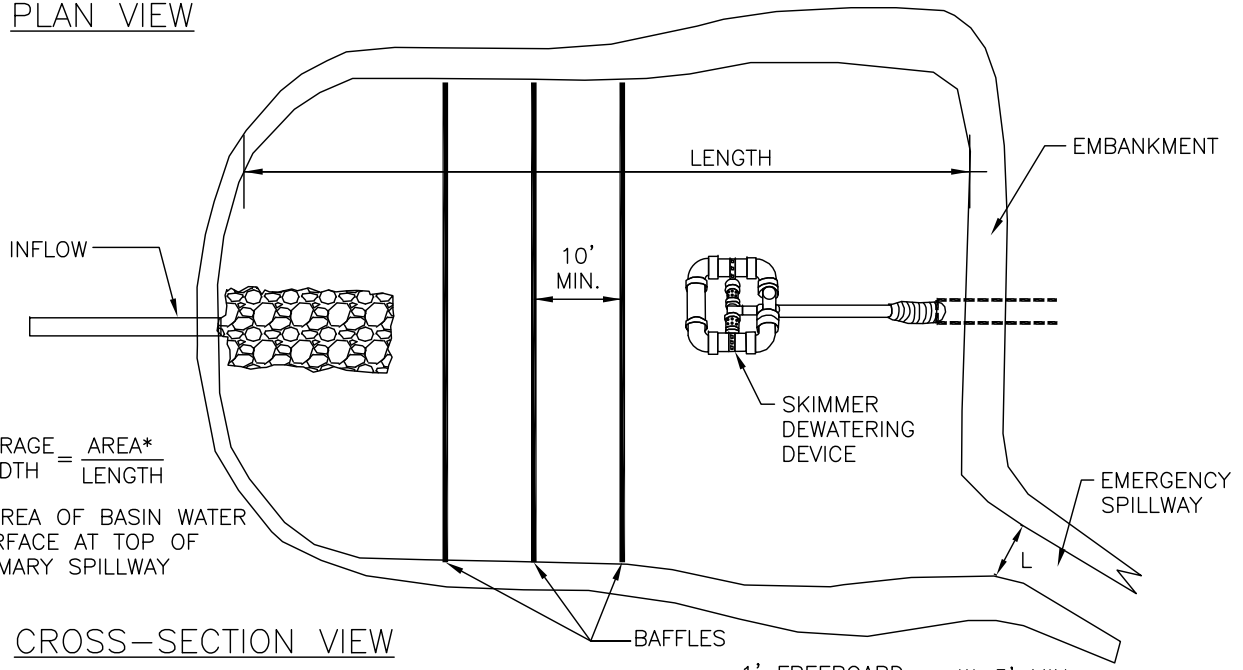
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

TEMPORARY SEDIMENT TRAP

STD. NO. 501.1 | REV.

SKIMMER SEDIMENT BASIN DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	< 10 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MAX. LENGTH TO WIDTH RATIO	6:1
MIN. VOLUME REQUIRED	1800 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	325 (SQ. FT. PER CFS Q10)

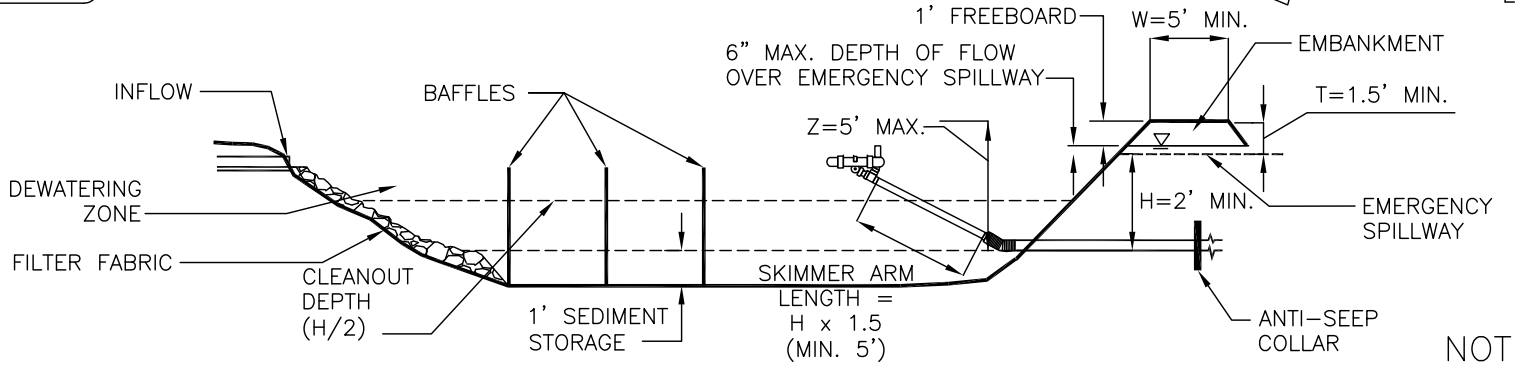
PLAN VIEW



$$\text{AVERAGE WIDTH} = \frac{\text{AREA*}}{\text{LENGTH}}$$

* AREA OF BASIN WATER SURFACE AT TOP OF PRIMARY SPILLWAY

CROSS-SECTION VIEW



NOTES:

1. REFER TO NCESCPDM SECTION #6.64 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SKIMMER SEDIMENT BASINS.
2. REFER TO STD. #524.1 FOR BAFFLE SPACING AND INSTALLATION
3. SKIMMER INVERT ELEVATION = BASIN BOTTOM + 1' MIN.
4. H = SPILLWAY ELEVATION – SKIMMER INVERT ELEVATION

NOT TO SCALE

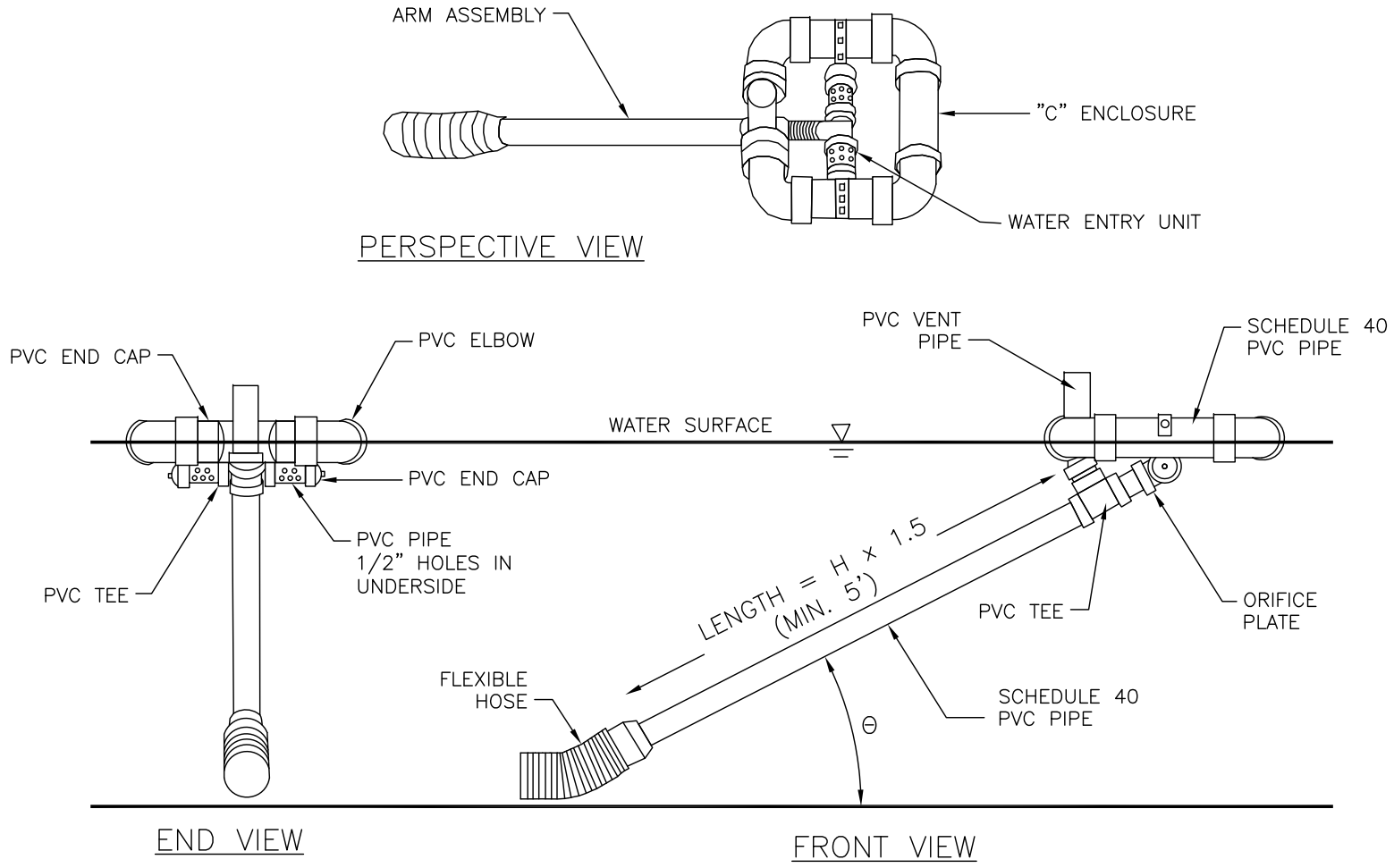
DATA BLOCK

BASIN	DRAINAGE AREA (ACRES)	DENUDED AREA (ACRES)	Q_{10}	BASIN VOLUME		BASIN SURFACE AREA		CLEANOUT DEPTH (FT.) H/2	H (FEET)	Z (FEET)	L (FEET)	T (FEET)	W (FEET)	SKIMMER PIPE DIAMETER	SKIMMER ORIFICE DIAMETER
				REQUIRED (CUBIC FT.)	PROVIDED (CUBIC FT.)	REQUIRED (SQ FT.)	PROVIDED (SQ FT.)								

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS

SKIMMER SEDIMENT BASIN

STD. NO.	REV.
502.1	



SCHEMATIC OF SKIMMER TAKEN FROM PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, MARCH 2000.

"H" REFERS TO THE HEIGHT FROM INVERT OF FLEXIBLE HOSE ON SKIMMER TO THE INVERT OF THE PRIMARY SPILLWAY.

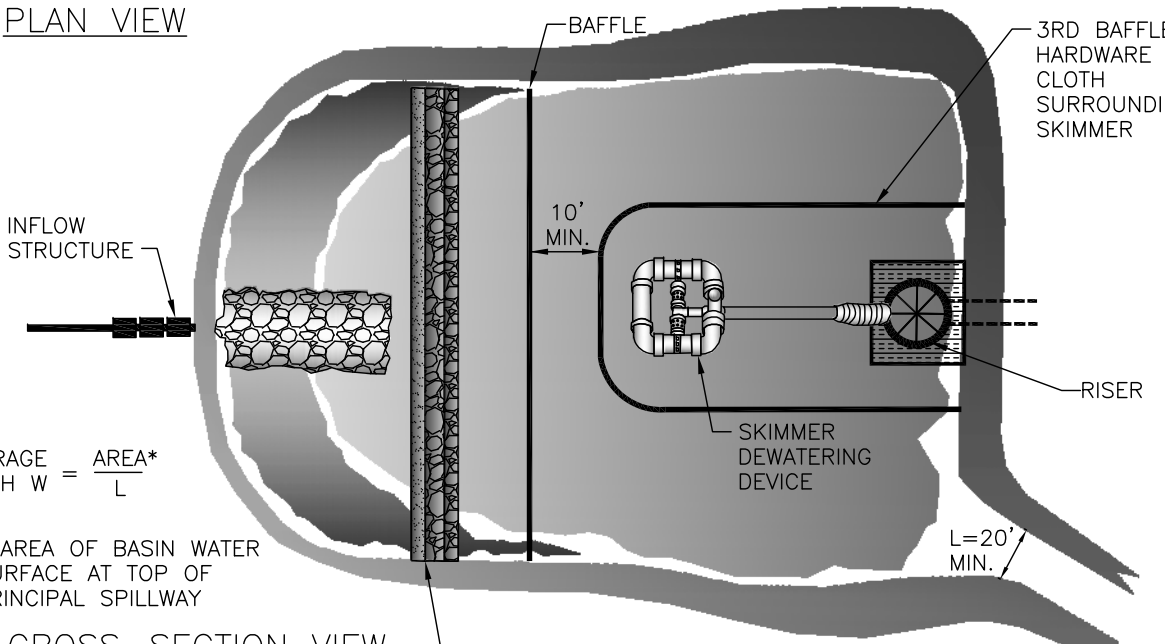
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SKIMMER

STD. NO.	REV.
503.1	

SEDIMENT BASIN DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	>10 AC. <100 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MAX. LENGTH TO WIDTH RATIO	6:1
MIN. VOLUME REQUIRED	1800 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	435 (SQ. FT. PER CFS Q10)

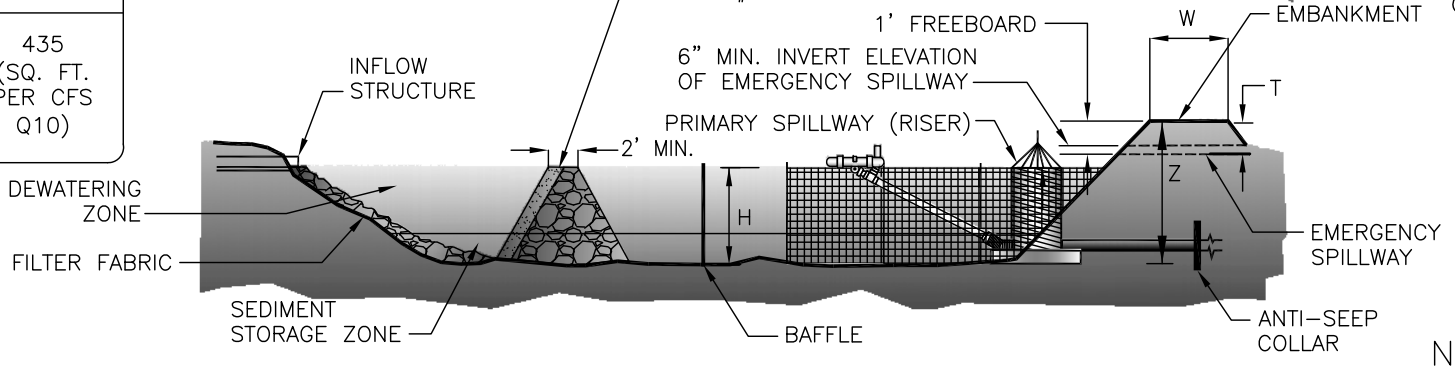
PLAN VIEW



AVERAGE WIDTH $W = \frac{AREA^*}{L}$

* AREA OF BASIN WATER SURFACE AT TOP OF PRINCIPAL SPILLWAY

CROSS-SECTION VIEW



NOTES:

1. REFER TO NCESCPDM SECTION #6.61 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SEDIMENT BASINS.
2. REFER TO STD. #524.1 FOR BAFFLE SPACING AND INSTALLATION.
3. FIRST BAFFLE IS TO BE CONSTRUCTED OF RIP-RAP AND #5 WASHED STONE, WITH A MIN. HEIGHT OF 3' AND MIN. TOPWIDTH OF 2'.
4. FLASHBOARD RISER NOT PERMITTED FOR USE IN THE TOWN OF WAXHAW

DATA BLOCK

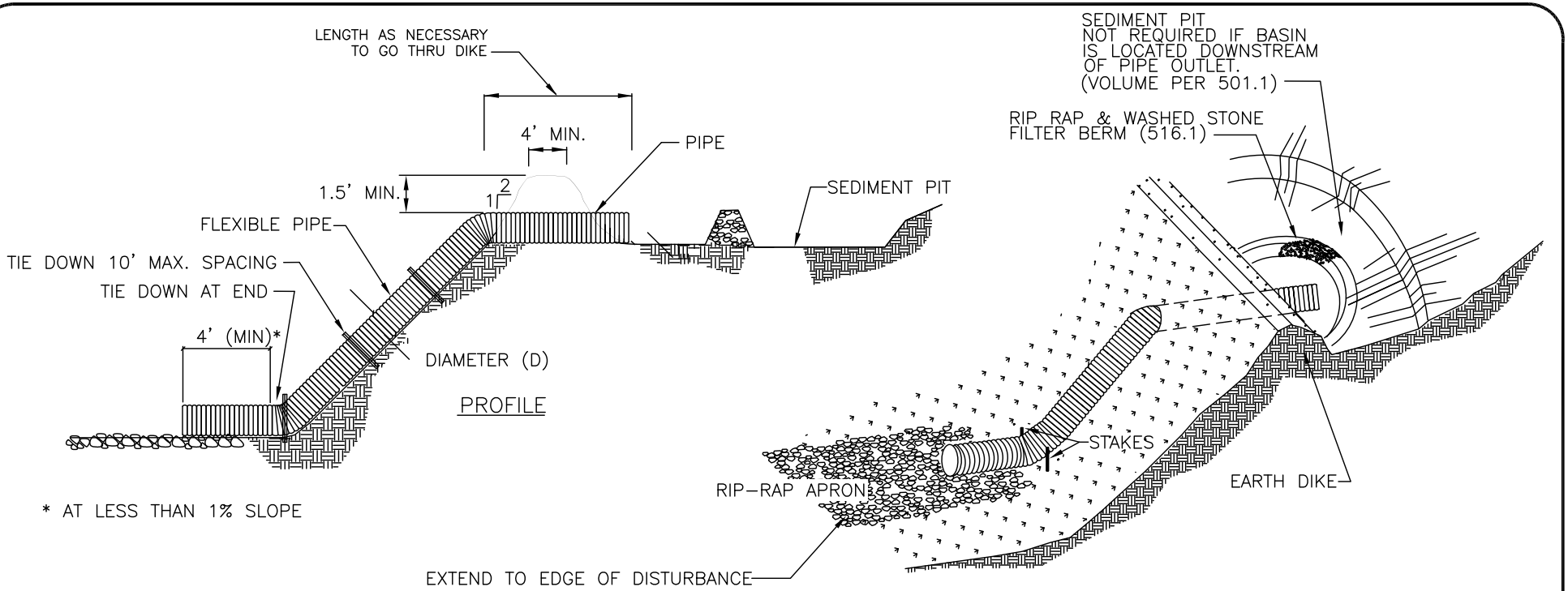
NOT TO SCALE

BASIN	DRAINAGE AREA (ACRES)	DENUDED AREA (ACRES)	Q_{10}	BASIN VOLUME		BASIN SURFACE AREA		CLEANOUT DEPTH (FT.) H/2	H (FEET)	Z (FEET)	L (FEET)	T (FEET)	W (FEET)	SKIMMER PIPE DIAMETER	SKIMMER ORIFICE DIAMETER
				REQUIRED (CUBIC FT.)	PROVIDED (CUBIC FT.)	REQUIRED (SQ FT.)	PROVIDED (SQ FT.)								

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

SEDIMENT BASIN

STD. NO. 504.1 | REV.

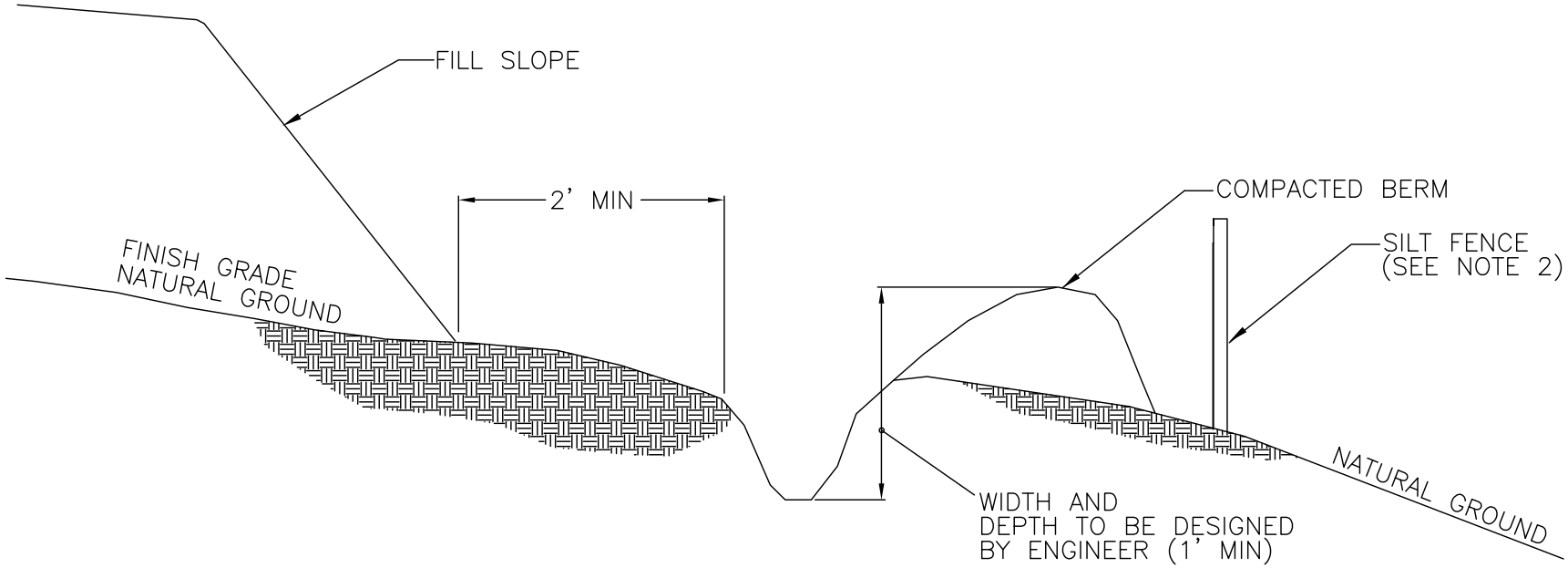


CONSTRUCTION SPECIFICATIONS:

1. THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1.5 FEET HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.
2. THE PIPE SHALL BE FLEXIBLE WITH WATER TIGHT CONNECTING BANDS. FLEXIBLE PIPE SHOULD BE STAKED ON EITHER SIDE.
3. A RIP RAP APRON SHALL BE PROVIDED AT THE OUTLET, IF EMPTYING INTO A DISTURBED AREA.
4. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.
5. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH STORM BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT.
6. OUTLET PIPE SHOULD BE TAKEN OVER OR THROUGH ANY SILT FENCE, TAKING CARE NOT TO VOID THE EFFECTIVENESS OF THE SILT FENCE.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	FLEXIBLE PIPE SLOPE DRAIN	STD. NO. 505.1	REV.



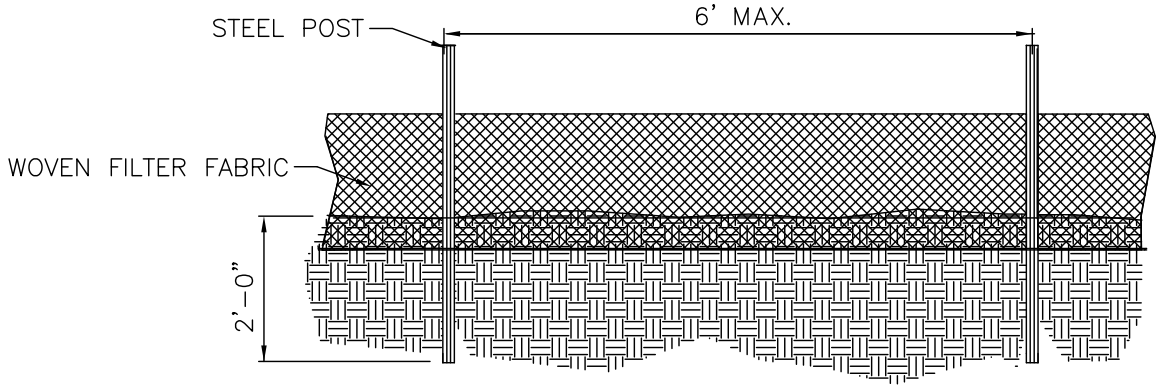
NOTE:

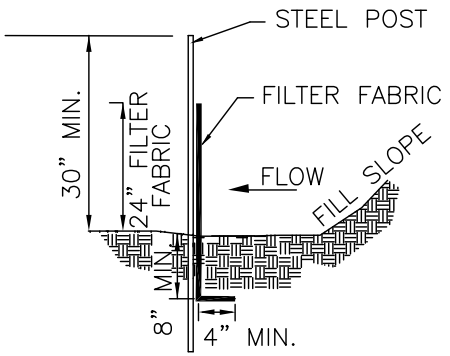
1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY SILT DITCH

STD. NO.	REV.
506.1	





GENERAL NOTES:

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

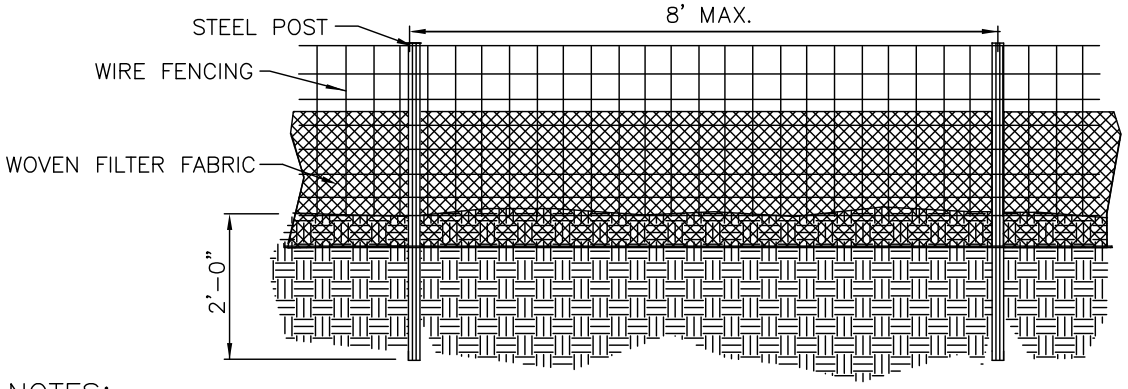
MAINTENANCE NOTES:

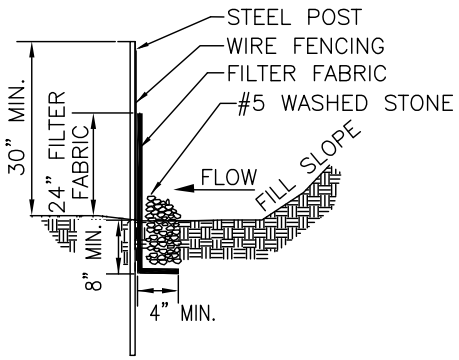
1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE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

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY SILT FENCE

STD. NO.	REV.
507.1	





GENERAL NOTES:

1. WIRE FENCING SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. WOVEN FILTER FABRIC SHALL BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.
6. WIRE MESH SHALL BE MIN. 13 GAGE WITH MAXIMUM 12" OPENINGS.
7. WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
8. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
9. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
10. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
11. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

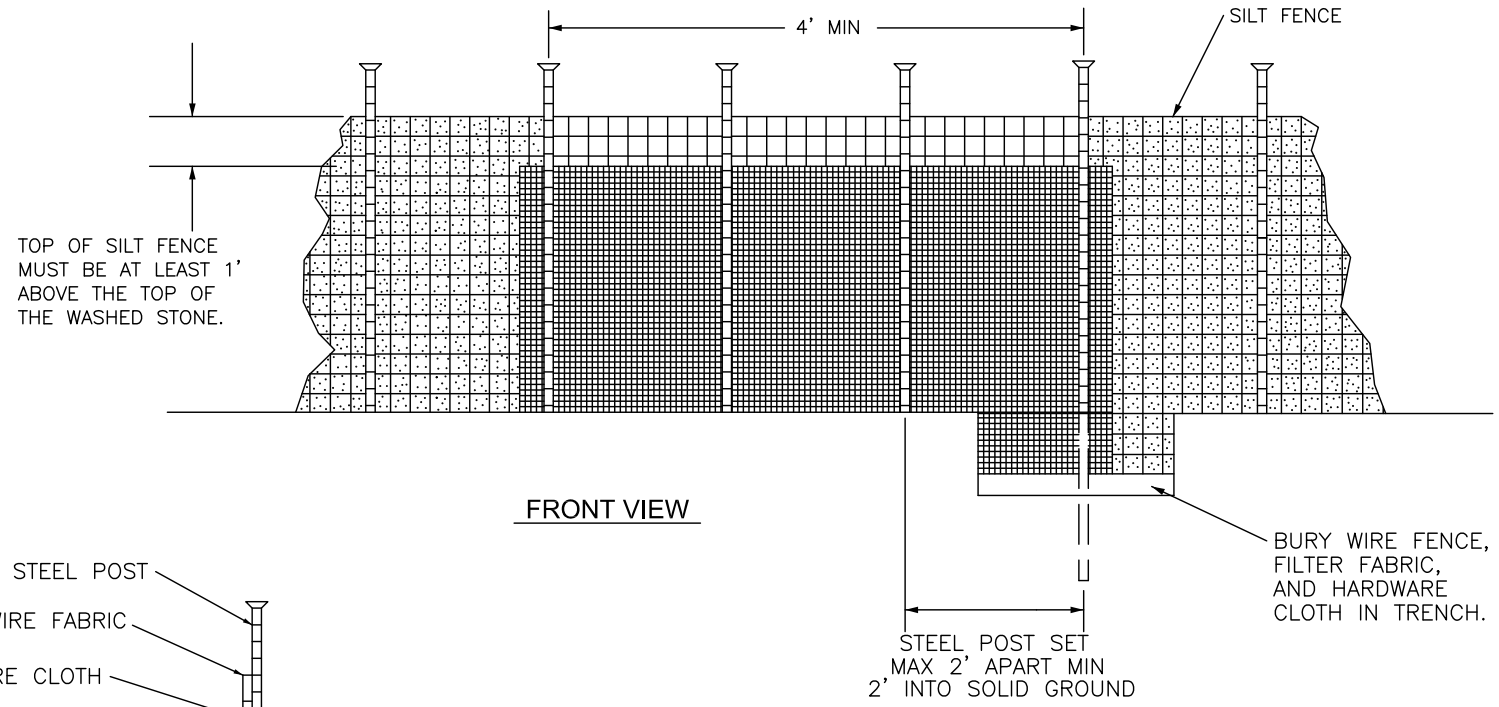
MAINTENANCE NOTES:

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

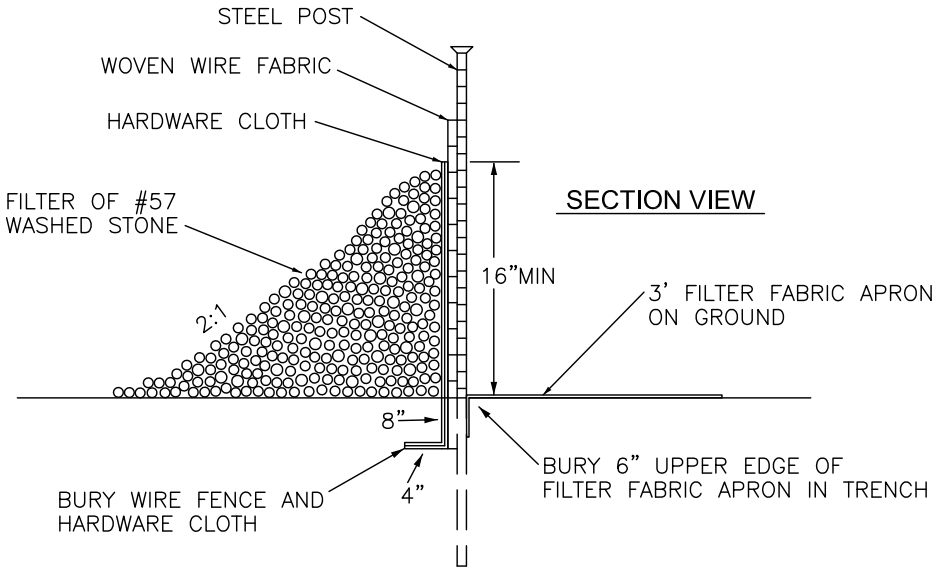
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	HIGH HAZARD TEMPORARY SILT FENCE

STD. NO.	REV.
508.1	



FRONT VIEW



SECTION VIEW

NOTES:

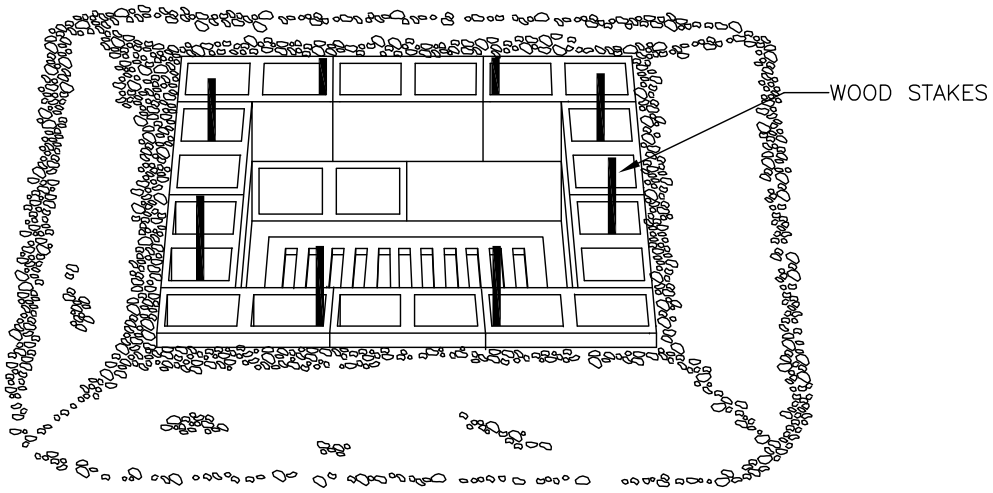
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.
3. MAXIMUM DRAINAGE AREA PER OUTLET SHALL NOT EXCEED 1 ACRE.

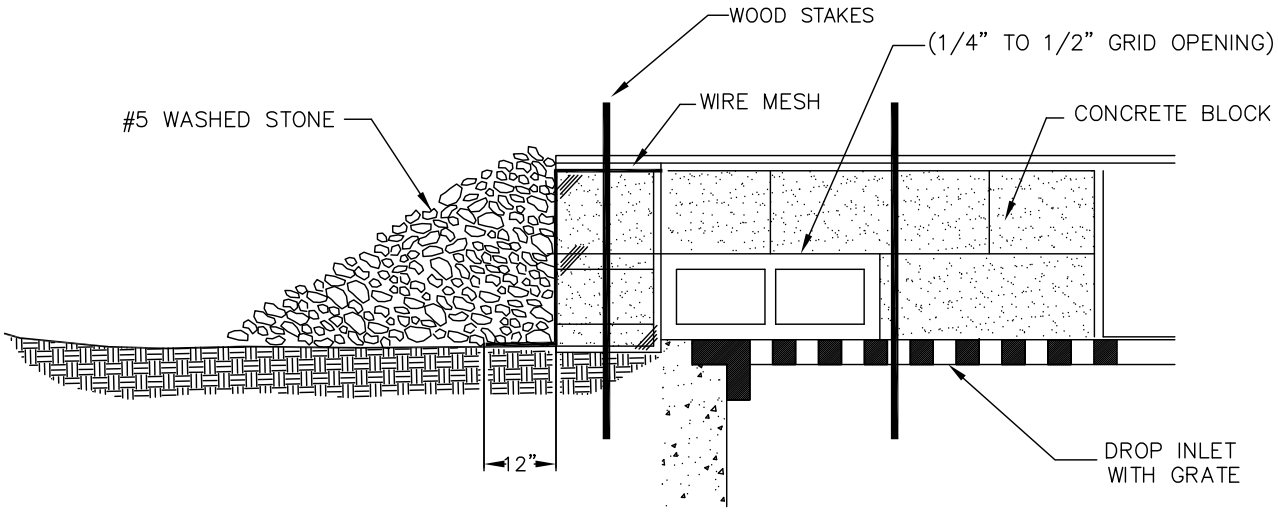
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

STANDARD SILT FENCE OUTLET

STD. NO.	REV.
509.1	1/22





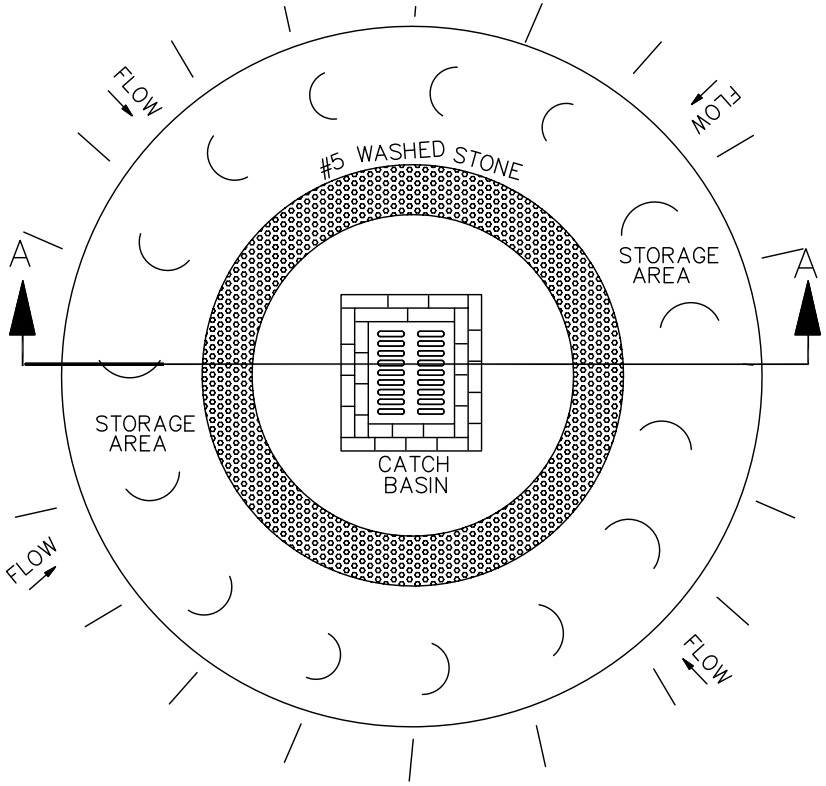
SPECIFIC APPLICATION:

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

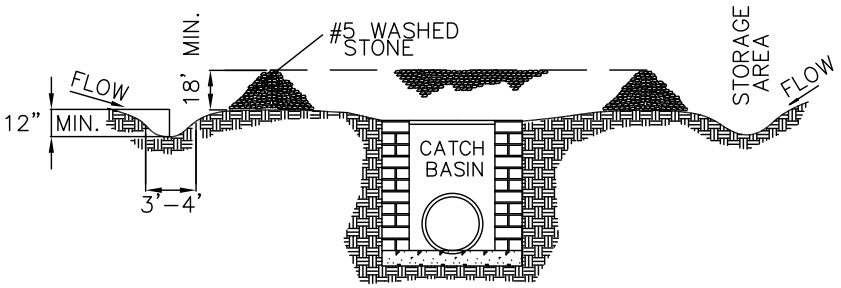
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BLOCK AND GRAVEL STONE INLET PROTECTION

STD. NO.	REV.
510.1	



PLAN VIEW



SECTION A-A

GENERAL NOTES:

1. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP.
2. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. THE STRUCTURE SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT AFTER EACH STORM EVENT AND REPAIRS MADE AS NECESSARY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE BASIN HAS BEEN PROPERLY STABILIZED.
6. ON LARGER DRAINAGE AREAS RIP RAP MAY BE REQUIRED UNDER THE WASHED STONE.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	STONE INLET PROTECTION

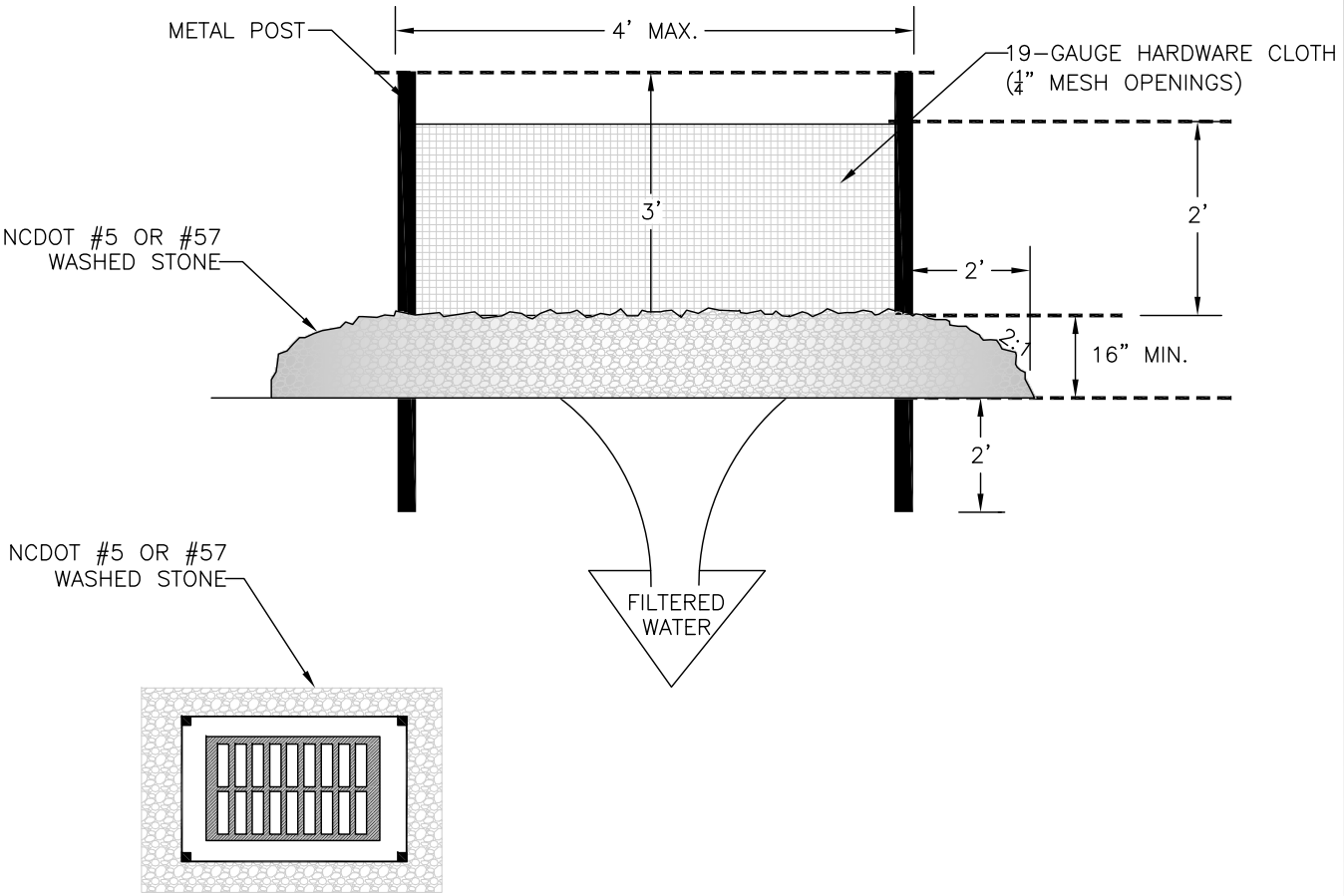
STD. NO.	REV.
511.1	

GENERAL NOTES:

1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5–FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 2–FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 16 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.

MAINTENACE

1. INSPECT THE FABRIC BARRIER AFTER EACH RAIN AND MAKE REPAIRS AS NEEDED.
2. REMOVE SEDIMENT FROM THE POOL AREA AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN. TAKE CARE NOT TO DAMAGE OR UNDERCUT THE FABRIC DURING SEDIMENT REMOVAL.



NOT TO SCALE

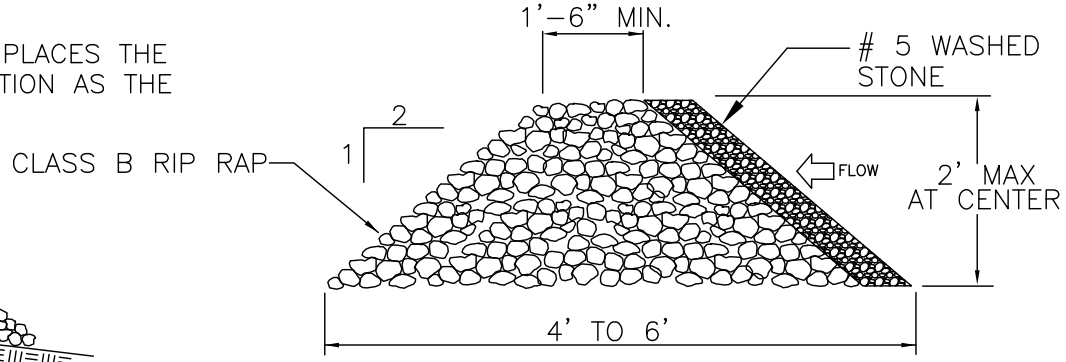
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	HARDWARE CLOTH AND GRAVEL INLET PROTECTION

STD. NO.	REV.
512.1	

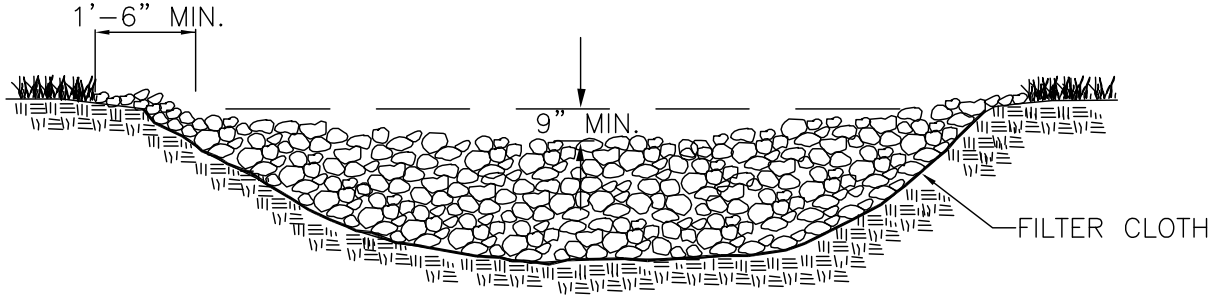
GENERAL NOTES:

1. RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
2. CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
3. ENSURE THAT MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE DOWNSTREAM DAM (SEE DIAGRAM BELOW).

A AND B ARE AT EQUAL ELEVATIONS



CROSS SECTION



PLAN

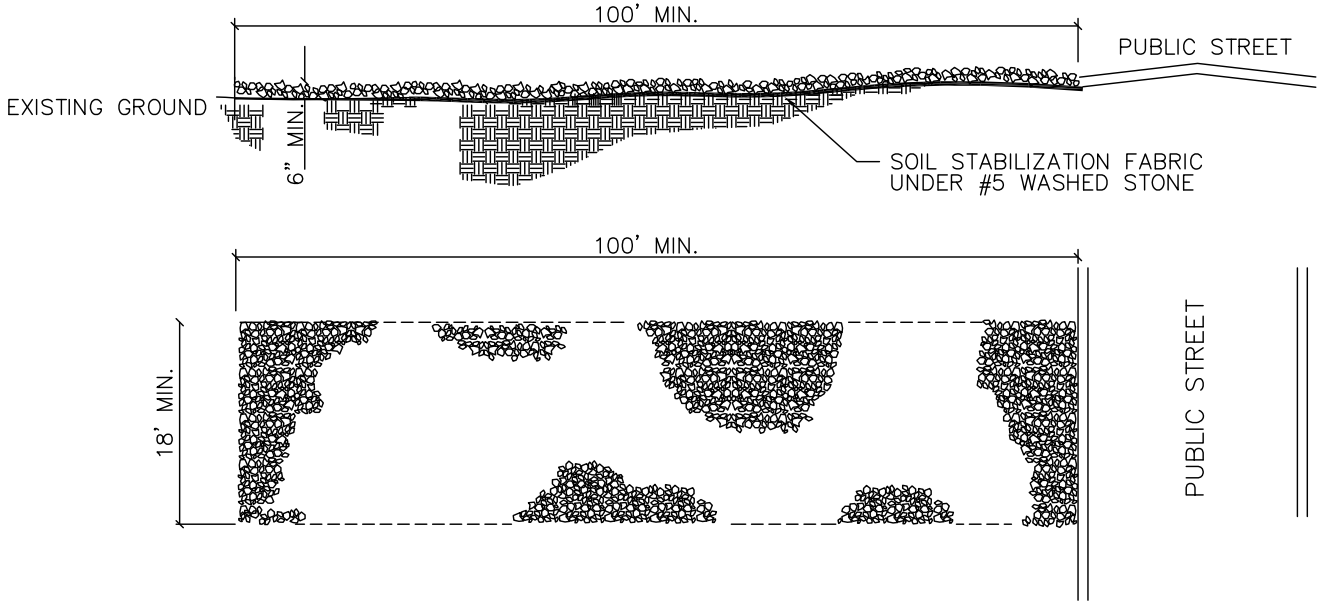
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY ROCK CHECK DAM

STD. NO.	REV.
513.1	

NOTES:

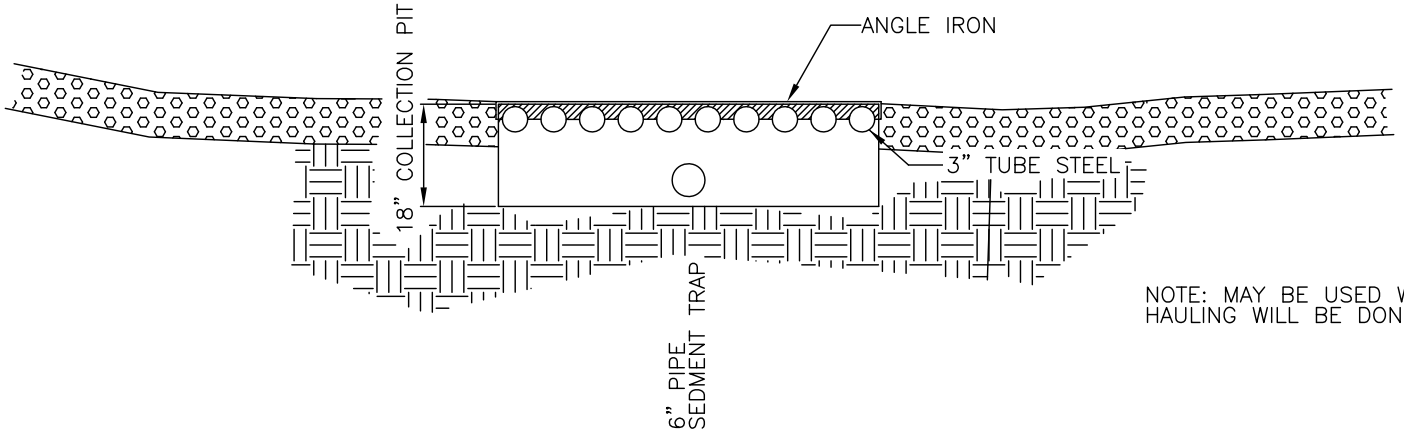
1. A STABILIZED ENTRANCE PAD OF #5 WASHED STONE AND RAILROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. FILTER FABRIC OR COMPACTED CRUSHER RUN STONE SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEPT BACK ONSITE ON A NIGHTLY BASIS.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN SEE STD. NO. 515.1
6. THE TOWN MAY REQUIRE A STANDARD COMMERCIAL DRIVEWAY (STD. 108.1 & 109.1) TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE.



NOT TO SCALE

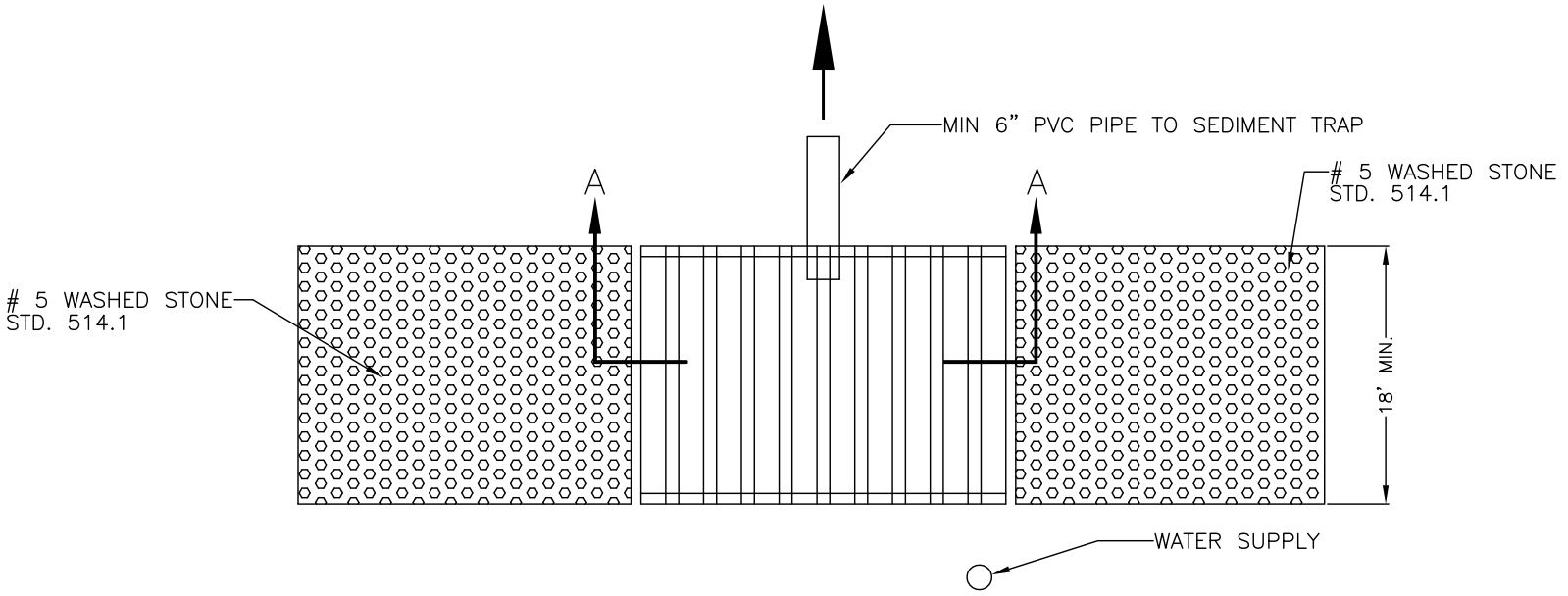
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	STABILIZED CONSTRUCTION ENTRANCE

STD. NO.	REV.
514.1	



NOTE: MAY BE USED WHERE EXTENSIVE HAULING WILL BE DONE.

SECTION A – A

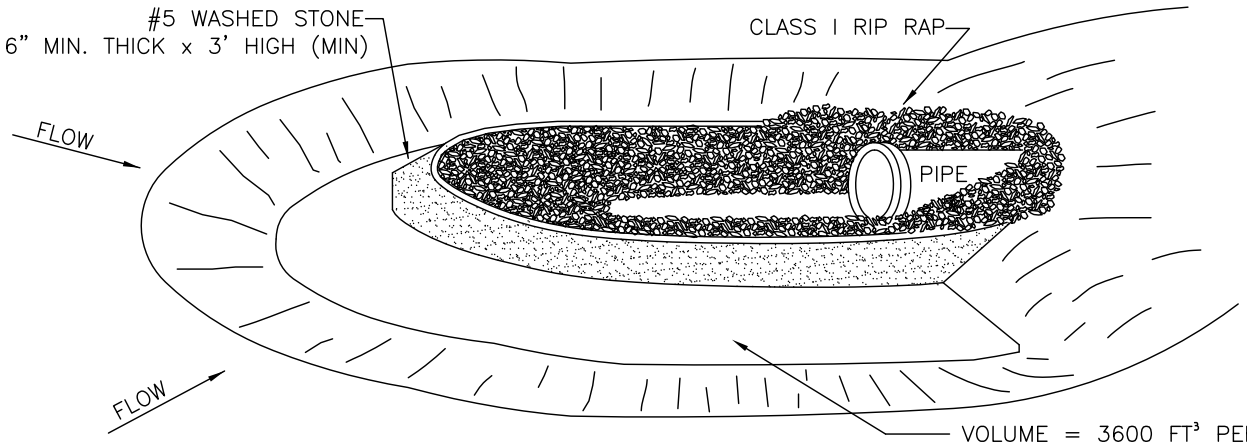


NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CONSTRUCTION ENTRANCE TIRE WASH	STD. NO. 515.1 / REV. 8/19

DATA BLOCK

BASIN NO.	DRAINAGE AREA (ACRES)	DENUDED AREA (ACRES)	BASIN VOLUME		BASIN SURFACE AREA		CLEANOUT DEPTH (FT.) H/2	H (FEET)
			REQUIRED (CUBIC FT.)	PROVIDED (CUBIC FT.)	REQUIRED (SQ FT.)	PROVIDED (SQ FT.)		

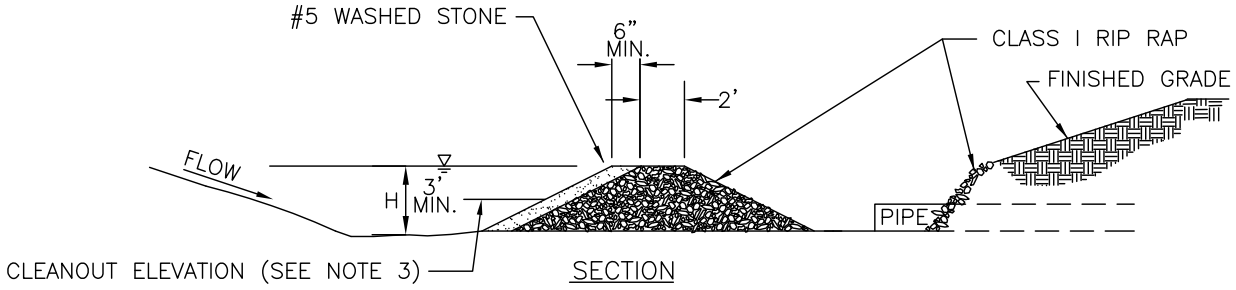


PERSPECTIVE VIEW

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

GENERAL NOTES:

1. GRAVEL AND RIP RAP FILTER BERM BASIN SHOULD BE USED TO PROTECT EXISTING PIPE INVERTS THAT DRAIN 5 ACRES OR LESS.
2. DIMENSIONS SHOWN ARE THE MINIMUM ACCEPTED UNLESS OTHERWISE NOTED.
3. CLEANOUT PRIOR TO SEDIMENT REACHING HALF OF BERM HEIGHT.



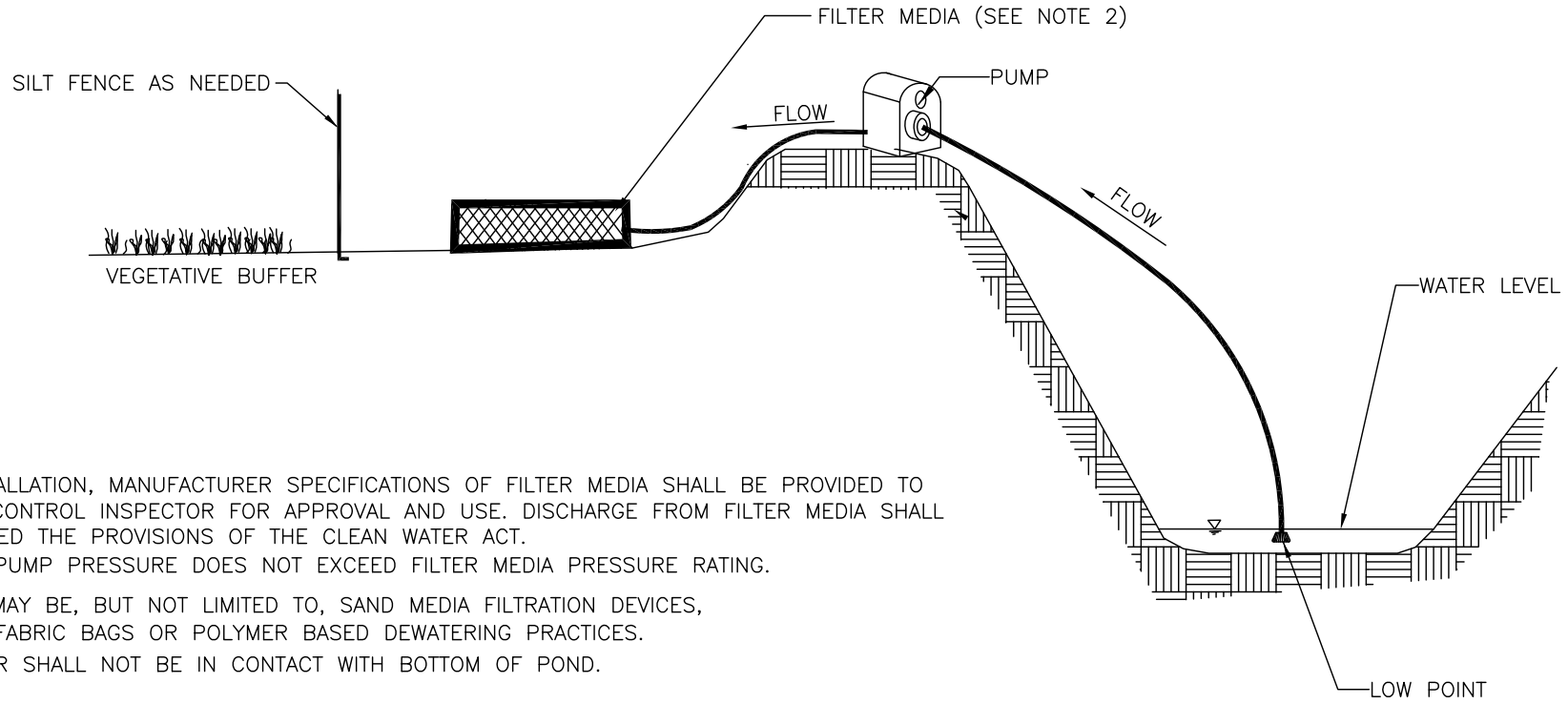
SECTION

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

GRAVEL AND RIP RAP FILTER BERM BASIN

STD. NO.	REV.
516.1	



NOTE:

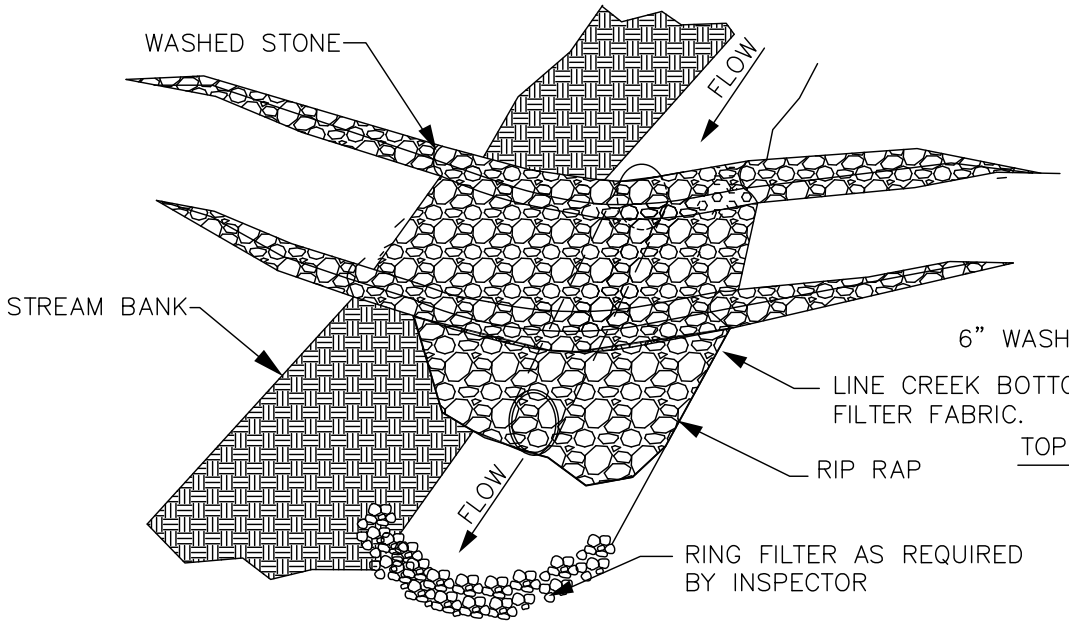
1. PRIOR TO INSTALLATION, MANUFACTURER SPECIFICATIONS OF FILTER MEDIA SHALL BE PROVIDED TO THE EROSION CONTROL INSPECTOR FOR APPROVAL AND USE. DISCHARGE FROM FILTER MEDIA SHALL MEET OR EXCEED THE PROVISIONS OF THE CLEAN WATER ACT.
2. ENSURE THAT PUMP PRESSURE DOES NOT EXCEED FILTER MEDIA PRESSURE RATING.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

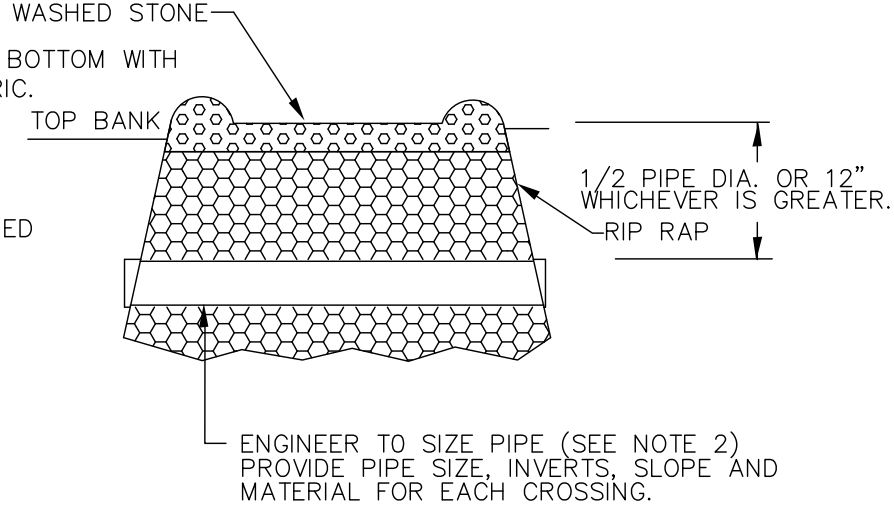
NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	EROSION CONTROL DEWATERING	STD. NO. 517.1	REV.

NOTES

1. REMOVE THE STRUCTURE WHEN NO LONGER NEEDED. (NOT TO EXCEED 1 YEAR).
2. AS A MINIMUM, DESIGN THE STRUCTURE TO PASS 2 YEAR PEAK FLOW WITHOUT OVERTOPPING.
3. ENSURE THAT DESIGN FLOW VELOCITY AT THE OUTLET OF THE CROSSING STRUCTURE IS NON–EROSIVE FOR THE RECEIVING STREAM CHANNEL.





NOTES:

1. ADDITIONAL MEASURES MAY BE REQURIED PER THE TOWN ENGINEER BASED ON SPECIFIC SITE CONDITIONS.

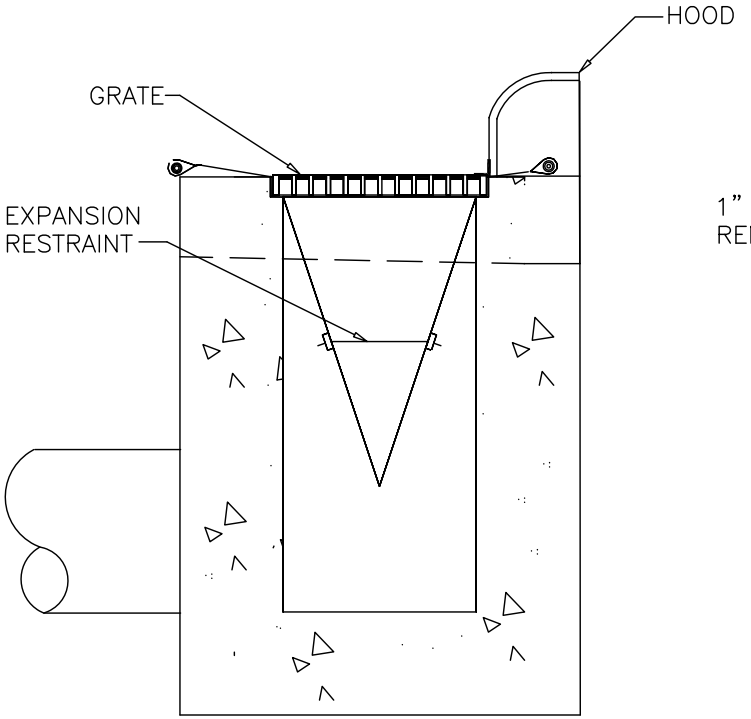
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY STREAM CROSSING

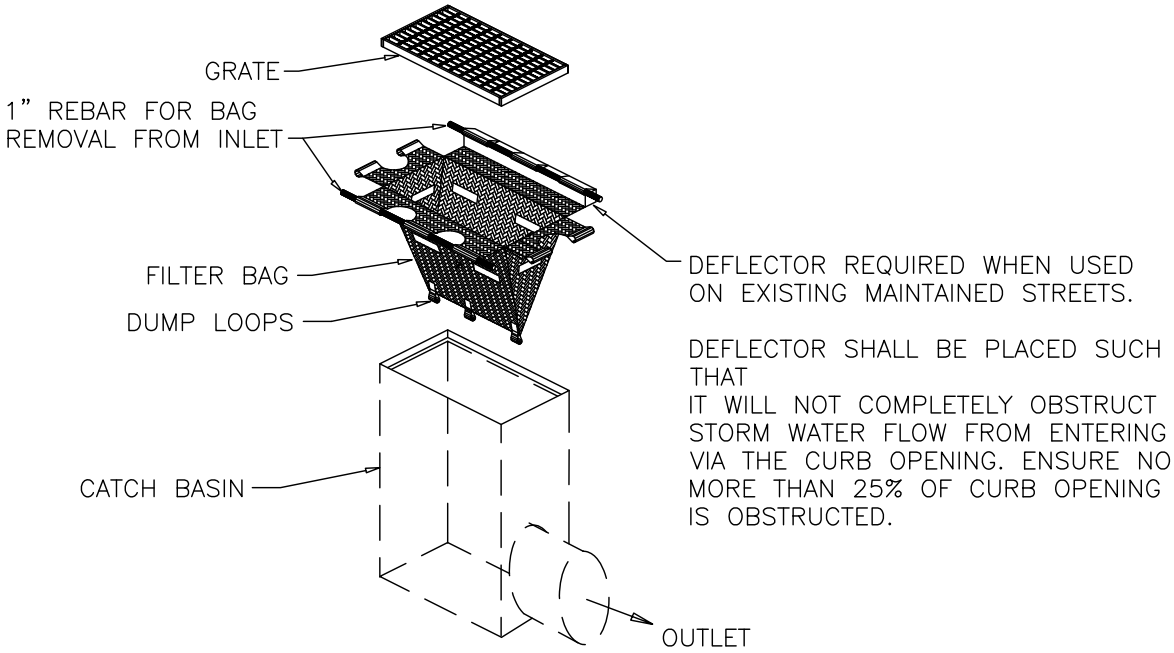
STD. NO.	REV.
518.1	

NOTES:

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



SECTION



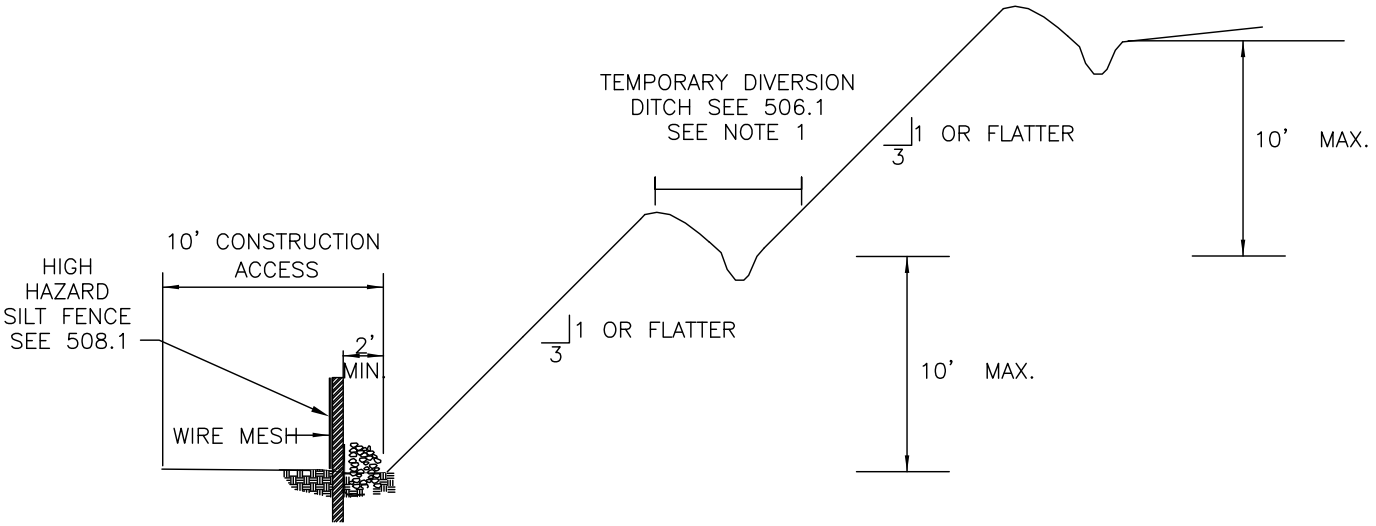
INSTALLATION

NOT TO SCALE

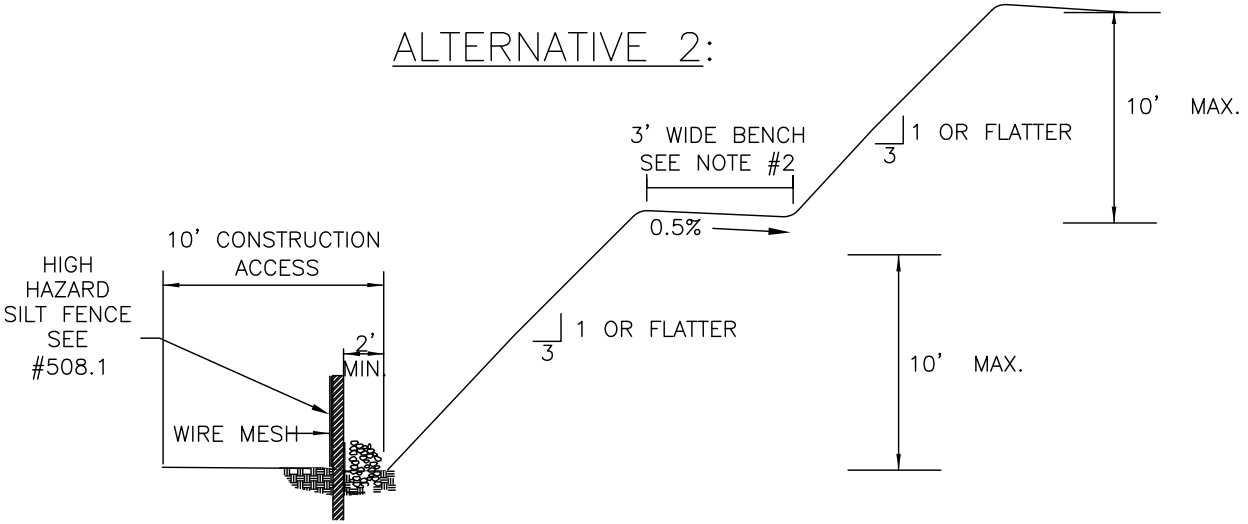
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CATCH BASIN INLET PROTECTION

STD. NO.	REV.
519.1	

ALTERNATIVE 1:



ALTERNATIVE 2:



NOTES:

1. IF DIVERSION DITCH USED, IT SHOULD FLOW INTO SEDIMENT BASIN ROCK CHECK DAM, OR SLOPE DRAIN
2. BENCH SHOULD BE GRADED AT 0% LONGITUDINAL SLOPE (ON-CONTOUR)
3. SLOPES SHALL BE A MAXIMUM OF 3:1 FOR RESIDENTIAL DEVELOPMENT.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SLOPE STABILITY BENCH

STD. NO.	REV.
520.1	

FOR LATE WINTER AND EARLY SPRING:

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

SEEDING DATES:
JAN. 1 – MAY 1

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

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

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

FOR SUMMER:

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

SEEDING DATES:
MAY 1 – AUG. 15

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

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

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

FOR FALL:

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

SEEDING DATES:
AUG. 15 – DEC 30

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

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

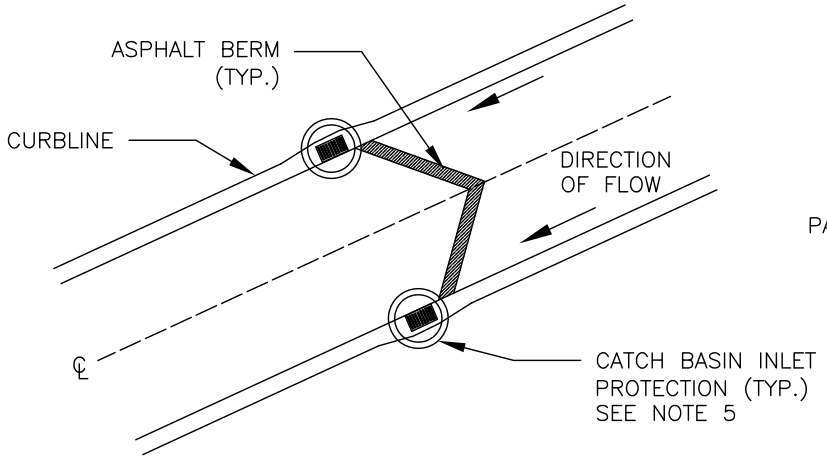
MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

FOR ADDITIONAL INFORMATION, REFER TO NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10.
FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDEQ ESCPDM SECTION 6.11.

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

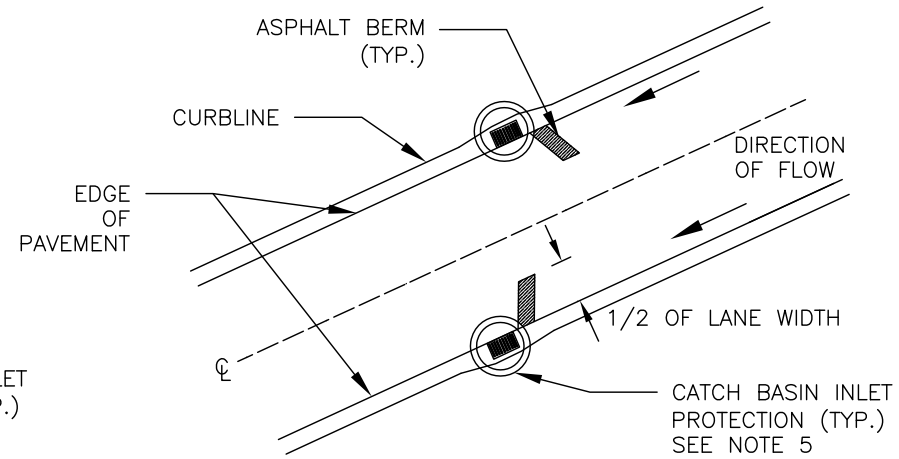
TEMPORARY SEEDING SCHEDULE

STD. NO.	REV.
521.1	



OPTION 1

CATCH BASINS ALIGNED
ACROSS STREET

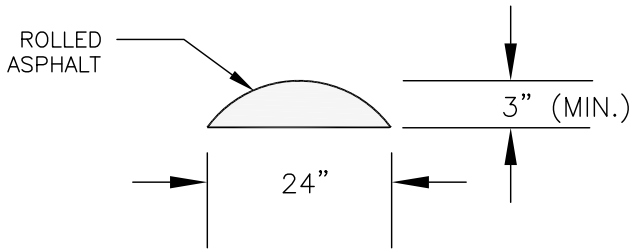


OPTION 2

CATCH BASINS OFFSET OR
INDIVIDUAL CATCH BASIN

NOTES:

1. TEMPORARY BERMS ARE INSTALLED TO ACHIEVE DESIGNED DRAINAGE AREAS PRIOR TO FINAL ASPHALT LIFT BEING INSTALLED ON ROAD SURFACE.
2. CONTRACTOR TO INSTALL TEMPORARY BERMS ON INTERMEDIATE COURSE, ON HIGH SIDE OF CURB INLETS FOR STRUCTURES ALONG THE STREET SLOPE.
3. REMOVE BERM PRIOR INSTALLING FINAL ASPHALT LIFT, FINISHING ROAD SURFACE.
4. REMOVE ACCUMULATED SEDIMENT FROM ABOVE BERM WEEKLY AND AFTER RAINFALL, AS NEEDED TO MAINTAIN FUNCTION.
5. CATCH BASIN INLET PROTECTION MAY BE OMITTED IF APPROVED BY EROSION CONTROL COORDINATOR



BERM CROSS SECTION

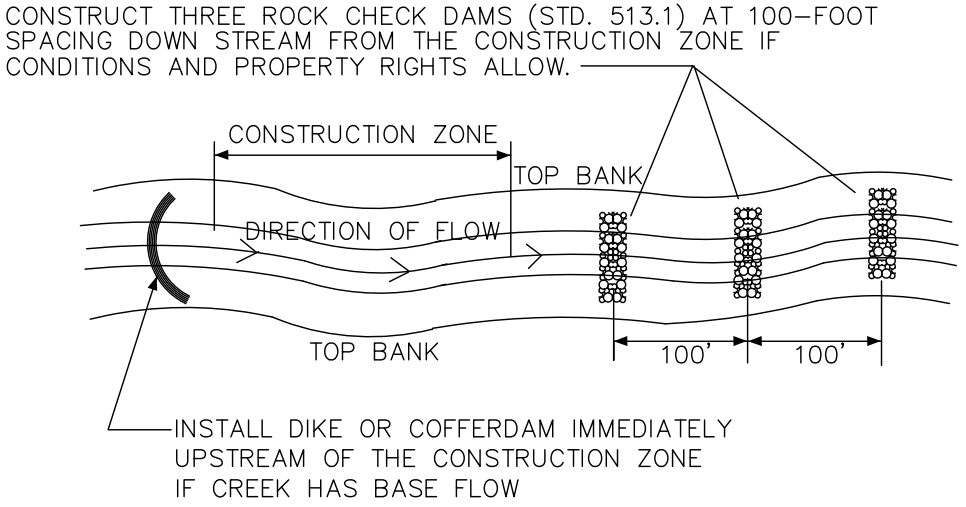
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY ASPHALT DIVERSION BERM

STD. NO.	REV.
522.1	1/22

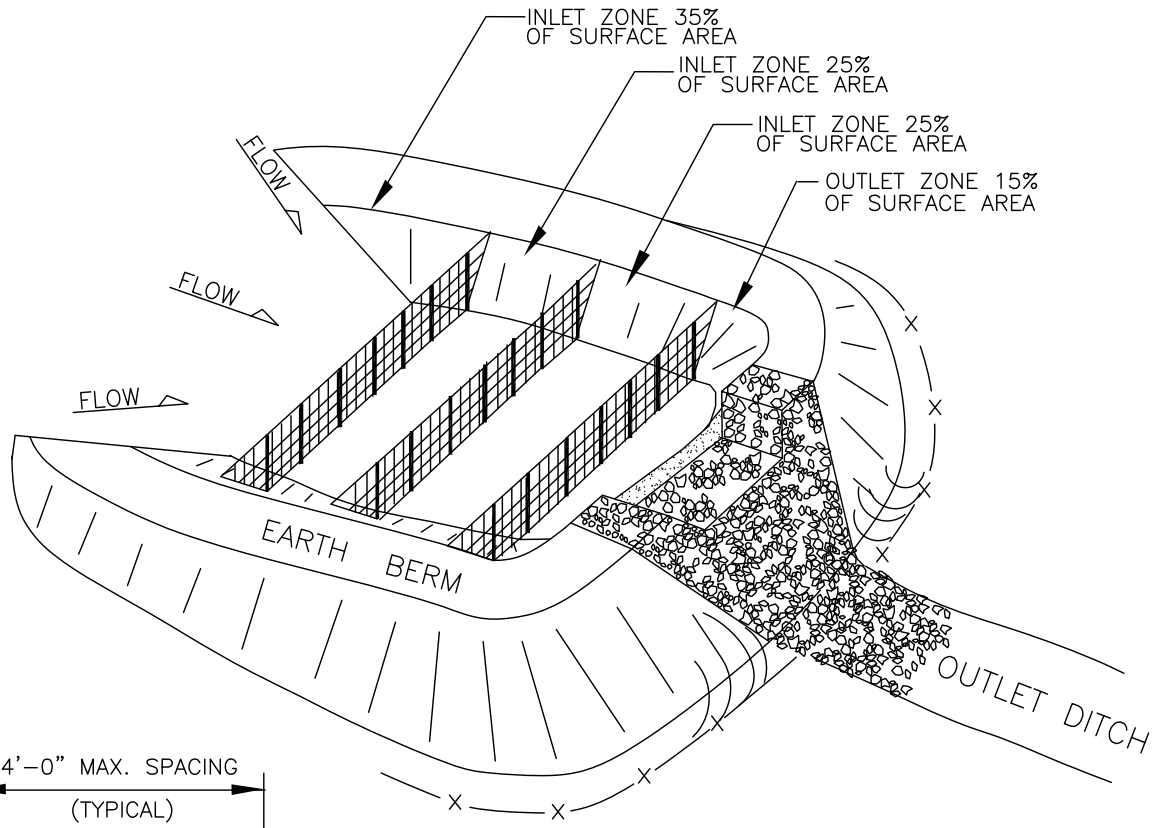
NOTES:

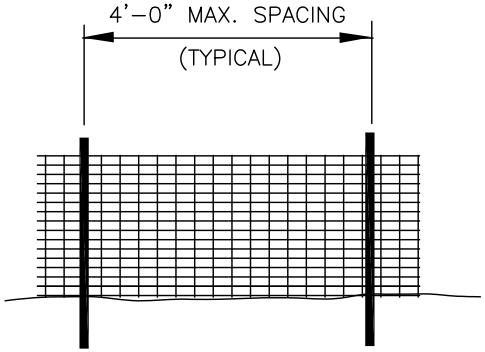
1. WORK IN CREEK SHALL BE PLANNED TO MINIMIZE THE NUMBER OF DAYS OF DISTURBANCE.
2. THE CONTRACTOR IS TO OBSERVE THE LOCAL WEATHER FORECASTS AND NOT BEGIN WORK IN THE CREEK UNLESS AT LEAST THREE DAYS WITHOUT RAIN IS ANTICIPATED.
3. ALL DISTURBED CREEK BED AND BANKS ARE TO BE STABILIZED PRIOR TO THE END OF EACH WORK DAY.
4. FOR LARGER CREEKS, CONSTRUCTION SHOULD OCCUR ON ONE SIDE OF THE CREEK AT A TIME. THE FIRST SIDE SHOULD BE STABILIZED BEFORE BEGINNING CONSTRUCTION ON THE OPPOSITE SIDE.
5. A TEMPORARY PIPE OR PUMP MAY BE INSTALLED TO CONTROL CREEK FLOW DURING CUNSTRUCTION.

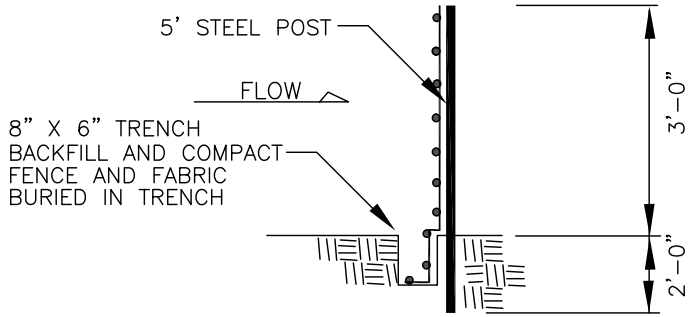


NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CONSTRUCTION WITHIN CREEK BANK (FOR USE WITH ROAD CROSSINGS, UTILITY CROSSINGS & CULVERT CONSTRUCTION)	STD. NO. 523.1	REV.







GENERAL NOTES:

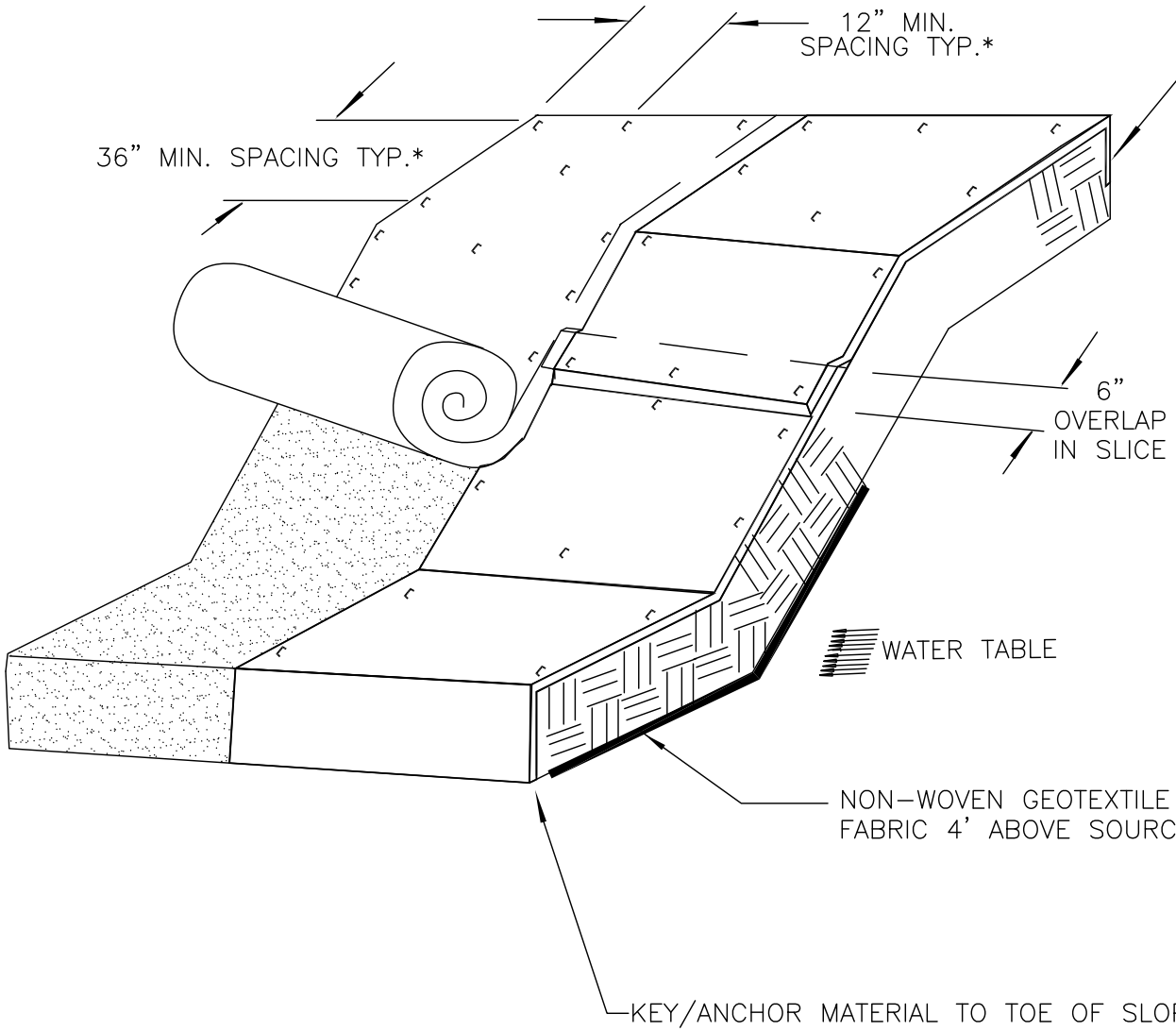
1. DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.
2. USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FILTER FABRIC TO THE WIRE FENCE.
3. MINIMUM BAFFLE SPACING IS 10'.
4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.
5. REFER TO NCESCPDM SECTION #6.65 FOR ADDITIONAL SPECIFIATIONS.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

BAFFLE INSTALLATION

STD. NO.	REV.
524.1	



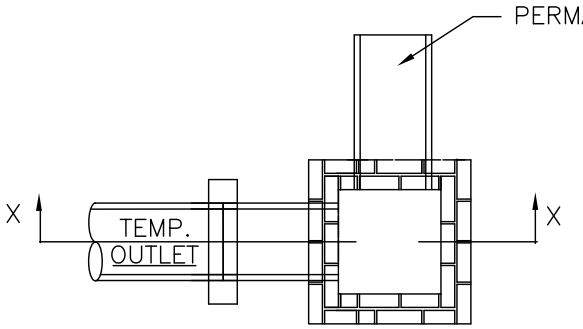
GENERAL NOTES:

1. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
2. * DIMENSIONS SHOWN ARE MINIMUM, MANUFACTURED PRODUCTS MAY HAVE ADDITIONAL REQUIREMENTS THAT MUST BE MET.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, SOIL CLODS, STICKS, GRASS. MAT/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
4. THE DETAIL SHOWN IS FOR SLOPE MATTING. FOR CHANNEL OR PIPE OUTFALL MATTING SPECIFICATIONS, PLEASE REFER TO NCESCPDM STANDARD #6.17 AND MANUFACTURER'S GUIDELINES.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	EMBANKMENT MATTING DETAIL

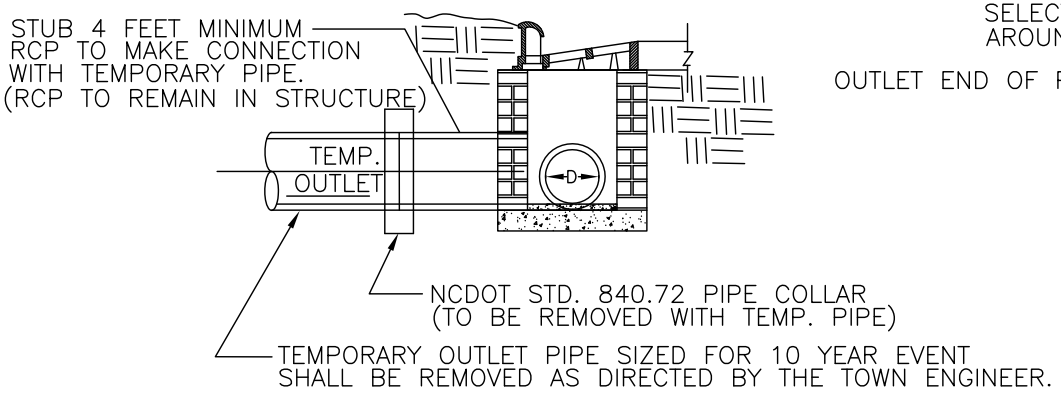
STD. NO.	REV.
525.1	



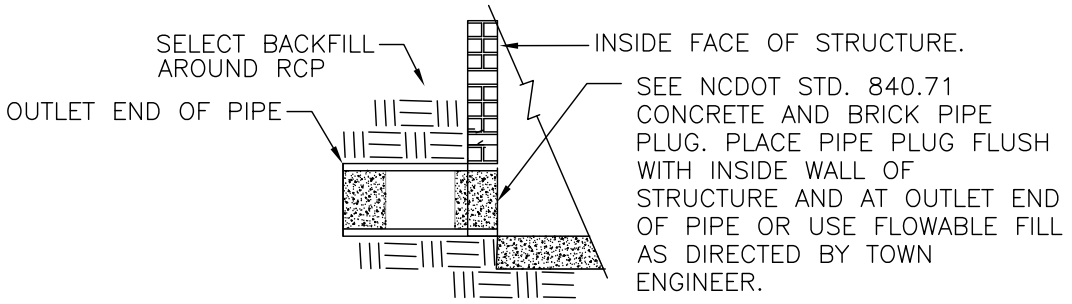
PLAN

GENERAL NOTES:

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



SECTION X–X
ACTIVE SYSTEM



PIPE PLUG DETAIL
AFTER REMOVAL OF TEMPORARY PIPE

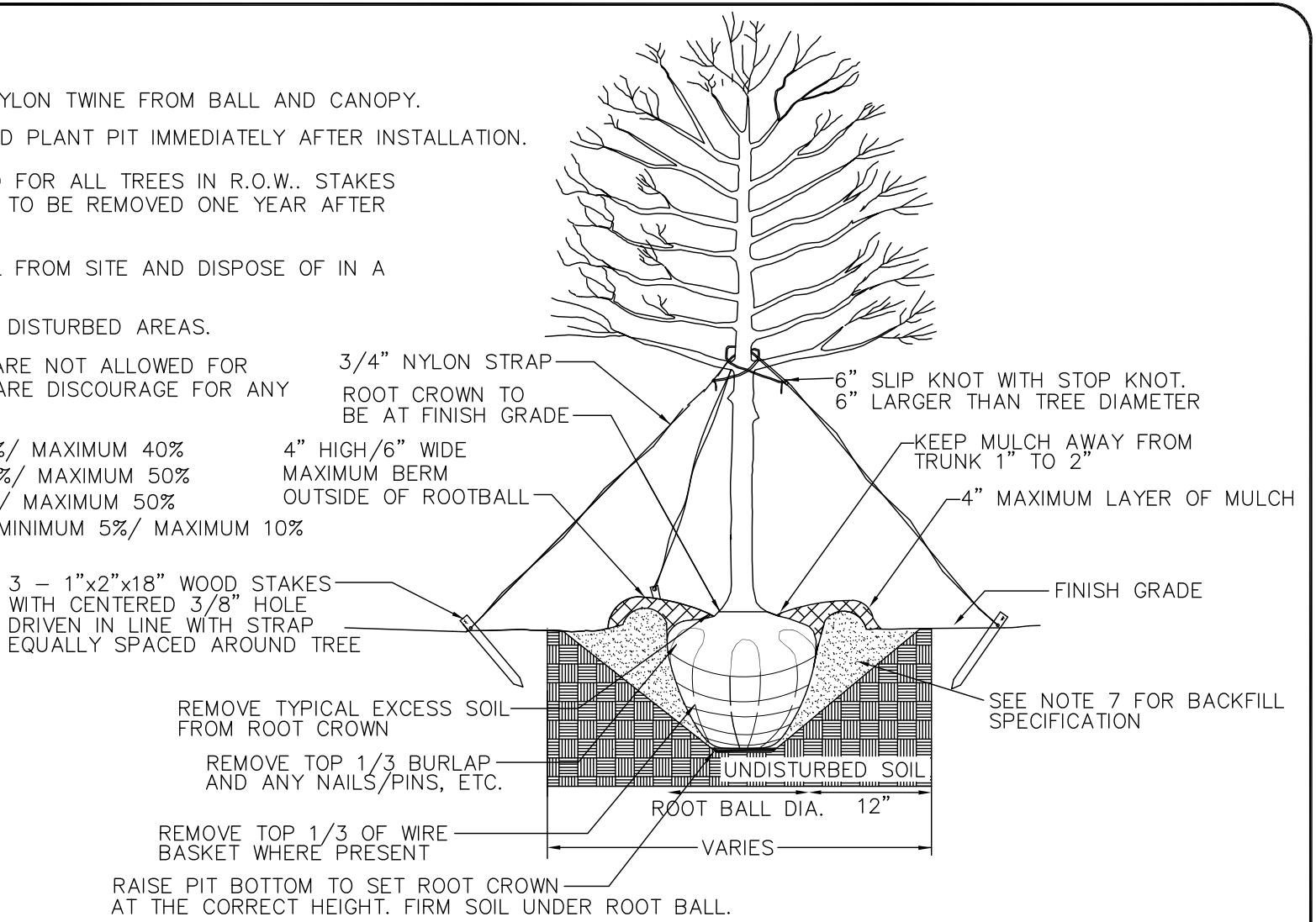
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	BRICK STORM STRUCTURE WITH TEMPORARY PIPE

STD. NO.	REV.
526.1	

NOTES:

1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W.. STAKES AND STRAPPING ARE TO BE REMOVED ONE YEAR AFTER PLANTING
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.
6. MULTI-STEM TREES ARE NOT ALLOWED FOR STREET TREES AND ARE DISCOURAGE FOR ANY APPLICATION.
7. CLAY – MINIMUM 10%/ MAXIMUM 40%
   SAND – MINIMUM 20%/ MAXIMUM 50%
   SILT – MINIMUM 20%/ MAXIMUM 50%
   ORGANIC MATTER – MINIMUM 5%/ MAXIMUM 10%



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

FOR EXAMPLE: CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
2"	12–14'	16'	24"	16"
3"	14–16'	18'	32"	21"

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

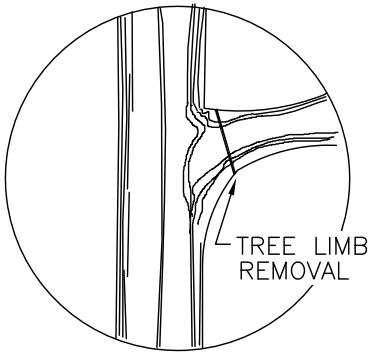
TREE PLANTING

(FOR SINGLE AND MULTI-STEM TREES)

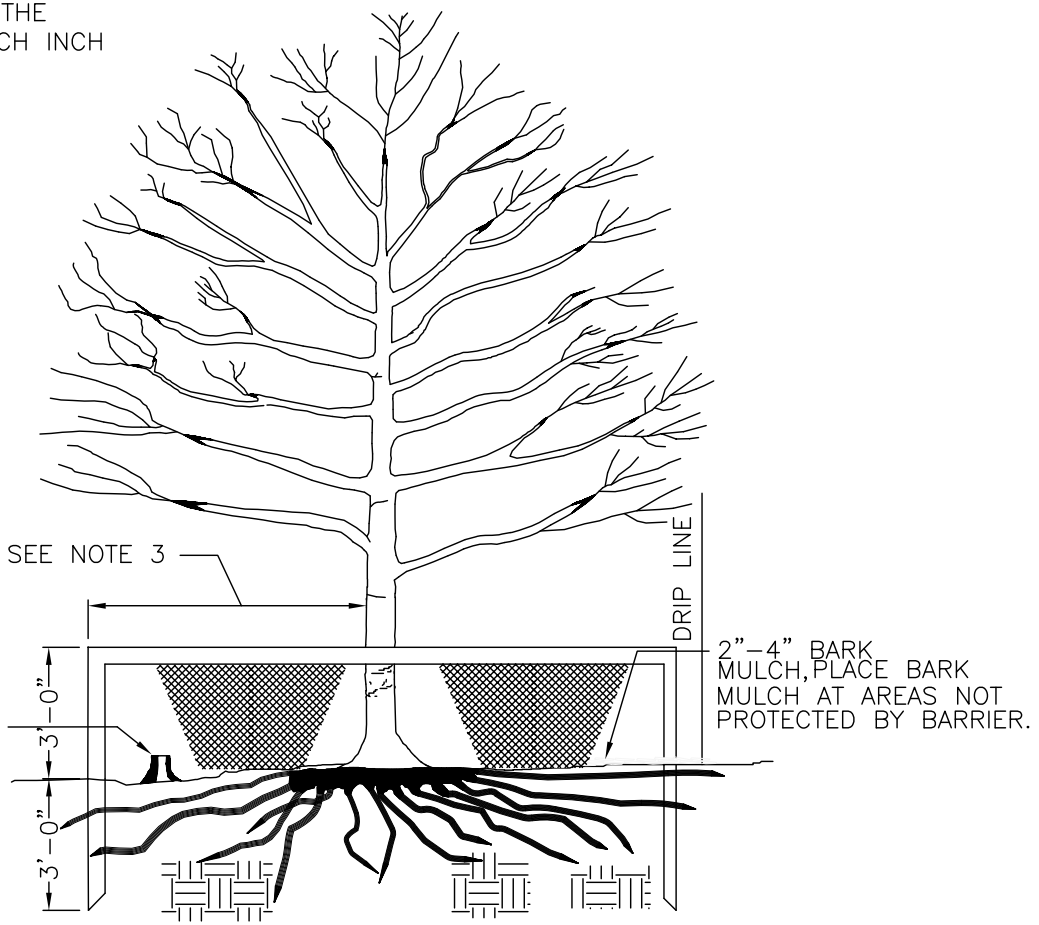
STD. NO.	REV.
600.1	3/24

NOTES:

1. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
2. LANDSCAPING PLANS SHALL SHOW THE LOCATIONS OF ALL TREE PROTECTION FENCES.
3. PROTECTION RADIUS SHALL BE THE GREATER OF; 6 FEET, THE THE OUTER LIMITS OF THE DRIPLINE OR 1.5 FEET FOR EACH INCH OF TREE DIAMETER AT 4.5 FEET ABOVE GROUND.



FOR PRUNING SEE
INTERNATIONAL SOCIETY
OF ARBORICULTURE SPECS.

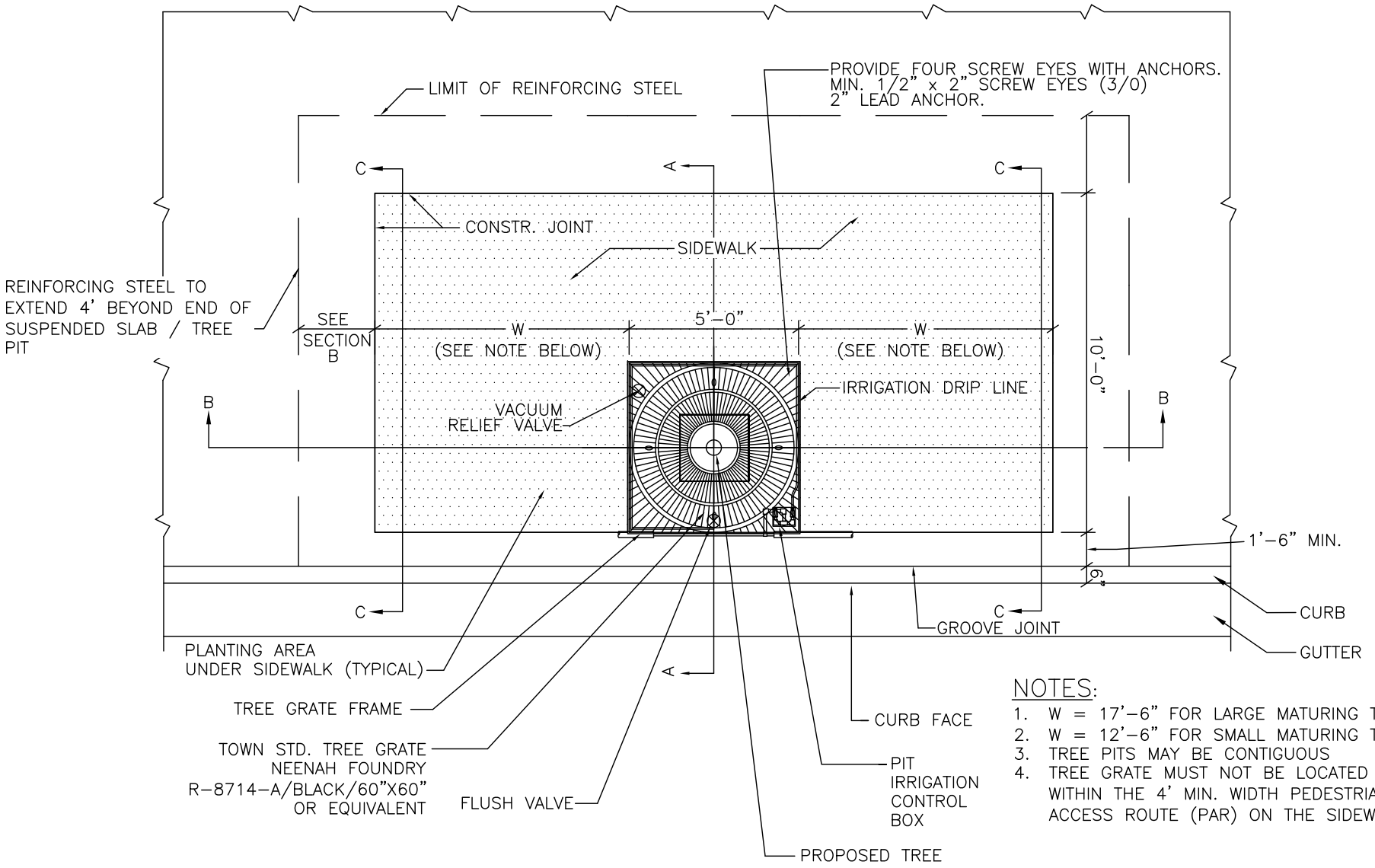


DEAD TREES AND SCRUB OR UNDER GROWTH SHALL BE CUT FLUSH WITH ADJACENT GRADE. NO GRUBBING ALLOWED UNDER DRIP LINE.

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

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TREE PROTECTION DETAIL

STD. NO.	REV.
601.1	



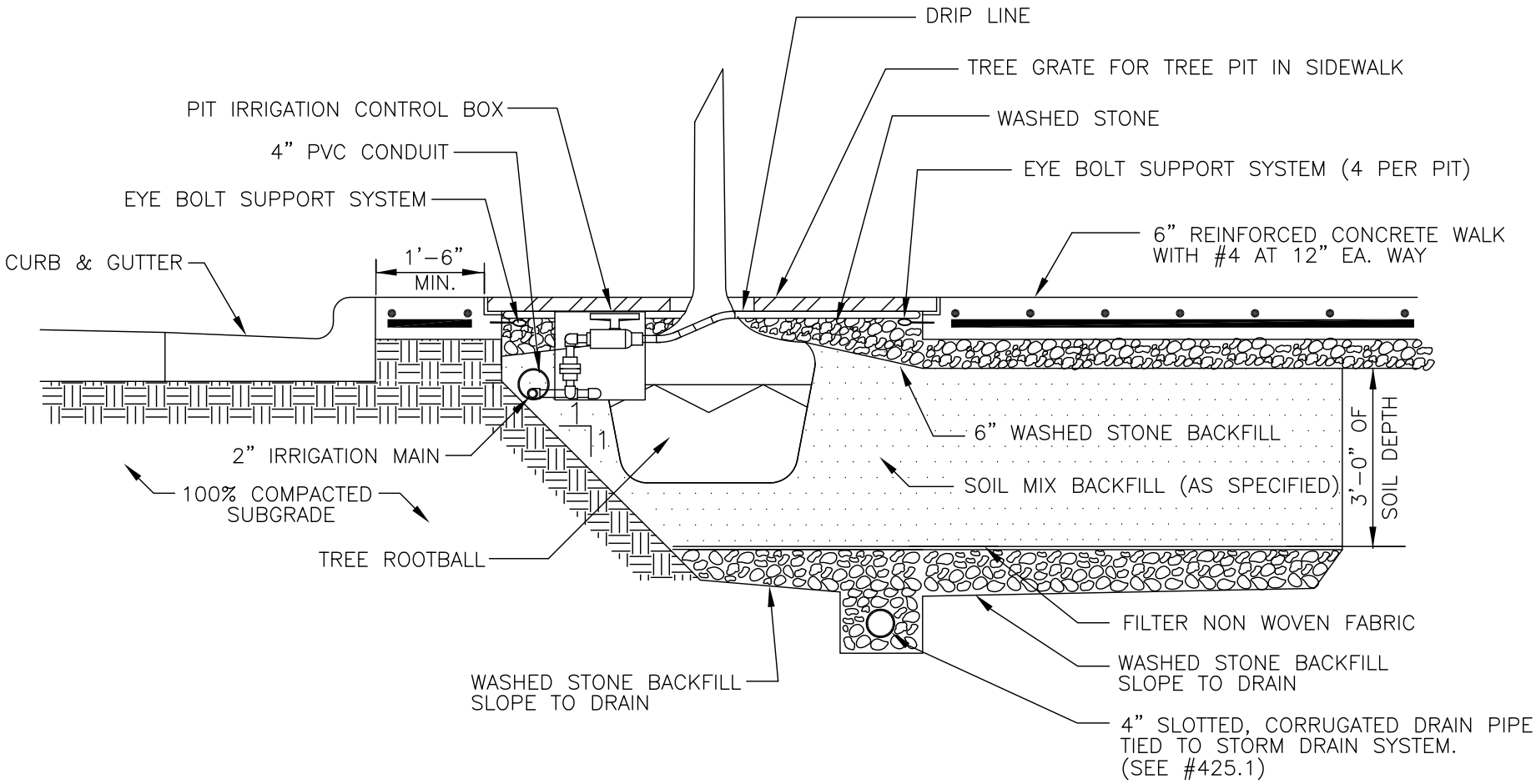
NOTES:

1. W = 17'-6" FOR LARGE MATURING TREE.
2. W = 12'-6" FOR SMALL MATURING TREE.
3. TREE PITS MAY BE CONTIGUOUS
4. TREE GRATE MUST NOT BE LOCATED WITHIN THE 4' MIN. WIDTH PEDESTRIAN ACCESS ROUTE (PAR) ON THE SIDEWALK.

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

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

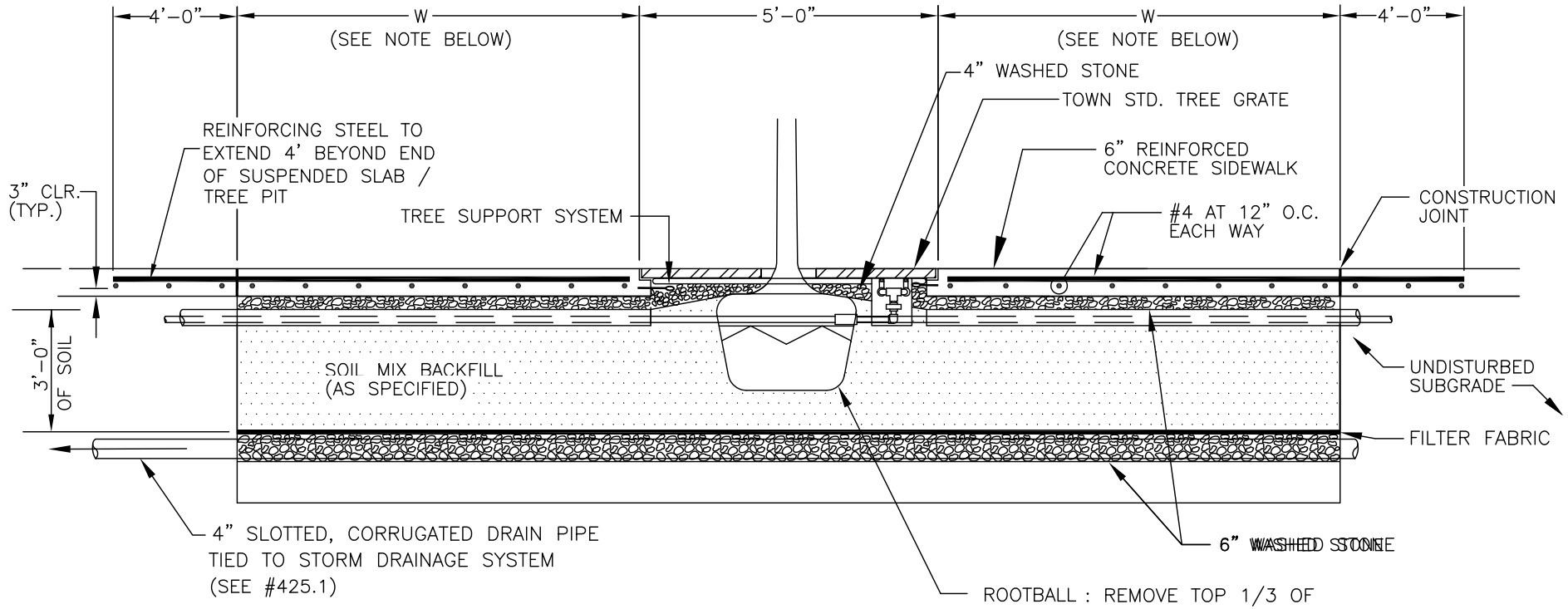
STD. NO.	REV.
602.1	



SECTION A

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	LARGE AND SMALL MATURING TREE PIT WITH GRATE IN SIDEWALK (SECTION)	STD. NO. 603.1 / REV.



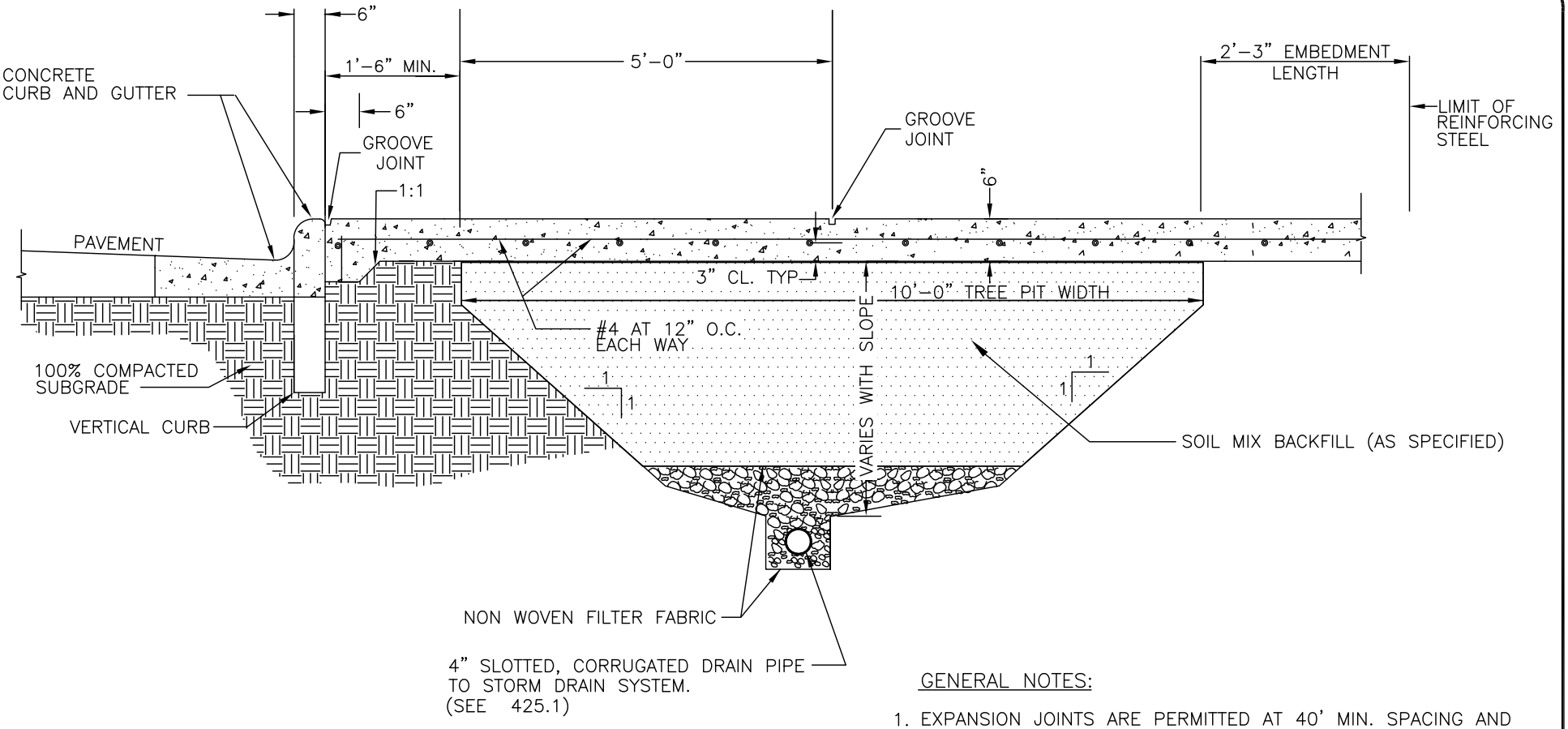
NOTE:
W = 17'-6" FOR LARGE MATURING TREE.
W = 12'-6" FOR SMALL MATURING TREE.
TREE PITS MAY BE CONTIGUOUS

SECTION B

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	LARGE AND SMALL MATURING TREE PIT WITH GRATE IN SIDEWALK (SECTION)

STD. NO.	REV.
604.1	



SECTION C

NOTE

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

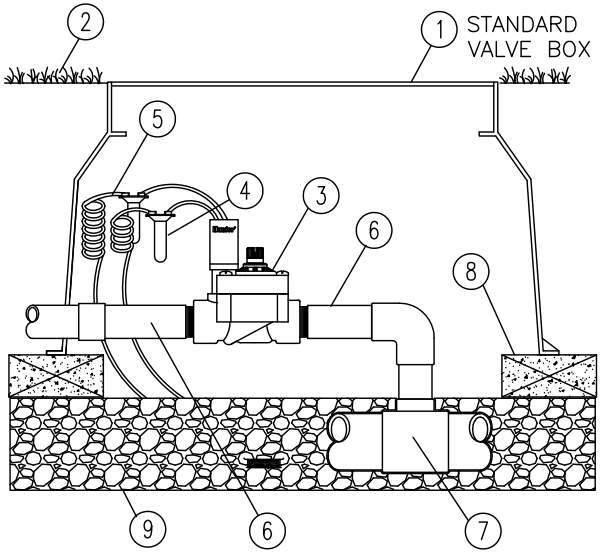
GENERAL NOTES:

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

NOT TO SCALE

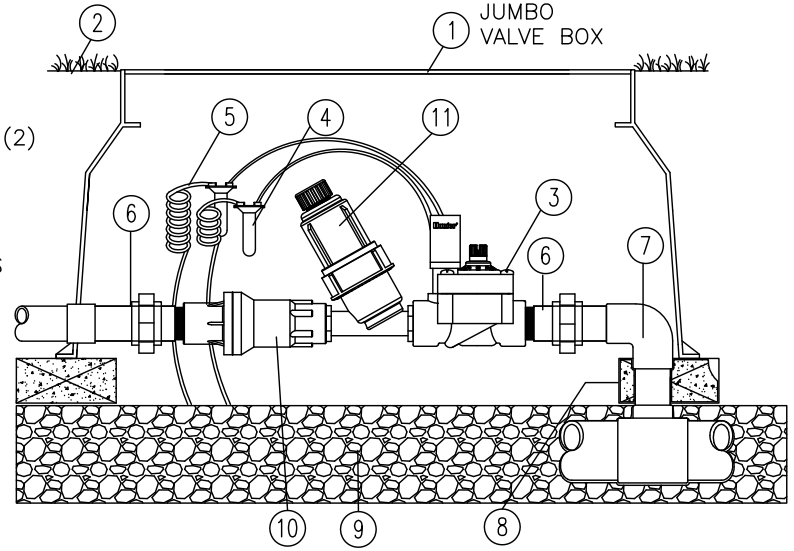
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	LARGE AND SMALL TREE PIT WITH GRATE IN SIDEWALK (SECTION)

STD. NO.	REV.
605.1	



CONTROL VALVE

2 FINISH GRADE
3 CONTROL VALVE WITH FLOW CONTROL
4 WATERPROOF CONNECTORS (2)
5 18–24" COILED WIRE
6 SCH 80 T.O.E. NIPPLE
7 MAIN LINE PIPE & FITTINGS
8 BRICK SUPPORTS (4)
9 3/4" MINUS WASHED GRAVEL, MIN. 3" DEPTH
10 PRESSURE REGULATOR
11 FILTER



DRIP IRRIGATION W/ PRESSURE REGULATOR AND FILTER

NOT TO SCALE

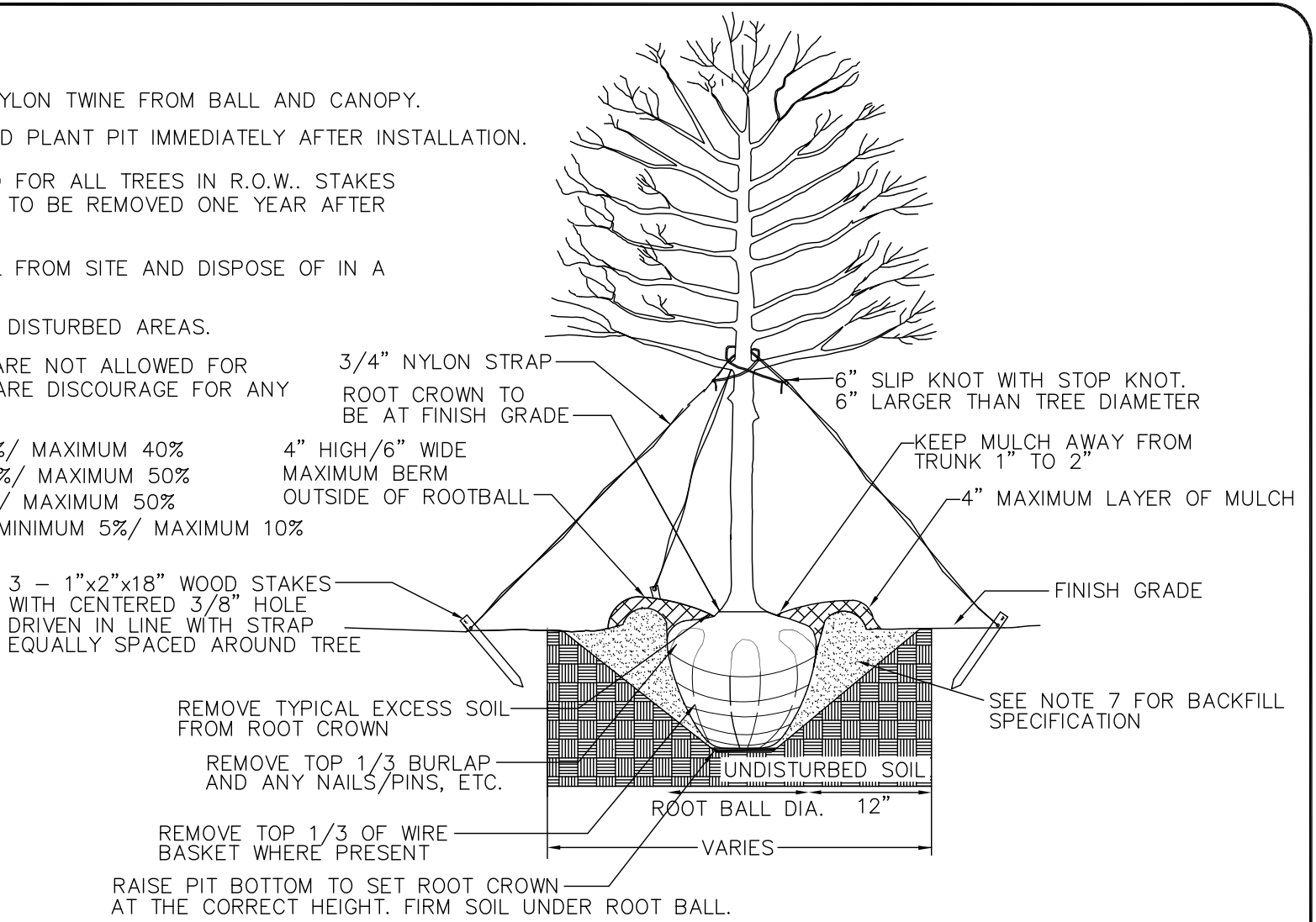
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

TYPICAL VALVE AND VALVE BOX INSTALLATION

STD. NO.	REV.
606.1	

NOTES:

1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W.. STAKES AND STRAPPING ARE TO BE REMOVED ONE YEAR AFTER PLANTING
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.
6. MULTI-STEM TREES ARE NOT ALLOWED FOR STREET TREES AND ARE DISCOURAGE FOR ANY APPLICATION.
7. CLAY – MINIMUM 10%/ MAXIMUM 40%
   SAND – MINIMUM 20%/ MAXIMUM 50%
   SILT – MINIMUM 20%/ MAXIMUM 50%
   ORGANIC MATTER – MINIMUM 5%/ MAXIMUM 10%



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

FOR EXAMPLE: CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
2"	12–14'	16'	24"	16"
3"	14–16'	18'	32"	21"

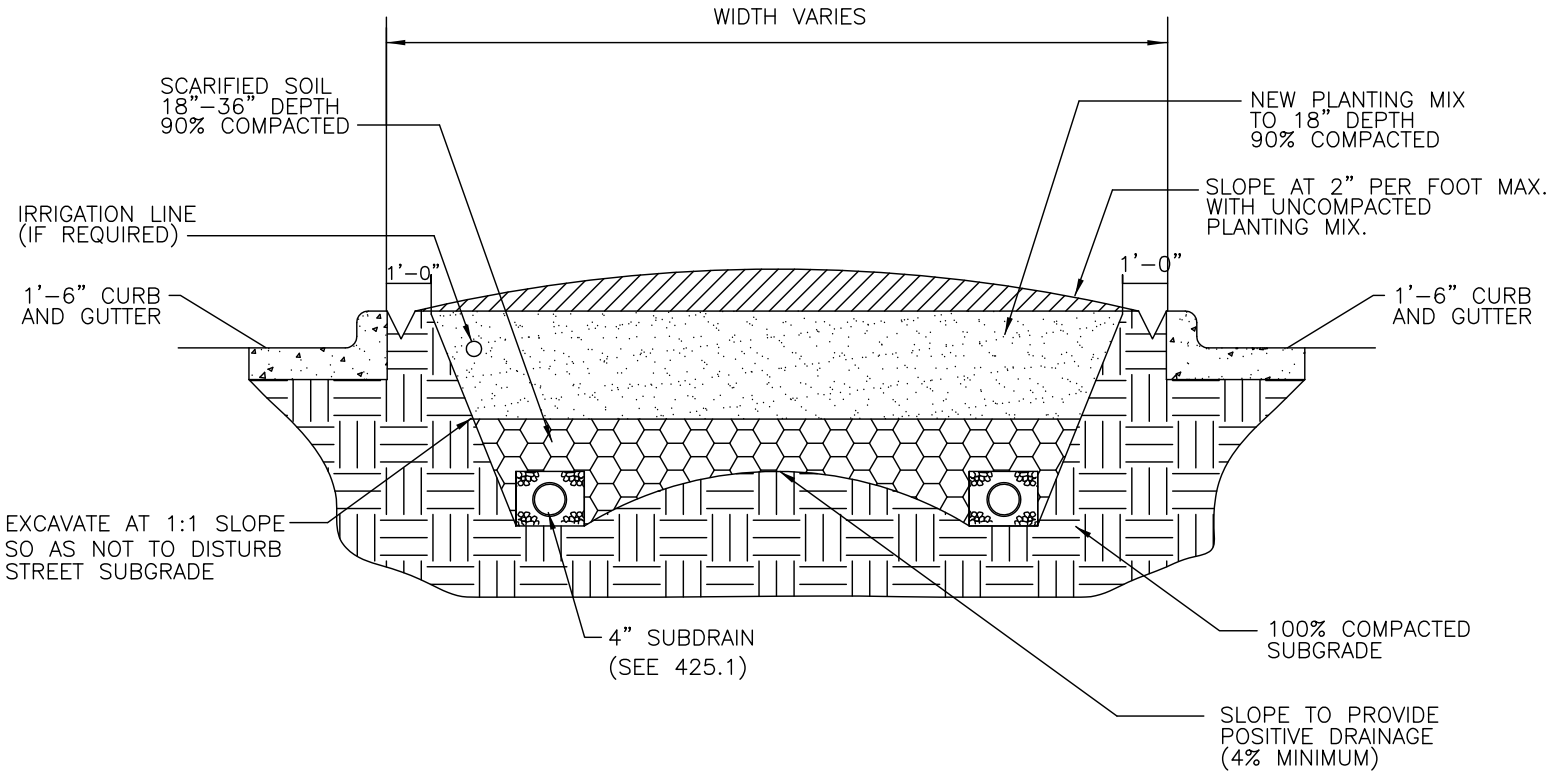
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

TREE PLANTING

(FOR SINGLE AND MULTI-STEM TREES)

STD. NO.	REV.
600.1	3/24



NOTES:

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

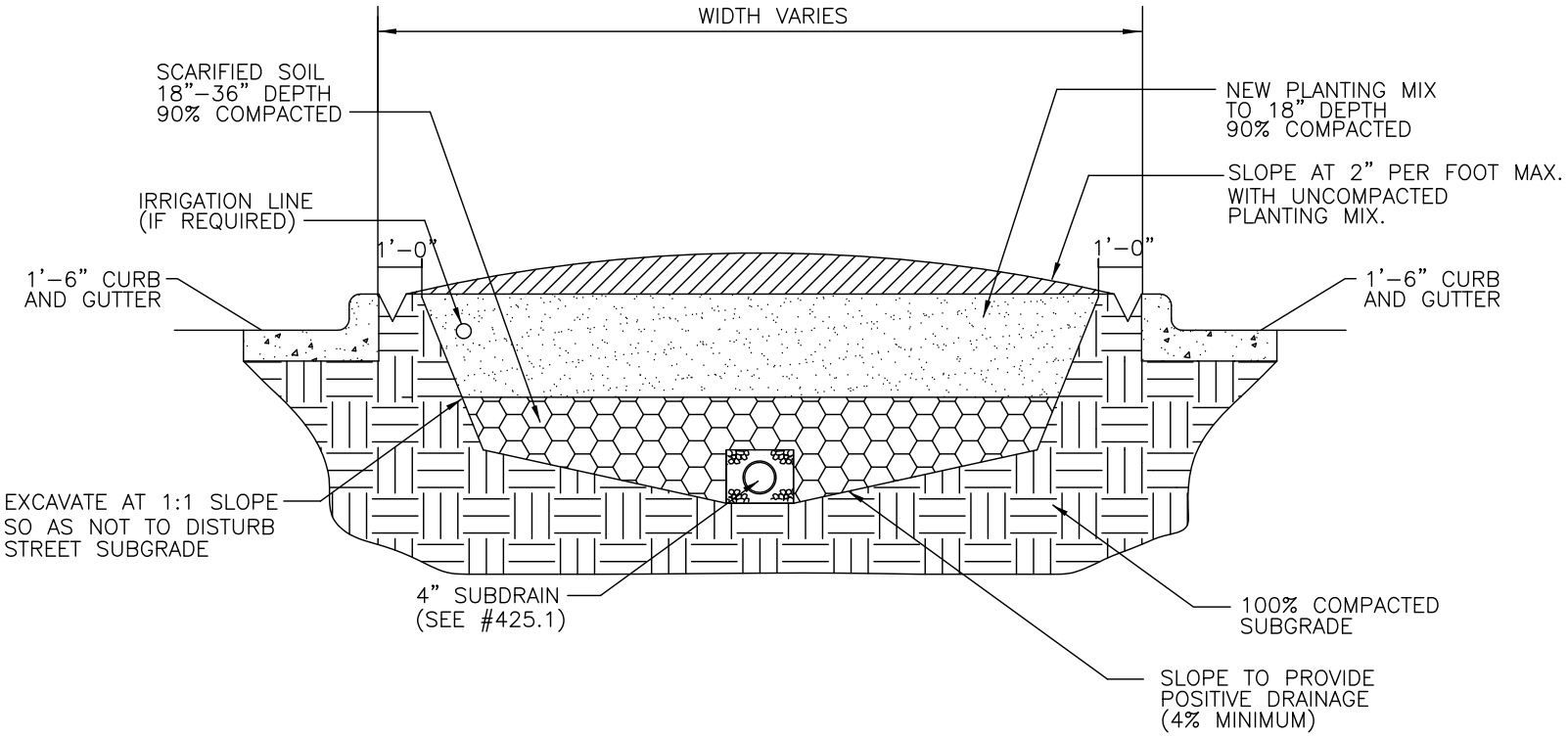
2. REMOVE SOIL TO A DEPTH OF 18". SCARIFY, TILL OR OTHERWISE LOOSEN THE REMAINING SOIL TO A DEPTH OF 18". ADD NEW PLANTING MIX AS SPECIFIED.

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

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	MEDIAN GREATER THAN 120 INCHES EXCAVATION, DRAINAGE AND BACKFILL

STD. NO.	REV.
611.1	



NOTES:

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

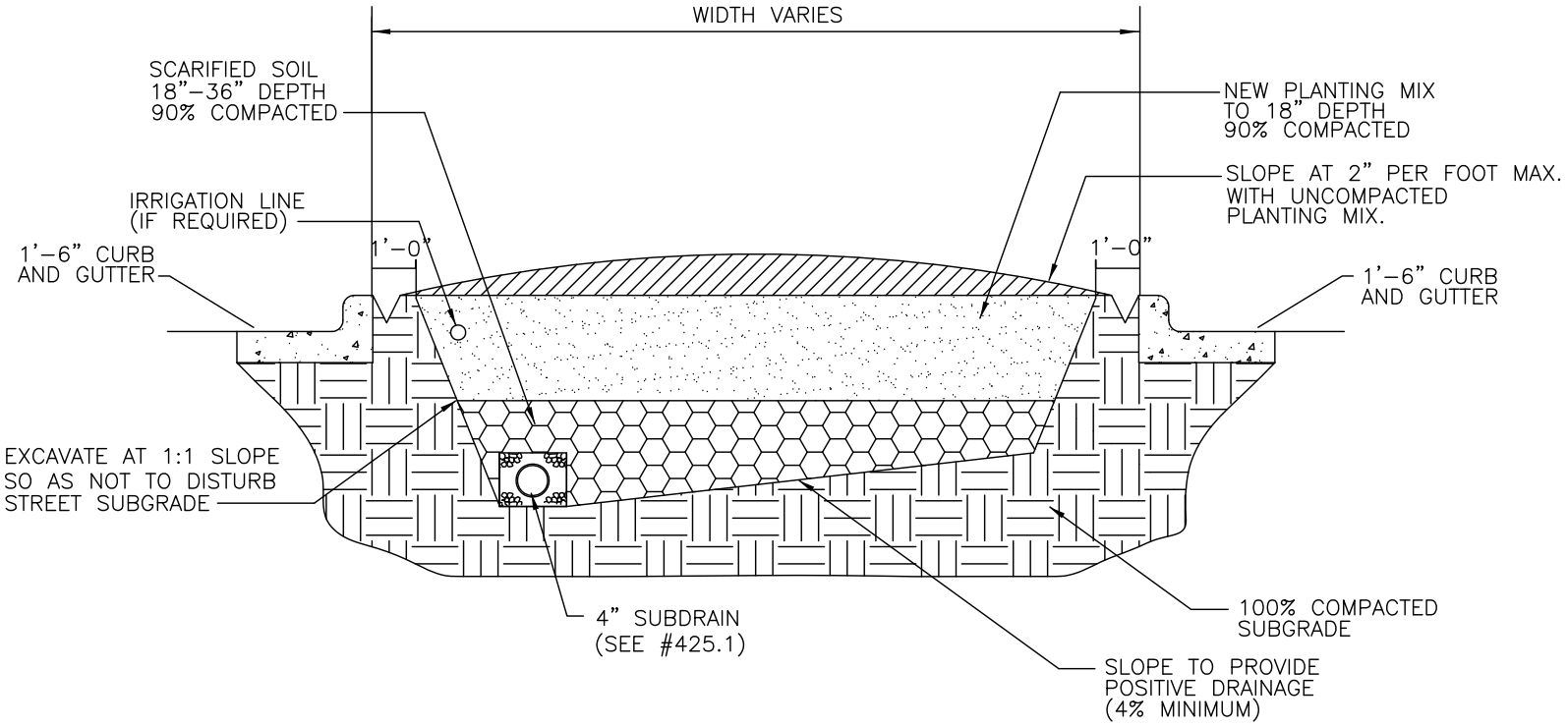
2. REMOVE SOIL TO A DEPTH OF 18". SCARIFY, TILL OR OTHERWISE LOOSEN THE REMAINING SOIL TO A DEPTH OF 18". ADD NEW PLANTING MIX AS SPECIFIED.

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

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	73 TO 120 INCH MEDIAN EXCAVATION, DRAINAGE AND BACKFILL

STD. NO.	REV.
612.1	



NOTES:

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

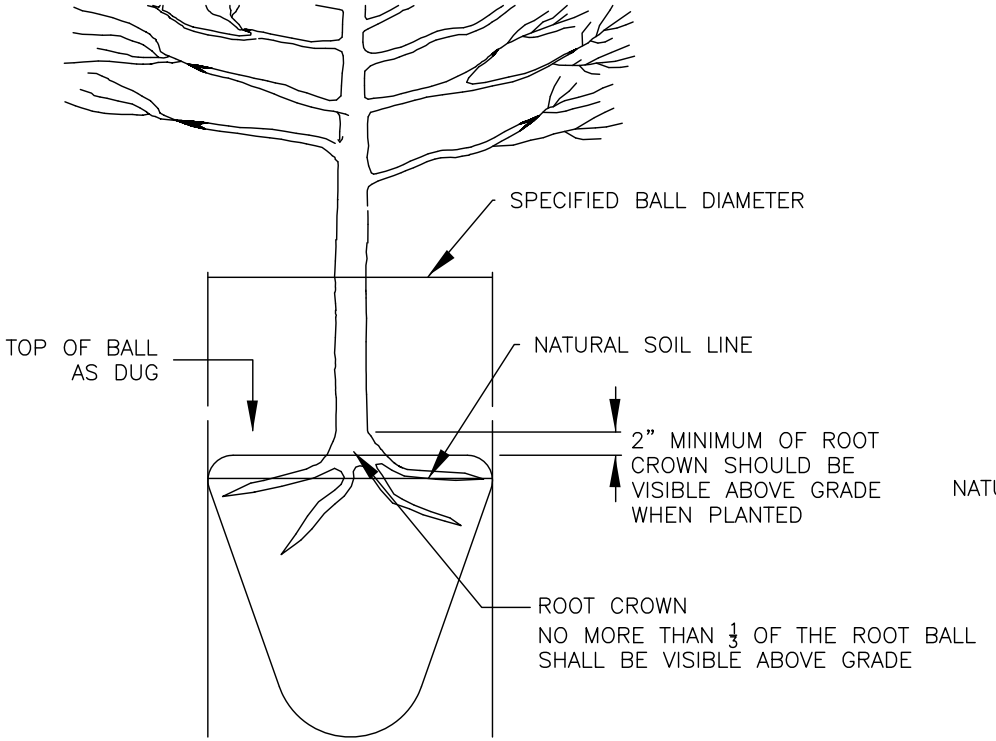
2. REMOVE SOIL TO A DEPTH OF 18". SCARIFY, TILL OR OTHERWISE LOOSEN THE REMAINING SOIL TO A DEPTH OF 18". ADD NEW PLANTING MIX AS SPECIFIED.

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

NOT TO SCALE

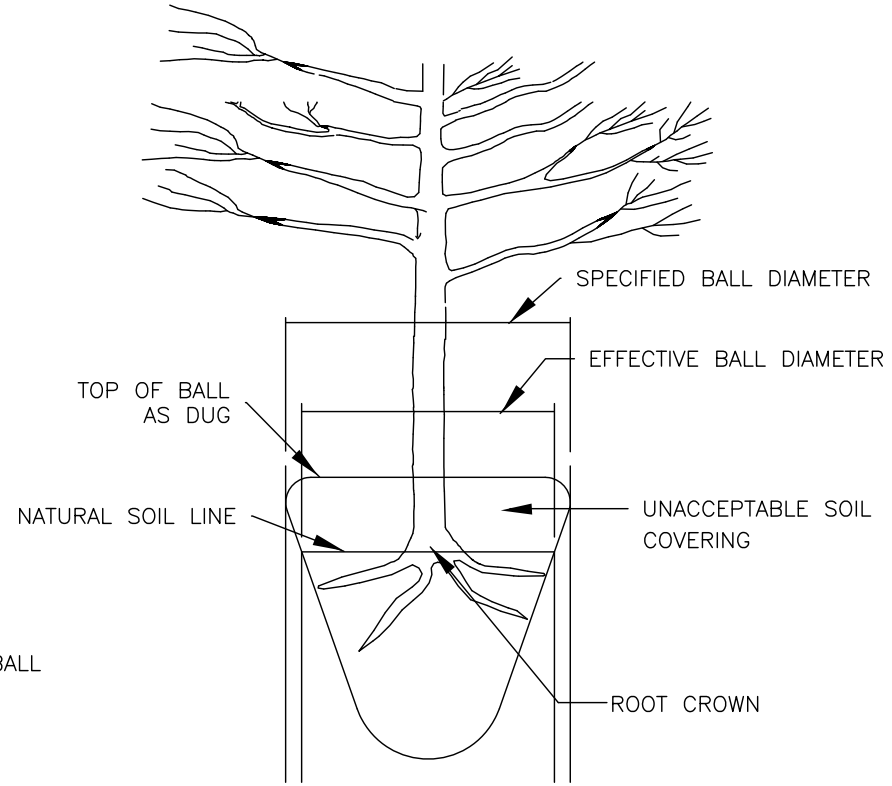
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	48 TO 72 INCH MEDIAN EXCAVATION, DRAINAGE AND BACKFILL

STD. NO.	REV.
613.1	



ACCEPTABLE CONDITION

(AS DELIVERED)



UNACCEPTABLE CONDITION

(AS DELIVERED)

NOTE:

1. A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE ARBORIST TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF ARBORIST DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.
2. NO TREES ARE TO BE PLANTED UNTIL THE ARBORIST HAS INSPECTED AND APPROVED EACH TREE.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

ROOT FLARE DEPTHS

(TREE ROOT BALL CONDITION ON TREES FROM SUPPLIERS)

STD. NO.	REV.
614.1	

PLANTINGS IN STREET RIGHT-OF-WAY

GENERAL NOTES

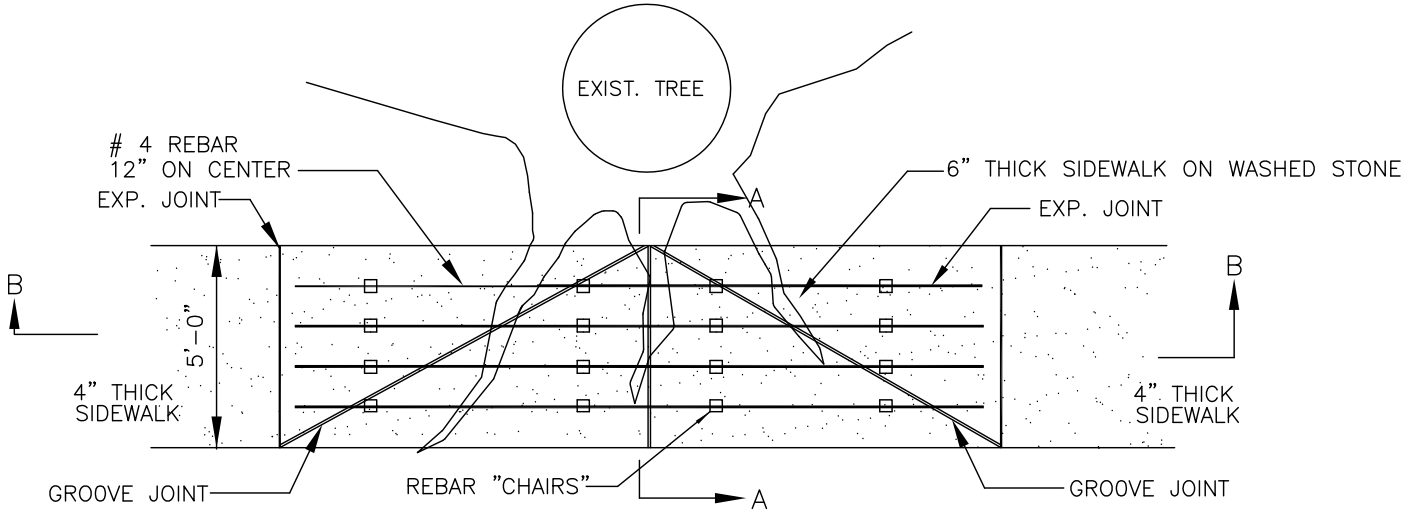
1. TREE GRATES AND ASSOCIATED IRRIGATION SYSTEMS ARE REQUIRED AT VARIOUS LOCATIONS IN THE DOWNTOWN AREAS TO COMPLY WITH THE DOWNTOWN STREETSCAPE GUIDELINES AND OTHER ZONING REQUIREMENTS. ALL OTHER INSTALLATIONS OF IRRIGATION SYSTEMS WITHIN THE RIGHT-OF-WAY OF TOWN OR STATE MAINTAINED STREETS REQUIRE AN ENCROACHMENT AGREEMENT EXECUTED THROUGH TOWN OR NCDOT. THE TOWN'S ENCROACHMENT AGREEMENT REVIEW/APPROVAL PROCESS MAY INCLUDE ADDITIONAL REQUIREMENTS. CONTACT TOWNS DEVELOPMENT SERVICES DEPARTMENT FOR ADDITIONAL INFORMATION REGARDING COST, SUBMITTAL, AND LIABILITY INSURANCE COVERAGE REQUIREMENTS.

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

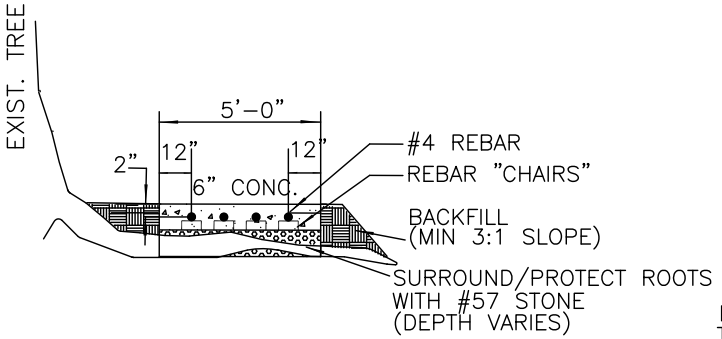
   SUBDRAINAGE INSPECTION
   TREE PIT/WELL OR PLANTING STRIP INSPECTION
   SOIL MIX APPROVALS/INSPECTIONS
   TREE APPROVALS/INSPECTIONS – PRIOR TO PURCHASING THE TREES, TO BE MADE BY THE ARBORIST.
   THIS MAY INCLUDE PHOTO APPROVAL OR PARTICIPATION IN TAGGING THE TREES.
   TREE PLANTING INSPECTION
   IRRIGATION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

   ALL OF THE ABOVE INSPECTIONS WILL BE PERFORMED BY THE ARBORIST EXCEPT FOR THE TREE APPROVALS AS NOTED.

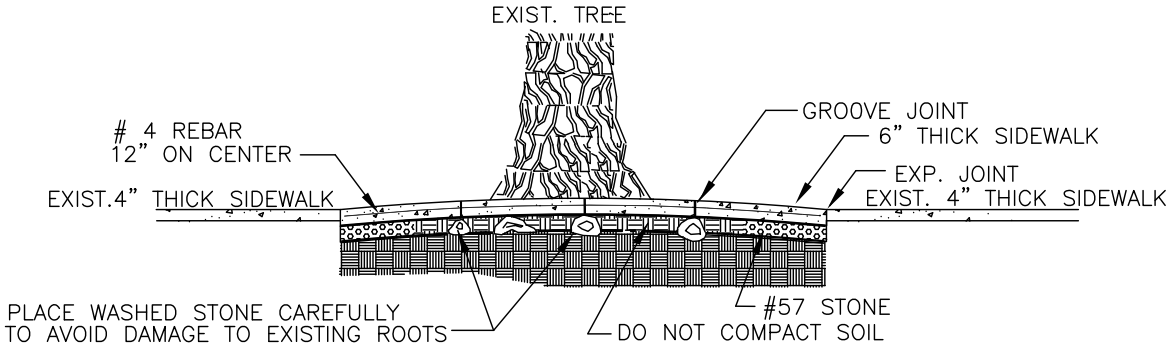
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TREE PLANTING-NOTES (DRAINAGE AND INSPECTION)	STD. NO. 615.1 / REV. 8/19



PLAN VIEW



SECTION A–A



SECTION B–B

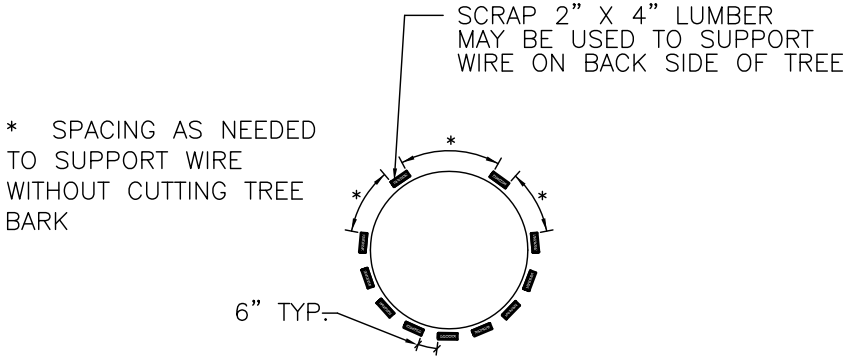
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	REINFORCED CONCRETE SIDEWALK (BRIDGING TREE ROOTS)

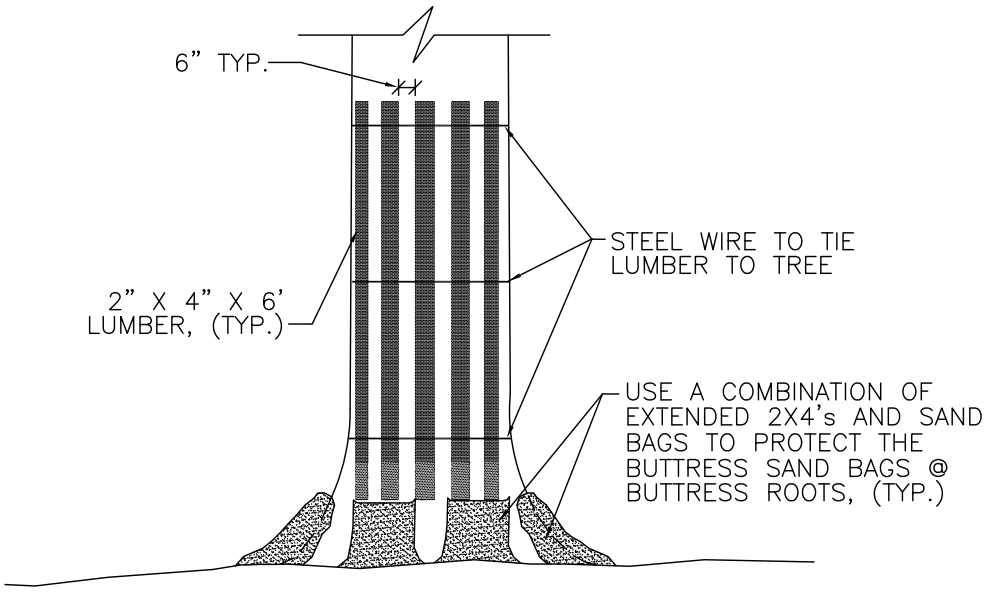
STD. NO.	REV.
616.1	

NOTES:

1. THIS TREE BUMPER DETAIL SHALL BE USED WHEN WORKING WITHIN 10' OF AN EXISTING TREE TO BE PROTECTED.
2. ALL TREES SHALL BE SAVED UNLESS NOTED OTHERWISE ON THE PLANS OR DIRECTED BY THE ENGINEER.
3. LUMBER, WIRE, AND SANDBAGS MAY BE REUSED AT OTHER TREES.
4. THE INTENT OF THIS DETAIL IS TO PROTECT EXISTING TREES FROM DAMAGE DURING CONSTRUCTION ESPECIALLY FROM BACKHOE ARM SWING. AN ALTERNATE APPROACH MAY BE USED IF APPROVED IN WRITING BY THE ENGINEER AFTER CONSULTATION WITH THE ARBORIST OR HIS DULY AUTHORIZED REPRESENTATIVE.



PLAN VIEW



ELEVATION VIEW

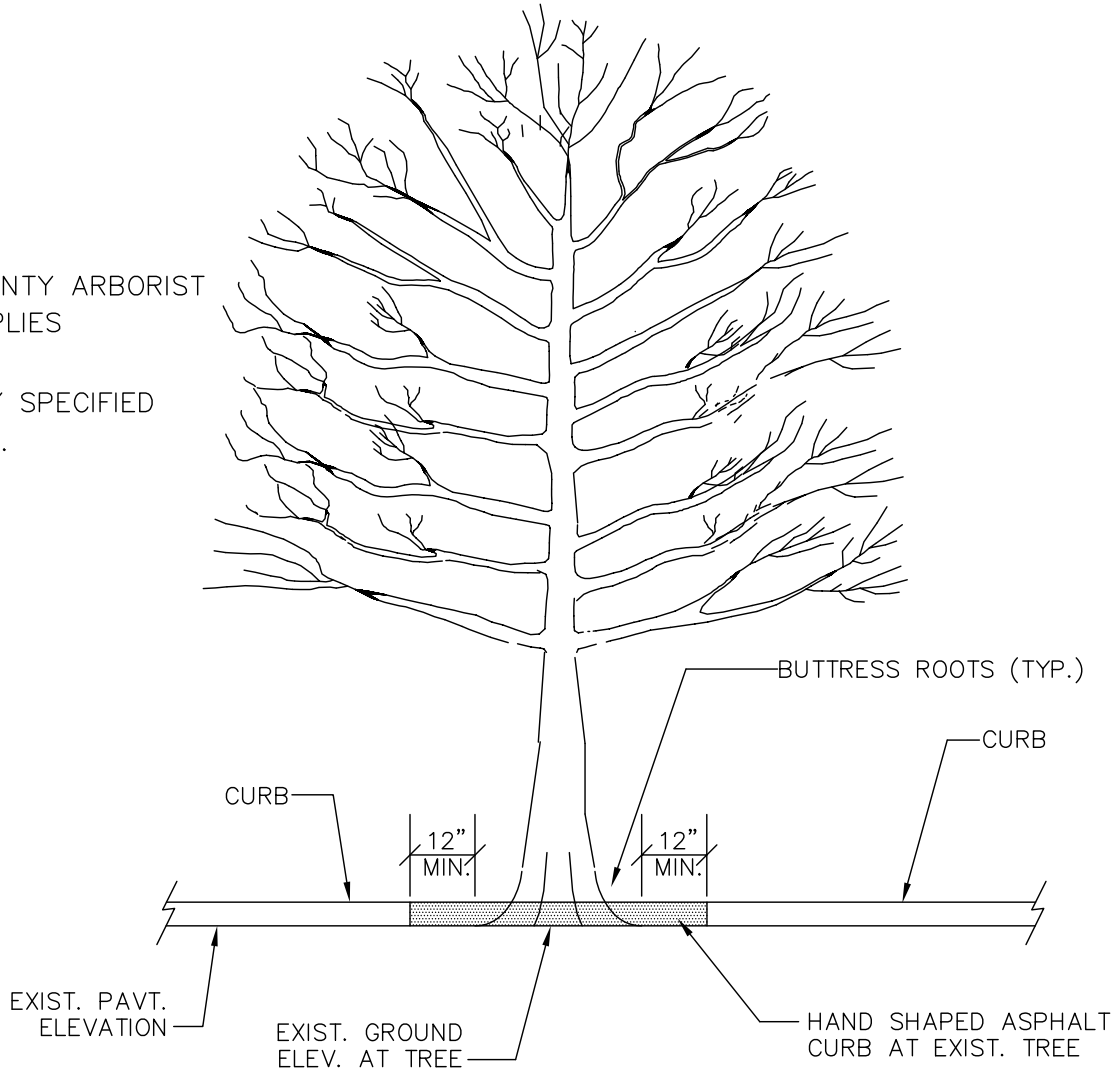
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TEMPORARY TREE PROTECTION DETAIL

STD. NO.	REV.
617.1	

NOTES:

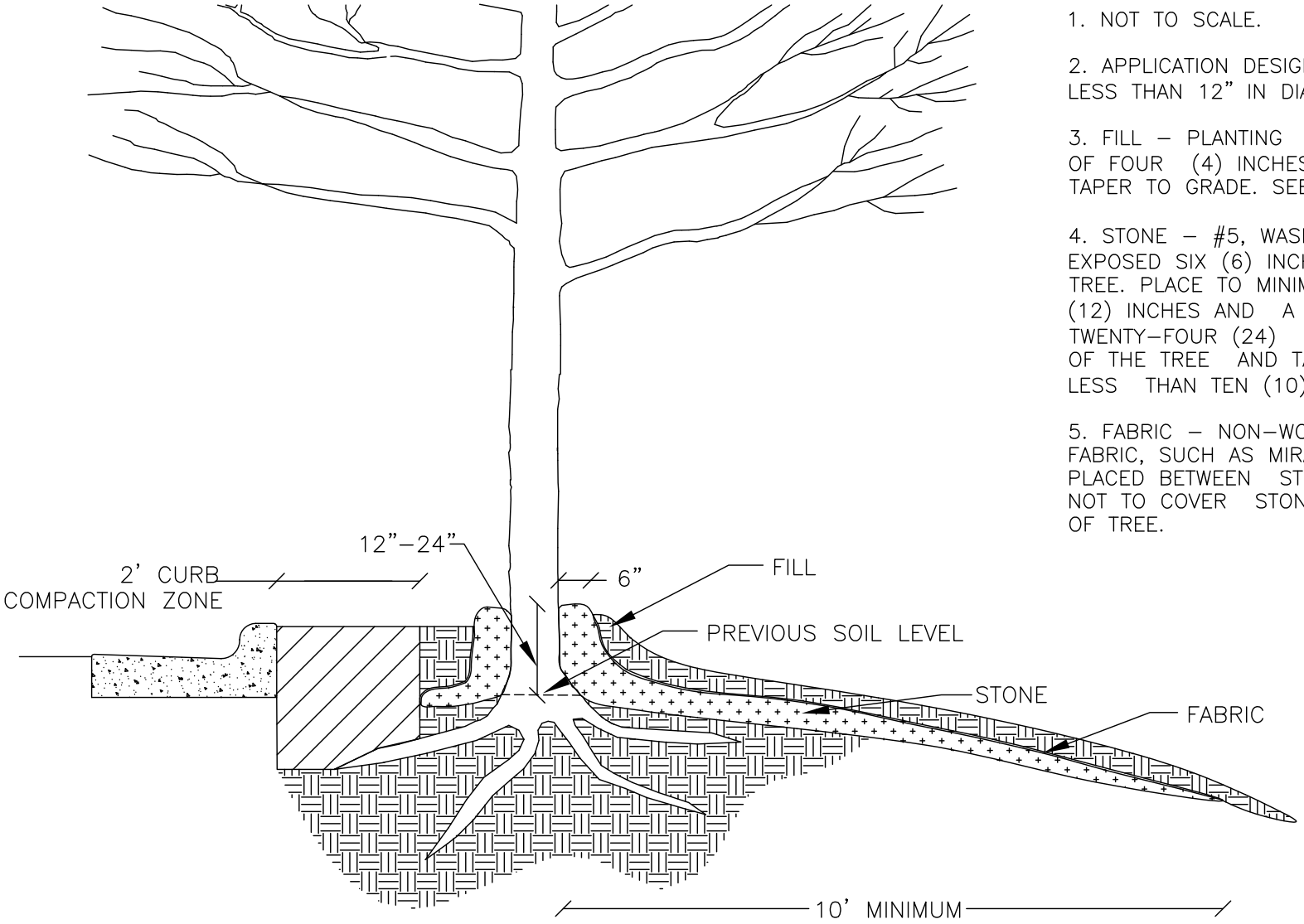
1. CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR EXISTING TREES.
2. WHERE EXISTING TREES ARE WITHIN 4' OF THE PROPOSED BACK OF CURB, THE PROPOSED CURB SHALL END A MINIMUM OF 12" FROM THE TREE'S BUTTRESS ROOTS.
3. CONTRACTOR SHALL COORDINATE WITH THE COUNTY ARBORIST TO IDENTIFY TREES FOR WHICH THIS DETAIL APPLIES PRIOR TO CONSTRUCTION NEAR THE TREE(S).
4. NO TREES SHALL BE REMOVED UNLESS CLEARLY SPECIFIED ON THE PLANS OR IDENTIFIED BY THE ENGINEER.
5. AVOID FILL PLACEMENT NEAR TREE.



NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ASPHALT CURB PLACEMENT AT EXISTING TREES

STD. NO.	REV.
618.1	



NOTES:

1. NOT TO SCALE.

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

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

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

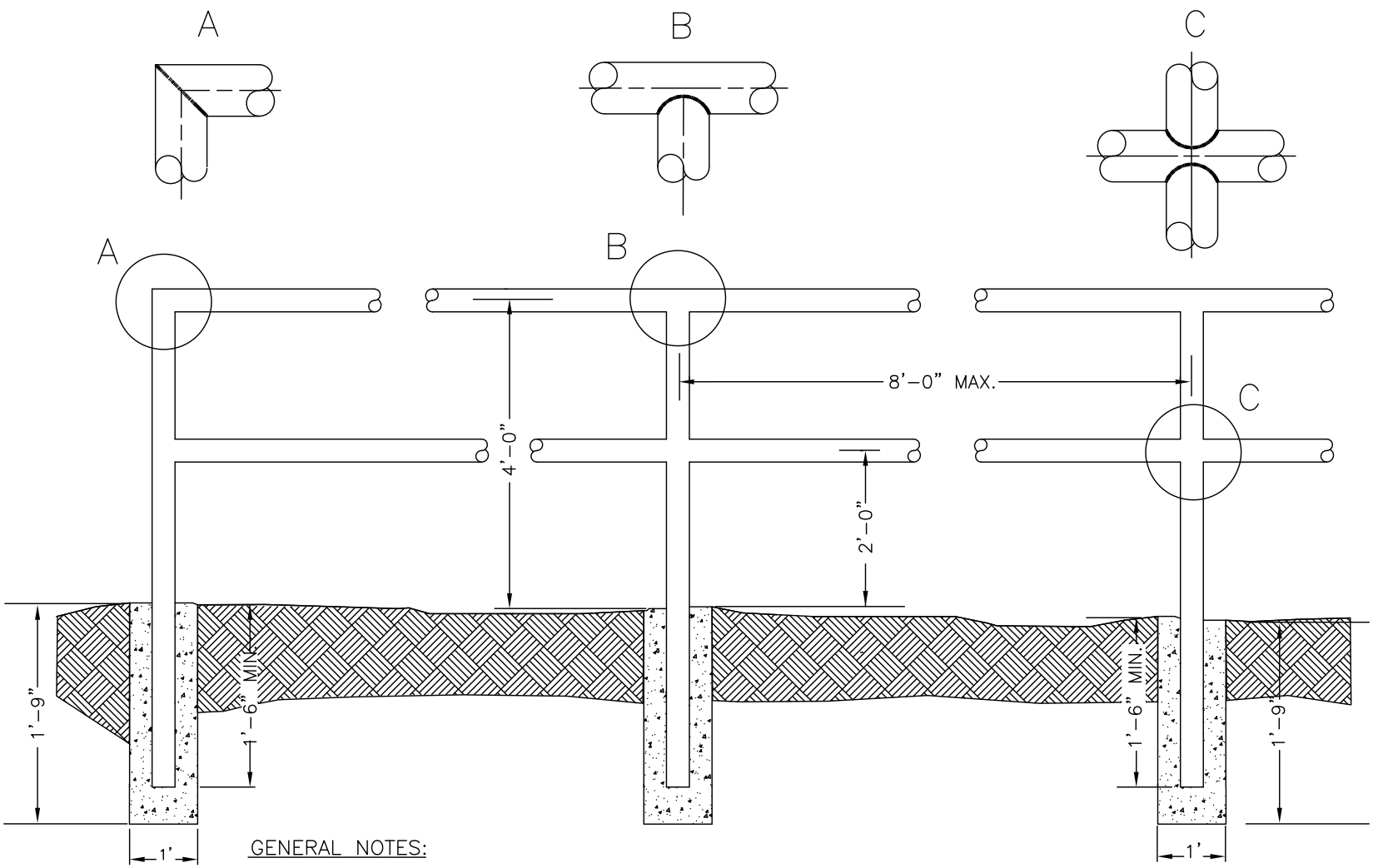
5. FABRIC – NON–WOVEN GEOTEXTILE FABRIC, SUCH AS MIRAFI OR EQUIVALENT, PLACED BETWEEN STONE AND FILL. IT IS NOT TO COVER STONE EXPOSED AT TRUNK OF TREE.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

ROCK CHIMNEY

STD. NO.	REV.
619.1	



GENERAL NOTES:

1. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
2. TYPE OF PIPE TO BE USED IS 1-5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE OR GALVANIZED.
3. ALL JOINTS TO HAVE A 1/2" FILLET WELD AT ALL JOINTS.
4. AFTER INSTALLATION PAINT ASSMBLY WITH BLACK ALL WEATHER ENAMEL.
5. SEE DETAIL 701.1 FOR WARRANTS

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

SAFETY RAIL

STD. NO.	REV.
700.1	

WARRANTS

STANDARD SAFETY RAIL (STD. #700.1) SHALL BE INSTALLED UNDER ANY OF THE FOLLOWING CIRCUMSTANCES IN BOTH NEW CONSTRUCTION AND IN RETROFITTING OR RECONSTRUCTION OF EXISTING ROADWAYS OR SITES:

1. WHEN THE CULVERT CROSSING DETAIL APPLIES.
2. IF THERE IS A TWO FOOT OR GREATER DROPOFF WITHIN 2 FEET OF THE EDGE OF THE SIDEWALK (SEE DIAGRAM A).
3. IF THERE IS A 1–FOOT OR LARGER DROPOFF DIRECTLY ADJACENT TO THE SIDEWALK EDGE (SEE DIAGRAM B).
4. AT THE TOP OF ANY DROPOFF WITHIN THE PEDESTRIAN CLEAR ZONE OR WHERE PEDESTRIANS CAN REASONABLY BE EXPECTED IN THE VICINITY.
5. AT THE DIRECTION OF DEVELOPMENT SERVICES STAFF BASED ON FIELD CONDITIONS.

DEFINITIONS

- DROPOFF – A SLOPE OF 3:1 OR STEEPER. EXAMPLES INCLUDE HEADWALLS, RETAINING WALLS, AND CULVERTS.
- PEDESTRIAN CLEAR ZONE – 10 FEET OF ANY COMBINATION OF SIDEWALK, SLOPE, AND SHOULDER SLOPED AT 6:1 OR FLATTER. SIDEWALK DOES NOT NEED TO BE PRESENT.
- SIDEWALK – FOR PURPOSES OF THIS STANDARD, THE TERM "SIDEWALK" IS USED GENERICALLY AND SHALL MEAN ANY PATH OR SURFACE TO BE USED FOR BICYCLE AND/OR PEDESTRIAN TRANSPORTATION. EXAMPLES INCLUDE, BUT ARE NOT LIMITED TO, SIDEWALKS, BIKE PATHS, SHARED–USE PATHS, PEDESTRIAN PATHS, AND GREENWAYS.

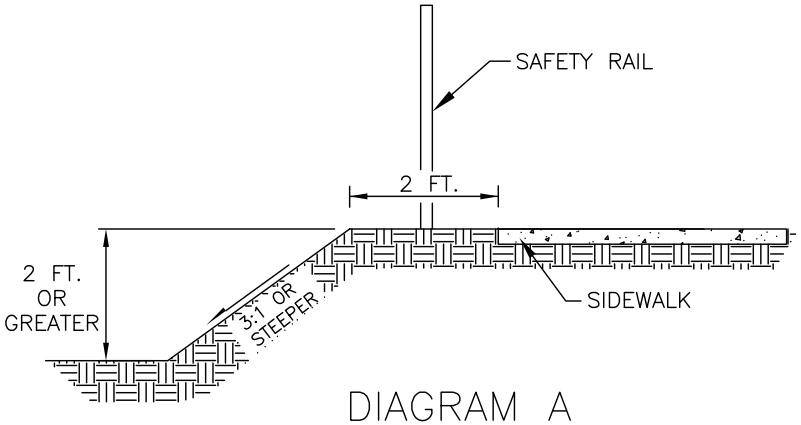


DIAGRAM A

SLOPED DROPOFF AT BACK OF SIDEWALK

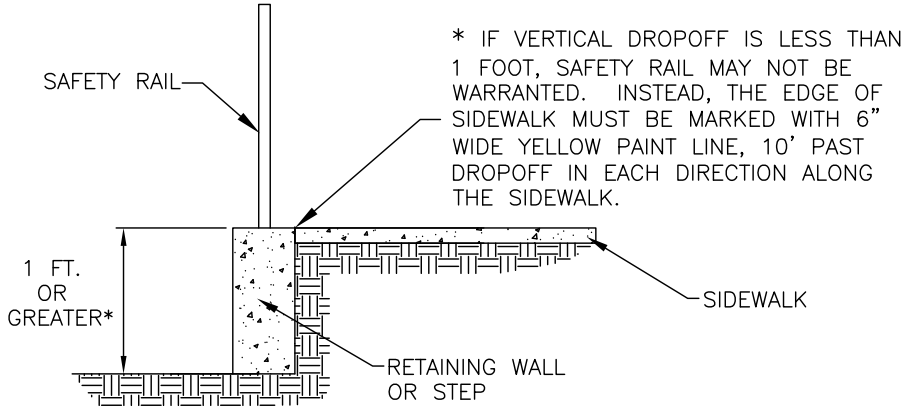


DIAGRAM B

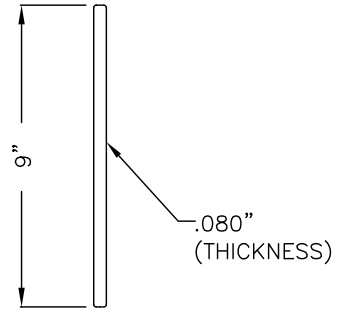
VERTICAL DROPOFF AT BACK OF SIDEWALK

NOT TO SCALE

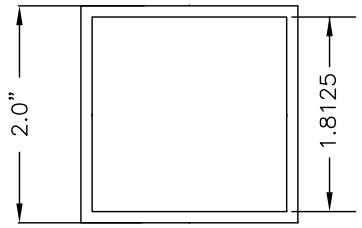
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SAFETY RAIL WARRANTS

STD. NO.	REV.
701.1	

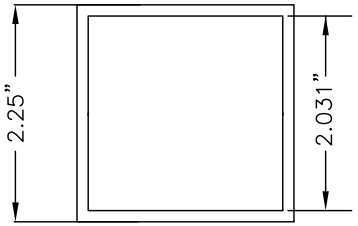
SIGN



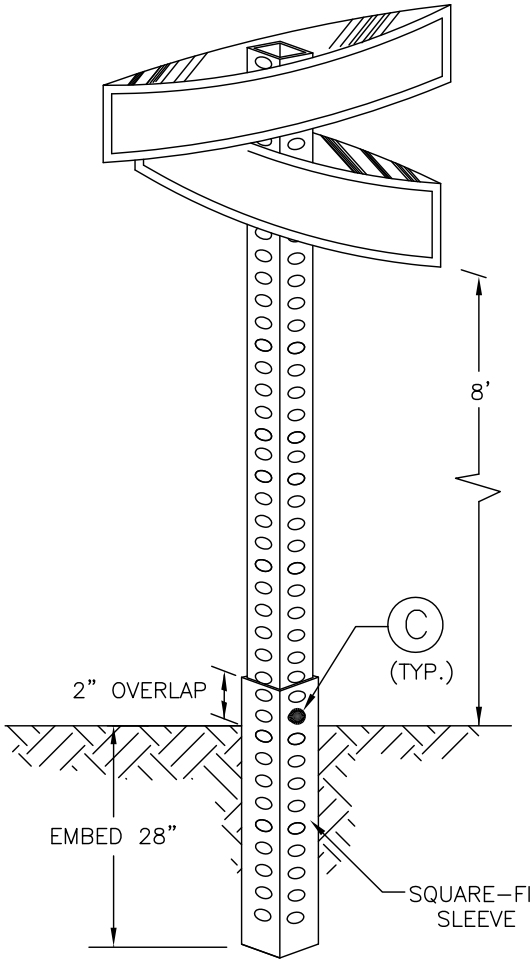
POST
(14 GAUGE)



SQUARE–FIT SLEEVE
(12 GAUGE)



STREET NAME SIGN
POST INSTALLATION

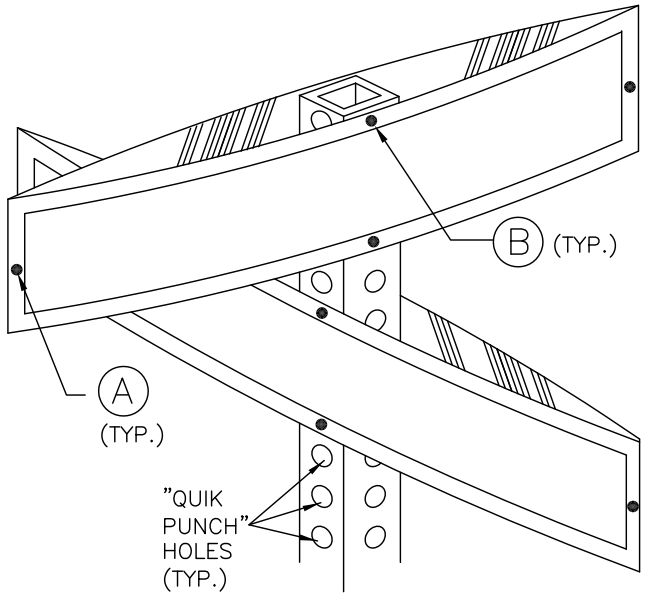


KEY TO FASTENERS:

(A) #10–24 x $\frac{3}{4}$" HEX HEAD MACHINE, ZINC– DEAD END
#10–24 FLANGE NUT, ZINC– DEAD END

(B) $\frac{5}{16}$" #16 X 3" CARRIAGE BOLT, ZINC
$\frac{5}{16}$" #16 HEX NUT, STEEL

(C) $\frac{5}{16}$" #16 X 2–$\frac{3}{4}$" CORNER BOLT (BREAKAWAY), ZINC
$\frac{5}{16}$" #16 HEX NUT, STEEL



NOTES:

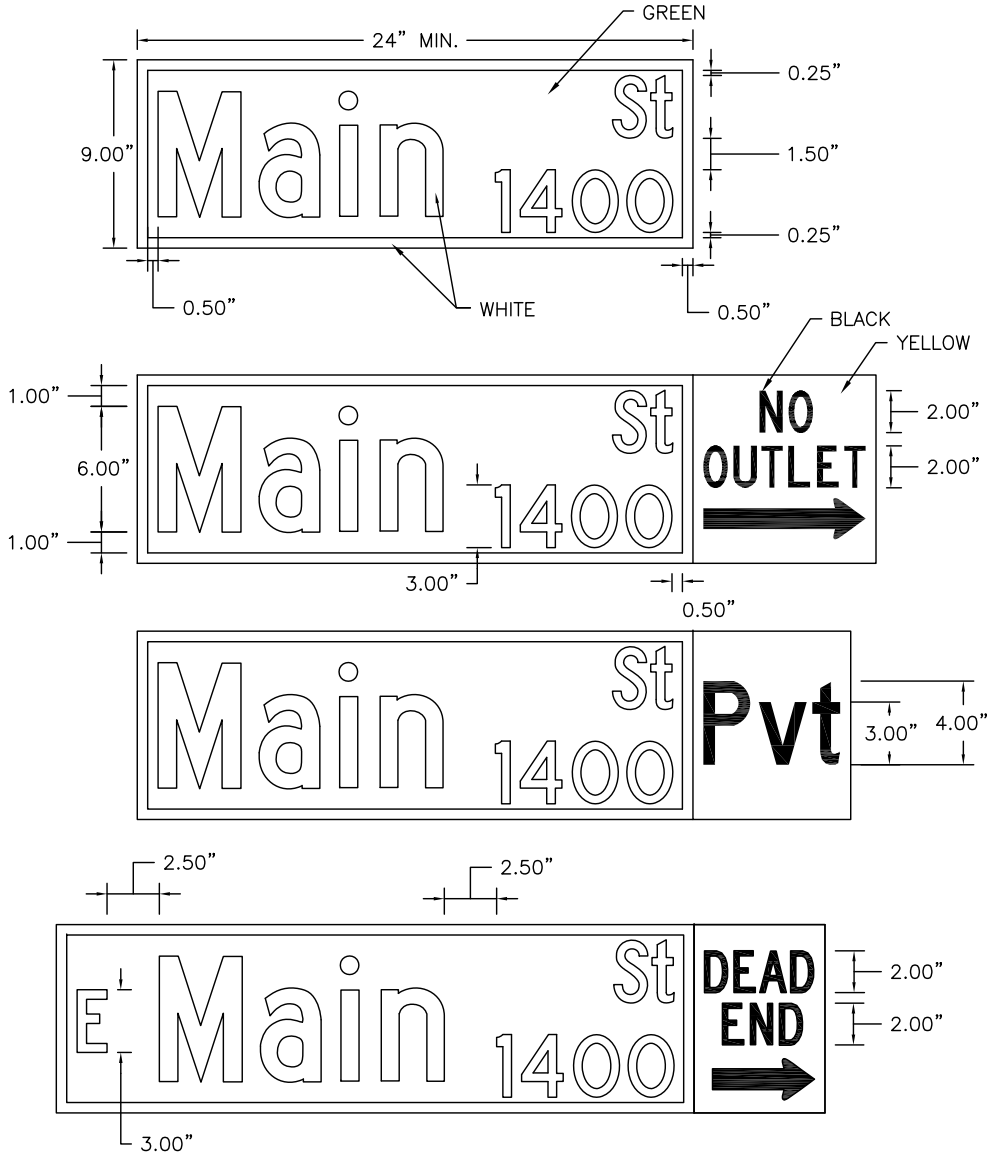
1. POST SHALL BE 14–GAUGE GALVANIZED STEEL, QUIK–PUNCH, $\frac{7}{16}$" HOLES, 1" ON CENTER, ALIGNED ON ALL SIDES, AND 2" SQUARE, 10 FEET IN LENGTH.
2. THE SLEEVE SHALL BE 12–GAUGE GALVANIZED STEEL, $\frac{7}{16}$" HOLES, 1" ON CENTER, ALIGNED ON ALL SIDES, AND 2.25" SQUARE, 30" IN LENGTH.
3. ALL STREET NAME SIGNS ARE SUBJECT TO THE APPROVAL OF THE TOWN MANAGER AND TOWN ENGINEER.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

NON THOROUGHFARE STREET NAME SIGN

STD. NO.	REV.
702.1	



NOT TO SCALE

NOTES:

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

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

3. THE STREET NAME SHALL BE COMPOSED OF INITIAL UPPER CASE LETTERS 6" IN HEIGHT AND CORRESPONDING LOWER CASE LETTERS 4.5" IN HEIGHT, IN FHWA "HIGHWAY B" FONT. THE STREET NAME SHALL BE LEFT-JUSTIFIED AND PLACED 0.5" FROM THE SIGN BORDER. ANY STREET NAME WITH 3 OR FEWER LETTERS SHALL BE CENTERED IN THE SIGN TEXT AREA.

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

4. SUPPLEMENTAL SNM WORDING ON YELLOW HIP RETRO-REFLECTIVE SHEETING WITH BLACK VINYL LETTERS SHALL BE PLACED ADJACENT TO THE GREEN OVERLAY FILM/BORDER TO INDICATE STREETS THAT DEAD END, HAVE NO OUTLET, ETC. OR ARE PRIVATE STREETS (PVT). THE YELLOW HIP RETRO-REFLECTIVE SHEETING MUST BE PLACED ON THE SNM TO MAINTAIN AN EXPOSED 0.5" BORDER OF THE UNDERLAY WHITE HIP RETRO-REFLECTIVE SHEETING.

   - NO OUTLET WITH ARROW (RIGHT OR LEFT) – PLACED ON SNM AT ENTRANCE TO A STREET OR STREET NETWORK FROM WHICH THERE IS NO OTHER EXIT. USE UPPER CASE LETTERS 2" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - PVT – PLACED ON SNM AT ENTRANCE TO PRIVATE STREET, USE UPPER CASE LETTER 4" IN HEIGHT AND CORRESPONDING LOWER CASE LETTERS 3" IN HEIGHT, IN FHWA "HIGHWAY C" FONT.
   - DEAD END WITH ARROW (RIGHT OR LEFT) – PLACED ON SNM AT ENTRANCE TO A SINGLE STREET THAT TERMINATES IN A DEAD END OR CUL-DE-SAC. USE UPPER CASE LETTERS 2" IN HEIGHT, IN FHWA "HIGHWAY C" FONT. IF STUB STREET IS LESS THAN OR EQUAL TO 200 FEET, THEN DEAD END IS NOT NECESSARY.

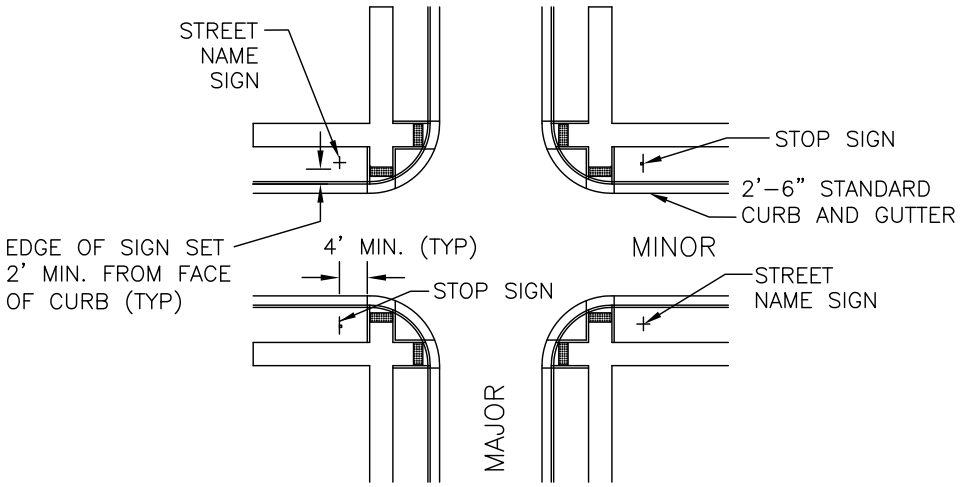
5. ALL SNMs ARE SUBJECT TO THE APPROVAL OF THE TOWN ENGINEER.

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

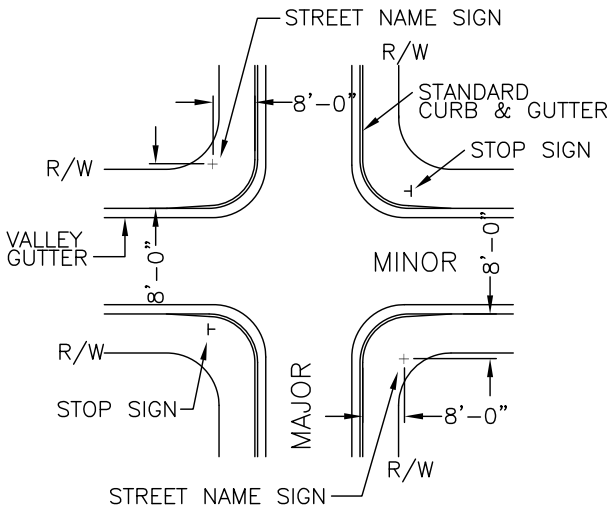
THOROUGHFARE STREET NAME SIGN

STD. NO.	REV.
703.1	

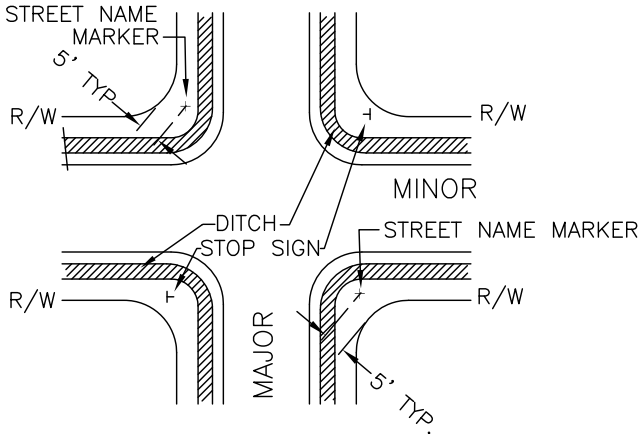
INTERSECTION WITH
SIDEWALK, CURB, AND GUTTER



INTERSECTION WITH CURB AND GUTTER



INTERSECTION WITH
DITCHES, AND NO CURB AND GUTTER



NOTES

1. TWO STREET NAME MARKERS ARE REQUIRED IF THE MAJOR STREET HAS 3 OR MORE LANES.
2. ANY VARIANCE FROM THIS STANDARD MUST BE APPROVED BY THE TOWN ENGINEER.
3. ENSURE STOP SIGN SIZE AND INSTALLATION PER MUTCD STANDARDS.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

STREET SIGN INSTALLATION LOCATIONS

STD. NO.	REV.
704.1	

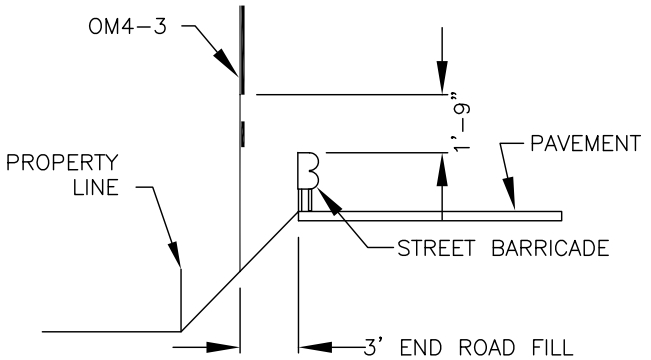
NOTES:

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

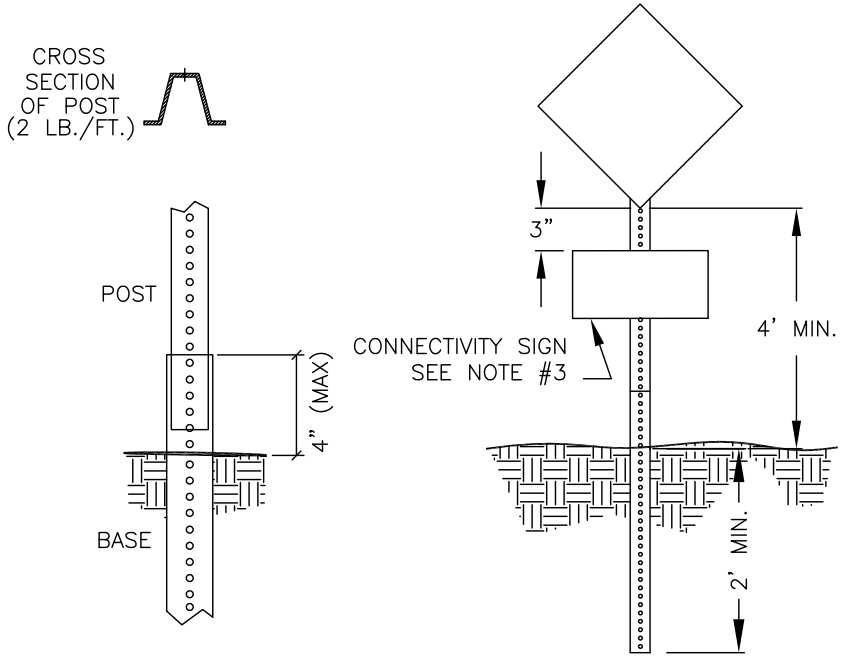
2. SIGNS ARE TO BE PLACED BEHIND THE BARRICADE (SEE DETAILS 706.1), EVENLY SPACED WITH ONE SIGN PLACED AT THE CENTERLINE LOCATION AND ADDITIONAL SIGNS AT 6' O.C. (MINIMUM OF 3 SIGNS, MAXIMUM OF 5 SIGNS).

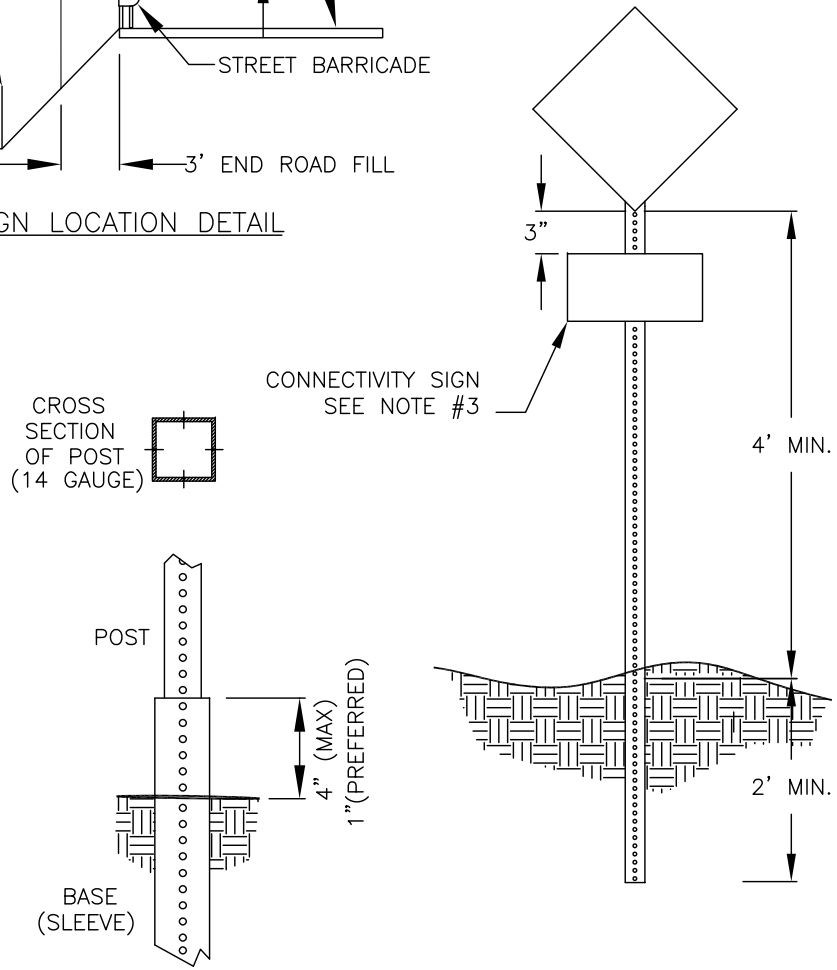
3. WHEN BARRICADE IS USED ON A STREET STUB, THE SIGN AT THE CENTERLINE SHALL BE SUPPLEMENTED WITH A STREET CONNECTIVITY SIGN. SEE DETAIL 708.1

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



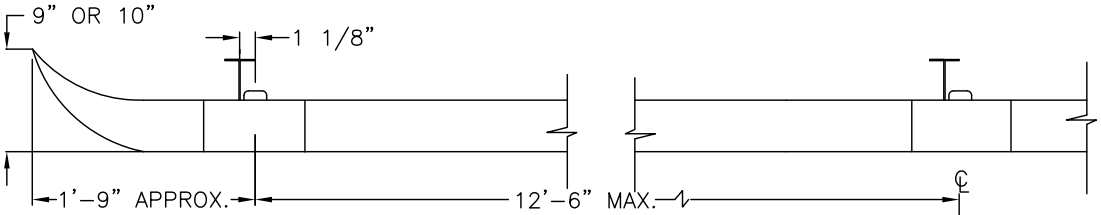
SIGN LOCATION DETAIL



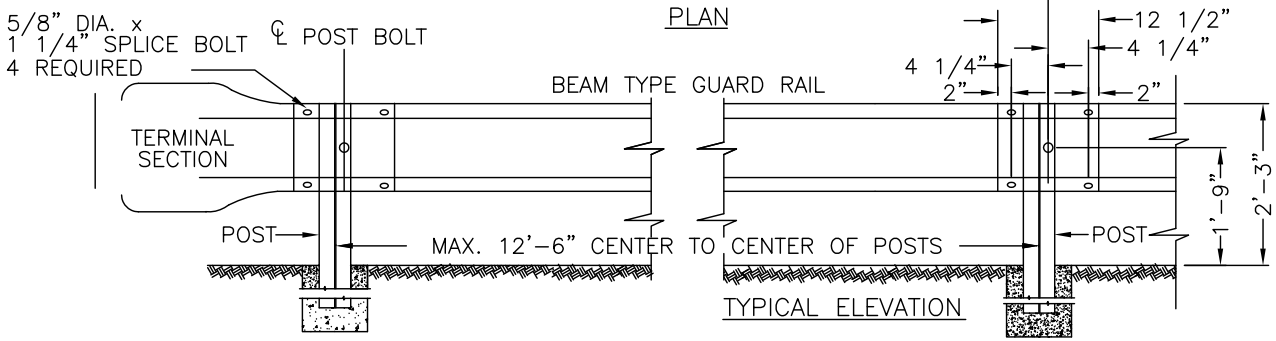


NOT TO SCALE

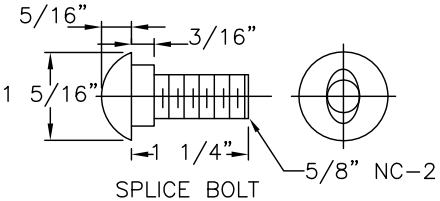
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	END OF ROADWAY MARKER	STD. NO. 705.1	REV.



PLAN

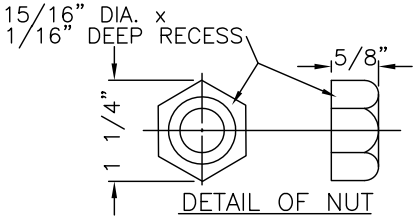


TYPICAL ELEVATION

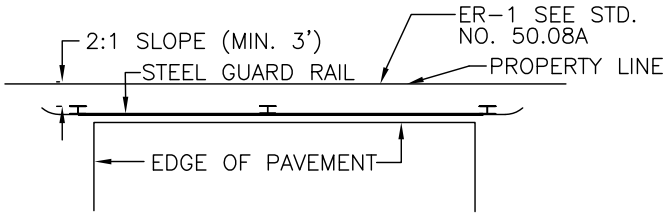


SPLICE BOLT
2" FOR POST BOLT

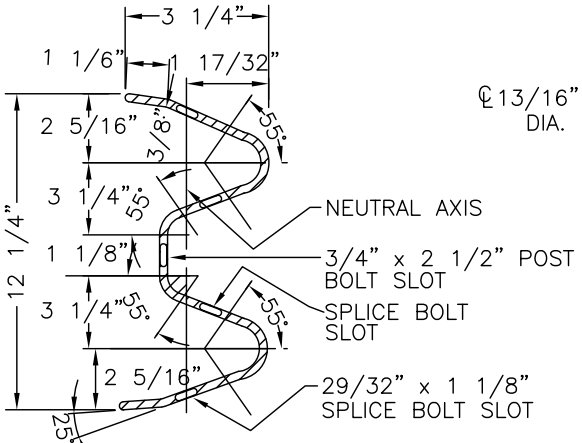
DETAIL OF BOLT



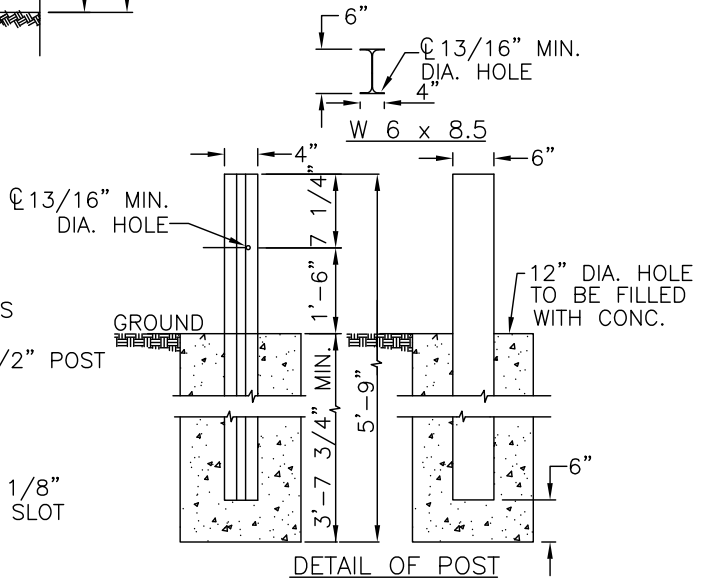
DETAIL OF NUT



DEAD-END STREET BARRICADE



SECTION THRU RAIL ELEMENT



DETAIL OF POST

APPROVED DATE

NOTE

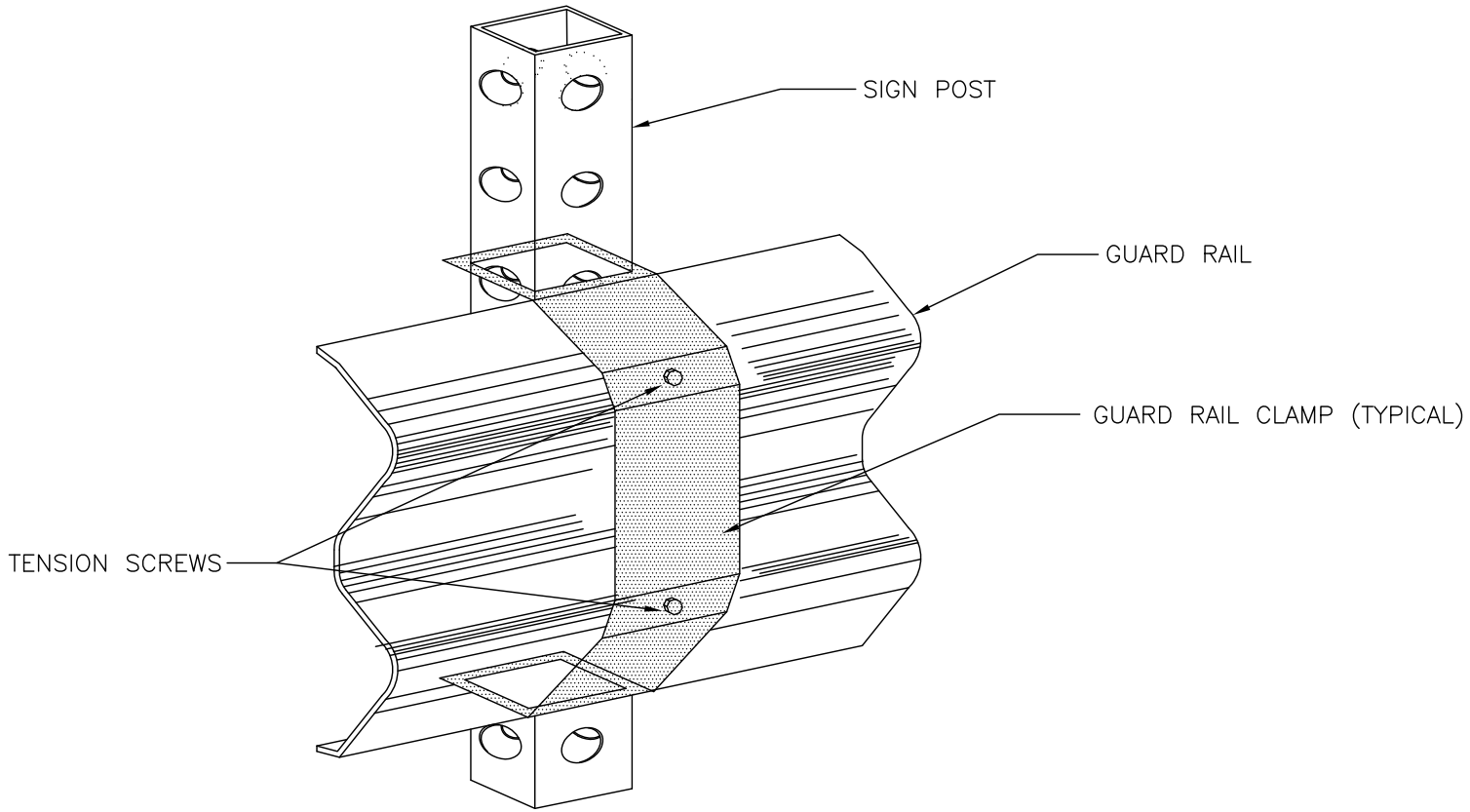
THIS DETAIL IS NOT A GUARDRAIL DETAIL. FOR ROADSIDE GUARDRAIL, SEE NCDOT STANDARD DRAWINGS 862.01-862.03

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

DEAD END STREET BARRICADE

STD. NO.	REV.
706.1	



NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

END OF ROADWAY MARKER
GUARD RAIL CLAMP INSTALLATION

STD. NO.	REV.
707.1	

NOTES:

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

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	STREET CONNECTIVITY SIGN FOR END–OF–ROAD BARRICADE

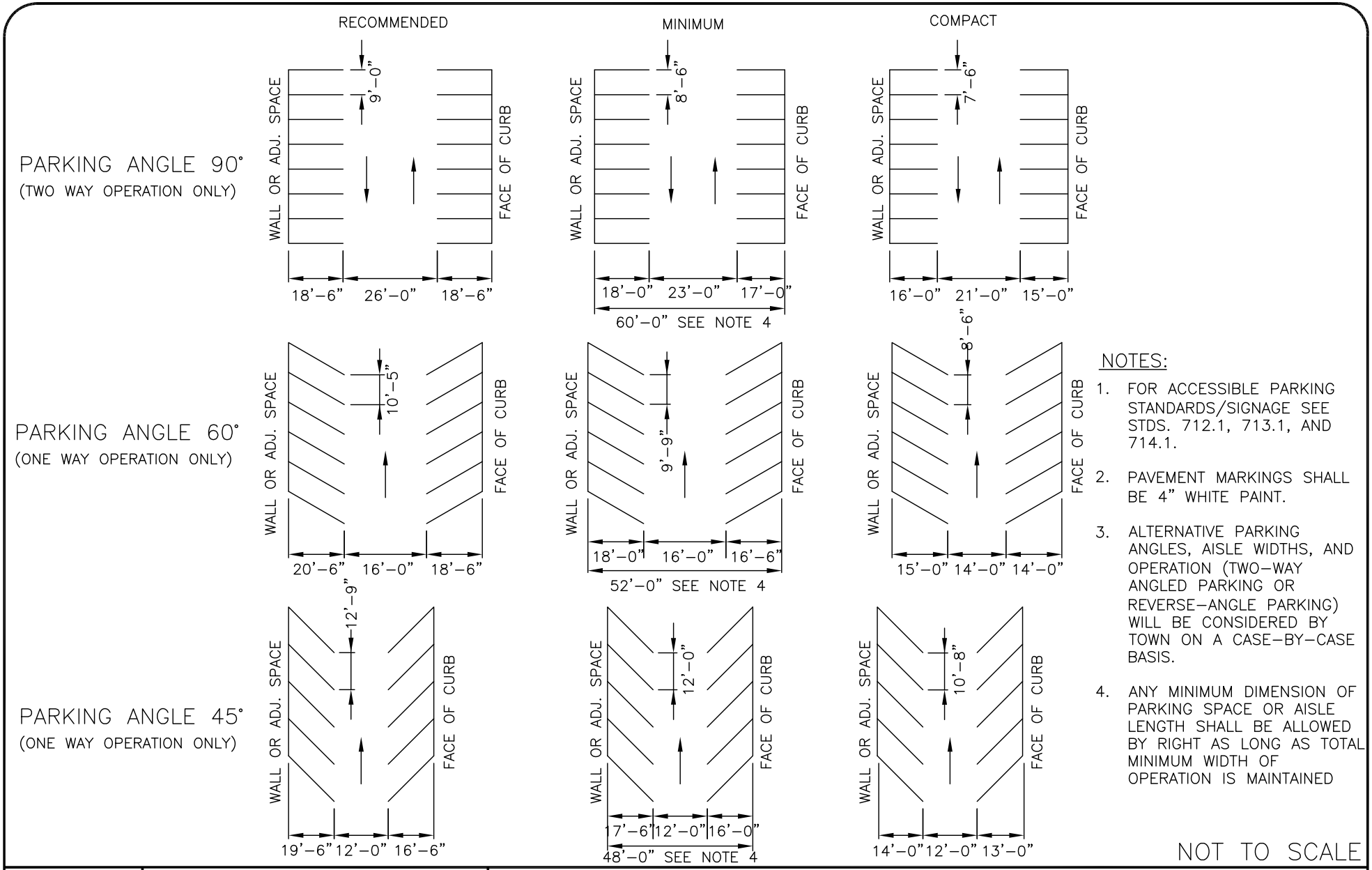
STD. NO.	REV.
708.1	

GENERAL NOTES:

1. STEEL BEAM TYPE GUARD RAILS SHALL BE INSTALLED AT THE END OF ALL DEAD–END STREETS, EXCEPT CUL–DE–SAC STREETS WHICH HAVE BEEN IMPROVED WITH A PERMANENT TURN–AROUND.
2. FOR STREETS 26' IN WIDTH THE GUARD RAIL SHALL CONSIST OF TWO(2) 12'–6" SECTIONS OR ONE(1) 25' SECTION, THREE (3) STEEL POSTS, AND TWO (2) TERMINAL SECTIONS. FOR STREETS GREATER THAN 25' IN WIDTH THE GUARD RAIL SHALL SPAN THE ENTIRE WIDTH OF THE STREET.
3. GUARD RAIL SHALL CONSIST OF RAIL ELEMENTS FABRICATED TO DEVELOP CONTINUOUS BEAM STRENGTH AND INSTALLED AS SHOWN.
4. MINIMUM THICKNESS OF GUARD RAIL SHALL BE 12 GAGE U.S. STANDARD.
   THE RAIL ELEMENT INCLUDING SPLICES, SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 80,000 LBS.
   GUARD RAIL PARTS FURNISHED SHALL BE INTERCHANGEABLE WITH SIMILAR PARTS REGARDLESS OF THE SOURCE OF MANUFACTURER.
   THE HOLES FOR CONNECTING BOLTS SHALL BE PUNCHED OR DRILLED, BURNING WILL NOT BE PERMITTED.
5. THE GUARD, BOLTS, NUTS, STEEL POSTS. AND ALL OTHER METAL PARTS SHALL BE GALVANIZED TO CONFORM TO THE REQUIREMENTS FOR THE COATING CLASS, (2.50 OUNCES PER SQUARE FOOT) OF THE CURRENT SPECIFICATIONS FOR ZINC–COATED (GALVANIZED) IRON, AND STEEL SHEETS, COILS, AND CUT LENGTHS, IN ACCORDANCE WITH ASTM 123A.
6. IF THE AVERAGE SPELTER COATING AS DETERMINED FROM THE REQUIRED SAMPLES IS LESS THAN TWO (2) OUNCES OF SPELTER PER SQUARE FOOT, OR IF ANY ONE SPECIMEN HAS LESS THAN 1.8 ONCES OF SPELTER PER SQUARE FOOT OF DOUBLE EXPOSED SURFACE, THE LOT SAMPLED SHALL BE REJECTED, THE FINISHED SHEETS SHALL BE OF FIRST CLASS COMMERCIAL QUALITY, FREE FROM INJURIOUS DEFECTS, SUCH AS BLISTERS, FLUX, AND UNCOATED SPOTS.
7. THE GUARD RAIL SHALL BE INSPECTED TO DETERMINE THAT THE MATERIAL, DIMENSIONS, AND WORKMANSHIP ARE IN ACCORDANCE WITH THIS PLAN.
8. WHERE A DEAD–END STREET REQUIRES GUARD RAIL, END OF ROADWAY MARKER SIGNS SHALL ALSO BE REQUIRED. (SEE STD.707.1 & 708.1)

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	END OF ROADWAY STREET BARRICADE GENERAL NOTES	STD. NO. 709.1 / REV.



NOTES:

1. FOR ACCESSIBLE PARKING STANDARDS/SIGNAGE SEE STDS. 712.1, 713.1, AND 714.1.
2. PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT.
3. ALTERNATIVE PARKING ANGLES, AISLE WIDTHS, AND OPERATION (TWO-WAY ANGLED PARKING OR REVERSE-ANGLE PARKING) WILL BE CONSIDERED BY TOWN ON A CASE-BY-CASE BASIS.
4. ANY MINIMUM DIMENSION OF PARKING SPACE OR AISLE LENGTH SHALL BE ALLOWED BY RIGHT AS LONG AS TOTAL MINIMUM WIDTH OF OPERATION IS MAINTAINED

NOT TO SCALE

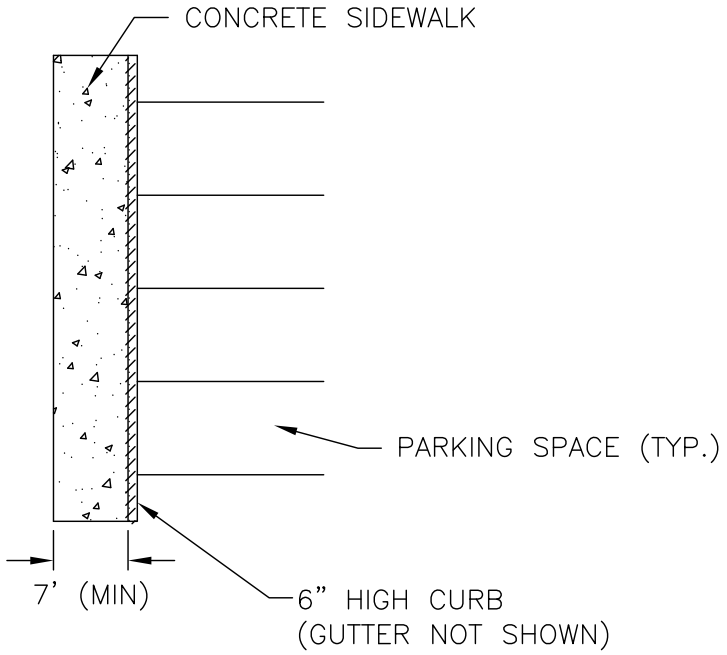
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

PARKING STANDARDS

STD. NO.	REV.
710.1	3/24

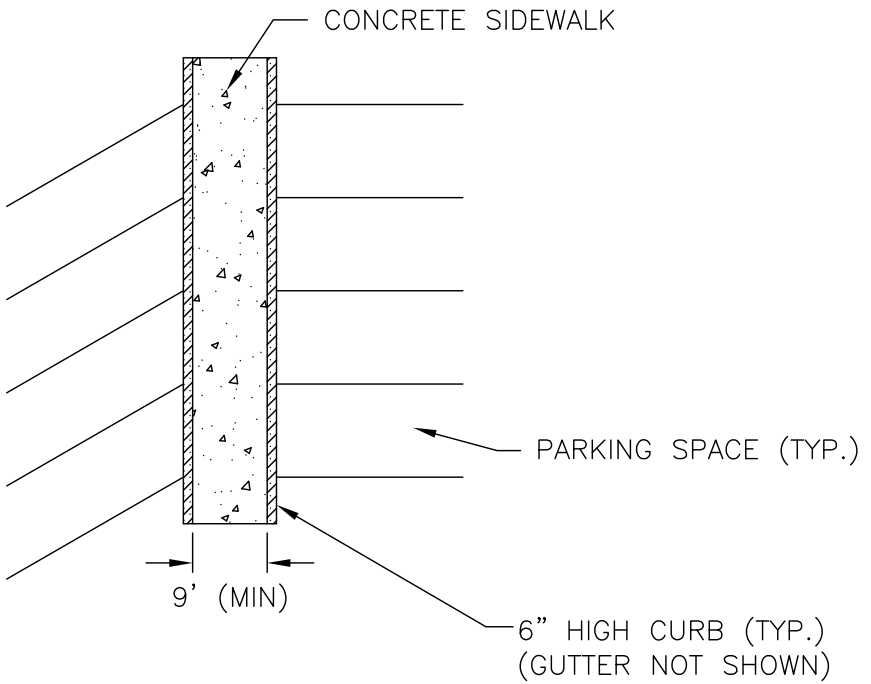
SIDEWALK ADJACENT TO HEAD–IN OR BACK–IN PARKING SHALL BE AT LEAST 7 FEET WIDE.

PARKING ON ONE SIDE OF A SIDEWALK



SIDEWALK BETWEEN TWO ROWS OF HEAD–IN OR BACK–IN PARKING SHALL BE AT LEAST 9 FEET WIDE.

PARKING ON BOTH SIDES OF A SIDEWALK



NOTES:

1. A 2–FOOT–WIDE PLANTING STRIP LOCATED AT THE BACK OF CURB CAN BE USED IN LIEU OF 2 FEET OF SIDEWALK WIDTH.
2. PARKING AT ANY ANGLE OTHER THAN PARALLEL SHALL BE SUBJECT TO THIS STANDARD.
3. IF MONOLITHIC CURB & SIDEWALK IS USED, ADD 6" TO ALL DIMENSIONS (1' IF PARKING ON BOTH SIDES).
4. WHEELSTOPS SHALL ONLY BE USED IN LIEU OF 2 FEET OF SIDEWALK WITH THE APPROVAL OF THE TOWN AND WHEN EXISTING CONDITIONS PREVENT CONSTRUCTION OF A 7–FOOT/9–FOOT SIDEWALK. WHEELSTOPS SHALL BE 6" HIGH, MADE OUT OF 3600–PSI REINFORCED CONCRETE, AND ANCHORED WITH #5 OR GREATER REBAR (2' MINIMUM LENGTH). REBAR HOLES SHALL BE GROUTED UPON INSTALLATION. WHEELSTOPS SHALL BE PLACED AT 2 FEET FROM THE EDGE OF SIDEWALK OR OBSTRUCTION.

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	PARKING STANDARDS (CONTINUED) STD. NO. 711.1 REV.

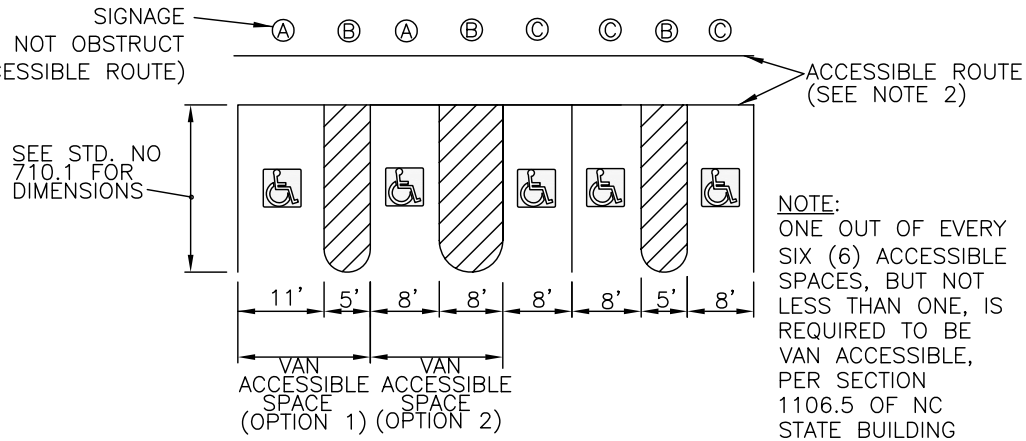
ACCESSIBLE PARKING REQUIREMENTS

TOTAL PARKING SPACES PROVIDED	MINIMUM NUMBER OF ACCESSIBLE SPACES SPACES REQUIRED	MINIMUM NUMBER OF ACCESSIBLE SPACES REQUIRED TO BE VAN ACCESSIBLE
1 TO 25	1	1
26 TO 50	2	1
51 TO 75	3	1
76 TO 100	4	1
101 TO 150	5	1
151 TO 200	6	1
201 TO 300	7	2
301 TO 400	8	2
401 TO 500	9	2
501 TO 1000	2% OF TOTAL	1 IN EVERY 6 ACCESSIBLE SPACES
1001 AND OVER	20 PLUS 1 FOR EACH 100 OVER 1000	1 IN EVERY 6 ACCESSIBLE SPACES
REFERENCE: SECTION 1106 OF NC BUILDING CODE		

NOTES:

1. ALL 12"x18" ACCESSIBLE SIGNS (R7-8 & R7-1) SHALL BE MOUNTED AT 7 FEET FROM GRADE TO BOTTOM EDGE OF SIGN FACE (MUTCD). MOUNTING HEIGHT CAN BE REDUCED TO 5 FEET IF PLACED IN AN AREA BETWEEN SIDEWALK AND BUILDING FACE IN WHICH PEDESTRIANS ARE NOT EXPECTED TO USE.
2. IF ACCESSIBLE ROUTE IS A RAISED SIDEWALK AREA, THEN RAMPS ARE REQUIRED AT LOADING ZONE AREA. MAINTAIN MIN. 4' WIDE CONTINUOUS PASSAGE.
3. VERTICAL CLEARANCE FOR VANS MUST BE GREATER THAN 98-INCHES.
4. THIS DETAIL IS TO PROVIDE GENERAL GUIDANCE FOR PARKING LAYOUT AND DESIGN; REFER TO MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) U.S. DEPARTMENT OF TRANSPORTATION AND NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SUPPLEMENT AND NC BUILDING CODE FOR ADDITIONAL INFORMATION.

PARKING SPACE PAVEMENT MARKINGS



NOTE:
ONE OUT OF EVERY SIX (6) ACCESSIBLE SPACES, BUT NOT LESS THAN ONE, IS REQUIRED TO BE VAN ACCESSIBLE, PER SECTION 1106.5 OF NC STATE BUILDING CODE

Ⓐ

MUTCD R7-8P 12"x6"

MUTCD R7-8 12"x18"

713.1 12"x9"

Ⓑ

MUTCD R7-1 12"x18"

OPTIONAL ACCESIBLE LOADING ZONE SIGN

Ⓒ

MUTCD R7-8 12"x18"

713.1 12"x9"

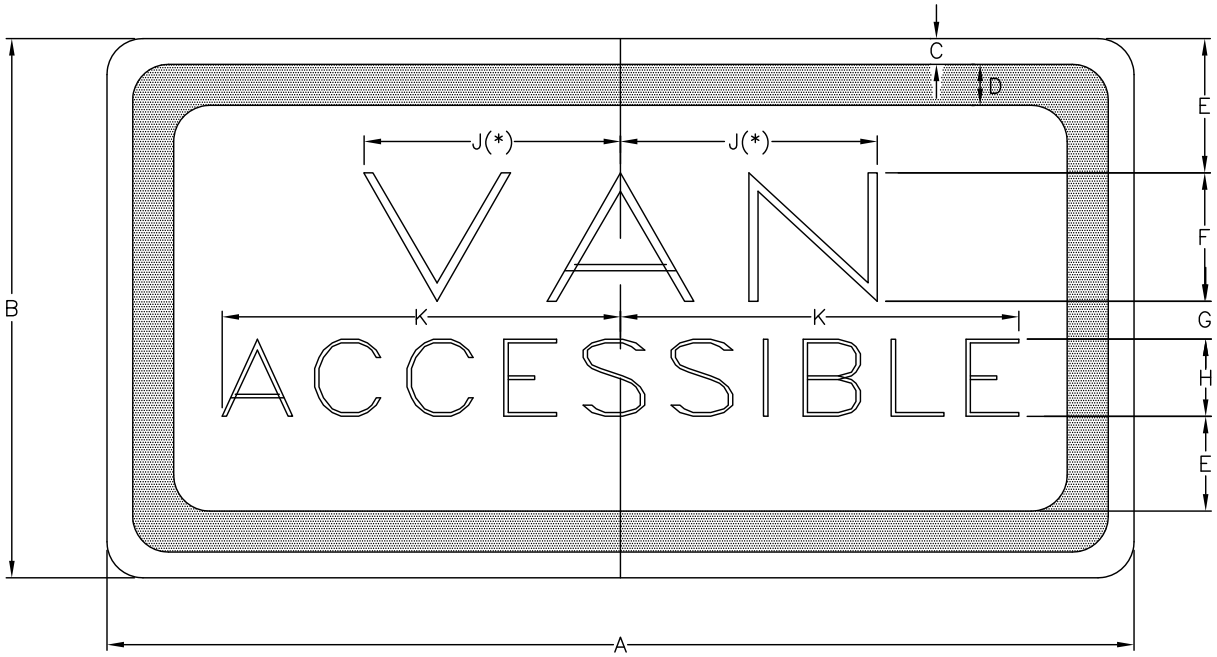
SEE STANDARD NO. 50.10C FOR SUPPLEMETAL SIGN DETAIL

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

ACCESSIBLE PARKING AND SIGNAGE STANDARDS

STD. NO.	REV.
712.1	

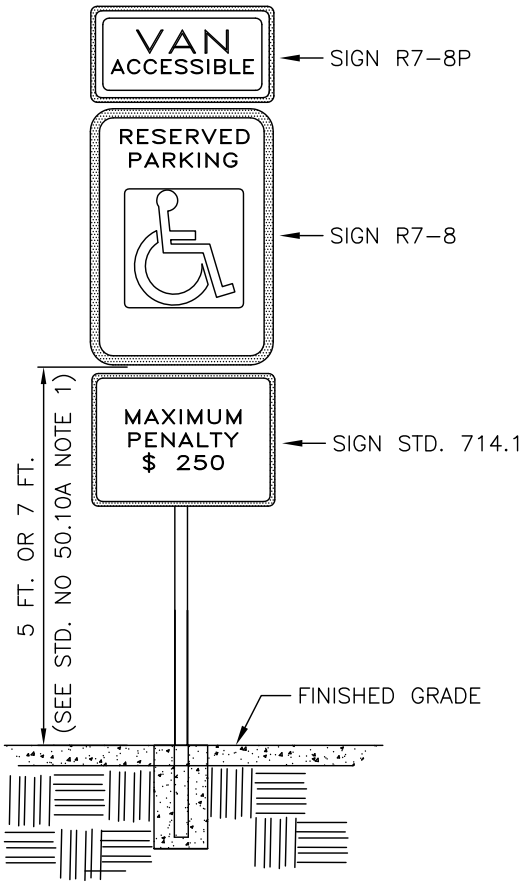


R7–8P

DIMENSIONS (INCHES)										
A	B	C	D	E	F	G	H	J	K	L
12	6	3/8	3/8	1–1/2	1–1/2D	1/2	1D	2–1/2	4	1–1/2

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

LEGEND AND BORDER – GREEN
BACKGROUND – WHITE



NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7–8P)	STD. NO. 713.1 / REV.

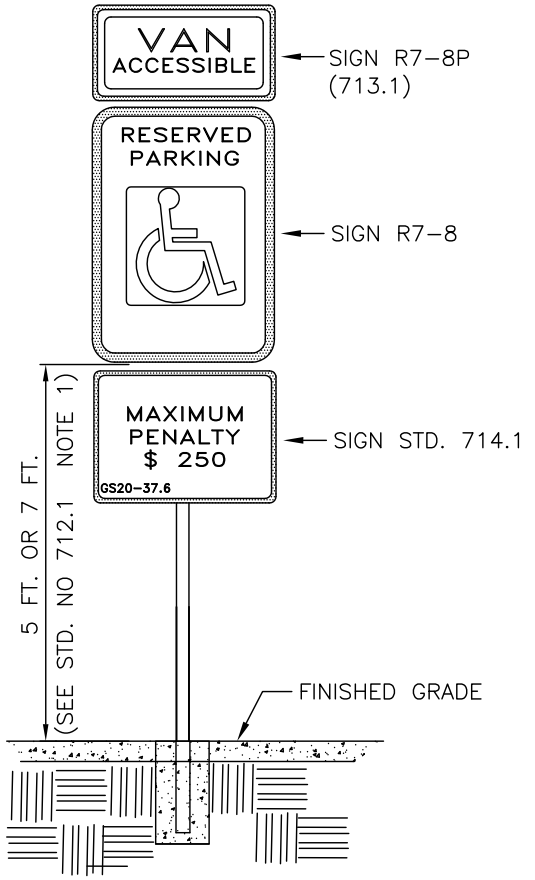
LEGEND AND BORDER – GREEN
BACKGROUND – WHITE

SIGN APPROVED FOR USE UNDER GENERAL STATUTE 20-37.6

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

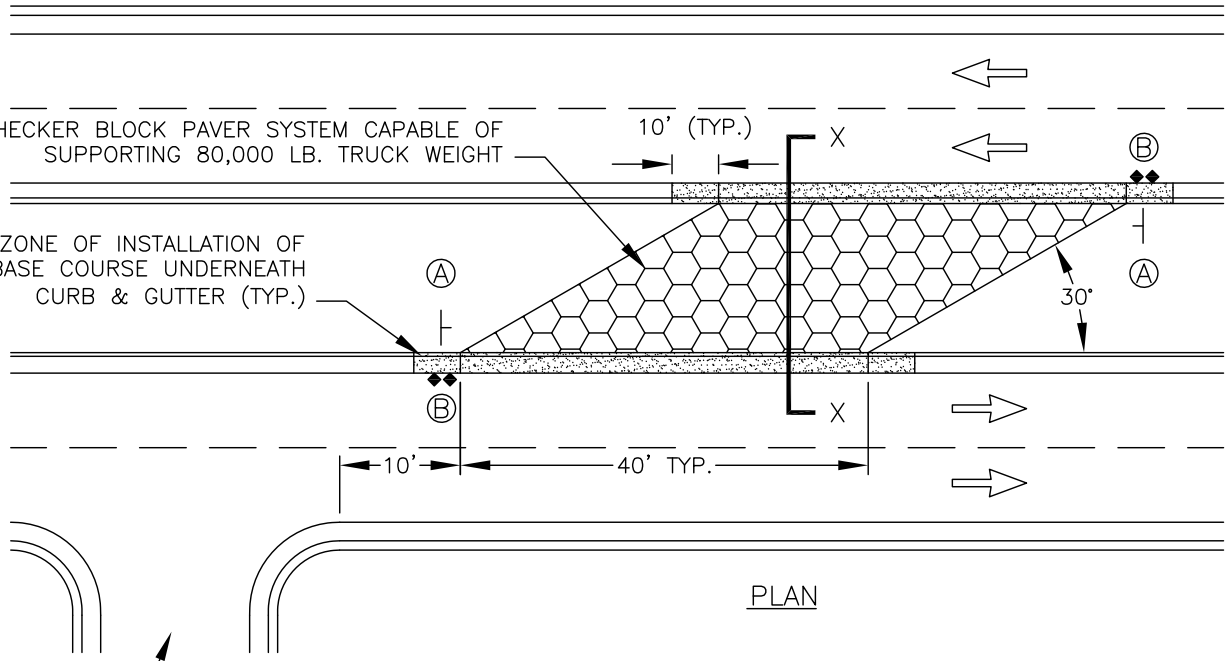
NOTE:

SUPPLEMENTAL VAN ACCESSIBLE SIGN (R7-8P) USED IF THERE IS ONLY ONE REQUIRED ACCESSIBLE PARKING SPACE (MUST BE VAN ACCESSIBLE) AND AT EACH ADDITIONAL REQUIRED VAN ACCESSIBLE SPACE. (SEE STD. NO. 713.1)

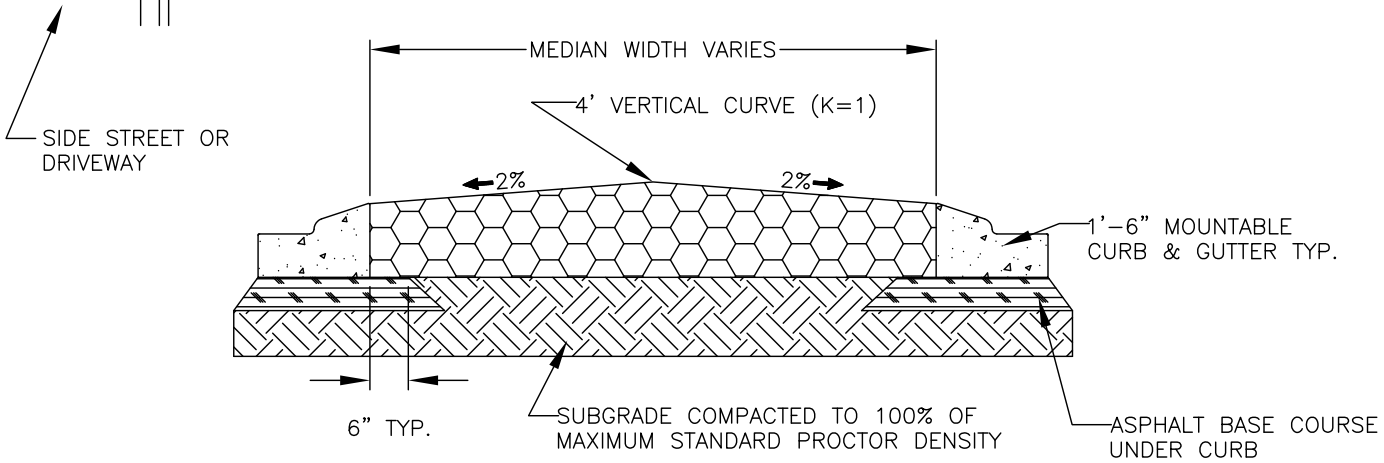


NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	SUPPLEMENTAL ACCESSIBLE PENALTY SIGN	STD. NO. 714.1 REV.



PLAN



CROSS-SECTION X-X

Ⓐ "NO LEFT TURN" (R3-2, 24"x24")

Ⓑ YELLOW/YELLOW RAISED PVMT. MARKER 1' O.C. SEE NCDOT STD. #1250.01.

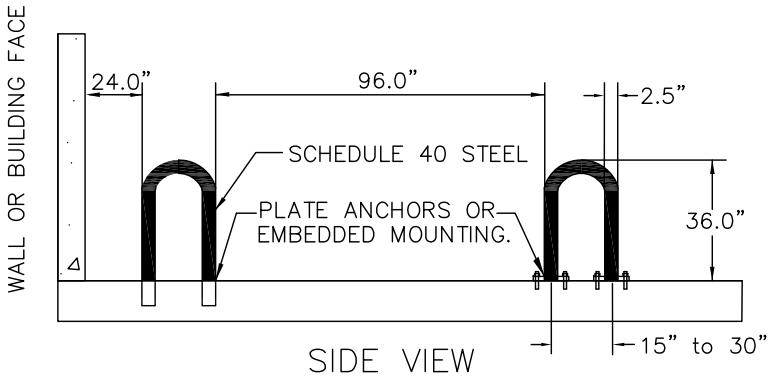
NOTES:

1. CROSSOVER TO BE OFFSET 10' FROM ANY INTERSECTING STREET OR DRIVEWAY OTHER THAN A FIRE DEPARTMENT DRIVEWAY.
2. ASPHALT BASE COURSE UNDERNEATH MOUNTABLE CURB AND GUTTER SHALL EXTEND AT LEAST 10 FEET BEYOND CROSSOVER.
3. ONLY FOR USE AT RIGHT-IN/RIGHT-OUT (RI/RO) ENTRANCES TO RESIDENTIAL SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS WITH PRIOR APPROVAL FROM TOWN ENGINEER.
4. INCLUDE SUBDRAIN AS NECESSARY PER 312.1.

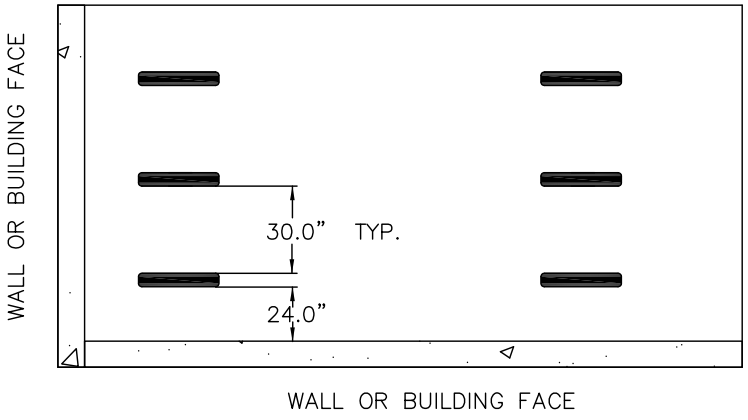
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	EMERGENCY VEHICLE MEDIAN CROSSOVER

STD. NO.	REV.
715.1	



SIDE VIEW



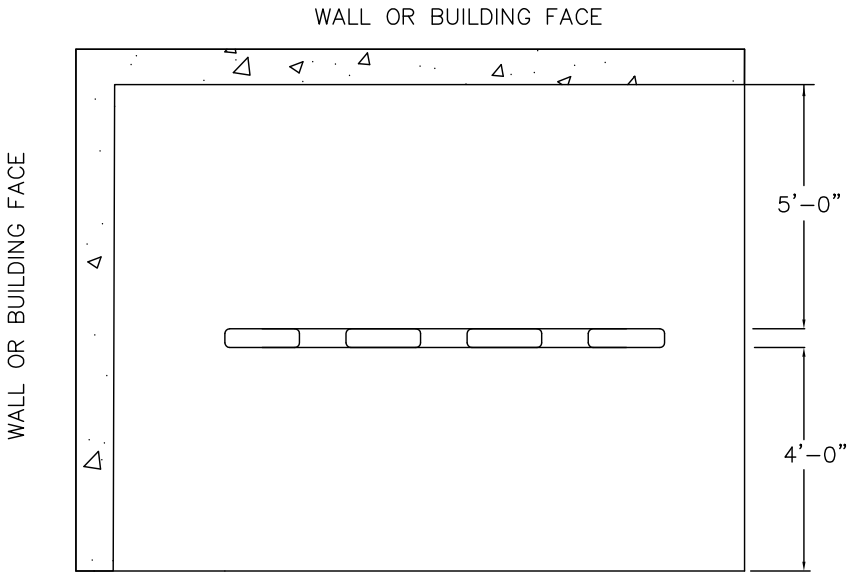
PLAN VIEW

NOTES:

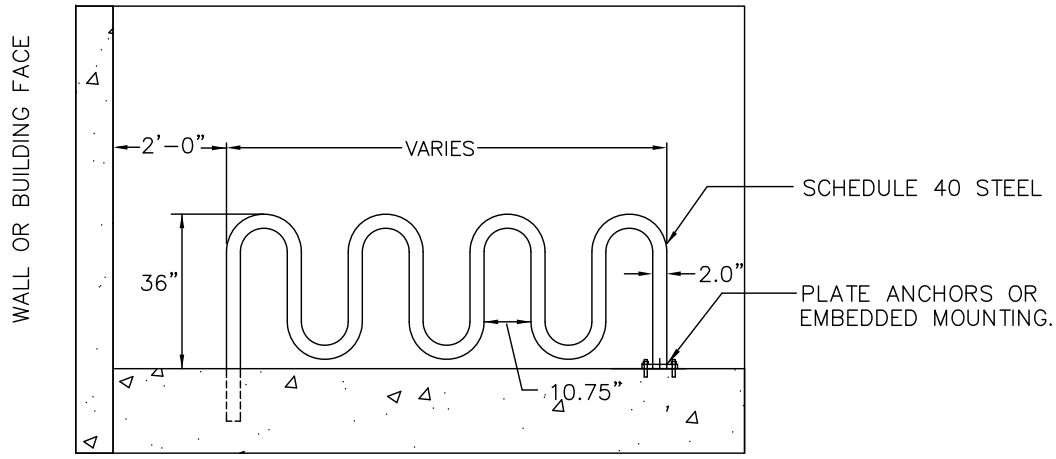
1. BIKE RACKS SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
2. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL BY THE TOWN ENGINEER.
3. ALL DIMENSIONS SHOWN ARE MINIMUM.
4. PLACEMENT SHOULD BE CANE DETECTABLE AND PLACED OUTSIDE PEDESTRIAN ACCESS ROUTE.

NOT TO SCALE

TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	INVERTED "U" RACK FOR BICYCLE PARKING	STD. NO. 716.1	REV.



PLAN VIEW



SIDE VIEW

NOTES:

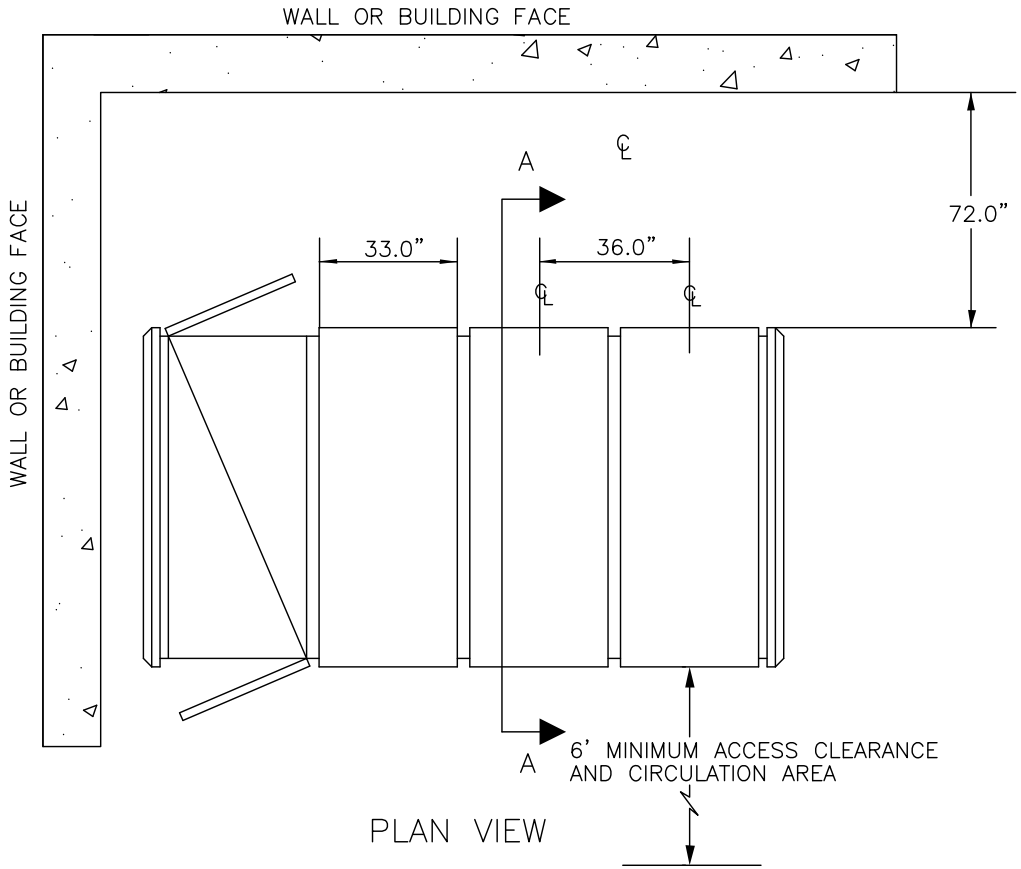
1. BIKE RACKS SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
2. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL BY THE TOWN OF WAXHAW TOWN ENGINEER.
3. ALL DIMENSIONS SHOWN ARE MINIMUM.
4. PLACEMENT SHOULD BE CANE DETECTABLE AND PLACED OUTSIDE PEDESTRIAN ACCESS ROUTE.

NOT TO SCALE

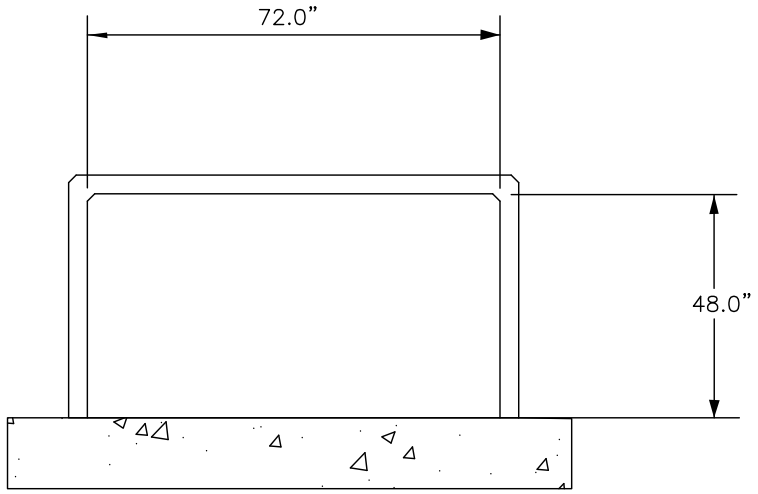
TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	WAVE RACK FOR BICYCLE PARKING	STD. NO. 717.1	REV. 8/19

NOTES:

1. BIKE LOCKERS SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
2. ALTERNATIVE BIKE RACKS OR LOCKERS MAY BE USED BUT ARE SUBJECT TO APPROVAL BY THE TOWN OF WAXHAW TOWN ENGINEER.
3. ALL DIMENSIONS SHOWN ARE MINIMUM.
4. ALLOW FOR POSITIVE DRAINAGE AWAY FROM LOCKERS.



PLAN VIEW



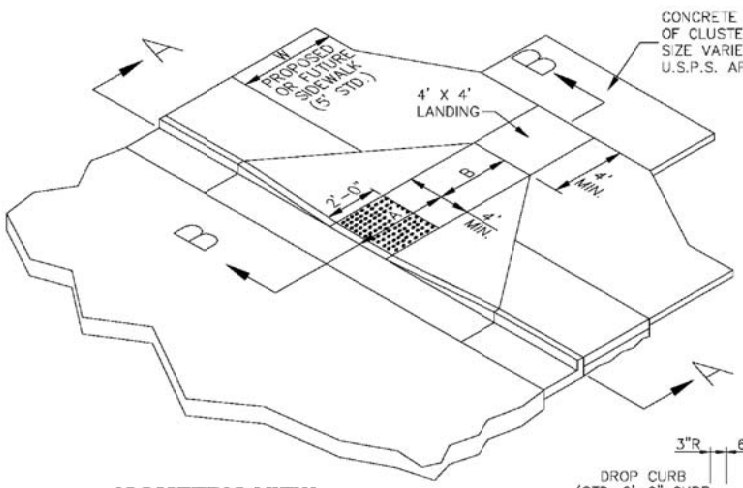
SECTION A–A

NOT TO SCALE

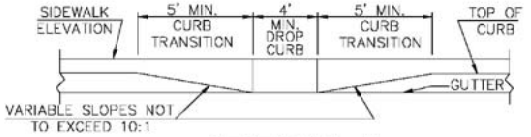
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

BICYCLE LOCKERS

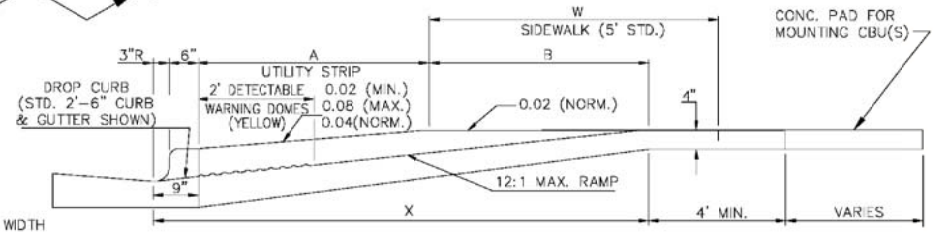
STD. NO.	REV.
718.1	8/19



ISOMETRIC VIEW



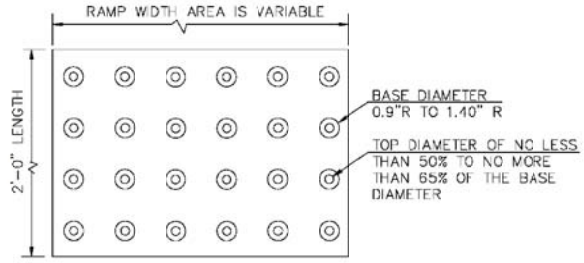
SECTION A - A



SECTION B - B

NOTE:

YELLOW DETECTABLE WARNING DOME TILE WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.



DETECTABLE WARNING DOMES

W	A	W+A+9"	X	B
5'	0.0'	5.8'	5.8'	5.0'*
6'	0.0'	6.8'	6.8'	6.0'**
7'	0.0'	7.8'	7.3'	6.5'**
8'	0.0'	8.8'	7.3'	6.5'**
5'	2.0'	7.8'	7.8'	5.0'
5'	2.5'	8.3'	8.1'	4.8'
5'	3.0'	8.8'	8.3'	4.4'
5'	3.5'	9.3'	8.4'	4.1'
5'	4.0'	9.8'	8.6'	3.8'
5'	4.5'	10.3'	8.7'	3.4'
5'	5.0'	10.8'	8.9'	3.1'

B = X-(A+9")

B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.

* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.

** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.

CURB RAMP FOR CLUSTER BOX UNIT(S)

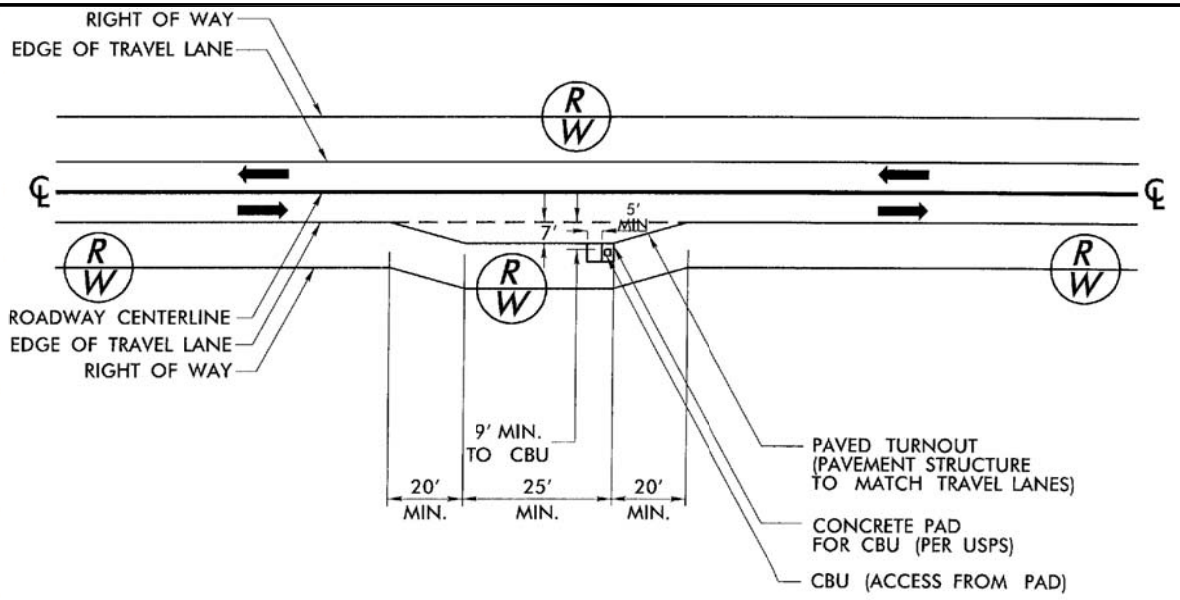
N.T.S.

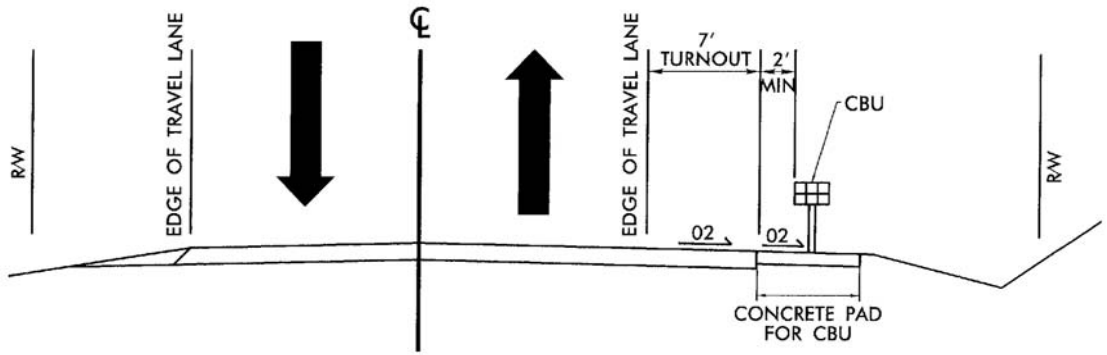
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CURB RAMP FOR CLUSTER BOX UNITS

STD. NO.	REV.
719.1	





SEE FIGURE 1 PAGE 39, "NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS JANUARY 2010" FOR LOCAL AND COLLECTOR ROAD DIMENSIONS.

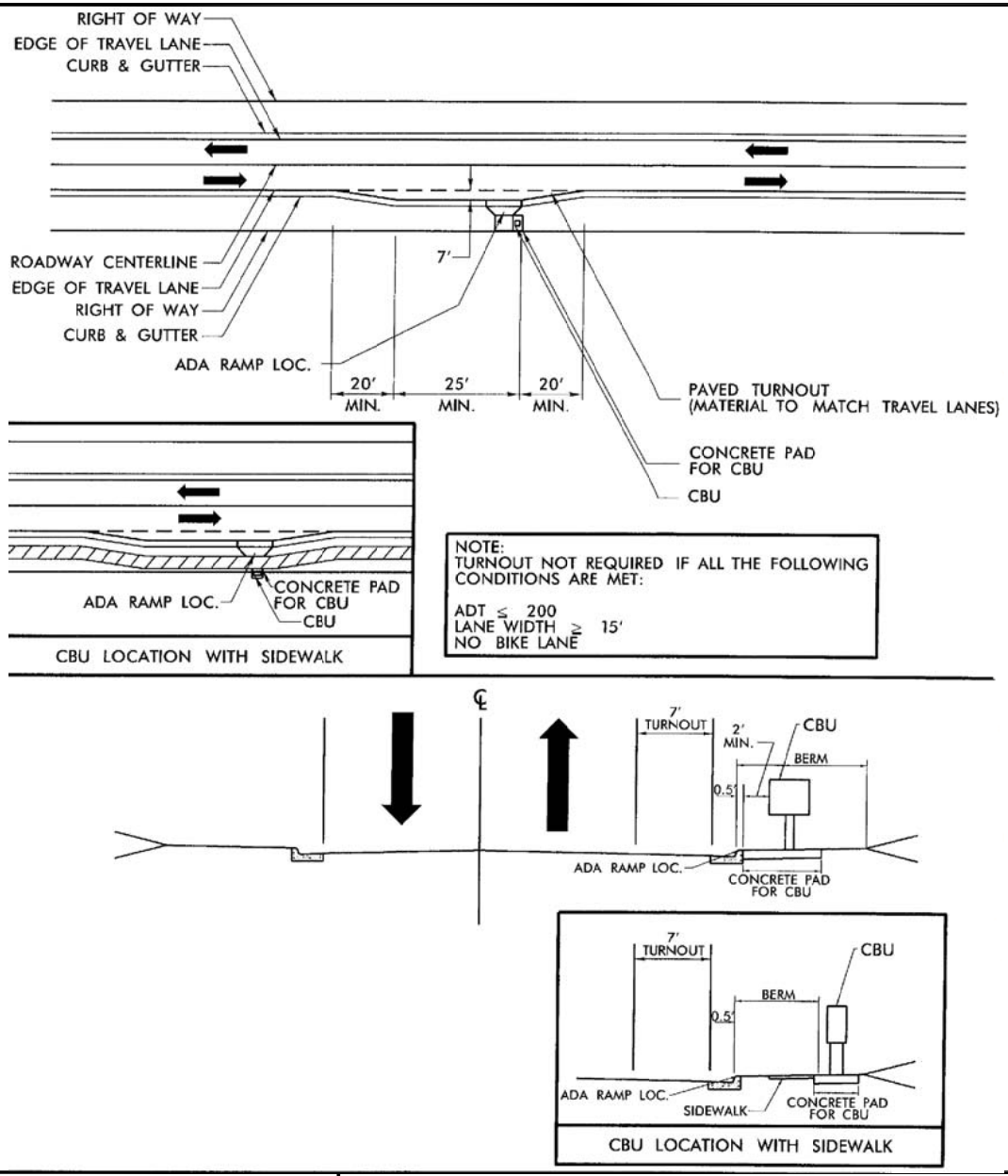
NOTE:
MAINTAIN R/W OFFSET AROUND CBU TURNOUT

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CBU PLACEMENT FOR SHOULDER SECTION RESIDENTIAL LOCAL AND COLLECTOR SUBDIVISION STREETS

STD. NO.	REV.
720.1	

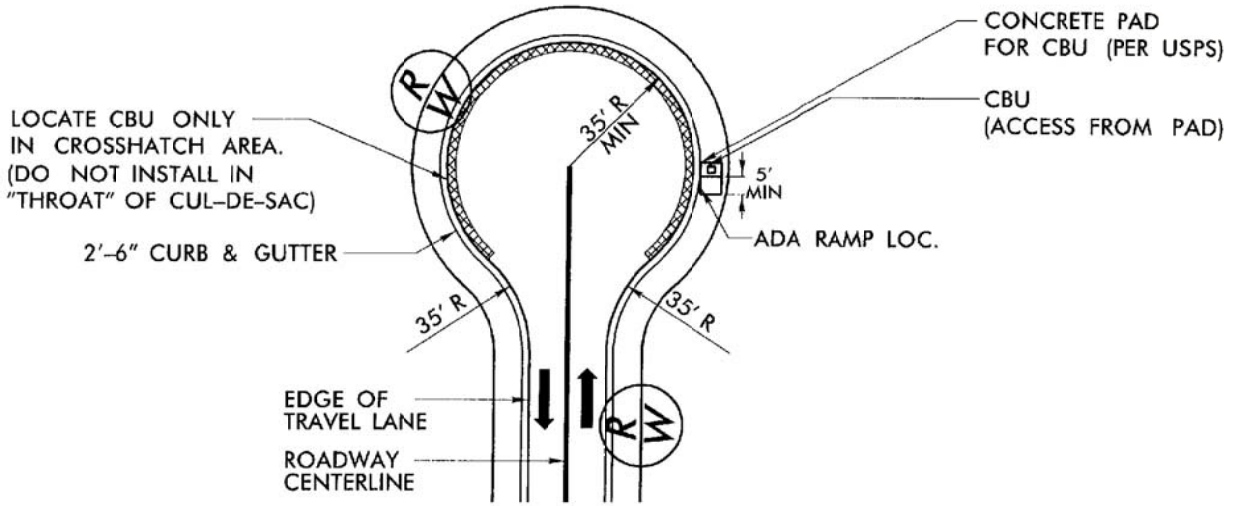


NOT TO SCALE

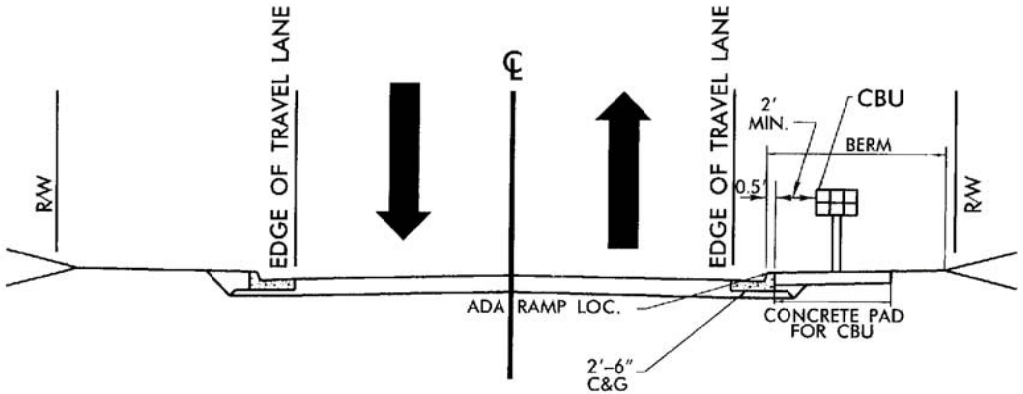
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

CBU PLACEMENT FOR C & G SECTION RESIDENTIAL LOCAL AND COLLECTOR SUBDIVISION STREETS

STD. NO.	REV.
721.1	



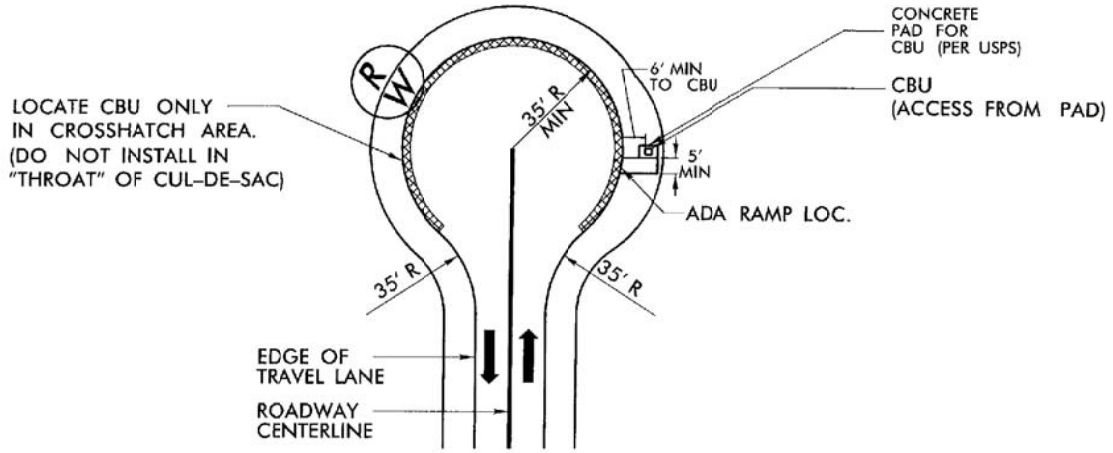
SEE FIGURE 7 PAGE 45, "NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS JANUARY 2010" FOR LOCAL AND COLLECTOR ROAD DIMENSIONS.



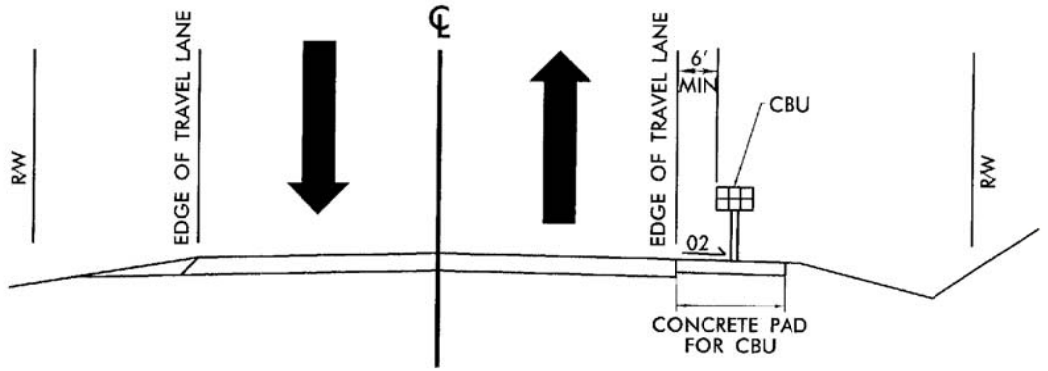
NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CBU PLACEMENT FOR C & G SECTION RESIDENTIAL SUBDIVISION STREETS CUL-DE-SAC

STD. NO.	REV.
722.1	



SEE FIGURE 8 PAGE 46, "NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS JANUARY 2010" FOR LOCAL AND COLLECTOR ROAD DIMENSIONS.

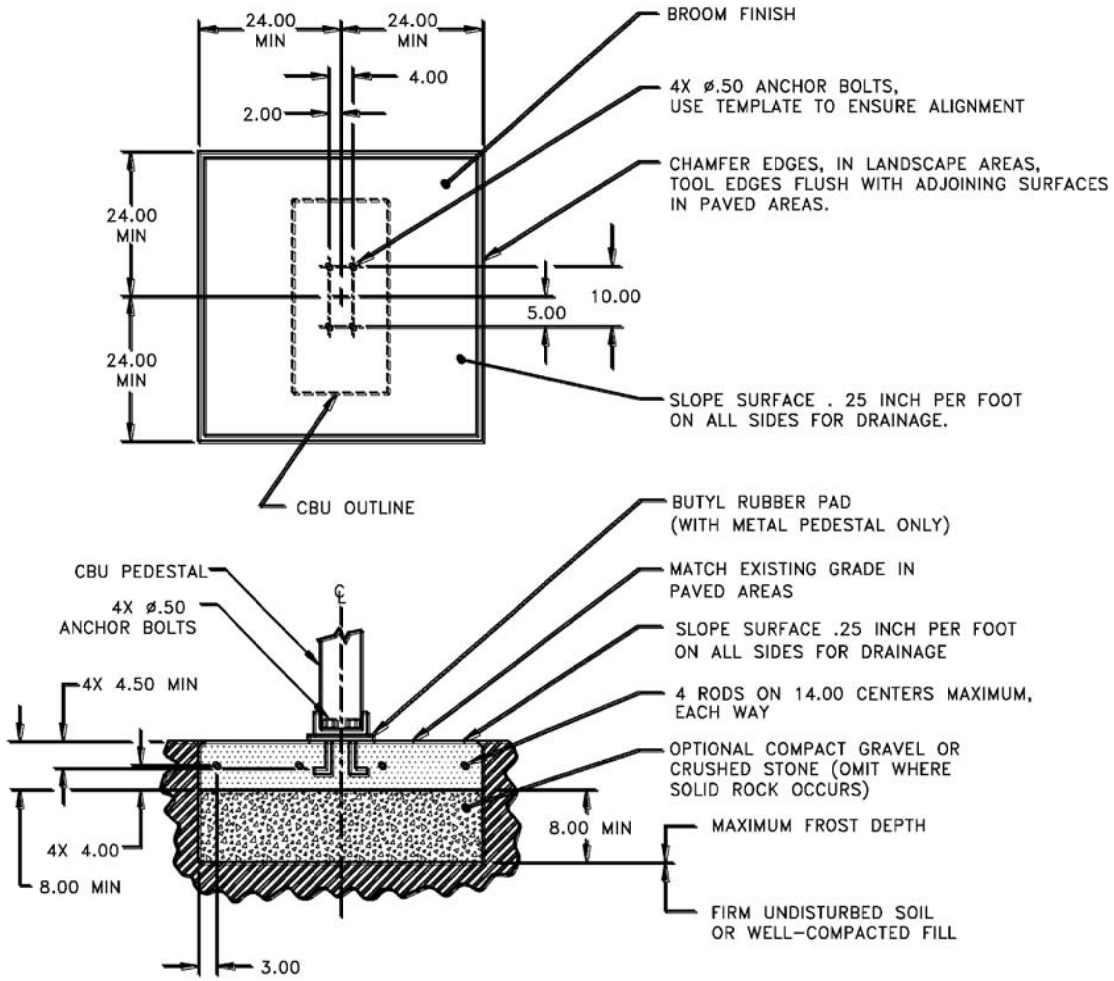


NOTE:
MAINTAIN R/W OFFSET AROUND CBU PAD

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	CBU PLACEMENT FOR SHOULDER SECTION RESIDENTIAL SUBDIVISION STREETS CUL-DE-SAC

STD. NO.	REV.
723.1	



NOTES:

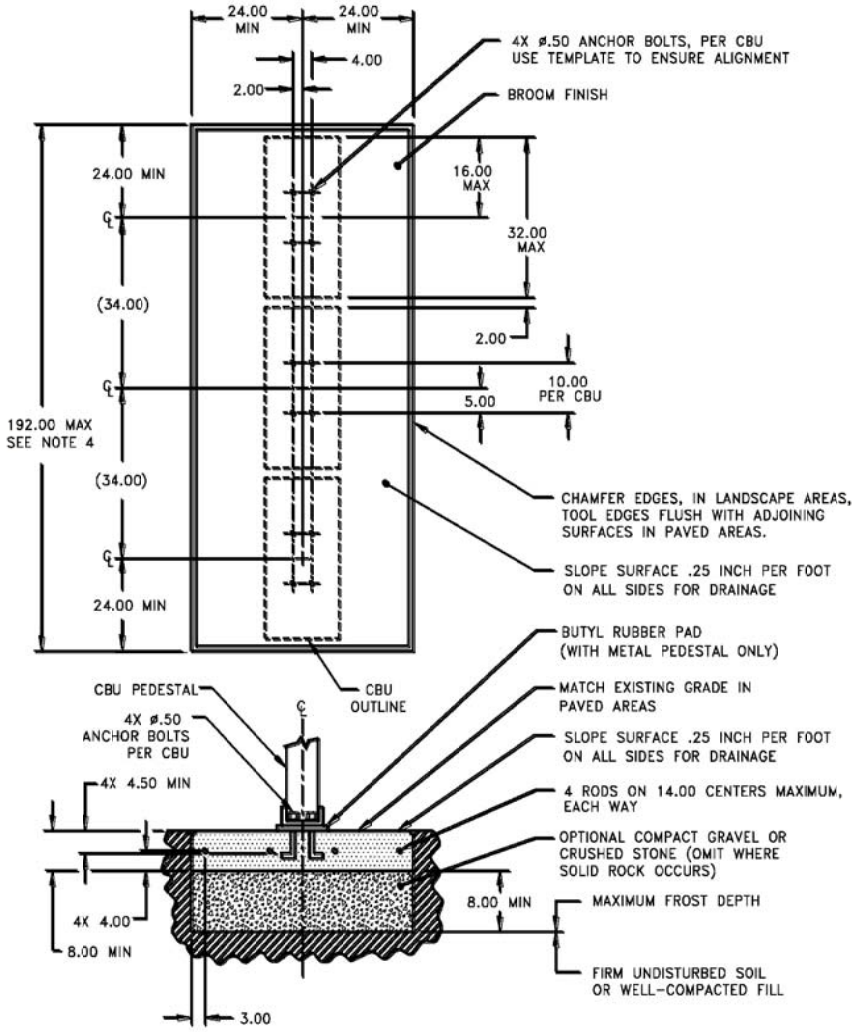
1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS, CONTAIN 4% MIN – 6% MAX AIR ENTRAINMENT AND BE PLACED WITH A 3.50 – 4.50 SLUMP IN ACCORDANCE WITH ACI 301.
2. REINFORCING STEEL RODS SHALL CONFORM TO ASTM A615, GRADE 60.
3. ANCHOR BOLTS SHALL CONFORM TO ASTM A193, GRADE B8M, TYPE 316 STAINLESS STEEL.

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

USPS APPROVED SPECIFICATIONS
CONCRETE PAD (SINGLE UNIT)

STD. NO.	REV.
724.1	



NOTES:

1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS, CONTAIN 4% MIN – 6% MAX AIR ENTRAINMENT AND BE PLACED WITH A 3.50 – 4.50 SLUMP IN ACCORDANCE WITH ACI 301.
2. REINFORCING STEEL RODS SHALL CONFORM TO ASTM A615, GRADE 60.
3. ANCHOR BOLTS SHALL CONFORM TO ASTM A193, GRADE B8M, TYPE 316 STAINLESS STEEL.
4. A 3 CBJ CONFIGURATION IS DEPICTED. A 2 OR 4 CBU CONFIGURATION MAY BE USED AS LONG AS THEY ARE ARRANGED IN GROUPS SUCH THAT THE OVERALL DIMENSION OF THE CONCRETE BASE DOES NOT EXCEED 192 INCHES.

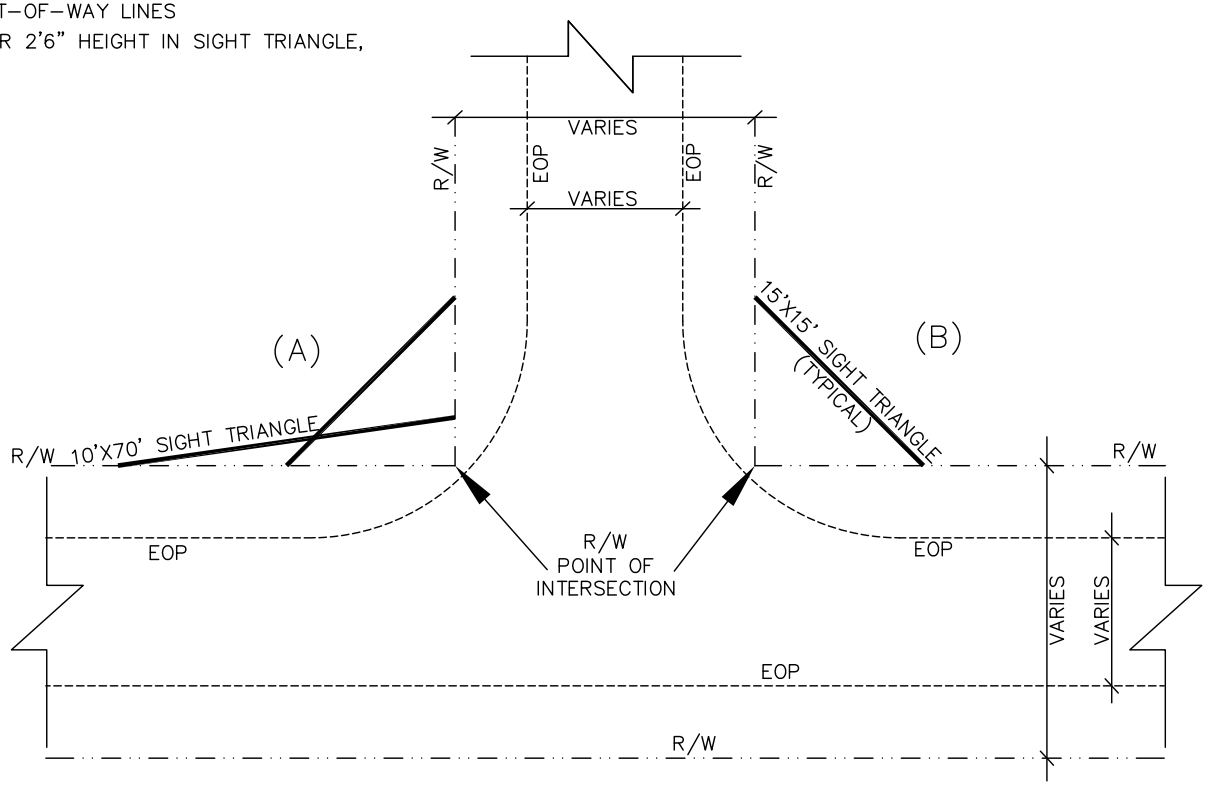
NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

USPS APPROVED SPECIFICATIONS
CONCRETE PAD (MULTIPLE UNIT)

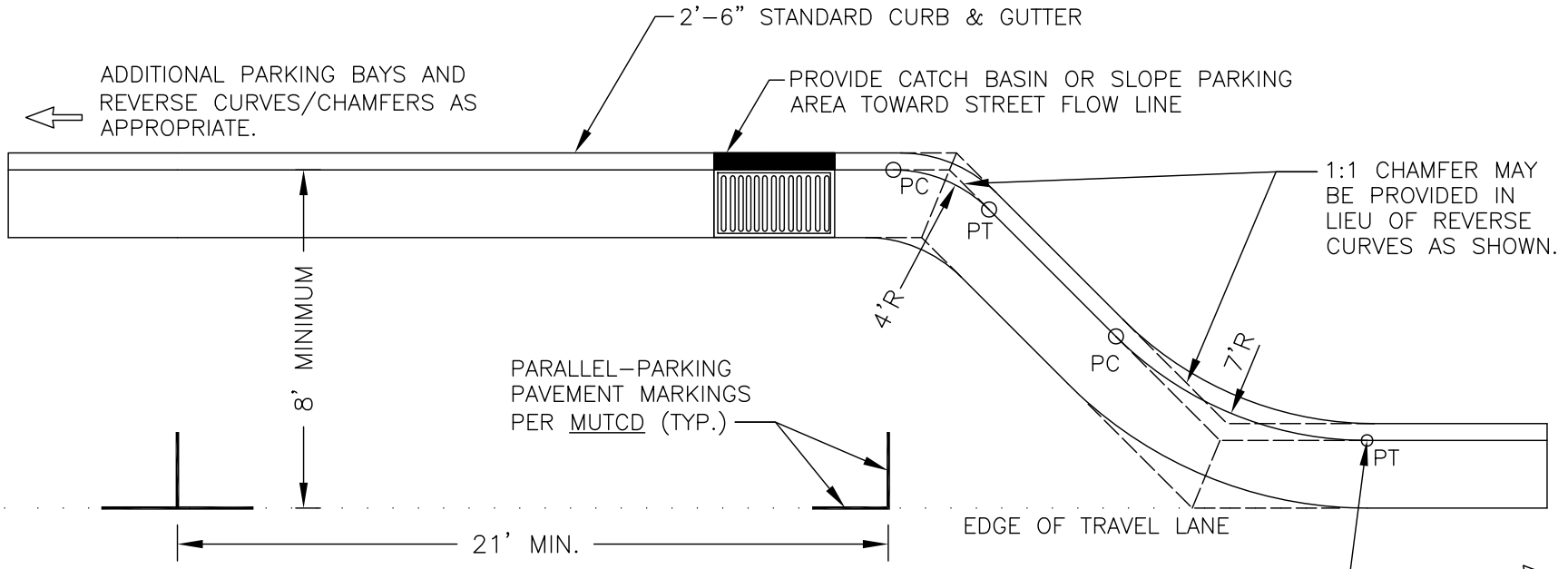
STD. NO.	REV.
725.1	

1. 10' X 70' AND 35' X 35' SIGHT TRIANGLES SHALL BE PROVIDED ON BOTH SIDES OF THE CONNECTING ROAD WHEN A MAIN ENTRANCE ROAD FOR A SUBDIVISION IS CONNECTED TO AN EXISTING ROAD IN ACCORDANCE WITH (A). THESE DIMENSION SHALL BE MEASURED FROM THE POINT OF INTERSECTION OF THE TWO RIGHT-OF-WAY LINES LONGITUDINALLY ALONG THE RIGHT-OF-WAY LINES
2. 15' X 15' SIGHT TRIANGLES SHALL BE PROVIDED ON ALL CORNERS OF AN INTERSECTION FOR ALL INTERIOR SUBDIVISION STREETS IN ACCORDANCE WITH (B). THESE DIMENSION SHALL BE MEASURED FROM THE POINT OF INTERSECTION OF THE TWO RIGHT-OF-WAY LINES LONGITUDINALLY ALONG THE RIGHT-OF-WAY LINES
3. NO TREES, PLANTS, SHRUBS OVER 2'6" HEIGHT IN SIGHT TRIANGLE,



NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	TYPICAL SIGHT TRIANGLES	REV. DATE STD. NO. 726.1



NOTES:

1. REVERSE CURVES/CHAMFERS NOT NECESSARY IF ADEQUATE DRAINAGE CAN BE PROVIDED THAT WILL ENSURE THAT SEDIMENT, WATER, DEBRIS, ETC., DOES NOT COLLECT IN 90–DEGREE CORNERS.
2. FOR PARKING BAYS THAT ARE 8 FEET IN WIDTH OR GREATER, THE PAVEMENT MARKINGS SHALL BE SET AT ONE (1) FOOT LESS THAN THE STALL WIDTH.
3. GREATER SEPARATION FROM INTERVENING STREETS THAN THE DISTANCES PROVIDED IN THE MATRIX MAY BE REQUIRED AT THE TOWN ENGINEER'S DISCRETION.
4. POSITIVE DRAINAGE SHALL BE PROVIDED EITHER BY INSTALLATION OF APPROPRIATE DRAINAGE STRUCTURES OR SLOPE PARKING AREA TO STREET FLOW LINE. SLOPING PARKING AREA TO STREET FLOW LINE ONLY PERMITTED IF ROAD GRADE IS GREATER THAN 2%.

MINIMUM DISTANCE TO NEXT INTERVENING STREET

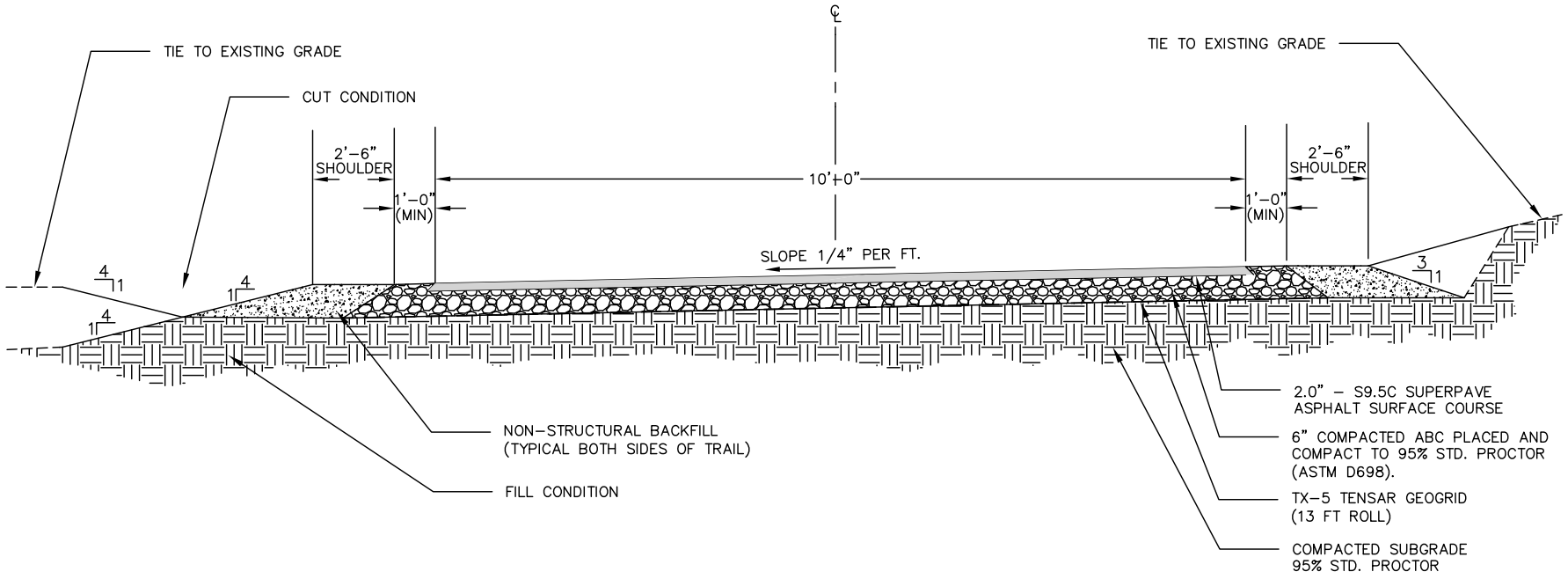
PARALLEL PARKING BAY LOCATED ON	DRIVEWAY	LOCAL/ COLLECTOR	TH'FARE
LOCAL	20'	20'	20'

NOT TO SCALE

TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

PARALLEL PARKING STANDARDS

STD. NO.	REV.
727.1	8/19



NOTES:

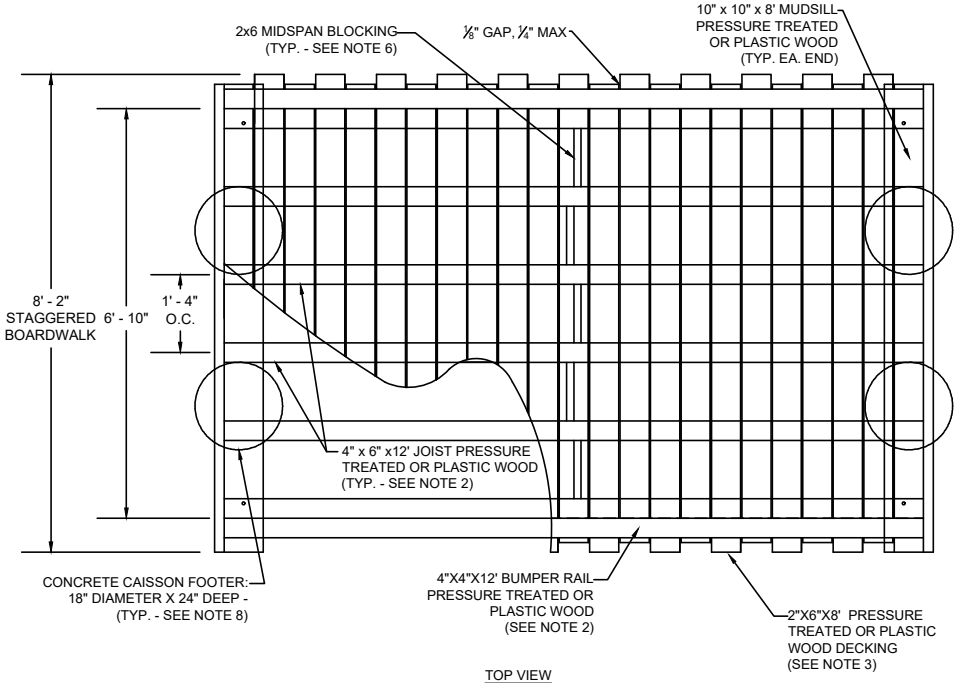
1. EXTEND ABC BASE 12" BEYOND ASPHALT EDGE.

2. HAND COMPACT ASPHALT EDGE (SIDE)

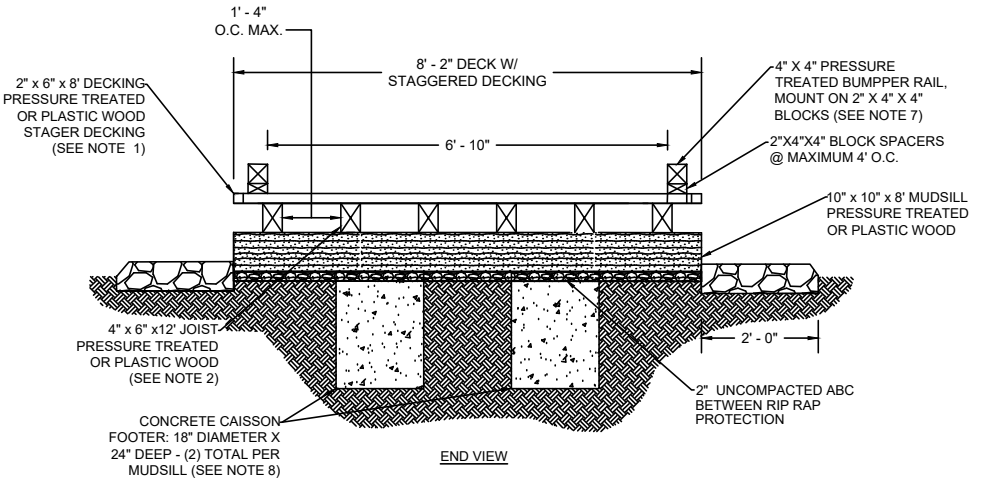
3. SEED AND STRAW ALL DISTURBED AREAS PER SPECIFICATIONS.

NOT TO SCALE

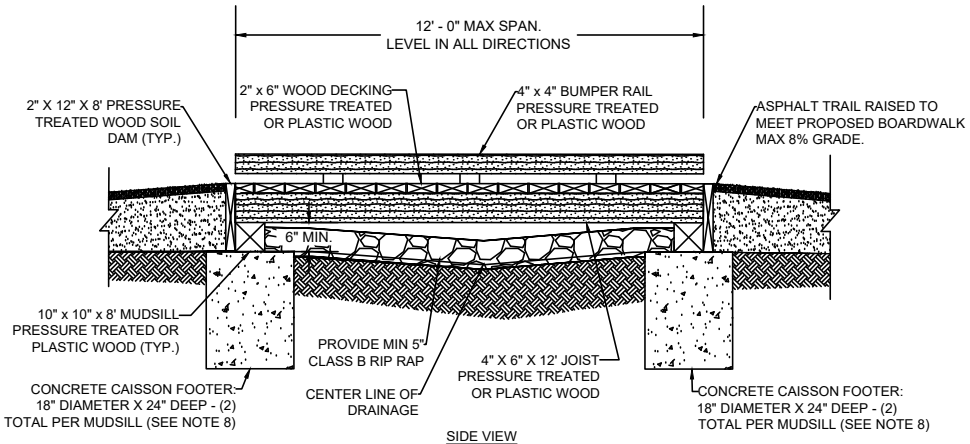
	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	ASPHALT TRAIL TYPICAL SECTION	DATE 3/24
			STD. NO. 728.1



TOP VIEW



END VIEW



SIDE VIEW

NOTES:

1) USE OF ALTERNATIVE THICKNESS AND WIDTH OF BOARDS SUBJECT TO APPROVAL FROM TOWN ENGINEER PRIOR TO CONSTRUCTION.

2) ATTACH JOIST TO MUDSILL USING SIMPSON STRONG TIE MTS12 OR APPROVED EQUAL.

3) USE TWO (2) - 3 " GALVANIZED WOOD SCREWS AT EACH JOIST LOCATION TO ANCHOR DECKING TO JOIST.

4) LINE BELOW ALL RIP RAP WITH FILTER FABRIC

5) SILT FENCE SHALL BE INSTALLED ALONG THE SPAN OF THE PROPOSED BOARDWALK AND EXTEND NO LESS THAN 10 FEET BEYOND EACH END OF THE DISTURBANCE AT EACH BOARDWALK LOCATION.

6) ATTACH BLOCKING TO JOIST USING TWO (2) #12 X 5" HOT-DIP GALVANIZED WOOD SCREWS, CONFORMING TO ASTM A153, AT EACH JOIST. PREDRILL AS REQUIRED TO AVOID SPLITTING.

7) USE FOUR (4) 8" GALVANIZED WOOD SCREWS AT EACH BLOCK SPACER LOCATION TO ANCHOR BUMPER RAIL TO BLOCK SPACERS AND DECKING.

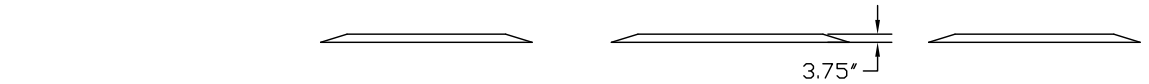
8) ATTACH MUDSILL TO CONCRETE FOOTERS USING SIMPSON STRONG TIE CCQM COLUMN CAP OR APPROVED EQUAL. INSTALL PER MANUFACTURERS INSTRUCTIONS. CONCRETE SHALL HAVE MIN. STRENGTH OF 3000 PSI. FOOT DEPTH MAY BE REDUCED TO 12" WHEN NOT IN FLOODPLAIN.

9) PRESSURE TREATED WOOD SHALL BE SOUTHERN PINE GRADE NO. 1 DENSE. PLASTIC WOOD MUST HAVE EQUAL OR GREATER STRUCTURAL PERFORMANCE THAN PRESSURE TREATED WOOD.

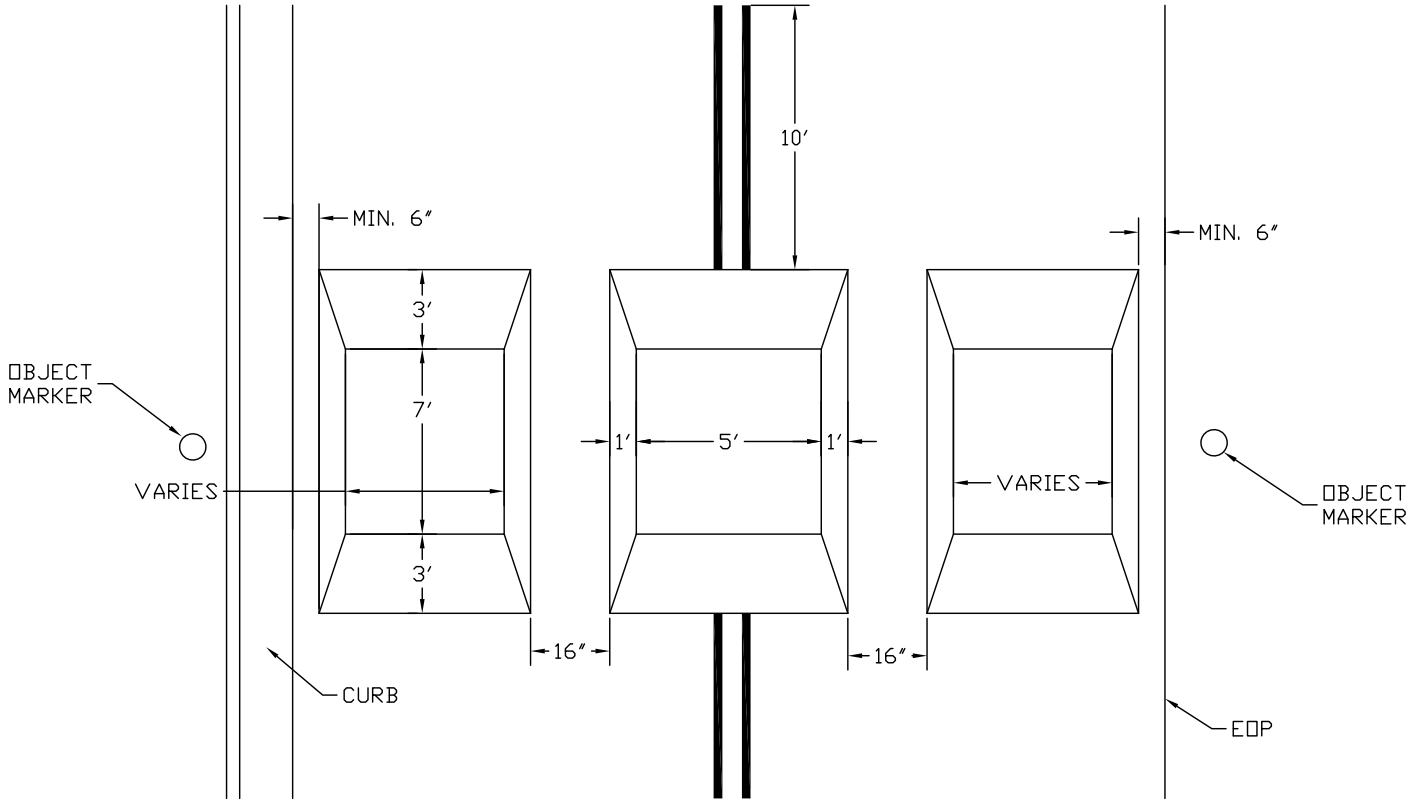
TOWN OF WAXHAW
ENGINEERING DESIGN
STANDARDS

PUNCHEON BOARDWALK
TYPICAL SECTION

STD. NO.	REV.
729.1	3/24



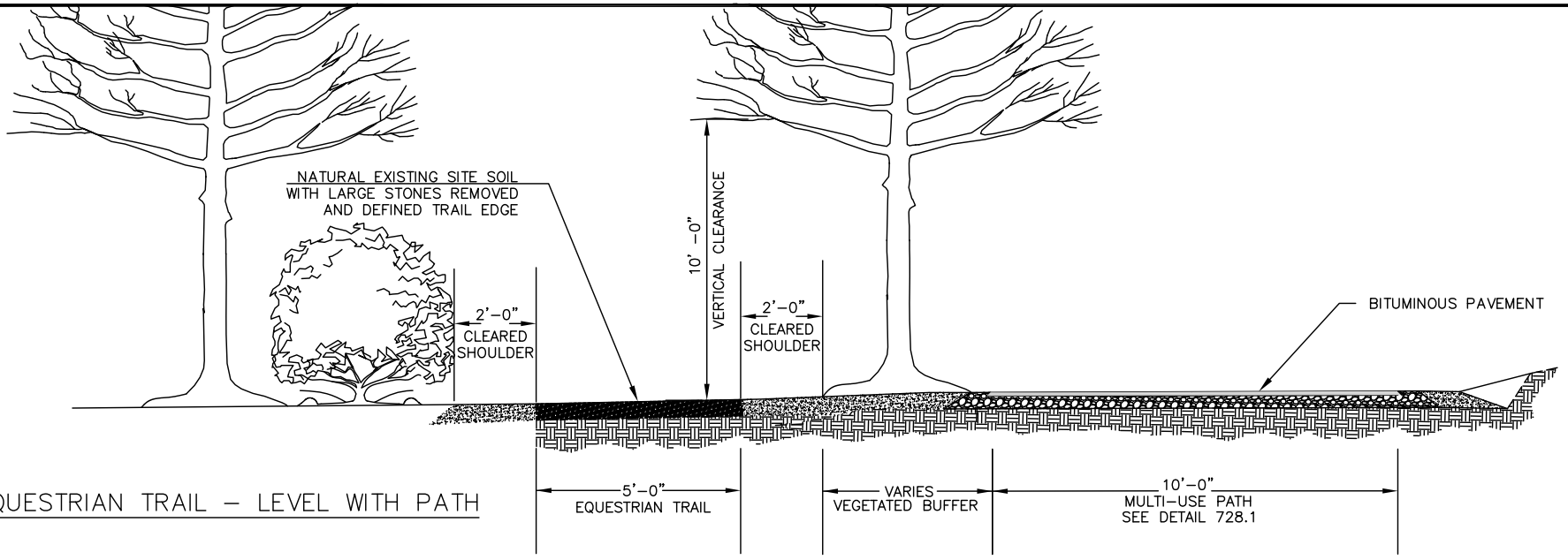
PROFILE



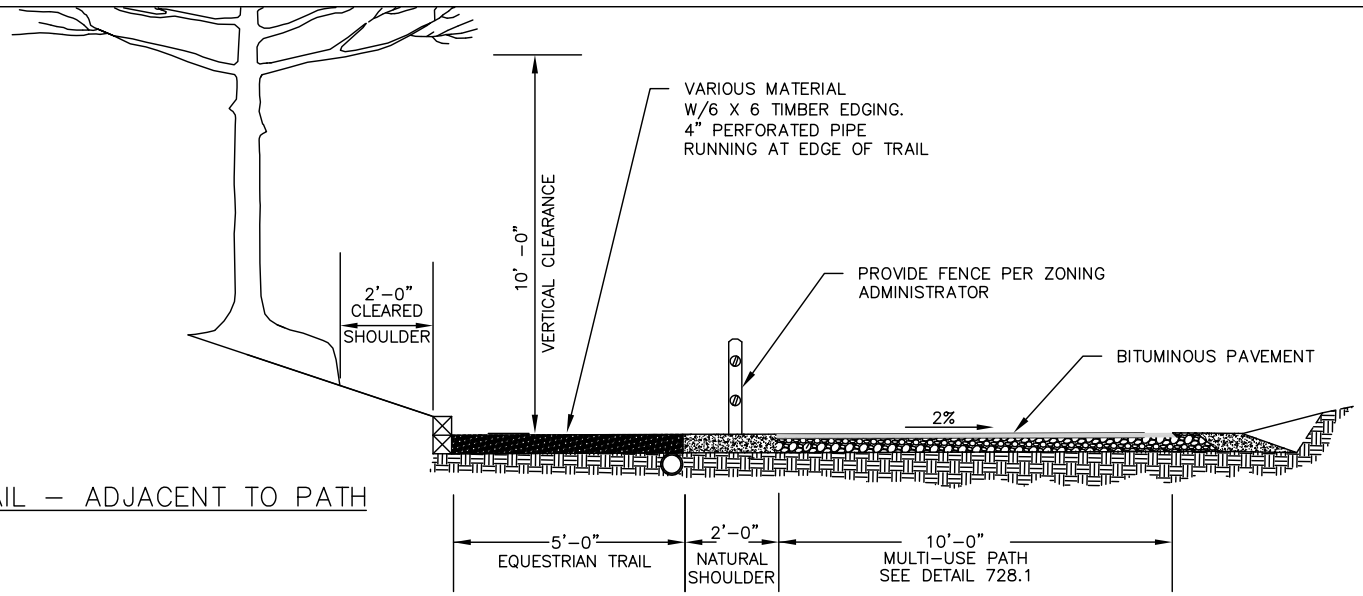
PLAN

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	RESIDENTIAL LOCAL STREET SPEED CUSHION	STD. NO. 730.1 / REV. 3/24



EQUESTRIAN TRAIL – LEVEL WITH PATH



EQUESTRIAN TRAIL – ADJACENT TO PATH

NOT TO SCALE

	TOWN OF WAXHAW ENGINEERING DESIGN STANDARDS	EQUESTRIAN TRAIL SECTIONS	DATE 3/25/24 STD. NO. 731.1