2016 ROAD & BRIDGE STANDARDS

CG-12

GENERAL NOTES:

1. THE DETECTABLE WARNING SHALL BE PROVIDED BY TRUNCATED DOMES.
2. ALL DETECTABLE WARNING SURFACE PRODUCTS SHALL MEET THE REQUIREMENTS OF SECTION 904 OF THE SPECIFICATIONS FOR CS-12 DETECTABLE WARNING SURFACE. DETECTABLE WARNING SURFACE PRODUCTS USED SHALL BE FROM THE MATERIALS APPROVED PRODUCT LIST NUMBER 7(2).
3. SLOPING SIDES OF CURB RAMP MAY BE POURED MONOLITHICALLY WITH RAMP, THROUGH BY USING PERMISSIBLE CONSTRUCTION JOINT WITH REQUIRED BARS.
4. REQUIRED BARS ARE TO BE NO. 5 X 8' PLACED 1' CENTER TO CENTER ALONG FLOOR/SIDE JOINT. MINIMUM RAMP FLOOR, MID-DEPTH OF RAMP FLOOR, MINIMUM CONCRETE COVER 3".
5. ROADWAY CURB / CURB AND GUTTER SLOPE TRANSITIONS ADJACENT TO CURB RAMPS ARE INCLUDED IN PAYMENT FOR CURB / CURB AND GUTTER.
6. CURB RAMPS ARE REQUIRED FOR SIDEWALKS AND SHARED USE PATHS. THE WIDTH OF THE CURB RAMP SHALL MATCH SIDEWALK WIDTH WHEN CURB RAMPS ARE USED IN CONJUNCTION WITH A SHARED USE PATH, THE MINIMUM WIDTH SHALL BE THE WIDTH OF THE SHARED USE PATH.
7. DETECTABLE WARNINGS SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP LANDING FLOOR.
8. CURB RAMPS WILL BE INSTALLED AND LOCATED WITHIN PEDESTRIAN CROSSWALKS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER TO BE RAMPS AVOID OBSTRUCTED BOARD VEHICLE STOP LINES, LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC.
9. RAMPS MAY BE PLACED ON RADIAL OR TANGENTIAL SECTIONS PROVIDED THAT THE CURB OPENING IS PLACED WITHIN THE LIMITS OF THE CROSSWALK AND THAT THE SLOPE AT THE CONNECTION OF THE CURB OPENING IS PERPENDICULAR TO THE CURB.
10. DETECTABLE WARNING SURFACE PANELS SHALL BE INSTALLED FLUSH WITH THE BACK OF CURB.
11. WHERE CURB RAMPS INTERSECT A RADIAL SECTION OF CURB AT ENTRANCES ON STREET CONNECTIONS THE DETECTABLE WARNING SURFACE SHALL HAVE A RADIAL EDGE TO MATCH THE FIELD CONDITIONS. THE PANELS SHALL BE MANUFACTURED TO MATCH THE RADIUS OF CURB. SEE CG-12-1 AND PAGES 204.05 AND 204.07 FOR METHODS OF INSTALLING DETECTABLE WARNINGS ON A RADIUS.

NOTE: COMPONENTS OF CURB RAMPS (CORNER OF THE FOLLOWING: CURB RAMP, 12:1 SIDEWALK SLOPES, 5% RONDES, AND A 5% SQUARE YARDS) CURB WHEN REQUIRED COST OF SQ.Y. IN LINEAR FEET(1) DETECTABLE WARNING SURFACE (AREA IN SQUARE YARDS) EACH OF THESE ITEMS SHALL BE CONSIDERED A SEPARATE PAY ITEM AND SHOULD BE SUMMARIZED FOR EACH CURB CUT RAMP.

TYPE A PERPENDICULAR

TYPE B PARALLEL

TYPE C PARALLEL & PERPENDICULAR

DETECTABLE WARNING INSTALLED ON A RADIUS

TRUNCATED DOME DETAIL

DETECTABLE WARNING DETAIL

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT ROAD AND BRIDGE STANDARDS

CG-12 DETECTABLE WARNING SURFACE (GENERAL NOTES)

VIRGINIA DEPARTMENT OF TRANSPORTATION

SHEET 1 OF 5	REVISION DATE	SPECIFICATION REFERENCE
204.01	04/19	105 502 504

2016 ROAD & BRIDGE STANDARDS

2016 ROAD & BRIDGE STANDARDS

CG-12

PERMISSIBLE CONSTRUCTION JOINT

#5 DOWEL, 8" LONG @ 12" C-C

TRANSITION GUTTER PAN SLOPE TO 20:1 THROUGH RAMP LENGTH

GUTTER PAN MAXIMUM SLOPE 20:1

SECTION A-A

SECTION B-B

TYPICAL DESIGN

TYPE A WITH BUFFER STRIP

NOTES:

1. FOR GENERAL NOTES ON THE DETECTABLE WARNING SURFACE, SEE SHEET 1 OF 5.
2. THIS DESIGN TO BE USED FOR CONSTRUCTION THAT INCORPORATES WIDER SIDEWALK, LANDING THAT IS REQUIRED AT TOP OF LONG RAMP. MINIMUM CURB RAMP LENGTH 8 FEET FOR NEW CONSTRUCTION.
3. GUTTER PAN SHALL BE A MAXIMUM SLOPE OF 20:1 AT THE RAMP OPENING.
4. DIAGONAL PLACEMENT IS NOT PERMITTED.

EXAMPLE INSTALLATION METHODS - SEE PLANS FOR LAYOUT

TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK

TYPICAL PLACEMENT AT INTERSECTION WITHIN CROSSWALK (WITH BUFFER STRIP)

A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE.

VDOT ROAD AND BRIDGE STANDARDS

CG-12 DETECTABLE WARNING SURFACE

TYPE A (PERPENDICULAR) APPLICATION

VIRGINIA DEPARTMENT OF TRANSPORTATION

SPECIFICATION REFERENCE	REVISION DATE	SHEET 2 OF 5
105 502 504	04/19	204.02

2016 ROAD & BRIDGE STANDARDS

1. PUBLIC EASEMENT WIDTH SHALL BE DETERMINED BASED ON 1:1 SIDE SLOPE EXTENDING FROM THE FINISHED GRADE TO OUTSIDE EDGE OF PIPE (NOMINAL PIPE DIAMETER) ROUNDED UP TO THE NEAREST 1' INCREMENT, OR 20' MINIMUM, WHICHEVER IS GREATER.
2. THIS EASEMENT SHALL EXTEND ALONG THE ENTIRE LENGTH OF THE SUBJECT PIPE AT LEAST ONE HALF THE DISTANCE OF EASEMENT PAST CENTER OF LAST MANHOLE OR WATER APPURTENANCE.

EASEMENT WIDTH (20') MIN.

FINISHED GRADE

FULL DEPTH

D = PIPE DIAMETER

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SANITARY SEWER AND WATER LINE EASEMENTS — G-3

01/01/14

1. TRACER WIRES SHALL BE INSTALLED USING MANHOLES, TRACER WIRE ACCESS BOXES, VALVE BOXES OR VAULTS, WATER METERS AND FIRE HYDRANTS AS ACCESS POINTS.
2. FOR WATER AND SEWER INSTALLED BY OPEN TRENCHING, HORIZONTAL DIRECTIONAL DRILLING, OR PIPE BURSTING, TRACER WIRE SHALL BE NEPTCO TRACE-SAFE WATER BLOCKING TRACER WIRE OR APPROVED EQUAL.
3. SPLICES SHALL ONLY BE MADE WITH GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH A WOVEN POLYESTER FIBER CORE SUCH AS NEPTCO TRACE-SAFE WATER BLOCKING CONNECTORS OR APPROVED EQUAL. SPLICES SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING CONTINUITY AT ALL SPLICE LOCATIONS.
4. WHERE HDPE PIPE IS INSTALLED WITHOUT STEEL CASING PIPE, SUCH AS A DIRECTIONALLY DRILLED CROSSINGS, AND CONNECTED TO DUCTILE IRON PIPE ON EACH END, TRACER WIRE SHALL BE INSTALLED ALONG FULL LENGTH OF HDPE PIPE WITH AN ACCESS POINT INSTALLED AT EACH HDPE/DUCTILE IRON TRANSITION. TRACER WIRE SHALL BE CONNECTED TO THE ACCESS POINT IN ACCORDANCE WITH THIS DETAIL, ANY TRANSITION FROM DUCTILE IRON MAIN TO NON-DUCTILE IRON MAIN SHALL HAVE AN ACCESS POINT TO BEGIN TRACER WIRE.
5. AS-BUILTS SHALL SHOW TRACER WIRE(S) LOCATION AND ACCESS POINT(S), ALONG WITH BUTT SPLICE LOCATIONS.
6. THE TRACER WIRE SHALL BE PLACED ALONG THE LOWER QUADRANT OF THE PIPE. THE WIRE SHALL NOT TOUCH THE PIPE, BUT SHALL BE A MAXIMUM OF 6" FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.
7. WIRE SHALL BE BROUGHT TO THE SURFACE EVERY **FIVE-HUNDRED (500) FEET** AND PLACED IN A WATER METER BOX OR A DRAINAGE & WATER SOLUTIONS, INC. (OR APPROVED EQUAL) ALL CAST IRON TRACER WIRE ACCESS BOX.
8. THE TRACER WILL BE TESTED BY THE PARTICIPATING UTILITY AS PART OF THE PROJECT'S FINAL ACCEPTANCE. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING ALL CONTINUITY OF TRACER WIRE.
9. THE GROUND WIRE SHALL BE #6 AWG COPPER WIRE AND SHALL BE OF ADEQUATE LENGTH TO EXTEND A MINIMUM OF (5) FIVE FEET BEYOND THE TOP OF THE STRUCTURE. THE END OF THE GROUND WIRED SHALL CONNECT TO THE GROUND BAR OR LID TERMINAL USING A BURNDY KAGU MECHANICAL TERMINAL LUG.
10. A GROUND ROD SHALL BE INSTALLED AT EACH LOCATION WHERE GROUND WIRE SURFACES AND CONNECTS TO GROUND BAR. GROUND ROD SHALL BE COPPER COATED WITH A MINIMUM DIAMETER OF 5/8" AND SHALL BE BURIED A MINIMUM OF FOUR (4) FEET INTO THE GROUND.
11. THE GROUND BAR SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED USING SS [" X 1]" SS HEX TAPCON. THE FOLLOWING SHALL BE INSTALLED IN (4) FOUR CENTER HOLES: 10-32SS NUTS, #10 SS WASHERS AND 10-32 X [SS PHILLIPS. THE FOURTH HOLE SHALL HAVE A BURNDY KAGU MECHANICAL TERMINAL LUG FOR THE #6 AWG GROUND WIRE. THE ASSEMBLY CAN BE ACQUIRED AT RCS INDUSTRIAL SUPPLY, INC. (540-353-0683) - CLAMP RFC-11. THE ENDS OF THE TRACER WIRES SHALL BE PLACED IN THE GROUND BAR AS SHOWN BELOW.
12. IF USING TRACER WIRE ACCESS BOX AS ACCESS POINT, GROUND BAR WILL NOT BE REQUIRED. WIRES SHALL BE CONNECTED AS SHOWN BELOW. TRACER WIRE SHALL BE OF ADEQUATE LENGTH TO EXTEND FIVE (5) FEET ABOVE THE TOP OF ACCESS BOX.
13. TWO WRAPS OF TRACER WIRE SHALL BE WRAPPED SNUGGLY AROUND BASE OF HYDRANT. WIRE SHALL NOT BE LEFT IN A WAY THAT WOULD INTERFERE WITH MOWING AROUND HYDRANT.
14. WHEN USING ALL DUCTILE MAIN, TRACER WIRE FOR SERVICES SHALL BE 12 AWG COPPER TRACER WIRE. TRACER WIRE SHALL HAVE BARE WIRE CONTACT TO DUCTILE MAIN.

GROUND BAR

LOCATING CLIP (TS19-IL-LC-C)

GROUND WIRE

TO GROUNDING SOURCE

5' TRACE SAFE

TRACER WIRE ACCESS BOX LID

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TRACER WIRE FOR NON-METALLIC PRESSURE PIPE — G-4

09/06/16

BLUE = TRACE SAFE TRACER WIRE
BLACK = GROUND WIRE & GROUND BAR
TS19-IL-LC-C = TRACE SAFE LOCATING CLIP AT GROUND BAR
TS19-C = SERVICE LATERAL TRACE SAFE CONNECTOR
GROUND WIRE = #6 AWG COPPER WIRE
NOTE: LEAVE FIVE FEET (5') OF EXCESS TRACER WIRE COILED UP IN VAULT

TS19-C

TS19-C

GROUND BAR (TYP.)

LOCATING CLIP FRONT VIEW (TS19-IL-LC-C)

LOCATING CLIP (TYP.) (TS19-IL-LC-C)

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TRACER WIRE SAMPLE TEE/CROSS INTERSECTION — G-4A

09/06/16

1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE, OR CRUSHER RUN.
3. IN AREAS SUBJECTED TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS FROM BOTTOM OF TRENCH TO 1' ABOVE THE PIPE AND THE REMAINING SHALL BE PLACED IN 12" LIFTS AND SHALL BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
4. BEDDING REQUIREMENTS FOR DUCTILE IRON WATER LINE ARE DEPENDENT ON MANUFACTURER'S BEDDING CRITERIA.
5. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
6. THE TRACER WIRE SHALL BE PLACED ALONG THE LOWER QUADRANT OF THE PIPE. THE WIRE SHALL NOT TOUCH THE PIPE, BUT SHALL BE A MAXIMUM OF 6" FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.

FINISHED GRADE

NORMAL SOIL CONDITIONS

3' MIN.

(4" MIN.- 6" IN ROCK CONDITIONS)

WIDTH OF TRENCH EXCAVATION PIPE DIA. + 6" EACH SIDE (MINIMUM)

NON-DETECTABLE WARNING TAPE, 3 TO 5 MILS IN THICKNESS. TO BE INSTALLED APPROX. 24" ABOVE PIPE AND AT A MINIMUM OF 6" BELOW GRADE (ALL PIPE)

BACKFILL ONLY WITH APPROVED MATERIAL PER APPLICABLE LOCALITY OR VDOT STANDARDS

PIPE SIZE & MATERIAL AS SHOWN ON PLAN

FOR WATERLINES INSTALL BEDDING STONE TO SPRING LINE OF PIPE AT A MINIMUM, OR PER MANUFACTURER'S RECOMMENDATION FOR SEWER LINES BEDDING SHALL BE MIN. 6" ABOVE PIPE

LOCATION OF TRACER WIRE WITH NON-METALLIC PRESSURE PIPE. TRACER WIRE NOT REQUIRED FOR TYPICAL GRAVITY SANITARY SEWER. SEE DETAIL G-4 FOR ADDITIONAL REQUIREMENTS

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL OUTSIDE OF PAVED AREAS — G-11

08/01/15

APPURTENANCE

P.L.

DOUBLE WATER METER

SEWER CLEANOUT (DOUBLE LATERAL)

E.O.P.

S.S.M.H.

R.O.W.

SINGLE WATER METER

WATER LINE

SEWER MAIN

C/L PAVEMENT

E.O.P.

R.O.W.

PUE FOR OTHER UTILITIES

R.O.W. OR LIMITS OF WORKING EASEMENT

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PUBLIC WATER AND SANITARY SEWER STANDARD CUL-DE-SAC CONFIGURATION — G-2

01/01/14

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MOUNTAIN BROOK VILLAS
COMPREHENSIVE DEVELOPMENT PLAN
ROANOKE, VIRGINIA

City of Roanoke
Planning, Building, & Development
COMPREHENSIVE DEVELOPMENT PLAN
APPROVED
by Ken Richardson 06/07/2021

No.	Date	Description	By

GENERAL DETAIL

COMMONWEALTH OF VIRGINIA
DOUGLAS R. MEREDITH, JR.
Lic. No. 22942
4-21-21
PROFESSIONAL ENGINEER

Drawn By	MCP
Checked By	RCW
Project Date	08/17/20
Drawing	4343
Commission No.	4343

C-17

Sheet 20 of 27