

CITY OF RALEIGH

RALEIGH STREET DESIGN DETAILS



ADOPTED AUGUST , 2020

PREFACE

The standard detail drawings contained in this manual will apply to all new infrastructure construction plans submitted on or after August, 2020. They are intended to be used as a guide in the preparation and submittal of plans for private development and city contract projects within the City of Raleigh and the city's extra-territorial jurisdiction.

The City of Raleigh will use these standards and specifications as well as sound engineering principles to review detailed engineering drawings submitted for the above type of projects. All engineers are encouraged to take these specifications into consideration in the preliminary layout of the project so changes can be held to a minimum when construction drawings are reviewed.

If a required detail is not included in this document, the NCDOT Roadway Standard Drawings shall apply. All construction shall conform to either City of Raleigh specifications or to the latest edition of the NCDOT Standard Specifications for Roads and Structures. If there are questions or conflicts between two drawings or specifications, the coordinating representative listed below shall be notified for resolution.

The Standard Details within this manual may be downloaded from the City's website at www.raleighnc.gov.

If there are questions regarding details, you may contact the individual division coordinators listed below.

Bicycle Facilities: Transportation Planning Manager 919-996-2161
GSI: Assistant Director of Engineering Services 919-996-3940
Stormwater: Assistant Director of Engineering Services 919-996-3940
Transit: Assistant Director of Transportation - Transit 919-996-3030
Transportation: Assistant Director of Transportation 919-996-6446
Tree Protection and Planting: Capital Projects Superintendent 919-996-3285

CITY OF RALEIGH

STANDARD DETAILS

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	SW-20.12		RIP RAP LINED CHANNELS
	SW-20.13		TEMPORARY STREAM CROSSING
	SW-20.14		BLOCK AND GRAVEL INLET PROTECTION
	SW-20.15		STANDARD CATCH BASIN YARD INLET PROTECTION
	SW-20.16		TEMPORARY SILT DITCH
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	SW-20.20		SEDIMENT BASIN
	SW-20.21		SEDIMENT BASIN WITH ROCK DAM
	SW-20.22		WATERCOURSE BUFFER PROTECTION FENCE
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	SW-20.24		STANDARD SILT FENCE OUTLET
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	TT-02		BUS STOP PAD
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	T-10.02		DRIVEWAY FOR VALLEY TYPE CURB & GUTTER
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	T-10.04		DRIVEWAY GRADES
	T-10.05		ASPHALT PAVEMENT PATCH
	T-10.06		STANDARD RESIDENTIAL CUL-DE-SAC
	T-10.07		SENSITIVE AREA PARKWAY
	T-10.08		SENSITIVE AREA AVENUE

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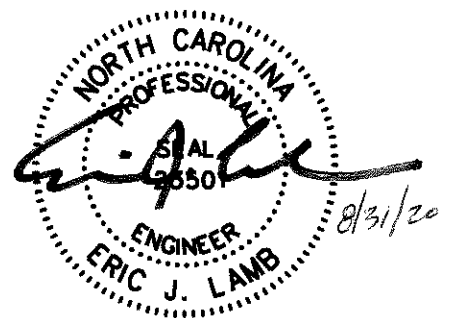
TRANSPORTATION	STD#	REVISION	DESCRIPTION
	T-10.09		SENSITIVE AREA RESIDENTIAL STREET
	T-10.10		NEIGHBORHOOD YIELD
	T-10.11		NEIGHBORHOOD LOCAL STREET (TWO-WAY)
	T-10.12		NEIGHBORHOOD STREET
	T-10.13		MULTIFAMILY STREET
	T-10.14		AVENUE, 2 LANE UNDIVIDED
	T-10.15		AVENUE, 2 LANE, DIVIDED (RAISED MEDIAN)
	T-10.16		AVENUE, 3 LANE, PARALLEL PARKING
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	T-10.19		AVENUE, 4 LANE & 6 LANE, DIVIDED
	T-10.20		MULTI-WAY BOULEVARD
	T-10.21		INDUSTRIAL STREET
	T-10.22		ALLEY
	T-10.23		PRIVATE ACCESSWAY PRIMARY INTERNAL ACCESS DRIVE
	T-10.24		STANDARD METHOD OF REMOVING EXISTING CURB (FOR A DRIVEWAY APRON INSTALLATION)
	T-10.25		STANDARD METHOD OF ENDING CURB AND GUTTER
	T-10.26.1		CURB AND GUTTER
	T-10.26.2		CURB TRANSITION TO 2'-6" VALLEY GUTTER
	T-10.27		STANDARD PAVEMENT WIDENING TAPER & MARKINGS
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	T-10.29		STANDARD UTILITY LOCATIONS IN STREET
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	T-20.01.2		CURB RAMPS (NEW DEVELOPMENT)
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	T-20.01.5		CURB RAMPS (RETROFIT)
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	T-20.01.8		CURB RAMPS (NOTES)
	T-20.02		MEDIAN ISLAND CURB RAMPS/CUT THROUGH

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BICYCLE FACILITIES

PLACE BIKE LANE MARKINGS AT THE BEGINNING OF EACH BIKE LANE SEGMENT - I.E. AFTER EVERY INTERSECTION AND MAJOR DRIVEWAY AND WHERE BIKE LANES END.

CONSIDER ADDITIONAL BIKE LANE MARKINGS AS NEEDED TO CLEARLY DELINEATE THE BIKE LANE ON A CASE-BY-CASE BASIS. DESIRED SPACING IS 250' IN DOWNTOWN RALEIGH AND 500' ELSEWHERE.

WHERE ADJACENT TO THE EDGE OF
PAVEMENT, THE BIKE LANE WIDTH
(EXCLUDING THE GUTTER PAN)
SHOULD BE: 5' DESIRED
4' MINIMUM

WHERE THE BIKE LANE ENDS AT MID-BLOCK LOCATIONS, PLACE "BIKE LANE ENDS" SIGNAGE AT THE BEGINNING OF THE BIKE LANE MINUSKIPS.

USE 2' DASHED WITH 6' GAPS TO
END BIKE LANES AND INDICATE
CONFLICT ZONES, E.G. AT BUS STOPS.

END BIKE LANE AND PLACE SHARED
LANE MARKINGS IN THE CENTER OF
THE TRAVEL LANE THROUGH A
MEDIAN AREA

THE PARKING LANE WIDTH
(INCLUDING THE GUTTER PAN)
SHOULD BE : 8' DESIRED
7.5' MINIMUM

WHERE ADJACENT TO A PARKING
LANE, THE BIKE LANE WIDTH SHOULD
BE: 5' MINIMUM, 6' DESIRED
2' STRIPED BUFFER DESIRED

CITY OF RALEIGH	
STANDARD DETAIL	
<i>REVISIONS</i>	<i>DATE: 8/2020 NOT TO SCALE</i>
	BIKE LANE SIGNS AND MARKINGS
	B-10.01

COMBINED LANE

WHERE PAVEMENT WIDTH DOES NOT ALLOW FOR BOTH A DEDICATED BIKE LANE AND DEDICATED RIGHT TURN LANE APPROACHING THE STOP BAR, USE OF A COMBINED BIKE LANE/RIGHT-TURN LANE IS PERMITTED.

PLACE SHARED LANE MARKINGS AT THE BEGINNING AND END ON THE LEFT SIDE OF THE COMBINED LANE.

COMBINED BIKE LANE/RIGHT-TURN LANE WIDTH, W_2

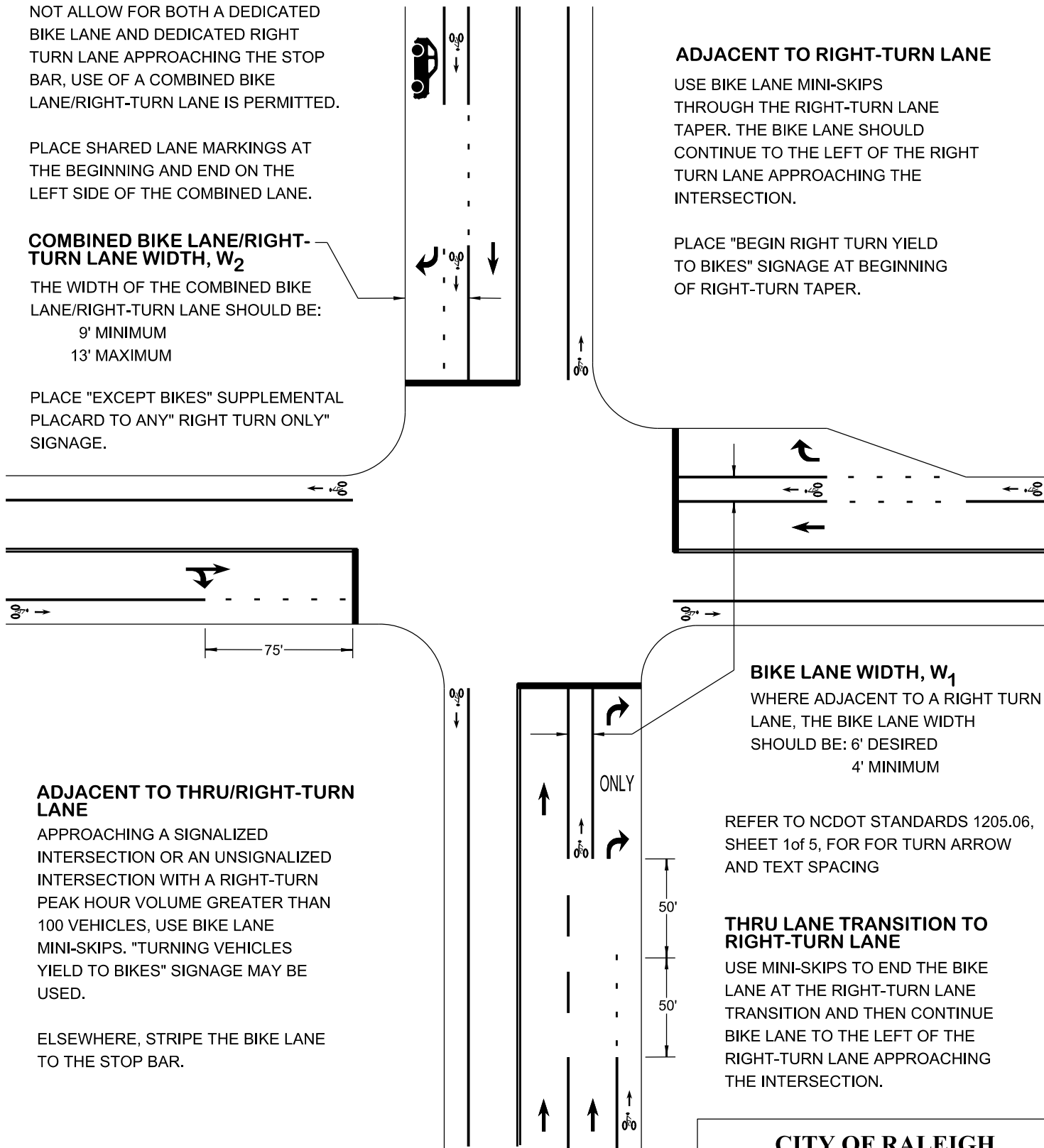
THE WIDTH OF THE COMBINED BIKE LANE/RIGHT-TURN LANE SHOULD BE:
9' MINIMUM
13' MAXIMUM

PLACE "EXCEPT BIKES" SUPPLEMENTAL PLACARD TO ANY "RIGHT TURN ONLY" SIGNAGE.

ADJACENT TO RIGHT-TURN LANE

USE BIKE LANE MINI-SKIPS THROUGH THE RIGHT-TURN LANE TAPER. THE BIKE LANE SHOULD CONTINUE TO THE LEFT OF THE RIGHT TURN LANE APPROACHING THE INTERSECTION.

PLACE "BEGIN RIGHT TURN YIELD TO BIKES" SIGNAGE AT BEGINNING OF RIGHT-TURN TAPER.



ADJACENT TO THRU/RIGHT-TURN LANE

APPROACHING A SIGNALIZED INTERSECTION OR AN UNSIGNALIZED INTERSECTION WITH A RIGHT-TURN PEAK HOUR VOLUME GREATER THAN 100 VEHICLES, USE BIKE LANE MINI-SKIPS. "TURNING VEHICLES YIELD TO BIKES" SIGNAGE MAY BE USED.

ELSEWHERE, STRIPE THE BIKE LANE TO THE STOP BAR.

BIKE LANE WIDTH, W_1

WHERE ADJACENT TO A RIGHT TURN LANE, THE BIKE LANE WIDTH SHOULD BE: 6' DESIRED
4' MINIMUM

REFER TO NCDOT STANDARDS 1205.06, SHEET 1 of 5, FOR TURN ARROW AND TEXT SPACING

THRU LANE TRANSITION TO RIGHT-TURN LANE

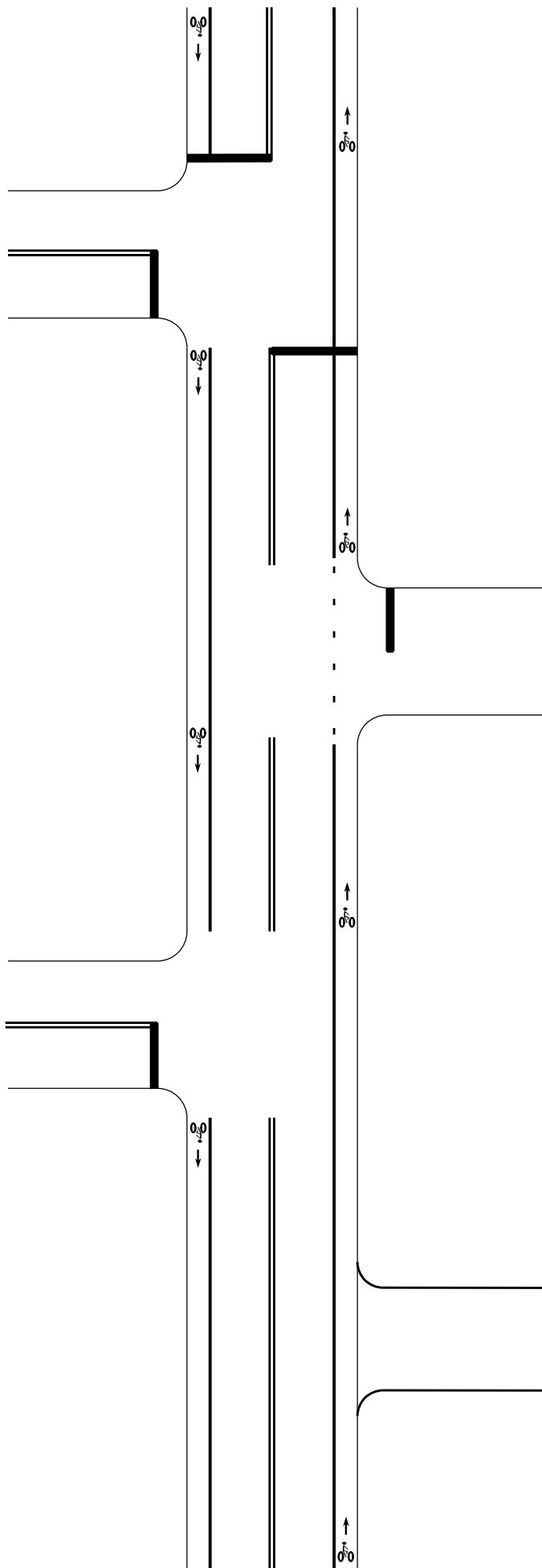
USE MINI-SKIPS TO END THE BIKE LANE AT THE RIGHT-TURN LANE TRANSITION AND THEN CONTINUE BIKE LANE TO THE LEFT OF THE RIGHT-TURN LANE APPROACHING THE INTERSECTION.

BIKE LANE MINI-SKIPS

USE 2' DASHED WITH 6' GAPS TO END BIKE LANES AND INDICATE CONFLICT ZONES.

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REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE LANE SIGNS AND MARKINGS APPROACHING INTERSECTIONS	
	B-10.03	



INTERSECTIONS

DISCONTINUE BIKE LANE MARKINGS THROUGH SIGNALIZED AND UNSIGNALIZED INTERSECTIONS.

WHERE CONDITIONS WARRANT (LONG CROSSING DISTANCES, TRAVEL LANE OFFSETS, HIGH RIGHT-TURN VOLUMES, ETC.), MINI-SKIPS AND BIKE LANE MARKINGS MAY BE USED THROUGH THE INTERSECTION.

AT T-INTERSECTIONS, A BIKE LANE AT THE "TOP" OF THE "T" SHOULD BE STRIPED SOLID THROUGH THE INTERSECTION.

MAJOR DRIVEWAYS

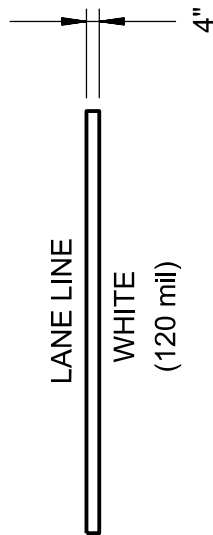
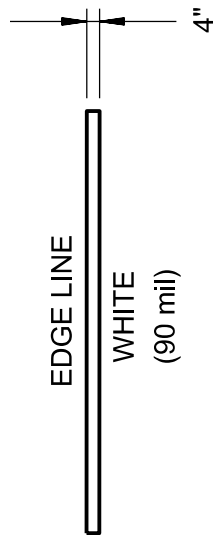
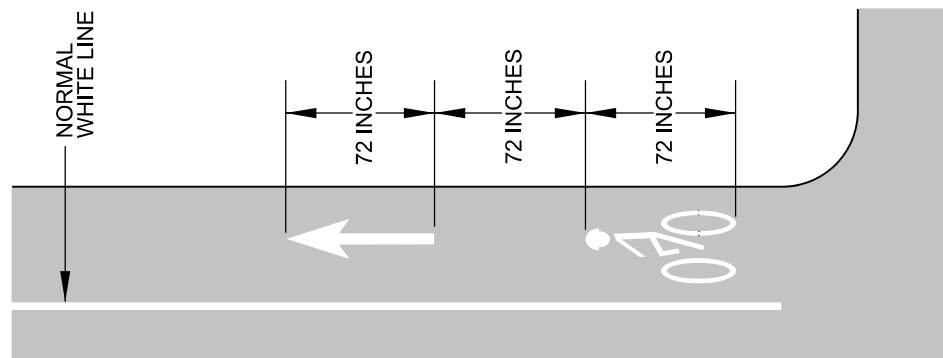
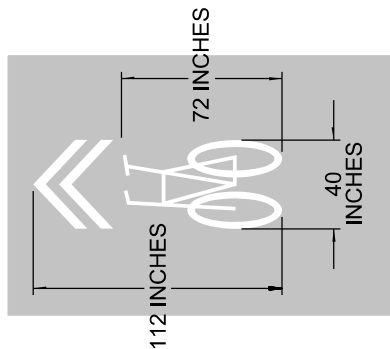
USE BIKE LANE MINI-SKIPS AT HIGH-VOLUME DRIVEWAYS, E.G. RETAIL CENTERS, APARTMENTS, ETC.

MINOR DRIVEWAYS

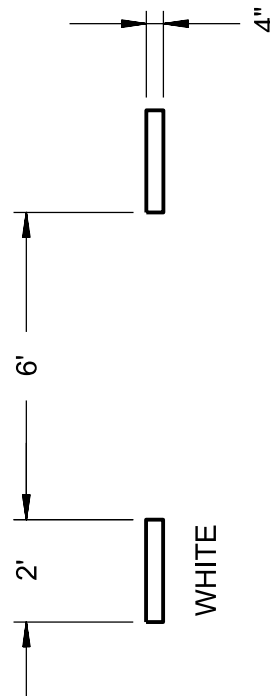
USE SOLID BIKE LANE STRIPING AT LOW-VOLUME DRIVEWAYS, E.G. SINGLE-FAMILY HOMES, FARMS, ETC.

CITY OF RALEIGH STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE LANE MARKINGS THROUGH INTERSECTIONS AND DRIVEWAYS	
	B-10.04	



2'-6"/SP MINI-SKIP LINE



CITY OF RALEIGH STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BICYCLE MARKING	
	B-10.06	



R3-17



R3-17bP



R4-4

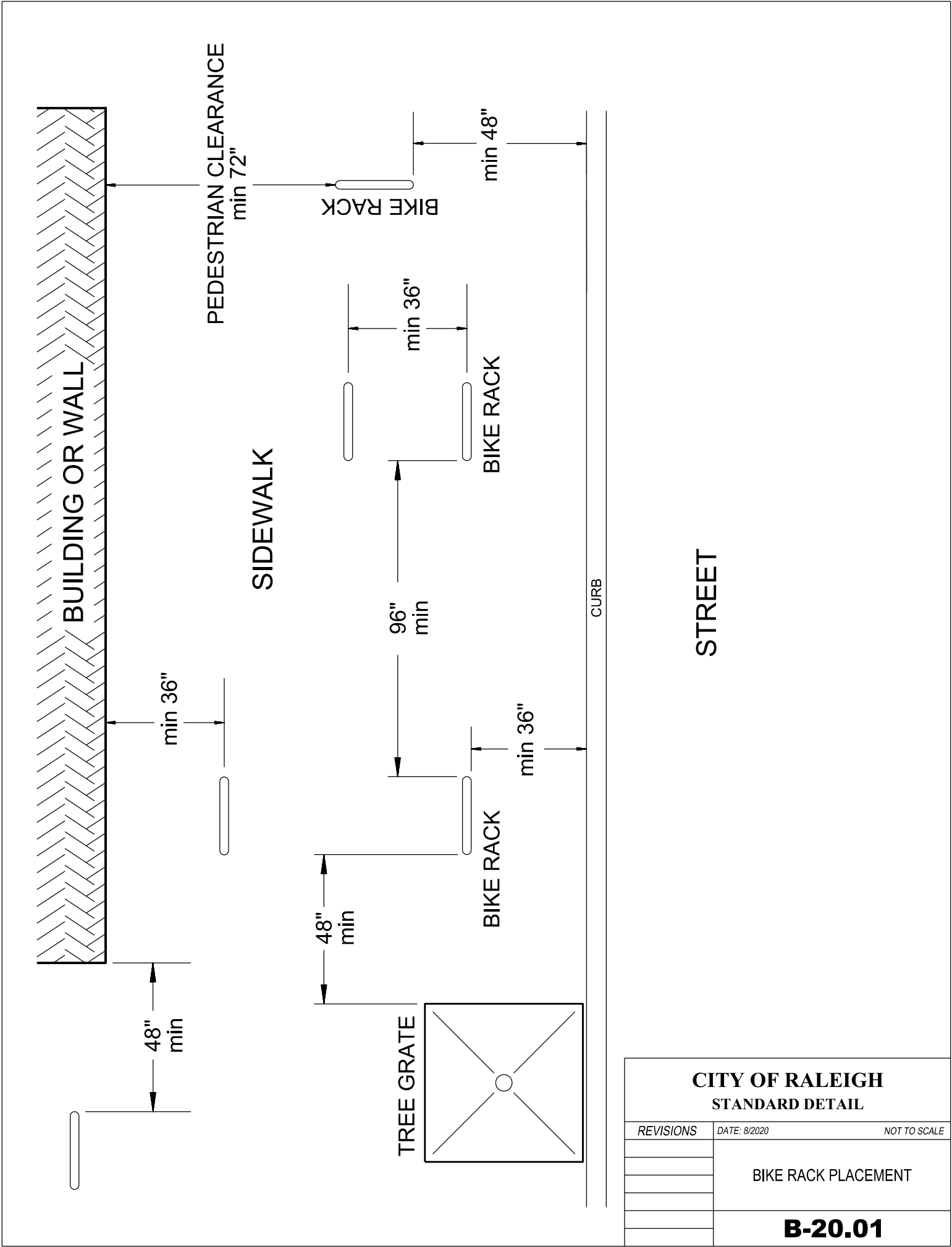


R10-15 MODIFIED



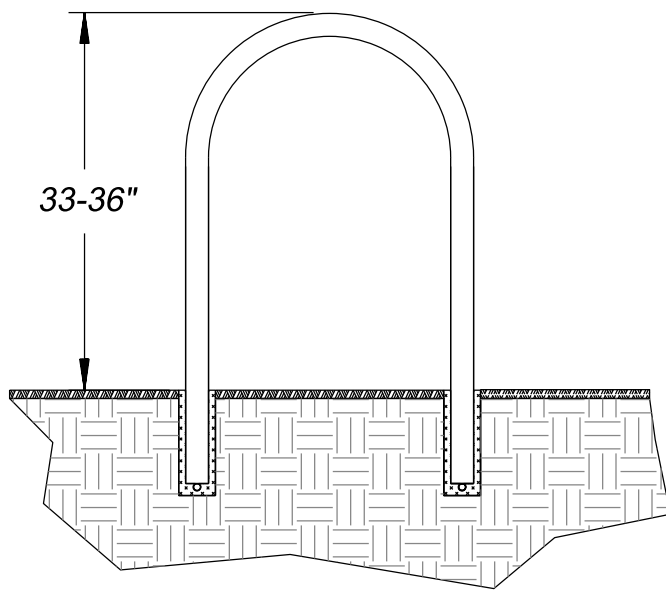
R7-9

CITY OF RALEIGH		
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REVISIONS	DATE: 8/2020	NOT TO SCALE
	BICYCLE SIGNS	
		B-10.07

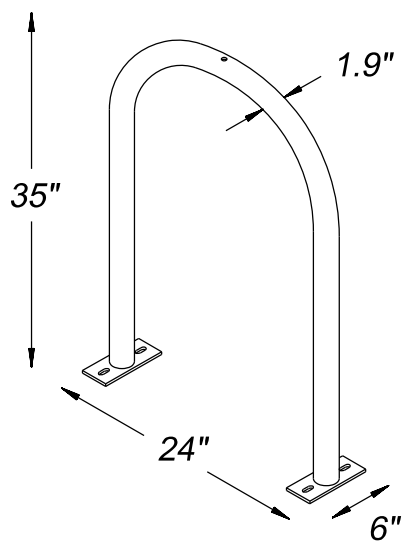
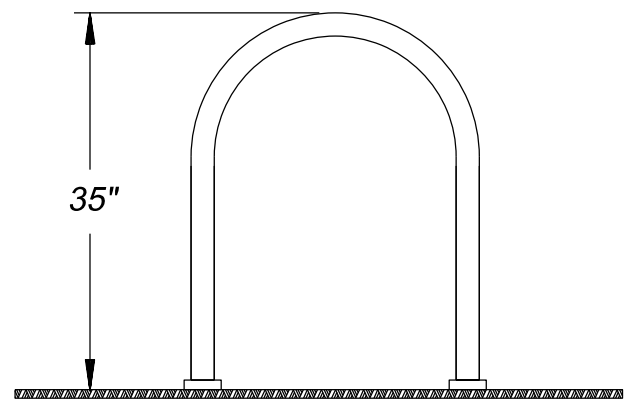


CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE RACK PLACEMENT	
	B-20.01	

IN-GROUND MOUNT



SURFACE MOUNT



STANDARD BIKE RACK

BIKE RACK INSTALLATION:

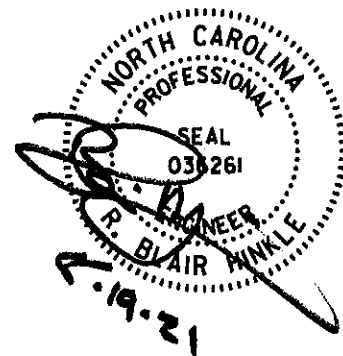
SURFACE MOUNT - WHEN INSTALLED ON CONCRETE SURFACE, USE 3/8" ANCHORS TO PLATE MOUNT. SHIM AS NECESSARY TO ENSURE VERTICAL PLACEMENT.

IN-GROUND MOUNT - WHEN INSTALLED ON
PAVERS OR OTHER NON-STABLE SURFACES,
EMBED INTO BASE. CORE HOLES NO LESS
THAN 3" IN DIAMETER AND 10" DEEP.

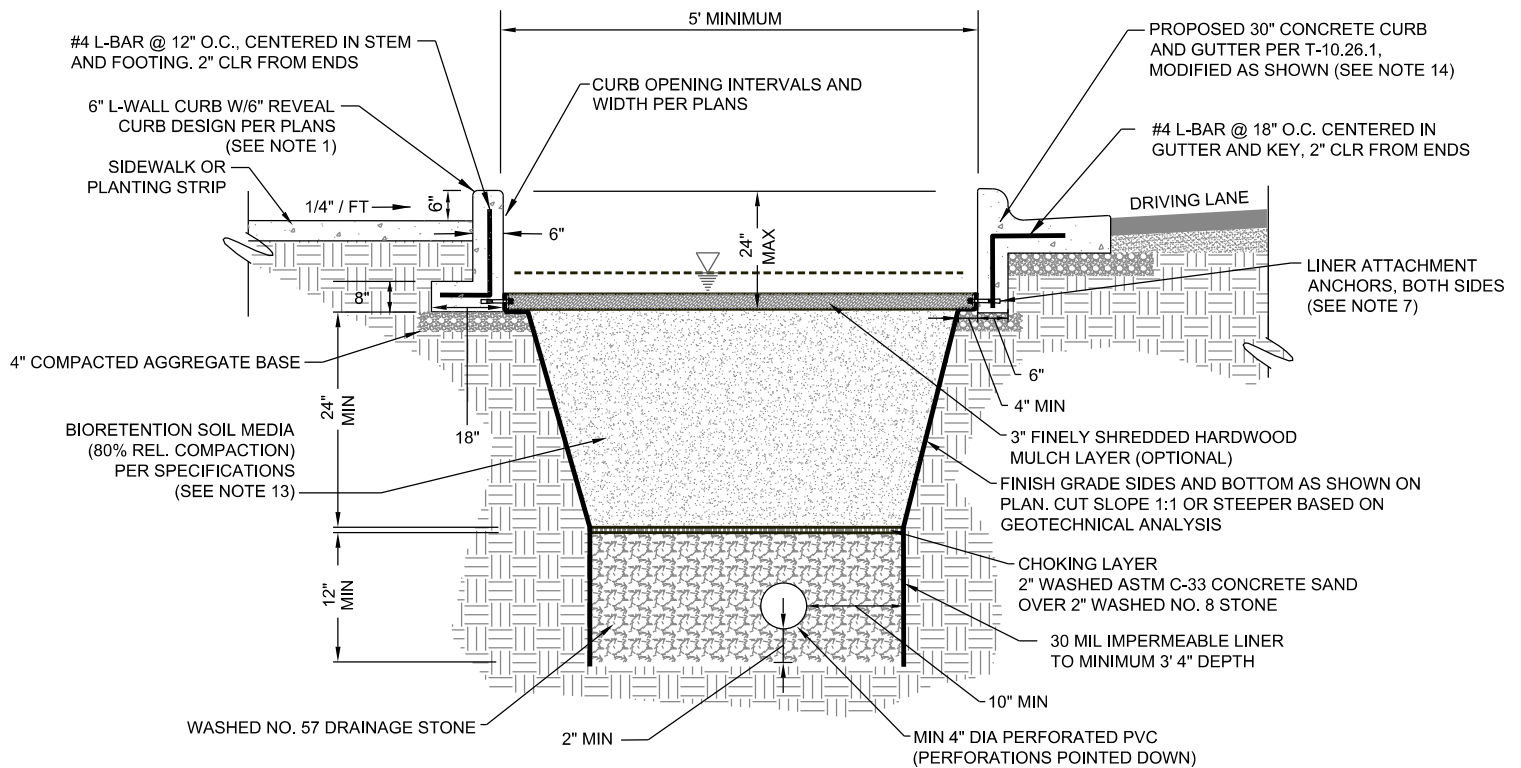
CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	DATE: 8/2020 NOT TO SCALE
	BIKE RACK DETAILS
	B-20.03

CITY OF RALEIGH

STANDARD DETAILS



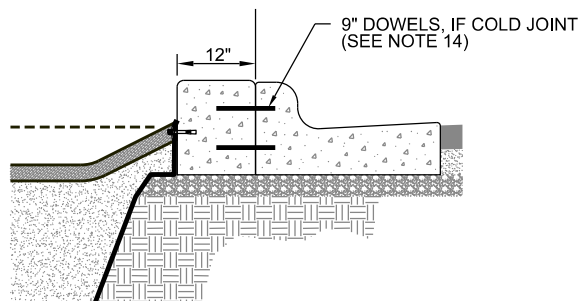
GREEN STORMWATER INFRASTRUCTURE



TYPICAL BUMP-OUT BIORETENTION SECTION

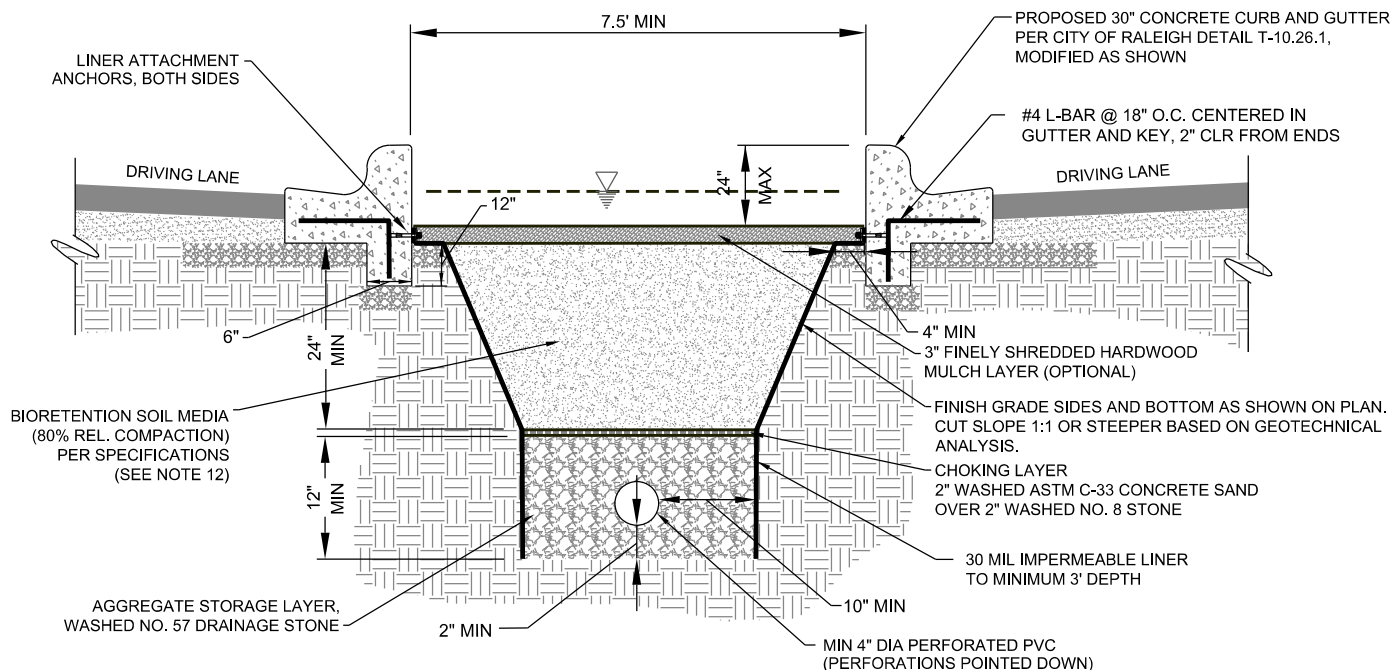
NOTES:

1. EXPANSION JOINTS AND DUMMY JOINTS SHALL BE PER STANDARD DETAIL T-10.26.1, CURB AND GUTTER.
2. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
3. BIORETENTION SIZING IS THE RESPONSIBILITY OF THE DESIGN ENGINEER. SIZING CALCULATIONS SHALL BE SUBMITTED TO THE CITY FOR REVIEW.
4. THE INCLUSION OF AN UNDERDRAIN SYSTEM WITH IMPERMEABLE LINER (INCLUDING BOTTOM LAYER) IS DEPENDENT UPON THE RECOMMENDATION OF GEOTECHNICAL INVESTIGATION CONSISTENT WITH THE GUIDANCE PROVIDED IN THE NCDEQ STORMWATER DESIGN MANUAL AND CITY OF RALEIGH DESIGN MANUAL. IMPERMEABLE LINER SHALL BE HDPE, PVC, OR LDPE AND SHOULD BE INSTALLED SO THAT LINER EXPOSURE TO SUNLIGHT IS MINIMIZED.
5. IF REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
6. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
7. BOTH PIPE PENETRATIONS AND ATTACHMENT OF 30 MIL IMPERMEABLE LINER TO CONCRETE CURBS (USING CONCRETE ANCHORS SPACED AT MAXIMUM 18\" O.C. AND BATTEN STRIPS) SHALL BE DONE IN ACCORDANCE WITH ASTM 6497.
8. GEOTEXTILE MAY BE UTILIZED IN-LIEU OF AGGREGATE CHOKING LAYER IF APPROVED BY ENGINEER.
9. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL.
10. ALL UNDERDRAINS, IF REQUIRED, SHALL CONNECT TO STORM DRAIN OR OTHER DRAINAGE FEATURE.
11. ALL FEATURES INTEGRATED INTO BUMP-OUT BIORETENTION, INCLUDING VEGETATION, SHALL MEET SIGHT DISTANCE REQUIREMENTS PER STREET DESIGN MANUAL AND RECOMMENDED PLANT SPECIES IN THE NCDEQ STORMWATER DESIGN MANUAL.
12. MINIMUM RADII FOR BUMP-OUT BIORETENTION SHALL MEET ENGINEERING SPECIFICATIONS IN STREET DESIGN MANUAL DEPENDING ON ROADWAY TYPE.
13. BIORETENTION MEDIA SHALL BE PLACED IN 8\" LIFTS THAT ARE WALKED ON OR WATERED TO CONSOLIDATE AND ALLOW SHAPING OF THE MEDIA'S SURFACE. THE MEDIA SHALL NOT BE MECHANICALLY COMPACTED. REFER TO NCDEQ STORMWATER DESIGN MANUAL FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
14. CONCRETE CURB EXTENSIONS ARE RECOMMENDED WHERE PARKING IS IMMEDIATELY ADJACENT AND/OR WHERE SPEED LIMITS EXCEED 35 MPH. POUR 1' WIDE CONCRETE EXTENDED CURB MONOLITHICALLY WITH THE PROPOSED CURB AND GUTTER. OTHERWISE, ANCHOR CONCRETE STRIP TO EXISTING CURB WITH OILED OR GREASED BAR (1/2\"X9\") AT 24\" O.C. INSTALL BAR 3\" INTO THE EXISTING CURB. USE CONCRETE ADHESIVE ON THE EXISTING CURB.
15. THE SEASONAL HIGH WATER TABLE SHALL BE 2 FEET BELOW THE BOTTOM OF THE DRAINAGE STONE LAYER.
16. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
17. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.



(OPTIONAL) CONCRETE CURB EXTENSION DETAIL

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB-SIDE AND BUMP-OUT BIORETENTION	
	GSI-01	



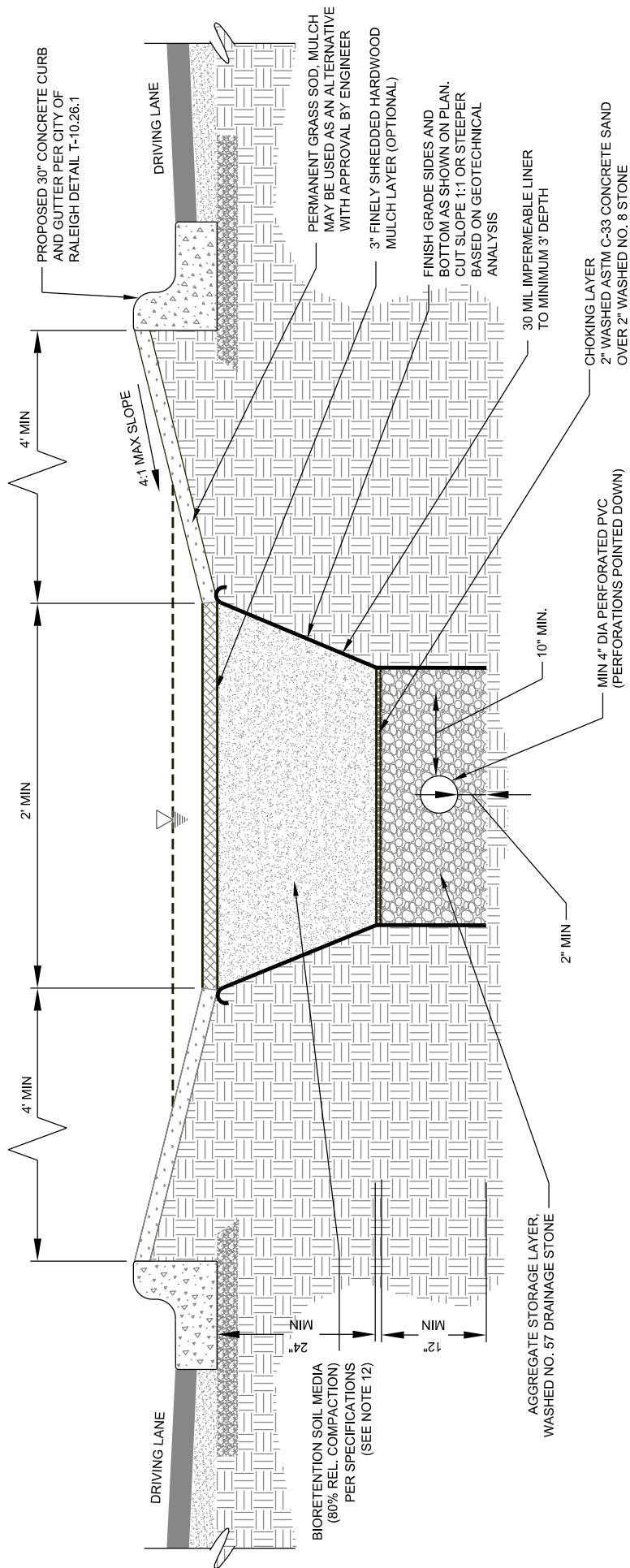
**TYPICAL MEDIAN BIORETENTION SECTION
POSTED SPEED LIMIT OF 30 MPH AND LOWER**

NOTES:

1. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
2. BIORETENTION SIZING IS THE RESPONSIBILITY OF THE DESIGN ENGINEER. SIZING CALCULATIONS SHALL BE SUBMITTED TO THE CITY FOR REVIEW.
3. THE INCLUSION OF AN UNDERDRAIN SYSTEM WITH IMPERMEABLE LINER (INCLUDING BOTTOM LAYER) IS DEPENDENT UPON THE RECOMMENDATION OF GEOTECHNICAL INVESTIGATION CONSISTENT WITH THE GUIDANCE PROVIDED IN THE NCDEQ STORMWATER DESIGN MANUAL AND CITY OF RALEIGH DESIGN MANUAL. IMPERMEABLE LINER SHALL BE HDPE, PVC, OR LDPE AND SHOULD BE INSTALLED SO THAT LINER EXPOSURE TO SUNLIGHT IS MINIMIZED.
4. IF REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
5. THE SEASONAL HIGH WATER TABLE SHALL BE 2 FEET BELOW THE BOTTOM OF THE DRAINAGE STONE LAYER.
6. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
7. BOTH PIPE PENETRATIONS, AND ATTACHMENT OF 30 MIL IMPERMEABLE LINER TO CONCRETE CURBS (USING CONCRETE ANCHORS SPACED AT MAXIMUM 18" O.C. AND BATTEN STRIPS), SHALL BE DONE IN ACCORDANCE WITH ASTM 6497.
8. GEOTEXTILE MAY BE UTILIZED IN-LIEU OF AGGREGATE CHOKING LAYER IF APPROVED BY ENGINEER.
9. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL.
10. ALL UNDERDRAINS, IF REQUIRED, SHALL CONNECT TO STORM DRAIN OR OTHER DRAINAGE FEATURE.
11. ALL FEATURES, INCLUDING VEGETATION, INTEGRATED INTO MEDIAN BIORETENTION SHALL MEET SIGHT DISTANCE REQUIREMENTS PER STREET DESIGN MANUAL AND RECOMMENDED PLANT SPECIES IN THE NCDEQ STORMWATER DESIGN MANUAL.
12. BIORETENTION MEDIA SHALL BE PLACED IN 8" LIFTS THAT ARE WALKED ON OR WATERED TO CONSOLIDATE AND ALLOW SHAPING OF THE MEDIA'S SURFACE. THE MEDIA SHALL NOT BE MECHANICALLY COMPACTED. REFER TO NCDEQ STORMWATER DESIGN MANUAL FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
13. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
14. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	MEDIAN BIORETENTION (FOR 30 MPH AND BELOW)	
	GSI-02.1	

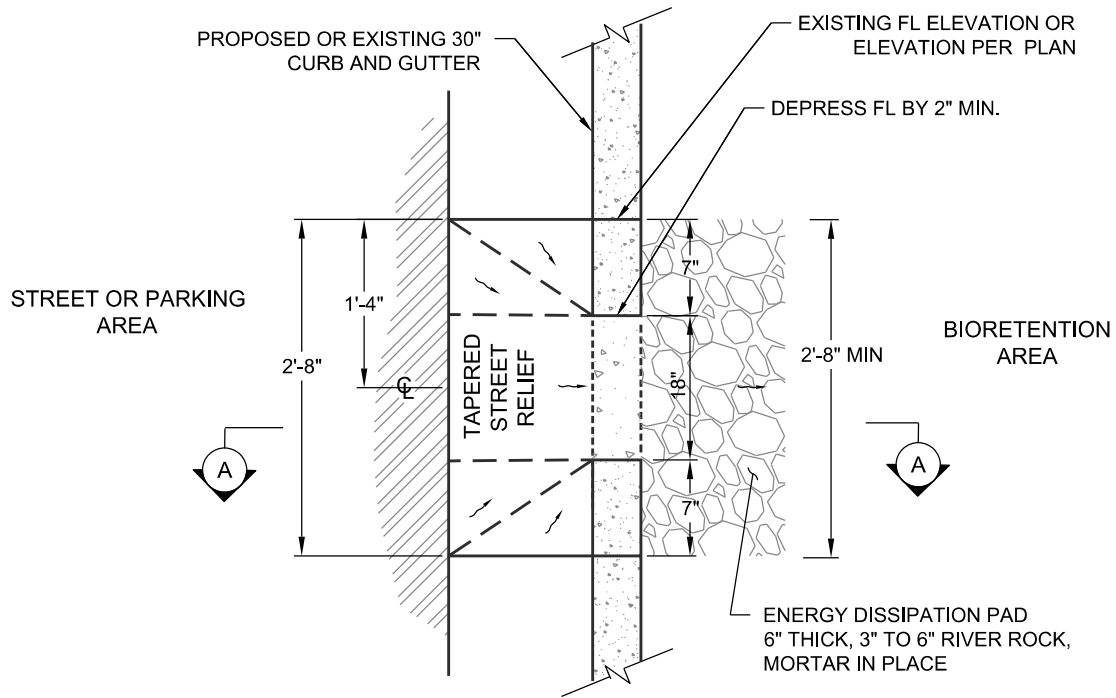


**TYPICAL MEDIAN BIORETENTION SECTION
POSTED SPEED LIMIT HIGHER THAN 30 MPH**

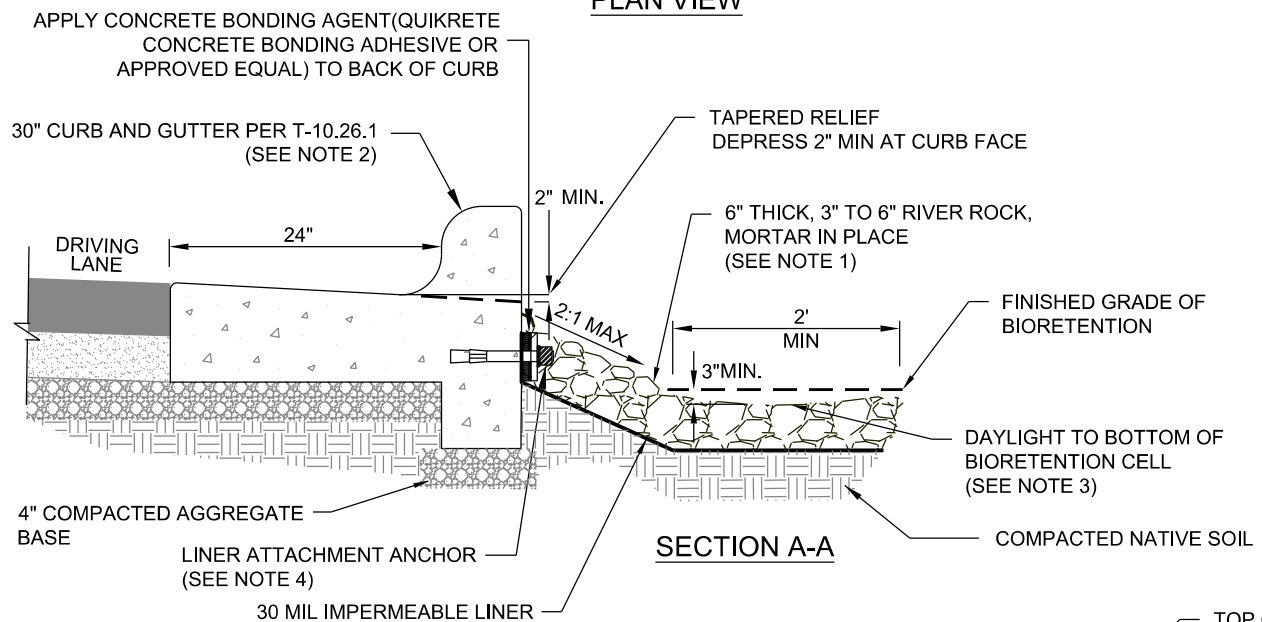
NOTES:

1. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
2. BIORETENTION SIZING IS THE RESPONSIBILITY OF THE DESIGN ENGINEER; SIZING CALCULATIONS SHALL BE SUBMITTED TO THE CITY FOR REVIEW.
3. THE INCLUSION OF AN UNDERDRAIN SYSTEM IS DEPENDENT UPON THE RECOMMENDATION OF GEOTECHNICAL INVESTIGATION CONSISTENT WITH THE GUIDANCE PROVIDED IN THE NCDEQ STORMWATER DESIGN MANUAL AND CITY OF RALEIGH DESIGN MANUAL. IMPERMEABLE LINER SHALL BE HDPE, PVC, OR LDPE AND SHOULD BE INSTALLED SO THAT EXPOSURE TO SUNLIGHT IS MINIMIZED.
4. IF UNDERDRAIN IS REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
5. THE SEASONAL HIGH WATER TABLE SHALL BE 2 FEET BELOW THE BOTTOM OF THE DRAINAGE STONE LAYER.
6. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
7. GEOTEXTILE MAY BE UTILIZED IN-LEU OF AGGREGATE CHOKING LAYER IF APPROVED BY ENGINEER.
8. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL.
9. ALL UNDERDRAINS, IF REQUIRED, SHALL CONNECT TO STORM DRAIN OR OTHER DRAINAGE FEATURE.
10. VEGETATION MAY BE PLACED ON SIDE SLOPES TO ANCHOR MULCH IF DESIRED.
11. ALL FEATURES, INCLUDING VEGETATION, INTEGRATED INTO MEDIAN BIORETENTION SHALL MEET SIGHT DISTANCE REQUIREMENTS PER STREET DESIGN MANUAL AND RECOMMENDED PLANT SPECIES IN THE NCDEQ STORMWATER DESIGN MANUAL.
12. BIORETENTION MEDIA SHALL BE PLACED IN 8" LIFTS THAT ARE WALKED ON OR WATERED TO CONSOLIDATE AND ALLOW SHAPING OF THE MEDIA'S SURFACE. THE MEDIA SHALL NOT BE MECHANICALLY COMPACTED. REFER TO NCDEQ STORMWATER DESIGN MANUAL FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
13. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
14. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.

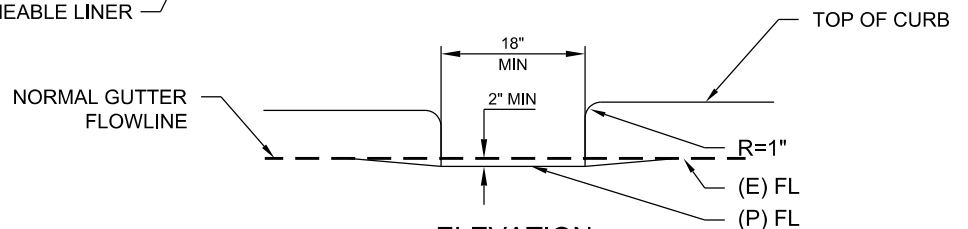
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	MEDIAN BIORETENTION (FOR ABOVE 30 MPH)	
	GSI-02.2	



PLAN VIEW



SECTION A-A



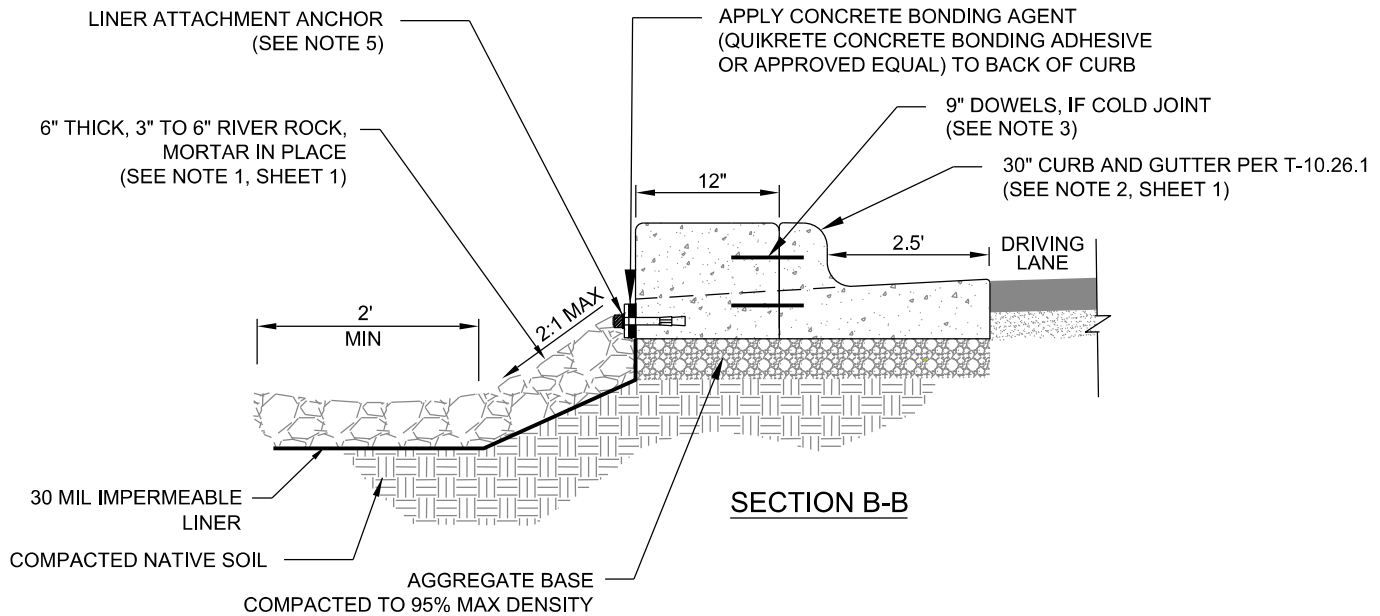
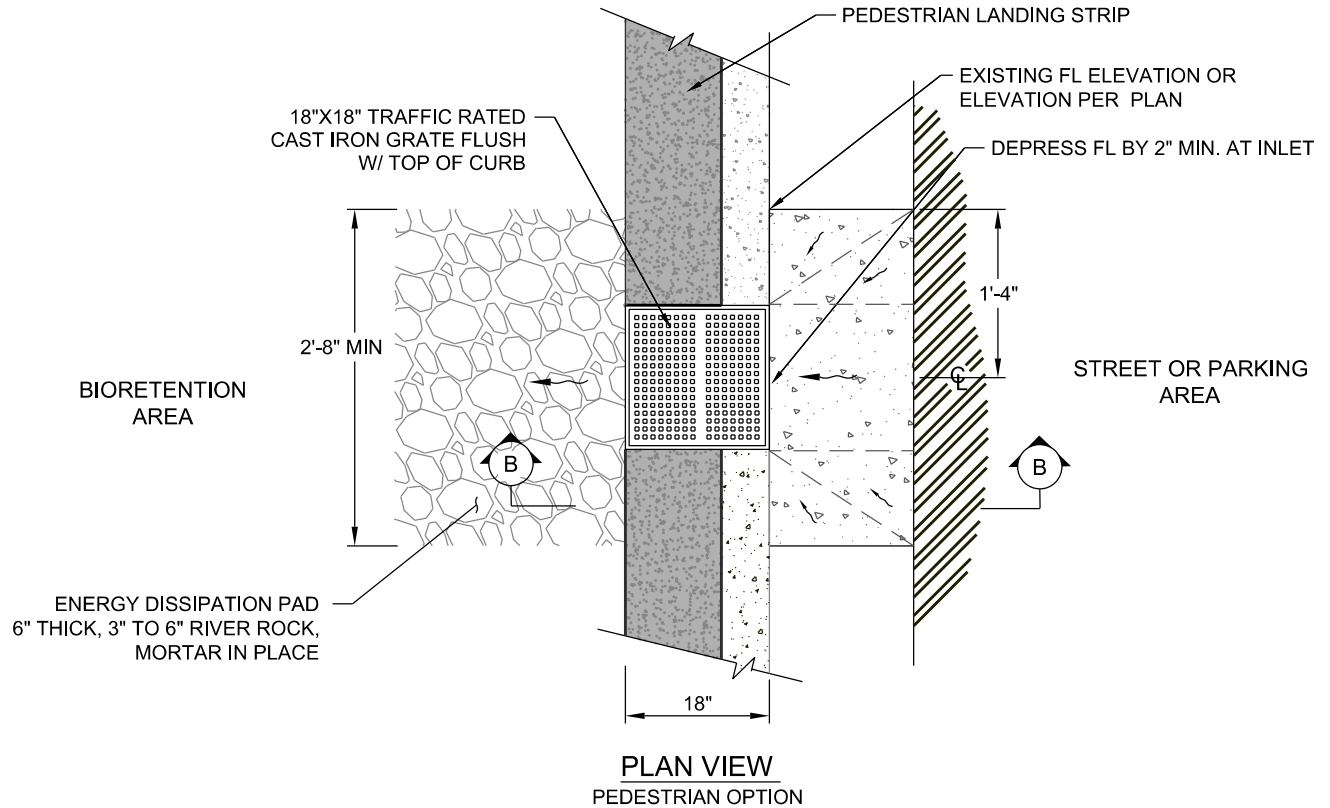
ELEVATION

NOTES:

1. ENERGY DISSIPATION PAD PROVIDED AS STABILIZED ENTRANCE TO BIORETENTION SYSTEM. ROCK SHALL BE PLACED IN IRREGULAR PATTERN USING NON-UNIFORM SIZES TO PREVENT PREFERENTIAL FLOW PATHS, INCREASE ENERGY DISSIPATION, AND TO LIMIT THE SURFACE AREA OF EXPOSED MORTAR. ALTERNATIVE PRE-TREATMENT SOLUTIONS WILL BE CONSIDERED.
2. WHERE NECESSARY, EXTEND GUTTER TO 2.5' WIDTH TO ACCOMMODATE TRASH CONTAINER PLACEMENT.
3. ROCK AND MORTAR INLET PROTECTION SHALL EXTEND ACROSS BOTTOM OF BIORETENTION TO OPPOSITE TOE OF SLOPE, OR 2' MINIMUM. FINISH GRADE OF MORTARED BOTTOM SHALL BE AT LEAST 3" BELOW ADJACENT BIORETENTION BOTTOM ELEVATION TO PROVIDE SEDIMENT STORAGE.
4. ATTACHMENT OF 30 MIL IMPERMEABLE LINER TO CONCRETE CURBS (USING CONCRETE ANCHORS SPACED AT MAXIMUM 18" O. C. AND BATTEN STRIPS) SHALL BE DONE IN ACCORDANCE WITH ASTM 6497.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB-CUT INLET (TAPERED STREET RELIEF)	
	GSI-03.1	

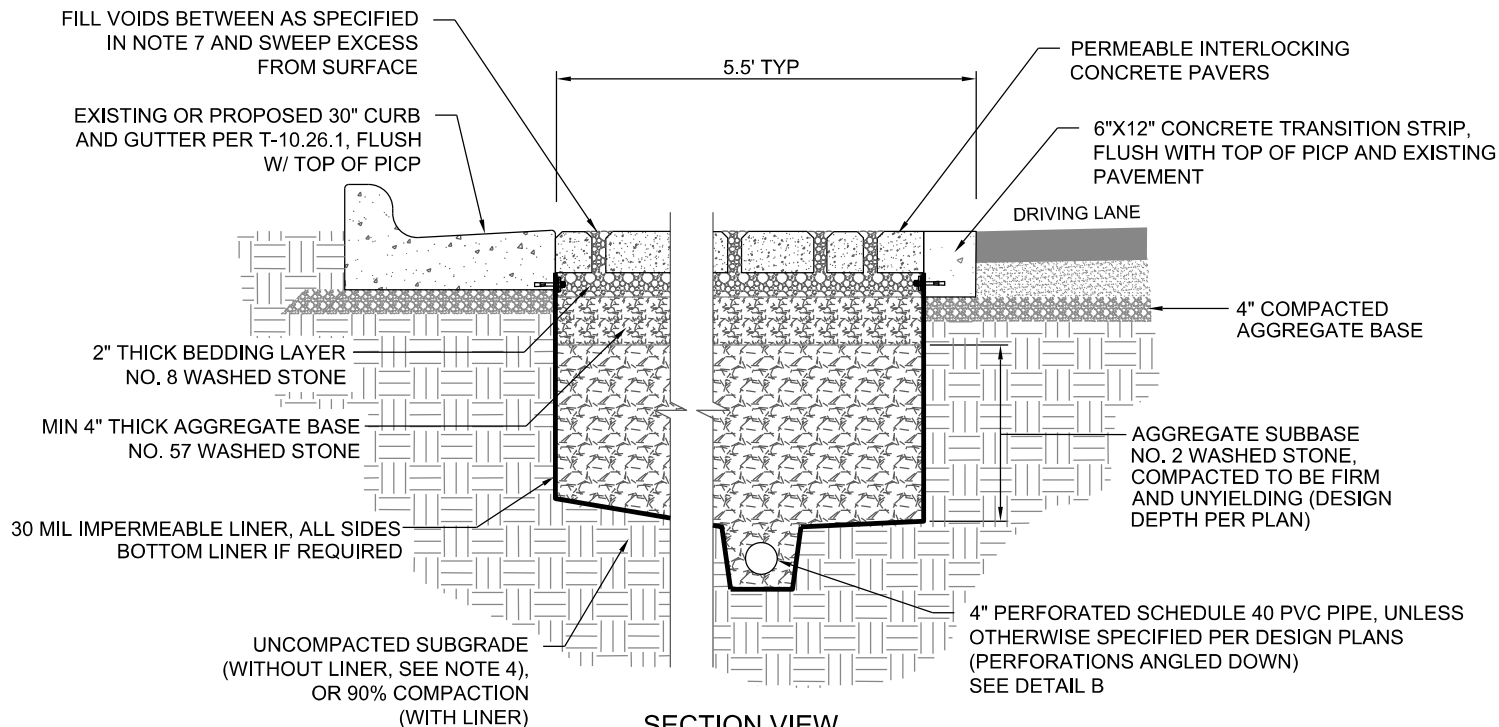


NOTES:

1. CURB CUT SHALL BE 18" WIDE WITH VERTICAL SIDES.
2. GRATE FRAME SHALL BE CAST INTO TOP EDGES OF CURB CUT SO GRATE IS FLUSH WITH TOP OF CURB AND PEDESTRIAN LANDING STRIP.
3. CONCRETE CURB EXTENSIONS ARE RECOMMENDED WHERE PARKING IS IMMEDIATELY ADJACENT AND/OR WHERE SPEED LIMITS EXCEED 35 MPH. POUR 1' WIDE CONCRETE EXTENDED CURB MONOLITHICALLY WITH THE PROPOSED CURB AND GUTTER. OTHERWISE, ANCHOR CONCRETE STRIP TO EXISTING CURB WITH OILED OR GREASED BAR (1/2"X 9") AT 24" O.C. INSTALL BAR 3" INTO THE EXISTING CURB. USE CONCRETE ADHESIVE ON THE EXISTING CURB.
4. GRATE SHALL BE COMPLIANT WITH AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS.
5. ATTACHMENT OF 30 MIL IMPERMEABLE LINER TO CONCRETE CURBS (USING CONCRETE ANCHORS SPACED AT MAXIMUM 18" O. C. AND BATTEN STRIPS) SHALL BE DONE IN ACCORDANCE WITH ASTM 6497

CITY OF RALEIGH
STANDARD DETAIL

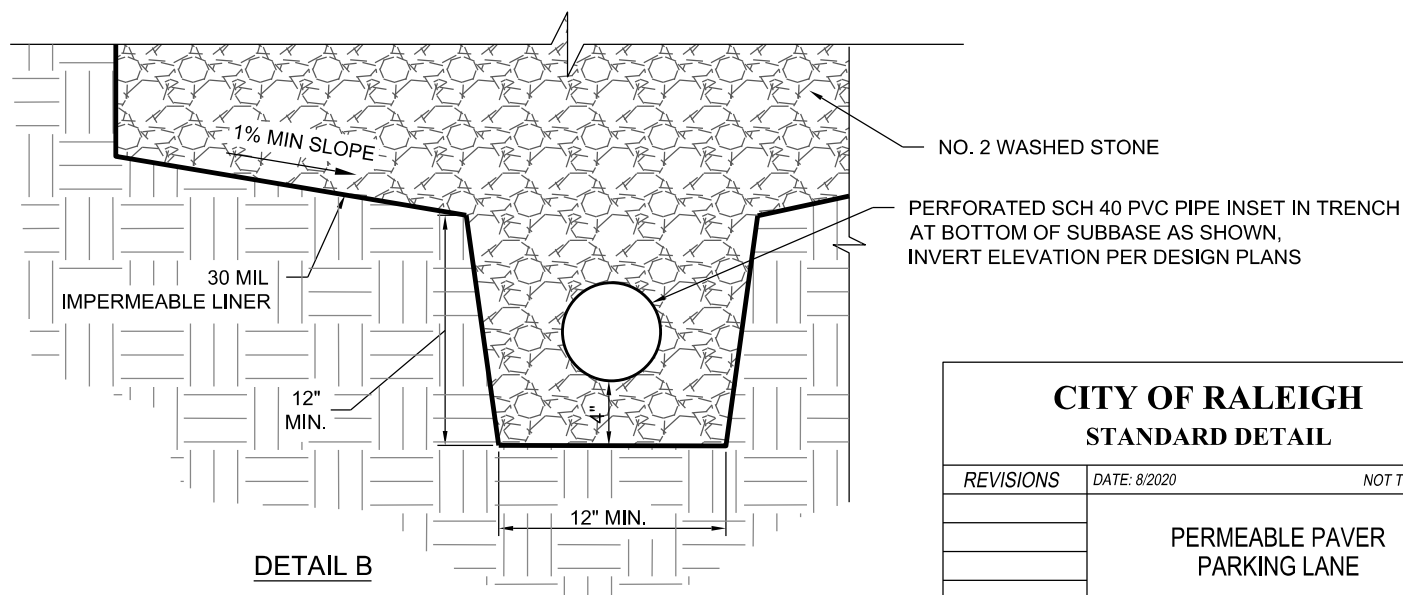
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB-CUT INLET (CAST IRON GRATE)	
	GSI-03.2	



SECTION VIEW

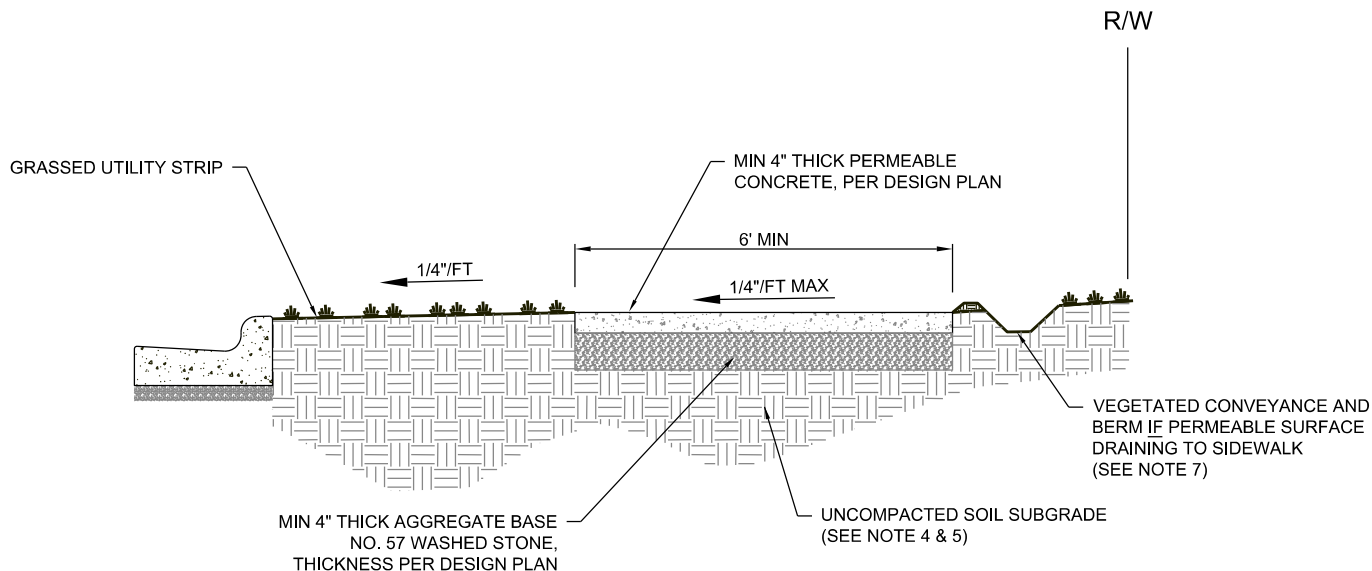
NOTES:

1. ALL PICP SHALL CONFORM TO ASTM C936 AND ADA DESIGN GUIDELINES.
2. SLOPE OF SOIL SUBGRADE SHALL BE 0.5% OR LESS. MAXIMUM PICP SURFACE SLOPE SHALL BE 6%.
3. THE SEASONAL HIGH WATER TABLE SHALL HAVE A MINIMUM 2 FT SEPARATION FROM THE BOTTOM OF THE AGGREGATE SUBBASE.
4. IN HSG B, C, OR D SOILS, THE SURFACE OF THE SUBGRADE UNDER INFILTRATING PICP SYSTEMS SHOULD BE SCARIFIED, RIPPED, OR TRENCHED IMMEDIATELY PRIOR TO AGGREGATE SUBBASE PLACEMENT TO MAINTAIN PRE-CONSTRUCTION SUBGRADE INFILTRATION RATE.
5. THE INCLUSION OF AN UNDERDRAIN SYSTEM WITH IMPERMEABLE LINER (INCLUDING BOTTOM LAYER) IS DEPENDENT UPON THE RESULTS OF THE GEOTECHNICAL INVESTIGATION CONSISTENT WITH THE GUIDANCE PROVIDED IN THE NCDEQ STORMWATER DESIGN MANUAL AND CITY OF RALEIGH DESIGN MANUAL. IMPERMEABLE LINER SHALL BE HDPE, PVC, OR LDPE AND SHOULD BE INSTALLED SO THAT LINER EXPOSURE TO SUNLIGHT IS MINIMIZED.
6. ELEVATION GRADIENT BETWEEN THE CONCRETE GUTTER AND ADJACENT PICP SHALL NOT EXCEED 1/4"; OTHERWISE, PROVIDE 1:2 BEVEL ON EDGE OF GUTTER.
7. OPEN VOID FILL MEDIA AROUND PICP SHALL BE LARGER OF NO. 8, NO.9, OR NO. 89 STONE, WASHED AND FREE OF FINES, SUITABLE FOR PLACEMENT IN JOINT SIZE SPECIFIED BY MANUFACTURER.
8. BOTH PIPE PENETRATIONS AND ATTACHMENT OF 30 MIL IMPERMEABLE LINER TO CONCRETE CURBS (USING CONCRETE ANCHORS SPACED AT MAXIMUM 18" O.C. AND BATTEN STRIPS) SHALL BE DONE IN ACCORDANCE WITH ASTM 6497.
9. ALL AGGREGATE SIZED ACCORDING TO ASTM C136.
10. AASHTO LAYER COEFFICIENTS FOR OPEN-GRADED BASE AND SUBBASE SHALL RANGE BETWEEN 0.06 AND 0.10.
11. AASHTO MINIMUM LAYER COEFFICIENT OF 0.3 FOR PAVER AND BEDDING LAYERS IS RECOMMENDED.
12. LOCATE UNDERDRAIN AS SHOWN ON THE IMPROVEMENT PLANS. HORIZONTAL LOCATION MAY VARY WITHIN PAVEMENT SECTION AS LONG AS MINIMUM OFFSET DISTANCES AND BOTTOM SLOPES ARE MAINTAINED.
13. DEPTH OF PERFORATED PVC PIPE MAY BE ADJUSTED TO TIE INTO THE ADJACENT DRAINAGE INFRASTRUCTURE AS NEEDED.
14. ALTERNATE BOTTOM PROFILE OMITTING THE INSET TRENCH MAY BE USED AT DIRECTION OF ENGINEER SO LONG AS 1% MIN SLOPE TO UNDERDRAIN IS RETAINED.
15. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.



DETAIL B

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	PERMEABLE PAVER PARKING LANE	
	GSI-04	

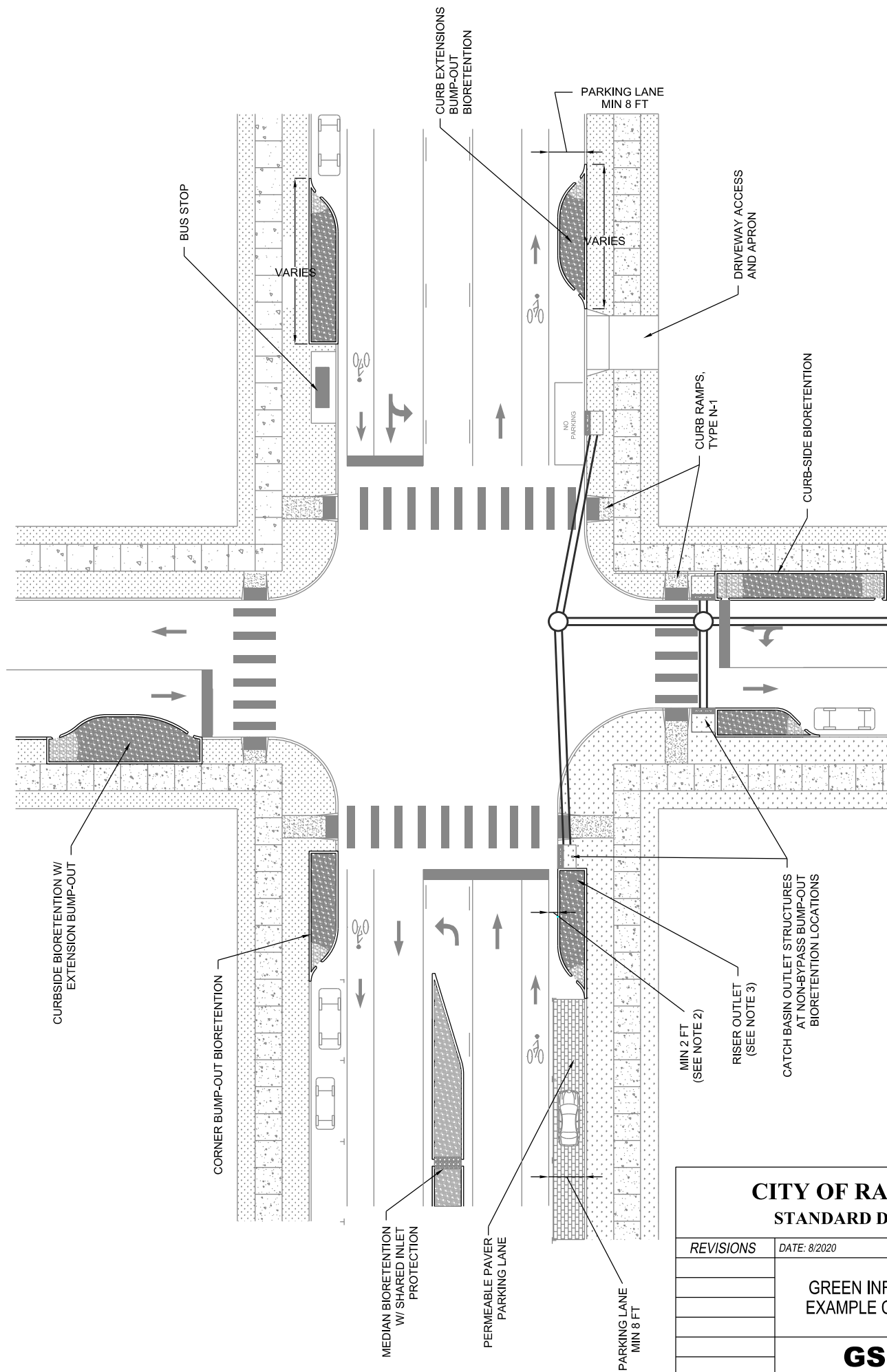


SECTION VIEW

NOTES:

1. MATERIALS AND CONSTRUCTION OF PERMEABLE CONCRETE (PC) SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS: MIX DESIGN (ACI 522.1); FRESH UNIT WEIGHTS AND VOIDS (ASTM C1688); FIELD INFILTRATION (ASTM C1701); RAVELING POTENTIAL (ASTM C1747); HARDENED UNIT WEIGHT AND VOID CONTENT (ASTM C1754).
2. RECOMMENDED VOIDS RATIO FOR PC IS 20% (15-25% ACCEPTABLE).
3. SLOPE OF SOIL SUBGRADE SHALL BE 0.5% OR LESS. MAXIMUM PC SURFACE SLOPE SHALL BE 6%.
4. THE SEASONAL HIGH WATER TABLE SHALL BE 2 FEET BELOW THE BOTTOM OF THE AGGREGATE BASE.
5. IN HSG B, C, OR D SOILS, THE SURFACE OF THE SUBGRADE SHOULD BE SCARIFIED, RIPPED, OR TRENCHED IMMEDIATELY PRIOR TO AGGREGATE SUBBASE PLACEMENT TO MAINTAIN PRE-CONSTRUCTION SUBGRADE INFILTRATION RATE.
6. THE INCLUSION OF AN UNDERDRAIN SYSTEM WITH IMPERMEABLE LINER (INCLUDING BOTTOM LAYER) IS DEPENDENT UPON THE RESULTS OF THE GEOTECHNICAL INVESTIGATION CONSISTENT WITH THE GUIDANCE PROVIDED IN THE NCDEQ STORMWATER DESIGN MANUAL AND CITY OF RALEIGH DESIGN MANUAL.
7. IF PERMEABLE RUNOFF DRAINS TO THE PC SIDEWALK, A VEGETATED CONVEYANCE DIVERSION SHALL BE INSTALLED UPGRADIENT AND SIZED FOR SAFE CONVEYANCE OF THE 10-YR, 24-HR STORM. CONVEYANCE DIVERSION SHALL DISCHARGE TO STORM DRAINAGE SYSTEM AND NOT ON OR ACROSS PC SIDEWALK.
8. IMPERMEABLE RUNOFF IS ALLOWED TO DRAIN TO THE PC SIDEWALK IN ACCORDANCE WITH DESIGN CRITERIA PROVIDED IN CHAPTER 18 OF THE NCDEQ STORMWATER DESIGN MANUAL.
9. ALL AGGREGATE SIZED ACCORDING TO ASTM C136.
10. IF REQUIRED BASED ON SITE CONDITIONS, INCLUDING SIGNIFICANT IMPERVIOUS RUN-ON VOLUMES, LOCATE UNDERDRAIN AS SHOWN ON THE IMPROVEMENT PLANS. HORIZONTAL LOCATION MAY VARY WITHIN PAVEMENT SECTION AS LONG AS MINIMUM OFFSET DISTANCES AND BOTTOM SLOPES ARE MAINTAINED. DEPTH OF PERFORATED PVC PIPE MAY BE ADJUSTED TO TIE INTO THE ADJACENT DRAINAGE INFRASTRUCTURE AS NEEDED.
11. ALL MATERIAL SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	PERMEABLE CONCRETE SIDEWALK	
	GSI-05	



PLAN VIEW

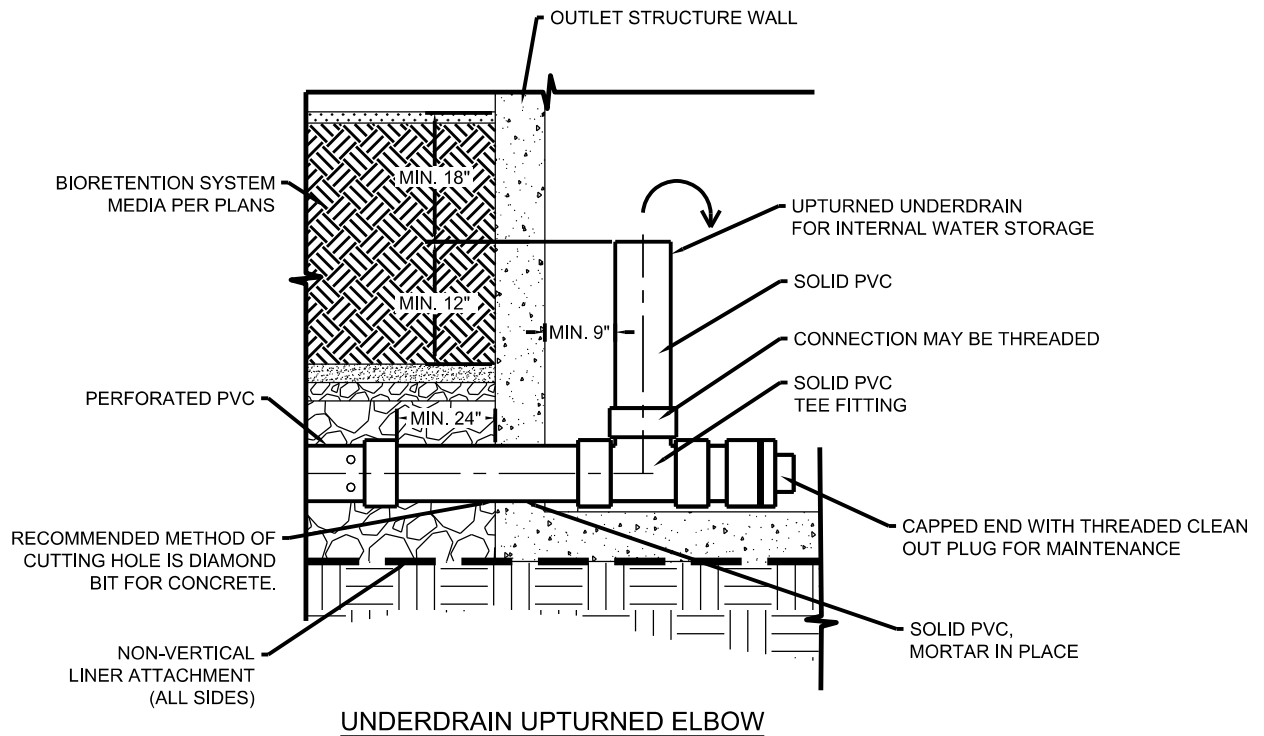
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	GREEN INFRASTRUCTURE EXAMPLE CONFIGURATION	
	GSI-06.1	

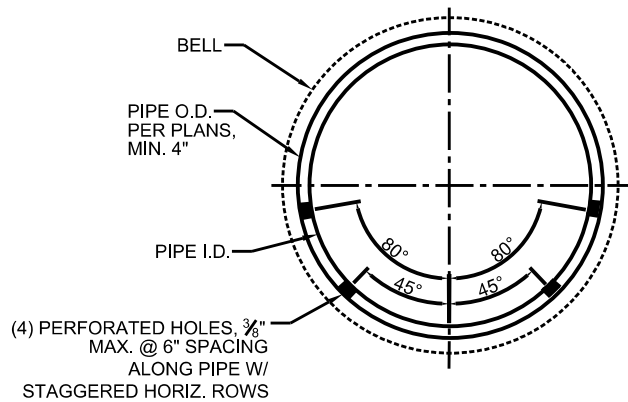
NOTES:

1. SELECTION OF BUMP-OUT BIORETENTION TYPE AND LOCATION DEPENDS ON ROADWAY DESIGN CONDITIONS AND ARE ASSUMED TO BE INSTALLED IN CONJUNCTION WITH RETROFIT/STREET IMPROVEMENT PROJECTS.
2. IN ALL CASES, BUMP-OUTS MUST MAINTAIN REQUIRED GUTTER SPREAD TO SAFELY PASS OVERFLOW FROM THE 2-YR STORM (I.E., PONDED WATER LESS THAN 1/2 LANE WIDTH FROM EDGE OF CURB).
3. WHERE NECESSARY, RISER STRUCTURES SIZED FOR THE 2-YR STORM SHALL BE LOCATED WITHIN BUMP-OUT BIORETENTION. ALL BIORETENTION BUMP-OUTS SHALL BE DESIGNED TO BYPASS STORMS LARGER THAN THE 2-YR EVENT.
4. ALL BIORETENTION AND PERMEABLE PAVEMENT UNDERDRAINS, IF REQUIRED, SHALL CONNECT TO STORM DRAIN OR OTHER DRAINAGE FEATURE ACCEPTABLE TO THE CITY ENGINEER.
5. ALL FEATURES, INCLUDING VEGETATION, INTERGRATED INTO BUMP-OUT BIORETENTION SHALL MEET SIGHT DISTANCE REQUIREMENTS PER STREET DESIGN MANUAL AND RECOMMENDED PLANT SPECIES IN THE NC DEQ STORMWATER BMP MANUAL AND CITY OF RALEIGH STORMWATER DESIGN MANUAL.
6. ROADWAY FEATURES AND PAVEMENT MARKINGS ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS AND MARKINGS SHALL CONFORM TO THE CITY OF RALEIGH STREET DESIGN MANUAL.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	GREEN INFRASTRUCTURE GENERAL NOTES	
	GSI-06.2	



UNDERDRAIN UPTURNED ELBOW

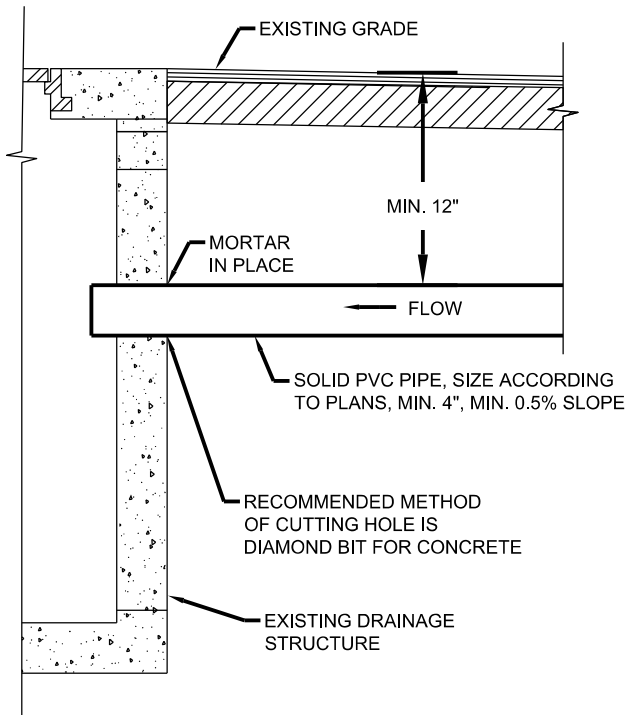


PERFORATED HOLE PLACEMENT

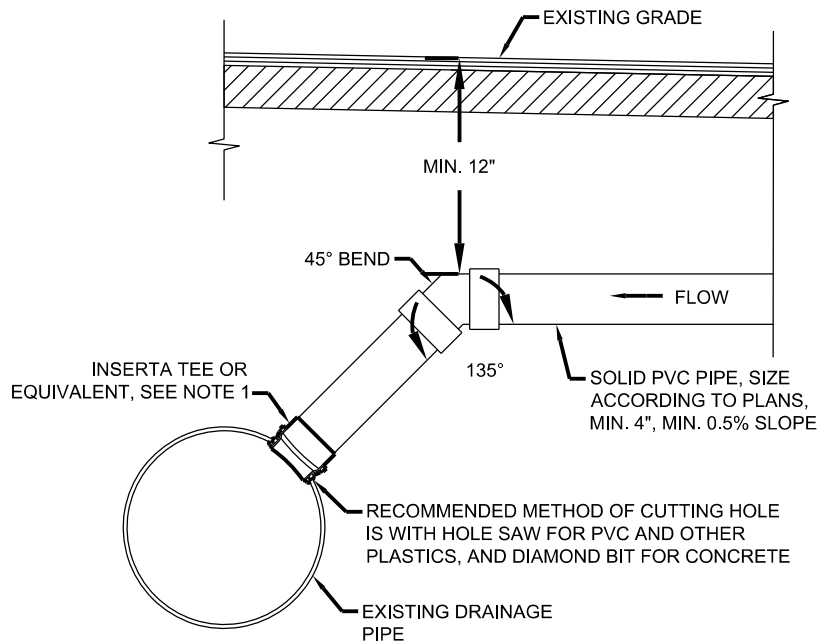
NOTES:

1. PLACEMENT OF THE UNDERDRAIN SHALL BE IN ACCORDANCE WITH THE APPROVED IMPROVEMENT PLANS, OR AS INDICATED BY THE CITY ENGINEER. HORIZONTAL LOCATION MAY VARY AS LONG AS MINIMUM OFFSET DISTANCES AND BOTTOM SLOPES ARE MAINTAINED.
2. PERFORATED PLASTIC PIPE SHALL BE SMOOTH-WALL PVC PLASTIC PIPE HAVING A CELL CLASSIFICATION OF 12454 OR 13364, AS DEFINED IN ASTM D1784.
3. PIPE, FITTING, AND JOINT DIMENSIONS SHALL BE COMPATIBLE AND MEASURED IN ACCORDANCE WITH ASTM D 2122. FITTING AND JOINT MATERIAL SHALL BE COMPATIBLE WITH THE PIPE MATERIAL. GLUE OR PRESS FIT ALL JOINTS PER MANUFACTURER'S SPECIFICATIONS.
4. PIPE PENETRATIONS THROUGH IMPERMEABLE BARRIER SHALL BE SEALED ACCORDING TO PLANS.
5. DEPTH OF UNDERDRAIN MAY BE ADJUSTED TO TIE INTO THE ADJACENT CONNECTION POINT OF THE DOWNSTREAM DRAINAGE INFRASTRUCTURE, AS NEEDED, PER CITY ENGINEER'S APPROVAL.
6. DIMENSIONS OF PERFORATED PVC PIPE, SOLID PVC PIPE, AND ALL FITTINGS SPECIFIED IN PLANS.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2021	NOT TO SCALE
	UNDERDRAIN DETAIL	
	GSI-07.1	



CONNECTION TO EXISTING STORMWATER STRUCTURE



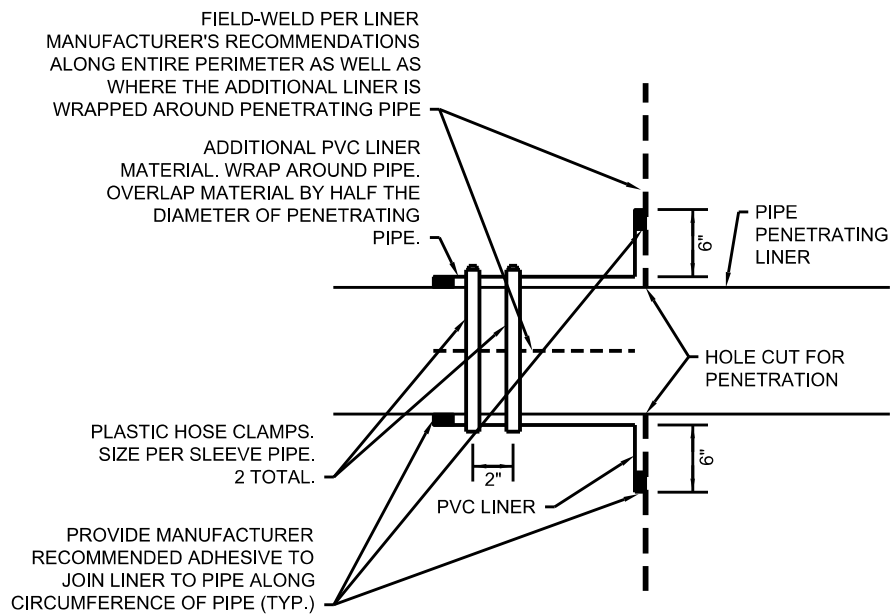
CONNECTION TO EXISTING STORMWATER PIPE

NOTES

1. INSTALL INSERTA TEE PER MANUFACTURER'S SPECIFICATIONS.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 08/2021	NOT TO SCALE
	UNDERDRAIN CONNECTION TO EXISTING INFRASTRUCTURE	
	GSI-07.2	



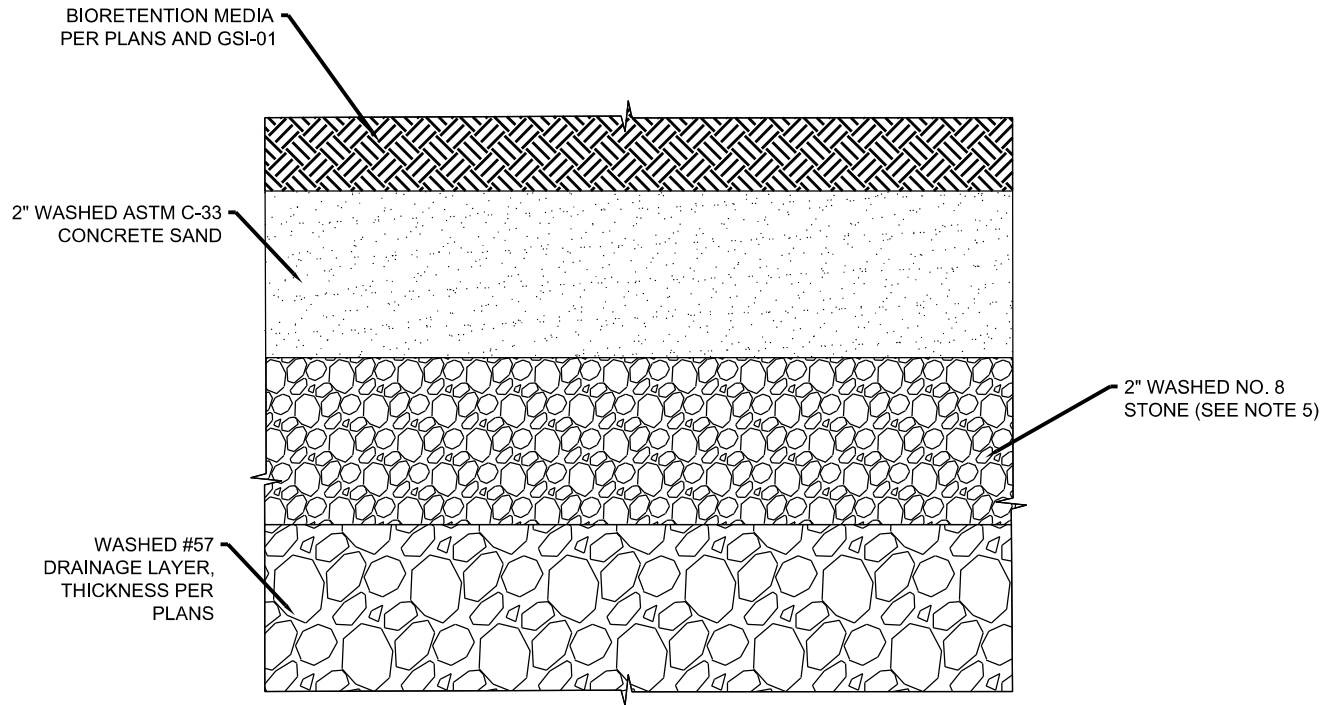
LINER PENETRATION

NOTE:

1. CONTACT UTILITY OWNER FOR SLEEVE, COVERAGE, AND OTHER CROSSING REQUIREMENTS.
2. INCLUDE SLEEVE WITHIN PVIOUS PAVEMENT SIMILAR TO THIS DETAIL.
3. CROSSING MAY PASS THROUGH SOIL MEDIA FILTER COURSE OR UNDERDRAIN GRAVEL LAYERS AND ARE NOT RESTRICTED TO THE SOIL AS SHOWN HEREIN.

CITY OF RALEIGH STANDARD DETAIL

REVISIONS	DATE: 08/2021	NOT TO SCALE
	LINER PENETRATION DETAIL	
GSI-08.2		



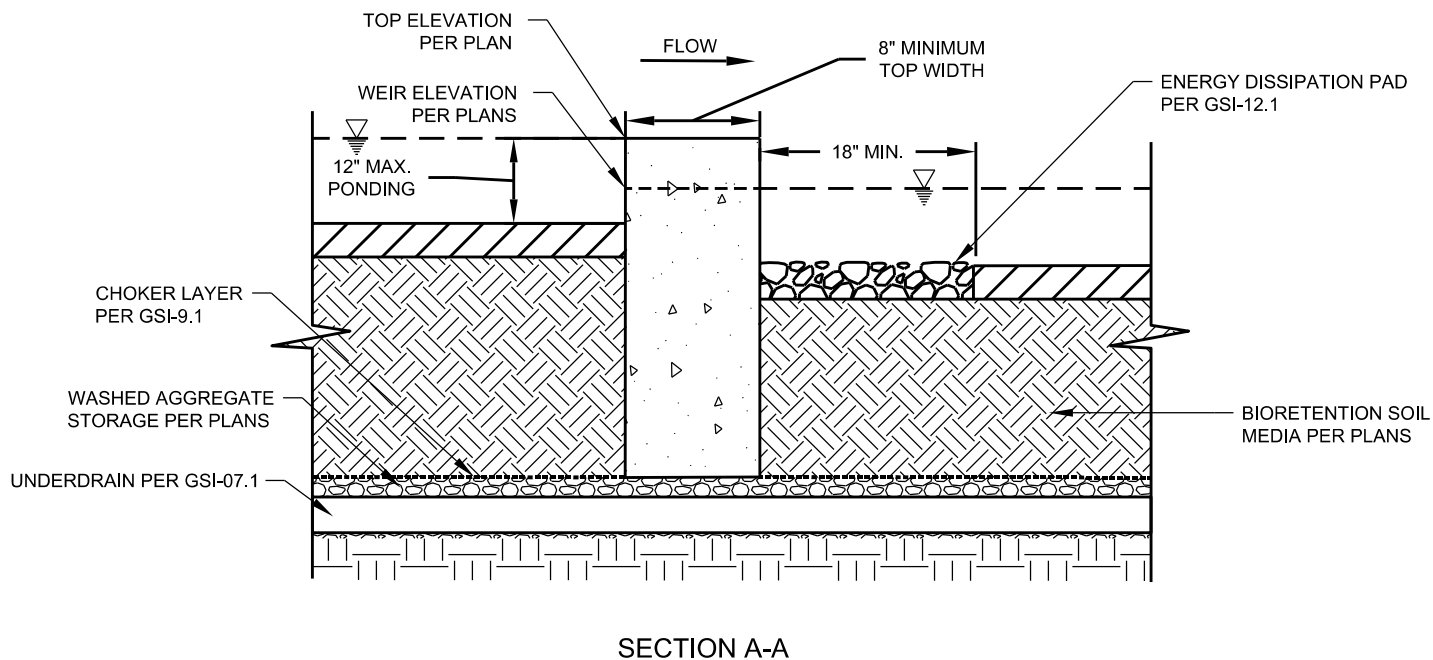
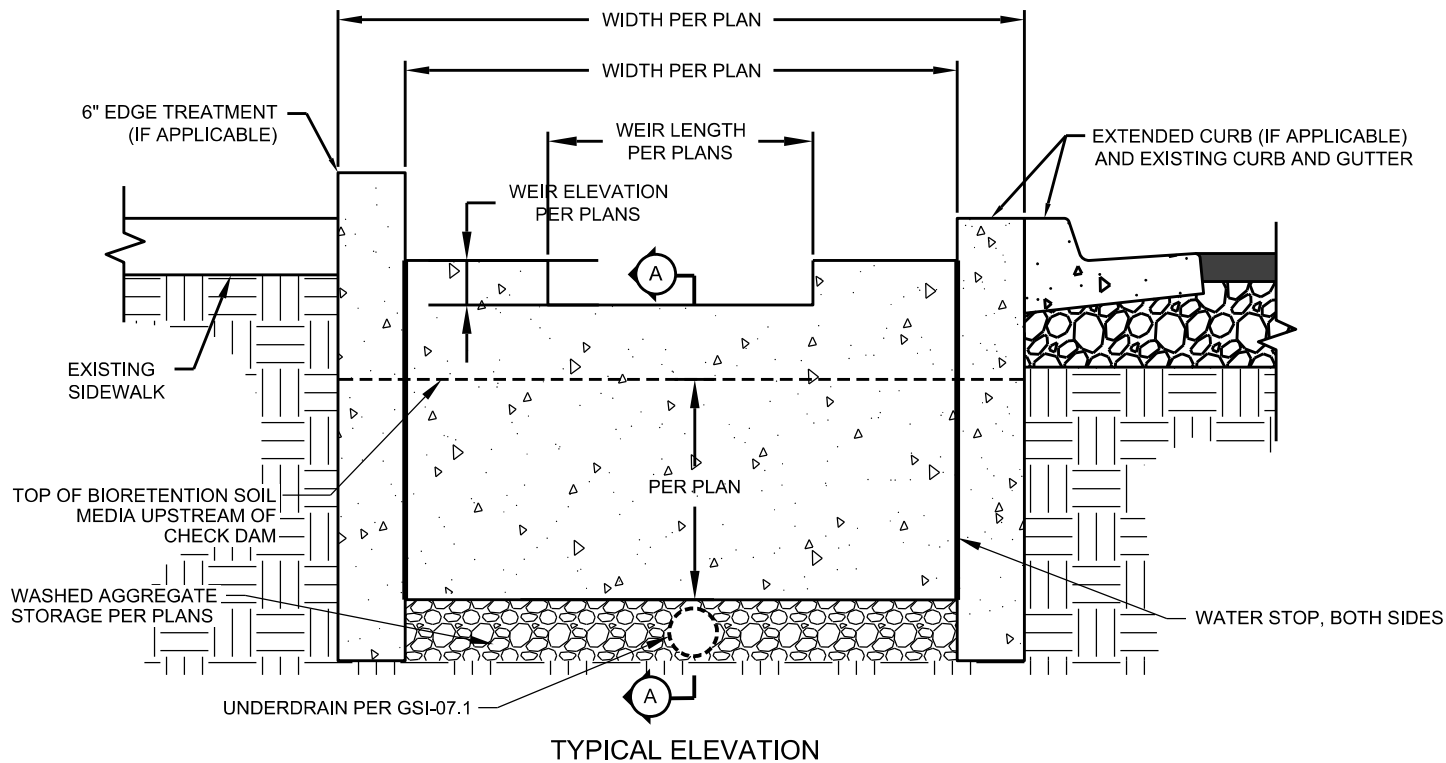
CHOKER LAYER DETAIL

NOTES

1. GRADED AGGREGATE FOR CHOKER LAYER SHALL BE WASHED AND CONFORM TO ASTM D-448.
2. SAND FOR THE CHOKER LAYER SHALL BE WASHED AND CONFORM TO ASTM C-33 CONCRETE SAND.
3. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.
4. SAND AND NO. 8 STONE LAYERS SHALL BE SPREAD USING HAND TOOLS TO ENSURE A CONSISTENT THICKNESS AND PREVENT VOIDS.
5. AGGREGATE MATERIAL SHALL BE NO. 8 STONE OR 78M (NCDOT SPECIFICATIONS).

CITY OF RALEIGH STANDARD DETAIL

REVISIONS	DATE: 08/2021	NOT TO SCALE
	TYPICAL CHOKER LAYER DETAILS	
	GSI-09	



NOTES:

1. REFER TO PLANS FOR HORIZONTAL AND VERTICAL CONTROL INFORMATION.

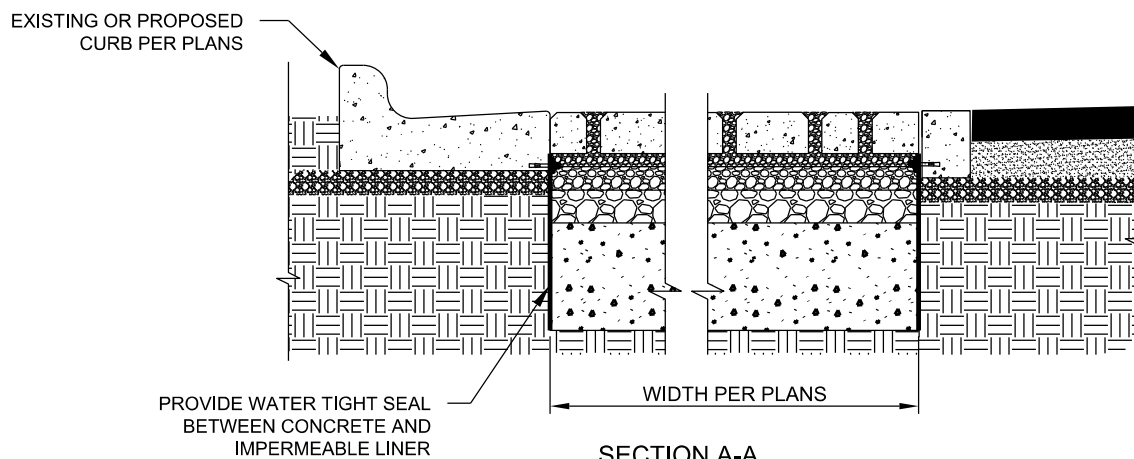
**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 08/2021	NOT TO SCALE
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LINEAR BIORETENTION
CHECK DAM DETAIL

GSI-11.1

TYPICAL ELEVATION

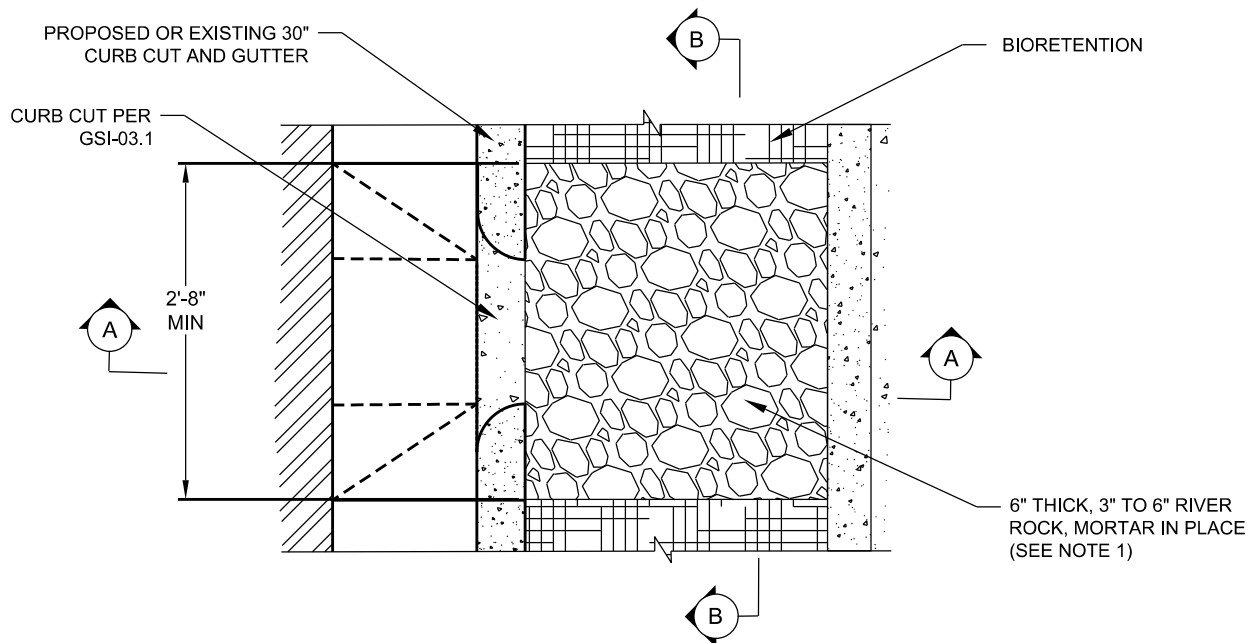


SECTION A-A

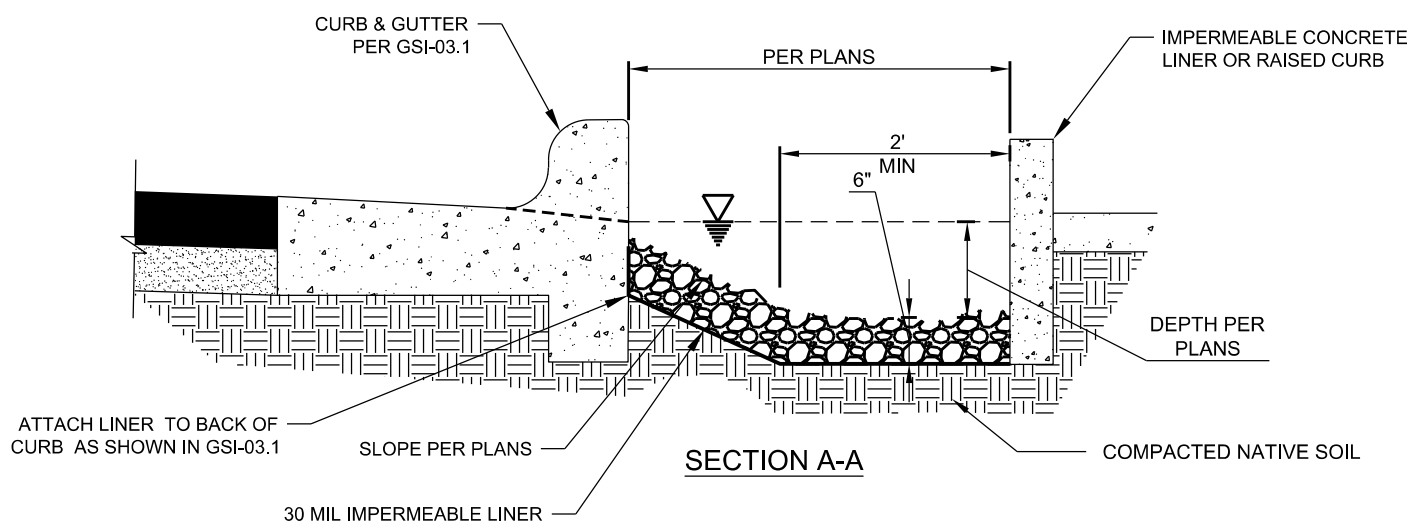
NOTES

1. CHECK DAMS TO BE USED UNDER PERMEABLE INTERLOCKING CONCRETE PAVERS WHERE INFILTRATION IS ALLOWED. IF THE SYSTEM IS FULLY LINED WITH NO INFILTRATION, CHECK DAMS ARE NOT NEEDED.
2. CONCRETE CHECK DAM EMBEDMENT PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. IF INCIDENTAL INFILTRATION IS ALLOWED ON POOR SOILS, OPTIONALLY INSTALL PERFORATED UNDERDRAIN PER GSI-07.1 AT ENGINEER'S DISCRETION.
4. CONCRETE SHALL BE 650-C-3250.

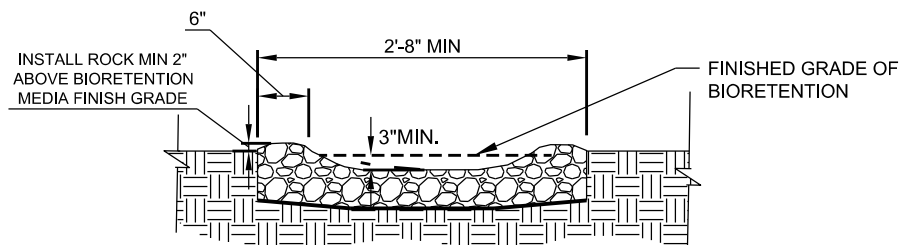
CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	DATE: 08/2021 NOT TO SCALE
	PERMEABLE PAVER SUB-SURFACE CHECK DAM DETAIL
	GSI-11.2



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. ENERGY DISSIPATION PAD PROVIDED AS STABILIZED ENTRANCE TO BIORETENTION SYSTEM. ROCK SHALL BE PLACED IN IRREGULAR PATTERN USING NON-UNIFORM SIZES TO PREVENT PREFERENTIAL FLOW PATHS, INCREASE ENERGY DISSIPATION, AND TO LIMIT THE SURFACE AREA OF EXPOSED MORTAR. ALTERNATIVE PRE-TREATMENT SOLUTIONS WILL BE CONSIDERED.
2. ROCK AND MORTAR INLET PROTECTION SHALL EXTEND ACROSS BOTTOM OF BIORETENTION TO OPPOSITE TOE OF SLOPE, OR 2' MINIMUM. FINISH GRADE OF MORTARED BOTTOM SHALL BE AT LEAST 3" BELOW ADJACENT BIORETENTION BOTTOM ELEVATION TO PROVIDE SEDIMENT STORAGE.

**CITY OF RALEIGH
STANDARD DETAIL**

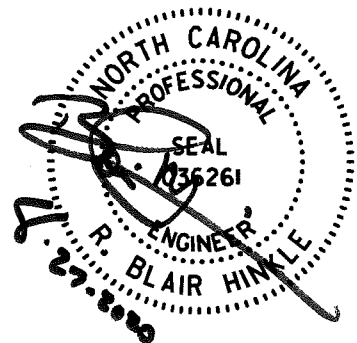
REVISIONS	DATE: 08/2021	NOT TO SCALE
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ENERGY DISSIPATION PAD

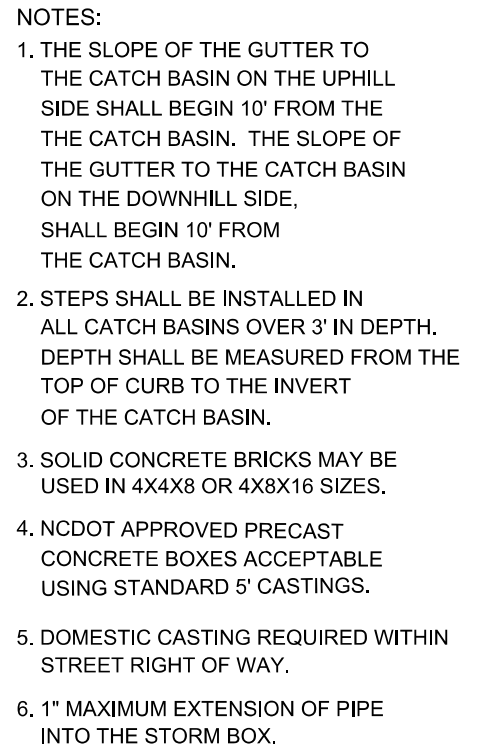
GSI-12

CITY OF RALEIGH

STANDARD DETAILS

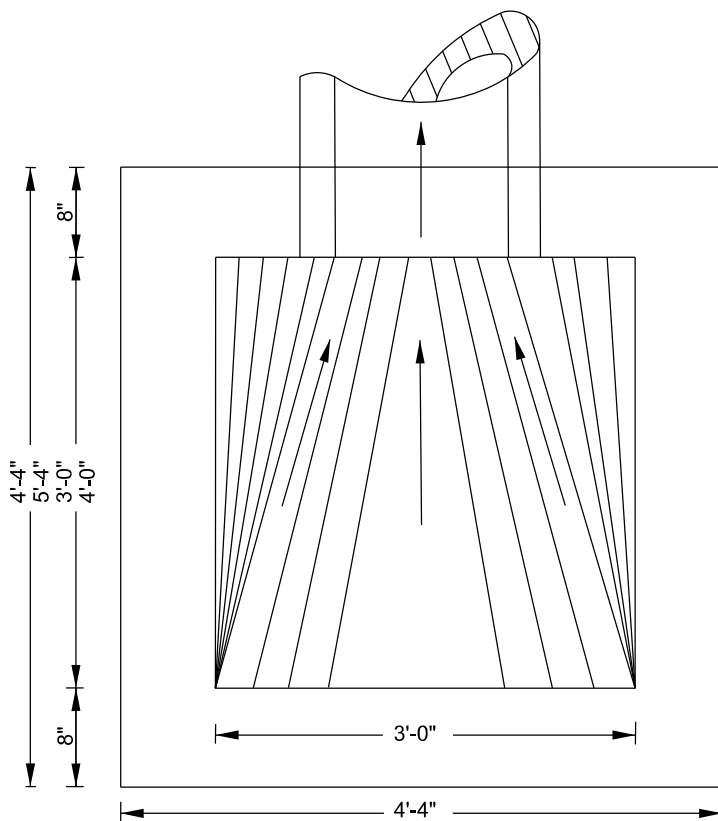


STORMWATER



CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	5' OM CATCH BASIN	
	SW-10.01	

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DOUBLE WIDTH CATCH BASIN	
	SW-10.02	

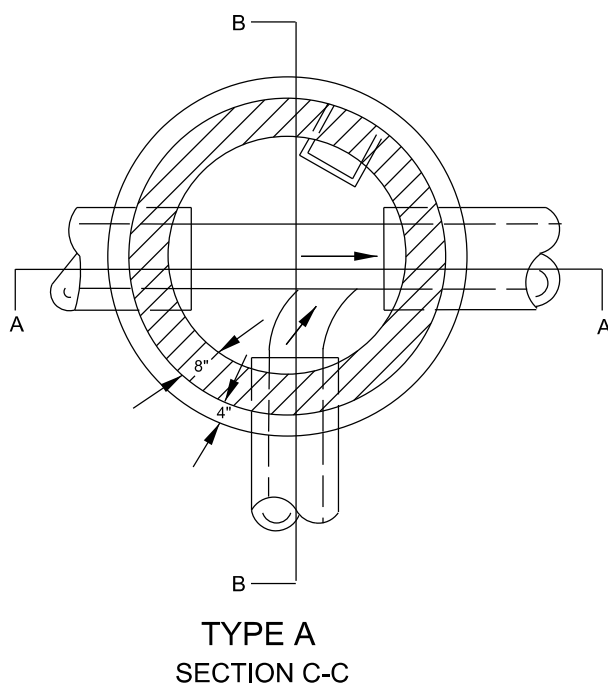
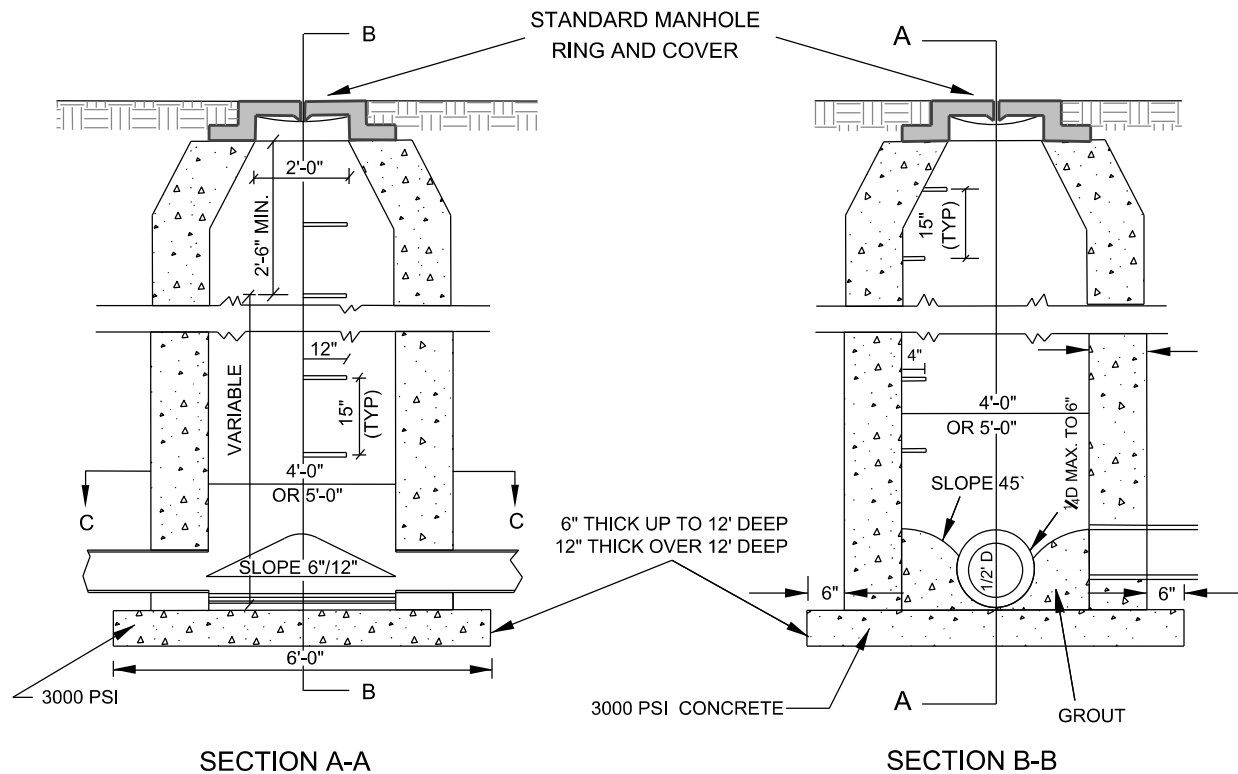


1. FOR 24" RCP & LARGER USE
PIPE DIAMETER PLUS 12" FOR
MINIMUM INSIDE DIMENSION.
2. 24" X 24" CASTING WITH 12",
15" & 18" PIPE, 24" X 36"
CASTING USED WITH 24" PIPE
OR LARGER. IF PLACED WITHIN
PUBLIC R/W CASTING MUST BE
TRAFFIC BEARING TYPE PER
NCDOT STANDARDS.
3. USE 4" X 4" X 8" OR 4" X 8" X 16"
SOLID CONCRETE BLOCK. CAST
IN PLACE OR PRECAST CONCRETE TO
MEET N.C.D.O.T. STANDARDS
ACCEPTABLE.
4. STEPS SHALL BE INSTALLED IN ALL
DROP INLETS OVER 3' IN DEPTH. DEPTH
SHALL BE MEASURED FROM THE TOP OF
GRATE TO THE INVERT OF THE DROP INLET.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD DROP INLET	
	SW-10.03	

TYPICAL MH FOR STORM SEWER

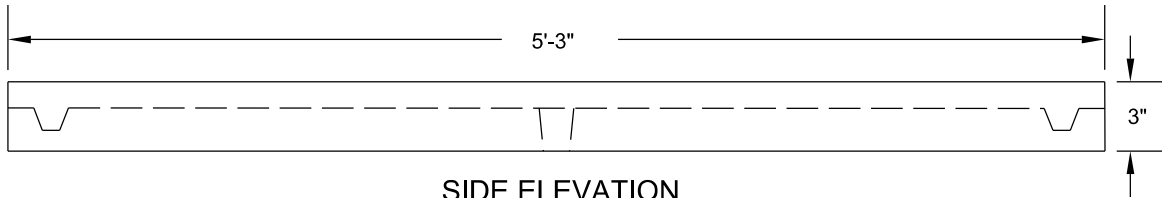
PIPE SIZE	MH DIAMETER
12-24"	4'-0"
30-42"	5'-0"
48"	6'-0"
54"	8'-0"



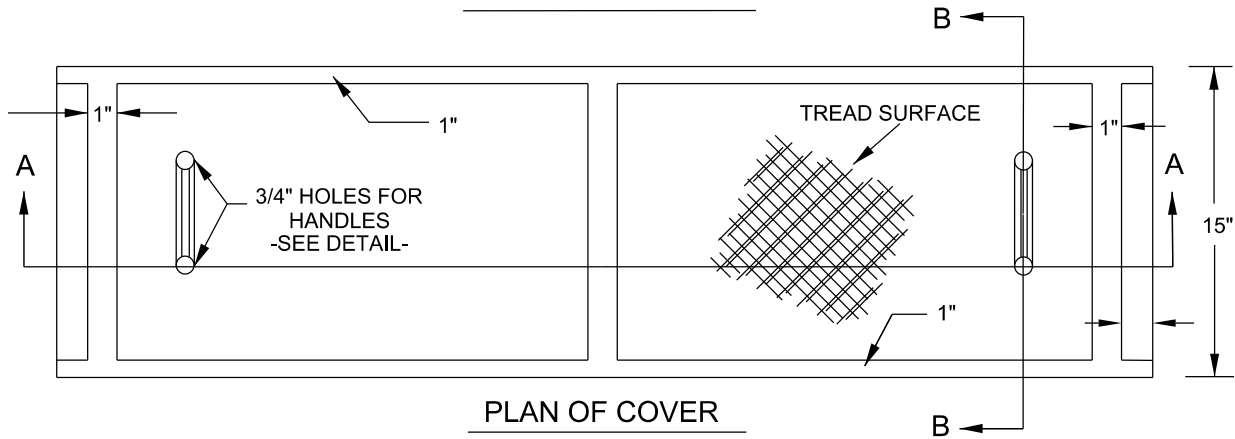
NOTES:

1. DEPTH MEASURED FROM TOP OF CASTING TO INVERT OF MANHOLE.
2. PRECAST MANHOLE COMPONENTS SHALL MEET ASTM-C-478 REQUIREMENTS.
3. SEE STANDARD. SW-10.10 FOR MANHOLE COVER DETAIL.
4. DOMESTIC CASTINGS REQUIRED WITHIN STREET RIGHT-OF-WAY.

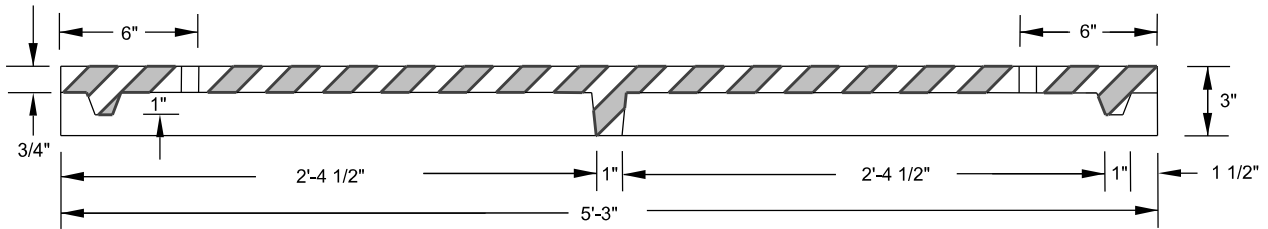
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD CLASS "A" MANHOLE	
	SW-10.05	



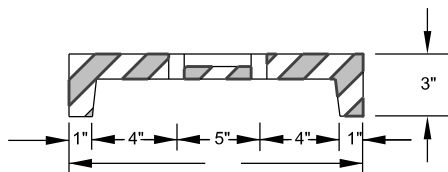
SIDE ELEVATION



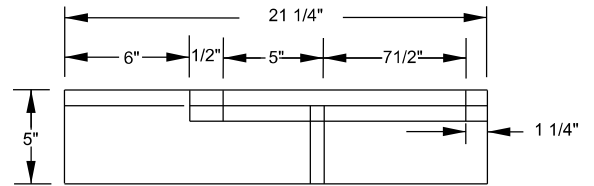
PLAN OF COVER



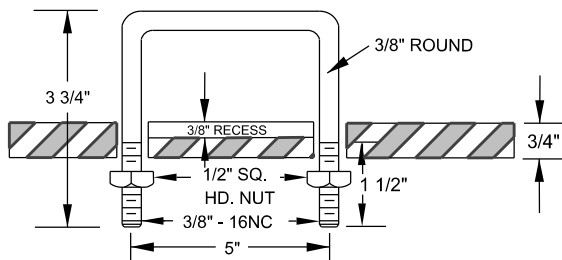
SECTION A-A



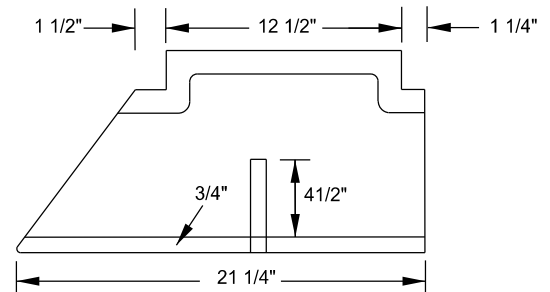
SECTION B-B



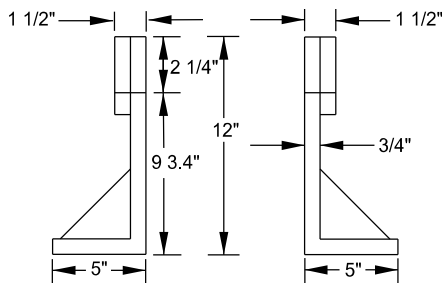
TOP VIEW



DETAIL OF HANDLE



SIDE ELEVATION



END ELEVATION

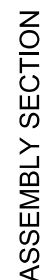
SHEET 1 OF 2

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS DATE: 8/2020 NOT TO SCALE

CATCH BASIN
CASTINGS

SW-10.06.1



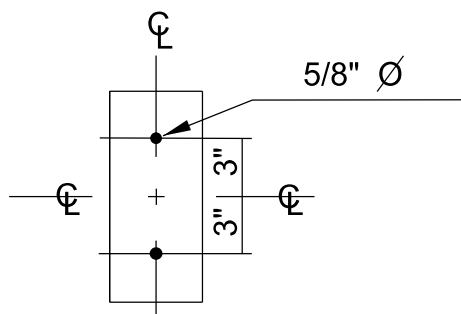
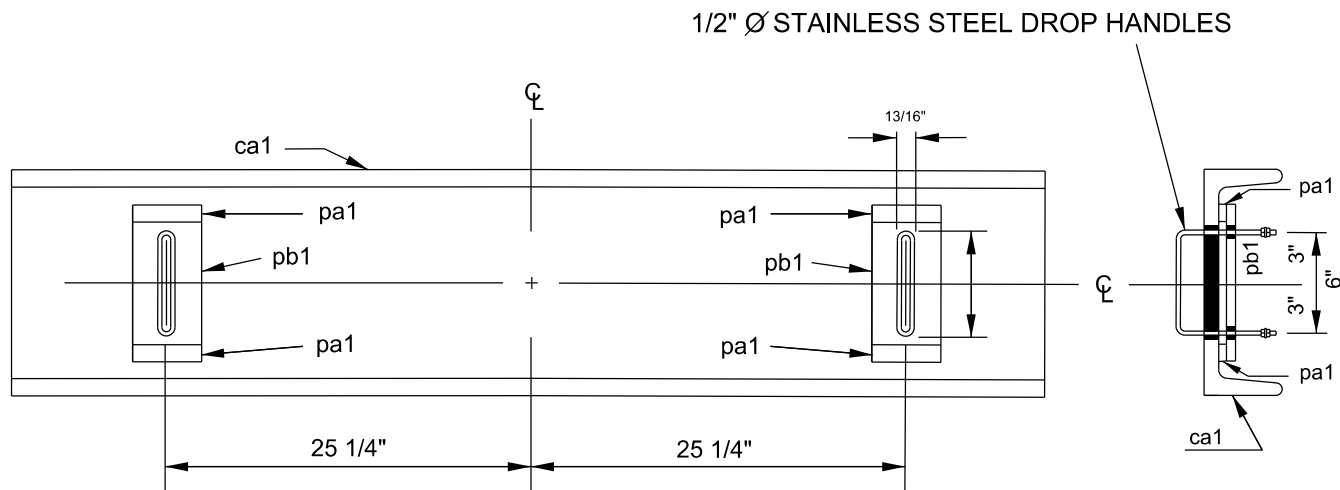
(3) 7/8"-9x3 3/4" LG HEX HD
BOLTS, NUTS (GRADE 8)
WITH LOCK WASHERS

USE EAST JORDAN
IRON WORKS, INC.
V-4096-2
FOR APPROVED EQUAL

SHEET 2 OF 2

CITY OF RALEIGH
STANDARD DETAIL

<i>REVISIONS</i>	<i>DATE: 8/2020</i>	<i>NOT TO SCALE</i>
	TWO PIECE CATCH BASIN COVER	
	SW-10.06.2	

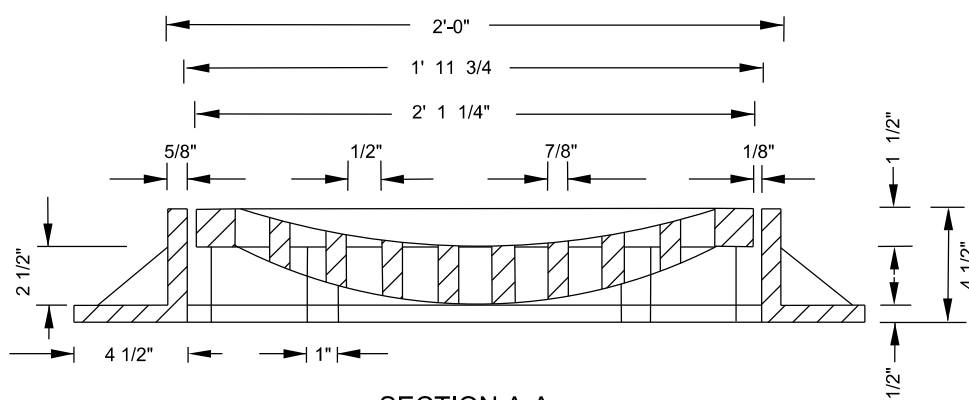
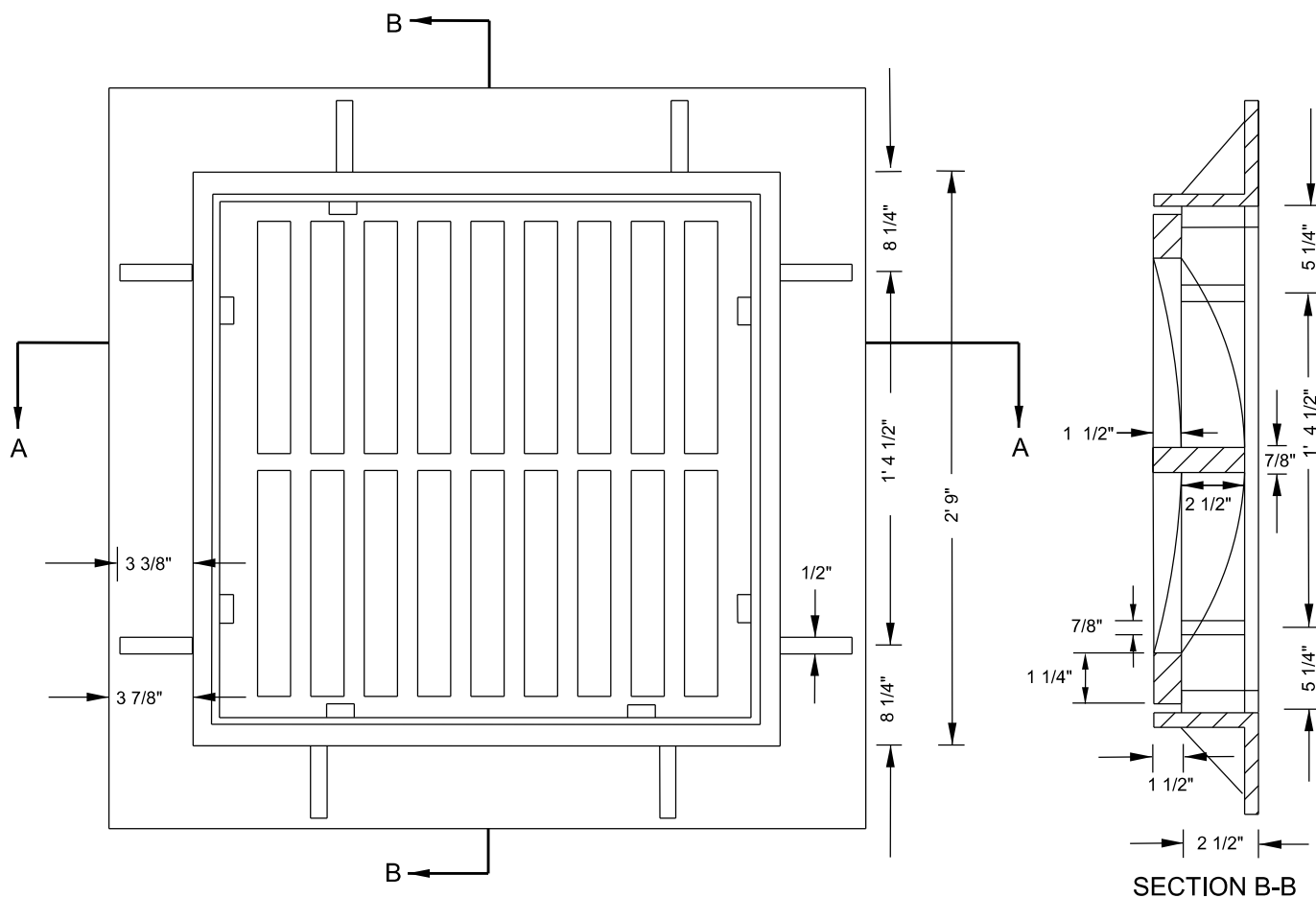


NOTES:
 PAINT WITH RUST INHIBITING BLACK PAINT.

**DETAIL OF
pb1 PLATES**

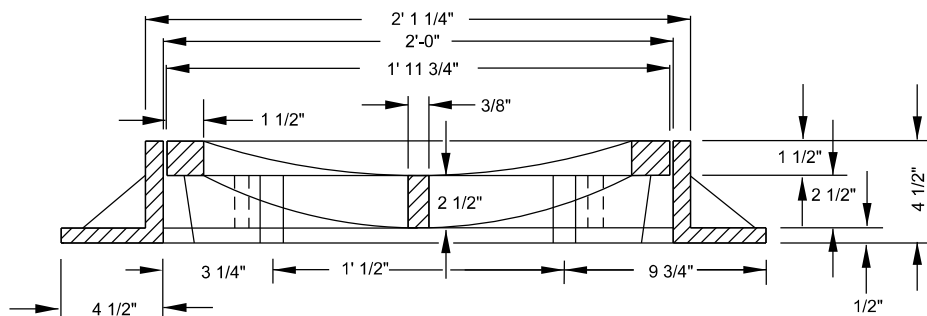
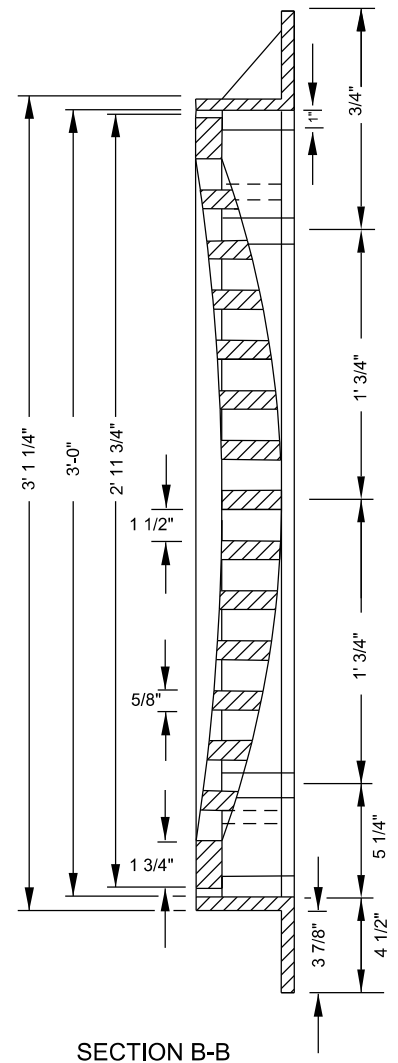
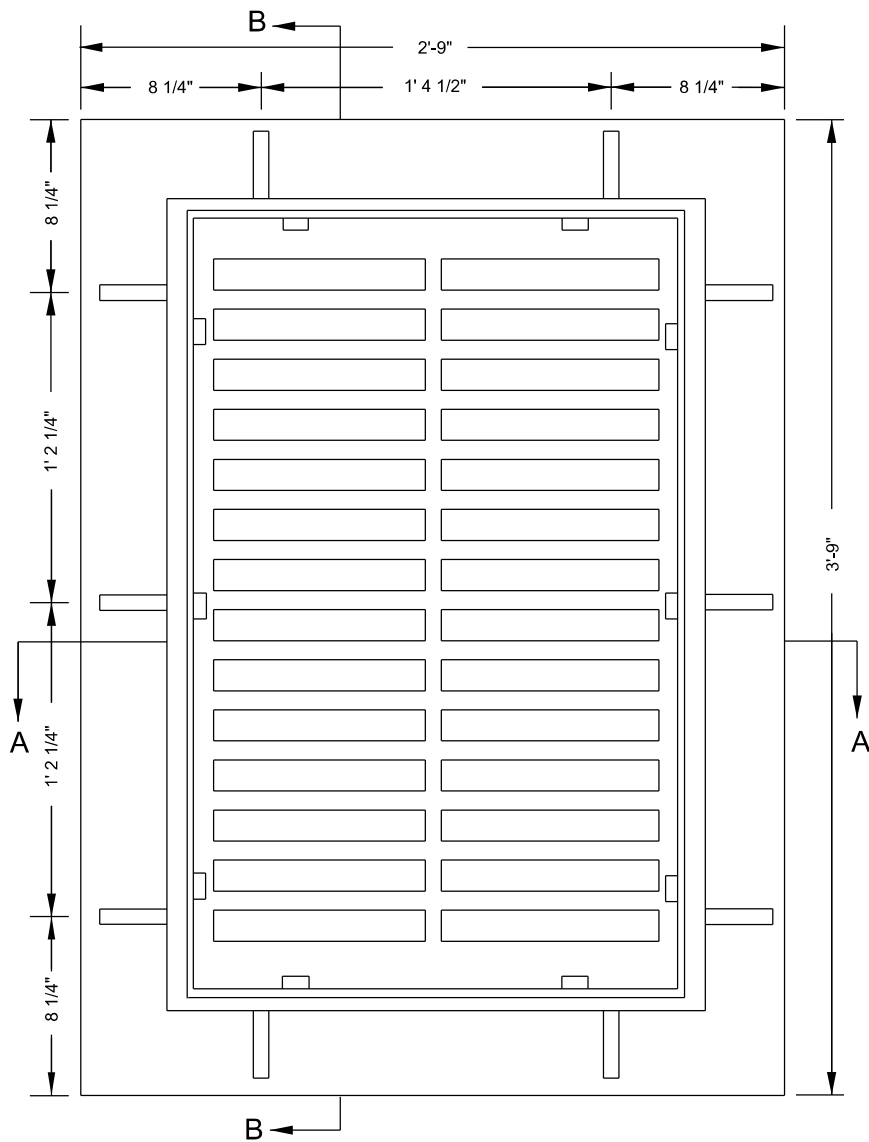
BILL OF MATERIAL		
MATERIAL LIST FOR ONE UNIT - MAKE () UNITS		
1	C15 X 33.9# CHANNEL 62 1/2"	MK-ca1
4	1/8" X 1" H.R. FLAT BAR 3"	MK-pa1
2	3/8" x 3" H.R. FLAT BAR 10"	MK-pb1
2	1/2" STAINLESS STEEL ROUND ROD 18"	
8	1/2" STAINLESS STEEL HEX NUTS	
4	1/2" STAINLESS STEEL FLAT WASHERS	

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CATCH BASIN STEEL TOP	
	SW-10.07	



STANDARD 24" X 24" DROP INLET CASTING

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DROP INLET CASTING	
	SW-10.08	

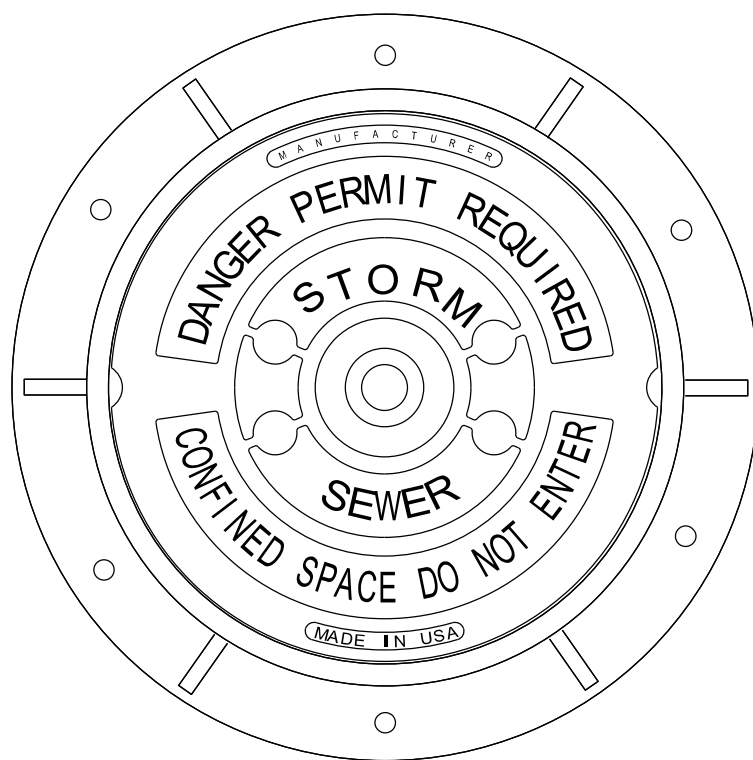


SECTION A-A

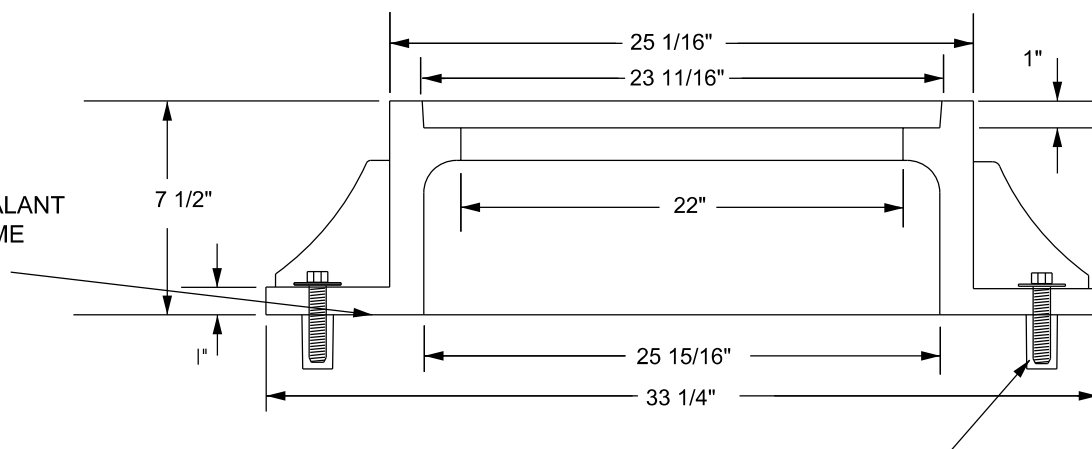
STANDARD 24" X 36"
DROP INLET CASTING

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD DROP INLET CASTING	
SW-10.09		



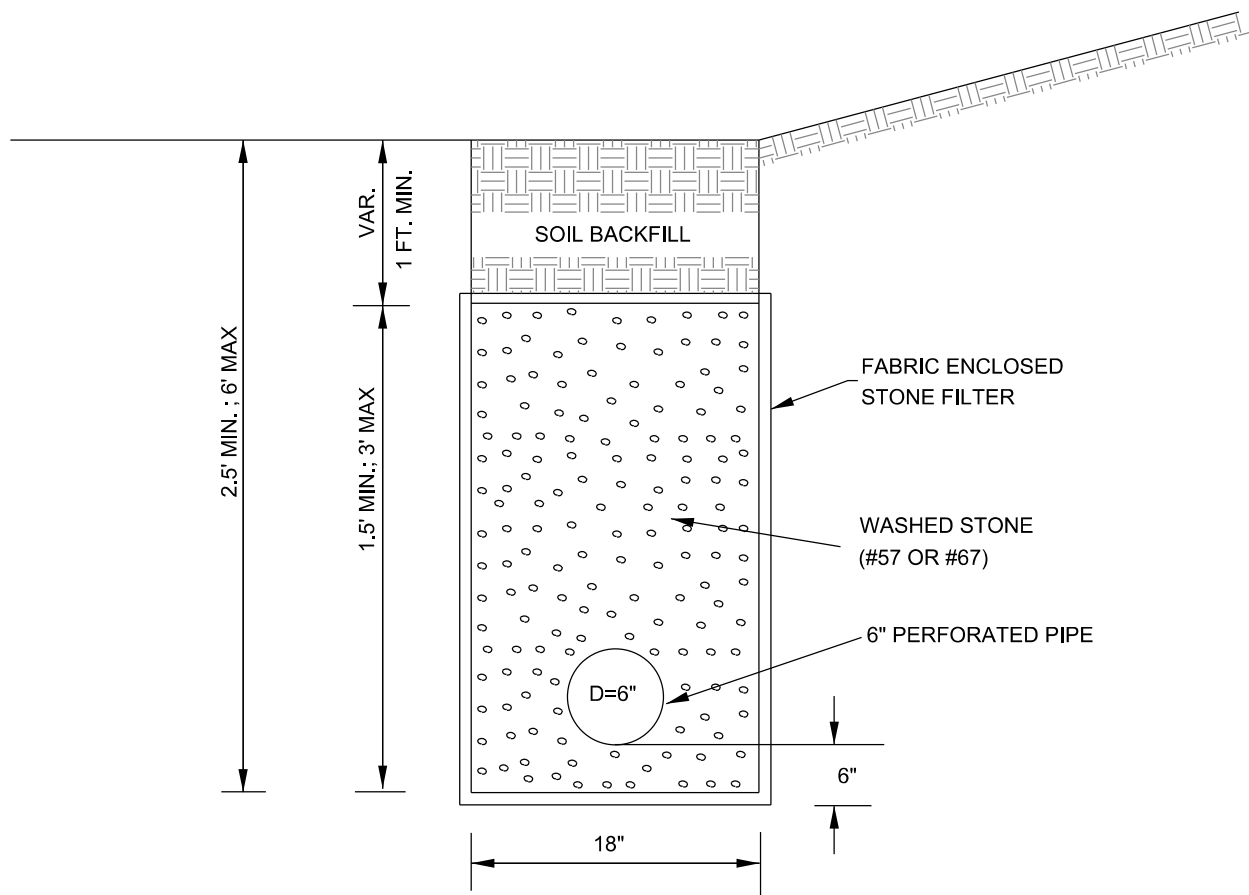
BUTYL-NEK OR
APPROVED SEALANT
BETWEEN FRAME
AND COVER



NOTES:

1. ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2. FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3. COVER SHALL WEIGH A MINIMUM OF 120 LBS.
4. ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACE SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH	
STANDARD DETAIL	
REVISIONS	DATE: 8/2020 NOT TO SCALE
	STANDARD STORM MANHOLE COVER
	SW-10.10



NOTES:

ALL PIPE UNDERDRAINS ARE TO EXIT INTO DRAINAGE STRUCTURES SUCH AS CATCH BASINS OR JUNCTION BOXES. IF STRUCTURE IS NOT AVAILABLE, SPECIAL EXIT REQUIREMENTS WILL APPLY IN ACCORDANCE WITH THE DIRECTION OF ENGINEERING SERVICES DIRECTOR OR HIS/HER DESIGNEE.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	PIPE UNDERDRAIN DETAIL	
	SW-10.11	



<i>REVISIONS</i>	<i>DATE: 8/2020</i>	<i>NOT TO SCALE</i>
	CURB DRAIN DETAIL	
	SW-10.12	

REPLACE DISTURBED AREA W/ FULL-DEPTH STONE & ASPHALT

EX. ROADWAY

30" VALLEY C & G

CONC DRIVEWAY APPROACH W/ EXPANSION JOINT

UNDISTURBED SUBGRADE

NEW FRONT WALL

12" CONC SLAB (MIN 3000 PSI W/#5 REBAR @11" O/C)

3' MIN

6"

SEE NOTE #2

#5 DOWELS @ 8" CENTERS

8" MINIMUM OVER 12' DEEP
12" MINIMUM UP TO 6' FROM TOP OF CURB

IF STRUCTURE IS GREATER THAN 12' DEEP, FOOTING IS TO EXTEND 6" BEYOND THE STRUCTURE

2'-6" MIN.

8"

15" TYP.

1 1/2' D

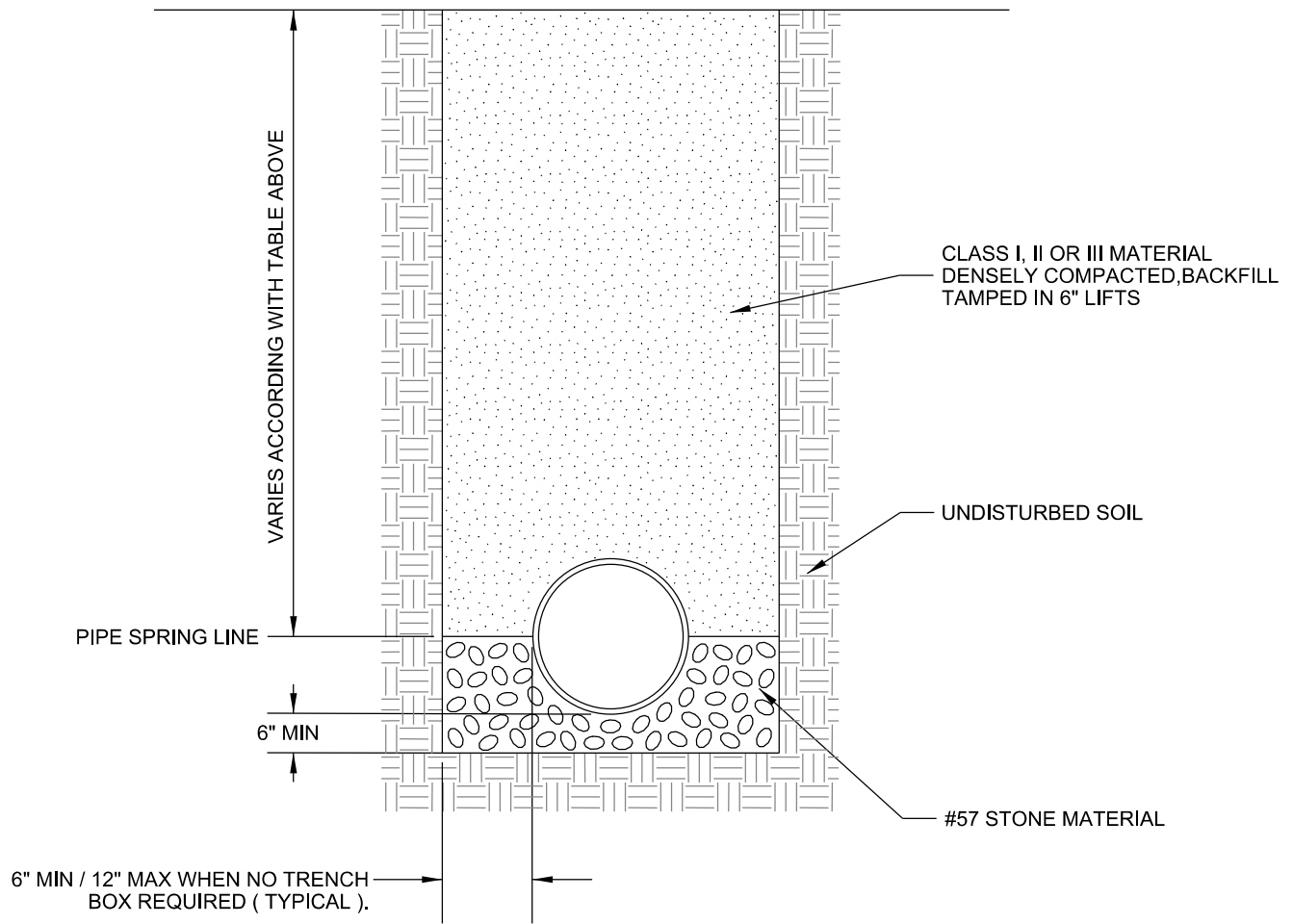
6"

3000 PSI CONCRETE

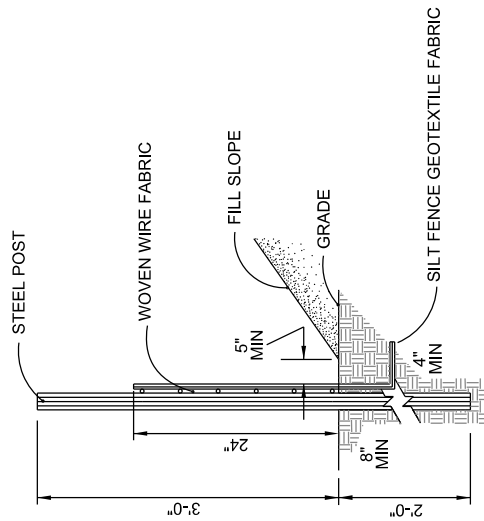
1. IF STRUCTURE IS LESS THAN 5' IN DEPTH,
BOX MUST BE REBUILT BEGINNING AT ORIGINAL
FOOTING ELEVATION.
2. IF STRUCTURE IS GREATER THAN 5' IN DEPTH. THE
ELEVATED FOOTING DESIGN AS INDICATED ABOVE
MAY BE USED.
3. DOMESTIC CASTING REQUIRED WITHIN STREET
RIGHT-OF-WAY.
4. FOR STEP REQUIREMENTS, SEE NOTE 4 ON STANDARD
DETAIL SW-10.03.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CATCH BASIN CONVERSION DETAIL	
	SW-10.13	

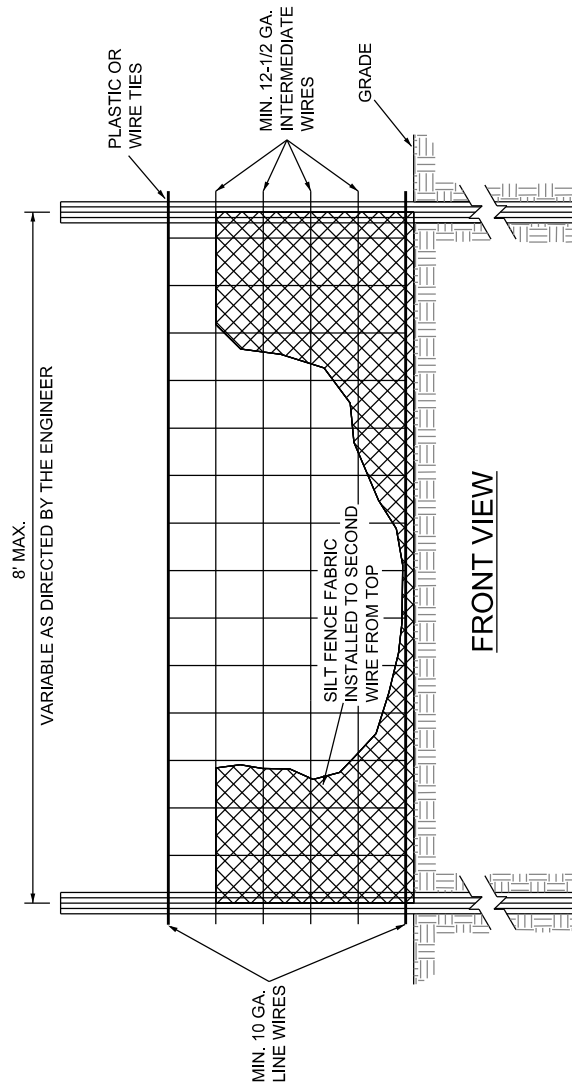
COVER FOR PIPES WITHIN THE R.O.W. MINIMUM PIPE CLEARANCE FROM INVERT TO SUBGRADE	
PIPE SIZE (in)	CLEARANCE DISTANCE (ft)
15	2.4
18	2.7
24	3.3
30	3.6
36	4.4
42	4.9
48	5.4
54	6.0
60	6.5
66	7.0
72	7.6



CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BEDDING FOR STORMWATER RCP PIPES	
	SW-10.14	



SIDE VIEW



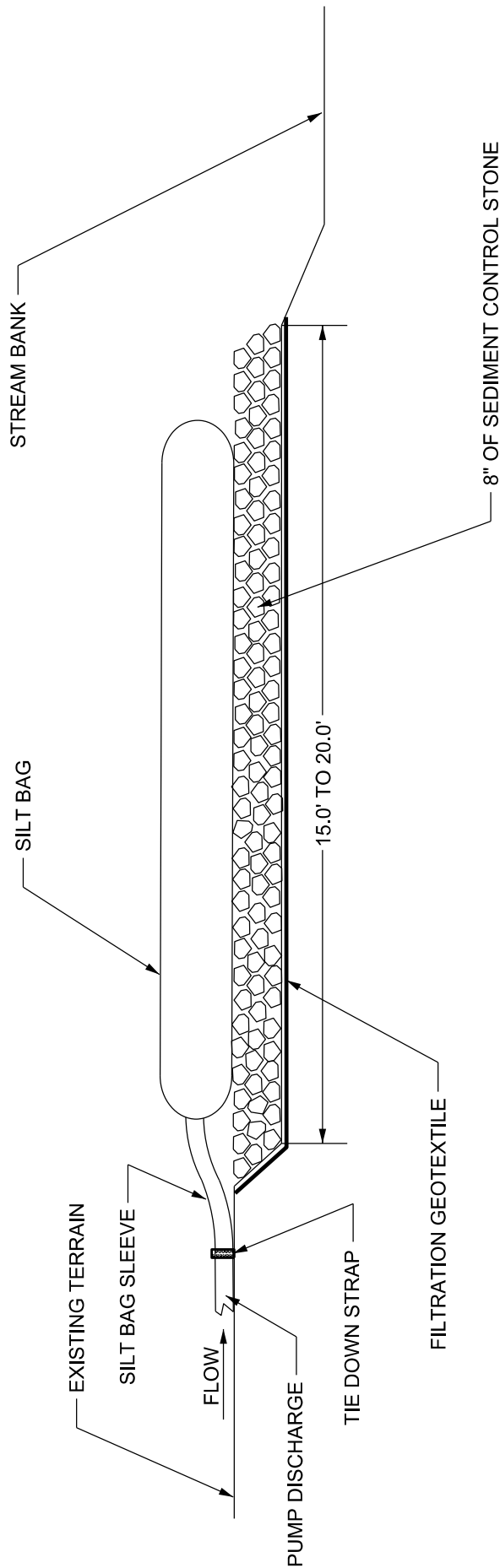
FRONT VIEW

NOTES:

1. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
2. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.
3. SEE NC DEQ SEDIMENT DESIGN MANUAL FOR CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS.
4. SILT FENCE SHOULD NOT BE USED ALONE BELOW GRADED SLOPES GREATER THAN 10' IN HEIGHT.

MAINTENANCE: CLEAN OUT AT 50% CAPACITY
LIFE OF FENCING: 6-9 MONTHS

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD TEMPORARY (SEDIMENT/SILT) FENCE	
	SW-20.01	

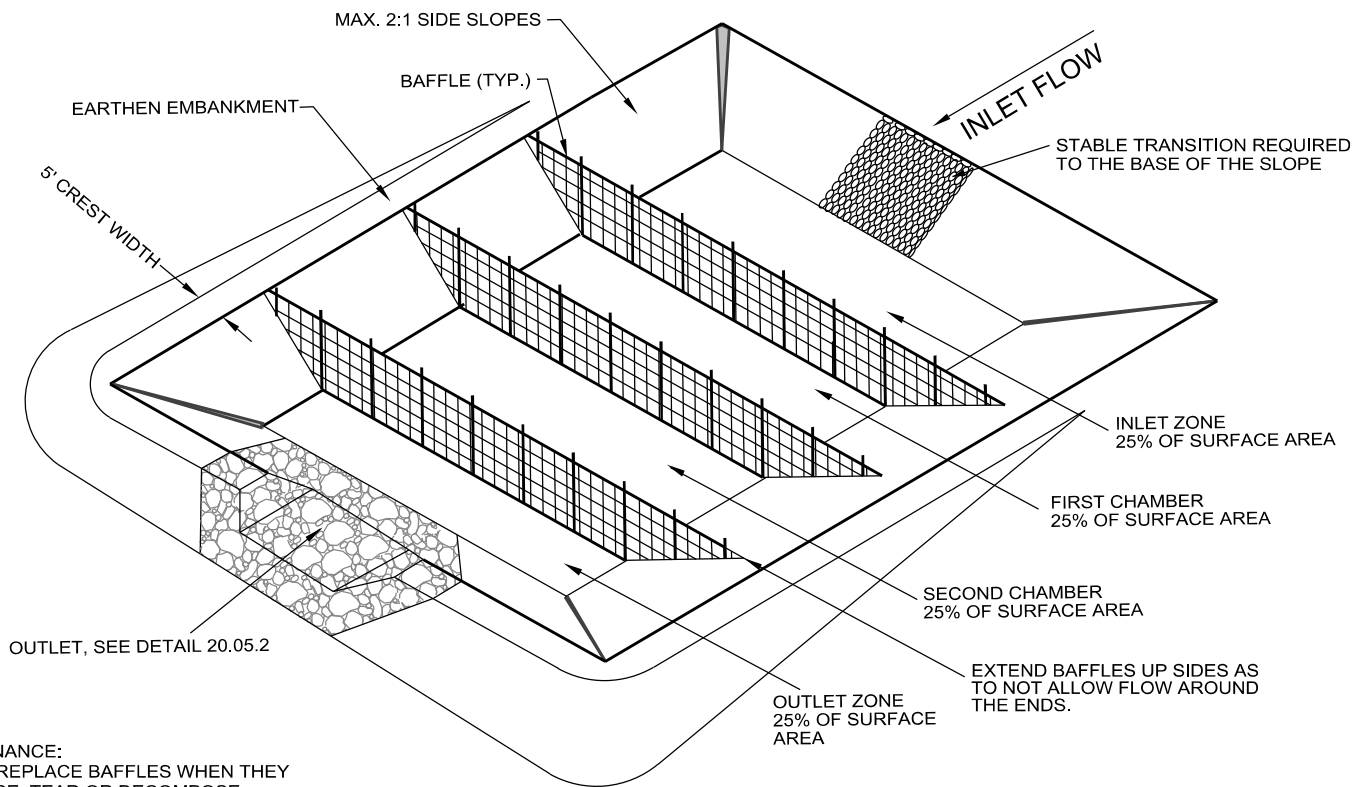


NOTES:

1. USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
2. PROVIDE STABILIZED OUTLET TO STREAM BANK.
3. WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE SPECIAL STILLING BASIN ABOVE NATURAL GROUND.
4. THE SIZE AND NUMBER OF SILT BAGS SHOULD BE BASED ON THE DEWATERING PUMP AND MANUFACTURER RECOMMENDATIONS.
5. TIGHTLY SECURE THE PUMP DISCHARGE TO THE SILT BAG SLEEVE WITH A STRAP OR SIMILAR DEVICE TO PREVENT WATER/SEDIMENT FROM LEAKING WITHOUT TREATMENT.
6. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE SILT BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITHIN SEDIMENT, REDUCE THE PUMP RATE.
7. REPLACE THE SILT BAG WHEN ONE HALF (1/2) FULL OF SEDIMENT.
8. SILT BAG DEVICE MUST BE $\geq$ 50FT FROM THE TOP OF THE STREAM BANK AND WATER MUST BE DISCHARGED IN A DIFFUSE MANNER.

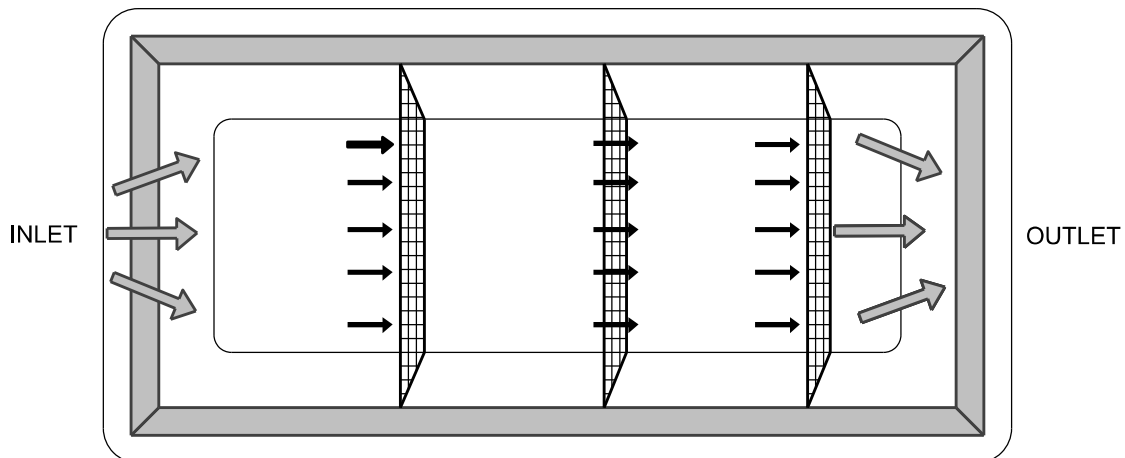
NOT TO SCALE

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SILT BAG	
	SW-20.04	



MAINTENANCE:
REPAIR/REPLACE BAFFLES WHEN THEY
COLLAPSE, TEAR OR DECOMPOSE.
REMOVE SEDIMENT WHEN CELL IS 1/2 FULL.

PERSPECTIVE VIEW

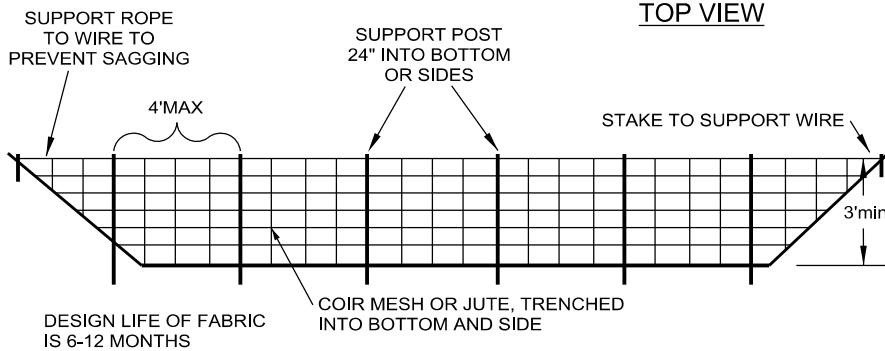


MIN. LENGTH:WIDTH RATIO - 2:1

NOTES:

1. 3 BAFFLES (MIN) BETWEEN INLET & OUTLET.
2. SEE N.C. DEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES; PLANNING CONSIDERATION & DESIGN CRITERIA.
3. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS
4. AT A MINIMUM, SEED, STRAW & TACK APPLICATION REQUIRED FOR SITE INSPECTION APPROVAL
5. TRAPS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL

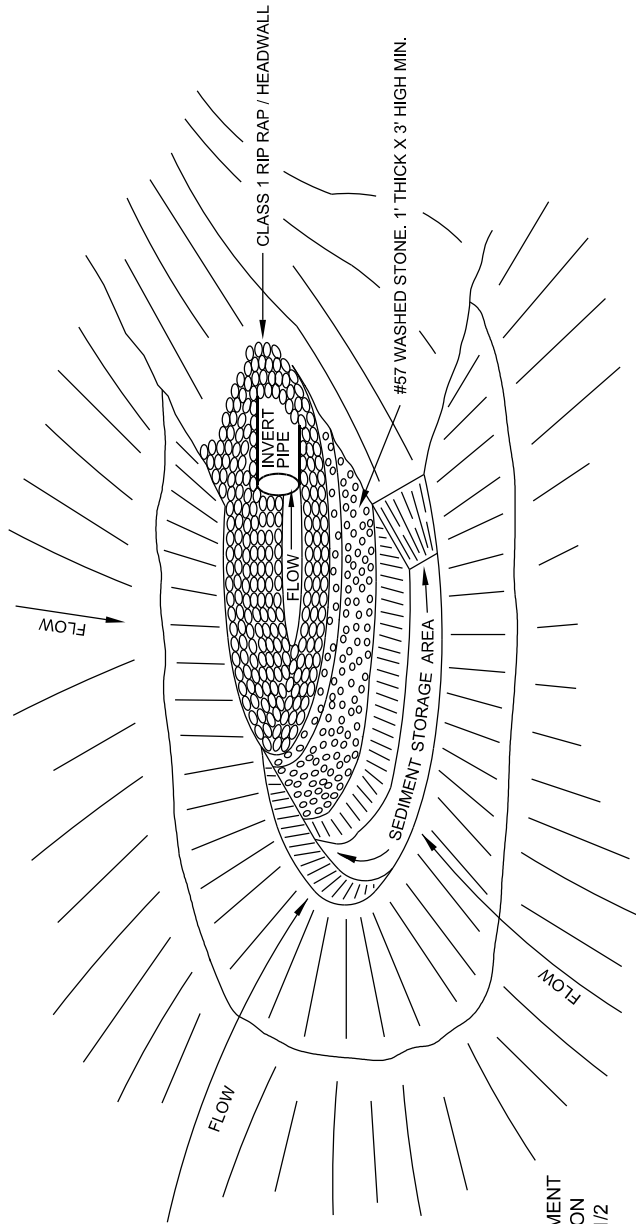
TOP VIEW



BAFFLE DETAIL

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	TEMPORARY SEDIMENT TRAP	
	SW-20.05.1	

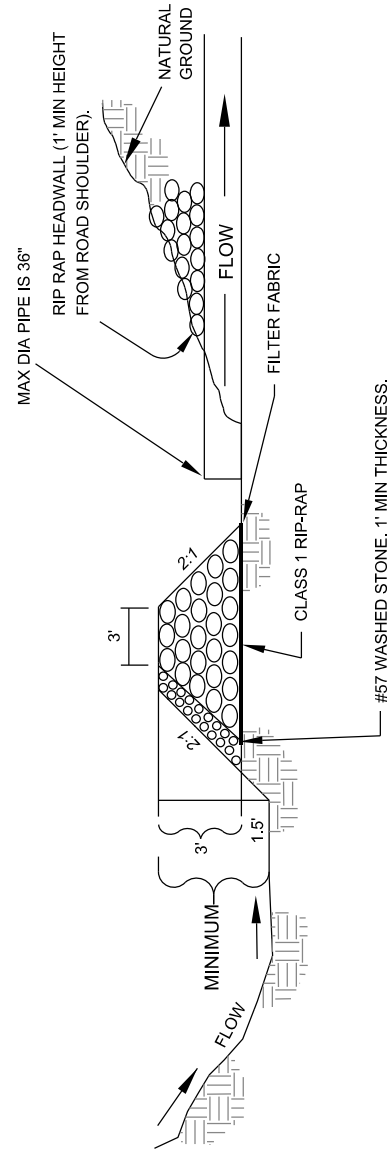


MAINTENANCE:
REMOVE SEDIMENT & RESTORE THE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSION WHEN SEDIMENT HAS ACCUMULATED TO 1/2 DESIGN DEPTH OF THE TRAP.

PLAN VIEW

NOTES:
IF EXCAVATED STORAGE AREA IS USED AS TEMPORARY SEDIMENT TRAP, THE DESIGN CRITERIA FOR TEMPORARY SEDIMENT TRAP MUST BE SATISFIED.

ANY RIP-RAP DISPLACED FROM THE STONE HORSESHOE MUST BE REPLACED IMMEDIATELY.



CROSS SECTION

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ROCK PIPE INLET PROTECTION	
	SW-20.06	



1. AT END OF PROJECT, CATCH BASIN CAN BE RAISED AS NEEDED PLUGGING OPEN COURSE OF BLOCK WITH MORTAR.
2. RISER CAN BE BUILT AS A STANDARD CATCH BASIN/JUNCTION BOX (WITH WEEP HOLES) IN RECEIVING WALL AND BE UTILIZED AS SUCH WHEN PROJECT IS STABLE.
3. IF DRAINAGE AREA IS <1 ACRE THEN THIS STRUCTURE NEEDS TO BE TREATED AS A RISER STRUCTURE AND ALL RELATED INFORMATION NEEDS TO BE SUPPLIED. (TRASH RACK, ELEVATIONS, AND ANTI-FLOATABLE)
4. IF THIS DEVICE IS TREATED AS A SEDIMENT TRAP THEN IT SHALL MEET THE SPECIFICATION AS OUTLINED IN SW-20.05.1 AND SW-20.05.2.

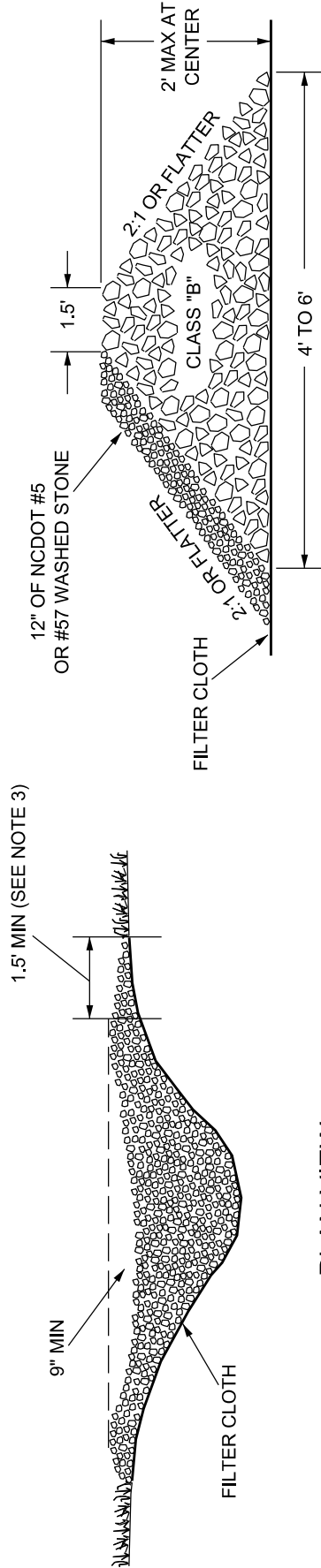
SECTION VIEW

CATCH BASIN RISER

CITY OF RALEIGH STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 8/2020</i>	<i>NOT TO SCALE</i>
	CATCH BASIN RISER	
	SW-20.07	

NOTES:

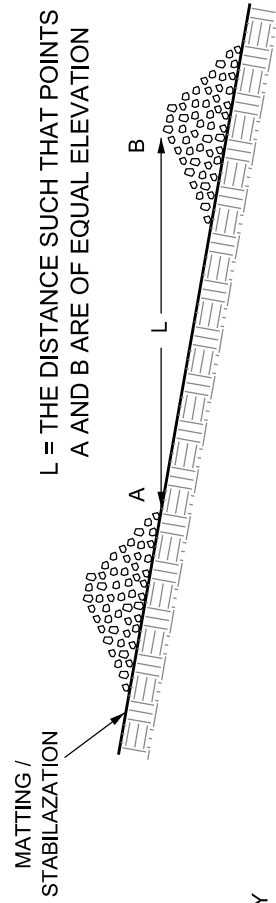
1. ENSURE THAT CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONES.
2. THE DRAINAGE AREA IS LIMITED TO ONE HALF ACRE.
3. KEY THE STONE INTO THE DITCH BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 1.5 FEET TO AVOID WASHOUT FROM OVERFLOW AROUND THE DAM.



PLAN VIEW

CROSS-SECTION VIEW

MAINTENANCE:
CLEAN OUT SEDIMENT AND DEBRIS AND REPAIR WASH OUTS.



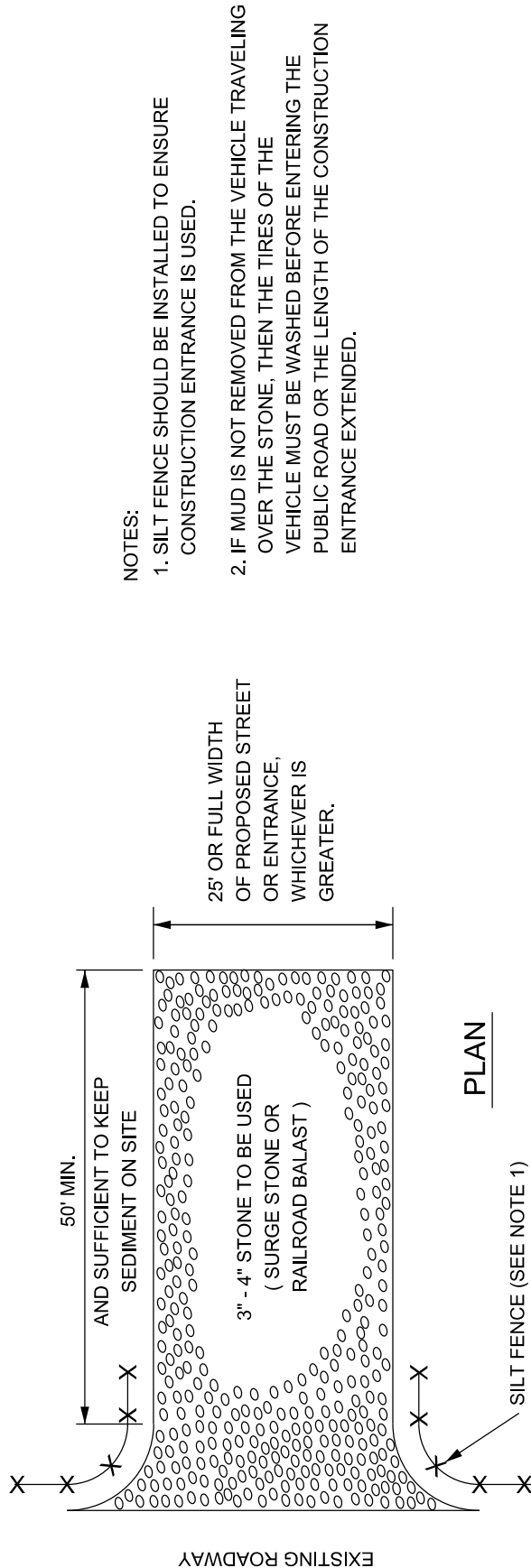
PROFILE VIEW

PURPOSE: TO REDUCE EROSION IN A CHANNEL BY REDUCING THE VELOCITY OF FLOW.

DO NOT USE CHECK DAM IN INTERMITTENT OR PERENNIAL STREAMS.

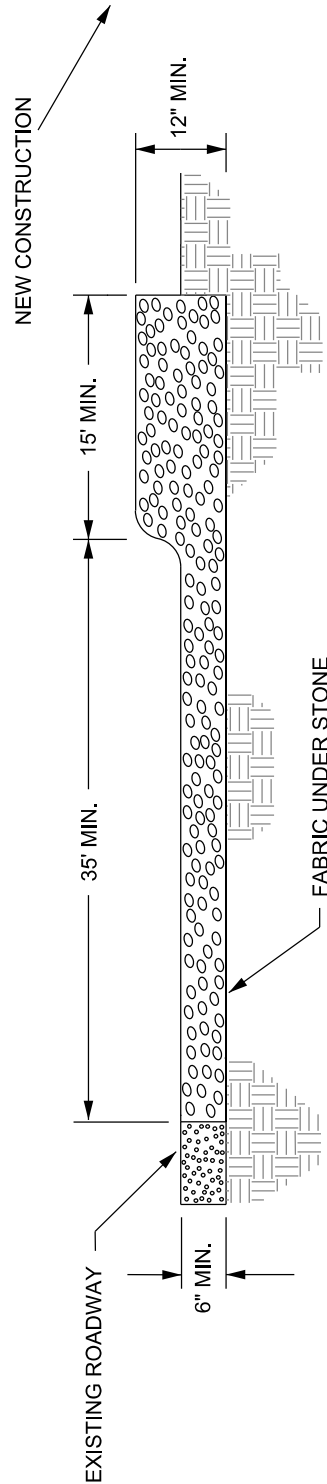
SEE N.C. DEQ EROSION AND SEDIMENT CONTROL PLANNING and DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES; PLANNING CONSIDERATION & DESIGN CRITERIA.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CHECK DAM	
	SW-20.08	



NOTES:

1. SILT FENCE SHOULD BE INSTALLED TO ENSURE CONSTRUCTION ENTRANCE IS USED.
2. IF MUD IS NOT REMOVED FROM THE VEHICLE TRAVELING OVER THE STONE, THEN THE TIRES OF THE VEHICLE MUST BE WASHED BEFORE ENTERING THE PUBLIC ROAD OR THE LENGTH OF THE CONSTRUCTION ENTRANCE EXTENDED.



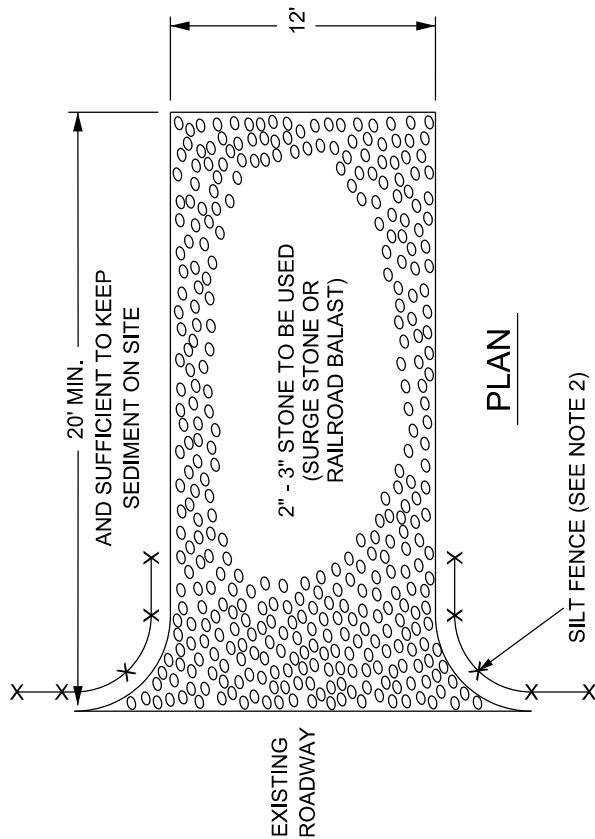
MAINTENANCE:

ADD ADDITIONAL STONE AND "FLUFF" TOP DRESSING WITH 2" STONE.

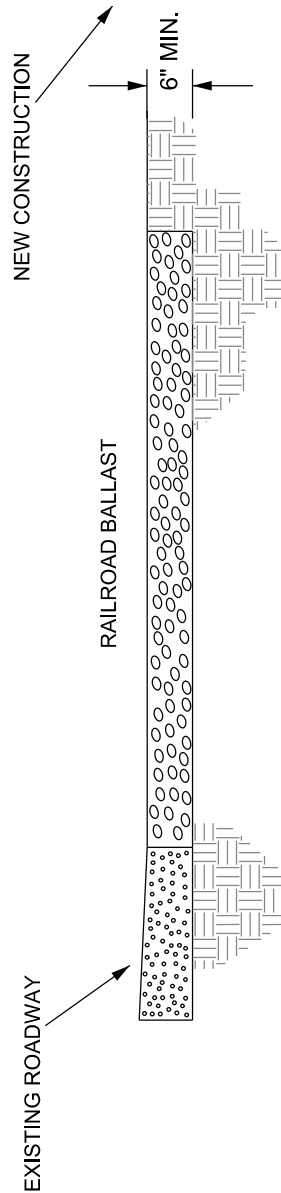
SEE N.C. DEQ EROSION and SEDIMENT CONTROL PLANNING and DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES; PLANNING CONSIDERATION & DESIGN CRITERIA.

CROSS SECTION

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CONSTRUCTION ENTRANCE	
	SW-20.09	

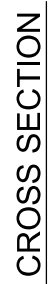


- NOTES:
1. THIS DETAIL APPLIES ONLY TO ENTRANCES OF INDIVIDUAL SINGLE FAMILY RESIDENTIAL UNITS
 2. SILT FENCE SHOULD BE INSTALLED TO ENSURE CONSTRUCTION ENTRANCE IS USED.



CROSS SECTION

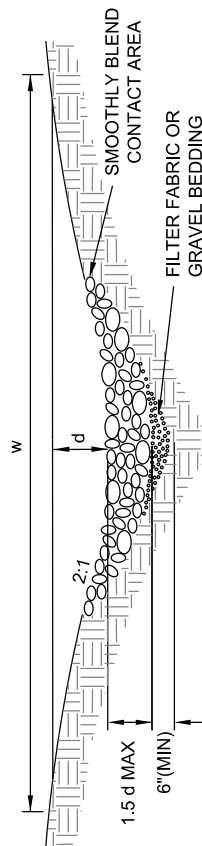
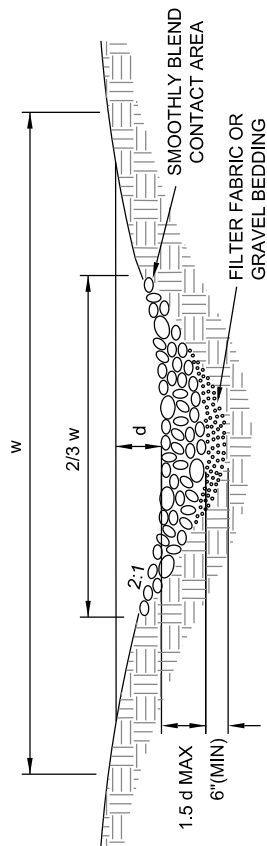
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	RESIDENTIAL CONSTRUCTION ENTRANCE	
	SW-20.10	

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PARABOLIC-SHAPED

(SHAPED BY BULLDOZER)



V-SHAPED

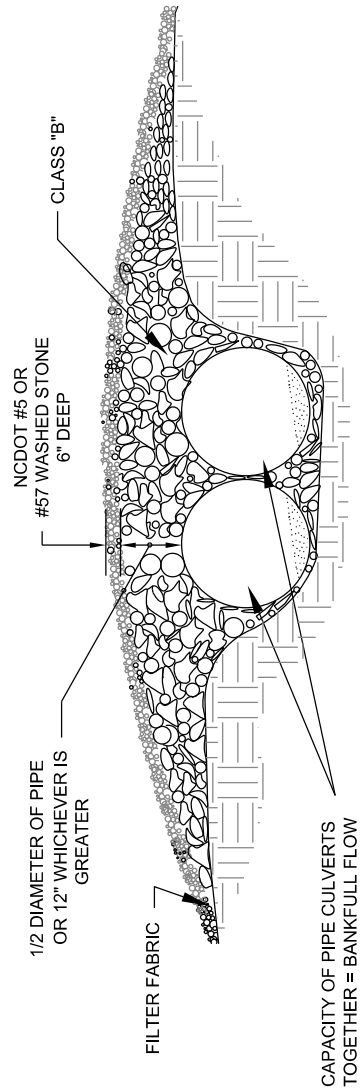
(SHAPED BY MOTOR GRADER)

2. DIMENSIONS FOR d & w AND SIZE OF STONE MUST BE DETERMINED BY APPROPRIATE DESIGN CRITERIA.

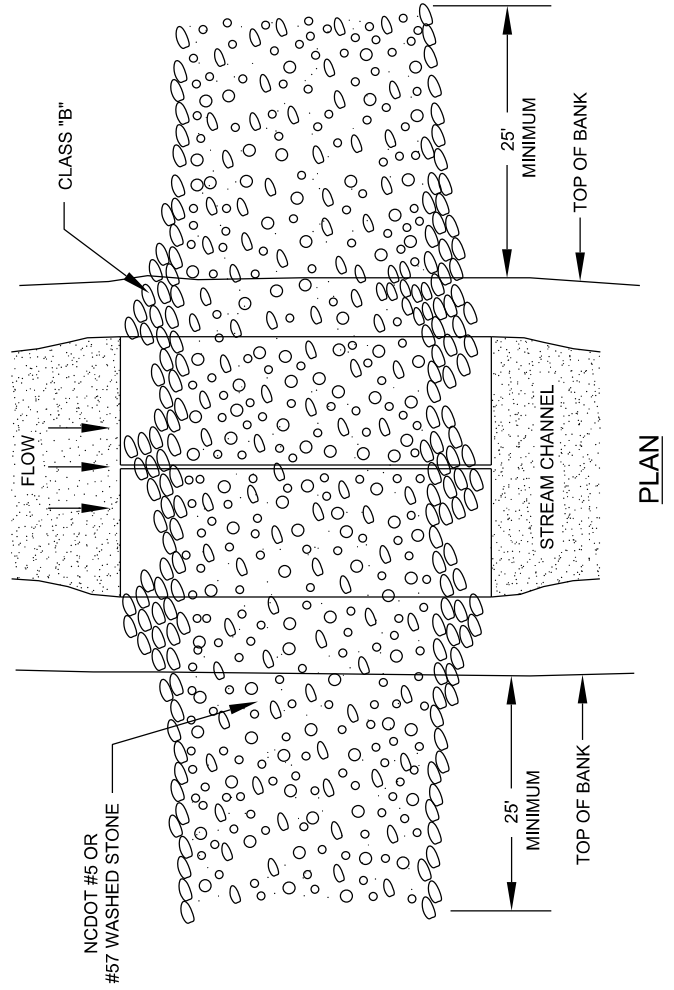
TABLE

d MAX	STONE CLASSIFICATION	RIP RAP DEPTH
8"	A	12"
12"	B	18"
18"	CLASS 1	27"
24"	CLASS 2	36"

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	RIP RAP LINED CHANNELS	
	SW-20.12	



ELEVATION



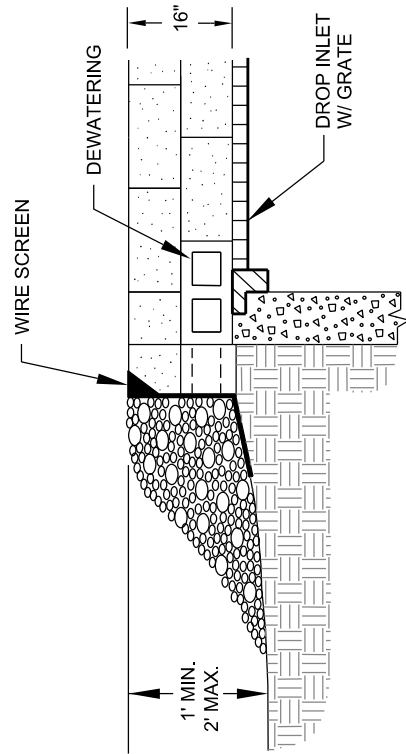
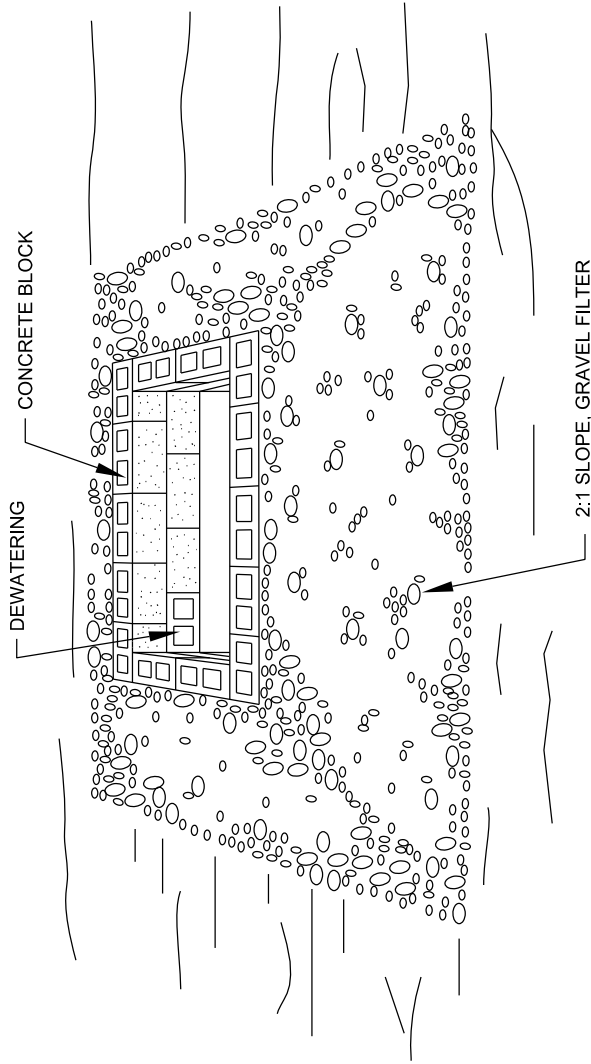
PLAN

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	TEMPORARY STREAM CROSSING	
	SW-20.13	

CONSTRUCTION SPECIFICATIONS

1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE IN THE BOTTOM ROW TO ALLOW POOL DRAINAGE. PLACE THE BOTTOM ROW OF BLOCKS AGAINST THE EDGE OF THE STORM DRAIN FOR LATERAL SUPPORT AND TO AVOID WASHOUTS WHEN OVERFLOW OCCURS.
2. CAREFULLY FIT HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS OVER ALL BLOCK OPENINGS TO HOLD GRAVEL IN PLACE.
3. USE CLEAN GRAVEL, PLACED 2 INCHES BELOW THE TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER AND SMOOTH IT TO AN EVEN GRADE. DOT #57 WASHED STONE IS RECOMMENDED.
4. NOT TO BE USED FOR SEDIMENT STORAGE OR ON ROADWAYS OPEN TO PUBLIC TRAFFIC.



CITY OF RALEIGH STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BLOCK AND GRAVEL DROP INLET PROTECTION	
	SW-20.14	

STANDARD METAL POSTS
(MINIMUM LENGTH 5')
2'-0" IN GROUND

HARDWARE WIRE

#57 WASHED STONE

2:1

6"-8"

2' BURY IN
SOLID GROUND

CONCRETE
BLOCKS

16"

2'

4' MAX

GALVANIZED HARDWARE WIRE
EXTENDS TO THE TOP OF BOX.
(19 GAUGE, 1/4" MESH OPENINGS.)

2:1

#57 WASHED STONE PLACED AGAINST HARDWARE
WIRE TO A HEIGHT OF 16" MIN. ABOVE TOP OF BOX.

DRAINAGE AREA = <1 ACRE (MAXIMUM).

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD CATCH BASIN YARD INLET PROTECTION	
	SW-20.15	

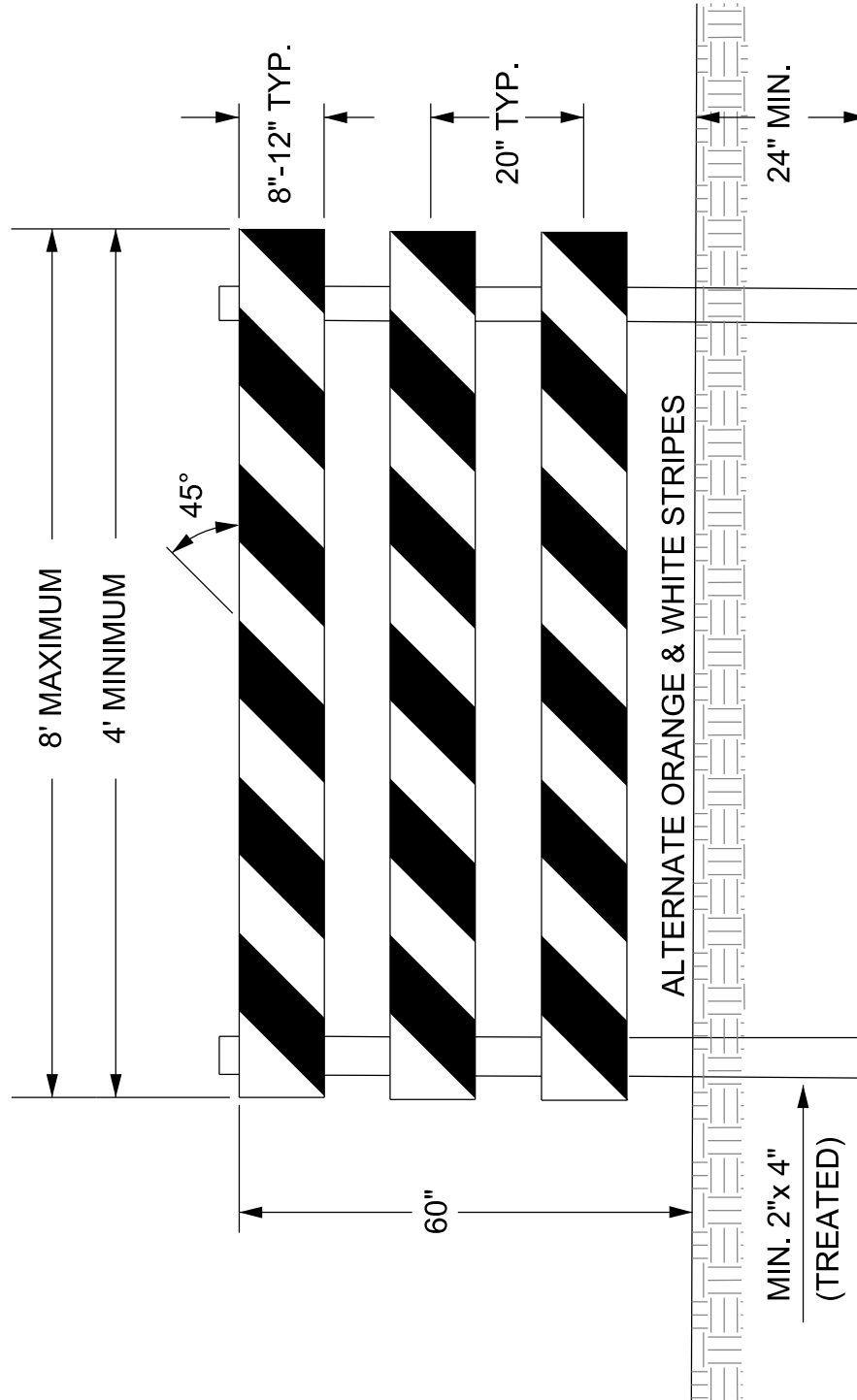
[illegible]

CROSS SECTIONAL VIEW

MAINTENANCE:

1. REMOVE SILT WHEN DITCH IS 1/2 FULL.
2. STABILIZE IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.

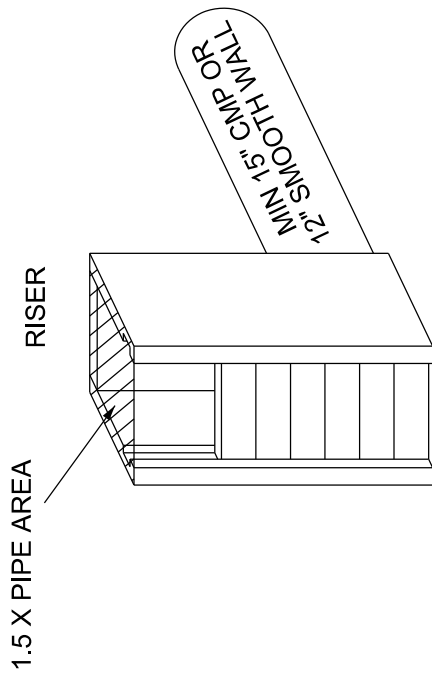
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TEMPORARY SILT DITCH	
	SW-20.16	



NOTES:

1. STRIPES ON BARRICADE RAILS SLOPE AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS.
2. BARRICADE RAIL STRIPE SHALL BE 6 INCHES.
3. THE SIDES OF THE BARRICADE FACING TRAFFIC SHALL HAVE RETROREFLECTIVE RAIL FACES.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD TEMPORARY BARRICADE	
	SW-20.17	

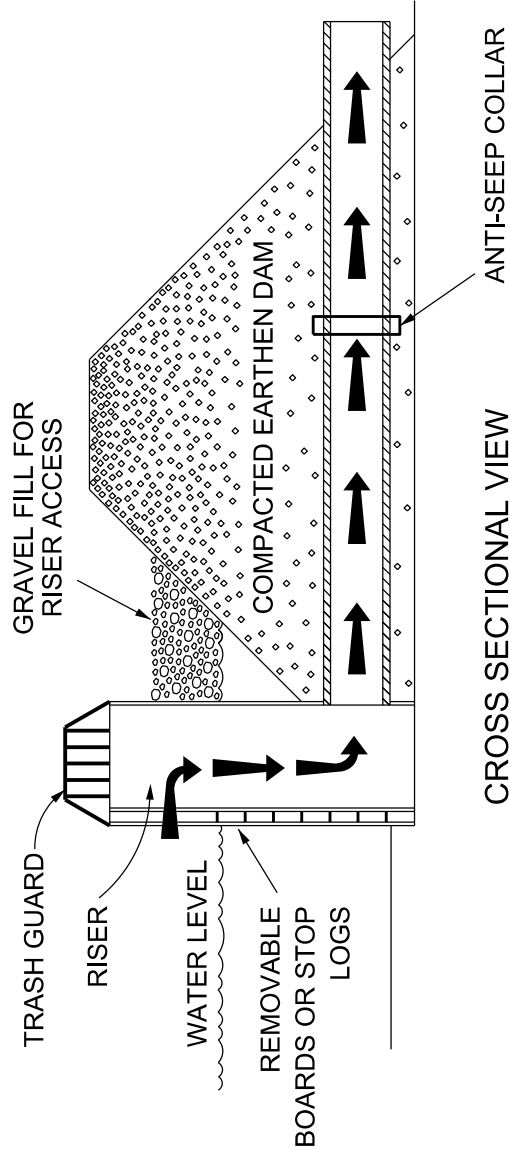


ISOLATED VIEW

FILL HEIGHT	MINIMUM TOP WIDTH
LESS THAN 10 FT	8.0 FT
10 FT TO 15 FT	10.00 FT

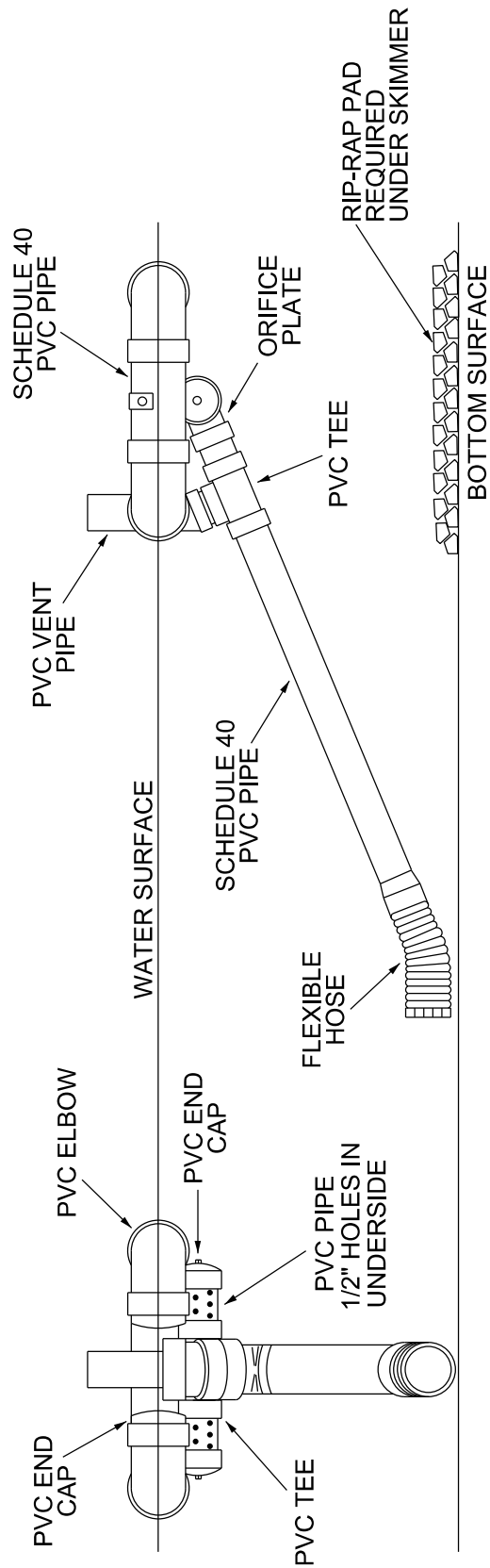
DESIGN NOTES:

1. MAXIMUM DRAINAGE AREA WHEN UTILIZING RISER IS 100 ACRES.
2. DAM HEIGHT BEHIND RISER IS 15 FEET OR LESS FROM TOP OF DAM TO LOW POINT OF DOWNSTREAM TOE.
3. MAY OR MAY NOT BE "FLASHBOARD" RISER



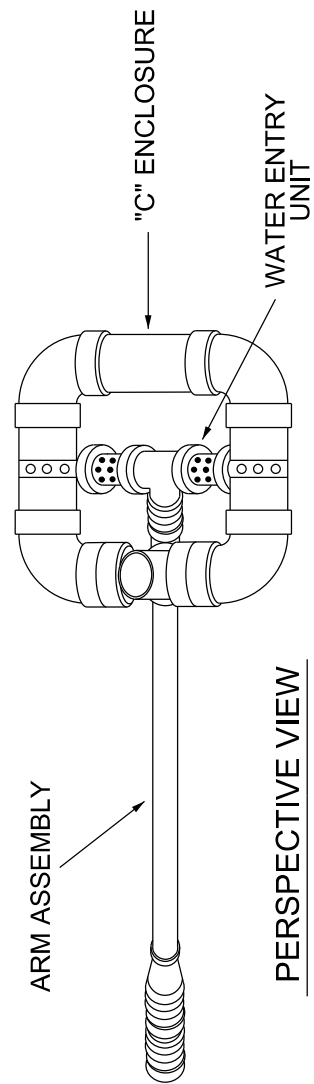
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	FLASHBOARD RISER	
	SW-20.18	

SEE N.C. DEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR CONDITIONS WHERE PRACTICE APPLIES; PLANNING CONSIDERATION & DESIGN CRITERIA.



FRONT VIEW

END VIEW



PERSPECTIVE VIEW

NOTE: SKIMMER TO BE TETHERED

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SKIMMER	
	SW-20.19	

SEE N.C. DENR EROSION and SEDIMENT
CONTROL PLANNING and DESIGN MANUAL
FOR CONDITIONS WHERE PRACTICE APPLIES;
PLANNING CONSIDERATION & DESIGN CRITERIA.

DESIGN CRITERIA

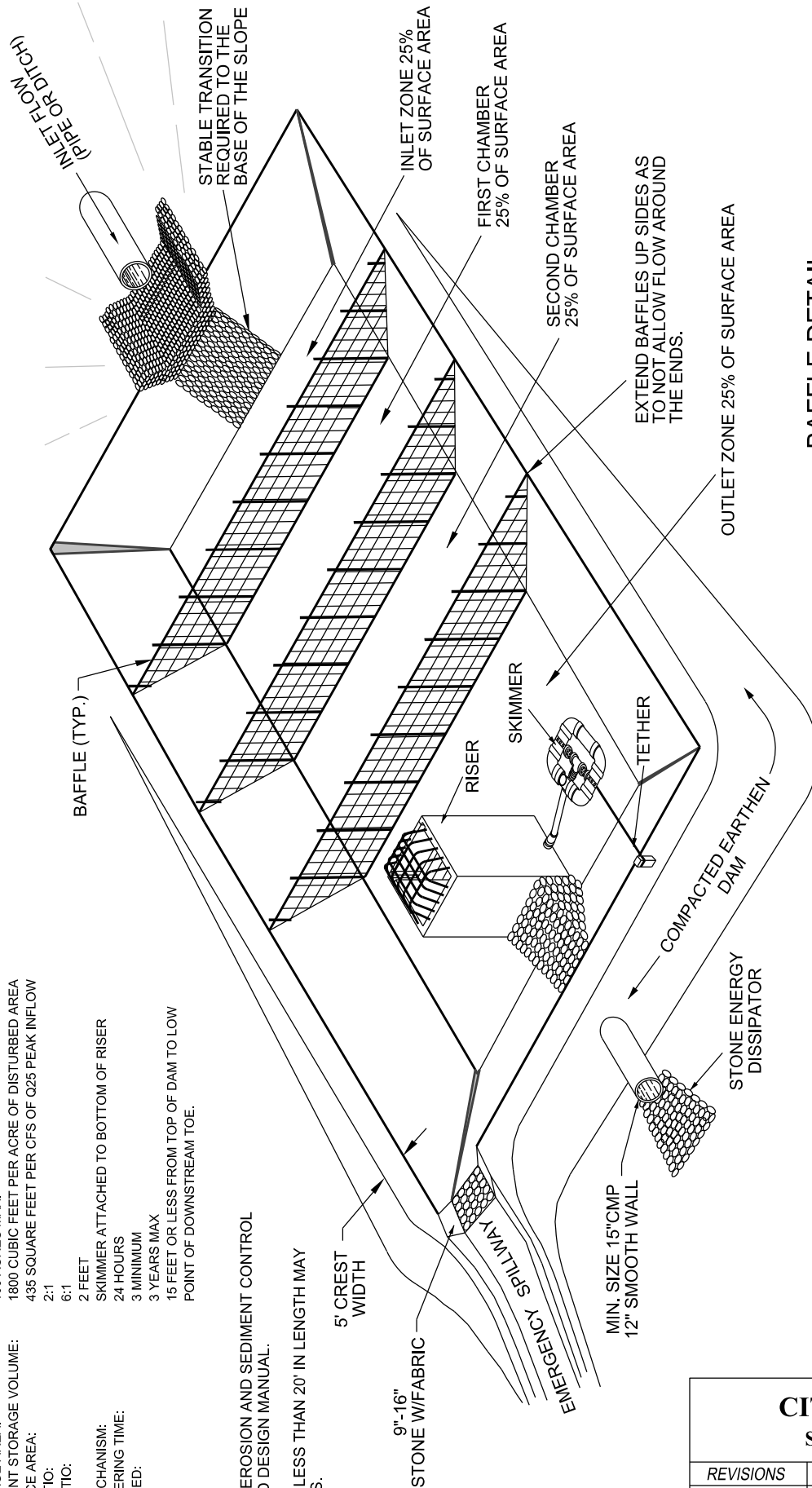
SUMMARY:

PRIMARY SPILLWAY:	TEMPORARY SEDIMENT BASIN
MAXIMUM DRAINAGE AREA:	RISER / BARREL PIPE
MINIMUM SEDIMENT STORAGE VOLUME:	100 ACRES MAX.
MINIMUM SURFACE AREA:	1800 CUBIC FEET PER ACRE OF DISTURBED AREA
MINIMUM L/W RATIO:	435 SQUARE FEET PER CFS OF Q25 PEAK INFLOW
MAXIMUM L/W RATIO:	2:1
MINIMUM DEPTH:	6:1
DEWATERING MECHANISM:	2 FEET
MINIMUM DEWATERING TIME:	SKIMMER ATTACHED TO BOTTOM OF RISER
BAFFLES REQUIRED:	24 HOURS
DESIGN LIFE:	3 MINIMUM
DAM HEIGHT:	3 YEARS MAX
	15 FEET OR LESS FROM TOP OF DAM TO LOW POINT OF DOWNSTREAM TOE.

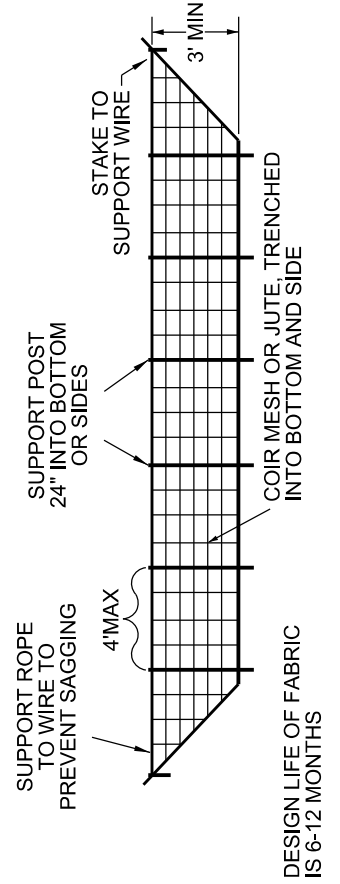
SEE NC DENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

NOTE: BASINS LESS THAN 20' IN LENGTH MAY USE 2 BAFFLES.

PERSPECTIVE VIEW



BAFFLE DETAIL



- NOTES:
1. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS
 2. BASINS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL

CITY OF RALEIGH STANDARD DETAIL

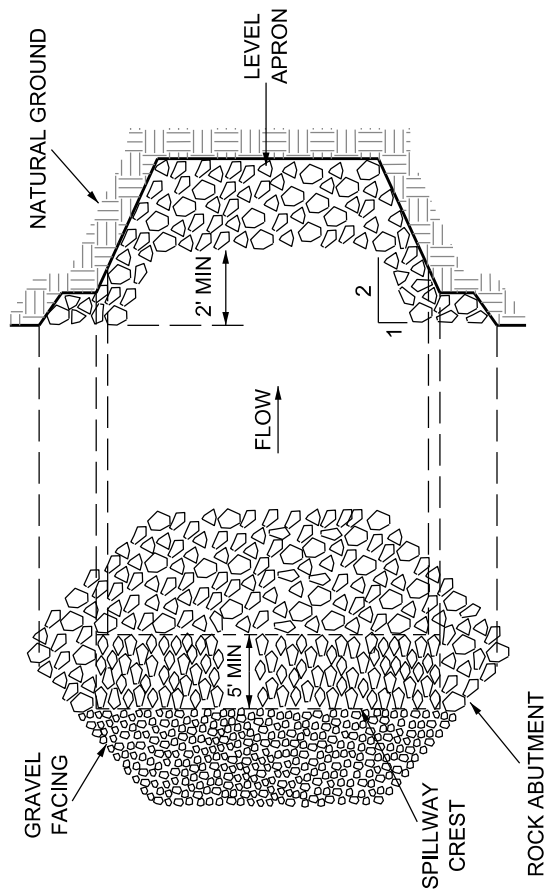
REVISIONS

DATE: 8/2020

NOT TO SCALE

SEDIMENT BASIN

SW-20.20

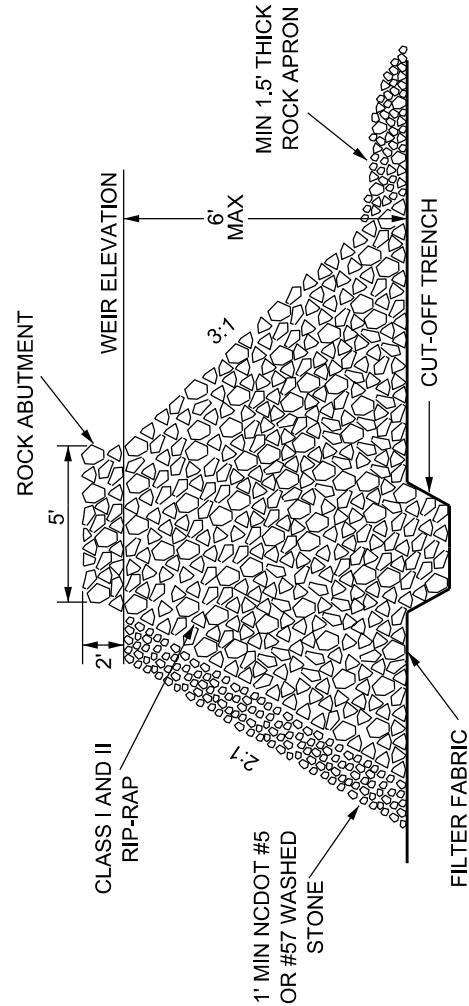


SEDIMENT BASIN
WITH ROCK DAM

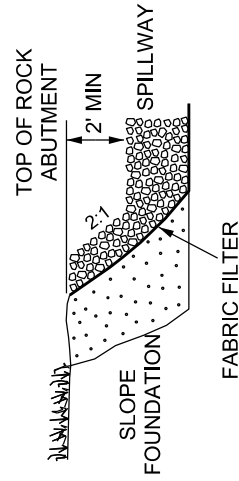
DESIGN CRITERIA

SUMMARY:
PRIMARY SPILLWAY:
MAXIMUM DRAINAGE AREA:
MINIMUM SEDIMENT STORAGE
VOLUME:
MINIMUM SURFACE AREA:
MINIMUM L/W RATIO:
MINIMUM DEPTH:
MAXIMUM HEIGHT:
DEWATERING MECHANISM:
MINIMUM DEWATERING TIME:
BAFFLES REQUIRED:
DESIGN BASIN LIFE:
DAM HEIGHT:

TEMPORARY SEDIMENT BASIN
STONE SPILLWAY
<1 ACRE.
3600 CUBIC FEET PER ACRE OF DISTURBED AREA.
435 SQUARE FEET PER CFS OF Q_{10} PEAK INFLOW
2:1
3.5 FEET, 1.5 FEET EXCAVATION BELOW GRADE
WEIR ELEVATION 6 FEET ABOVE GRADE
STONE SPILLWAY
N/A
3 MINIMUM
3 YEARS OR LESS
LIMITED TO 8 FEET.



CROSS-SECTION VIEW



SPILLWAY DETAILS

SEE N.C. DEQ SEDIMENT DESIGN MANUAL FOR
CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE
APPLIES AND PLANNING CONSIDERATIONS.

NOTE: DEVICE SHOULD NOT BE LOCATED IN ANY
INTERMITTENT OR PERENNIAL STREAM.

CITY OF RALEIGH STANDARD DETAIL

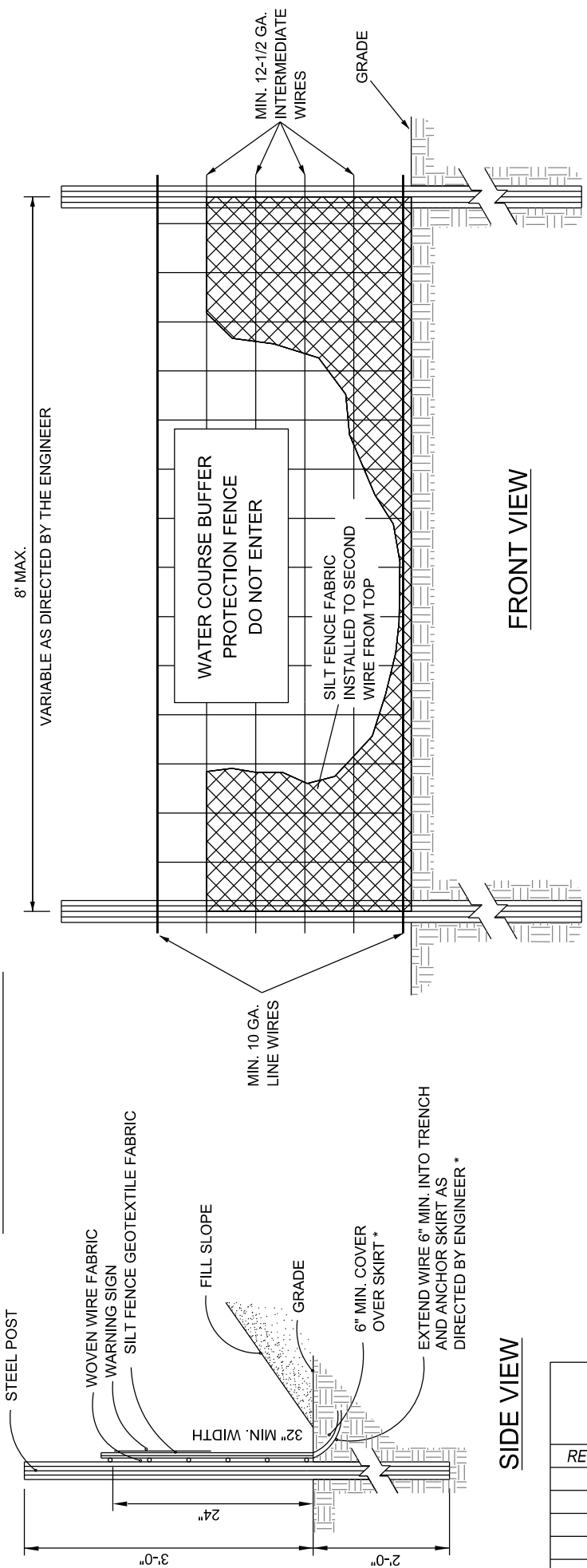
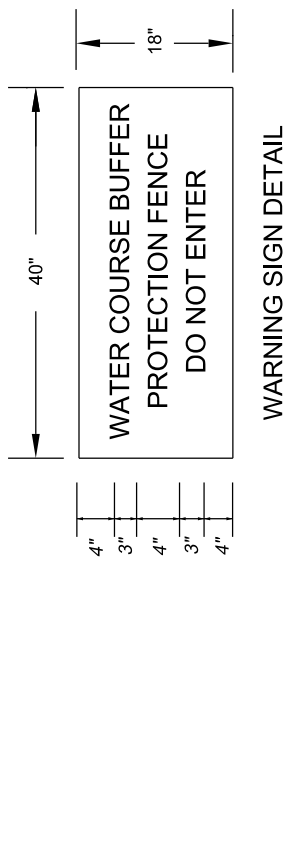
REVISIONS

DATE: 8/2020

NOT TO SCALE

SEDIMENT BASIN
WITH ROCK DAM

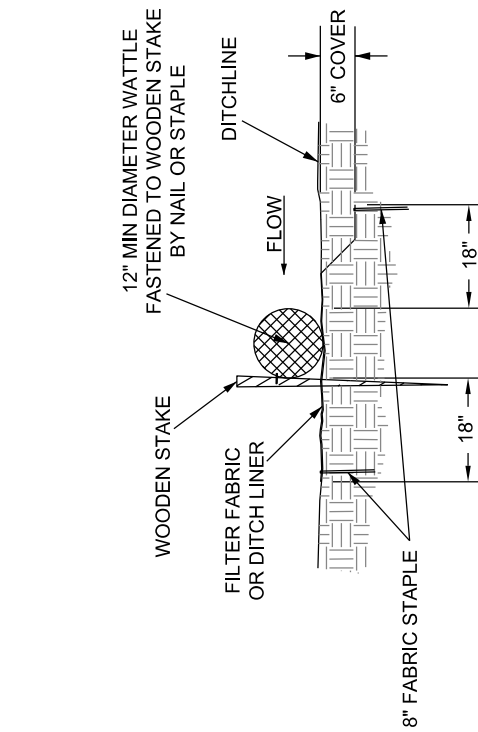
SW-20.21



NOTES:

1. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
2. LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
3. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS.
4. FOR WATERCOURSE BUFFER PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
5. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
6. MAINTAIN WATERCOURSE BUFFER PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
7. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF RALEIGH BASED ON ACTUAL FIELD CONDITIONS.
8. PLACE A SIGN AT EACH END OF LINEAR WATERCOURSE BUFFER PROTECTION AND 50' ON CENTER THEREAFTER.
9. END OF SILT FENCE SHALL BE TURNED UPHILL.
10. SEE N.C. STATE DENR PRACTICE & SPECIFICATION SEDIMENTS FENCE SECTION FOR CONDITIONS WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS.

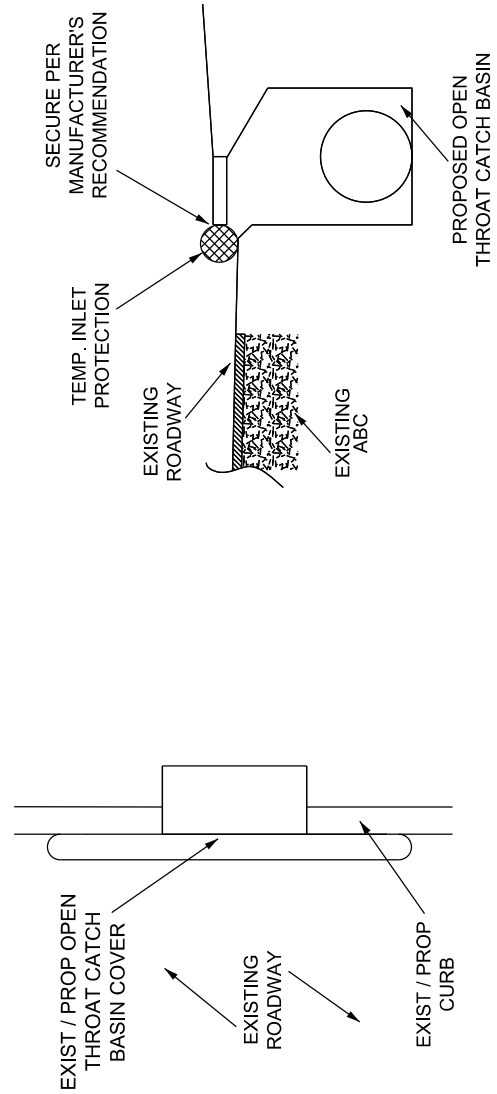
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	WATERCOURSE BUFFER PROTECTION FENCE	
	SW-20.22	



PROFILE VIEW

NOTES:

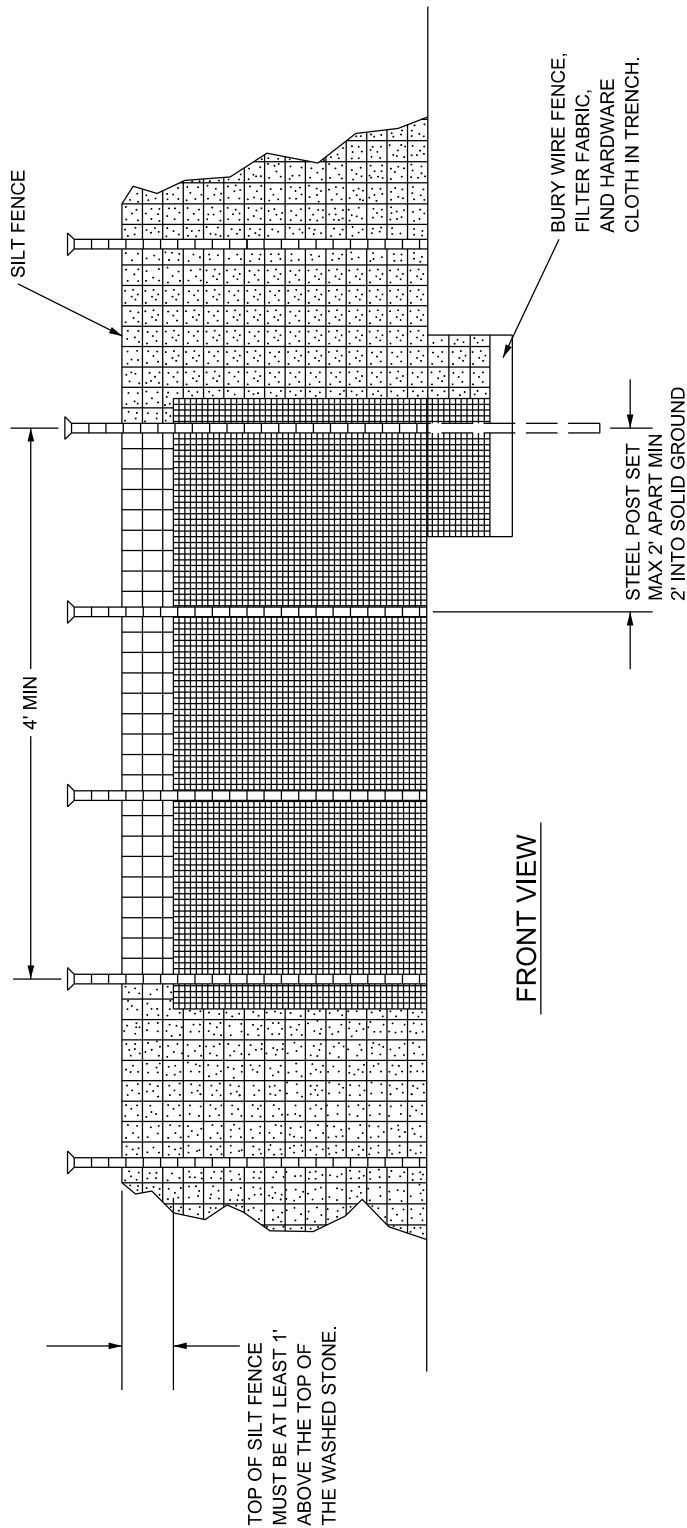
1. WATTLES SHALL BE FILLED WITH STRAW OR OTHER APPROVED MATERIAL.
2. SPACING FOR WATTLES SHALL BE DETERMINED BY THE SITE ENGINEER.
3. WATTLES MAY BE USED FOR PROTECTION OF CATCH BASINS AND DROP INLETS WITH APPROVAL BY THE STORMWATER PROGRAM MANAGER OR DESIGNEE.
4. FOR USE OF WATTLE IN A DITCH, GRADE OF DITCH MUST BE <2.5%.



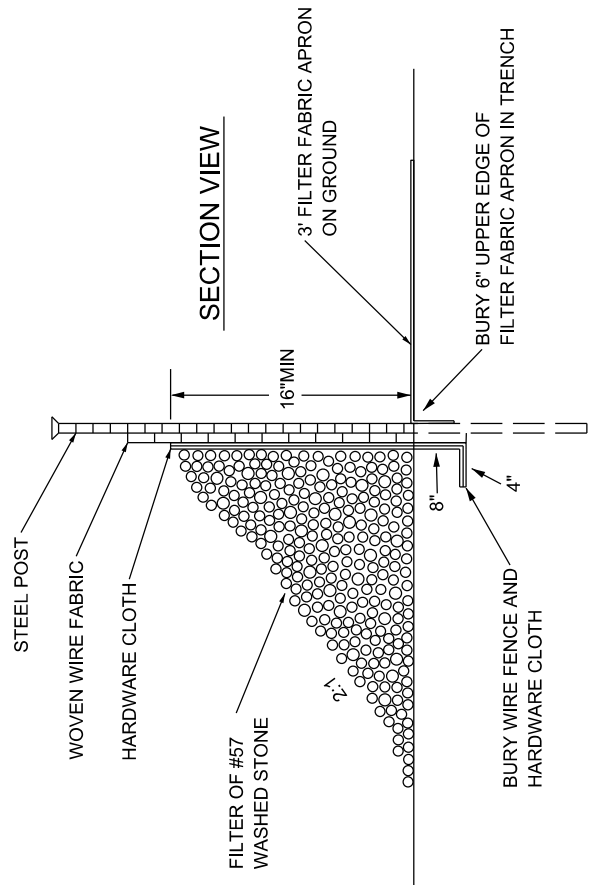
**PLAN W / INLET
INLET PROTECTION - COR BOX**

CROSS SECTION

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	WATTLE / INLET PROTECTION DETAIL	
	SW-20.23	

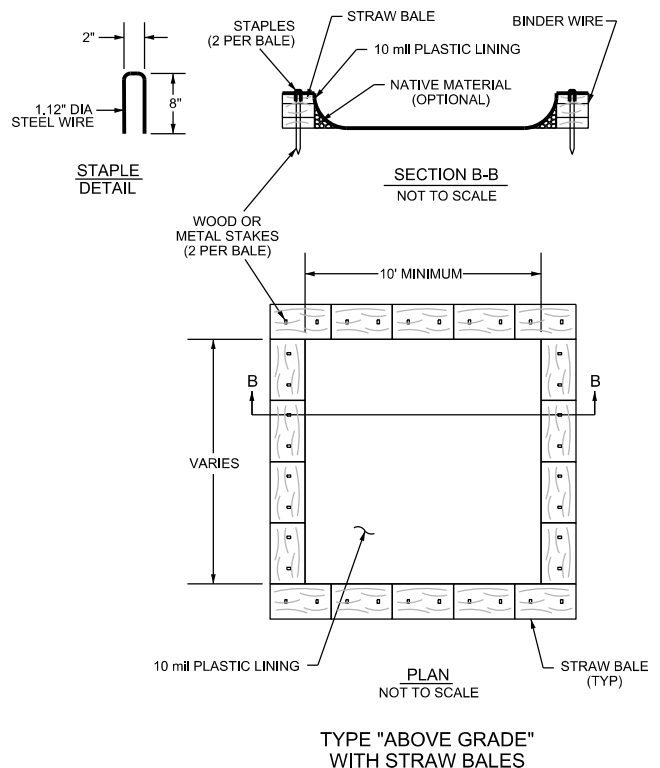
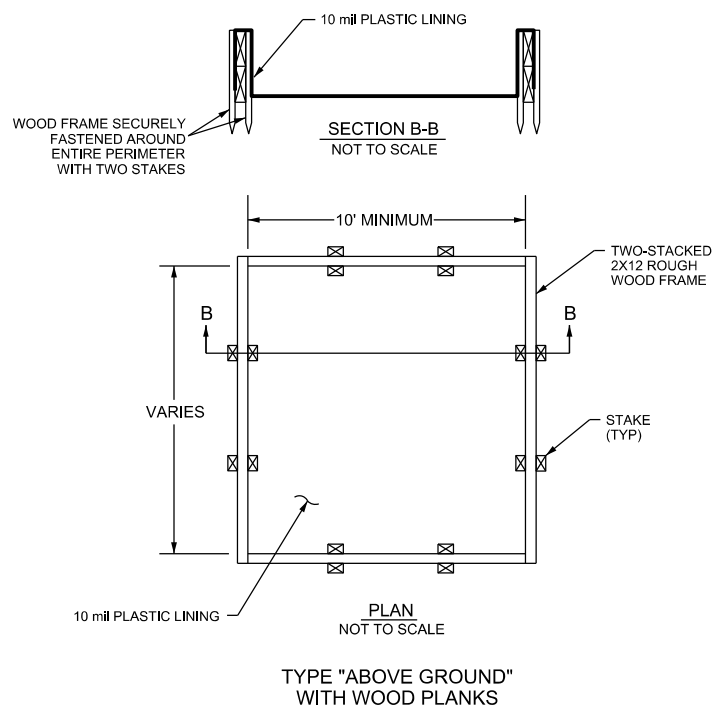


- NOTES:
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
 2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.



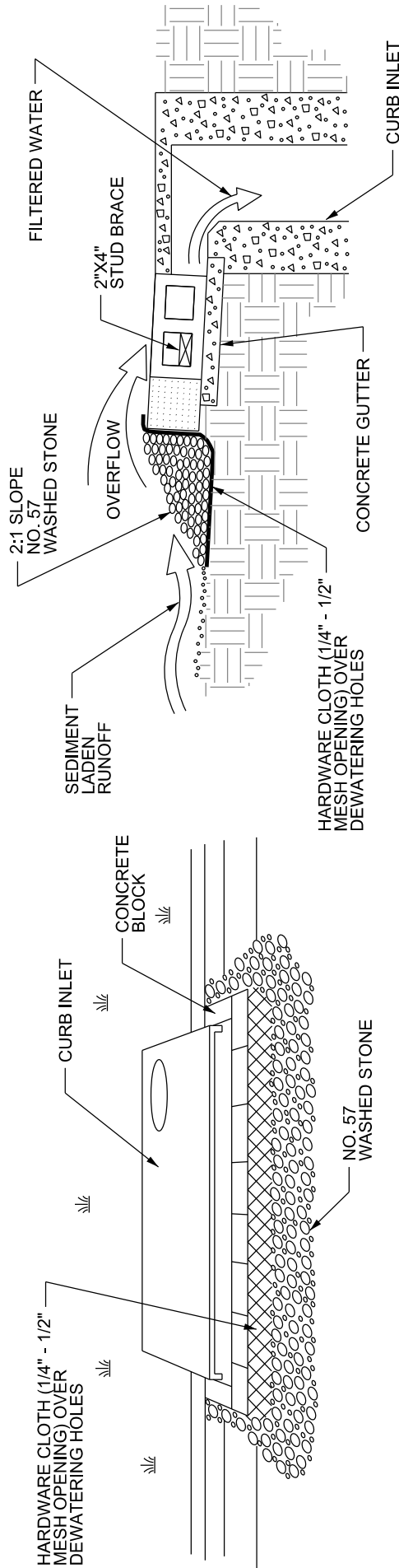
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD SILT FENCE OUTLET	
	SW-20.24	



1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF OR RECYCLED.
4. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE BACKFILLED, REPAIRED, AND STABILIZED TO PREVENT EROSION.
5. MUST BE LOCATED >50 FT AWAY FROM INLETS/WATERWAYS UNLESS THERE IS NO OTHER PRACTICAL ALTERNATIVE.

CITY OF RALEIGH STANDARD DETAIL		
<i>REVISIONS</i>	<i>DATE: 8/2020</i>	<i>NOT TO SCALE</i>
	CONCRETE WASHOUT	
	SW-20.25	



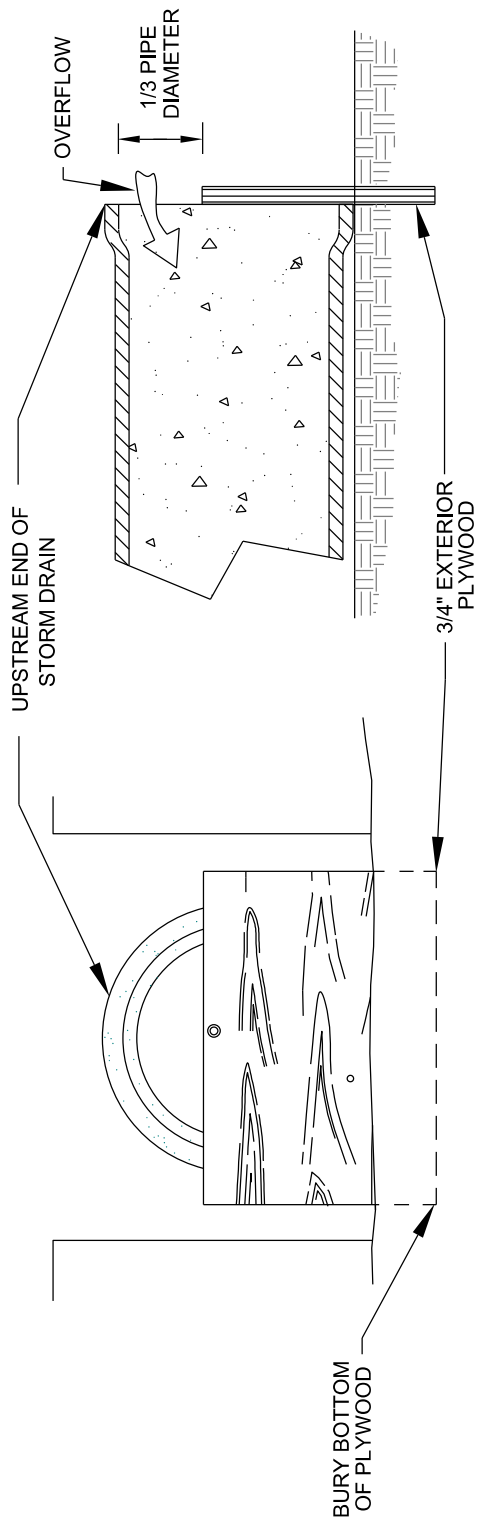
PERSPECTIVE VIEW

CROSS SECTION VIEW

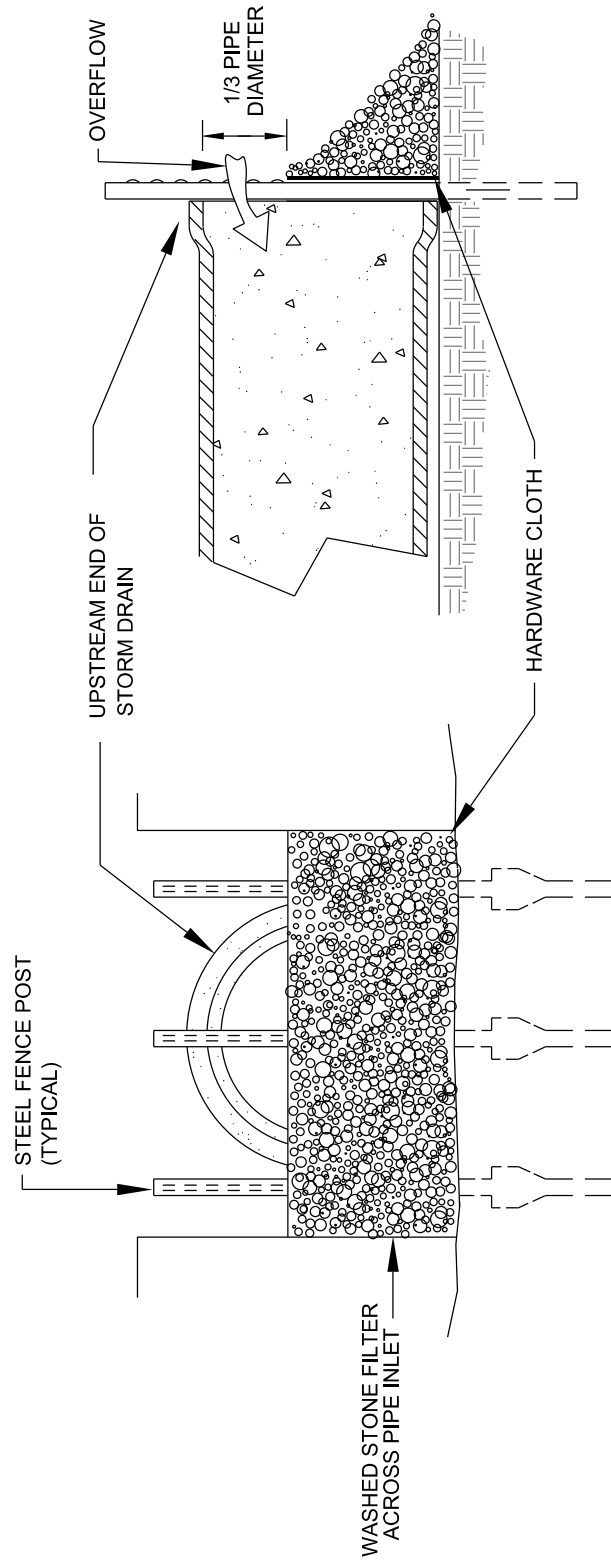
NOTES:

1. TWO CONCRETE BLOCKS SHALL BE PLACED ON THEIR SIDES ABUTTING THE CURB AT EITHER SIDE OF THE INLET OPENING, A 2" X 4" STUD SHALL BE CUT AND PLACED THROUGH THE OUTER HOLES OF THE SPACER BLOCKS TO BRACE THE FRONT BLOCKS. FRONT BLOCKS ARE PLACED ON THEIR SIDES ACROSS THE INLET AND ABUTTING THE SPACER BLOCKS.
2. WIRE MESH OR HARDWARE CLOTH WITH 1/4" - 1/2" OPENINGS SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE (WEBBING) OF THE BLOCKS, TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS.
3. STONE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BLOCK. (NO. 57 WASHED STONE)
4. CHECK DEVICE AFTER EACH RAIN AND REPLACE WASHED STONE IF IT CLOGS WITH SEDIMENT.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BLOCK AND GRAVEL INLET PROTECTION FOR CURB INLET	
	SW-20.26	



PLYWOOD INLET PROTECTION



STONE FILTER INLET PROTECTION

NOTES:
ALL PARTIALLY COMPLETED STORM DRAINS
SHALL BE PROTECTED AT THE END OF EACH DAY
IN ACCORDANCE WITH THESE DETAILS.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	UNDER CONSTRUCTION PIPE INLET PROTECTION	
	SW-20.27	

DESIGN CRITERIA

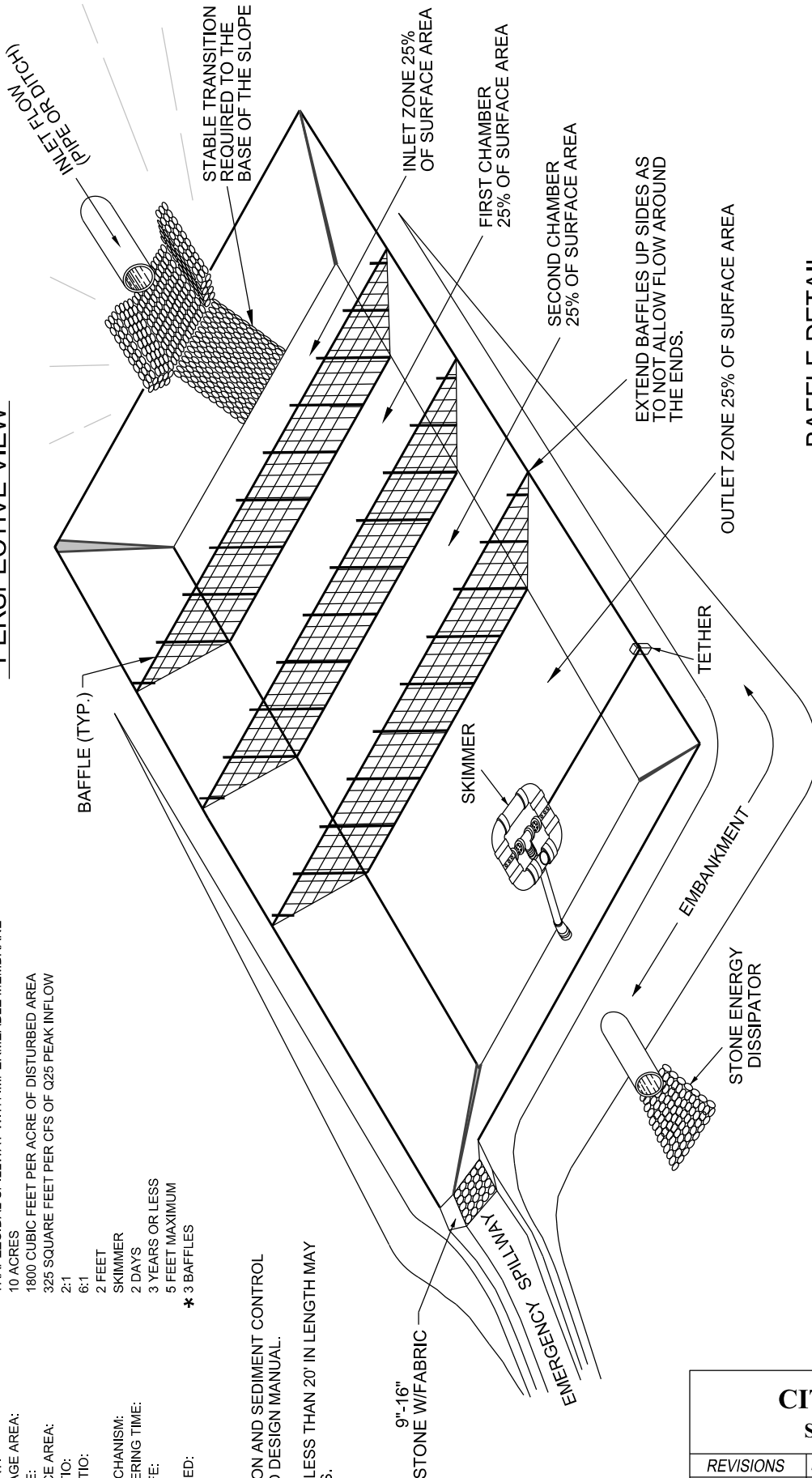
SUMMARY:

PRIMARY SPILLWAY: SKIMMER SEDIMENT BASIN
MAXIMUM DRAINAGE AREA: TRAPEZOIDAL SPILLWAY WITH IMPERMEABLE MEMBRANE
MINIMUM VOLUME: 10 ACRES
MINIMUM SURFACE AREA: 1800 CUBIC FEET PER ACRE OF DISTURBED AREA
MINIMUM L/W RATIO: 325 SQUARE FEET PER CFS OF Q25 PEAK INFLOW
MAXIMUM L/W RATIO: 2:1
MINIMUM DEPTH: 6:1
DEWATERING MECHANISM: SKIMMER
MINIMUM DEWATERING TIME: 2 FEET
DESIGN BASIN LIFE: 3 YEARS OR LESS
DAM HEIGHT: 5 FEET MAXIMUM
BAFFLES REQUIRED: * 3 BAFFLES

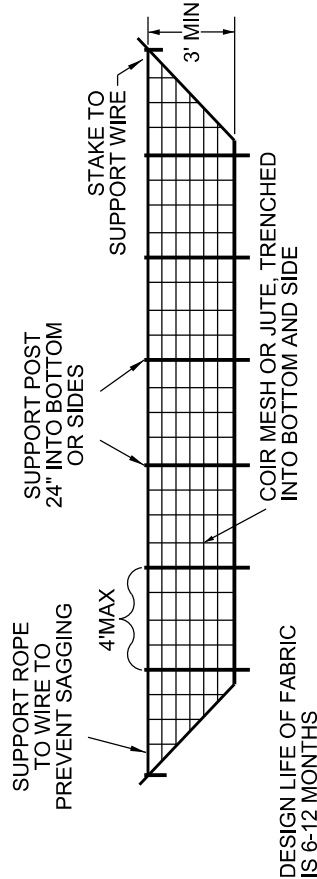
SEE NC EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

* NOTE: BASINS LESS THAN 20' IN LENGTH MAY USE 2 BAFFLES.

PERSPECTIVE VIEW

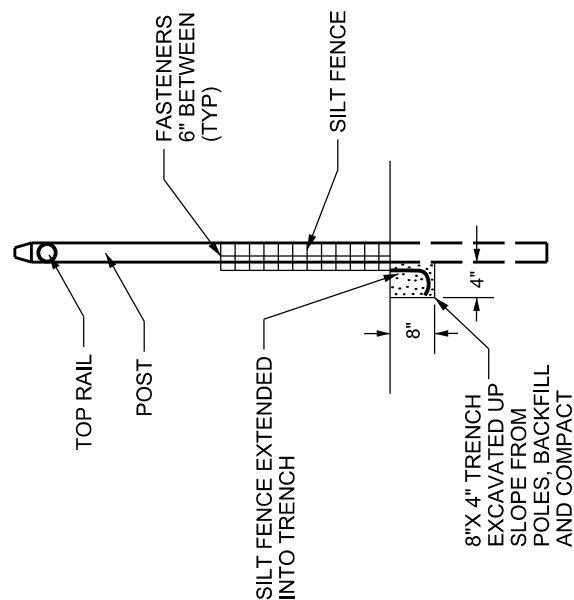


BAFFLE DETAIL



- NOTES:
1. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS.
 2. BASIN MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SKIMMER SEDIMENT BASIN	
	SW-20.28	

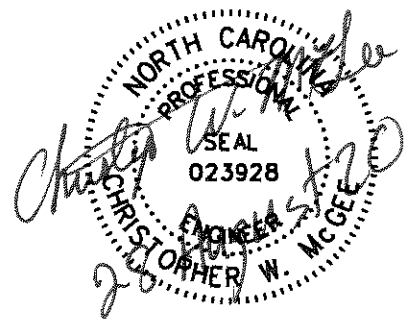


SW-20.29

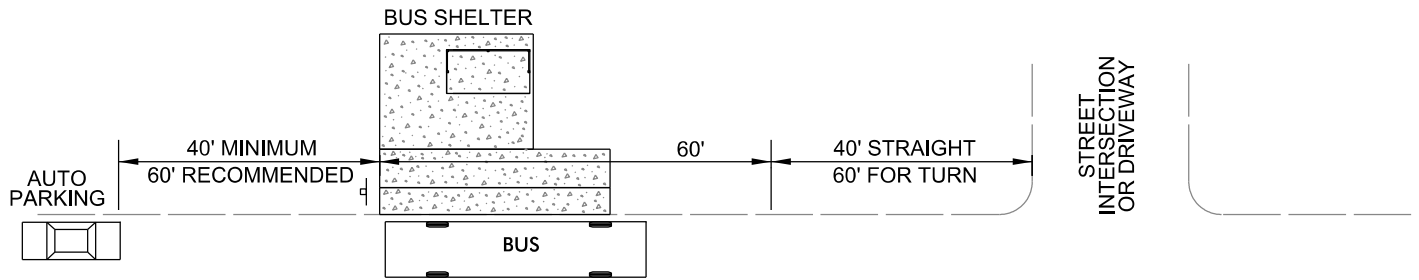
2. SILT FENCE SHOULD BE A MINIMUM OF 5 FEET FROM THE TOE OF SLOPE.

CITY OF RALEIGH

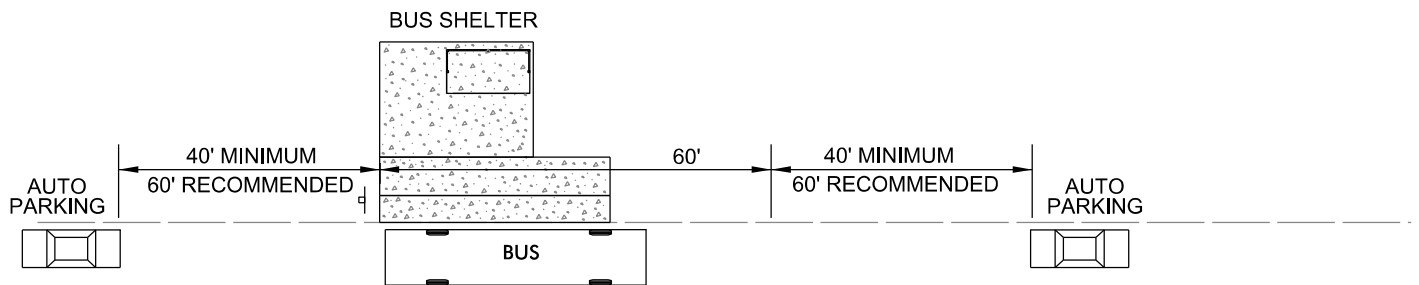
STANDARD DETAILS



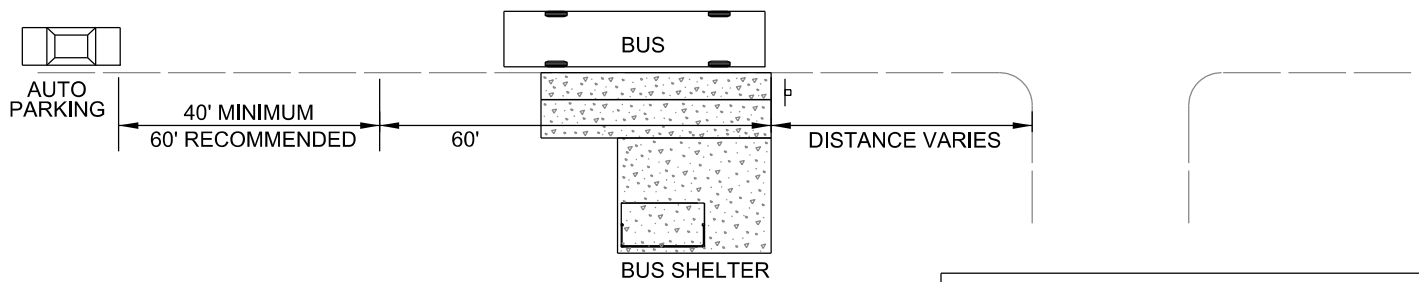
TRANSIT



FAR SIDE BUS STOPS



MID BLOCK BUS STOPS



NEAR SIDE BUS STOPS

CITY OF RALEIGH STANDARD DETAIL

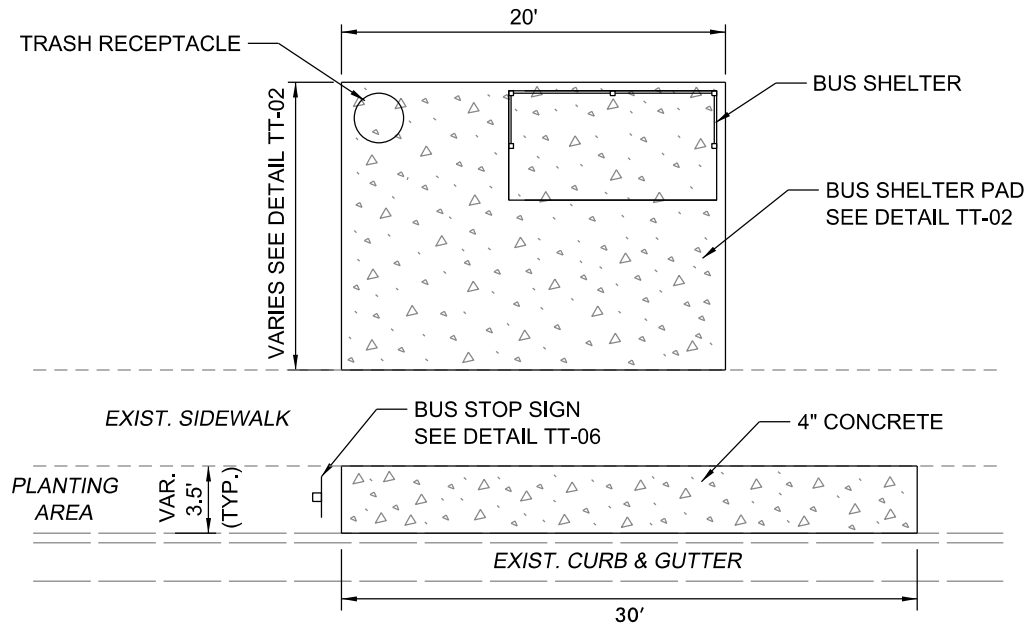
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TYPICAL STOP LOCATION	
	TT-01	



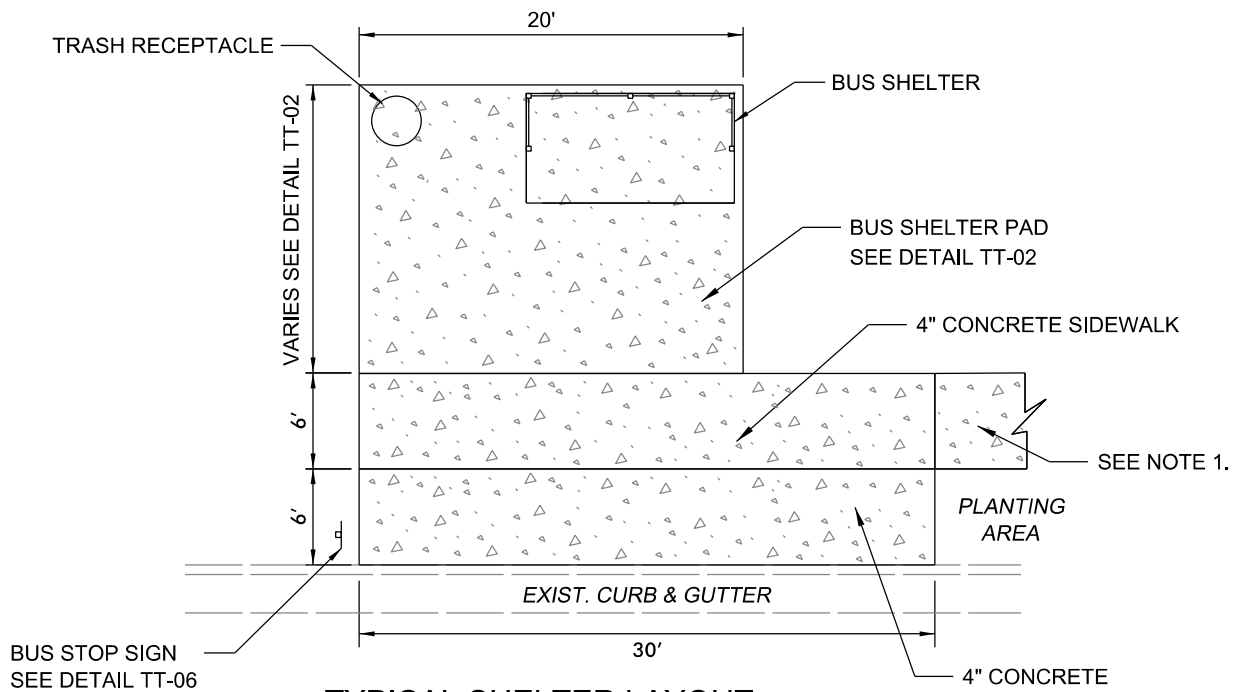
11. SIDEWALK AND CONCRETE IN UTILITY STRIP AT BACK OF CURB WILL BE 4" THICK IN ACCORDANCE WITH THE STANDARD SIDEWALK SECTION.



CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BUS STOP PAD	
	TT-02	



**TYPICAL SHELTER LAYOUT
WITH EXISTING SIDEWALK**
NTS

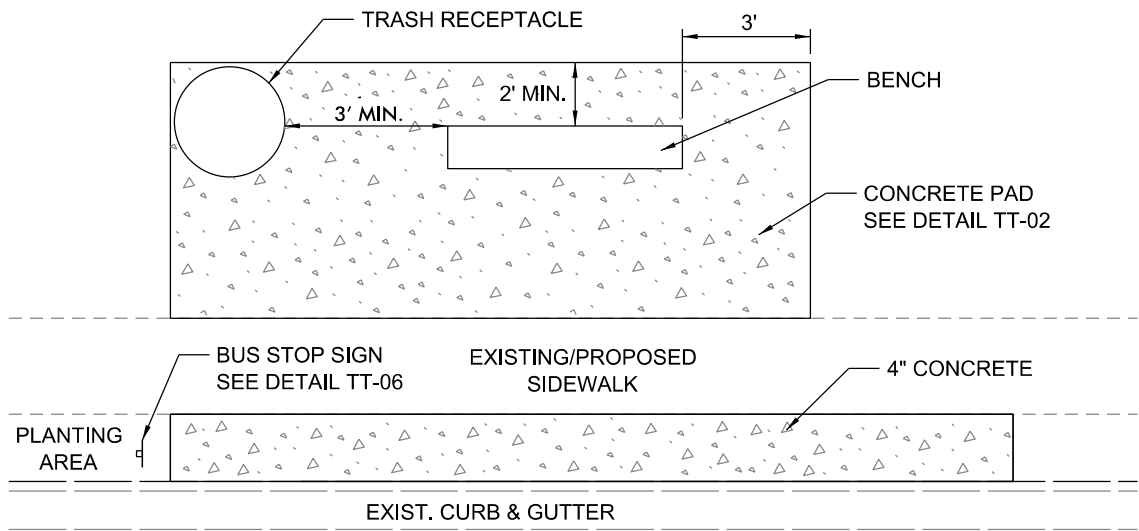


**TYPICAL SHELTER LAYOUT
WITHOUT EXISTING SIDEWALK**
NTS

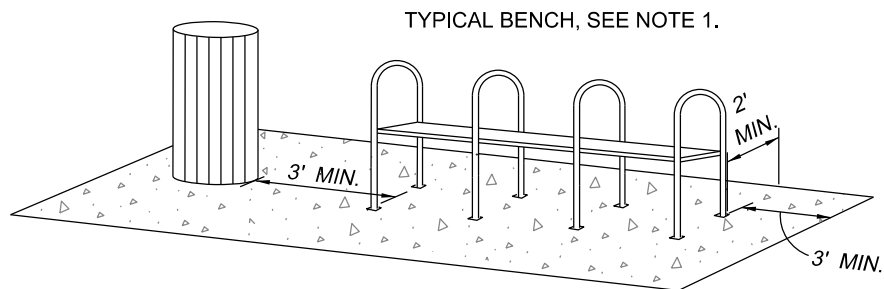
NOTES:

1. IF NO SIDEWALK CURRENTLY EXISTS, PROVIDE SIDEWALK TO NEAREST ADA ACCESSIBLE INTERSECTION OR DRIVEWAY WITH APPROPRIATE RAMPS. SIDEWALK AND PLANTING AREA WIDTH TO BE IN COMPLIANCE WITH THE CITY'S UDO. PROVIDE CURB RAMP IN ACCORDANCE WITH CITY STANDARDS.
2. BUS SHELTER SHALL BE MINIMUM 6" FROM EDGE OF CONCRETE PAD.
3. FIXED OBJECTS SHALL BE PLACED OUTSIDE OF THE CLEAR ZONE.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SITE LAYOUT FOR SHELTER	
	TT-04	



**TYPICAL BENCH LAYOUT
WITH EXISTING SIDEWALK**
NTS

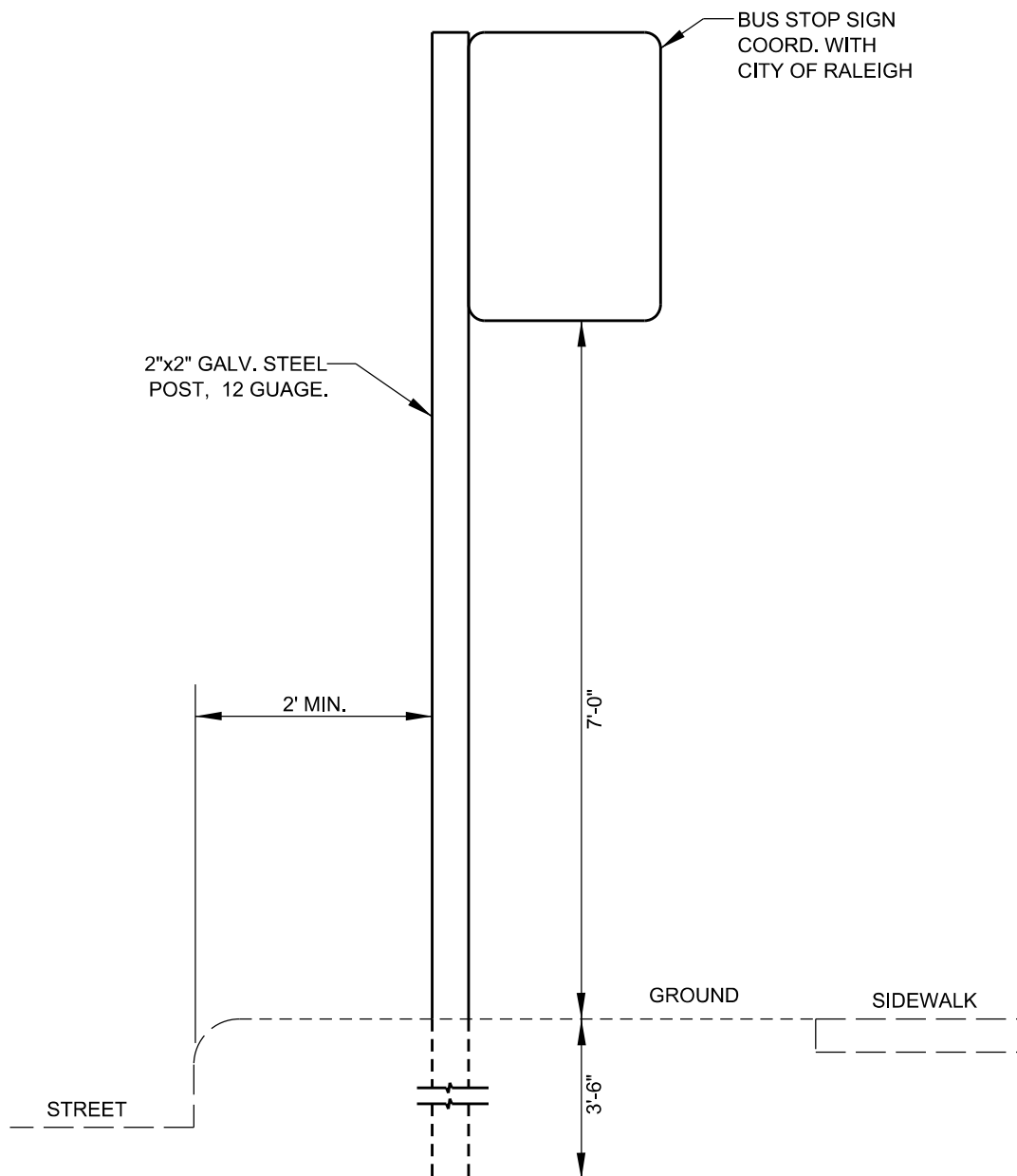


BENCH SCHEMATIC

NOTES:

1. BENCH STYLE SUBJECT TO CHANGE, COORDINATE WITH CITY.
2. BENCH SHOULD BE A MINIMUM OF 3' FROM THE SIDE OF THE CONCRETE PAD AND 2' FROM THE BACK EDGE OF THE CONCRETE PAD. COORDINATE LOCATION WITH THE CITY.
3. IF NO SIDEWALK CURRENTLY EXISTS, PROVIDE SIDEWALK TO NEAREST ADA ACCESSIBLE INTERSECTION OR DRIVEWAY WITH APPROPRIATE RAMPS.
4. FIXED OBJECTS SHALL BE PLACED OUTSIDE OF THE CLEAR ZONE.

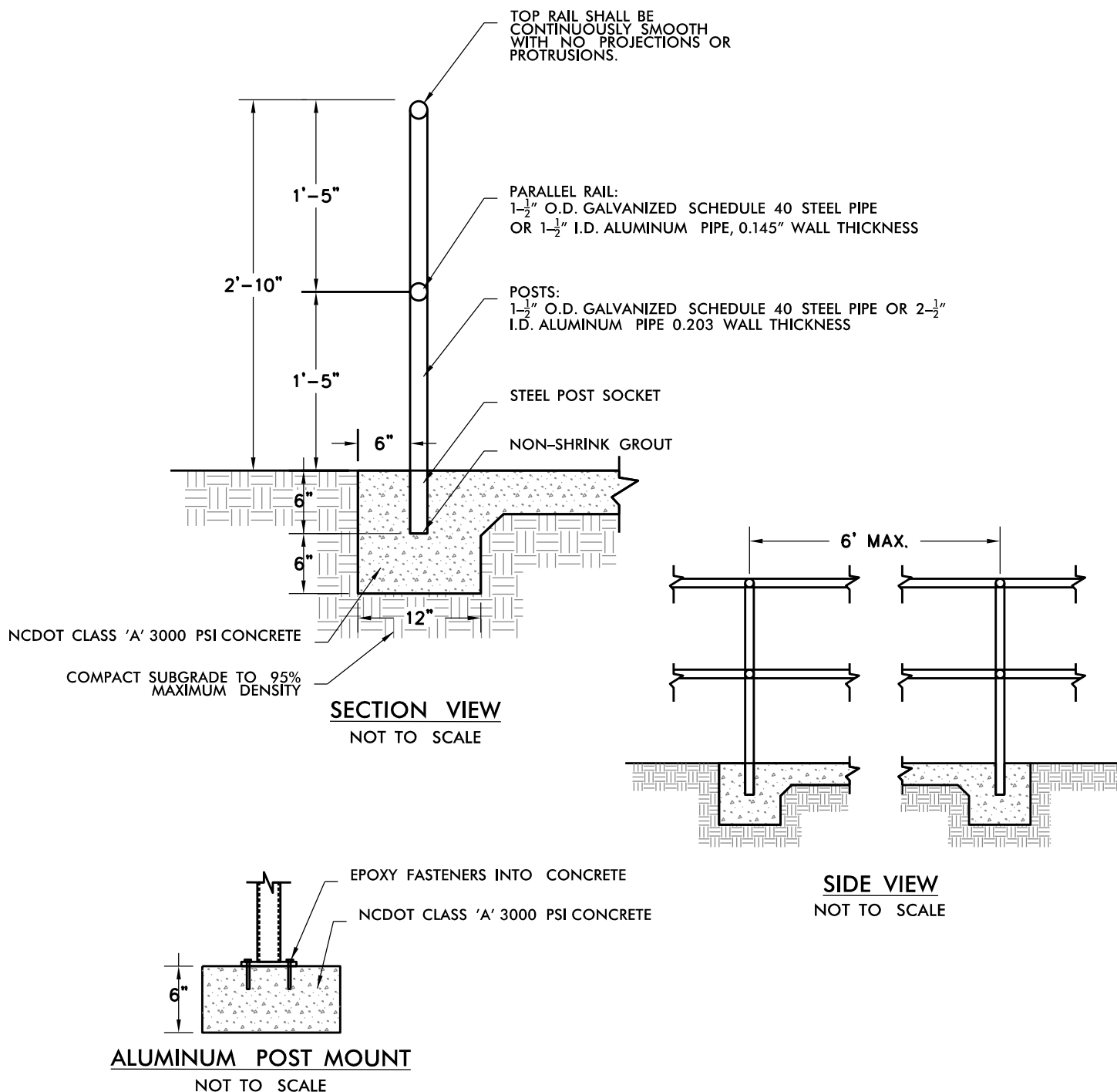
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SITE LAYOUT FOR BENCH	
	TT-05	



NOTES:

1. INSTALL SIGN AHEAD OF STOP 2' FROM CONCRETE SECTION IN UTILITY STRIP
2. CALL 811 FOR UNDERGROUND UTILITY LOCATION PRIOR TO INSTALLATION.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SIGN POST LAYOUT	
	TT-06	

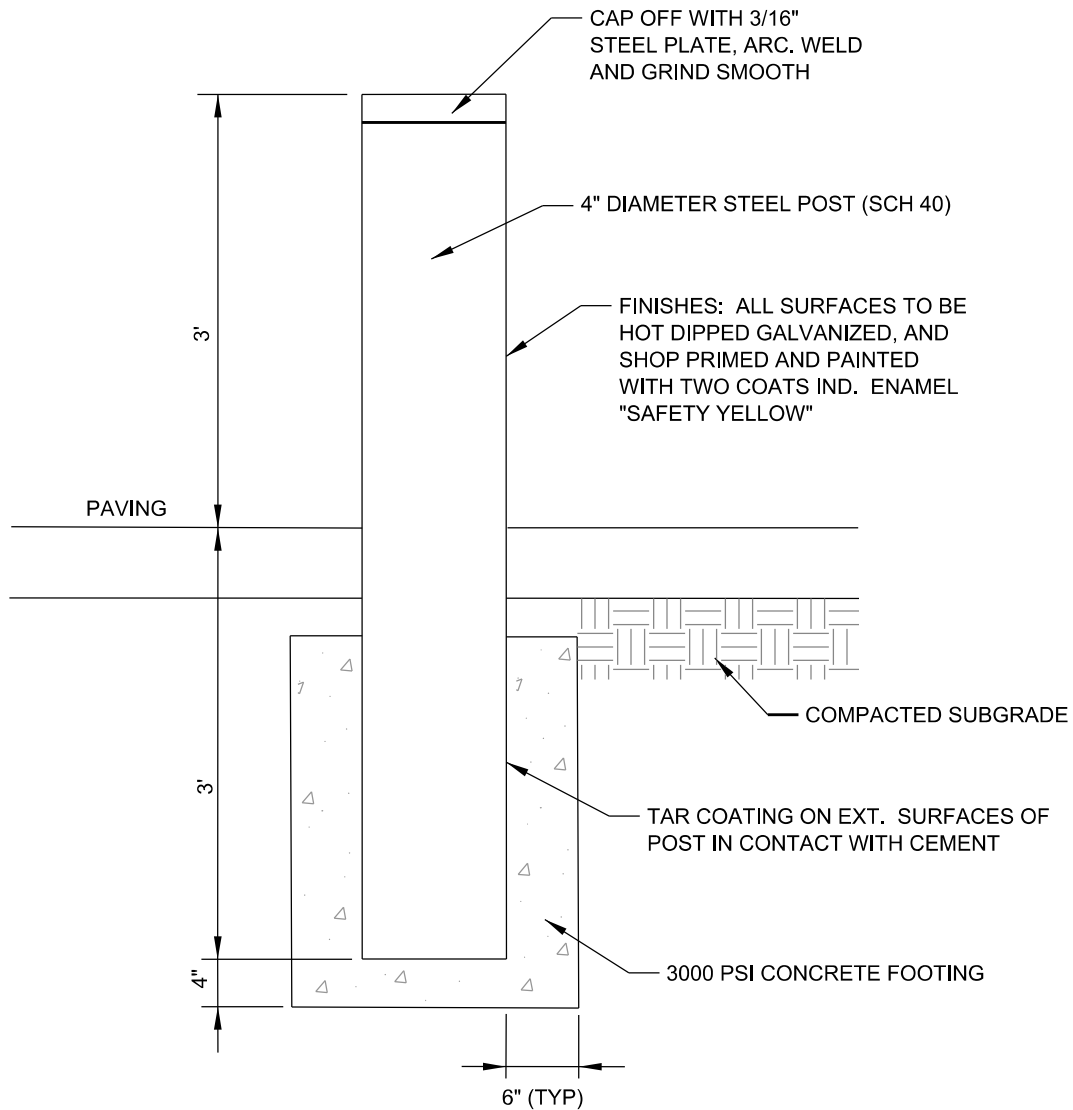


NOTES:

1. CONTRACTOR TO PROVIDE FULL SHOP DRAWINGS FOR HANDRAIL PRIOR TO INSTALLING.

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	HANDRAIL INSTALLATION	
	TT-07	



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BOLLARD INSTALLATION	
	TT-08	

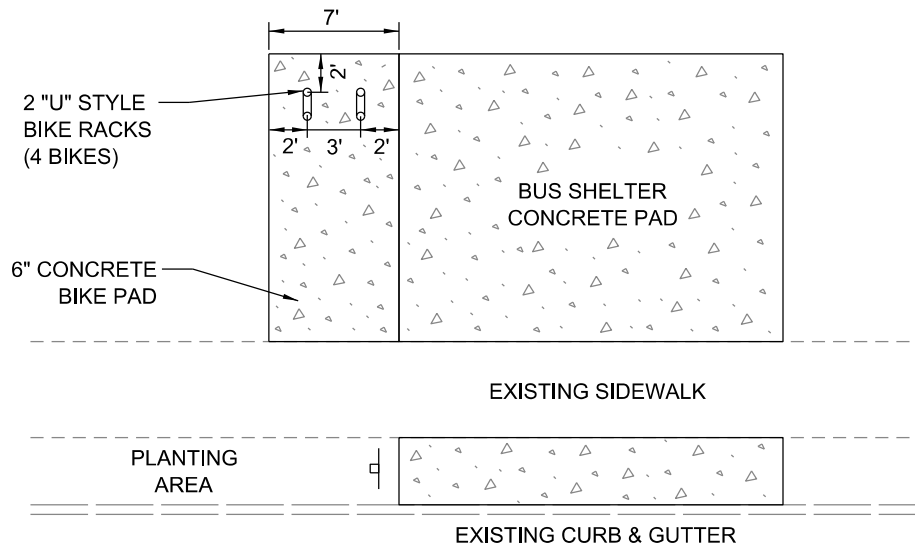


1. STANDARD UNIT WILL MEET NCDOT APPROVED VENDORS LIST. DIMENSIONS OF CONCRETE BLOCKS ARE TYPICALLY 18" WIDE BY 18" DEEP BY 8" TALL WITH PIN OR SIMILAR LOCKING MECHANISMS. BACK FILL VOIDS IN BLOCKS WITH #57 STONE TO TOP.
2. DO NOT MIX UNITS FROM DIFFERENT VENDORS ON SAME WALL.
3. TOP CAP UNIT WILL BE GLUED TO BLOCKS WITH ADHESIVE MEETING MANUFACTURERS RECOMMENDATIONS.
4. DO NOT USE SEGMENTAL GRAVITY WALLS WHEN SURCHARGE LOADS WILL BE WITHIN 5'-6" OF THE BACK OF THE CAP UNIT.
5. DO NOT ATTACH FENCE OR HANDRAIL TO WALL.
6. WALL SIMILAR TO NCDOT STANDARD DRAWING 453.02.

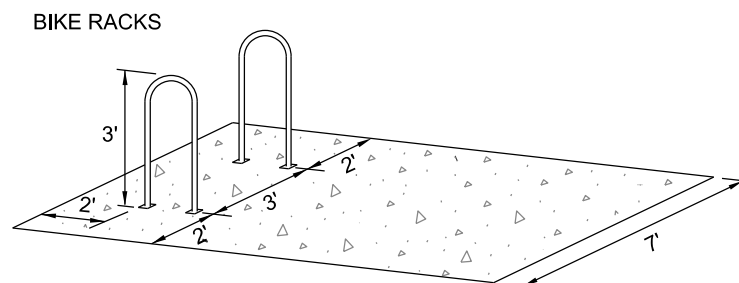
1. USE CLASS A CONCRETE AND PROVIDE CLASS I SURFACE FINISH ON ALL EXPOSED SURFACES.
2. PROVIDE GROVED CONTRACTION JOINTS EVERY 10'-0"
3. PROVIDE 4" PERFORATED PVC DRAIN PIPE THE LENGTH OF THE WALL. WRAP PIPE WITH FILTER FABRIC AND PROVIDE 1' WIDE BY 1' DEEP WASHED STONE AROUND PIPE. TIE TO STORM DRAIN OR DAYLIGHT AT ENDS AND PROVIDE SOCK AROUND END OF PIPE.
4. DO NOT BACKFILL WALL UNTIL CONCRETE DEVELOPS A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. COMPACT BACKFILL AND COMPACT WITH HAND OPERATED EQUIPMENT.
5. TAPER ENDS OF WALL TO 6" ABOVE GRADE IN 3' MINIMUM. END OF WALL SHALL HAVE 6" HORIZONTAL CLEARANCE FROM THE EDGE OF SIDEWALK.
6. WALL SIMILAR TO NCDOT STANDARD DRAWING 453.01.

1. COORDINATE WITH CITY OF RALEIGH ON WHICH WALL TYPE TO USE.
2. ALL RETAINING WALLS SHALL BE DESIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	RETAINING WALL	
	TT-09	



TYPICAL BIKE PAD LAYOUT
NTS



BIKE RACK SCHEMATIC

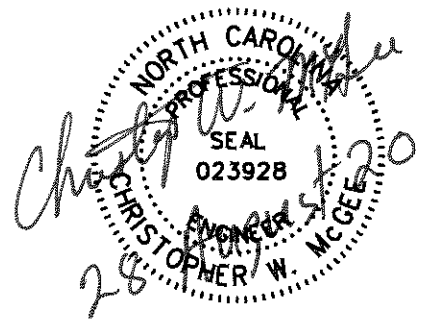
NOTES:

1. BIKE RACK TO BE 2" SCHEDULE 40 STEEL POWDER COATED BLACK.
2. COORDINATE LOCATION WITH THE CITY PRIOR TO INSTALLATION.

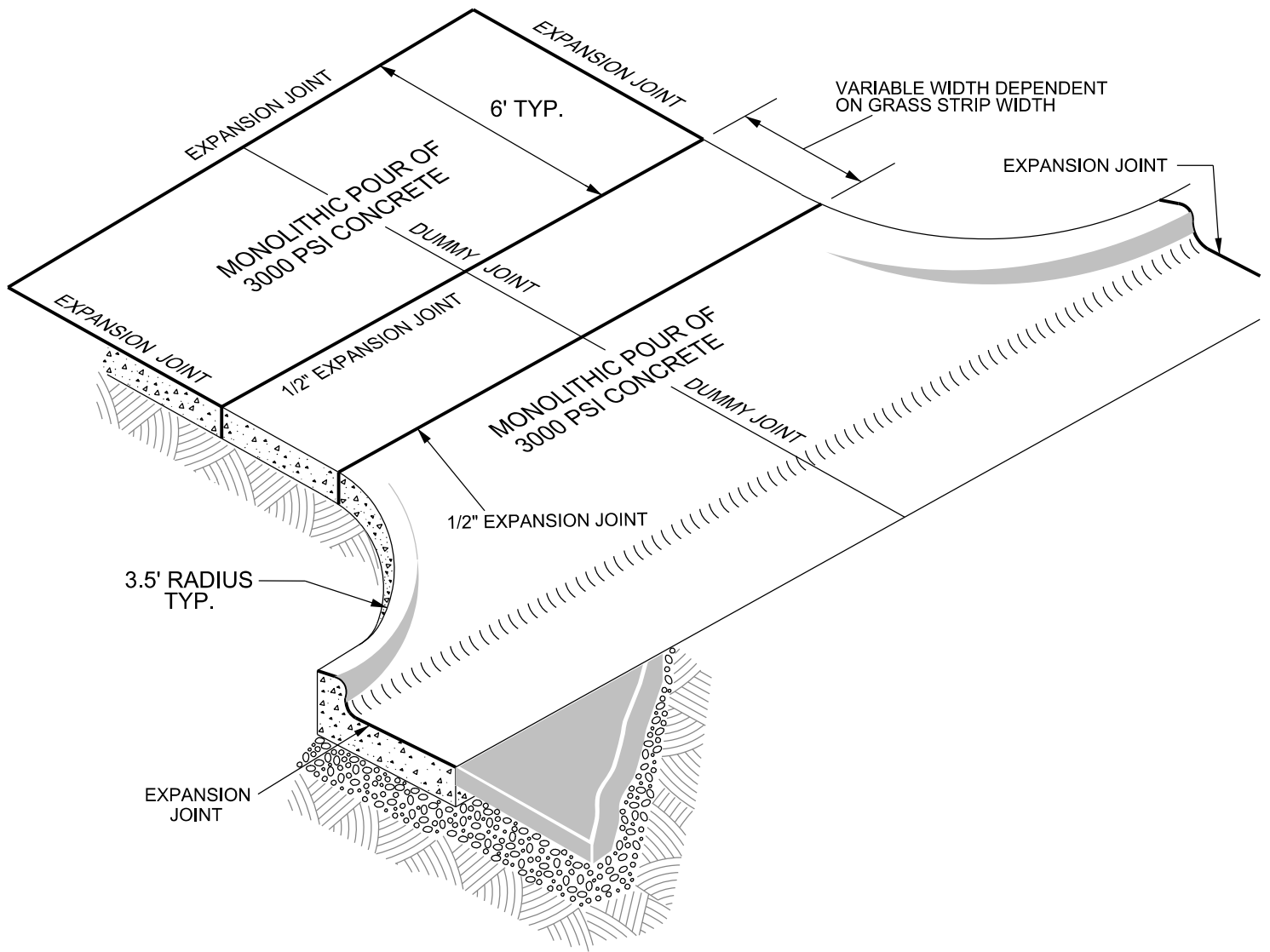
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SITE LAYOUT FOR BIKE PAD	
	TT-10	

CITY OF RALEIGH

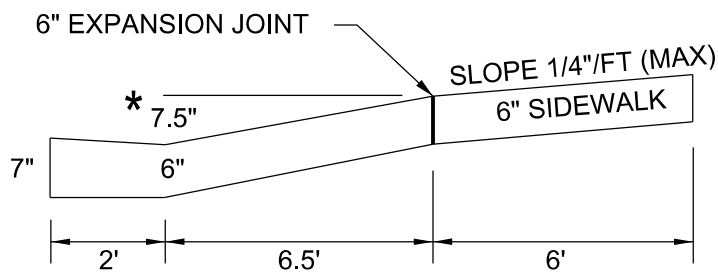
STANDARD DETAILS



TRANSPORTATION



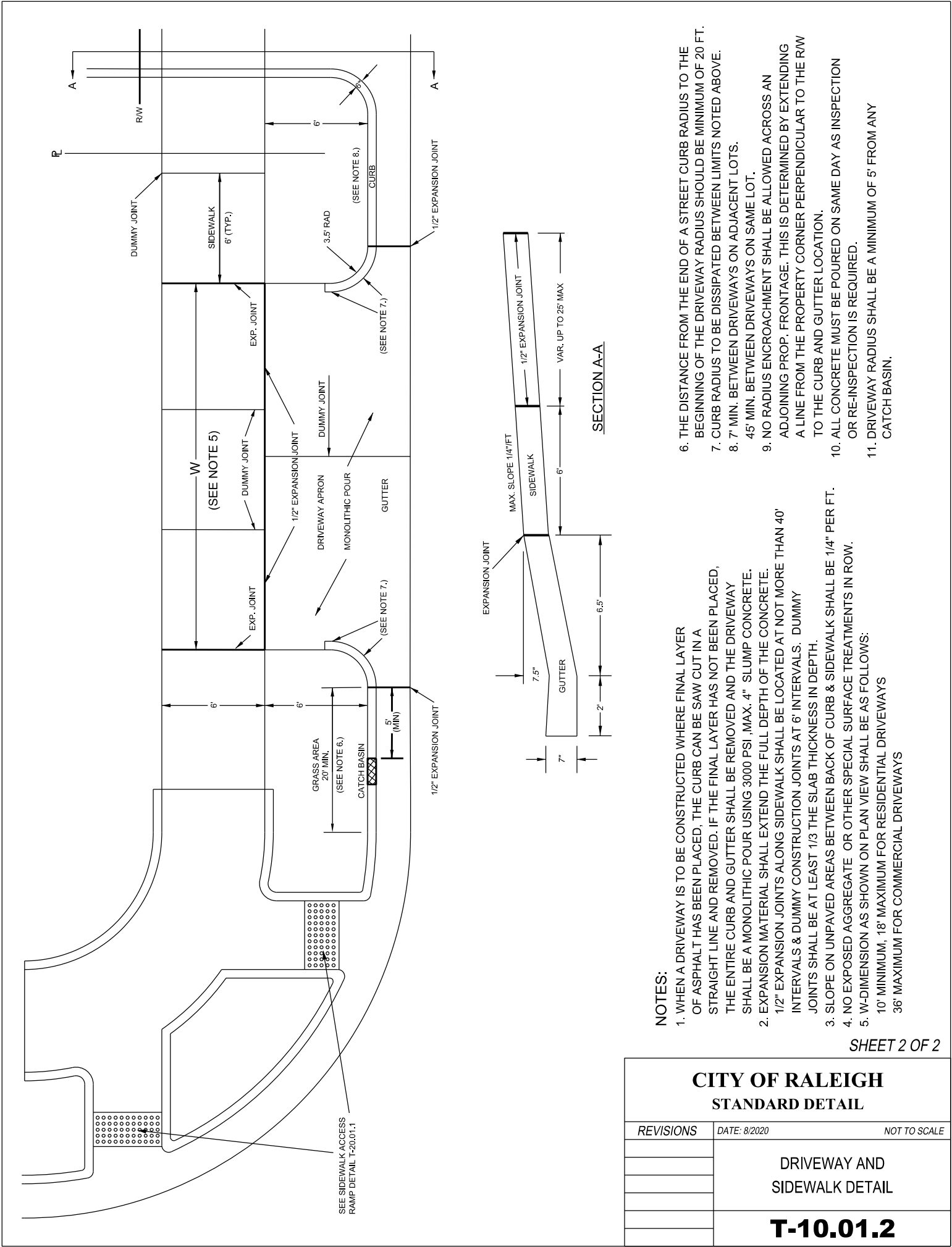
SEE T-10.01.2 FOR ADDITIONAL NOTES



* USE 6.5" WHEN DRIVEWAY IS USED IN LIEU OF A WHEELCHAIR RAMP TO ACCOMMODATE 12:1 MAXIMUM SLOPE (ADA COMPLIANT), SUCH AS IN A CUL-DE SAC.

SHEET 1 OF 2

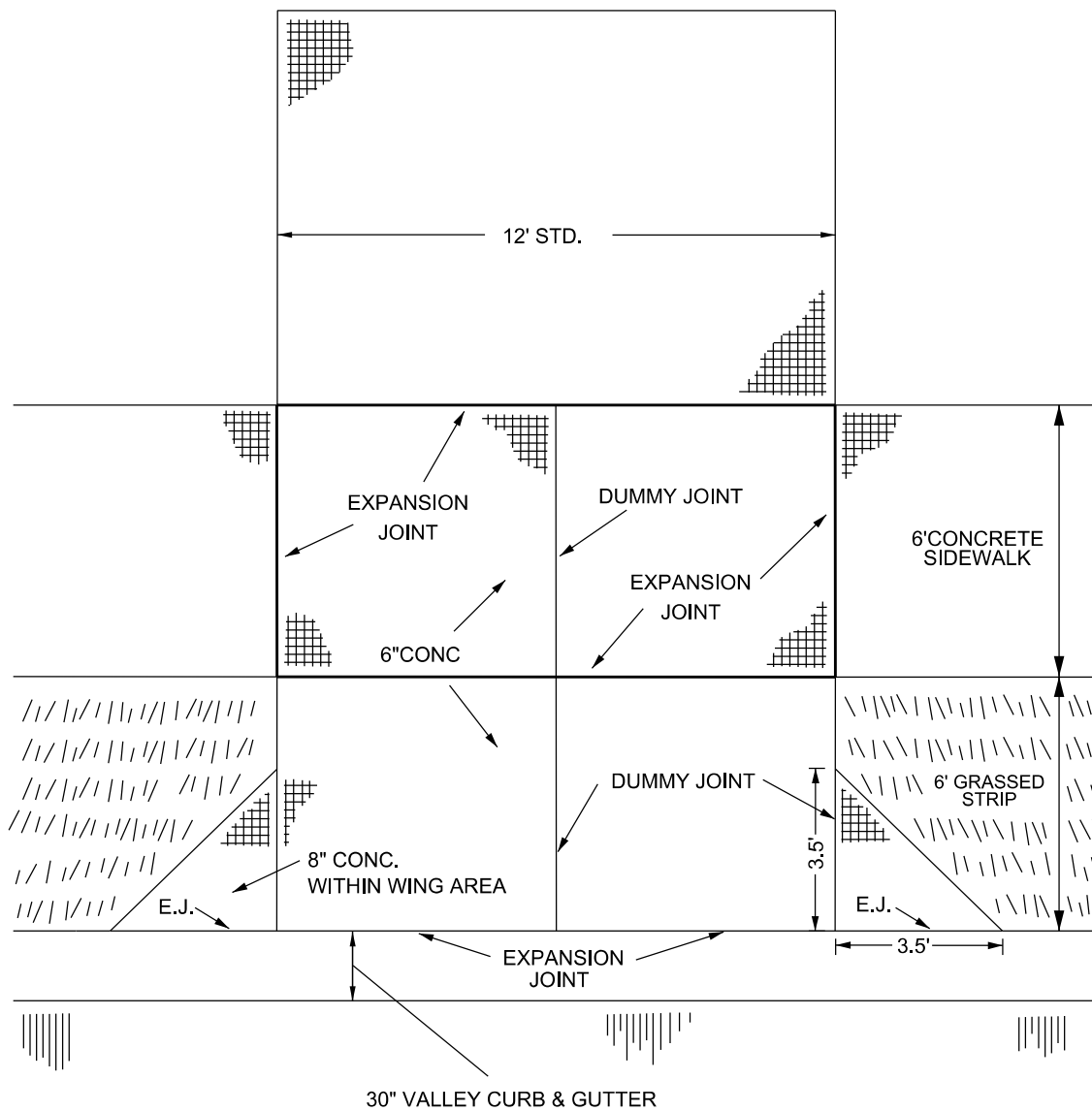
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DRIVEWAY AND SIDEWALK DETAIL	
	T-10.01.1	



NOTES:

- 1. WHEN A DRIVEWAY IS TO BE CONSTRUCTED WHERE FINAL LAYER OF ASPHALT HAS BEEN PLACED, THE CURB CAN BE SAW CUT IN A STRAIGHT LINE AND REMOVED. IF THE FINAL LAYER HAS NOT BEEN PLACED, THE ENTIRE CURB AND GUTTER SHALL BE REMOVED AND THE DRIVEWAY SHALL BE A MONOLITHIC POUR USING 3000 PSI, MAX. 4" SLUMP CONCRETE.
- 2. EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH OF THE CONCRETE.
- 3. 1/2" EXPANSION JOINTS ALONG SIDEWALK SHALL BE LOCATED AT NOT MORE THAN 40' INTERVALS & DUMMY CONSTRUCTION JOINTS AT 6' INTERVALS. DUMMY JOINTS SHALL BE AT LEAST 1/3 THE SLAB THICKNESS IN DEPTH.
- 4. SLOPE ON UNPAVED AREAS BETWEEN BACK OF CURB & SIDEWALK SHALL BE 1/4" PER FT.
- 5. NO EXPOSED AGGREGATE OR OTHER SPECIAL SURFACE TREATMENTS IN ROW.
- 6. THE DISTANCE FROM THE END OF A STREET CURB RADIUS TO THE BEGINNING OF THE DRIVEWAY RADIUS SHOULD BE MINIMUM OF 20 FT.
- 7. CURB RADIUS TO BE DISSIPATED BETWEEN LIMITS NOTED ABOVE.
- 8. 7' MIN. BETWEEN DRIVEWAYS ON ADJACENT LOTS.
- 9. 45' MIN. BETWEEN DRIVEWAYS ON SAME LOT.
- 10. NO RADIUS ENCROACHMENT SHALL BE ALLOWED ACROSS AN ADJOINING PROP. FRONTAGE. THIS IS DETERMINED BY EXTENDING A LINE FROM THE PROPERTY CORNER PERPENDICULAR TO THE ROW TO THE CURB AND GUTTER LOCATION.
- 11. ALL CONCRETE MUST BE POURED ON SAME DAY AS INSPECTION OR RE-INSPECTION IS REQUIRED.
- 12. DRIVEWAY RADIUS SHALL BE A MINIMUM OF 5' FROM ANY CATCH BASIN.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DRIVEWAY AND SIDEWALK DETAIL	
	T-10.01.2	

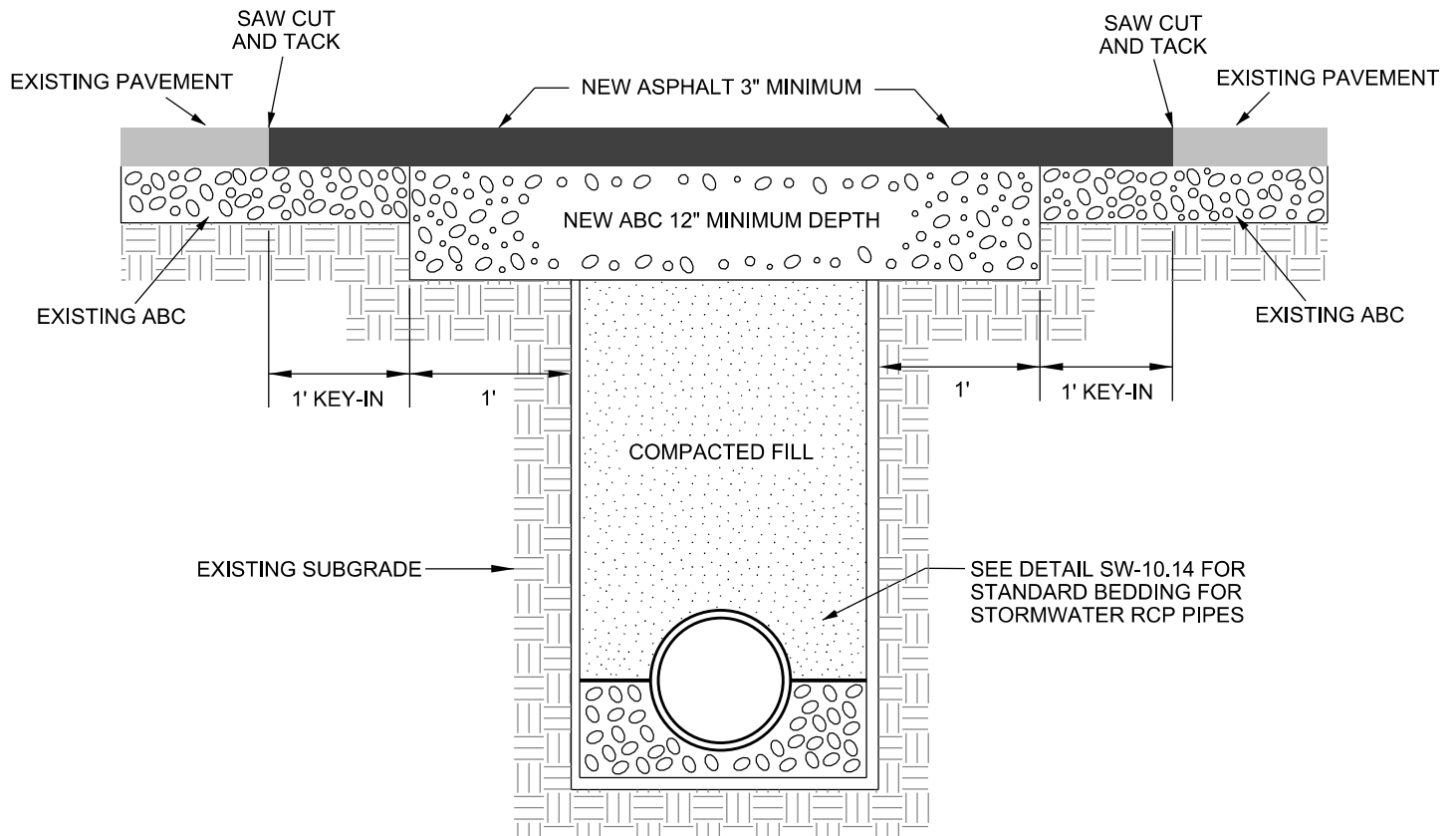


NOTES:

1. SEE STANDARD DETAIL T-10.26.1 FOR CURB AND GUTTER DETAILS.
2. EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH OF THE CONCRETE.
3. ALL CONCRETE SHALL BE 3000 PSI (MIN.).

CITY OF RALEIGH
STANDARD DETAIL

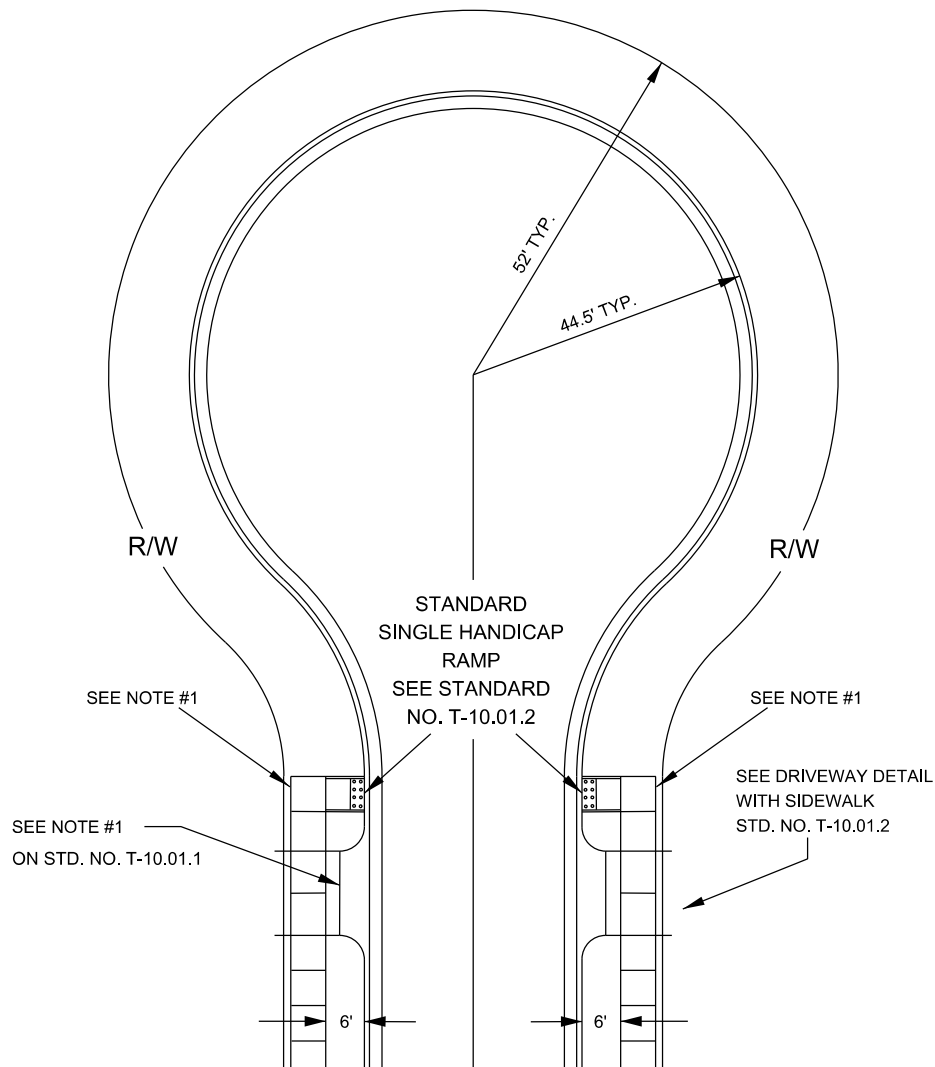
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DRIVEWAY FOR VALLEY TYPE CURB & GUTTER	
	T-10.02	



NOTES:

1. THE PAVEMENT EDGE SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1' OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY TRANSPORTATION DIRECTOR OR DESIGNEE.
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED.
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY AND ROLLED WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH, LEVEL PATCH.

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ASPHALT PAVEMENT PATCH AND RCP PIPE BACKFILL	
	T-10.05	

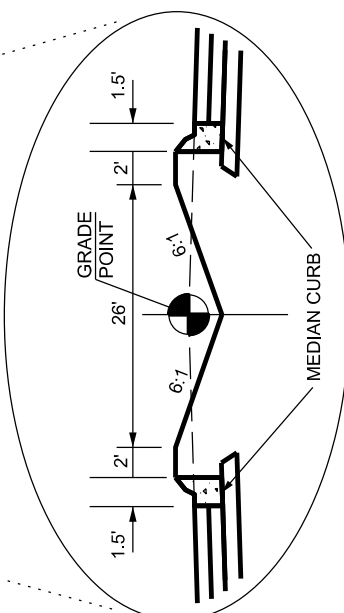
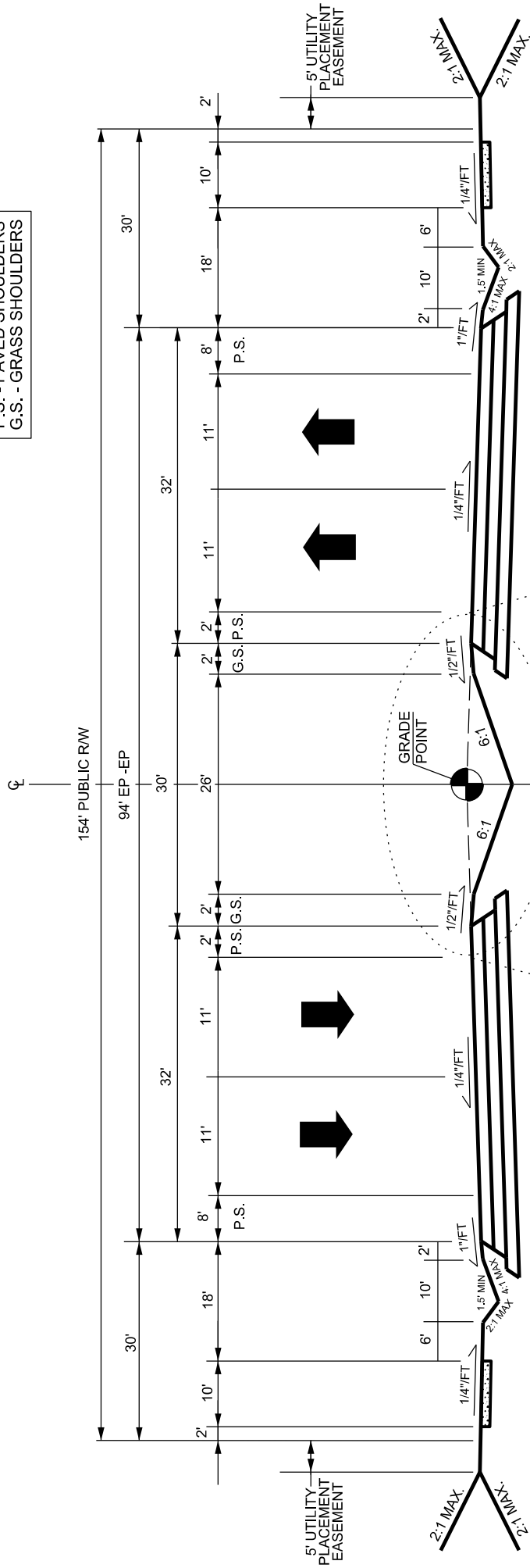


NOTES:

1. IF DRIVEWAY IS WITHIN CLOSE PROXIMITY OF ACCESS RAMP, TIE SIDEWALK INTO DRIVEWAY.
2. REFER TO STANDARD DETAIL T-10.01.2, DRIVE WAY AND SIDEWALK DETAIL, SHEET 1 OF 2.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD RESIDENTIAL CUL-DE-SAC	
	T-10.06	

P.S. - PAVED SHOULDERS
G.S. - GRASS SHOULDERS



(4-LANE CURB ALTERNATIVE)

PAVEMENT DESIGN
3" S9.5B
4" I19.0B
10" ABC

GENERAL	
WALKWAY TYPE	MULTI-USE PATH
PLANTING TYPE	TREE/LAWN
TREE SPACING	50' O.C. AVG
PARKING TYPE	NONE

REVISIONS

DATE: 8/2020

NOT TO SCALE

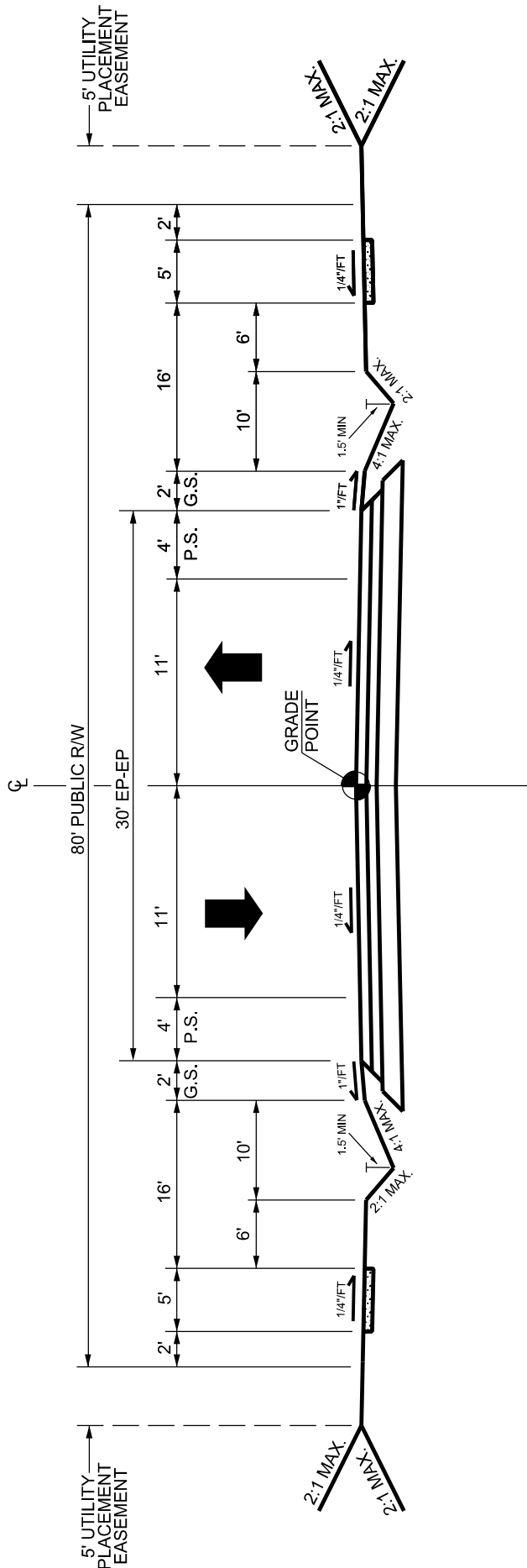
CITY OF RALEIGH

STANDARD DETAIL

SENSITIVE AREA PARKWAY

T-10.07

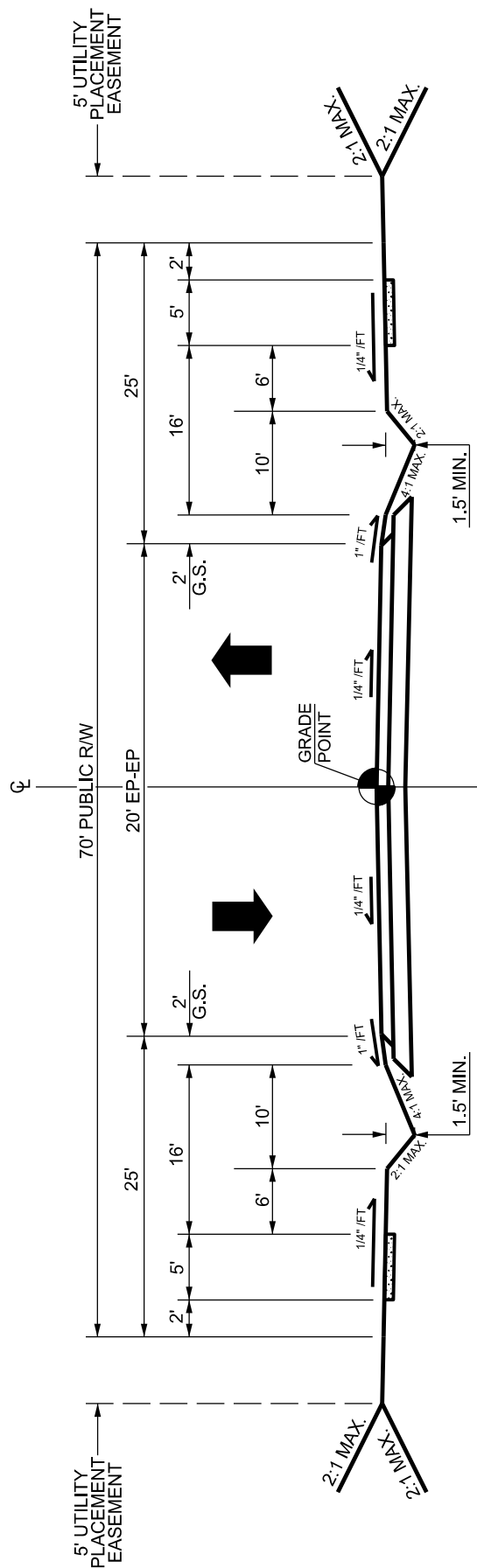
P.S. - PAVED SHOULDERS
G.S. - GRASS SHOULDERS



PAVEMENT DESIGN	
3" S9.5B	
3" I19.0B	
8" ABC	

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	50' O.C. AVG
PARKING TYPE	NONE

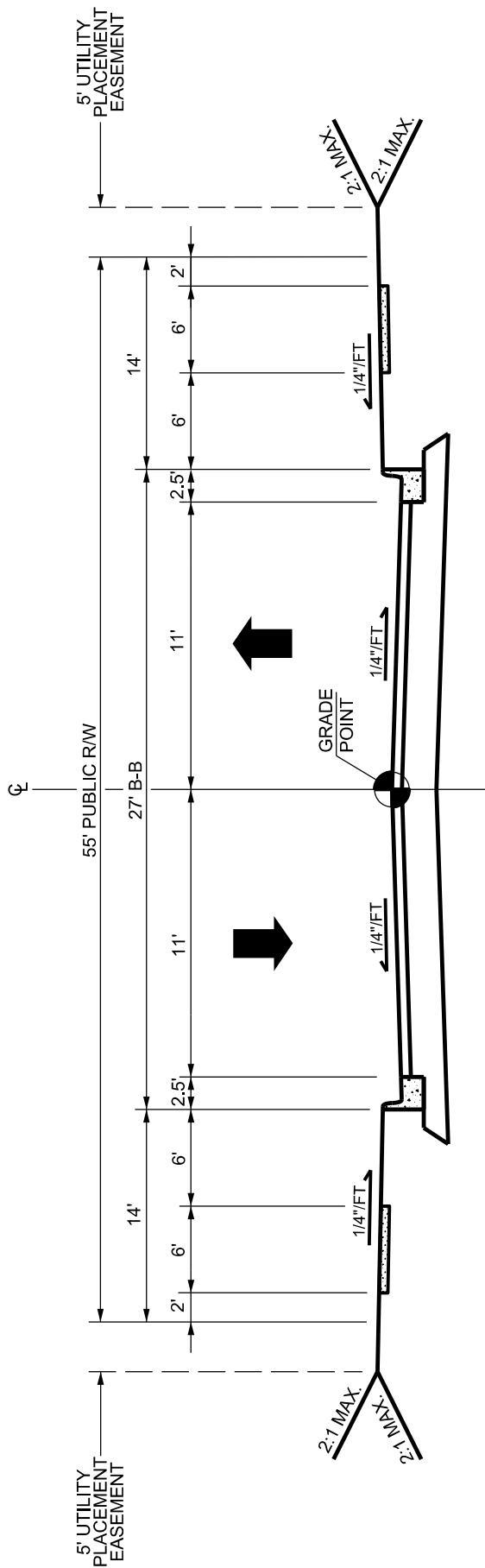
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SENSITIVE AREA AVENUE	
	T-10.08	



PAVEMENT DESIGN	3" SF9.5A 8" ABC
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GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	50' O.C. AVG.

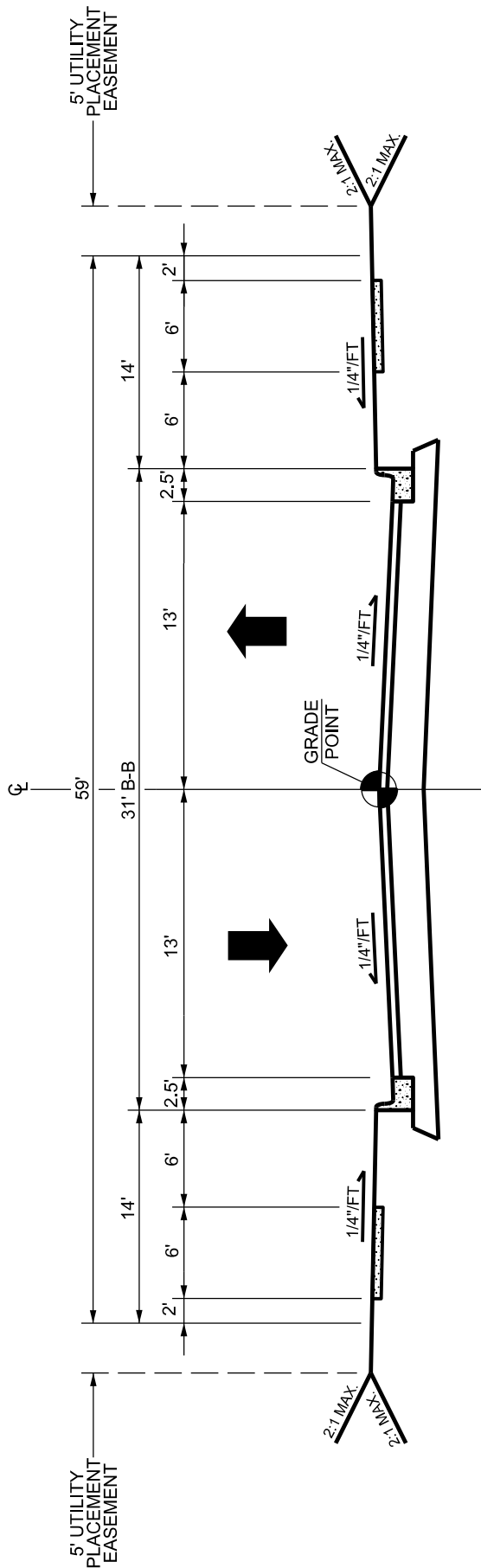
CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	DATE: 8/2020 NOT TO SCALE
	SENSITIVE AREA RESIDENTIAL STREET
	T-10.09



PAVEMENT DESIGN	
3" SF9.5A	8" ABC

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL STAGGERED

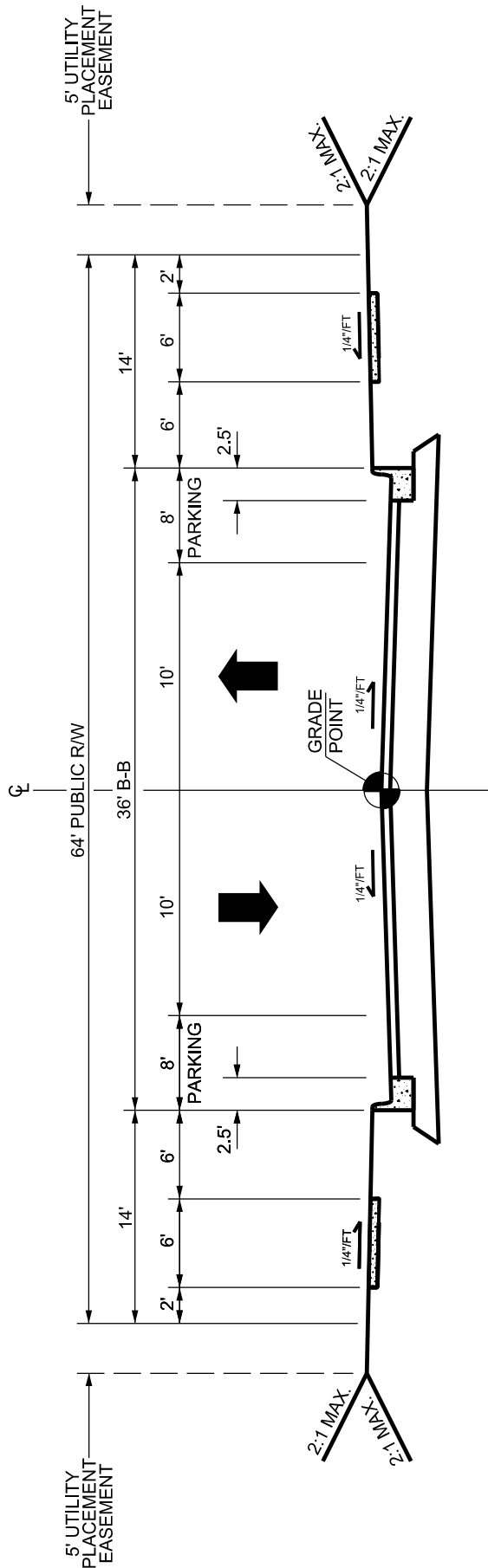
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	NEIGHBORHOOD YIELD	
	T-10.10	



PAVEMENT DESIGN	
3" SF9.5A 8" ABC	

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL ON 2 SIDES

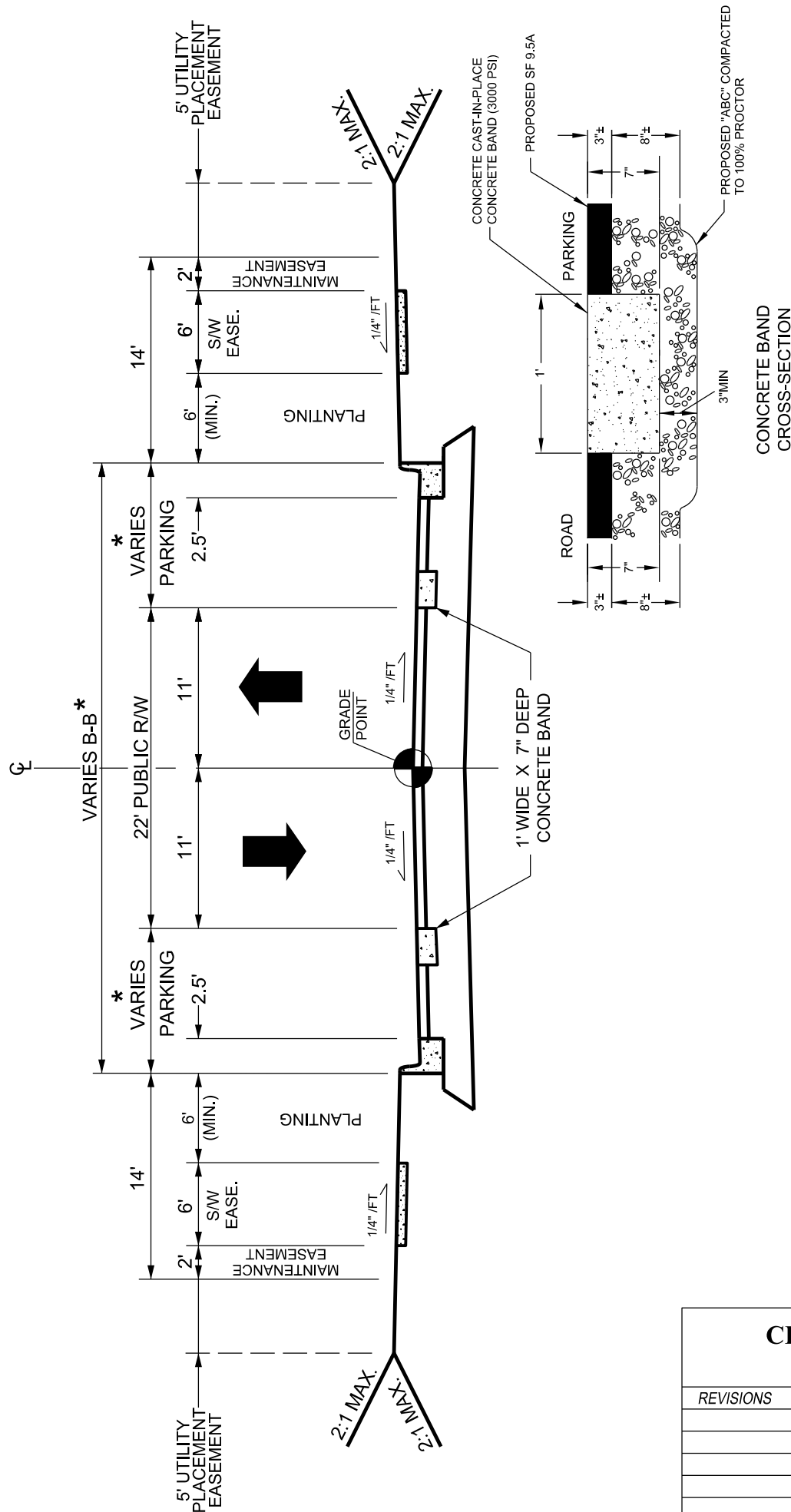
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	NEIGHBORHOOD LOCAL STREET (TWO - WAY)	
	T-10.11	



PAVEMENT DESIGN	
3" SF9.5A	
8" ABC	

GENERAL	
WALKWAY TYPE	SIDEWALK BOTH SIDES
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL ON 2 SIDES

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	NEIGHBORHOOD STREET	
	T-10.12	

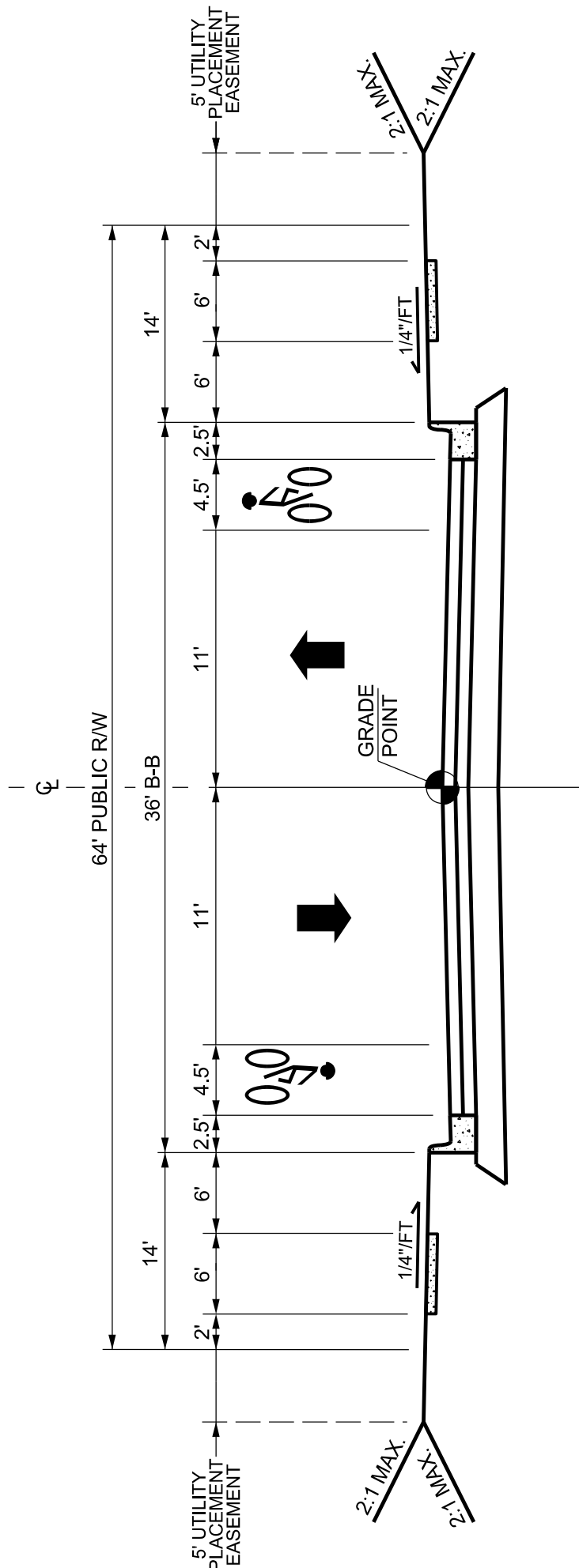


* PARKING DIMENSION VARIES: PARALLEL 8', HEAD-IN 18', 60° ANGLE 20'

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C.AVG.
PARKING TYPE	PARALLEL, HEAD-IN, ANGLE

PAVEMENT DESIGN
3" SF9.5A 8" ABC

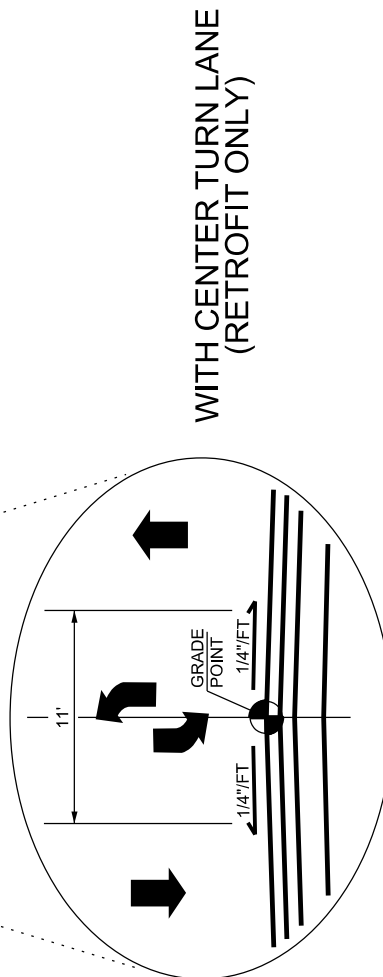
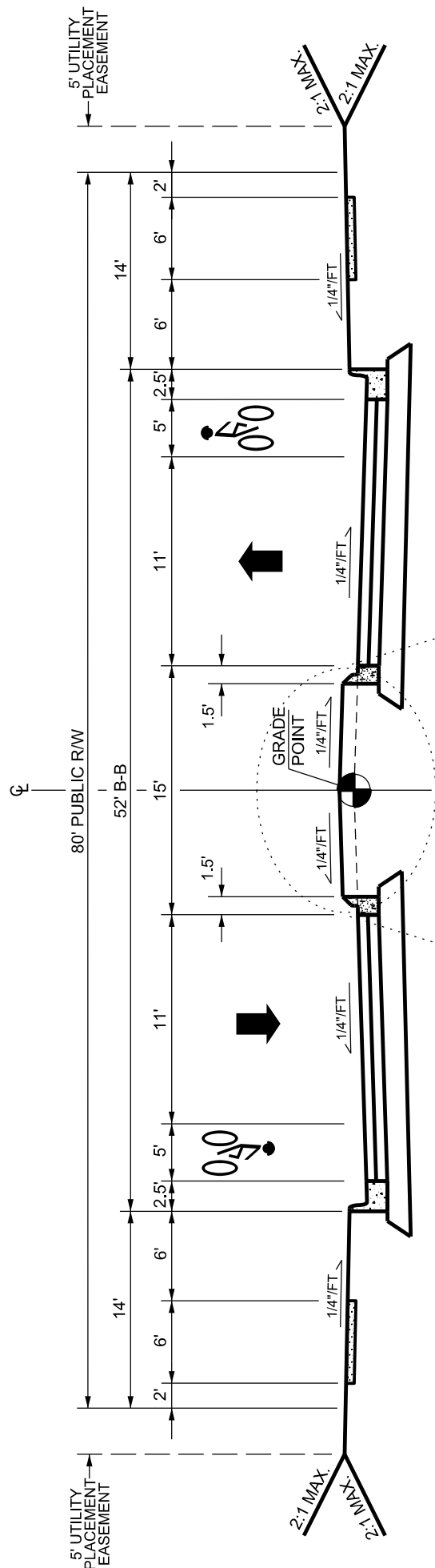
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	MULTIFAMILY STREET	
	T-10.13	



PAVEMENT DESIGN
3" S9.5B
3" I19.0B
8" ABC

GENERAL
WALKWAY TYPE
PLANTING TYPE
TREE SPACING
PARKING TYPE
SIDEWALK
TREE / LAWN
40' O.C. AVG
NONE

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	AVENUE, 2 LANE UNDIVIDED	
	T-10.14	

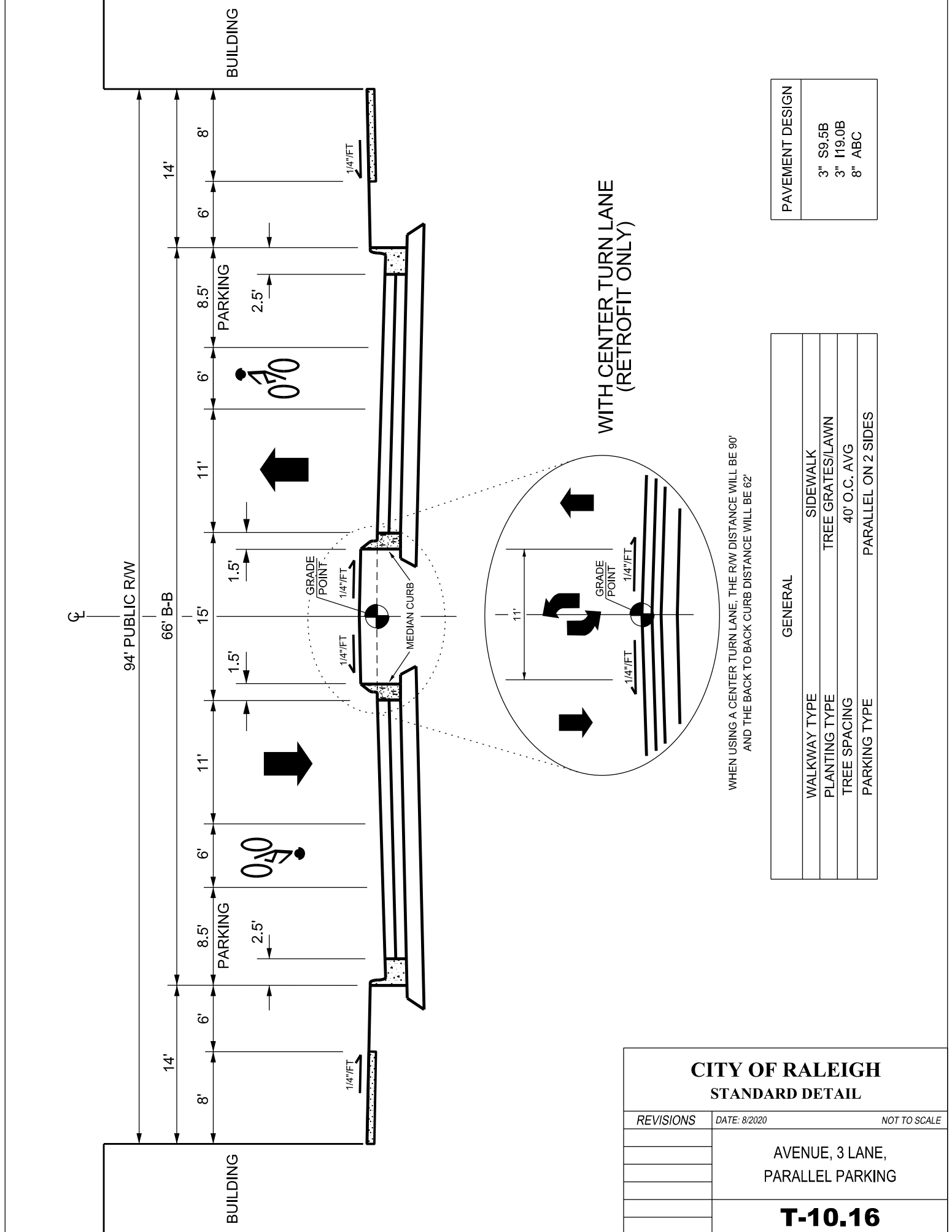


WHEN USING A CENTER TURN LANE, THE RW DISTANCE WILL BE 76'
AND THE BACK TO BACK CURB DISTANCE WILL BE 48'

PAVEMENT DESIGN	
3"	S9.5B
3"	I19.0B
8"	ABC

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	AVENUE, 2 LANE, DIVIDED (RAISED MEDIAN)	
	T-10.15	

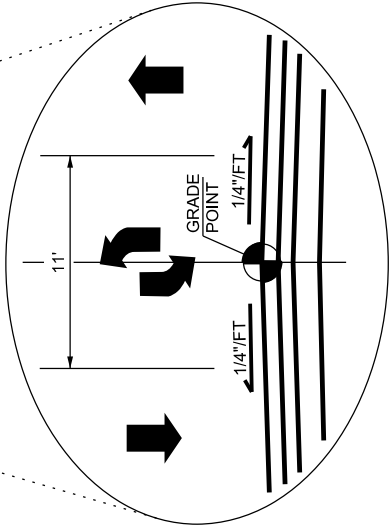


PAVEMENT DESIGN	
3"	S9.5B
3"	I19.0B
8"	ABC

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE GRATES/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL ON 2 SIDES

WHEN USING A CENTER TURN LANE, THE RW DISTANCE WILL BE 90'
AND THE BACK TO BACK CURB DISTANCE WILL BE 62'

WITH CENTER TURN LANE
(RETROFIT ONLY)



CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	AVENUE, 3 LANE, PARALLEL PARKING	
	T-10.16	

[illegible]

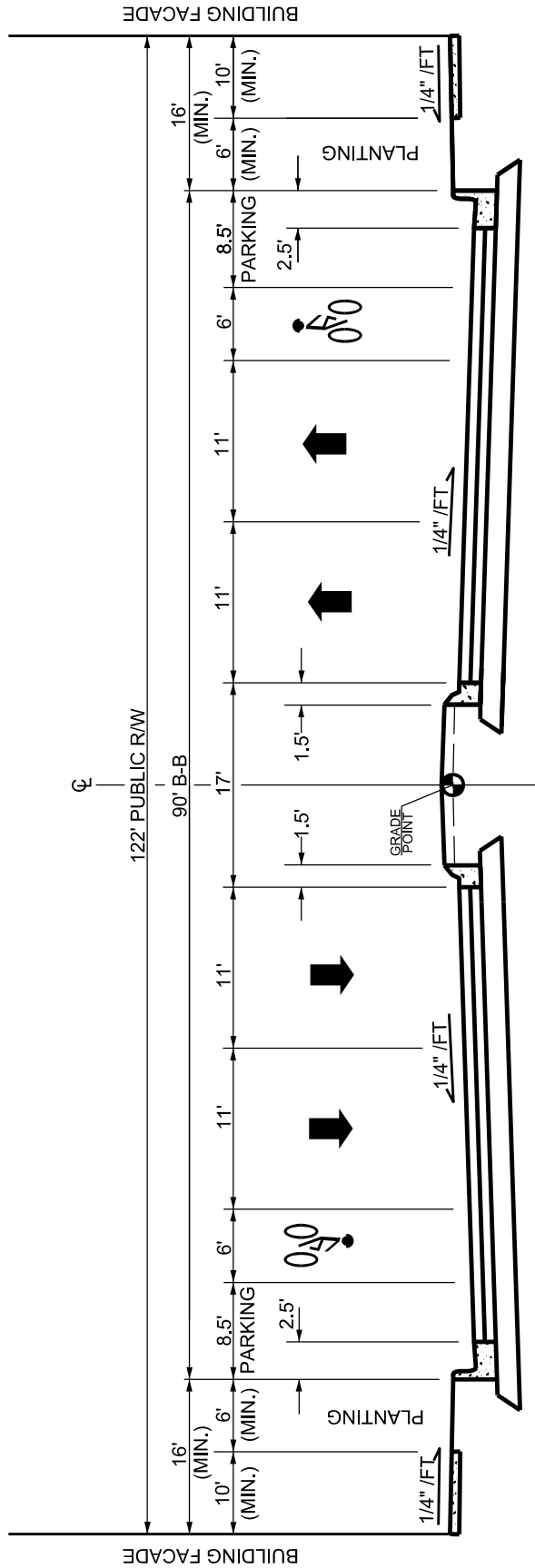
Plan view of a street cross-section showing a 73' PUBLIC ROW (Right-of-Way) and a 41' B-B (Bus-Belt). The diagram includes dimensions for various features:

- Overall width: 73' PUBLIC ROW
- Left side dimensions (from left edge): 16', 10', 6', 8.5' (PARKING), 2.5' (TREE GRATES).
- Right side dimensions (from right edge): 16', 10', 6', 8.5' (PARKING), 2.5' (TREE GRATES).
- Central dimensions: 12' (left of centerline), 12' (right of centerline).
- Centerline: 41' B-B.
- Grade Point: Indicated by a black dot on the centerline with a 1/4" scale bar.
- Arrows: Large black arrows pointing left and right from the centerline, and a 1/4" scale bar.

GENERAL	
WALKWAY TYPE	SIDEWALK ON 2 SIDES
PLANTING TYPE	TREE GRATES/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL/60° ANGLED

PAVEMENT DESIGN	3" S9.5B 3" I19.0B 8" ABC
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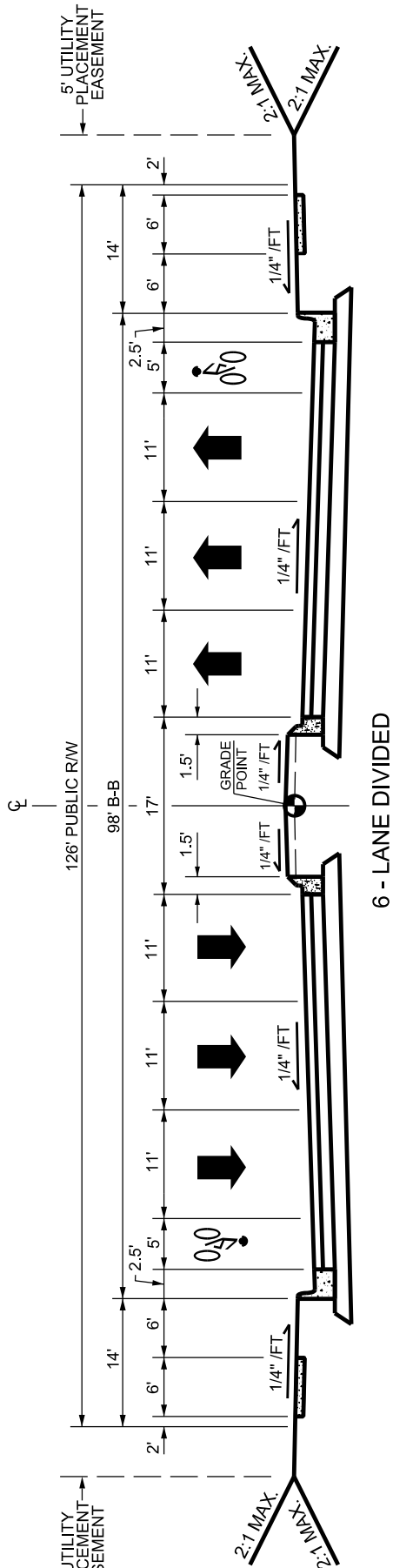
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	MAIN STREET	
	T-10.17	



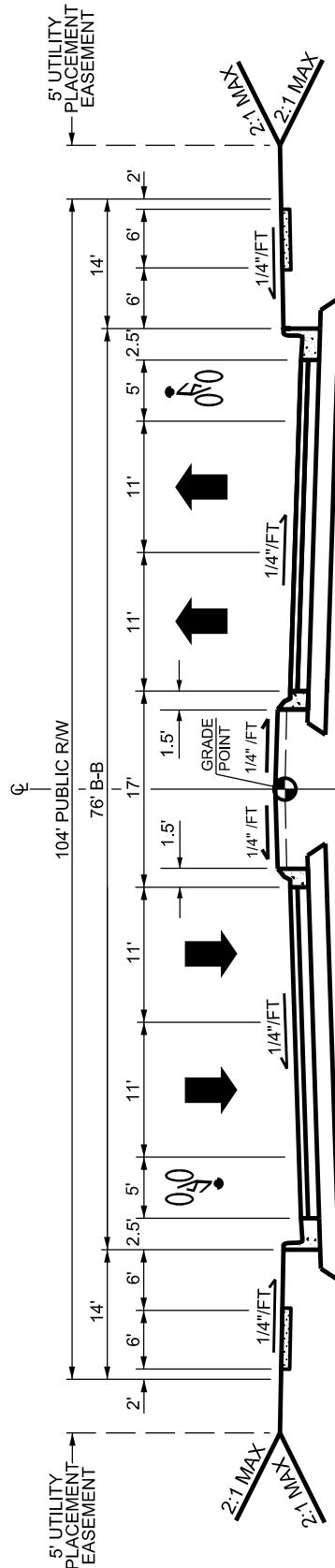
PAVEMENT DESIGN	
3" S9.5B	
3" I19.0B	
8" ABC	

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE GRATE / LAWN
TREE SPACING	40' O.C. AVG.
PARKING TYPE	PARALLEL ON 2 SIDES

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	AVENUE, 4 LANE, PARALLELL PARKING	
	T-10.18	



6 - LANE DIVIDED



4 - LANE DIVIDED

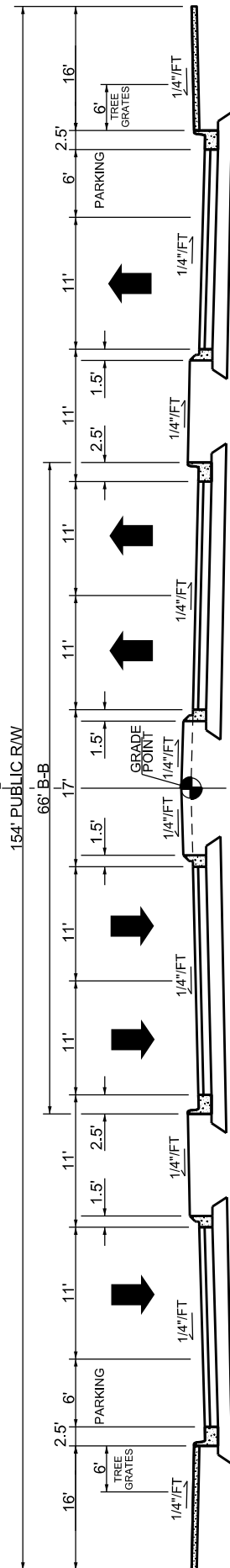
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	AVENUE, 4 LANE & 6 LANE, DIVIDED	
	T-10.19	

GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

PAVEMENT DESIGN
3" S9.5B
4" I19.0B
10" ABC

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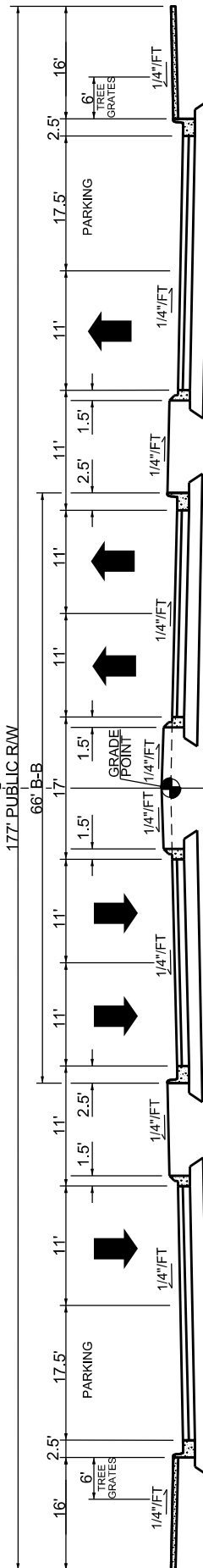


PAVEMENT DESIGN (ACCESS / PARKING)	3" S9.5B 3" I19.0B 8" ABC
---------------------------------------	--

PAVEMENT DESIGN (4-LANES)	3" S9.5B 4" I19.0B 10" ABC
------------------------------	---

GENERAL	
WALKWAY TYPE	SIDEWALK BOTH SIDES
PLANTING TYPE	TREE GRATE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL IN A ACCESS LANE

14.



PAVEMENT DESIGN (ACCESS / PARKING)	3" S9.5B 3" I19.0B 8" ABC
---------------------------------------	---------------------------------

PAVEMENT DESIGN (4-LANES)	3" S9.5B 4" I19.0B 10" ABC
------------------------------	----------------------------------

GENERAL	
WALKWAY TYPE	SIDEWALK BOTH SIDES
PLANTING TYPE	TREE GRATE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	60° ANGLE IN A ACCESS LANE

REVISIONS

DATE: 8/2020

NOT TO SCALE

MULTI-WAY BOULEVARD

T-10.20

CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	DATE: 8/2020 NOT TO SCALE
	INDUSTRIAL STREET
	T-10.21

Diagram illustrating a 20' EASEMENT. The easement is divided into a 16' TRAVEL LANE and a 4' SHOULDER. The travel lane is further divided into two 8' lanes by a centerline. The shoulder has a 1'1"/FT slope. A GRADE POINT is marked on the centerline. Arrows indicate traffic flow in both directions.

PAVEMENT DESIGN	3" SF9.5A 8" ABC
-----------------	---------------------

Diagram illustrating the proposed road layout and cross-section details.

Plan View Dimensions:

- 24' EASEMENT
- 20' TRAVEL LANE
- 2' (Shoulder width on each side of the travel lane)

Cross-Section Details:

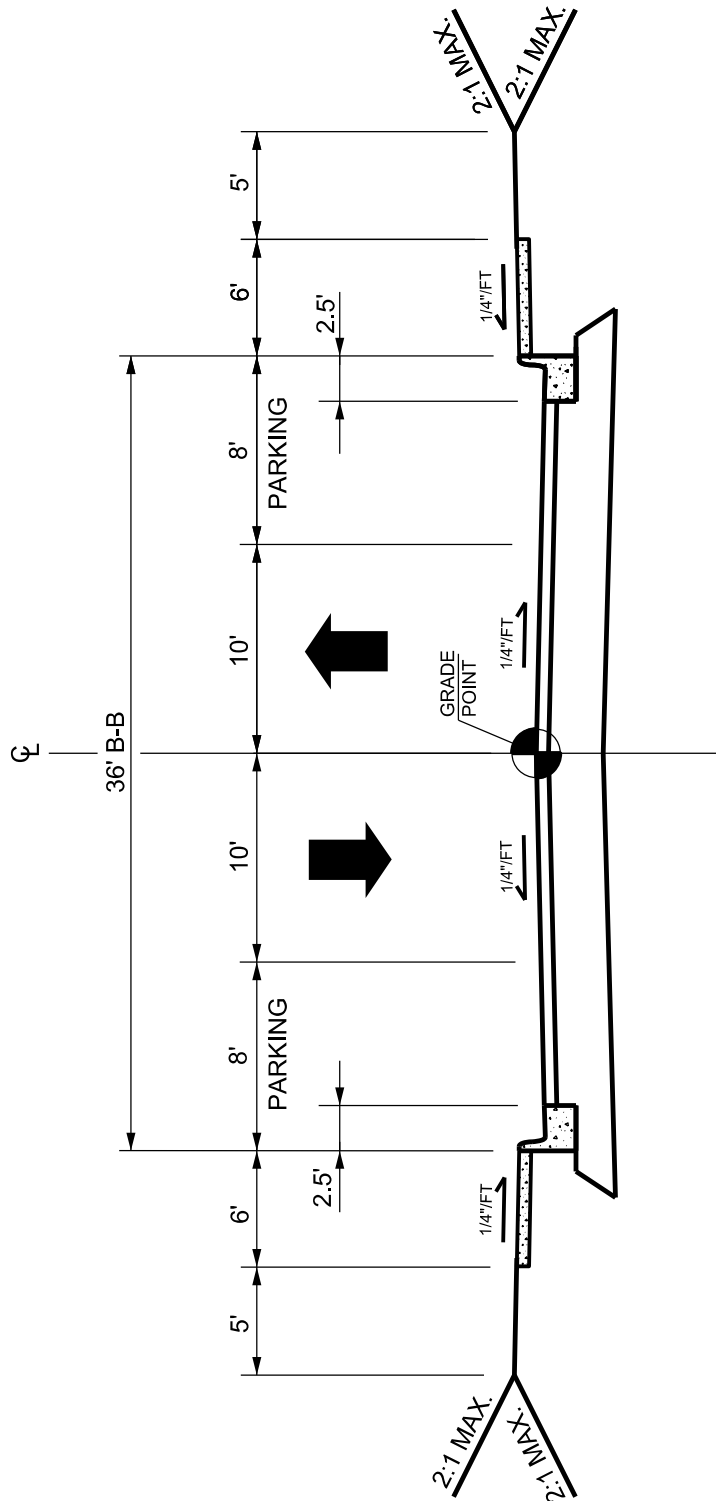
- GRADE POINT
- 1/4"/FT (Slope on each side of the grade point)

Pavement Details:

PAVEMENT D	
3" SF9.5	
8" ABC	

PAVEMENT DESIGN	3" SF9.5A 8" ABC
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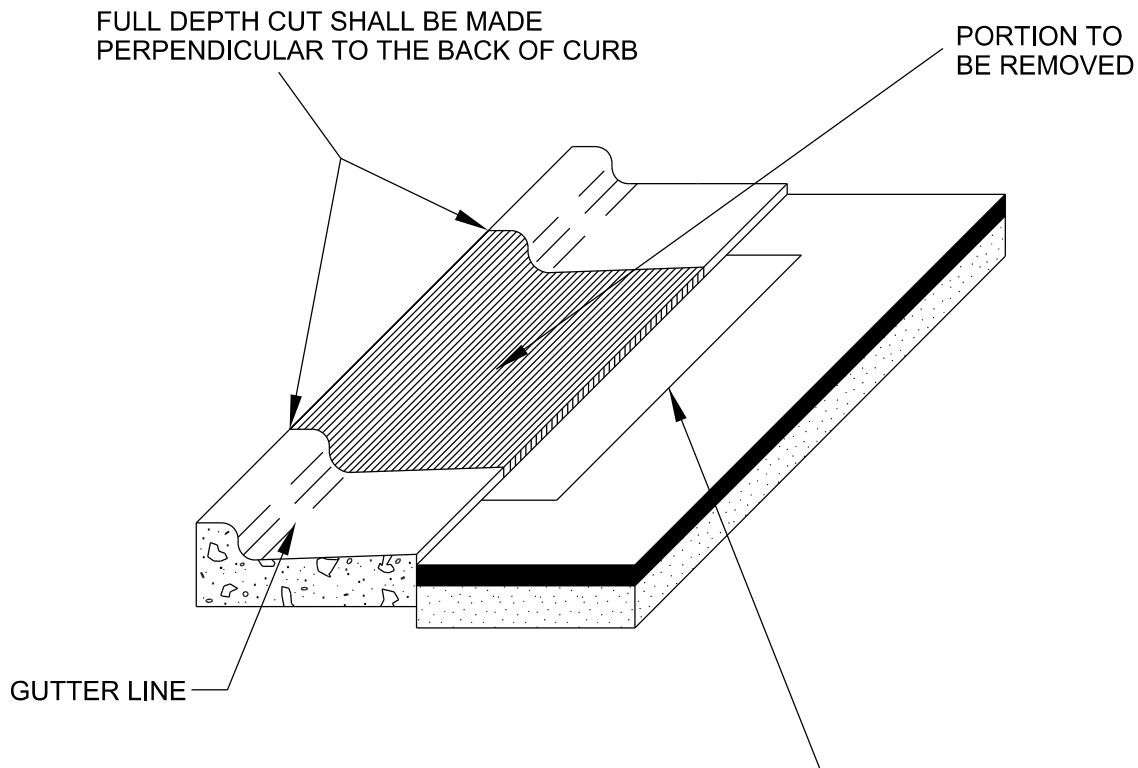
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ALLEY	
	T-10.22	



PAVEMENT DESIGN	
	3" SF9.5A 8" ABC

GENERAL	
WALKWAY TYPE	SIDEWALK
PARKING TYPE	PARALLEL ON 2 SIDES

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	PRIVATE ACCESSWAY PRIMARY INTERNAL ACCESS DRIVE	
	T-10.23	



IF THE FINAL LIFT OF ASPHALT HAS BEEN INSTALLED AND IS DAMAGED DURING CURB REMOVAL, A ONE FOOT WIDE SECTION OF ASPHALT SHOULD BE SAWCUT AND REMOVED FOR FORMS TO BE USED TO KEEP A STRAIGHT EDGE ON THE DRIVEWAY APRON. REINSTALL HOT MIX SURFACE ASPHALT PATCH S9.5B.

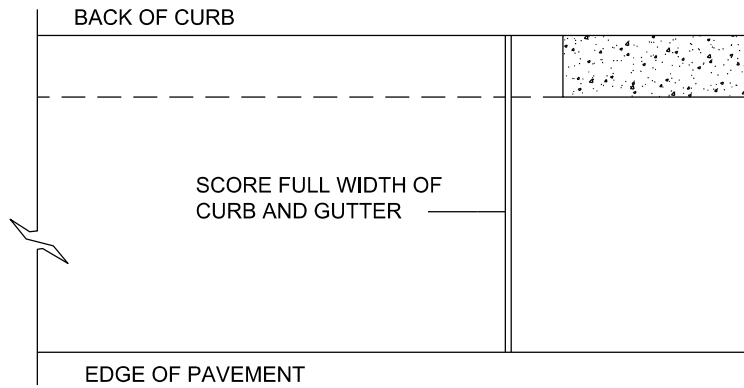
IF THE FINAL LIFT OF ASPHALT HAS NOT BEEN INSTALLED, THE ASPHALT IN FRONT OF THE APRON CAN REMAIN IN PLACE.

NOTES:

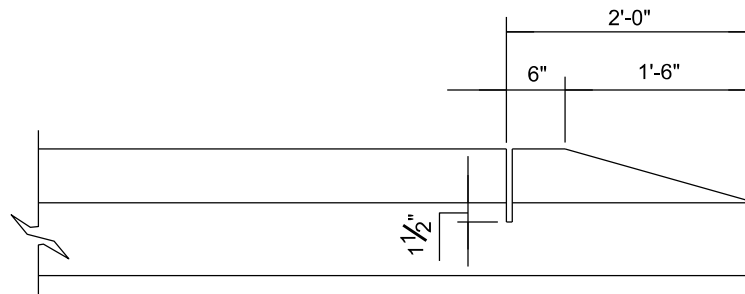
1. CURB AND GUTTER SECTION SHALL BE REMOVED IN ACCORDANCE WITH DRIVEWAY WIDTH APPROVED BY THE CITY.
2. IF PERPENDICULAR CUT IS LESS THAN 5' FROM NEXT JOINT, THEN THE PARALLEL CUT SHALL BE MADE TO THAT JOINT.
3. THIS METHOD IS NOT ALLOWED IN NEW ROADWAY CONSTRUCTION.

**CITY OF RALEIGH
STANDARD DETAIL**

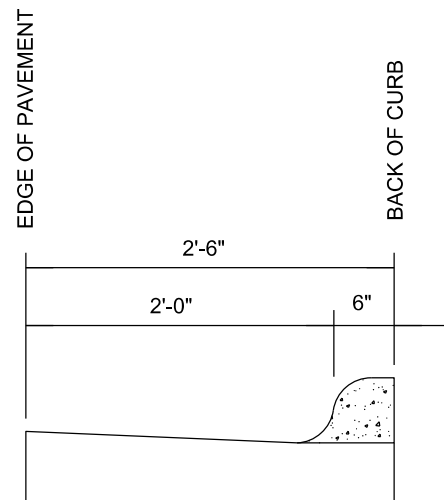
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD METHOD OF REMOVING EXISTING CURB (FOR A DRIVEWAY APRON INSTALLATION)	
	T-10.24	



PLAN



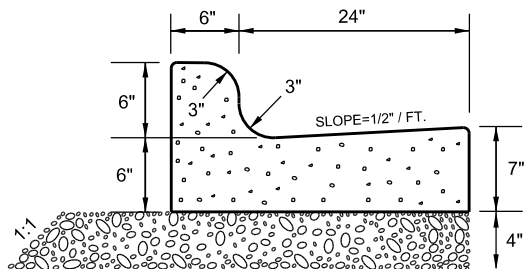
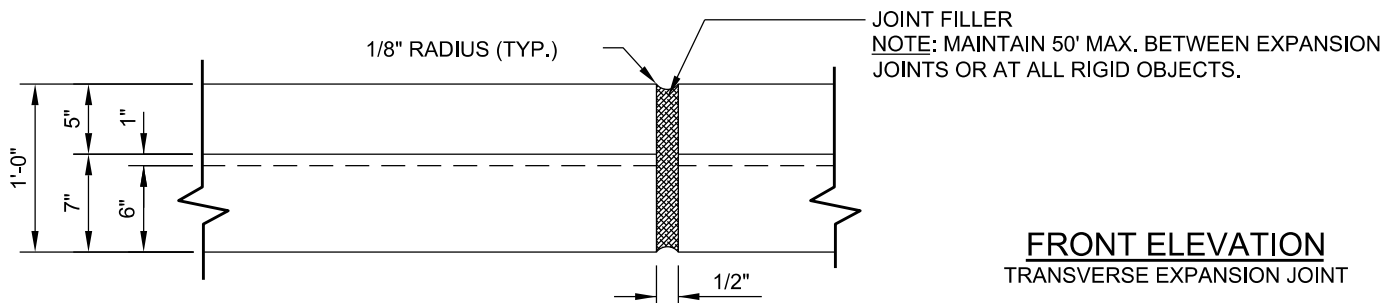
FRONT



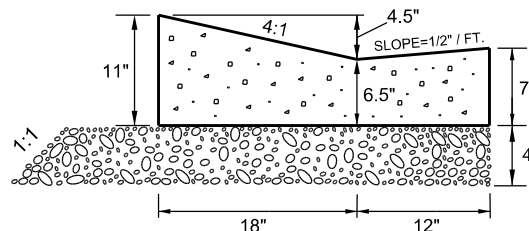
END

CITY OF RALEIGH
STANDARD DETAIL

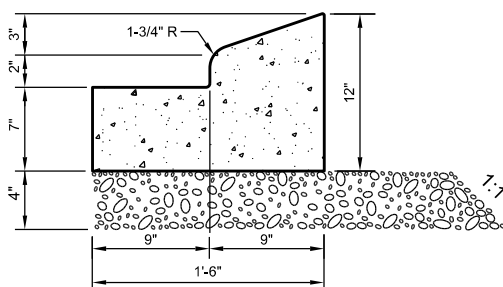
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD METHOD OF ENDING CURB AND GUTTER	
	T-10.25	



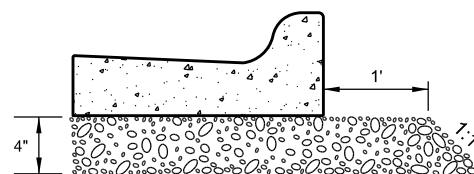
1. 30" CURB & GUTTER



2. 30" VALLEY TYPE GUTTER

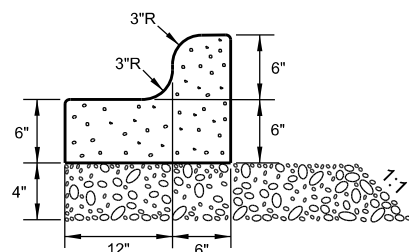


MEDIAN CURB AND GUTTER
SIDE ELEVATION

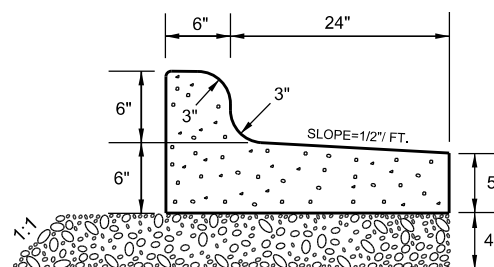


4" COMPACTED A.B.C. UNDER STANDARD
CURB & GUTTER (MIN)

NO VALLEY CURB SHALL BE USED
AT INTERSECTIONS, HYDRANTS, ETC.



MEDIAN CURB AND GUTTER
(NON-MOUNTABLE)



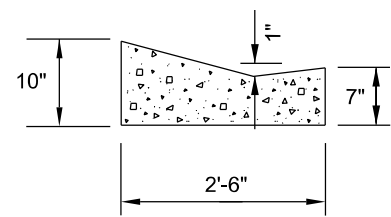
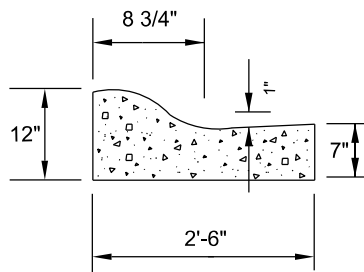
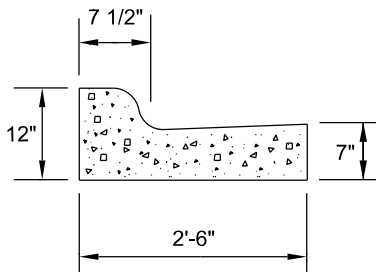
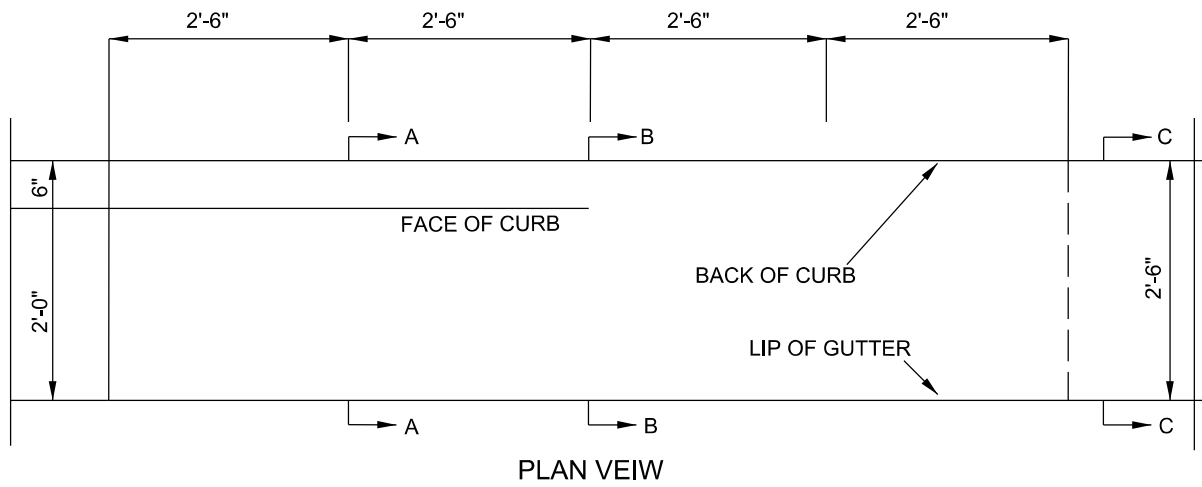
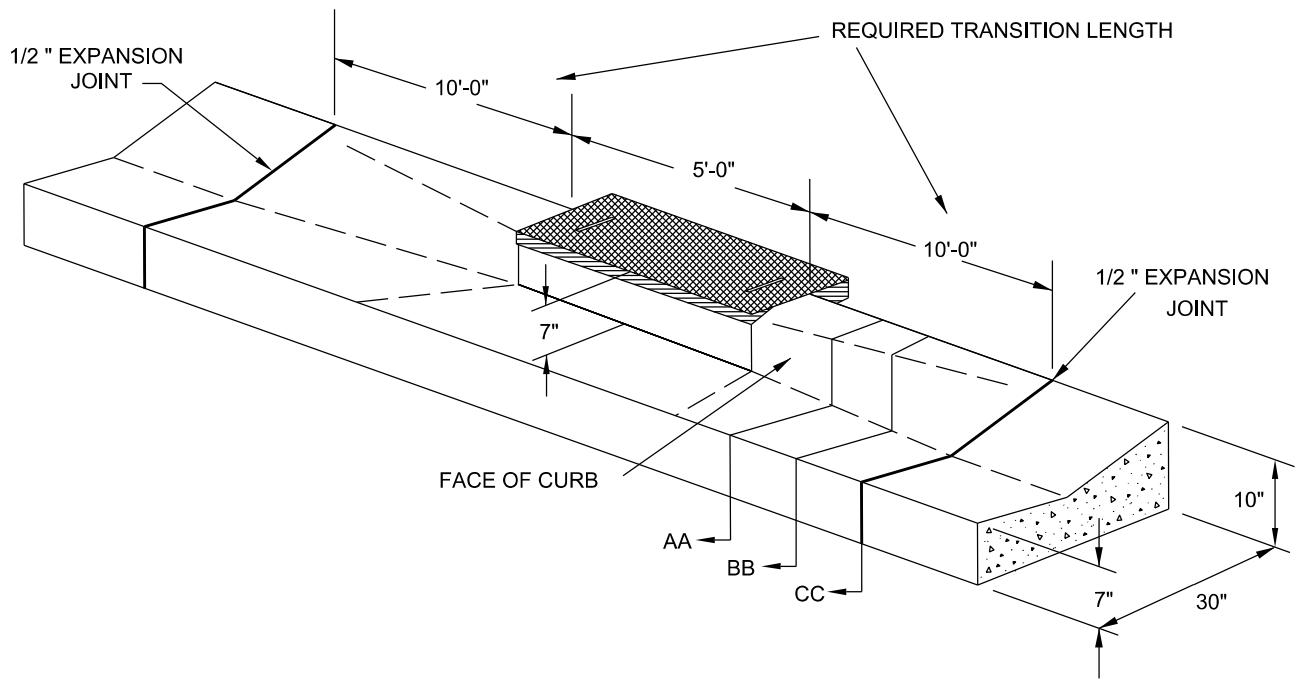
SPILL CURB DETAIL

NOTES:

1. 10' MAXIMUM BETWEEN DUMMY JOINTS.
15' MAXIMUM BETWEEN DUMMY JOINTS ON MACHINE POURS.
2. 1/2" EXPANSION JOINT EVERY 50'.
3. 3000 PSI CONCRETE MINIMUM, 4" SLUMP MAXIMUM.
4. LIQUID MEMBRANE CURING COMPOUND SHALL MEET THE REQUIREMENTS OF SECTION 1026-2 OF NCDOT STANDARDS & SPECIFICATIONS FOR ROADS AND STRUCTURES.
5. ALL CONSTRUCTION JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER IN ACCORDANCE WITH NCDOT ROADWAY STANDARD DETAIL 846.01 THE JOINT MATERIAL SHALL CONFORM TO SECTION 1028-2 OF NCDOT STANDARD & SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. REFER TO NCDOT DETAIL 846.01 FOR CURB AND GUTTER SUPERELEVATION RATES.

SHEET 1 OF 2

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB AND GUTTER	
	T-10.26.1	



NOTES:
TRANSITION NOT TO BE LOCATED WITHIN
THE CURB RADIUS.

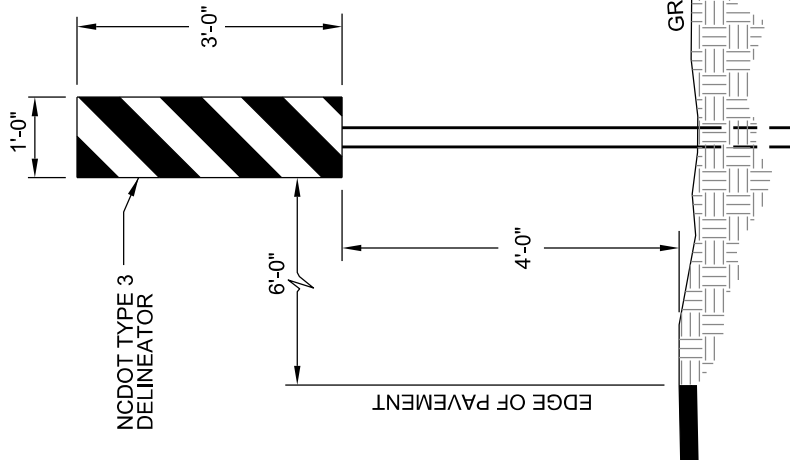
SHEET 2 OF 2

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB TRANSITION TO 2'-6"	
	VALLEY GUTTER	
	T-10.26.2	

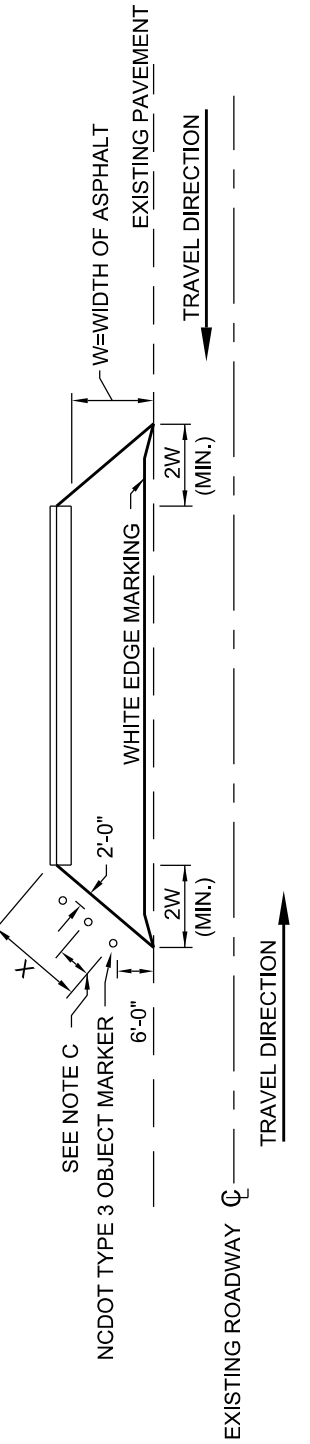
NOTES:

- BOTTOM EDGE OF DELINEATOR SHALL BE 4 FEET ABOVE ROADWAY.
- THE DELINEATOR STRIPES SHALL SLOPE UPWARD AND OUTWARD FROM TRAFFIC.
- DELINEATORS TO BE SPACED ON CENTERS AT 1/3 OF THE DISTANCE 'X', SHOWN BELOW, FOR NEW ASPHALT WIDTHS ≤ 15 FEET OR AT 1/4 OF 'X' FOR NEW ASPHALT WIDTHS > 15 FEET.
- DELINEATORS SHALL BE MOUNTED ON BREAKAWAY POSTS.
- DELINEATORS SHALL BE REFLECTORIZED.
- CALL 811 FOR UNDERGROUND UTILITY LOCATE PRIOR TO INSTALLATION.



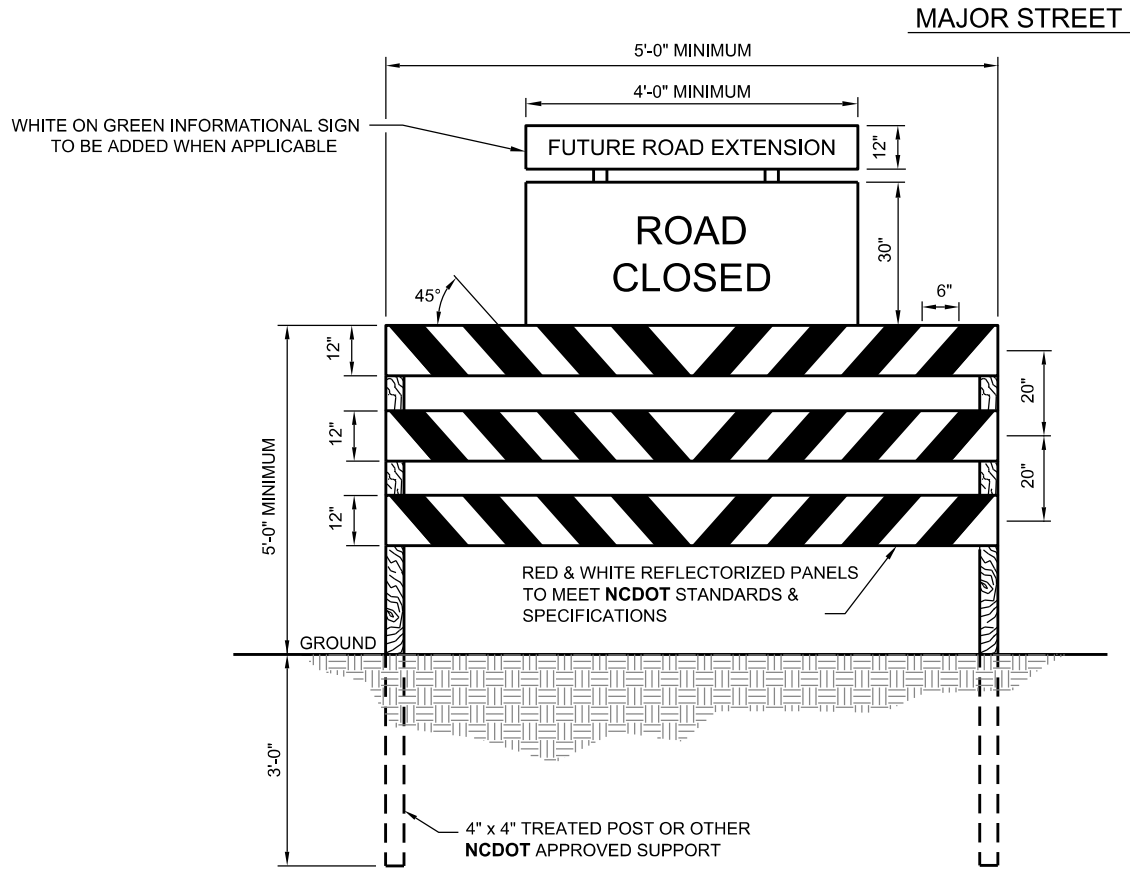
- NOTES:
- TAPER ON BOTH ENDS OF ROADWAY WIDENING SHALL BE A MINIMUM 2:1. THE TRANSPORTATION DIRECTOR OR DESIGNER AND/OR NCDOT RESERVES THE RIGHT TO REQUIRE A LONGER TAPER IF DEEMED NECESSARY FOR THE SAFETY OF THE PUBLIC.
 - A SOLID WHITE EDGE MARKING SHALL BE EXTENDED ALONG WIDENING AT EXISTING PAVEMENT.
 - DELINEATORS SHALL ONLY BE REQUIRED AT TAPER FROM CURB TO EXISTING PAVEMENT IN DIRECTION OF TRAVEL.
 - DELINEATORS SHALL BE ORIENTED SUCH THAT THE FACE OF THE SIGN IS PERPENDICULAR TO TRAVEL LANE.

DETAIL

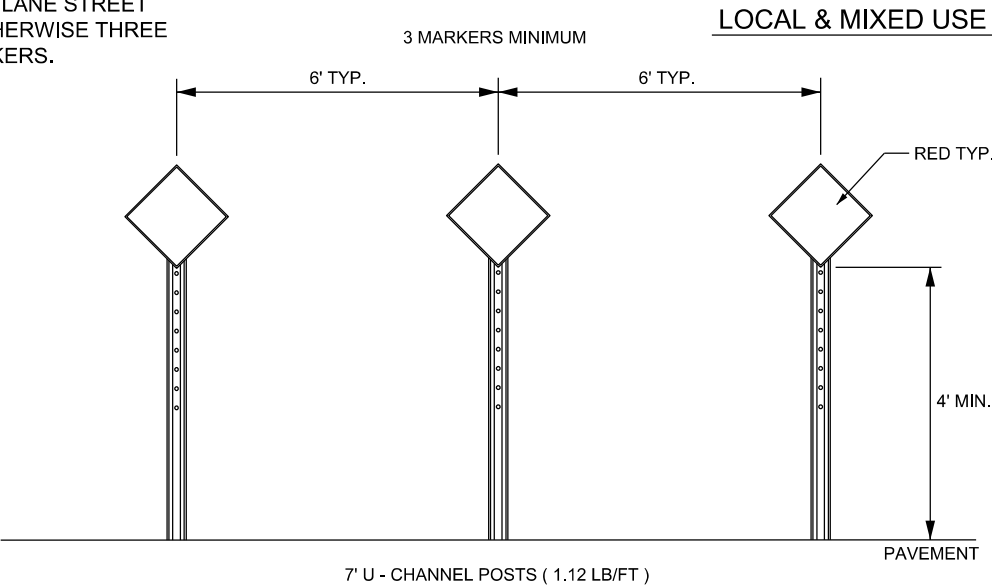


PLAN VIEW

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD PAVEMENT WIDENING TAPER & MARKINGS	
	T-10.27	



FOR USE AT FOUR LANE STREET
AND ≥ 40 MPH, OTHERWISE THREE
RED OBJECT MARKERS.



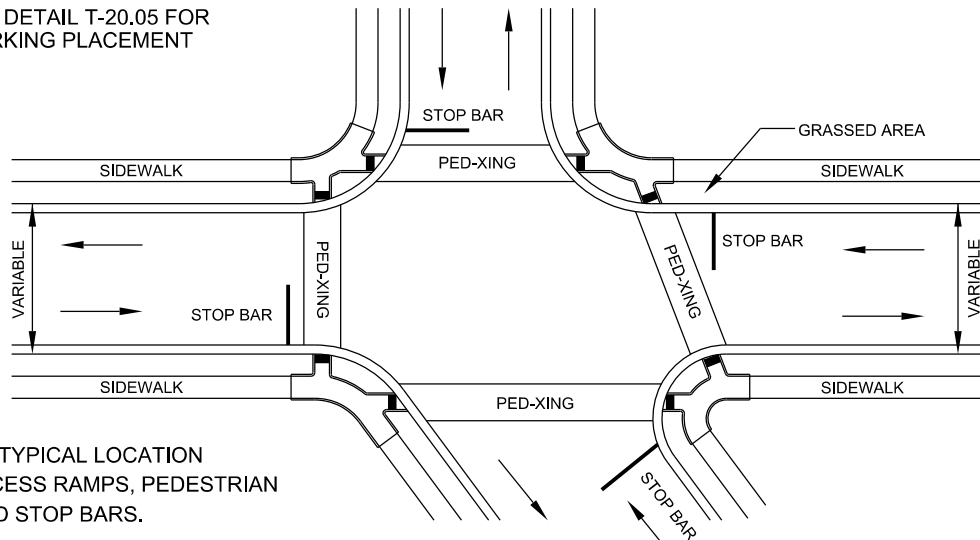
- NOTES:
1. BARRICADE(S) TO BE ERECTED ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
 2. ADVANCE WARNING SIGN W14-1 (DEAD END) SHALL BE PLACED JUST AFTER LAST INTERSECTING STREET.
 3. MARKINGS FOR BARRICADE RAILS SHALL BE REFLECTIVE AND ALTERNATE RED & WHITE STRIPS.
 4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS OF M.U.T.C.D. R11-2 AND BE REQUIRED ATOP EACH BARRICADE USED.
 5. CALL 811 FOR UNDERGROUND UTILITY LOCATE PRIOR TO INSTALLATION.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TEMPORARY BARRICADE FOR DEAD END ROADS	
	T-10.28	

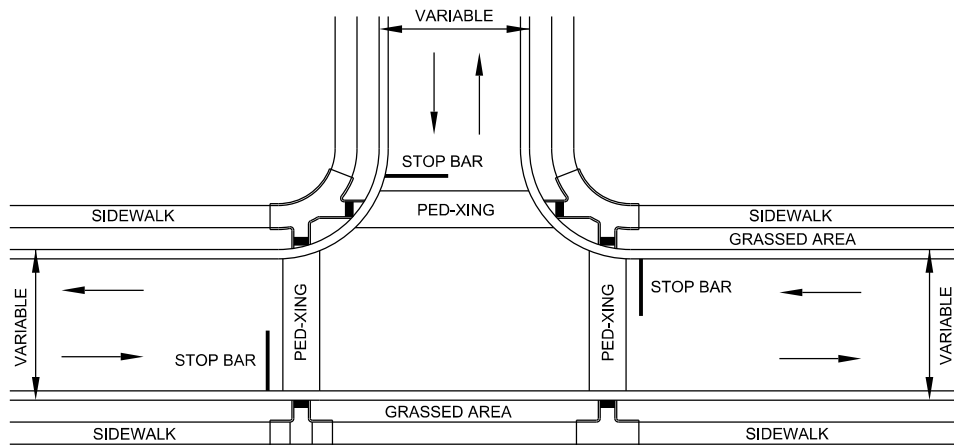
1. WATER AND/OR SANITARY SEWER LINES SHALL BE A MINIMUM OF TWO FEET FROM THE EDGE OF THE CURB AND GUTTER.
2. ENCROACHMENT ONTO CITY MAINTAINED RIGHT OF WAY SHALL FOLLOW CONDITIONS OF THE APPLICABLE ENCROACHMENT AGREEMENT OR FRANCHISE AGREEMENT.
3. FOR HYDRANT LOCATION SEE PUBLIC UTILITIES STANDARD DETAIL W-4.
4. PUE TO BE EXPANDED ON A CASE BY CASE BASIS AS NEEDED TO ACCOMMODATE PRIVATE UTILITIES APPURTENANT FACILITIES AND EQUIPMENT.

CITY OF RALEIGH	
STANDARD DETAIL	
REVISIONS	DATE: 8/2020 NOT TO SCALE
	STANDARD UTILITY LOCATIONS IN STREET
	T-10-29

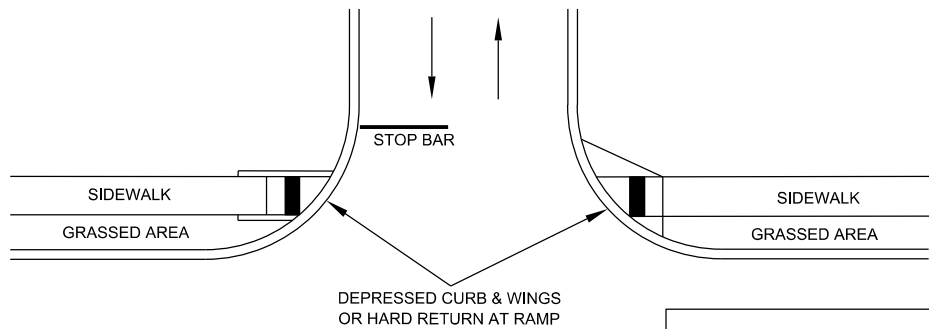
NOTE: SEE STANDARD DETAIL T-20.05 FOR PAVEMENT MARKING PLACEMENT



DETAIL SHOWING TYPICAL LOCATION OF SIDEWALK ACCESS RAMPS, PEDESTRIAN CROSSWALKS AND STOP BARS.

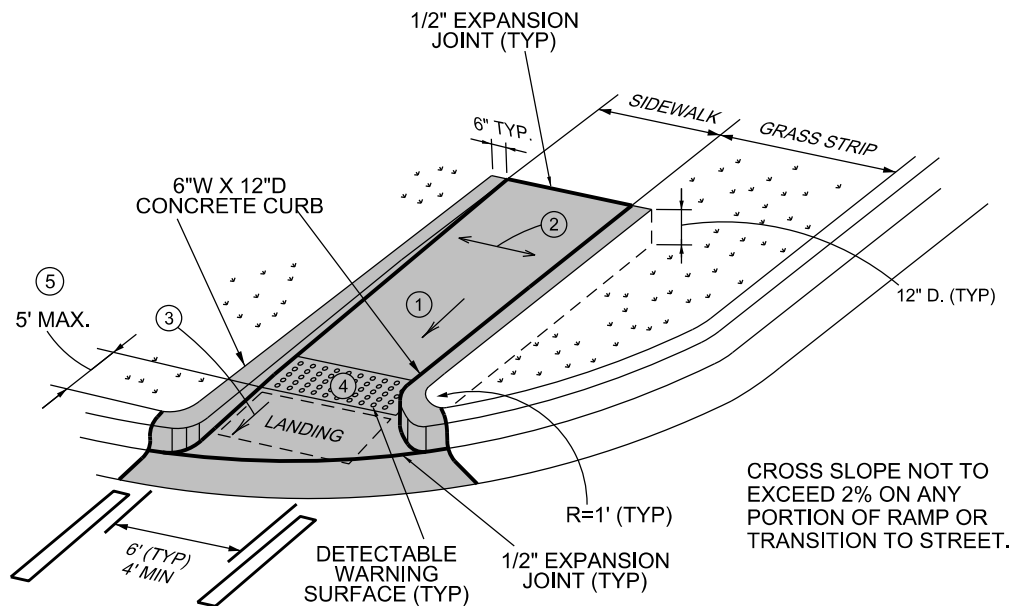


DETAIL SHOWING TYPICAL LOCATION OF SIDEWALK ACCESS RAMPS, PEDESTRIAN CROSSWALKS AND STOP BARS FOR TEE INTERSECTION.



FOR RAMPS AT ASPHALT TO ASPHALT STREET TYPE DRIVEWAYS OR PRIVATE STREET TIE IN.

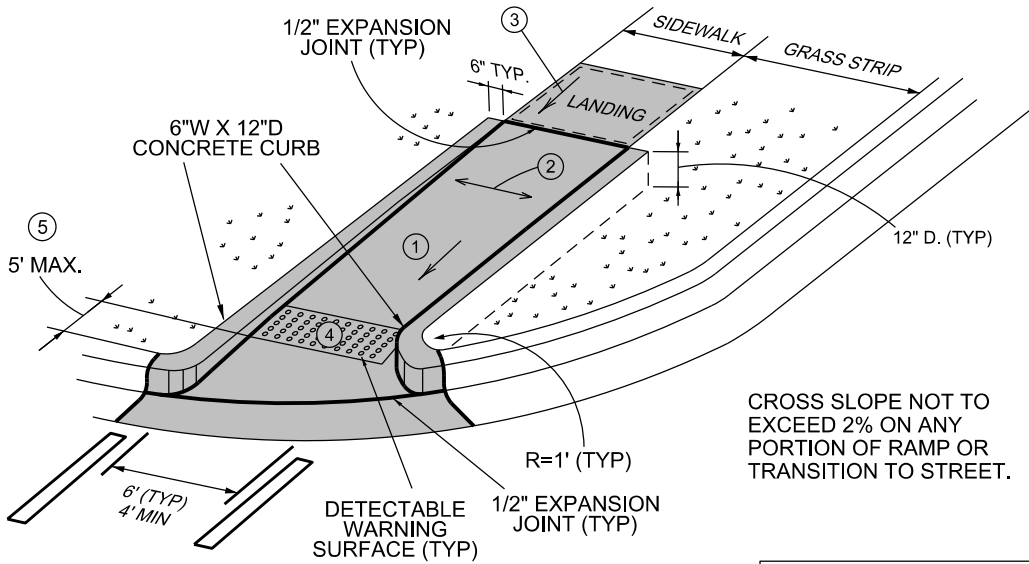
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS	
	T-20.01.1	



TYPE N-4

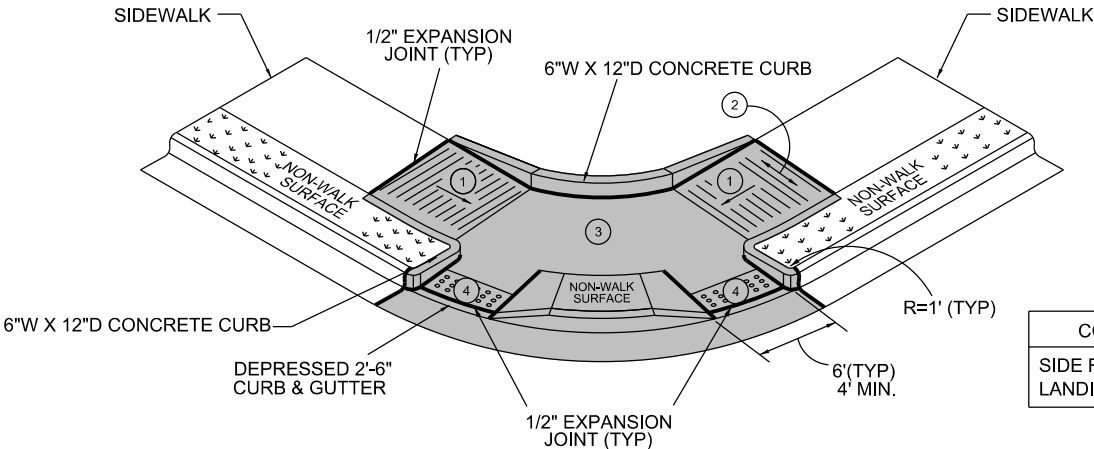
- 1 SLOPE TO MEET GRADE, 15' MAXIMUM.
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
- 4 RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
- 5 IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

CONCRETE DEPTH	
RAMP	6"
LANDING	4"



TYPE N-4A

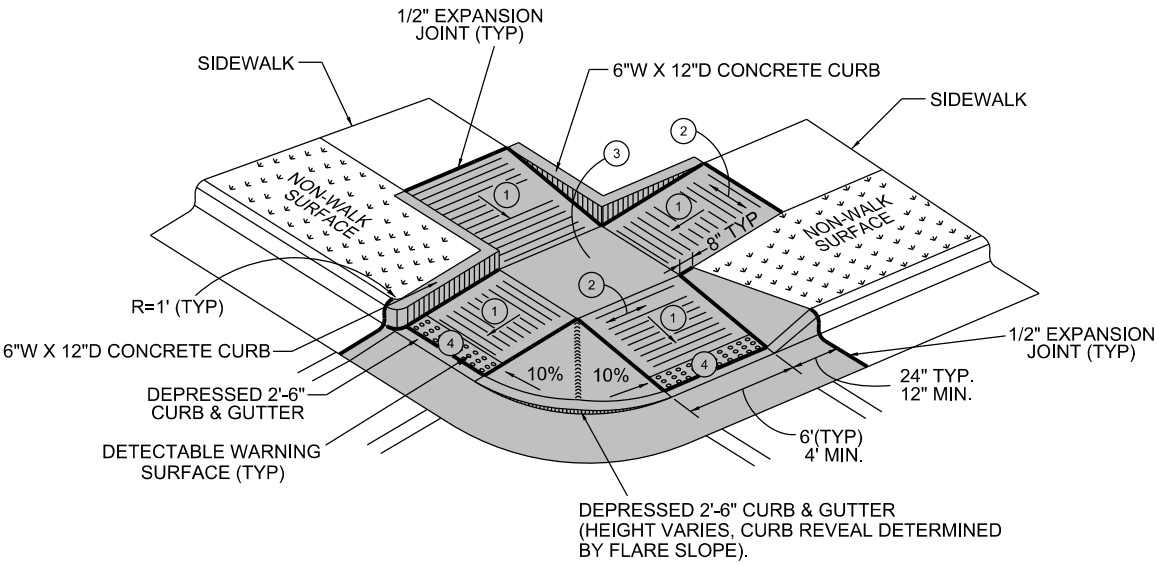
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS (NEW DEVELOPMENT)	
	T-20.01.4	



CONCRETE DEPTH	
SIDE RAMPS	4"
LANDING & OPENINGS	6"

TYPE R-3

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
- 4 RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.



CONCRETE DEPTH	
SIDE RAMPS	4"
LANDING & CURB RAMPS	6"

TYPE R-4

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS (RETROFIT)	
	T-20.01.6	

CITY OF RALEIGH

CURB RAMPS

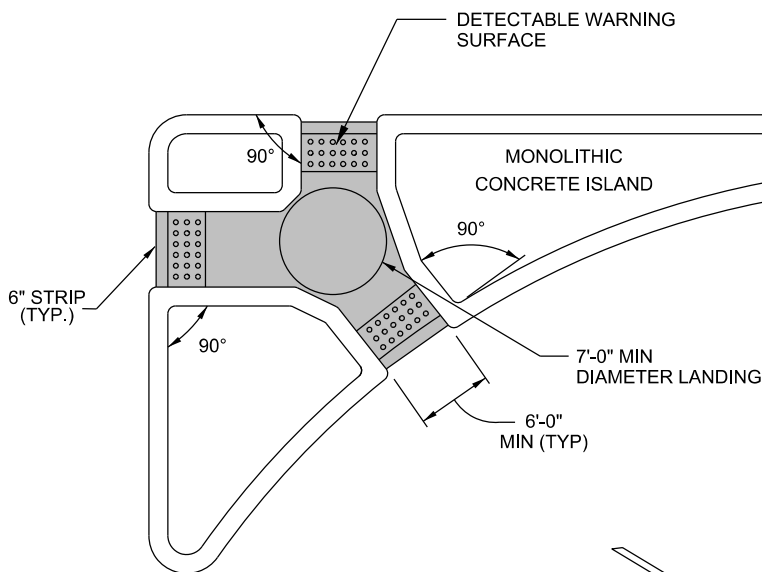
GENERAL NOTES

1. CITY OF RALEIGH STANDARD CURB RAMPS HAVE BEEN DEVELOPED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND PUBLIC RIGHT OF WAY ACCESS GUIDELINES (PROWAG).
2. CURB RAMPS SHALL BE PROVIDED AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SIDEWALK ACCESS RAMPS SHALL BE LOCATED AS INDICATED IN THE DETAIL, HOWEVER, THE LOCATION MAY BE ADJUSTED IN COORDINATION WITH THE CITY OF RALEIGH WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. AFFECT PLACEMENT.
3. DOUBLE WHEELCHAIR RAMPS ARE TO BE INSTALLED AT ALL PUBLIC STREET INTERSECTIONS WHERE SIDEWALK IS REQUIRED.
4. THE WALKING SURFACE SHALL BE SLIP RESISTANT. THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.
5. NO SLOPE ON THE SIDEWALK ACCESS RAMP SHALL EXCEED 1"/FT (12:1) IN RELATIONSHIP TO THE GRADE OF THE STREET.
6. IN NO CASE SHALL THE WIDTH OF THE SIDEWALK ACCESS RAMP BE LESS THAN 48"
ALL RAMPS SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
7. USE CLASS A (3000 PSI) CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NONSKID SURFACE.
8. A 1/2" EXPANSION JOINT INSTALLED FULL DEPTH WILL BE REQUIRED WHERE THE CONCRETE SIDEWALK ACCESS RAMP JOINS THE CURB AND ALSO WHERE NEW CONCRETE ABUTS EXISTING CONCRETE.
9. CURB RAMPS SHOULD BE PLACED PARALLEL TO THE DIRECTION OF TRAVEL.

SHEET 8 OF 8

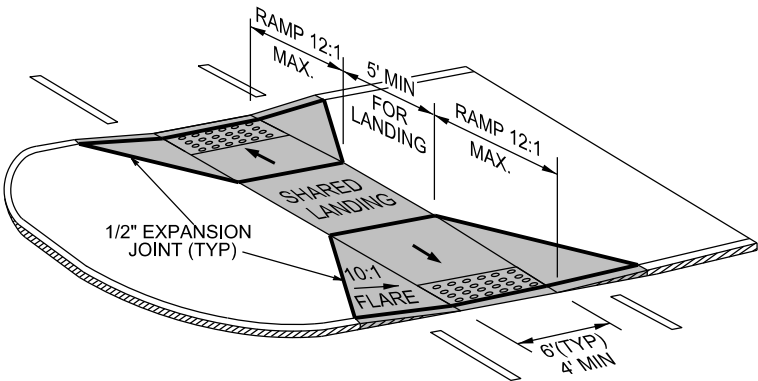
SHEET 8 OF 8

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMP NOTES	
	T-20.01.8	

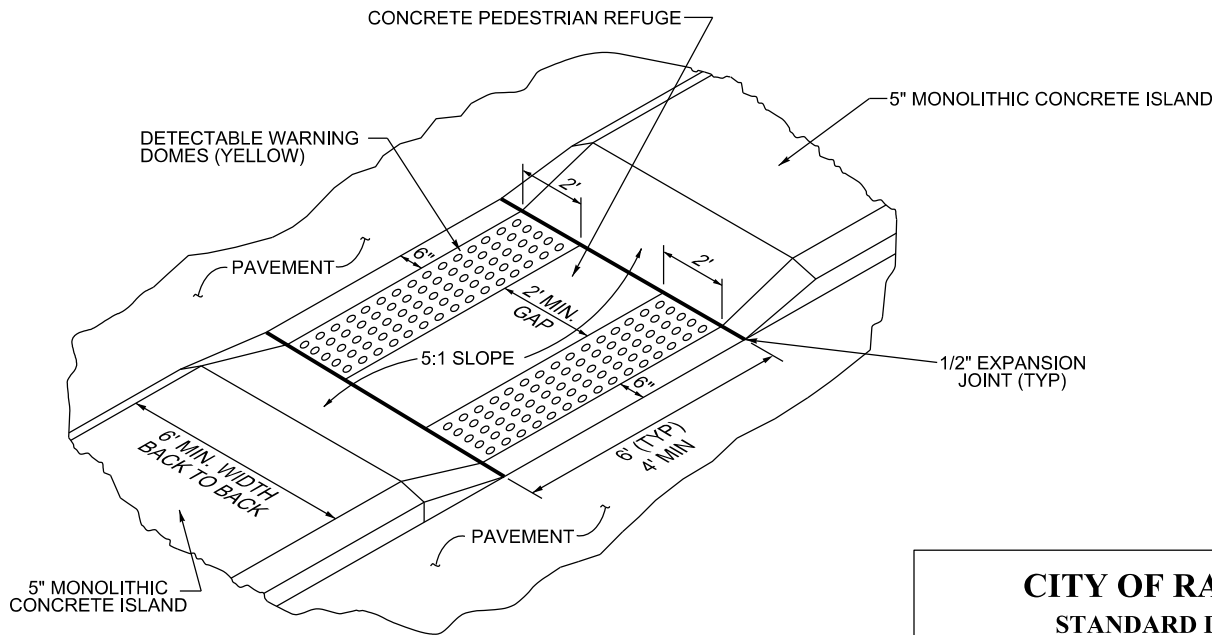


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY 2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE ROADWAY PLANS.

TRIANGULAR ISLAND
WITH CUT THROUGH



MEDIAN ISLAND
CURB RAMPS
(MEDIANS WIDER THAN 20')

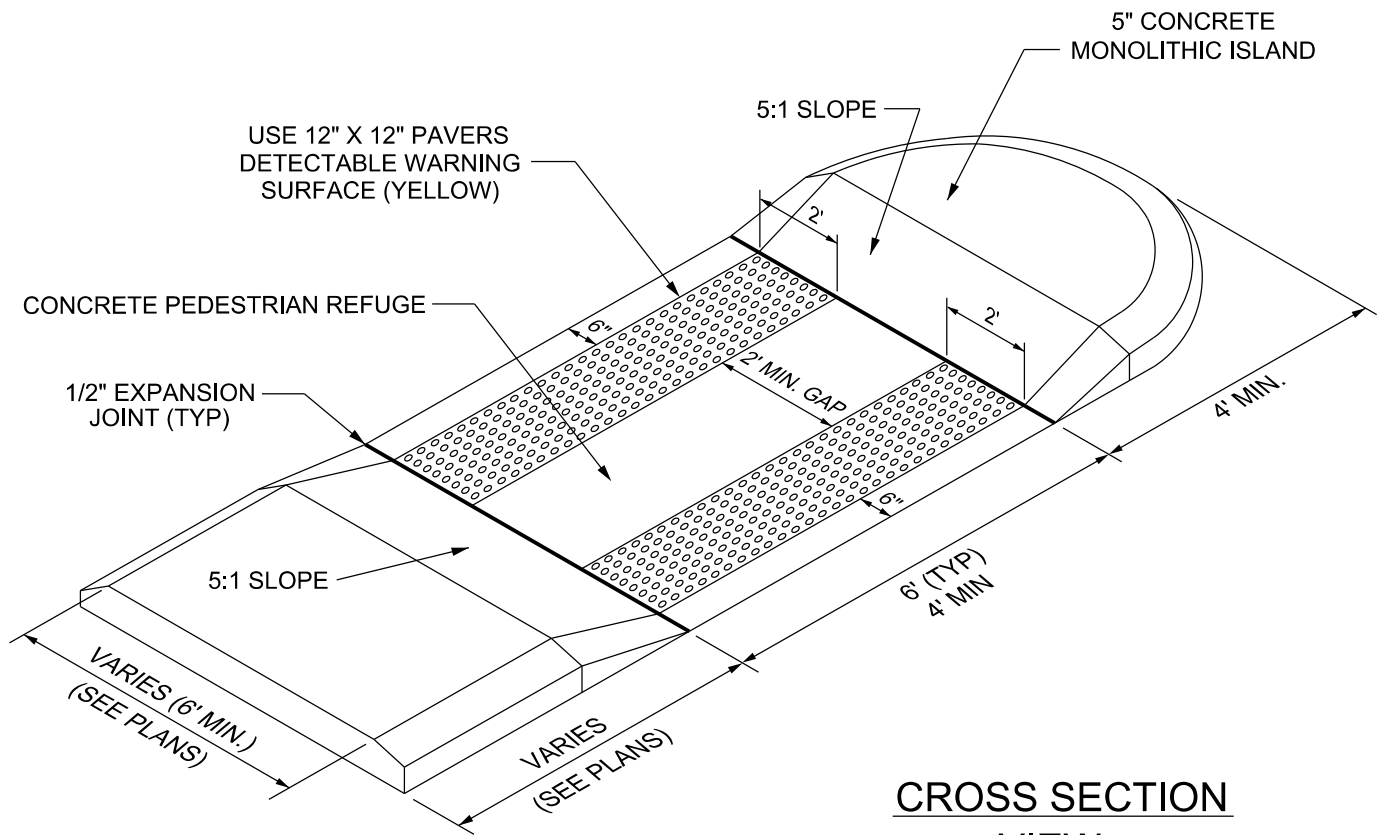


MEDIAN ISLAND
WITH CUT THROUGH
(MEDIANS ≤ 20')

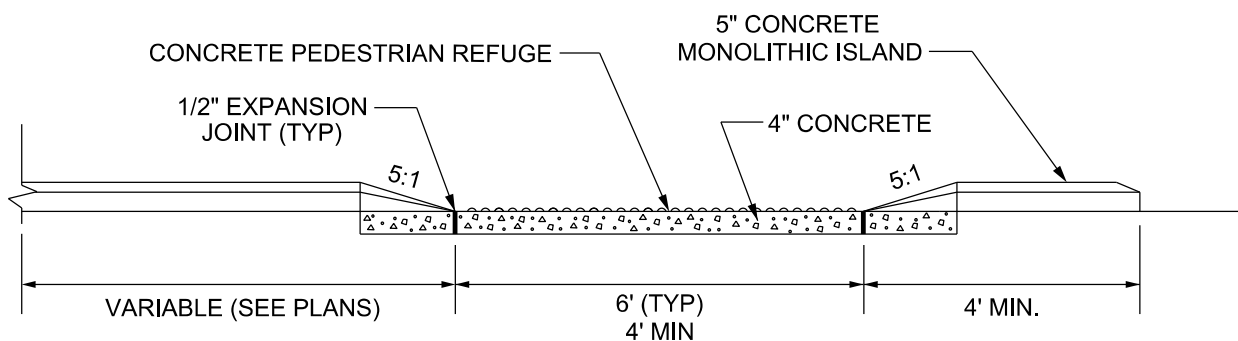
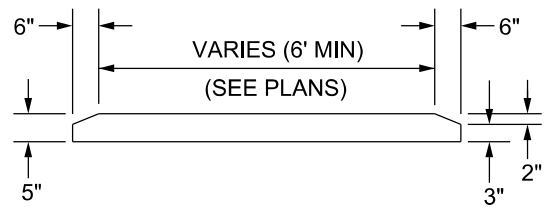
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	MEDIAN ISLAND CURB RAMPS/CUT THROUGHS	
	T-20.02	

ISOMETRIC VIEW



CROSS SECTION VIEW



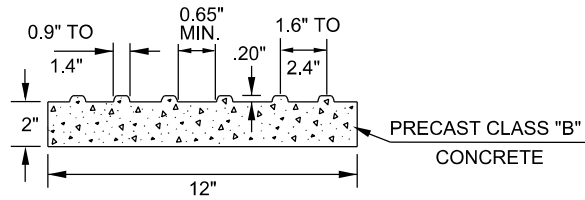
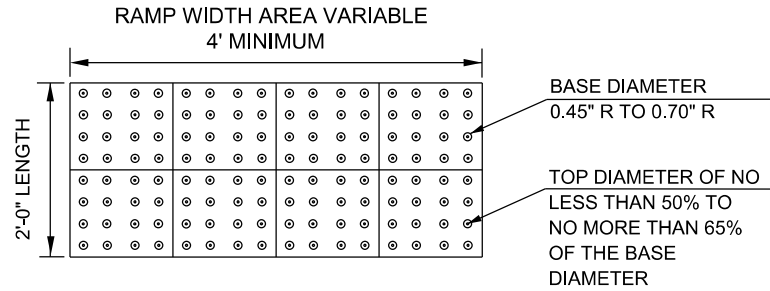
PROFILE VIEW

CITY OF RALEIGH STANDARD DETAIL

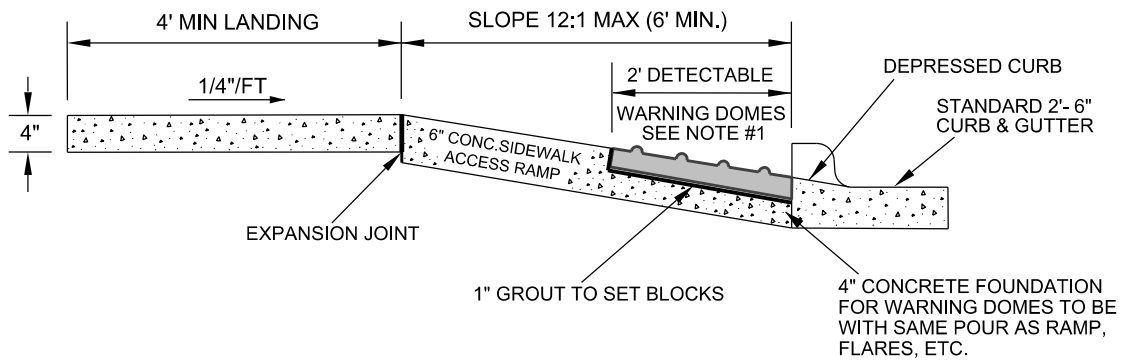
REVISIONS DATE: 8/2020 NOT TO SCALE

PEDESTRIAN REFUGE

T-20.03



DETECTABLE WARNING
DOMES CONCRETE PAVER



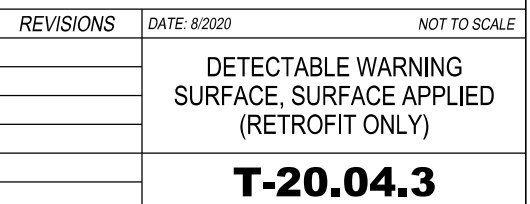
RAMP SECTION
WITH DETECTABLE WARNING PAVERS

NOTES:

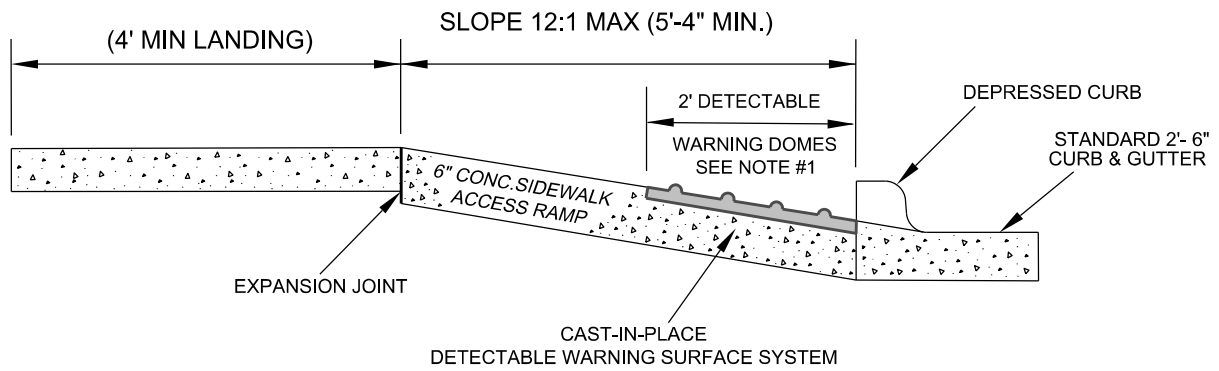
1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON DETAIL. SIZE OF PAVER SHALL BE 1' X 1'.
2. THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.

SHEET 2 OF 4

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DETECTABLE WARNING SURFACE PAVERS	
	T-20.04.2	



RAMP SECTION
WITH DETECTABLE WARNING SURFACE
CAST-IN-PLACE SYSTEM

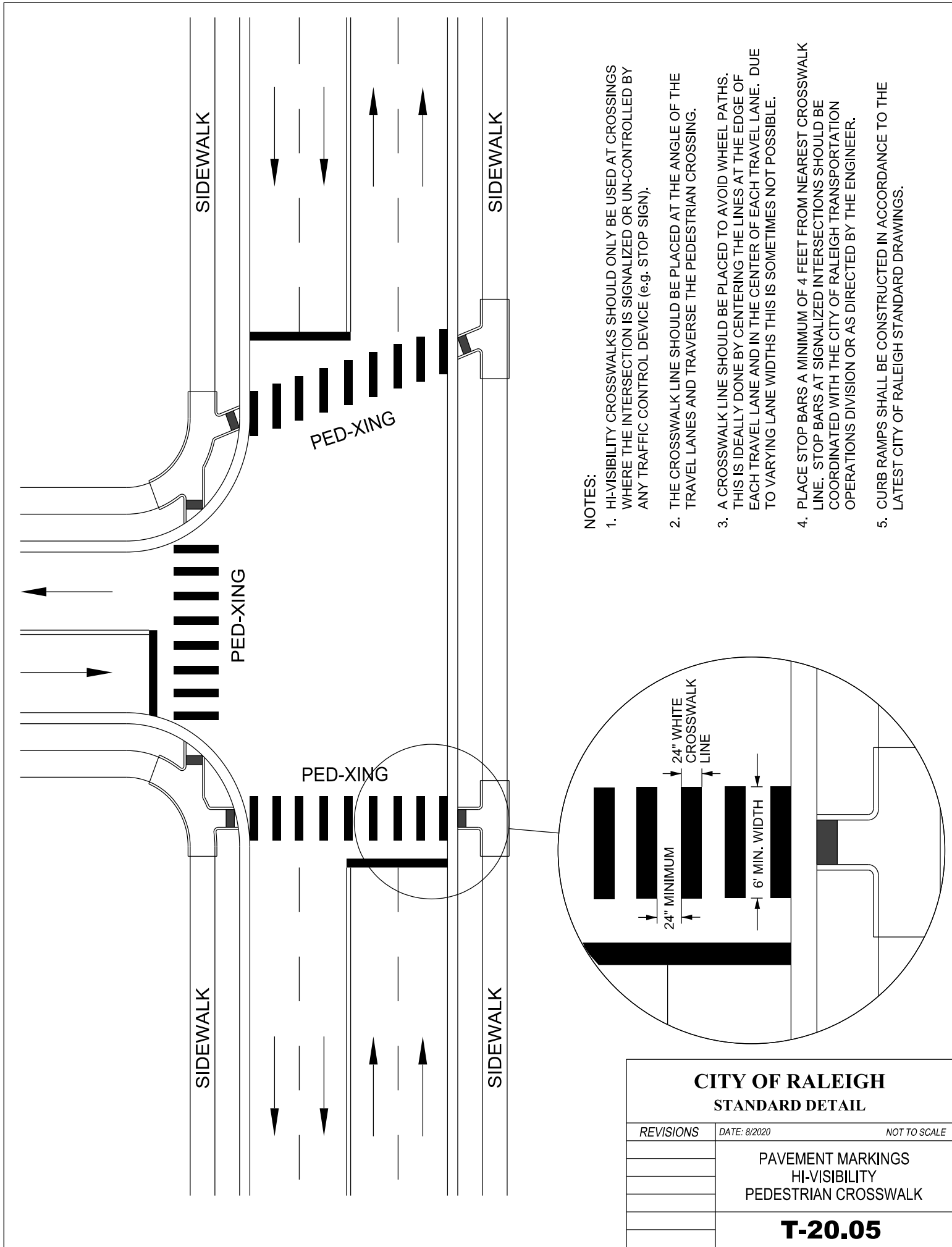


NOTES:

1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON DETAIL.
2. THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.

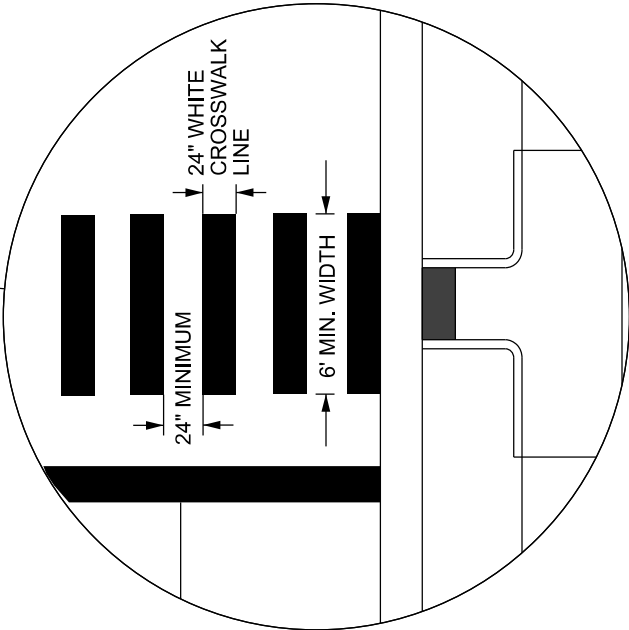
SHEET 4 OF 4

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DETECTABLE WARNING CAST-IN-PLACE	
	T-20.04.4	

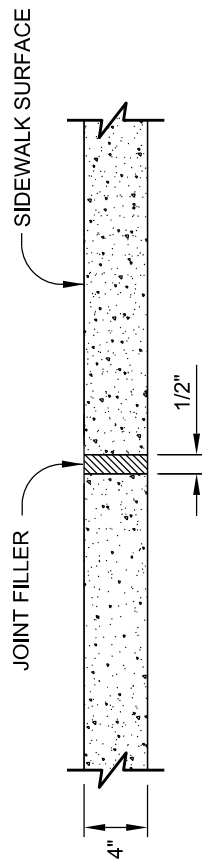
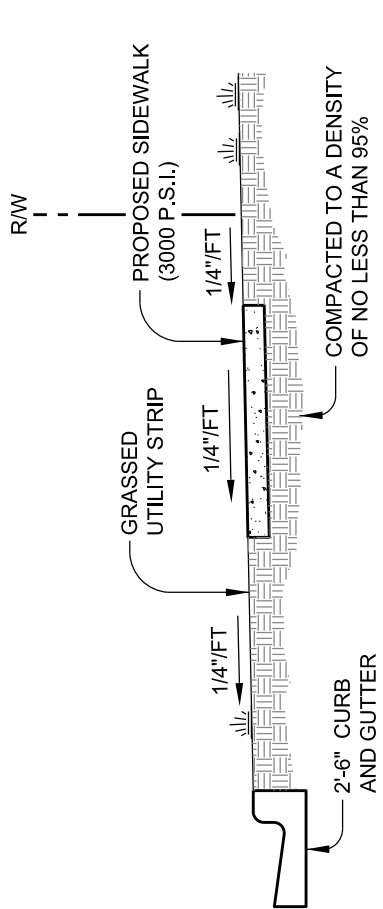
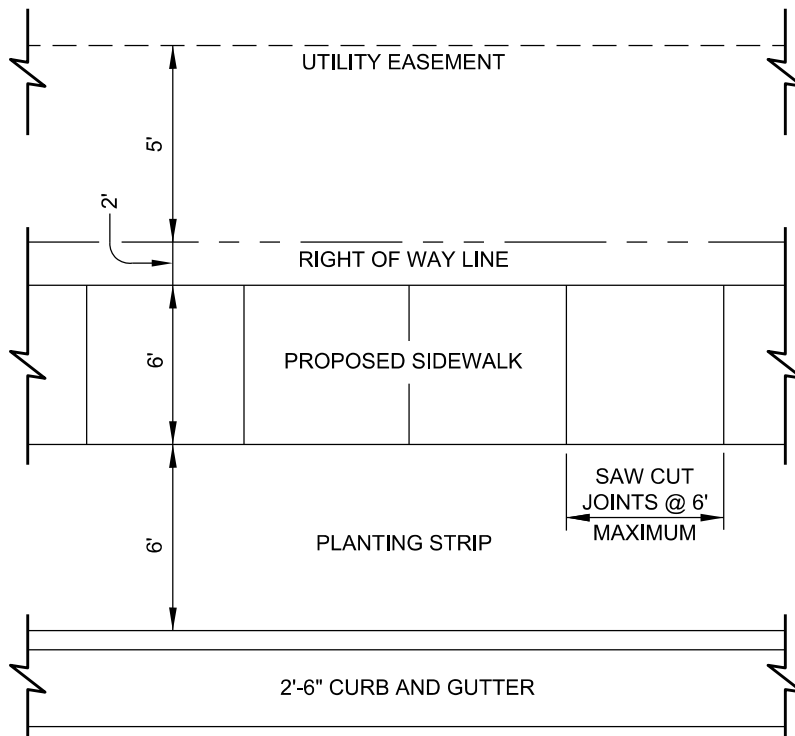


NOTES:

1. HI-VISIBILITY CROSSWALKS SHOULD ONLY BE USED AT CROSSINGS WHERE THE INTERSECTION IS SIGNALIZED OR UN-CONTROLLED BY ANY TRAFFIC CONTROL DEVICE (e.g. STOP SIGN).
2. THE CROSSWALK LINE SHOULD BE PLACED AT THE ANGLE OF THE TRAVEL LANES AND TRAVERSE THE PEDESTRIAN CROSSING.
3. A CROSSWALK LINE SHOULD BE PLACED TO AVOID WHEEL PATHS. THIS IS IDEALLY DONE BY CENTERING THE LINES AT THE EDGE OF EACH TRAVEL LANE AND IN THE CENTER OF EACH TRAVEL LANE. DUE TO VARYING LANE WIDTHS THIS IS SOMETIMES NOT POSSIBLE.
4. PLACE STOP BARS A MINIMUM OF 4 FEET FROM NEAREST CROSSWALK LINE. STOP BARS AT SIGNALIZED INTERSECTIONS SHOULD BE COORDINATED WITH THE CITY OF RALEIGH TRANSPORTATION OPERATIONS DIVISION OR AS DIRECTED BY THE ENGINEER.
5. CURB RAMP SHALL BE CONSTRUCTED IN ACCORDANCE TO THE LATEST CITY OF RALEIGH STANDARD DRAWINGS.



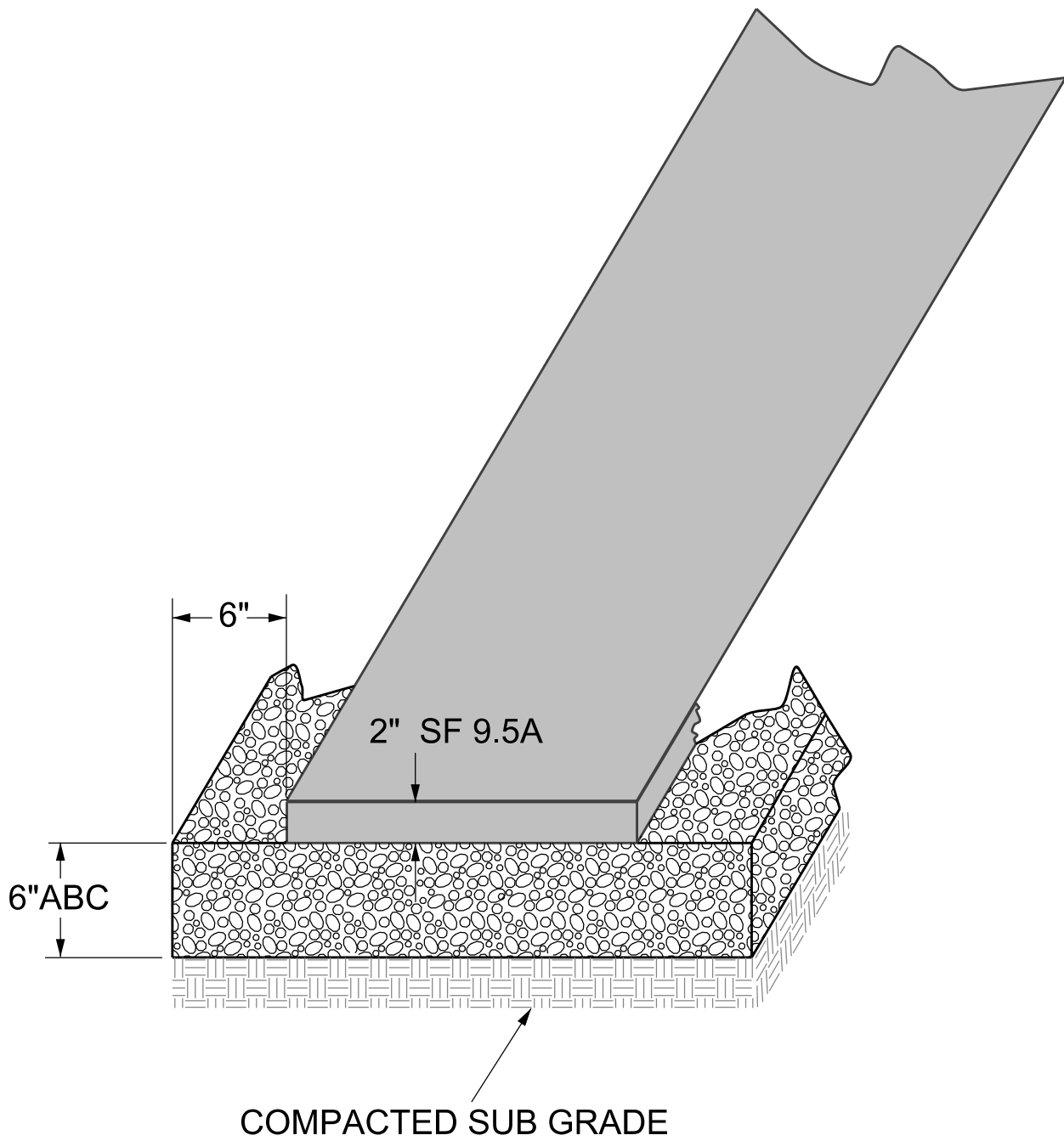
CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	PAVEMENT MARKINGS HI-VISIBILITY PEDESTRIAN CROSSWALK	
	T-20.05	



NOTES:

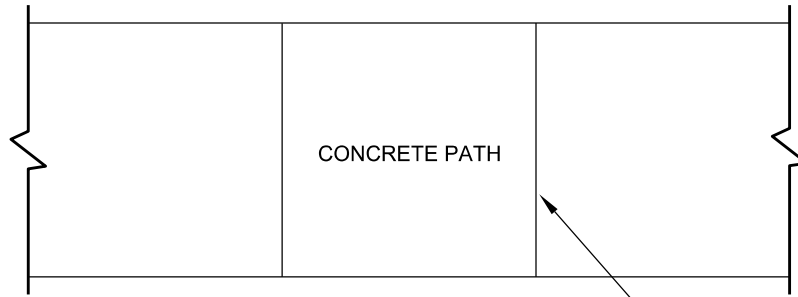
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET.
2. ALL CONCRETE TO BE 3000 PSI AND FINISHED WITH CURING COMPOUND.
3. A 6 INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND IN THE HANDICAP RAMPS.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CONCRETE SIDEWALK	
	T-30.01	



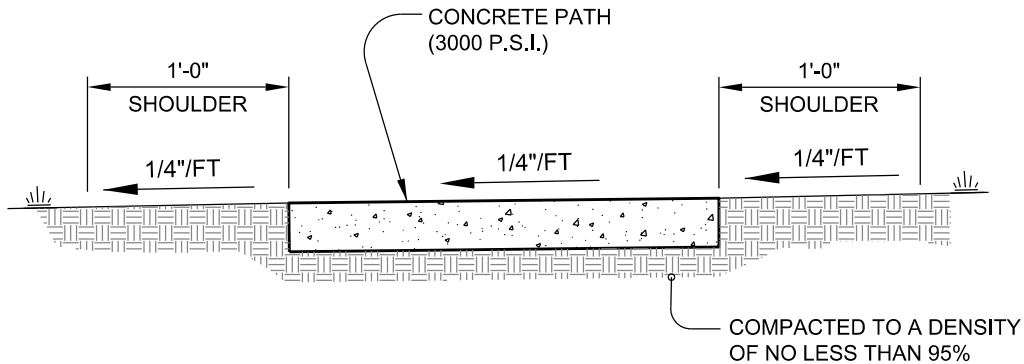
SHEET 1 OF 2

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ASPHALT MULTI-PURPOSE PATH	
	T-30.02.1	

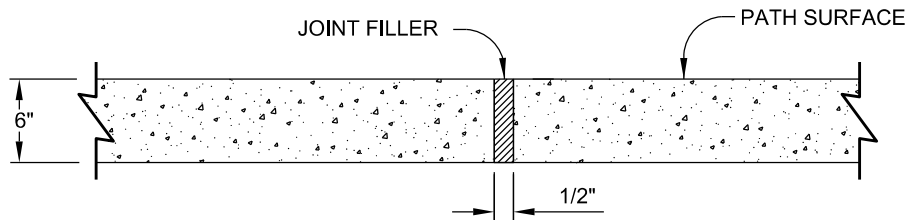


PLAN VIEW

SAW CUT JOINT SPACING @ 10' O.C.



TYPICAL SECTION



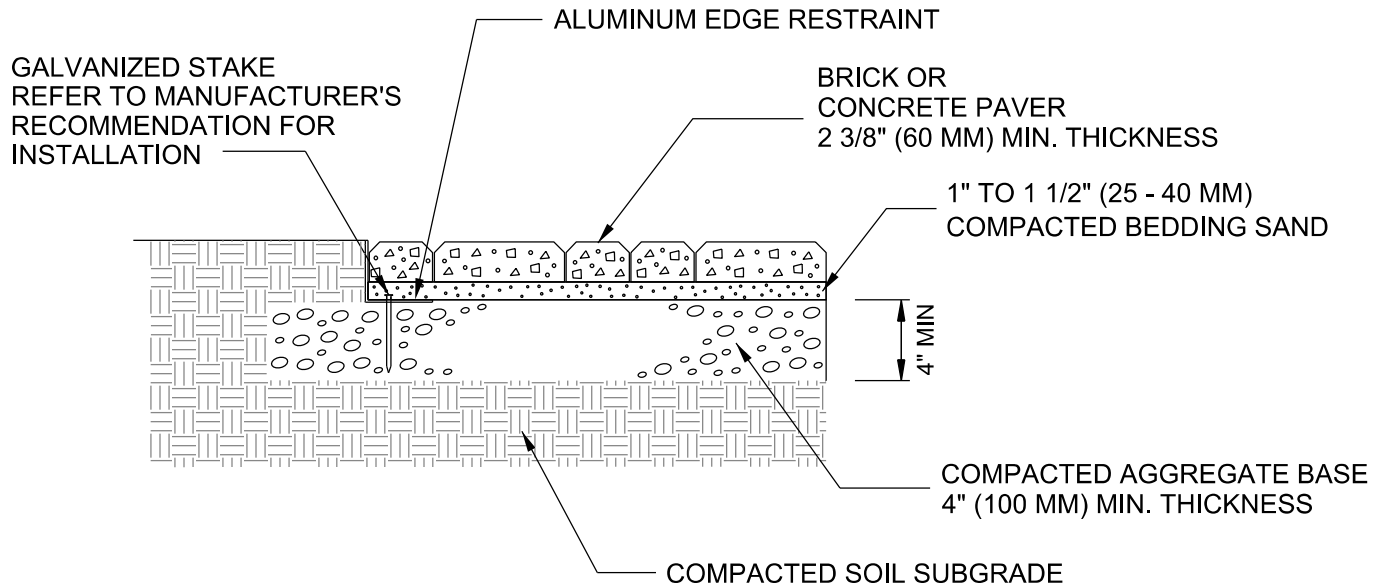
TRANSVERSE EXPANSION JOINT

NOTES:

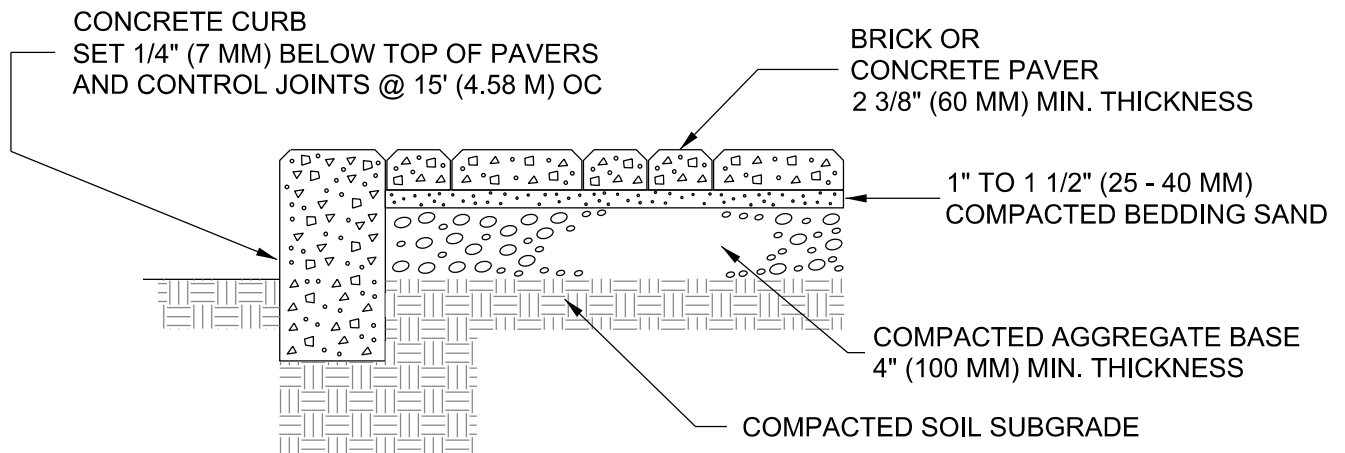
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET APART.
2. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.
3. A 6 INCH DEPTH IS REQUIRED.
4. SAW CUT JOINTS EVERY 10 FEET OR SAME AS WIDTH. WHICHEVER IS LESS.
5. NO UTILITY SURFACE COVERS/PLATES/MANHOLES (i.e. WATERLINE VALVE COVERS, ETC.) SHALL BE LOCATED WITHIN PATH AND SHALL BE MINIMUM 1 FOOT FROM THE EDGE OF PATH.
6. ALL PATHS SHALL BE LOCATED MINIMUM 6 FEET FROM THE BACK OF CURB.
7. MULTI-USE PATH WIDTH TO BE DETERMINED BY CITY OF RALEIGH BASED ON ROADWAY TYPE, LOCATION AND PEDESTRIAN VOLUMES.

SHEET 2 OF 2

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CONCRETE MULTI-PURPOSE PATH	
	T-30.02.2	



SECTION 1



SECTION 2

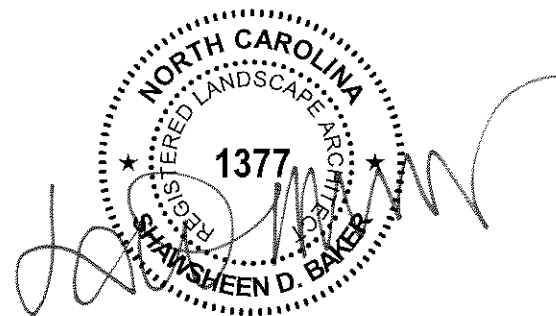
NOTES:

1. BRICK OR CONCRETE PAVERS ALLOWED ONLY UNDER SPECIAL CONDITIONS.
2. THICKNESS OF BASE MAY VARY WITH SUBGRADE/TRAFFIC CONDITIONS.
3. SCATTER SAND OR SCREENINGS OVER COMPLETE WORK AND SWEEP INTO CRACKS.
4. CONCRETE PAVERS SHOULD CONFORM TO REQUIREMENTS OF ASTM C-1319.
BRICK PAVERS SHOULD CONFORM TO REQUIREMENTS OF ASTM C902-95
5. SEE CITY OF RALEIGH CODE SECTION 10-7001 (D) FOR CONDITIONS UNDER WHICH CONCRETE / BRICK PAVERS ARE ALLOWED.

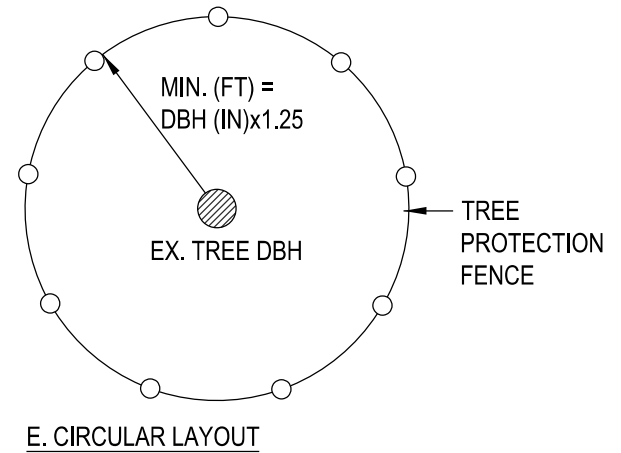
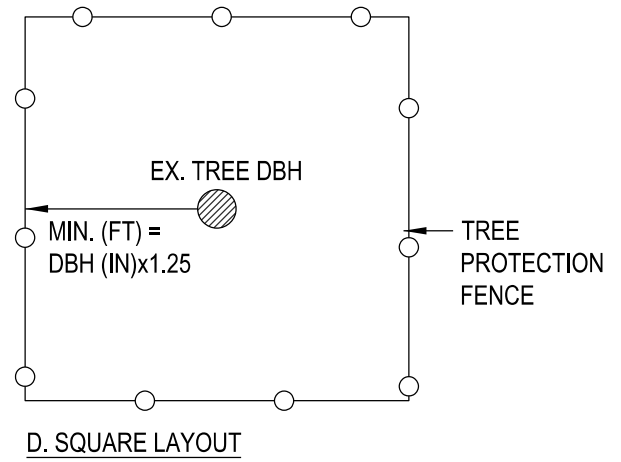
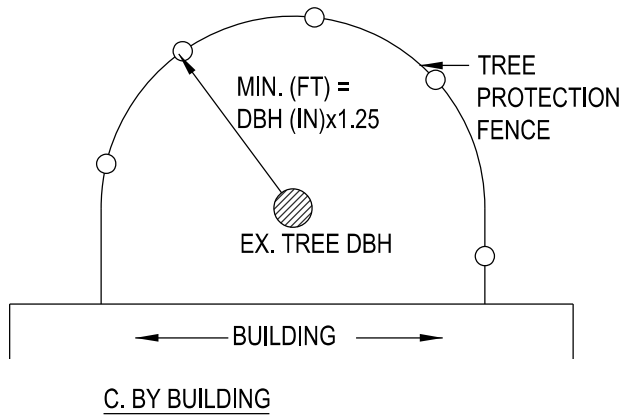
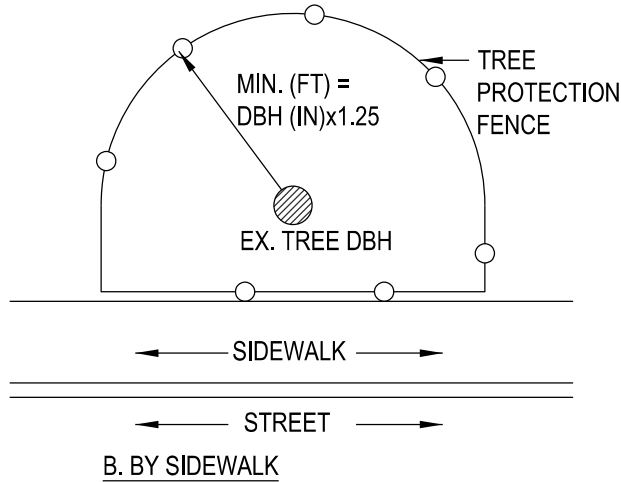
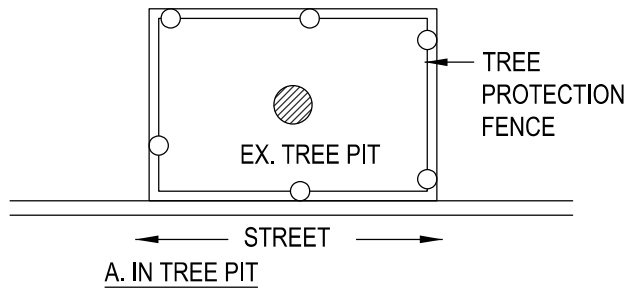
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CONCRETE/BRICK PAVER SIDEWALK DETAIL	
	T-30.03	

CITY OF RALEIGH

STANDARD DETAILS



TREE PROTECTION AND PLANTING

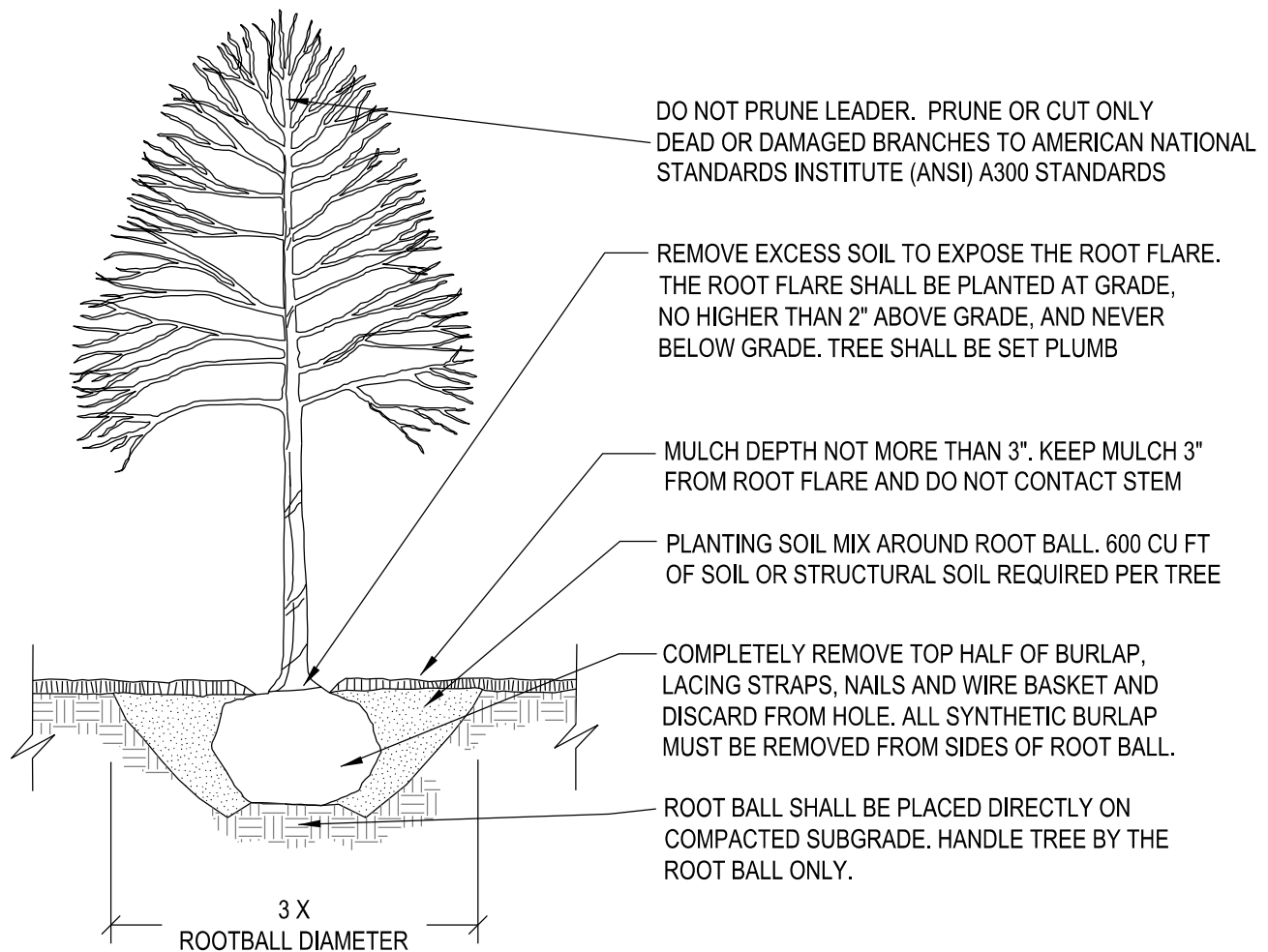


CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND
CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

NOTES:

1. CONTRACTOR MUST PROVIDE AND INSTALL TREE PROTECTION SIGNAGE.
2. A TREE IMPACT PERMIT IS REQUIRED PRIOR TO INITIATION OF CONSTRUCTION IF ANY TREES ON CITY PROPERTY ARE TO BE IMPACTED BY PRUNING, TRENCHING, BORING, REMOVAL, PAVING, PLANTING, ETC.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TREE PROTECTION FENCE LAYOUT	
	TTP-02	

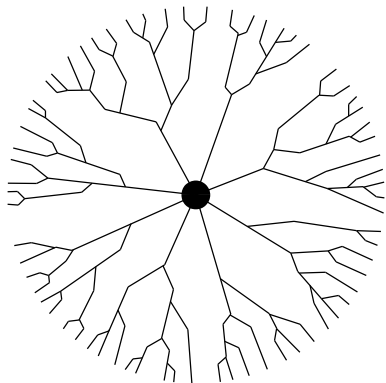


CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL
RESOURCES DEPARTMENT URBAN FORESTER:
TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

NOTES:

1. TREES MUST MEET THE TREE QUALITY STANDARDS IN CH. 2 OF THE CITY TREE MANUAL.
2. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE DRAINAGE OF ALL PLANTING PITS. (POSITIVE DRAINAGE AWAY FROM PIT)
3. TREES SHALL BE PLANTED BETWEEN OCTOBER 1ST AND APRIL 30TH.
4. A TREE IMPACT PERMIT IS REQUIRED.
5. ELECTRICAL OUTLETS AND OTHER UTILITIES ARE PROHIBITED IN THE PLANTING AREA IMMEDIATELY SURROUNDING THE TREE.
6. IF STAKING IN ACCORDANCE WITH THE CITY TREE MANUAL, THE STAKING MUST BE REMOVED WITHIN ONE YEAR
7. TREES WILL HAVE A MINIMUM 1 YEAR WARRANTY AFTER THE INITIAL PLANTING IS APPROVED BY THE CITY.

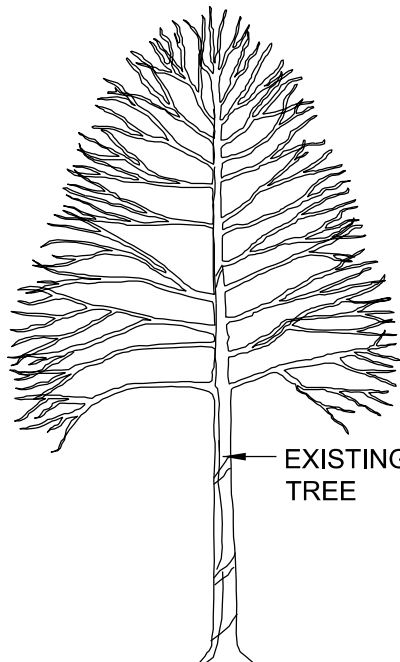
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
10/2019	TREE PLANTING DETAIL	
	TPP-03	



PLAN

CRITICAL ROOT ZONE

CRITICAL ROOT ZONE



30" MINIMUM

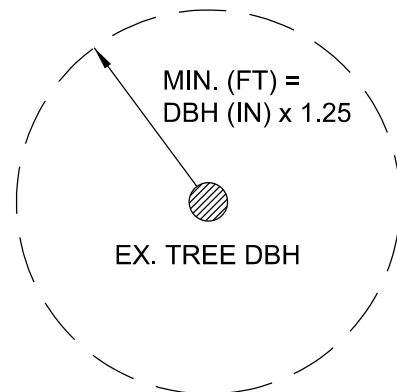
TUNNELING/BORING PERMITTED

SECTION

NOTES:

1. THE CRITICAL ROOT ZONE (CRZ) IS DEFINED AS A RADIUS EXTENDING FROM THE TRUNK OF A TREE 1.25 FEET PER INCH OF DBH.
2. TRENCHING SHALL OCCUR OUTSIDE THE CRZ
 - 2.1. TUNNELING AND BORING IS PERMITTED WITHIN THE CRZ AS LONG AS IT IS 30 INCHES DEEP OR GREATER. EXCAVATIONS AND HAND HOLES SHALL BE OUTSIDE THE CRZ.
 - 2.2. ENCROACHMENT INTO THE CRZ REQUIRES APPROVAL FROM THE URBAN FORESTER
3. ROOTS MUST BE PRUNED TO A CLEAN CUT. CUTTING OR PRUNING OF ROOTS 2" OR LARGER IS PROHIBITED.
4. IF EXCAVATION CAUSES PRUNED ROOTS OVER 1.5" IN DIAMETER TO REMAIN EXPOSED FOR MORE THAN 24 HOURS, ROOTS ON TREE SIDE MUST BE KEPT MOIST.
5. A TREE IMPACT PERMIT IS REQUIRED PRIOR TO INITIATION OF CONSTRUCTION IF ANY TREES ON CITY PROPERTY ARE TO BE IMPACTED BY PRUNING, TRENCHING, BORING, REMOVAL, PAVING, PLANTING, ETC.

TRENCHING IS PERMITTED OUTSIDE OF THE CRZ



CRITICAL ROOT ZONE

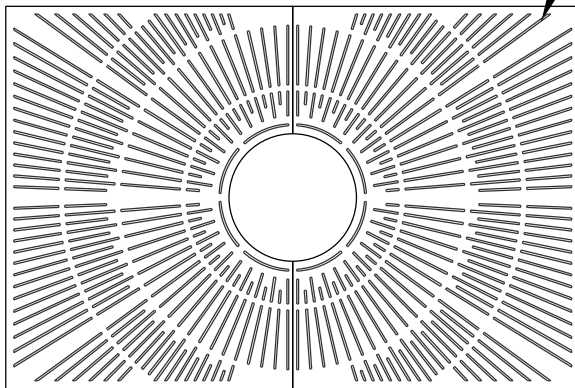
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND
CULTURAL RESOURCES DEPARTMENT URBAN
FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	TRENCHING/TUNNELING NEAR EXISTING TREES	
	TPP-04	

	PRUNING BOX FOR UTILITY EASEMENT
	TPP-05

GRAY IRON, RECTANGULAR 4'X6', 1.5" MIN. THICK, WITH 1/4" OPENING OR LESS

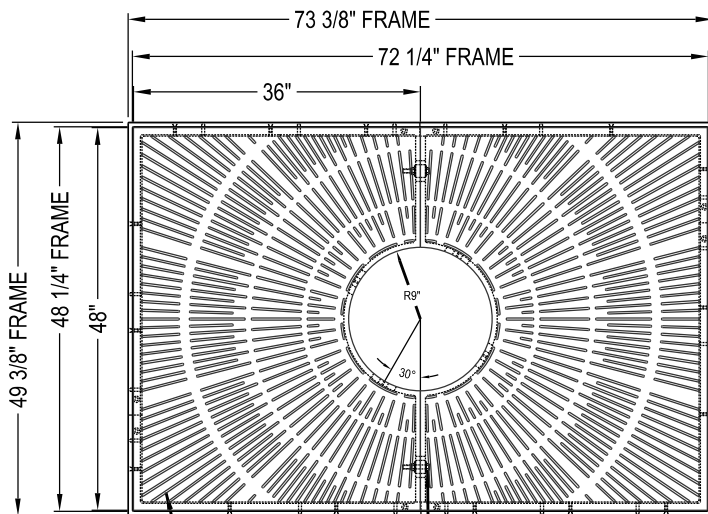


NOTES:

1. GRATE DESIGN MUST BE ADA COMPLIANT.
2. GENERAL PATTERN DESIGN MUST BE AS SHOWN.
3. EXCEPTIONS OR PERSONALIZATION MUST BE REVIEWED AND APPROVED BY THE CITY OF RALEIGH.
4. A TREE IMPACT PERMIT IS REQUIRED.
5. ADHERE TO STANDARDS IN THE CITY TREE MANUAL.
6. ELECTRIC OUTLETS AND OTHER UTILITIES ARE PROHIBITED IN THE GRATE AREA.

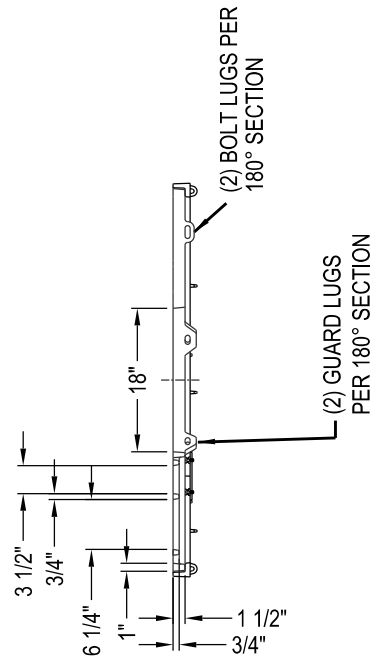
CONTACT INFORMATION:

CITY OF RALEIGH PARKS, RECREATION AND CULTURAL
RESOURCES DEPARTMENT URBAN
FORESTER:TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

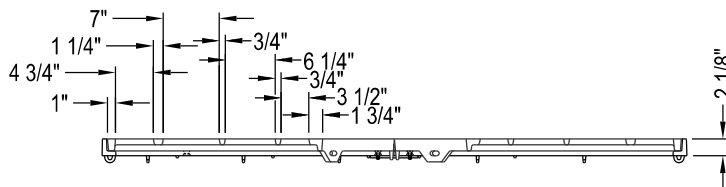
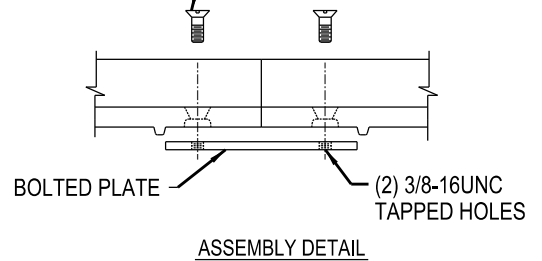


ALL SLOTS ARE
1/4\" WIDE MAX.

BOLT TREE GRATE HALVES TOGETHER w/
(2) 1/2\"-13 x 3\" STNL. STL. HEX BOLTS,
GALV. FLAT WASHERS AND STNL. STL. HEX NUT



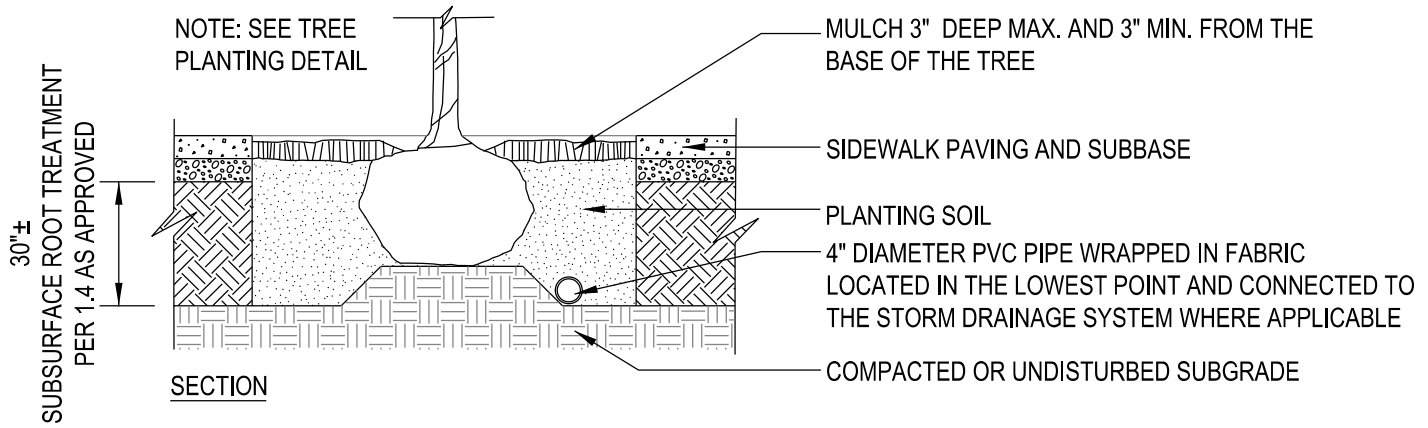
FRAMES ARE ASSEMBLED
USING A 6\" X 1 1/4\" X 1/4\"
THICK STEEL PLATE BOLTED
TO FRAME w/ (2) 3/8-16UNC
X 1 STNLS STL. FLAT HD.
CAP SCREWS



NOTE: ALL DIMENSIONS SHOWN ARE IN ENGLISH
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 608#/SET

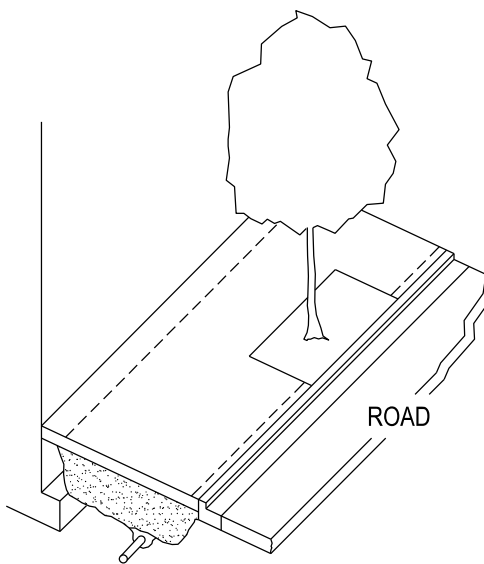
**CITY OF RALEIGH
STANDARD DETAIL**

REVISIONS	DATE: 8/2020	NOT TO SCALE
	TREE GRATE IN SIDEWALK WITHIN ROW	
	TPP-06	

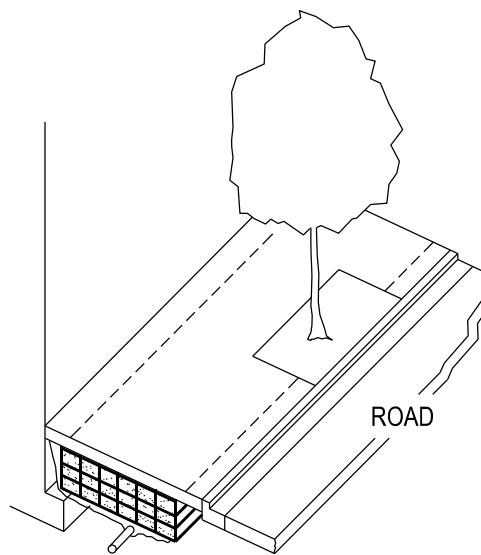


NOTES:

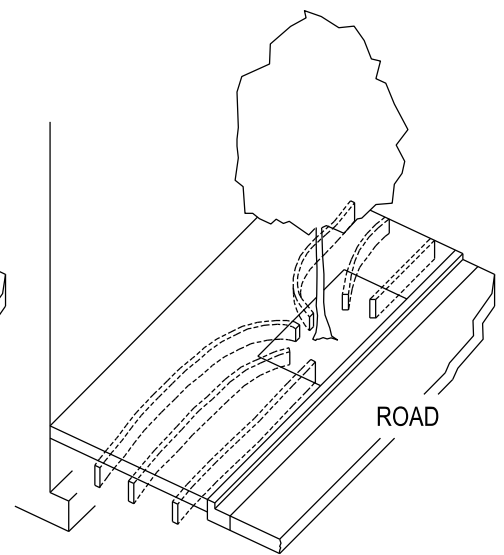
1. A SITE SPECIFIC PLAN MUST BE DEVELOPED TO ENSURE THAT:
 - 1.1. EACH TREE IS PROVIDED A MIN. ROOT-ACCESSIBLE SOIL VOLUME OF 600 CUBIC FEET.
 - 1.2. THE TREE ROOT AREA BENEATH THE SIDEWALK IS EXPANDED TO MAXIMIZE ROOT ACCESSIBLE SOIL SPACE UNDER THE PAVEMENT.
 - 1.3. CONNECT SOIL SPACE FOR ROOT EXPANSION WHERE POSSIBLE TO ALLOW ROOT SYSTEMS OF TREES TO OVERLAP AND COLONIZE A SHARED SOIL SPACE.
 - 1.4. ANY COMBINATION OF STRUCTURAL SOILS, SOIL CONTAINMENT SYSTEM (e.g., SILVA CELL), OR ROOT CHANNELING (e.g., SOIL STRIP DRAIN/AERATION SYSTEM) THAT PERFORMS AS SPECIFIED IS ACCEPTABLE.
3. 40' X 6' WIDTH MINIMUM APPLIES TO BOTH STRUCTURAL SOILS AND SUBSURFACE SOIL CONTAINMENT SYSTEMS.
4. SUBSURFACE APPLICATION SHALL BE REVIEWED AND APPROVED BY CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES URBAN FORESTRY DIVISION PRIOR TO INSTALLATION.



STRUCTURAL SOIL SYSTEM



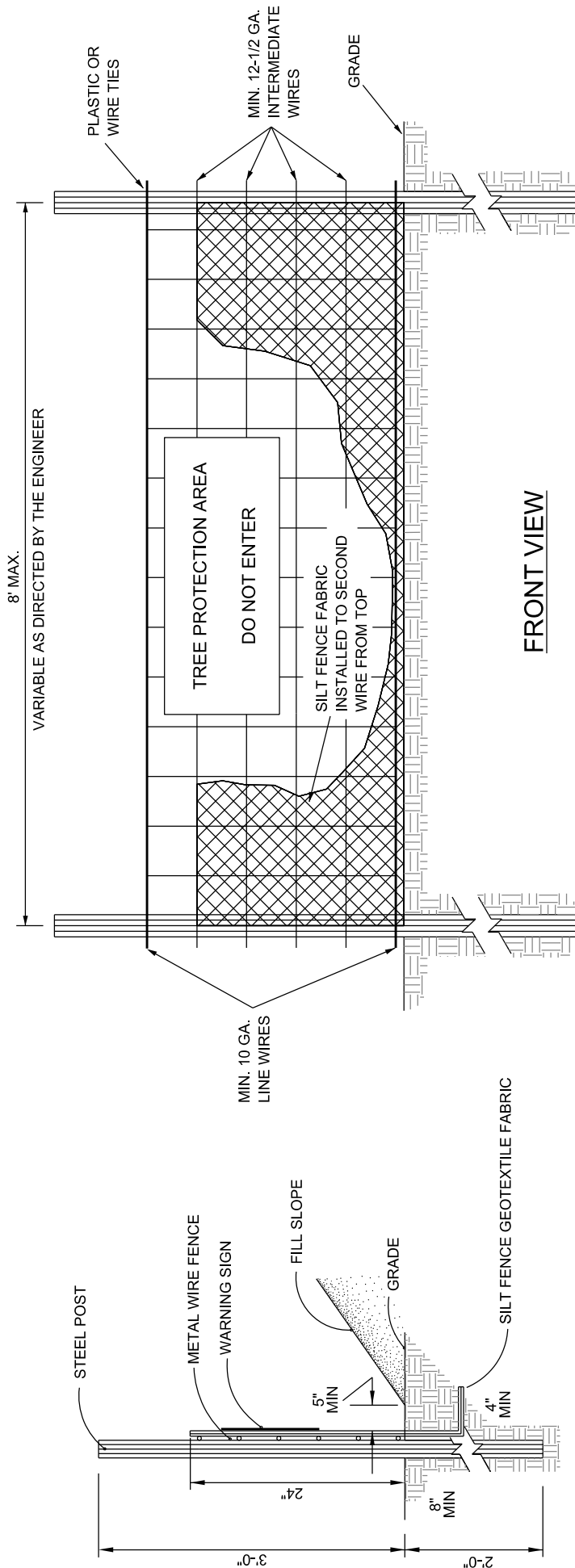
SOIL CONTAINMENT SYSTEM



ROOT CHANNELING/PATHWAYS

CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TREE PLANTING IN SIDEWALK WITHIN ROW	
	TPP-07	

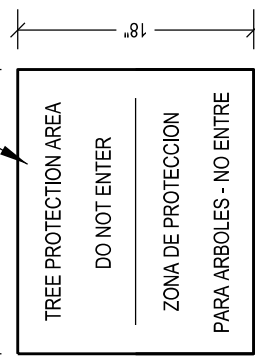


MAINTENANCE: CLEAN OUT AT 50% CAPACITY
LIFE OF FENCING: 6-9 MONTHS
 DO NOT DISTURB TREE CONSERVATION AREAS
 SILT FENCE SHOULD NOT BE USED ALONE BELOW
 GRADED SLOPES GREATER THAN 10' IN HEIGHT.

NOTES:

1. TREE PROTECTION FENCING MUST BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE (SEE DETAIL TPP-02 FOR EXAMPLES)
2. THE TREE PROTECTION FENCING MUST REMAIN IN PLACE FOR THE DURATION OF THE PROJECT UNLESS OTHERWISE APPROVED BY URBAN FORESTRY STAFF.
3. APPROVED IMPACT PROTECTION DEVICES MUST BE REMOVED AFTER CONSTRUCTION WHEN APPLICABLE.
4. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER FOR THE REMAINDER
5. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTED AREA.
6. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
7. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF RALEIGH BASED ON ACTUAL FIELD CONDITIONS.
8. SIGNS ARE TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL WITH LETTERS A MINIMUM OF 2 1/2" HIGH, CLEARLY LEGIBLE AND SPACED AS SHOWN.
9. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.
10. SEE NC STATE DEQ PRACTICE STANDARDS & SPECIFICATIONS SEDIMENT FENCE SET FOR CONDITIONS WHERE APPLIES: PLANNING CONSIDERATIONS & DESIGN CRITERIA. (HOWEVER, FLOW SHALL NOT RUN PARALLEL WITH THE TOE OF THE FENCE.)

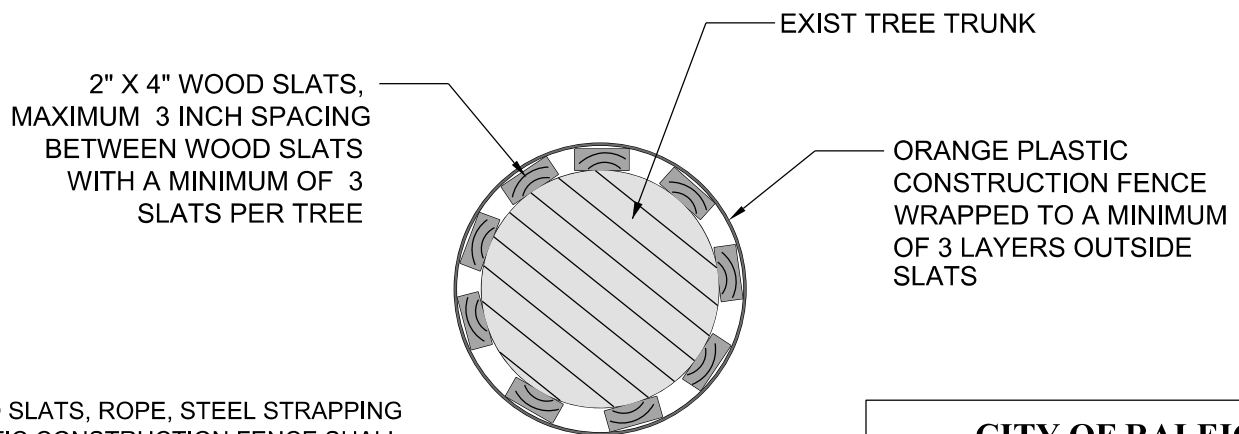
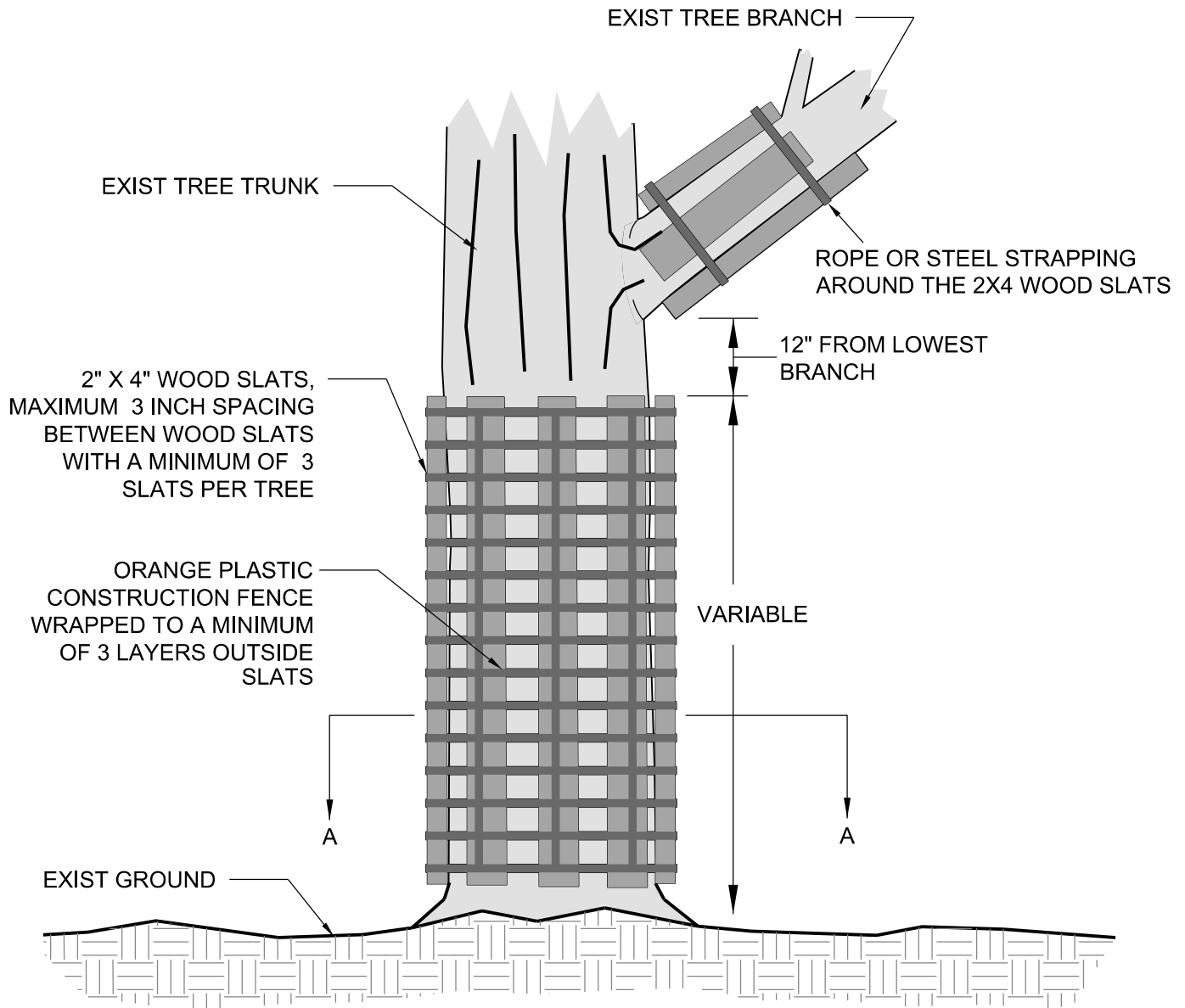
PROVIDE WARNING
 LANGUAGE IN BOTH
 ENGLISH AND SPANISH,
 AS SHOWN



WARNING SIGN DETAIL

CONTACT INFORMATION:
 CITY OF RALEIGH PARKS, RECREATION AND
 CULTURAL RESOURCES DEPARTMENT
 URBAN FORESTER:
 TREES@RALEIGHNC.GOV
 WWW.RALEIGHNC.GOV

CITY OF RALEIGH		
STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD TEMPORARY (SEDIMENT/SILT) / TREE PROTECTION FENCE	
	TPP-08	



SECTION A - A

NOTE: NO SLATS, ROPE, STEEL STRAPPING OR PLASTIC CONSTRUCTION FENCE SHALL BE ATTACHED TO, ANCHORED TO OR TIED TO THE TREE.

CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND
CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	TREE ARMOUR	
	TPP-09	