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: Mobility Strategy and Infrastructure Manager - 919-996-3030
Greenways: Greenway Planning Manager - 919-996-3285
GSI: Assistant Director of Engineering Services - 919-996-3940
Stormwater: Assistant Director of Engineering Services - 919-996-3940
Transit: Mobility Strategy and Infrastructure Manager - 919-996-3030
Transportation: Mobility Strategy and Infrastructure Manager - 919-996-3030
Tree Protection and Planting: Capital Projects Superintendent - 919-996-3285

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

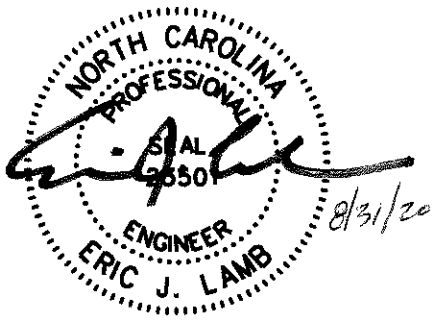
CITY OF RALEIGH
STANDARD DETAILS

TABLE OF CONTENTS

TREE PROTECTION AND PLANTING

CITY OF RALEIGH

STANDARD DETAILS



BICYCLE FACILITIES

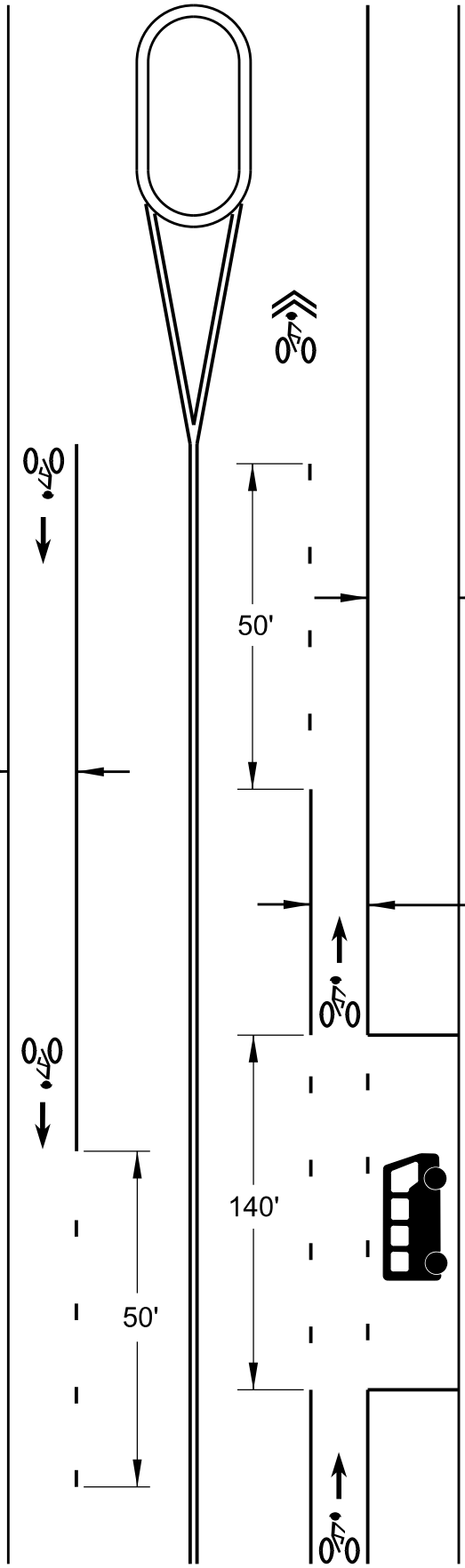
PLACEMENT & SPACING

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.

MEDIAN TRANSITIONS

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



PARKING LANE WIDTH, W_3

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

BIKE LANE WIDTH,W_1

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

BIKE LANE WIDTH, W_2

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

BIKE LANE SIGN

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

BIKE LANE MINI-SKIPS

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

CITY OF RALEIGH
STANDARD DETAIL

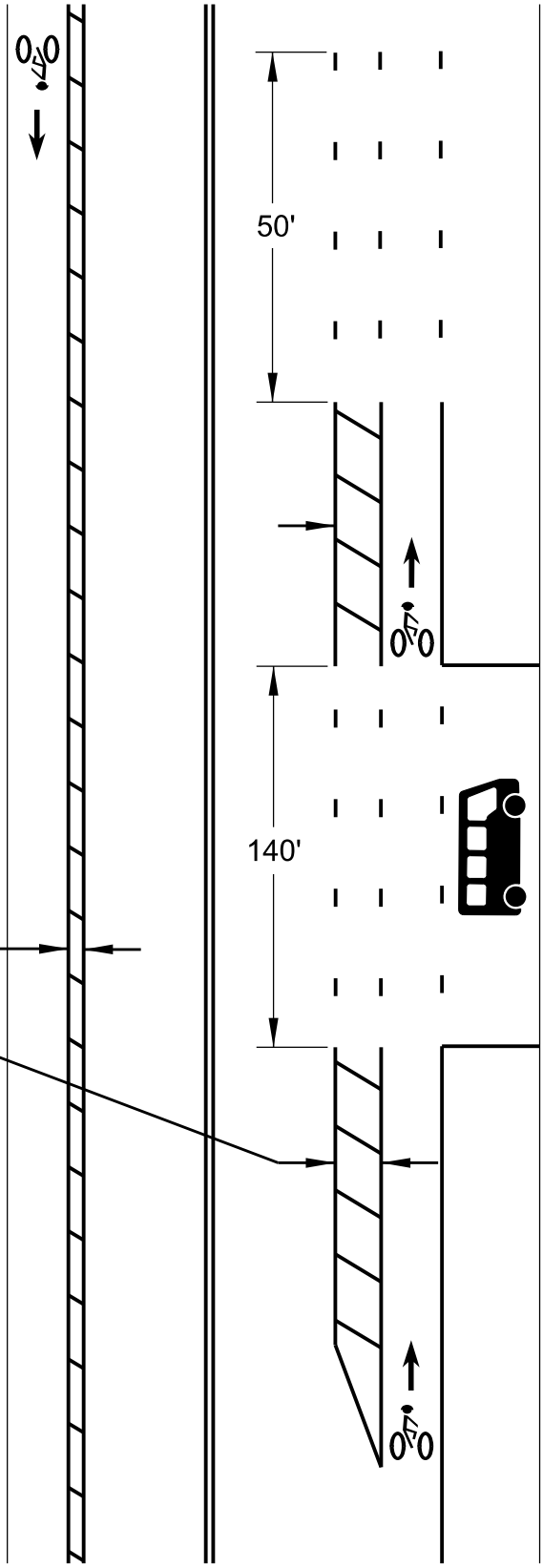
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE LANE SIGNS AND MARKINGS	
	B-10.01	

BUFFER TRANSITION

TAPER THE START OF A BIKE LANE BUFFER BY NARROWING THE TRAVEL LANE.

A TAPER IS NOT REQUIRED AT THE END OF A BIKE LANE BUFFER UNLESS THE END OCCURS ON A HORIZONTAL CURVE.

TAPERS ARE NOT REQUIRED WHEN TRANSITION TO MINI-SKIPS AT CONFLICT ZONES I.E. BUS STOPS AND MAJOR DRIVEWAYS.



BUFFER WIDTH

WHERE PAVEMENT WIDTH ALLOWS FOR A BUFFER, THE BUFFER WIDTH SHOULD BE: 3' DESIRED
2' MINIMUM

USE DIAGONAL CROSS-HATCHING IN BUFFERS.

PLACEMENT OF BUFFER FOR BIKE LANES ADJACENT TO PARKING LANES

WHERE THE BIKE LANE IS ADJACENT TO A PARKING LANE WITH LOW TURN OVER, PLACE THE BUFFER BETWEEN THE BIKE LANE AND THE TRAVEL LANE.

WHERE THE BIKE LANE IS ADJACENT TO A PARKING LANE WITH HIGH TURN OVER, PLACE THE BUFFER BETWEEN THE BIKE LANE AND THE PARKING LANE.

BIKE LANE MINI-SKIPS

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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE LANE BUFFER MARKINGS	
	B-10.02	

COMBINED LANE

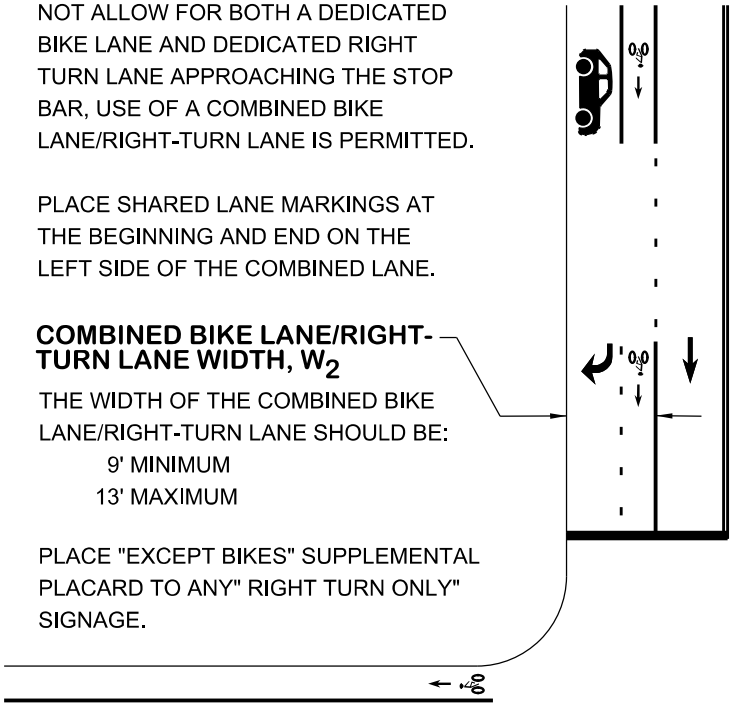
WHERE PAVEMENT WIDTH DOES NOT ALLOW FOR BOTH A DEDICATED BIKE LANE AND DEDICATED RIGHT TURN LANE APPROACHING THE STOP BAR, USE OF A COMBINED BIKE LANE/RIGHT-TURN LANE IS PERMITTED.

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.

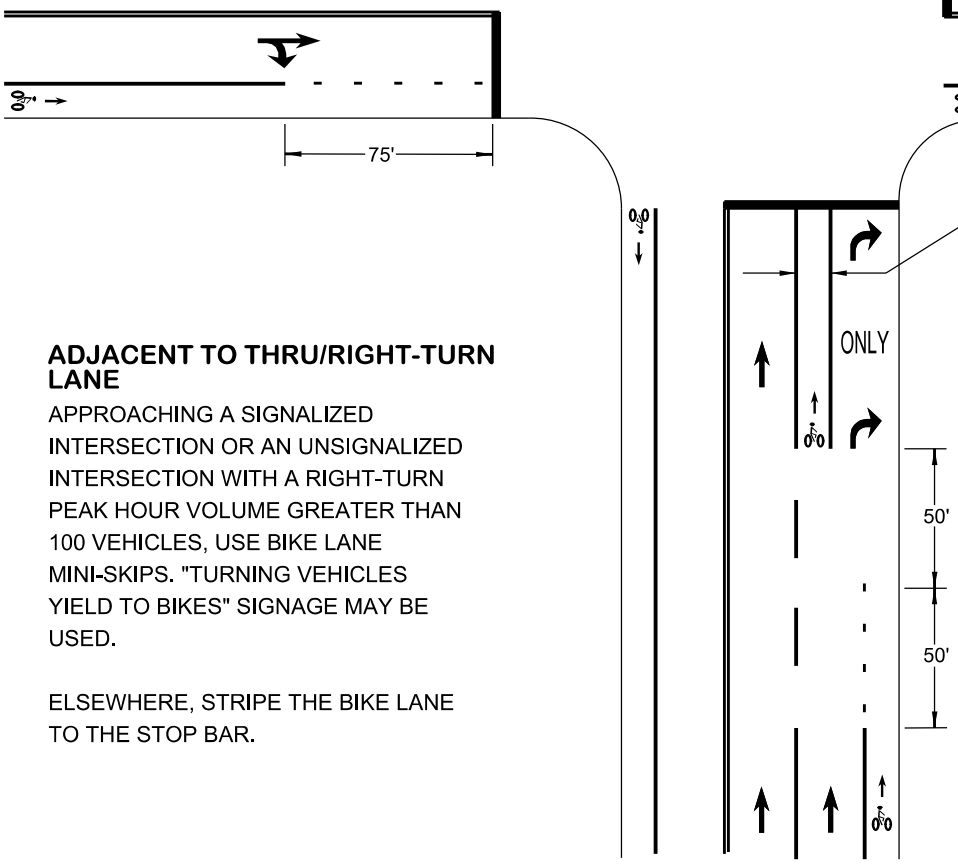
BIKE LANE WIDTH, W_1

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

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.



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

THRU LANE TRANSITION TO RIGHT-TURN LANE

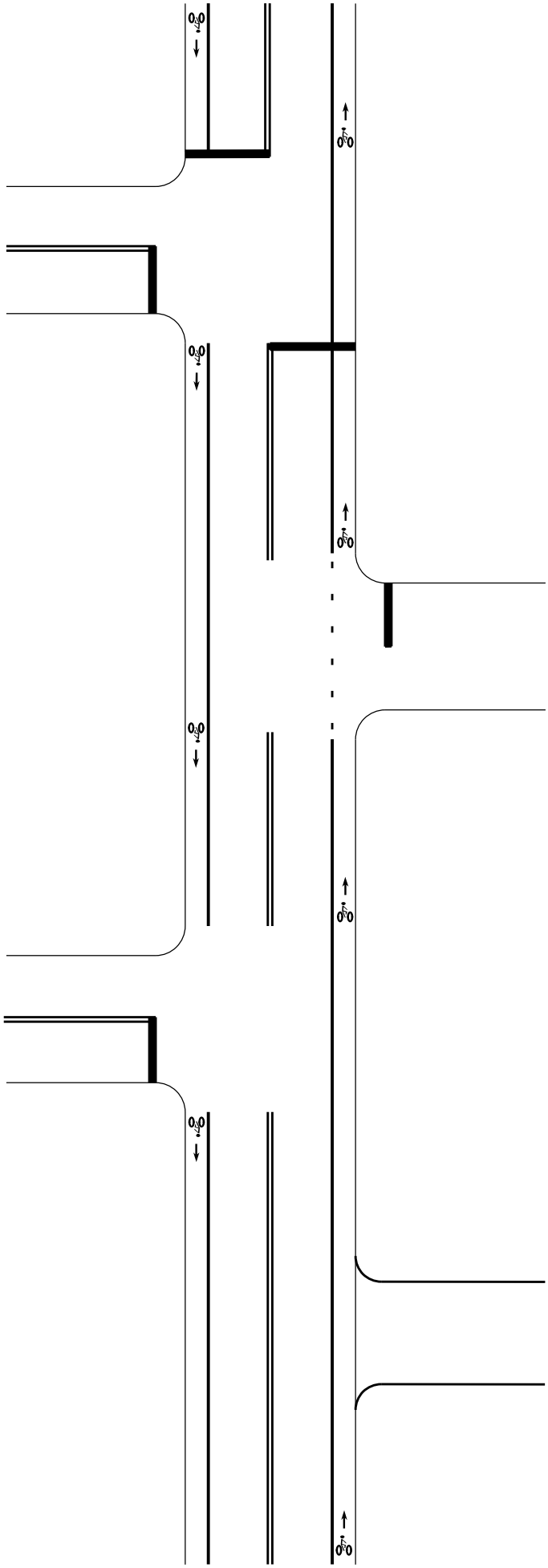
USE MINI-SKIPS TO END THE BIKE LANE AT THE RIGHT-TURN LANE TRANSITION AND THEN CONTINUE BIKE LANE TO THE LEFT OF THE RIGHT-TURN LANE APPROACHING THE INTERSECTION.

BIKE LANE MINI-SKIPS

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

CITY OF RALEIGH
STANDARD DETAIL

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.

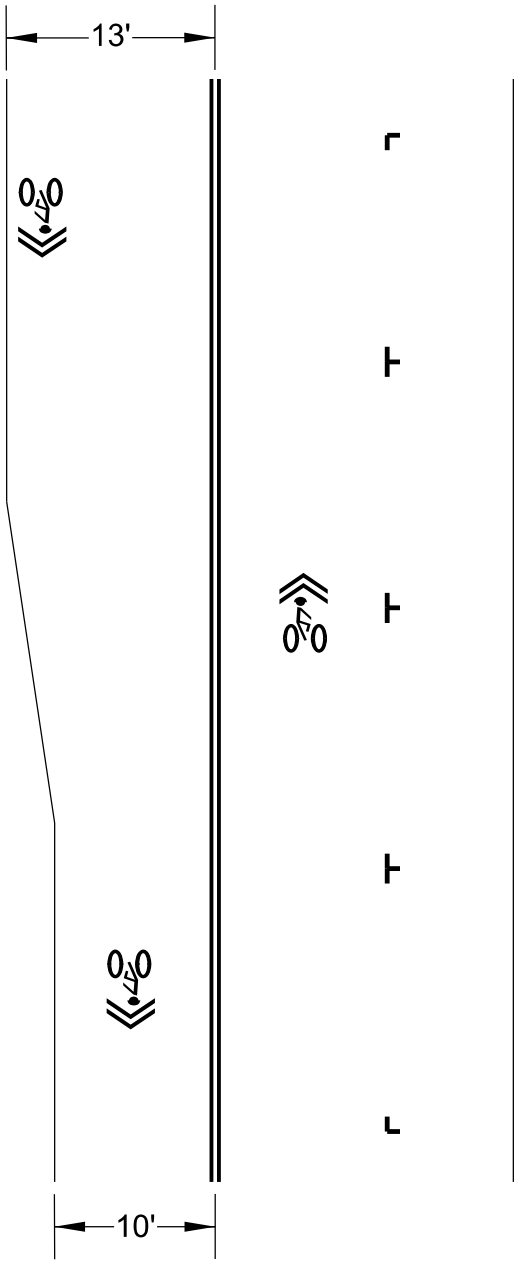
CITY OF RALEIGH
STANDARD DETAIL

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

PLACEMENT AND SPACING

PLACE SHARED LANE MARKINGS AFTER EVERY INTERSECTION AND MAJOR HIGHWAYS.

ADDITIONALLY, PLACE SHARED LANE MARKINGS EVERY 150' IN DOWNTOWN RALEIGH AND 250' ELSEWHERE.



WIDE LANES

WHERE THE TRAVEL LANE WIDTH IS 13', PLACE SHARED LANE MARKINGS 4' FROM THE EDGE OF PAVEMENT (MEASURED FROM THE APEX OF THE CHEVRON), EXCLUDING THE GUTTER PAN.

WHERE THE TRAVEL LANE WIDTH IS 14' OR WIDER, INSTALL BIKE LANE MARKINGS.

NARROW LANES OR ADJACENT TO PARKING LANES

WHERE THE TRAVEL LANE WIDTH IS LESS THAN 13' OR WHERE ADJACENT TO PARKING LANES, PLACE SHARED LANE MARKINGS IN THE CENTER OF THE TRAVEL LANE.

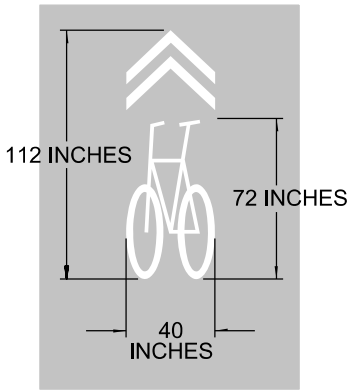
STREET CRITERIA

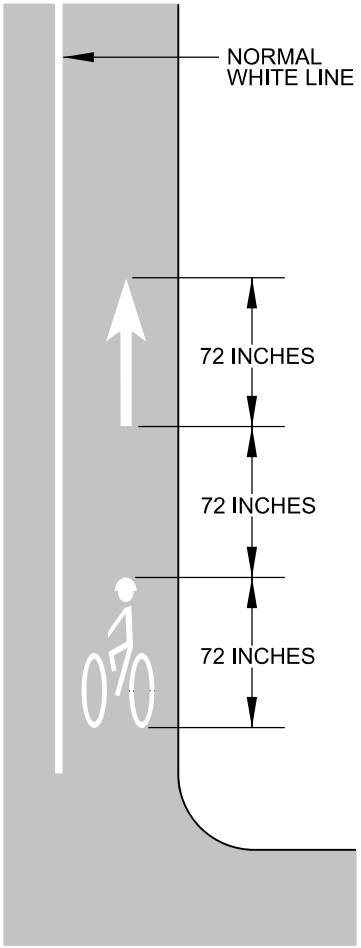
SHARED LANE MARKINGS DO NOT ESTABLISH A BICYCLE FACILITY AND SHOULD ONLY BE USED WHEN ONE OR MORE OF THE CONDITIONS APPLY:

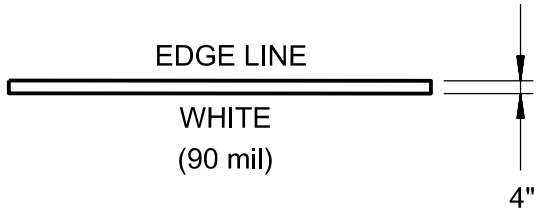
- THE POSTED SPEED LIMIT OR PREVAILING SPEED IS 25 MPH OR LESS.
- THE AVERAGE DAILY TRAFFIC VOLUME IS 4,000 VEHICLES OR LESS.
- PLACEMENT THROUGH MEDIAN AREAS OR COMBINED BIKE LANE/RIGHT-TURN LANE.
- INSTALLATION PAIRED WITH TRAFFIC CALMING MEASURES, WAYFINDING SIGNAGE, AND INTERSECTION TREATMENTS TO ESTABLISH A NEIGHBORHOOD BIKEWAY.

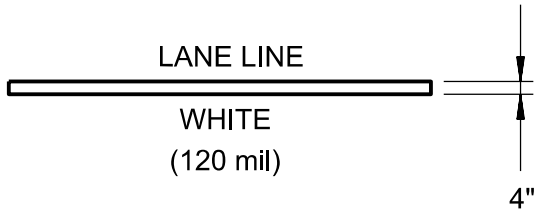
CITY OF RALEIGH
STANDARD DETAIL

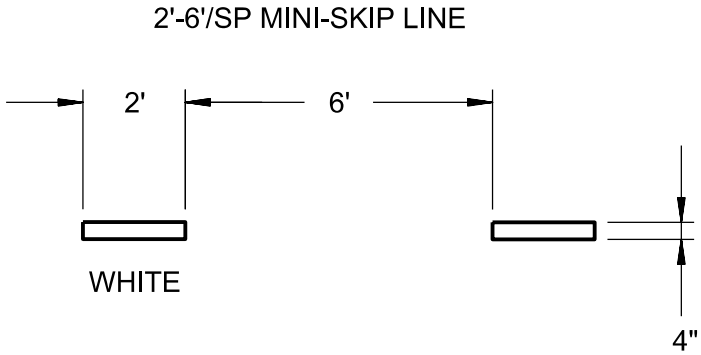
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SHARED LANE SIGNS & MARKINGS	
	B-10.05	











CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 8/2020
NOT TO SCALE

BICYCLE MARKING

B-10.06

R3-17

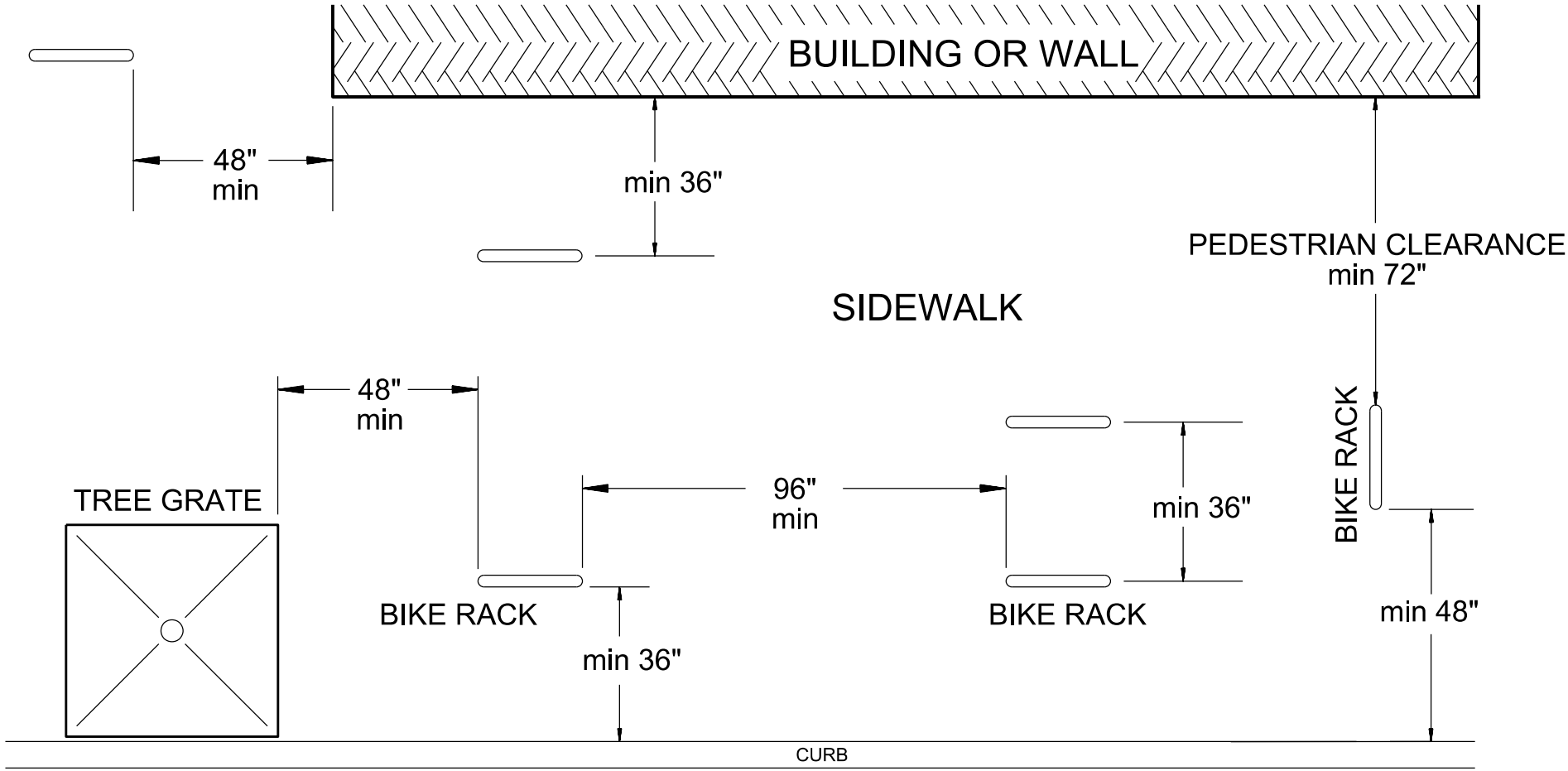
R3-17bP

R4-4

R10-15 MODIFIED

R7-9

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



CITY OF RALEIGH
STANDARD DETAIL

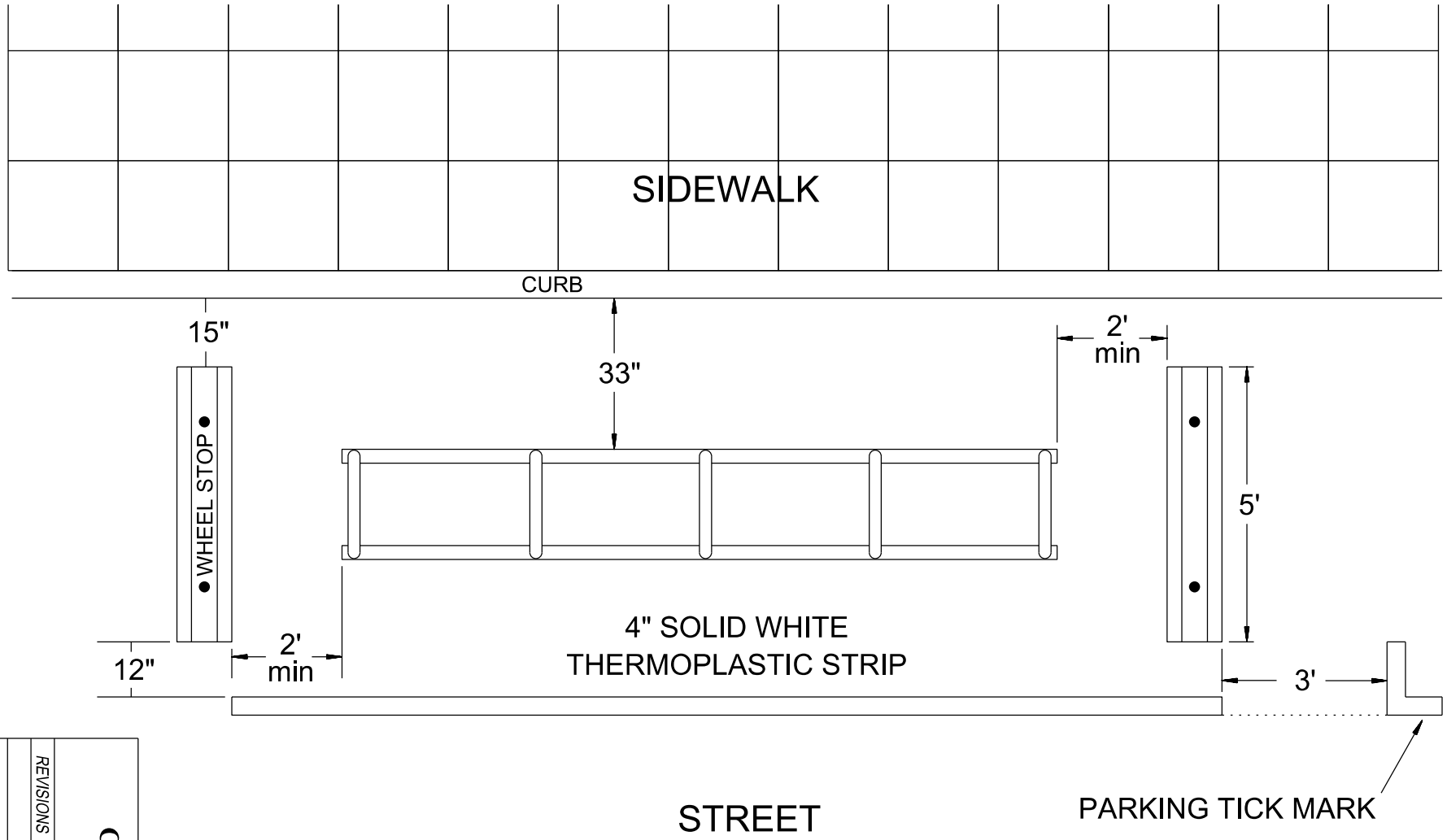
REVISIONS

DATE: 8/2020

NOT TO SCALE

BIKE RACK PLACEMENT

B-20.01



NOTES:

1. WHEEL STOPS TO BE EQUIPPED WITH RETROREFLECTIVE MARKINGS.
2. ANGLED RACKS MAY ALSO BE USED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS

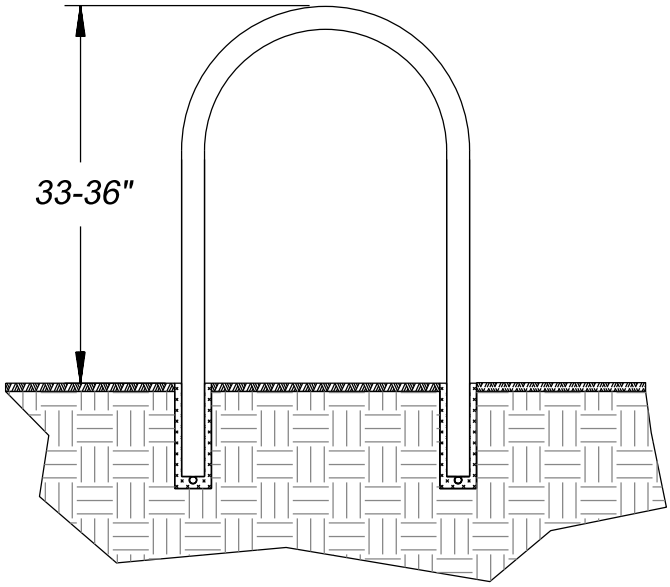
DATE: 8/2020

NOT TO SCALE

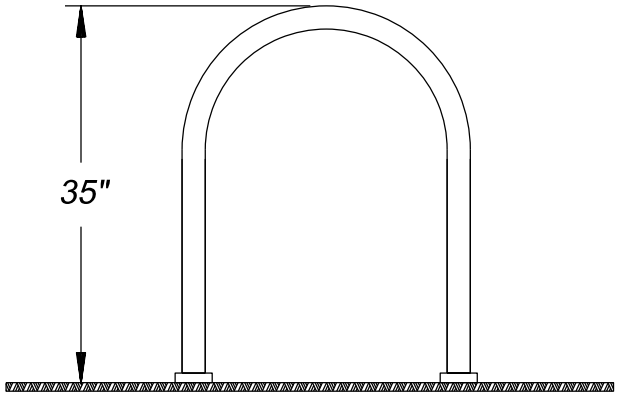
BIKE RACK CORRAL

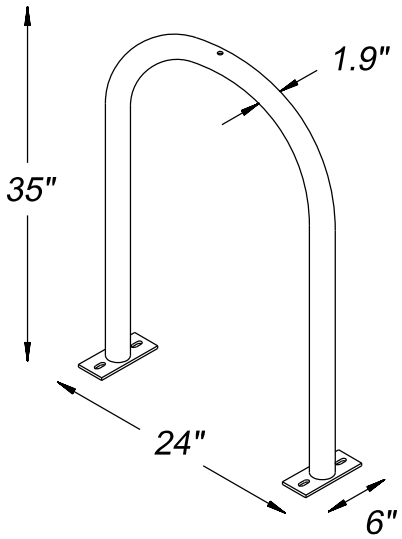
B-20.02

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.

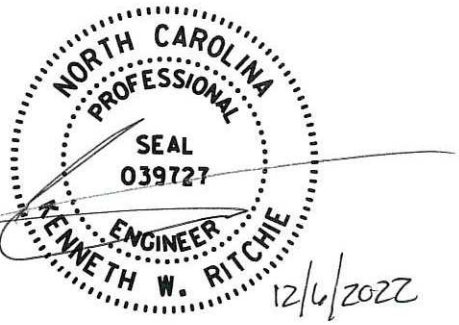
IN-GROUND MOUNT - WHEN INSTALLED ON PAVERS OR OTHER NON-STABLE SURFACES, EMBED INTO BASE. CORE HOLES NO LESS THAN 3" IN DIAMETER AND 10" DEEP.

CITY OF RALEIGH
STANDARD DETAIL

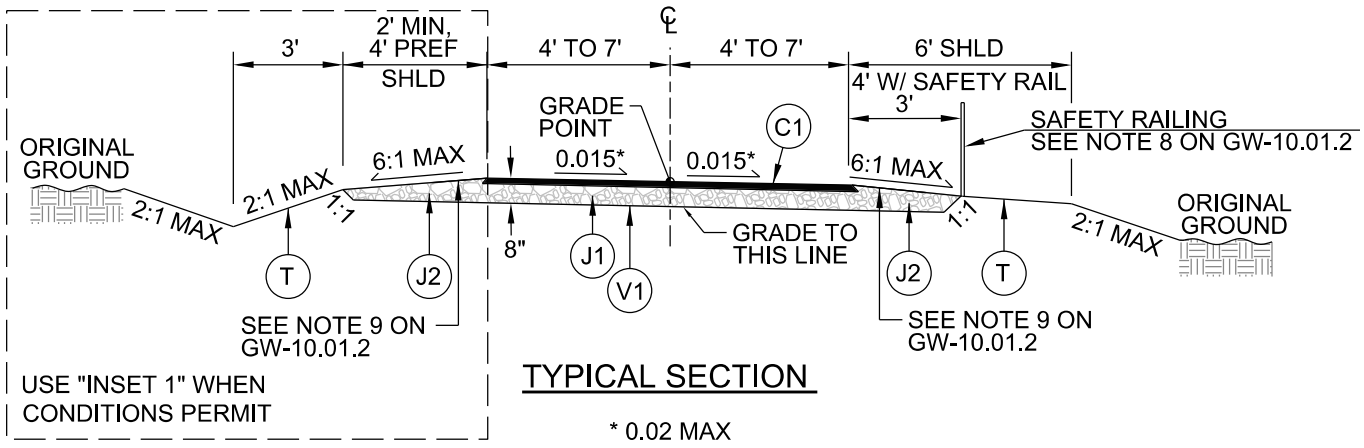
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BIKE RACK DETAILS	
	B-20.03	

CITY OF RALEIGH

STANDARD DETAILS

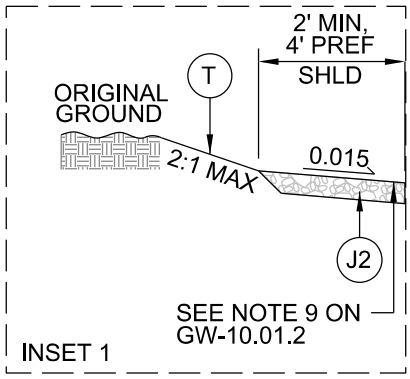


GREENWAY



TYPICAL SECTION

* 0.02 MAX



ASPHALT TYPICAL TRAIL SECTION
VARIABLE WIDTH (8' MIN, 14' MAX)

PAVEMENT SCHEDULE	
C1	2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 220 LBS. PER SQ. YD. OR 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
J1	6" AGGREGATE BASE COURSE
J2	VARIABLE DEPTH AGGREGATE BASE COURSE
T	EARTH MATERIAL
V1	GEOTEXTILE FOR PAVEMENT STABILIZATION

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	ASPHALT TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX)	
	GW-10.01.1	

ASPHALT TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX) - NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY CITY OF RALEIGH.

2. WHEN CONDITIONS PERMIT, USE 6' SHOULDER IN FILL SECTIONS AND 4' SHOULDER IN CUT SECTIONS. USE MINIMUM 2' SHOULDER IN CUT AND FILL SECTIONS. FOR CUT SECTION CONDITION SHOWN IN "INSET 1," APPLY ENGINEERING JUDGMENT TO DETERMINE IF UPHILL SIDE REQUIRES A SWALE.

3. TRAILS OR TRAIL SEGMENTS OF ANY LENGTH MAY BE CONSTRUCTED WITH RUNNING SLOPES/VERTICAL GRADES UP TO 1:20 (5%). TO ACCOMMODATE STEEP TERRAIN, TRAILS MAY BE DESIGNED WITH STEEPER SECTIONS OF CONSTRAINED LENGTH AS SHOWN IN TABLE 1. RESTING INTERVALS WITH FLATTER GRADES ARE REQUIRED BETWEEN TRAIL SEGMENTS ANY TIME THE RUNNING SLOPE EXCEEDS 1:20 (5%). RESTING INTERVALS SHALL BE LOCATED ON UPHILL SIDE OF TRAIL IF ONLY PROVIDED ON ONE SIDE.

4. TO ENSURE THAT A TRAIL IS NOT DESIGNED AS A SERIES OF STEEP SEGMENTS, NO MORE THAN 30% OF THE TOTAL LENGTH OF TRAIL MAY HAVE A RUNNING SLOPE/VERTICAL GRADE of 7.5% (8.33% OR 1:12 MAX). RESTING INTERVALS MUST BE PROVIDED MORE FREQUENTLY AS THE RUNNING SLOPE INCREASES.

5. RUNNING SLOPE/VERTICAL GRADE RECOMMENDATIONS MAY NOT BE ABLE TO BE ACHIEVED FOR TRAIL REPLACEMENT PROJECTS. FOR THESE TYPES OF PROJECTS, REPLACEMENT OF THE EXISTING CONDITION IN KIND IS SUFFICIENT.

6. 1.5% (2.08% OR 1:48 MAX) CROSS SLOPE. CROSS SLOPE DIRECTION VARIES. SLOPE SHOULDERS FOR POSITIVE DRAINAGE. OFTEN REQUIRES CONTINUING PAVEMENT OR SHOULDER SLOPE UNTIL TIE-IN WITH NATURAL GROUND. SEE PLAN SHEETS AND CROSS SECTIONS.

7. WHEN CONDITIONS PERMIT, SHOULDERS TO MATCH CROSS SLOPE OF TRAIL AND SIDE SLOPES TO BE 3:1 OR FLATTER.

8. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF PAVEMENT: 1) SLOPE > 3:1 AND DROP OF 6'; 2) SLOPE > 2:1 AND DROP OF 4'; 3) SLOPE > 1:1 AND DROP OF 1'. REFER TO GW-20.01 AND GW-20.02 FOR SAFETY RAIL DETAILS.

9. CONTRACTOR GRADE SEED SHALL BE SEWN INTO AGGREGATE BASE COURSE ON SHOULDERS AT THE SURFACE.

10. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.

11. PROOF ROLLING SHALL OCCUR IN PRESENCE OF THE OWNER OR THE OWNER'S TESTING AGENCY AT THE FOLLOWING STAGES: 1) PRIOR TO PLACING FILL IN LOW AREAS; 2) AFTER THE PREPARATION OF SUBGRADE PRIOR TO PLACING ABC; 3) AFTER THE PLACEMENT OF ABC PRIOR TO PAVING.

12. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

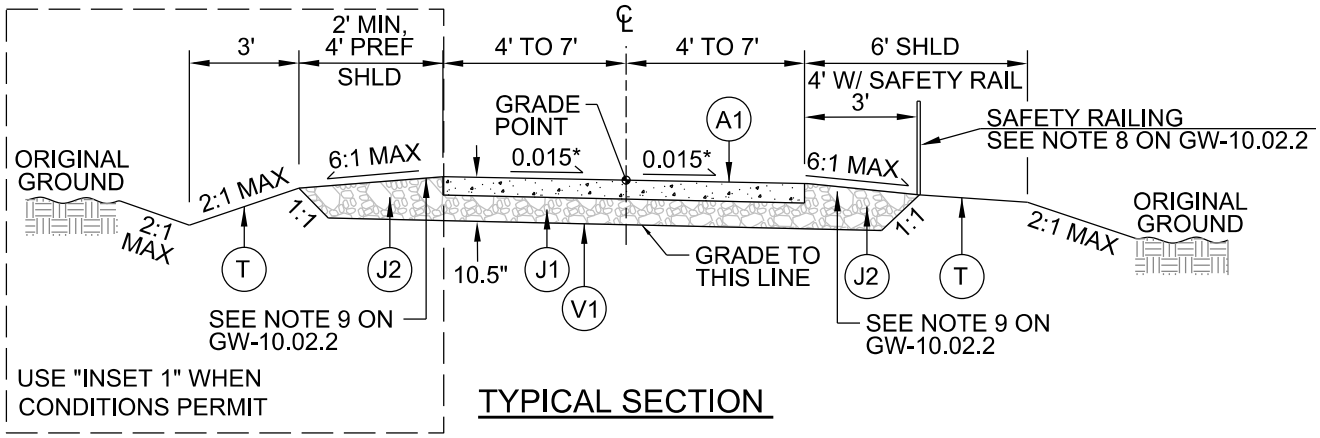
13. NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2' FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4' FROM THE EDGE OF TRAIL.

TABLE 1 - MAXIMUM RUNNING SLOPE AND TRAIL SEGMENT LENGTH

RUNNING SLOPE	MAX LENGTH OF SEGMENT
1:20 (5%)	200 FT
1:12 (8.33%)	30 FT

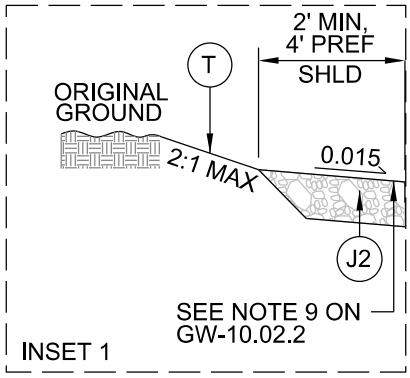
CITY OF RALEIGH
STANDARD DETAIL

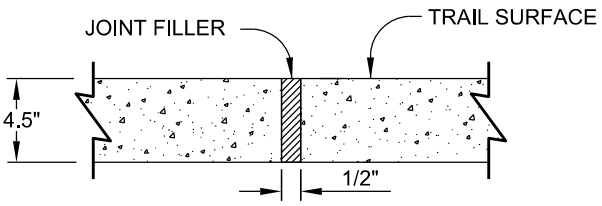
REVISIONS	*DATE: 12/2022*	*NOT TO SCALE*
	ASPHALT TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX)	
	GW-10.01.2	



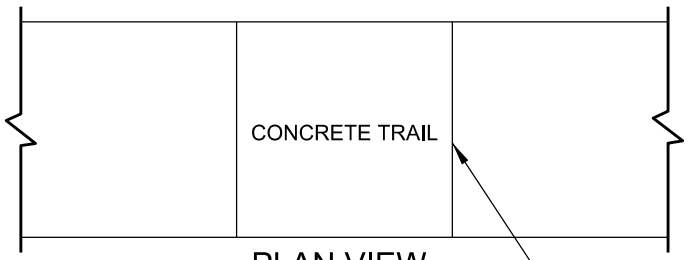
TYPICAL SECTION

* 0.02 MAX





TRANSVERSE EXPANSION JOINT



PLAN VIEW

SAW CUT JOINT SPACING @ 10' O.C. OR SAME AS WIDTH, WHICHEVER IS LESS

CONCRETE TYPICAL TRAIL SECTION
VARIABLE WIDTH (8' MIN, 14' MAX)

PAVEMENT SCHEDULE	
A1	4.5" CONCRETE TRAIL, 3,000 PSI, FINISHED WITH CURING COMPOUND, BRUSHED CONCRETE TEXTURE
J1	6" AGGREGATE BASE COURSE
J2	VARIABLE DEPTH AGGREGATE BASE COURSE
T	EARTH MATERIAL
V1	GEOTEXTILE FOR PAVEMENT STABILIZATION

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	CONCRETE TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX)	
	GW-10.02.1	

CONCRETE TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX) - NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY CITY OF RALEIGH.

2. WHEN CONDITIONS PERMIT, USE 6' SHOULDER IN FILL SECTIONS AND 4' SHOULDER IN CUT SECTIONS. USE MINIMUM 2' SHOULDER IN CUT AND FILL SECTIONS. FOR CUT SECTION CONDITION SHOWN IN "INSET 1," APPLY ENGINEERING JUDGMENT TO DETERMINE IF UPHILL SIDE REQUIRES A SWALE.

3. TRAILS OR TRAIL SEGMENTS OF ANY LENGTH MAY BE CONSTRUCTED WITH RUNNING SLOPES/VERTICAL GRADES UP TO 1:20 (5%). TO ACCOMMODATE STEEP TERRAIN, TRAILS MAY BE DESIGNED WITH STEEPER SECTIONS OF CONSTRAINED LENGTH AS SHOWN IN TABLE 1. RESTING INTERVALS WITH FLATTER RUNNING SLOPES ARE REQUIRED BETWEEN TRAIL SEGMENTS ANYTIME THE RUNNING SLOPE EXCEEDS 1:20 (5%). RESTING INTERVALS SHALL BE LOCATED ON UPHILL SIDE OF TRAIL IF ONLY PROVIDED ON ONE SIDE.

4. TO ENSURE THAT A TRAIL IS NOT DESIGNED AS A SERIES OF STEEP SEGMENTS, NO MORE THAN 30% OF THE TOTAL LENGTH OF TRAIL MAY HAVE A RUNNING SLOPE/VERTICAL GRADE OF 7.5% (8.33% OR 1:12 MAX). RESTING INTERVALS MUST BE PROVIDED MORE FREQUENTLY AS THE RUNNING SLOPE INCREASES.

5. RUNNING SLOPE/VERTICAL GRADE RECOMMENDATIONS MAY NOT BE ABLE TO BE ACHIEVED FOR TRAIL REPLACEMENT PROJECTS. FOR THESE TYPES OF PROJECTS, REPLACEMENT OF THE EXISTING CONDITION IN KIND IS SUFFICIENT.

6. 1.5% (2.08% OR 1:48 MAX) CROSS SLOPE. CROSS SLOPE DIRECTION VARIES. SLOPE SHOULDERS FOR POSITIVE DRAINAGE. OFTEN REQUIRES CONTINUING PAVEMENT OR SHOULDER SLOPE UNTIL TIE-IN WITH NATURAL GROUND. SEE PLAN SHEETS AND CROSS SECTIONS.

7. WHEN CONDITIONS PERMIT, SHOULDERS TO MATCH CROSS SLOPE OF TRAIL AND SIDE SLOPES TO BE 3:1 OR FLATTER.

8. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF PAVEMENT: 1) SLOPE > 3:1 AND DROP OF 6'; 2) SLOPE > 2:1 AND DROP OF 4'; 3) SLOPE > 1:1 AND DROP OF 1'. REFER TO GW-20.01 AND GW-20.02 FOR SAFETY RAIL DETAILS.

9. CONTRACTOR GRADE SEED SHALL BE SEWN INTO AGGREGATE BASE COURSE ON SHOULDERS AT THE SURFACE.

10. TRANSVERSE EXPANSION JOINTS TO BE MAXIMUM 50' APART. SAWCUT TRANSVERSE CONTROL JOINTS AT MAXIMUM 10' ON-CENTER OR AS OTHERWISE SHOWN ON PLANS.

11. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.

12. PROOF ROLLING SHALL OCCUR IN PRESENCE OF THE OWNER OR THE OWNER'S TESTING AGENCY AT THE FOLLOWING STAGES: 1) PRIOR TO PLACING FILL IN LOW AREAS; 2) AFTER THE PREPARATION OF SUBGRADE PRIOR TO PLACING ABC; 3) AFTER THE PLACEMENT OF ABC PRIOR TO POURING CONCRETE.

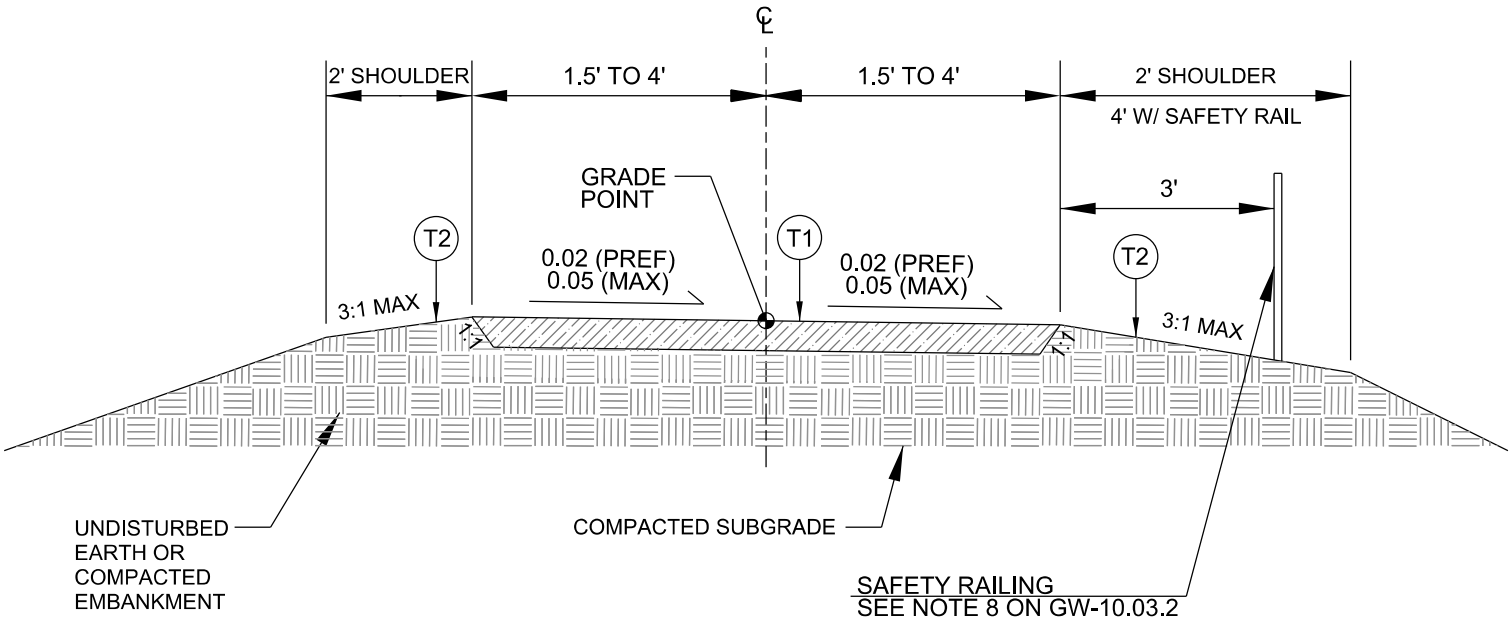
13. NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2' FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4' FROM THE EDGE OF TRAIL.

TABLE 1 - MAXIMUM RUNNING SLOPE AND TRAIL SEGMENT LENGTH

RUNNING SLOPE	MAX LENGTH OF SEGMENT
1:20 (5%)	200 FT
1:12 (8.33%)	30 FT

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	*DATE: 12/2022*	*NOT TO SCALE*
	CONCRETE TYPICAL TRAIL SECTION VARIABLE WIDTH (8' MIN, 14' MAX)	
	GW-10.02.2	



UNPAVED TRAIL

PAVEMENT SCHEDULE	
T1	3" COMPACTED MATERIAL (SEE NOTE 2 ON GW-10.03.2)
T2	EARTH MATERIAL

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	UNPAVED TRAIL	
	GW-10.03.1	

UNPAVED TRAIL - NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY CITY OF RALEIGH.

2. TRAIL TO BE FIRM AND STABLE. MATERIALS SUCH AS PACKED CRUSHED STONE, GRAVEL FINES COMPACTED WITH ROLLER, PACKED SOIL, AND OTHER NATURAL MATERIALS BONDED WITH SYNTHETIC MATERIALS CAN BE USED TO PROVIDE THE REQUIRED DEGREE OF STABILITY AND FIRMNESS. MATERIAL SELECTION TO BE APPROVED BY THE CITY.

3. TRAILS OR TRAIL SEGMENTS OF ANY LENGTH MAY BE CONSTRUCTED WITH RUNNING SLOPES/VERTICAL GRADES UP TO 1:20 (5%). TO ACCOMMODATE STEEP TERRAIN, TRAILS MAY BE DESIGNED WITH STEEPER SECTIONS OF CONSTRAINED LENGTH AS SHOWN IN TABLE 1. RESTING INTERVALS WITH FLATTER RUNNING SLOPES ARE REQUIRED BETWEEN TRAIL SEGMENTS ANYTIME THE RUNNING SLOPE EXCEEDS 1:20 (5%).

4. TO ENSURE THAT A TRAIL IS NOT DESIGNED AS A SERIES OF STEEP SEGMENTS, NO MORE THAN 30% OF THE TOTAL LENGTH OF TRAIL MAY HAVE A RUNNING SLOPE/VERTICAL GRADE EXCEEDING 1:12 (8.33%). THE RUNNING SLOPE MUST NEVER EXCEED 1:8 (12.5%). RESTING INTERVALS MUST BE PROVIDED MORE FREQUENTLY AS THE RUNNING SLOPE INCREASES.

5. RESTING INTERVALS MAY BE PROVIDED WITHIN THE TRAIL TREAD OR ADJACENT TO THE TRAIL TREAD. WHEN THE RESTING INTERVAL IS WITHIN THE TRAIL TREAD, IT MUST BE AT LEAST 60 INCHES LONG AND AT LEAST AS WIDE AS THE TRAIL. WHEN THE RESTING INTERVAL IS ADJACENT TO THE TRAIL, IT MUST BE AT LEAST 60 INCHES LONG AND 36 INCHES WIDE. RESTING INTERVALS SHALL BE LOCATED ON UPHILL SIDE OF TRAIL IF ONLY PROVIDED ON ONE SIDE.

6. IF COMPLIANCE CANNOT BE ACHIEVED FOR NOTES 2 THROUGH 5 ABOVE DUE TO CONDITIONS SUCH AS THE EXISTING TERRAIN, PREVAILING CONSTRUCTION PRACTICES, THE FUNCTION OR PURPOSE OF THE FACILITY, OR IF THE SETTING WOULD BECOME FUNDAMENTALLY ALTERED, THEN IT MUST BE DEMONSTRATED THAT THE STANDARDS CANNOT BE ACHIEVED.

7. FIVE PERCENT MAX CROSS SLOPE. CROSS SLOPE DIRECTION VARIES TO FACILITATE POSITIVE DRAINAGE.

8. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF TRAIL: 1) SLOPE > 3:1 AND DROP OF 6'; 2) SLOPE > 2:1 AND DROP OF 4'; 3) SLOPE > 1:1 AND DROP OF 1'. REFER TO GW-20.01 AND GW-20.02 FOR SAFETY RAIL DETAILS.

9. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.

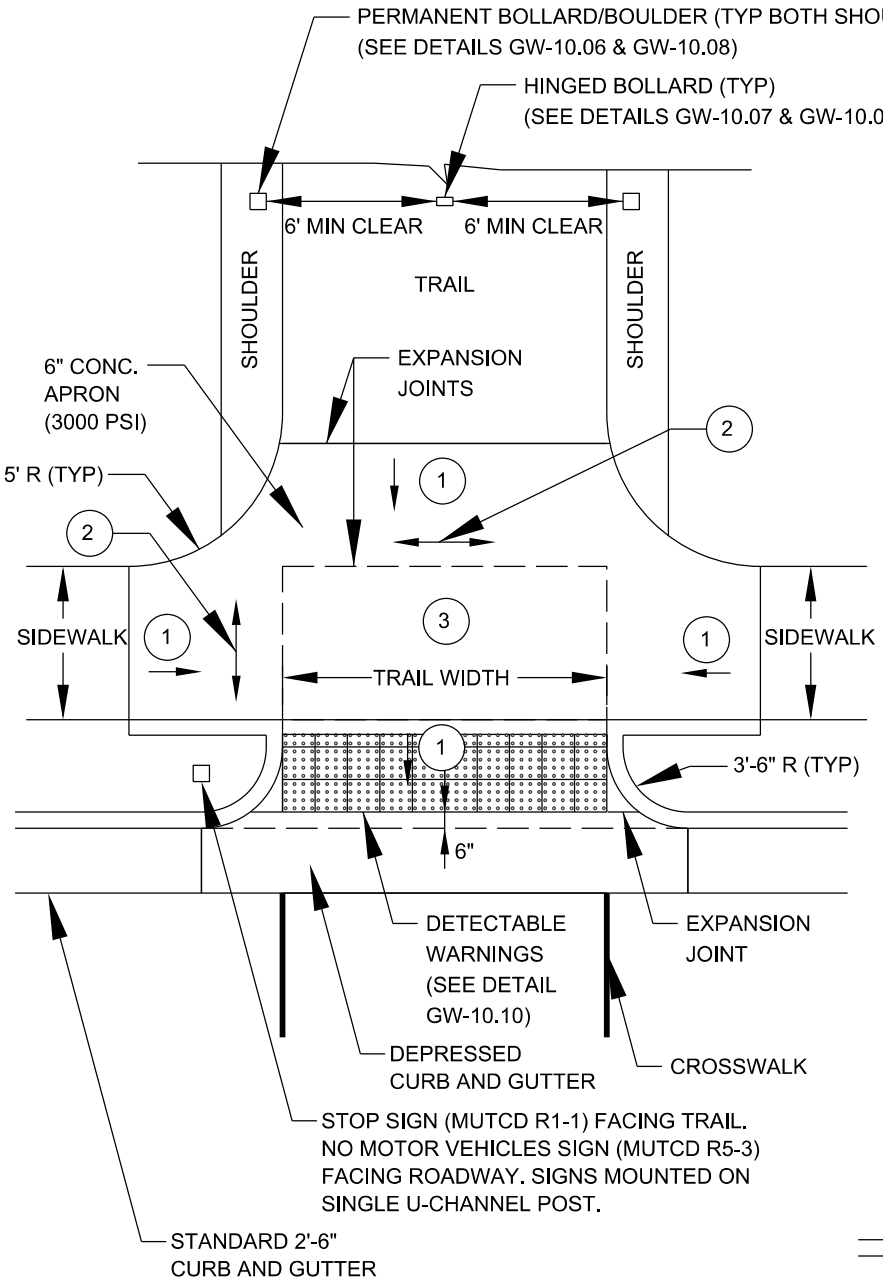
10. NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2' FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4' FROM THE EDGE OF TRAIL.

TABLE 1 - MAXIMUM RUNNING SLOPE AND TRAIL SEGMENT LENGTH

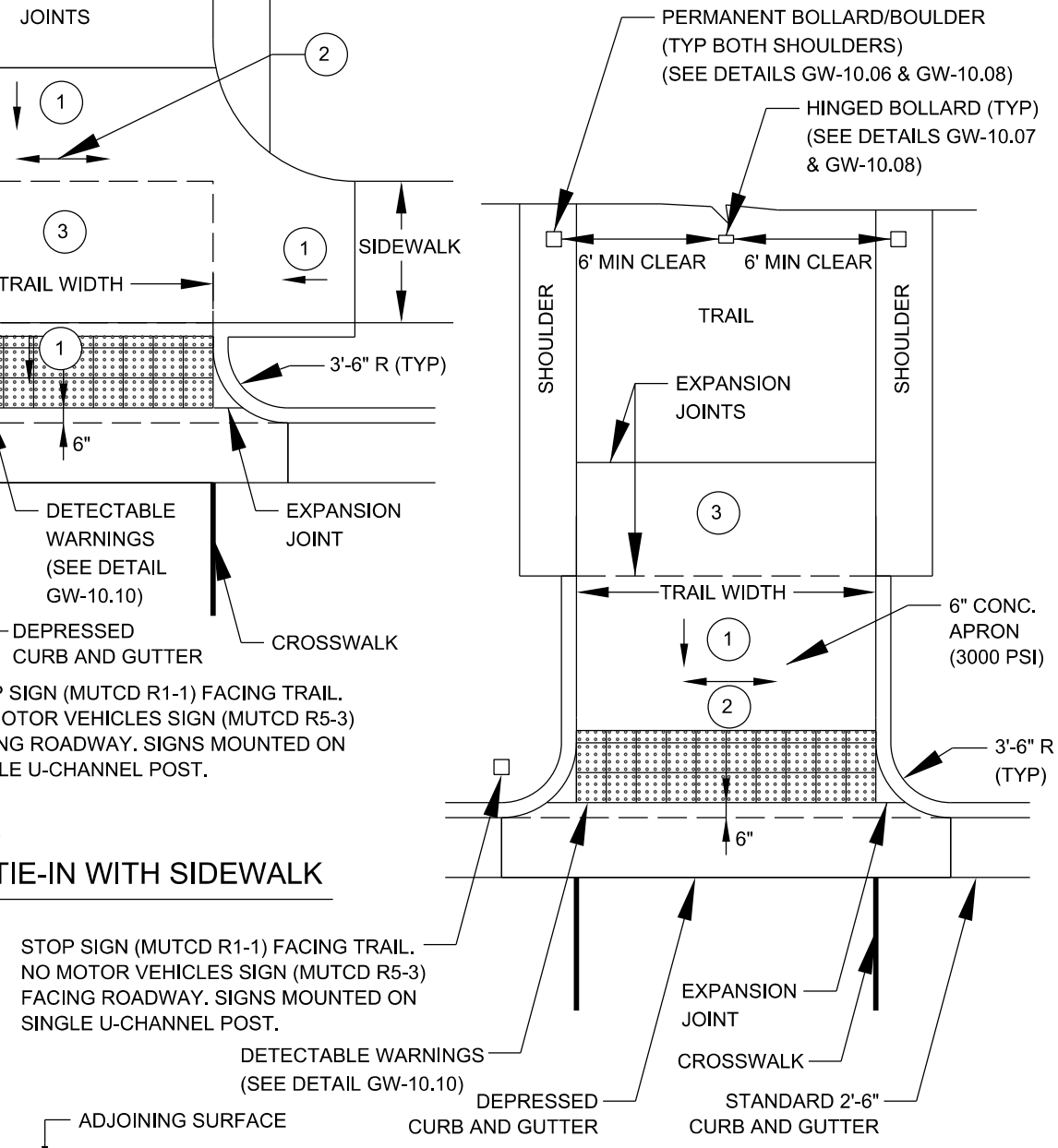
RUNNING SLOPE		MAX LENGTH OF SEGMENT
STEEPER THAN	BUT NOT STEEPER THAN	
1:20 (5%)	1:12 (8.33%)	200 FT
1:12 (8.33%)	1:10 (10%)	30 FT
1:10 (10%)	1:8 (12.5%)	10 FT

CITY OF RALEIGH
STANDARD DETAIL

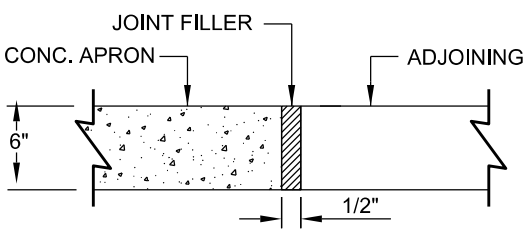
REVISIONS	DATE: 12/2022	NOT TO SCALE
	UNPAVED TRAIL	
	GW-10.03.2	



TRAIL TIE-IN WITH SIDEWALK



TRAIL TIE-IN WITHOUT SIDEWALK



EXPANSION JOINT DETAIL

DRIVEWAY, SIDEWALK, AND TRAIL TIE-IN

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	DRIVEWAY, SIDEWALK, AND TRAIL TIE-IN	
	GW-10.04.1	

DRIVEWAY, SIDEWALK, AND TRAIL TIE-IN - NOTES:

1. THE DRIVEWAY, SIDEWALK, TRAIL TIE-IN SHALL BE BUILT IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG).

2. THE DRIVEWAY, SIDEWALK, TRAIL TIE-IN SHALL BE PLACED PARALLEL TO THE TRAIL DIRECTION OF TRAVEL.

3. DETECTABLE WARNINGS SHALL BE INSTALLED ALONG THE BACK OF CURB COVERING THE FULL WIDTH OF THE RAMP.

4. FOR THE TRAIL APRON, USE CLASS A (3000 PSI) CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH, NONSKID SURFACE.

5. A 1/2" EXPANSION JOINT INSTALLED FULL DEPTH WILL BE REQUIRED WHERE THE CONCRETE RAMP JOINS THE CURB AND ALSO WHERE NEW CONCRETE ABUTS EXISTING CONCRETE.

6. REMOVE AND REPLACE CURB AND GUTTER TO NEAREST JOINT.

7. BOLLARDS/BOULDERS SHOULD BE SET BACK FROM THE ROADWAY EDGE A MINIMUM OF 7 FEET AND A MAXIMUM OF 30 FEET AND WILL VARY DEPENDING ON LOCATION. OWNER SHALL INDICATE WHICH OPTION IS BEST FOR THE SITE LOCATION. BOLLARD SHALL NOT BE PLACED WITHIN THE ROADWAY RIGHT-OF-WAY UNLESS AN APPROVED RIGHT-OF-WAY OBSTRUCTION PERMIT IS SECURED WITH THE CITY OF RALEIGH RIGHT OF WAY SERVICES. SEE DETAILS GW-10.06, GW-10.07, AND GW-10.08 FOR BOLLARD/BOULDER DETAILS.

8. STOP SIGN (MUTCD R1-1) AND NO MOTOR VEHICLES SIGN (MUTCD R5-3) SHALL BE 0.063 GAUGE, 3105 ALLOY ALUMINUM AND SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL GUIDELINES.

(1) 8.33% (12:1) MAX RAMP SLOPE (DRAIN TO ROADWAY)

(2) CROSS SLOPE: MAXIMUM 2.00%

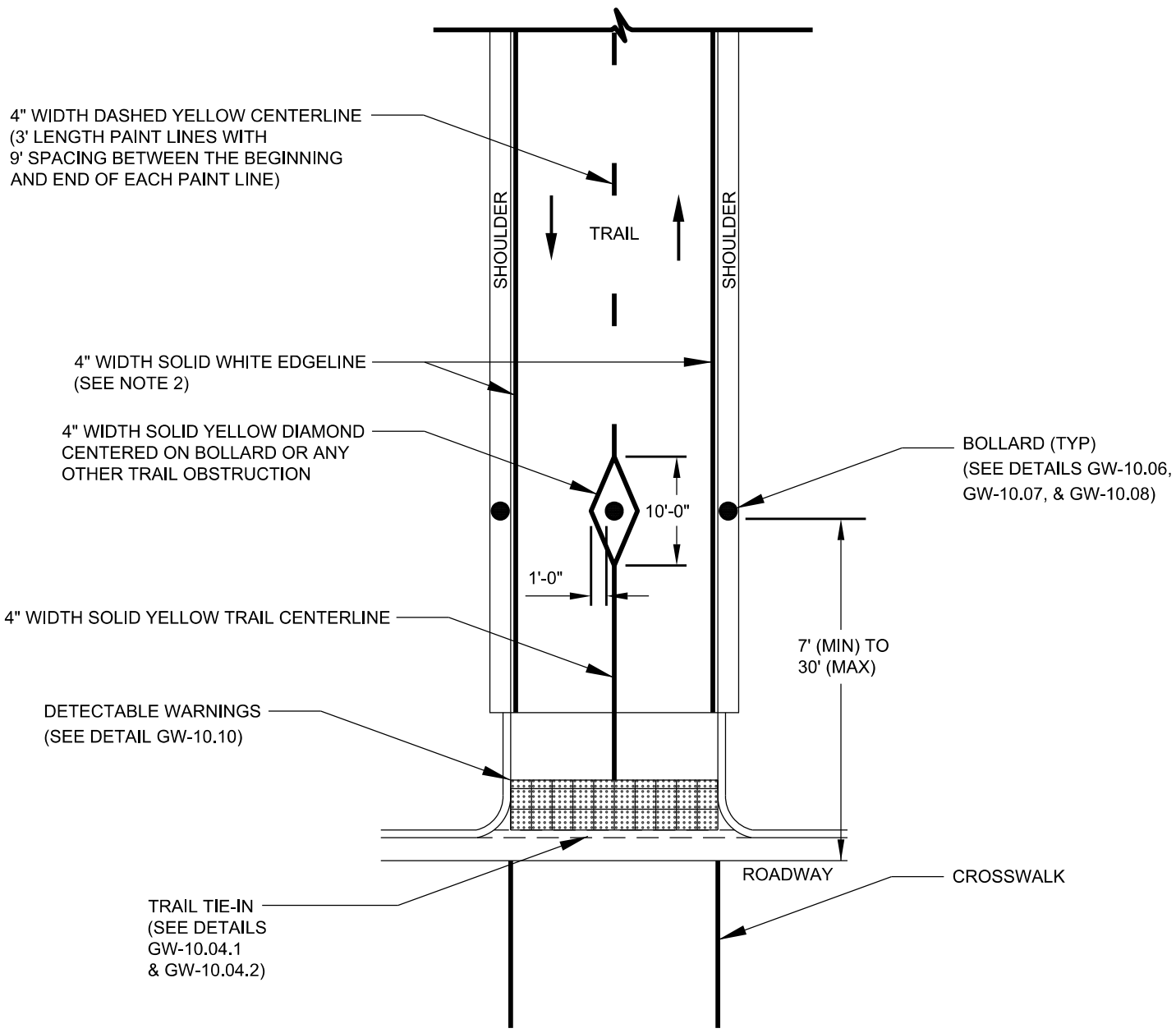
(3) RAMP REQUIRES A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN CURB.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE

DRIVEWAY, SIDEWALK, AND TRAIL TIE-IN

GW-10.04.2



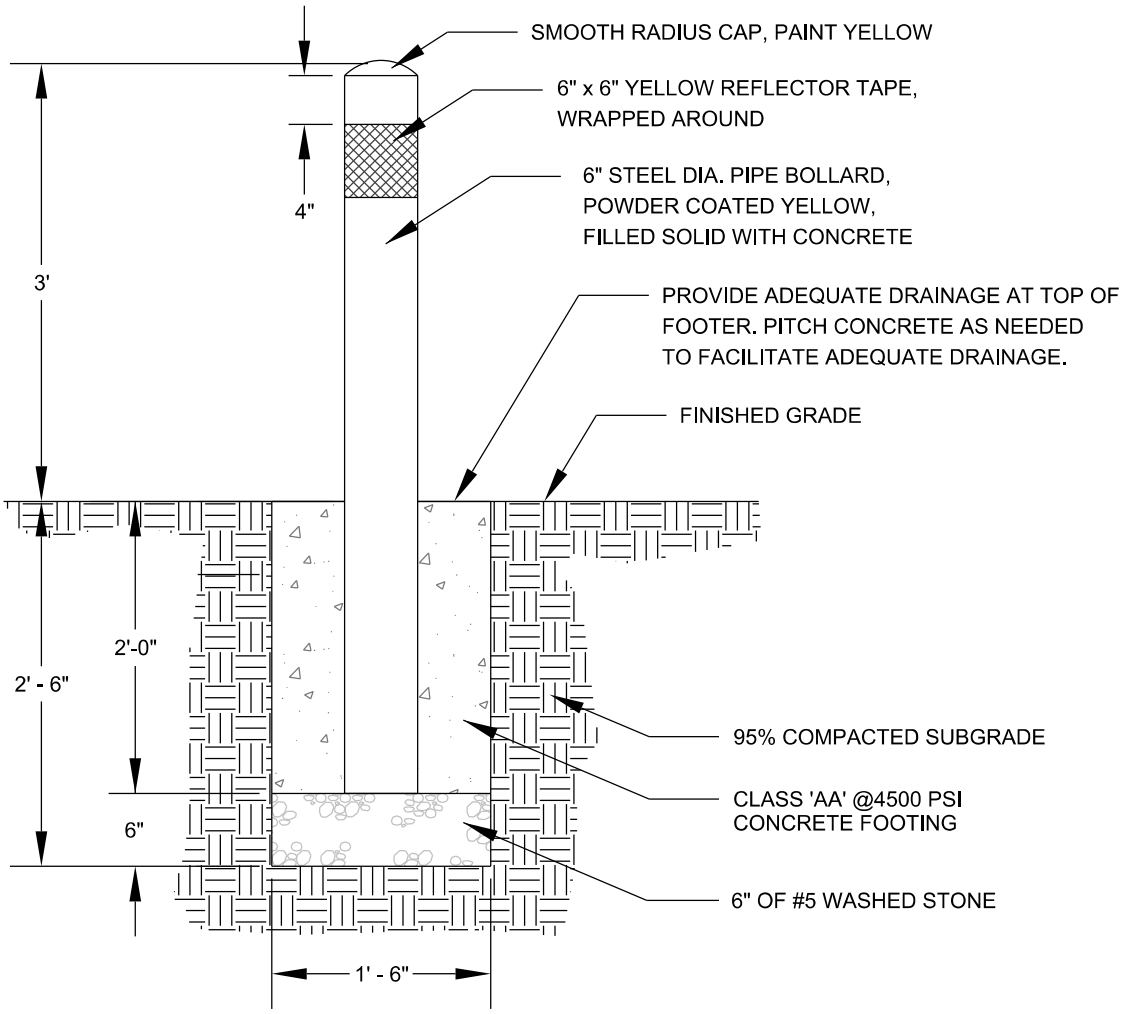
TRAIL PAVEMENT MARKINGS

NOTES:

1. TRAIL STRIPING MATERIAL SHALL BE STANDARD ROAD PAINT UNLESS OTHERWISE NOTED. UTILIZE NON-SLIP/NON-SKID STRIPING MATERIALS TO AVOID HAZARDS WHEN TRAILS ARE WET.
2. WHEN TRAIL STRIPING IS REQUIRED PER THE CITY OF RALEIGH, 4" WIDTH DASHED YELLOW CENTERLINE STRIPE IS TYPICALLY USED. 4" WIDTH SOLID YELLOW CENTERLINES ARE RECOMMENDED ON TIGHT OR BLIND CORNERS, ON TRAIL SWITCHBACKS, AND ON THE APPROACHES TO ROADWAY CROSSINGS. 4" WIDTH SOLID WHITE EDGE LINES OFFSET 4" FROM EDGE OF TRAIL SHALL ONLY BE USED WHEN HAZARDOUS CONDITIONS ARE PRESENT. THESE HAZARDOUS CONDITIONS INCLUDE BUT ARE NOT LIMITED TO WHEN A TRAIL IS ADJACENT TO A WALL OR STEEP SLOPE. ADDITIONAL TRAIL WIDTH IS TYPICALLY REQUIRED WHEN THESE HAZARDOUS CONDITIONS ARE PRESENT.
3. STRIPING AN ENVELOPE AROUND THE BOLLARD POST WITH 4" SOLID YELLOW IS RECOMMENDED. SEE GW-10.06, GW-10.07, AND GW-10.08 FOR BOLLARD DETAILS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRAIL PAVEMENT MARKINGS	
	GW-10.05	



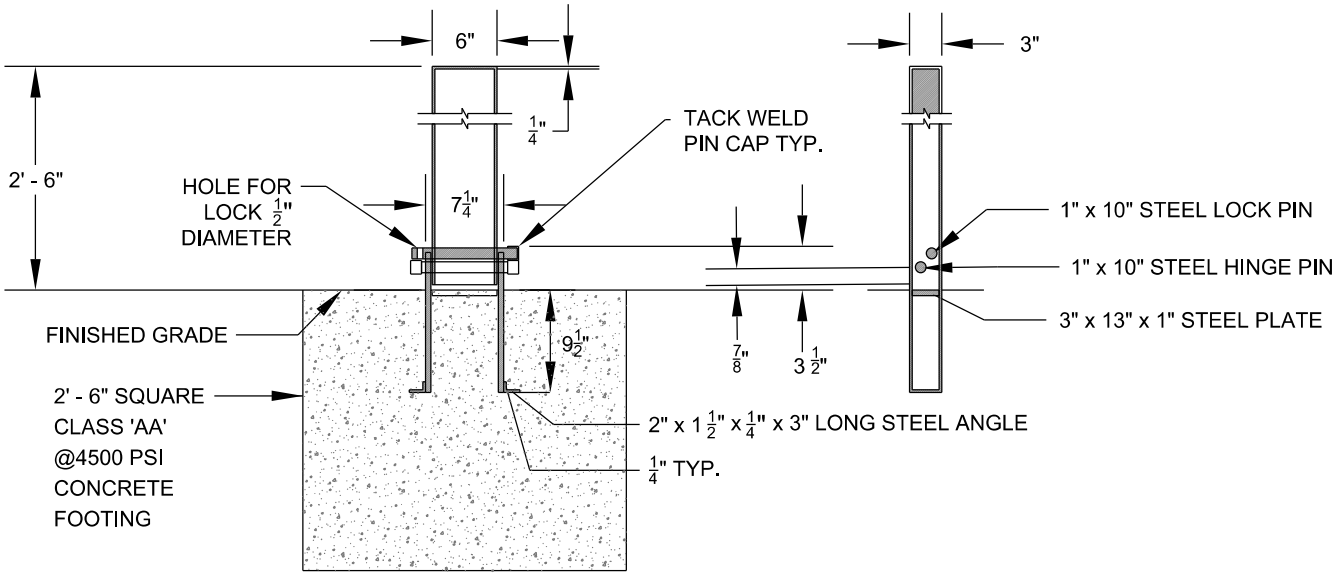
PERMANENT BOLLARD

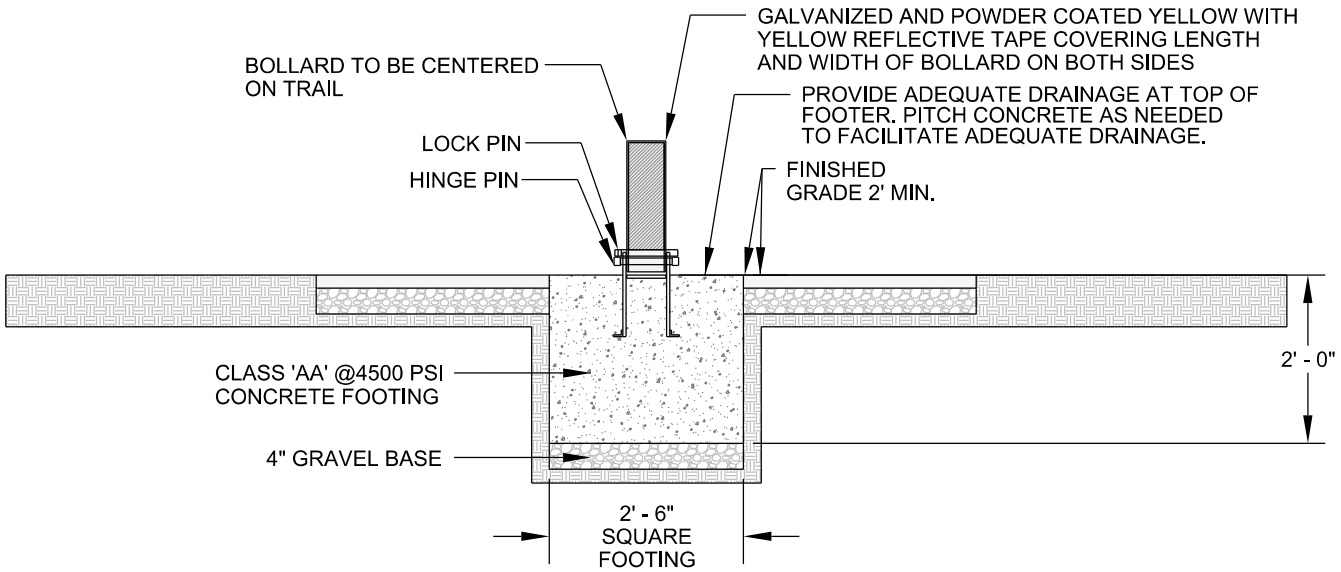
NOTES:

1. A PERMANENT BOLLARD IS TYPICALLY USED ON THE OUTSIDE OF TRAILS TO PREVENT UNAUTHORIZED MOTOR VEHICLE ENTRY. PERMANENT BOLLARDS MAY BE USED IN COMBINATION WITH HINGED BOLLARDS. IN SOME CASES, A PERMANENT BOLLARD CAN BE USED IN THE CENTER OF THE TRAIL IN LIEU OF A HINGED BOLLARD WHEN REQUESTED BY THE OWNER. SEE DETAIL GW-10.08 FOR THE VARIOUS BOLLARD COMBINATIONS. PERMANENT BOLLARDS SHOULD BE UTILIZED AT ALL MAJOR ACCESS POINTS AND TRAIL HEADS. "NO MOTOR VEHICLES" SIGNAGE (MUTCD R5-3) MAY BE USED TO REINFORCE ACCESS RULES.
2. BOLLARDS SHOULD BE SET BACK FROM THE ROADWAY EDGE A MINIMUM OF 7 FEET AND A MAXIMUM OF 30 FEET AND WILL VARY DEPENDING ON LOCATION. OWNER SHALL INDICATE WHICH OPTION IS BEST FOR THE SITE LOCATION. BOLLARD SHALL NOT BE PLACED WITHIN THE ROADWAY RIGHT-OF-WAY UNLESS AN APPROVED RIGHT-OF-WAY OBSTRUCTION PERMIT IS SECURED WITH THE CITY OF RALEIGH RIGHT OF WAY SERVICES.
3. STRIPING AN ENVELOPE AROUND THE POST IS RECOMMENDED IF THE BOLLARD IS LOCATED WITHIN THE PAVED LIMITS OF THE TRAIL (SEE DETAIL GW-10.05).
4. SEE MIDDLE BOLLARD WITH TRAIL SIDE BOLLARDS DETAIL, GW-10.08, FOR TYPICAL BOLLARD PLACEMENT.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	PERMANENT BOLLARD	
	GW-10.06	





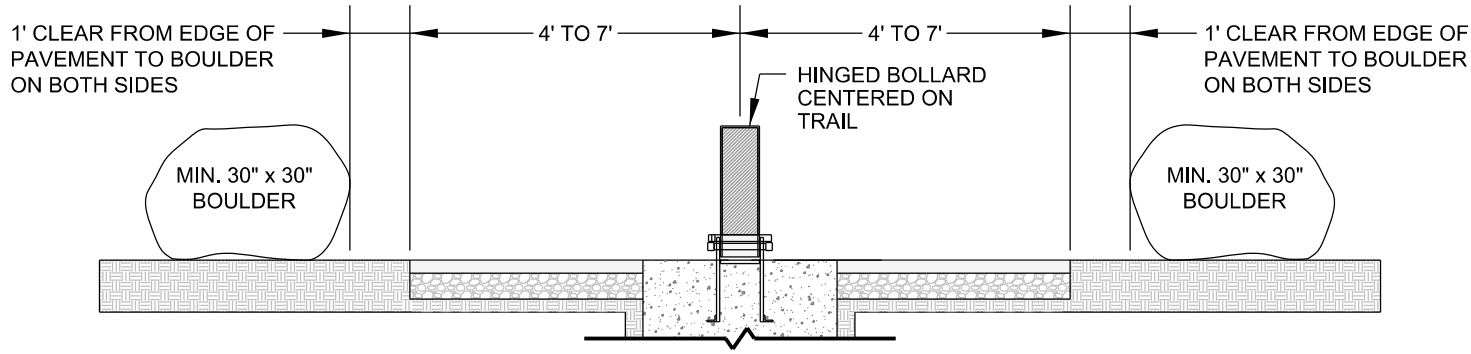
HINGED BOLLARD

NOTES:

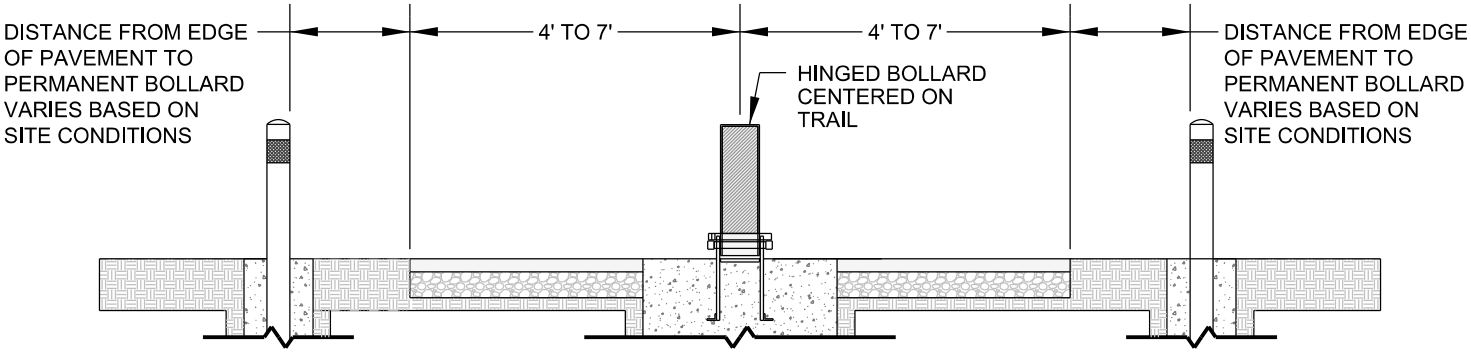
1. A HINGED BOLLARD IS TYPICALLY USED IN THE CENTER OF TRAILS TO PREVENT UNAUTHORIZED MOTOR VEHICLE ENTRY. HINGED BOLLARDS MAY BE USED IN COMBINATION WITH PERMANENT BOLLARDS AND BOULDERS. SEE DETAIL GW-10.08 FOR THE VARIOUS BOLLARD AND BOULDER COMBINATIONS. HINGED BOLLARDS SHOULD BE UTILIZED AT ALL MAJOR ACCESS POINTS AND TRAIL HEADS. "NO MOTOR VEHICLES" SIGNAGE (MUTCD R5-3) MAY BE USED TO REINFORCE ACCESS RULES.
2. BOLLARDS SHOULD BE SET BACK FROM THE ROADWAY EDGE A MINIMUM OF 7 FEET AND A MAXIMUM OF 30 FEET AND WILL VARY DEPENDING ON LOCATION. OWNER SHALL INDICATE WHICH OPTION IS BEST FOR THE SITE LOCATION. BOLLARD SHALL NOT BE PLACED WITHIN THE ROADWAY RIGHT-OF-WAY UNLESS AN APPROVED RIGHT-OF-WAY OBSTRUCTION PERMIT IS SECURED WITH THE CITY OF RALEIGH RIGHT OF WAY SERVICES.
3. STRIPING AN ENVELOPE AROUND THE POST IS RECOMMENDED IF THE BOLLARD IS LOCATED WITHIN THE PAVED LIMITS OF THE TRAIL (SEE DETAIL GW-10.05).
4. LOCKABLE, REMOVABLE BOLLARDS ALLOW ENTRANCE BY AUTHORIZED VEHICLES. WHERE USED, THE TOP OF THE MOUNT POINT SHOULD BE FLUSH WITH THE PATH SURFACE.
5. SEE MIDDLE BOLLARD WITH TRAIL SIDE BOLLARDS DETAIL, GW-10.08, FOR TYPICAL BOLLARD PLACEMENT.

CITY OF RALEIGH
STANDARD DETAIL

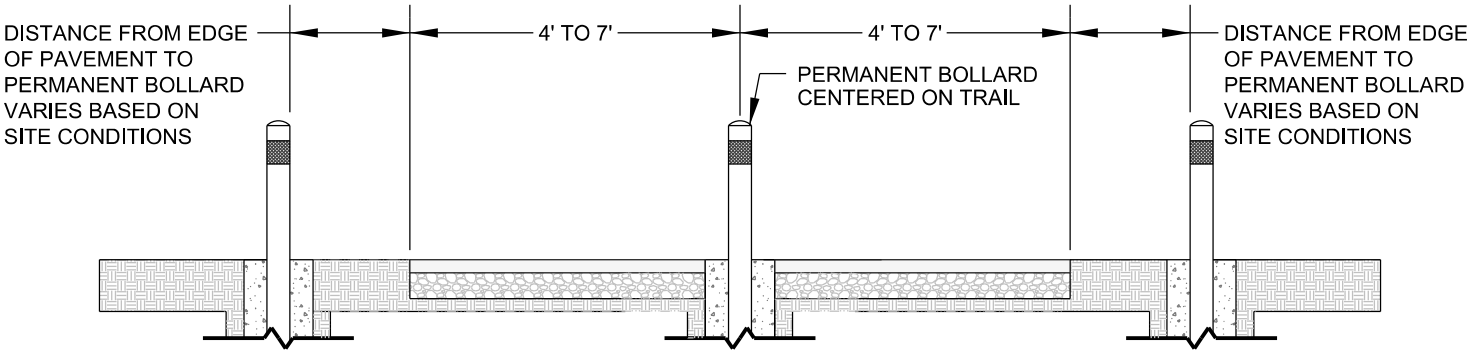
REVISIONS	DATE: 12/2022	NOT TO SCALE
	HINGED BOLLARD	
	GW-10.07	



HINGED BOLLARD IN MIDDLE, BOULDERS ON SIDES



HINGED BOLLARD IN MIDDLE, PERMANENT BOLLARDS ON SIDES



PERMANENT BOLLARD IN MIDDLE, PERMANENT BOLLARDS ON SIDES

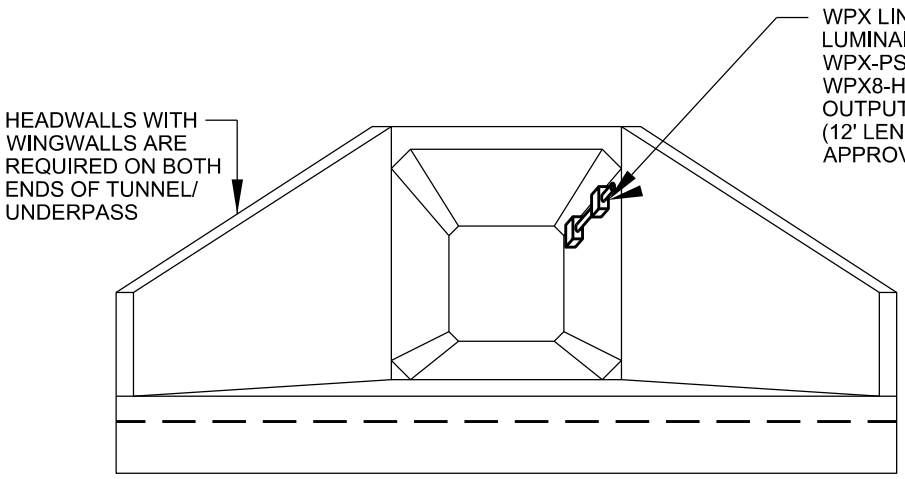
MIDDLE BOLLARD WITH TRAIL SIDE BOLLARDS

NOTES:

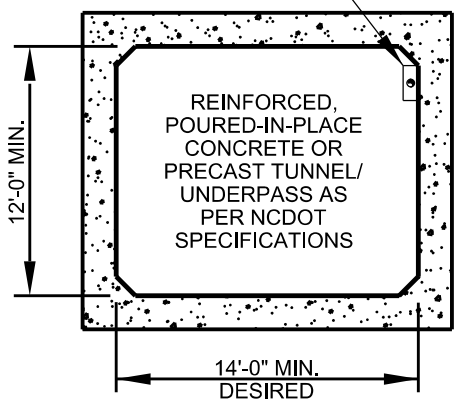
1. OWNER SHALL INDICATE WHICH OF THE THREE BOLLARD/BOULDER PLACEMENT OPTIONS IS BEST FOR THE SITE LOCATION.
2. BOLLARDS/BOULDERS ARE EFFECTIVE IN PREVENTING UNAUTHORIZED MOTOR VEHICLE ENTRY AND SHOULD BE UTILIZED AT ALL MAJOR ACCESS POINTS AND TRAIL HEADS. “NO MOTOR VEHICLES” SIGNAGE (MUTCD R5-3) MAY BE USED TO REINFORCE ACCESS RULES.
3. BOLLARDS SHOULD BE SET BACK FROM THE ROADWAY EDGE A MINIMUM OF 7 FEET AND A MAXIMUM OF 30 FEET AND WILL VARY DEPENDING ON LOCATION. OWNER SHALL INDICATE WHICH OPTION IS BEST FOR THE SITE LOCATION. BOLLARD SHALL NOT BE PLACED WITHIN THE ROADWAY RIGHT-OF-WAY UNLESS AN APPROVED RIGHT-OF-WAY OBSTRUCTION PERMIT IS SECURED WITH THE CITY OF RALEIGH RIGHT OF WAY SERVICES.
4. STRIPING AN ENVELOPE AROUND THE POST IS RECOMMENDED IF THE BOLLARD IS LOCATED WITHIN THE PAVED LIMITS OF THE TRAIL (SEE DETAIL GW-10.05).

CITY OF RALEIGH
STANDARD DETAIL

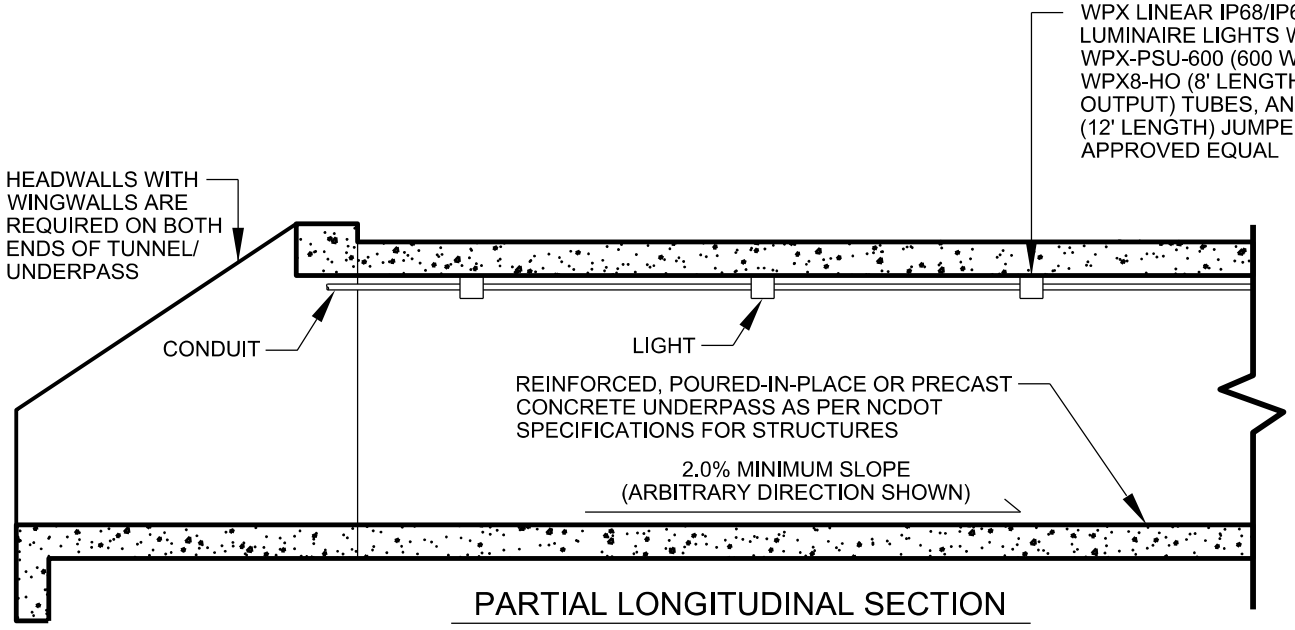
REVISIONS	DATE: 12/2022	NOT TO SCALE
	MIDDLE BOLLARD WITH TRAIL SIDE BOLLARDS	
	GW-10.08	



FRONT VIEW (ENTRANCE/EGRESS OF TUNNEL/UNDERPASS)



CROSS-SECTION VIEW



PARTIAL LONGITUDINAL SECTION

TRAIL TUNNEL/UNDERPASS

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRAIL TUNNEL/UNDERPASS	
	GW-10.09.1	

TRAIL TUNNEL/UNDERPASS - NOTES:

1. 14-FOOT MINIMUM WIDTH DESIRED; GREATER WIDTHS PREFERRED FOR LENGTHS OVER 60 FEET.

2. THE UNDERPASS AS WELL AS THE TRAIL APPROACH SHOULD HAVE A CENTERLINE STRIPE EVEN IF THE REST OF THE TRAIL DOES NOT HAVE ONE.

3. UNDERPASSES SHOULD HAVE A DAYTIME ILLUMINANCE MINIMUM OF 10 FOOT-CANDLES AND A NIGHT-TIME LEVEL OF 4 FOOT-CANDLES.

4. SEALING OF FIXTURES TO BE DESIGNED IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY (IES) STANDARDS.

5. LIGHTING FIXTURE SPACING TO BE 12 FEET MINIMUM AND 15 FEET MAXIMUM.

6. CONDUIT CONNECTION TO POWER SOURCE SHALL BE DETERMINED BY THE ENGINEER AND SPECIFIED ON THE PLANS ACCORDINGLY.

7. PROPER DRAINAGE MUST BE ESTABLISHED TO AVOID POOLING OF STORMWATER; HOWEVER, SOME UNDERPASSES MAY FLOOD PERIODICALLY. WHERE APPROPRIATE, INCORPORATE TRENCH DRAINS AT THE TUNNEL ENTRANCE TO INTERCEPT WATER.

8. POST ADVANCED WARNING SIGNAGE ON OPPOSITE ENDS OF THE UNDERPASS APPROACH WITH INFORMATION ON VISIBILITY AND OTHER SAFETY REGULATIONS.

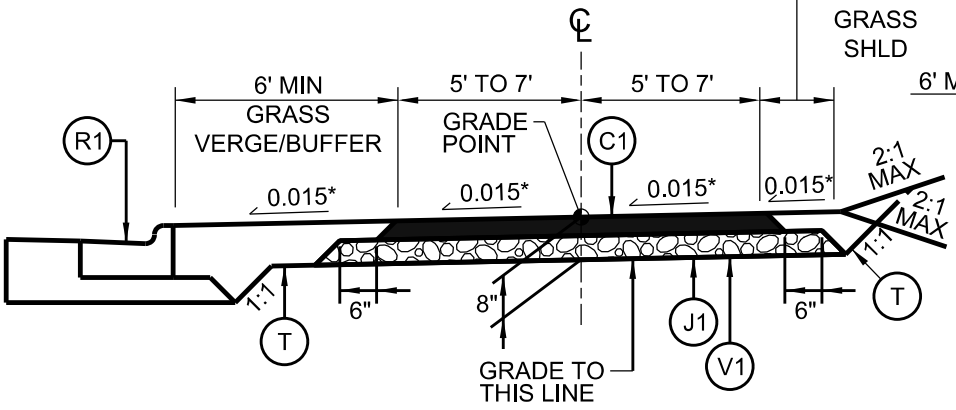
9. APPROPRIATE SIGNAGE MAY BE REQUIRED AT ENTRANCE TO INDICATE NARROWING TRAIL WIDTH AND/OR LIMITED VERTICAL CLEARANCE.

10. CONVEX MIRRORS SHOULD BE PROVIDED AT BLIND CORNERS AND AT THE APPROACHES TO UNDERPASSES WITH POOR SIGHT LINES.

CITY OF RALEIGH
STANDARD DETAIL

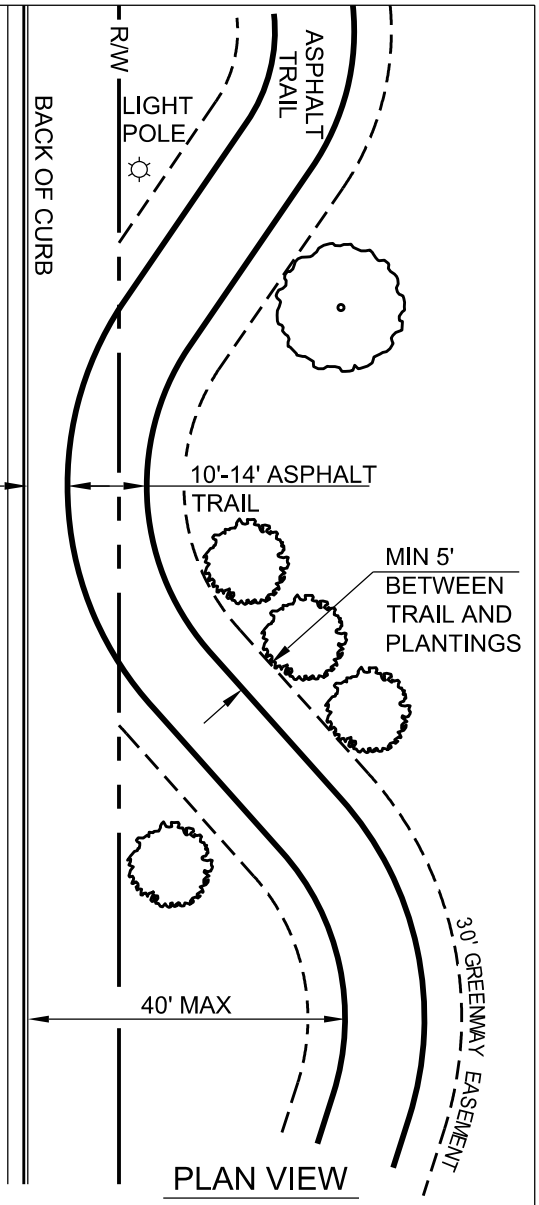
REVISIONS	*DATE: 12/2022*	*NOT TO SCALE*
	TRAIL TUNNEL/UNDERPASS	
	GW-10.09.2	

PAVEMENT SCHEDULE	
C1	2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 220 LBS. PER SQ. YD. OR 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
J1	6" AGGREGATE BASE COURSE
R1	CURB AND GUTTER
T	EARTH MATERIAL
V1	GEOTEXTILE FOR PAVEMENT STABILIZATION



CROSS-SECTION VIEW

* 0.02 MAX



PLAN VIEW

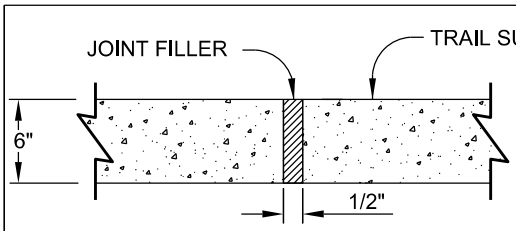
ASPHALT MULTI-USE STREET SIDE TRAIL, VARIABLE WIDTH

NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY CITY OF RALEIGH. 10 FEET MINIMUM TRAIL WIDTH IS NECESSARY FOR BICYCLISTS TO PASS OTHER USERS SAFELY ON SIDE TRAILS.
2. TRAILS CAN MEANDER BUT SHALL BE LOCATED MINIMUM 6 FEET FROM THE BACK OF CURB. NCDOT WILL ALLOW A 3-FOOT VEGETATED BUFFER INSTEAD OF 6-FOOT UNDER CERTAIN CONDITIONS WHERE ROW IS CONSTRAINED. SPECIAL PERMISSION MUST BE GRANTED.
3. IDEALLY, NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2 FEET FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4 FEET FROM THE EDGE OF TRAIL.
4. TRAIL RUNNING SLOPES/VERTICAL GRADE SHALL NOT EXCEED THE VERTICAL GRADE OF THE ROADWAY.
5. 1.5% (2.08% OR 1:48 MAX) CROSS SLOPE. CROSS SLOPE DIRECTION TYPICALLY SLOPES TOWARD ROADWAY BUT CAN VARY. SLOPE SHOULDERS FOR POSITIVE DRAINAGE. OFTEN REQUIRES CONTINUING PAVEMENT OR SHOULDER SLOPE UNTIL TIE-IN WITH NATURAL GROUND. SEE PLAN SHEETS AND CROSS SECTIONS.
6. WHEN CONDITIONS PERMIT, SHOULDERS TO MATCH CROSS SLOPE OF TRAIL AND SIDE SLOPES TO BE 3:1 OR FLATTER.
7. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.
8. PROOF ROLLING SHALL OCCUR IN PRESENCE OF OWNER OR OWNER'S TESTING AGENCY AT THE FOLLOWING STAGES: 1) PRIOR TO PLACING FILL IN LOW AREAS; 2) AFTER PREPARING SUBGRADE PRIOR TO PLACING ABC; 3) AFTER PLACEMENT OF ABC PRIOR TO PAVING.
9. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
10. UNDER SOME CIRCUMSTANCES, SIDE TRAILS MAY TRANSITION TO SIDEWALKS AND DESIGNATED BICYCLE LANES. IN THE EVENT THAT SIDE TRAILS MERGE ONTO STREETS, PROVIDE APPROPRIATE SIGNAGE AND PAVEMENT MARKINGS TO HELP SAFE MERGING.
11. ALL TRAILS WITHIN NCDOT ROADWAY ROW MUST CONSIDER THE FOLLOWING:
-NCDOT REQUIRES AN ENCROACHMENT PERMIT FROM NCDOT.
-STRUCTURES, SUCH AS RETAINING WALLS AND BRIDGES, ARE TYPICALLY NOT PERMITTED IN NCDOT ROW AND MAY ONLY BE USED IN SPECIAL CONDITIONS.
-NCDOT MAY REQUIRE A CLEAR RECOVERY ZONE OF 11.5 FEET TO 24 FEET (IN THE PRESENCE OF A DITCH SECTION) FROM THE EDGE OF TRAVEL LANE TO EDGE OF GREENWAY TRAIL DEPENDING ON AVERAGE DAILY TRAFFIC (ADT) AND DESIGN SPEEDS.
-STORMWATER TREATMENT AND VEG. MUST BE INSTALLED PER NCDOT'S SPECS.

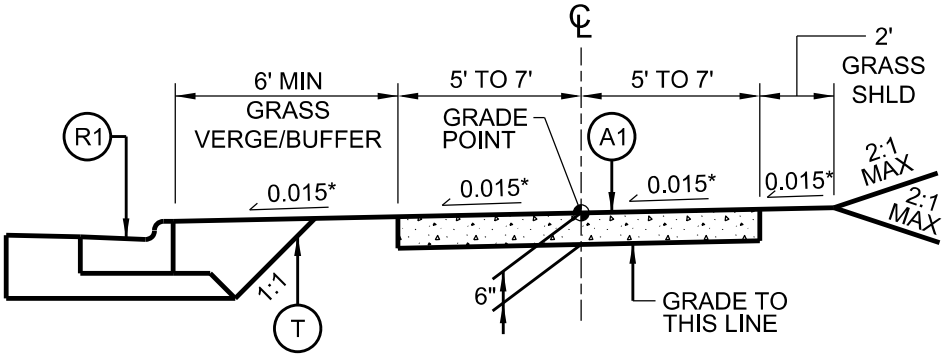
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	ASPHALT MULTI-USE STREET SIDE TRAIL, VARIABLE WIDTH	
	GW-10.10	



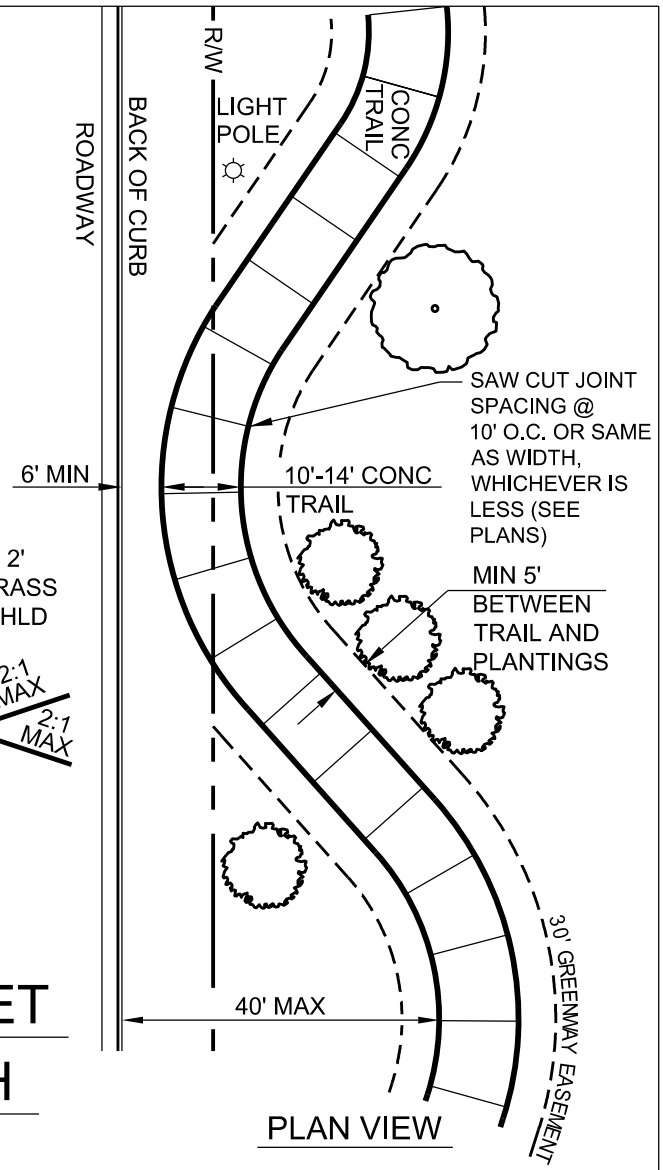
TRANSVERSE EXPANSION JOINT

PAVEMENT SCHEDULE	
A1	6" CONCRETE TRAIL, 3,000 PSI, FINISHED WITH CURING COMPOUND
R1	CURB AND GUTTER
T	EARTH MATERIAL



CROSS-SECTION VIEW

* 0.02 MAX



PLAN VIEW

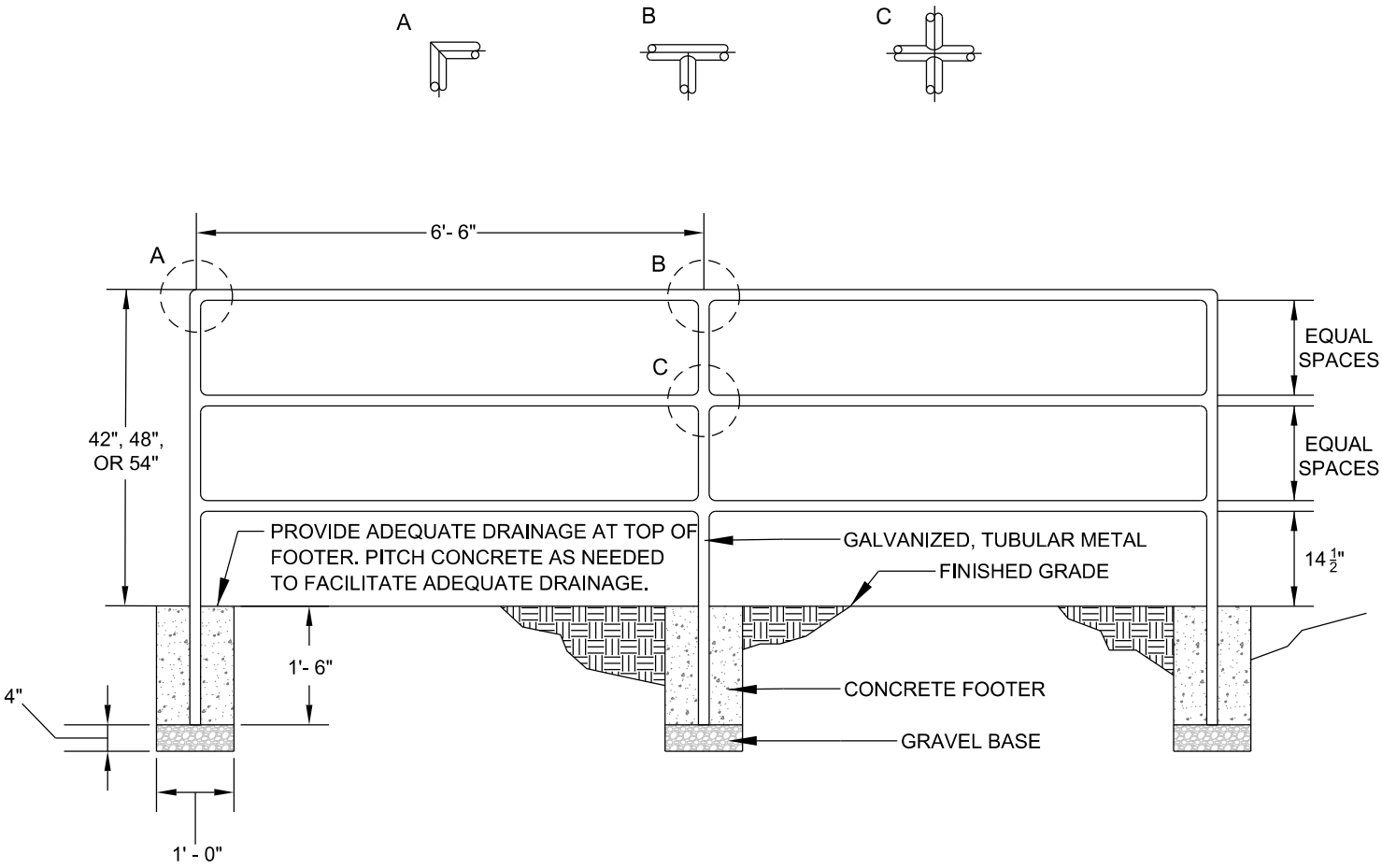
CONCRETE MULTI-USE STREET SIDE TRAIL, VARIABLE WIDTH

NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY CITY OF RALEIGH. 10 FEET MINIMUM TRAIL WIDTH IS NECESSARY FOR BICYCLISTS TO PASS OTHER USERS SAFELY ON SIDE TRAILS.
2. TRAILS CAN MEANDER BUT SHALL BE LOCATED MINIMUM 6 FEET FROM THE BACK OF CURB. NCDOT WILL ALLOW A 3-FOOT VEGETATED BUFFER INSTEAD OF 6-FOOT UNDER CERTAIN CONDITIONS WHERE ROW IS CONSTRAINED. SPECIAL PERMISSION MUST BE GRANTED.
3. IDEALLY, NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2 FEET FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4 FEET FROM THE EDGE OF TRAIL.
4. TRAIL RUNNING SLOPES/VERTICAL GRADE SHALL NOT EXCEED THE VERTICAL GRADE OF THE ROADWAY.
5. 1.5% (2.08% OR 1:48 MAX) CROSS SLOPE. CROSS SLOPE DIRECTION TYPICALLY SLOPES TOWARD ROADWAY BUT CAN VARY. SLOPE SHOULDERS FOR POSITIVE DRAINAGE. OFTEN REQUIRES CONTINUING PAVEMENT OR SHOULDER SLOPE UNTIL TIE-IN WITH NATURAL GROUND. SEE PLAN SHEETS AND CROSS SECTIONS.
6. WHEN CONDITIONS PERMIT, SHOULDERS TO MATCH CROSS SLOPE OF TRAIL AND SIDE SLOPES TO BE 3:1 OR FLATTER.
7. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.
8. PROOF ROLLING SHALL OCCUR IN PRESENCE OF OWNER OR OWNER'S TESTING AGENCY AT THE FOLLOWING STAGES: 1) PRIOR TO PLACING FILL IN LOW AREAS; 2) AFTER PREPARING SUBGRADE PRIOR TO PLACING ABC; 3) AFTER PLACEMENT OF ABC PRIOR TO PAVING.
9. TRANSVERSE EXPANSION JOINTS TO BE MAXIMUM 50 FEET APART.
10. UNDER SOME CIRCUMSTANCES, SIDE TRAILS MAY TRANSITION TO SIDEWALKS AND DESIGNATED BICYCLE LANES. IN THE EVENT THAT SIDE TRAILS MERGE ONTO STREETS, PROVIDE APPROPRIATE SIGNAGE AND PAVEMENT MARKINGS TO HELP SAFE MERGING.
11. ALL TRAILS WITHIN NCDOT ROADWAY ROW MUST CONSIDER THE FOLLOWING:
-NCDOT REQUIRES AN ENCROACHMENT PERMIT FROM NCDOT.
-STRUCTURES, SUCH AS RETAINING WALLS AND BRIDGES, ARE TYPICALLY NOT PERMITTED IN NCDOT ROW AND MAY ONLY BE USED IN SPECIAL CONDITIONS.
-NCDOT MAY REQUIRE A CLEAR RECOVERY ZONE OF 11.5 FEET TO 24 FEET (IN THE PRESENCE OF A DITCH SECTION) FROM THE EDGE OF TRAVEL LANE TO EDGE OF GREENWAY TRAIL DEPENDING ON AVERAGE DAILY TRAFFIC (ADT) AND DESIGN SPEEDS.
-STORMWATER TREATMENT AND VEG. MUST BE INSTALLED PER NCDOT'S SPECS.
12. IF THE MULTI-USE PATH IS ALONG A NON-NCDOT ROAD, THEN THE CITY OF RALEIGH DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS WILL APPLY.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	CONCRETE MULTI-USE STREET SIDE TRAIL, VARIABLE WIDTH	
	GW-10.11	



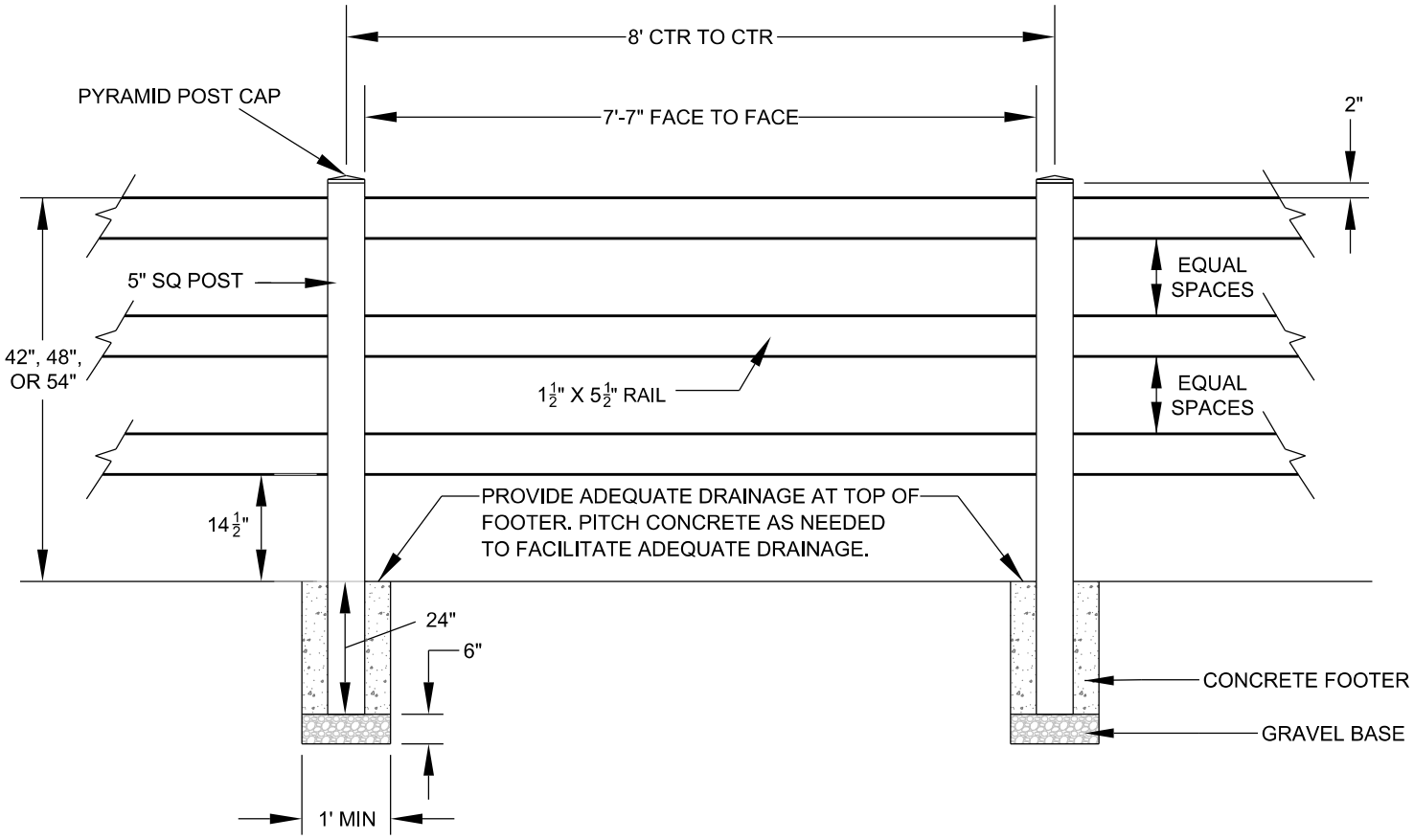
GALVANIZED SAFETY RAILING - VARIABLE HEIGHT

NOTES:

1. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF PAVEMENT, WHICH ARE CONSIDERED HAZARDOUS DROP-OFFS:
   1) SLOPE > 3:1 AND DROP OF 6'
   2) SLOPE > 2:1 AND DROP OF 4'
   3) SLOPE > 1:1 AND DROP OF 1'
2. ALL CONCRETE TO BE CLASS 'A' AT 3000 PSI COMPRESSIVE STRENGTH.
3. TYPE OF PIPE TO BE USED IS 1' - $\frac{5}{8}$" MAX O.D. BLACK IRON, LOW CARBON PIPE, OR GALVANIZED.
4. ALL JOINTS TO HAVE A $\frac{1}{2}$" FILLET WELD.
5. ALL METAL SHALL BE GALVANIZED.
6. SAFETY RAIL SHALL BE UNIFORM IN HEIGHT ALONG EACH PROPOSED SEGMENT. 42" RAIL HEIGHT SHALL BE THE MINIMUM. 48" RAIL HEIGHT SHALL BE UTILIZED ALONG BRIDGES, BRIDGE APPROACHES, AND AT OTHER LOCATIONS WHERE HIGH-SPEED, STEEP-ANGLE (25 DEGREES OR GREATER) IMPACTS BETWEEN A BICYCLIST AND THE RAILING MAY OCCUR, SUCH AS AT A CURVE AT THE FOOT OF A LONG, DESCENDING GRADE WHERE THE CURVE RADIUS IS LESS THAN THAT APPROPRIATE FOR THE DESIGN SPEED OR ANTICIPATED SPEED. 54" RAIL HEIGHT SHALL BE UTILIZED IN EXTREME CONDITIONS AND WHERE CITY REGULATIONS DICTATE.
7. SAFETY RAIL LATERAL OFFSET FROM EDGE OF PAVEMENT WILL VARY BUT SHOULD BE 1' MINIMUM. THE ENDS OF THE SAFETY RAIL SHOULD BE FLARED AWAY FROM THE PATH EDGE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	GALVANIZED SAFETY RAILING - VARIABLE HEIGHT	
	GW-20.01	



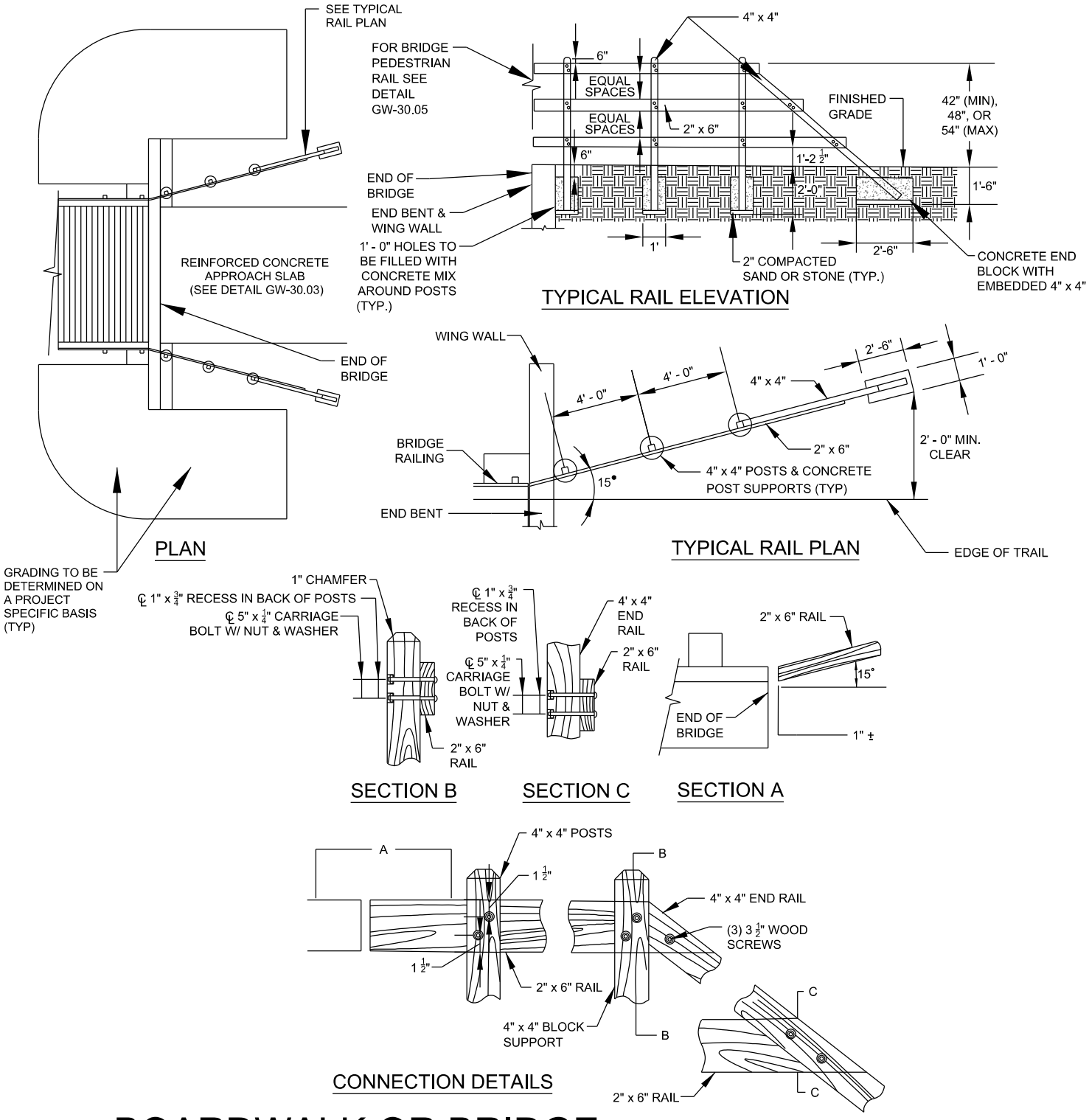
VINYL SAFETY RAILING - VARIABLE HEIGHT

NOTES:

1. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF PAVEMENT, WHICH ARE CONSIDERED HAZARDOUS DROP-OFFS:
   1) SLOPE > 3:1 AND DROP OF 6'
   2) SLOPE > 2:1 AND DROP OF 4'
   3) SLOPE > 1:1 AND DROP OF 1'
2. SAFETY RAIL TO BE THREE-RAIL WHITE VINYL WITH NOMINAL 8' SECTION LENGTH.
3. FOOTING WIDTH TO BE 2X POST WIDTH OR 1', WHICHEVER IS GREATER. MIN FOOTING DEPTH OF 30". ALL CONCRETE TO BE CLASS 'A' AT 3000 PSI COMPRESSIVE STRENGTH.
4. SAFETY RAIL SHALL BE UNIFORM IN HEIGHT ALONG EACH PROPOSED SEGMENT. 42" RAIL HEIGHT SHALL BE THE MINIMUM. 48" RAIL HEIGHT SHALL BE UTILIZED ALONG BRIDGES, BRIDGE APPROACHES, AND AT OTHER LOCATIONS WHERE HIGH-SPEED, STEEP-ANGLE (25 DEGREES OR GREATER) IMPACTS BETWEEN A BICYCLIST AND THE RAILING MAY OCCUR, SUCH AS AT A CURVE AT THE FOOT OF A LONG, DESCENDING GRADE WHERE THE CURVE RADIUS IS LESS THAN THAT APPROPRIATE FOR THE DESIGN SPEED OR ANTICIPATED SPEED. 54" RAIL HEIGHT SHALL BE UTILIZED IN EXTREME CONDITIONS AND WHERE CITY REGULATIONS DICTATE.
5. SAFETY RAIL LATERAL OFFSET FROM EDGE OF PAVEMENT WILL VARY BUT SHOULD BE 1' MINIMUM. THE ENDS OF THE SAFETY RAIL SHOULD BE FLARED AWAY FROM THE PATH EDGE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	VINYL SAFETY RAILING - VARIABLE HEIGHT	
	GW-20.02	



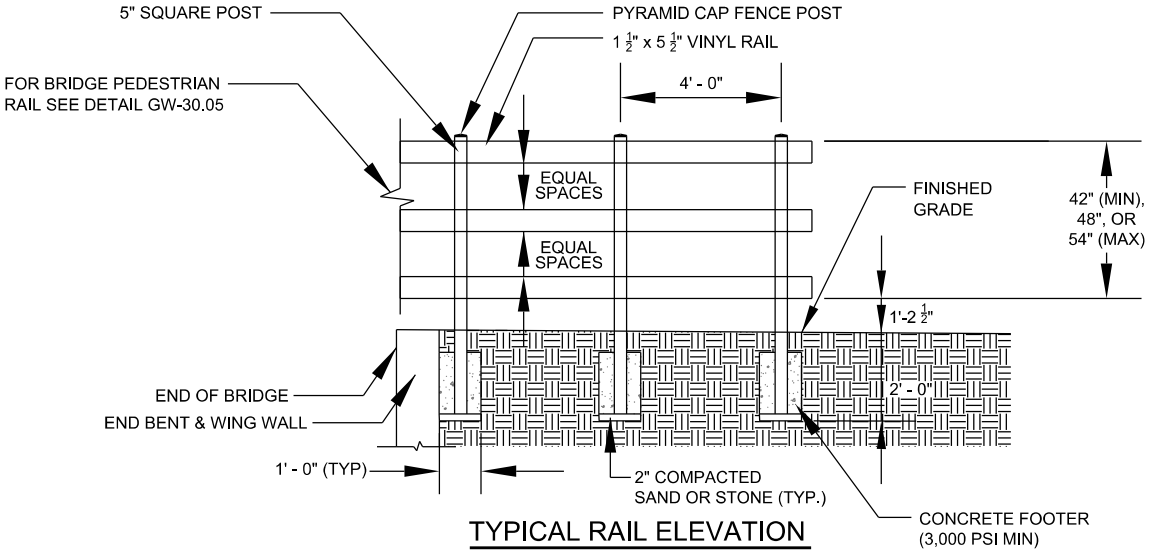
BOARDWALK OR BRIDGE TIMBER APPROACH RAILING

NOTES:

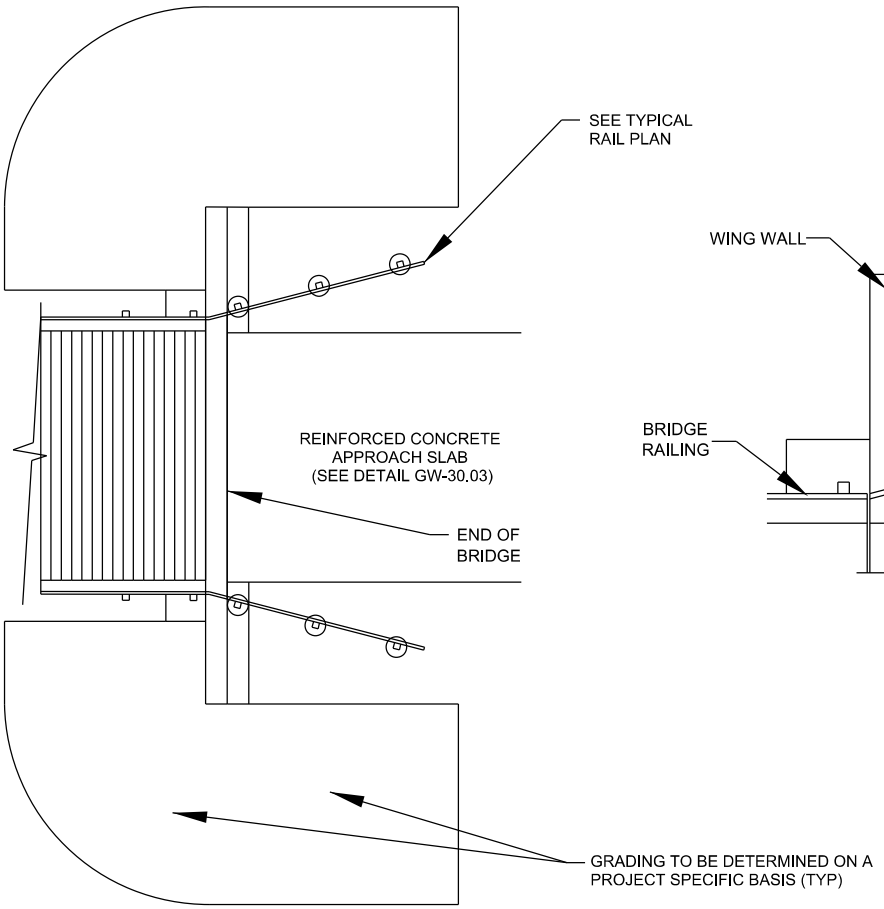
1. THE LENGTH OF THE APPROACH RAILING SHALL VARY DEPENDING ON SITE CONDITIONS.
2. THE LATERAL OFFSET OF THE RAILING SHOULD BE AT LEAST 1 FOOT FROM THE EDGE OF PATH. THE ENDS OF THE RAILING SHOULD BE FLARED AWAY FROM THE PATH EDGE.
3. THE APPROACH RAILING HEIGHT SHALL MATCH THE HEIGHT OF THE BRIDGE OR BOARDWALK RAILING, UNLESS OTHERWISE NOTED. THE RAILING HEIGHT WILL BE 42" (MIN), 48", OR 54" (MAX).
4. ALL CONCRETE FOOTERS AND END BLOCKS SHALL BE 3000 PSI MIN.

CITY OF RALEIGH
STANDARD DETAIL

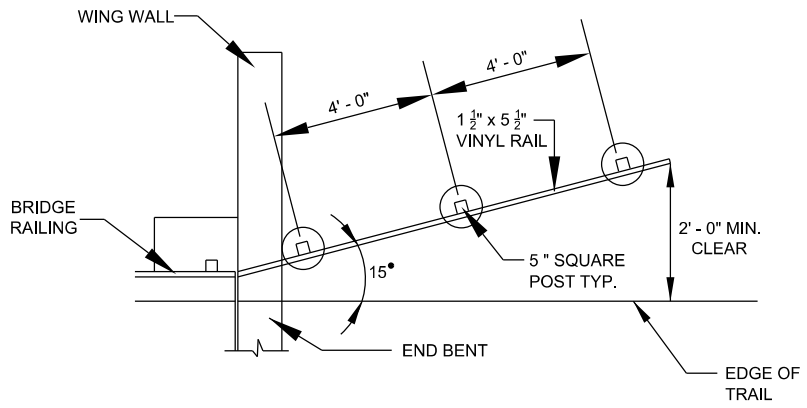
REVISIONS	DATE: 12/2022	NOT TO SCALE
	BOARDWALK OR BRIDGE TIMBER APPROACH RAILING	
	GW-20.03	



TYPICAL RAIL ELEVATION



PLAN



TYPICAL RAIL PLAN

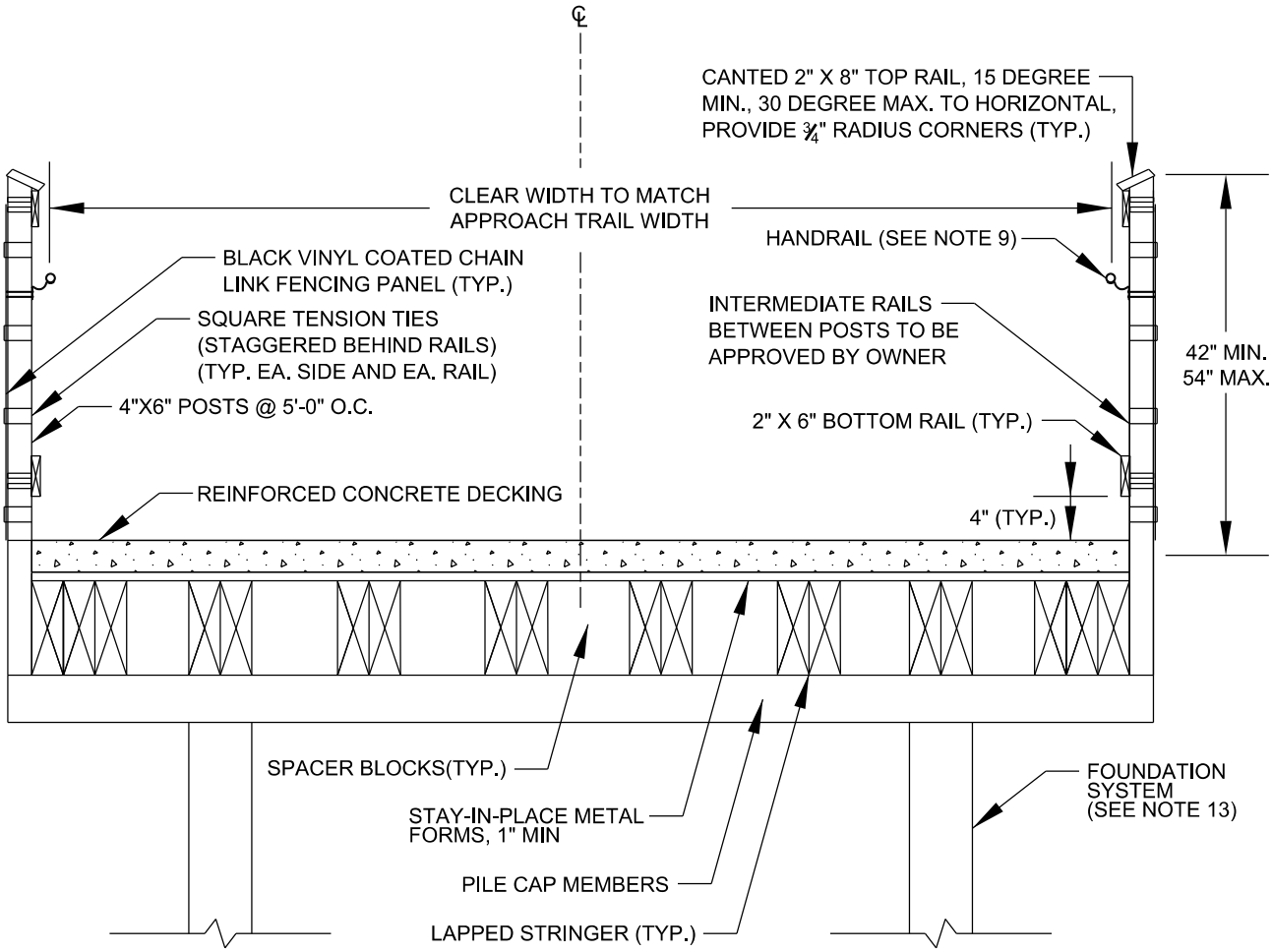
BOARDWALK OR BRIDGE
VINYL APPROACH RAILING

NOTES:

1. THE LENGTH OF THE APPROACH RAILING SHALL VARY DEPENDING ON SITE CONDITIONS.
2. THE LATERAL OFFSET OF THE RAILING SHOULD BE AT LEAST 1 FOOT FROM THE EDGE OF PATH. THE ENDS OF THE RAILING SHOULD BE FLARED AWAY FROM THE PATH EDGE.
3. THE APPROACH RAILING HEIGHT SHALL MATCH THE HEIGHT OF THE BRIDGE OR BOARDWALK RAILING, UNLESS OTHERWISE NOTED. THE RAILING HEIGHT WILL BE 42" (MIN), 48", OR 54" (MAX).

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	BOARDWALK OR BRIDGE VINYL APPROACH RAILING	
	GW-20.04	



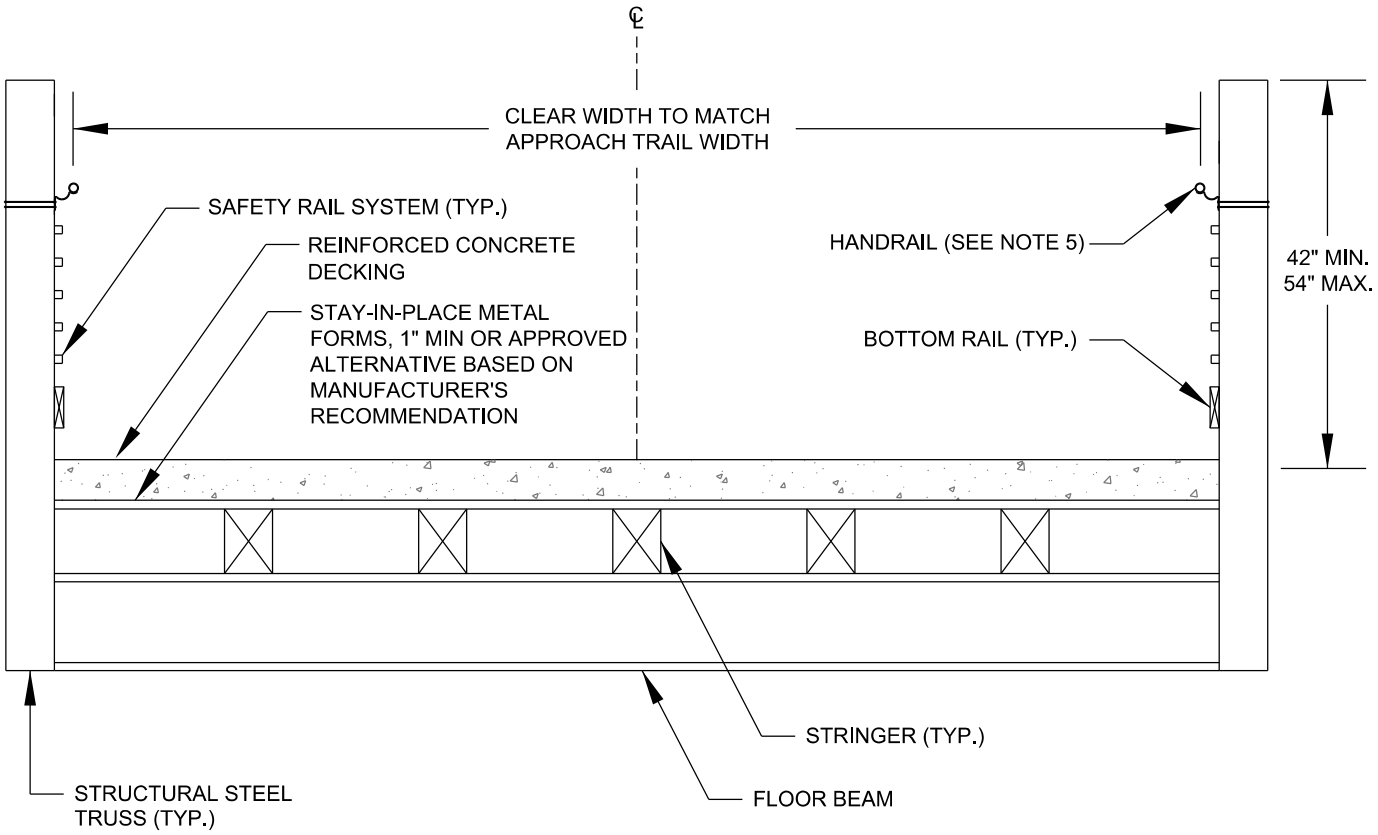
TYPICAL BOARDWALK SECTION

NOTES:

1. BOARDWALK DECK IS TO BE CAST-IN-PLACE REINFORCED CONCRETE WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
2. THE REINFORCING STEEL IN THE CAST-IN-PLACE CONCRETE BOARDWALK DECK SHALL BE EPOXY COATED GRADE 60.
3. CONCRETE DECKING CROSS SLOPE SHALL MATCH CROSS SLOPE OF TRAIL ON BOTH APPROACHES TO FACILITATE POSITIVE DRAINAGE AND PREVENT PONDING.
4. STAY-IN-PLACE METAL FORMS SHALL BE PROVIDED TO FACILITATE REINFORCED CONCRETE DECK CONSTRUCTION.
5. STAY-IN-PLACE METAL FORMS SHALL BE ATTACHED TO LONGITUDINAL TIMBER JOISTS USING AN APPROVED METHOD. ALL SCREWS AND OTHER HARDWARE USED SHALL BE GALVANIZED.
6. ALL OTHER HARDWARE (NUTS, WASHERS, BOLTS, ETC.) SHALL BE HOT DIPPED GALVANIZED PER ASTM A153.
7. TOP RAIL AND OTHER CONNECTIONS SHALL BE MADE WITH WOOD SCREW; NAILED CONNECTIONS WILL NOT BE ACCEPTABLE.
8. THE MINIMUM HEIGHT OF BRIDGE/BOARDWALK RAILING SHALL BE 42", UNLESS OTHERWISE NOTED. THE HEIGHT CAN RANGE BETWEEN 42", 48", OR 54".
9. A GRIP-ABLE, ROUND RAIL THAT WILL ACT AS BOTH A RUB RAIL AND HANDRAIL SHALL ONLY BE REQUIRED WHEN GRADES ARE GREATER THAN 5%. REFER TO DETAIL GW-30.04 FOR BRIDGE OR BOARDWALK RUB RAIL/HANDRAIL ATTACHMENT.
10. BLACK VINYL COATED CHAIN LINK FENCE AND TENSION TIES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
11. ALL TIMBER BOARDWALK COMPONENTS AND REINFORCED CONCRETE DECK SHALL DESIGNED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AASHTO LRFD GUIDE SPECIFICATIONS FOR PEDESTRIAN BRIDGES.
12. SPAN LENGTHS, JOIST SPACING, SIZING OF MEMBERS, REINFORCED CONCRETE DECK, AND OTHER DESIGN SPECIFICS SHALL BE DETERMINED BY THE ENGINEER ON A PROJECT SPECIFIC BASIS.
13. FOUNDATION SHALL CONSIST OF DRIVEN PILES, AUGURED PILES, HELICAL PIERS, OR OTHER APPLIED FOUNDATION SYSTEM. SPECIFICS SUCH AS NUMBER OF PILES, SPACING, AND HEIGHT SHALL BE DETERMINED BY ENGINEER ON A PROJECT SPECIFIC BASIS BASED ON REQUIRED LOADING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TYPICAL BOARDWALK SECTION	
	GW-30.01	



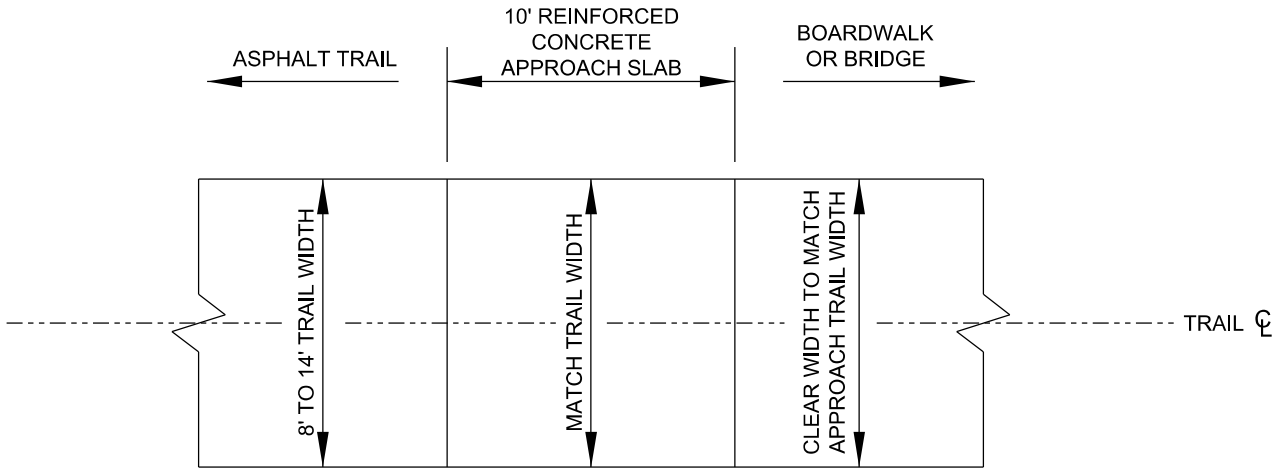
TYPICAL PREMANUFACTURED BRIDGE SECTION

NOTES:

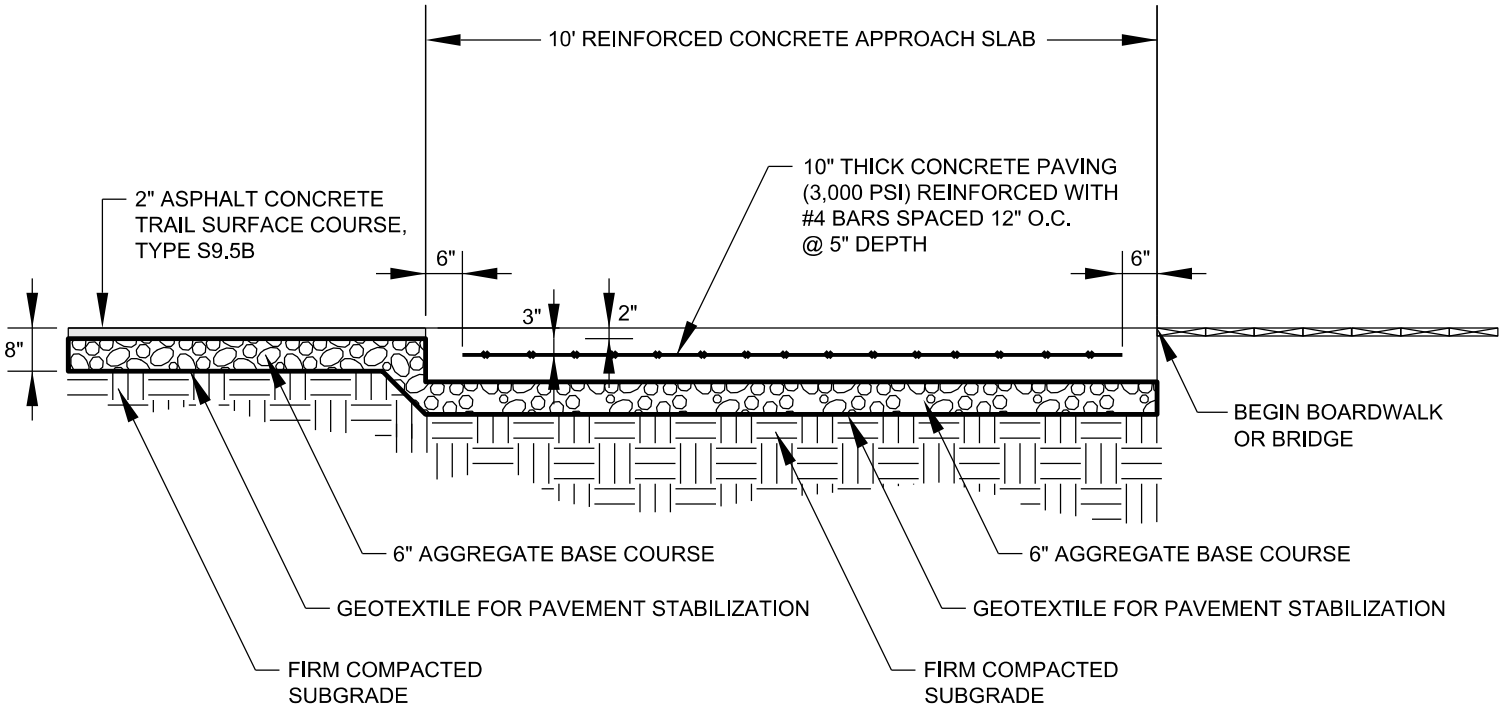
1. PREMANUFACTURED PEDESTRIAN BRIDGE SECTION AND DETAILS MAY VARY BY PROJECT. STRUCTURAL STEEL TRUSS BRIDGE SECTION SHOWN.
2. PREMANUFACTURED PEDESTRIAN BRIDGE SHALL BE DESIGNED AND DETAILED ON A PROJECT-SPECIFIC BASIS DEPENDING ON OVERALL GEOMETRY, LOADING, AND AESTHETIC REQUIREMENTS BY MANUFACTURER WITH INPUT FROM THE ENGINEER.
3. CONCRETE DECKING CROSS SLOPE SHALL MATCH CROSS SLOPE OF TRAIL ON BOTH APPROACHES TO FACILITATE POSITIVE DRAINAGE AND PREVENT PONDING.
4. THE MINIMUM HEIGHT OF BRIDGE/BOARDWALK RAILING SHALL BE 42", UNLESS OTHERWISE NOTED. THE HEIGHT CAN RANGE BETWEEN 42", 48", OR 54".
5. A GRIP-ABLE, ROUND RAIL THAT WILL ACT AS BOTH A RUB RAIL AND HANDRAIL SHALL ONLY BE REQUIRED WHEN GRADES ARE GREATER THAN 5%. REFER TO DETAIL GW-30.04 FOR BRIDGE OR BOARDWALK RUB RAIL/HANDRAIL ATTACHMENT.
6. FOUNDATION SYSTEM SHALL BE DETERMINED BY ENGINEER ON A PROJECT SPECIFIC BASIS BASED ON REQUIRED LOADING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TYPICAL PREMANUFACTURED BRIDGE SECTION	
	GW-30.02	



PLAN VIEW



SECTION VIEW (CUT ALONG TRAIL CENTERLINE)

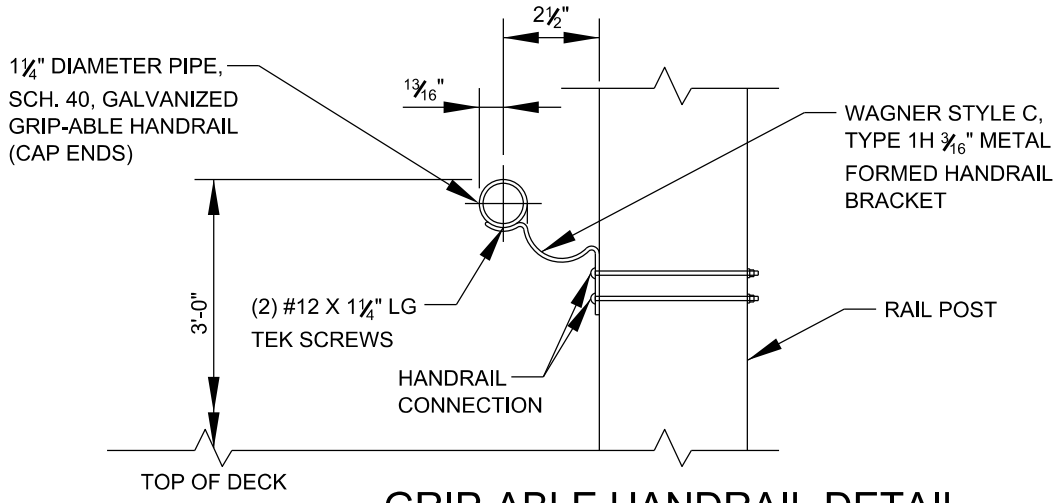
BRIDGE OR BOARDWALK APPROACH SLAB

NOTES:

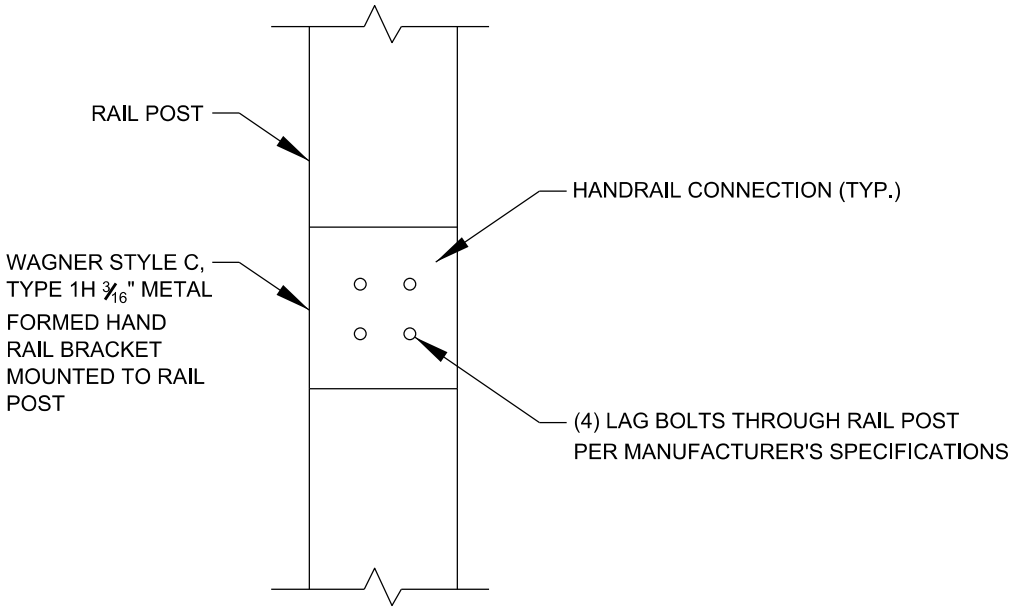
1. BRIDGE/BOARDWALK FOUNDATION, BACKWALL, AND STRINGERS NOT SHOWN FOR CLARITY.
2. BRIDGE/BOARDWALK APPROACH SLABS TO MATCH APPROACH TRAIL WIDTH AND CROSS SLOPE AS REQUIRED BY DESIGN.
3. APPROACH SLAB REQUIRED ON BOTH ENDS OF BRIDGE/BOARDWALK IF TRANSITIONING TO ASPHALT TRAIL PAVEMENT. BEGIN APPROACH SLAB SHOWN IN DETAIL ABOVE. END APPROACH SLAB WILL BE SIMILAR.
4. APPROACH TRAIL PAVEMENT DESIGN TO BE DETERMINED ON A PROJECT SPECIFIC BASIS BY THE ENGINEER. ASPHALT PAVEMENT DESIGN IS SHOWN IN THIS DETAIL TO ILLUSTRATE TRANSITION FROM ASPHALT TO CONCRETE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	BRIDGE OR BOARDWALK APPROACH SLAB	
	GW-30.03	



GRIP-ABLE HANDRAIL DETAIL



GRIP-ABLE HANDRAIL ATTACHMENT DETAIL

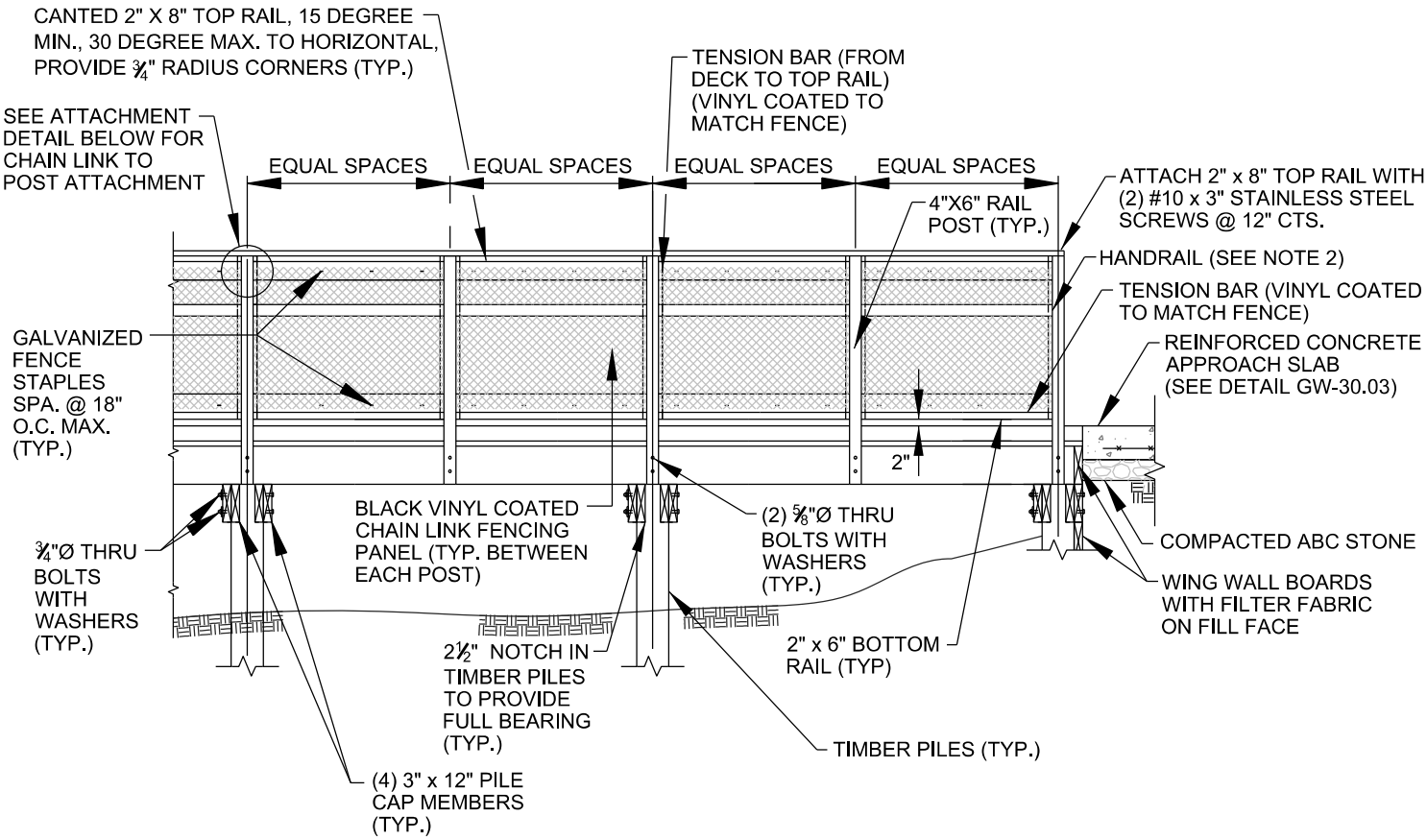
BRIDGE OR BOARDWALK RUB RAIL / HANDRAIL ATTACHMENT

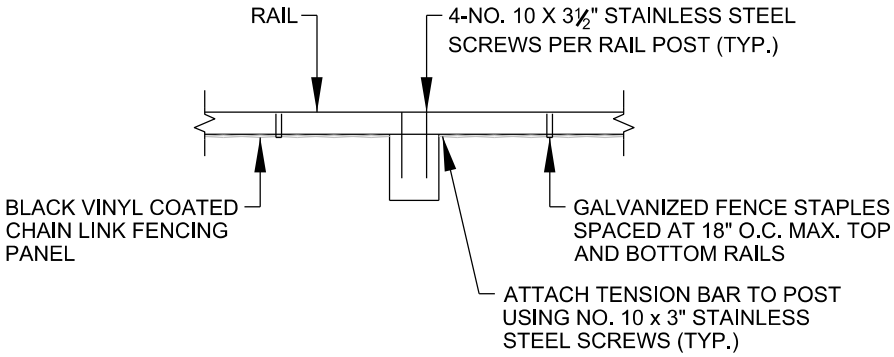
NOTE:

1. A GRIP-ABLE, ROUND RAIL THAT WILL ACT AS BOTH A RUB RAIL AND HANDRAIL SHALL ONLY BE REQUIRED WHEN GRADES ARE GREATER THAN 5%.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	BRIDGE OR BOARDWALK RUB RAIL / HANDRAIL ATTACHMENT	
	GW-30.04	





ATTACHMENT DETAIL

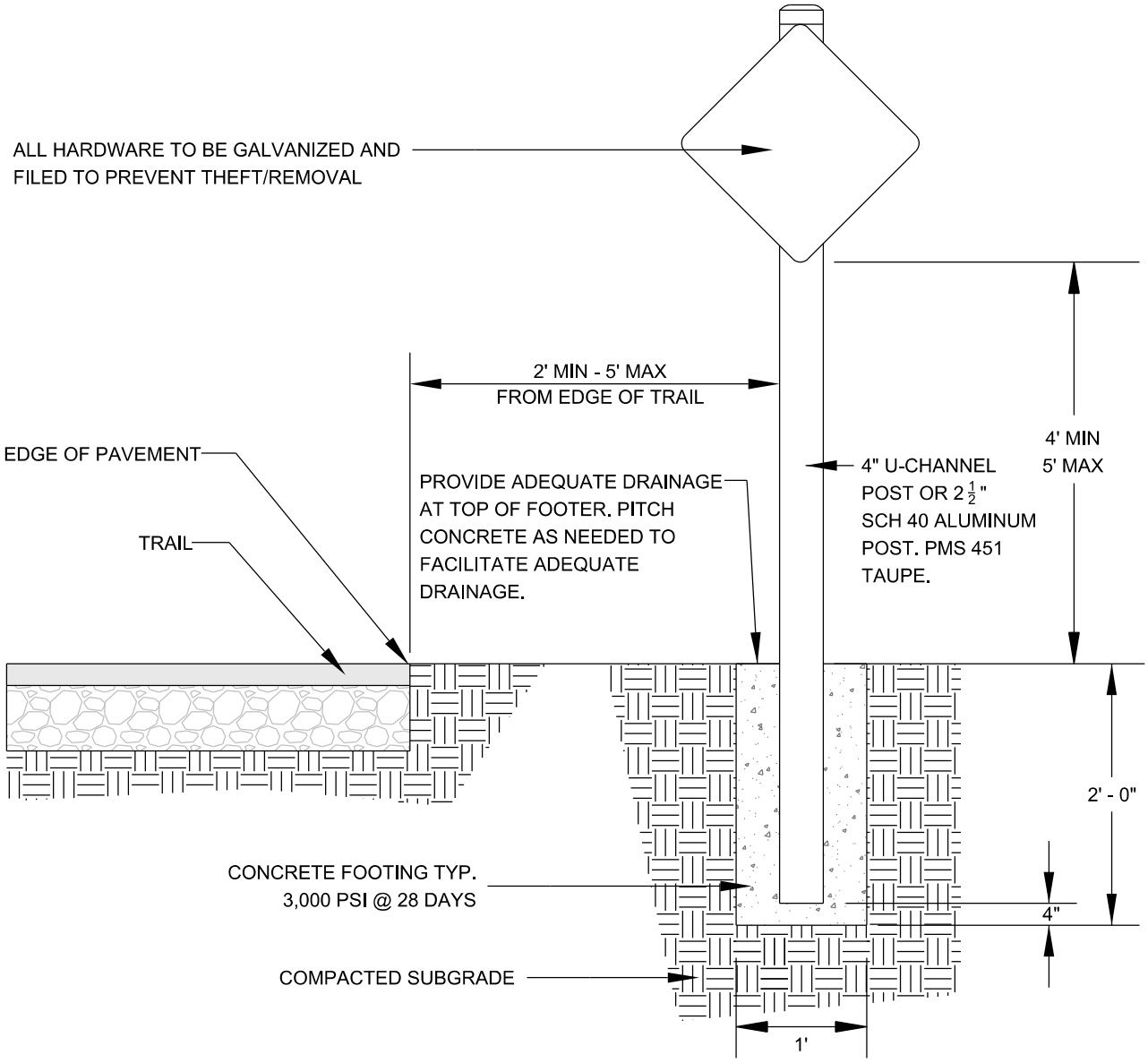
TYPICAL BOARDWALK ELEVATION VIEW

NOTES:

1. THE MINIMUM HEIGHT OF BRIDGE/BOARDWALK RAILING SHALL BE 42", UNLESS OTHERWISE NOTED. THE HEIGHT CAN RANGE BETWEEN 42", 48", OR 54".
2. A GRIP-ABLE, ROUND RAIL THAT WILL ACT AS BOTH A RUB RAIL AND HANDRAIL SHALL ONLY BE REQUIRED WHEN GRADES ARE GREATER THAN 5%. REFER TO DETAIL GW-30.04 FOR BRIDGE OR BOARDWALK RUB RAIL/HANDRAIL ATTACHMENT.
3. UTILIZE DETAIL GW-30.04 "BRIDGE OR BOARDWALK RUB RAIL/HANDRAIL ATTACHMENT" AS A TYPICAL RAIL ATTACHMENT DETAIL FOR HORIZONTAL RAILS TO RAIL POST CONNECTIONS.
4. BLACK VINYL COATED CHAIN LINK FENCE AND TENSION TIES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
5. SPAN LENGTHS, JOIST SPACING, SIZING OF MEMBERS, REINFORCED CONCRETE DECK, AND OTHER DESIGN SPECIFICS SHALL BE DETERMINED BY THE ENGINEER ON A PROJECT SPECIFIC BASIS.
6. FOUNDATION SHALL CONSIST OF DRIVEN PILES, AUGURED PILES, HELICAL PIERS, OR OTHER APPLIED FOUNDATION SYSTEM. SPECIFICS SUCH AS NUMBER OF PILES, SPACING, AND HEIGHT SHALL BE DETERMINED BY ENGINEER ON A PROJECT SPECIFIC BASIS BASED ON REQUIRED LOADING. TIMBER PILES ARE SHOWN IN THIS DETAIL AS AN EXAMPLE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TYPICAL BOARDWALK ELEVATION VIEW	
	GW-30.05	



TYPICAL TRAIL SIGN INSTALLATION

NOTE:

1. SMALLER SCALE SIGNS OR PLAQUES MAY BE USED FOR GREENWAY TRAIL APPLICATIONS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TYPICAL TRAIL SIGN INSTALLATION	
	GW-40.01	

<INSERT TRAIL NAME> IS CLOSED AHEAD

FOR IMPROVEMENTS TO <INSERT BRIEF DESCRIPTION>

INSERT PROJECT MAP SHOWING LOCATION(S) OF CLOSURE(S) AND/OR DETOUR(S)

START DATE: <INSERT DATE>

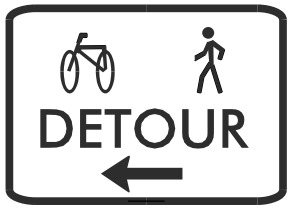
FINISH DATE: <INSERT DATE>

FOR QUESTIONS PLEASE CONTACT:
CITY OF RALEIGH
PARKS DEPARTMENT
M-F 8:00 AM - 5:00 PM
(919) 996-3285
PARKPLAN@RALEIGHNC.GOV

24" X 12" WHITE SIGN WITH BLACK BORDER AND BLACK LETTERING (RESEMBLING MUTCD R9-9) FIRMLY ATTACHED TO BARRICADE

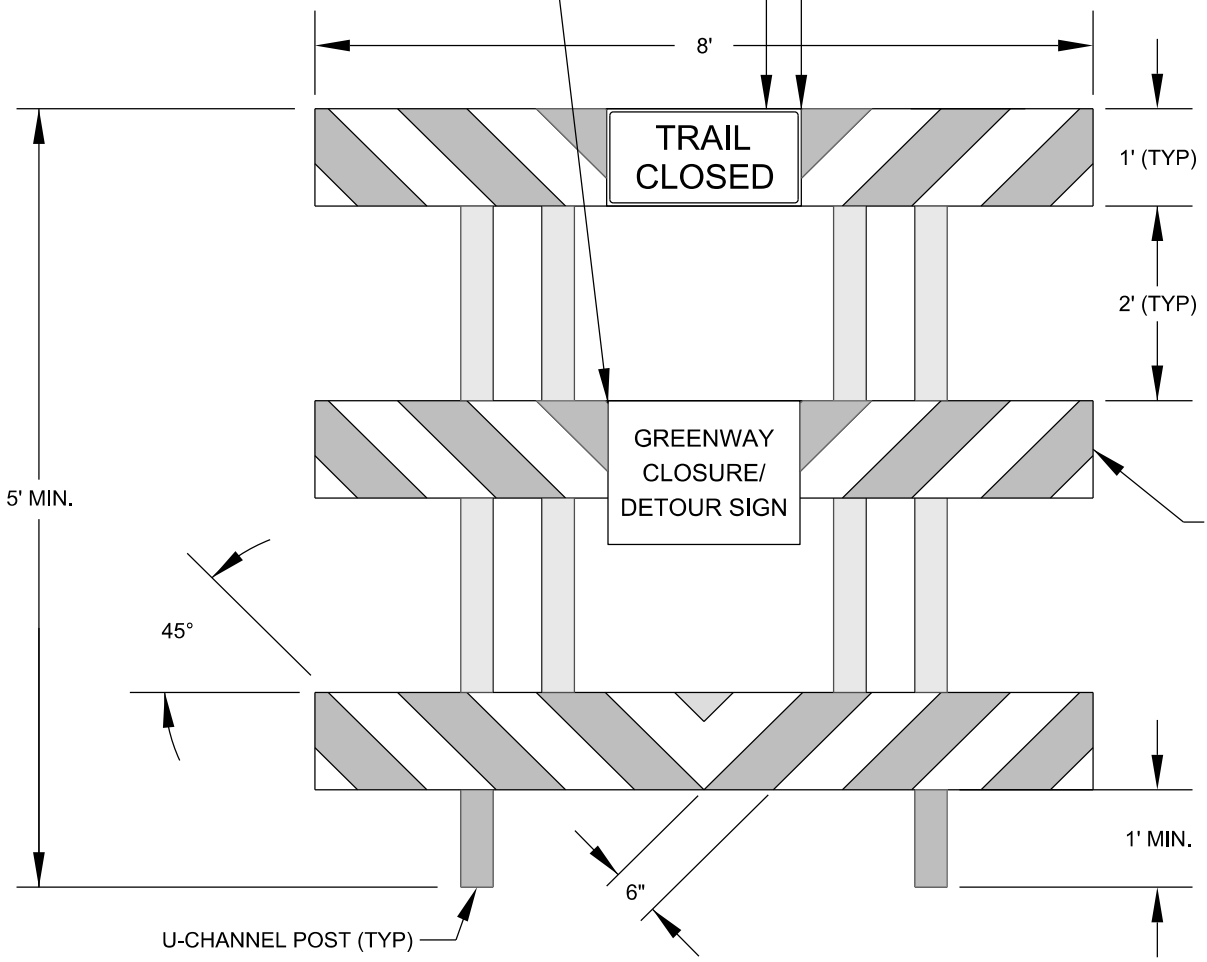
ALTERNATIVE SIGN ATTACHMENT OPTIONS SHOWN BELOW

24" X 18" WHITE SIGN WITH BLACK BORDER AND BLACK LETTERING (RESEMBLING MUTCD R9-11) FIRMLY ATTACHED TO BARRICADE



30" X 24" MUTCD M4-9A (ORANGE SIGN WITH BLACK BORDER AND BLACK LETTERING) FIRMLY ATTACHED TO BARRICADE

STANDARD 18" X 24" YARD SIGN WITH BLACK LETTERING FIRMLY ATTACHED TO BARRICADE DISPLAYING THE INFORMATION DESCRIBED ABOVE



CONSTRUCTION BARRICADE AND SIGN

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	CONSTRUCTION BARRICADE AND SIGN	
	GW-40.02.1	

CONSTRUCTION BARRICADE AND SIGN - NOTES:

1. CONTRACTOR TO UTILIZE PROVIDED PEDESTRIAN DETOUR PLANS TO INSTALL AND MAINTAIN PEDESTRIAN DETOUR ROUTES FOR EACH PHASE OF THE PROJECT. IF PEDESTRIAN DETOUR PLANS ARE NOT PROVIDED, CONTRACTOR IS TO DEVELOP SAID PLANS AND OBTAIN CITY APPROVAL PRIOR TO IMPLEMENTATION.

2. INSTALL DETOUR SIGNS BEFORE BARRICADES WHEN CLOSING TRAIL TO PEDESTRIAN TRAFFIC. REMOVE BARRICADES BEFORE DETOUR SIGNS WHEN OPENING TRAIL TO PEDESTRIAN TRAFFIC. INSTALL/REMOVE DETOUR SIGNS AND BARRICADES WITHIN SAME CALENDAR DAY.

3. EACH DETOUR SHALL BE ADEQUATELY MARKED. THE NUMBER OF BARRICADES AND SIGNS NEEDED WILL BE DETERMINED BY THE CONTRACTOR BASED ON THE PROPOSED PEDESTRIAN DETOUR PLANS.

4. INSTALL PEDESTRIAN BARRICADES TO BLOCK FULL WIDTH OF TRAIL DURING TRAIL CLOSURES. MORE THAN ONE BARRICADE MAY BE NEEDED TO COVER THE FULL WIDTH OF TRAIL. CHAIN BARRICADES TOGETHER AS NEEDED IF MULTIPLE BARRICADES ARE USED.

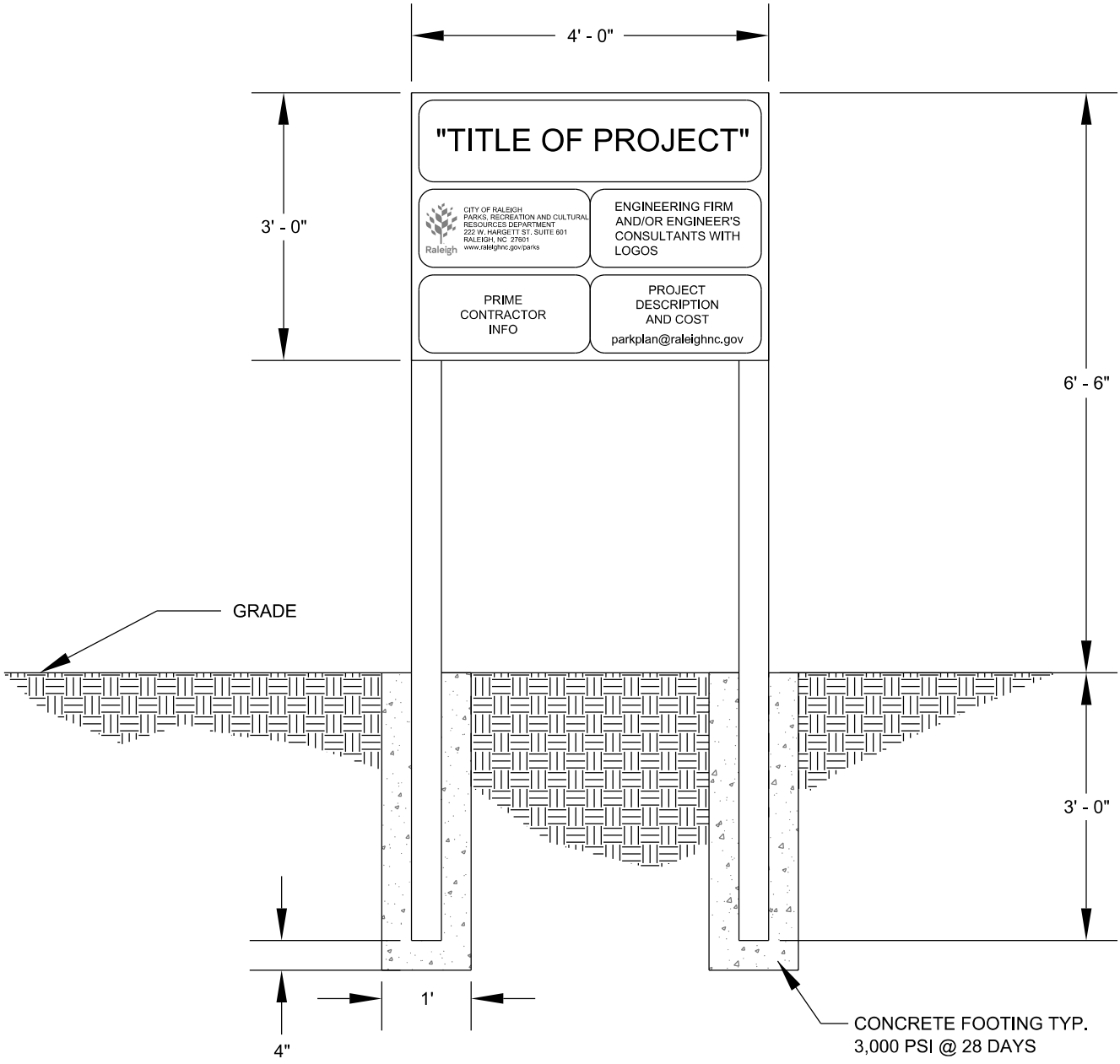
5. "TRAIL CLOSED AHEAD" SIGNS AND BARRICADES SHOULD BE USED WHERE PEDESTRIAN FLOW IS RESTRICTED SUCH AS AT THE BEGINNING AND END OF THE CLOSED TRAIL AND AT THE INTERSECTIONS PRECEDING THE CLOSED TRAIL, IF APPLICABLE.

6. MOUNT "TRAIL CLOSED AHEAD" SIGN TO BARRICADE RAILS TO ENSURE SIGN WILL NOT BECOME DETACHED DURING NORMAL WIND CONDITIONS.

7. PLACE SANDBAGS OR OTHER APPROVED BALLASTING METHODS ON THE FEET OF THE FRAME. DO NOT PLACE SANDBAGS ON TOP OF A STRIPED RAIL OR STABILIZER BAR. DO NOT BALLAST BARRICADES WITH HEAVY OBJECTS SUCH AS ROCKS, CHUNKS OF CONCRETE, OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	*DATE: 12/2022*	*NOT TO SCALE*
	CONSTRUCTION BARRICADE AND SIGN	
	GW-40.02.2	



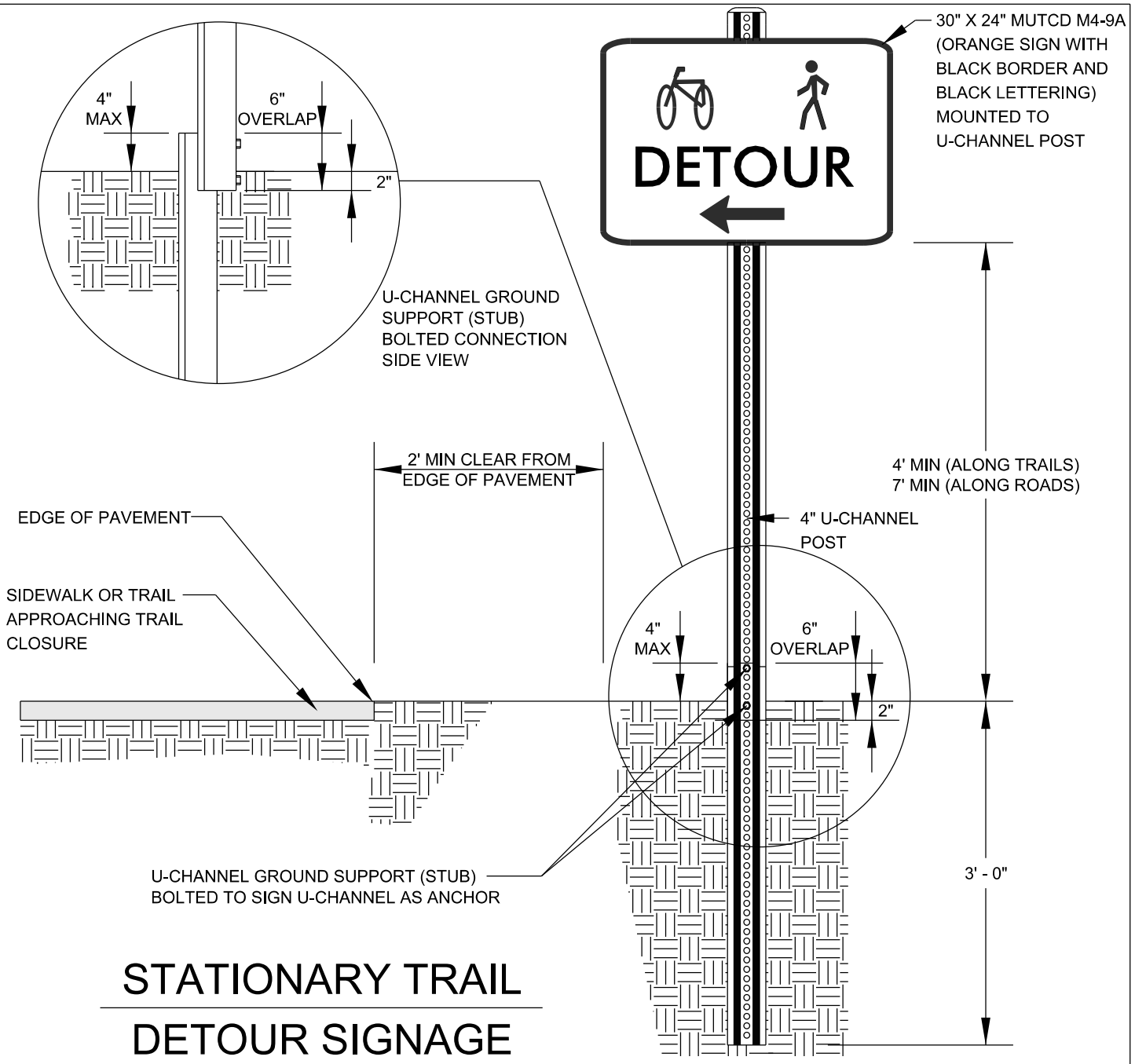
CONSTRUCTION PROJECT IDENTIFICATION SIGN

NOTES:

1. CONSTRUCTION PROJECT IDENTIFICATION SIGNS ARE TO BE PLACED AT EITHER END OF THE TRAIL SECTION UNDER CONSTRUCTION UNLESS OTHERWISE INSTRUCTED BY THE CITY. IF THE PROJECT IS CONSTRUCTED IN SECTIONS, THE CONSTRUCTION PROJECT IDENTIFICATION SIGNS CAN BE MOVED TO EACH SEGMENT UNDER CONSTRUCTION AS NEEDED.
2. ERECT SUPPORTS AND FRAMING ON SECURE FOUNDATION, RIGIDLY BRACED AND FRAMED TO RESIST WIND LOADINGS AND SIGN THEFT. INSTALL SIGN SURFACE PLUMB AND LEVEL.
3. REMOVE SIGN(S), FRAMING, SUPPORTS, AND FOUNDATIONS AT COMPLETION OF PROJECT AND RESTORE THE AREA.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	CONSTRUCTION PROJECT IDENTIFICATION SIGN	
	GW-40.03	



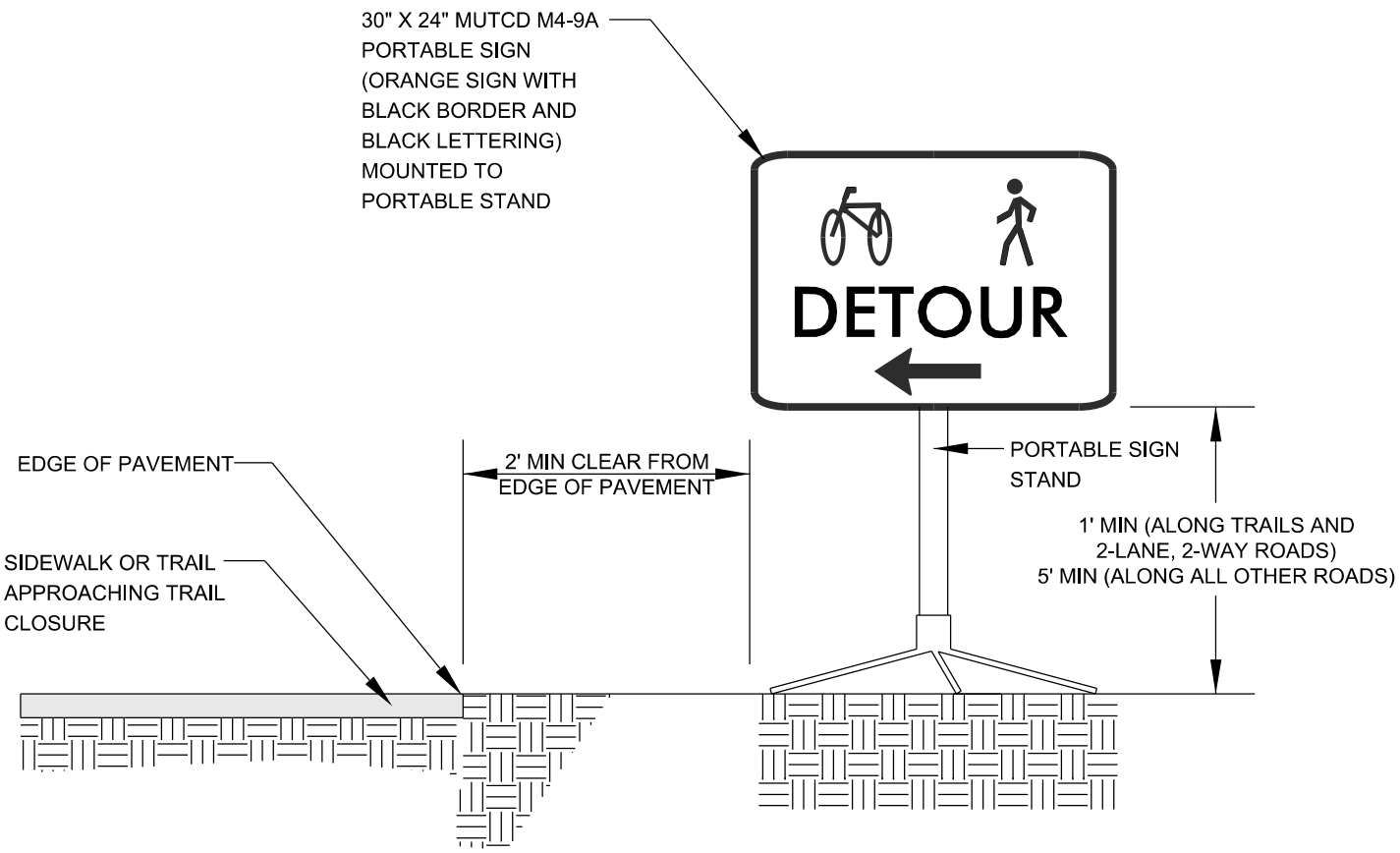
STATIONARY TRAIL DETOUR SIGNAGE

NOTES:

1. CONTRACTOR TO UTILIZE PROVIDED PEDESTRIAN DETOUR PLANS TO INSTALL AND MAINTAIN PEDESTRIAN DETOUR ROUTES FOR EACH PHASE OF THE PROJECT. IF PEDESTRIAN DETOUR PLANS ARE NOT PROVIDED, CONTRACTOR IS TO DEVELOP SAID PLANS AND OBTAIN CITY APPROVAL PRIOR TO IMPLEMENTATION.
2. INSTALL DETOUR SIGNS BEFORE BARRICADES WHEN CLOSING TRAIL TO PEDESTRIAN TRAFFIC. REMOVE BARRICADES BEFORE DETOUR SIGNS WHEN OPENING TRAIL TO PEDESTRIAN TRAFFIC. INSTALL/REMOVE DETOUR SIGNS AND BARRICADES WITHIN SAME CALENDAR DAY.
3. EACH DETOUR SHALL BE ADEQUATELY MARKED. THE NUMBER OF SIGNS NEEDED WILL BE DETERMINED BY THE CONTRACTOR BASED ON THE PROPOSED PEDESTRIAN DETOUR PLANS.
4. THE PEDESTRIAN/BICYCLE DETOUR (M4-9A) SIGN SHOULD BE USED WHERE A PEDESTRIAN/BICYCLE DETOUR ROUTE HAS BEEN ESTABLISHED TO REROUTE PEDESTRIAN TRAFFIC DUE TO A TRAIL CLOSURE. THE M4-9A DETOUR SIGN SHALL HAVE AN ARROW POINTING IN THE APPROPRIATE DIRECTION.
5. STATIONARY TRAIL DETOUR SIGNAGE IS PREFERABLE FOR PEDESTRIAN DETOUR ROUTES THAT SHALL BE IN PLACE FOR EXTENDED DURATIONS OR IF THERE IS DEEMED TO BE A HIGH PROBABILITY OF SIGN THEFT. CONSULT WITH CITY OF RALEIGH PROJECT MANAGER TO DETERMINE IF STATIONARY OR PORTABLE SIGNS SHALL BE USED. REFER TO DETAIL GW-40.05 FOR PORTABLE TRAIL DETOUR SIGNAGE IF APPLICABLE.
6. ALL HARDWARE TO BE GALVANIZED AND FILED TO PREVENT THEFT/REMOVAL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	STATIONARY TRAIL DETOUR SIGNAGE	
	GW-40.04	



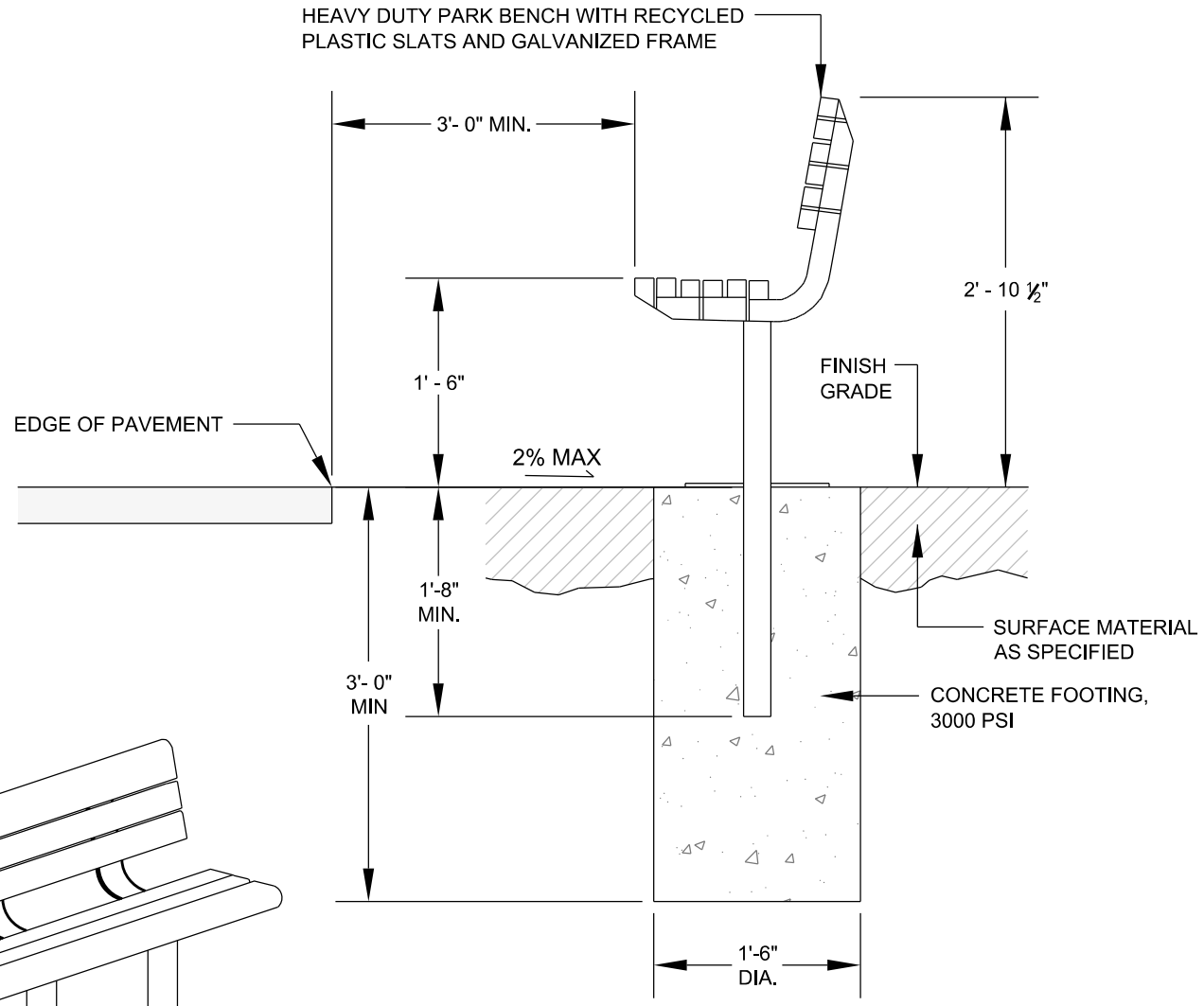
PORTABLE TRAIL DETOUR SIGNAGE

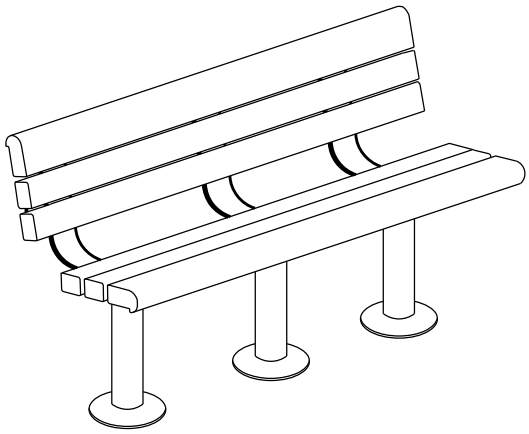
NOTES:

1. CONTRACTOR TO UTILIZE PROVIDED PEDESTRIAN DETOUR PLANS TO INSTALL AND MAINTAIN PEDESTRIAN DETOUR ROUTES FOR EACH PHASE OF THE PROJECT. IF PEDESTRIAN DETOUR PLANS ARE NOT PROVIDED, CONTRACTOR IS TO DEVELOP SAID PLANS AND OBTAIN CITY APPROVAL PRIOR TO IMPLEMENTATION.
2. INSTALL DETOUR SIGNS BEFORE BARRICADES WHEN CLOSING TRAIL TO PEDESTRIAN TRAFFIC. REMOVE BARRICADES BEFORE DETOUR SIGNS WHEN OPENING TRAIL TO PEDESTRIAN TRAFFIC. INSTALL/REMOVE DETOUR SIGNS AND BARRICADES WITHIN SAME CALENDAR DAY.
3. EACH DETOUR SHALL BE ADEQUATELY MARKED. THE NUMBER OF SIGNS NEEDED WILL BE DETERMINED BY THE CONTRACTOR BASED ON THE PROPOSED PEDESTRIAN DETOUR PLANS.
4. THE PEDESTRIAN/BICYCLE DETOUR (M4-9A) SIGN SHOULD BE USED WHERE A PEDESTRIAN/BICYCLE DETOUR ROUTE HAS BEEN ESTABLISHED TO REROUTE PEDESTRIAN TRAFFIC DUE TO A TRAIL CLOSURE. THE M4-9A DETOUR SIGN SHALL HAVE AN ARROW POINTING IN THE APPROPRIATE DIRECTION.
5. PORTABLE TRAIL DETOUR SIGNAGE IS PREFERABLE FOR PEDESTRIAN DETOUR ROUTES THAT SHALL BE IN PLACE FOR SHORT DURATIONS AND IF THERE IS DEEMED TO BE A LOW PROBABILITY OF SIGN THEFT. CONSULT WITH CITY OF RALEIGH PROJECT MANAGER TO DETERMINE IF STATIONARY OR PORTABLE SIGNS SHALL BE USED. REFER TO DETAIL GW-40.04 FOR STATIONARY TRAIL DETOUR SIGNAGE IF APPLICABLE.
6. USE COMPOSITE OR ROLL-UP SIGN SUBSTRATES ON PORTABLE SIGN STANDS. FOR BOTH COMPOSITE AND ROLL-UP SIGN SUBSTRATES, USE GRADE B FLUORESCENT ORANGE RETROREFLECTIVE SHEETING. USE ROLL-UP SIGNS THAT HAVE A MINIMUM 3/16 INCH X 1 1/4 INCHES HORIZONTAL RIB AND 3/8 INCH X 1 1/4 INCHES VERTICAL RIB.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	PORTABLE TRAIL DETOUR SIGNAGE	
	GW-40.05	





ISOMETRIC VIEW

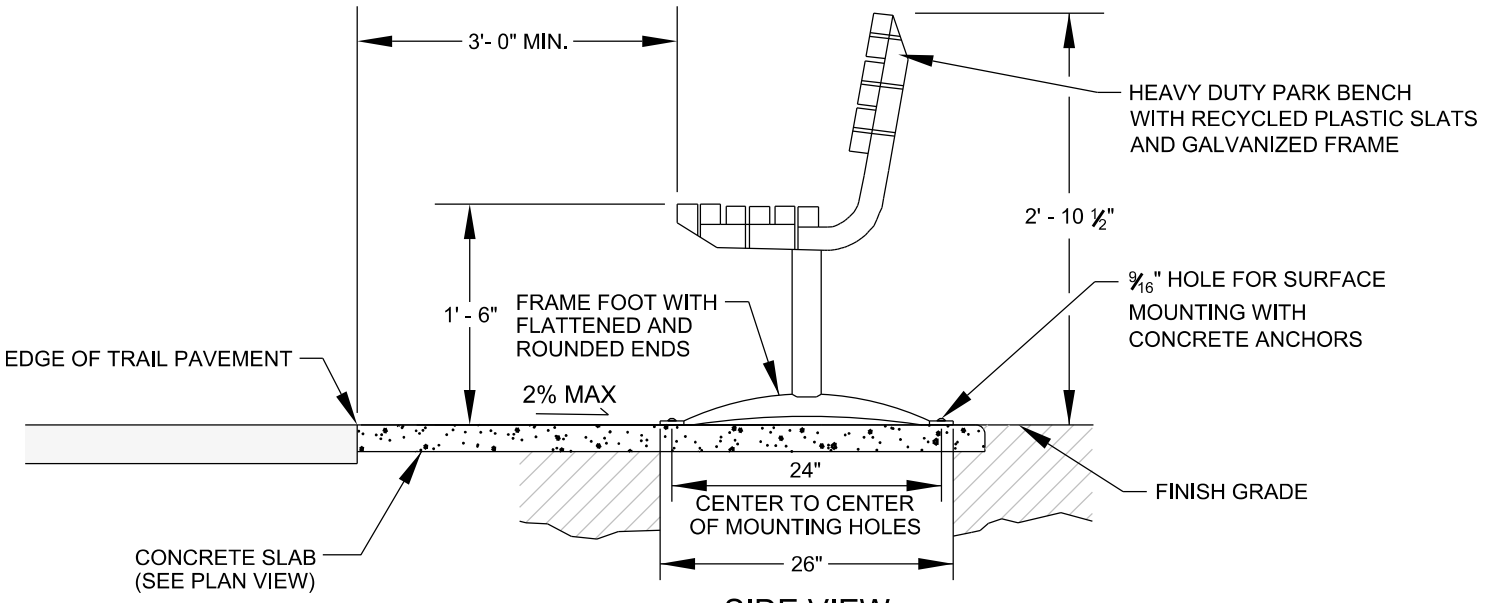
BENCH INSTALLATION IN-GROUND MOUNT

NOTES:

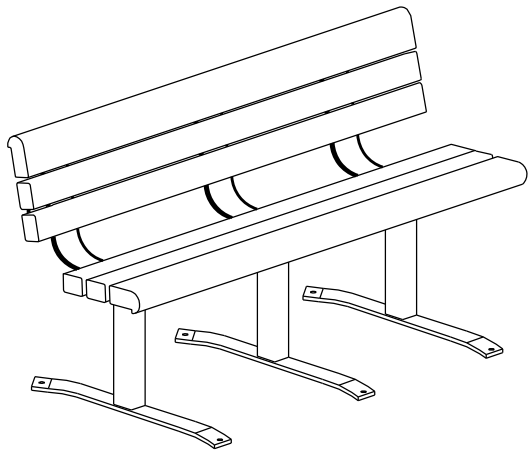
1. LOCATE BENCHES ALONG THE GREENWAY TRAIL WHERE APPROPRIATE, WHERE THERE IS A DEMAND BY USERS, OR AS DIRECTED BY THE CITY. PROVIDING SEATING AT ONE MILE GAPS IS THE GOAL. SEATING WITHIN 1/2 MILE OF TRAIL HEADS IS RECOMMENDED.
2. PROVIDE BENCHES IN AREAS THAT PROVIDE INTERESTING VIEWS, ARE CLOSE TO AN INTERPRETIVE ELEMENT, AND OFFER SHADE OR SHELTER FROM SEASONAL WINDS.
3. LOCATE BENCHES A MINIMUM OF 4 FEET FROM RESTROOMS, DRINKING FOUNTAINS, AND TRASH AND RECYCLING RECEPTACLES. LOCATE BENCHES A MINIMUM OF 2 FEET FROM LIGHTING POLES AND SIGN POSTS.
4. DRAINAGE SHOULD SLOPE AWAY FROM THE BENCH AND THE GREENWAY TRAIL.
5. FRAME: 3 HOT-DIPPED GALVANIZED FRAMES ALL WELDED STEEL FROM CONSTRUCTION, SEAT SUPPORT CHANNEL DIE-FORMED FROM 1/8" THICK STEEL, FRAME POSTS 2' - 3/8" OD STEEL PIPE.
6. FINISH: HOT DIP GALVANIZED FINISH AFTER FABRICATION.
7. BENCH TO BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND DETAILS. SEAT SHOULD BE SECURELY ANCHORED TO THE GROUND. TO BE STATIONARY/EMBEDDED, MOUNT WITH FRAME POSTS IN CONCRETE FOOTING.
8. LENGTH: RECYCLED PLASTIC 6 FEET LONG.
9. SEAT BACK MATERIAL: 2" x 4" 100% RECYCLED PLASTIC PLANK.
10. ACCEPTABLE BENCH MANUFACTURER IS PILOT ROCK SCXB3/G-6PC24 EMBEDDED MOUNT BENCH, CEDAR COLOR OR APPROVED EQUAL BY CITY OF RALEIGH.

CITY OF RALEIGH
STANDARD DETAIL

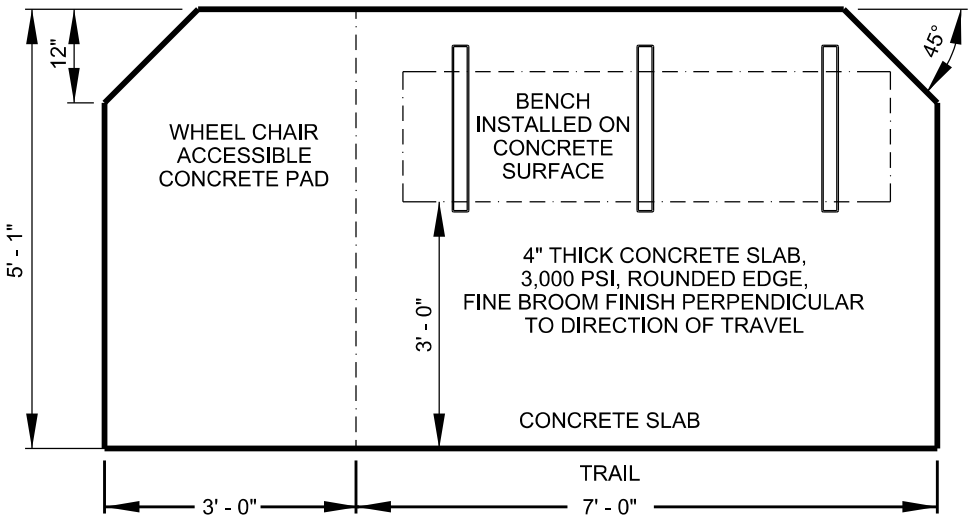
REVISIONS	DATE: 12/2022	NOT TO SCALE
	BENCH INSTALLATION IN-GROUND MOUNT	
	GW-50.01	



SIDE VIEW



ISOMETRIC VIEW



PLAN VIEW

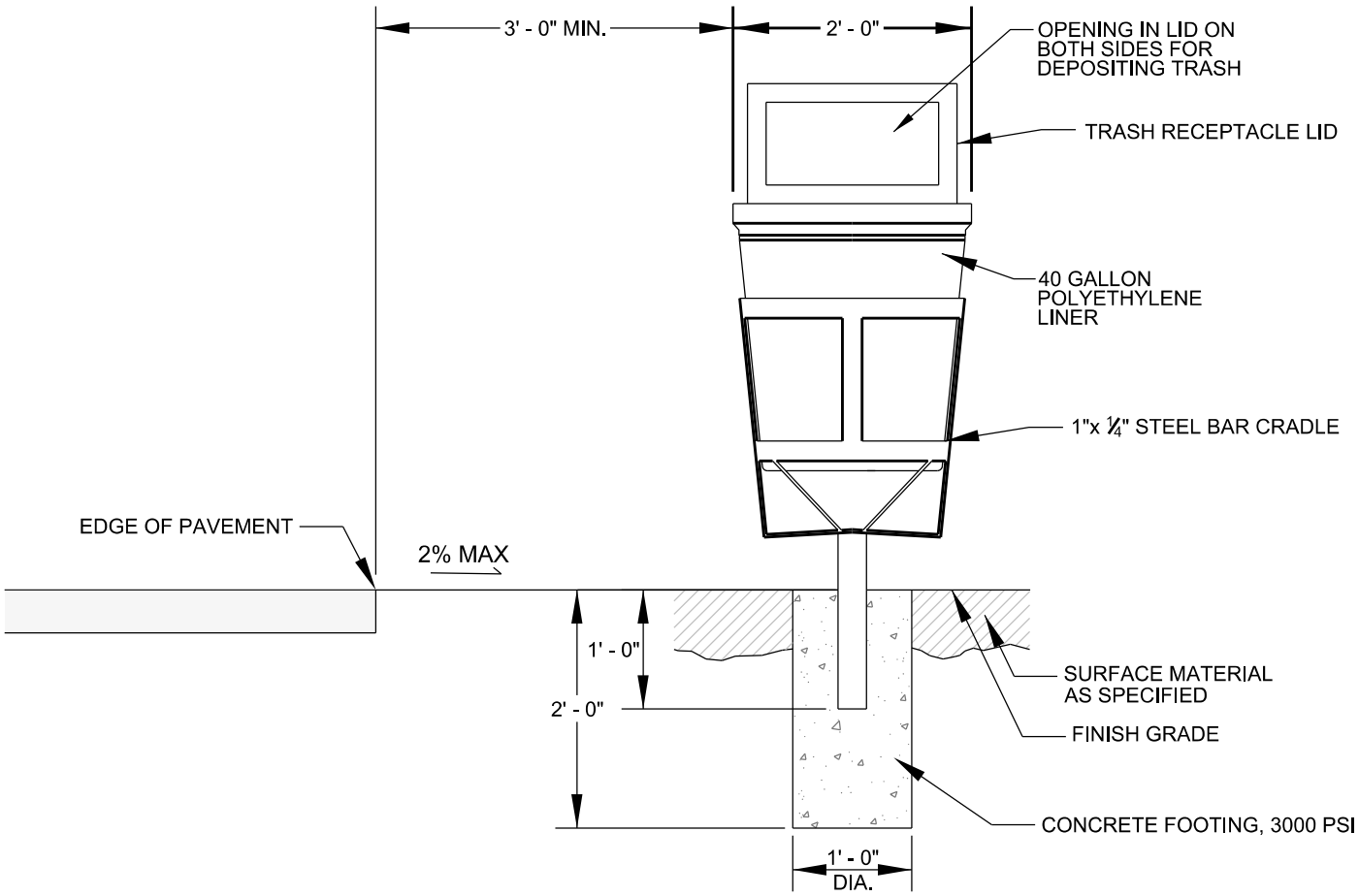
BENCH INSTALLATION SURFACE MOUNT

NOTES:

1. LOCATE BENCHES ALONG THE GREENWAY TRAIL WHERE APPROPRIATE, WHERE THERE IS A DEMAND BY USERS, OR AS DIRECTED BY THE CITY. PROVIDING SEATING AT ONE MILE GAPS IS THE GOAL. SEATING WITHIN 1/2 MILE OF TRAIL HEADS IS RECOMMENDED.
2. PROVIDE BENCHES IN AREAS THAT PROVIDE INTERESTING VIEWS, ARE CLOSE TO AN INTERPRETIVE ELEMENT, AND OFFER SHADE OR SHELTER FROM SEASONAL WINDS.
3. LOCATE BENCHES A MINIMUM OF 4 FEET FROM RESTROOMS, DRINKING FOUNTAINS, AND TRASH AND RECYCLING RECEPTACLES. LOCATE BENCHES A MINIMUM OF 2 FEET FROM LIGHTING POLES AND SIGN POSTS. BENCHES AND RECEPTACLES CAN BE LOCATED ON THE SAME CONCRETE PAD IF SIZED APPROPRIATELY.
4. WHEELCHAIR ACCESS SHOULD BE POSSIBLE ALONGSIDE BENCHES. PROVIDE ACCESS WITH A HARDENED SURFACE SUCH AS CONCRETE OR ASPHALT.
5. DRAINAGE SHOULD SLOPE AWAY FROM THE BENCH AND THE GREENWAY TRAIL.
6. FRAME: 3 HOT-DIPPED GALVANIZED FRAMES ALL WELDED STEEL FROM CONSTRUCTION, SEAT SUPPORT CHANNEL DIE-FORMED FROM 1/8" THICK STEEL, FRAME POSTS 2' - 3/8" OD STEEL PIPE.
7. FINISH: HOT DIP GALVANIZED FINISH AFTER FABRICATION.
8. BENCH TO BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND DETAILS. SEAT SHOULD BE SECURELY ANCHORED TO THE GROUND. TO BE STATIONARY, MOUNT WITH FRAME FOOT AND CONCRETE ANCHORS TO CONCRETE SLAB.
9. LENGTH: RECYCLED PLASTIC 6 FEET LONG.
10. SEAT BACK MATERIAL: 2" x 4" 100% RECYCLED PLASTIC PLANK.
11. WHEN CONCRETE SLAB IS ADJACENT TO CONCRETE TRAIL, A 1/2" EXPANSION JOIN INSTALLED FULL DEPTH WILL BE REQUIRED WHERE THE CONCRETE SLAB JOINS THE CONCRETE TRAIL.
12. ACCEPTABLE BENCH MANUFACTURER IS PILOT ROCK PCXB/G-6PC24 SURFACE MOUNT BENCH, CEDAR COLOR OR APPROVED EQUAL BY CITY OF RALEIGH.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	BENCH INSTALLATION SURFACE MOUNT	
	GW-50.02	



TRASH RECEPTACLE SIDE VIEW

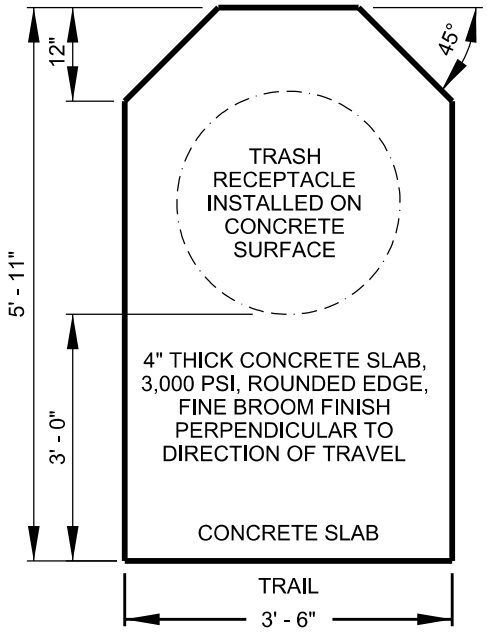
TRASH RECEPTACLE INSTALLATION IN-GROUND MOUNT

NOTES:

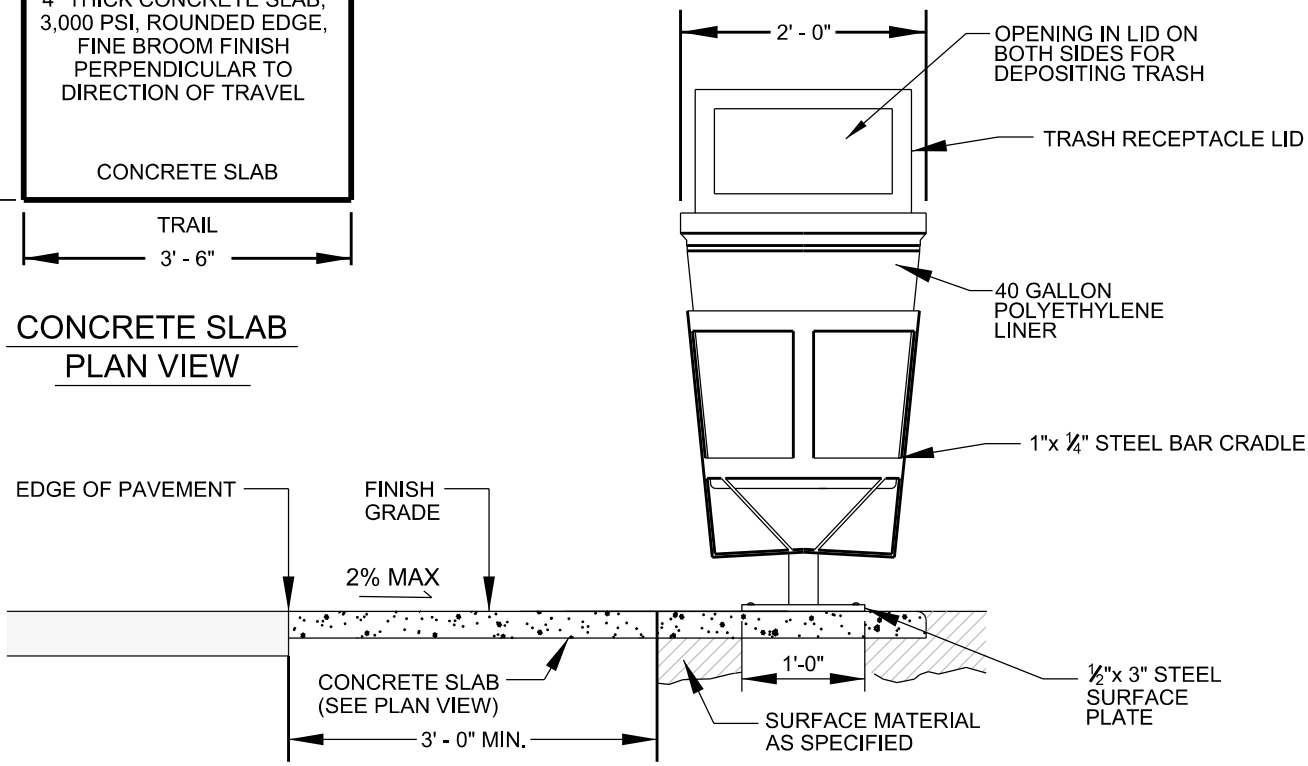
1. LOCATE RECEPTACLE AT EACH TRAIL HEAD OR AS DIRECTED BY THE CITY. RECEPTACLES AND BENCHES CAN BE LOCATED ON THE SAME CONCRETE PAD IF SIZED APPROPRIATELY. RECEPTACLES MUST BE A MINIMUM OF 4 FEET FROM BENCHES.
2. RECEPTACLES NEED TO BE ACCESSIBLE TO MAINTENANCE PERSONNEL AND GREENWAY TRAIL USERS.
3. DRAINAGE SHOULD SLOPE AWAY FROM THE RECEPTACLES AND TRAIL.
4. STEEL MEMBERS FINISH: HOT DIP GALVANIZED FINISH AFTER FABRICATION.
5. TRASH RECEPTACLE CRADLE SHALL BE CONSTRUCTED OF 1" X ¼" STEEL BARS.
6. FOLLOWING FABRICATION, STEEL CRADLE AND POST SHALL BE SEALED IN VINYL TO INHIBIT RUST AND ELIMINATE PERIODIC PAINTING.
7. A 40-GALLON LINER SHALL FIT INSIDE STEEL CRADLE. LINER AND LINER LID SHALL BE CONSTRUCTED OF TOUGH, ROTARY MOLDED POLYETHYLENE WITH A ROCKER BOTTOM. WEIGHT OF LINER SHALL NOT EXCEED 12-POUNDS. LINER LID SHALL BE ATTACHED TO STEEL CRADLE WITH A VINYL CABLE. PROVIDE WEEP HOLE IN LINER TO PERMIT DRAINAGE FOR OUTDOOR APPLICATION. PROVIDE AN OPENING IN THE LID ON BOTH SIDES FOR DEPOSITING LITTER.
8. PROVIDE MOUNTING BRACKET FOR ATTACHING STEEL CRADLE TO IN-GROUND POST. IN-GROUND POST SHALL BE MANUFACTURER'S STANDARD. ANCHOR POST IN CONCRETE FOUNDATION.
9. TRASH RECEPTACLES ARE SINGLE RECEPTACLES (SEPARATE PIECES WITH IN-GROUND POSTS).
10. ACCEPTABLE TRASH RECEPTACLE MANUFACTURER IS BEST LITTER RECEPTACLE, INC RTC-1000, GREEN COLOR OR APPROVED EQUAL BY CITY OF RALEIGH.
11. LID TO BE GREEN COLOR TO MATCH CRADLE. LID TO HAVE TWO OPENINGS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRASH RECEPTACLE INSTALLATION IN-GROUND MOUNT	
	GW-50.03	



CONCRETE SLAB
PLAN VIEW



TRASH RECEPTACLE SIDE VIEW

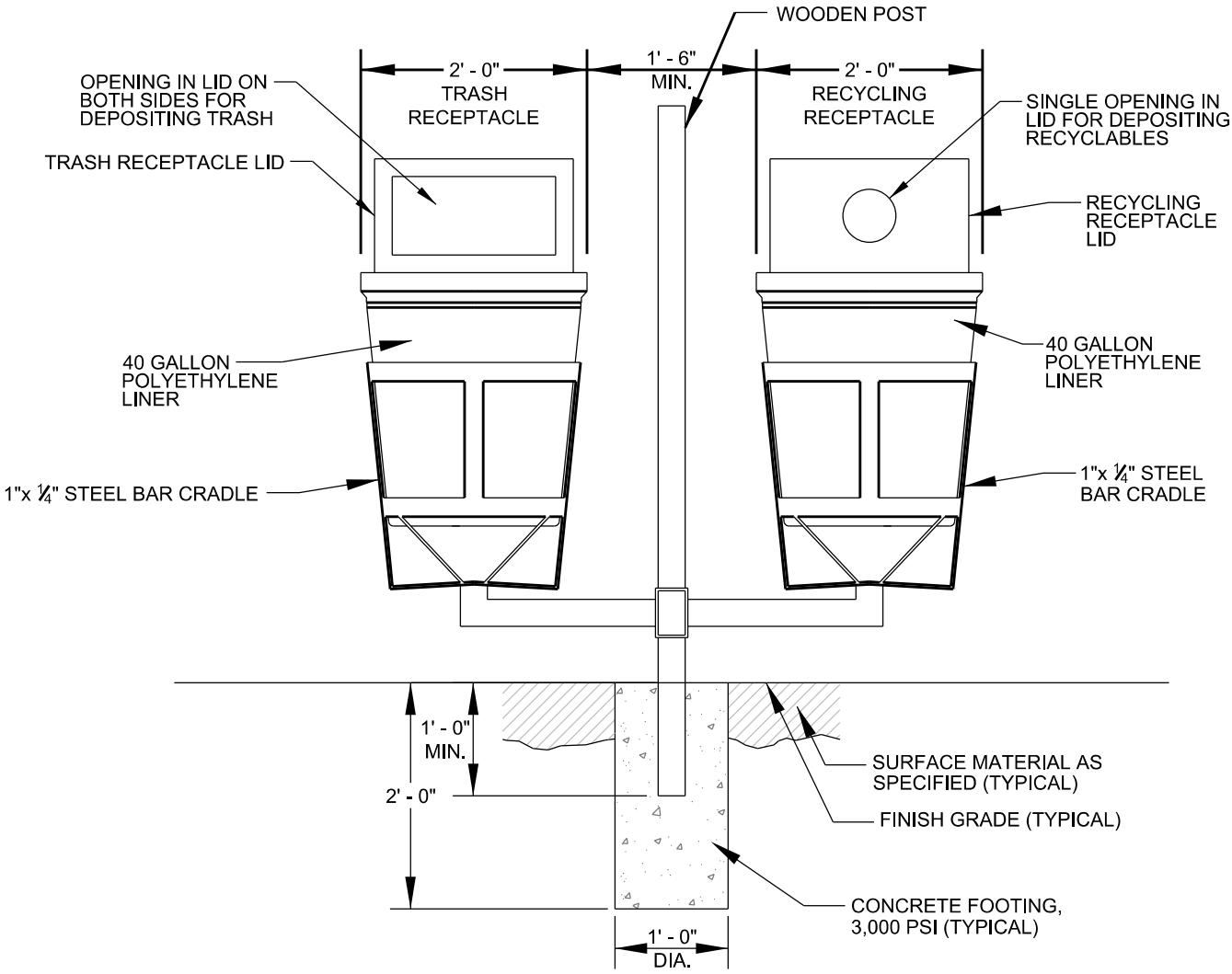
TRASH RECEPTACLE INSTALLATION
SURFACE MOUNT

NOTES:

1. LOCATE RECEPTACLE AT EACH TRAIL HEAD OR AS DIRECTED BY THE CITY. RECEPTACLES AND BENCHES CAN BE LOCATED ON THE SAME CONCRETE PAD IF SIZED APPROPRIATELY. RECEPTACLES MUST BE A MINIMUM OF 4 FEET FROM BENCHES.
2. RECEPTACLES NEED TO BE ACCESSIBLE TO MAINTENANCE PERSONNEL AND GREENWAY TRAIL USERS.
3. DRAINAGE SHOULD SLOPE AWAY FROM RECEPTACLES AND TRAIL.
4. STEEL MEMBERS FINISH: HOT DIP GALVANIZED FINISH AFTER FABRICATION.
5. TRASH RECEPTACLE CRADLE SHALL BE CONSTRUCTED OF 1" X ¼" STEEL BARS.
6. FOLLOWING FABRICATION, STEEL CRADLE AND POST SHALL BE SEALED IN VINYL TO INHIBIT RUST AND ELIMINATE PERIODIC PAINTING.
7. A 40-GALLON LINER SHALL FIT INSIDE STEEL CRADLE. LINER AND LINER LID SHALL BE CONSTRUCTED OF TOUGH, ROTARY MOLDED POLYETHYLENE WITH A ROCKER BOTTOM. WEIGHT OF LINER SHALL NOT EXCEED 12-POUNDS. LINER LID SHALL BE ATTACHED TO STEEL CRADLE WITH A VINYL CABLE. PROVIDE WEEP HOLE IN LINER TO PERMIT DRAINAGE FOR OUTDOOR APPLICATION. PROVIDE AN OPENING IN THE LID ON BOTH SIDES FOR DEPOSITING LITTER.
8. MOUNTING SHALL BE MANUFACTURER'S STANDARD.
9. TRASH RECEPTACLES ARE SINGLE RECEPTACLES (SEPARATE PIECES WITH SURFACE MOUNT).
10. ACCEPTABLE TRASH RECEPTACLE MANUFACTURER IS BEST LITTER RECEPTACLE, INC RTC-1000, GREEN COLOR OR APPROVED EQUAL BY CITY OF RALEIGH.
11. LID TO BE GREEN COLOR TO MATCH CRADLE. LID TO HAVE TWO OPENINGS.
12. WHEN CONCRETE SLAB IS ADJACENT TO CONCRETE TRAIL, A 1/2" EXPANSION JOINT INSTALLED FULL DEPTH WILL BE REQUIRED WHERE THE CONCRETE SLAB JOINS THE CONCRETE TRAIL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRASH RECEPTACLE INSTALLATION SURFACE MOUNT	
	GW-50.04	



TRASH AND RECYCLING RECEPTACLE SIDE VIEW

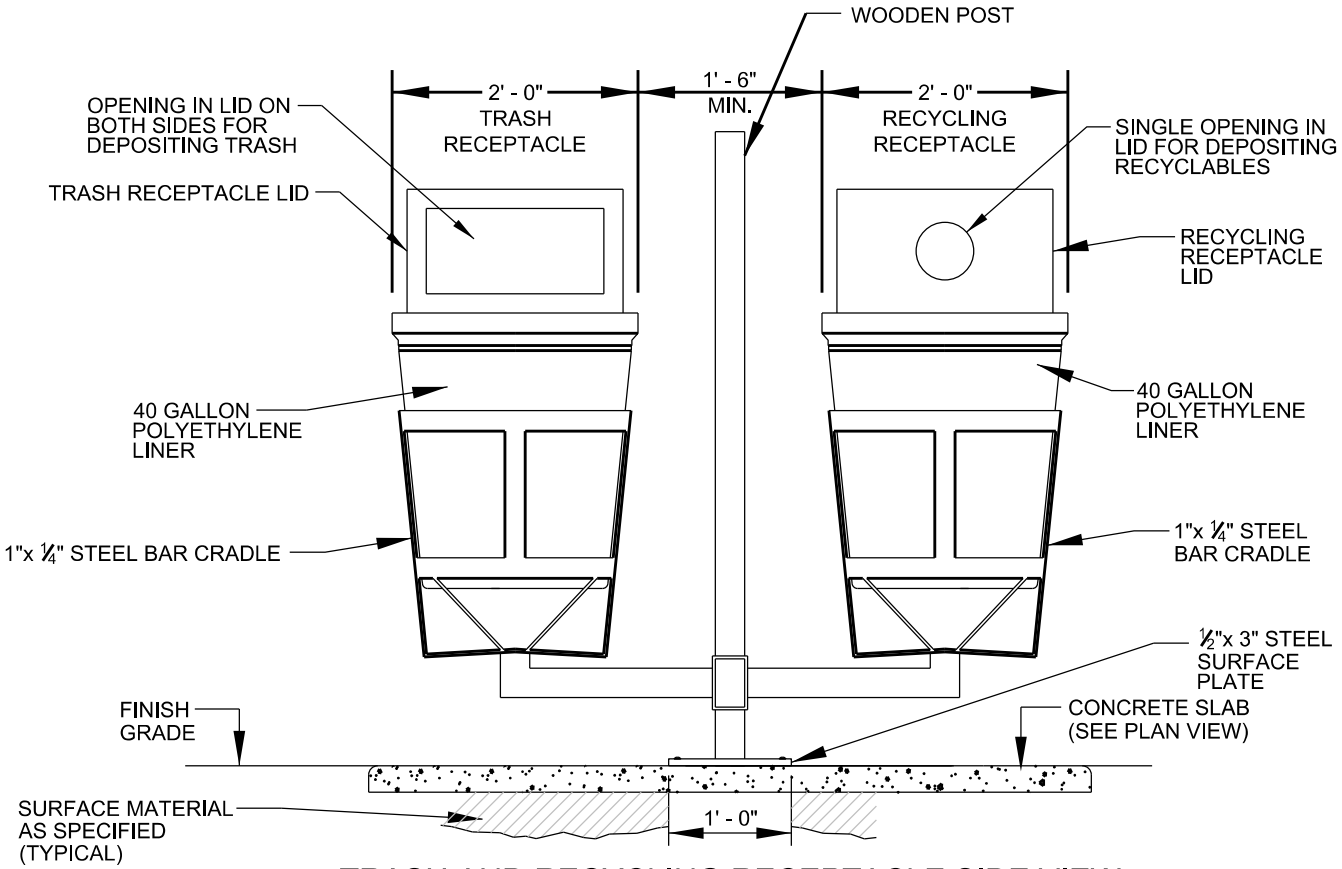
TRASH AND RECYCLING RECEPTACLE INSTALLATION IN-GROUND MOUNT

NOTES:

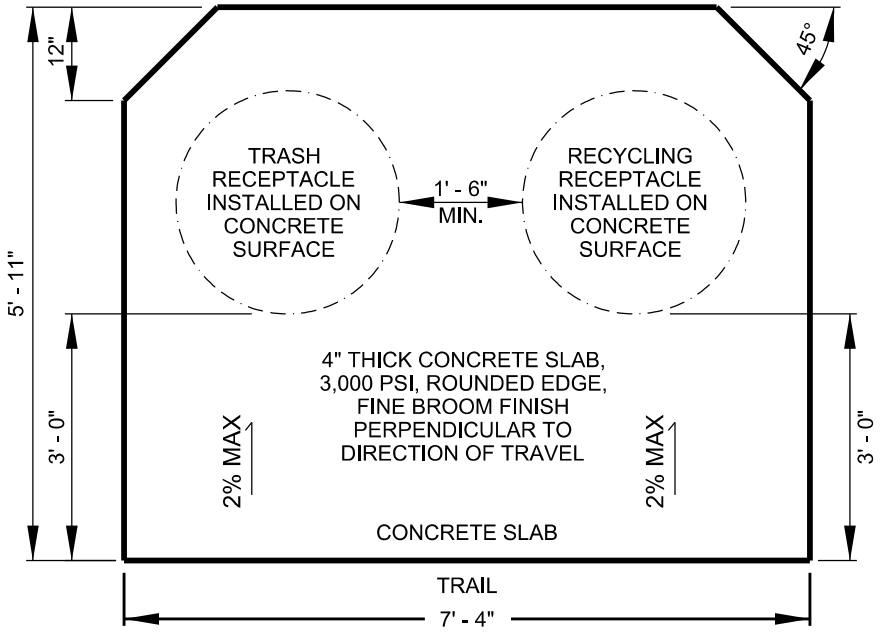
1. LOCATE RECEPTACLES AT EACH TRAIL HEAD OR AS DIRECTED BY THE CITY. RECEPTACLES MUST BE A MINIMUM OF 4 FEET FROM BENCHES.
2. RECEPTACLES SHOULD BE SET BACK A MINIMUM OF 3 FEET FROM THE EDGE OF THE GREENWAY TRAIL.
3. DRAINAGE SHOULD SLOPE AWAY FROM THE RECEPTACLES AND GREENWAY TRAIL. PROVIDE 2% MAX CROSS SLOPE FROM EDGE OF TRAIL TO RECEPTACLES WHERE FEASIBLE.
4. RECEPTACLE CRADLES SHALL BE CONSTRUCTED OF 1" X ¼" STEEL BARS.
5. FOLLOWING FABRICATION, STEEL CRADLES AND POSTS SHALL BE SEALED IN VINYL TO INHIBIT RUST AND ELIMINATE PERIODIC PAINTING.
6. A 40-GALLON LINER SHALL FIT INSIDE EACH STEEL CRADLE. LINERS AND LINER LIDS SHALL BE CONSTRUCTED OF TOUGH, ROTARY MOLDED POLYETHYLENE WITH A ROCKER BOTTOM. WEIGHT OF LINERS SHALL NOT EXCEED 12-POUNDS. LINER LIDS SHALL BE ATTACHED TO STEEL CRADLES WITH A VINYL CABLE. PROVIDE WEEP HOLE IN LINERS TO PERMIT DRAINAGE FOR OUTDOOR APPLICATION. PROVIDE TWO OPENINGS (ONE ON EACH SIDE) IN THE TRASH RECEPTACLE LID AND ONE OPENING IN THE RECYCLING RECEPTACLE LID FOR DEPOSITING LITTER AND RECYCLABLES, RESPECTIVELY.
7. RECEPTACLES ARE A COMBINATION UNIT (COMBINED UNIT WITH IN-GROUND POST).
8. ACCEPTABLE RECEPTACLE MANUFACTURER IS BEST LITTER RECEPTACLE, INC RTC-1000, GREEN COLOR FOR TRASH AND BLUE COLOR FOR RECYCLING OR APPROVED EQUAL BY CITY OF RALEIGH. RECYCLING RECEPTACLES SHOULD BE SIGNED AS RECYCLING AND PROVIDE INFORMATION ON WHAT RECYCLABLES ARE ACCEPTED. CONSIDER INCLUDING EDUCATIONAL SIGNAGE ABOUT THE IMPORTANCE OF RECYCLING AND THE ENVIRONMENTAL BENEFITS.
9. TRASH RECEPTACLE LID TO BE GREEN COLOR TO MATCH CRADLE. RECYCLING RECEPTACLE LID TO BE BLUE COLOR TO MATCH CRADLE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRASH AND RECYCLING RECEPTACLE INSTALLATION IN-GROUND MOUNT	
	GW-50.05	



TRASH AND RECYCLING RECEPTACLE SIDE VIEW



CONCRETE SLAB PLAN VIEW

TRASH AND RECYCLING RECEPTACLE INSTALLATION SURFACE MOUNT

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 12/2022	NOT TO SCALE
	TRASH AND RECYCLING RECEPTACLE INSTALLATION SURFACE MOUNT	
	GW-50.06.1	

TRASH AND RECYCLING RECEPTACLE INSTALLATION SURFACE MOUNT - NOTES:

1. LOCATE RECEPTACLES AT EACH TRAIL HEAD OR AS DIRECTED BY THE CITY. RECEPTACLES MUST BE A MINIMUM OF 4 FEET FROM BENCHES.

2. RECEPTACLES SHOULD BE SET BACK A MINIMUM OF 3 FEET FROM THE EDGE OF THE GREENWAY TRAIL.

3. DRAINAGE SHOULD SLOPE AWAY FROM THE RECEPTACLES AND GREENWAY TRAIL. PROVIDE 2% MAX CROSS SLOPE FROM EDGE OF TRAIL TO RECEPTACLES WHERE FEASIBLE.

4. RECEPTACLE CRADLES SHALL BE CONSTRUCTED OF 1" X ¼" STEEL BARS.

5. FOLLOWING FABRICATION, STEEL CRADLES AND POSTS SHALL BE SEALED IN VINYL TO INHIBIT RUST AND ELIMINATE PERIODIC PAINTING.

6. A 40-GALLON LINER SHALL FIT INSIDE EACH STEEL CRADLE. LINERS AND LINER LIDS SHALL BE CONSTRUCTED OF TOUGH, ROTARY MOLDED POLYETHYLENE WITH A ROCKER BOTTOM. WEIGHT OF LINERS SHALL NOT EXCEED 12-POUNDS. LINER LIDS SHALL BE ATTACHED TO STEEL CRADLES WITH A VINYL CABLE. PROVIDE WEEP HOLE IN LINERS TO PERMIT DRAINAGE FOR OUTDOOR APPLICATION. PROVIDE TWO OPENINGS (ONE ON EACH SIDE) IN THE TRASH RECEPTACLE LID AND ONE OPENING IN THE RECYCLING RECEPTACLE LID FOR DEPOSITING LITTER AND RECYCLABLES, RESPECTIVELY.

7. RECEPTACLES ARE A COMBINATION UNIT (COMBINED UNIT SURFACE MOUNT).

8. ACCEPTABLE RECEPTACLE MANUFACTURER IS BEST LITTER RECEPTACLE, INC RTC-1000, GREEN COLOR FOR TRASH AND BLUE COLOR FOR RECYCLING OR APPROVED EQUAL BY CITY OF RALEIGH. RECYCLING RECEPTACLES SHOULD BE SIGNED AS RECYCLING AND PROVIDE INFORMATION ON WHAT RECYCLABLES ARE ACCEPTED. CONSIDER INCLUDING EDUCATIONAL SIGNAGE ABOUT THE IMPORTANCE OF RECYCLING AND THE ENVIRONMENTAL BENEFITS.

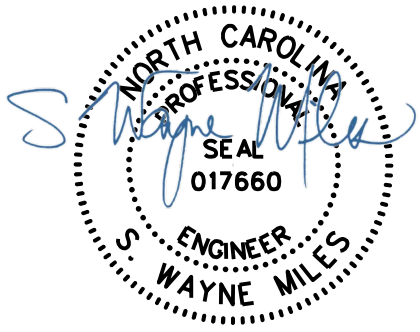
9. TRASH RECEPTACLE LID TO BE GREEN COLOR TO MATCH CRADLE. RECYCLING RECEPTACLE LID TO BE BLUE COLOR TO MATCH CRADLE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	*DATE: 12/2022*	*NOT TO SCALE*
	TRASH AND RECYCLING RECEPTACLE INSTALLATION SURFACE MOUNT	
	GW-50.06.2	

City of Raleigh

Standard Details



Stormwater

APPROVED NCDOT DETAILS

DETAIL NUMBER	DETAIL NAME
310.10	DRIVEWAY PIPE CONSTRUCTION USING NO SPECIAL END SECTIONS
838.01 - 838.80	ENDWALLS PER NCDOT
840.00	CONCRETE BASE PAD FOR DRAINAGE STRUCTURES
840.01	BRICK CATCH BASIN 12" THRU 54" PIPE
840.02	CONCRETE CATCH BASIN 12" THRU 54" PIPE
840.03	FRAME, GRATES AND HOOD
840.04	CONCRETE OPEN THROAT CATCH BASIN 12" THRU 48" PIPE
840.05	BRICK OPEN THROAT CATCH BASIN 12" THRU 48" PIPE
840.14	CONCRETE DROP INLET 12" THRU 30" PIPE
840.15	BRICK DROP INLET 12" THRU 30" PIPE
840.16	DROP INLET FRAME AND GRATE FOR USE WITH DWGS. 840.14 & 840.15
840.31	CONCRETE JUNCTION BOX 12" THRU 66" PIPE
840.32	BRICK JUNCTION BOX 12" THRU 66" PIPE
840.34	TRAFFIC BEARING JUNCTION BOX FOR PIPES 42" AND UNDER
840.45	PRECAST DRAINAGE STRUCTURE (SOLID ONLY)
840.46	TRAFFIC BEARING PRECAST DRAINAGE STRUCTURE
840.51	BRICK MANHOLE 12" THRU 36" PIPE
840.52	PRECAST MANHOLE 4', 5' AND 6' DIAMETER 12" THRU 48" PIPE
840.53	PRECAST MANHOLE WITH MASONRY BASE 12" THRU 42" PIPE
840.54	MANHOLE FRAME AND COVER
840.55	MANHOLE FRAME AND COVER (FLUSH WITH SLAB FOR OPEN THROAT CATCH BASIN)
840.66	DRAINAGE STRUCTURE STEPS
840.71	CONCRETE AND BRICK PIPE PLUG
840.72	PIPE COLLAR
876.01	RIP RAP IN CHANNELS AND DITCHES
876.03	DRAINAGE DITCHES WITH CLASS "A" RIP RAP
876.04	DRAINAGE DITCHES WITH CLASS "B" RIP RAP

NOTES:

1. THIS TABLE DOES NOT NEED TO BE PLACED ON THE PLANS.
2. PLACE ANY APPLICABLE NCDOT DETAILS FROM THE TABLE ON THE PLANS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	APPROVED NCDOT DETAILS	
	SW-10.01.1	

APPROVED NCDOT DETAILS

DETAIL NUMBER	DETAIL NAME
CONVERSION	CONVERT BOX TO OTCB
CONVERSION	CONVERT BOX TO TB 2GI
CONVERSION	CONVERT BOX TO TBJB
CONVERSION	CONVERT CB DI OTCB OR 2GI TO JB
CONVERSION	CONVERT CB OR JB TO DI OR 2GI
CONVERSION	CONVERT DI OR CB TO TBJB WITH STEEL COVER
CONVERSION	CONVERT DI OR JB TO CB
CONVERSION	CONVERT OTCB TO CB

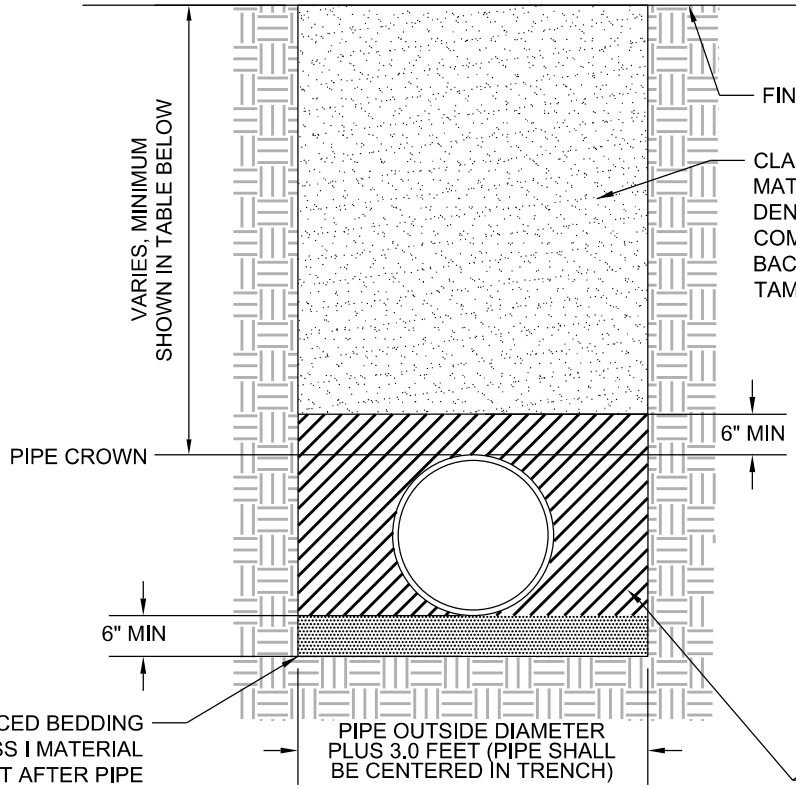
NOTES:

1. THIS TABLE DOES NOT NEED TO BE PLACED ON THE PLANS.
2. PLACE ANY APPLICABLE NCDOT DETAILS FROM THE TABLE ON THE PLANS.

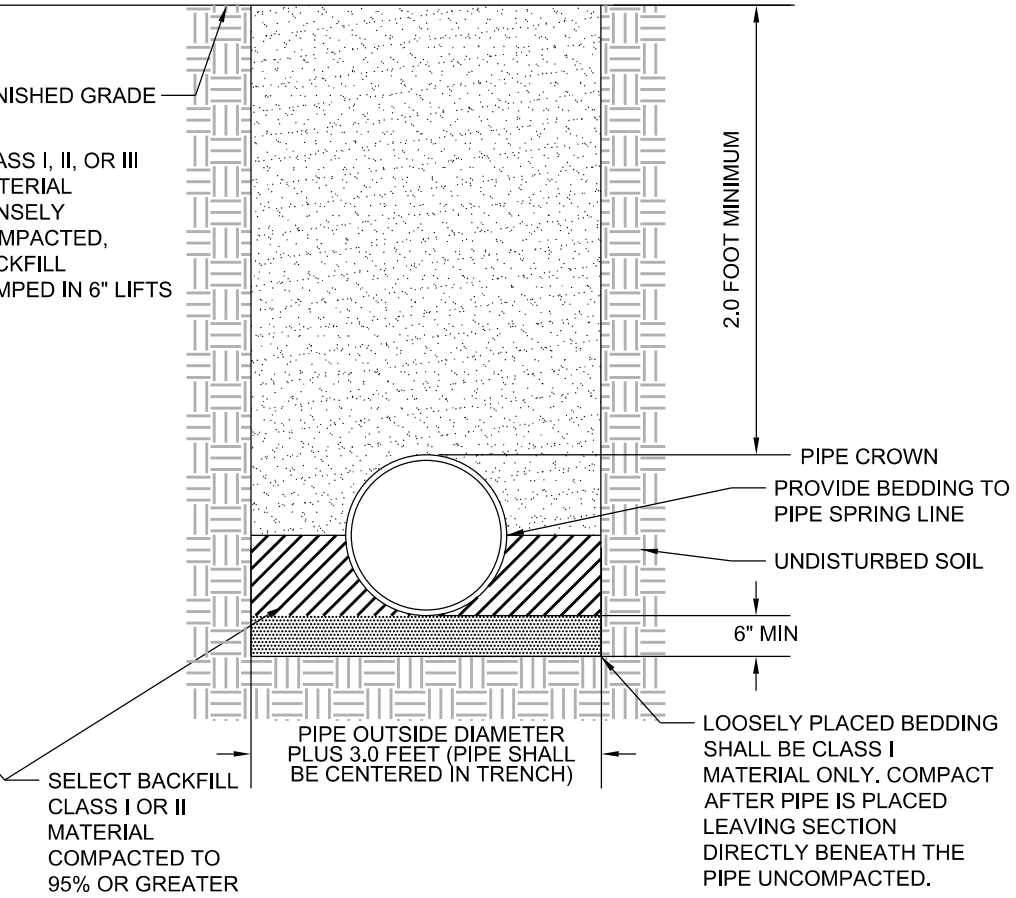
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	APPROVED NCDOT DETAILS	
	SW-10.01.2	

TYPICAL SECTION A: HDPE AND PP



TYPICAL SECTION B: RCP



DIAMETER (in)	HIGH DENSITY POLYETHYLENE (HDPE) AND POLYPROPLYENE (PP) MIN COVER CROWN TO FINISHED GRADE (ft)
15	2.0
18	2.0
24	2.0
30	2.0
36	2.1
42	2.4
48	2.8

GENERAL NOTES:

1. BACKFILL MATERIAL SHALL BE #57 STONE, #67 STONE, ASTM D2321 CLASS II MATERIAL, OR AASHTO A1 OR A3 MATERIAL.
2. MAXIMUM COVER REQUIREMENTS SHALL BE ESTABLISHED BY THE ENGINEER OF RECORD THROUGH ENGINEERING CALCULATIONS BASED UPON AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THE PIPE MATERIALS SPECIFIED ON THE PLANS.
3. MAXIMUM ALLOWABLE DIAMETER FOR HDPE AND PP IS 48".
4. IF WATER TABLE IS HIGHER THAN SUBGRADE OF TRENCH, STONE BACKFILL MATERIAL SHALL BE WRAPPED IN NCDOT TYPE 4A GEOTEXTILE.
5. IT IS THE RESPONSIBILITY OF THE ENGINEER TO CONFIRM THE STRUCTURAL DESIGN ASSUMPTIONS REGARDING THE FOUNDATION SUPPORT AND THAT THE ASSUMED GROUNDWATER CONDITIONS OF THE STRUCTURAL TRENCH SUPPORT WILL BE MET.

CITY OF RALEIGH
STANDARD DETAIL

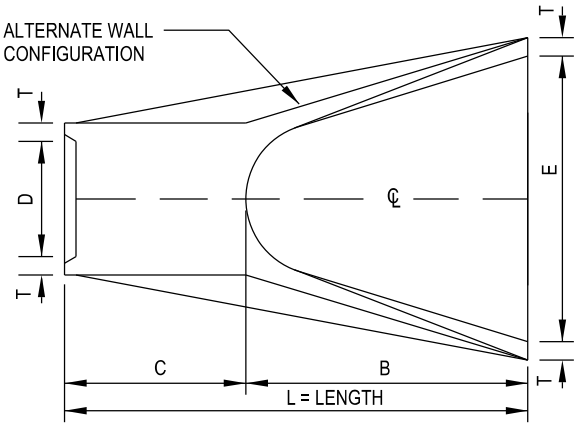
REVISIONS

BEDDING FOR STORMWATER PIPES

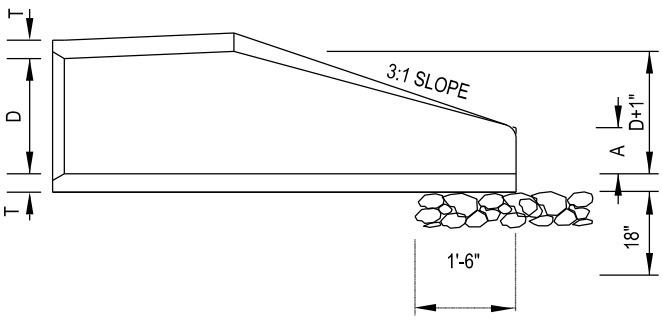
DATE: 9/2024

NOT TO SCALE

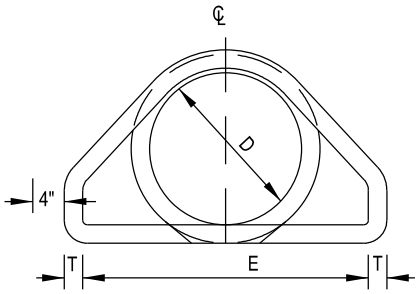
SW-10.02



PLAN



SECTION



END VIEW

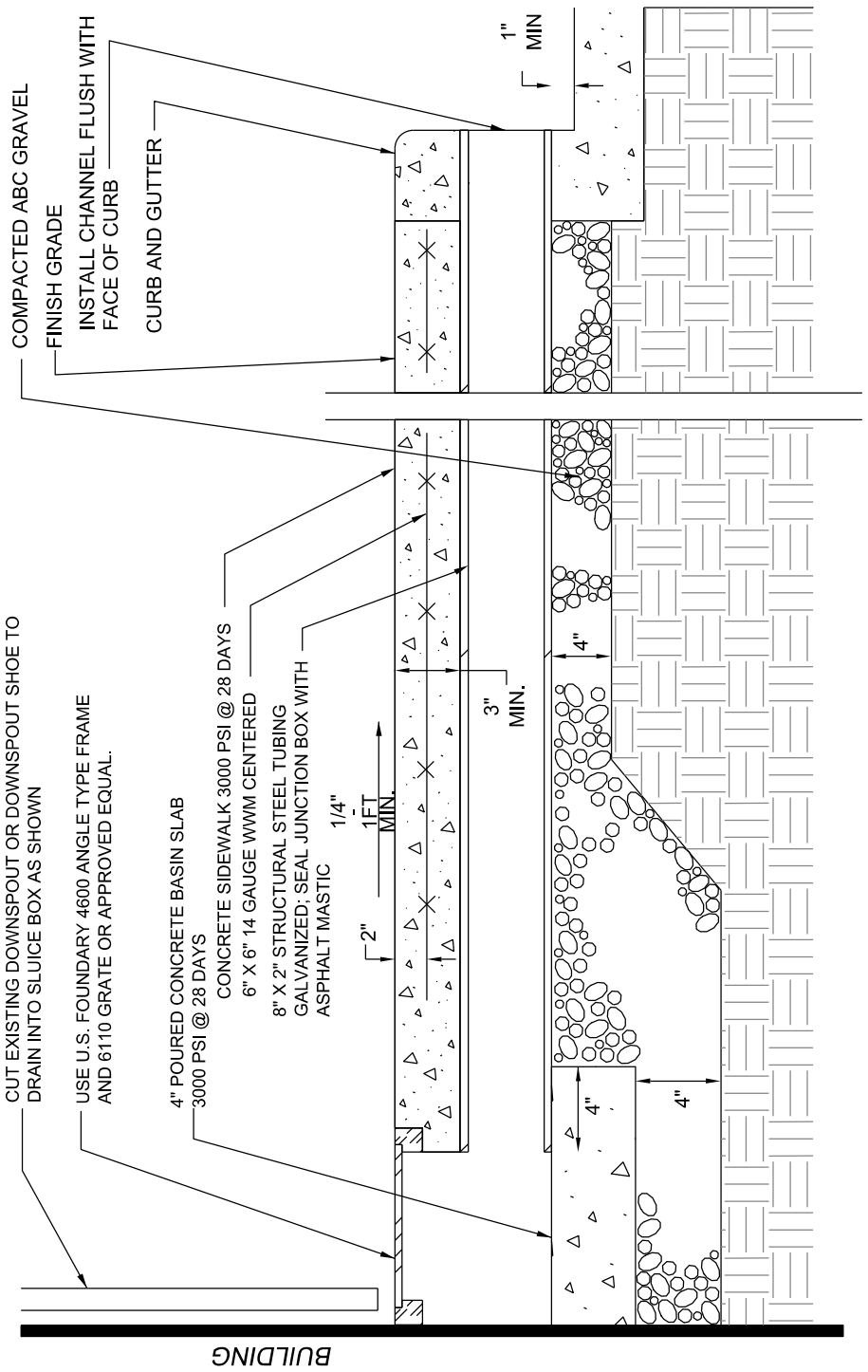
TABLE OF DIMENSIONS							
D	T	A	B	C	E	L	WT.
15"	2-1/4"	6"	2'-3"	3'-10"	2'-0"	6'-1"	730
18"	2-1/2"	9"	2'-3"	3'-10"	3'-0"	6'-1"	1190
24"	3"	10"	3'-8"	2'-6"	4'-0"	6'-2"	1770
30"	3-1/2"	1'-0"	4'-6"	1'-8"	5'-0"	6'-2"	2380

NOTES:

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

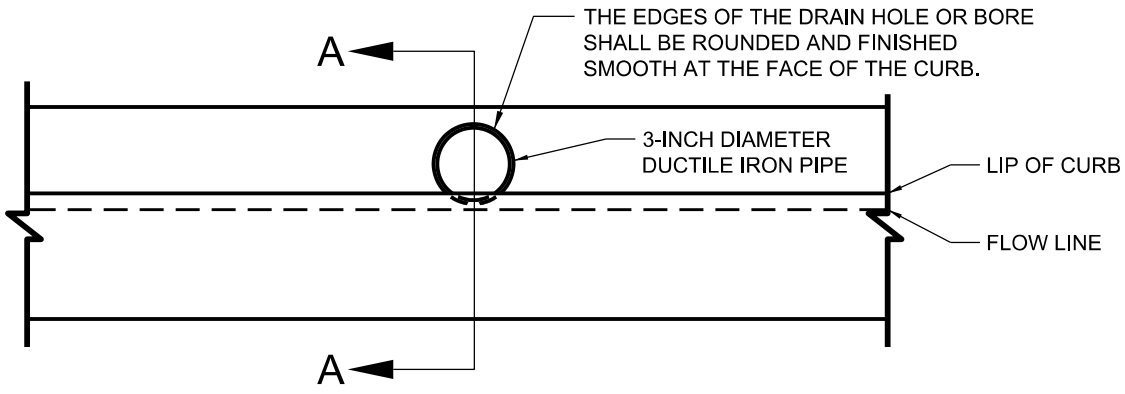
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	FLARED END SECTION 15" THRU 30" PIPE	
	SW-10.03	

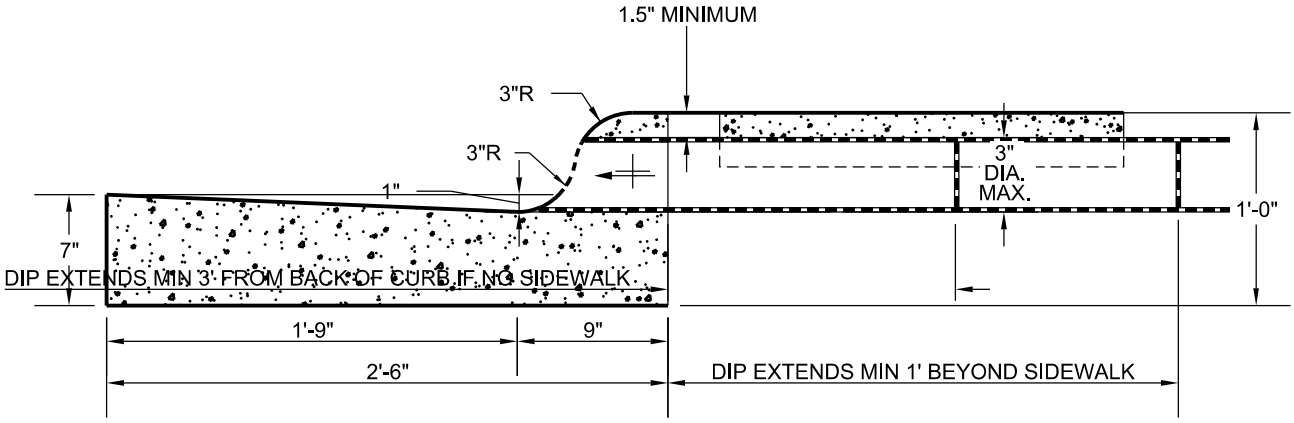


CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	COMMERCIAL CURB DRAIN DETAIL	
	SW-10.04	



FRONT VIEW



SECTION A-A

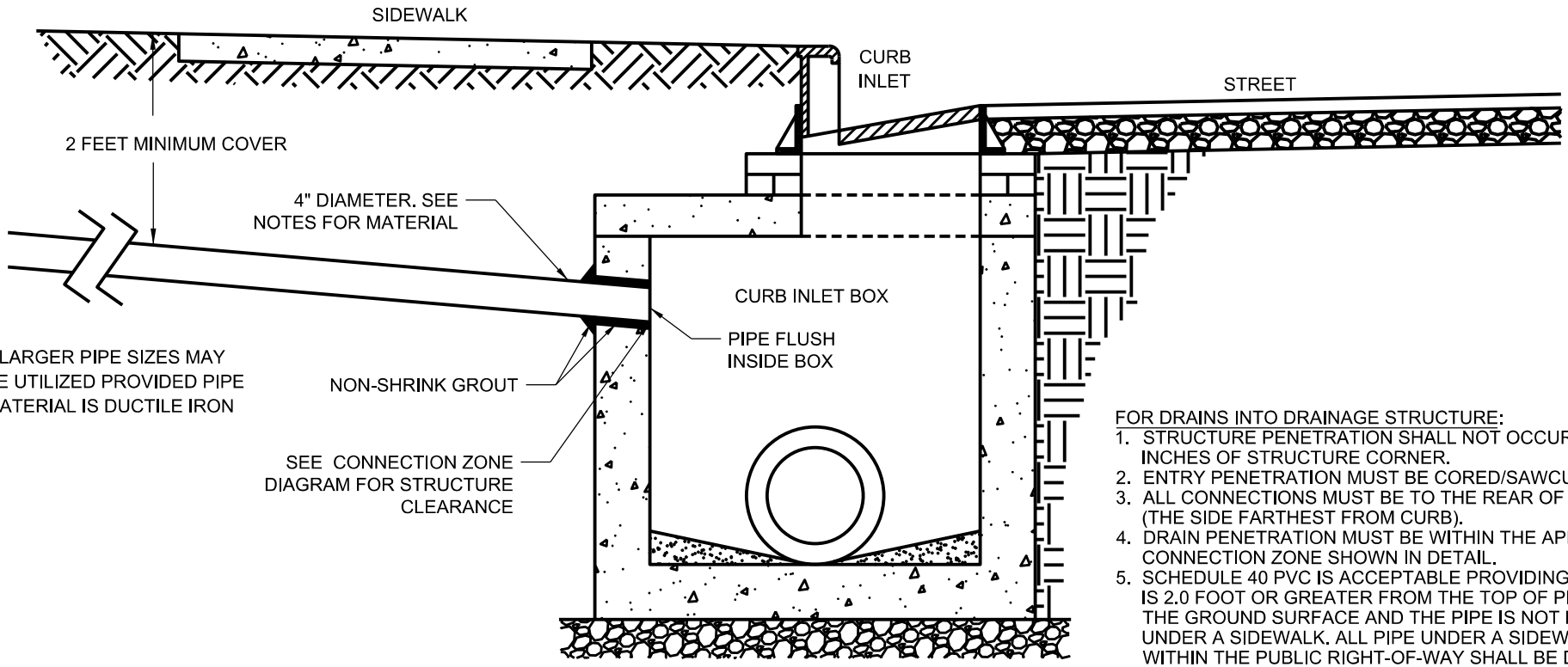
GENERAL NOTES:
1. A RIGHT-OF-WAY PERMIT IS REQUIRED FOR ANY CONNECTION OF RESIDENTIAL DRAINAGE INTO THE RIGHT-OF-WAY
2. ALL STORMWATER PIPE DISCHARGE SHALL BE TIED INTO A STORMWATER SYSTEM STRUCTURE (JUNCTION, MANHOLE, INLET, ETC. SEE DRAIN CONNECTION TO STRUCTURE DETAIL SW-10.06). IF A DIRECT TIE IN IS NOT POSSIBLE DUE TO ELEVATION CONSTRAINTS, LOCATION CONSTRAINTS, UTILITY/PHYSICAL OBSTRUCTIONS OR OTHER REASON ACCEPTABLE TO THE CITY, A CURB-O-LET (OR EQUAL) MAY BE USED TO TIE INTO THE CURB LINE. IF CURB-O-LET CANNOT BE USED, RESIDENTIAL CURB BORE DETAIL MAY BE USED WITH APPROVAL BY THE CITY
3. WHEN SIDEWALK IS PRESENT, THE FULL SIDEWALK PANEL (FROM JOINT TO JOINT) MUST BE REPLACED WHEN INSTALLING DRAIN. BORING UNDER THE SIDEWALK IS NOT ALLOWED.
4. ALL CONCRETE USED SHALL BE 3000 PSI OR GREATER.
5. FUTURE MAINTENANCE IS THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY FROM WHICH THE DRAIN ORIGINATES

FOR CURB BORE:
1. ALL CURB BORES REQUIRE THE USE OF DUCTILE IRON PIPE A MINIMUM OF 3 FEET FROM THE CURB OR, FOR SIDEWALK LOCATIONS, THE DIP MUST EXTEND A MINIMUM OF 1 FOOT BEYOND THE CURB. SEE DETAIL.
2. PVC IS NOT ALLOWED IN CURB BORE CONNECTIONS.
3. CURB BORE CANNOT BE WITHIN 6 FEET OF A INTERSECTION RADIUS OR 12 INCHES OF CONSTRUCTION OR EXPANSION JOINTS.
4. ANY OVERBORE $\frac{1}{2}$" OR LESS SHALL BE SEALED WITH CEMENTITIOUS GROUT OR CAULK. IF OVERBORE IS $\frac{1}{2}$" OR GREATER THEN 3000 PSI CONCRETE FILLER IS REQUIRED.
5. DISCHARGE PIPE SHALL NOT EXTEND BEYOND OR PROTRUDE BEYOND THE CURB FACE.
6. MULTIPLE CURB BORES (DRAINS) IN THE CURB SHALL BE SEPARATED BY A MINIMUM OF 12 INCHES OF CURB.
7. ALL CURB BORES MUST USE A CONCRETE BORE NO GREATER THAN 4 INCHES.

FOR PREMANUFACTURED CURB DRAIN STRUCTURES:
1. PREMANUFACTURED CURB DRAIN STRUCTURE MAY BE USED IN LIEU OF CURB BORE TIE-IN WITH CITY APPROVAL.
2. PREMANUFACTURED CURB DRAIN STRUCTURE SHALL BE CURB-O-LET OR EQUAL.
3. PREMANUFACTURED CURB DRAIN SHALL BE INSTALLED IN COMPLIANCE WITH MANUFACTURER'S RECOMMENDATIONS.
4. PREMANUFACTURED CURB DRAINS MAY BE INSTALLED SIDE BY SIDE IF NECESSARY.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	RESIDENTIAL CURB BORE	
	SW-10.05	

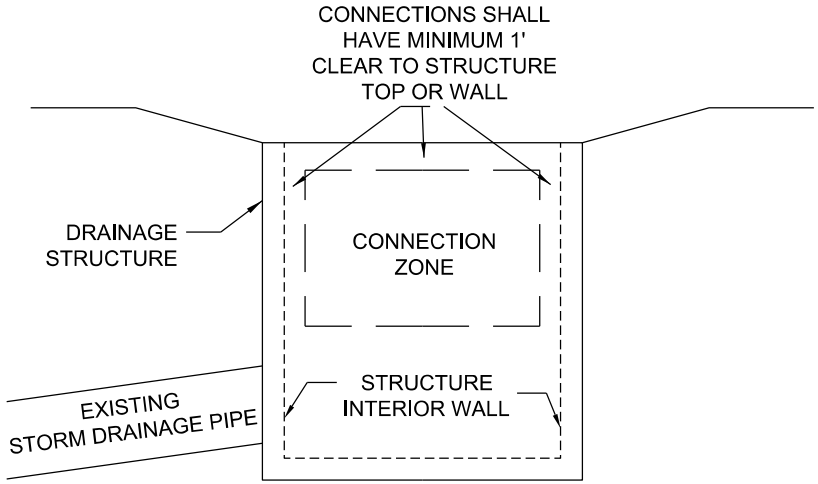


FOR DRAINS INTO DRAINAGE STRUCTURE:

1. STRUCTURE PENETRATION SHALL NOT OCCUR WITHIN 12 INCHES OF STRUCTURE CORNER.
2. ENTRY PENETRATION MUST BE CORED/SAWCUT.
3. ALL CONNECTIONS MUST BE TO THE REAR OF THE BOX (THE SIDE FARTHEST FROM CURB).
4. DRAIN PENETRATION MUST BE WITHIN THE APPROVED CONNECTION ZONE SHOWN IN DETAIL.
5. SCHEDULE 40 PVC IS ACCEPTABLE PROVIDING THE PIPE IS 2.0 FOOT OR GREATER FROM THE TOP OF PIPE TO THE GROUND SURFACE AND THE PIPE IS NOT LOCATED UNDER A SIDEWALK. ALL PIPE UNDER A SIDEWALK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE DUCTILE IRON PIPE.

GENERAL NOTES:

1. A RIGHT-OF-WAY PERMIT IS REQUIRED FOR ANY CONNECTION OF RESIDENTIAL DRAINAGE INTO THE RIGHT-OF-WAY.
2. ALL STORMWATER PIPE DISCHARGES SHALL BE TIED INTO A STORMWATER SYSTEM STRUCTURE (JUNCTION, MANHOLE, INLET, ETC.) IF A DIRECT TIE IN IS NOT POSSIBLE DUE TO ELEVATION CONSTRAINTS, LOCATION CONSTRAINTS, UTILITY/PHYSICAL OBSTRUCTIONS OR OTHER REASON ACCEPTABLE TO THE CITY, A CURB-O-LET (OR EQUAL) MAY BE USED TO TIE INTO THE CURB LINE. IF CURB-O-LET CANNOT BE USED, CURB BORE DETAIL (SW-10.05) MAY BE USED WITH APPROVAL BY THE CITY.
3. WHEN SIDEWALK IS PRESENT, THE FULL SIDEWALK PANEL (FROM JOINT TO JOINT) MUST BE REPLACED WHEN INSTALLING DRAIN. BORING UNDER THE SIDEWALK IS NOT ALLOWED.
4. ALL CONCRETE USED SHALL BE 3000 PSI OR GREATER.
5. FUTURE MAINTENANCE IS THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY FROM WHICH THE DRAIN ORIGINATES.



CONNECTION ZONE
DIAGRAM

SW-10.06	SMALL DRAIN CONNECTION TO DRAINAGE STRUCTURE	REVISIONS DATE: 9/2024 NOT TO SCALE	CITY OF RALEIGH STANDARD DETAIL

APPROVED NCDEQ DETAILS FOR EROSION AND SEDIMENT CONTROL

DETAIL	SPECIAL NOTES
6.03 SURFACE ROUGHENING	
6.10 TEMPORARY SEEDING	
6.11 PERMANENT SEEDING	
6.14 MULCHING	
6.15 RIPRAP	
6.17 ROLLED EROSION CONTROL PRODUCTS	
6.18 COMPOST BLANKETS	
6.23 RIGHT-OF-WAY DIVERSIONS	
6.24 RIPARIAN AREA SEEDING (PIEDMONT)	ENSURE PIEDMONT DETAIL IS USED
6.30 GRASS-LINED CHANNELS	
6.31 RIPRAP AND PAVED CHANNELS	
6.32 TEMPORARY SLOPE DRAINS	
6.41 OUTLET STABILIZATION STRUCTURES	
6.50 EXCAVATED DROP INLET PROTECTION	
6.54 ROCK DOUGHNUT INLET PROTECTION	
6.55 ROCK PIPE INLET PROTECTION	
6.63 SEDIMENT BASIN WITH ROCK DAM	ONLY FOR DRAINAGE AREAS LESS THAN 1 AC
6.66 POROUS BAFFLES	
6.67 SILT SOCK (FOR CHECK DAM)	
6.67 SILT SOCK (FOR PERIMETER AND INLET PROTECTION)	
6.70 TEMPORARY STREAM CROSSING	
6.87 CHECK DAM (WITH WEIR)	OPTIONAL USE OF PAM
6.87 CHECK DAM WITHOUT WEIR	OPTIONAL USE OF PAM

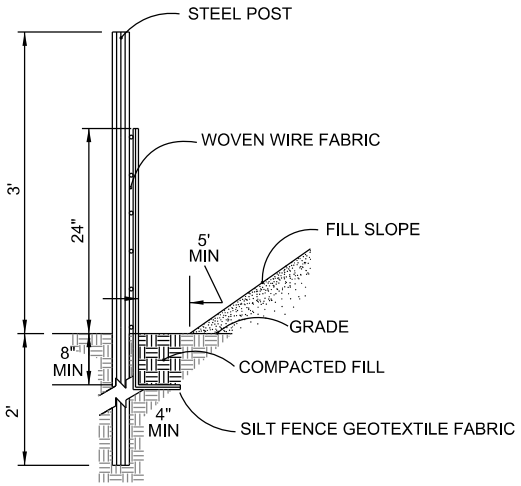
NOTES:
1. THIS TABLE DOES NOT NEED TO BE PLACED ON THE PLANS.
2. PLACE ANY APPLICABLE NCDEQ DETAILS FROM THE TABLE ON THE PLANS.

CITY OF RALEIGH
STANDARD DETAIL

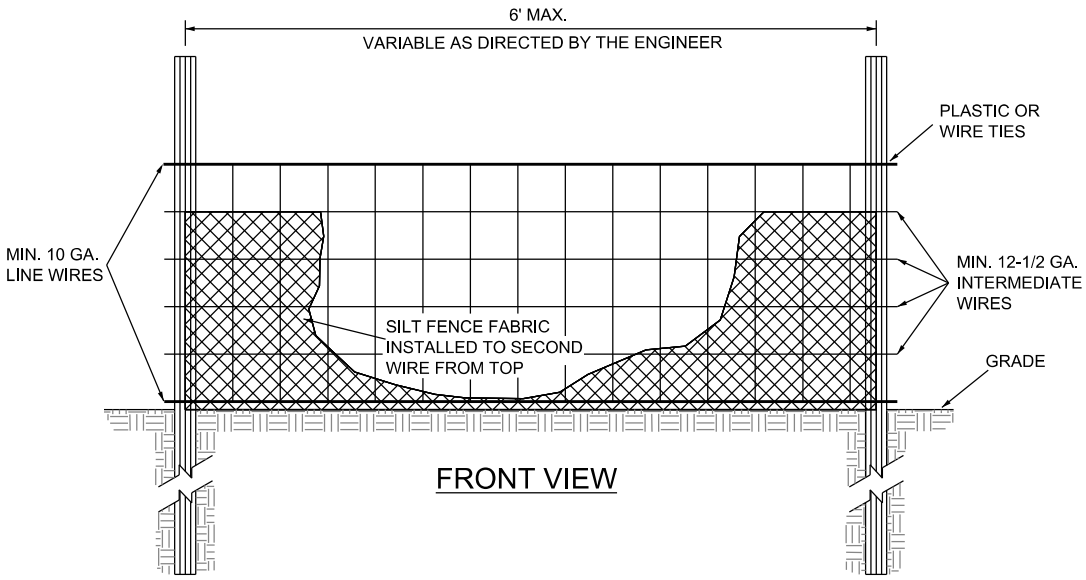
REVISIONS	DATE: 9/2024	NOT TO SCALE
	APPROVED NCDEQ DETAILS FOR EROSION CONTOL	
	SW-20.01	

INSTALLATION NOTES:

1. SEE NCDEQ SEDIMENT DESIGN MANUAL FOR CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS.
2. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
3. END OF SILT FENCE MUST BE TURNED UPHILL.
4. UV RESISTANCE GEOTEXTILE MUST BE USED.
5. NOT FOR USE IN AREAS OF CONCENTRATED FLOW.
6. THE TRENCH SHALL BE BACKFILLED, AND THE SOIL COMPACTED OVER THE GEOTEXTILE.
7. TO JOIN TWO ROLLS OF GEOTEXTILE, PLACE THE END STAKE FROM ONE ROLL OF SILT FENCE ON THE TOP OF THE END PIECE OF THE OTHER ROLL. ROTATE BOTH STAKES IN THE SAME DIRECTION, TOGETHER, AT LEAST 180 DEGREES TO FORM A TIGHT CONNECTION AND THEN DRIVE TWO STAKES, NOW STUCK TOGETHER, INTO THE GROUND.



SIDE VIEW



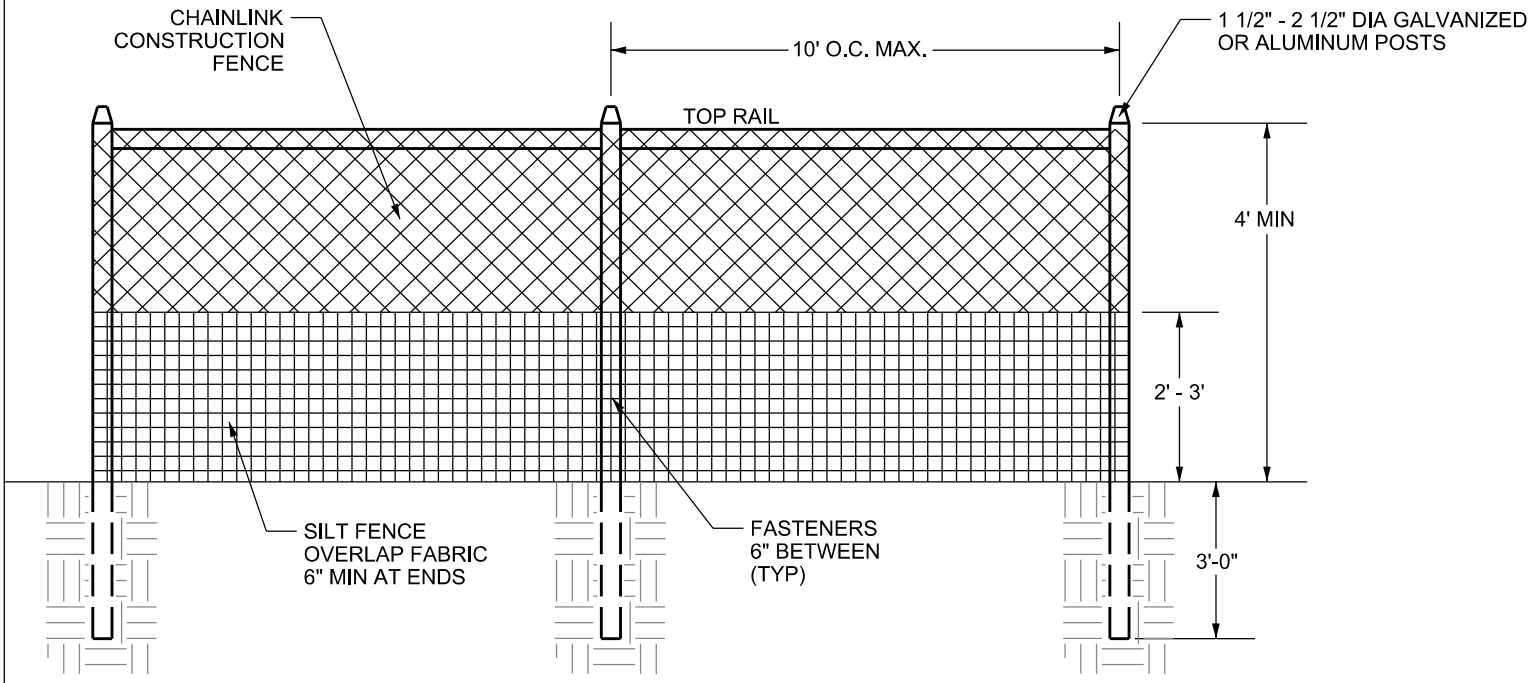
FRONT VIEW

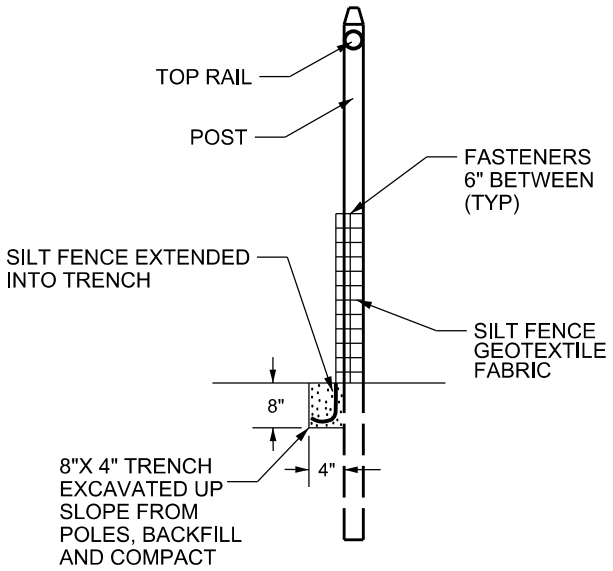
MAINTENANCE NOTES:

1. SILT FENCE SHALL BE INSPECTED AT LEAST ONCE A WEEK, OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
3. SHOULD SILT FENCE UNDERMINE, REINSTALL SILT FENCE ENSURING THAT SILT FENCE IS TRENCHED IN, BACKFILLED AND COMPACTED.
4. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. WHEN REMOVING SEDIMENT AVOID UNDERMINING THE SILT FENCE AND ENSURE THAT GEOTEXTILE IS NOT DAMAGED. CLEAN OUT IS REQUIRED WHEN SILT FENCE IS AT 50% CAPACITY.
5. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH EXISTING GRADE, PREPARED AND SEEDED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	STANDARD TEMPORARY (SEDIMENT/SILT) FENCE	
	SW-20.02	





INSTALLATION NOTES:

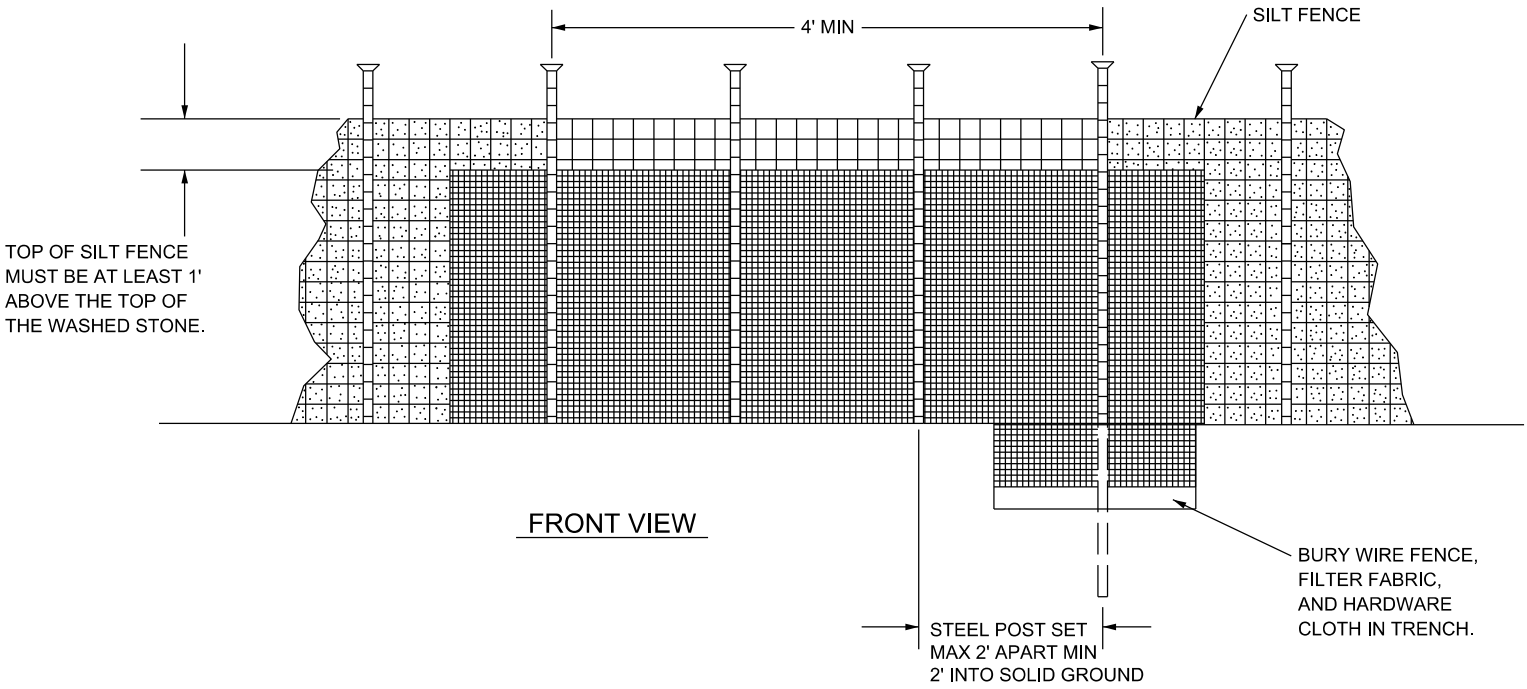
1. SILT FENCE SHOULD BE A MINIMUM OF 5 FEET FROM THE TOE OF SLOPE.
2. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES HORIZONTALLY AT THE TOP AND MIDDLE (VERTICAL) SECTIONS.
3. WHEN TWO HORIZONTAL SECTIONS OF FILTER FABRIC ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES AND FOLDED.

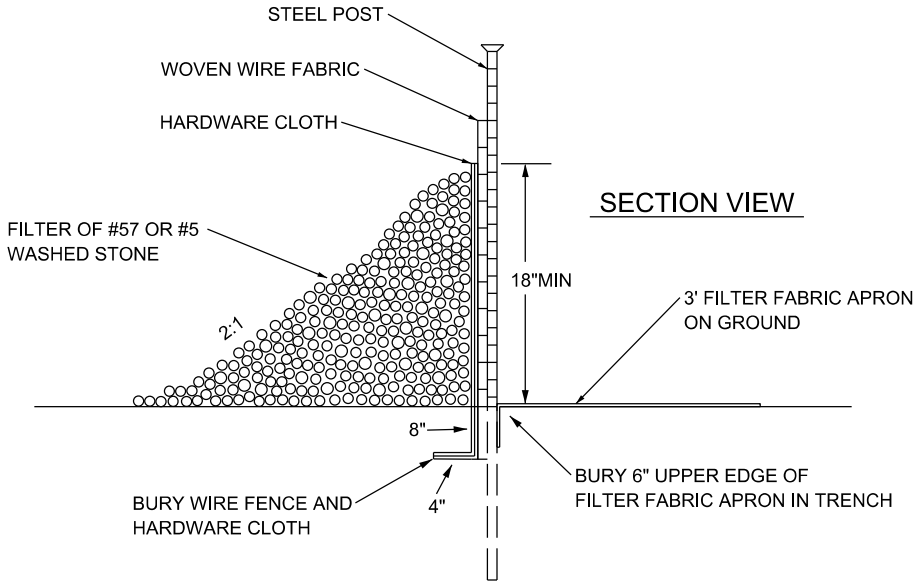
MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER.
2. FABRIC SHALL BE REPLACED PROMPTLY IF FOUND TO BE IN DISREPAIR.
3. ACCUMULATED SEDIMENT SHALL BE REMOVED AFTER EACH STORM EVENT AND WHEN IT REACHES APPROXIMATELY ⅓ OF THE HEIGHT OF THE CHAIN-LINK FENCE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	SUPER SILT FENCE	
	SW-20.03	





INSTALLATION NOTES:

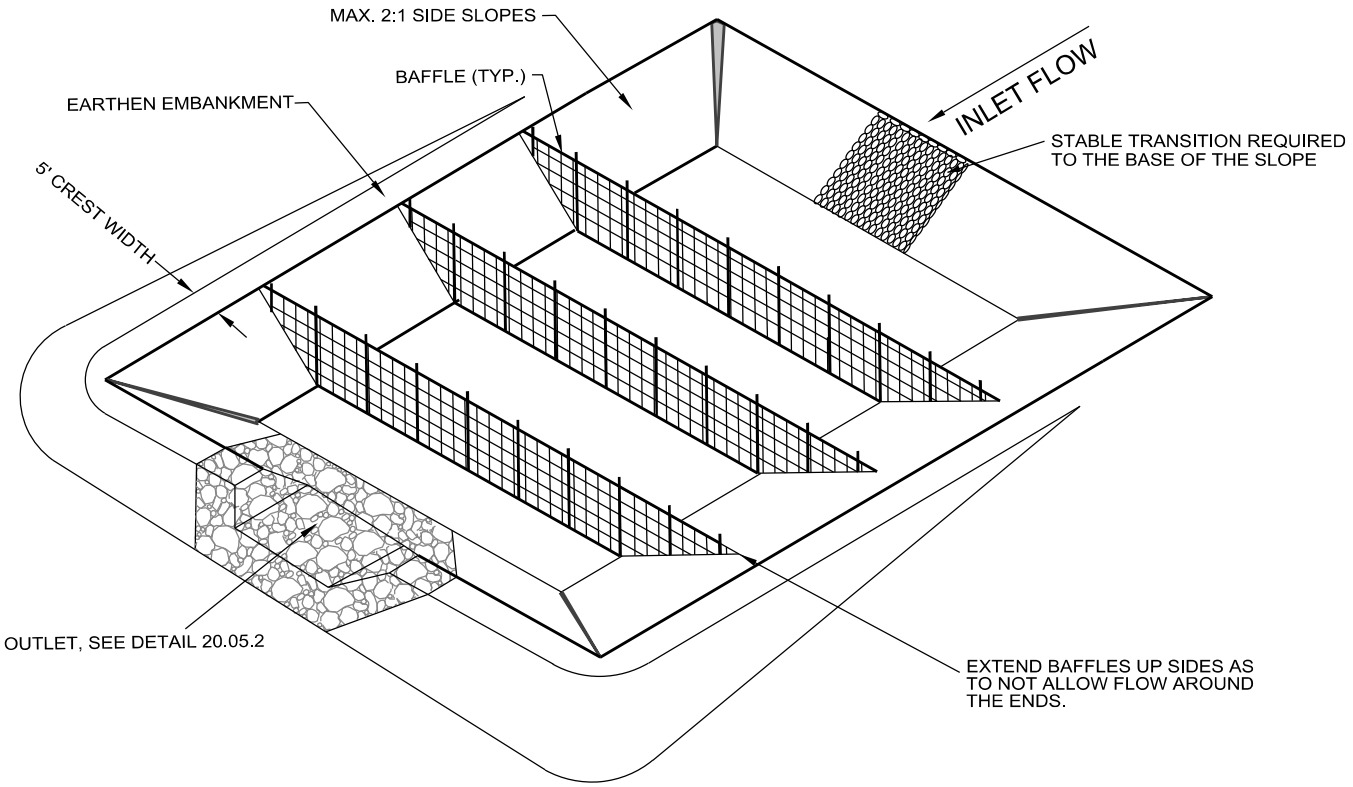
1. HARDWARE CLOTH AND GRAVEL SHOULD OVERLAY THE SILT FENCE A MINIMUM OF 12 INCHES.
2. STONE OUTLETS SHOULD BE PLACED ON LOW ELEVATION AREAS OF SILT FENCE AND BASED ON FIELD CONDITIONS.

MAINTENANCE NOTES:

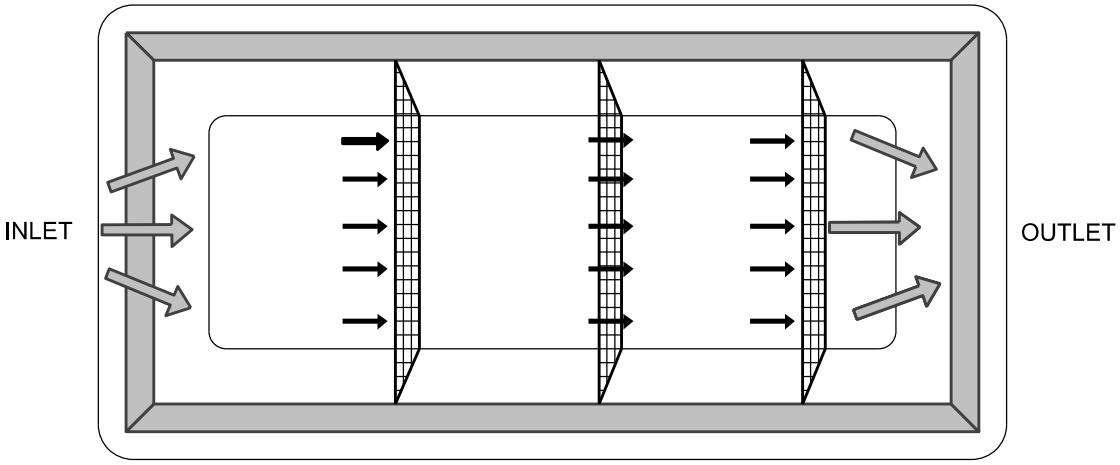
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. KEEP HARDWARE CLOTH FREE OF DEBRIS TO PROVIDE ADEQUATE FLOW.
3. FRESHEN STONE WHEN SEDIMENT ACCUMULATION EXCEEDS 6 INCHES.
4. REMOVE SEDIMENT AND REPLACE WITH NEW STONE WHEN HALF OF THE STONE OUTLET IS COVERED.
5. REPLACE STONE AS NEEDED TO FACILITATE DEWATERING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	STANDARD SILT FENCE OUTLET	
	SW-20.04	



PERSPECTIVE VIEW



MIN. LENGTH:WIDTH RATIO - 2:1

INSTALLATION NOTES:

1. PRACTICE ONLY ALLOWED FOR DRAINAGE AREAS LESS THAN 1 ACRE.
2. REFER TO MOST RECENT VERSION OF NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR DESIGN CRITERIA.
3. A MINIMUM OF 3 POROUS BAFFLES BETWEEN INLET AND OUTLET REQUIRED INSTALLED PERPENDICULAR TO FLOW. TRAPS LESS THAN 20 FEET IN LENGTH MAY USE 2 BAFFLES. EACH BAFFLE ZONE SHOULD COVER AN EQUAL AMOUNT OF BASIN SURFACE AREA.
4. LOCATE SEDIMENT INFLOW TO THE TRAP AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS.
5. AT A MINIMUM, SEED AND STRAW IS REQUIRED ON THE INTERIOR SIDE SLOPES OF THE TRAP PRIOR TO SITE INSPECTION APPROVAL.

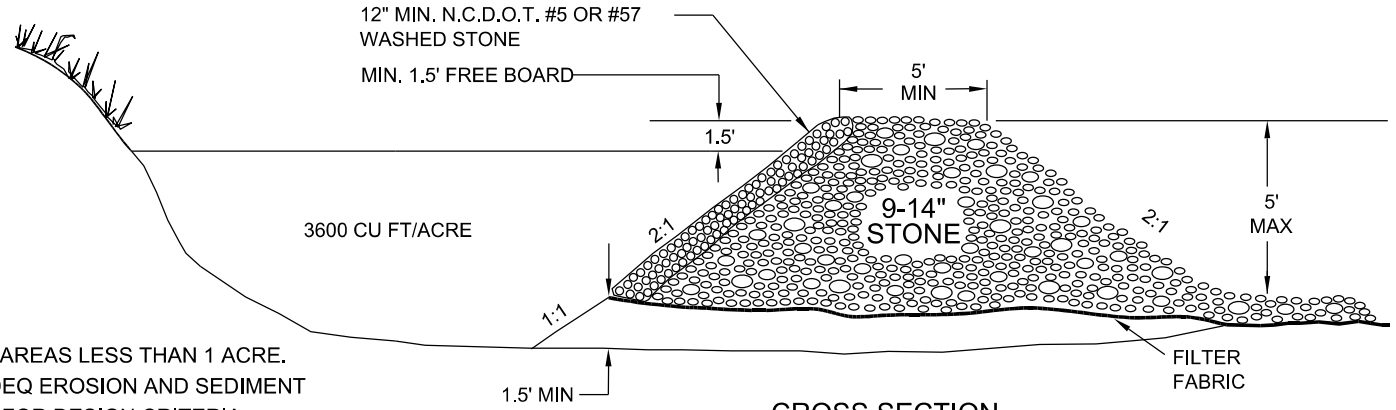
MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER.
2. REPAIR/REPLACE BAFFLES WHEN THEY COLLAPSE, TEAR OR DECOMPOSE.
3. REMOVE SEDIMENT WHEN ANY CELL IS AT 50%.
4. IF DEWATERING TRAP IS NECESSARY, NOTIFY NCDEMLR AND THE CITY PRIOR TO DEWATERING AND PUMP TO SILT BAG PER SILT BAG FOR DEWATERING ACTIVITIES DETAIL SW-20.04
5. AFTER ALL THE DISTURBED AREA DRAINING TO THE TRAP HAS BEEN PERMANENTLY STABILIZED, REMOVE THE TRAP AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND AND STABILIZE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	TEMPORARY SEDIMENT TRAP	
	SW-20.05	

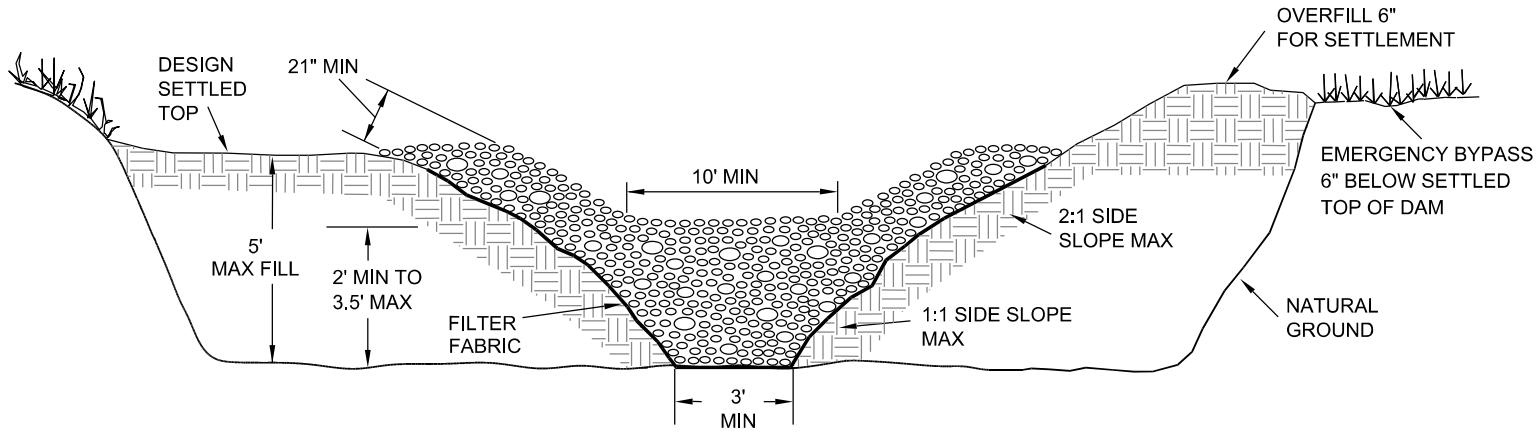
SEE 20.05 FOR BODY OF SEDIMENT TRAP



CROSS SECTION

INSTALLATION NOTES:

1. PRACTICE ONLY ALLOWED FOR DRAINAGE AREAS LESS THAN 1 ACRE.
2. REFER TO MOST RECENT VERSION OF NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR DESIGN CRITERIA.
3. STRUCTURE LIFE LIMITED TO 2 YEARS.



PLAN VIEW

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER.
2. REMOVE SEDIMENT AND RESTORE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP.
3. PLACE THE SEDIMENT THAT IS REMOVED IN A DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.
4. CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING.
5. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FEET BELOW THE LOW POINT OS THE EMBANKMENT.
6. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE.

ANY RIP RAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS

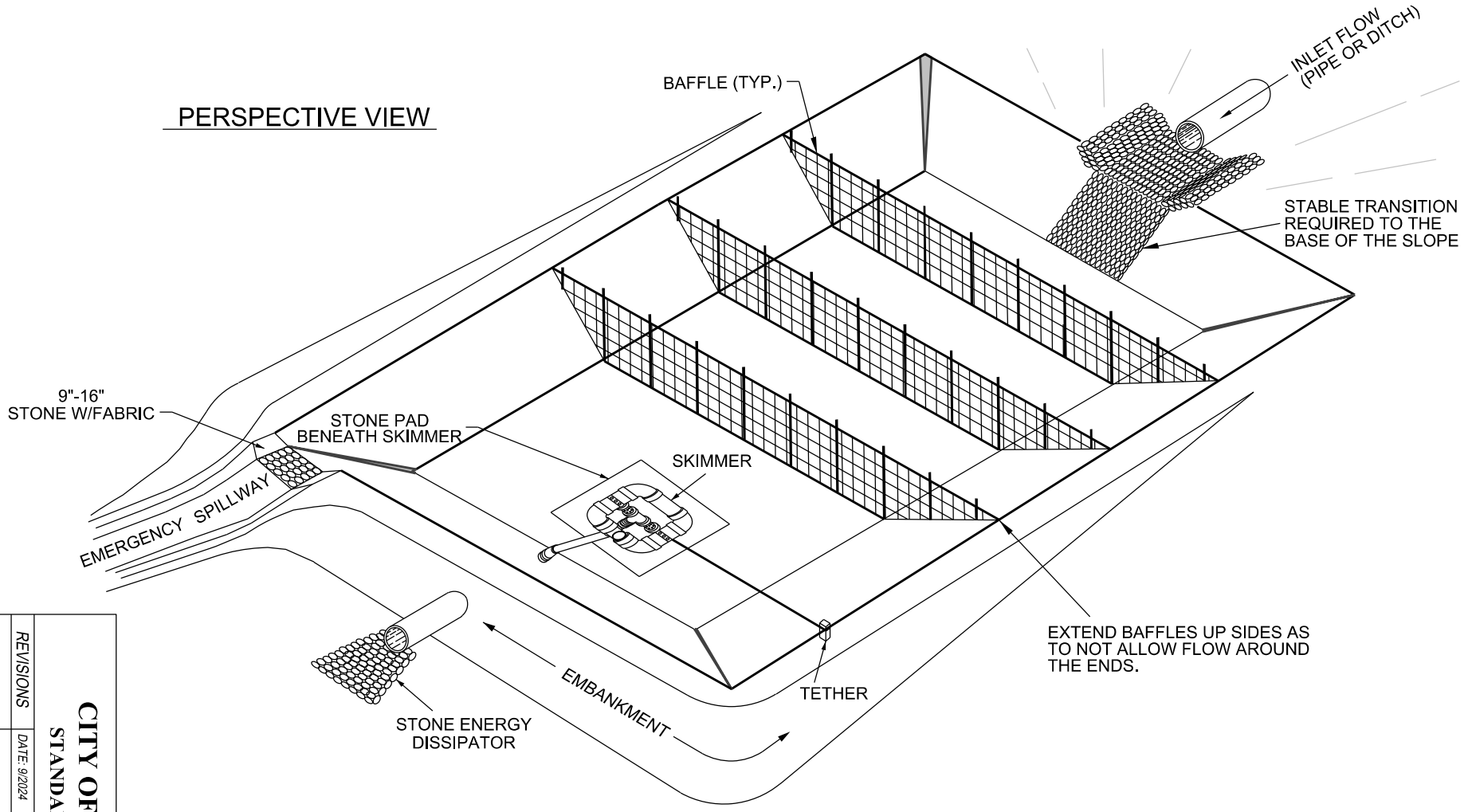
DATE: 9/2024

NOT TO SCALE

TEMPORARY SEDIMENT TRAP
OUTLET DETAIL

SW-20.06

PERSPECTIVE VIEW



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS

DATE: 9/2024

NOT TO SCALE

SKIMMER SEDIMENT BASIN

SW-20.07.1

INSTALLATION NOTES:

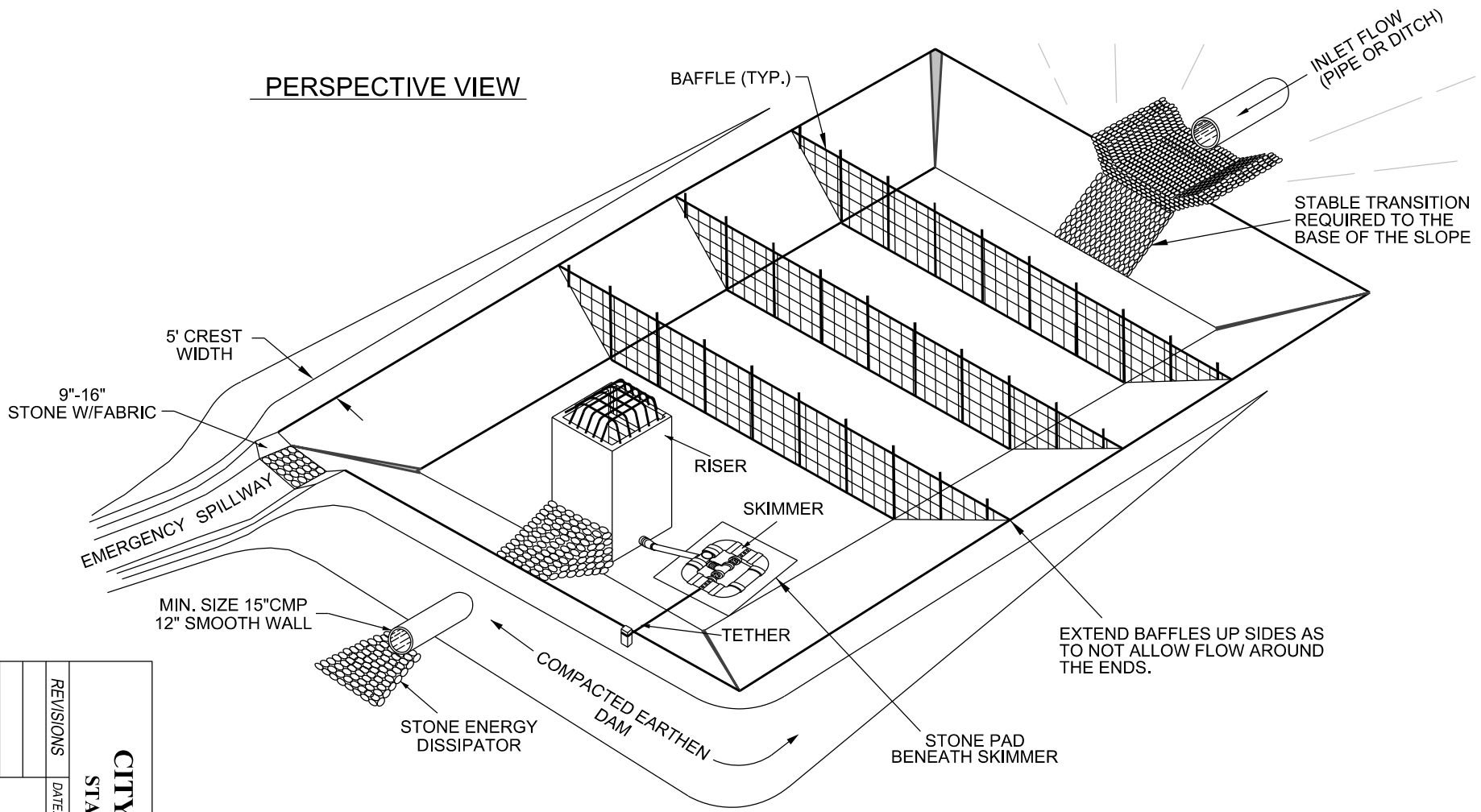
1. REFER TO MOST RECENT VERSION OF NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR DESIGN CRITERIA.
2. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS.
3. A MINIMUM OF 3 POROUS BAFFLES BETWEEN INLET AND OUTLET REQUIRED INSTALLED PERPENDICULAR TO FLOW. BASINS LESS THAN 20 FEET IN LENGTH MAY USE 2 BAFFLES. EACH BAFFLE ZONE SHOULD COVER AN EQUAL AMOUNT OF BASIN SURFACE AREA.
4. POINTS OF ENTRANCE OF SURFACE RUNOFF INTO SEDIMENT BASIN MUST TRANSITION TO THE BASE OF THE SEDIMENT BASIN VIA STABLE TRANSITION (E.G., RIP RAP, SLOPE DRAIN, ETC.).
5. SAFETY FENCING (MIN. 3-FOOT HEIGHT) TO BE INSTALLED SURROUNDING THE BASIN.
6. COUPLE THE SKIMMER ARM DIRECTLY INTO THE EMBANKMENT 1 FOOT FROM THE BOTTOM OF THE BASIN.
7. BASINS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SEDIMENT SHALL BE REMOVED FROM EACH CHAMBER WHEN IT REACHES ONE-HALF THE DEPTH OF THE BAFFLE. REMOVE SEDIMENT AND RESTORE BASIN TO ITS ORIGINAL DIMENSIONS. REINSTALL BAFFLES WHEN DAMAGED.
3. ENSURE THE SKIMMER IS NOT CLOGGED WITH TRASH OR DEBRIS. IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, REMOVE ORIFICE AND CLEAR DEBRIS WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH CLEAN WATER. BE SURE TO REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.
4. CHECK THE EMBANKMENT, SPILLWAY, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
5. CHECK FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
6. IF DEWATERING SEDIMENT BASIN IS NECESSARY, NOTIFY NCDEMLR AND THE CITY PRIOR TO DEWATERING AND PUMP SILT BAG PER SILT BAG FOR DEWATERING ACTIVITIES DETAIL SW-20.04.
7. UNLESS CONVERSION TO PERMANENT DEVICE IS NECESSARY, AFTER ALL THE DISTURBED AREA DRAINING TO THE BASIN HAS BEEN PERMANENTLY STABILIZED, REMOVE THE BASIN HAS BEEN PERMANENTLY STABILIZED, REMOVE THE BASIN AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND AND STABILIZE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	SKIMMER SEDIMENT BASIN	
	SW-20.07.2	



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS

DATE: 9/2024

NOT TO SCALE

RISER SEDIMENT BASIN

SW-20.08.1

INSTALLATION NOTES:

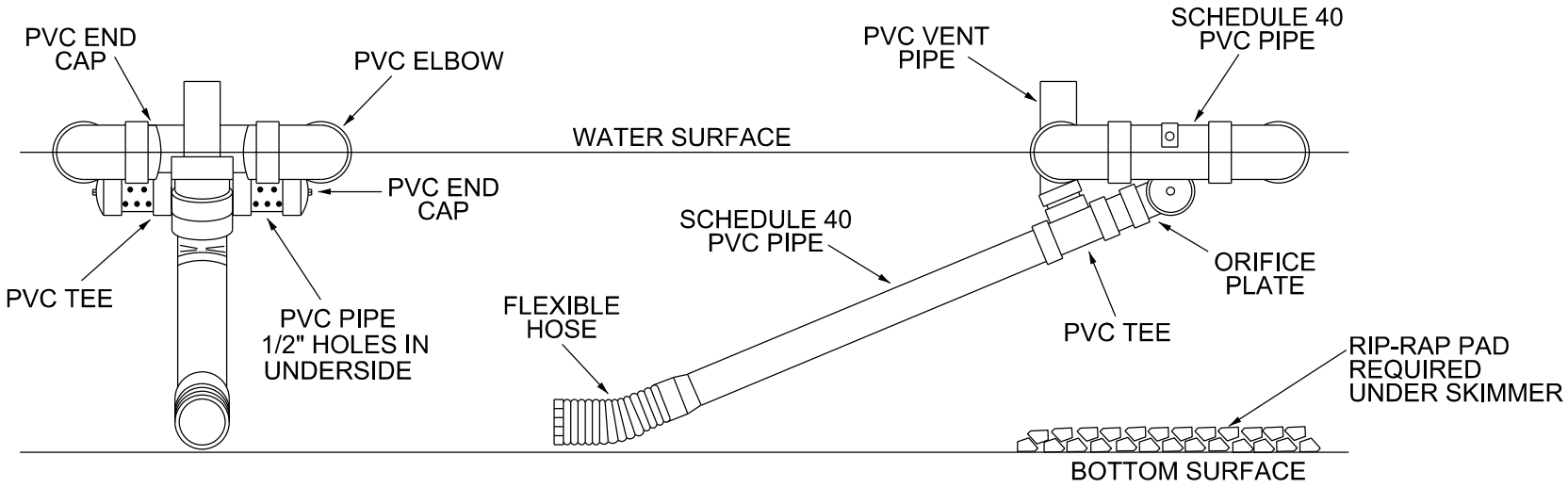
1. REFER TO MOST RECENT VERSION OF NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR DESIGN CRITERIA.
2. LOCATE SEDIMENT INFLOW TO THE BASIN AWAY FROM THE DAM TO PREVENT SHORT CIRCUITS FROM INLETS TO OUTLETS.
3. A MINIMUM OF 3 POROUS BAFFLES BETWEEN INLET AND OUTLET REQUIRED INSTALLED PERPENDICULAR TO FLOW. BASINS LESS THAN 20 FEET IN LENGTH MAY USE 2 BAFFLES. EACH BAFFLE ZONE SHOULD COVER AN EQUAL AMOUNT OF BASIN SURFACE AREA.
4. POINTS OF ENTRANCE OF SURFACE RUNOFF INTO SEDIMENT BASIN MUST TRANSITION TO THE BASE OF THE SEDIMENT BASIN VIA STABLE TRANSITION (E.G., RIP RAP, SLOPE DRAIN, ETC.).
5. SAFETY FENCING (MIN. 3-FOOT HEIGHT) TO BE INSTALLED SURROUNDING THE BASIN.
6. SECURELY ATTACH THE RISER TO THE BARREL OR BARREL STUB TO MAKE A WATERTIGHT STRUCTURAL CONNECTION. ALL CONNECTIONS SHOULD BE MADE USING APPROVED WATERTIGHT ASSEMBLES.
7. THE ARM PIPE CONNECTING THE SKIMMER TO THE RISER SHALL HAVE A MINIMUM LENGTH OF 6 FEET
8. PLACE BARREL AND RISER ON A FIRM, SMOOTH FOUNDATION OF IMPERVIOUS SOIL.
9. ANCHOR RISER IN PLACE BY CONCRETE OR OTHER SATISFACTORY MEANS TO PREVENT FLOATATION.
10. BASINS MUST BE STABILIZED IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SEDIMENT SHALL BE REMOVED FROM EACH CHAMBER WHEN IT REACHES ONE-HALF THE DEPTH OF THE BAFFLE. REMOVE SEDIMENT AND RESTORE BASIN TO ITS ORIGINAL DIMENSIONS. REINSTALL BAFFLES WHEN DAMAGED.
3. ENSURE THE SKIMMER IS NOT CLOGGED WITH TRASH OR DEBRIS. IF THE SKIMMER ARM OR BARREL PIPE IS CLOGGED, REMOVE ORIFICE AND CLEAR DEBRIS WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH CLEAN WATER. BE SURE TO REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.
4. CHECK THE EMBANKMENT, SPILLWAY, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
5. CHECK FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
6. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.
7. IF DEWATERING SEDIMENT BASIN IS NECESSARY, NOTIFY NCDEMLR AND THE CITY PRIOR TO DEWATERING AND PUMP SILT BAG PER SILT BAG FOR DEWATERING ACTIVITIES DETAIL SW-20.04.
8. UNLESS CONVERSION TO PERMANENT DEVICE IS NECESSARY, AFTER ALL THE DISTURBED AREA DRAINING TO THE BASIN HAS BEEN PERMANENTLY STABILIZED, REMOVE THE BASIN AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND AND STABILIZE.

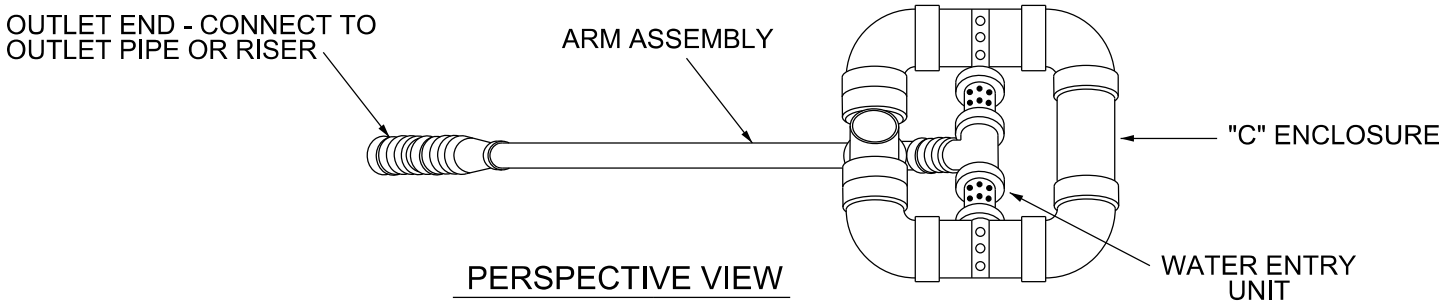
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	RISER SEDIMENT BASIN	
	SW-20.08.2	



END VIEW

FRONT VIEW



PERSPECTIVE VIEW

NOTE: SKIMMER TO BE TETHERED

INSTALLATION NOTES:

1. SEE NCDEQ SEDIMENT DESIGN MANUAL FOR CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS AND DESIGN CRITERIA.
2. ASSEMBLE THE SKIMMER FOLLOWING MANUFATURER'S INSTRUCTIONS OR AS DESIGNED AND LAY ON THE BOTTOM OF THE BASIN WITH THE FLEXIBLE JOINT AT THE INLET OF THE BARREL PIPE.
3. ATTACH THE FLEXIBLE JOINT TO THE BARREL PIPE AND POSITION THE SKIMMER OVER THE EXCAVATED PIT OR SUPPORT.
4. IF NO RISER STRUCTURE IS TO BE USED, COUPLE THE SKIMMER ARM DIRECTLY INTO THE EMBANKMENT 1 FOOT FROM THE BOTTOM OF THE BASIN.
5. THE ARM PIPE CONNECTING THE SKIMMER TO THE RISER SHALL HAVE A MINIMUM LENGTH OF 6 FEET.
6. INSTALL RIP-RAP UNDER THE SKIMMER IN ORDER TO HELP PREVENT SKIMMER FROM BEING LODGED IN THE MUD.
7. ATTACH A ROPE AND ANCHOR IT TO THE SIDE OF THE BASIN. THIS TETHER WILL BE USED TO PULL THE SKIMMER TO THE SIDE FOR MAINTENANCE.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. IF THE SKIMMER IS CLOGGED WITH TRASH, PULL THE TETHER AND REMOVE TRASH.
3. IF SKIMMER BECOMES STUCK IN SEDIMENT BASIN, USE THE TETHER TO DISLODGE FROM MUD. IT MAY BE NECESSARY TO REMOVE SEDIMENT FROM BASIN AND/OR REINSTALL PAD UNDER SKIMMER.

CITY OF RALEIGH
STANDARD DETAIL

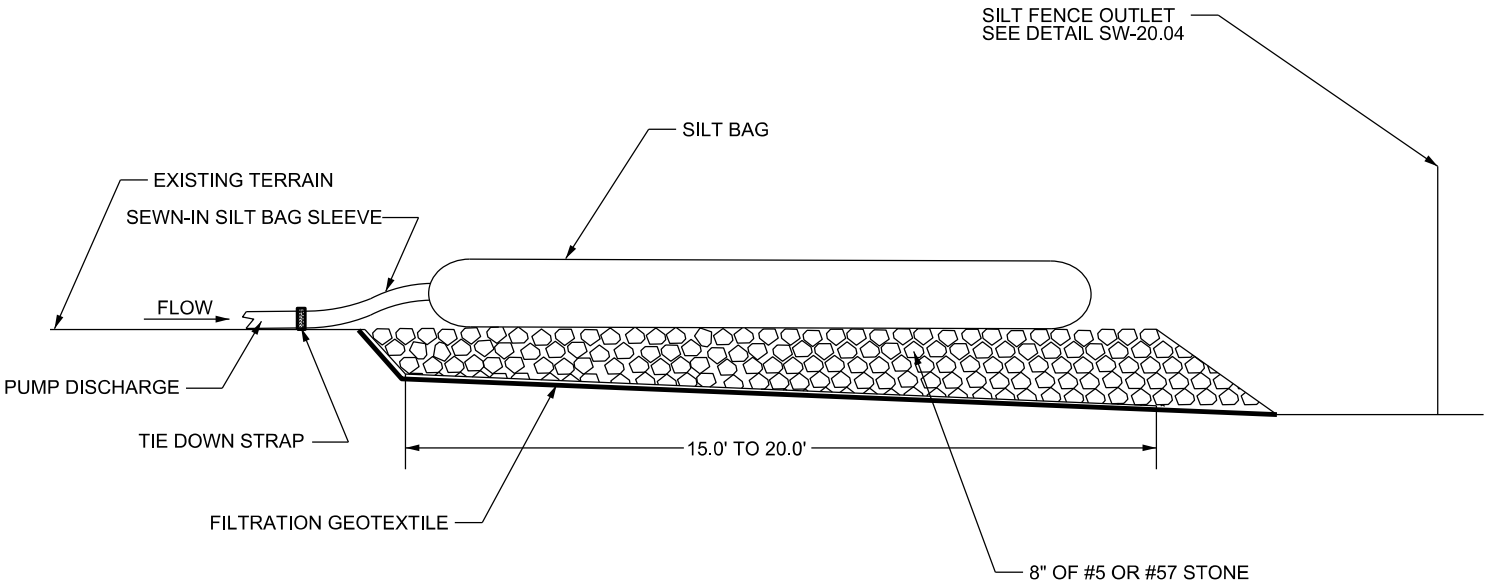
REVISIONS

SKIMMER

DATE: 9/2024

NOT TO SCALE

SW-20.09



INSTALLATION NOTES:

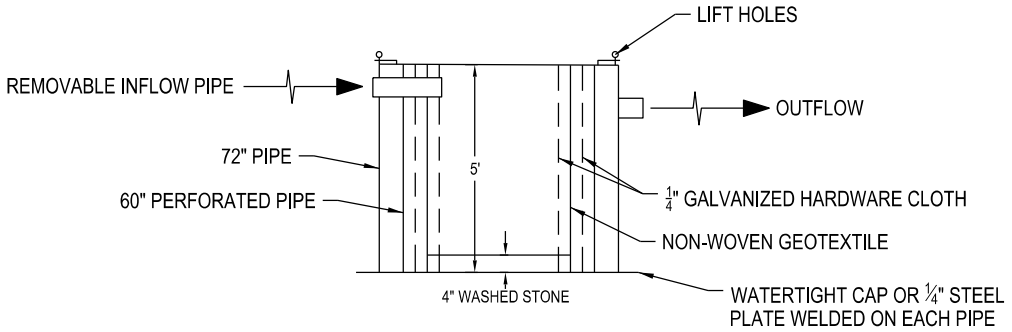
1. USE #5 OR #57 STONE TO LEVEL BAG FROM NATURAL GROUND.
2. THE SIZE AND NUMBER OF SILT BAGS SHOULD BE BASED ON THE DEWATERING PUMP AND MANUFACTURER RECOMMENDATIONS.
3. FILTER BAG SHALL BE EQUIPPED WITH SEWN-IN SLEEVE OF SUFFICIENT SIZE TO ACCEPT A MINIMUM 4-INCH DIAMETER PUMP DISCHARGE HOSE. THE DISCHARGE HOSE SHOULD BE EXTENDED INTO THIS SLEEVE A MINIMUM OF 6 INCHES AND BE TIGHTLY SECURED WITH A HOSE CLAMP OR OTHER SUITABLE MEANS TO PREVENT LEAKAGE WITHOUT TREATMENT.
4. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE SILT BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE THE PUMP RATE.
5. SILT BAG MUST BE ≥ 50FT FROM THE TOP OF THE STREAM BANK AND WATER MUST BE DISCHARGED IN A DIFFUSE MANNER.
6. NOTIFY NCDEMLR AND THE CITY PRIOR TO DEWATERING.
7. SILT BAG MUST FIT WITHIN THE ESTABLISHED LIMITS OF DISTURBANCE.

MAINTENANCE NOTES:

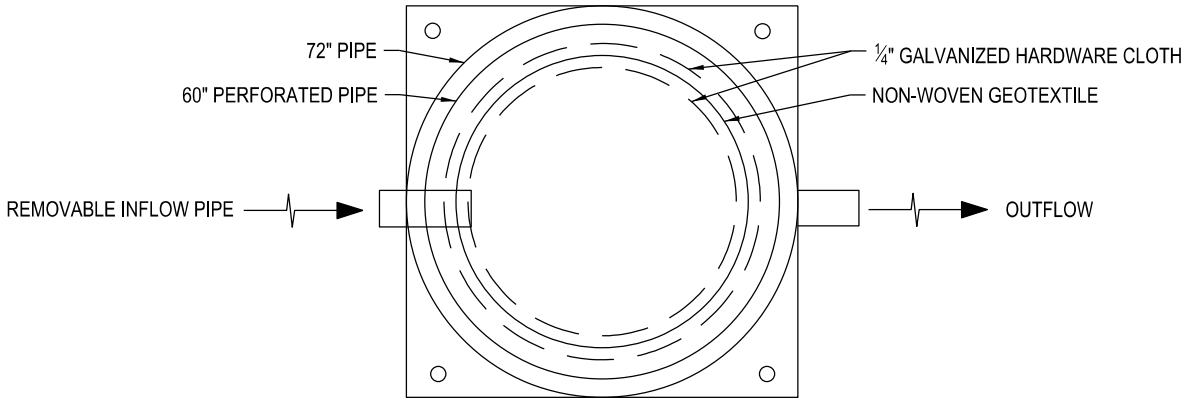
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER.
2. REPLACE SILT BAG IF CLOGGED OR HAS RIPS, TEARS OR PUNCTURES.
3. REPLACE SILT BAG WHEN 75% FULL OF SEDIMENT.
4. ADDITIONAL BAGS SHALL BE AVAILABLE ONSITE AT ALL TIMES DURING PUMPING OPERATIONS.
5. WHEN PUMPING IS COMPLETE, SILT BAG SHOULD BE REMOVED. LIFTING STRAPS MAY BE NECESSARY TO ENSURE BAG IS NOT DAMAGED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	SILT BAG FOR DEWATERING ACTIVITIES	
	SW-20.10	



ELEVATION



PLAN VIEW

INSTALLATION NOTES:

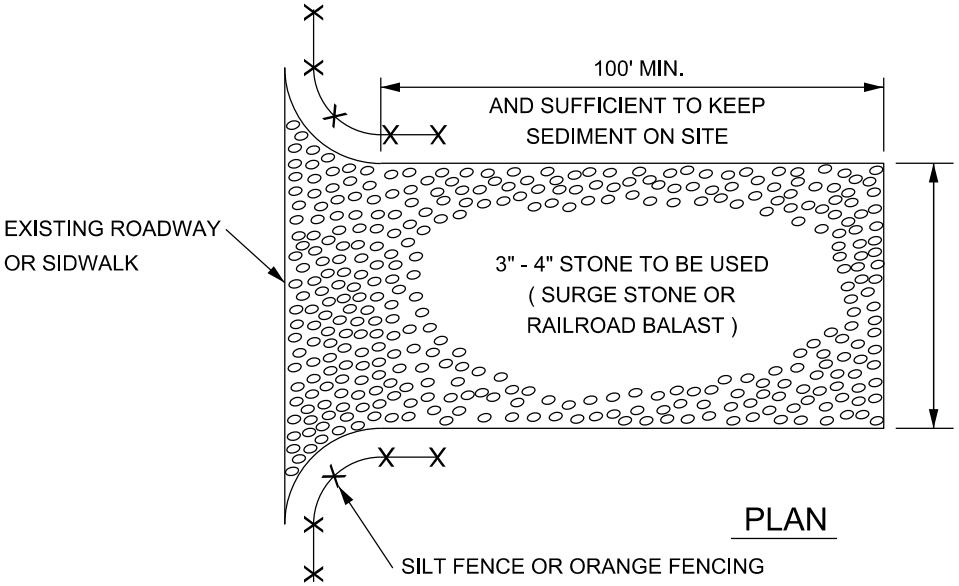
1. PROVIDE ONE CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60-INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NON-WOVEN GEOTEXTILE SANDWICHED BETWEEN AND ATTACHED TO 1/4-INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM, AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF WASHED STONE.
5. USE 72-INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE.
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.

MAINTENANCE NOTES:

1. INSPECT ALL MEASURES AT LEAST WEEKLY AND AFTER EVERY RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH.
3. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE.
4. DEPOSIT SEDIMENT REMOVED FROM THE DEVICE IN A SUITABLE AREA AWAY FROM THE DEVICE SO THAT IT WILL NOT BE RE-DEPOSITED. DEPOSIT AREA SHALL BE STABILIZED.

CITY OF RALEIGH
STANDARD DETAIL

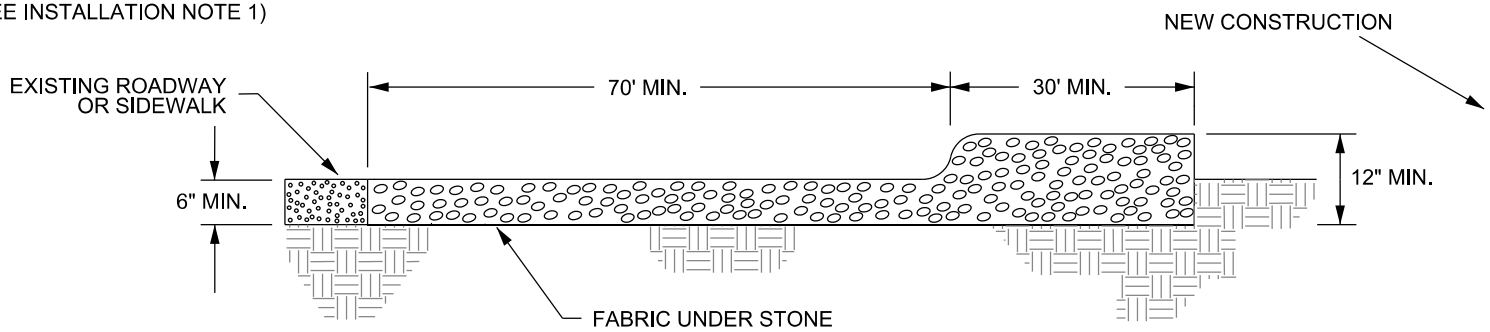
REVISIONS	DATE: 9/2024	NOT TO SCALE
	PORTABLE SEDIMENT TANK	
	SW-20.11	



PLAN

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. MAINTAIN CONSTRUCTION ENTRANCE IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS REQUIRES PERIODIC TOPDRESSING WITH 2 INCHES OF STONE.
3. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
4. SEDIMENT ON ROADWAYS IS TO BE REMOVED IMMEDIATELY BY BROOM AND SHOVEL, EITHER BY MANUAL OR MECHANICAL MEANS.
5. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.



CROSS SECTION

INSTALLATION NOTES:

1. IF CONSTRUCTION ENTRANCE IS ON LOW SIDE OF SITE, SILT FENCE MUST BE INSTALLED TO LIMIT VEHICULAR ACCESS TO THE CONSTRUCTION ENTRANCE AND PREVENT SEDIMENT FROM FLOWING DOWN THE ENTRANCE. WHEN THE CONSTRUCTION ENTRANCE IS ON THE HIGH SIDE OF THE SITE, ORANGE FENCING MUST BE INSTALLED TO LIMIT VEHICULAR ACCESS TO THE CONSTRUCTION ENTRANCE ONLY.
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 MUST BE EXTENDED. A WASH RACK MAY ALSO BE USED, SEE WASH RACK DETAIL SW-20.14. WASH WATER MUST BE CARRIED AWAY FROM THE ENTRANCE TO AN APPROVED SETTLING AREA TO REMOVE SEDIMENT.
3. WHEN CONSTRUCTION ENTRANCE MUST CROSS A SIDEWALK, ADA REQUIREMENTS MUST REMAIN INTACT. DO NOT REMOVE SIDEWALK OR COVER THE SIDEWALK WITH A CONSTRUCTION ENTRANCE STONE UNLESS THE SIDEWALK IS CLOSED.
4. CONVEYANCE OF SURFACE WATER UNDER ENTRANCE THROUGH CULVERTS SHALL BE PROVIDED AS NEEDED.
5. ON SITES WHERE THE GRADE TOWARD THE PAVED AREA IS GREATER THAN 2%, A DIVERSION RIDGE 6 TO 8 INCHES HIGH WITH 3:1 SIDE SLOPES SHALL BE CONSTRUCTED ACROSS THE FOUNDATION OF THE CONSTRUCTION ENTRANCE APPROXIMATELY 15 FEET FROM THE ROAD.

CITY OF RALEIGH
STANDARD DETAIL

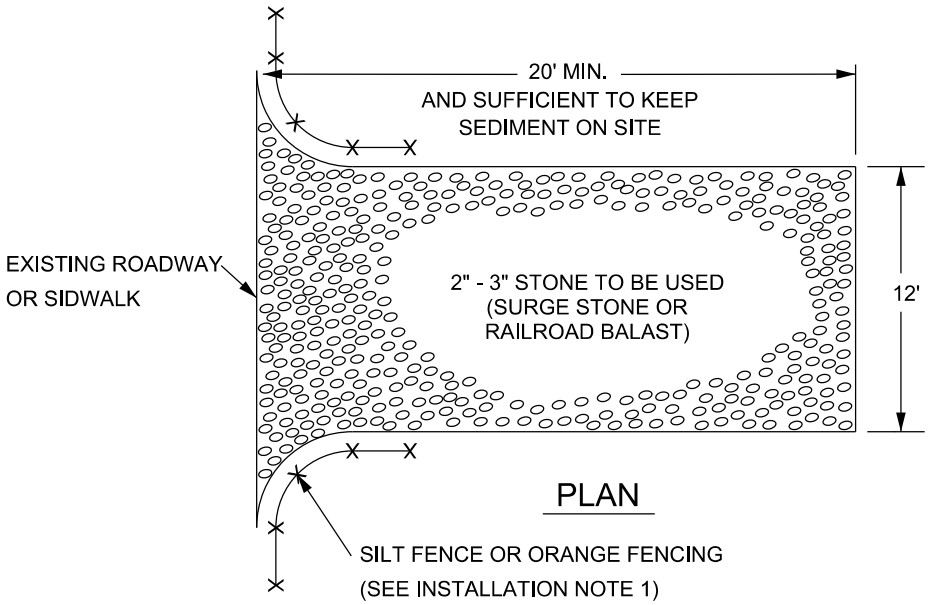
REVISIONS

DATE: 9/2024

NOT TO SCALE

CONSTRUCTION ENTRANCE

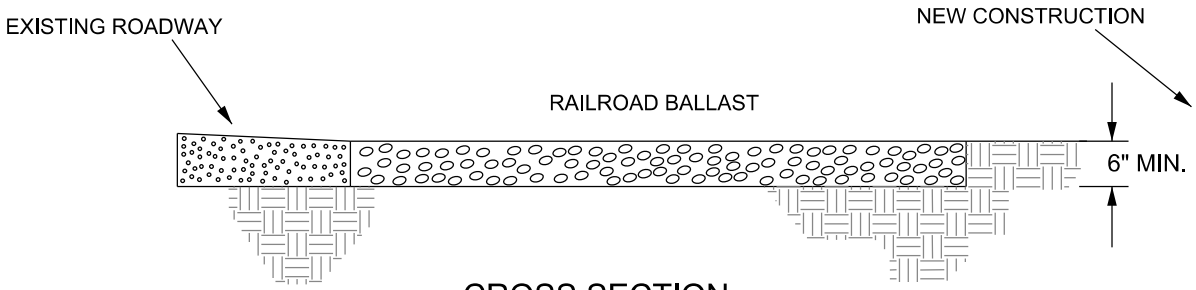
SW-20.12



PLAN

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. MAINTAIN CONSTRUCTION ENTRANCE IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS REQUIRES PERIODIC TOPDRESSING WITH 2 INCHES OF STONE.
3. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
4. SEDIMENT ON ROADWAYS IS TO BE REMOVED IMMEDIATELY BY BROOM AND SHOVEL, EITHER BY MANUAL OR MECHANICAL MEANS.
5. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED OR TRACKED ONTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.



CROSS SECTION

INSTALLATION NOTES:

1. IF CONSTRUCTION ENTRANCE IS ON LOW SIDE OF SITE, SILT FENCE MUST BE INSTALLED TO LIMIT VEHICULAR ACCESS TO THE CONSTRUCTION ENTRANCE AND PREVENT SEDIMENT FROM FLOWING DOWN THE ENTRANCE. WHEN THE CONSTRUCTION ENTRANCE IS ON THE HIGH SIDE OF THE SITE, ORANGE FENCING MUST BE INSTALLED TO LIMIT VEHICULAR ACCESS TO THE CONSTRUCTION ENTRANCE ONLY.
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 MUST BE EXTENDED. A WASH RACK MAY ALSO BE USED, SEE WASH RACK DETAIL SW-20.14. WASH WATER MUST BE CARRIED AWAY FROM THE ENTRANCE TO AN APPROVED SETTLING AREA TO REMOVE SEDIMENT.
3. WHEN CONSTRUCTION ENTRANCE MUST CROSS A SIDEWALK, ADA REQUIREMENTS MUST REMAIN INTACT. DO NOT REMOVE SIDEWALK OR COVER THE SIDEWALK WITH A CONSTRUCTION ENTRANCE STONE UNLESS THE SIDEWALK IS CLOSED.
4. CONVEYANCE OF SURFACE WATER UNDER ENTRANCE THROUGH CULVERTS SHALL BE PROVIDED AS NEEDED.
5. ON SITES WHERE THE GRADE TOWARD THE PAVED AREA IS GREATER THAN 2%, A DIVERSION RIDGE 6 TO 8 INCHES HIGH WITH 3:1 SIDE SLOPES SHALL BE CONSTRUCTED ACROSS THE FOUNDATION OF THE CONSTRUCTION ENTRANCE APPROXIMATELY 15 FEET FROM THE ROAD.

CITY OF RALEIGH
STANDARD DETAIL

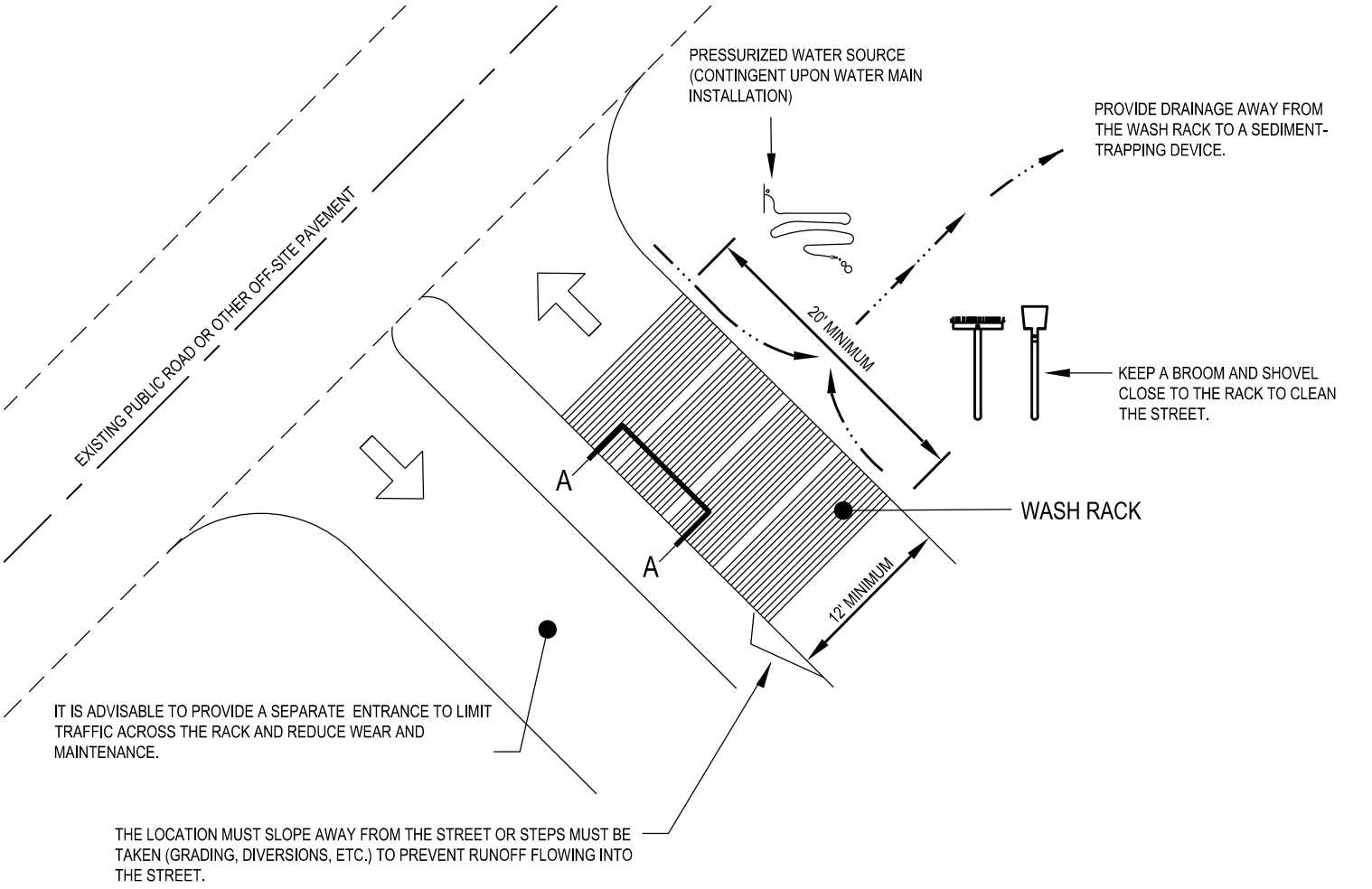
REVISIONS

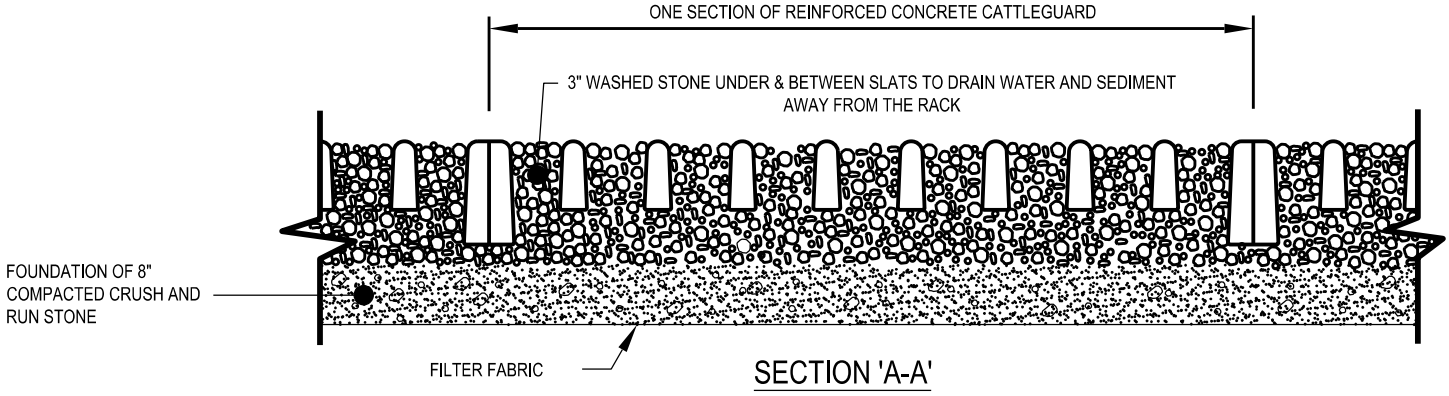
DATE: 9/2024

NOT TO SCALE

RESIDENTIAL & SMALL SITE
CONSTRUCTION ENTRANCE

SW-20.13





SECTION 'A-A'

INSTALLATION NOTES:

1. PROVIDE DRAINAGE AWAY FROM THE WASH RACK TO AN APPROVED SEDIMENT TRAPPING DEVICE.
2. THE WASH RACK LOCATION MUST SLOPE AWAY FROM THE STREET OR STEPS MUST BE TAKEN (GRADING, DIVERSIONS, ETC.) TO PREVENT RUNOFF FROM FLOWING INTO THE STREET.
3. IT IS ADVISABLE TO PROVIDE A SEPARATE STABILIZED CONSTRUCTION ENTRANCE FOR SMALLER VEHICLES TO ACCESS THE SITE TO LIMIT TRAFFIC ACROSS THE RACK AND REDUCE WEAR AND MAINTENANCE.

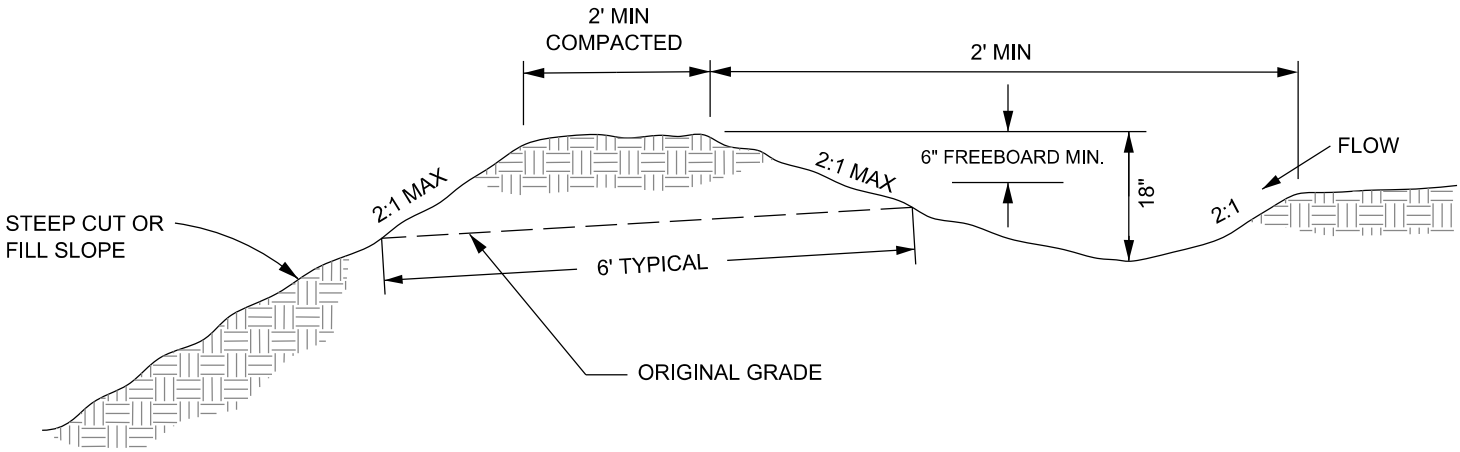
MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. MAINTAIN AS NEEDED TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE.
3. IMMEDIATELY REMOVE ALL MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

**THIS IS AN EXAMPLE OF AN ACCEPTABLE WASH RACK. OTHER APPROVED METHODS MAY BE UTILIZED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	CONSTRUCTION EXIT WASH RACK	
	SW-20.14	



CROSS SECTION

INSTALLATION NOTES:

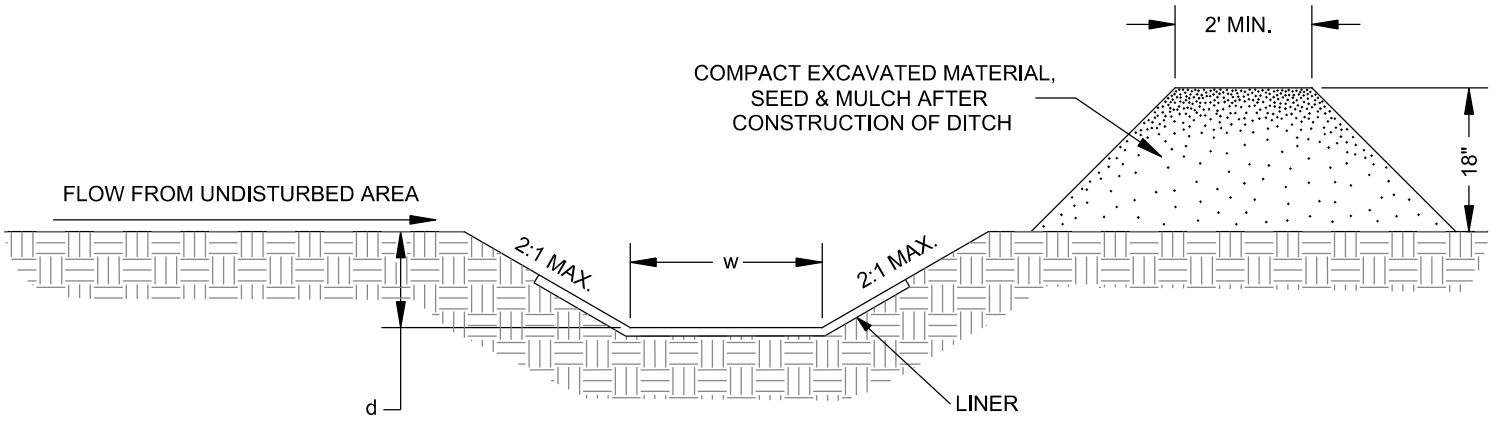
1. STABILIZE IMMEDIATELY UPON CONSTRUCTION AND PRIOR TO SITE INSPECTION APPROVAL.
2. STABILIZE DIVERSION DITCH BASED ON DESIGN VELOCITY. IF DESIGN VELOCITIES (Q2) IN BARE EARTH CONDITIONS EXCEED 2 FEET/SECOND, A TEMPORARY LINER IS REQUIRED.
3. TEMPORARY DIVERSIONS ARE TO ONLY BE USED FOR DRAINAGE AREAS OF 5 ACRES OR LESS TO INTERCEPT FLOW AND/OR DIVERT TO A SEDIMENT CONTROL MEASURE.
4. RIDGES WILL HAVE A 2 FEET MINIMUM TOP WIDTH, 2:1 OR FLATTER SIDE SLOPES AND A MINIMUM OF 6 INCHES OF FREEBOARD.
5. CHANNELS WILL HAVE A PARABOLIC, TRAPEZOIDAL, OR V SHAPE WITH SIDE SLOPES OF 2:1 OR FLATTER.
6. ANY POINT WHERE VEHICLES WILL BE CROSSING SHOULD HAVE 3:1 OR FLATTER SIDE SLOPES.
7. PROVIDE SUFFICIENT ROOM AROUND DIVERSIONS TO PERMIT MACHINE RE-GRADING AND CLEANOUT.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER.
2. SILT SHALL BE REMOVED WHEN DIVERSION DITCH IS ONE-HALF FULL.
3. DITCH SHALL BE RECONSTRUCTED BEFORE THE END OF THE WORKDAY WHEN DAMAGE BY EQUIPMENT OR COVERED BY FILL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	DIVERSION DITCH	
	SW-20.15	



CROSS SECTIONAL VIEW

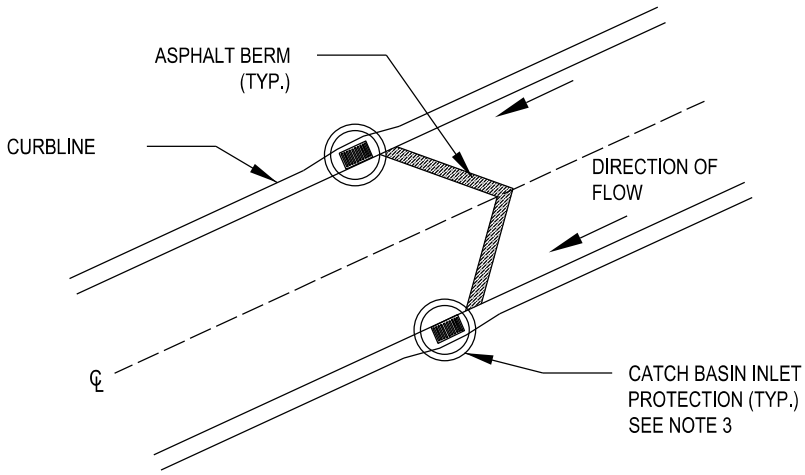
INSTALLATION NOTES:

1. DIMENSIONS d & w AND LINER TO BE DETERMINED BY ENGINEER.
2. CLEAN WATER DIVERSION TO BE USED UPSLOPE OF A CONSTRUCTION SITE TO PREVENT STORMWATER RUNOFF FROM ENTERING THE DISTURBED AREA.
3. IMMEDIATELY LINE AND STABILIZE BEFORE ANY DOWNSLOPE GRADING BEGINS.
4. DIVERSIONS SHOULD ONLY BE USED FOR DRAINAGE AREAS 5 ACRES OR LESS.

MAINTENANCE NOTES:

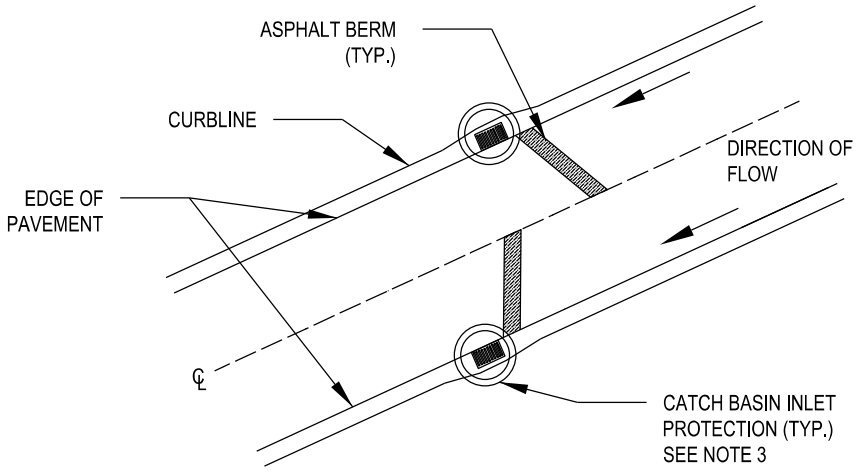
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. THIS MEASURE SHALL NOT ACCUMULATE SEDIMENT. IF THIS OCCURS, REMOVE SEDIMENT, RESTABILIZE DIVERSION IF NECESSARY AND/OR REEVALUATE DESIGN.
3. IMMEDIATELY REMOVE ANY OBSTRUCTIONS OR DEBRIS FROM THE FLOW AREAS, AND REPAIR DIVERSION RIDGE AS NEEDED.
4. CHECK OUTLET AND MAKE REPAIRS AS NEEDED.
5. MAINTAIN THE VEGETATION IN A HEALTHY CONDITION AT ALL TIMES.

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 9/2024	NOT TO SCALE
	CLEAN WATER DIVERSION	
	SW-20.16	



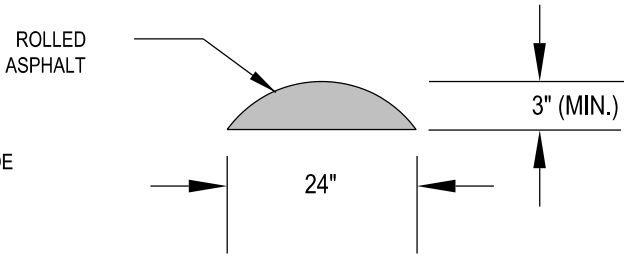
OPTION 1

CATCH BASINS ALIGNED ACROSS STREET



OPTION 2

CATCH BASINS OFFSET OR INDIVIDUAL CATCH BASIN



BERM CROSS SECTION

INSTALLATION NOTES:

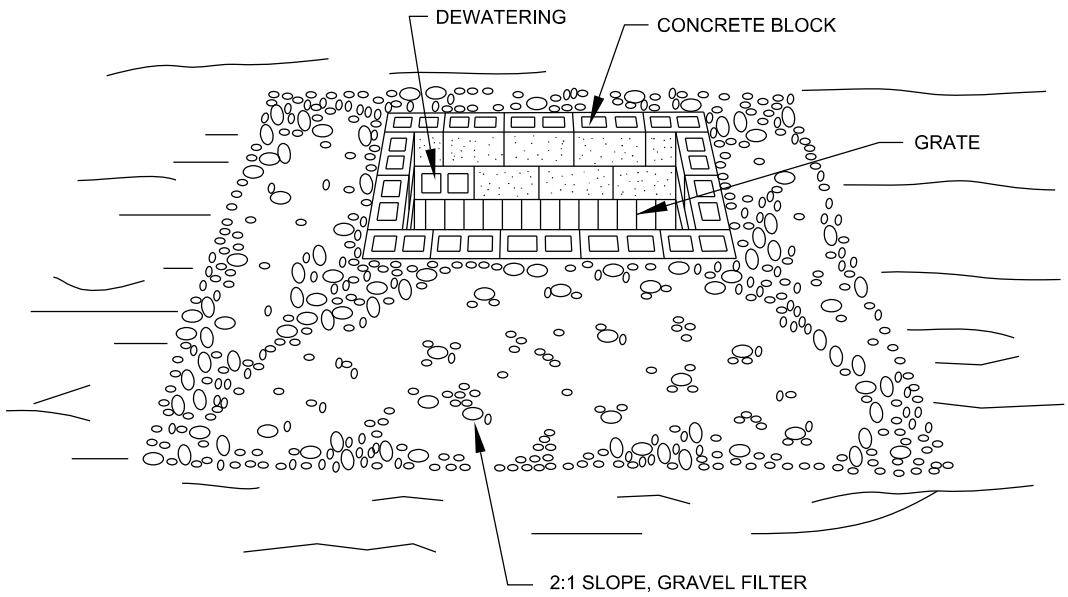
1. TEMPORARY ASPHALT BERMS ARE INSTALLED TO ACHIEVE DESIGNED DRAINAGE AREAS PRIOR TO FINAL ASPHALT LIFT BEING INSTALLED ON ROAD SURFACE.
2. CONTRACTOR TO INSTALL TEMPORARY BERMS ON INTERMEDIATE COURSE, ON HIGH SIDE OF CURB INLETS FOR STRUCTURES ALONG THE STREET SLOPE.
3. CATCH BASIN INLET PROTECTION MAY BE OMITTED IF APPROVED BY STORMWATER INSPECTOR.
4. THE ASPHALT BERM SHALL BE INSTALLED EXTENDING TO THE CROWN OF STREET TO ENSURE DRAINAGE ACCESSES CATCH BASIN.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. REMOVE ANY ACCUMULATED SEDIMENT FROM ABOVE BERM AS NEEDED TO MAINTAIN FUNCTION
3. REPLACE BERMS AS NECESSARY WHEN DAMAGED FROM EQUIPMENT.
4. REMOVE BERM PRIOR TO INSTALLING FINAL ASPHALT LIFT, FINISHING ROAD SURFACE.

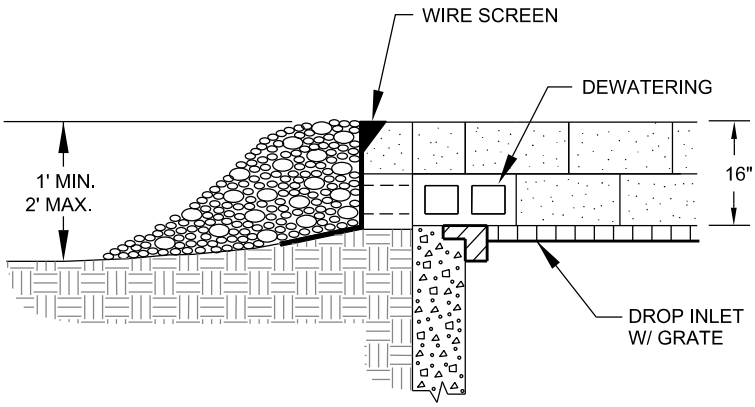
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	ASPHALT DIVERSION BERM	
	SW-20.17	



INISTALLATION NOTES:

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. NCDOT #57 WASHED STONE IS RECOMMENDED.
4. NOT TO BE USED FOR SEDIMENT STORAGE OR ON ROADWAYS OPEN TO PUBLIC TRAFFIC.

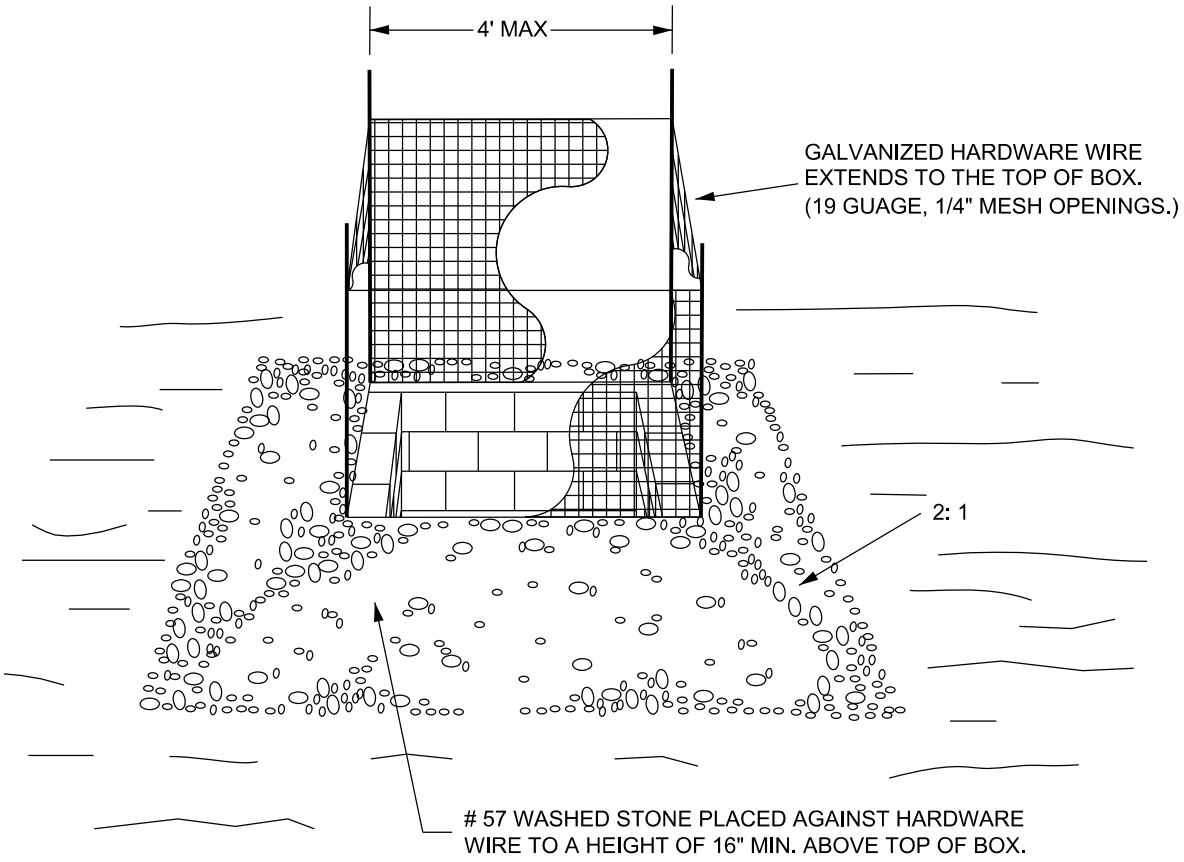


MAINTENANCE NOTES:

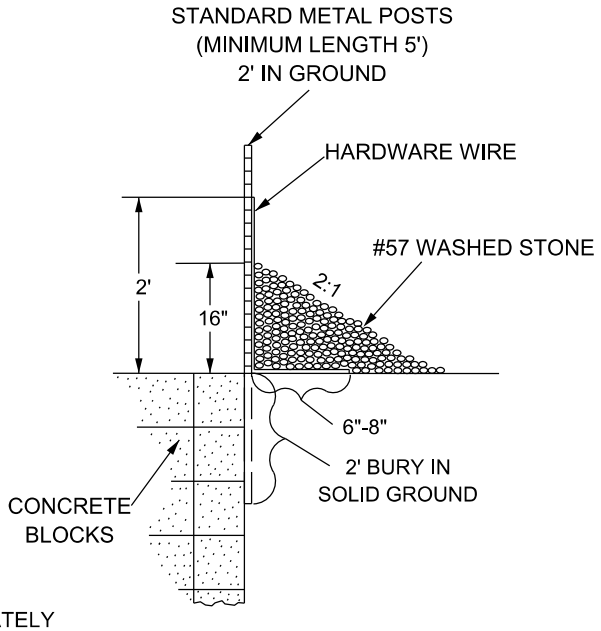
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS. SEDIMENT REMOVAL IS REQUIRED WHEN OVER HALF STONE IS COVERED. REMOVE SEDIMENT AND STONE AND REPLACE WITH NEW STONE.
3. WHEN DAMAGED, REPAIR AS NECESSARY AND REPLACE WITH NEW STONE.
4. REPLACE STONE AS NEEDED TO FACILITATE DE-WATERING.
5. WHEN THE CONTRIBUTING DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED, REMOVE ALL MATERIALS AND ANY UNSTABLE SOIL, AND EITHER SALVAGE OR DISPOSE OF IT PROPERLY. BRING THE DISTRUBED AREA TO PROPER GRADE, THEN SMOOTH AND COMPACT BEFORE STABILIZING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	BLOCK AND GRAVEL DROP INLET PROTECTION	
	SW-20.18	



SECTION VIEW



INISTALLATION NOTES:

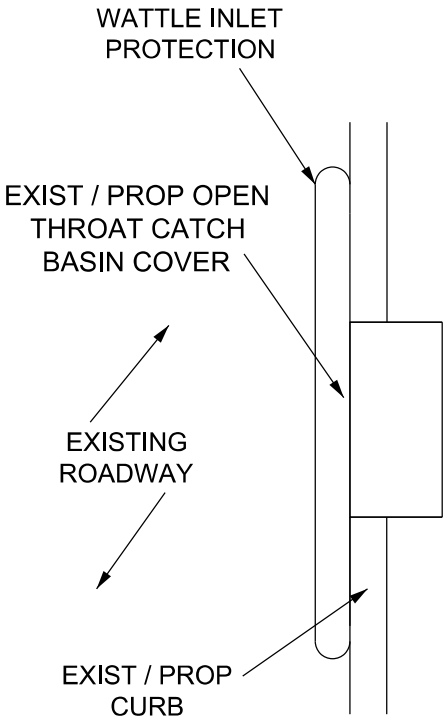
1. MAXIMUM DRAINAGE AREA TO PRACTICE IS 1 ACRE.
2. SEE NCDEQ SEDIMENT DESIGN MANUAL FOR CONSTRUCTION SPECIFICATIONS, WHERE PRACTICE APPLIES AND PLANNING CONSIDERATIONS AND DESIGN CRITERIA.
3. UNIFORMITY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.

MAINTENANCE NOTES:

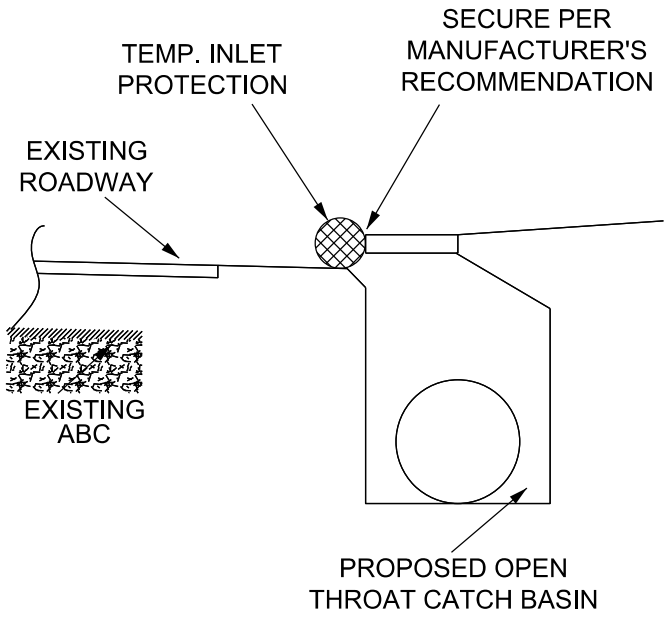
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. CLEAR THE WIRE MESH OF ANY DEBRIS OR OTHER OBJECTS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAIN EVENTS. SEDIMENT REMOVAL IS REQUIRED WHEN STONE IS 50% FULL. REMOVE SEDIMENT CAREFULLY NOT TO DAMAGE WIRE MESH. REPLACE STONE AS NEEDED TO FACILITATE DE-WATERING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	STANDARD CATCH BASIN YARD INLET PROTECTION	
	SW-20.19	



PLAN W / INLET
INLET PROTECTION - COR BOX



CROSS SECTION

INSTALLATION NOTES:

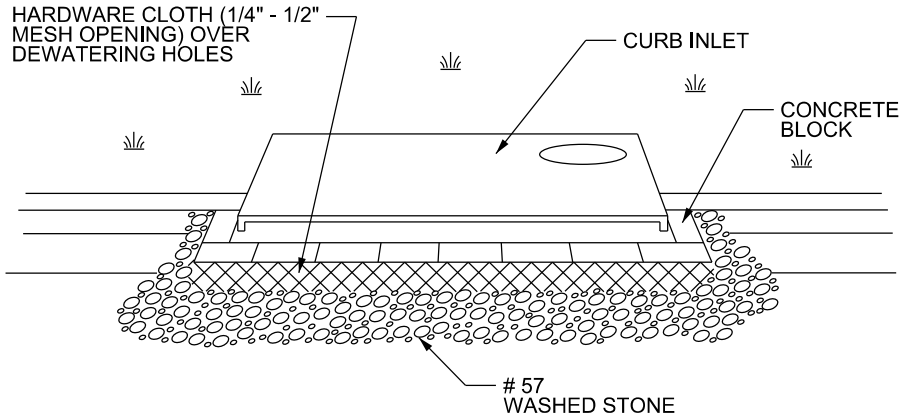
1. WATTLES SHALL BE FILLED WITH STRAW OR OTHER APPROVED MATERIAL.

MAINTENANCE NOTES:

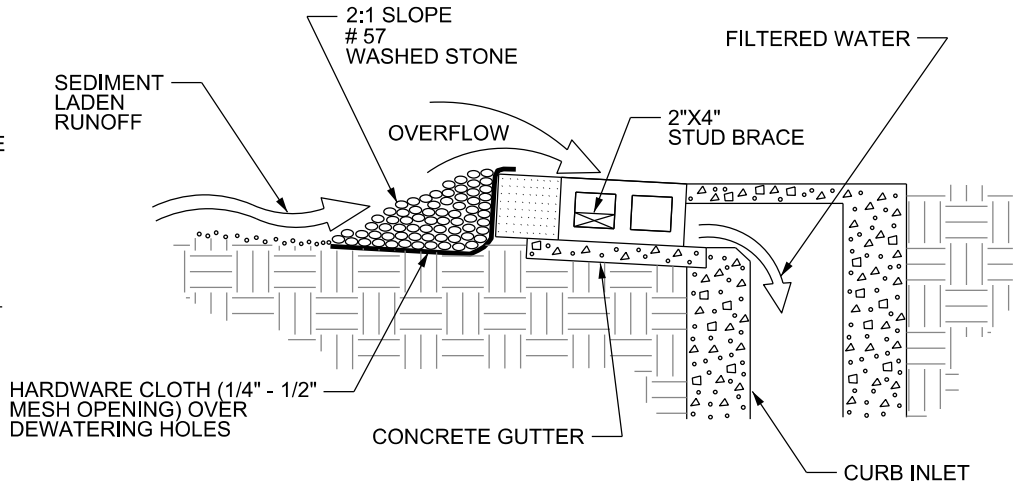
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. REMOVE ACCUMULATED SEDIMENT OR DEBRIS.
3. WATTLES MUST BE REPLACED IF CLOGGED OR TORN OR IF WATER DOES NOT APPEAR TO BE DRAINING THROUGH THE WATTLE.
4. REINSTALL IF DAMAGED OR DISLODGED. IF THE WATTLE FALLS INTO THE STORM DRAIN REMOVE IMMEDIATELY AND REINSTALL.
5. IF PONDING BECOMES EXCESSIVE, THE WATTLE MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	WATTLE / INLET PROTECTION DETAIL	
	SW-20.20	



PERSPECTIVE VIEW



CROSS SECTION VIEW

INSTALLATION NOTES:

1. TWO CONCRETE BLOCKS SHALL BE PLACED ON THEIR SIDES ABUTTING THE CURB AT EITHER SIDE OF INLET OPENING. A 2 INCH x 4 INCH STUD SHALL BE CUT AND PLACED THROUGH THE OUTER HOLES OF THE SPACER BLOCKS TO BRACE THE FRONT BLOCKS THAT ARE PLACED ON THEIR SIDES ACROSS THE INLET AND ABUTTING THE SPACER BLOCKS.
2. WIRE MESH OR HARDWARE CLOTH WITH¼ INCH -½ INCH 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, (# 57 WASHED STONE).

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. CLEAR INLET PROTECTION OF ANY DEBRIS OR OTHER OBJECTS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAIN EVENTS.
3. SEDIMENT REMOVAL IS REQUIRED WHEN STONE IS 50% FULL. REMOVE SEDIMENT CAREFULLY NOT TO DAMAGE WIRE MESH. REPLACE WITH NEW STONE.
4. REPLACE STONE AS NEEDED TO FACILITATE DEWATERING.

CITY OF RALEIGH
STANDARD DETAIL

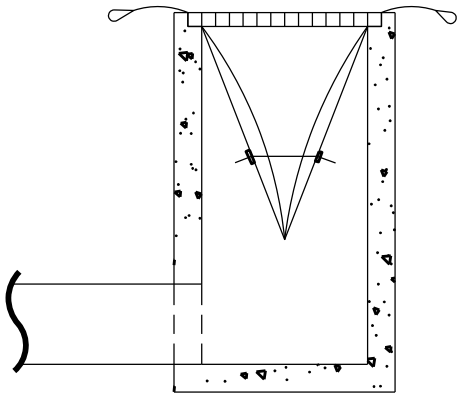
REVISIONS

DATE: 9/2024

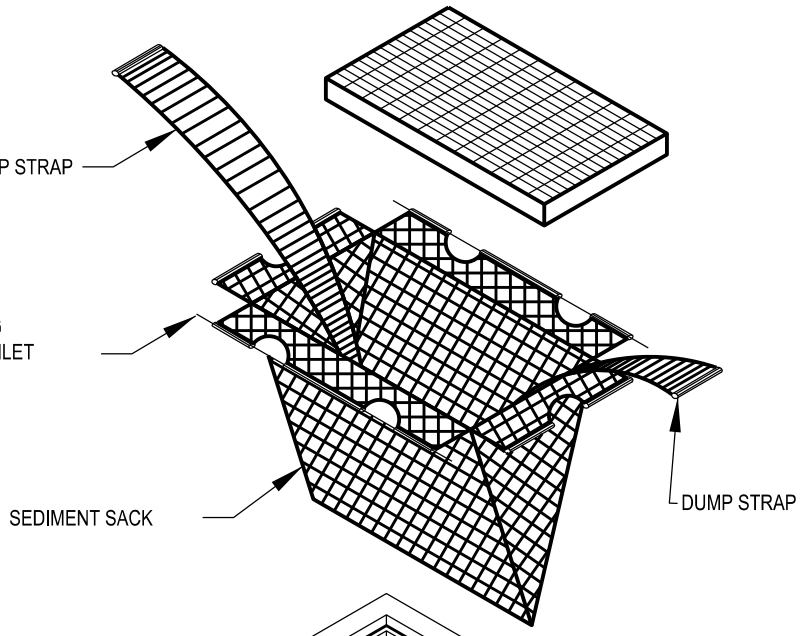
NOT TO SCALE

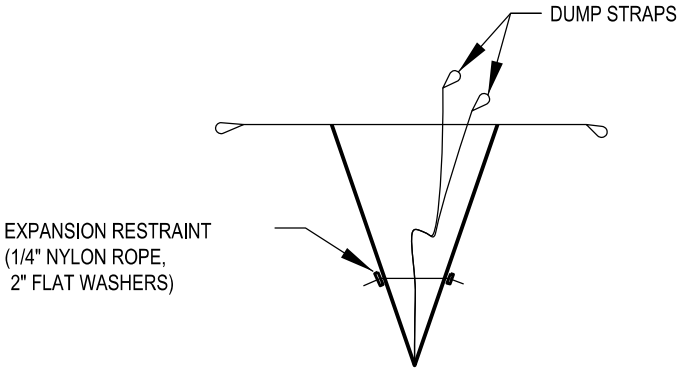
BLOCK AND GRAVEL INLET PROTECTION FOR CURB INLET

SW-20.21

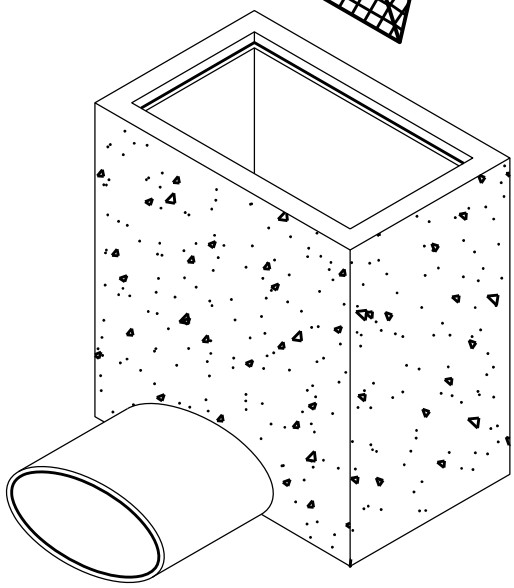


INSTALLATION DETAIL





BAG DETAIL



INSTALLATION NOTES:

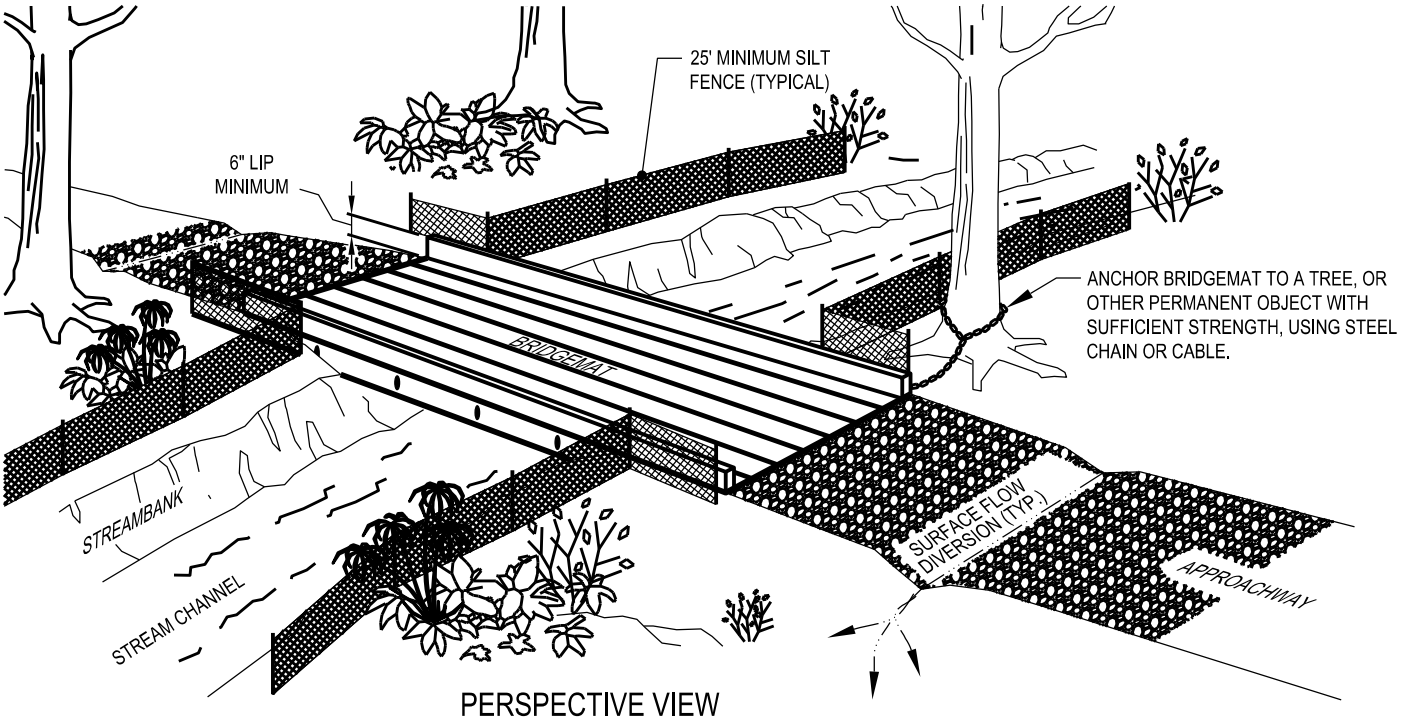
1. FILTER BAGS SHALL NOT BE ALLOWED ON PUBLIC OR PRIVATE ROADS TO HELP PREVENT FLOODING.

MAINTENANCE NOTES:

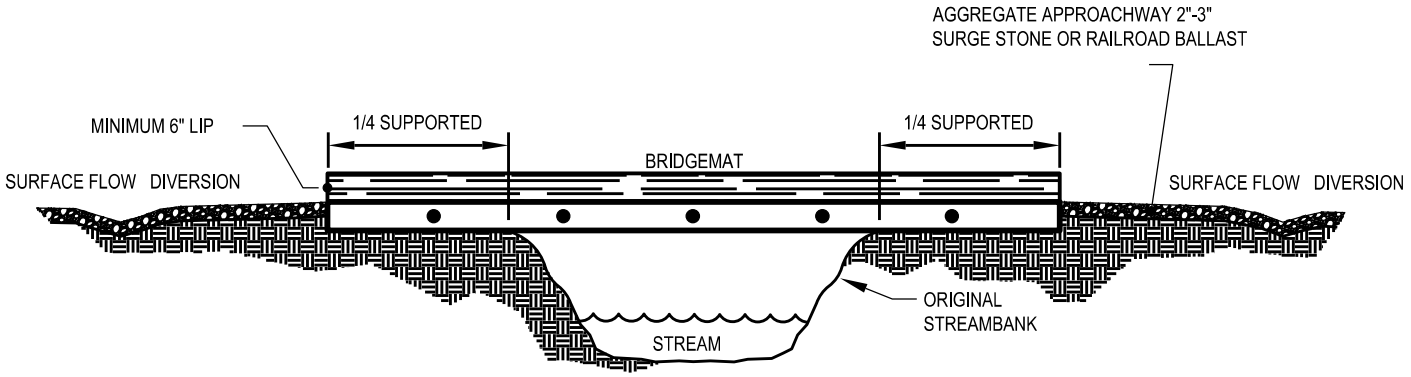
1. INSPECT ALL MEASURES AT LEAST WEEKLY AND AFTER EVERY RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. CLEAN AND REPLACE BAG WHEN IT IS HALF FULL WITH SEDIMENT AND/OR CONSTRUCTION DEBRIS OR IS INCAPABLE OF DRAINING.
3. WHEN MAINTAINING AND REMOVING INLET PROTECTION DEVICES, MINIMIZE SEDIMENT FALLING INTO THE INLET. IMMEDIATELY REMOVE ALL MATERIALS THAT HAVE FALLEN INTO INLETS.
4. DEPOSIT SEDIMENT REMOVED FROM THE DEVICE IN A SUITABLE AREA AWAY FROM THE DEVICE SO THAT IT WILL NOT BE RE-DEPOSITED. DEPOSIT AREA SHALL BE STABILIZED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	FILTER BAG INLET PROTECTION	
	SW-20.22	



PERSPECTIVE VIEW



SIDE VIEW

INSTALLATION NOTES:

1. REFER TO "NORTH CAROLINA DIVISION OF FOREST RESOURCES" LITERATURE, INSTALLATION MAINTENANCE GUIDELINES, & "NORTH CAROLINA FORESTRY BMP MANUAL-2006".
2. THE TEMPORARY BRIDGE MUST BE CONSTRUCTED AT OR ABOVE THE TOP OF BANK ELEVATION TO PREVENT ENTRAPMENT OF FLOATING MATERIALS AND DEBRIS.
3. SURFACE FLOW ON EITHER SIDE OF THE BRIDGE MUST BE DIVERTED BY SWALE AND/OR DIKE.
4. BRIDGE MUST BE CHAINED TO AN APPROPRIATE ANCHOR ON ONE OF THE BANKS.
5. STABILIZE EXPOSED MINERAL SOIL WITH TREE TOPS OR BRUSH DURING MAT INSTALLATION, AND SEEDING/MULCH AFTER MAT REMOVAL.
6. INSTALL MATS TO CREATE A MINIMUM 10 FOOT BRIDGE WIDTH.
7. INCLUDE COARSE AGGREGATE ON THE APPROACHWAY FOR A MINIMUM OF 25 FEET AND SILT FENCE ALONG STREAMBANKS ADJACENT TO CROSSING FOR A MINIMUM OF 25 FEET.

MAINTENANCE NOTES:

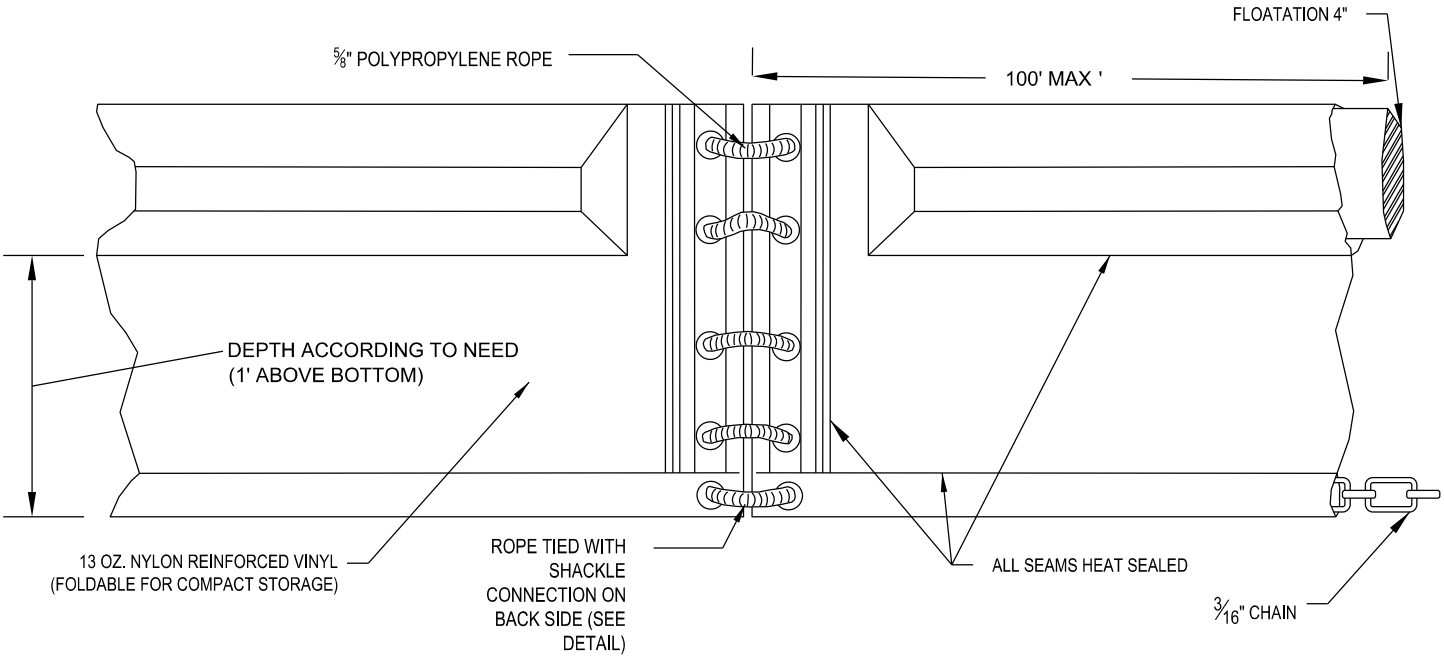
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. KEEP MATS' SURFACE FREE OF MINERAL SOIL AND DEBRIS THAT COULD ENTER STREAM.
3. PERIODICALLY CHECK MAT HARDWARE; RETIGHTEN NUTS & CABLE CLAMPS AS NECESSARY TO MAINTAIN BRIDGE STRENGTH AND INTEGRITY.
4. IMMEDIATELY REMOVE ANY DEBRIS WHICH ENTERS THE STREAM AT THE CROSSING LOCATION.

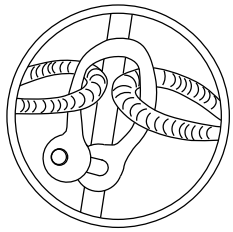
REMOVAL NOTES:

1. REMOVE MATS BY USING MAT CABLE LOOP OR SKIDDER GRAPPLE.
2. PERMANENTLY STABILIZE DISTRUBED PORTIONS OF STREAMBANK AND APPROACH ROADS WITH PERENNIAL GRASSES/MULCH (OR WETLAND MIX WHEN APPLICABLE).
3. LEAVE APPROPRIATE WATER DIVERSION STRUCTURES IN PLACE ON BOTH SIDES OF THE STREAM.
4. RESTORE THE STREAM CHANNEL TO ITS ORIGINAL CROSS-SECTION AND SMOOTH AND APPROPRIATELY STABILIZE ALL DISTURBED AREA.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	TEMPORARY STREAM CROSSING BRIDGE MAT	
	SW-20.23	





SHACKLE CONNECTION DETAIL

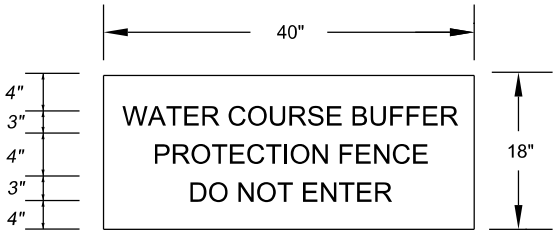
TURBIDITY CURTAIN (IN POND/COVE):

1. TURBIDITY CURTAINS MAY BE USED IN PONDS OR COVES (WITH REQUISITE APPROVAL) WHERE UPSLOPE DISTURBANCES/CONSTRUCTION WILL OCCUR TO REDUCE SEDIMENT TRANSPORT TO A LIMITED AREA IN THE RECEIVING WATERCOURSE.
2. TYPE 1 TURBIDITY CURTAINS SHALL BE USED IN PROTECTED AREAS WHERE THERE IS NO CURRENT AND THE AREA IS SHELTERED FROM WIND AND WAVES, CONSTRUCTED OF MINIMUM SPECIFICATIONS OF 13 OZ. PVC FABRIC, 4 INCH FLOAT, AND A 3/16 INCH BOTTOM BALLAST CHAIN. THE MAXIMUM SPAN BETWEEN JOINTS IS 100 FEET. SHOULD TYPE 2 OR TYPE 3 TURBIDITY CURTAINS BE NEEDED (WHERE THERE MAY BE SMALL TO CONSIDERATE CURRENT AND/OR WIND AND WAVE ACTION), ENGINEERED SPECIFICATIONS SHALL BE PROVIDED WITH THE PLAN SUBMISSION. TURBIDITY CURTAINS SHOULD NOT BE PLACED ACROSS THE MAIN FLOW OF A SIGNIFICANT BODY OF MOVING WATER.
3. THE TURBIDITY CURTAIN SHOULD BE ANCHORED TO THE SHORELINE ABOVE THE NORMAL HIGH WATER MARK, TOWED TO THE DESIRED LOCATION, AND ANCHORED (IF NEEDED) TO MAINTAIN THE DESIRED LOCATION WITHIN THE WATERCOURSE. THE TURBIDITY CURTAIN SHOULD EXTEND TO 1 FOOT ABOVE THE BOTTOM OF THE WATERCOURSE.

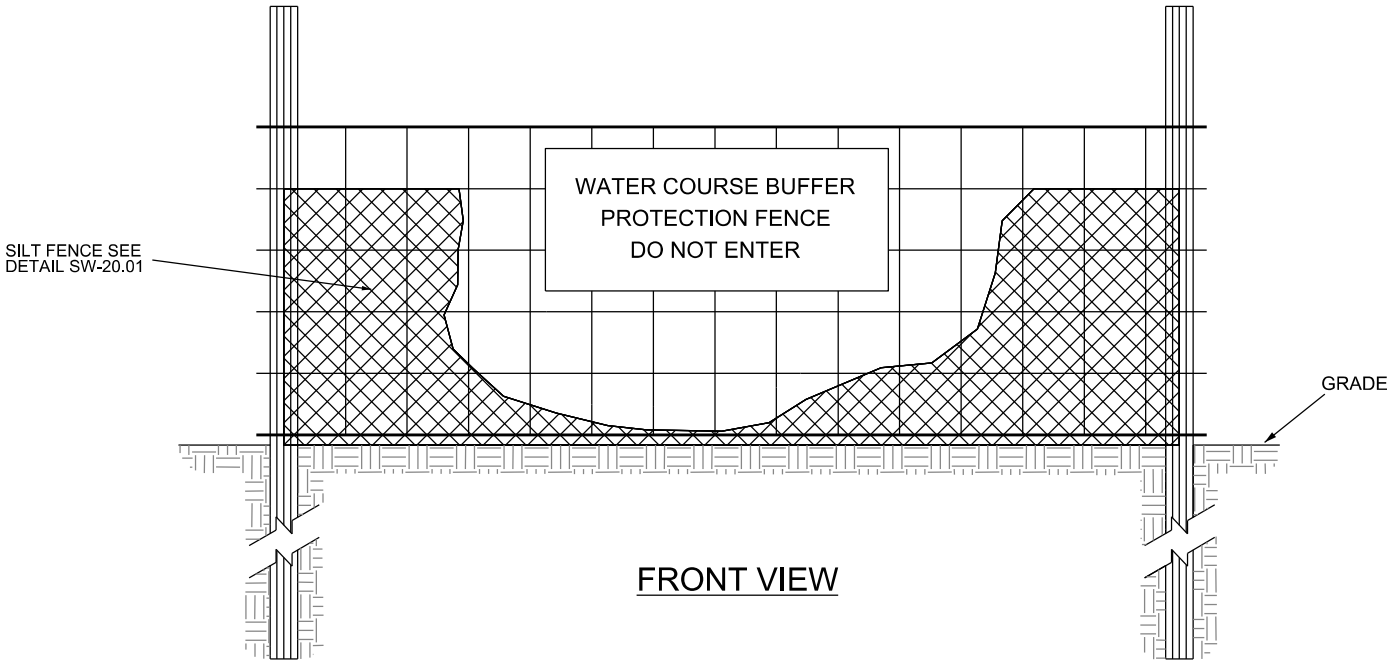
MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. WHEN THE CURTAIN IS NO LONGER REQUIRED, THE CURTAIN, ANCHORS, AND COMPONENTS SHALL BE REMOVED AND IN SUCH A MANNER AS TO MINIMIZE TURBIDITY. REMAINING SEDIMENT SHALL BE SUFFICIENTLY SETTLED BEFORE REMOVING THE CURTAIN. SEDIMENT MAY NEED TO BE REMOVED TO ACHIEVE THE ORIGINAL DEPTH OF THE WATERCOURSE AND SPOILS PROPERLY DISPOSED OR STABILIZED.

CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	*DATE: 9/2024* *NOT TO SCALE*
	TURBIDITY CURTAIN
	SW-20.24



WARNING SIGN DETAIL



FRONT VIEW

INSTALLATION NOTES:

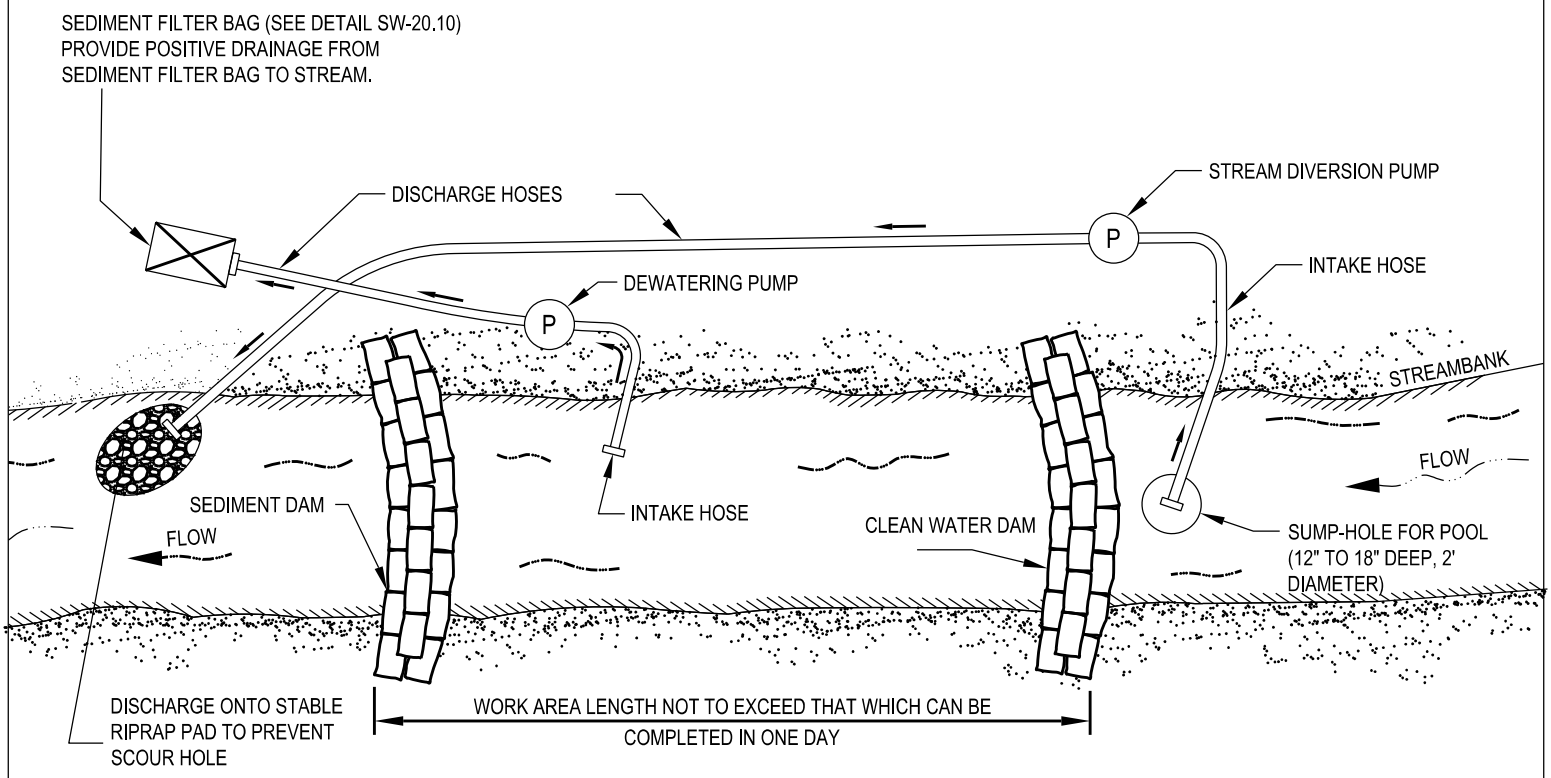
1. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
2. LETTERS TO BE 3 INCH HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
3. SIGNS SHALL BE PLACED AT 50 FFET MAXIMUM INTERVALS.
4. FOR WATERCOURSE BUFFER PROTECTION AREAS LESS THAN 200 FEET IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN 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 FEET ON CENTER THEREAFTER.

MAINTENANCE NOTES:

1. IF SIGN DETACHES OR FALLS FROM THE FENCE, AFFIX THE SIGN BACK ONTO THE FENCE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	WATERCOURSE BUFFER PROTECTION FENCE	
	SW-20.25	



TEMPORARY PUMP AROUND SEQUENCE

1. SET UP PUMP WITH SUCTION AND DISCHARGE HOSE.
2. INSTALL UP-STREAM SANDBAG DAM OR OTHER APPROVED MATERIAL.
3. INSTALL DOWN-STREAM DAM.
4. THE PUMP MUST RUN CONTINUOUSLY WHILE WORKING IN THE STREAM.
5. BANKS MUST BE STABILIZED AT THE END OF EACH DAY.

INSTALLATION NOTES:

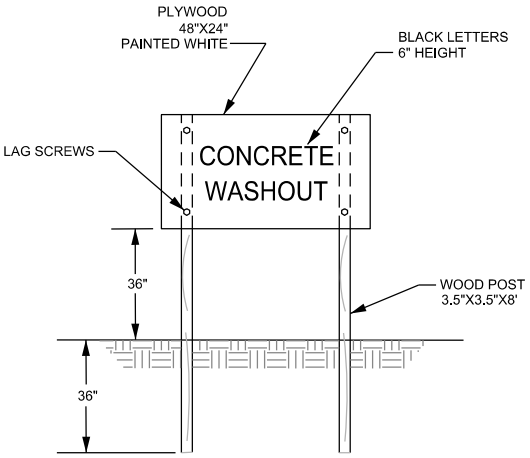
1. DAMS SHALL BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA, AND STREAM FLOW SHALL BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER CONSTRUCTED OF RIPRAP.
2. WATER FROM THE WORK AREA SHALL BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A SEDIMENT BAG OR OTHER APPROVED DEVICE. THE MEASURE SHALL BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DAM WITHOUT CAUSING FURTHER EROSION BETWEEN THE SEDIMENT FILTER BAG AND THE STREAMBANK.

MAINTENANCE NOTES:

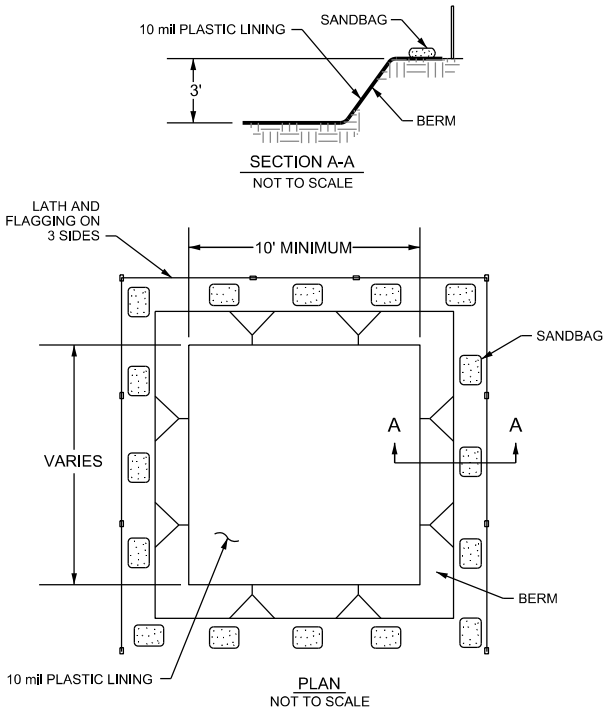
1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. BANKS MUST BE STABILIZED AT THE END OF EACH DAY.
3. WHEN RAIN EVENTS ARE ANTICIPATED, ENSURE THAT PUMPS ARE IN WORKING ORDER.

CITY OF RALEIGH
STANDARD DETAIL

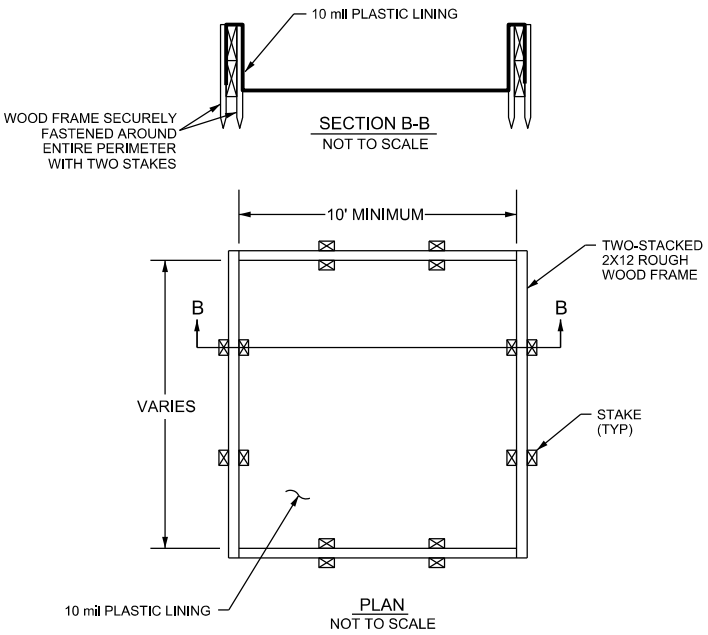
REVISIONS	DATE: 9/2024	NOT TO SCALE
	TEMPORARY PUMP AROUND	
	SW-20.26	



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)



TYPE "BELOW GRADE"



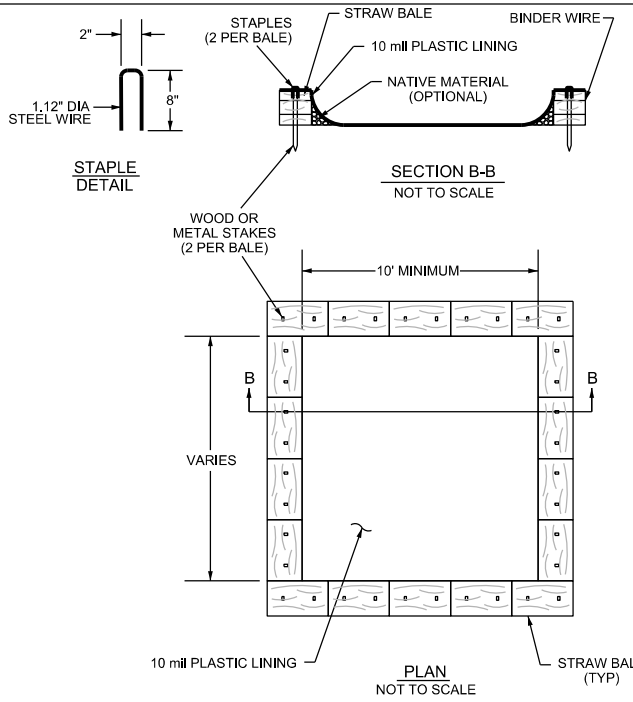
TYPE "ABOVE GROUND"
WITH WOOD PLANKS

INSTALLATION NOTES:

1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FEET 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 BACKFIELD, REPAIRED AND STABILIZED TO PREVENT EROSION.
5. MUST BE LOCATED AT LEAST 50 FEET FROM INLETS/WATERWAYS UNLESS THERE IS NO OTHER PRACTICAL ALTERNATIVE.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. REMOVE LIQUID AND/OR SOLID MATERIAL WHEN IT REACHES 75% CAPACITY TO LIMIT OVERFLOW EVENTS.
3. REPLACE STRUCTURAL COMPONENTS AS NEEDED.



TYPE "ABOVE GRADE"
WITH STRAW BALES

CITY OF RALEIGH
STANDARD DETAIL

CONCRETE WASHOUT

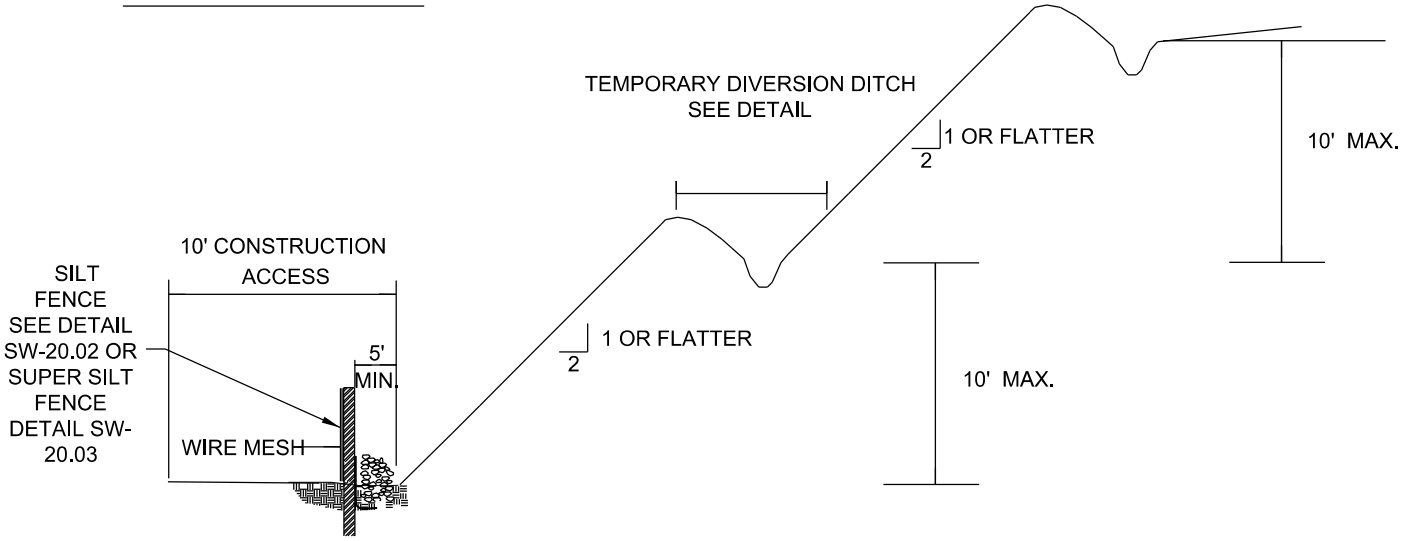
SW-20.27

REVISIONS

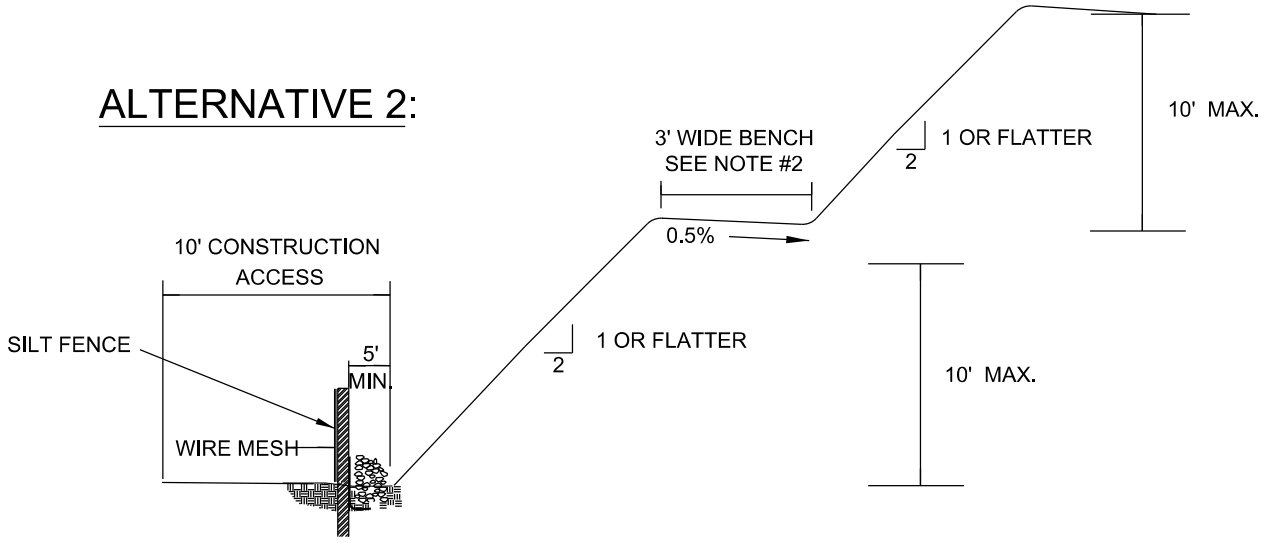
DATE: 9/2024

NOT TO SCALE

ALTERNATIVE 1:



ALTERNATIVE 2:



INSTALLATION NOTES:

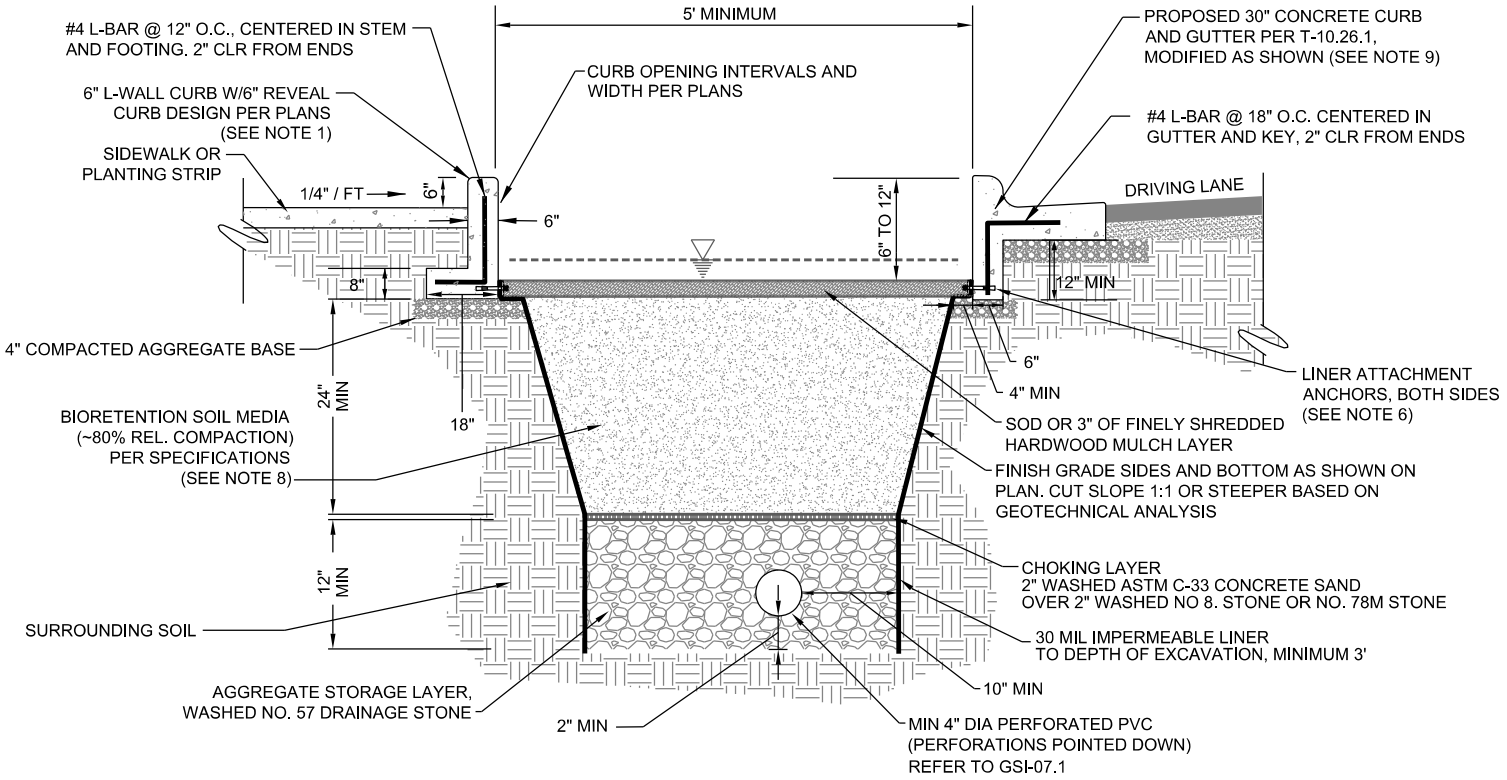
1. IF DIVERSION DITCH USED, IT SHOULD FLOW INTO SEDIMENT BASIN, ROCK CHECK DAM, OR SLOPE DRAIN.
2. BENCH SHOULD BE GRADED AT 0% LONGITUDINAL SLOPE (ON-CONTOUR).
3. SLOPES SHOULD BE STABILIZED IMMEDIATELY AFTER GRADING IS COMPLETE.

MAINTENANCE NOTES:

1. MEASURES SHALL BE INSPECTED AT LEAST ONCE A WEEK OR IMMEDIATELY AFTER EACH RAINFALL OF 1.0 INCH OR GREATER. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. IF SIGNS OF EROSION ARE EVIDENT, REGRADE AND RESTABILIZE. CONSIDER USING MATTING OR OTHER MEASURES TO HELP PREVENT EROSION.

CITY OF RALEIGH
STANDARD DETAIL

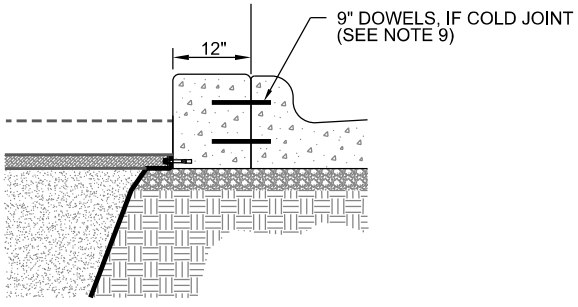
REVISIONS	DATE: 9/2024	NOT TO SCALE
	SLOPE TERRACING	
	SW-20.28	



TYPICAL BUMP-OUT BIORETENTION SECTION
POSTED SPEED LIMIT OF 30 MPH AND LOWER

NOTES:

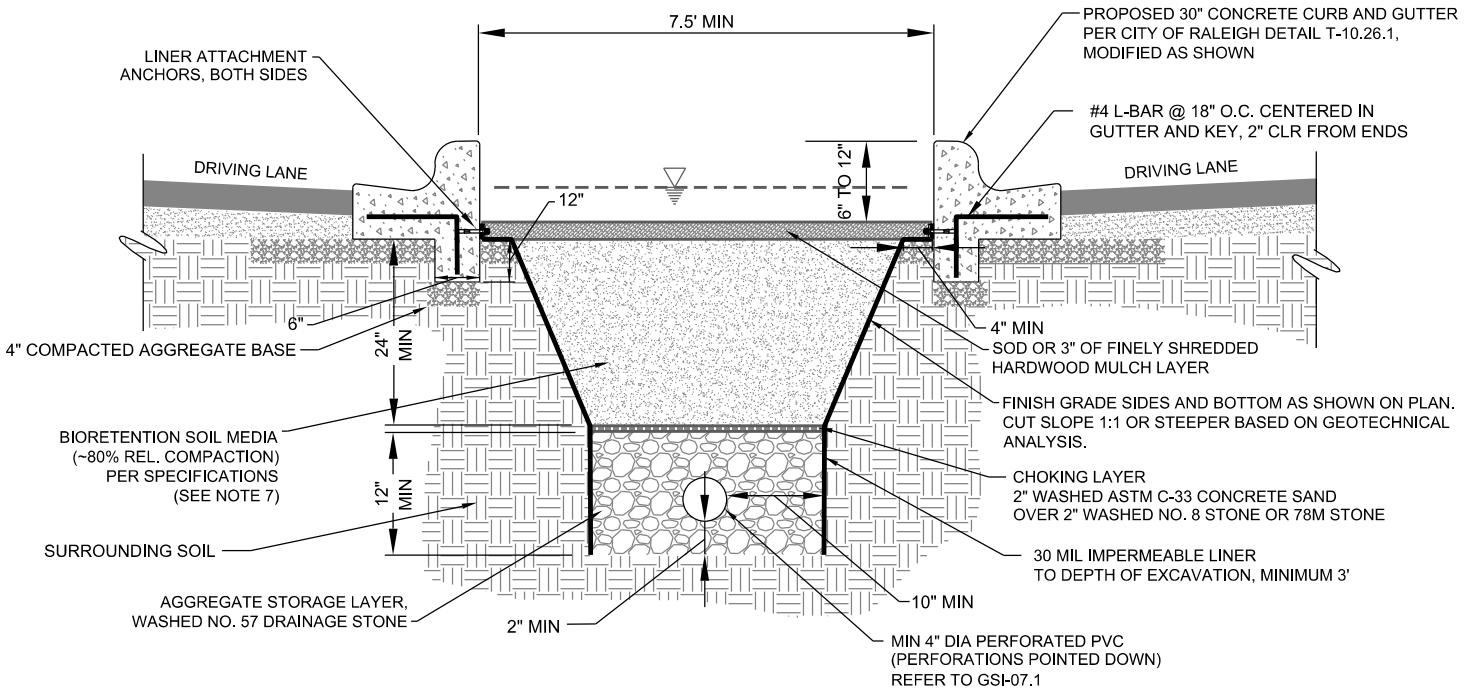
1. EXPANSION JOINTS AND DUMMY JOINTS SHALL BE PER STANDARD DETAIL T-10.26.1, CURB AND GUTTER.
2. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
3. BIORETENTION SIZING IS THE RESPONSIBILITY OF THE DESIGN ENGINEER. SIZING CALCULATIONS SHALL BE SUBMITTED TO THE CITY FOR REVIEW.
4. IF REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
5. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
6. 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. REFER TO GSI-08.1 AND GSI-08.2.
7. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL. FOR CITY PROJECTS SEE SPECIFICATION 33.43.73 FOR SUBGRADE PREPARATION.
8. BIORETENTION MEDIA SHALL BE PLACED IN 6" TO 12" 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 AND FOR CITY PROJECTS SPECIFICATION 33.46.70 FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
9. 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.
10. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
11. FOR CITY PROJECTS, ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED FOLLOWING SPECIFICATION 33.46.70.
12. EXTEND CLEANOUT TO ELEVATION SHOWN ON PLANS.



(OPTIONAL) CONCRETE CURB EXTENSION DETAIL

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	CURB-SIDE AND BUMP-OUT BIORETENTION (FOR 30 MPH AND BELOW)	
	SW-30.01	



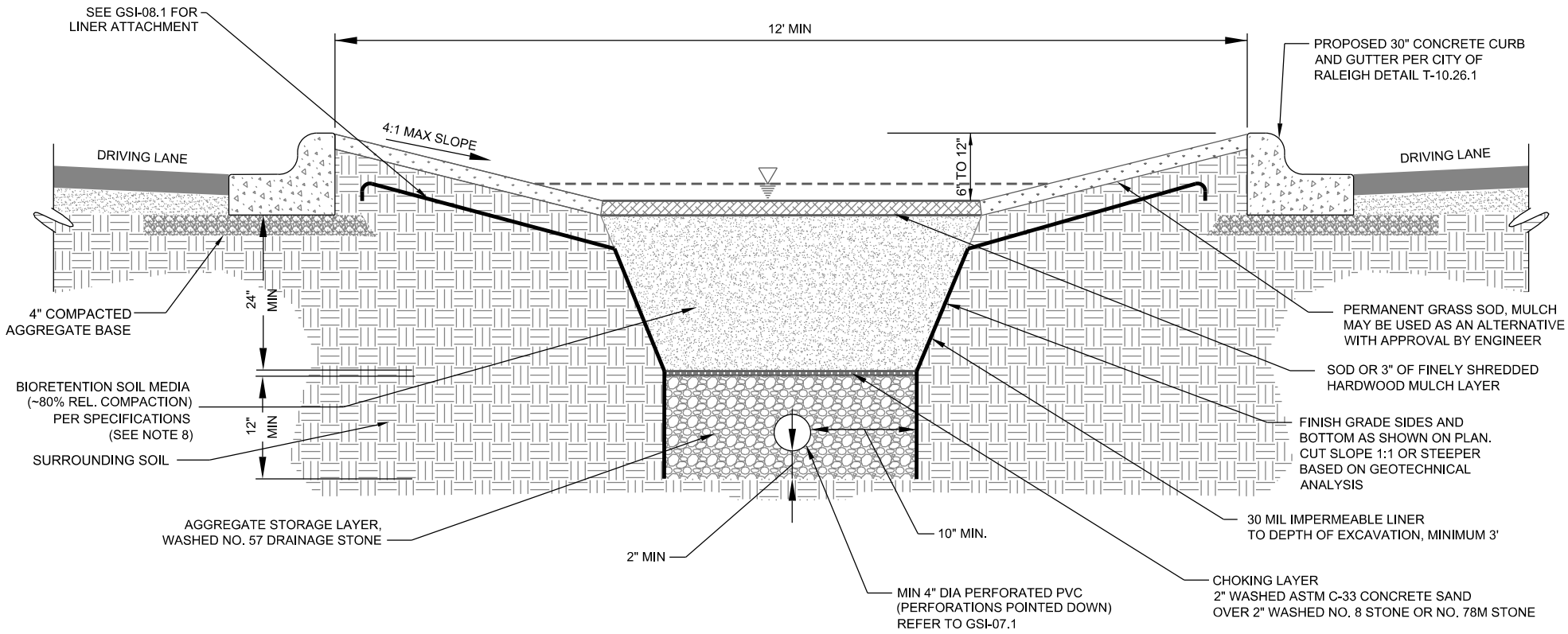
TYPICAL MEDIAN BIORETENTION SECTION
POSTED SPEED LIMIT OF 30 MPH AND LOWER

NOTES:

1. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
2. FOR CITY PROJECTS, SEE SPECIFICATION 33.46.71 FOR UNDERDRAIN AND SPECIFICATION 33.46.74 FOR IMPERMEABLE LINER.
3. IF REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
4. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
5. 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. REFER TO GSI-08.1 AND GSI-08.2.
6. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL. FOR CITY PROJECTS, SEE SPECIFICATION 33.43.73 FOR SUBGRADE PREPARATION.
7. BIORETENTION MEDIA SHALL BE PLACED IN 6" TO 12" 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 AND FOR CITY PROJECTS, SPECIFICATION 33.46.70 FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
8. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
9. FOR CITY PROJECTS, ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED FOLLOWING SPECIFICATION 33.46.70.
10. EXTEND CLEANOUT TO ELEVATION SHOWN ON PLANS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	MEDIAN BIORENTENTION (FOR 30 MPH AND BELOW)	
	SW-30.02.1	



TYPICAL MEDIAN BIORETENTION SECTION
POSTED SPEED LIMIT HIGHER THAN 30 MPH

NOTES:

1. REFER TO DESIGN PLANS FOR HORIZONTAL CONTROL INFORMATION.
2. FOR CITY PROJECTS, SEE SPECIFICATION 33.46.71 FOR UNDERDRAIN AND SPECIFICATION 33.46.74 FOR IMPERMEABLE LINER.
3. IF UNDERDRAIN IS REQUIRED, REFER TO DESIGN PLANS FOR UNDERDRAIN INVERT ELEVATIONS.
4. REFER TO PLANS FOR UNDERDRAIN CLEANOUT LOCATIONS AND INSTALLATION DETAILS.
5. BOTTOM OF STORAGE LAYER SHALL BE SCARIFIED TO PROMOTE INFILTRATION PRIOR TO BACKFILL. FOR CITY PROJECTS, SEE SPECIFICATION 33.43.73 FOR SUBGRADE PREPARATION.
6. VEGETATION MAY BE PLACED ON SIDE SLOPES TO ANCHOR MULCH IF DESIRED.
7. 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.
8. BIORETENTION MEDIA SHALL BE PLACED IN 6" TO 12" 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 AND FOR CITY PROJECTS, SPECIFICATION 33.46.70 FOR BIORETENTION SOIL MEDIA SPECIFICATIONS.
9. STABILIZE CONTRIBUTING DRAINAGE AREA PRIOR TO PLACEMENT OF UNDERDRAIN AND VARIOUS FILL MATERIALS.
10. FOR CITY PROJECTS, ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED FOLLOWING SPECIFICATION 33.46.70.
11. EXTEND CLEANOUT TO ELEVATION SHOWN ON PLANS.

CITY OF RALEIGH
STANDARD DETAIL

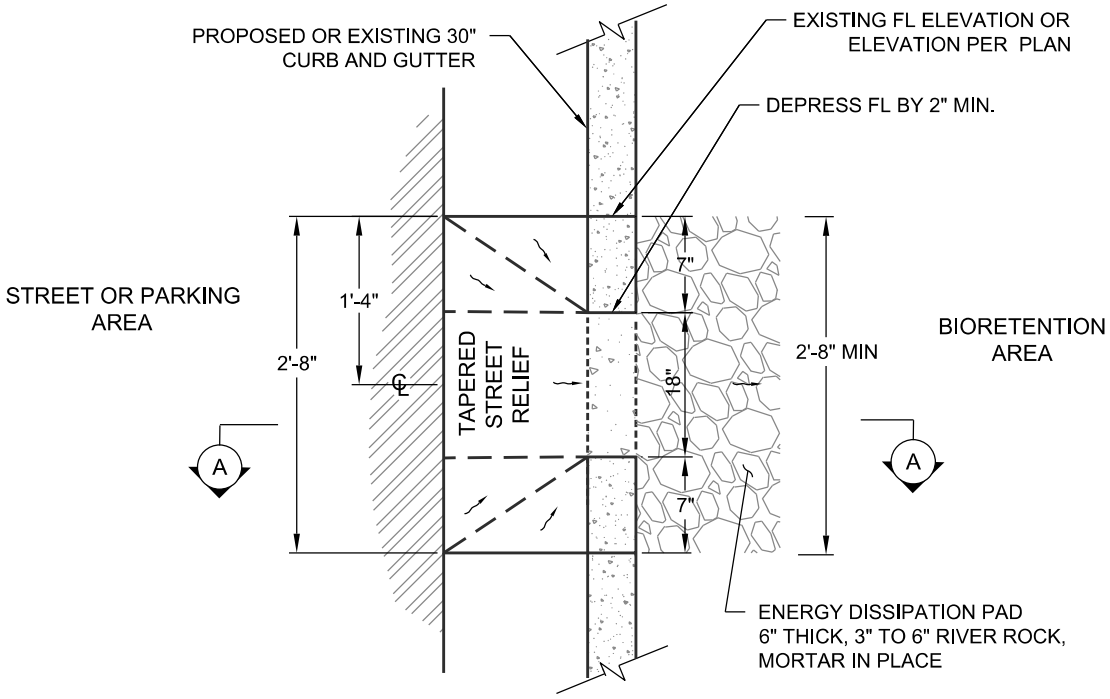
REVISIONS

MEDIAN BIORENTENTION
(FOR ABOVE 30 MPH)

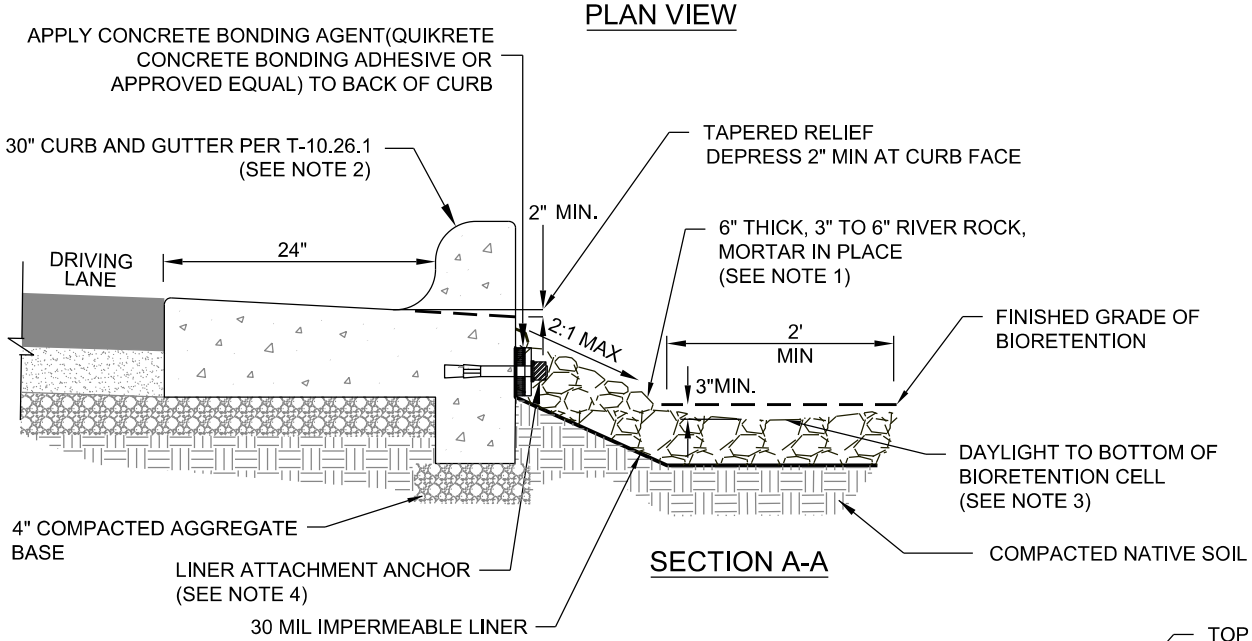
DATE: 9/2024

NOT TO SCALE

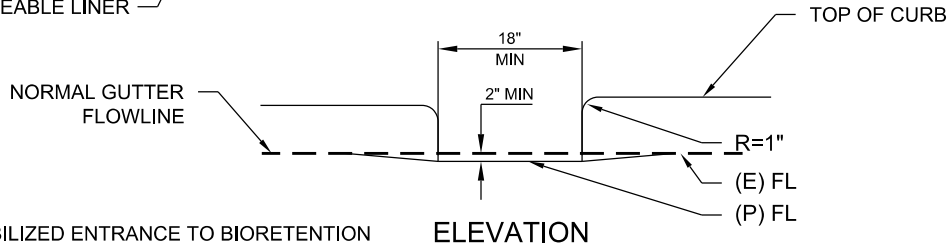
SW-30.02.2



PLAN VIEW



SECTION A-A



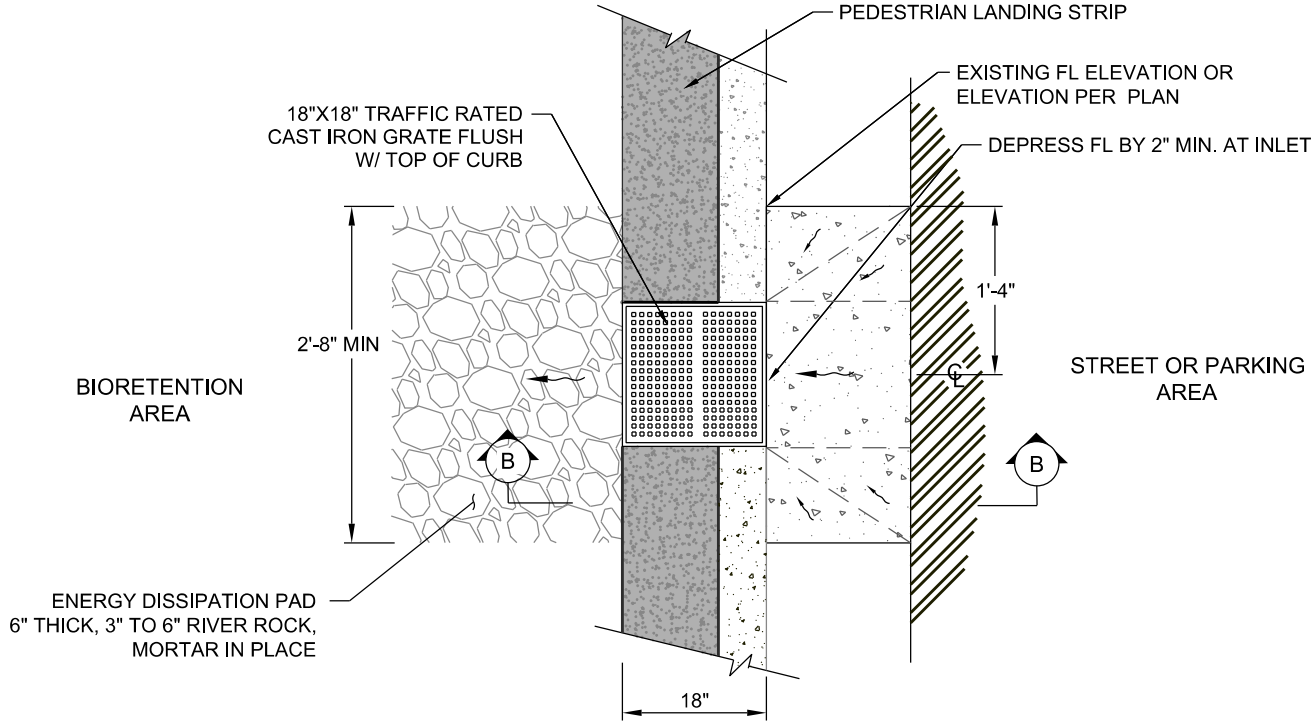
ELEVATION

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.

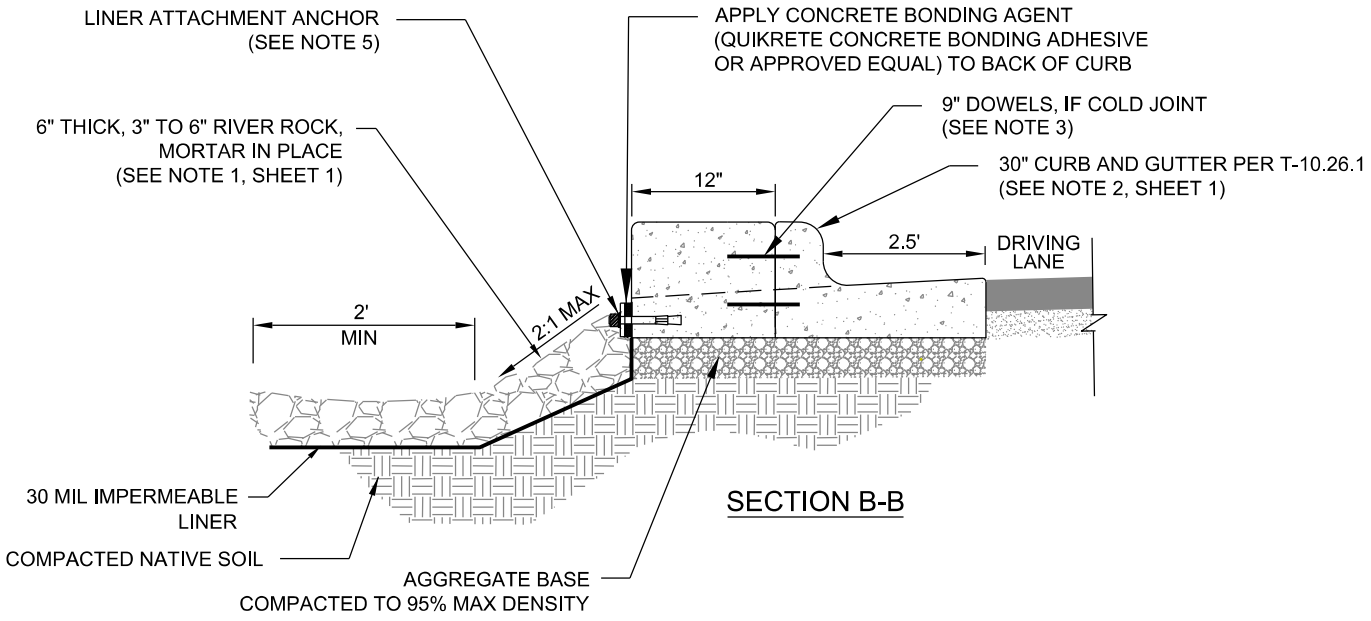
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	CURB-CUT INLET (TAPERED STREET RELIEF)	
	SW-30.03.1	



PLAN VIEW

PEDESTRIAN OPTION



SECTION B-B

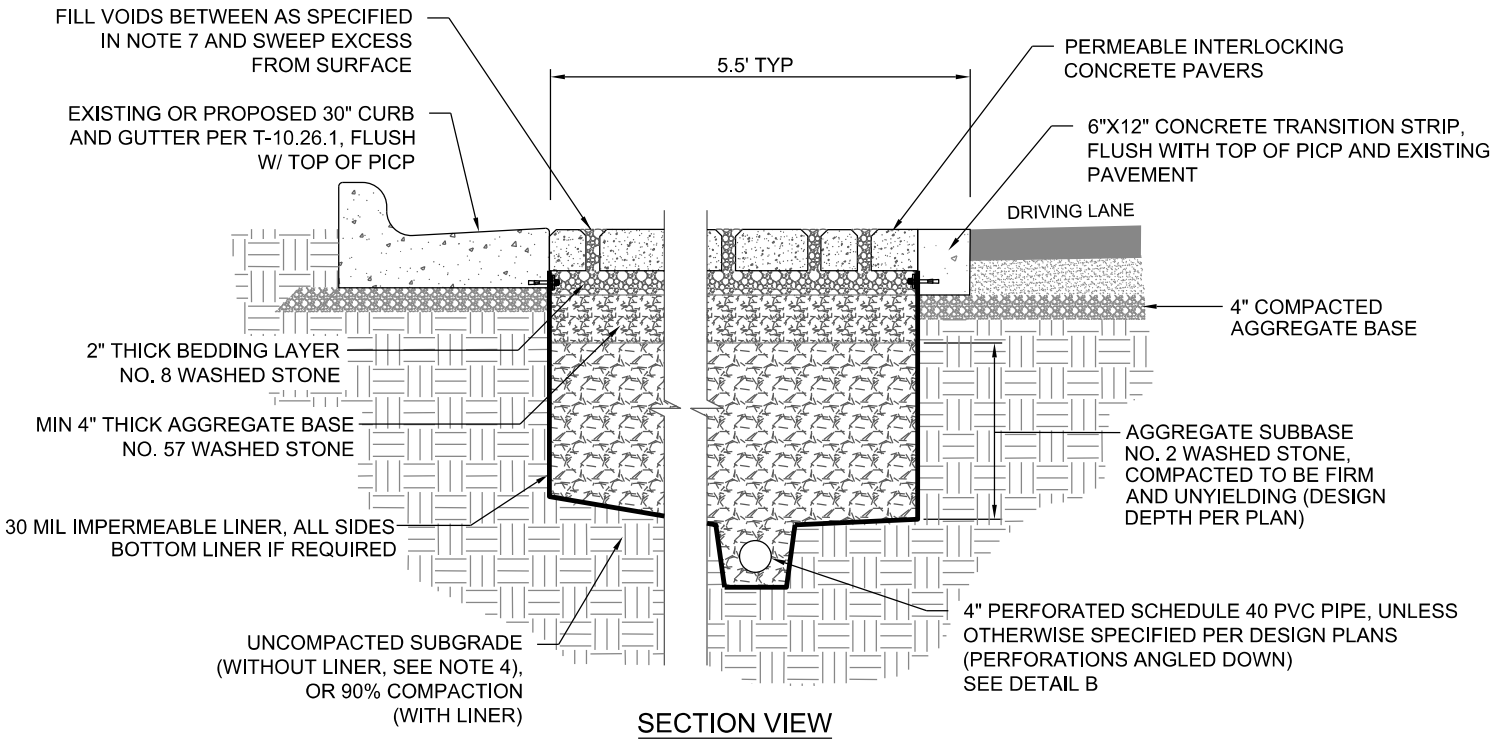
NOTES:

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

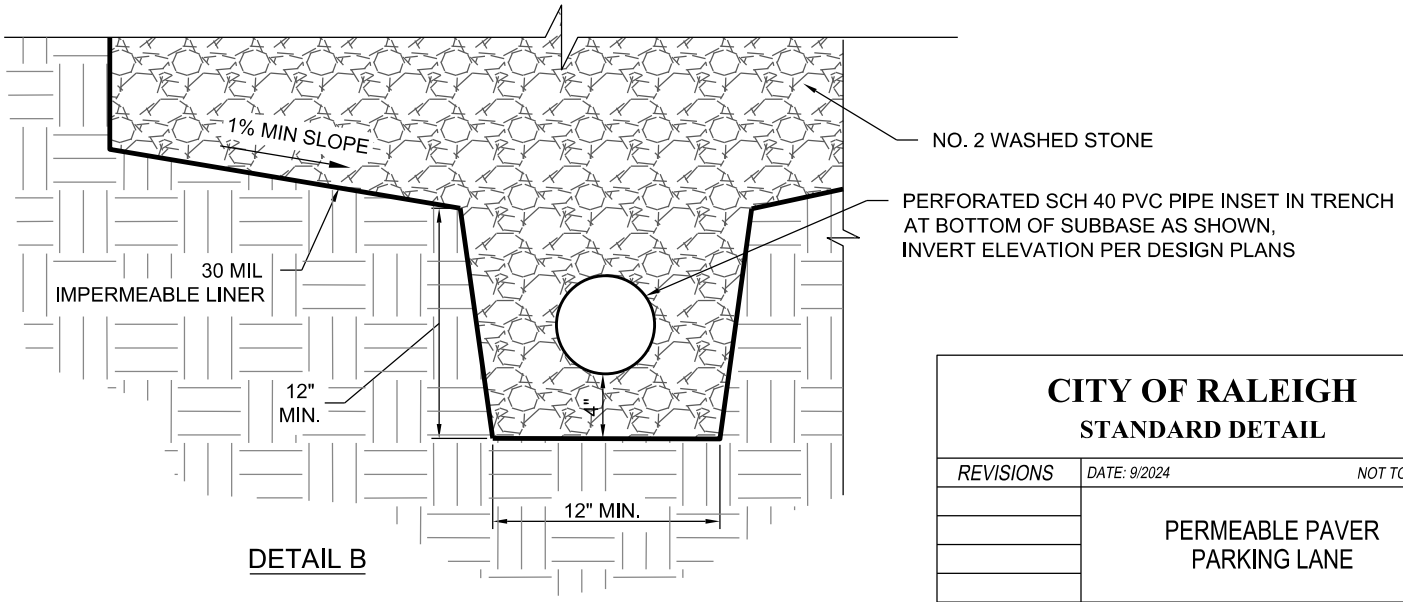
REVISIONS	DATE: 9/2024	NOT TO SCALE
	CURB-CUT INLET (CAST IRON GRATE)	
	SW-30.03.2	



SECTION VIEW

NOTES:

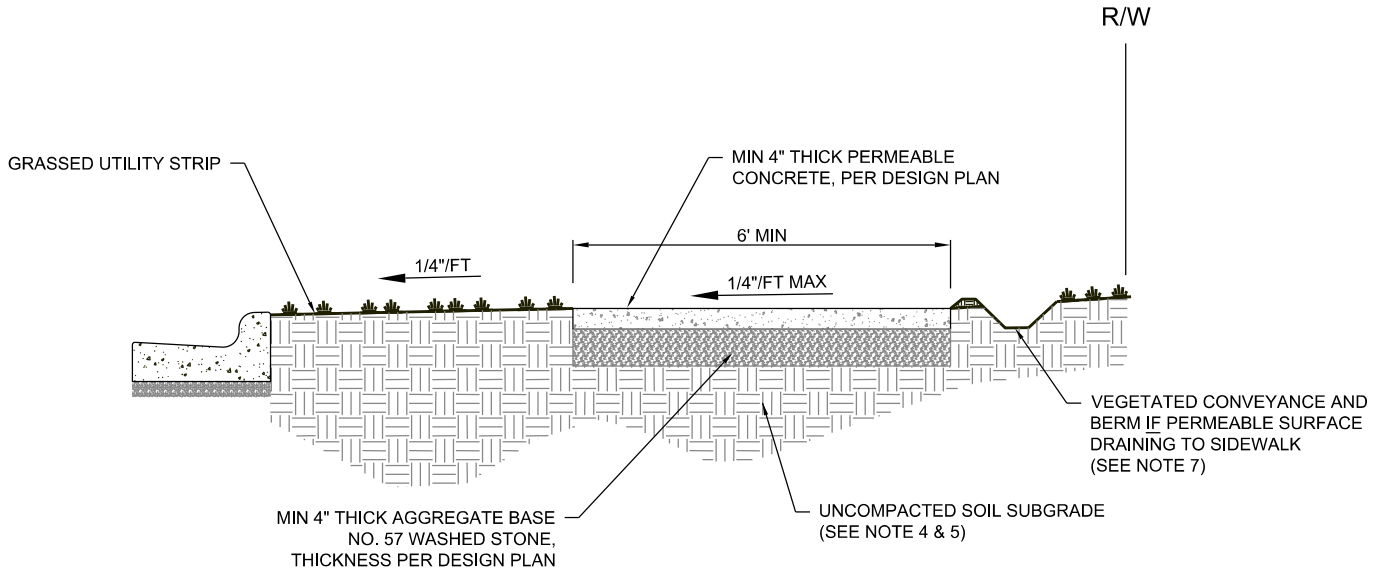
1. ALL PICP SHALL CONFORM TO ASTM C936 AND ADA DESIGN GUIDELINES.
2. SLOPE OF SOIL SUBGRADE SHALL BE 0.5% OR LESS. MAXIMUM PICP SURFACE SLOPE SHALL BE 6%.
3. THE SEASONAL HIGH WATER TABLE SHALL HAVE A MINIMUM 2 FT SEPARATION FROM THE BOTTOM OF THE AGGREGATE SUBBASE.
4. IN HSG B, C, OR D SOILS, THE SURFACE 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: 9/2024	NOT TO SCALE
	PERMEABLE PAVER PARKING LANE	
	SW-30.04	



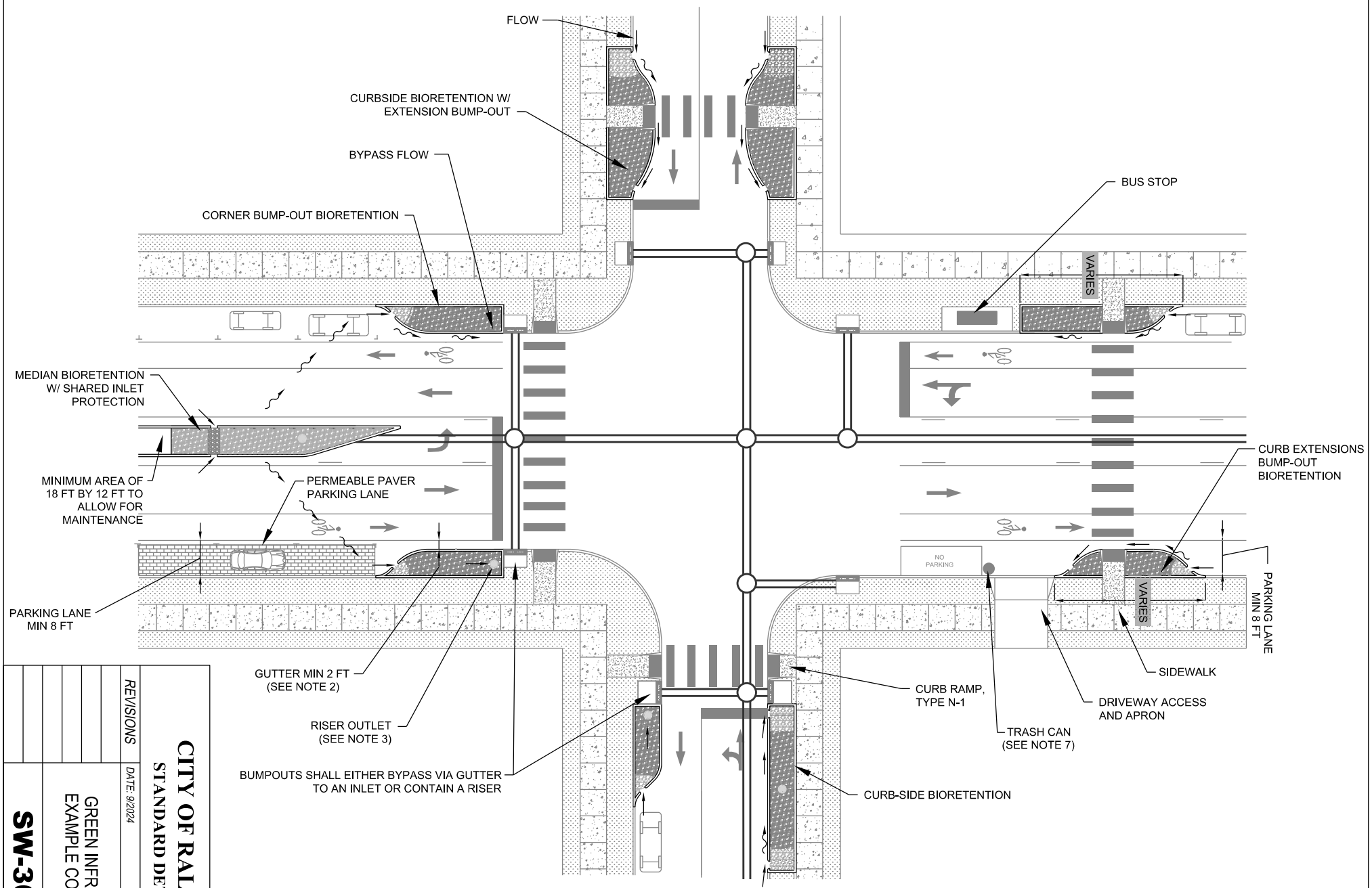
SECTION VIEW

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: 9/2024	NOT TO SCALE
	PERMEABLE CONCRETE SIDEWALK	
	SW-30.05	



PLAN VIEW

CITY OF RALEIGH
STANDARD DETAIL

GREEN INFRASTRUCTURE
EXAMPLE CONFIGURATION

SW-30.06.1

REVISIONS

DATE: 9/2024

NOT TO SCALE

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.

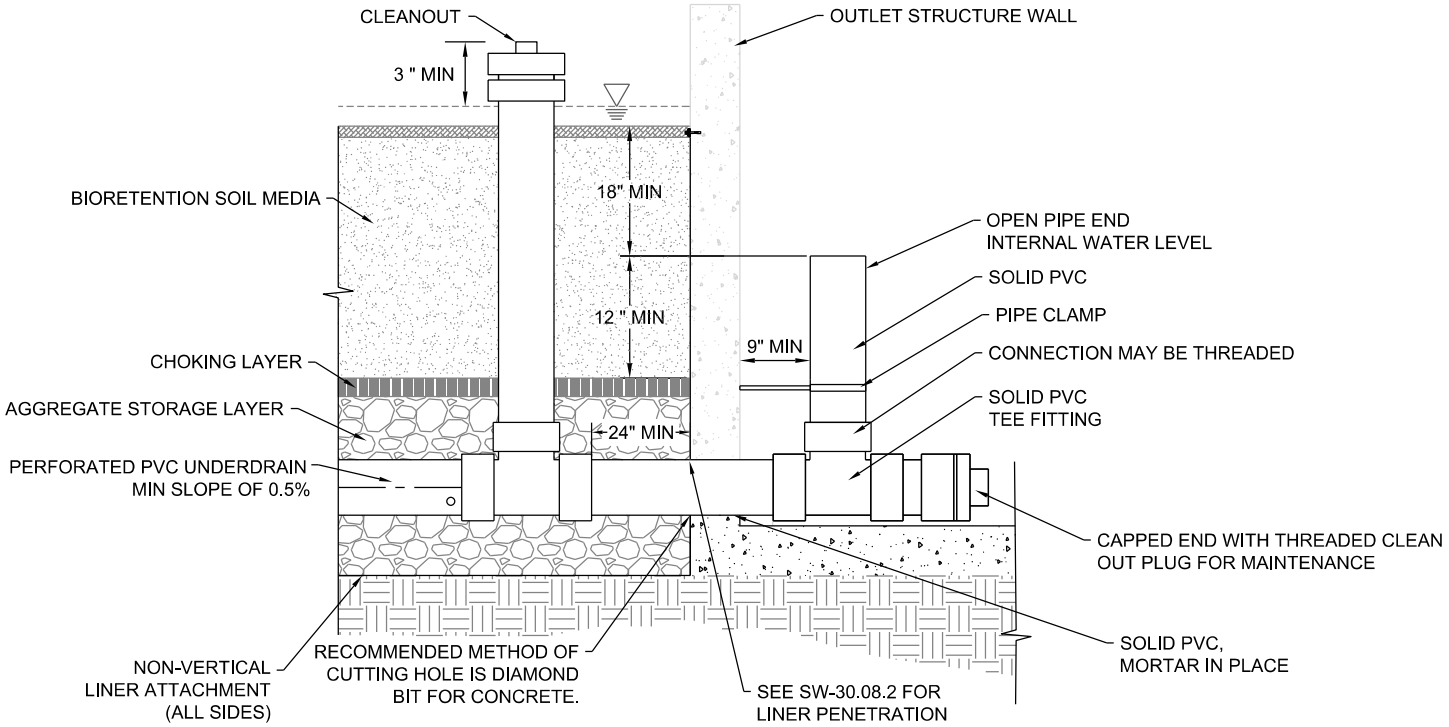
4. ALL BIORETENTION AND PERMEABLE PAVEMENT UNDERDRAINS, IF REQUIRED, SHALL CONNECT TO STORM DRAIN OR OTHER DRAINAGE FEATURE ACCEPTABLE TO THE CITY ENGINEER.

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 MANUAL AND CITY OF RALEIGH STORMWATER DESIGN MANUAL. FOR CITY PROJECTS, SEE SPECIFICATION 33.46.76 FOR VEGETATION.

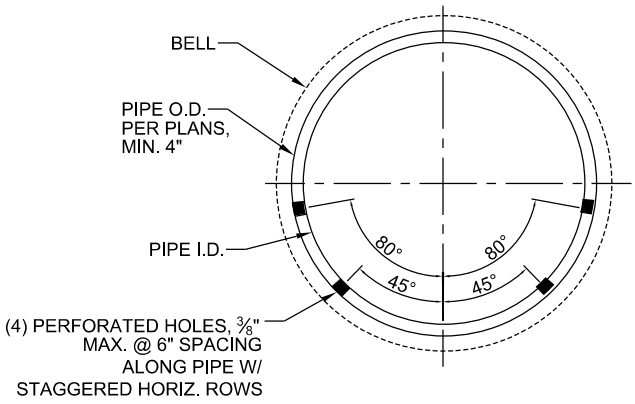
6. ROADWAY FEATURES AND PAVEMENT MARKINGS ARE FOR REFERENCE ONLY. ACTUAL DIMENSIONS AND MARKINGS SHALL CONFORM TO THE CITY OF RALEIGH STREET DESIGN MANUAL.

7. CURB AREA SHOULD BE PROVIDED TO ALLOW FOR PLACEMENT OF WASTE COLLECTION BINS (I.E., ALLOW SOME CURB THAT IS NOT TAKEN UP BY BIORETENTION AND DRIVEWAYS).

CITY OF RALEIGH STANDARD DETAIL	
REVISIONS	DATE: 9/2024 NOT TO SCALE
	GREEN INFRASTRUCTURE GENERAL NOTES
	SW-30.06.2



UNDERDRAIN UPTURNED ELBOW



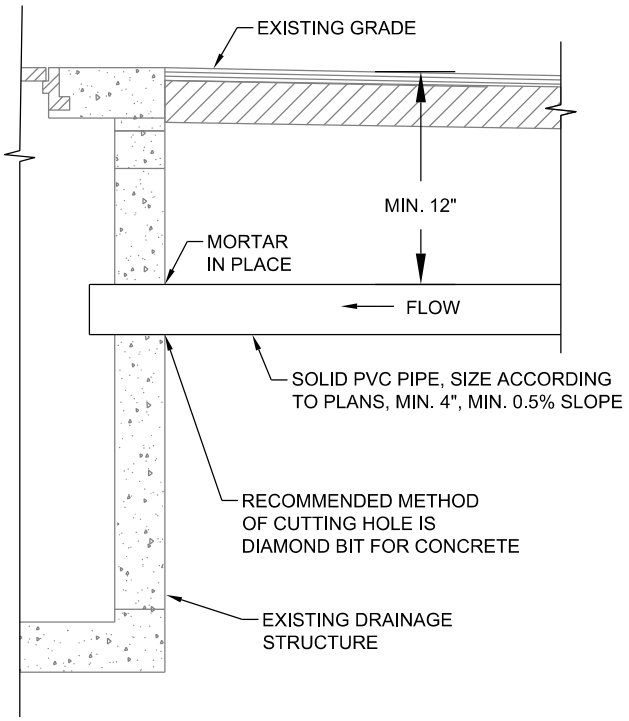
PERFORATED HOLE PLACEMENT

NOTES:

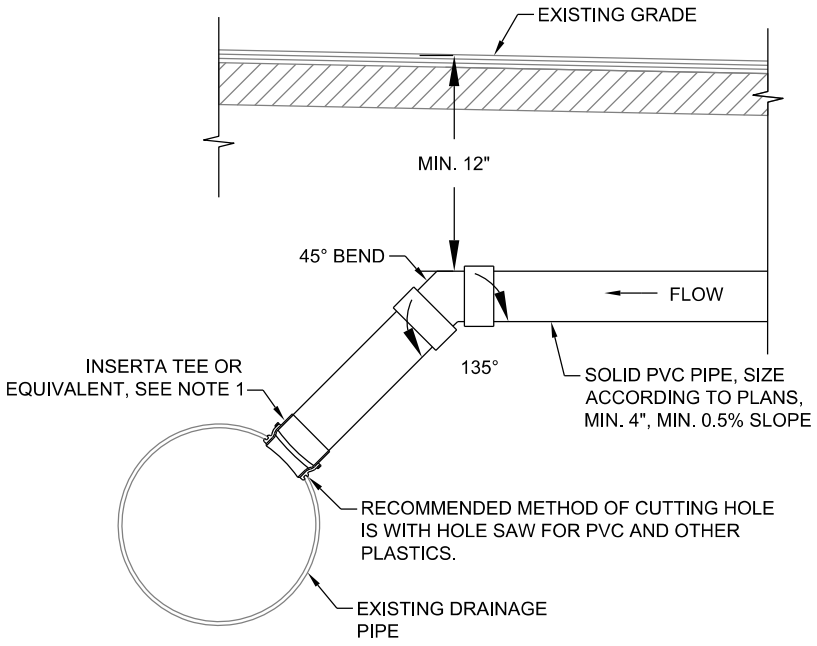
1. PLACEMENT OF THE UNDERDRAIN SHALL BE IN ACCORDANCE WITH THE APPROVED IMPROVEMENT PLANS, OR AS INDICATED BY THE CITY ENGINEER. HORIZONTAL LOCATION MAY VARY AS LONG AS MINIMUM OFFSET DISTANCES AND BOTTOM SLOPES ARE MAINTAINED.
2. PERFORATED PLASTIC PIPE SHALL BE SMOOTH-WALL PVC PLASTIC PIPE HAVING A 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.
7. ALL PIPE SHALL BE SCHEDULE 40 OR SDR 35 SMOOTH WALL PVC.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	UNDERDRAIN DETAIL	
	SW-30.07.1	



CONNECTION TO EXISTING STORMWATER STRUCTURE



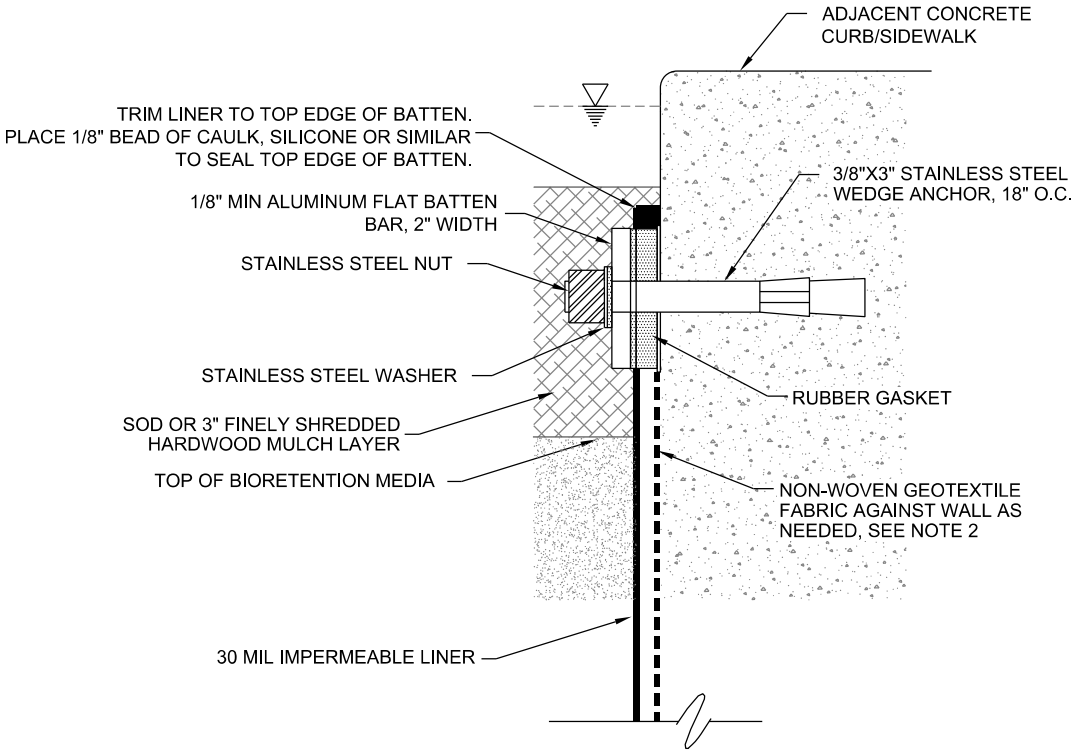
CONNECTION TO EXISTING STORMWATER PIPE

NOTES

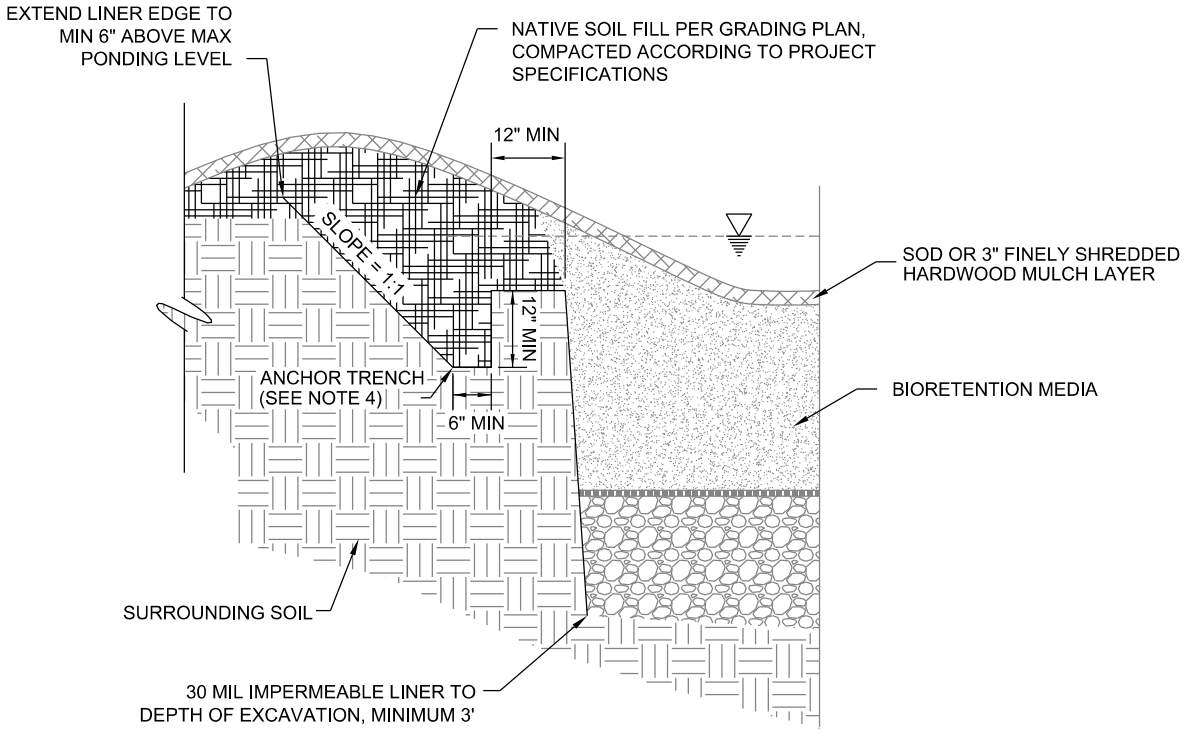
1. INSTALL INSERTA TEE PER MANUFACTURER'S SPECIFICATIONS. ONLY ALLOWED FOR PLASTIC PIPES.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	UNDERDRAIN CONNECTION TO EXISTING INFRASTRUCTURE	
	SW-30.07.2	



VERTICAL WALL LINER ATTACHMENT



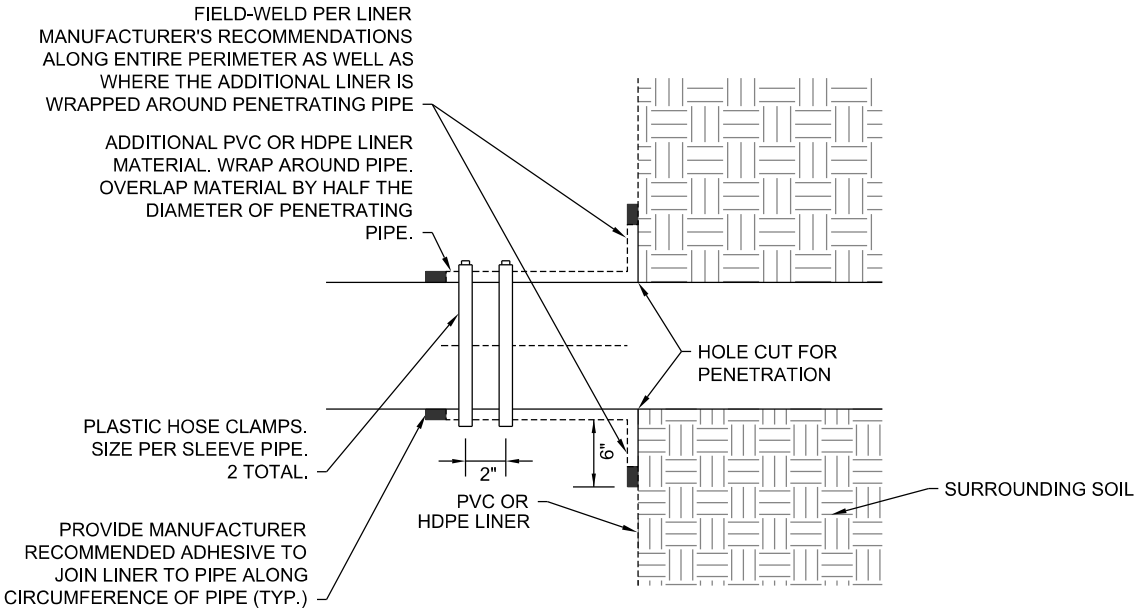
NON-VERTICAL LINER ATTACHMENT

NOTES:

1. THE SURFACE OF THE EXISTING/PROPOSED SIDEWALK OR EXTENDED CURB TO WHICH THE GEOMEMBRANE LINER IS TO BE ATTACHED SHOULD BE CONSTRUCTED OR FORMED TO PREVENT DAMAGE TO THE GEOMEMBRANE BY REMOVING IRREGULARITIES ON THE CONCRETE SURFACE TO PREVENT STRESS POINTS IN THE GEOMEMBRANE.
2. IF IRREGULARITIES (I.E., SHARP PROTRUSIONS EXCEEDING 1/2 INCH FROM SURFACE FACE) CAN NOT BE REMOVED FROM AN EXISTING SAW-CUT OR FORMED STRUCTURE, A PROTECTIVE GEOTEXTILE LAYER SHOULD BE PLACED BETWEEN THE SURFACE AND THE GEOMEMBRANE.
3. ENSURE BATTEN ANCHORS ARE MAX DISTANCE OF 6" FROM JOINTS.
4. WHERE SITE CONDITIONS PROHIBIT TEMPORARY SOIL SATURATION WITHIN THE ANCHOR TRENCH, THE LINER SHALL BE PUNCTURED ALONG THE BOTTOM OF THE TRENCH BY DRILLING/PUNCHING 1 INCH DIAMETER SEEPAGE HOLES AT 2 FOOT SPACING.
5. NON-VERTICAL LINER ATTACHMENT TO BE USED IF BATTEN BAR ATTACHMENT IS NOT AVAILABLE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	LINER ATTACHMENT DETAIL	
	SW-30.08.1	

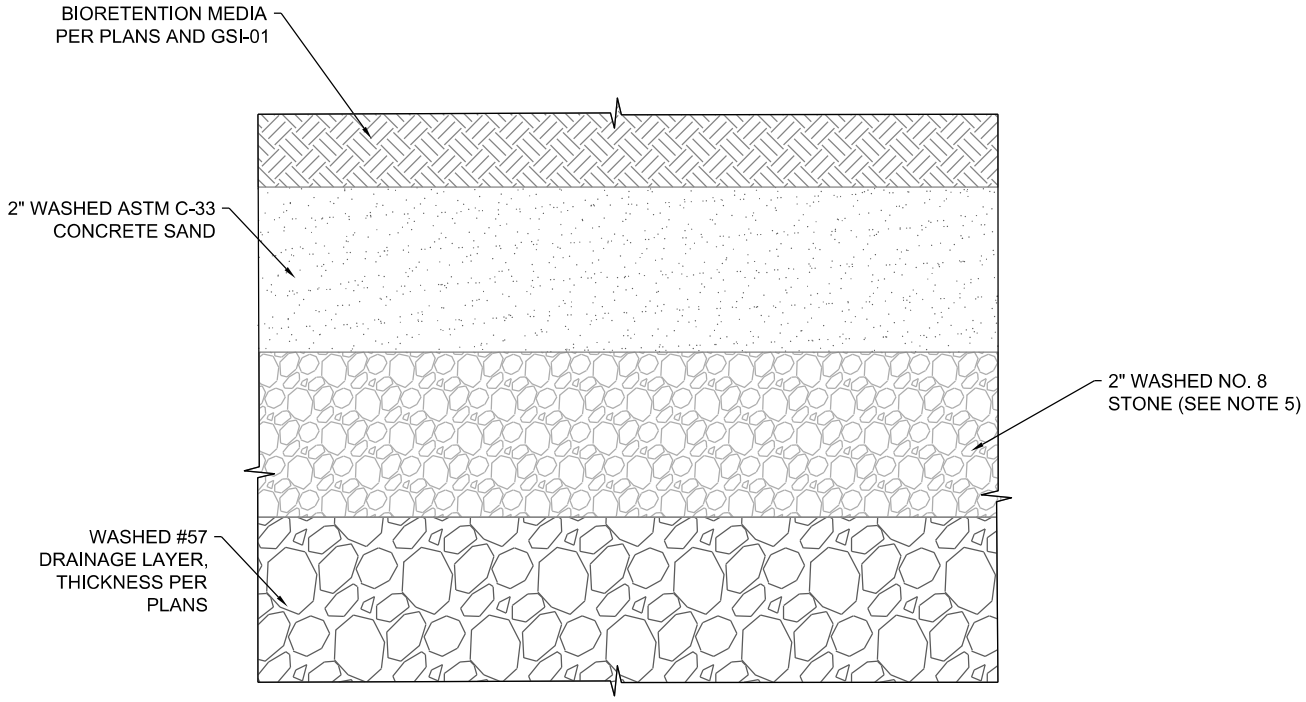


LINER PENETRATION

NOTE:

1. CONTACT UTILITY OWNER FOR SLEEVE, COVERAGE, AND OTHER CROSSING REQUIREMENTS.
2. INCLUDE SLEEVE WITHIN PERVIOUS 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: 9/2024	NOT TO SCALE
	LINER PENETRATION DETAIL	
	SW-30.08.2	



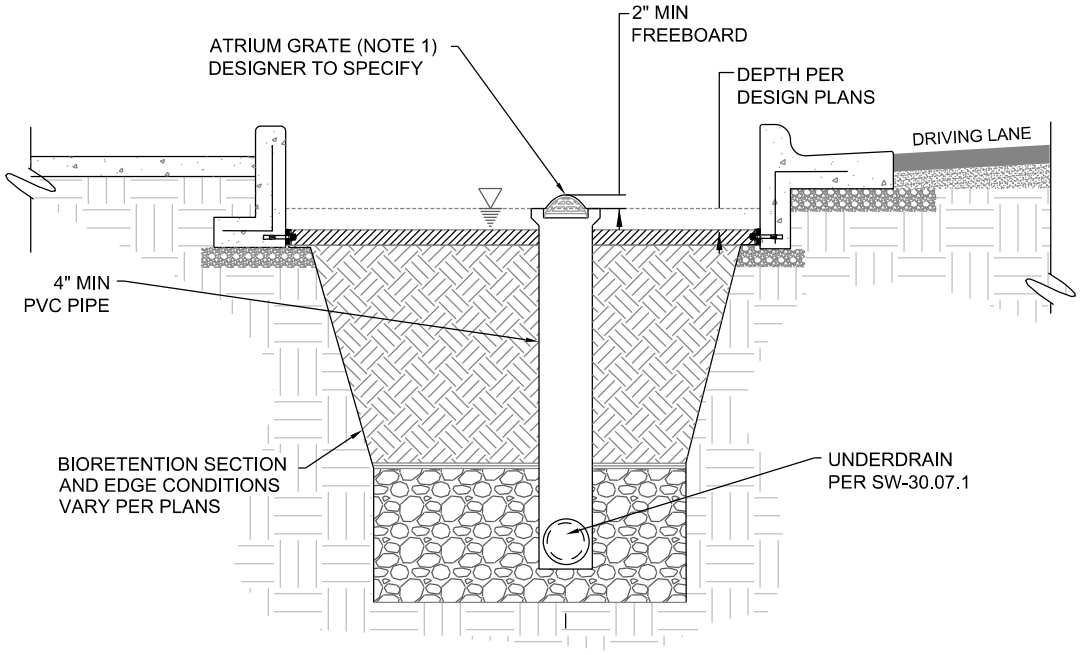
CHOKER LAYER DETAIL

NOTES

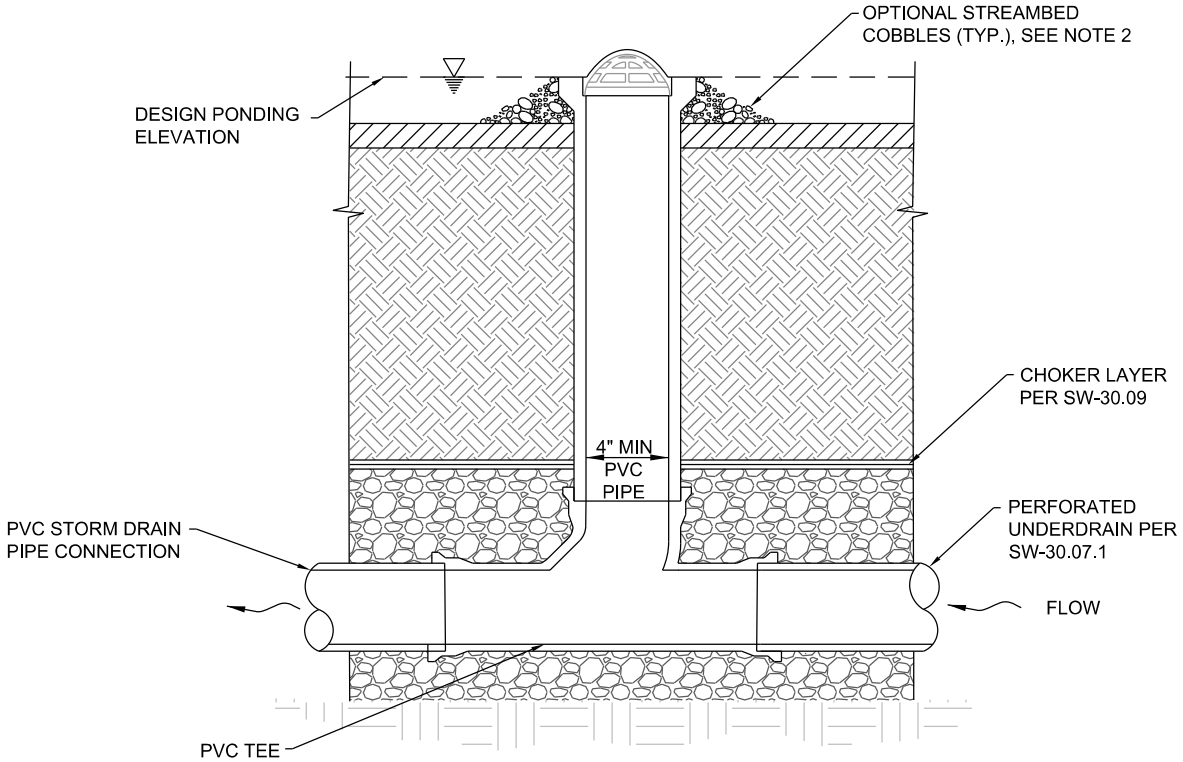
1. GRADED AGGREGATE FOR CHOKER LAYER SHALL BE WASHED AND CONFORM TO ASTM D-448.
2. SAND FOR THE CHOKER LAYER SHALL BE WASHED AND CONFORM TO ASTM C-33 CONCRETE SAND.
3. ALL MATERIALS SPECIFIED AS WASHED SHALL BE WASHED AND FREE OF FINES.
4. SAND AND NO. 8 STONE LAYERS SHALL BE SPREAD USING HAND TOOLS 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: 9/2024	NOT TO SCALE
	TYPICAL CHOKER LAYER DETAILS	
	SW-30.09	



BIORETENTION SECTION WITH OVERFLOW



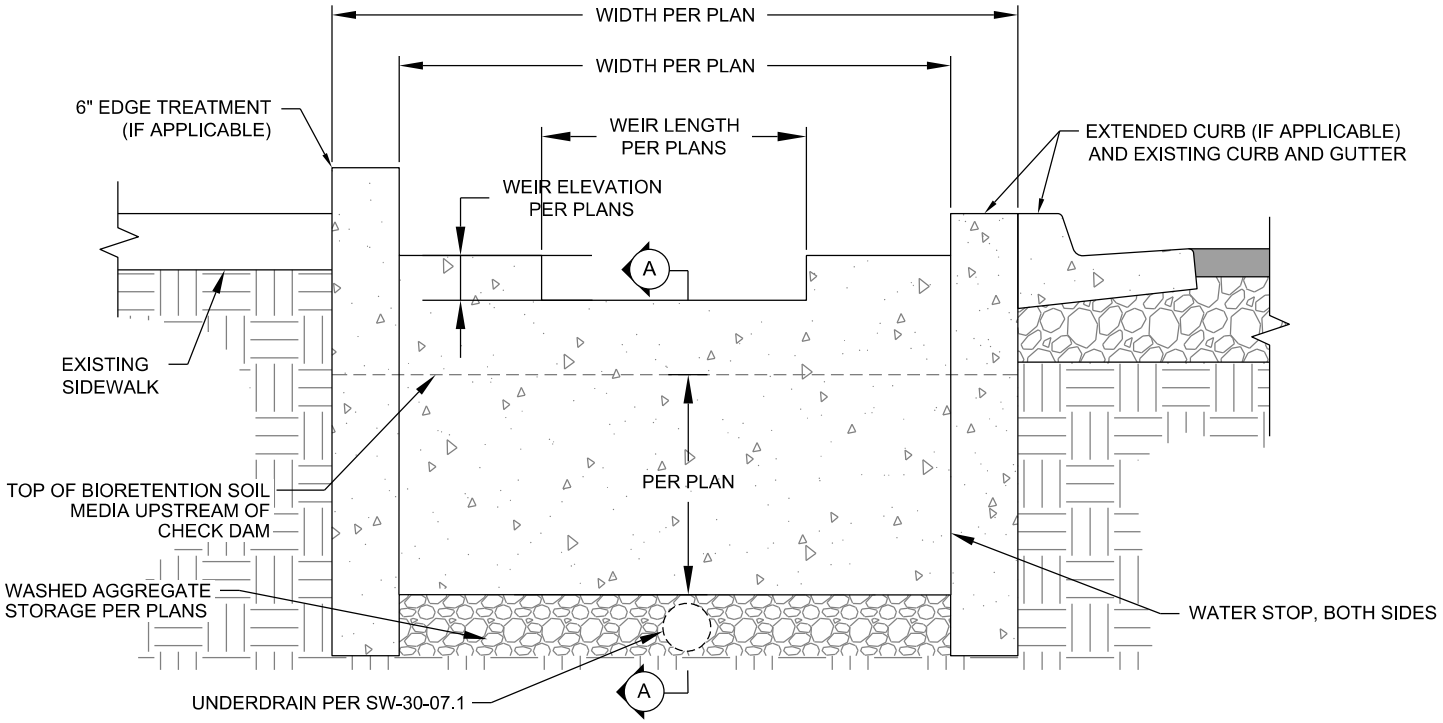
OVERFLOW STRUCTURE DETAIL

NOTES

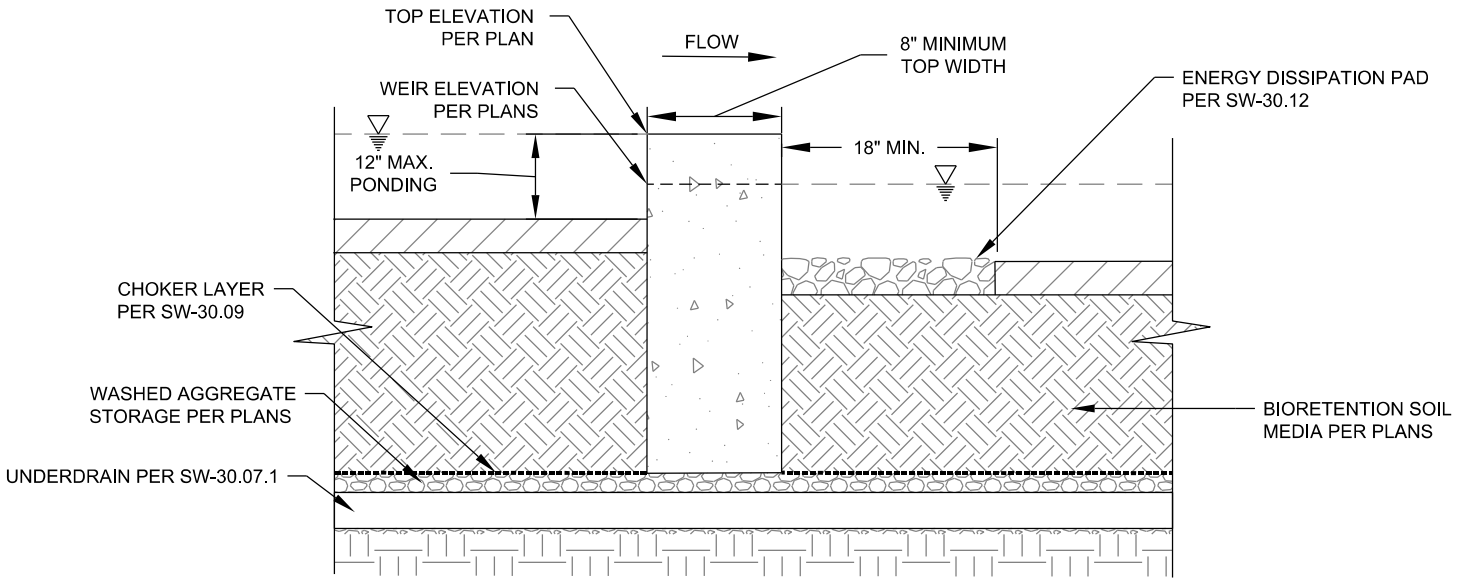
1. MAXIMUM GRATE OPENING SHALL BE 4 INCHES. SIZE OF ATRIUM GRATE SHALL MATCH SIZE OF RISER SPECIFIED IN PLANS, SHALL BE REMOVABLE TO PROVIDE MAINTENANCE ACCESS, AND SHALL BE BOLTED IN PLACE OR OUTFITTED WITH APPROVED TAMPER- RESISTANT LOCKING MECHANISM.
2. MINIMUM STREAMBED COBBLE DIAMETER SHALL BE LARGER THAN MAXIMUM GRAT OPENING.
3. OVERFLOW/ UNDERDRAIN PIPES MUST BE EQUIPPED WITH CLEANOUTS PER SW-30.07.1.
4. OVERFLOW RISER TO BE INSTALLED AS REQUIRED BY HYDRAULIC ANALYSIS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	RISER OVERFLOW STRUCTURE DETAILS	
	SW-30.10	



TYPICAL ELEVATION

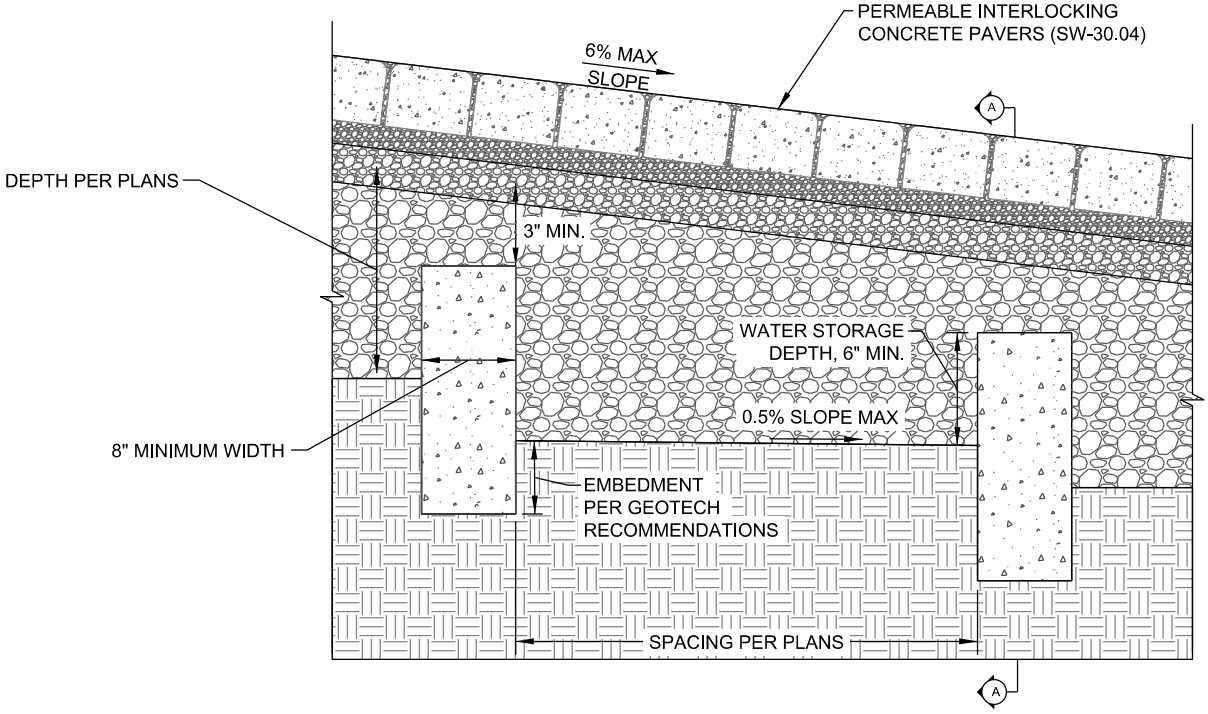


SECTION A-A

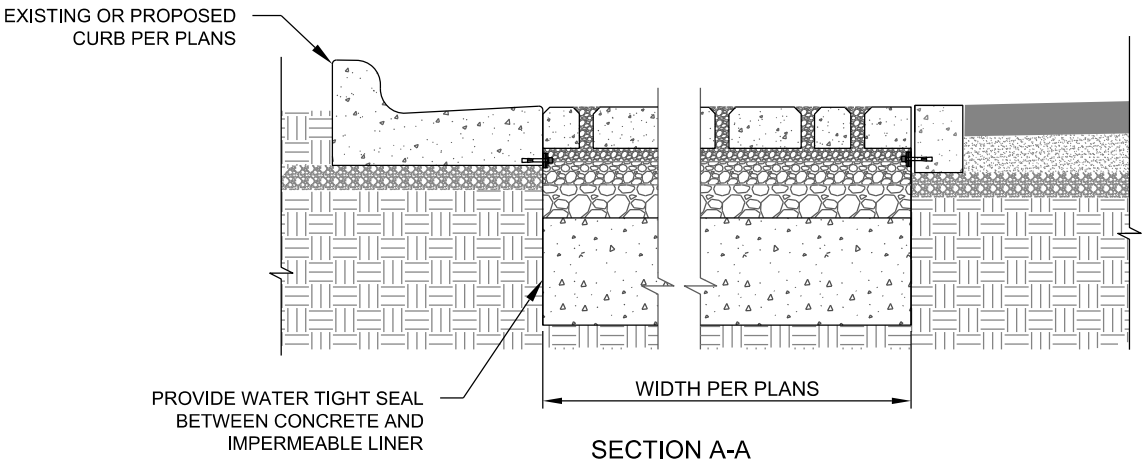
NOTES:
1. REFER TO PLANS FOR HORIZONTAL AND VERTICAL CONTROL INFORMATION.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	LINEAR BIORETENTION CHECK DAM DETAIL	
	SW-30.11.1	



TYPICAL ELEVATION



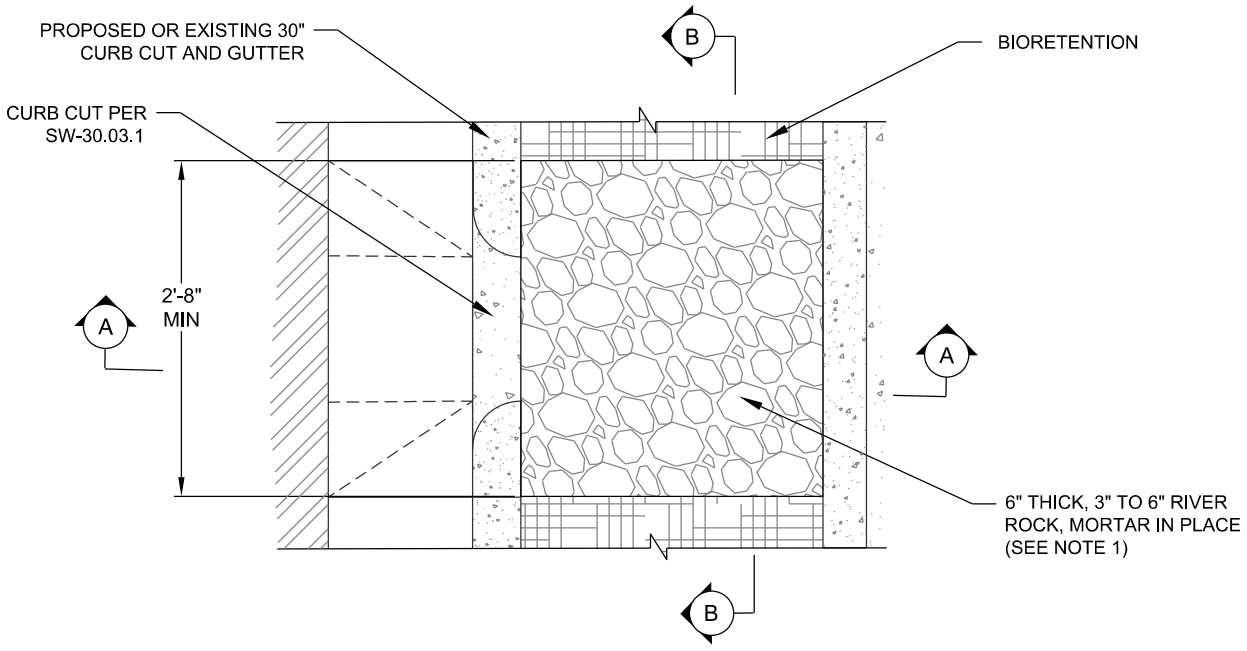
SECTION A-A

NOTES

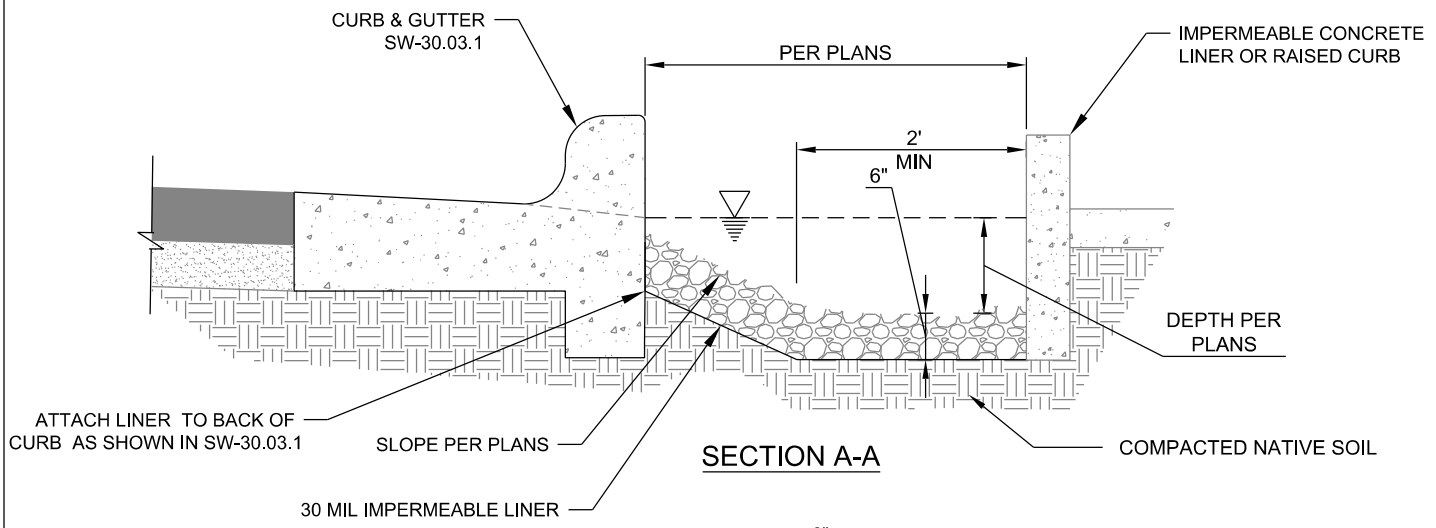
1. CHECK DAMS TO BE USED UNDER PERMEABLE INTERLOCKING CONCRETE PAVERS WHERE INFILTRATION IS ALLOWED. IF THE SYSTEM IS FULLY LINED WITH NO INFILTRATION, CHECK DAMS ARE NOT NEEDED.
2. CONCRETE CHECK DAM EMBEDMENT PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
3. IF INCIDENTAL INFILTRATION IS ALLOWED ON POOR SOILS, OPTIONALLY INSTALL PERFORATED UNDERDRAIN PER SW-30.07.1 AT ENGINEER'S DISCRETION.
4. CONCRETE SHALL BE 650-C-3250.

CITY OF RALEIGH
STANDARD DETAIL

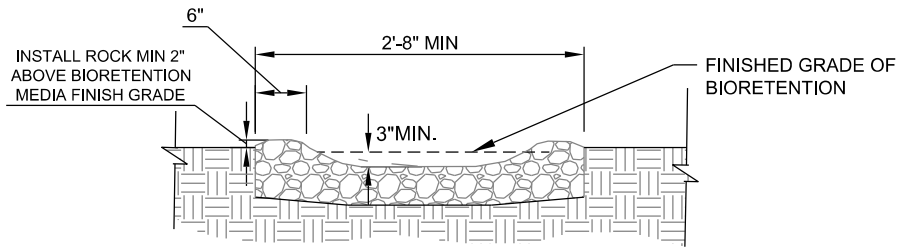
REVISIONS	DATE: 9/2024	NOT TO SCALE
	PERMEABLE PAVER SUB-SURFACE CHECK DAM DETAIL	
	SW-30.11.2	



PLAN VIEW



SECTION A-A



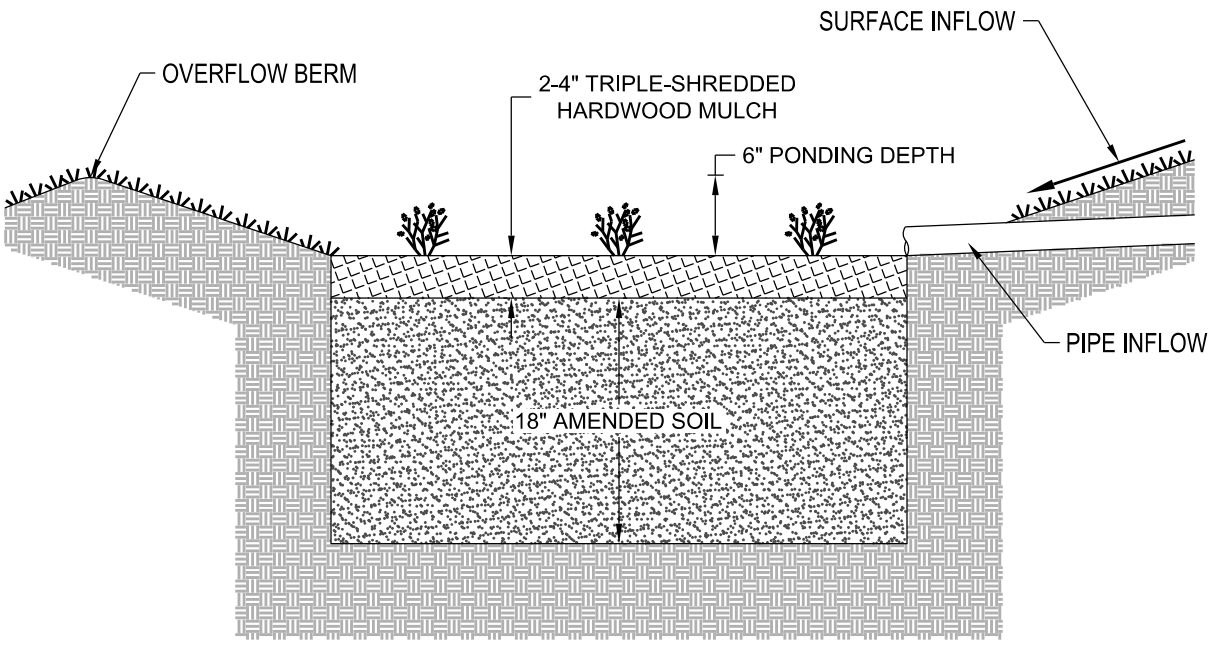
SECTION B-B

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: 9/2024	NOT TO SCALE
	ENERGY DISSIPATION PAD	
	SW-30.12	



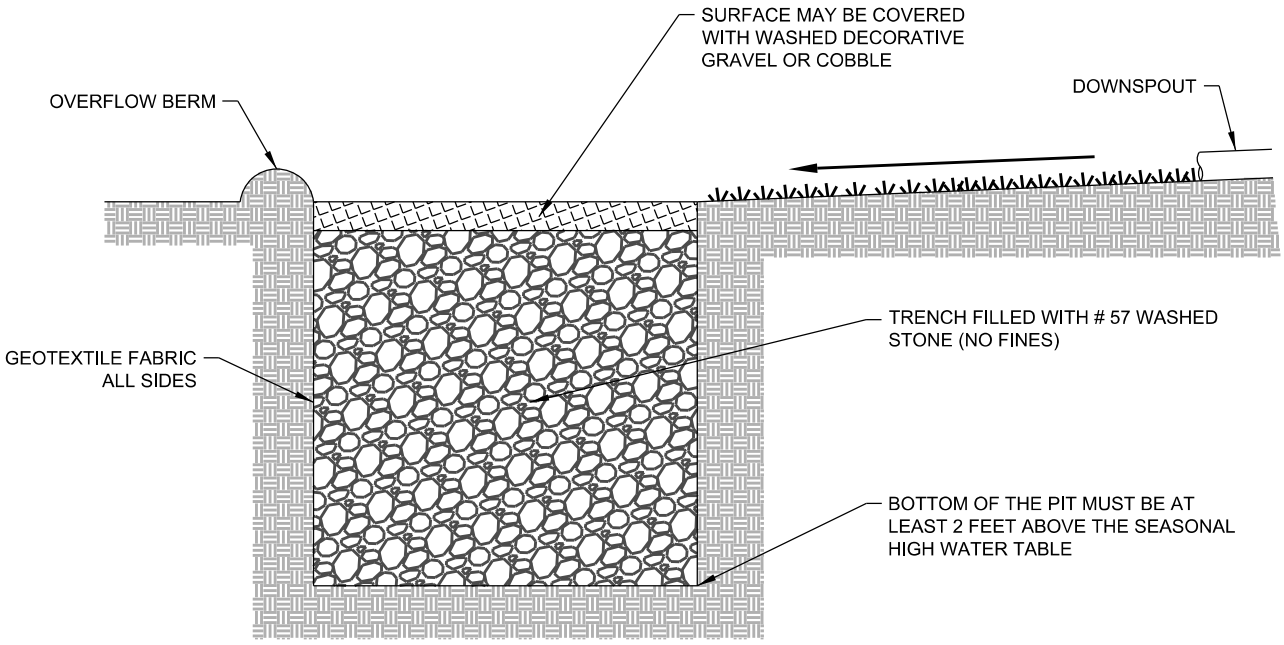
IMPERVIOUS SQUARE FOOTAGE (SF)	RAIN GARDEN SIZE (SF) ASSUMES 6" PONDING DEPTH
<= 100	16
GREATER THAN 100 AND <= 200	33
GREATER THAN 200 AND <=400	67
GREATER THAN 400 AND <=600	100
GREATER THAN 600 AND <=800	133
GREATER THAN 800 AND <=1000	167

INSTALLATION NOTES:

1. AMENDED SOIL SHALL BE COMPOSED OF 50% OF THE EXISTING SOIL (THE SOIL REMOVED TO CREATE THE HOLE) PLUS 40% COARSE WASHED SAND AND COMPOST OR ORGANIC MATTER FOR THE LAST 10%.
2. A SIMPLE INFILTRATION TEST SHALL BE PERFORMED TO ENSURE THE RAIN GARDEN WILL DRAIN. DIG A HOLE 1 FOOT DEEP. FILL IT WITH WATER. IF IT DOES NOT DRAIN WITHIN 36 HOURS, A RAIN GARDEN CANNOT BE USED.
3. CHOOSE PLANTS FROM A RAIN GARDEN PLANT LIST. SEE THIS LINK FOR IDEAS FOR PLANTS AND LAYOUTS: https://forsyth.ces.ncsu.edu/wp-content/uploads/2016/03/RGmanual2015.pdf?fwd=no
4. AS AN ALTERNATE TO THE ABOVE TABLE, THE PONDING AREA SHALL BE SIZED BASED ON THIS FORMULA: (0.0833 FT X IMPERVIOUS AREA SF)/0.5 FT

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	RESIDENTIAL RAIN GARDEN FOR LOT GRADING PLAN	
	SW-40.01	



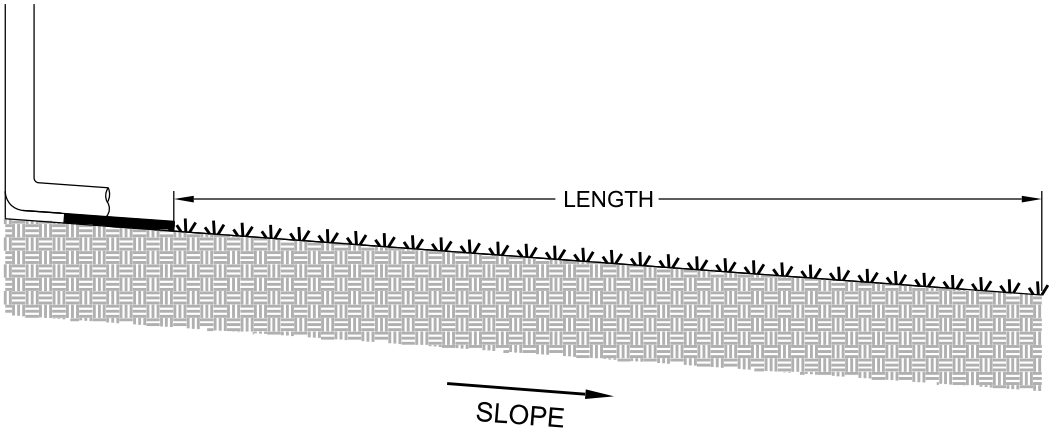
IMPERVIOUS SQUARE FOOTAGE (SF)	SURFACE INFILTRATION PIT SIZE (LENGTH X WIDTH X DEPTH IN FT)
<= 100	3.5 X 3.5 X 2.5
GREATER THAN 100 AND <= 200	4 X 4 X 3.5
GREATER THAN 200 AND <=400	6 X 6 X 3.5
GREATER THAN 400 AND <=600	9 X 5 X 4
GREATER THAN 600 AND <=800	9 X 7 X 4
GREATER THAN 800 AND <=1000	9 X 9 X 4

INSTALLATION NOTES:

1. PER NC RULES ABOUT INJECTION WELLS,ONE SURFACE DIMENSION TO BE GREATER THAN THE DEPTH OF THE PIT.
2. PER NC RULES ABOUT INJECTION WELLS, DOWNSPOUTS MUST DISCHARGE TO THE SURFACE AND NOT BE PIPED INTO THE STONE WITHIN THE PIT.
3. AS AN ALTERNATIVE TO THE ABOVE TABLE, THE SIZE OF THE INFILTRATION PIT CAN BE DETERMINED WITH THIS FORMULA:
   MINIMUM VOLUME (CUBIC FEET) = 0.3 X IMPERVIOUS AREA (SQUARE FEET)

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 9/2024	NOT TO SCALE
	RESIDENTIAL SURFACE INFILTRATION PIT FOR LOT GRADING PLAN	
	SW-40.02	



INSTALLATION NOTES:

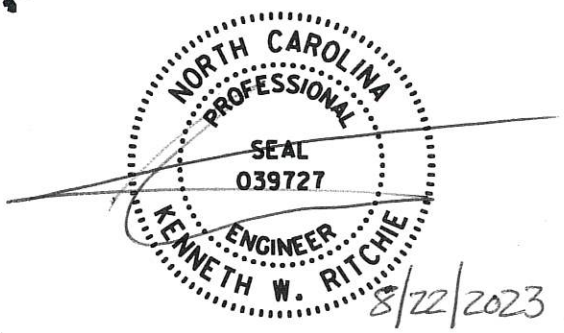
1. LENGTH: 0.04 TIMES THE DRAINAGE AREA (IN SF) OR 10 FEET, WHICHEVER IS GREATER
2. WIDTH: ONE HALF ($\frac{1}{2}$) THE LENGTH OF THE RECEIVING AREA
3. SLOPE: 8% OR LESS
4. VEGETATION: PLANTED WITH NON-CLUMPING, DEEP ROOTED GRASS AND/OR NATIVE PLANTS APPROPRIATE FOR RAIN GARDENS

CITY OF RALEIGH
STANDARD DETAIL

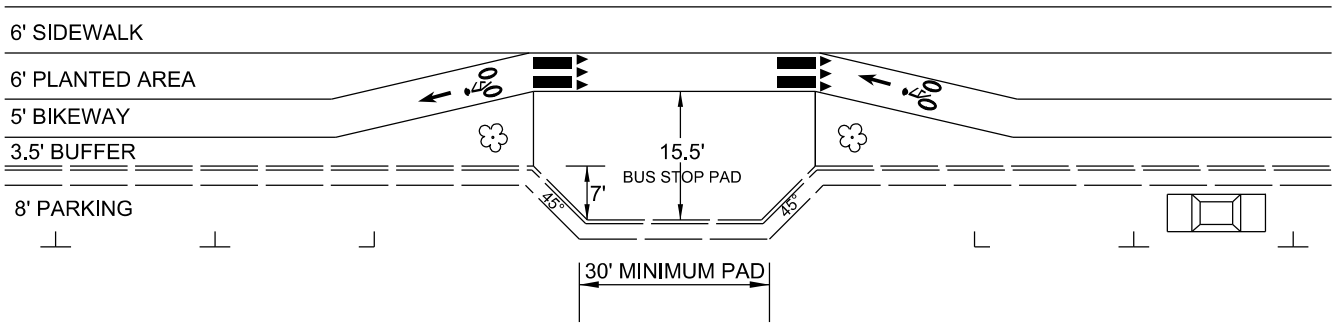
REVISIONS	DATE: 9/2024	NOT TO SCALE
	RESIDENTIAL VEGETATED AREA FOR LOT GRADING PLAN	
	SW-40.03	

CITY OF RALEIGH

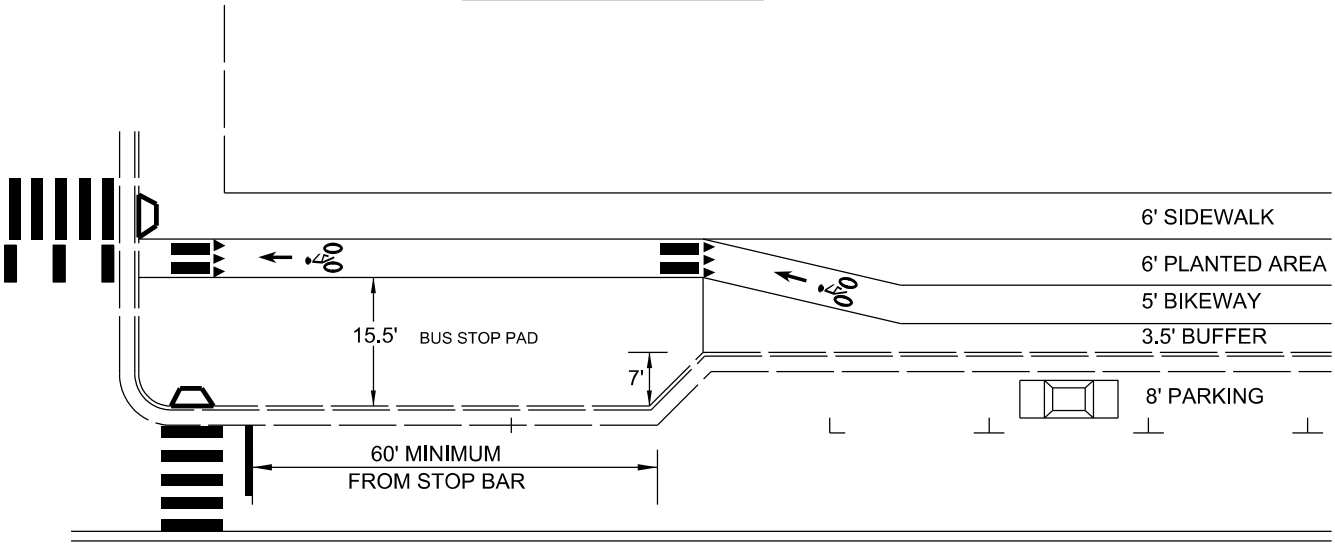
STANDARD DETAILS



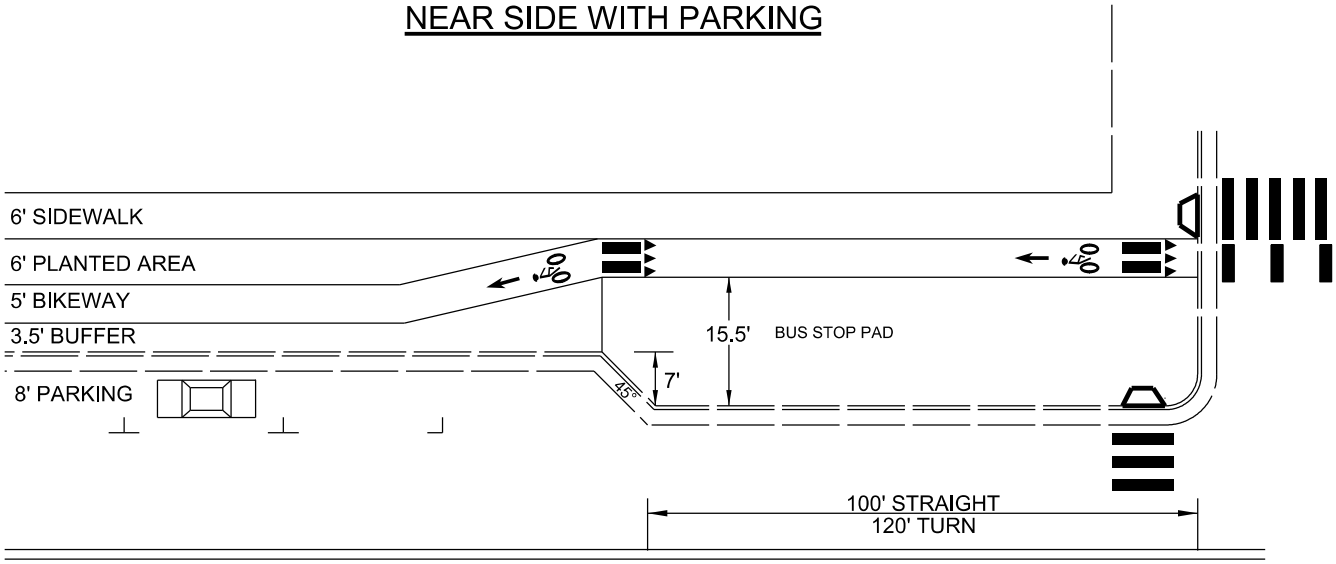
TRANSIT



MID WITH PARKING



NEAR SIDE WITH PARKING



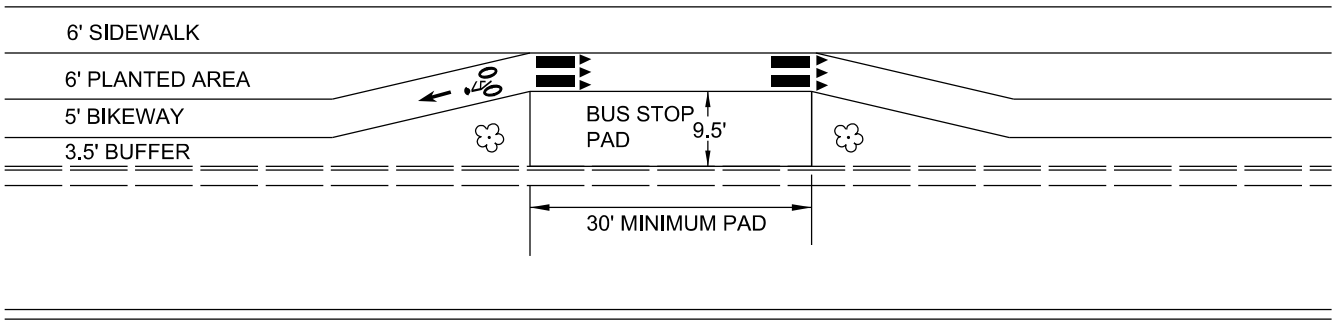
FAR SIDE WITH PARKING

NOTES:

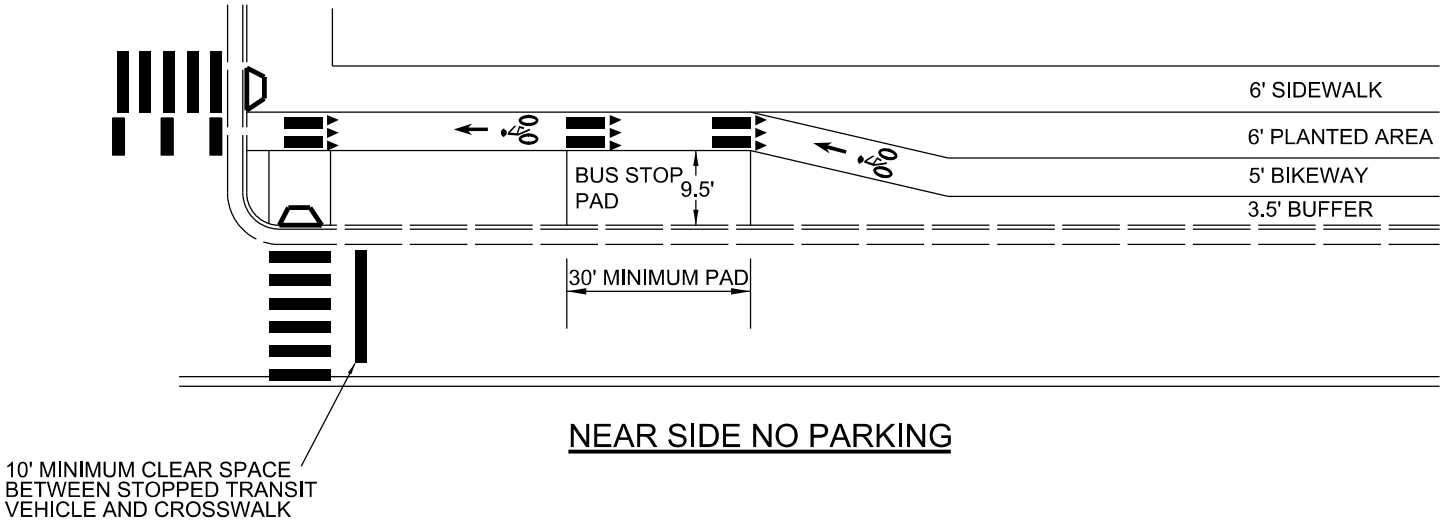
1. STOPS SERVING HIGH-FREQUENCY ROUTES SHOULD BE TWICE AS LONG AS THE DIMENSIONS SHOWN, OR AS OTHERWISE APPROVED BY THE TRANSIT DIVISION.
2. SEE TT-02 FOR BUS STOP PAD DESIGN SPECIFICATIONS.
3. THE BIKEWAY SHIFTING TAPER SHOULD BE 7:1 PREFERRED, 3:1 MINIMUM.

CITY OF RALEIGH
STANDARD DETAIL

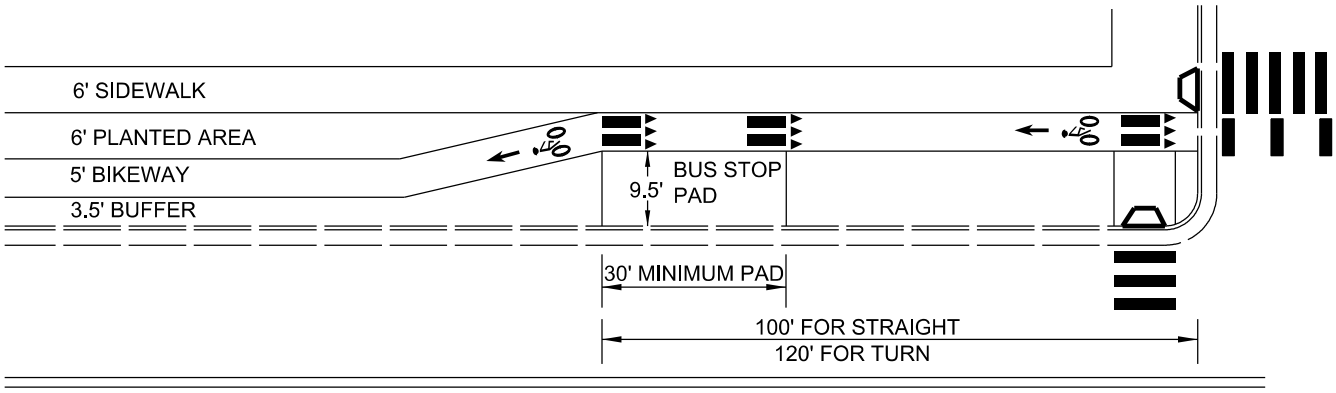
REVISIONS	DATE: 08/2023	NOT TO SCALE
	TYPICAL BUS STOP AT CURB-LEVEL BIKEWAY	
	TT-01.1	



MID NO PARKING



NEAR SIDE NO PARKING



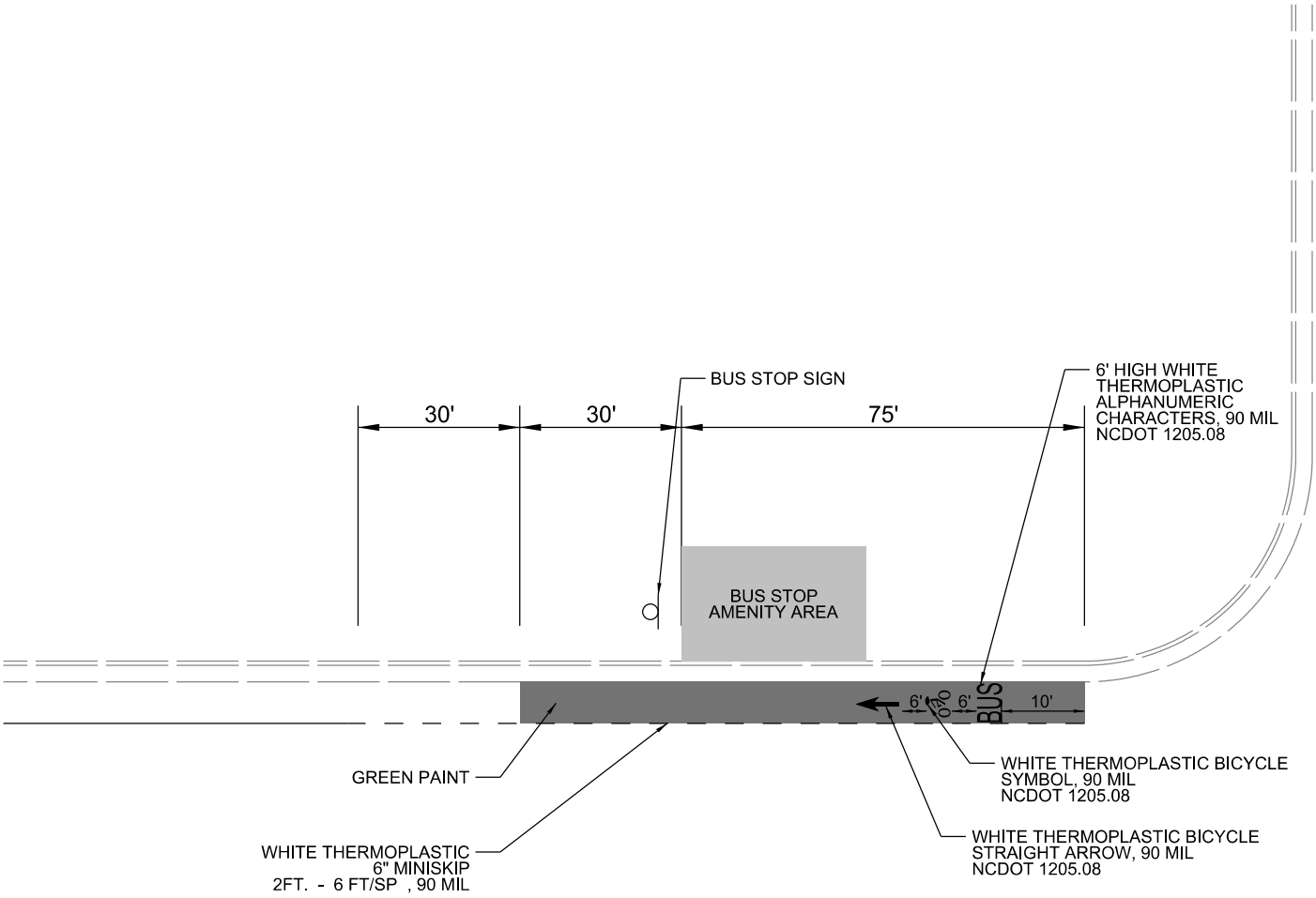
FAR SIDE NO PARKING

NOTES:

1. STOPS SERVING HIGH-FREQUENCY ROUTES SHOULD BE TWICE AS LONG AS THE DIMENSIONS SHOWN, OR AS OTHERWISE APPROVED BY THE TRANSIT DIVISION.
2. SEE TT-02 FOR BUS STOP PAD DESIGN SPECIFICATIONS.
3. THE BIKEWAY SHIFTING TAPER SHOULD BE 7:1 PREFERRED, 3:1 MINIMUM.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 08/2023	NOT TO SCALE
	TYPICAL BUS STOP AT CURB-LEVEL BIKEWAY	
	TT-01.2	



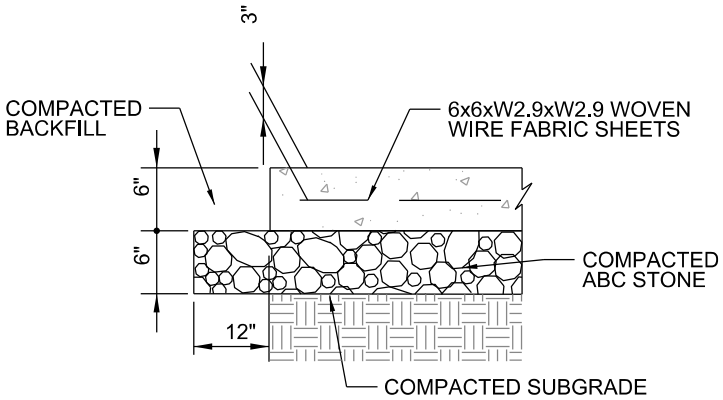
BUS STOP AT STREET-LEVEL BIKEWAY

NOTES:

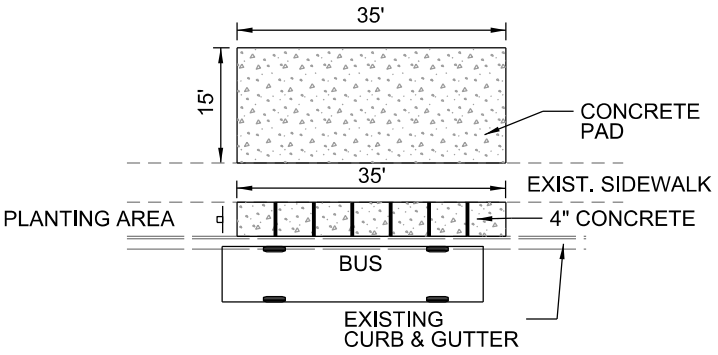
1. STOPS SERVING HIGH-FREQUENCY ROUTES SHOULD BE TWICE AS LONG AS THE DIMENSIONS SHOWN, OR AS OTHERWISE APPROVED BY THE TRANSIT DIVISION.
2. SEE TT-02 FOR BUS STOP PAD DESIGN SPECIFICATIONS.

CITY OF RALEIGH
STANDARD DETAIL

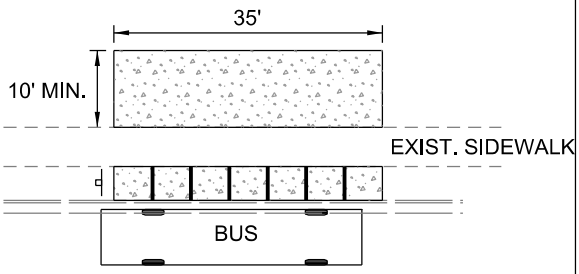
REVISIONS	DATE: 08/2023	NOT TO SCALE
	TYPICAL BUS STOP AT STREET-LEVEL BIKEWAY	
	TT-01.3	



CONCRETE PAD DETAILS



ENHANCED TRANSFER SITE PAD DIMENSIONS



MINIMUM ENHANCED TRANSFER SITE PAD DIMENSIONS

GENERAL CONCRETE PAD NOTES:

1. TYPICAL SECTION AND DIMENSIONS OF PAD ARE SUBJECT TO CHANGE DUE TO RIDERSHIP, AMENITIES TO BE INSTALLED, AND TO ENSURE PROPOSED FIXED OBJECTS ARE OUTSIDE THE CLEAR ZONE. COORDINATE WITH THE CITY OF RALEIGH & GORALEIGH, BY CALLING 919-996-4043 OR COMMUNICATING WITH TRANSIT DIVISION (TRANSPORTATION DEPARTMENT) STAFF.

2. CONCRETE PAD WILL CONSIST OF 3,000 PSI CONCRETE IN ACCORDANCE WITH NCDOT STANDARDS.

3. REINFORCE AS SHOWN IN TYPICAL SECTION. WOVEN WIRE FABRIC SHALL HAVE MINIMUM 6" OVERLAPS AND MINIMUM COVER OF 3" ON ALL SIDES.

4. WHERE PROPOSED SHELTER PAD ELEVATION IS ABOVE EXISTING GRADE, PROVIDE A 1' WIDE CONCRETE "BEAM" TO EXTEND A MINIMUM OF 6" BELOW THE EXISTING SURROUNDING GRADE WITH A 45° SECTION TO BRING BACK TO THE STANDARD 6" THICKNESS.

5. CONCRETE PAD WILL HAVE A BROOM FINISH.

6. MAXIMUM CROSS SLOPE SHALL BE 2%.

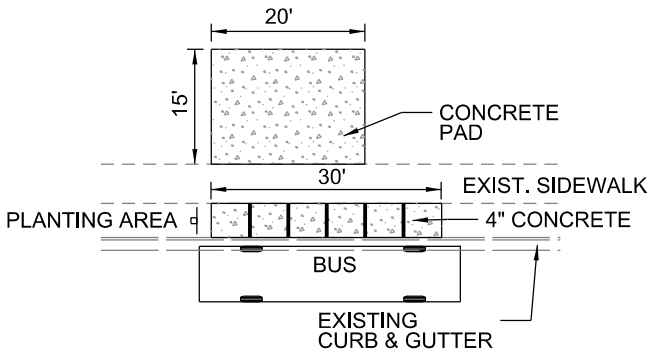
7. EXTEND ABC 1' BEYOND EDGE OF PAD IN ALL DIRECTIONS EXCEPT WHERE BORDERED BY EXISTING PAVEMENT OR SIDEWALK.

8. WHERE HANDRAIL IS INSTALLED INCREASE PAD THICKNESS AS SHOWN ON THE HANDRAIL DETAIL STD. T-8.

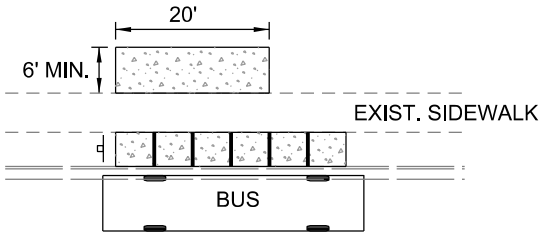
9. EXPANSION JOINTS WILL BE INSTALLED AT ALL RIGID OBJECTS AND ADJACENT TO EXISTING PAVEMENT AND HAVE 1/8 " RADIUS TOOLED EDGE AND FILL WITH SEALER. JOINT SEALER TO BE GREY IN COLOR.

10. WHERE SIDEWALK IS EXISTING, PLACE CONCRETE IN BETWEEN THE SIDEWALK AND THE EDGE OF PAVEMENT OR CURBING. IF NO SIDEWALK IS EXISTING PLACE CONCRETE IN THREE (3) SECTIONS: THE UTILITY STRIP, THE SIDEWALK SECTION, AND THE SHELTER PAD.

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



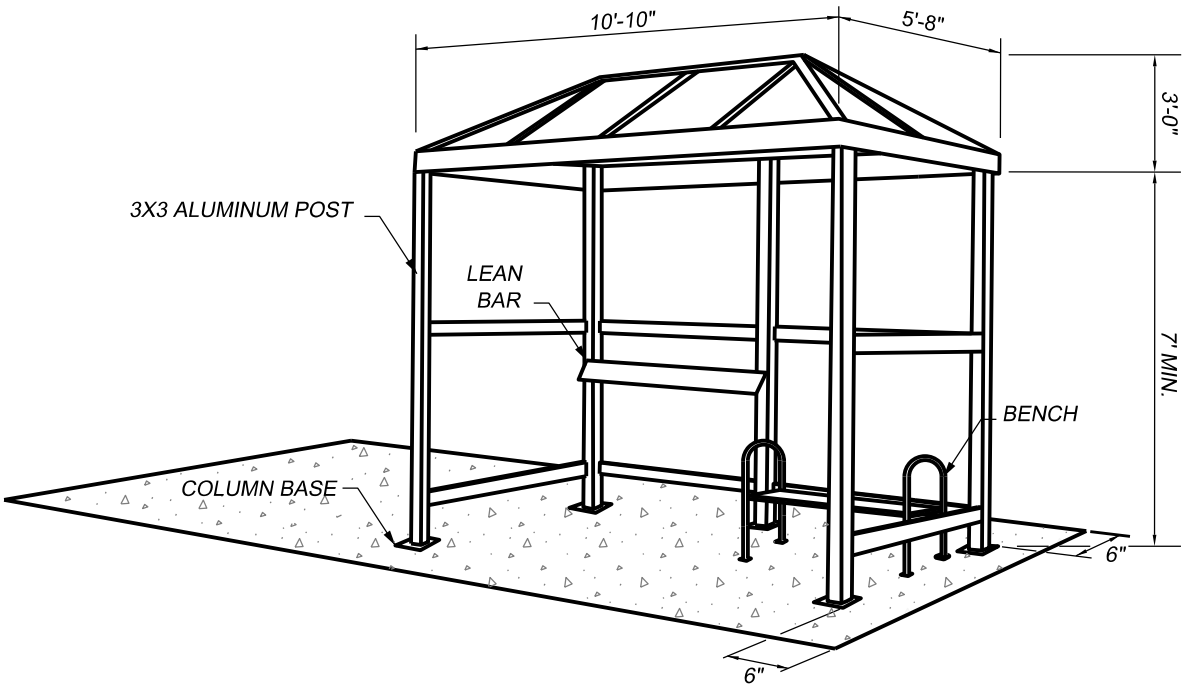
BUS STOP PAD DIMENSIONS

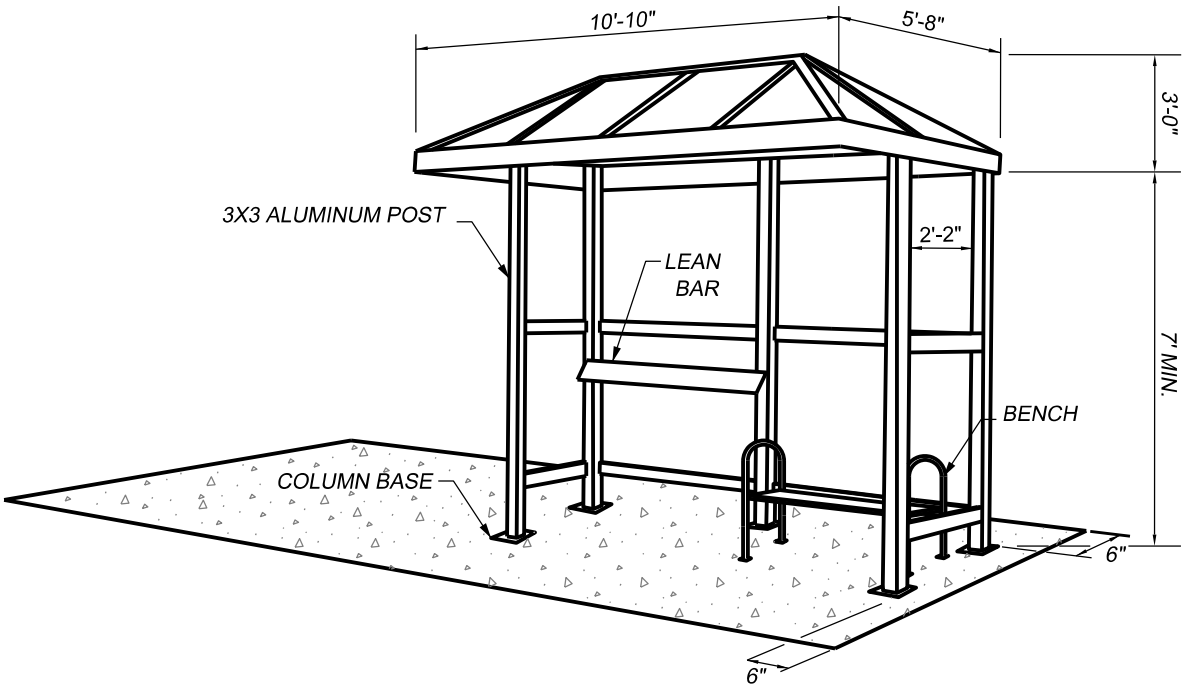


MINIMUM BUS STOP PAD DIMENSIONS

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BUS STOP PAD	
	TT-02	





NOTES:

1. SHELTER SHOWN IS A FULL SIZE BRASCO MODEL TL 510 ILS, OR APPROVED EQUAL. COORDINATE WITH CITY OF RALEIGH FOR SHELTER TYPE.

2. INSTALL COLUMN BASE 6" FROM EDGE OF CONCRETE PAD WITH APPROVED CONCRETE ANCHOR UNITS RECOMMENDED BY THE MANUFACTURER, TYPICAL UNLESS OTHERWISE SHOWN.

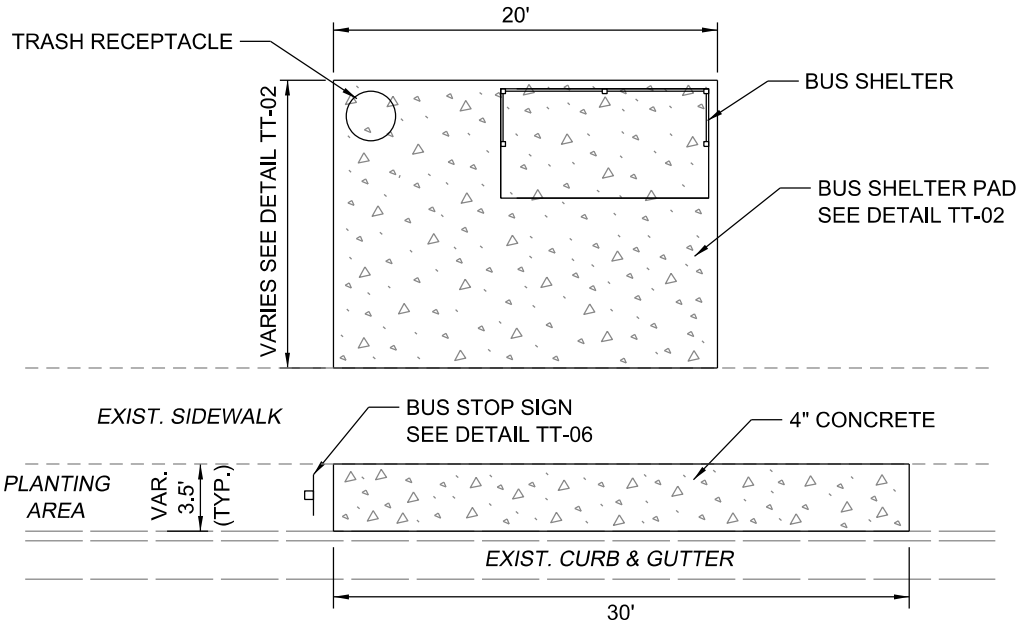
3. INSTALL BENCH ON OPPOSITE SIDE OF LEAN BAR.

4. ALL CERTIFICATIONS OF STRUCTURES TO BE PROVIDED BY MANUFACTURER.

5. IF INSTALLED WITHIN NCDOT RIGHT-OF-WAY, SHELTER MUST BE ON THE NCDOT APPROVED PRODUCTS LIST.

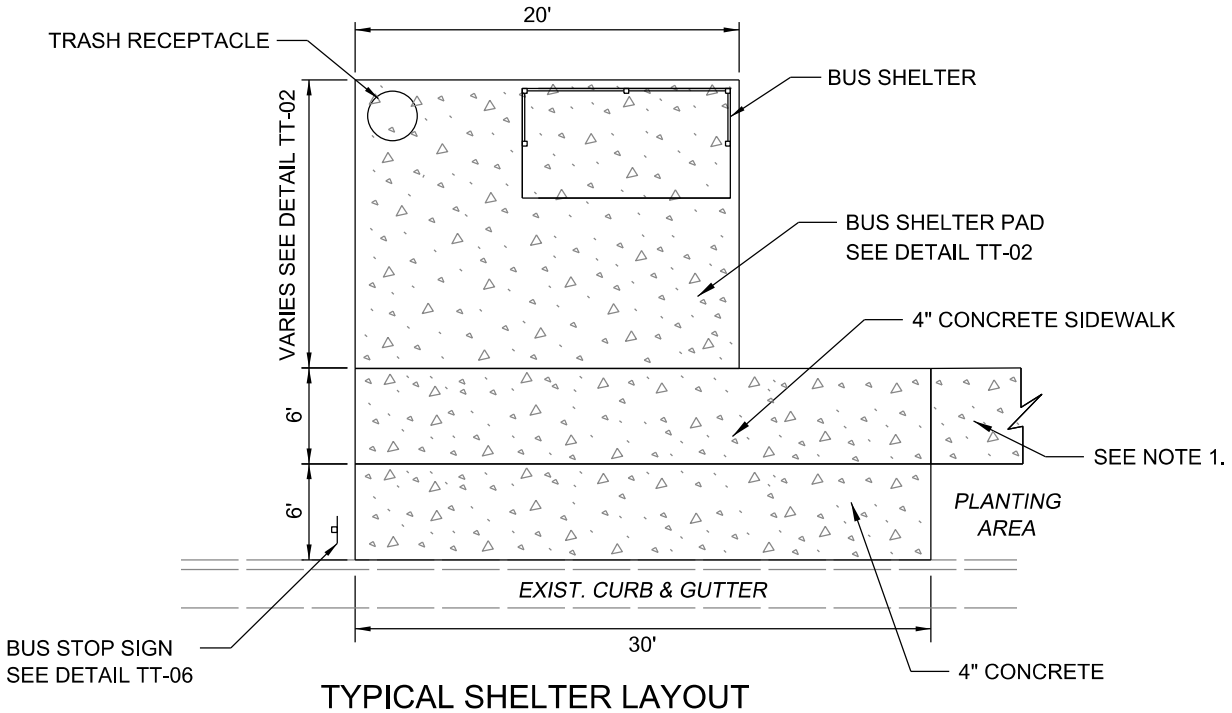
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	BUS SHELTER LAYOUT	
	TT-03	



TYPICAL SHELTER LAYOUT
WITH EXISTING SIDEWALK

NTS



TYPICAL SHELTER LAYOUT
WITHOUT EXISTING SIDEWALK

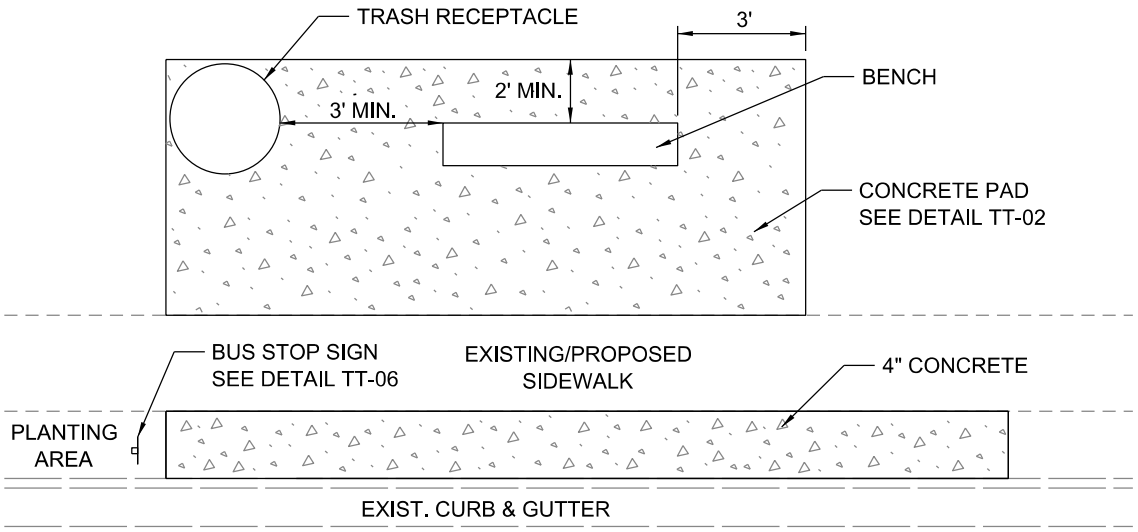
NTS

NOTES:

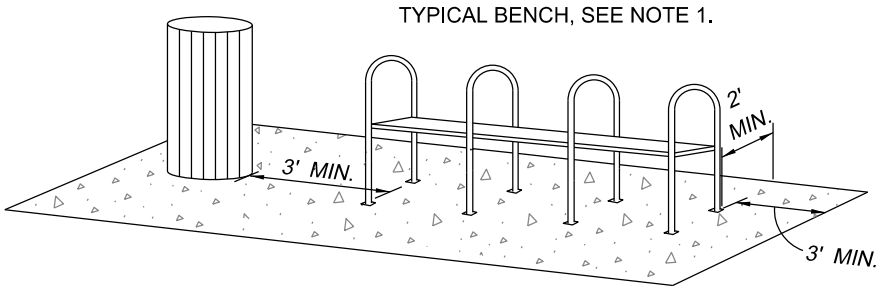
1. IF NO SIDEWALK CURRENTLY EXISTS, PROVIDE SIDEWALK TO NEAREST ADA ACCESSIBLE INTERSECTION OR DRIVEWAY WITH APPROPRIATE RAMPS. SIDEWALK AND PLANTING AREA WIDTH TO BE IN COMPLIANCE WITH THE CITY'S UDO. PROVIDE CURB RAMP IN ACCORDANCE WITH CITY STANDARDS.
2. BUS SHELTER SHALL BE MINIMUM 6" FROM EDGE OF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



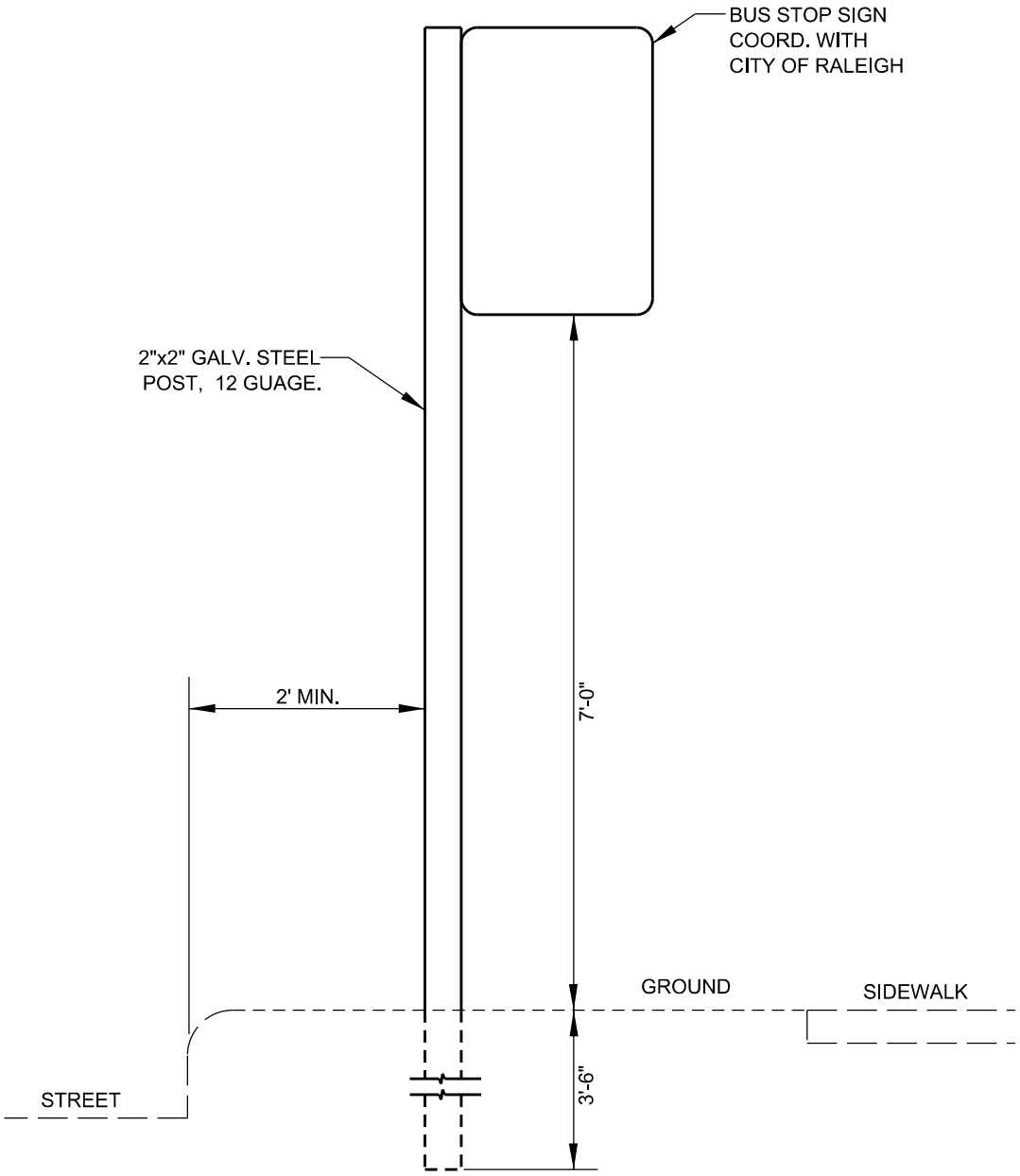
BENCH SCHEMATIC

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	



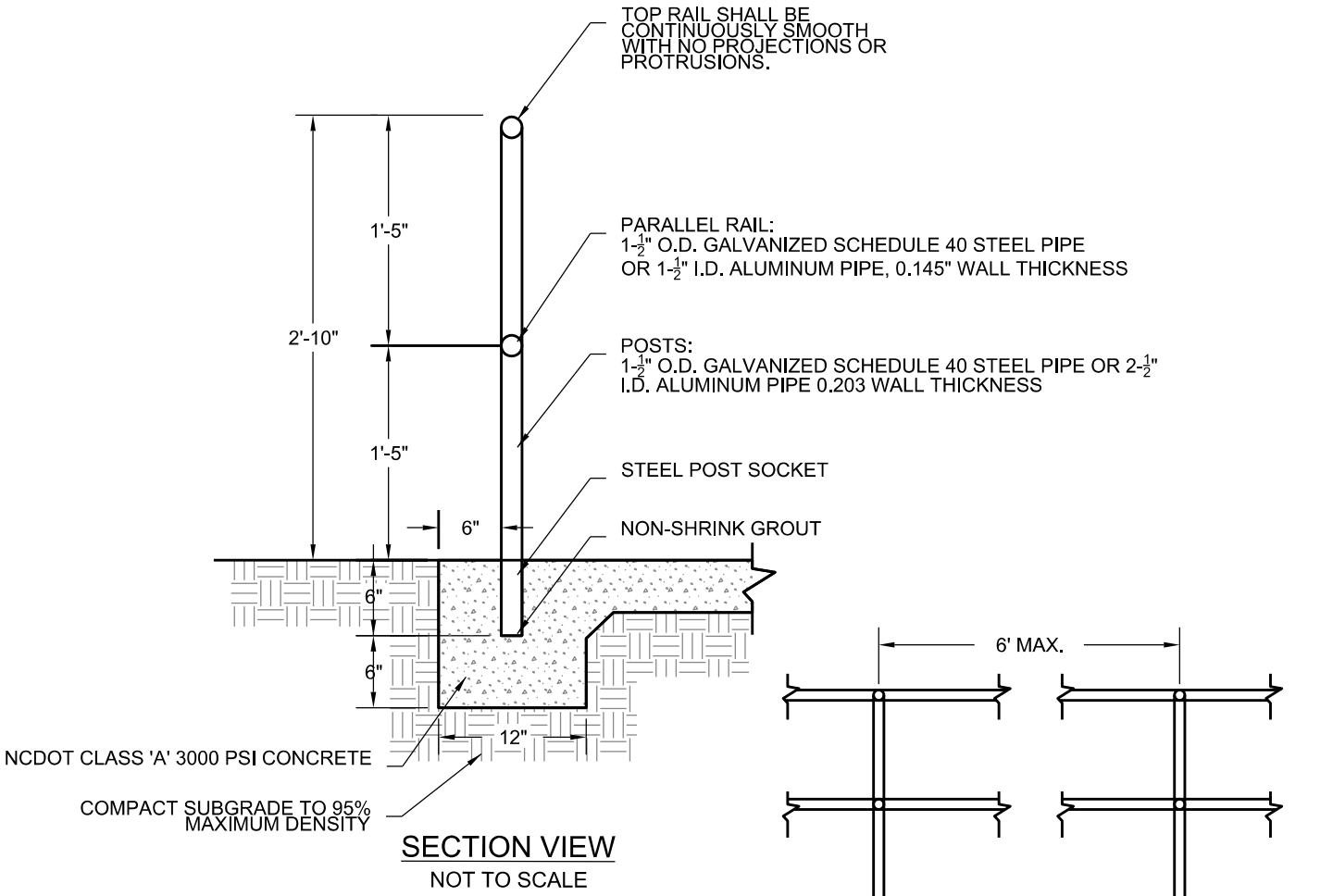
NOTES:

1. INSTALL SIGN AHEAD OF STOP 2' FROM CONCRETE SECTION IN UTILITY STRIP

2. CALL 811 FOR UNDERGROUND UTILITY LOCATION PRIOR TO INSTALLATION.

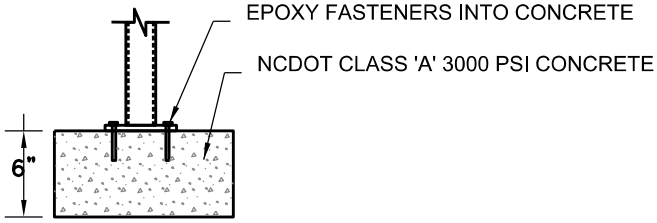
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	SIGN POST LAYOUT	
	TT-06	



SECTION VIEW
NOT TO SCALE

SIDE VIEW
NOT TO SCALE



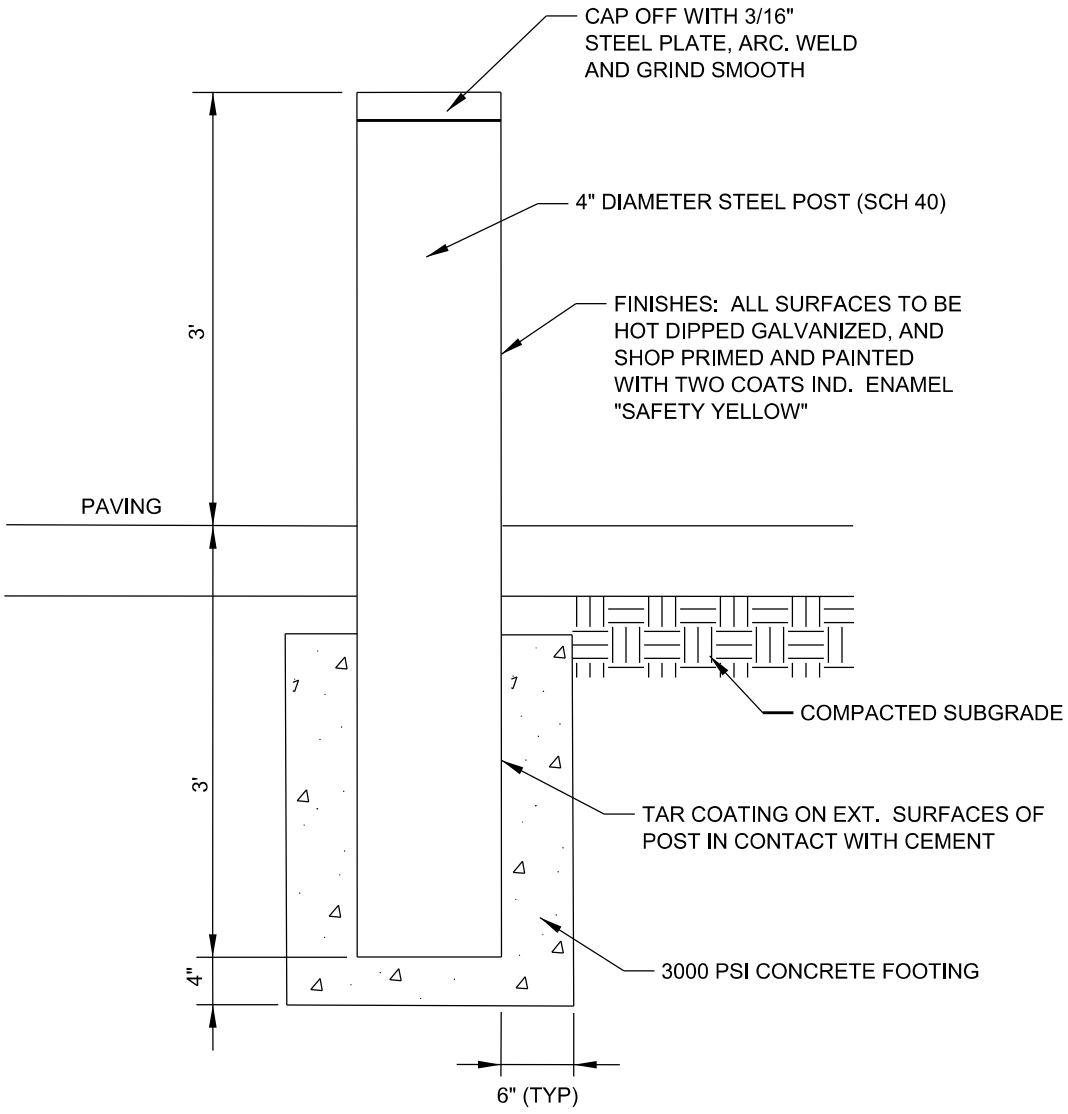
ALUMINUM POST MOUNT
NOT TO SCALE

NOTES:

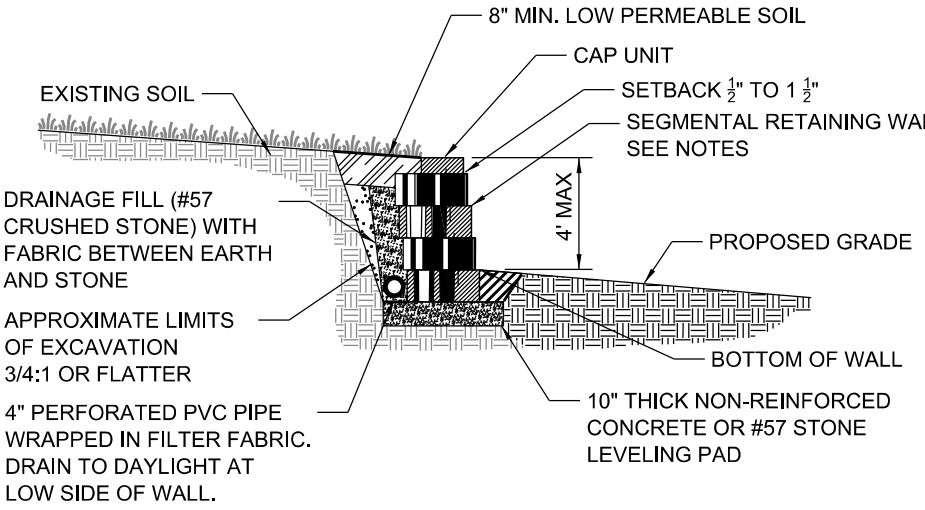
1. CONTRACTOR TO PROVIDE FULL SHOP DRAWINGS FOR HANDRAIL PRIOR TO INSTALLING.

CITY OF RALEIGH
STANDARD DETAIL

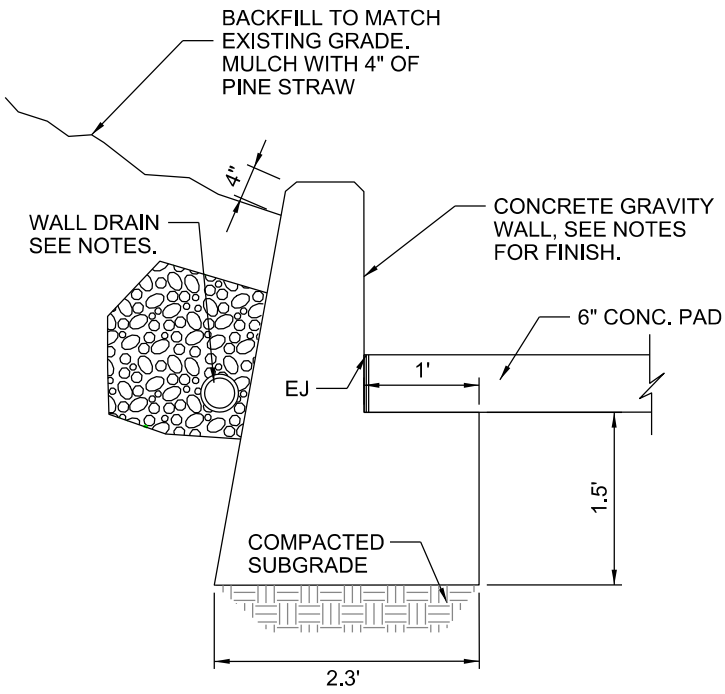
REVISIONS	DATE: 8/2020	NOT TO SCALE
	HANDRAIL INSTALLATION	
	TT-07	



CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
	BOLLARD INSTALLATION	
	TT-08	



SEGMENTAL GRAVITY RETAINING WALL



REINFORCED CONCRETE GRAVITY RETAINING WALL

SEGMENTAL GRAVITY RETAINING WALL NOTES:

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.

REINFORCED CONCRETE GRAVITY RETAINING WALL NOTES:

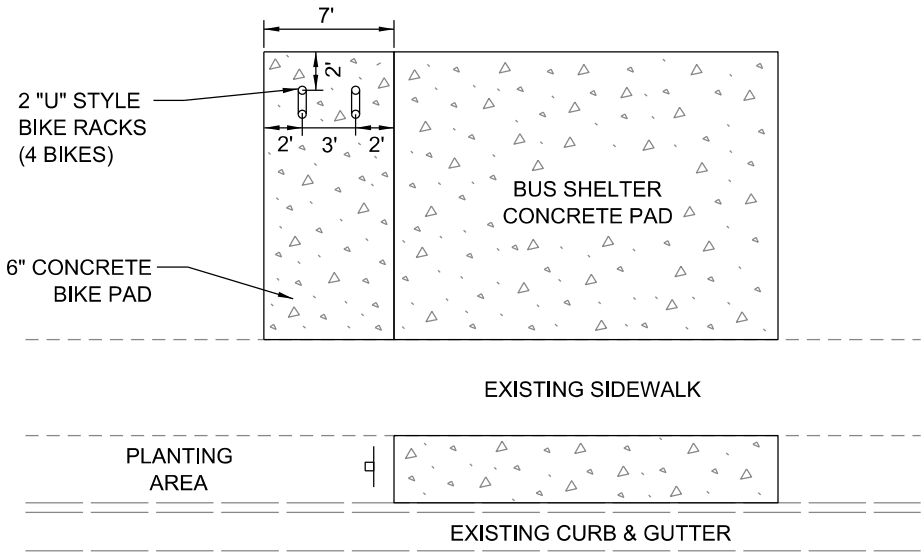
1. USE CLASS A CONCRETE AND PROVIDE CLASS I SURFACE FINISH ON ALL EXPOSED SURFACES.
2. PROVIDE GROVED CONTRACTION JOINTS EVERY 10'-0".
3. PROVIDE 4" PERFORATED PVC DRAIN PIPE THE LENGTH OF THE WALL. WRAP PIPE WITH FILTER FABRIC AND PROVIDE 1' WIDE BY 1' DEEP WASHED STONE AROUND PIPE. TIE TO STORM DRAIN 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.

GENERAL NOTES:

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.

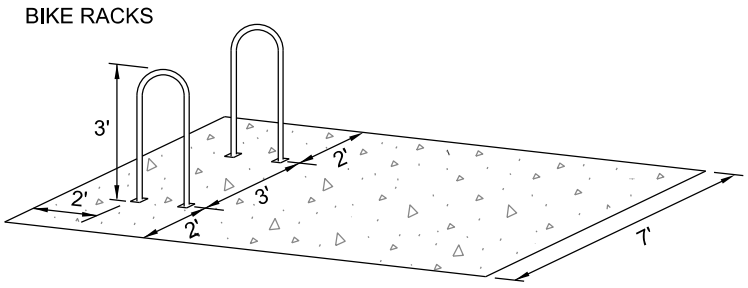
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	RETAINING WALL	
	TT-09	



TYPICAL BIKE PAD LAYOUT

NTS



BIKE RACK SCHEMATIC

NOTES:

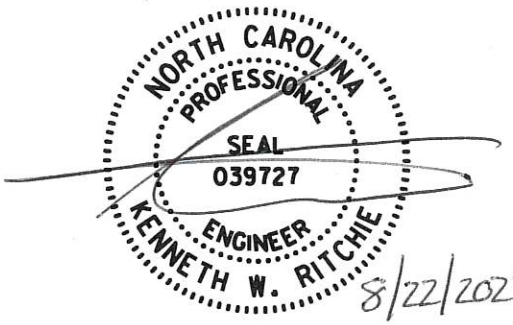
1. BIKE RACK TO BE 2" SCHEDULE 40 STEEL POWDER COATED BLACK.
2. COORDINATE LOCATION WITH THE CITY PRIOR TO INSTALLATION.

CITY OF RALEIGH
STANDARD DETAIL

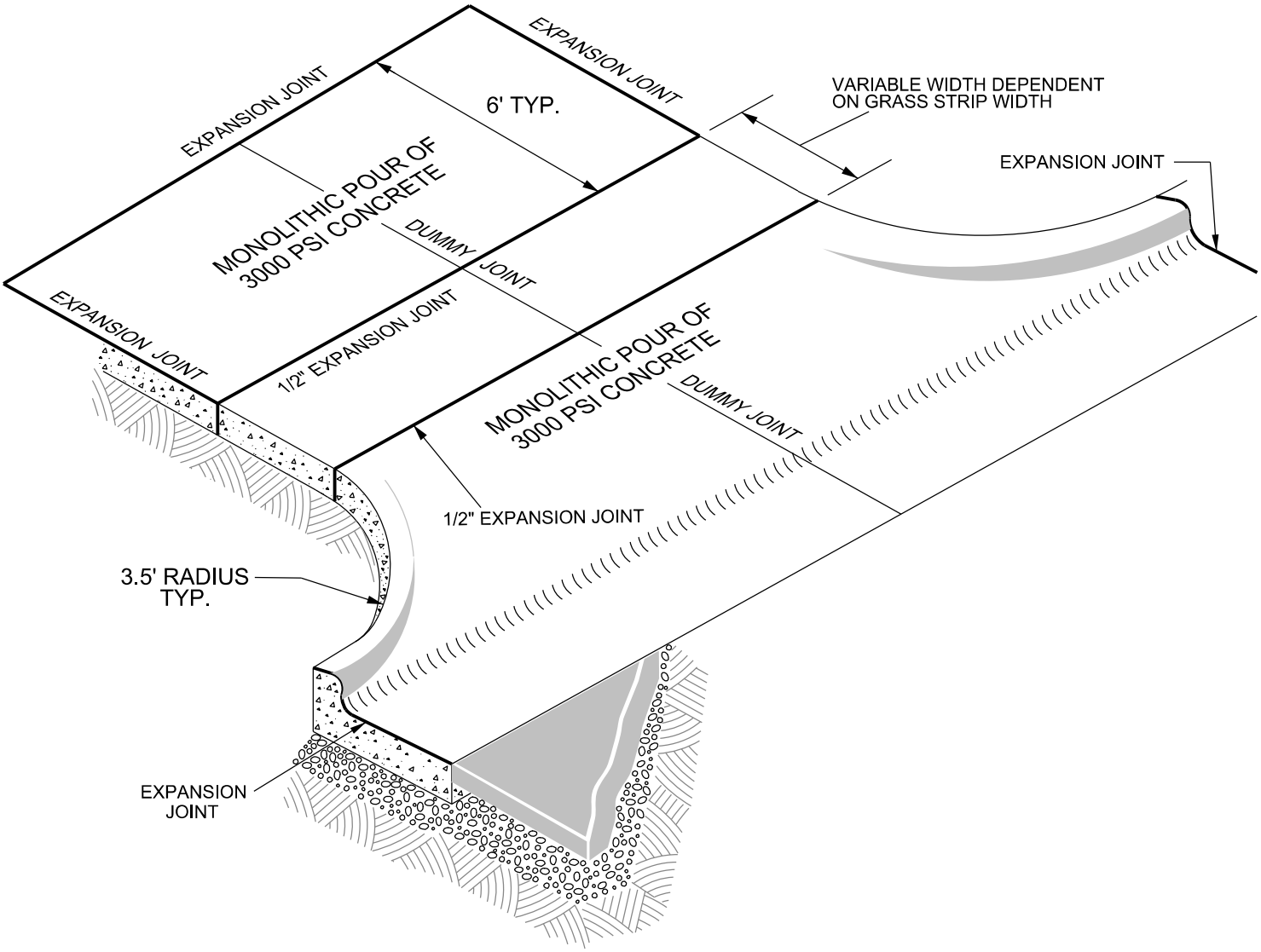
REVISIONS	DATE: 8/2020	NOT TO SCALE
	SITE LAYOUT FOR BIKE PAD	
	TT-10	

CITY OF RALEIGH

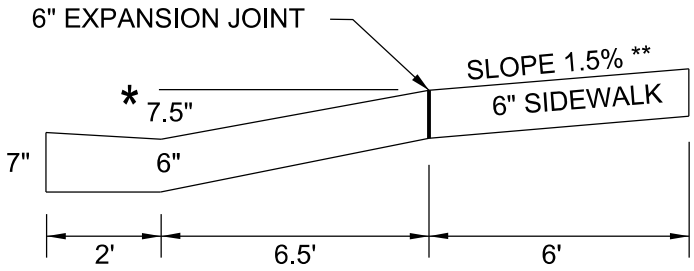
STANDARD DETAILS



TRANSPORTATION



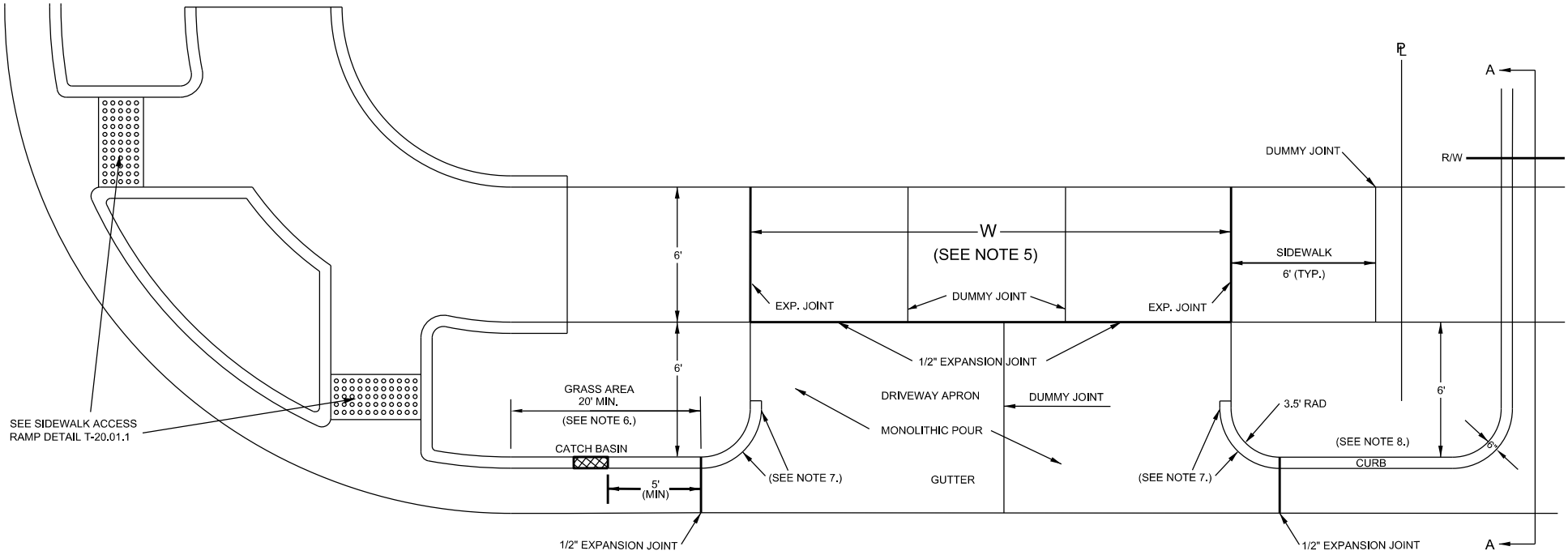
SEE T-10.01.2 FOR ADDITIONAL NOTES

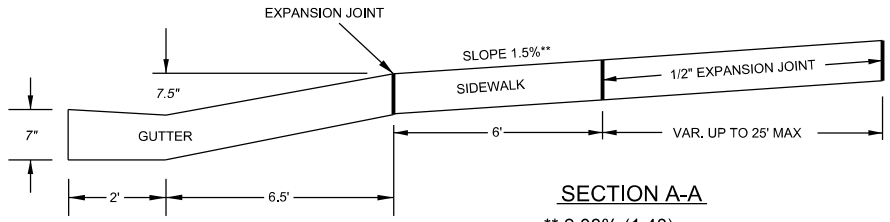


* USE 6.5" WHEN DRIVEWAY IS USED IN LIEU OF A WHEELCHAIR RAMP TO ACCOMMODATE 12:1 MAXIMUM SLOPE (ADA COMPLIANT), SUCH AS IN A CUL-DE SAC.

** 2.08% (1:48) max

CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	DRIVEWAY AND SIDEWALK DETAIL	
	T-10.01.1	





SECTION A-A

** 2.08% (1:48) max

NOTES:

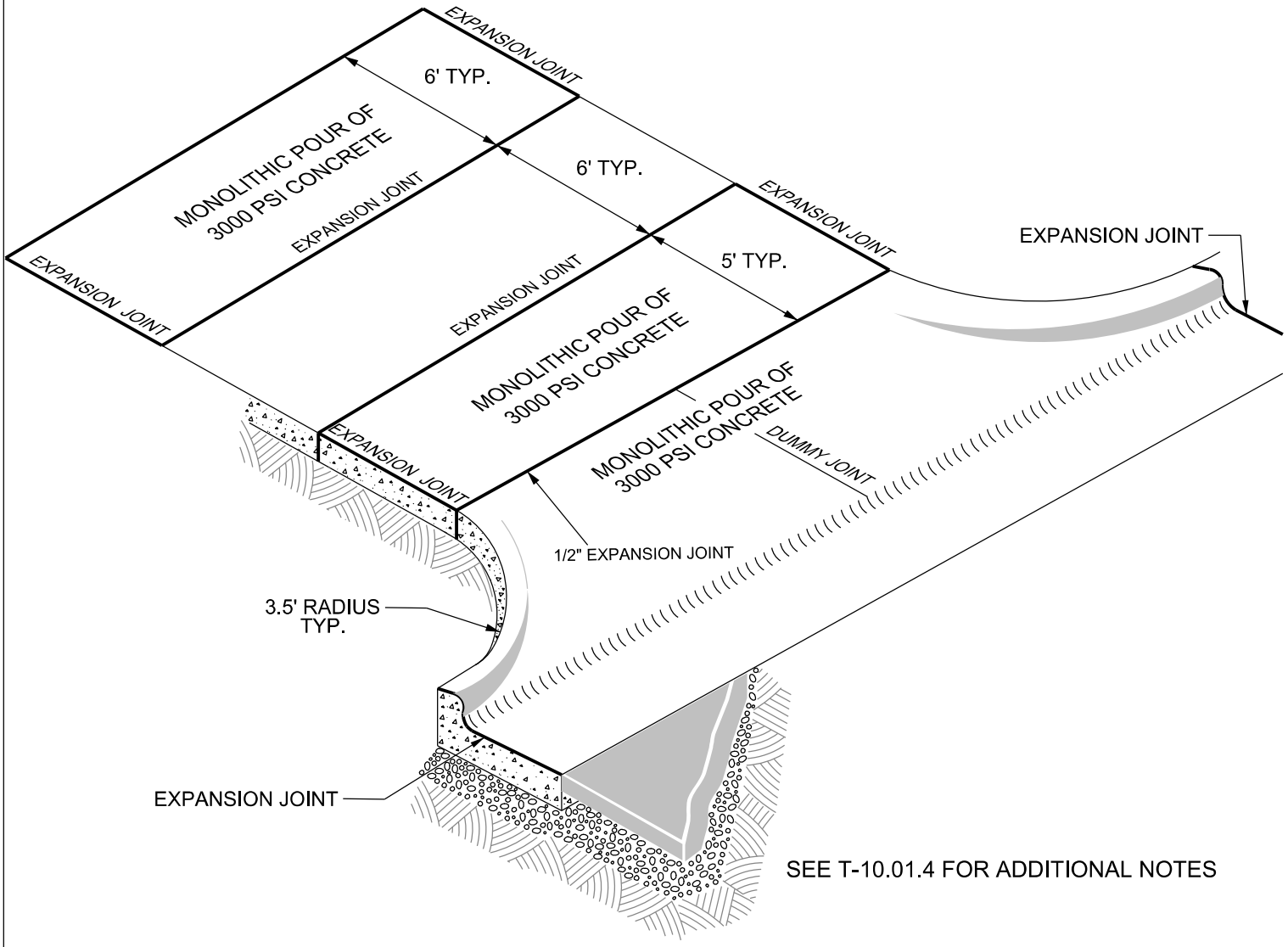
1. WHEN A DRIVEWAY IS TO BE CONSTRUCTED WHERE FINAL LAYER OF ASPHALT HAS BEEN PLACED, THE CURB CAN BE SAW CUT IN A STRAIGHT LINE AND REMOVED. IF THE FINAL LAYER HAS NOT BEEN PLACED, THE ENTIRE CURB AND GUTTER SHALL BE REMOVED AND THE DRIVEWAY SHALL BE A MONOLITHIC POUR USING 3000 PSI ,MAX. 4" SLUMP CONCRETE.
2. EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH OF THE CONCRETE. 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.
3. SLOPE ON UNPAVED AREAS BETWEEN BACK OF CURB & SIDEWALK SHALL BE 1/4" PER FT.
4. NO EXPOSED AGGREGATE OR OTHER SPECIAL SURFACE TREATMENTS IN ROW.
5. W-DIMENSION AS SHOWN ON PLAN VIEW SHALL BE AS FOLLOWS: 10' MINIMUM, 18' MAXIMUM FOR RESIDENTIAL DRIVEWAYS 36' MAXIMUM FOR COMMERCIAL DRIVEWAYS
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. 45' MIN. BETWEEN DRIVEWAYS ON SAME LOT.
9. 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 R/W TO THE CURB AND GUTTER LOCATION.
10. ALL CONCRETE MUST BE POURED ON SAME DAY AS INSPECTION OR RE-INSPECTION IS REQUIRED.
11. FINISH THE SURFACE TO GRADE AND CROSS SECTION WITH A FLOAT, TROWEL SMOOTH AND FINISH WITH A BROOM
12. DRIVEWAY RADIUS SHALL BE A MINIMUM OF 5' FROM ANY CATCH BASIN.
13. WHERE UTILITY BOXES/VAULTS MUST BE LOCATED IN THE SIDEWALK, THEY SHALL HAVE A MINIMUM 3" WIDE FRAME OF CONCRETE AROUND THEM.

CITY OF RALEIGH
STANDARD DETAIL

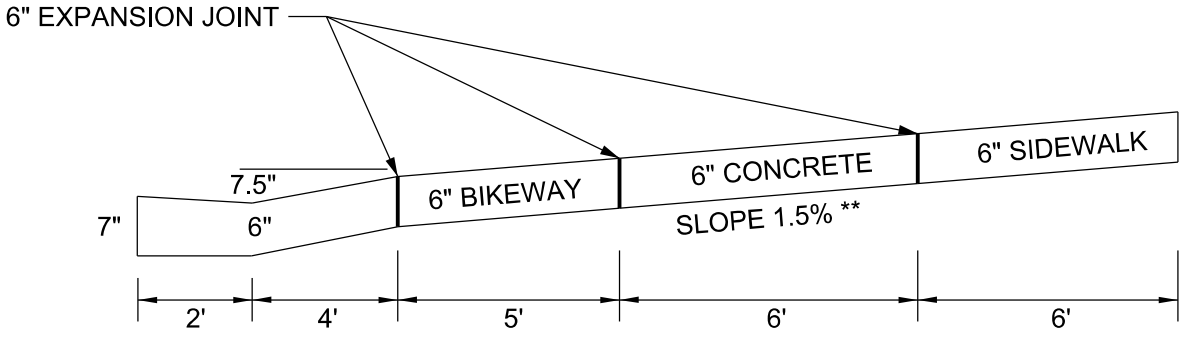
DRIVEWAY AND SIDEWALK DETAIL

T-10.01.2

REVISIONS
DATE: 8/2020
DATE: 12/2022
DATE: 08/2023
NOT TO SCALE



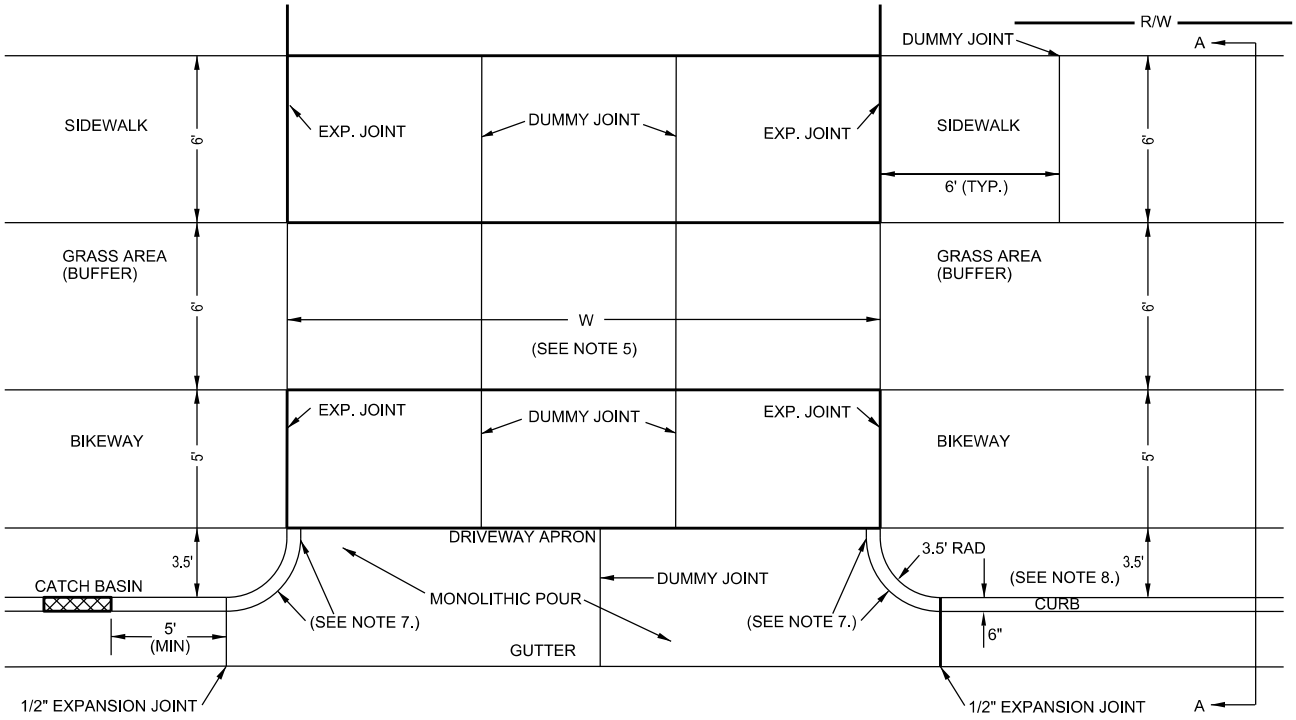
SEE T-10.01.4 FOR ADDITIONAL NOTES

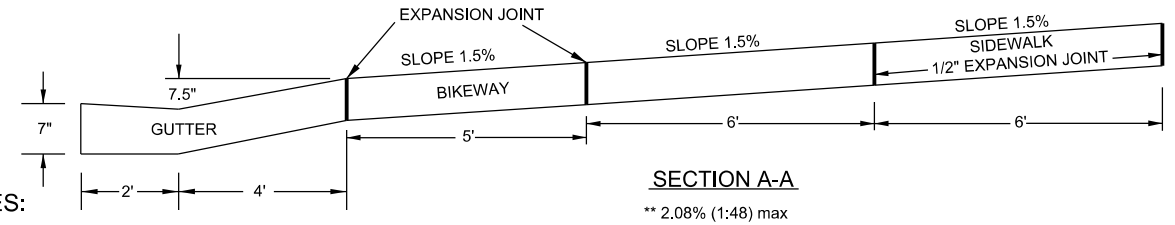


** 2.08% (1:48) max

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2022	NOT TO SCALE
DATE: 12/2022	DRIVEWAY, BIKEWAY AND SIDEWALK DETAIL	
	T-10.01.3	





SECTION A-A

** 2.08% (1:48) max

NOTES:

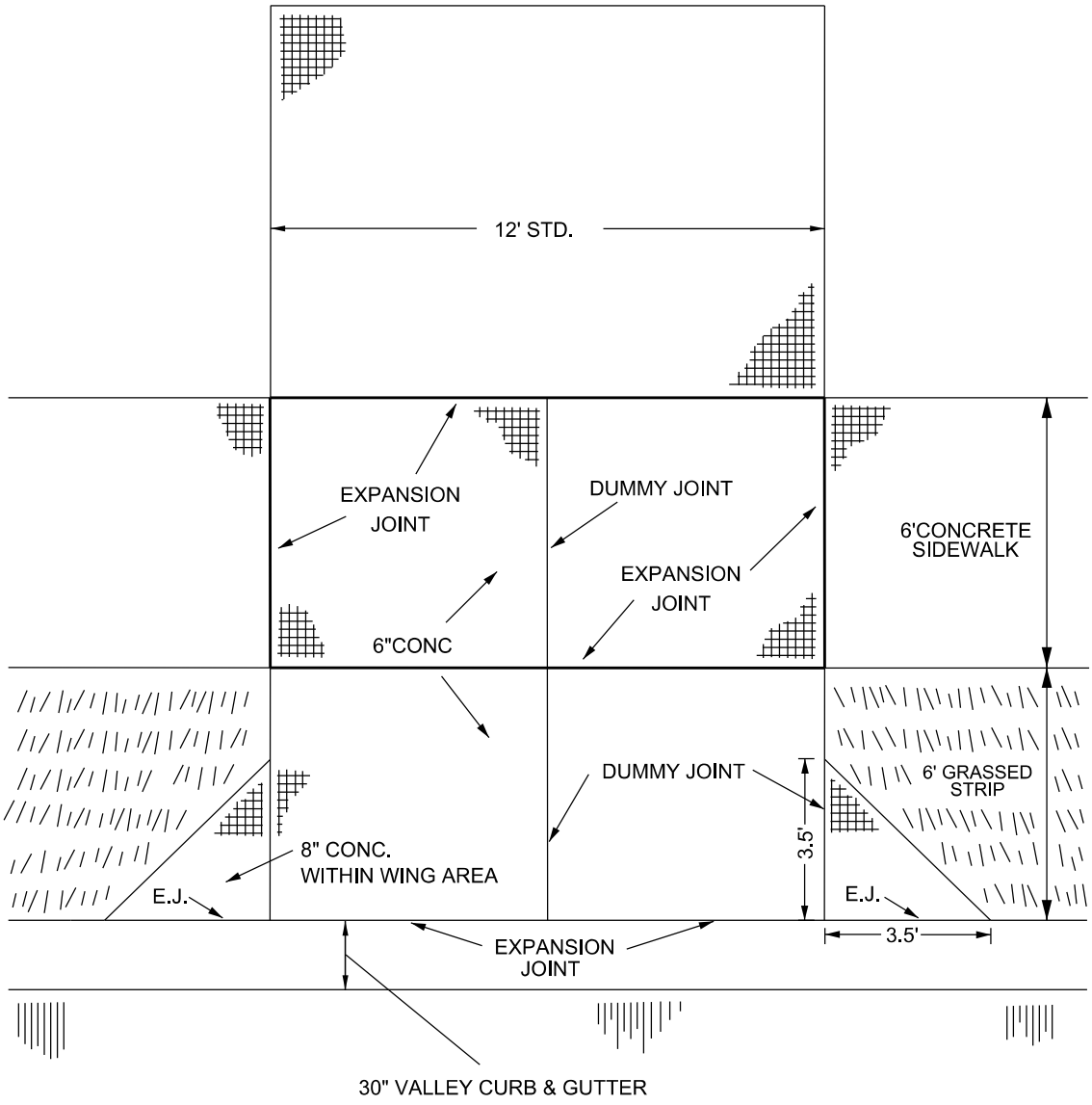
1. WHEN A DRIVEWAY IS TO BE CONSTRUCTED WHERE FINAL LAYER OF ASPHALT HAS BEEN PLACED, THE CURB CAN BE SAW CUT IN A STRAIGHT LINE AND REMOVED. IF THE FINAL LAYER HAS NOT BEEN PLACED, THE ENTIRE CURB AND GUTTER SHALL BE REMOVED AND THE DRIVEWAY SHALL BE A MONOLITHIC POUR USING 3000 PSI ,MAX. 4" SLUMP CONCRETE.
2. EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH OF THE CONCRETE. 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.
3. SLOPE ON UNPAVED AREAS BETWEEN BACK OF CURB & SIDEWALK SHALL BE 1/4" PER FT.
4. NO EXPOSED AGGREGATE OR OTHER SPECIAL SURFACE TREATMENTS IN ROW.
5. W-DIMENSION AS SHOWN ON PLAN VIEW SHALL BE AS FOLLOWS:
   10' MINIMUM, 18' MAXIMUM FOR RESIDENTIAL DRIVEWAYS
   36' MAXIMUM FOR COMMERCIAL DRIVEWAYS
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. 45' MIN. BETWEEN DRIVEWAYS ON SAME LOT.
9. 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 R/W TO THE CURB AND GUTTER LOCATION.
10. ALL CONCRETE MUST BE POURED ON SAME DAY AS INSPECTION OR RE-INSPECTION IS REQUIRED.
11. FINISH THE SURFACE TO GRADE AND CROSS SECTION WITH A FLOAT, TROWEL SMOOTH AND FINISH WITH A BROOM
12. DRIVEWAY RADIUS SHALL BE A MINIMUM OF 5' FROM ANY CATCH BASIN.
13. WHERE UTILITY BOXES/VAULTS MUST BE LOCATED IN THE SIDEWALK, THEY SHALL HAVE A MINIMUM 3" WIDE FRAME OF CONCRETE AROUND THEM.

CITY OF RALEIGH
STANDARD DETAIL

DRIVEWAY, BIKEWAY AND SIDEWALK DETAIL

T-10.01.4

REVISIONS	DATE: 8/2022	NOT TO SCALE
DATE: 12/2022		
DATE: 08/2023		

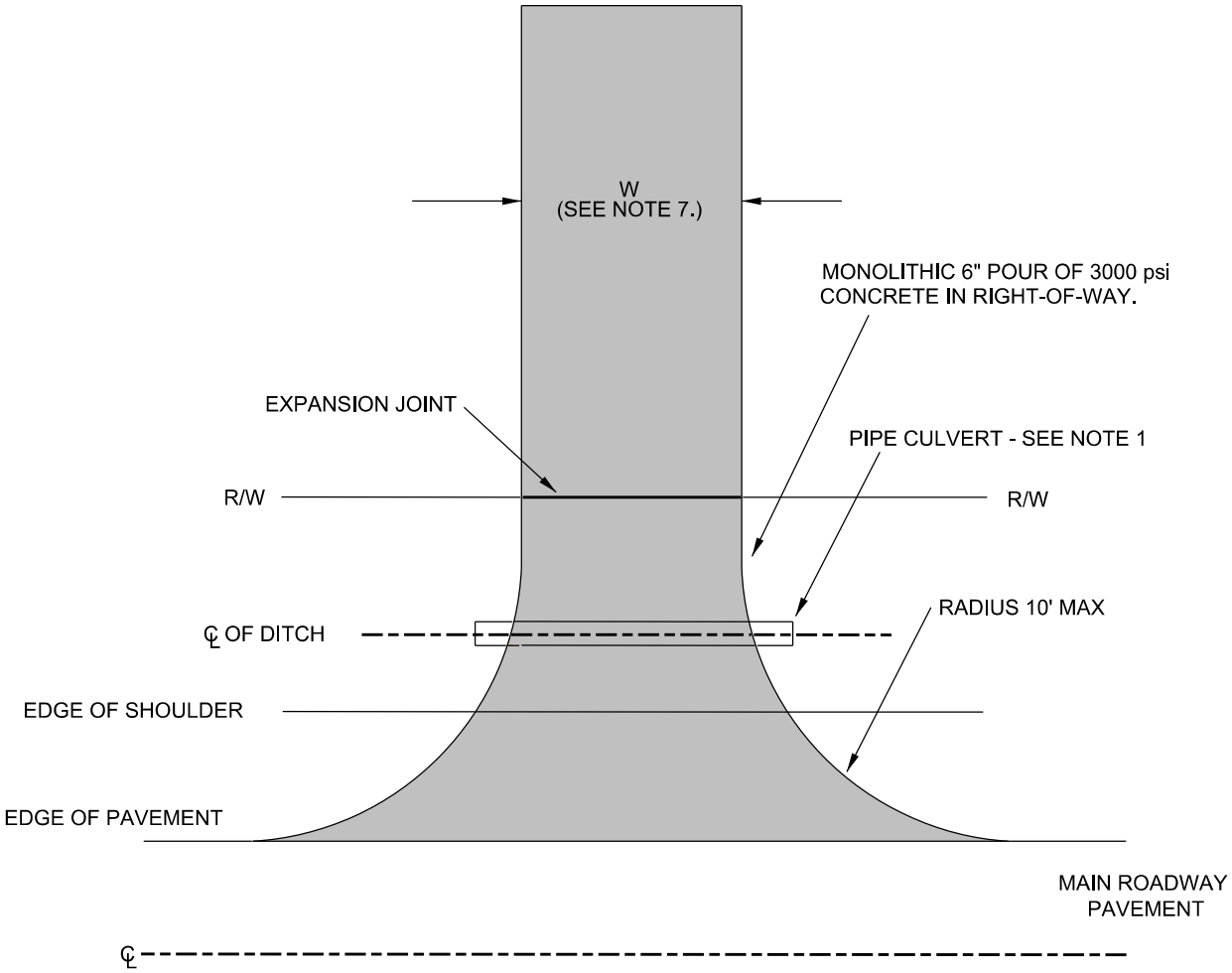


NOTES:

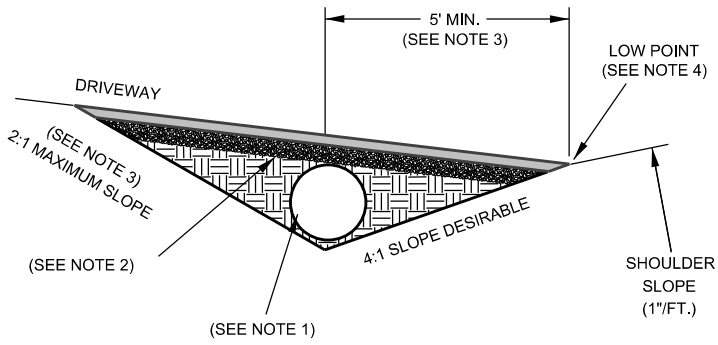
1. SEE STANDARD DETAIL T-10.26.1 FOR CURB AND GUTTER DETAILS.
2. EXPANSION MATERIAL SHALL EXTEND THE FULL DEPTH OF THE CONCRETE.
3. ALL CONCRETE SHALL BE 3000 PSI (MIN.).

CITY OF RALEIGH
STANDARD DETAIL

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



WITH UNPAVED ROADSIDE DITCH



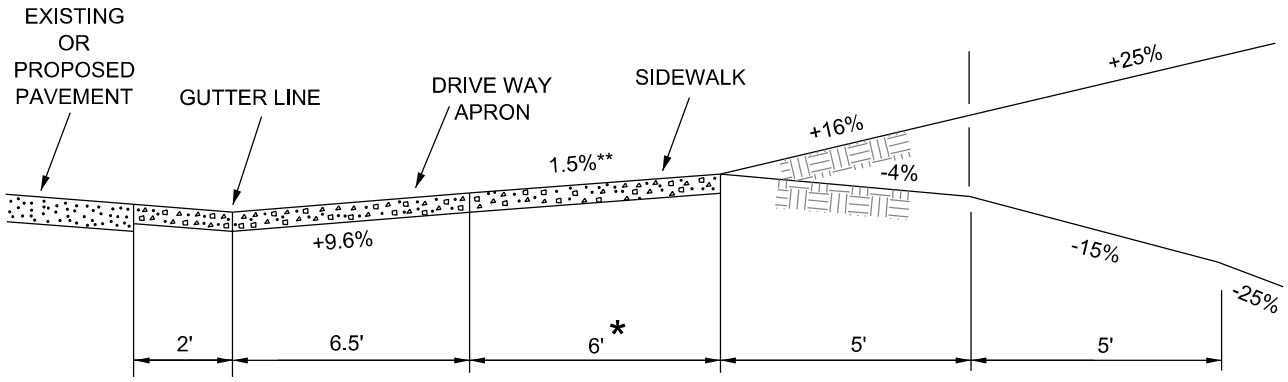
NOTES:

1. PIPE TO BE RCP OR HDPE AND SIZED TO CARRY THE DESIGN FLOW OF THE DITCH FOR A 10-YEAR, 24-HOUR STORM EVENT; THE MINIMUM ACCEPTABLE PIPE SIZE IS 15" IF THE DESIGN FLOW WOULD REQUIRE A SMALLER PIPE. PIPE TO BE EXTENDED TO ALLOW ACCEPTABLE COVER AND SLOPES.
2. 12" MINIMUM COVER OVER PIPE MEASURED FROM TOP OF PAVEMENT.
3. STEEPER SLOPES CAN BE ALLOWED WHERE SPECIAL STABILIZATION IS PROVIDED IN ACCORDANCE WITH EROSION AND SEDIMENTATION CONTROL ORDINANCE.
4. USE 5' VERTICAL CURVE FOR TRANSITION.
5. SEE CITY OF RALEIGH STREET DESIGN MANUAL FOR COMMERCIAL DRIVEWAYS.
6. NO EXPOSED AGGREGATE OR OTHER SPECIAL SURFACE TREATMENTS IN RIGHT OF WAY.
7. W-DIMENSION AS SHOWN ON PLANS SHALL BE AS FOLLOWS; 10' MINIMUM, 18' MAXIMUM FOR RESIDENTIAL DRIVEWAYS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	RESIDENTIAL DRIVEWAY INSTALLATION ON NON CURB & GUTTERED STREETS	
	T-10.03	

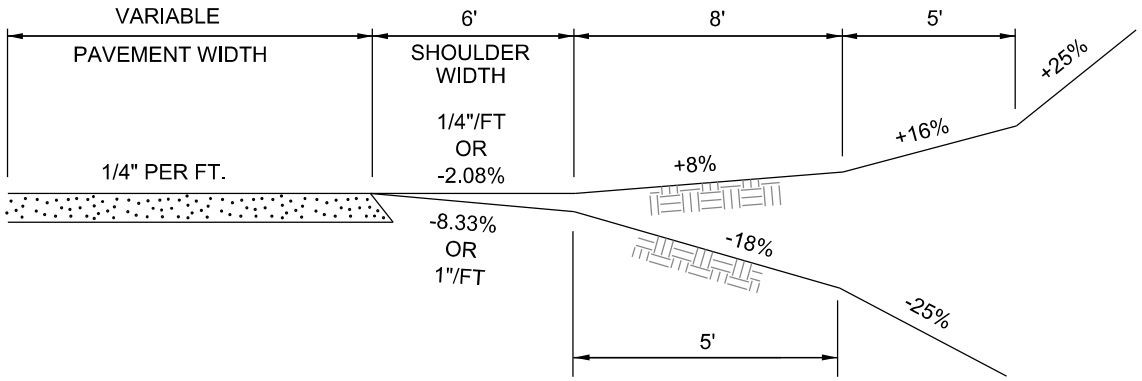
DRIVEWAY GRADES



* 5' FOR SENSITIVE AREA AVENUE
AND SENSITIVE AREA RESIDENTIAL STREET

** 2.08% (1:48) max

A. CURB & GUTTER , SIDEWALK SECTION



B. SHOULDER SECTION

NOTES:

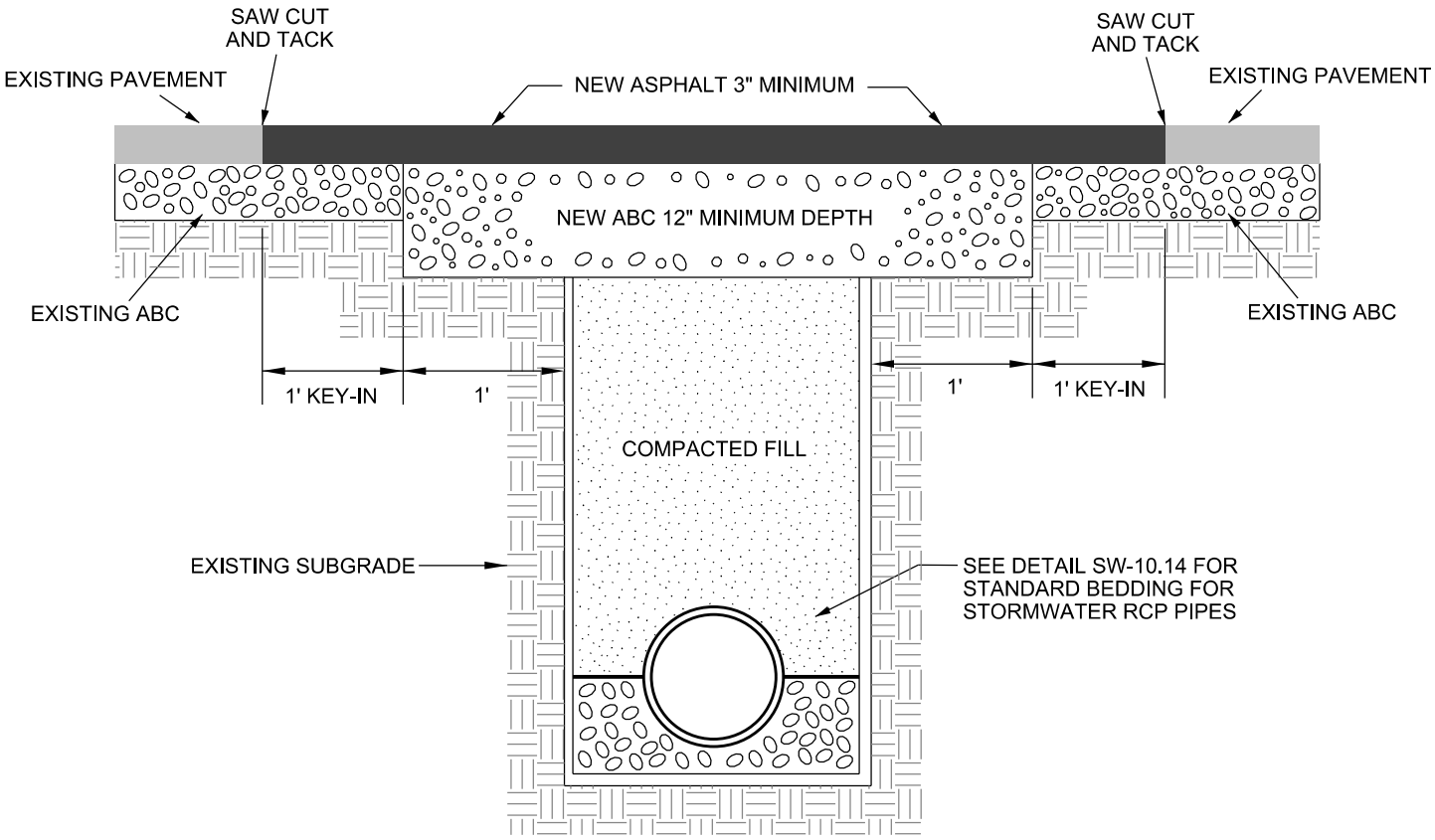
IF THE SLOPE BETWEEN THE TOP OF CURB AND GUTTER AND A POINT 30 FEET FROM THE CURB AND GUTTER EXCEEDS 20%, THIS SLOPE SHALL BE ADJUSTED TO A MAXIMUM OF 8.33% (1"/FT) UP OR 4.17% (1/2" /FT) DOWN.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022		

DRIVEWAY GRADES

T-10.04

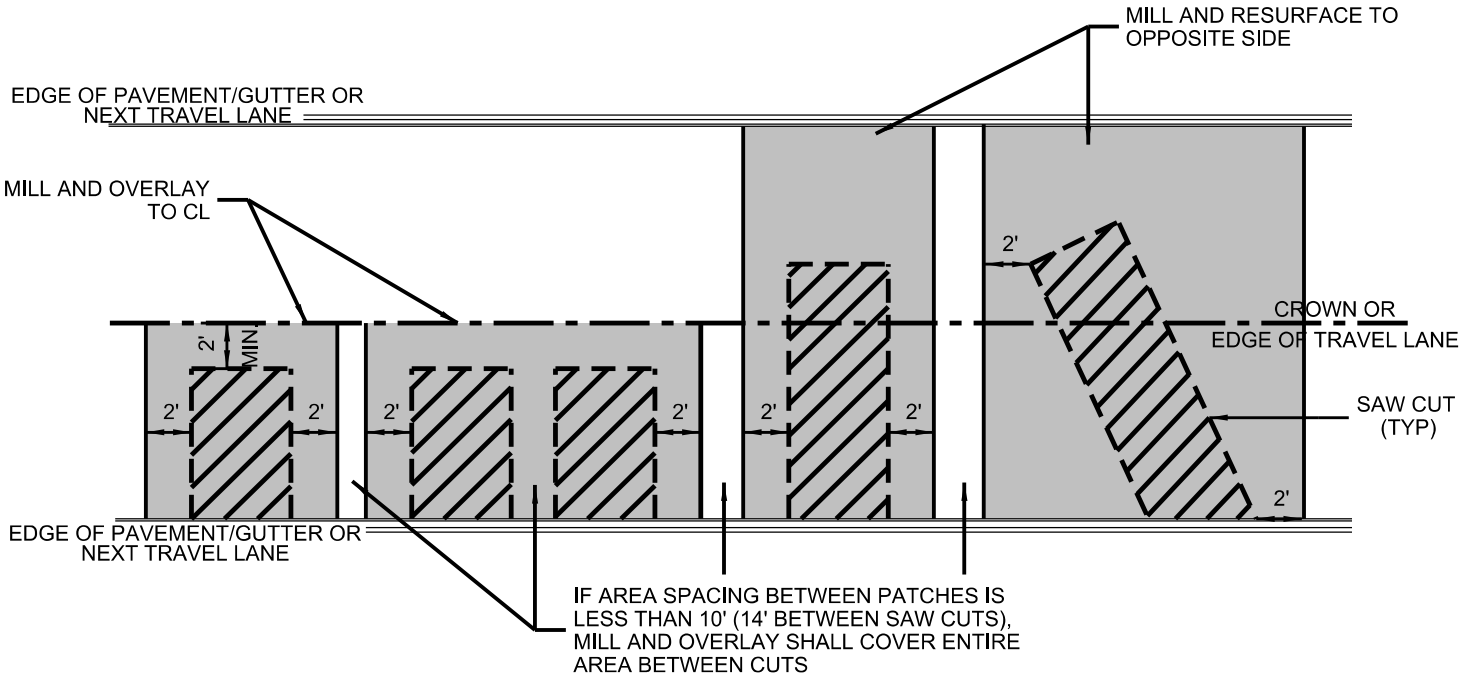


NOTES:

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
DATE: 08/2023	ASPHALT PAVEMENT PATCH AND RCP PIPE BACKFILL	
		T-10.05.1

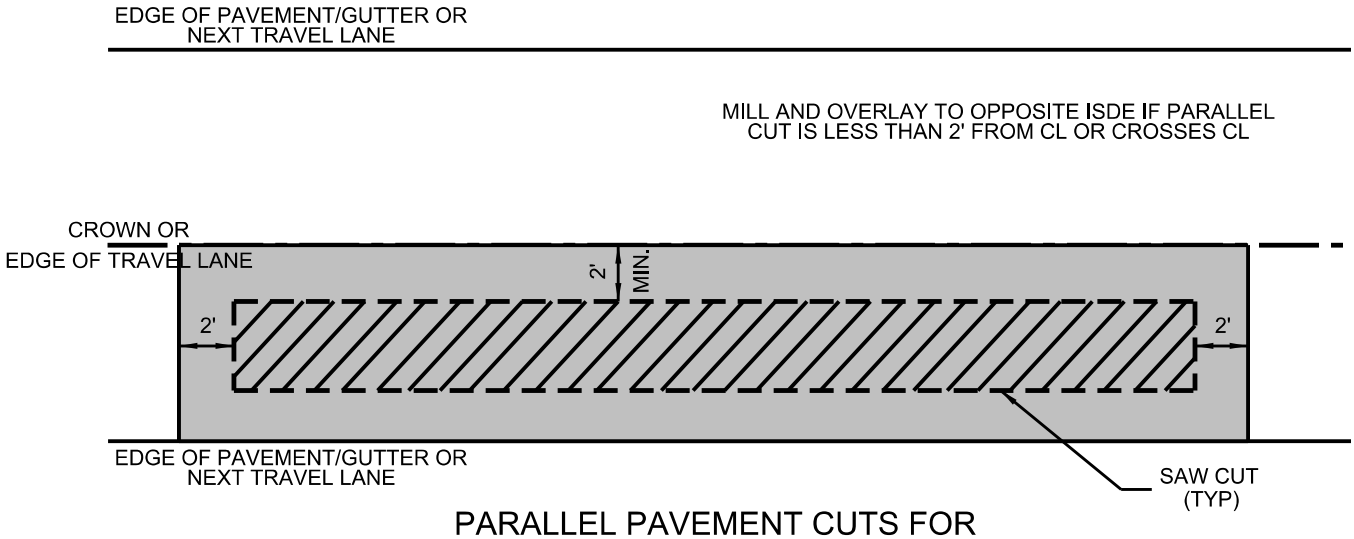


LATERAL PAVEMENT CUTS FOR UTILITY SERVICE

PAVEMENT PATCH (W-2 OR S-3)

MILL AND RESURFACE

MILL AND RESURFACE 1" - 1.5" MIN SURFACE COURSE OR FULL DEPTH REPAIR



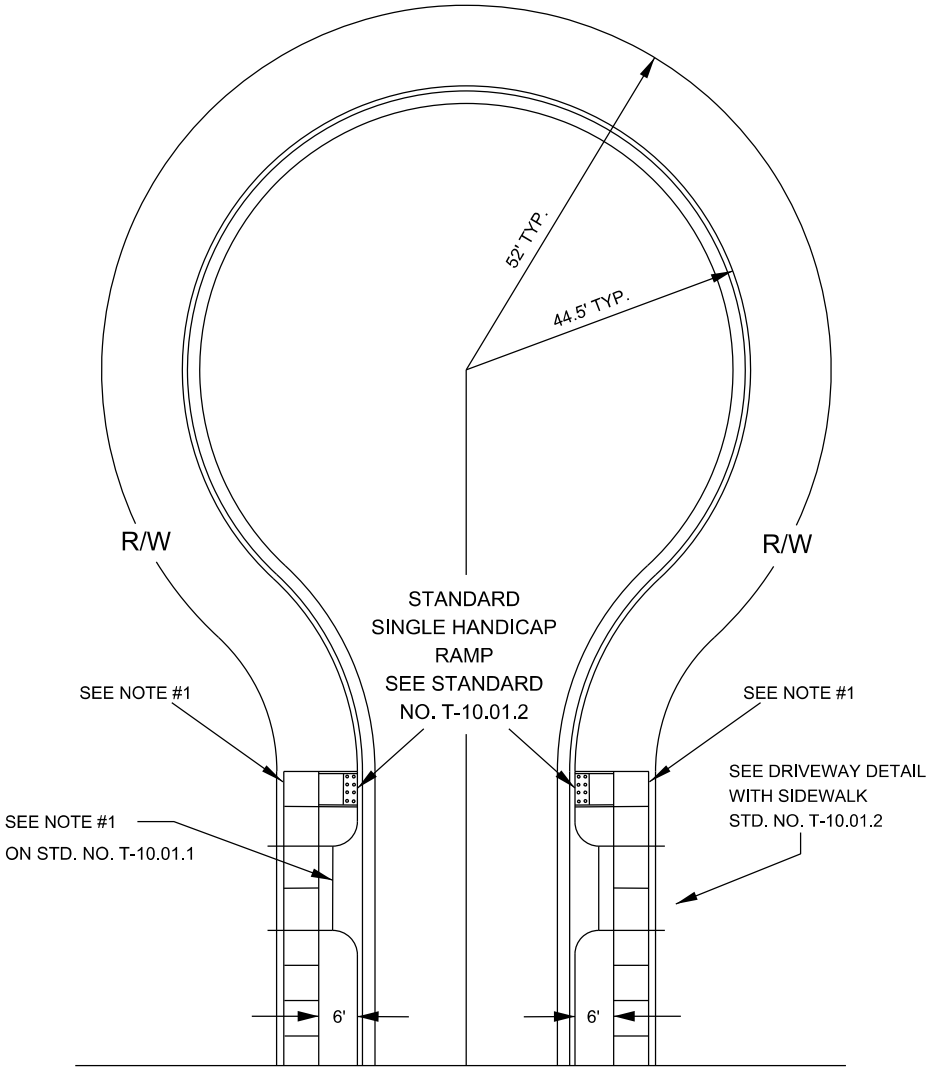
PARALLEL PAVEMENT CUTS FOR UTILITY SERVICE

NOTES:

1. THE PAVEMENT EDGES SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT OR MILLIING MACHINE
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 COMPCATED 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
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, COMPACTED THOROUGHLY AND ROLLED WITH A SMOOTH DRUM ROLLER TO LEVEL PATCH

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2023	NOT TO SCALE
	ASPHALT PAVEMENT PATCH AND RCP PIPE BACKFILL	
	T-10.05.2	



NOTES:

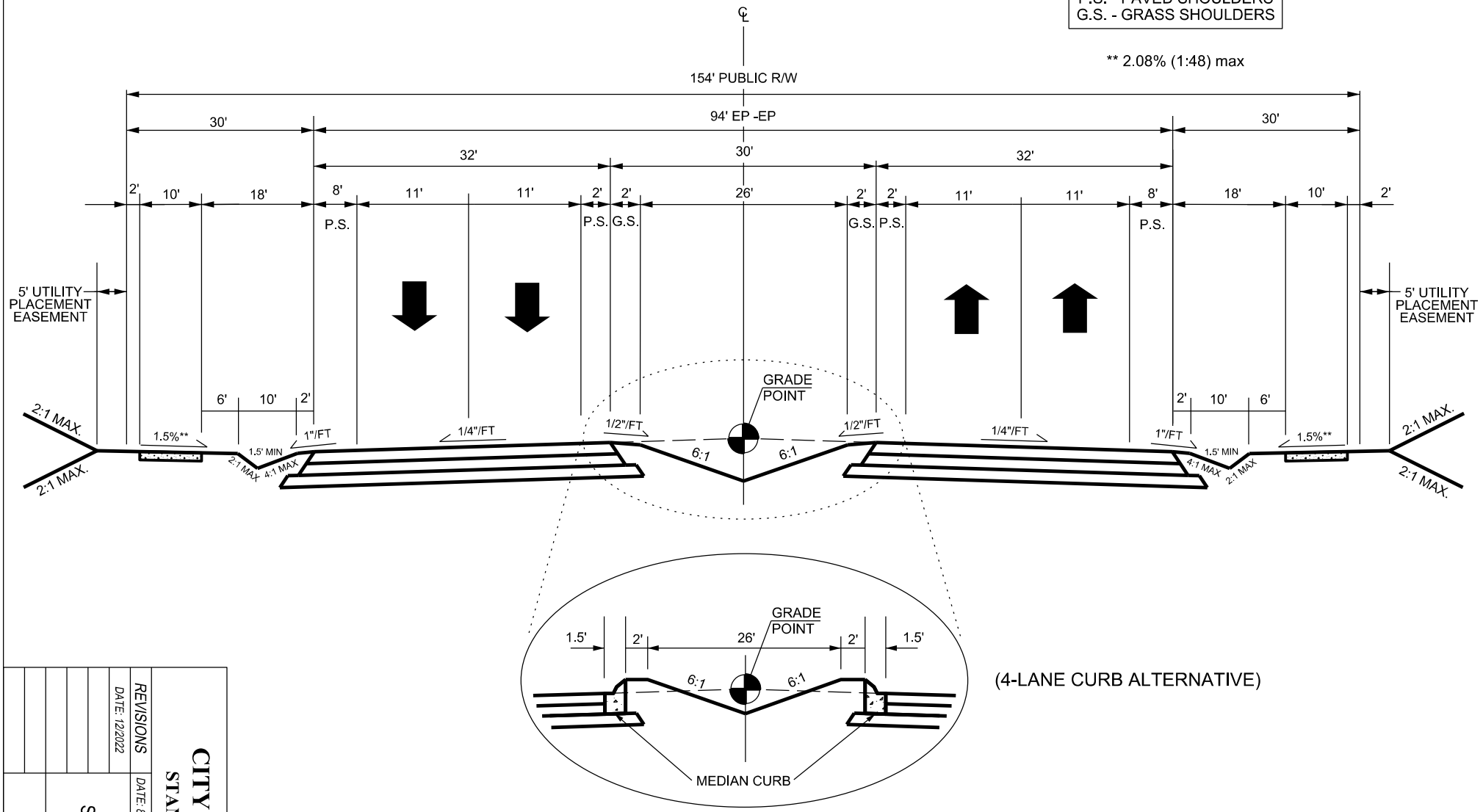
1. IF DRIVEWAY IS WITHIN CLOSE PROXIMITY OF ACCESS RAMP, TIE SIDEWALK INTO DRIVEWAY.
2. REFER TO STANDARD DETAIL T-10.01.2, DRIVE WAY AND SIDEWALK DETAIL, SHEET 1 OF 2.

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

** 2.08% (1:48) max



(4-LANE CURB ALTERNATIVE)

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

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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

DATE: 8/2020

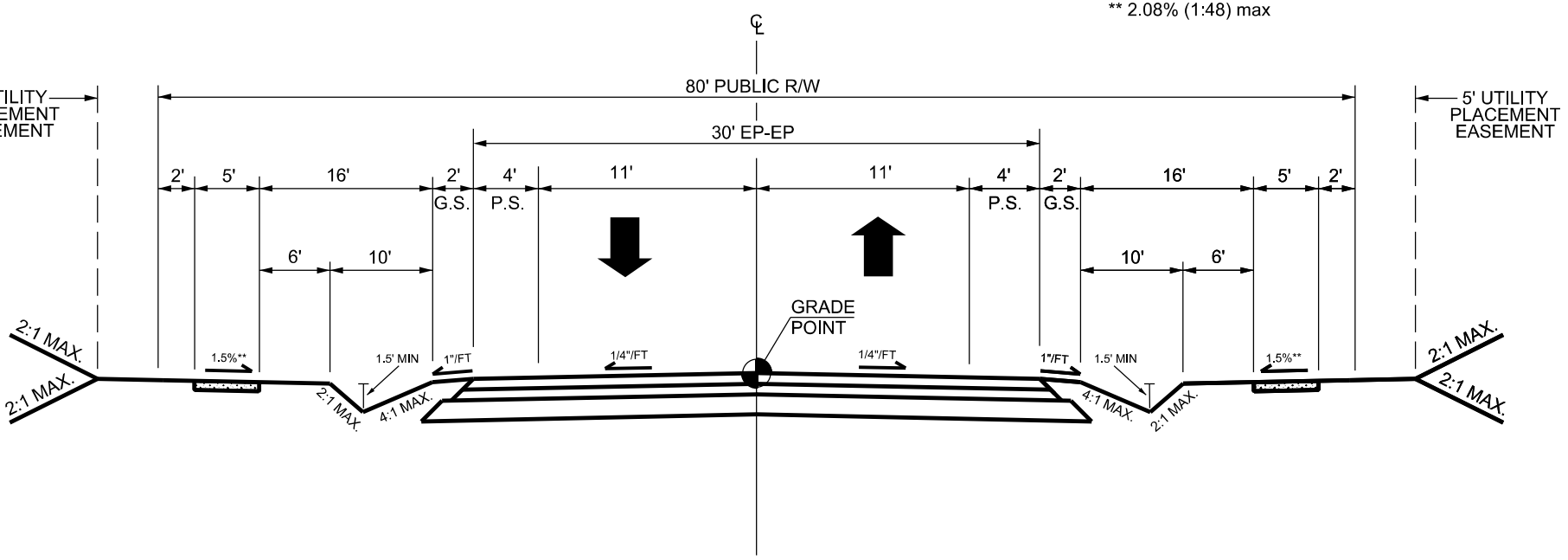
NOT TO SCALE

SENSITIVE AREA PARKWAY

T-10.07

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

** 2.08% (1:48) max



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

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

CITY OF RALEIGH
STANDARD DETAIL

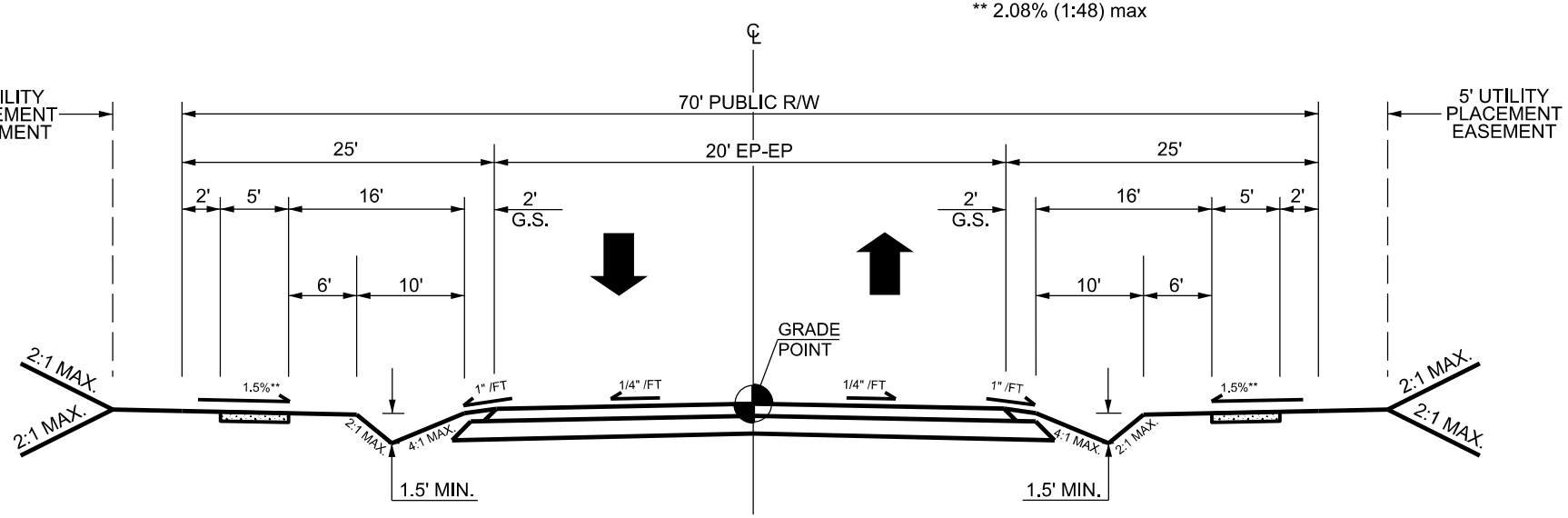
REVISIONS
DATE: 12/2022
DATE: 8/2020
NOT TO SCALE

SENSITIVE AREA AVENUE

T-10.08

G.S. - GRASSED SHOULDER

** 2.08% (1:48) max



GENERAL	
WALKWAY TYPE	SIDEWALK
PLANTING TYPE	TREE/LAWN
TREE SPACING	50' O.C. AVG

PAVEMENT DESIGN
3" SF9.5A 8" ABC

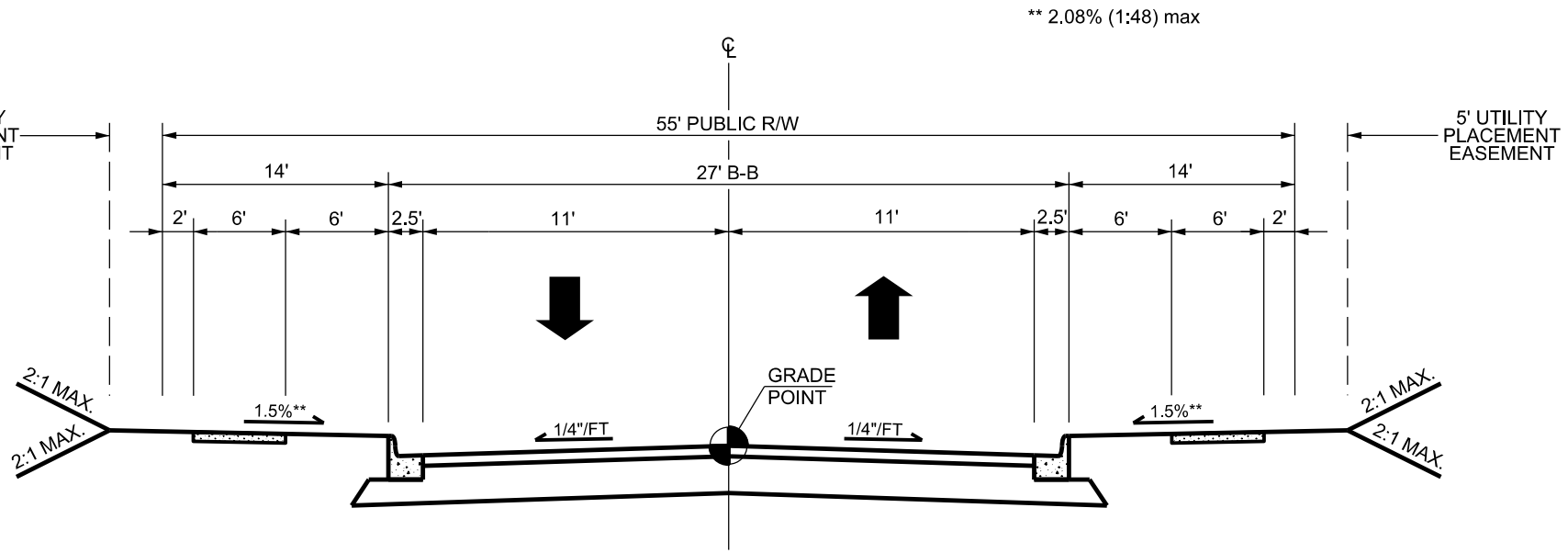
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

DATE: 8/2020
NOT TO SCALE

SENSITIVE AREA
RESIDENTIAL STREET

T-10.09



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

PAVEMENT DESIGN
3" SF9.5A
8" ABC

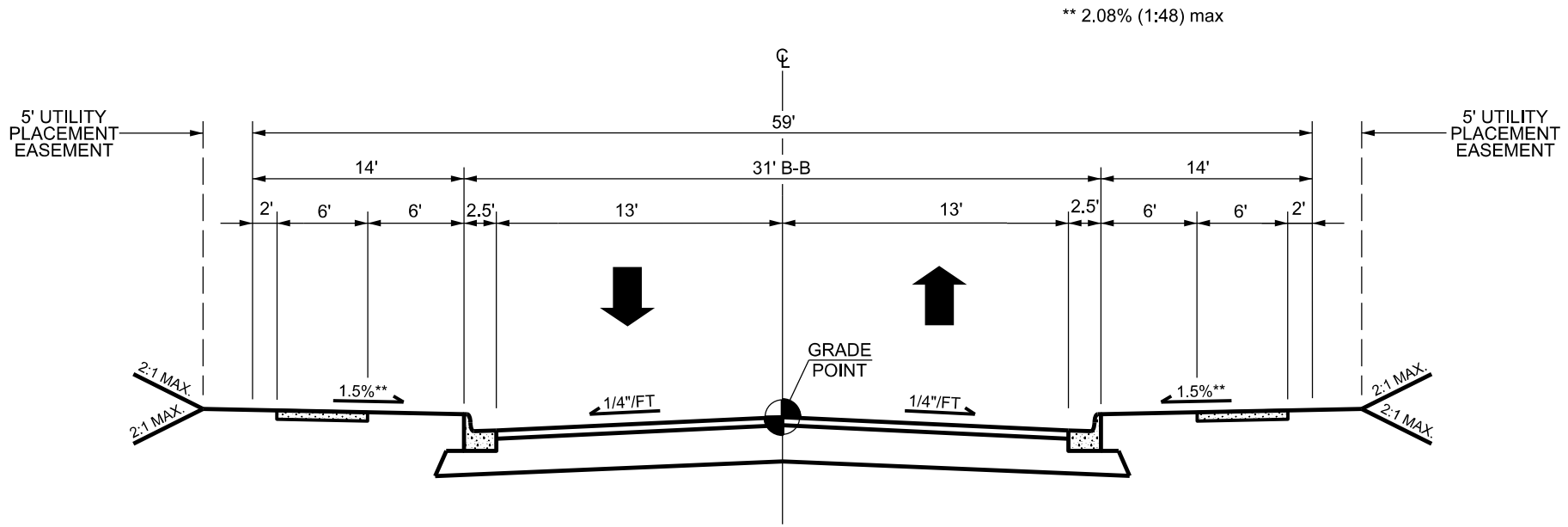
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

DATE: 8/2020
NOT TO SCALE

NEIGHBORHOOD YIELD

T-10.10



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

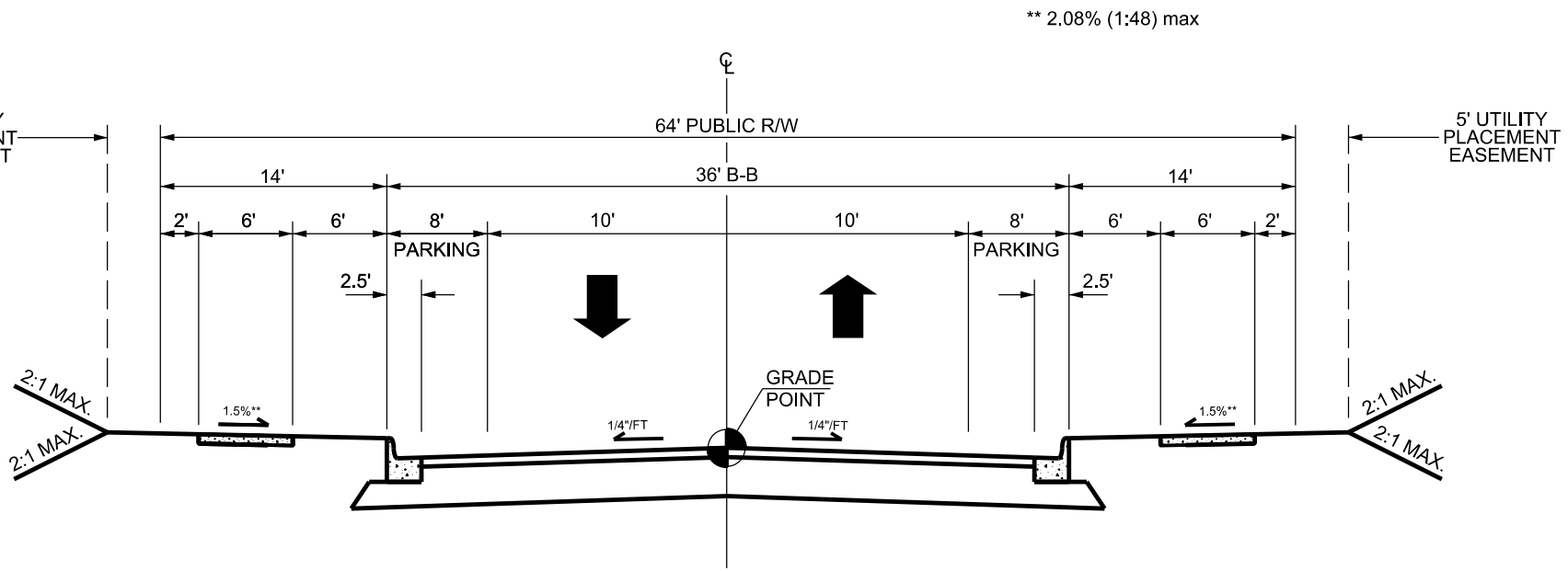
PAVEMENT DESIGN
3" SF9.5A 8" ABC

CITY OF RALEIGH
STANDARD DETAIL

NEIGHBORHOOD LOCAL STREET
(TWO - WAY)

T-10.11

REVISIONS
DATE: 12/2022
DATE: 8/2020
NOT TO SCALE



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

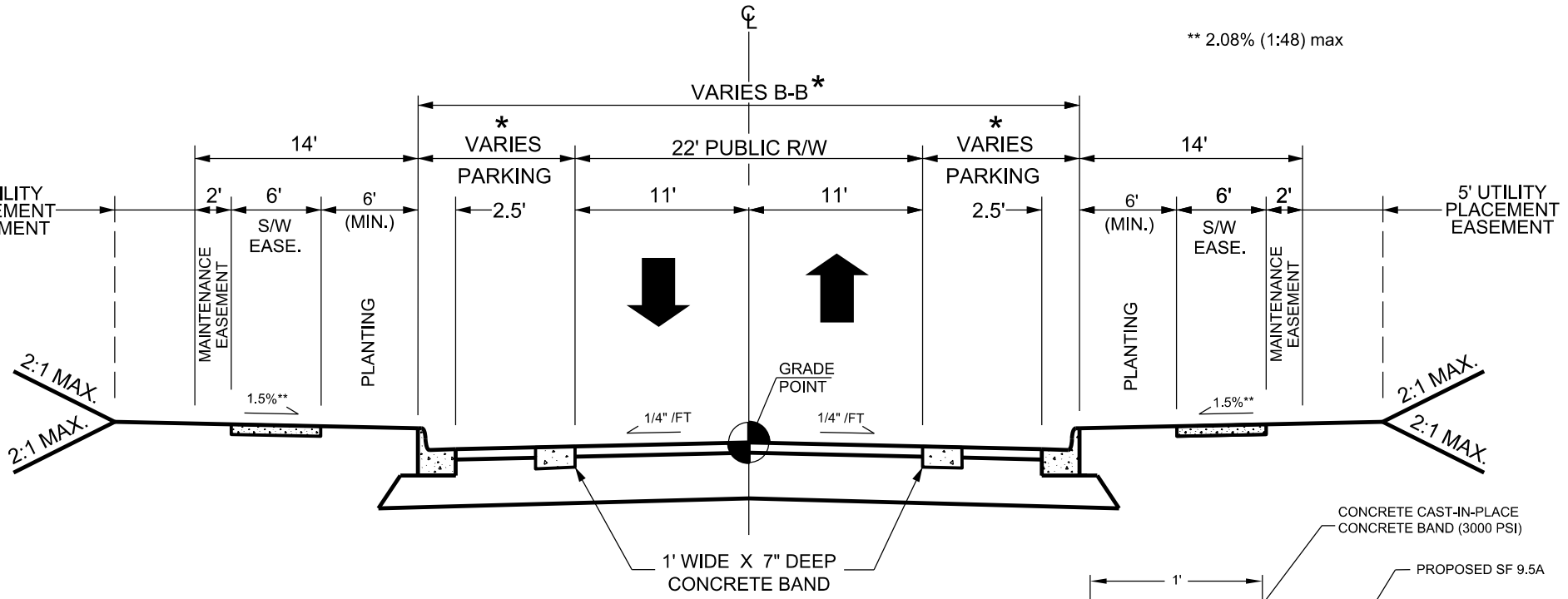
PAVEMENT DESIGN
3" SF9.5A 8" ABC

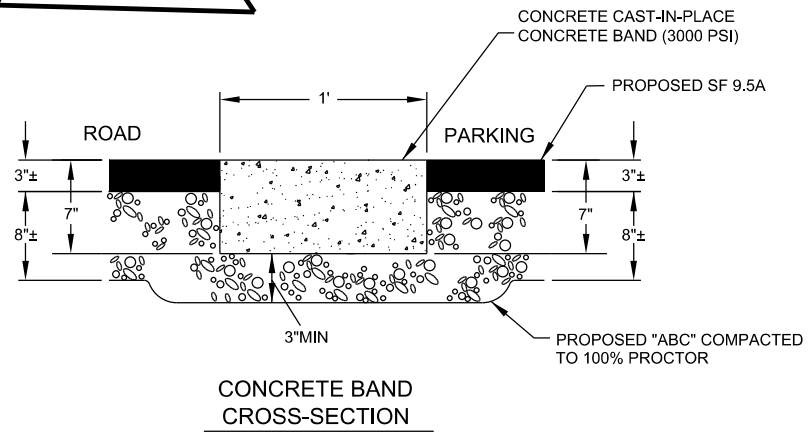
CITY OF RALEIGH
STANDARD DETAIL

NEIGHBORHOOD STREET

T-10.12

REVISIONS
DATE: 12/2022
DATE: 8/2020
NOT TO SCALE





CONCRETE BAND CROSS-SECTION

* 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

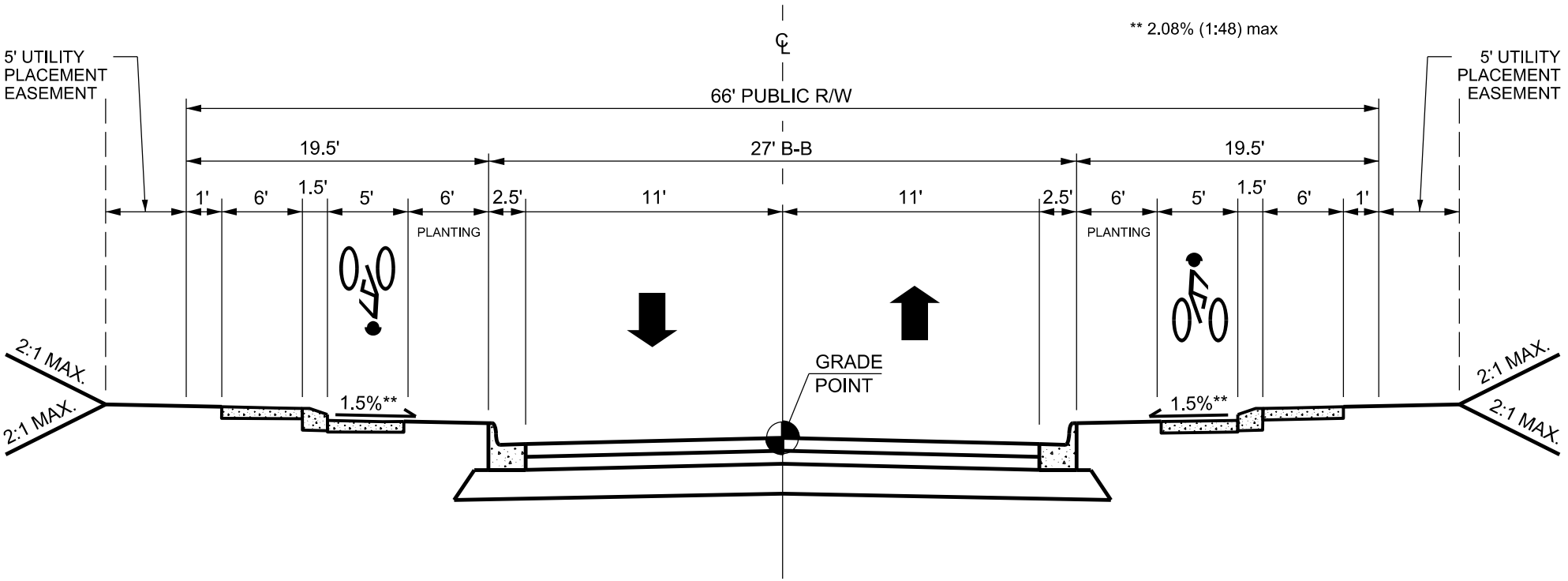
REVISIONS
DATE: 12/2022

DATE: 8/2020

NOT TO SCALE

MULTIFAMILY STREET

T-10.13



NOTE

1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.
2. THE BUFFER WIDTH BETWEEN THE SIDEWALK AND BIKE LANE IS A MAXIMUM AND MAY BE REDUCED AS LONG AS A) NOTE 3 IS MET AND B) THE TOTAL WIDTH OF THE SIDEWALK, BUFFER AND BIKEWAY IS 12'5.
3. THE BUFFER BETWEEN THE BIKE LANE AND THE SIDEWALK MUST BE DETECTABLE BY PEOPLE WITH VISION DISABILITIES. OPTIONS INCLUDE A ROLLED OR BEVELED CURB WHERE THE HEIGHT DIFFERENTIAL BETWEEN THE SIDEWALK AND BIKE LANE IS BETWEEN 2" AND 3" OR A DETECTABLE GUIDANCE SURFACE SET 1' OFF THE EDGE OF THE BIKEWAY IF THE SIDEWALK AND BIKEWAY ARE FLUSH
4. WHERE A CURB IS USED, THE CURB HEIGHT SHALL BE BETWEEN 8" AND 12" AND THE CURB WIDTH SHALL BE BETWEEN 6" AND 9". AN EXPANSION JOINT SHALL BE PROVIDED ON EACH SIDE OF THE CURB.
5. IN CONTEXTS WITH A LOW VOLUME OF PEDESTRIANS, THE SIDEWALK, BUFFER AND BIKE LANE CAN BE COMBINED INTO A 12.5' WIDE MULTI-USE PATH, PENDING THE APPROVAL OF THE OFFICE OF TRANSPORTATION PLANNING

GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

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

CITY OF RALEIGH
STANDARD DETAIL

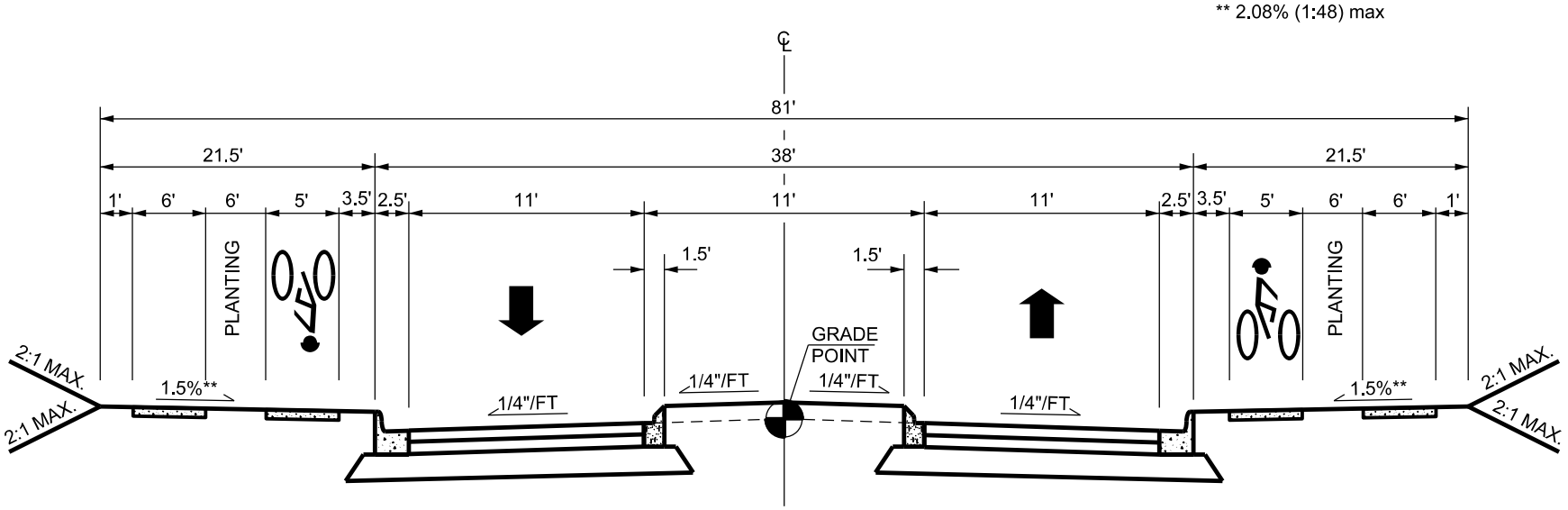
REVISIONS
DATE: 12/2022

DATE: 8/2020

AVENUE, 2 LANE
UNDIVIDED

NOT TO SCALE

T-10.14



NOTE
1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.

GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

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

CITY OF RALEIGH
STANDARD DETAIL

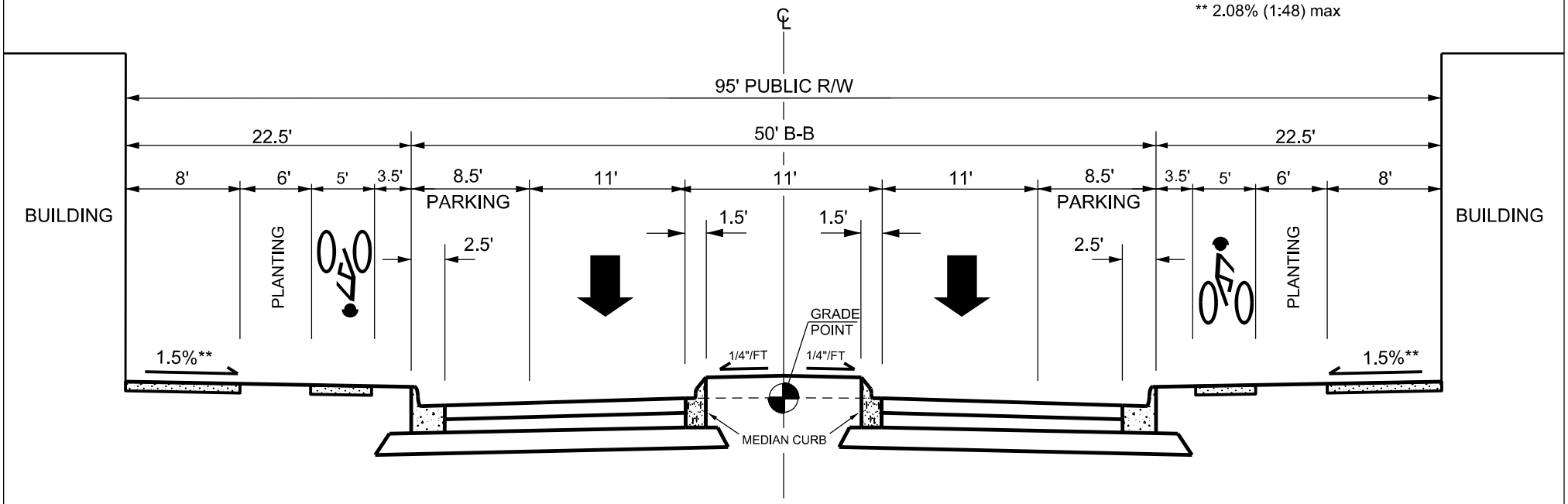
REVISIONS
DATE: 12/2022

DATE: 8/2020

AVENUE, 2 LANE, DIVIDED
(RAISED MEDIAN)

NOT TO SCALE

T-10.15



NOTE
1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.

GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL ON 2 SIDES

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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

DATE: 8/2020

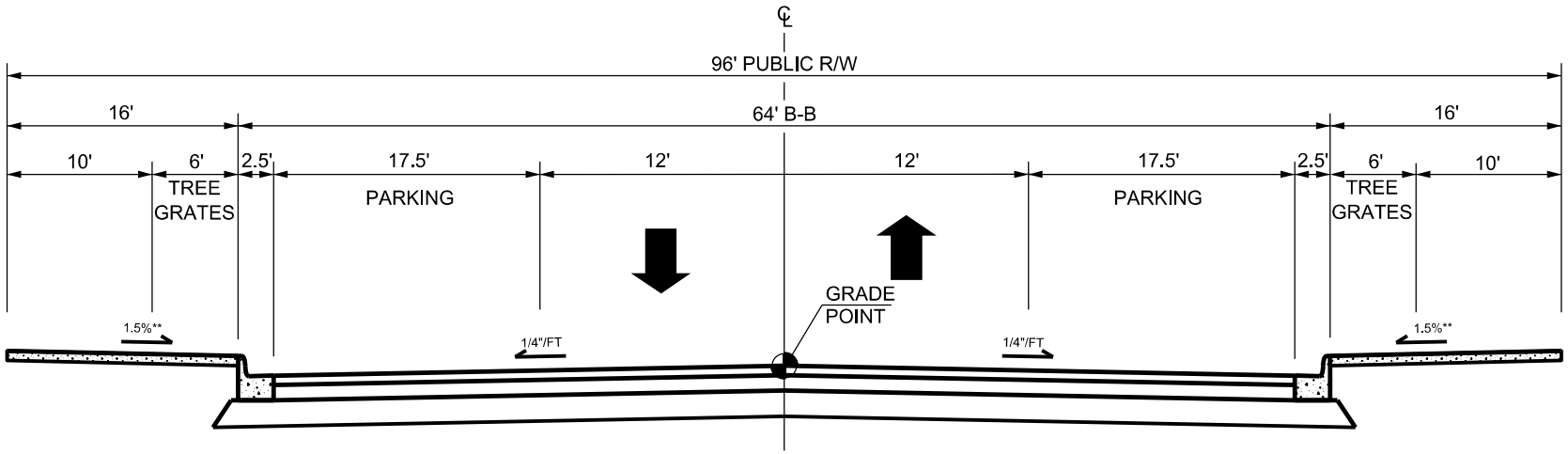
AVENUE, 3 LANE,
PARALLEL PARKING

NOT TO SCALE

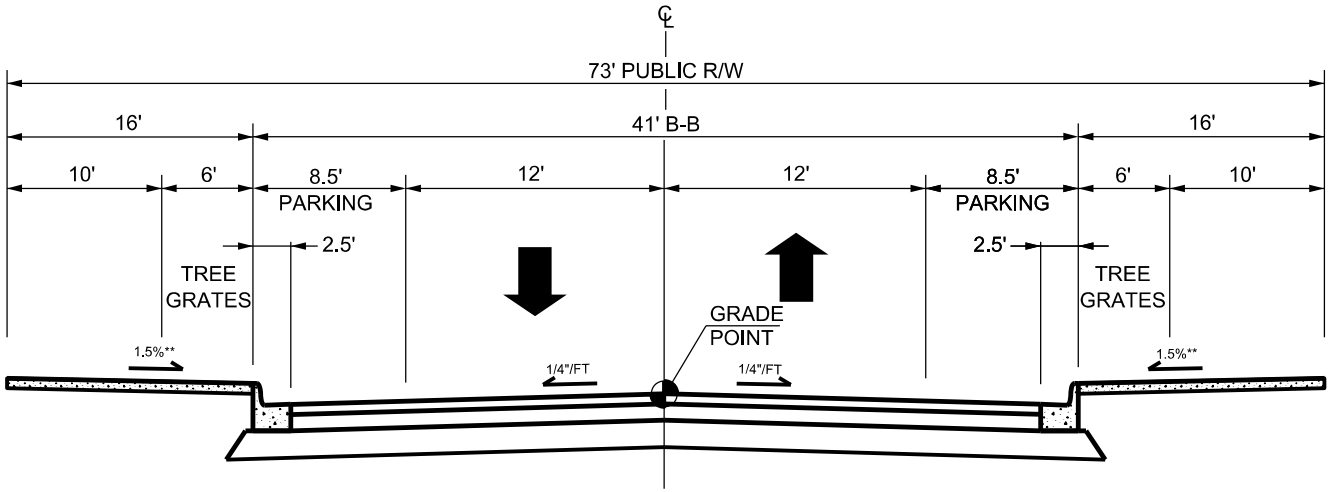
T-10.16

ANGLED PARKING

** 2.08% (1:48) max



PARALLEL PARKING



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

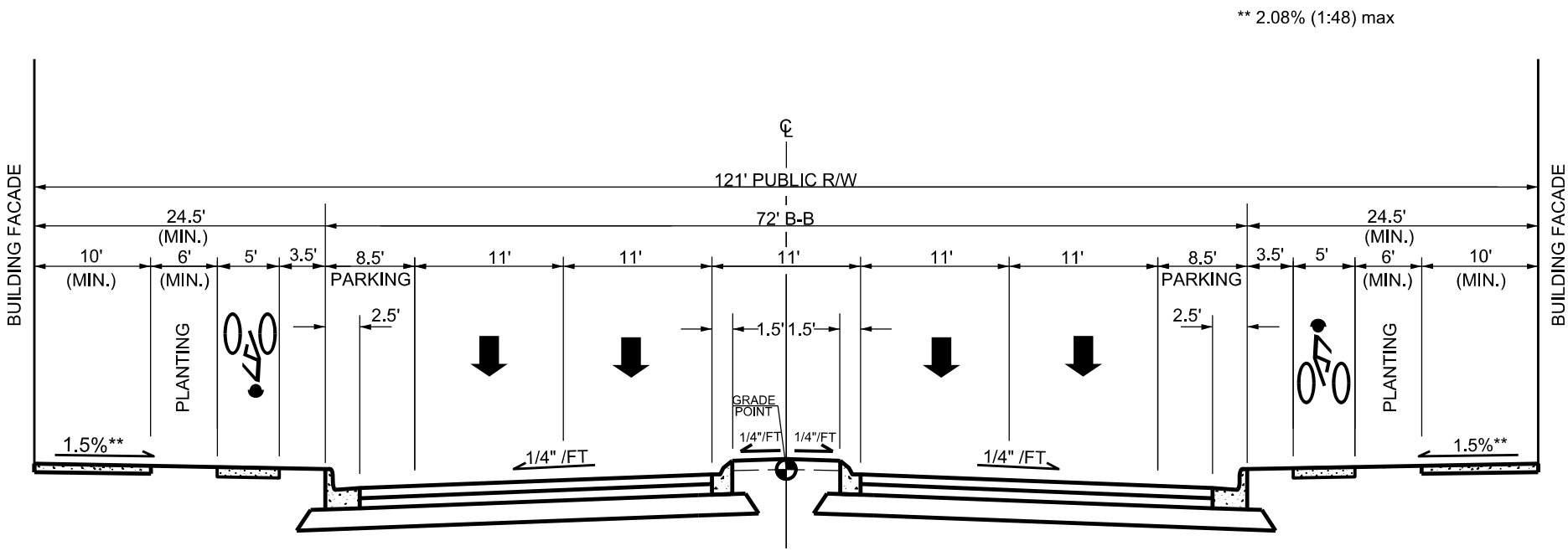
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

DATE: 8/2020
NOT TO SCALE

MAIN STREET

T-10.17



NOTE

1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.

GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL ON 2 SIDES

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

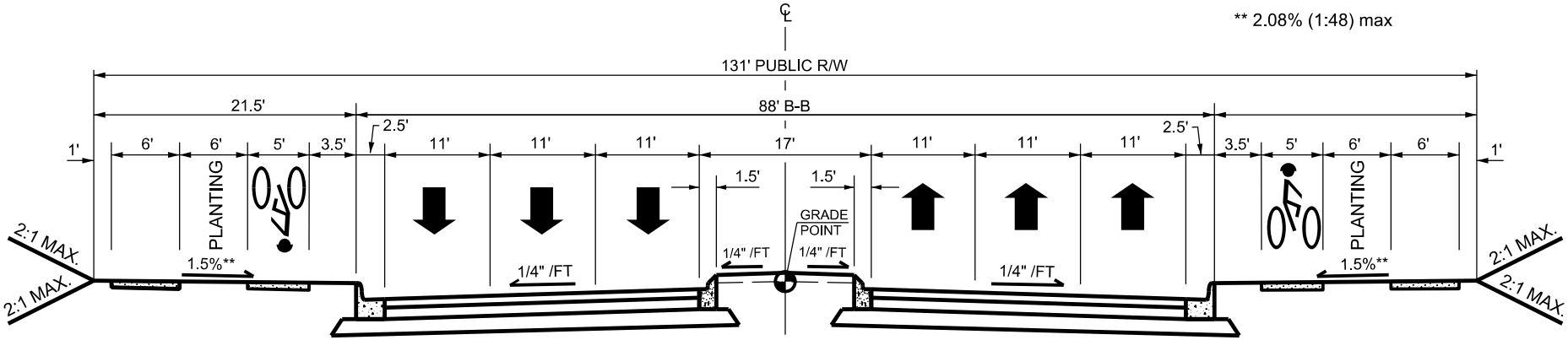
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

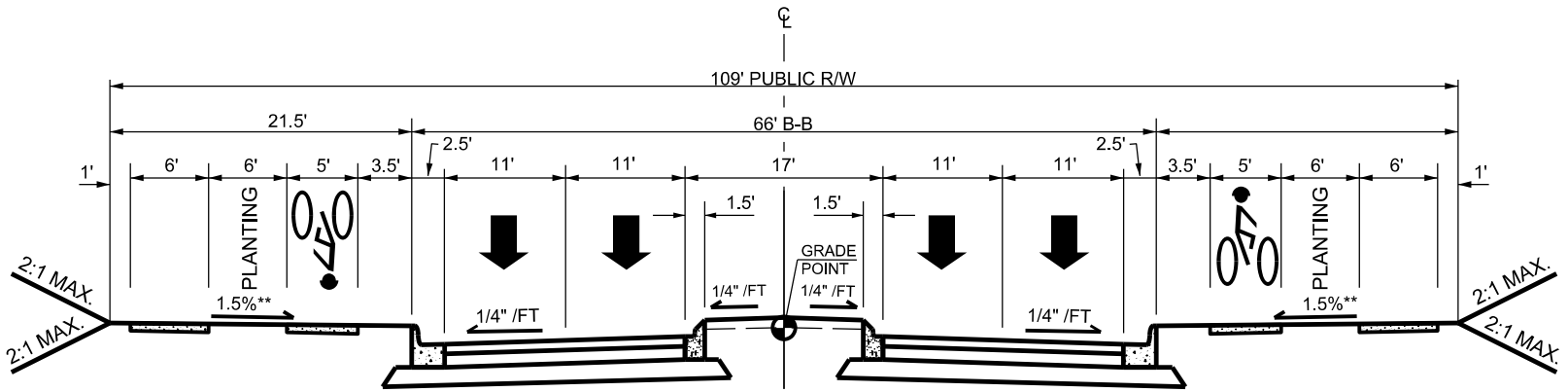
DATE: 8/2020
NOT TO SCALE

AVENUE, 4 LANE, PARALLELL PARKING

T-10.18



6 - LANE DIVIDED



4 - LANE DIVIDED

NOTE
1. THE BIKE LANE MATERIAL SHALL BE BLACK-DYED CONCRETE, SEE T-30.01.2.

GENERAL	
WALKWAY TYPE	SIDEWALK
BIKEWAY TYPE	CURB-LEVEL BIKE LANE
PLANTING TYPE	TREE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	NONE

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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

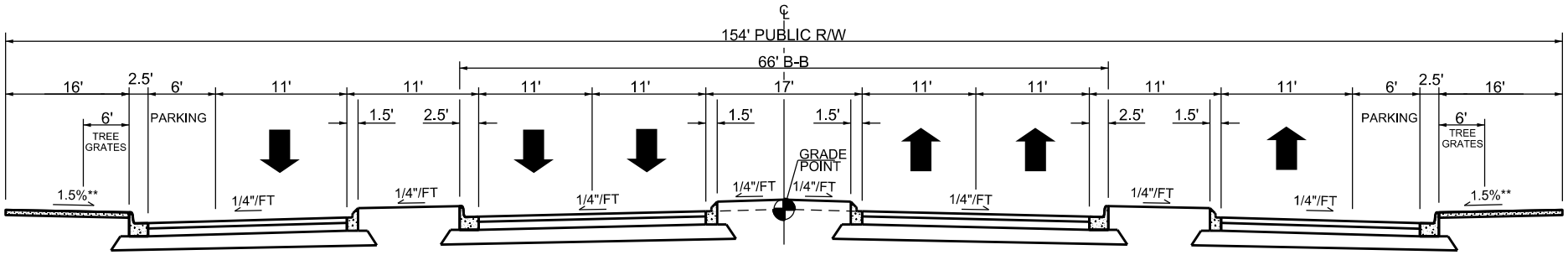
DATE: 8/2020
NOT TO SCALE

AVENUE, 4 LANE & 6 LANE, DIVIDED

T-10.19

PARALLEL PARKING

** 2.08% (1:48) max

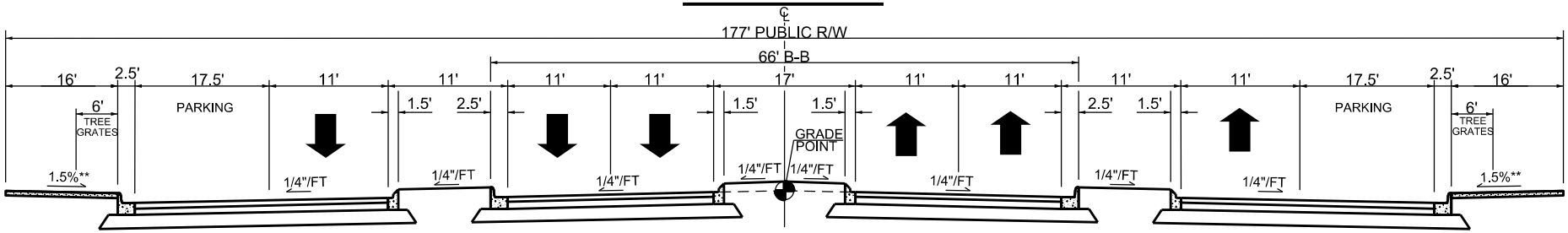


GENERAL	
WALKWAY TYPE	SIDEWALK BOTH SIDES
PLANTING TYPE	TREE GRATE / LAWN
TREE SPACING	40' O.C. AVG
PARKING TYPE	PARALLEL IN A ACCESS LANE

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

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

ANGLED PARKING



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

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

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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 12/2022

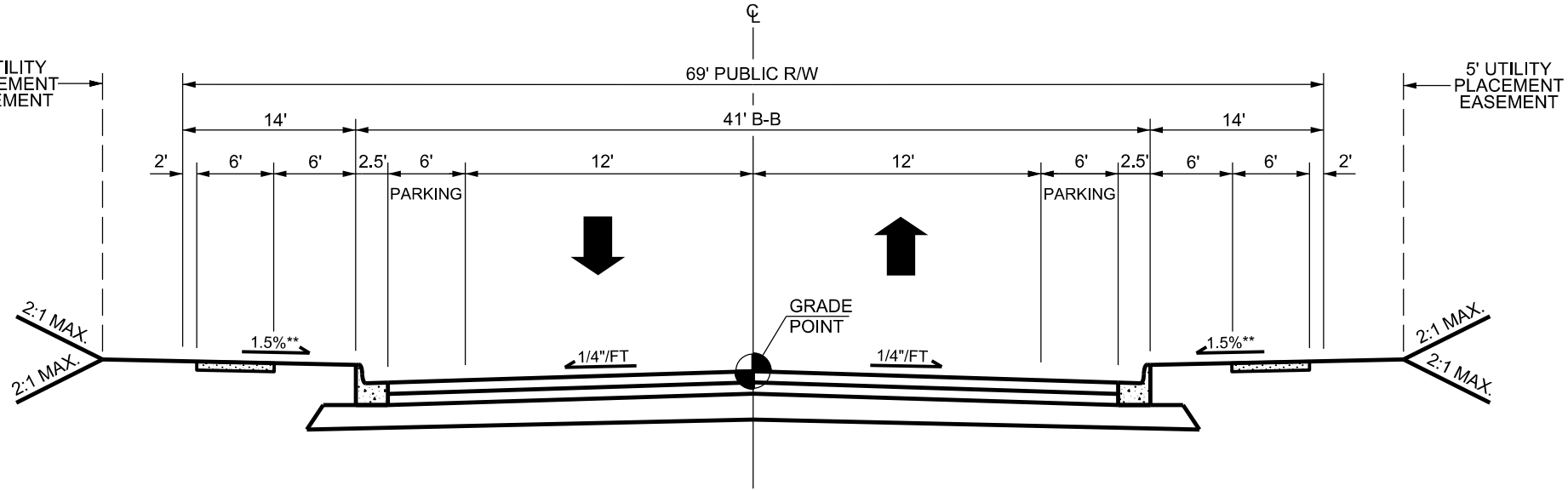
DATE: 8/2020

MULTI-WAY BOULEVARD

NOT TO SCALE

T-10.20

** 2.08% (1:48) max



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

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

CITY OF RALEIGH
STANDARD DETAIL

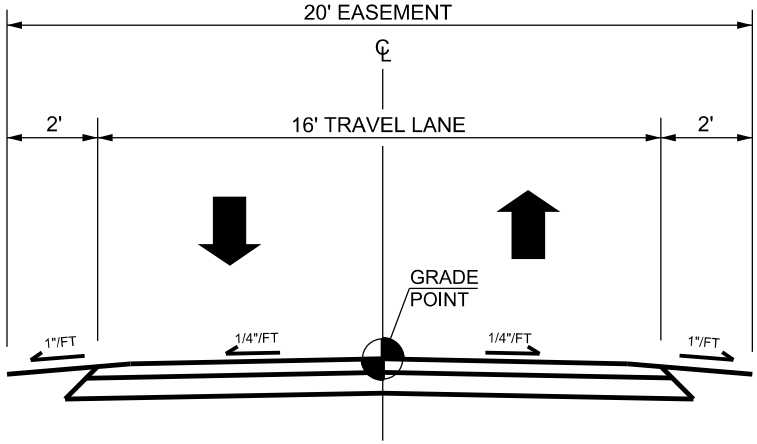
REVISIONS
DATE: 12/2022
DATE: 8/2020

INDUSTRIAL STREET

NOT TO SCALE

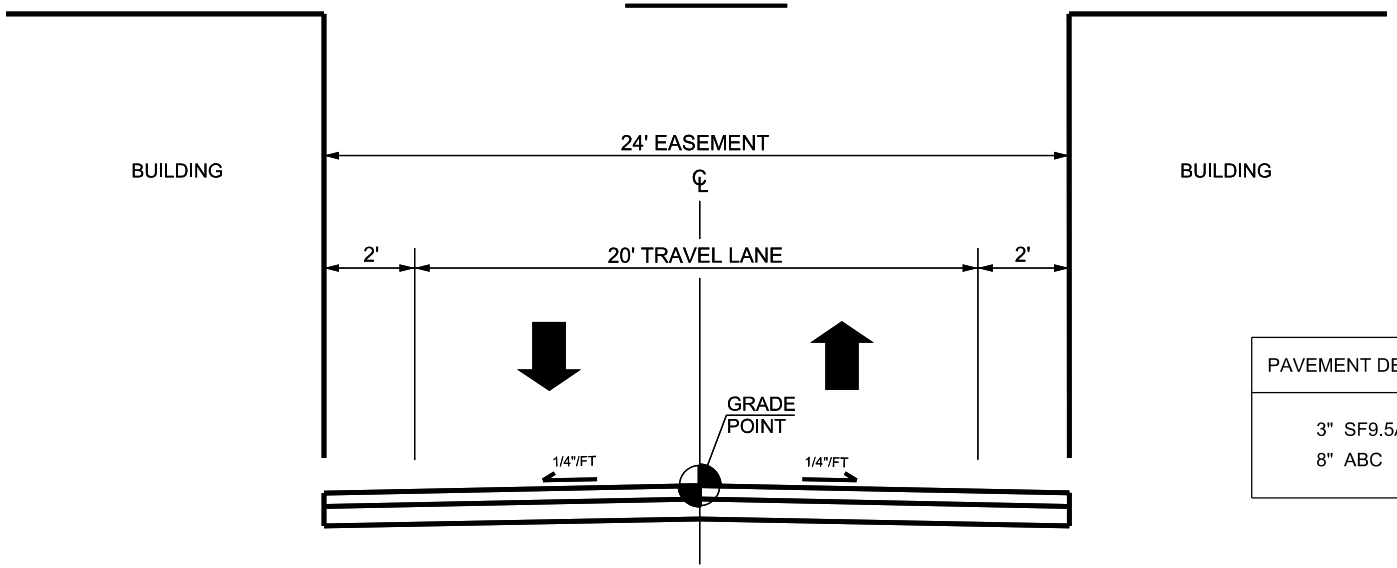
T-10.21

RESIDENTIAL



PAVEMENT DESIGN
3" SF9.5A 8" ABC

MIXED USE



PAVEMENT DESIGN
3" SF9.5A 8" ABC

CITY OF RALEIGH
STANDARD DETAIL

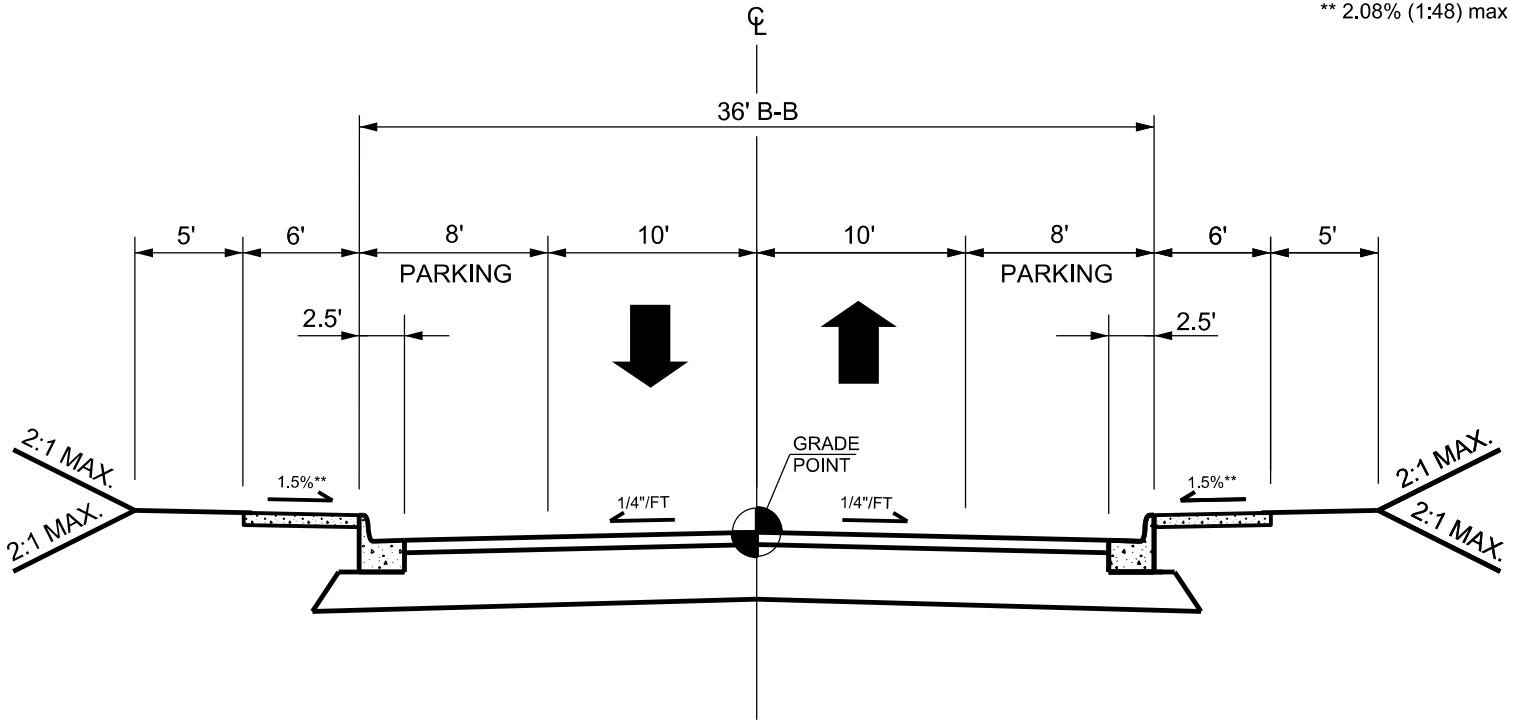
REVISIONS

DATE: 8/2020

NOT TO SCALE

ALLEY

T-10.22



GENERAL	
WALKWAY TYPE	SIDEWALK
PARKING TYPE	PARALLEL ON 2 SIDES

PAVEMENT DESIGN
3" SF9.5A 8" ABC

CITY OF RALEIGH

STANDARD DETAIL

PRIVATE ACCESSWAY

PRIMARY INTERNAL ACCESS DRIVE

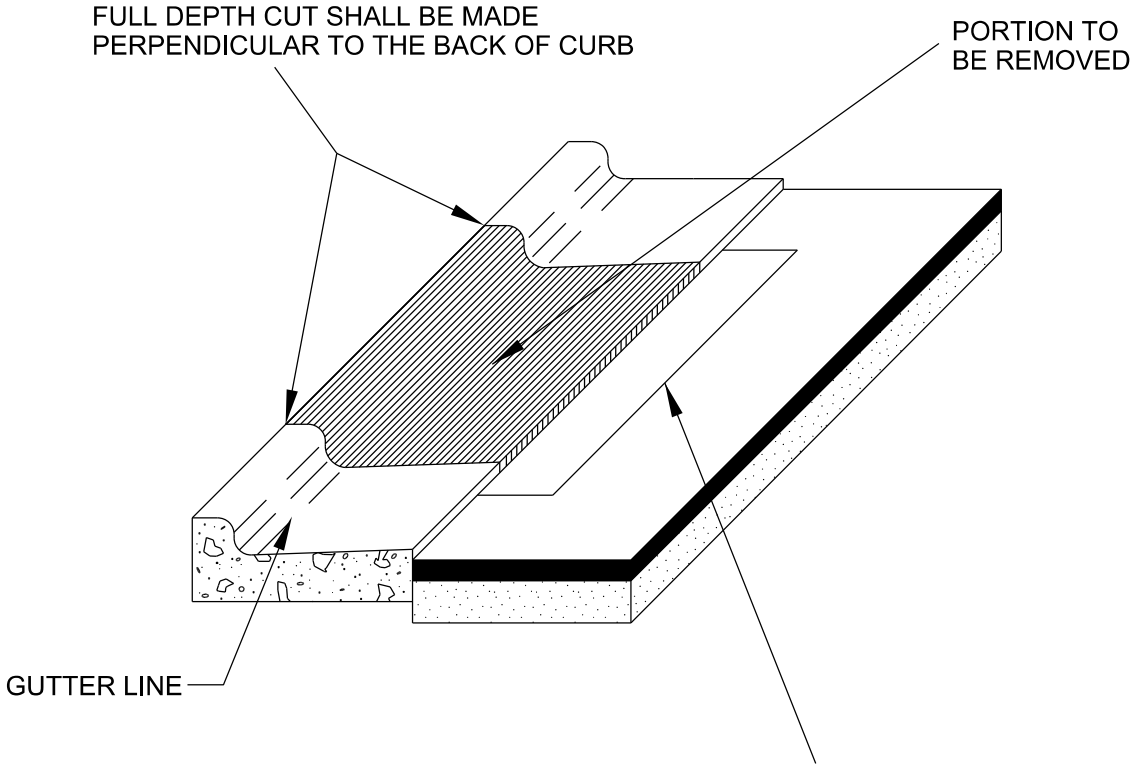
T-10.23

REVISIONS

DATE: 8/2020

DATE: 12/2022

NOT TO SCALE



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.

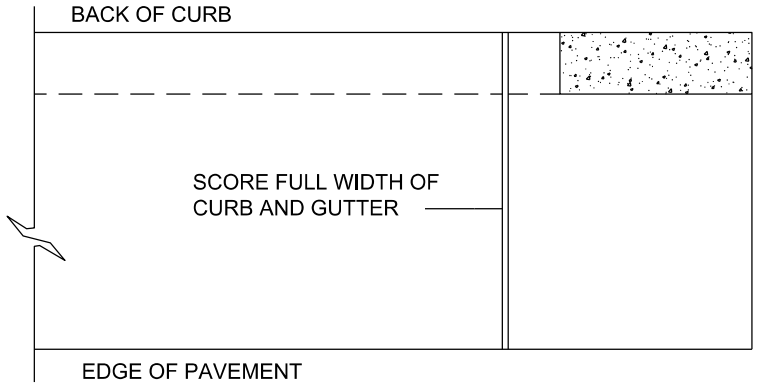
IF THE FINAL LIFT OF ASPHALT HAS NOT BEEN INSTALLED, THE ASPHALT IN FRONT OF THE APRON CAN REMAIN IN PLACE.

NOTES:

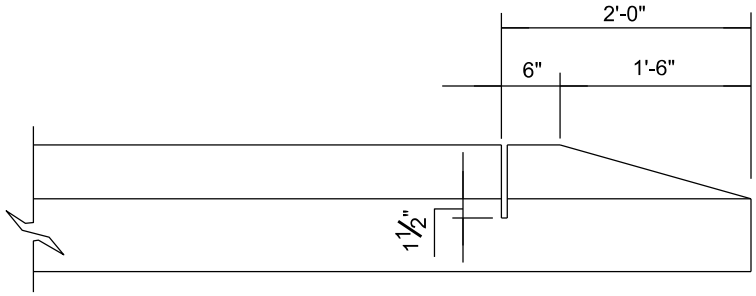
1. CURB AND GUTTER SECTION SHALL BE REMOVED IN ACCORDANCE WITH DRIVEWAY WIDTH APPROVED BY THE CITY.
2. IF PERPENDICULAR CUT IS LESS THAN 5' FROM NEXT JOINT, THEN THE PARALLEL CUT SHALL BE MADE TO THAT JOINT.
3. THIS METHOD IS NOT ALLOWED IN NEW ROADWAY CONSTRUCTION.

CITY OF RALEIGH
STANDARD DETAIL

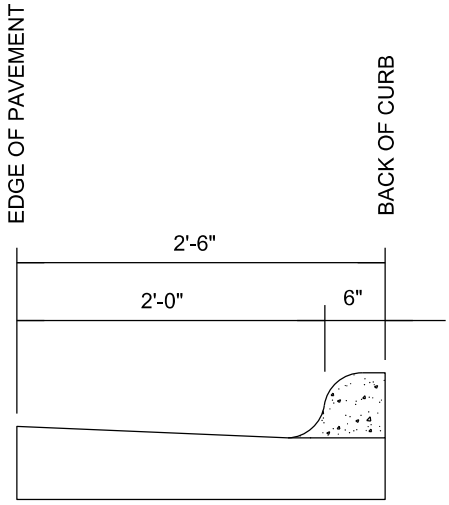
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD METHOD OF REMOVING EXISTING CURB (FOR A DRIVEWAY APRON INSTALLATION)	
	T-10.24	



PLAN

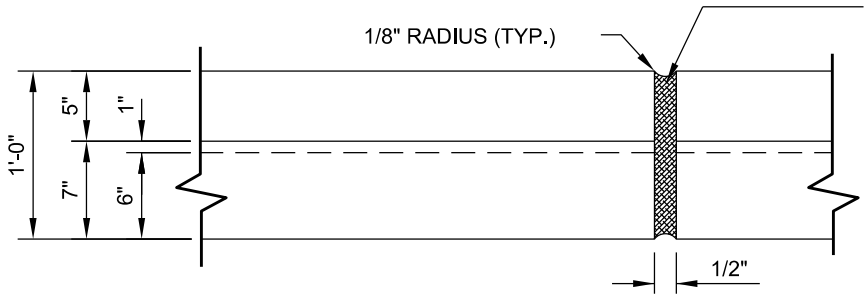


FRONT



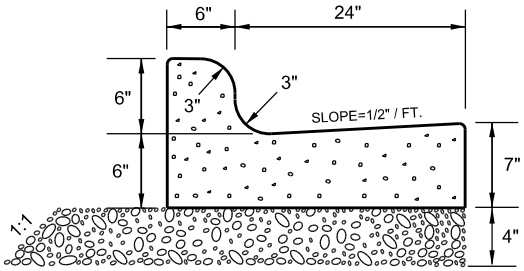
END

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

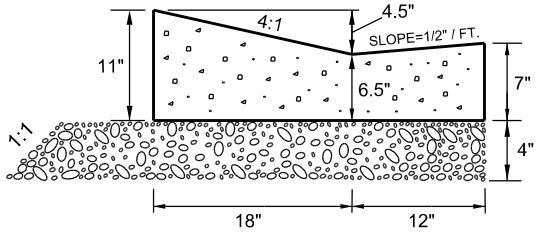


NOTE: MAINTAIN 50' MAX. BETWEEN EXPANSION JOINTS OR AT ALL RIGID OBJECTS.

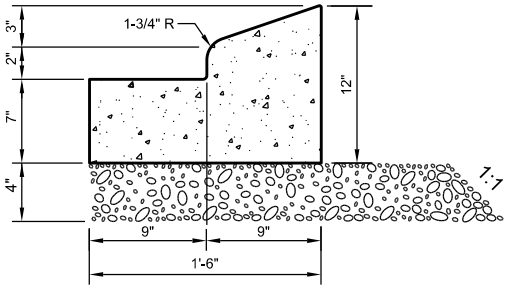
FRONT ELEVATION
TRANSVERSE EXPANSION JOINT



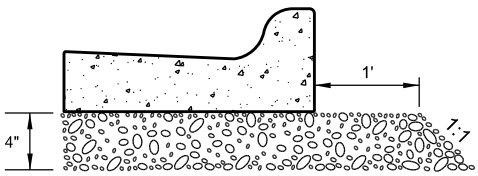
1. 30" CURB & GUTTER



2. 30" VALLEY TYPE GUTTER

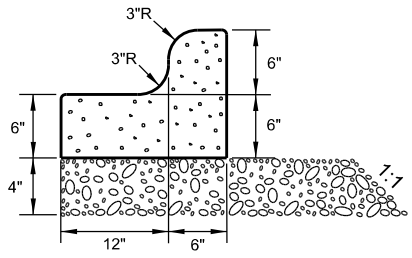


MEDIAN CURB AND GUTTER
SIDE ELEVATION

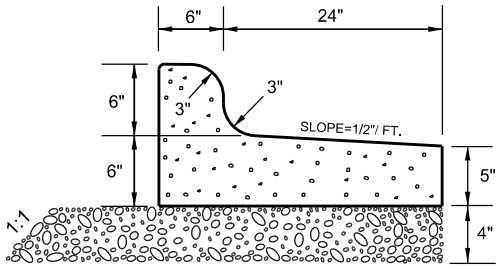


4" COMPACTED A.B.C. UNDER STANDARD CURB & GUTTER (MIN)

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



MEDIAN CURB AND GUTTER
(NON-MOUNTABLE)



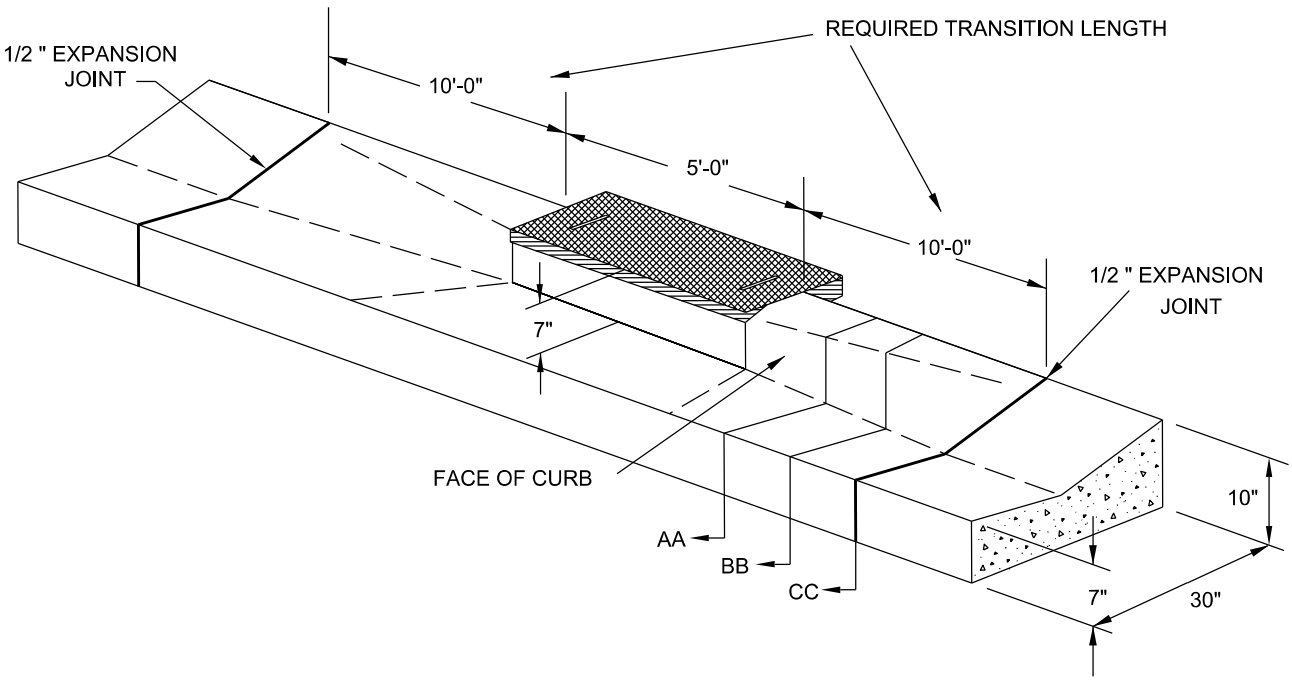
SPILL CURB DETAIL

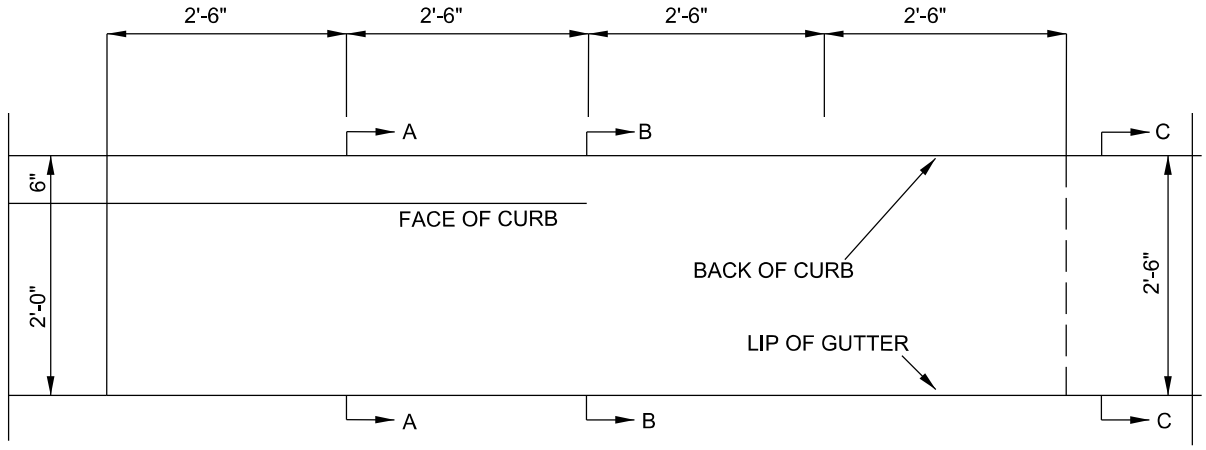
NOTES:

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.

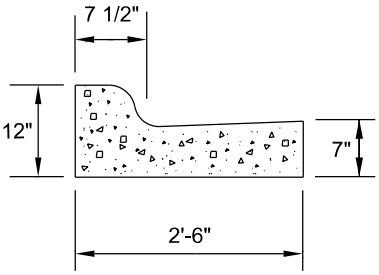
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB AND GUTTER	
	T-10.26.1	

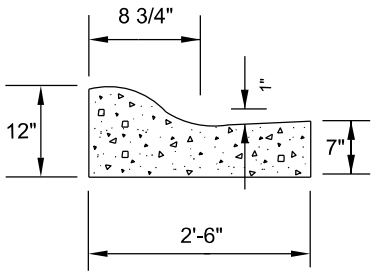




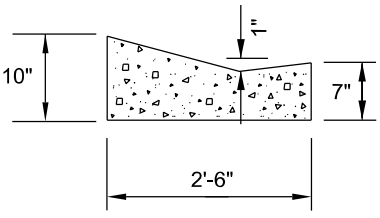
PLAN VEIW



SECTION A-A



SECTION B-B



SECTION C-C

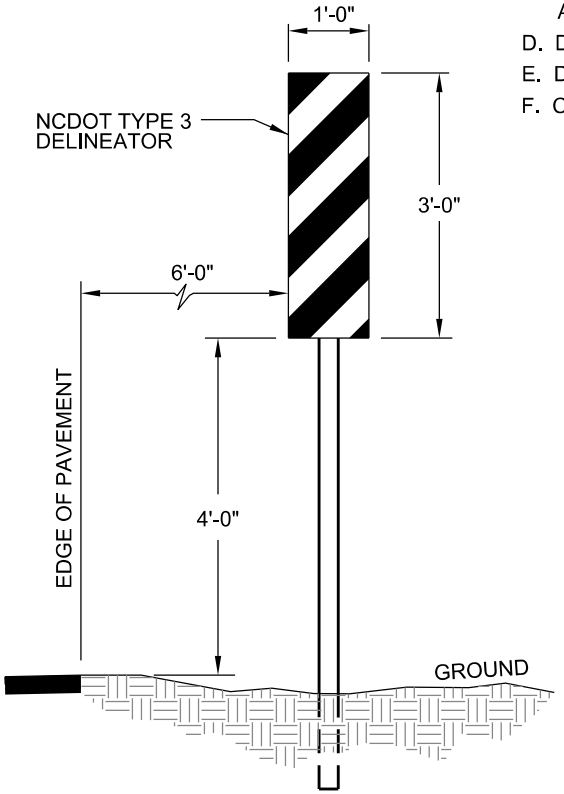
NOTES:
TRANSITION NOT TO BE LOCATED WITHIN THE CURB RADIUS.

CITY OF RALEIGH
STANDARD DETAIL

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

NOTES:

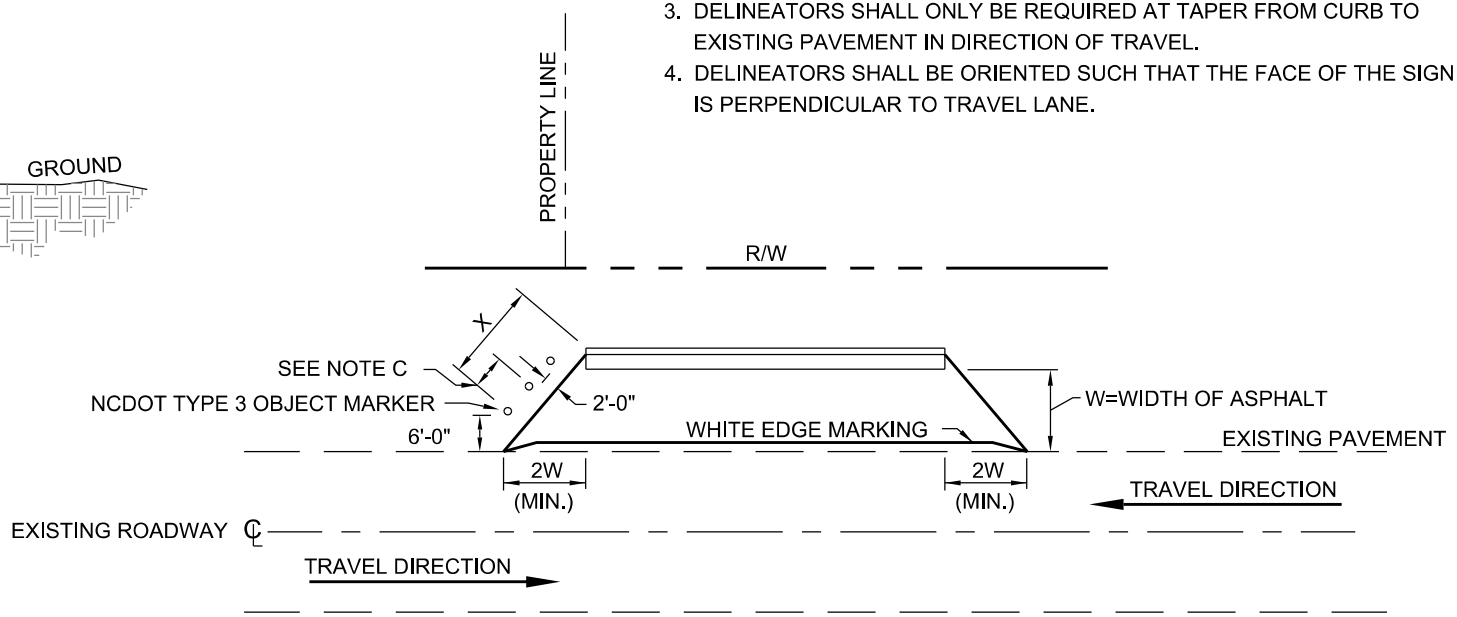
A. BOTTOM EDGE OF DELINEATOR SHALL BE 4 FEET ABOVE ROADWAY.
B. THE DELINEATOR STRIPES SHALL SLOPE UPWARD AND OUTWARD FROM TRAFFIC.
C. DELINEATORS TO BE SPACED ON CENTERS AT 1/3 OF THE DISTANCE 'X', SHOWN BELOW, FOR NEW ASPHALT WIDTHS ≤ 15 FEET OR AT 1/4 OF 'X' FOR NEW ASPHALT WIDTHS > 15 FEET.
D. DELINEATORS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



DETAIL

NOTES:

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



PLAN VIEW

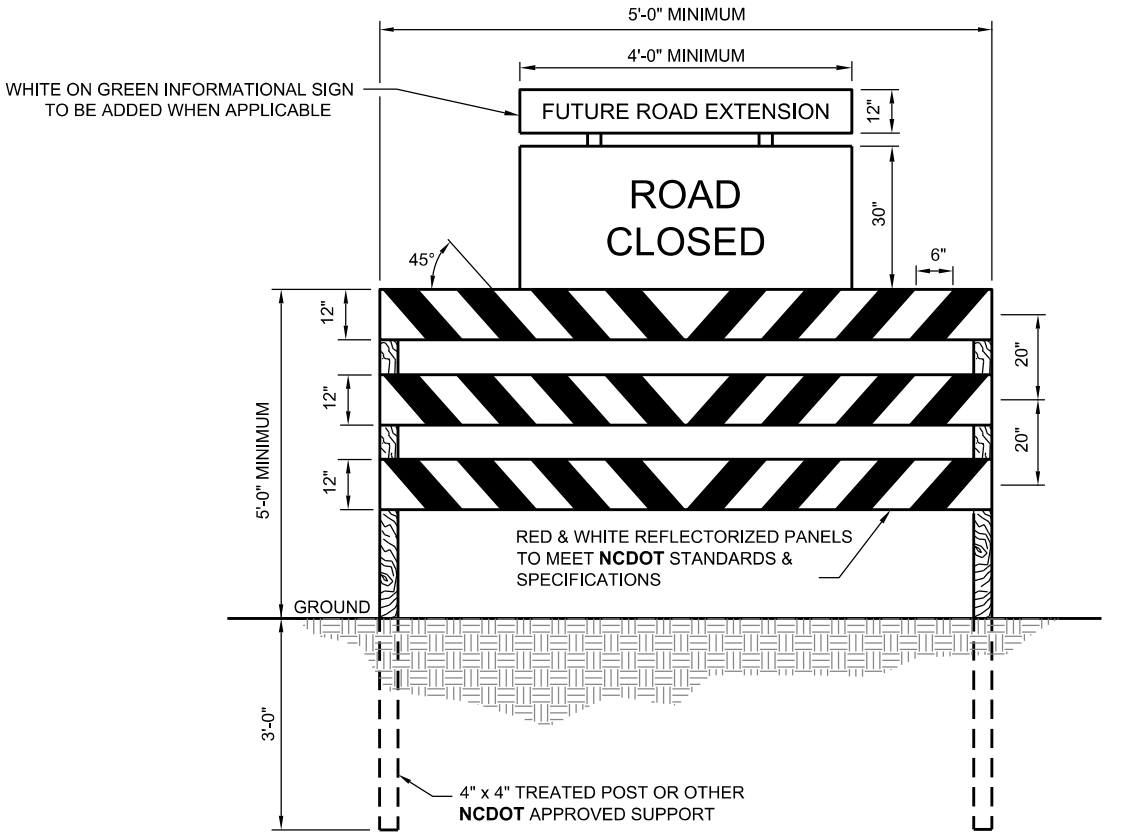
CITY OF RALEIGH
STANDARD DETAIL

STANDARD PAVEMENT WIDENING
TAPER & MARKINGS

REVISIONS
DATE: 8/2020
NOT TO SCALE

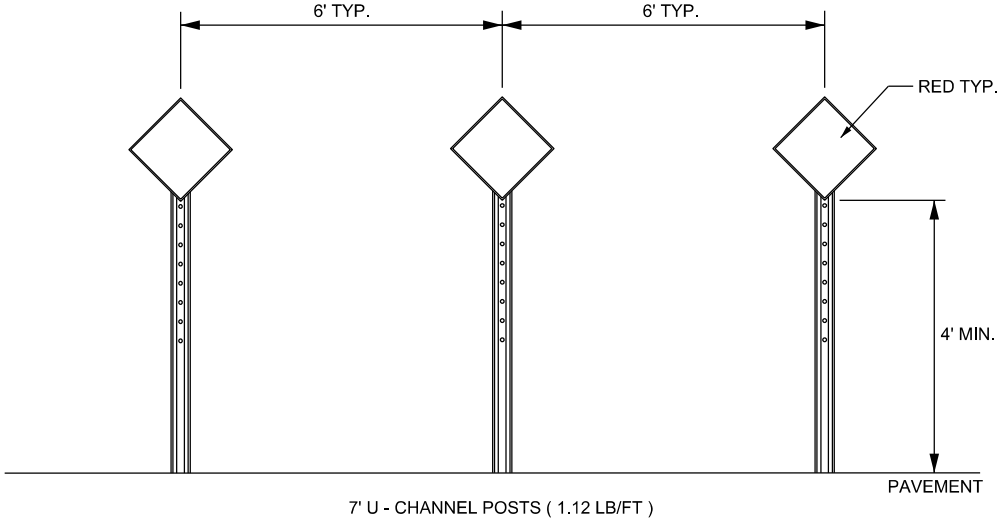
T-10.27

MAJOR STREET



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

LOCAL & MIXED USE



7' U - CHANNEL POSTS (1.12 LB/FT)

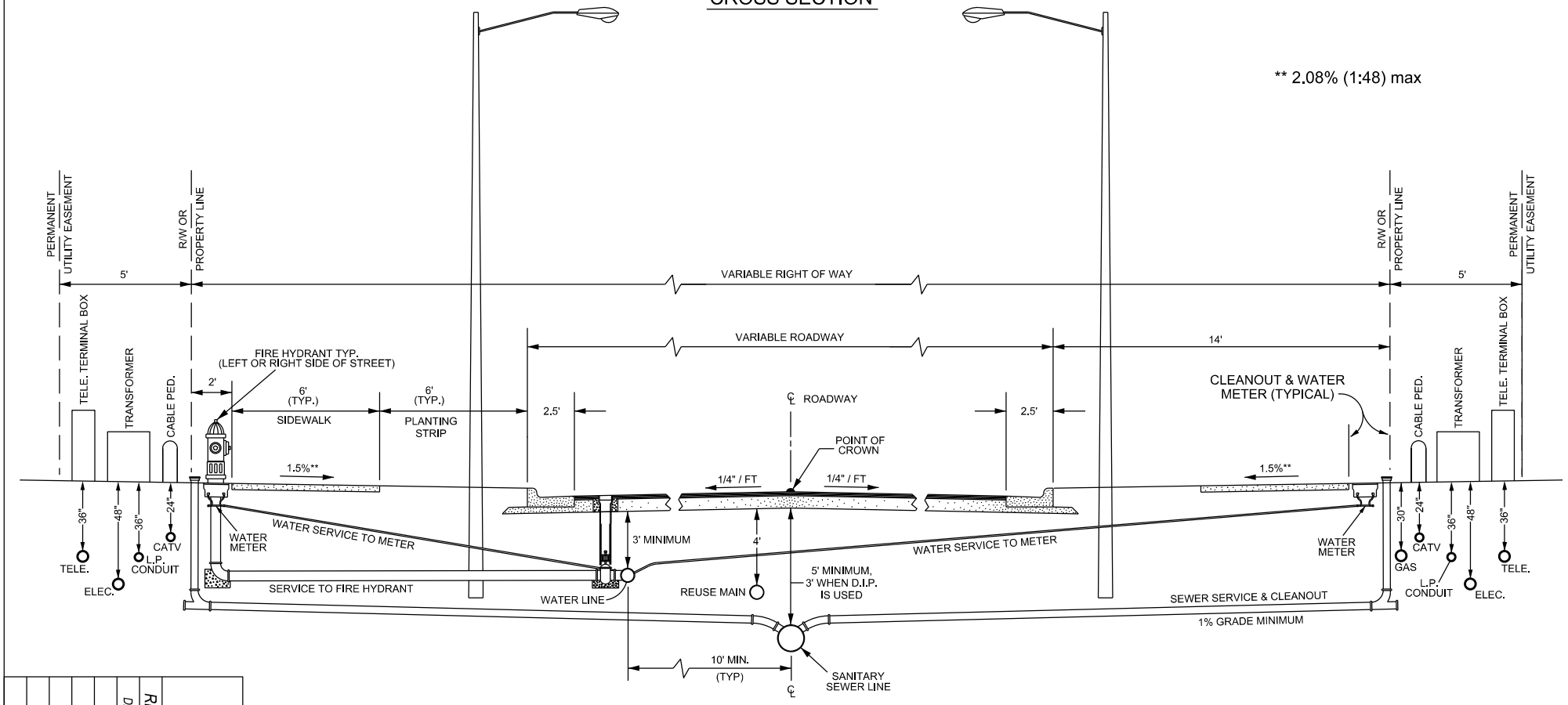
NOTES:

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	

CROSS SECTION



NOTES:

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.

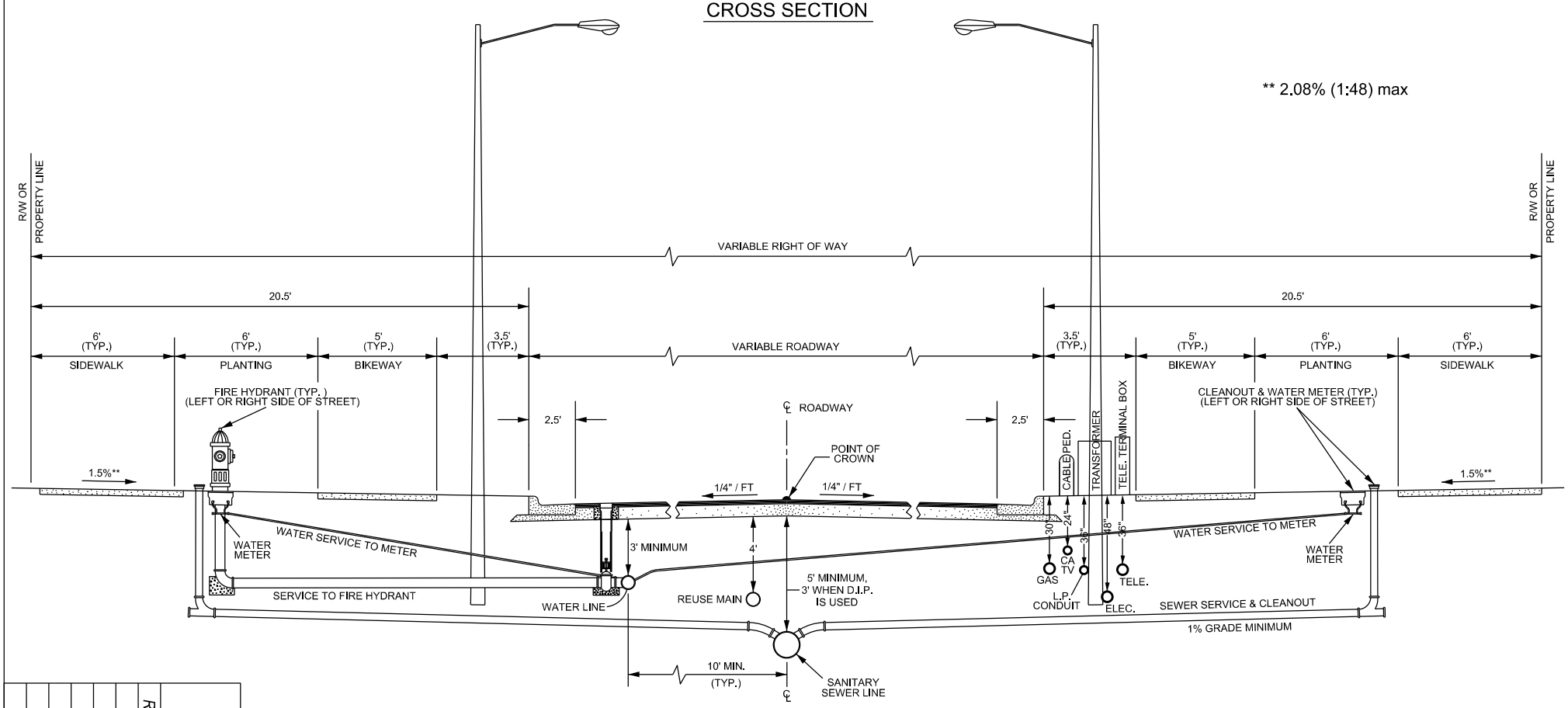
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 8/2020
DATE: 12/2022
NOT TO SCALE

STANDARD UTILITY LOCATIONS IN STREET

T-10.29

CROSS SECTION



NOTES:

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

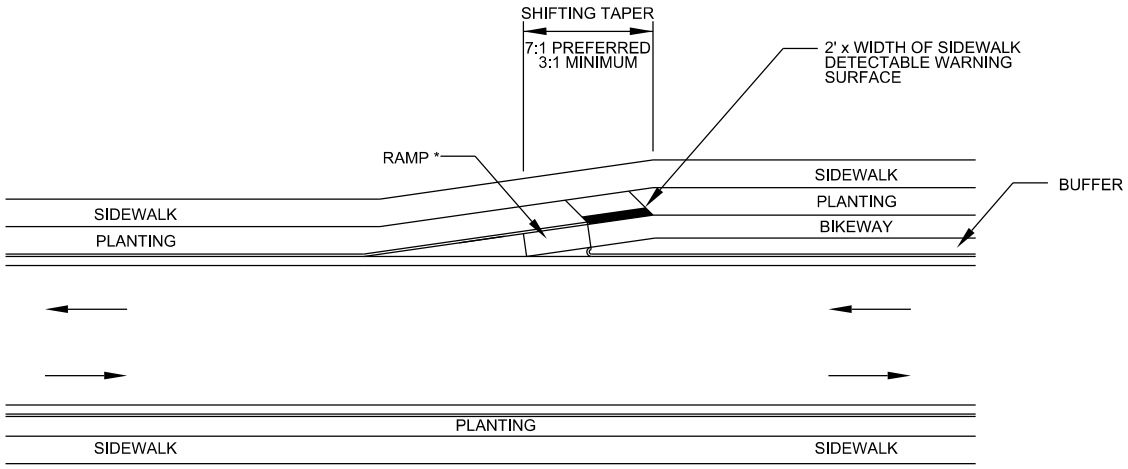
REVISIONS

DATE: 12/2022

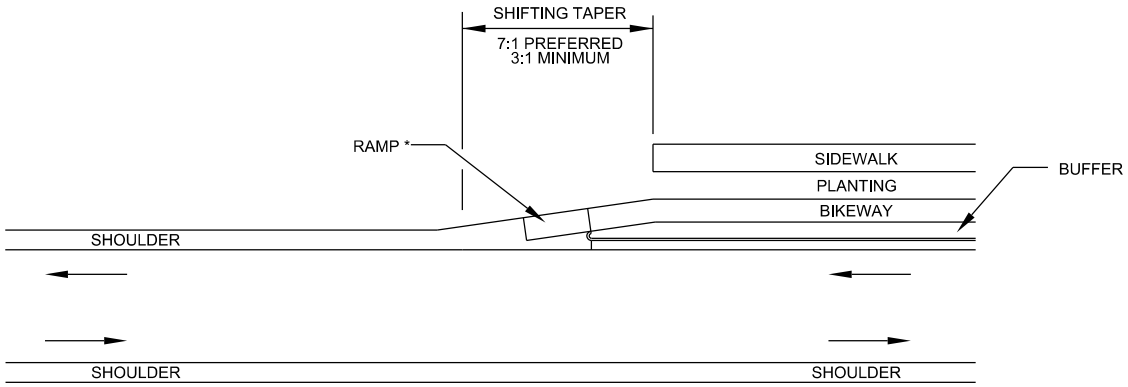
NOT TO SCALE

STANDARD UTILITY LOCATIONS IN STREET WITH CURB-LEVEL BIKEWAY

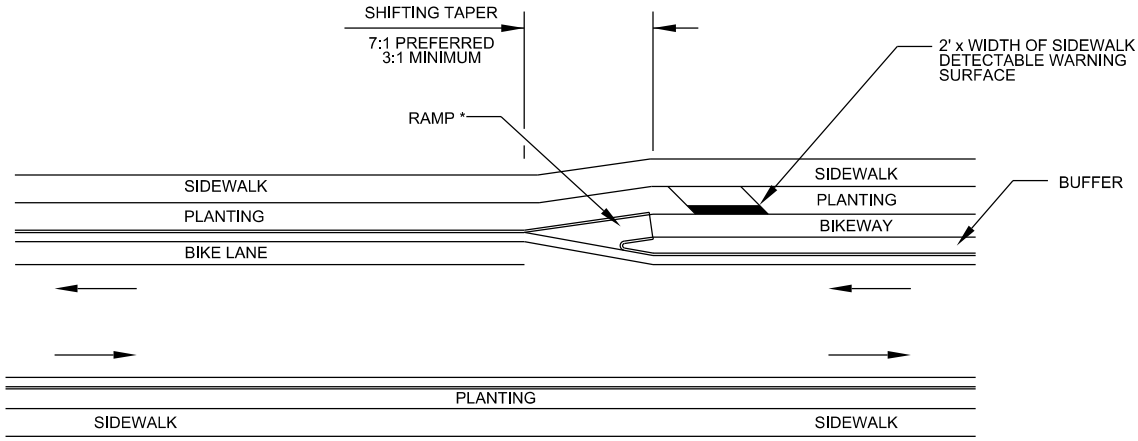
T-10.30



CURB-LEVEL BIKEWAY TO SHARED-LANE BIKEWAY WITH CURB & GUTTER



CURB-LEVEL BIKEWAY TO SHARED-LANE BIKEWAY WITHOUT CURB & GUTTER



CURB-LEVEL BIKEWAY TO ON-STREET BIKEWAY

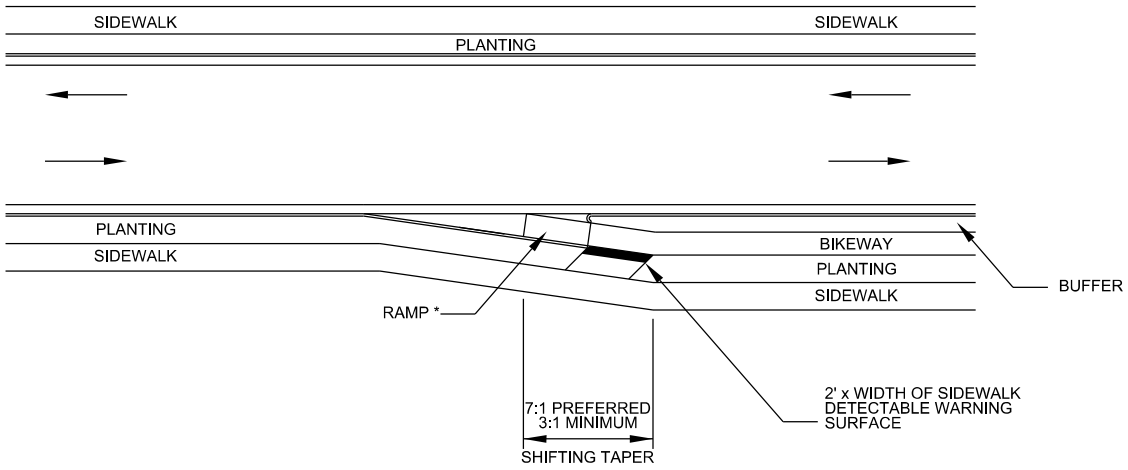
* SEE CITY OF RALEIGH STANDARD DETAIL T-20.01.1
TO DETERMINE APPROPRIATE RAMP TYPE

CITY OF RALEIGH
STANDARD DETAIL

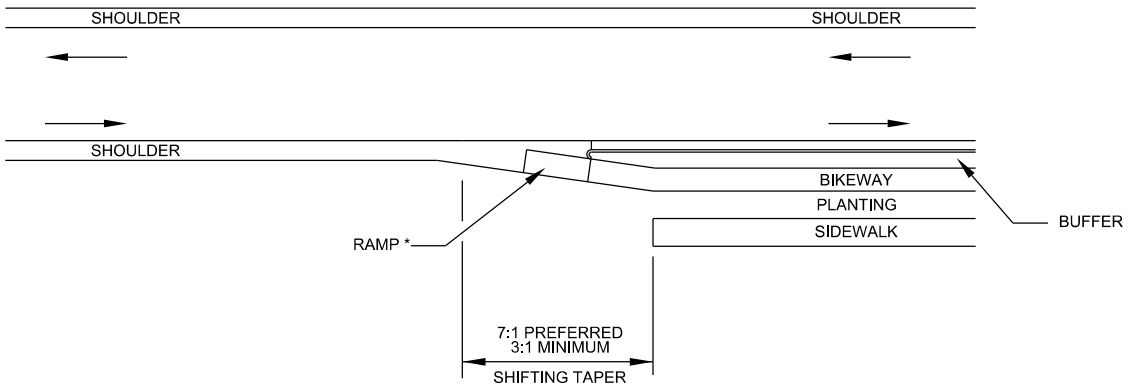
REVISIONS	DATE: 08/2023	NOT TO SCALE

CURB-LEVEL BIKEWAY TRANSITIONS

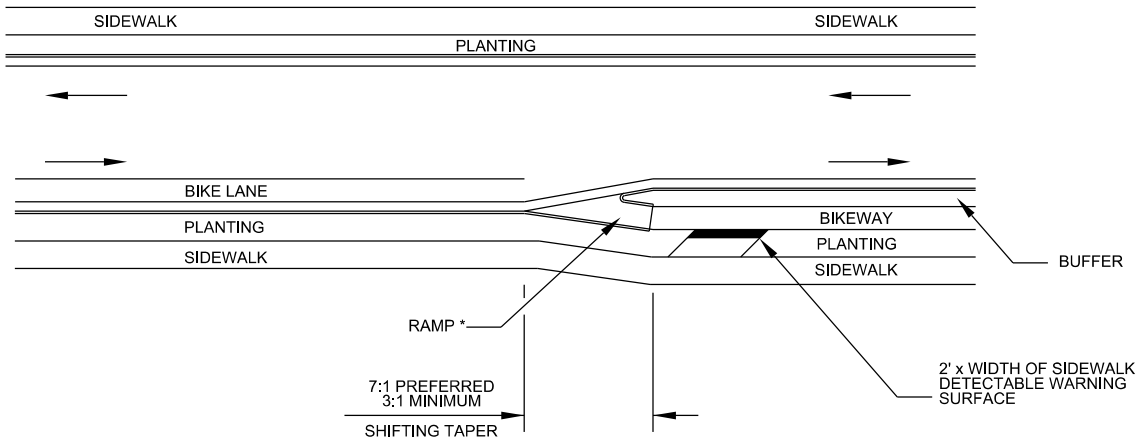
T-10.31.1



CURB-LEVEL BIKEWAY TO SHARED-LANE BIKEWAY WITH CURB & GUTTER



CURB-LEVEL BIKEWAY TO SHARED-LANE BIKEWAY WITHOUT CURB & GUTTER

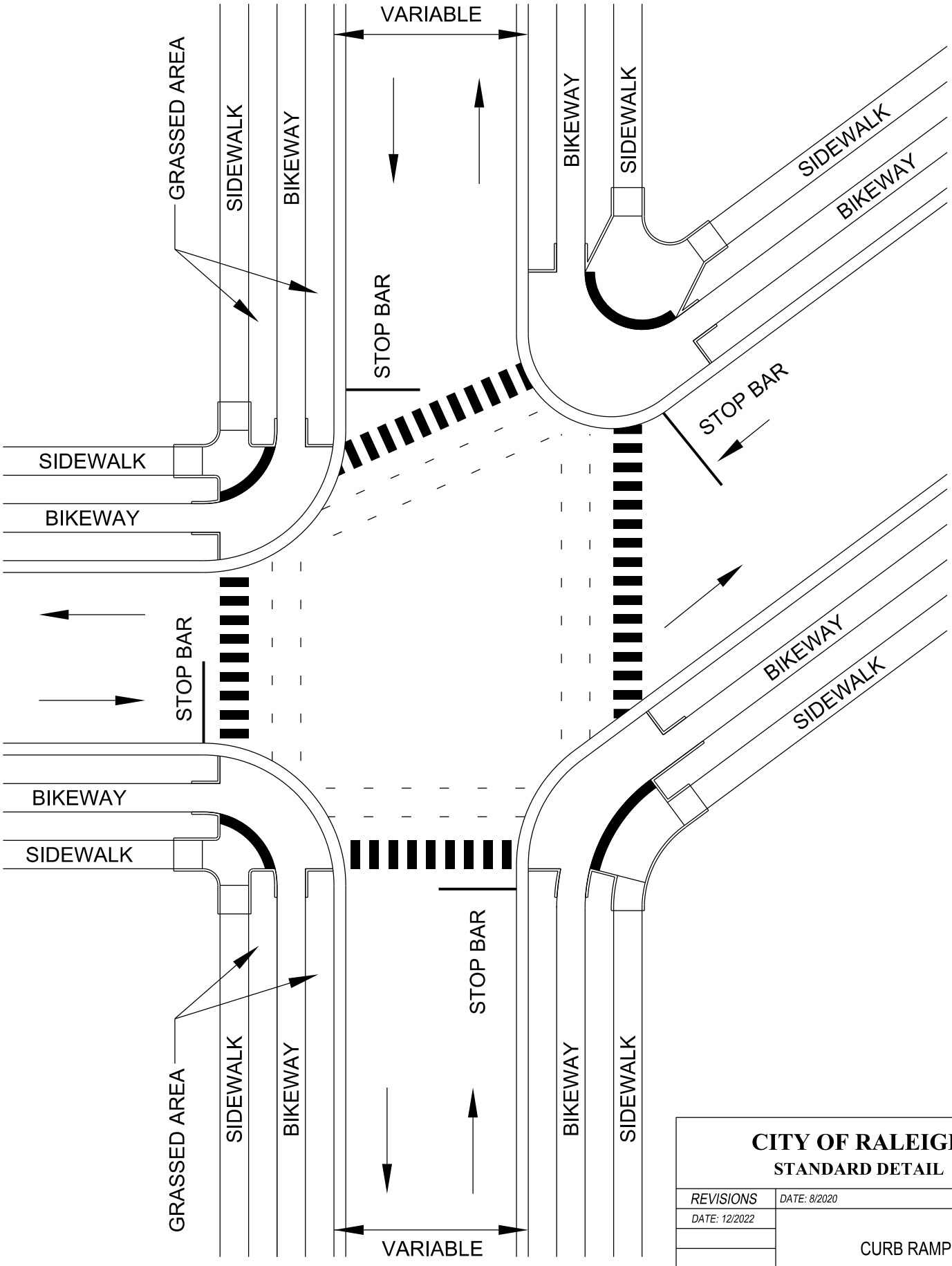


CURB-LEVEL BIKEWAY TO ON-STREET BIKEWAY

* SEE CITY OF RALEIGH STANDARD DETAIL T-20.01.1 TO DETERMINE APPROPRIATE RAMP TYPE

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	*DATE: 08/2023*	*NOT TO SCALE*
	CURB-LEVEL BIKEWAY TRANSITIONS	
	T-10.31.2	



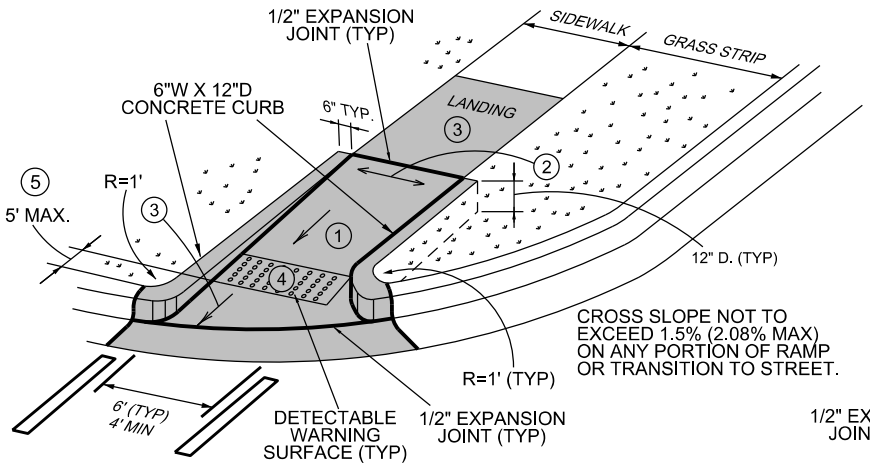
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022		

CURB RAMPS

T-20.01.1

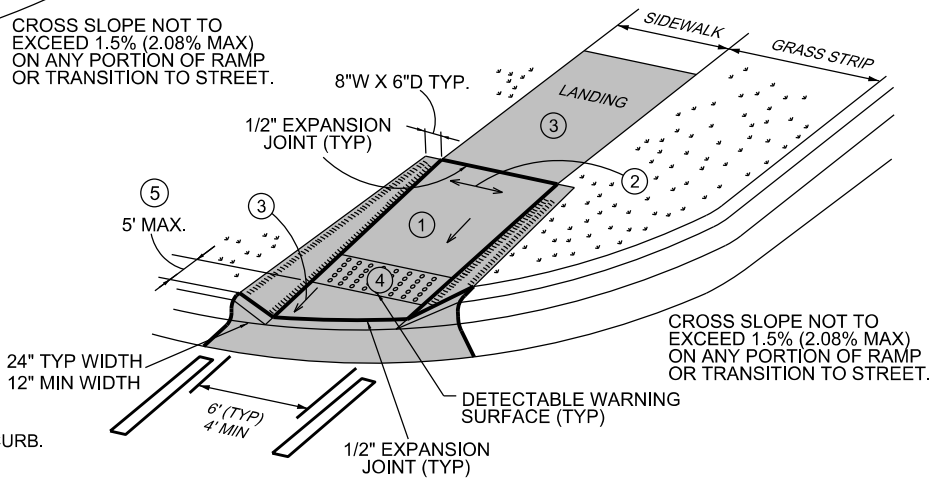
PAY LIMITS FOR CURB RAMP



CONCRETE DEPTH	
RAMP / FLARE	6"
LANDING	4"

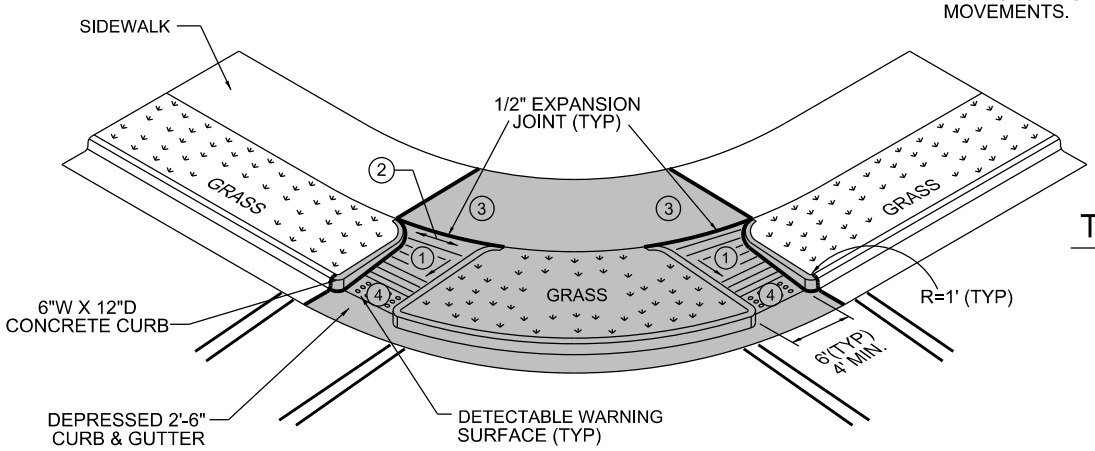
TYPE N-1 (CURB TYPE)

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) 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.



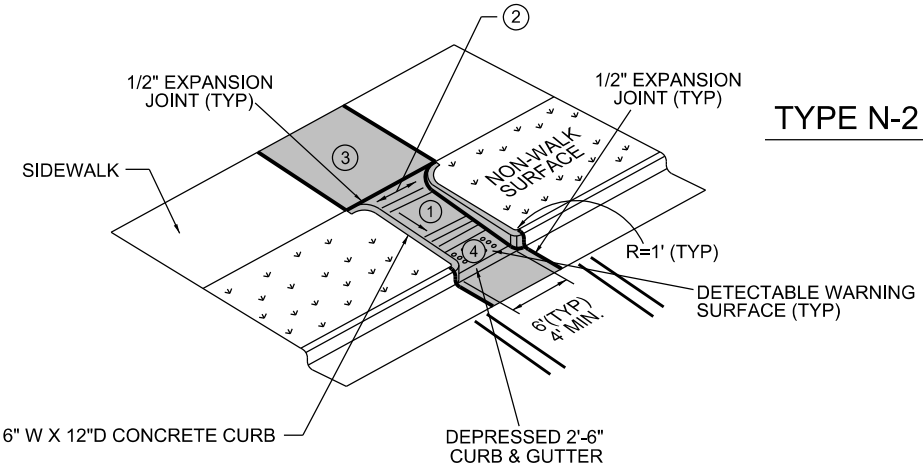
TYPE N-1A (FLARE TYPE)

NOTE: USE SMALL FLARES ONLY WHEN A CURB TYPE DIRECTLY CONFLICTS WITH APPROACHING VEHICULAR TURNING MOVEMENTS.



TYPE N-2 (RADIUS)

CONCRETE DEPTH	
RAMP / FLARE	6"
LANDING	4"



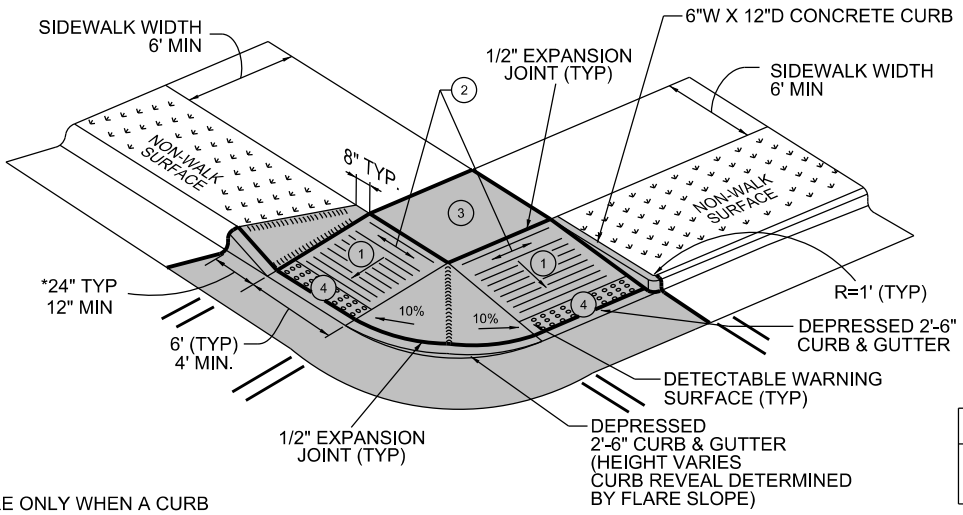
TYPE N-2 (TEE INTERSECTION)

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CURB RAMPS (NEW DEVELOPMENT)	

T-20.01.2

PAY LIMITS FOR CURB RAMP



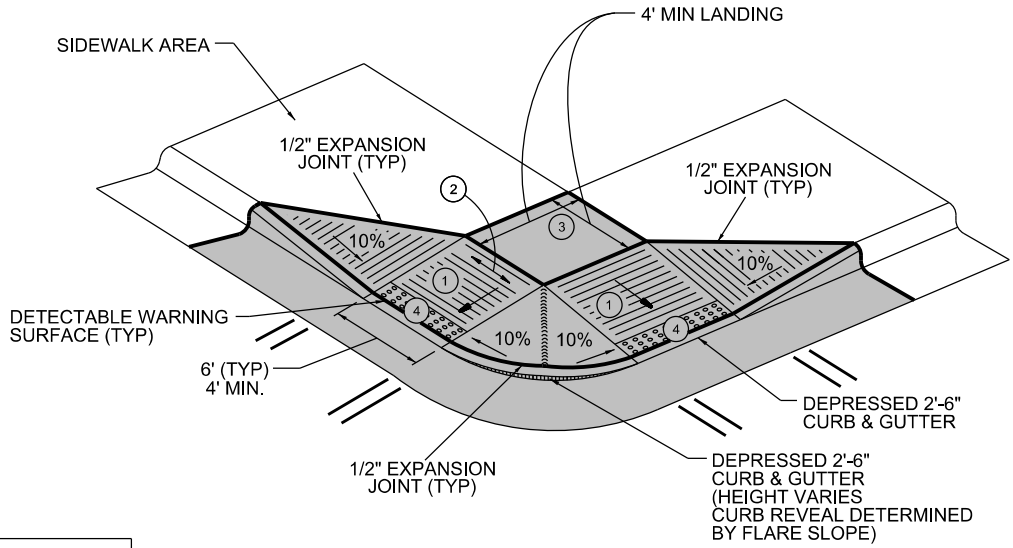
CONCRETE DEPTH	
RAMP / FLARE	6"
LANDING	4"

NOTE: * USE SMALL FLARE ONLY WHEN A CURB WOULD DIRECTLY CONFLICT WITH APPROACHING VEHICLE TURNING MOVEMENTS.

TYPE N-3

CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.



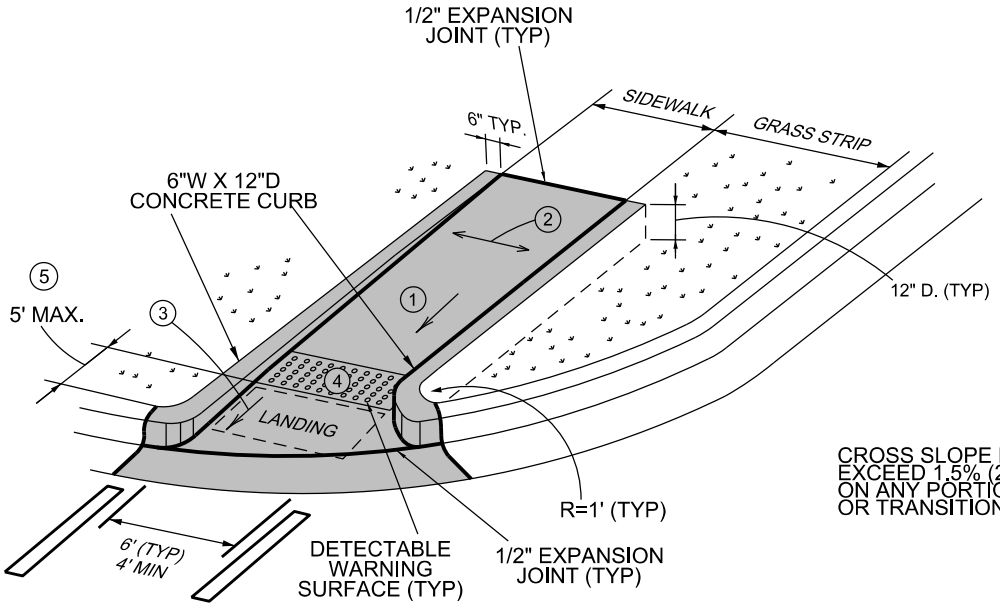
CONCRETE DEPTH	
RAMP / FLARE	6"
LANDING	4"

TYPE N-3A
(COMMERCIAL/RETAIL USE)

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CURB RAMPS (NEW DEVELOPMENT)	
	T-20.01.3	

PAY LIMITS FOR CURB RAMP

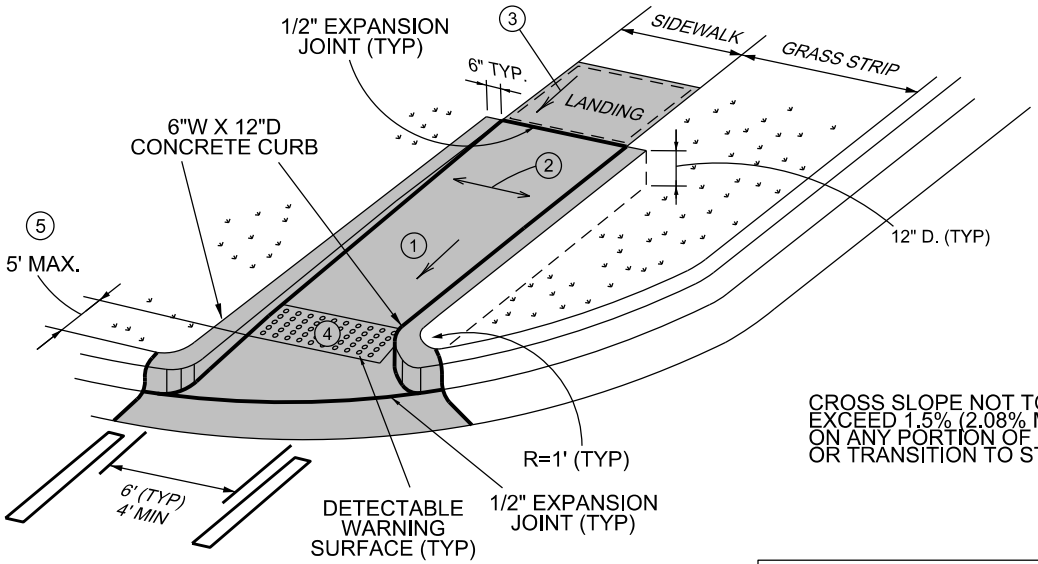


CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

TYPE N-4

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) 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"



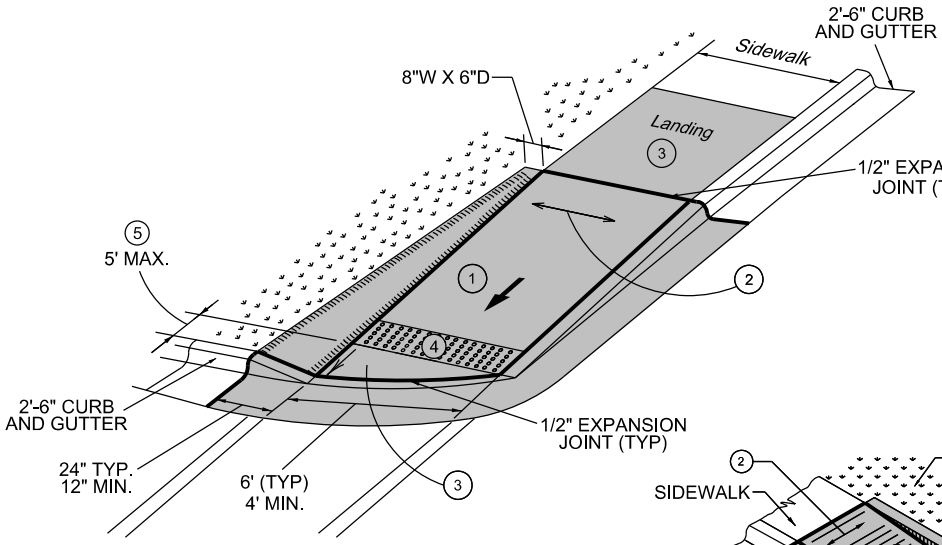
CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

TYPE N-4A

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CURB RAMPS (NEW DEVELOPMENT)	
	T-20.01.4	

PAY LIMITS FOR CURB RAMP

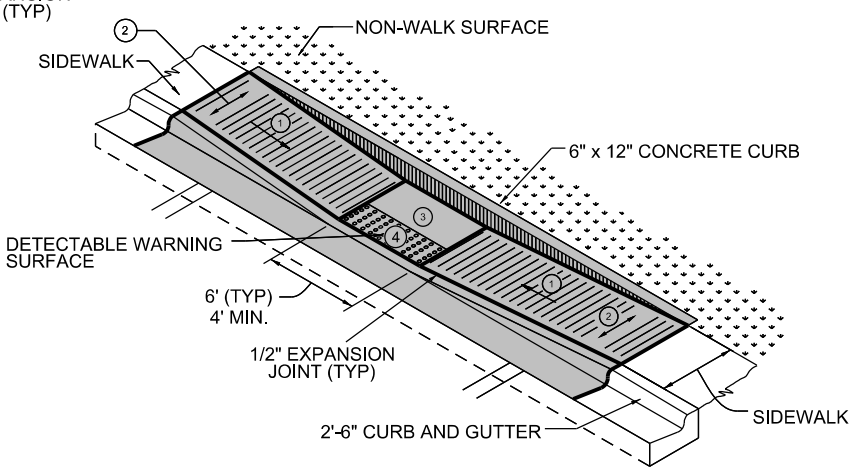


TYPE R-1

CONCRETE DEPTH	
RAMP / FLARES	6"
LANDING	4"

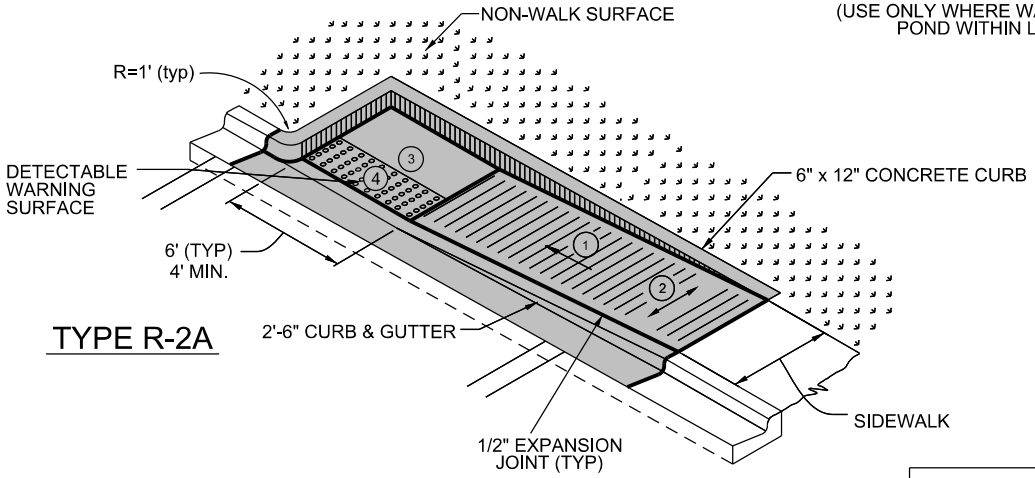
CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) 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.



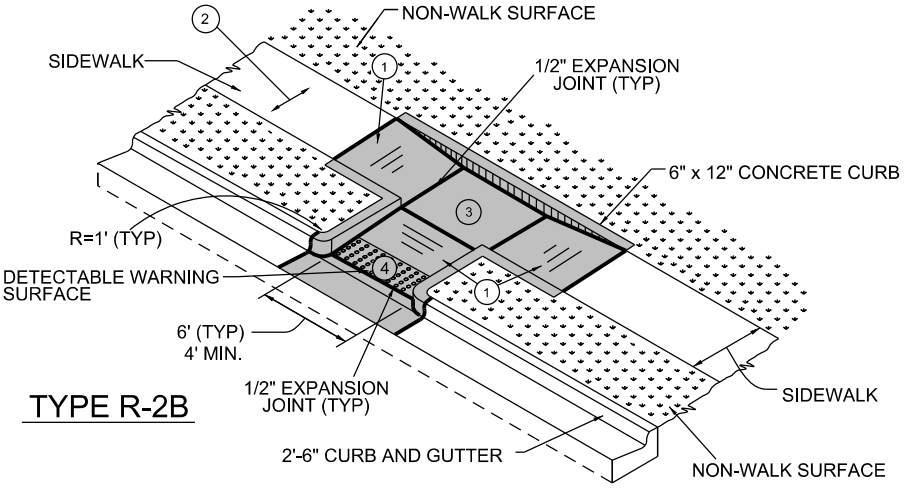
TYPE R-2

(USE ONLY WHERE WATER WILL NOT POND WITHIN LANDING)



TYPE R-2A

CONCRETE DEPTH	
RAMP / FLARES	6"
LANDING	4"

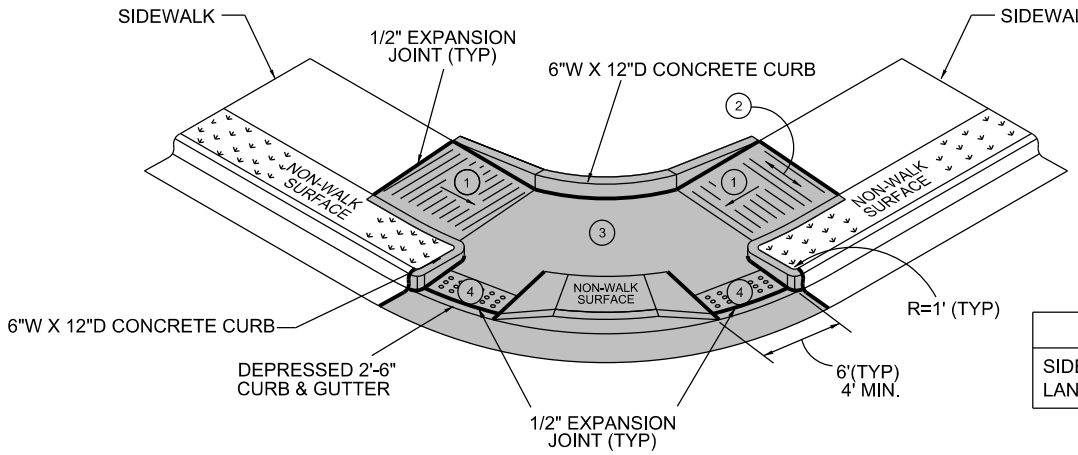


TYPE R-2B

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CURB RAMPS (RETROFIT)	
	T-20.01.5	

PAY LIMITS FOR CURB RAMP

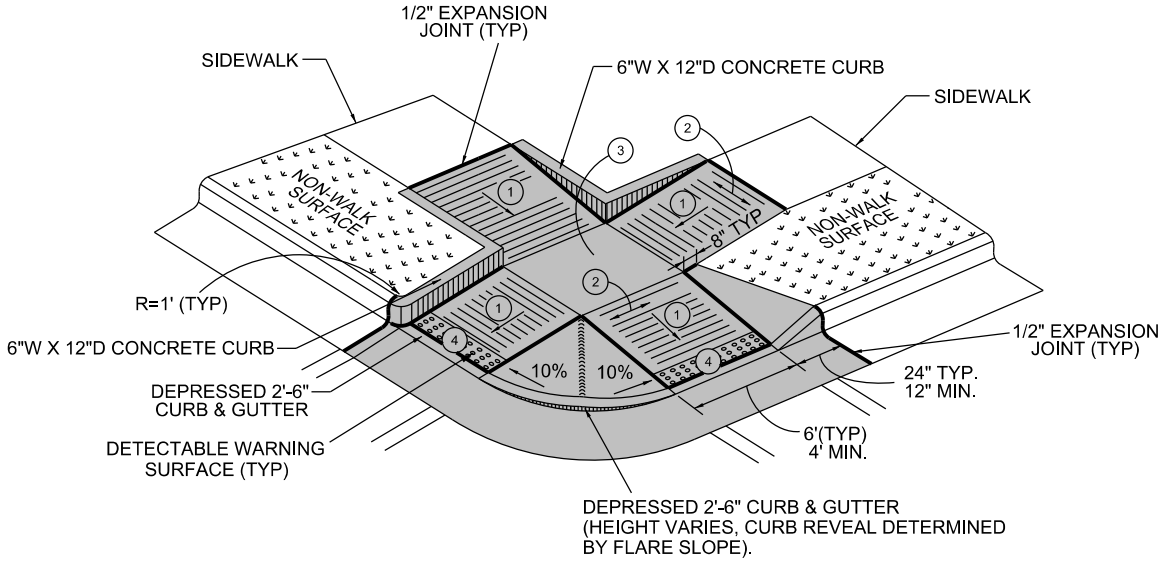


CONCRETE DEPTH	
SIDE RAMPS	4"
LANDING & OPENINGS	6"

TYPE R-3

CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.



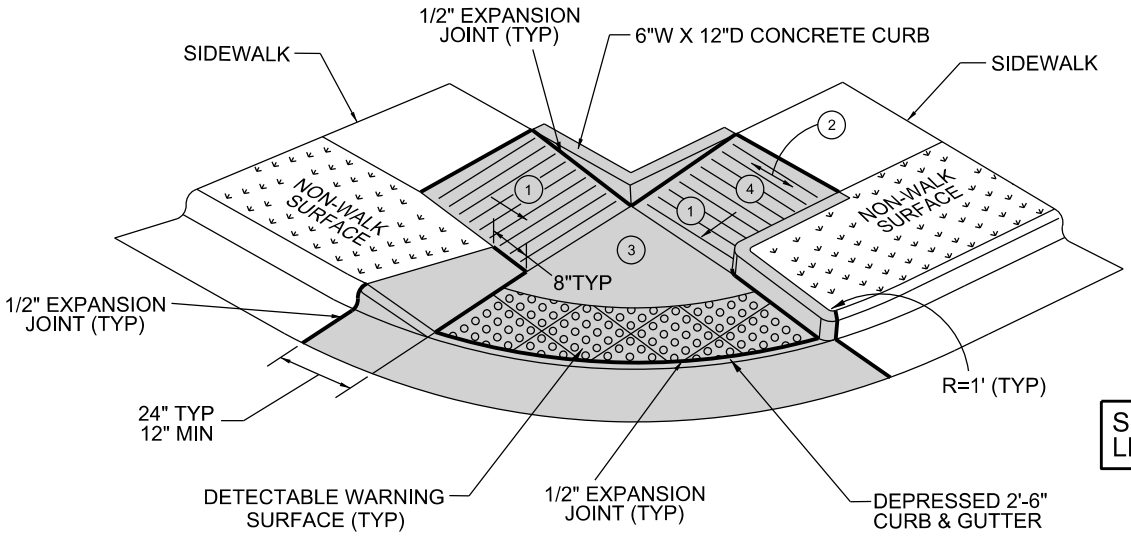
CONCRETE DEPTH	
SIDE RAMPS	4"
LANDING & CURB RAMPS	6"

TYPE R-4

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CURB RAMPS (RETROFIT)	
	T-20.01.6	

PAY LIMITS FOR CURB RAMP

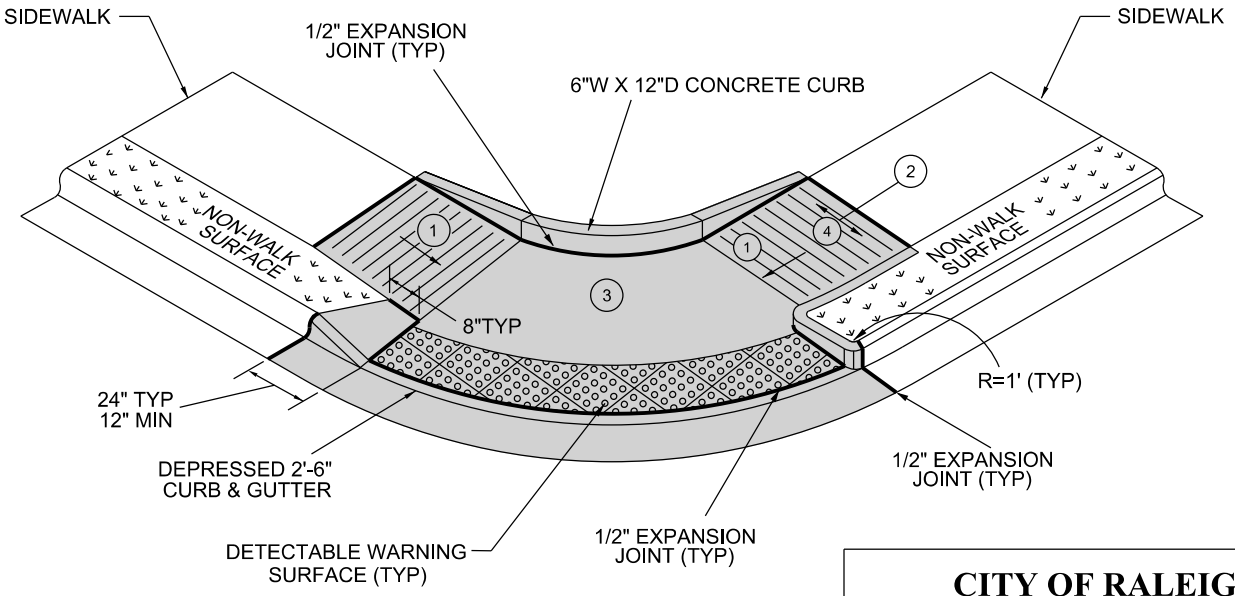


SMALL RADIUS LESS THAN 15'

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

1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5% (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.

CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OR TRANSITION TO STREET.



LARGER RADIUS 15' OR GREATER

ONLY TO BE USED WITH CITY OF RALEIGH APPROVAL.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	SHARED CURB RAMP/FLARE (RETROFIT)	
	T-20.01.7	

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.

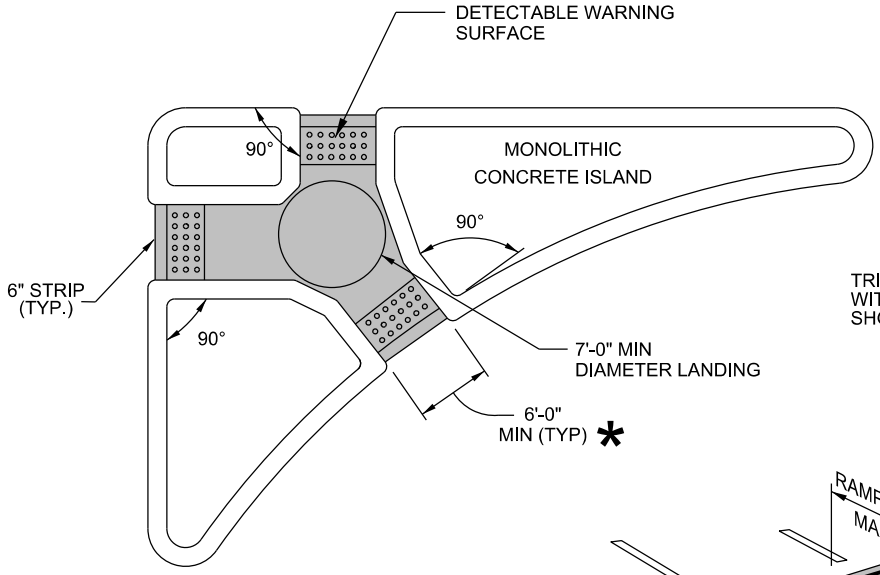
9. CURB RAMPS SHOULD BE PLACED PARALLEL TO THE DIRECTION OF TRAVEL.

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

CITY OF RALEIGH
STANDARD DETAIL

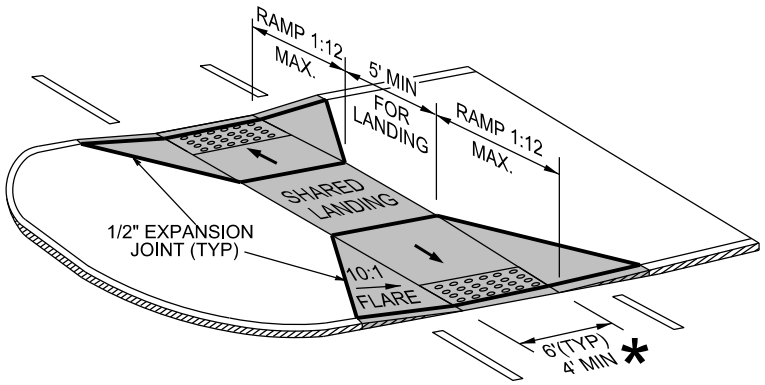
REVISIONS	DATE: 12/2022	NOT TO SCALE
	CURB RAMPS AT CURB-LEVEL BIKEWAY CROSSINGS	
	T-20.01.9	

PAY LIMITS FOR CURB RAMP



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

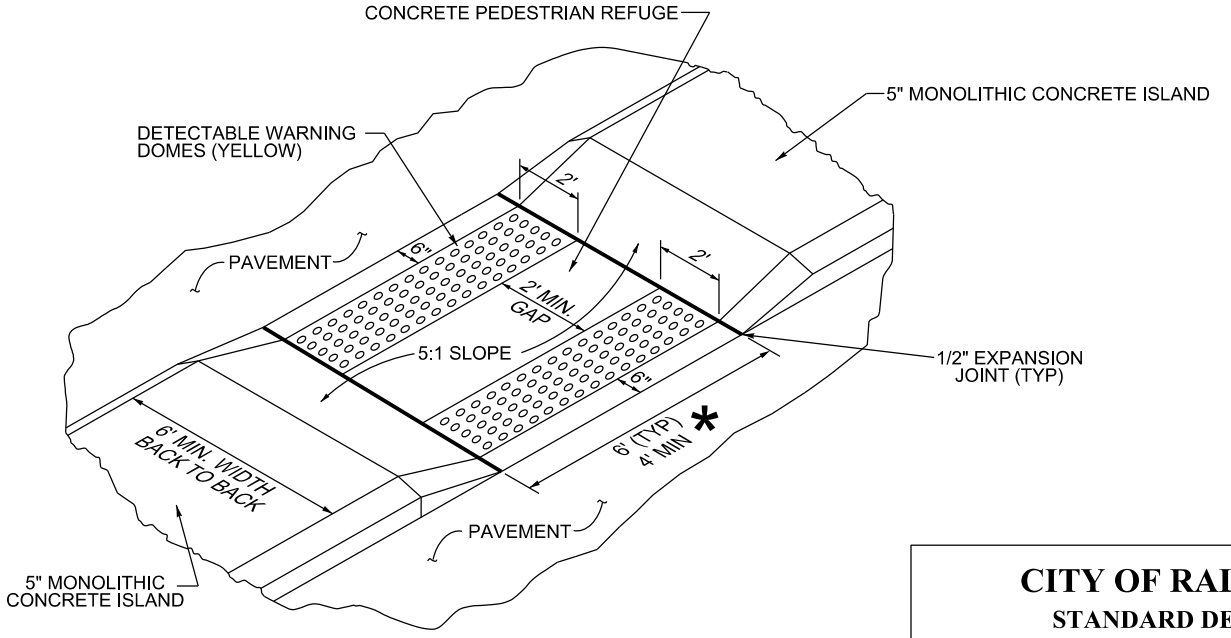
TRIANGULAR ISLAND WITH CUT THROUGH



* 10'-0" MIN AT SHARED PEDESTRIAN AND BICYCLE CROSSINGS (TYP)

MEDIAN ISLAND CURB RAMPS

(MEDIANS WIDER THAN 20')



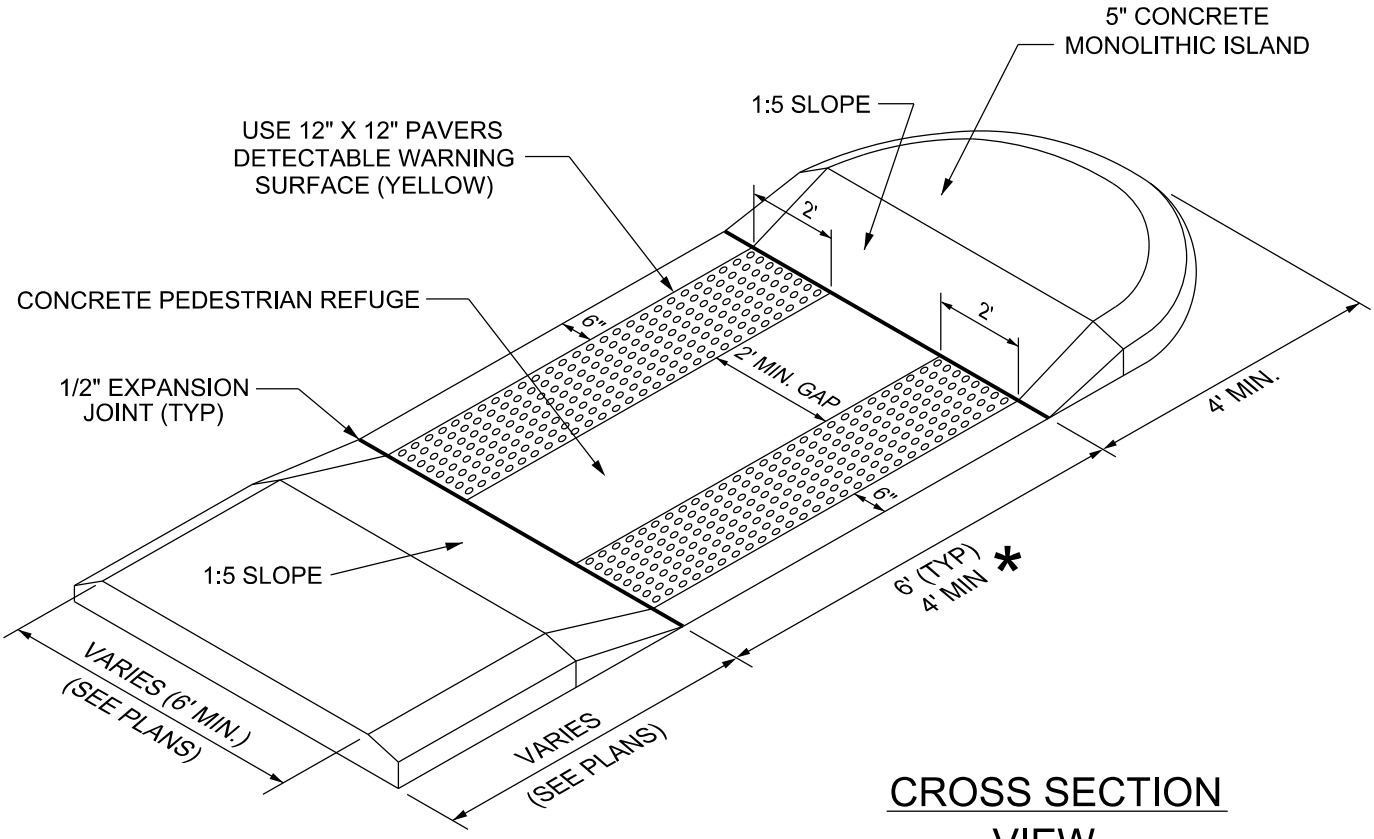
MEDIAN ISLAND WITH CUT THROUGH

(MEDIANS ≤ 20')

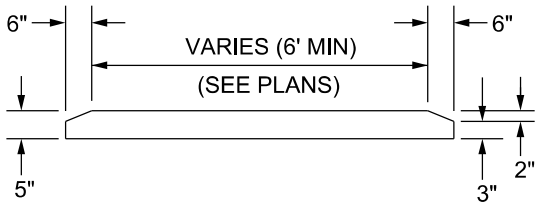
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	MEDIAN ISLAND CURB RAMPS/CUT THROUGHS	
	T-20.02	

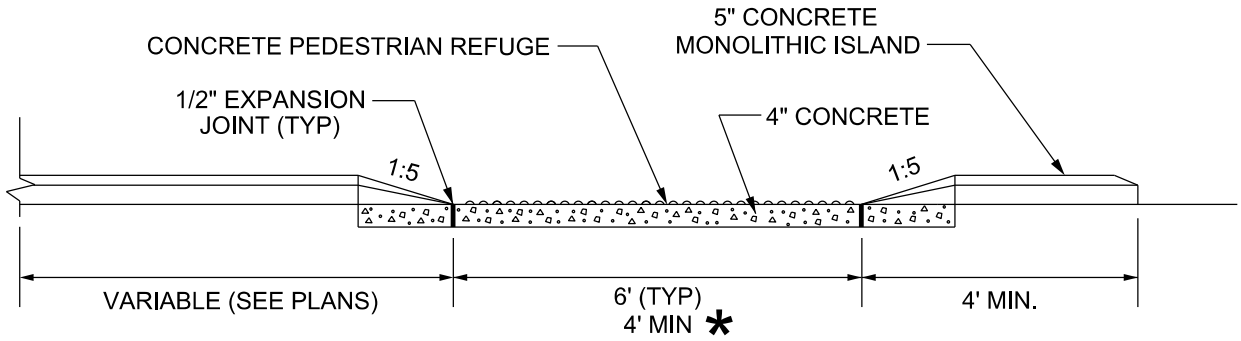
ISOMETRIC VIEW



CROSS SECTION VIEW



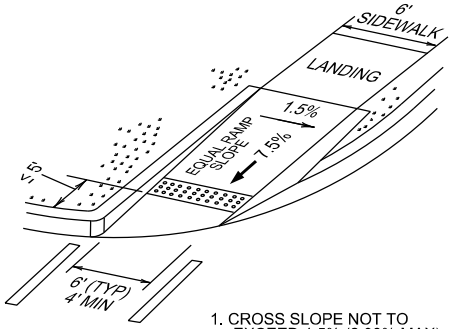
* 10'-0" MIN AT SHARED PEDESTRIAN AND BICYCLE CROSSINGS (TYP)



PROFILE VIEW

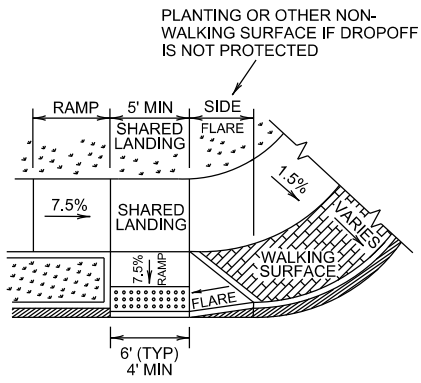
CITY OF RALEIGH STANDARD DETAIL		
REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	PEDESTRIAN REFUGE	
	T-20.03	

TYPE N-1, N-1A & R-1



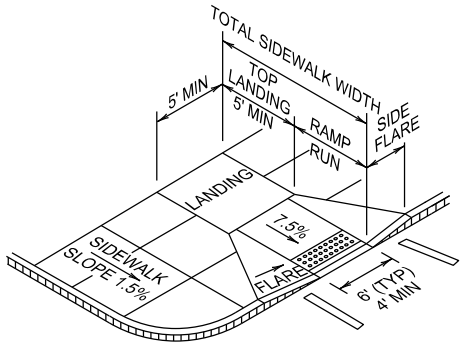
1. CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OF TRANSITION TO STREET.
2. RUNNING SLOPE NOT TO EXCEED 7.5% (8.33% MAX)

TYPE N-2 & N-3



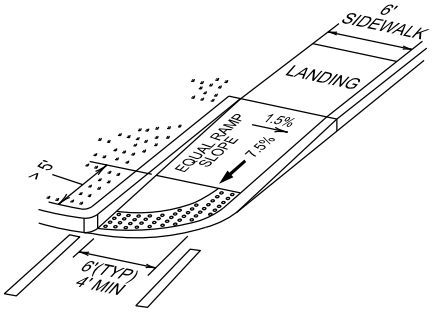
1. CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OF TRANSITION TO STREET.
2. RUNNING SLOPE NOT TO EXCEED 7.5% (8.33% MAX)

TYPE N-3A



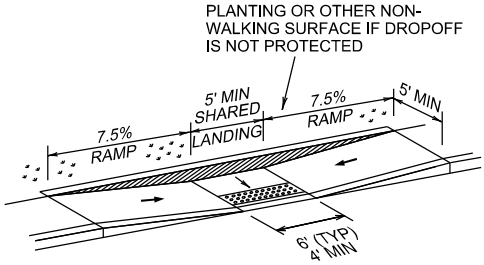
1. CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OF TRANSITION TO STREET.
2. RUNNING SLOPE NOT TO EXCEED 7.5% (8.33% MAX)

TYPE R-1A



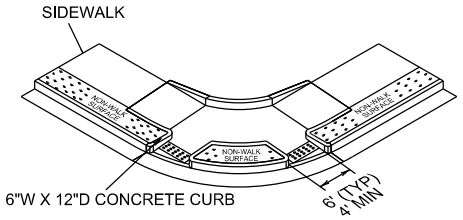
1. CROSS SLOPE NOT TO EXCEED 1.5% (2.08% MAX) ON ANY PORTION OF RAMP OF TRANSITION TO STREET.
2. RUNNING SLOPE NOT TO EXCEED 7.5% (8.33% MAX)

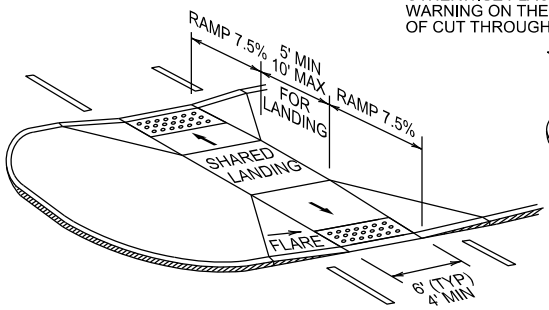
TYPE R-2

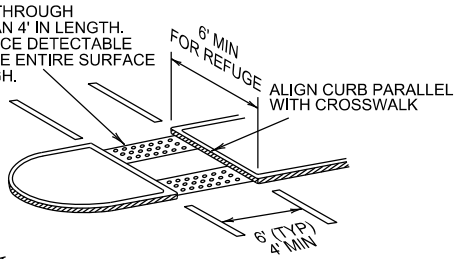


PARALLEL CURB RAMP

TYPE R-3

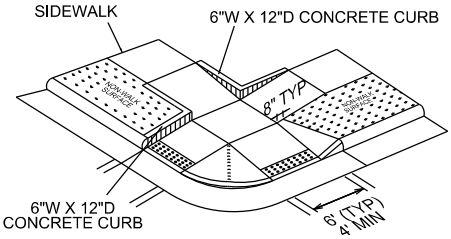


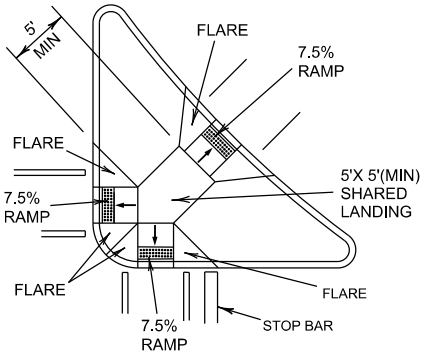




CURB RAMPS AT MEDIAN ISLANDS

TYPE R-4

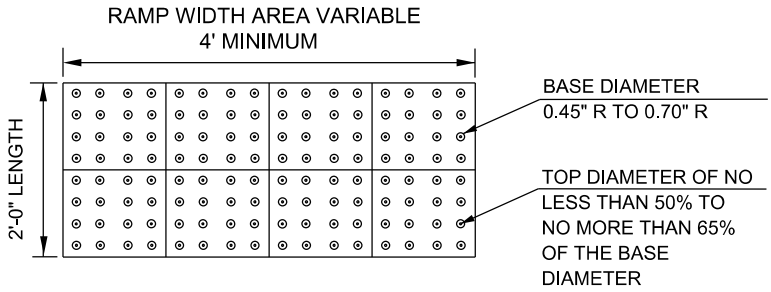


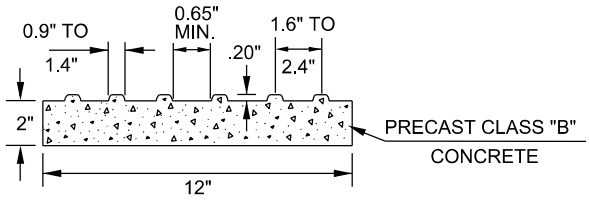


DETECTABLE WARNING SURFACE SHALL EXTEND FULL WIDTH OF SIDEWALK OR RAMP

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	DETECTABLE WARNING SURFACE PLACEMENT	
		T-20.04.1

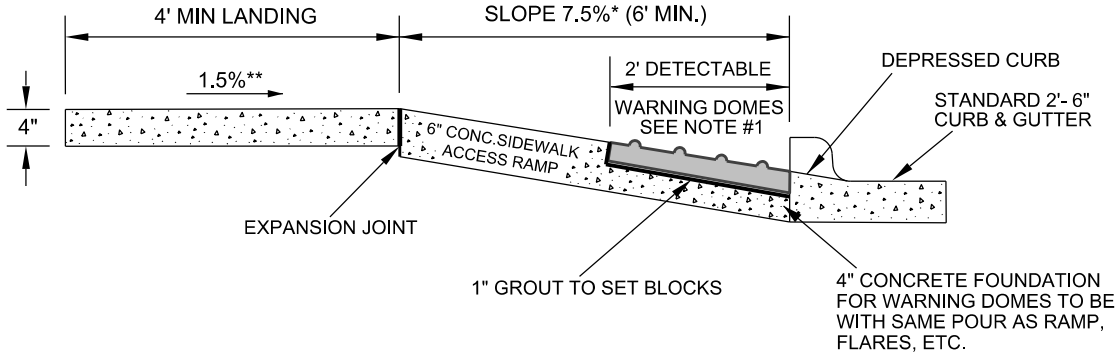




DETECTABLE WARNING
DOMES CONCRETE PAVER

* 8.33% (1:12) max

** 2.08% (1:48) max



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'.

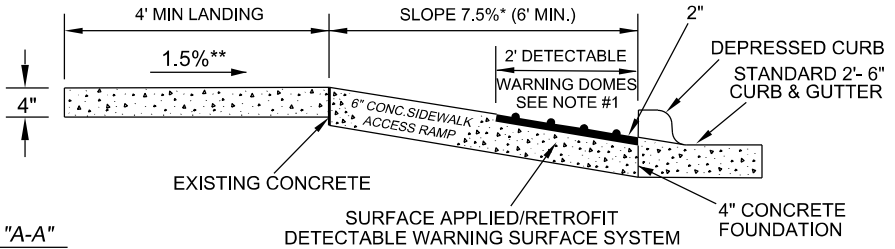
2. THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	*DATE: 8/2020*	*NOT TO SCALE*
DATE: 12/2022	DETECTABLE WARNING SURFACE PAVERS	
	T-20.04.2	

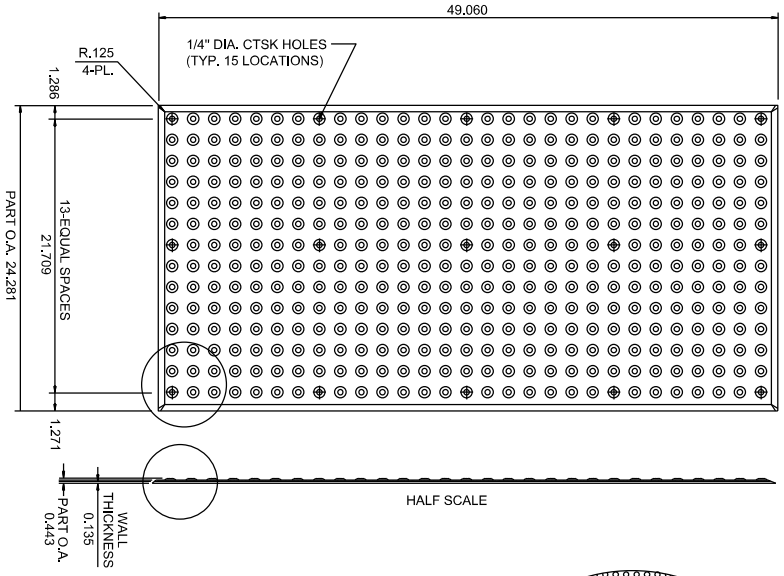
* 8.33% (1:12) max

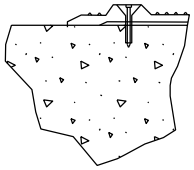
** 2.08% (1:48) max



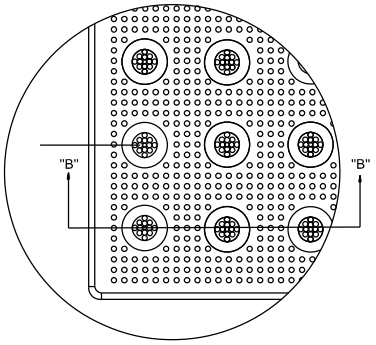
SECTION "A-A"

WITH DETECTABLE WARNING PAVERS



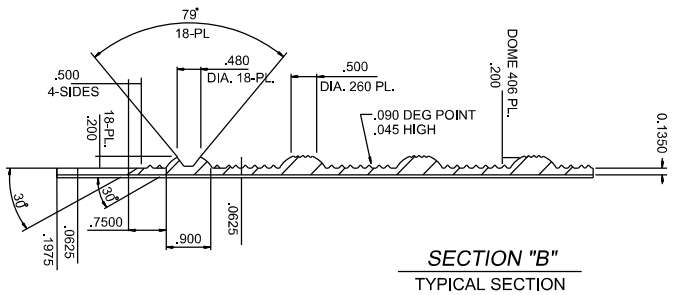


TILE INSTALLATION
VIEW B 4X SCALE



NOTE:

THIS APPLICATION ONLY TO BE USED WHEN RETRO FITTING EXISTING BARRIER FREE RAMPS



SECTION "B"

TYPICAL SECTION

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.

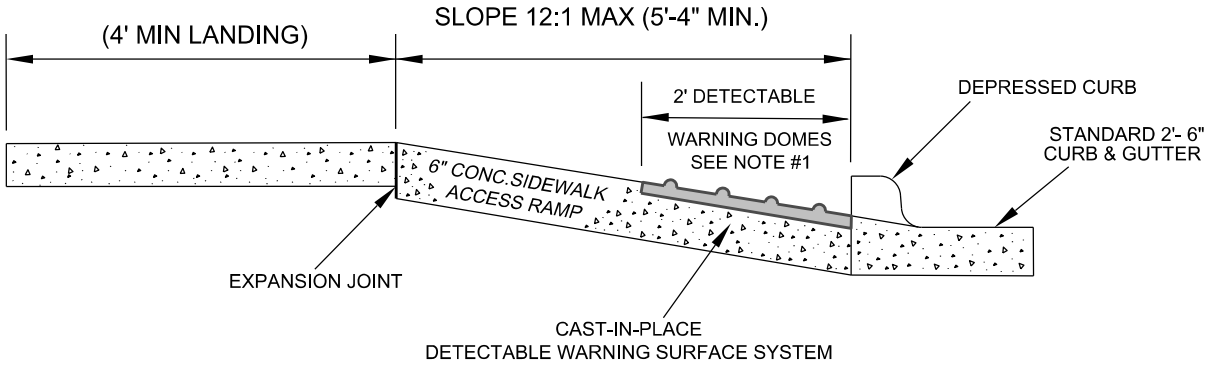
CITY OF RALEIGH

STANDARD DETAIL

REVISIONS	*DATE: 8/2020*	*NOT TO SCALE*
DATE: 12/2022	DETECTABLE WARNING SURFACE, SURFACE APPLIED (RETROFIT ONLY)	
	T-20.04.3	

RAMP SECTION

WITH DETECTABLE WARNING SURFACE
CAST-IN-PLACE SYSTEM



NOTES:

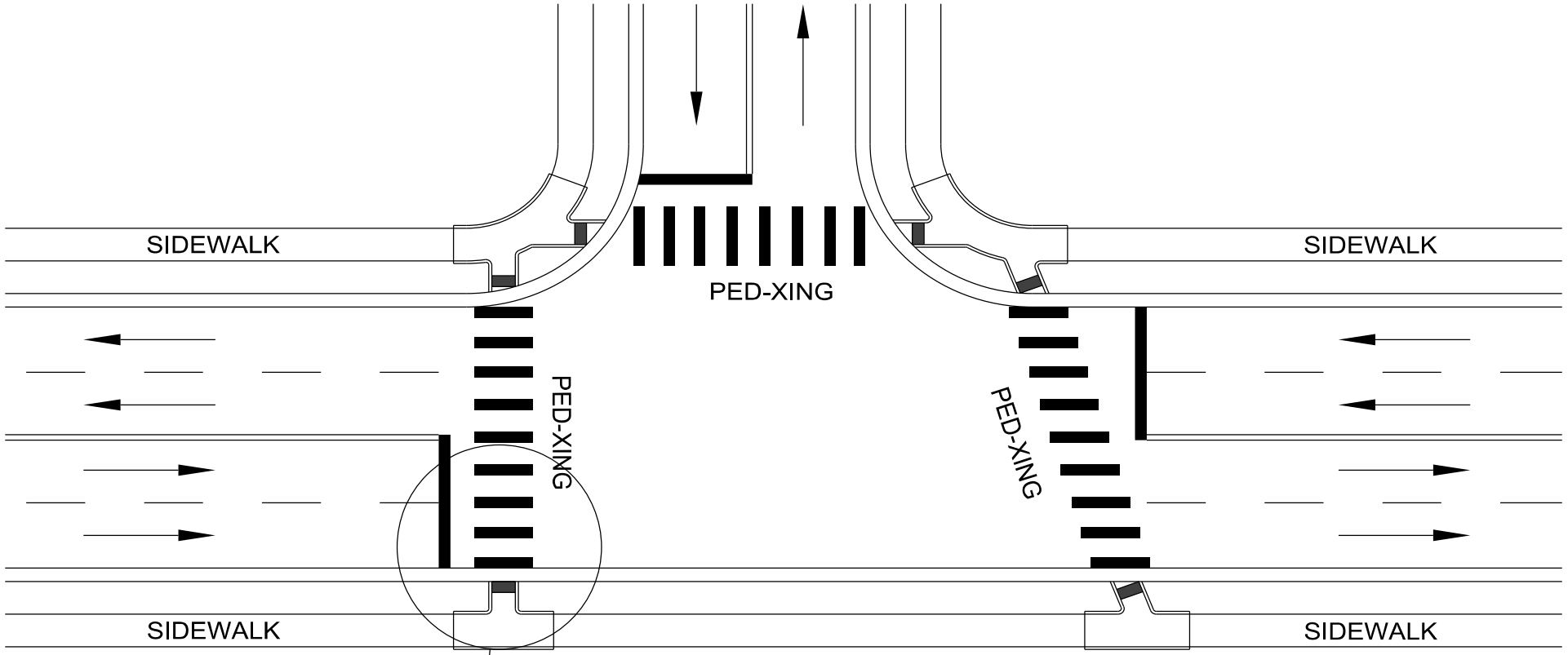
1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON DETAIL.

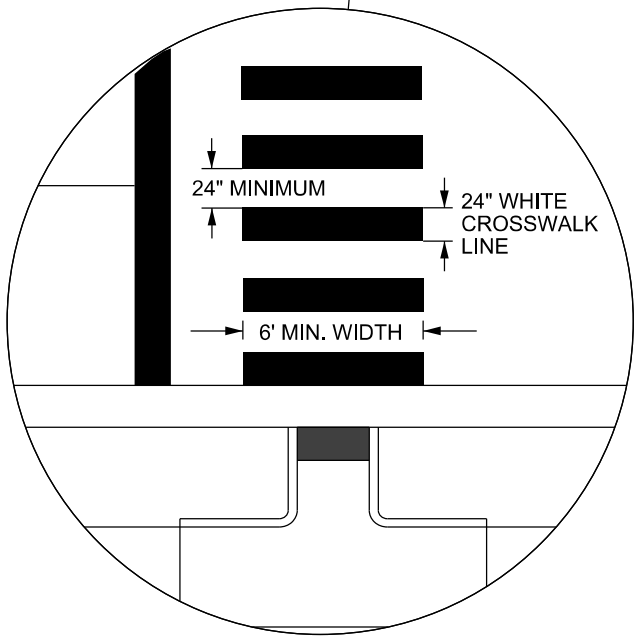
2. THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	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 RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE LATEST CITY OF RALEIGH STANDARD DRAWINGS.

CITY OF RALEIGH
STANDARD DETAIL

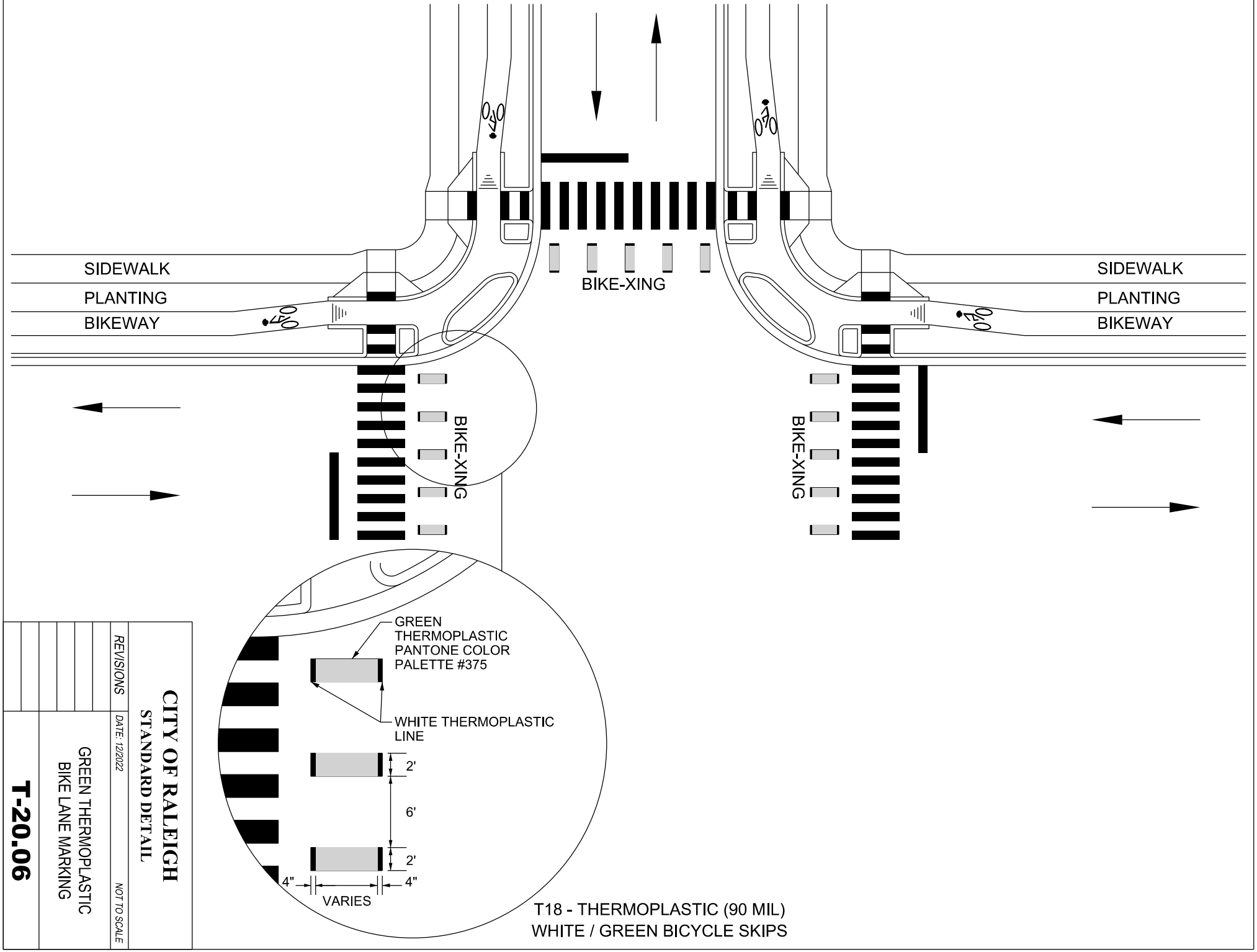
REVISIONS

DATE: 8/2020

NOT TO SCALE

PAVEMENT MARKINGS
HI-VISIBILITY
PEDESTRIAN CROSSWALK

T-20.05



T18 - THERMOPLASTIC (90 MIL)
WHITE / GREEN BICYCLE SKIPS

CITY OF RALEIGH
STANDARD DETAIL

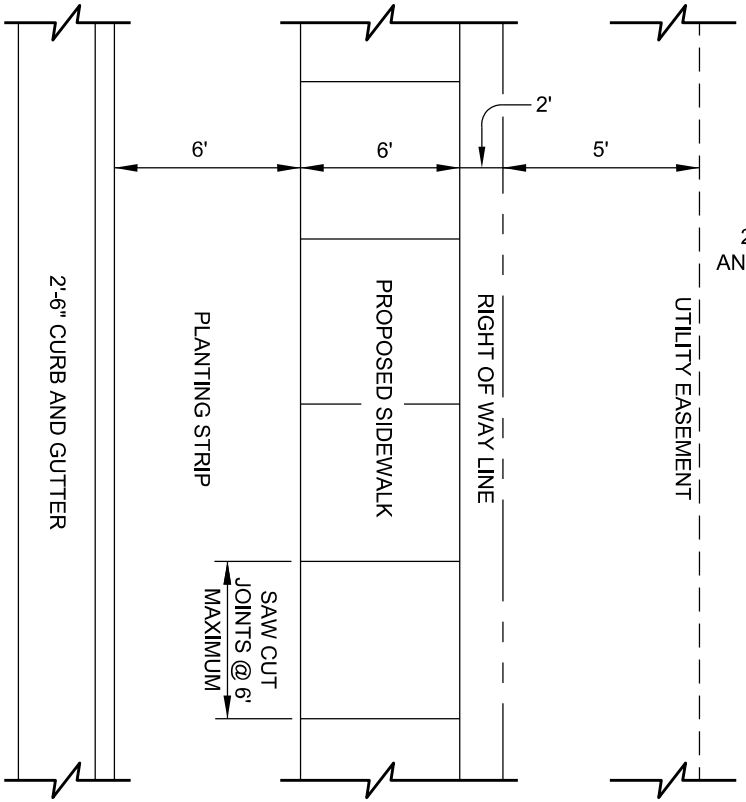
REVISIONS

DATE: 12/2022

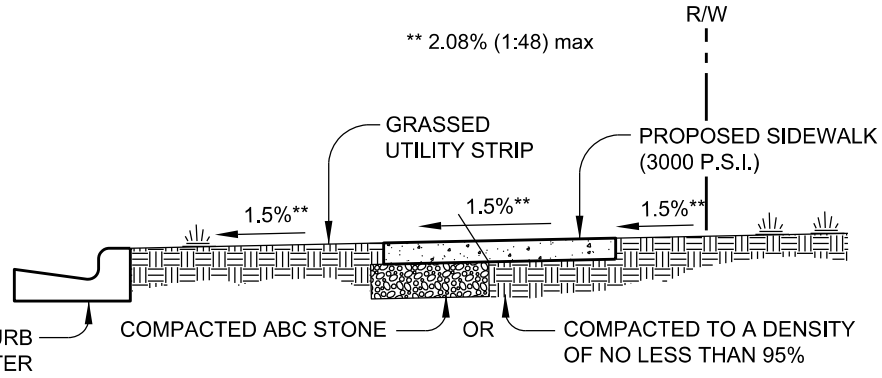
NOT TO SCALE

GREEN THERMOPLASTIC
BIKE LANE MARKING

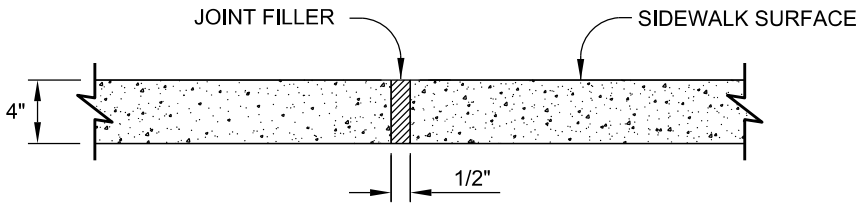
T-20.06



PLAN VIEW



TYPICAL SECTION



TRANSVERSE EXPANSION JOINT

NOTES:

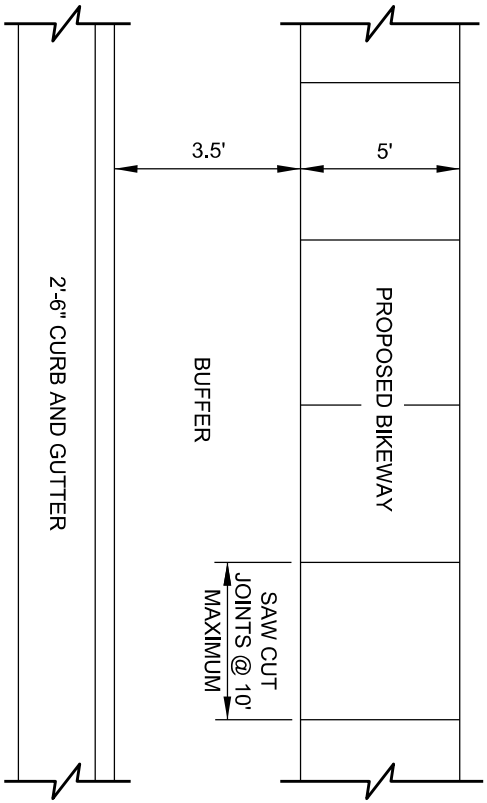
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET.
2. ALL CONCRETE TO BE 3000 PSI AND FINISHED WITH CURING COMPOUND.
3. A 6 INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INJTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND IN THE HANDICAP RAMPS.
4. COMPACTED ABC STONE MAY BE REQUIRED AS SUBGRADE AT THE DISCRESTION OF THE INSPECTOR
5. SURFACE SHALL BE FINISHED TO GRADE AND CROSS SECTION WITH A FLOAT, TROWEL SMOOTH AND FINISH WITH A BROOM
6. WHERE UTILITY BOXES/VAULTS MUST BE LOCATED IN THE SIDEWALK, THEY SHALL HAVE A MINIMUM 3" WIDE FRAME OF CONCRETE AROUND THEM

CITY OF RALEIGH
STANDARD DETAIL

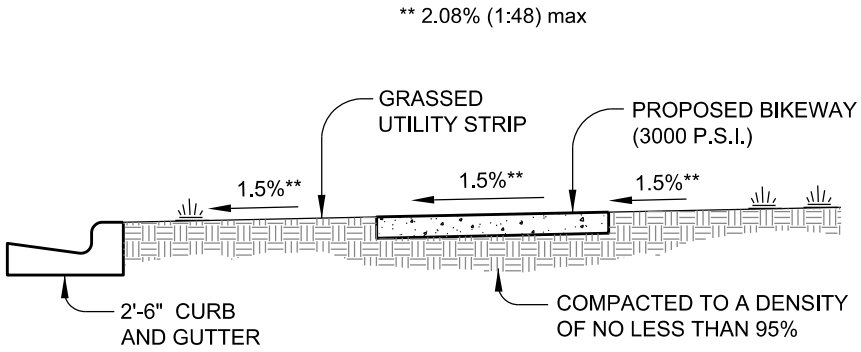
CONCRETE SIDEWALK

T-30.01.1

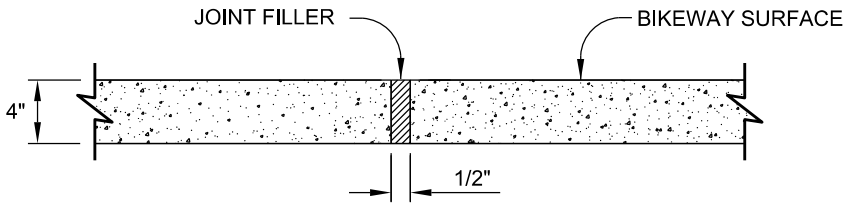
REVISIONS
DATE: 8/2020
DATE: 12/2022
DATE: 08/2023
NOT TO SCALE



PLAN VIEW



TYPICAL SECTION



TRANSVERSE EXPANSION JOINT

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 CORSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS) AND IN THE HANDICAP RAMPS.
4. BIKEWAY MATERIAL SHALL BE INTEGRALLY COLORED CONCRETE, COLORED BLACK, USING NON-FADING PIGMENTS.
5. CONTRACTOR SHALL SEAL ALL JOINTS. SEAL SHALL BE NON-SHRINKING AND FLUSH WITH FINISHED GRADE OF THE CONCRETE BIKEWAY.
6. JOINTS SHALL BE SAWCUT A MINIMUM OF 1/4 DEPTH, BUT NO MORE THAN 1/2 DEPTH.

CITY OF RALEIGH
STANDARD DETAIL

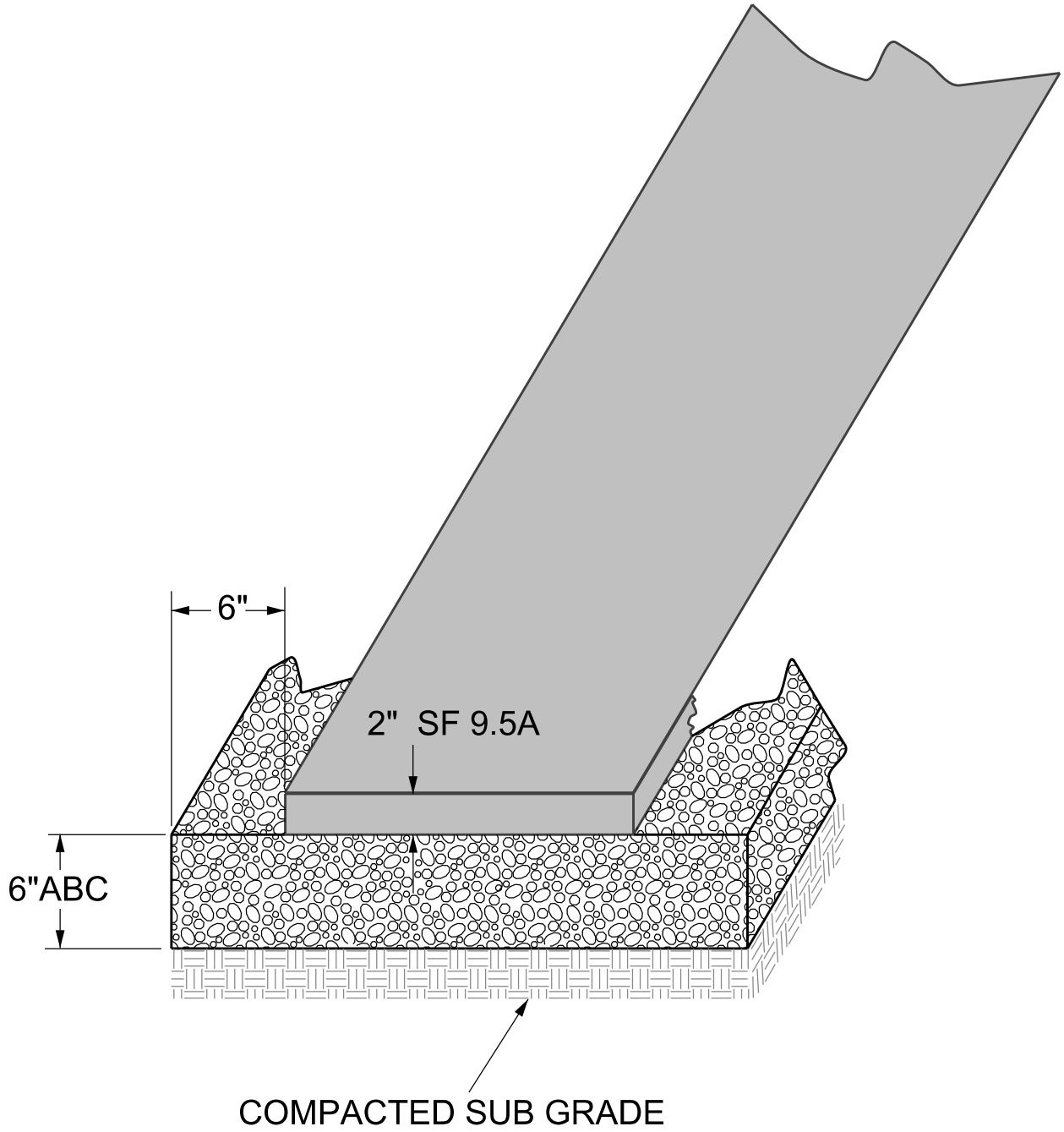
REVISIONS

DATE: 12/2022

NOT TO SCALE

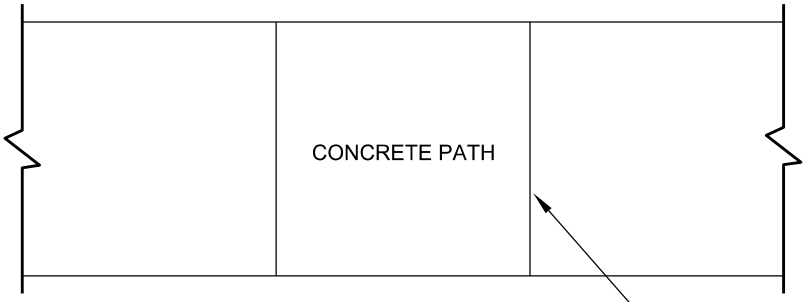
CONCRETE BIKEWAY

T-30.01.2

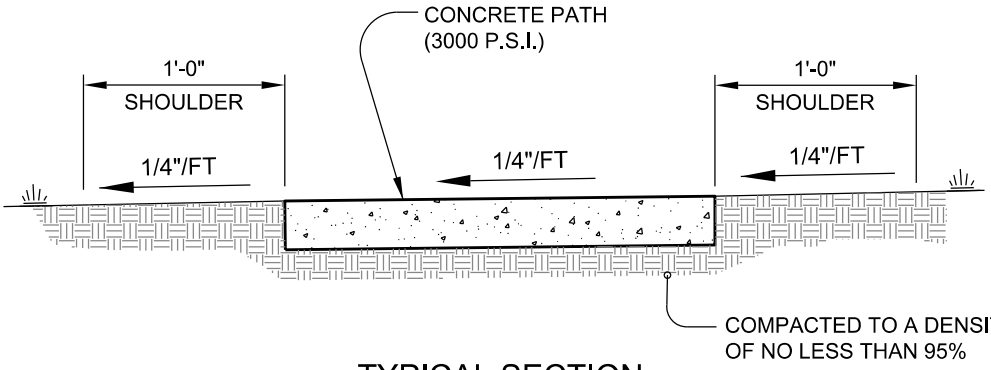


CITY OF RALEIGH
STANDARD DETAIL

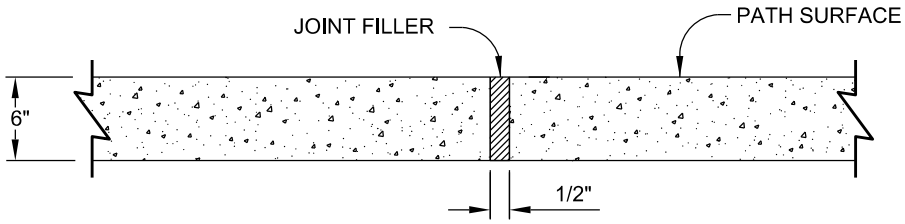
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ASPHALT MULTI-PURPOSE PATH	
	T-30.02.1	



PLAN VIEW



TYPICAL SECTION



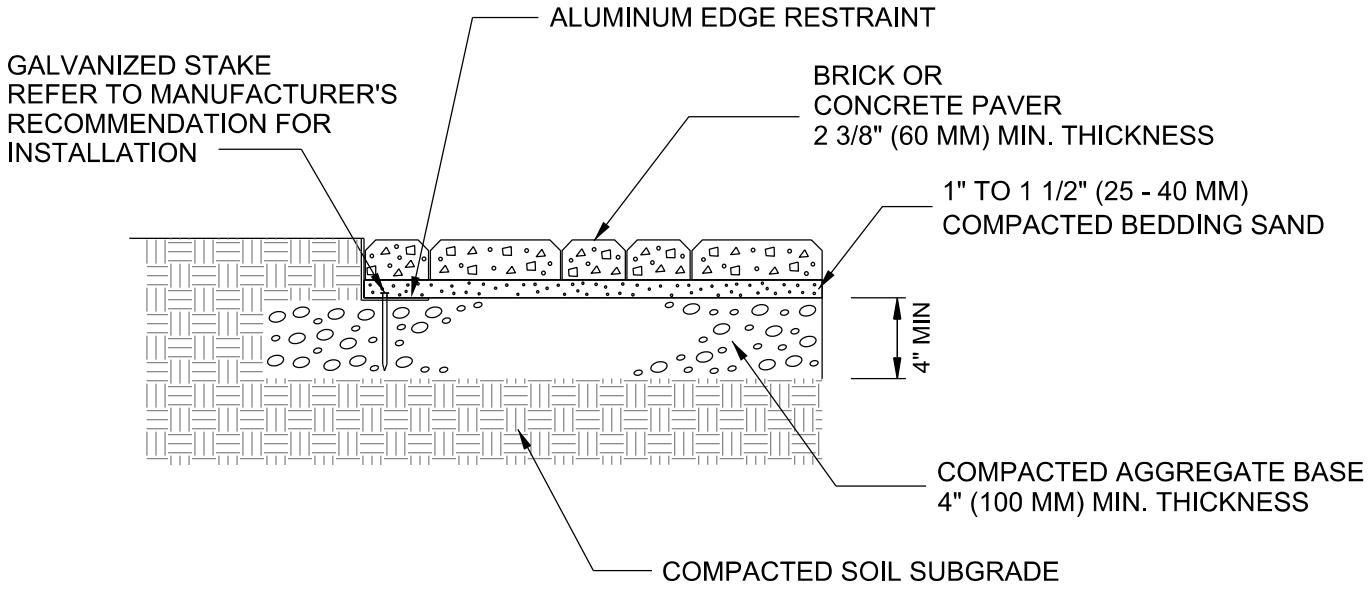
TRANSVERSE EXPANSION JOINT

NOTES:

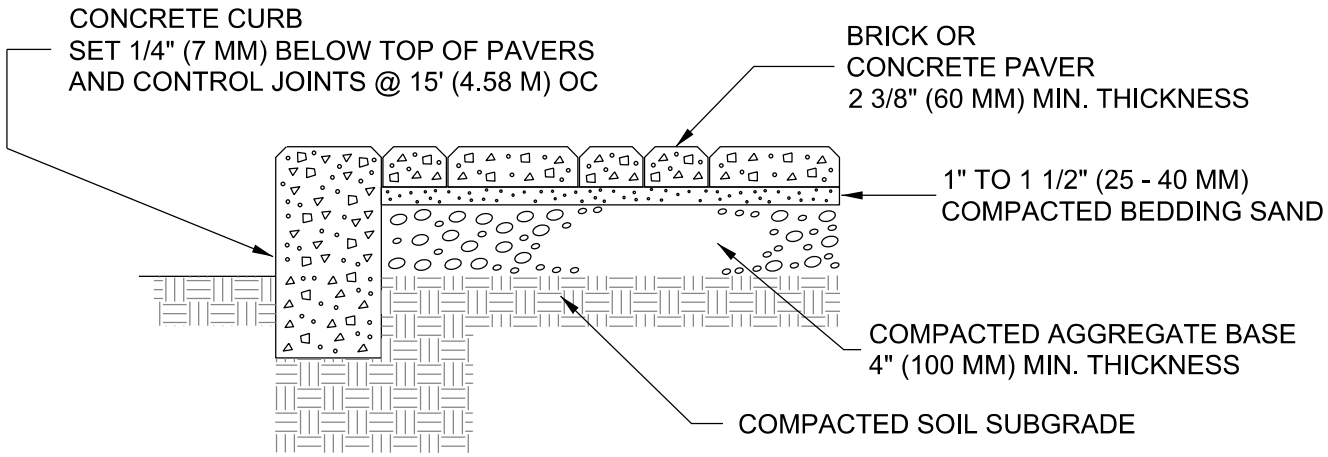
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET APART.
2. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.
3. A 6 INCH DEPTH IS REQUIRED.
4. SAW CUT JOINTS EVERY 10 FEET OR SAME AS WIDTH. WHICHEVER IS LESS.
5. NO UTILITY SURFACE COVERS/PLATES/MANHOLES (i.e. WATERLINE VALVE COVERS, ETC.) SHALL 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.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 12/2022	CONCRETE MULTI-PURPOSE PATH	
	T-30.02.2	



SECTION 1



SECTION 2

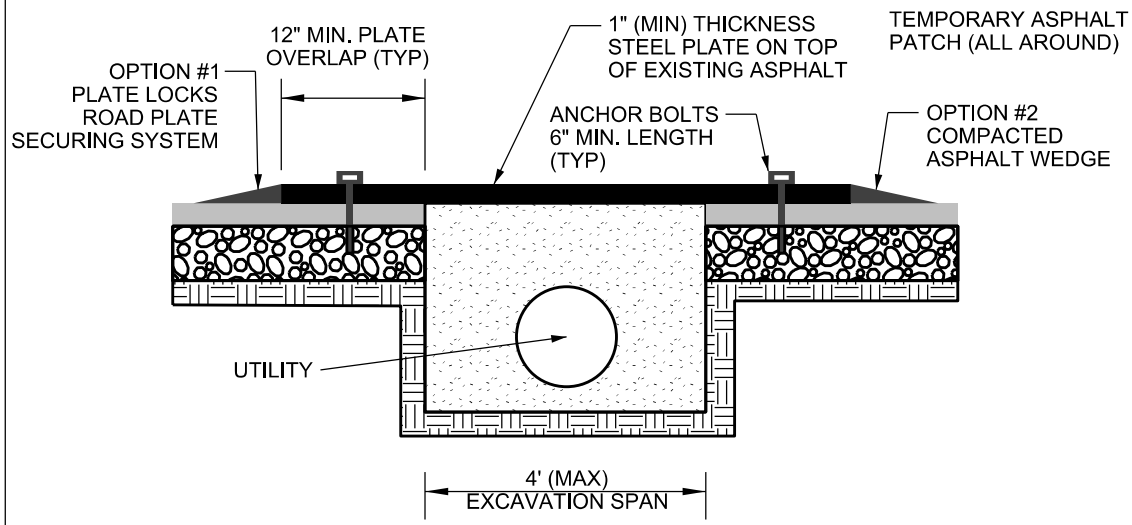
NOTES:

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.

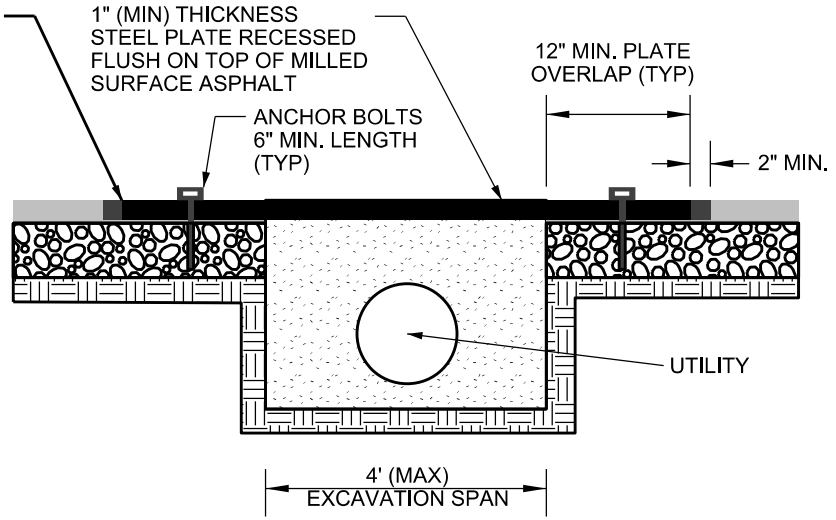
CITY OF RALEIGH
STANDARD DETAIL

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

TYPE 1 INSTALLATION DETAIL



TYPE 2 INSTALLATION DETAIL



NOTES:

1. ALL ROAD PLATES MUST BE ACCOMPANIED BY A VALID RIGHT-OF-WAY PERMIT.
2. TYPE 1 INSTALLATIONS ARE FOR USE ON ROADWAYS WITH A POSTED SPEED LIMIT UNDER 35 MPH.
3. TYPE 2 INSTALLATIONS ARE FOR USE ON ROADWAYS WITH A POSTED SPEED LIMIT ABOVE 35 MPH.
4. ALL ROAD PLATE INSTALLATIONS SHALL BE APPROVED BY THE INSPECTOR PRIOR TO ALLOWING PUBLIC TRAFFIC.
5. ALL ROAD PLATE INSTALLATIONS, LIABILITY AND MAINTENANCE ARE THE RESPONSIBILITY OF THE CONTRACTOR
6. METAL PLATES SHALL BE IDENTIFIED WITH A 24" HIGH STENCILED TEXT OF THE CONTRACTOR NAME OR DESIGNATED ABBREVIATION AND A 6" HIGH STENCILED TEXT OF THE CONTRACTORS AFTER -HOURS 24/7 CONTACT PHONE NUMBER. ANY MARKING DEEMED UNREADABLE MUST BE REPAINTED. SEE DETAIL T-40.01.2
7. METAL PLATES WILL HAVE WHITE REFLECTIVE MARKING TAPE ON ALL FOUR CORNERS OF EACH END OF A TRENCH. THESE PLATES DESIGNATE THE BEGINNING AND END OF THE EXCAVATION. THE REFLECTIVE TAPE WILL BE DURABLE ENOUGH TO WITHSTAND TRAFFIC. ANY PEELING TAPE DEEMED UNREADABLE MUST BE REPLACED IMMEDIATELY. SEE DETAIL T-40.01.2.
8. WARNING SIGNS ADVISING MOTORISTS THAT THEY SHOULD EXPECT TO ENCOUNTER METAL PLATES SHALL BE PLACED AT PPROXIMATELY 100 FEET, IN ADVANCE OF THE METAL PLATE LOCATION THE "BUMP" OR "STEEL PLATE AHEAD" SHALL BE USED. SEE DETAIL T-40.01.2
9. PLATES THAT ARE LEFT OVERNIGHT WILL REQUIRE THAT THE WARNING SIGN BE SUPPLEMENTED WITH A LOW-INTENSITY-FLASHING WARNING LIGHT MOUNTED ON OR ADJACENT TO THE ADVANCE WARNING SIGNAGE.
10. FAILURE TO FOLLOW THE STEPS OUTLINED ABOVE WILL RESULT IN STOP WORK ORDERS, CITATIONS AND FINES TO THE PERMITTEE OR CONTRACTOR WORKING WITHOUT A VALID PERMIT. ROAD PLATES REMOVED OR REPAIRED BY THE CITY WILL RESULT IN STOP WORK ORDERS, CITATIONS AND FINES.
11. PAVEMENT MUST BE RESTORED TO THE PREVIOUS OR BETTER CONDITION ONCE THE PLATE HAS BEEN REMOVED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS
DATE: 08/2023

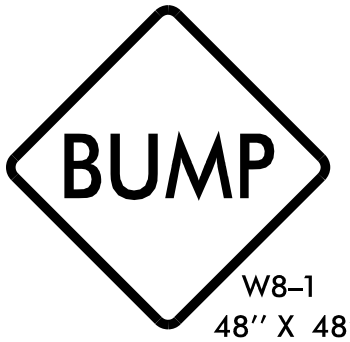
DATE: 8/2023
NOT TO SCALE

STEEL ROAD PLATE

T-40.01.1

SHEET 1 OF 2

ADVANCED WARNING SIGNAGE



W8–1
48'' X 48''

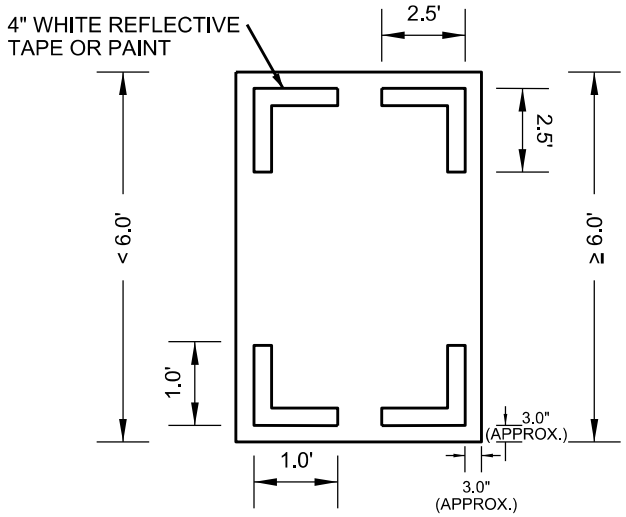
OR

METAL PLATE MARKING EXAMPLES

RALEIGH CONTRACTING
919-555-5555

EB
984-555-5555

METAL PLATE REFLECTIVE TAPE DETAILS



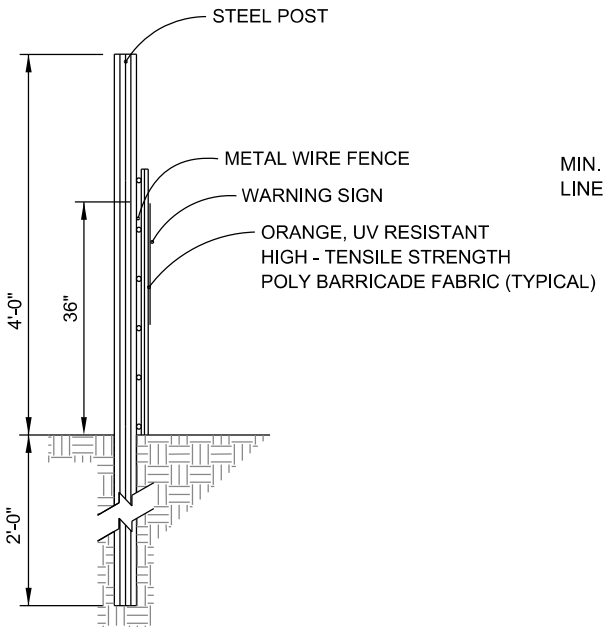
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2023	NOT TO SCALE
	STEEL ROAD PLATE	
	T-40.01.2	

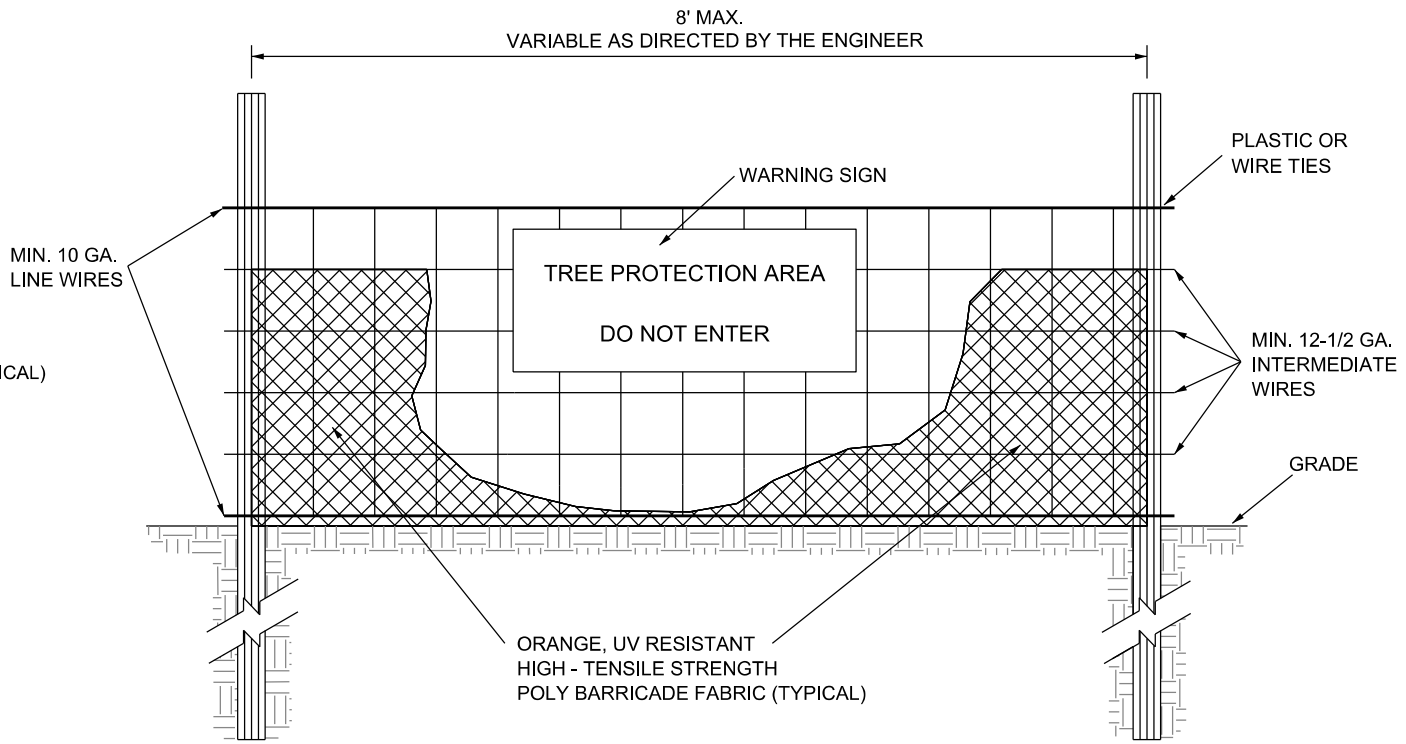
CITY OF RALEIGH

STANDARD DETAILS

TREE PROTECTION AND PLANTING

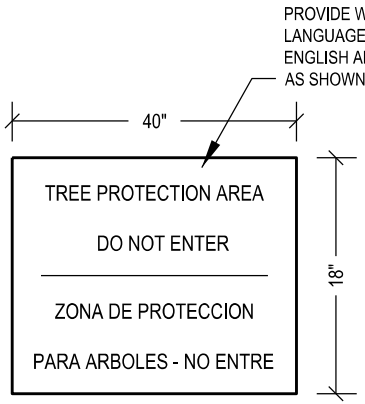


SIDE VIEW



FRONT VIEW

NOTE: FOR TREE PROTECTION ONLY



WARNING SIGN DETAIL

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.

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

CITY OF RALEIGH
STANDARD DETAIL

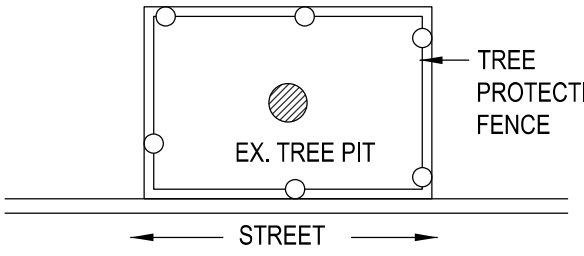
REVISIONS

STANDARD TREE PROTECTION DETAIL

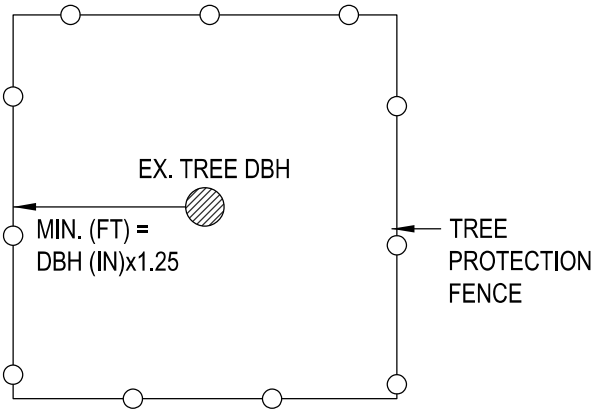
DATE: 8/2020

NOT TO SCALE

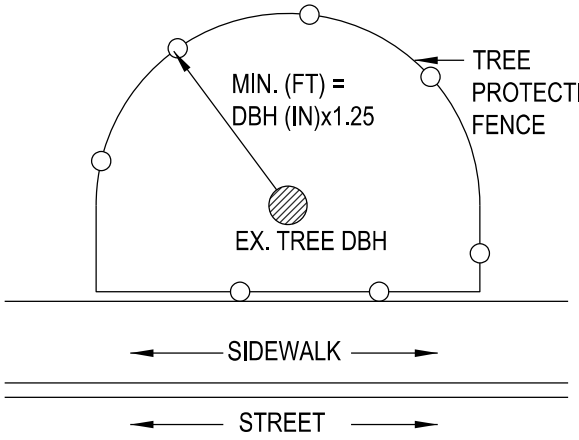
TPP-01



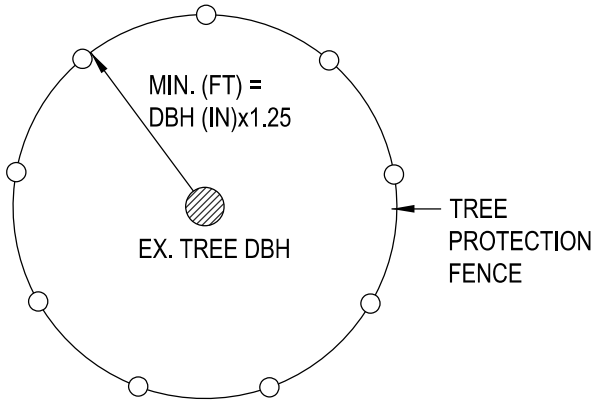
A. IN TREE PIT



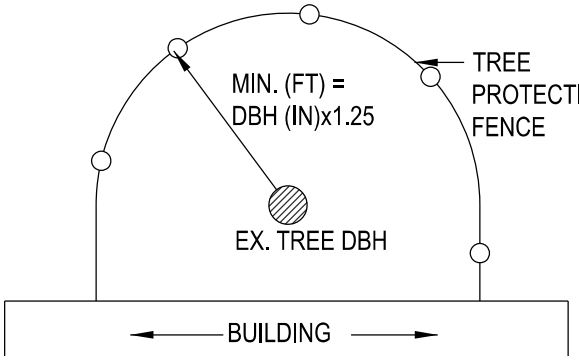
D. SQUARE LAYOUT



B. BY SIDEWALK



E. CIRCULAR LAYOUT



C. BY BUILDING

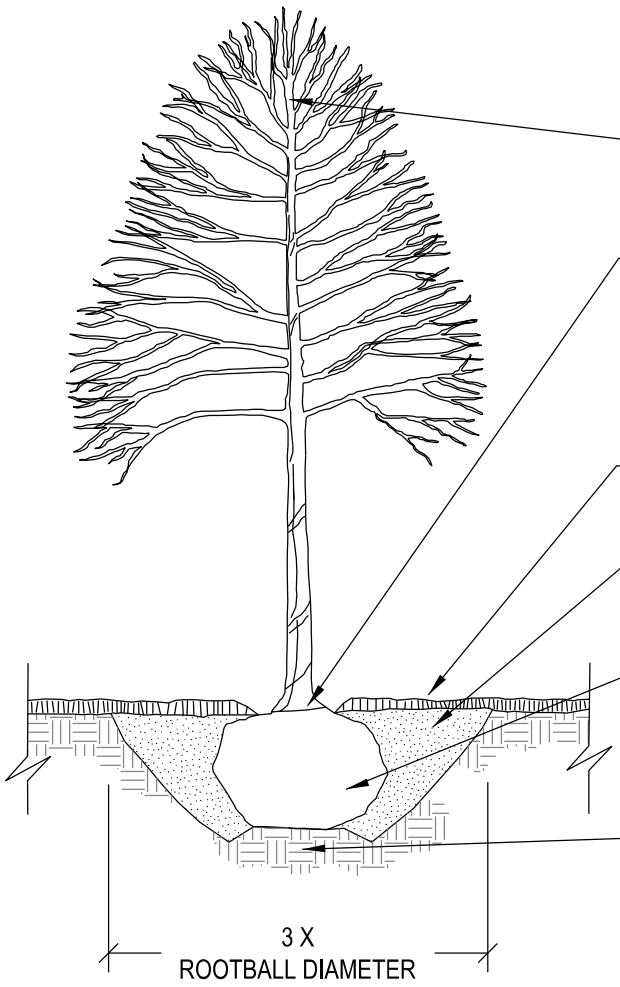
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND
CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

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	
	TPP-02	



DO NOT PRUNE LEADER. PRUNE OR CUT ONLY DEAD OR DAMAGED BRANCHES TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) A300 STANDARDS

REMOVE EXCESS SOIL TO EXPOSE THE ROOT FLARE. THE ROOT FLARE SHALL BE PLANTED AT GRADE, NO HIGHER THAN 2" ABOVE GRADE, AND NEVER BELOW GRADE. TREE SHALL BE SET PLUMB

MULCH DEPTH NOT MORE THAN 3". KEEP MULCH 3" FROM ROOT FLARE AND DO NOT CONTACT STEM

PLANTING SOIL MIX AROUND ROOT BALL. 600 CU FT OF SOIL OR STRUCTURAL SOIL REQUIRED PER TREE

COMPLETELY REMOVE TOP HALF OF BURLAP, LACING STRAPS, NAILS AND WIRE BASKET AND DISCARD FROM HOLE. ALL SYNTHETIC BURLAP MUST BE REMOVED FROM SIDES OF ROOT BALL.

ROOT BALL SHALL BE PLACED DIRECTLY ON COMPACTED SUBGRADE. HANDLE TREE BY THE ROOT BALL ONLY.

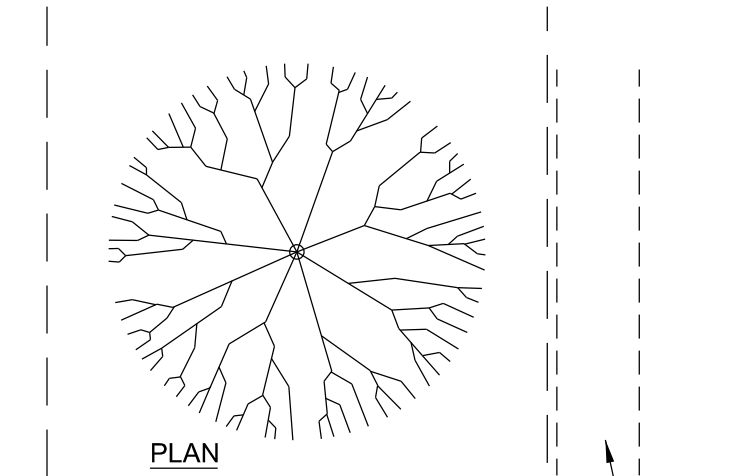
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT URBAN FORESTER:
TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

NOTES:

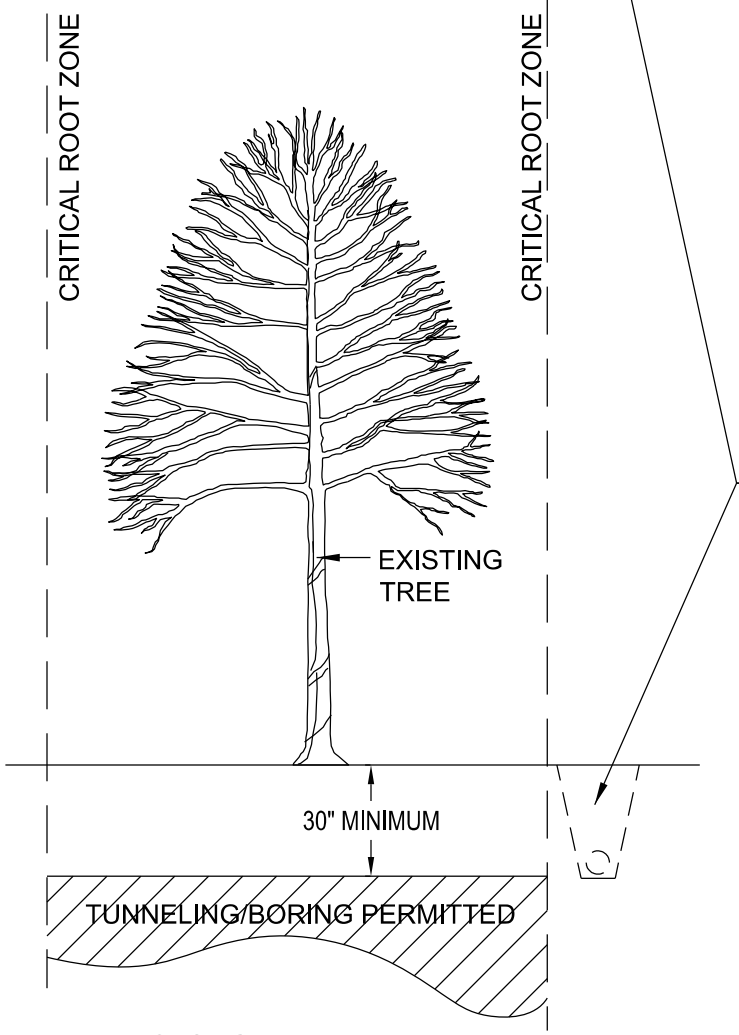
1. TREES MUST MEET THE TREE QUALITY STANDARDS IN CH. 2 OF THE CITY TREE MANUAL.
2. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE DRAINAGE OF ALL PLANTING PITS. (POSITIVE DRAINAGE AWAY FROM PIT)
3. TREES SHALL BE PLANTED BETWEEN OCTOBER 1ST AND APRIL 30TH.
4. A TREE IMPACT PERMIT IS REQUIRED.
5. ELECTRICAL OUTLETS 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

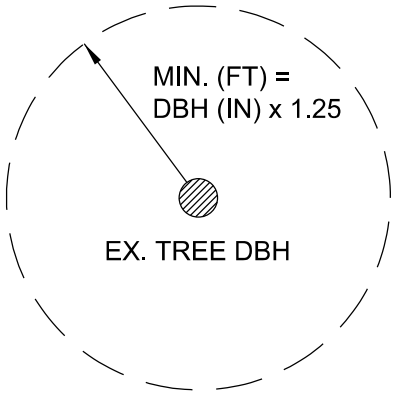


SECTION

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

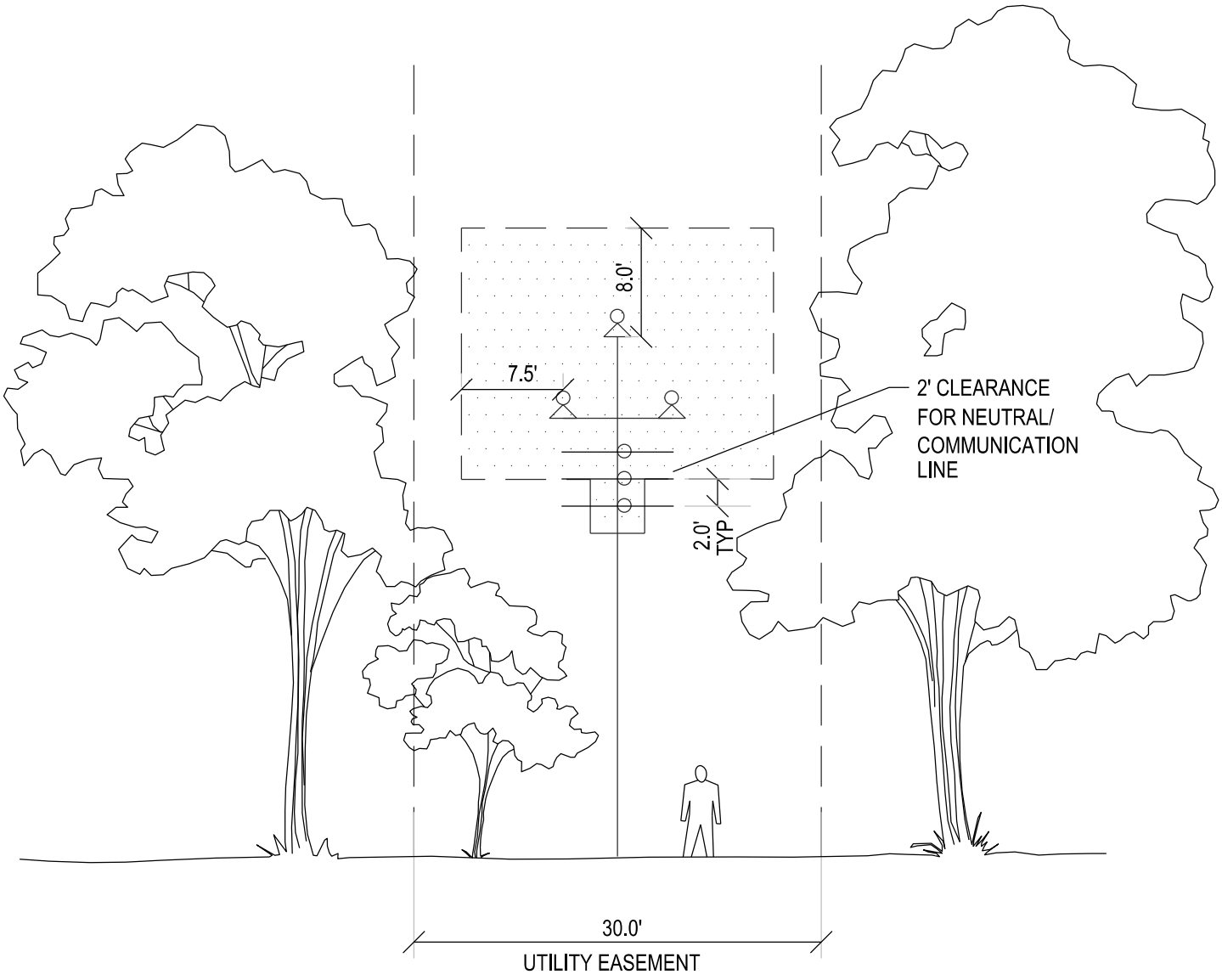


CRITICAL ROOT ZONE

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	



PRIMARY LINES

1.	OVERHEAD	8 FEET
2.	SIDE	7.5 FEET
3.	BELOW	6 FEET
4.	NEUTRAL	2 FEET

SECONDARY LINES

1.	OVERHEAD	6 FEET
2.	SIDE	4 FEET
3.	BELOW	4 FEET
4.	NEUTRAL	2 FEET

COMMUNICATION LINES
(SERVICE/PHONE/CABLE/FIBER OPTIC LINES, ETC.)

1.	OVERHEAD	2 FEET
2.	SIDE	2 FEET
3.	BELOW	2 FEET

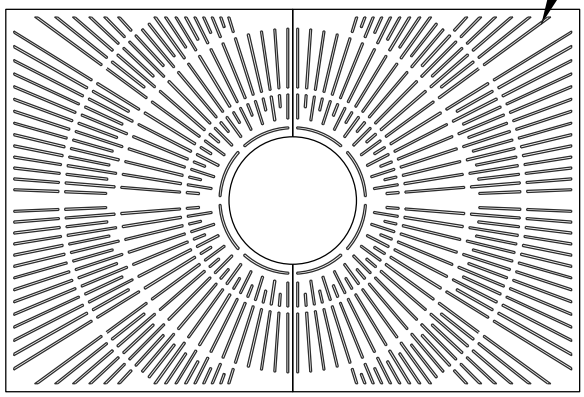
NOTES:
1. A TREE IMPACT PERMIT IS REQUIRED.
2. ADHERE TO STANDARDS IN THE CITY TREE MANUAL.

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
	PRUNING BOX FOR UTILITY EASEMENT	
	TPP-05	

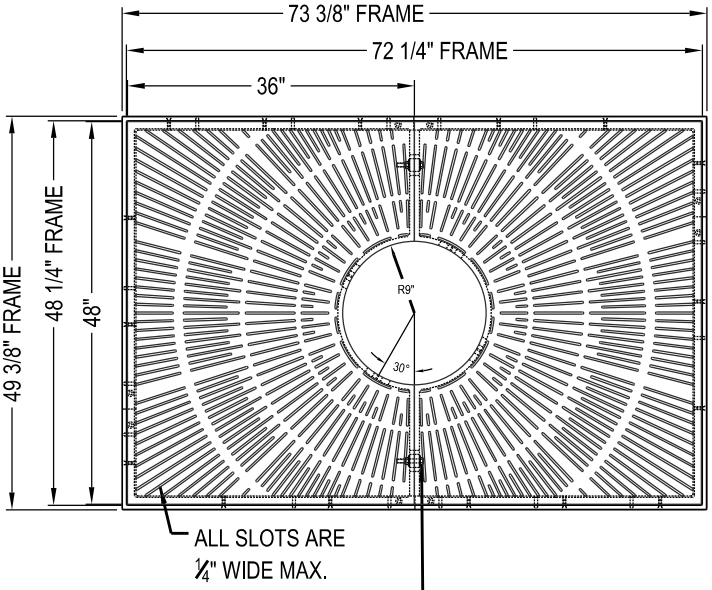
GRAY IRON, RECTANGULAR 4'X6', 1.5" MIN. THICK, WITH 1/4" OPENING OR LESS

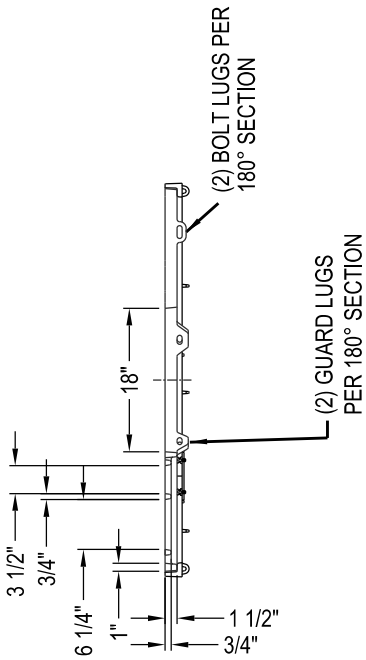


NOTES:

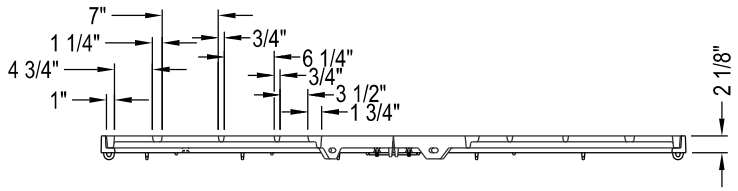
1. GRATE DESIGN MUST BE ADA COMPLIANT.
2. GENERAL PATTERN DESIGN MUST BE AS SHOWN.
3. EXCEPTIONS OR PERSONALIZATION MUST BE REVIEWED AND APPROVED BY THE CITY OF RALEIGH.
4. A TREE IMPACT PERMIT IS REQUIRED.
5. ADHERE TO STANDARDS IN THE CITY TREE MANUAL.
6. ELECTRIC OUTLETS AND OTHER UTILITIES ARE PROHIBITED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

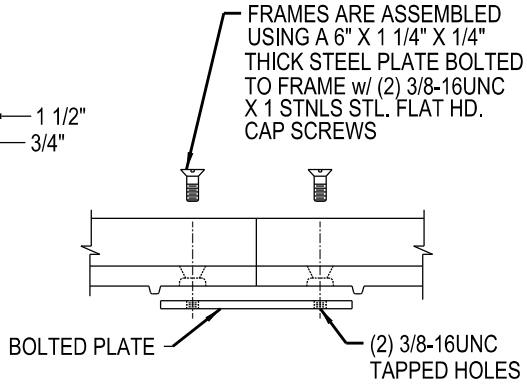
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT URBAN FORESTER:TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV





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



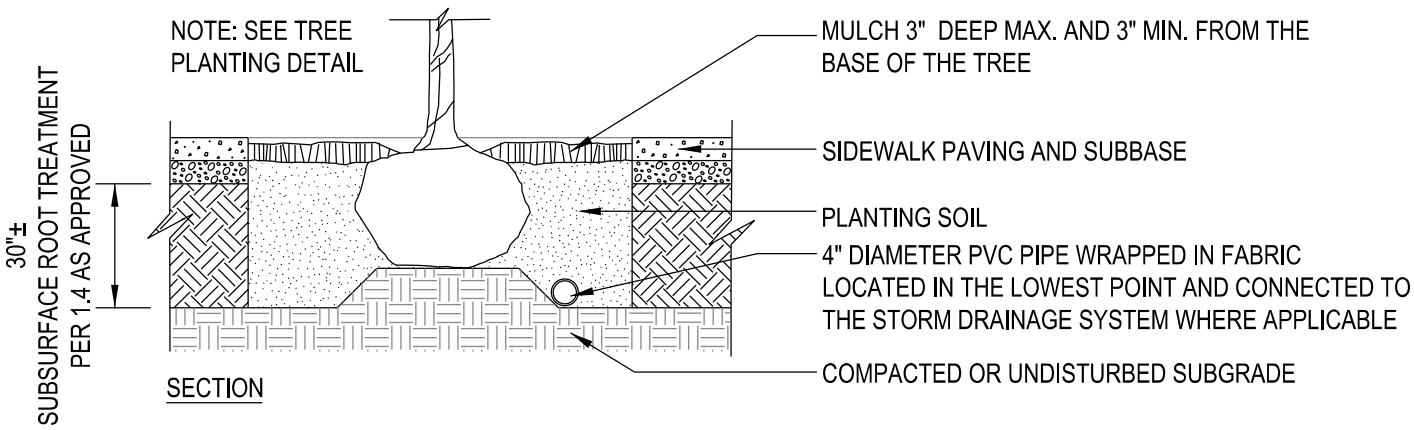


ASSEMBLY DETAIL

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

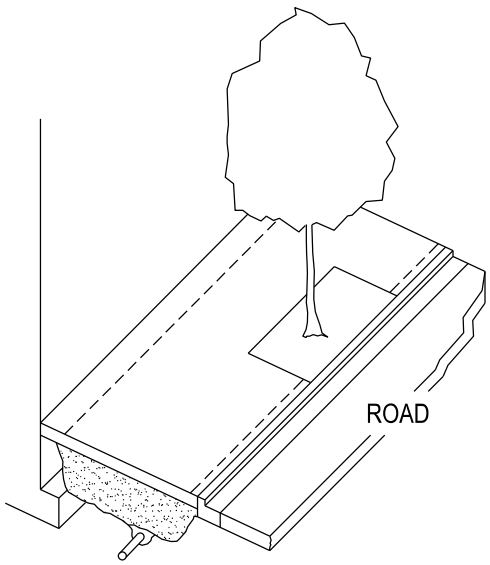
CITY OF RALEIGH
STANDARD DETAIL

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

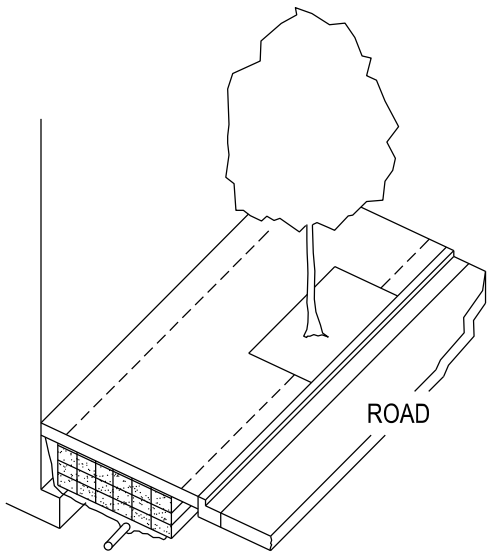


NOTES:

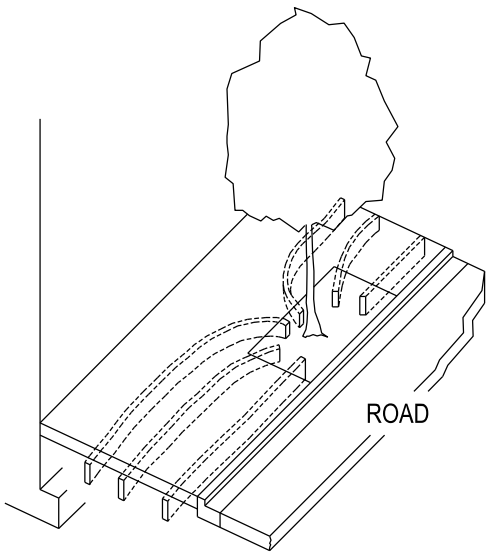
1. A SITE SPECIFIC PLAN MUST BE DEVELOPED TO ENSURE THAT:
   - 1.1. EACH TREE IS PROVIDED A MIN. ROOT-ACCESSIBLE SOIL VOLUME OF 600 CUBIC FEET.
   - 1.2. THE TREE ROOT AREA BENEATH THE SIDEWALK IS EXPANDED TO MAXIMIZE ROOT ACCESSIBLE SOIL SPACE UNDER THE PAVEMENT.
   - 1.3. CONNECT SOIL SPACE FOR ROOT 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

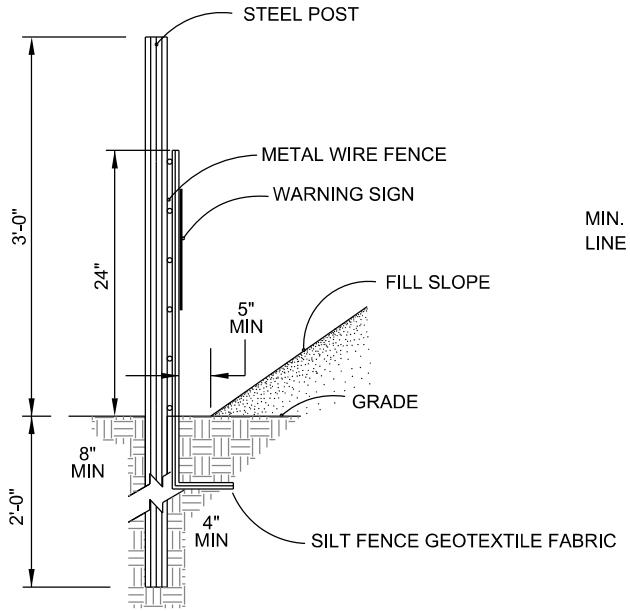


ROOT CHANNELING/PATHWAYS

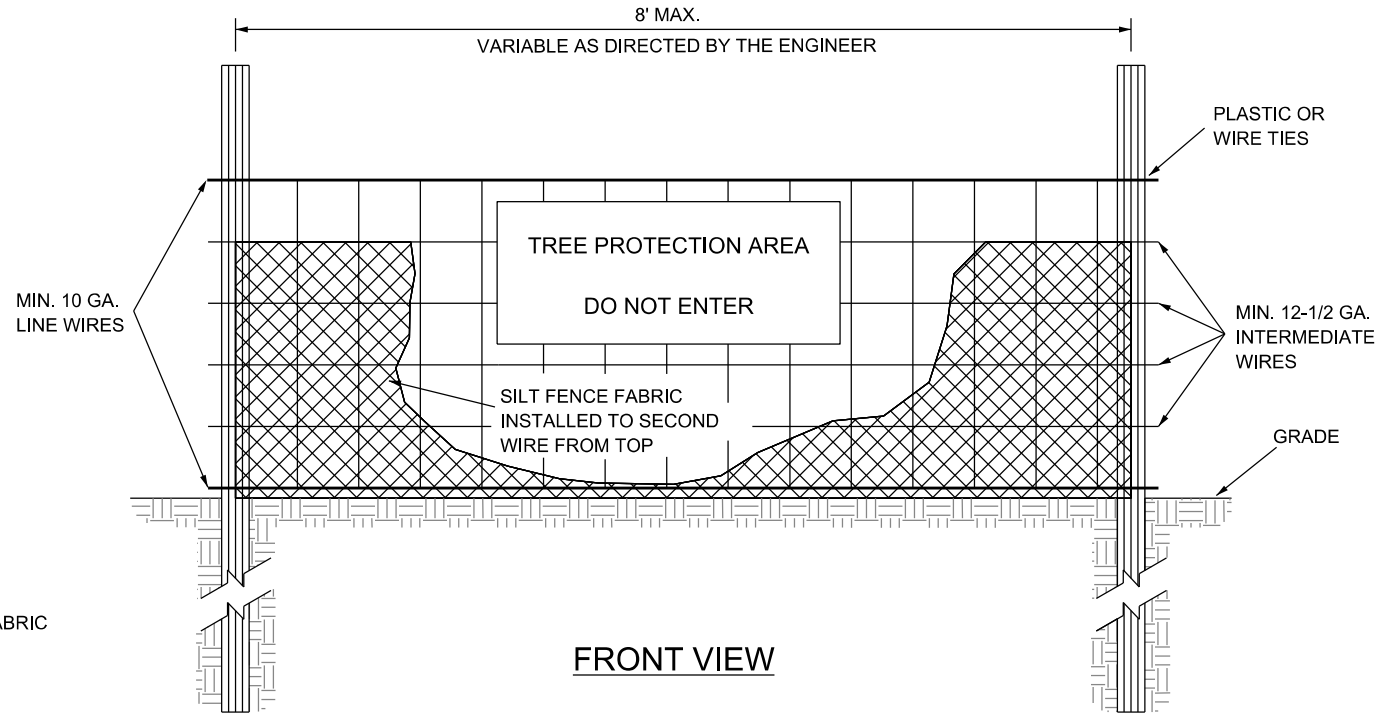
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER: TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	TREE PLANTING IN SIDEWALK WITHIN ROW	
	TPP-07	

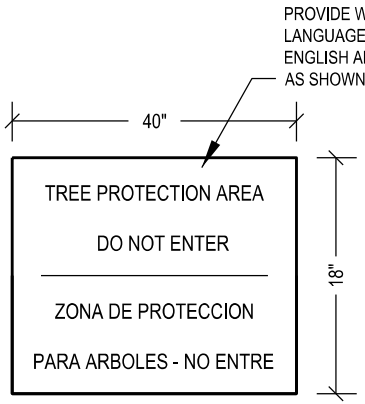


SIDE VIEW



FRONT VIEW

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.



WARNING SIGN DETAIL

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.)

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

CITY OF RALEIGH
STANDARD DETAIL

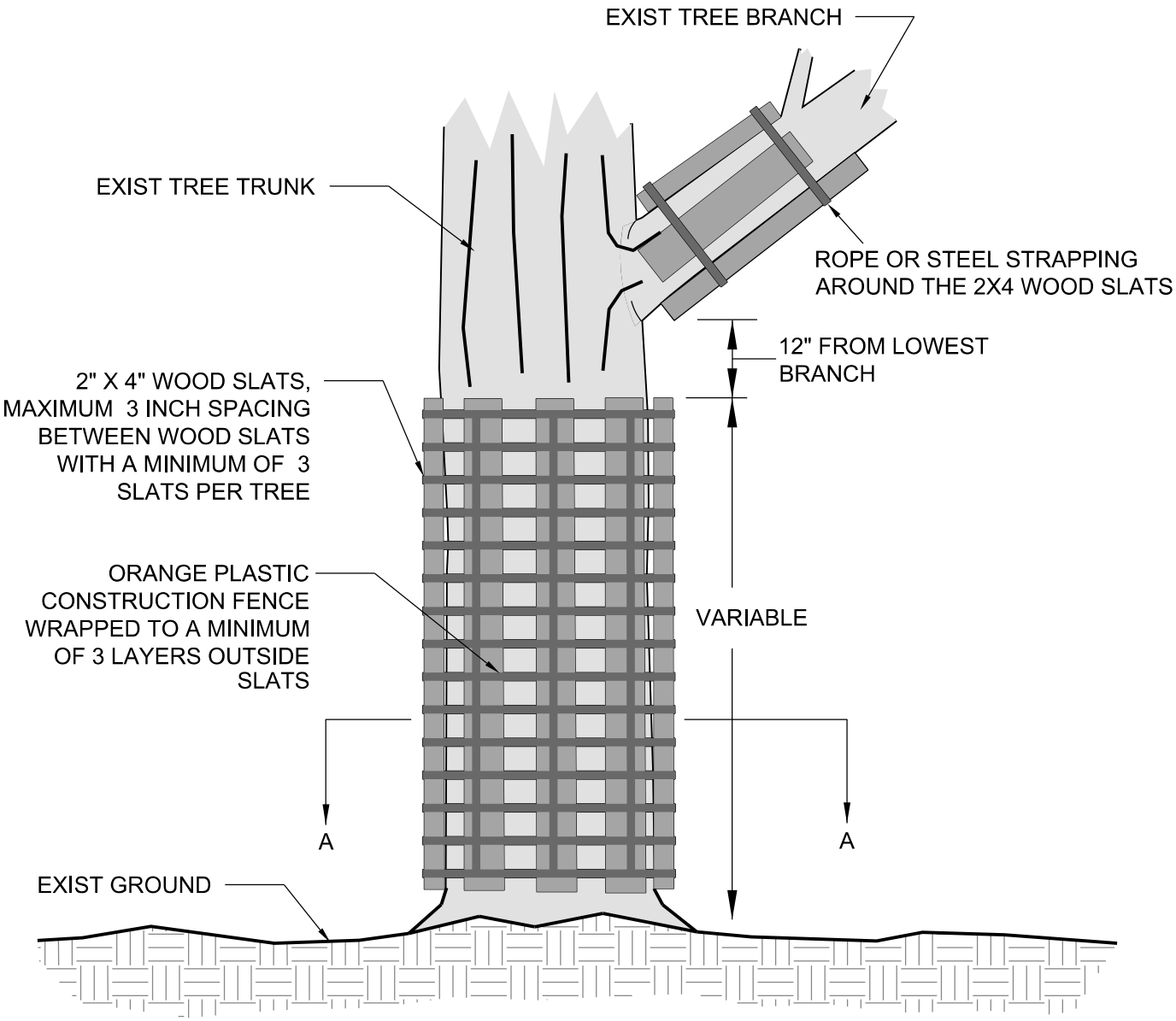
REVISIONS

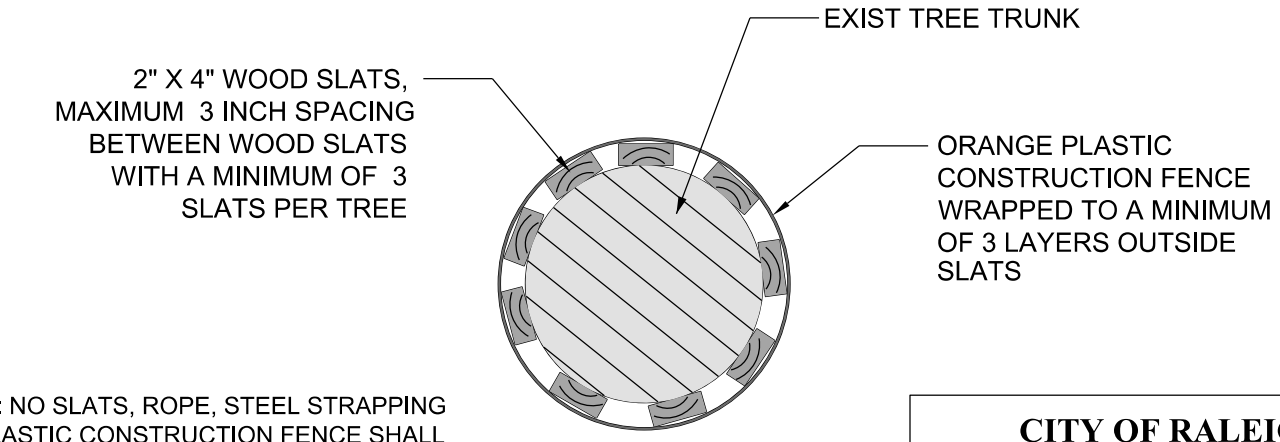
DATE: 8/2020

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	