CITY OF DELAWARE OHIO

Public Works Department

Part 3:
Land Development Standard Drawings

December 31, 2018

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CITY OF DELAWARE OHIO

Public Works Department

Standard Drawings Index

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CITY OF DELAWARE OHIO

Public Works Department

GENERAL
STANDARD DRAWINGS

12/31/2018 Edition

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EST 1808

CITY OF

DELAWARE

OHIO

DAVID M. EFLAND, AICP — DATE
DIRECTOR OF PLANNING AND COMMUNITY DEVELOPMENT

WILLIAM L. FERRIGNO, P.E. — DATE
PUBLIC WORKS DIRECTOR/CITY ENGINEER
OHIO REGISTERED PROFESSIONAL ENGINEER NO. 56942

MATTHEW B. WEBER, P.E. — DATE
DEPUTY CITY ENGINEER
OHIO REGISTERED PROFESSIONAL ENGINEER NO. 65563

BLAKE JORDAN, P.E. — DATE
PUBLIC UTILITIES DIRECTOR
OHIO REGISTERED PROFESSIONAL ENGINEER NO. 77515

Approval of these plans does not constitute assurance to operate as intended. The reviewer does not accept responsibility for the integrity of the plans.

Public Works Department

CITY OF DELAWARE OHIO EST 1808

STANDARD DETAIL

LAND DEVELOPMENT PROJECTS

INFRASTRUCTURE OWNERSHIP CHART

GENERAL

GEN-2.0

Rev. 12/31/2018

INFRASTRUCTURE OWNERSHIP CHART

INFRASTRUCTURE ITEM	PUBLIC	PRIVATE	COMMENTS
SANITARY SEWER		X	8" MAIN CONNECTING S.E. HIGHLAND SEWER TO THE WEST
STORM SEWER	X		EXCEPT RUN 7-15 AND 25 - 30 WHICH ARE PUBLIC
WATER	X		CONNECTED TO 16-INCH MAIN ALONG CHESHIRE (LOOPED)
STREETS		X	EXCEPT BLUE STREET WHICH IS PUBLIC

NOTE: THE CITY RESERVES THE RIGHT TO ENSURE ALL INFRASTRUCTURE IS PROPERLY CONSTRUCTED AND INSTALLED, REGARDLESS OF OWNERSHIP.

PLAN REVISION SCHEDULE

CHANGE #	PREPARED BY	DESCRIPTION OF CHANGE	PAGE #	APPROVED BY	DATE

EST 1808
CITY OF
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Public Works Department

STANDARD DETAIL

LAND DEVELOPMENT PROJECTS
REVISION BLOCK

GENERAL

GEN-3.0

Rev. 12/31/2018

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CITY OF DELAWARE OHIO

Public Works Department

ROADWAY
STANDARD DRAWINGS

12/31/2018 Edition

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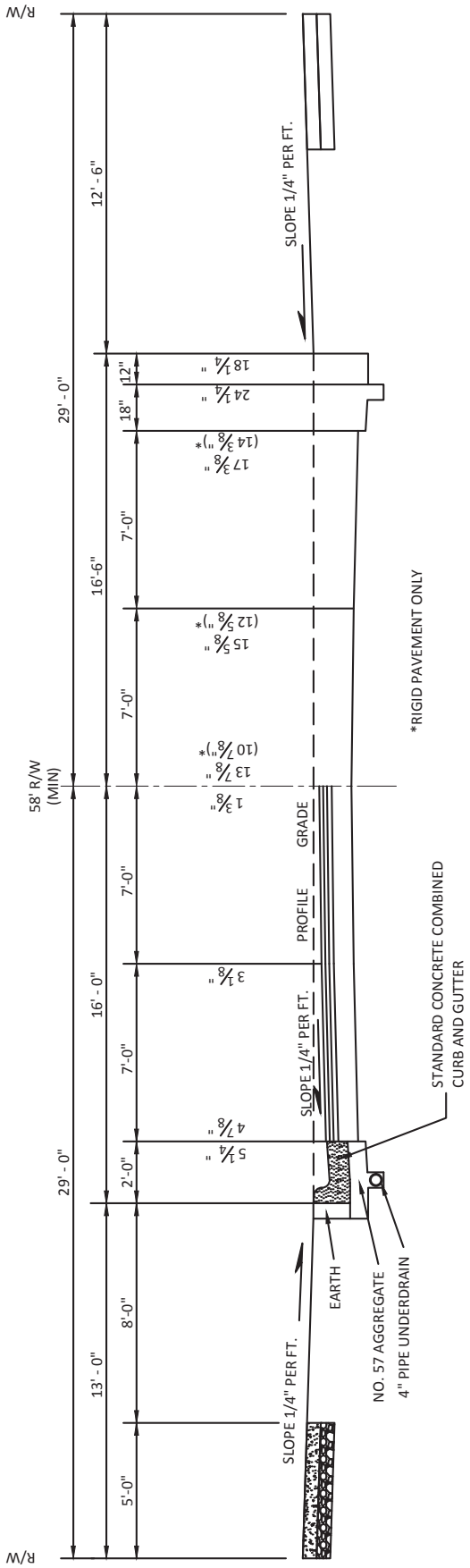
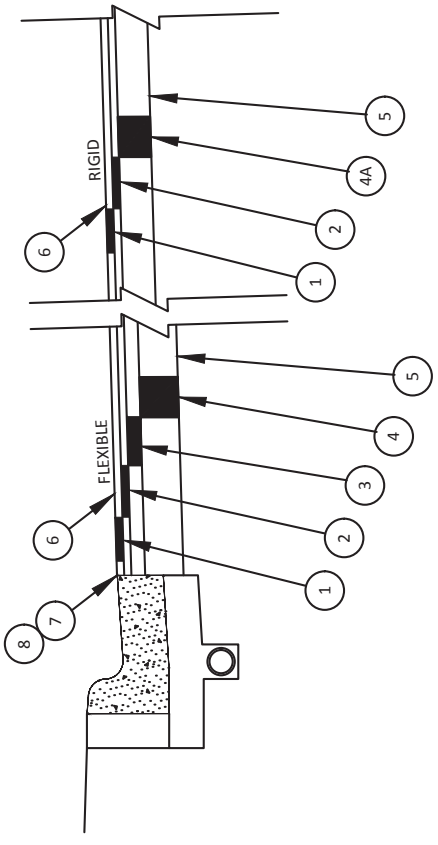


PAVEMENT SECTION

1. 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG64-22
2. 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)
3. 3" ITEM 301, ASPHALT CONCRETE BASE
4. 6" ITEM 304, AGGREGATE BASE
4A. 6" ITEM 305, CONCRETE BASE, CLASS COC 6 OR ITEM 307, ROLLER COMPACTED CONCRETE (RCC)
5. ITEM 204, SUBGRADE COMPACTION
6. ITEM 1540, ASPHALT REJUVENATING AGENT
7. ITEM 407, TACK COAT (FACE OF CURB PRIOR TO PAVING)
8. ITEM 423, CRACK SEALING, TYPE I (EDGE JOINTS)



PAVEMENT DETAIL

EST 1808
CITY OF
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OHIO
Public Works Department

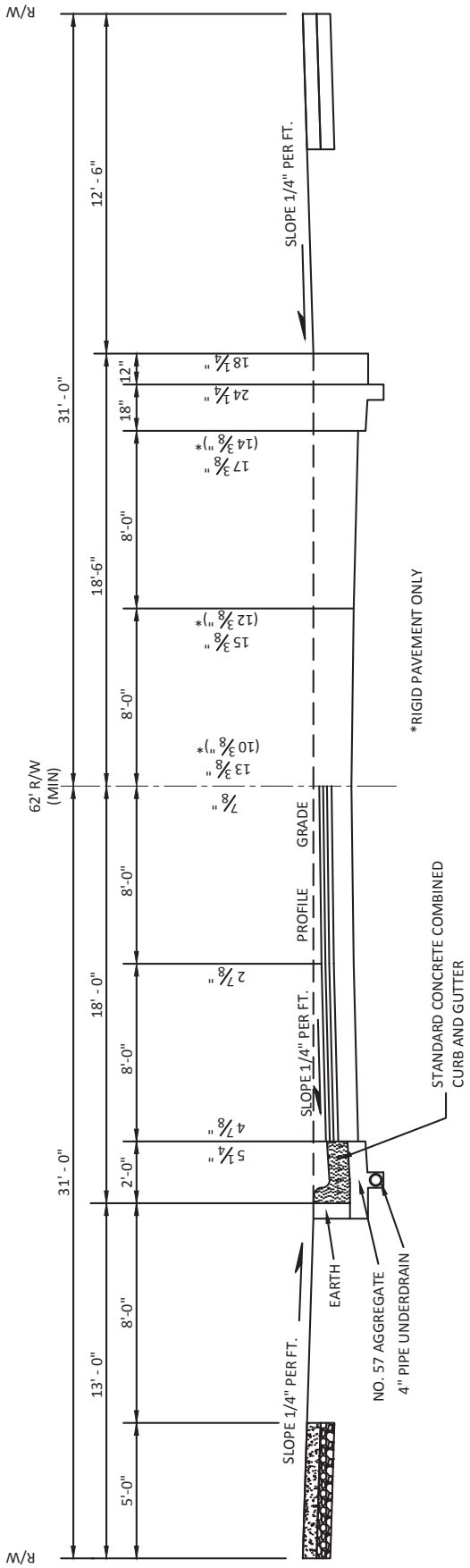
STANDARD DETAIL

28'-0" LOCAL PAVEMENT SECTION

ROADWAY

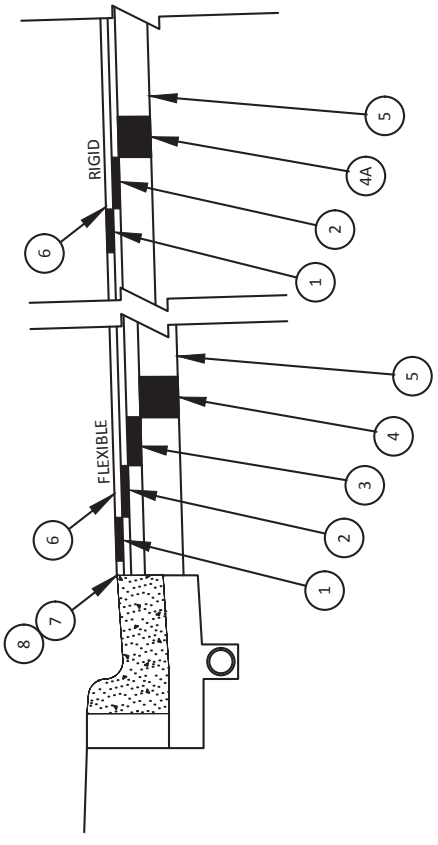
RDWD-1.0

Revised 12/31/2018



PAVEMENT SECTION

1. 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG64-22
2. 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)
3. 3" ITEM 301, ASPHALT CONCRETE BASE
4. 6" ITEM 304, AGGREGATE BASE
4A. 6" ITEM 305, CONCRETE BASE, CLASS COC 6 OR ITEM 307, ROLLER COMPACTED CONCRETE (RCC)
5. ITEM 204, SUBGRADE COMPACTION
6. ITEM 1540, ASPHALT REJUVENATING AGENT
7. ITEM 407, TACK COAT (FACE OF CURB PRIOR TO PAVING)
8. ITEM 423, CRACK SEALING, TYPE I (EDGE JOINTS)



PAVEMENT DETAIL

EST 1808
CITY OF DELAWARE OHIO
Public Works Department

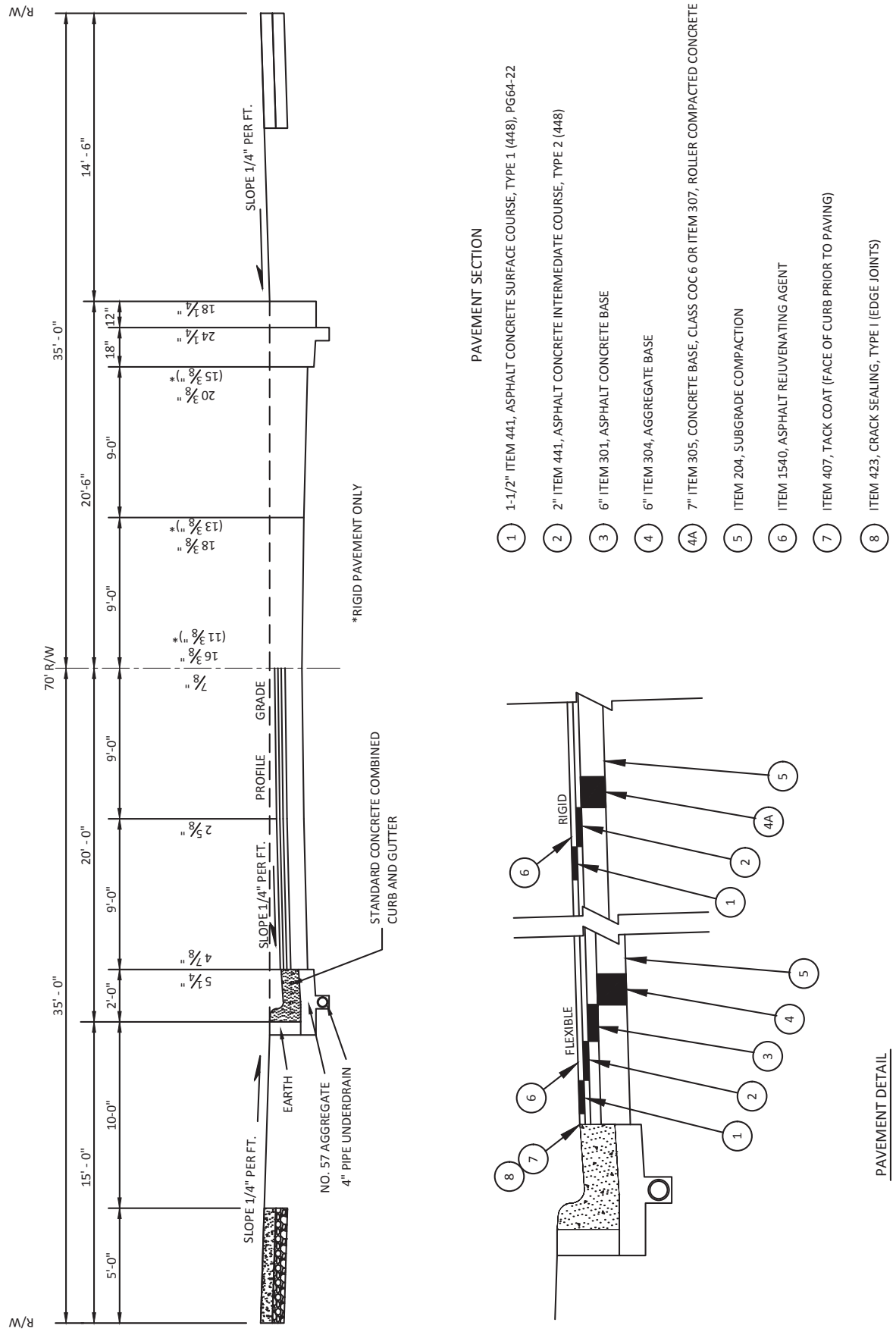
STANDARD DETAIL

32'-0" LOCAL PAVEMENT SECTION

ROADWAY

RDWD-2.0

Revised 12/31/2018



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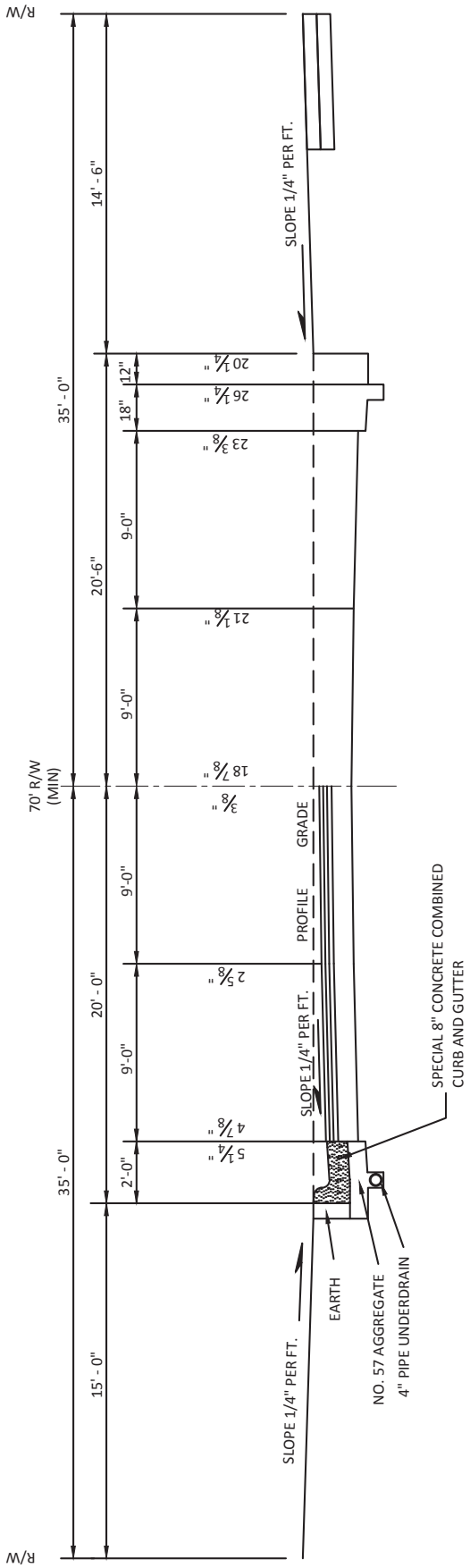
STANDARD DETAIL

36'-0" COLLECTOR PAVEMENT SECTION

ROADWAY

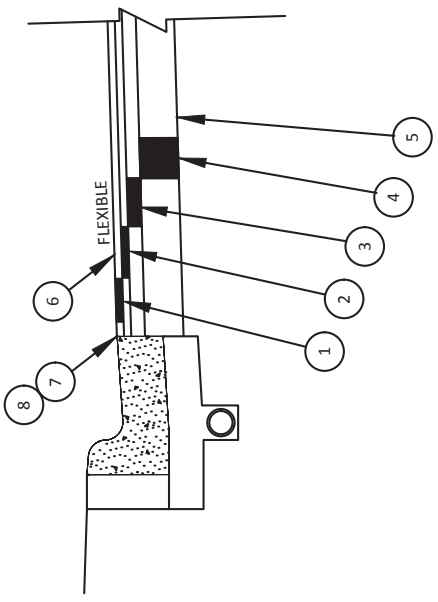
RDWD-3.0

Revised 12/31/2018



PAVEMENT SECTION

1. 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG70-22
2. 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)
3. 6" ITEM 301, ASPHALT CONCRETE BASE
4. 9" ITEM 304, AGGREGATE BASE
5. ITEM 204, SUBGRADE COMPACTION
6. ITEM 1540, ASPHALT REJUVENATING AGENT
7. ITEM 407, TACK COAT (FACE OF CURB PRIOR TO PAVING)
8. ITEM 423, CRACK SEALING, TYPE I (EDGE JOINTS)



PAVEMENT DETAIL

EST 1808
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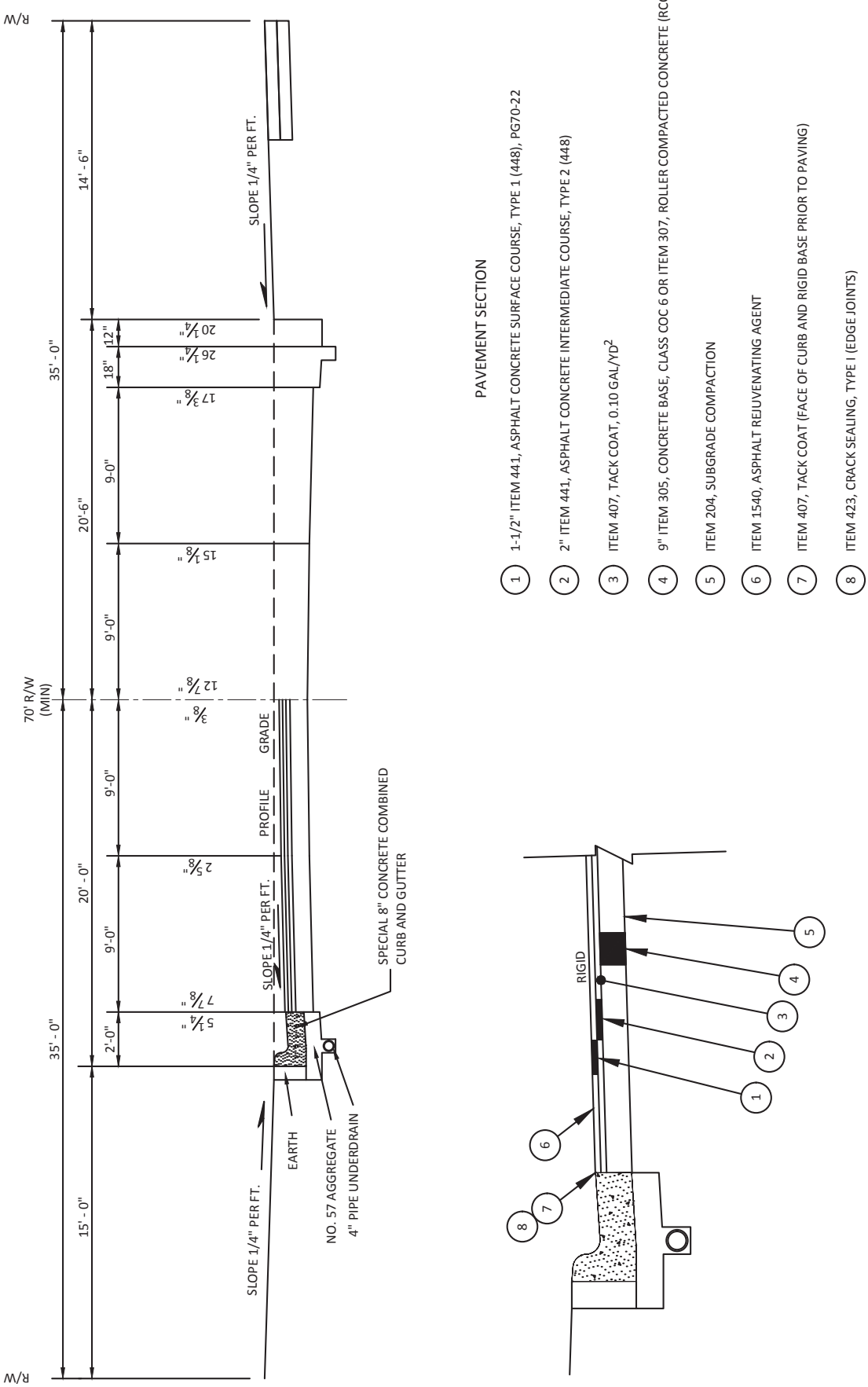
STANDARD DETAIL

36'-0 ARTERIAL/INDUSTRIAL FLEXIBLE PAVEMENT W/ CURBS

ROADWAY

RDWD-4.0

Revised 12/31/2018



PAVEMENT SECTION

1. 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG70-22
2. 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)
3. ITEM 407, TACK COAT, 0.10 GAL/YD^2
4. 9" ITEM 305, CONCRETE BASE, CLASS COC 6 OR ITEM 307, ROLLER COMPACTED CONCRETE (RCC)
5. ITEM 204, SUBGRADE COMPACTION
6. ITEM 1540, ASPHALT REJUVENATING AGENT
7. ITEM 407, TACK COAT (FACE OF CURB AND RIGID BASE PRIOR TO PAVING)
8. ITEM 423, CRACK SEALING, TYPE I (EDGE JOINTS)

PAVEMENT DETAIL

EST 1808
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Public Works Department

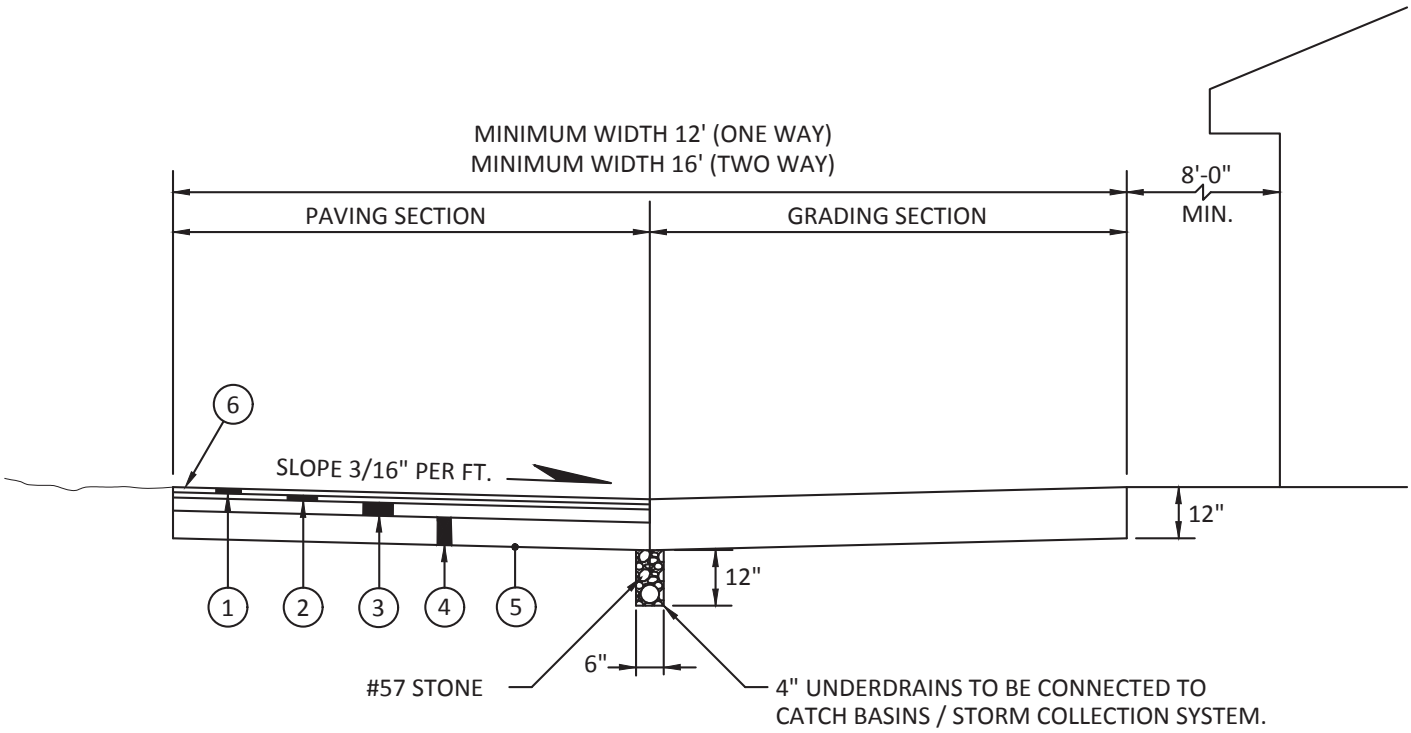
STANDARD DETAIL

36'-0 ARTERIAL/INDUSTRIAL RIGID PAVEMENT W/ CURBS

ROADWAY

RDWD-5.0

Revised 12/31/2018



ALLEY PAVEMENT SECTION

(1) 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG64-22

(2) 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)

(3) 3" ITEM 301, ASPHALT CONCRETE BASE

(4) 6" ITEM 304, AGGREGATE BASE

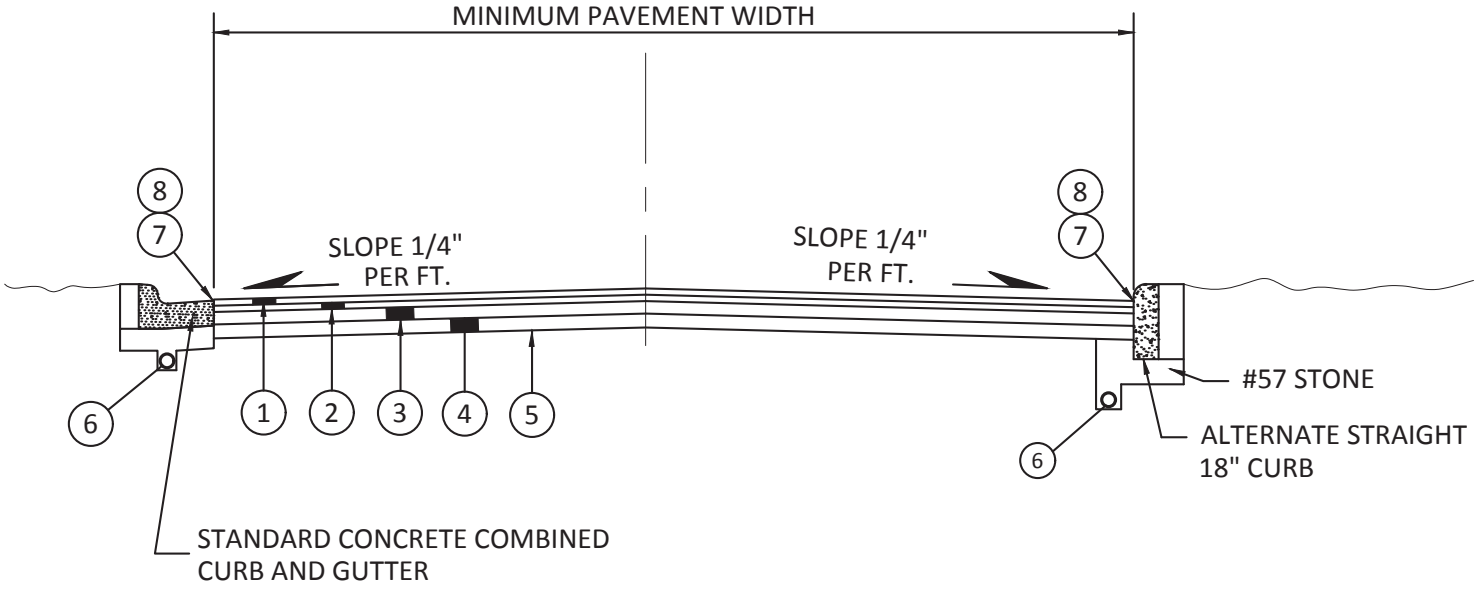
(5) ITEM 204, SUBGRADE COMPACTION

(6) ITEM 1540, ASPHALT REJUVENATING AGENT

NOTE:
MINIMUM PAVEMENT RADIUS AT CORNERS 20'-0"

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL ALLEY PAVEMENT SECTION (PUBLIC & PRIVATE)	ROADWAY RDWD-6.0 Revised 12/31/2018

MINIMUM PAVEMENT WIDTH	
ONE WAY/NO PARKING	12'-0"
TWO WAY/NO PARKING	20'-0"
PARKING ON BOTH SIDES	28'-0"



PRIVATE ROAD PAVEMENT SECTION WITH CURB

(1) 1-1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG64-22

(2) 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)

(3) 3" ITEM 301, ASPHALT CONCRETE BASE

(4) 6" ITEM 304, AGGREGATE BASE

(5) ITEM 204, SUBGRADE COMPACTION

(6) 4" UNDERDRAIN TO BE CONNECTED TO STORM SEWER SYSTEM

(7) ITEM 407, TACK COAT (FACE OF CURB PRIOR TO PAVING)

(8) ITEM 423, CRACK SEALING, TYPE I (EDGE JOINTS)

NOTE:
MINIMUM PAVEMENT RADIUS AT CORNERS 20'-0"

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

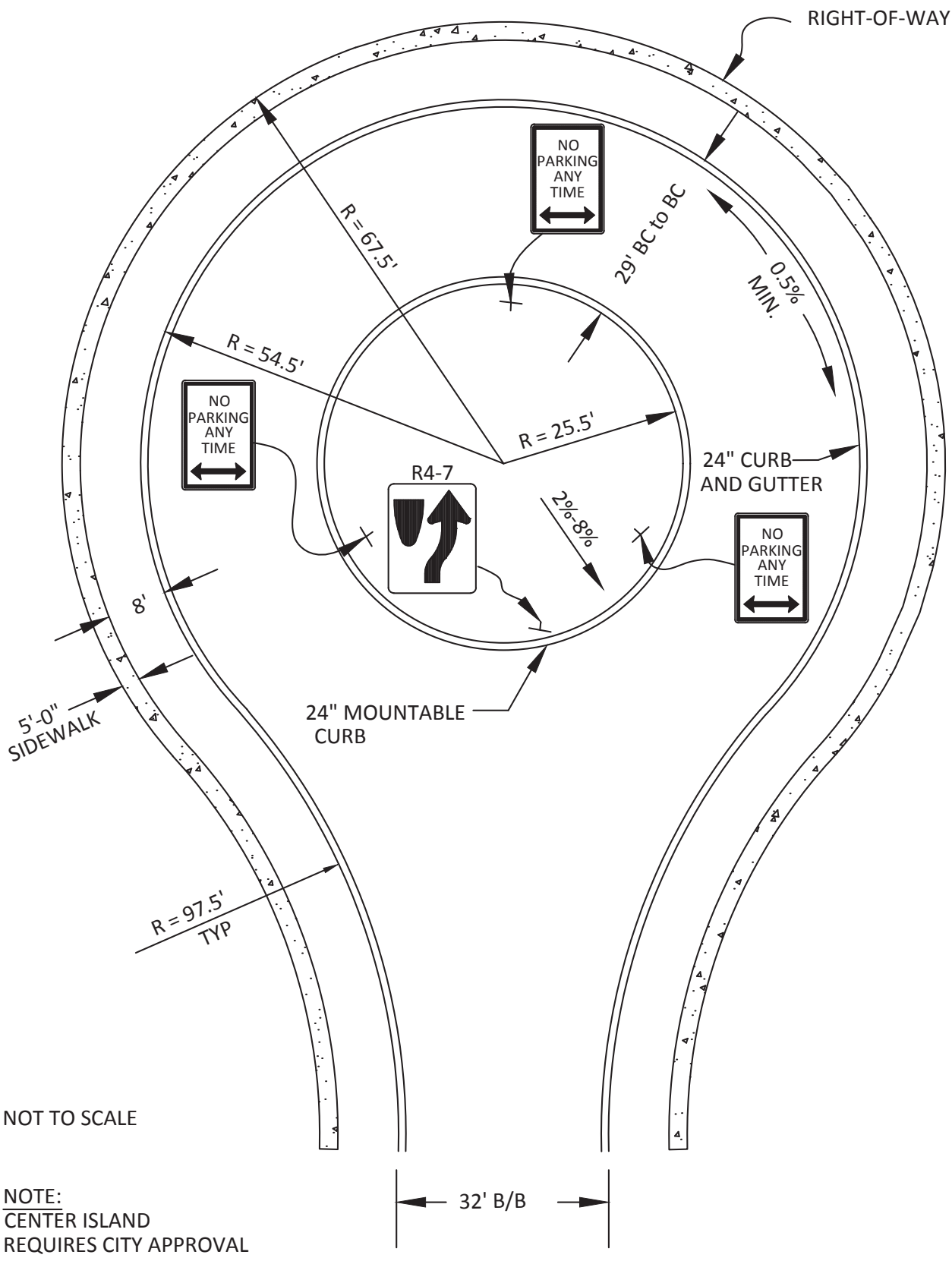
STANDARD DETAIL

PRIVATE ROAD PAVEMENT SECTION WITH CURB

ROADWAY

RDWD-7.0

Revised 12/31/2018



NOT TO SCALE

NOTE:
CENTER ISLAND
REQUIRES CITY APPROVAL

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL CUL-DE-SAC DETAIL	ROADWAY RDWD-8.0 Revised 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

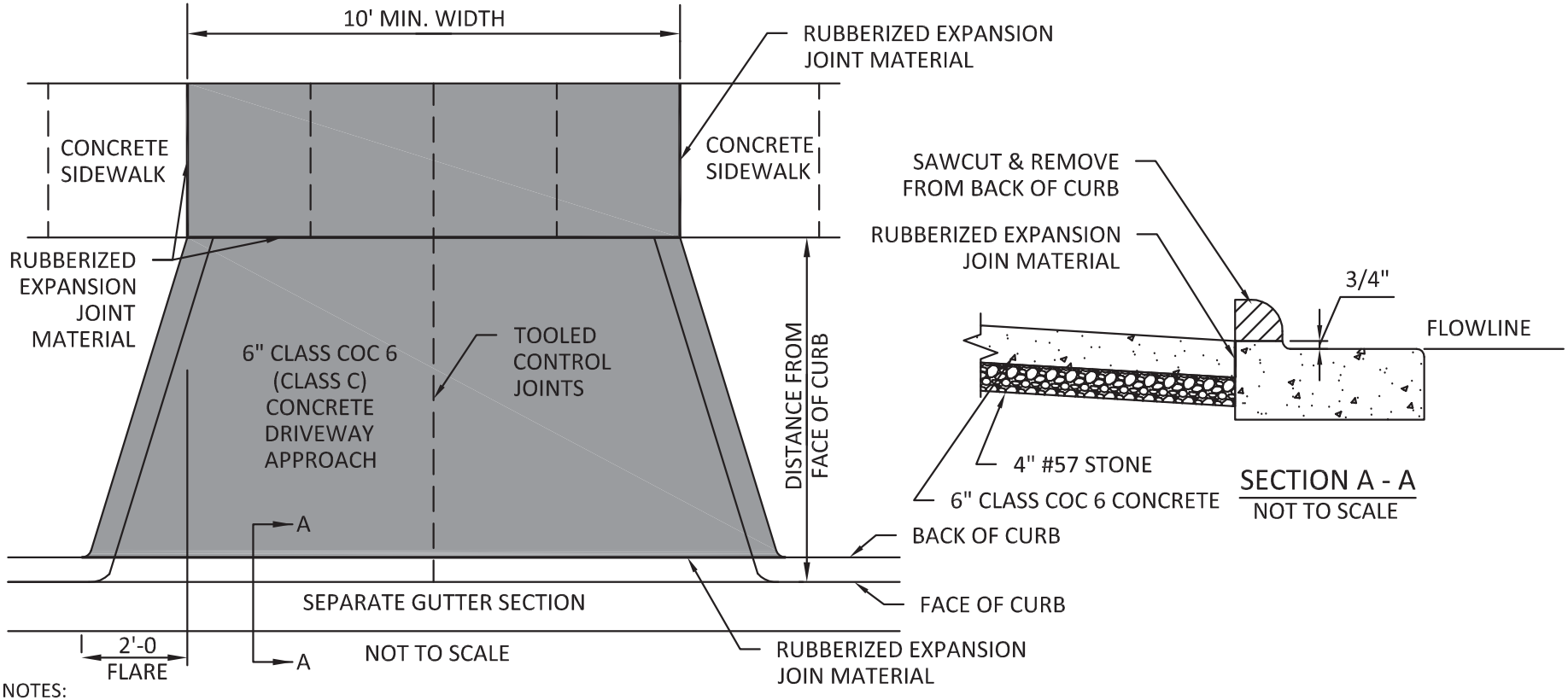
STANDARD DETAIL

RESIDENTIAL DRIVE CONCRETE APPROACH

ROADWAY

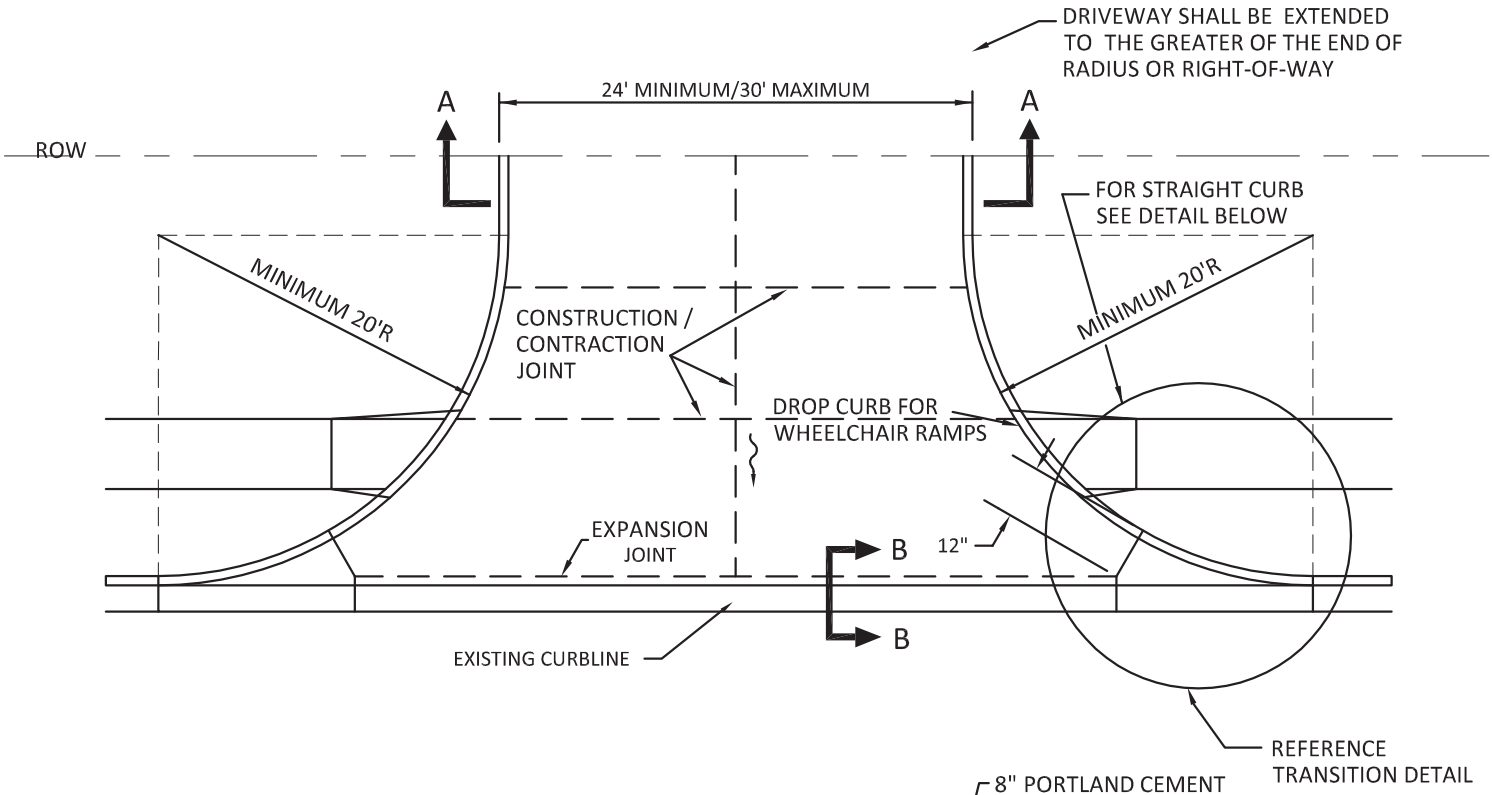
RDWD-9.0

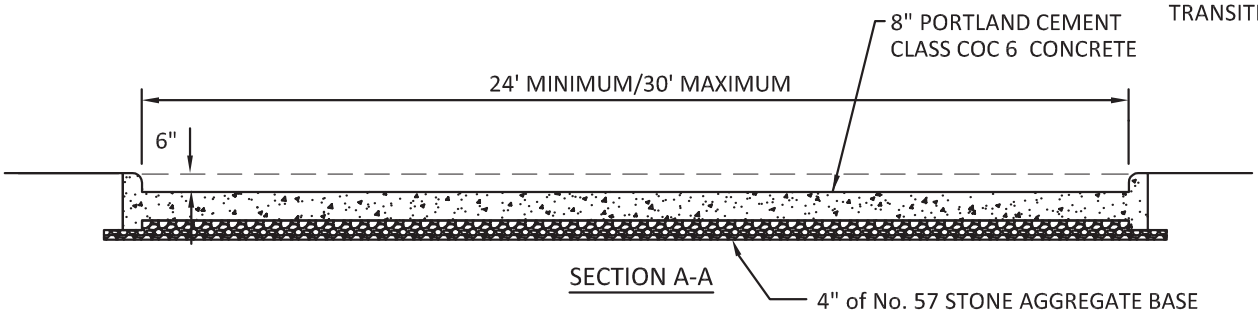
Revised 12/31/2018

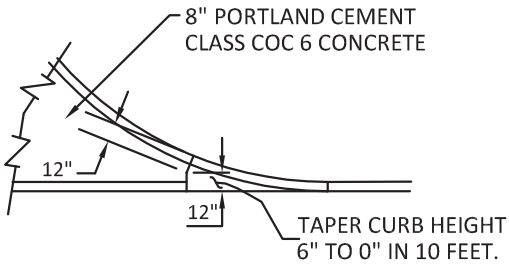


NOTES:

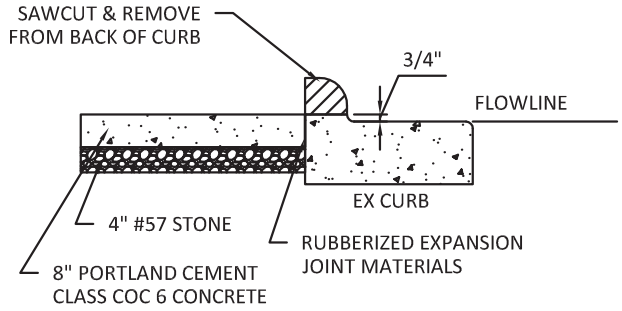
1. CURB OR COMBINED, CURB AND GUTTER SHALL BE TAKEN OUT AND REPLACED WITH CONCRETE, SEPARATED FROM THE APPROACH WITH RUBBERIZED EXPANSION JOINT MATERIAL BY 1/2" REFLEX RUBBER EXPANSION JOINT MATERIAL OR APPROVED EQUIVALENT. WHEN LESS THAN 5' OF A CURB SECTION REMAINS AFTER THE CURB CUT IS LOCATED, IT SHALL ALSO BE REMOVED AND REPLACED.
2. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE ½-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS A DRIVEWAY APPROACH, AROUND STRUCTURES, AGAINST THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN APPROVED EQUIVALENT SHALL BE USED AROUND RADII.
3. FILLS, IF REQUIRED, SHALL BE OF EARTH, COMPACTED IN 2" LAYERS, OR OF ITEM 304, AGGREGATE BASE, COMPACTED IN LAYERS NOT EXCEEDING 4".
4. DRIVEWAYS AND SIDEWALKS SHALL BE CONSTRUCTED PER CMS ITEM 608 WITH ITEM 499 CONCRETE CLASS COC 6 WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI AND SHALL CONTAIN 6% ±2% ENTRAINED AIR, AND A 3-INCH MAXIMUM SLUMP.
5. EXPANSION JOINTS SHALL BE PLACED TO FORM UTILITY STRIPS WHERE REQUIRED, AND WHEREVER NEW CONCRETE TOUCHES EXISTING CONSTRUCTION.
6. FORMS SHALL CONSIST OF WOOD 2" NOMINAL THICKNESS OR METAL OF EQUAL STRENGTH.
7. A STANDARD CURING COMPOUND, OPAQUE (WHITE TINTED), SHALL BE PROPERLY APPLIED IMMEDIATELY AFTER FINISH.
8. ITEM NUMBERS REFER TO CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS (CMS), CURRENT EDITION, AND ALL WORK SHALL BE DONE IN ACCORDANCE WITH THESE SPECIFICATIONS.
9. NOTIFY THE CITY WHEN FORMS WILL BE READY FOR INSPECTION, AT LEAST 24 HOURS BEFORE CONCRETE IS TO BE PLACED. IN NO CASE SHALL CONCRETE BE PLACED WITHOUT APPROVAL OF FORM WORK BY THE INSPECTOR.
10. NO CONCRETE SHALL BE PLACED UNTIL TEMPERATURE IS 35° F. MIN. CONCRETE SHALL BE PROTECTED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 451.
11. SIDEWALK POURED IN CONJUNCTION WITH DRIVEWAY SHALL HAVE ¼ -INCH RADIUS EDGE TOOLED JOINTS AND EDGES, WITH A BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL. ALL JOINTS AND EDGES SHALL BE RETRACED. RUBBERIZED EXPANSION JOINT MATERIAL IS NOT REQUIRED WITH MONOLITHIC POUR BETWEEN SIDEWALK AND DRIVEWAY.
12. ALL DRIVEWAYS SHALL NOT EXCEED 8% SLOPE.







TRANSITION DETAIL



SECTION B - B

NOTES:

1. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE ½-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS A DRIVEWAY APPROACH, AROUND STRUCTURES, AGAINST THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN APPROVED EQUIVALENT SHALL BE USED AROUND RADII.
2. COMMERCIAL CONCRETE DRIVEWAY APPROACH AND CURB SHALL BE 8-INCH PORTLAND CEMENT, CLASS COC 6 CONCRETE
3. DRIVEWAY APPROACH AND CURB SHALL BE POURED INTEGRAL
4. 4" UNDERDRAIN AND CONCRETE GUTTER SHALL BE MAINTAINED AT THE EXISTING CURBLINE.

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Public Works Department

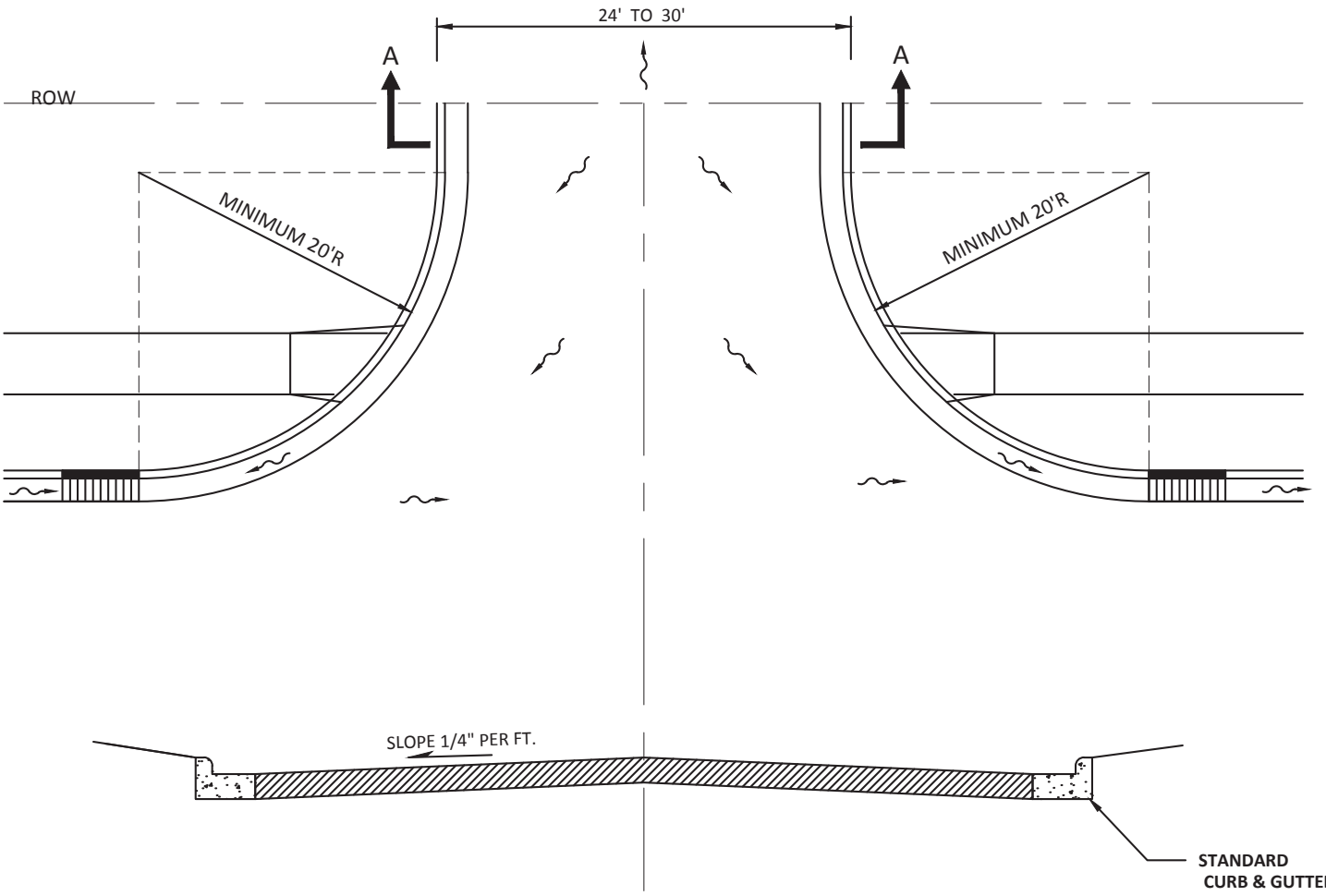
STANDARD DETAIL

NEW COMMERCIAL CONCRETE DRIVEWAY APPROACH

ROADWAY

RDWD-10.0

Revised 12/31/2018



SECTION A-A

PAVEMENT SECTION:

1.5" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG64-22

2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)

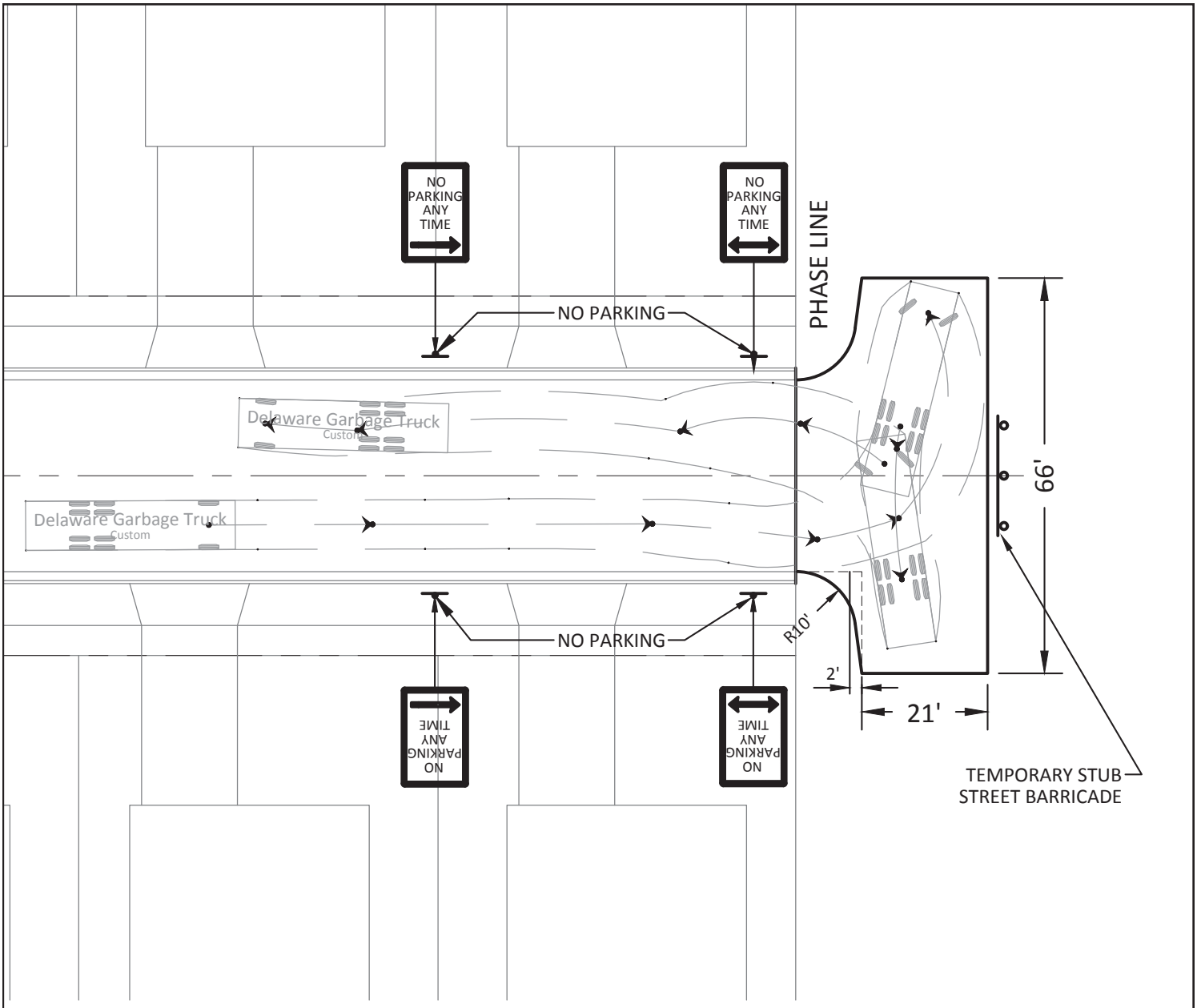
6" ITEM 301, ASPHALT CONCRETE BASE

6" ITEM 304, COMPACTED AGGREGATE BASE

NOTE:

THIS SECTION APPROVED ONLY FOR MAIN COMMERCIAL CENTER ACCESS POINTS AT TRAFFIC SIGNAL OR SERVICING THE INTERNAL PRIVATE ROAD NETWORK

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL NEW COMMERCIAL ASPHALT DRIVE APPROACH (SHOPPING CENTER ACCESS)	ROADWAY RDWD-11.0 Revised 12/31/2018



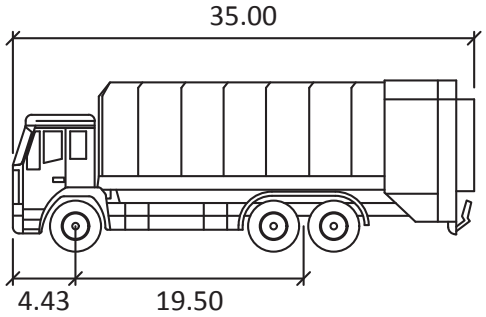
NOTES:

1. "T" TURNAROUNDS ARE TO BE USED ONLY DURING PHASES OF A PROJECT. THE DEVELOPER MUST CONTROL THE ADJACENT PROPERTY WHERE THE TURNAROUND IS TO BE CONSTRUCTED, OR ACQUIRE AN EASEMENT.

2. PROPER GRADING AND DRAINAGE SWALE SHALL BE PROVIDED TO DIRECT STORM WATER TO STORM SEWER COLLECTION SYSTEM.

TEMPORARY PAVEMENT SECTION

6" ITEM 301 - ASPHALT CONCRETE BASE
6" ITEM 304 - COMPACTED AGGREGATE BASE



Delaware Refuse Truck

Width	: 8.20
Track	: 8.20
Lock to Lock Time	: 6.0
Steering Angle	: 40.8

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

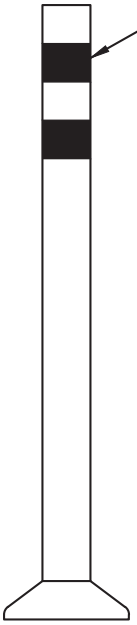
STANDARD DETAIL

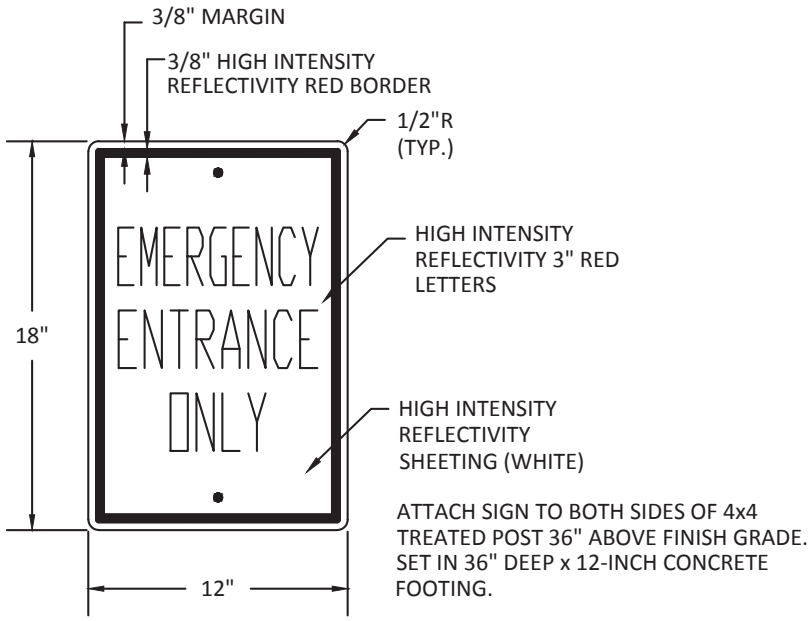
TEMPORARY "T" TYPE TURN-AROUND

ROADWAY

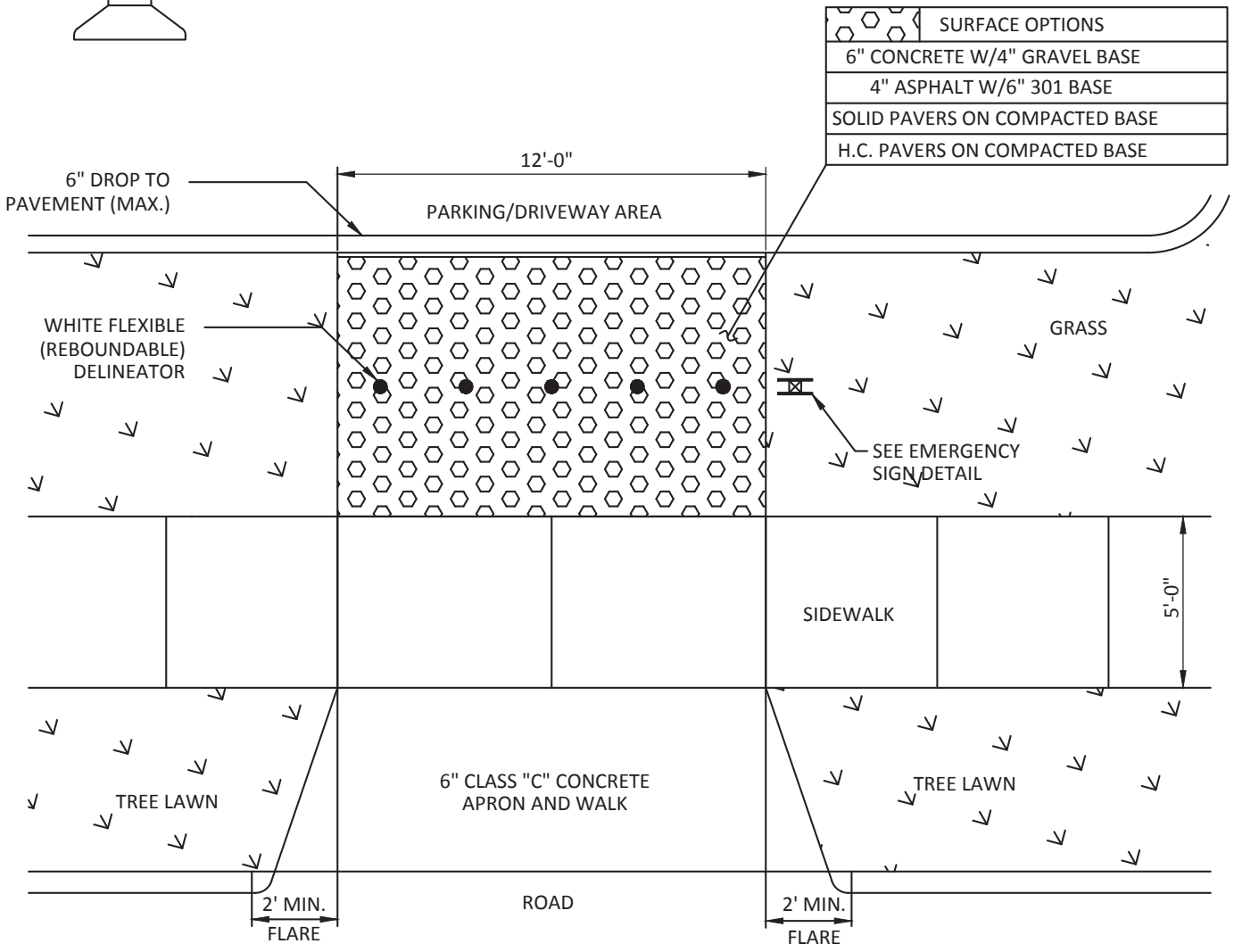
RDWD-12.0

Revised 12/31/2018





EMERGENCY SIGN DETAIL



EST 1808
CITY OF
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OHIO
Public Works Department

STANDARD DETAIL

EMERGENCY INGRESS/EGRESS ACCESS POINT

ROADWAY

RWDW-13.0

Revised 12/31/2018

CITY OF DELAWARE OHIO EST 1808

Public Works Department

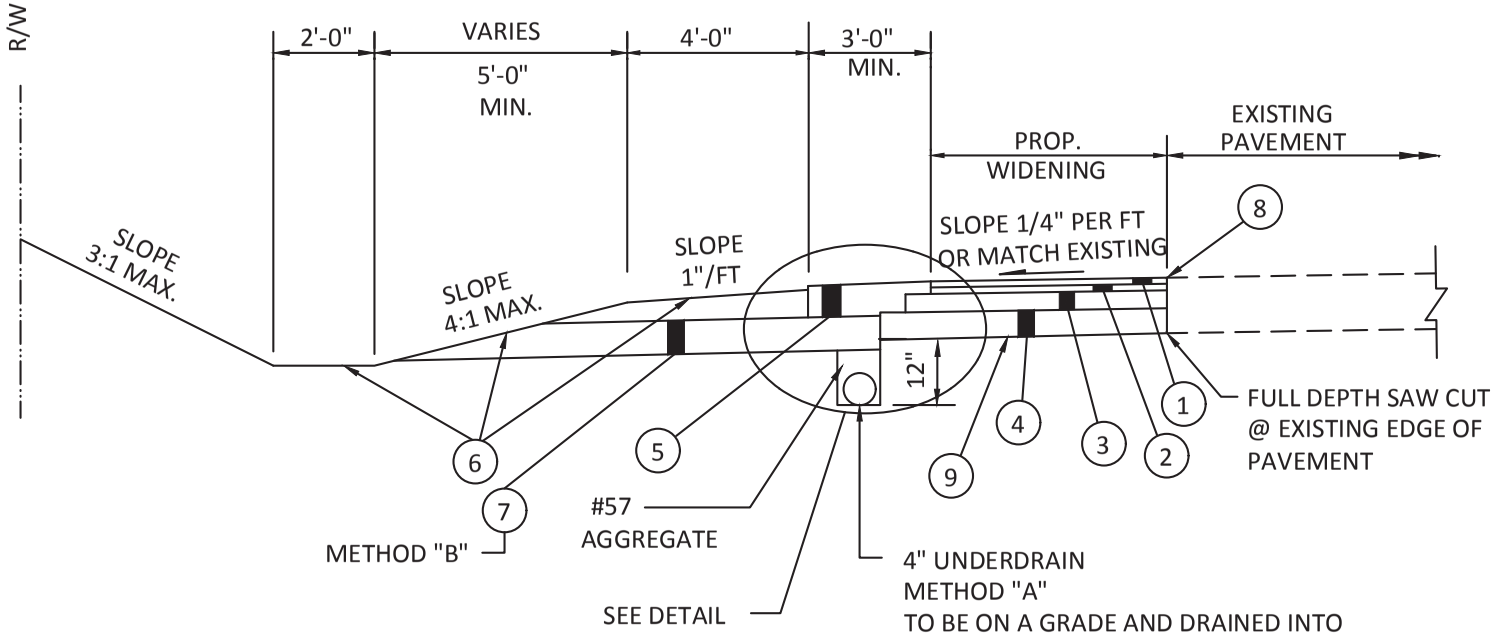
STANDARD DETAIL

WIDENING OF EXISTING PAVEMENT WITH BERM

RDWD-14.0

ROADWAY

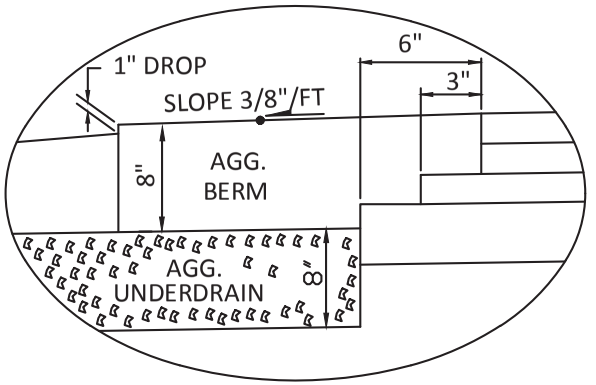
Revised 12/31/2018



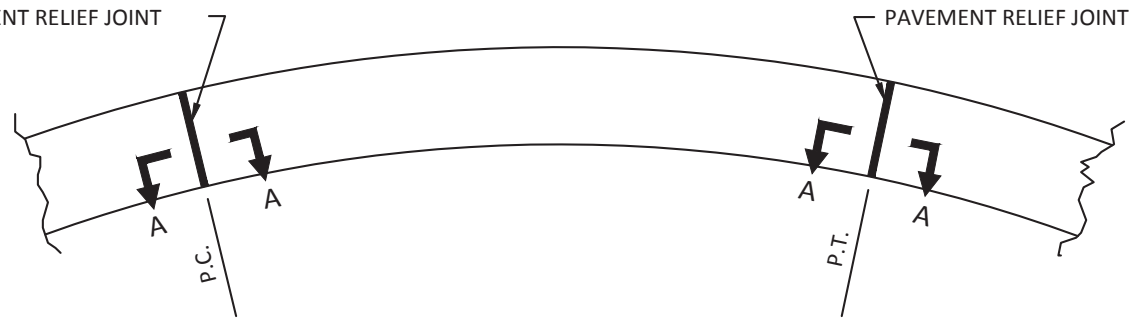
1. 1 1/2" ITEM 441, ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448) PG64-22
2. 2" ITEM 441, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2 (448)
3. 3" TO 6" ITEM 301, ASPHALT CONCRETE BASE (BASED ON ROADWAY CLASSIFICATION)
4. 6" ITEM 304, AGGREGATE BASE
5. 8" ITEM 304, AGGREGATE BERM
6. ITEM 523, SEEDING AND MULCHING
7. ITEM 605, 8" AGGREGATE UNDERDRAIN (SPACED EVERY 50')
8. ITEM 413, JOINT SEAL
9. ITEM 203, SUBGRADE COMPACTION

METHOD "A" TO BE USED WHEN POSSIBLE.

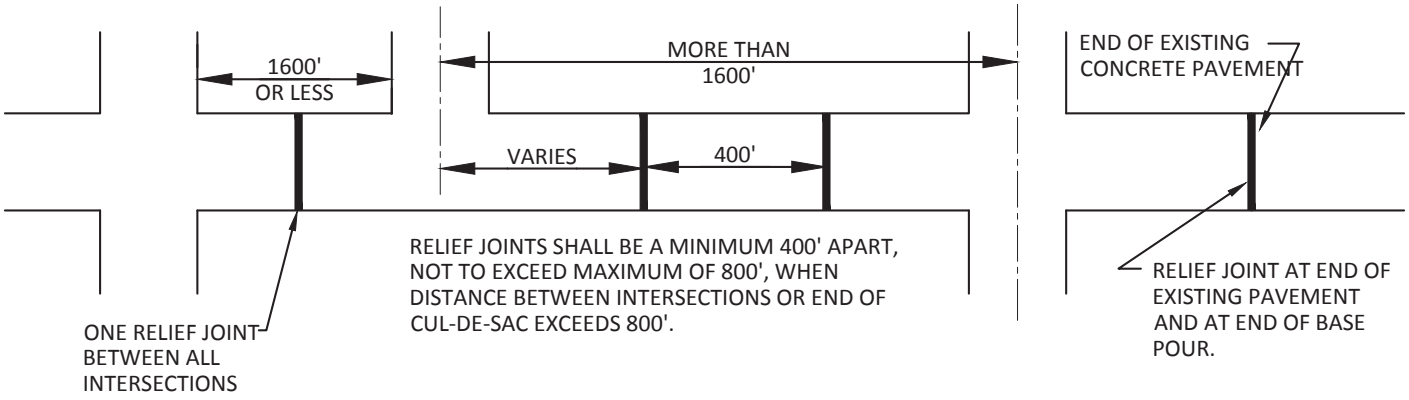
METHOD "B" AS ALTERNATE.



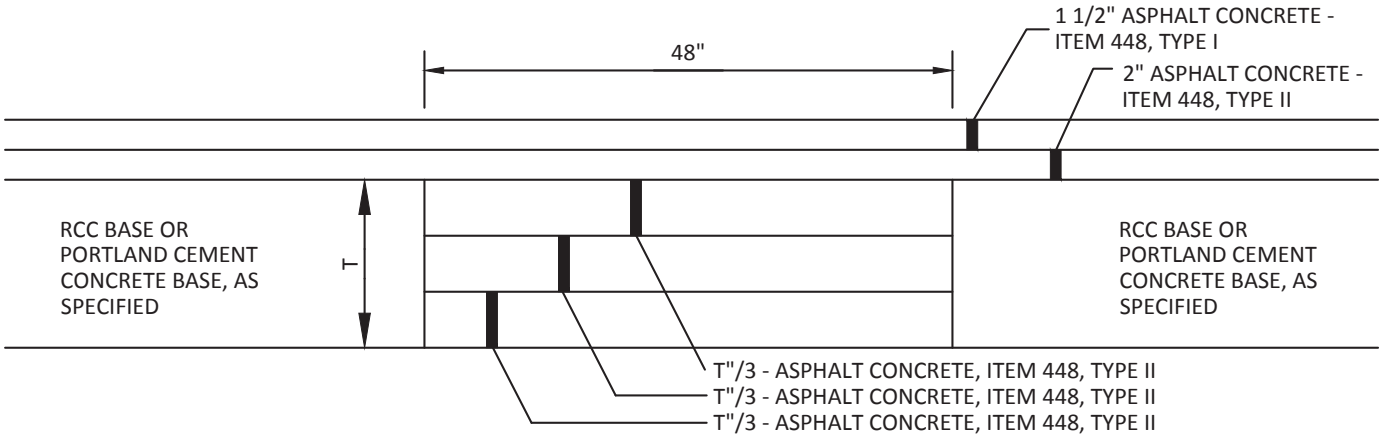
DETAIL



RELIEF JOINT DETAIL FOR PAVEMENT SECTIONS WITH C/L RADII
TO 500' AND DELTAS (△) GREATER THAN 50°



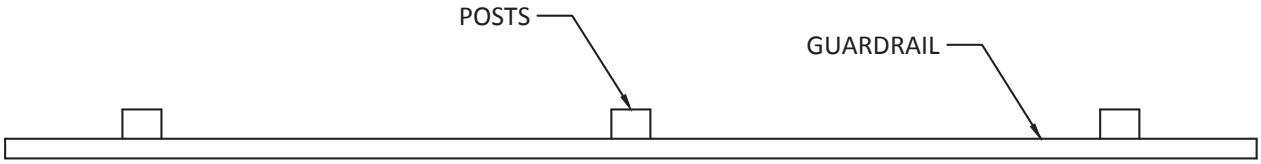
TYPICAL LOCATION PLAN



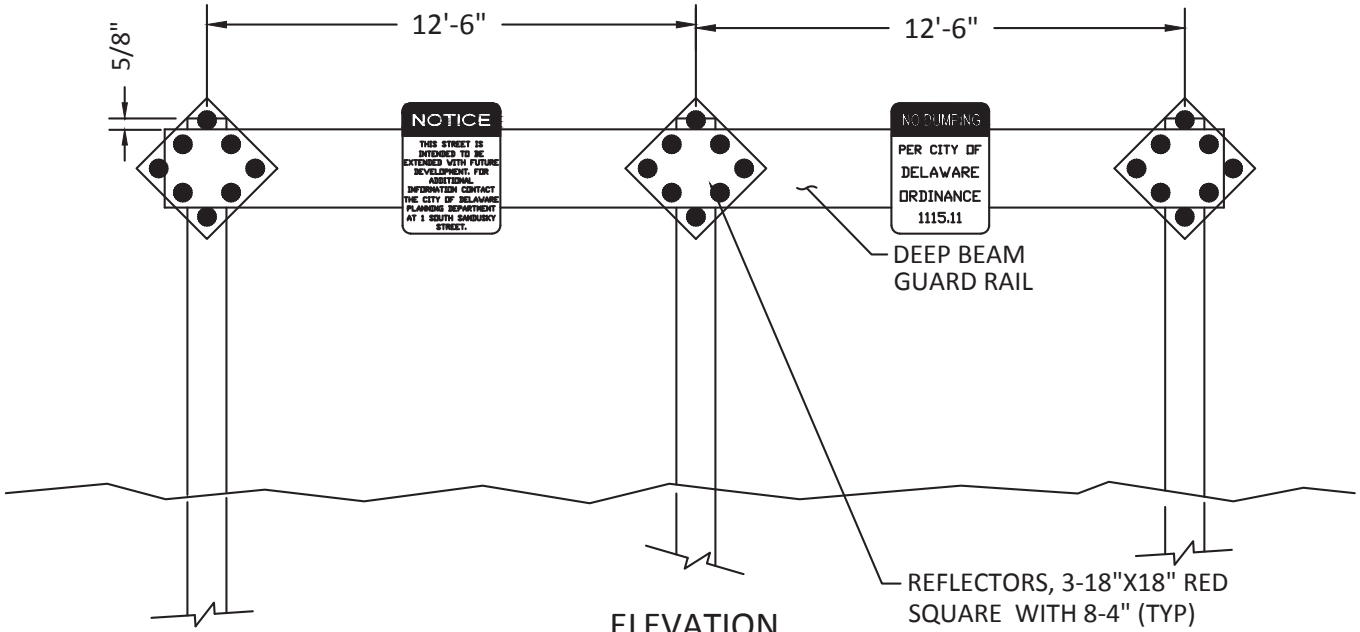
SECTION A-A
FOR CONCRETE BASE PAVEMENT

NOTE:
1. 2" PREFORMED EXPANSION MATERIAL SHALL BE PLACED AT ALL RELIEF JOINTS IN THE CONCRETE CURB.

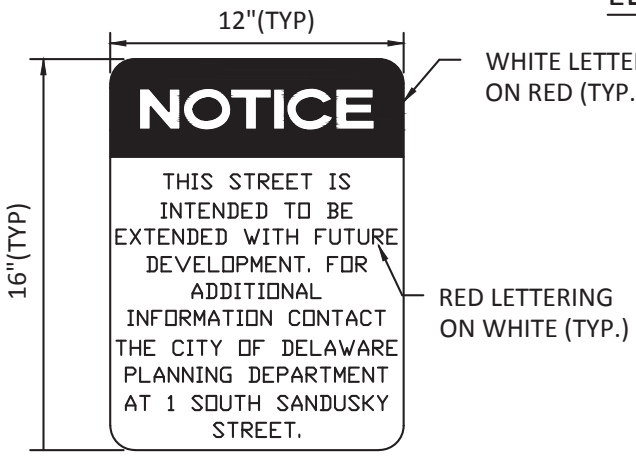
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL RIGID PAVEMENT RELIEF JOINT	ROADWAY RDWD-15.0 Revised 12/31/2018

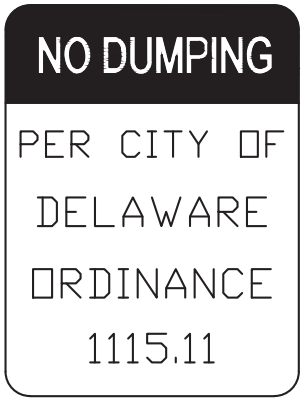


PLAN VIEW

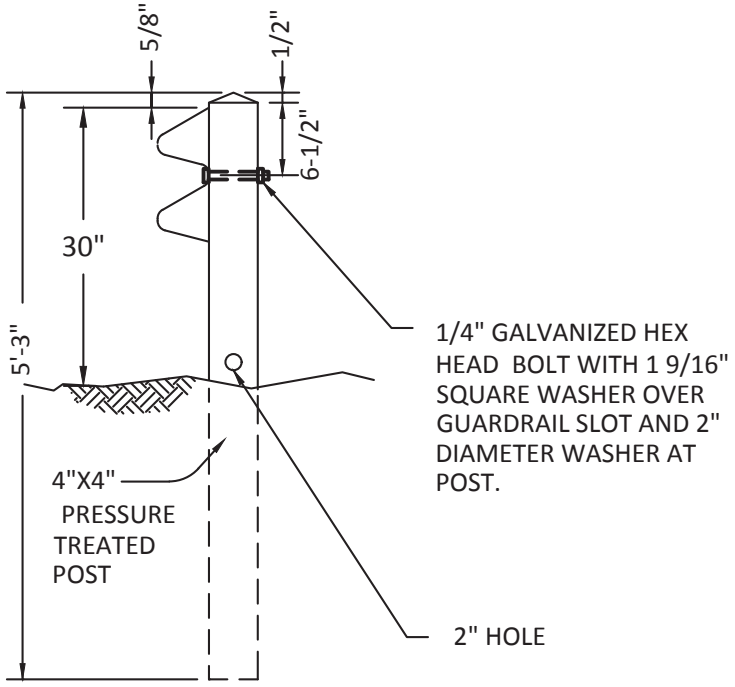


ELEVATION





SIGNS



WOOD POST

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

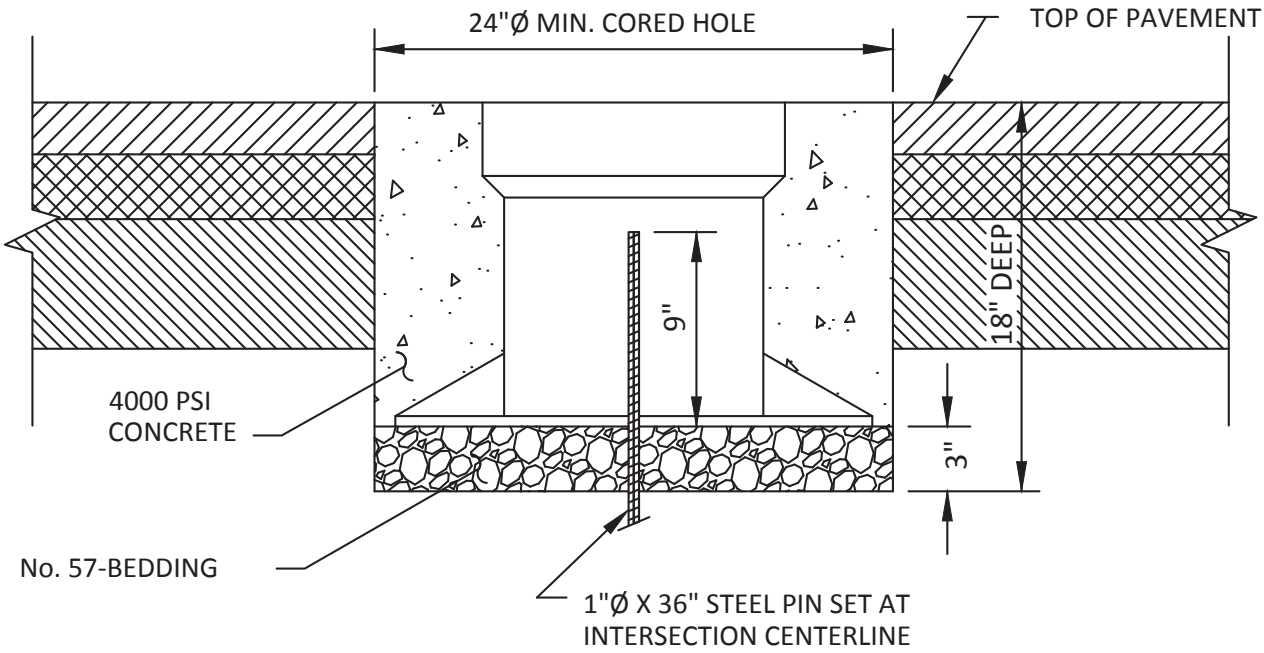
STANDARD DETAIL

TEMPORARY STUB STREET BARRICADE

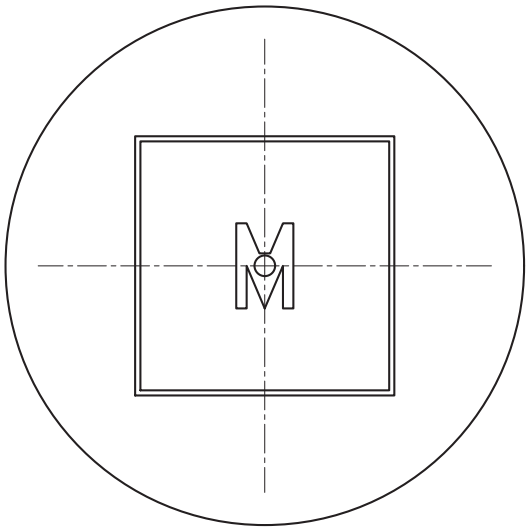
ROADWAY

RDWD-16.0

Revised 12/31/2018



SECTION

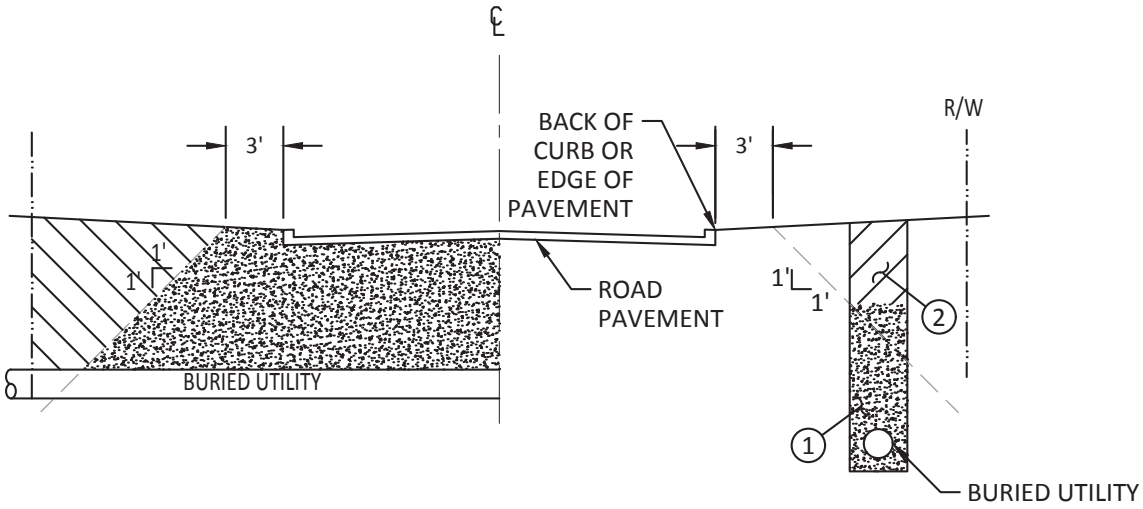


PLAN

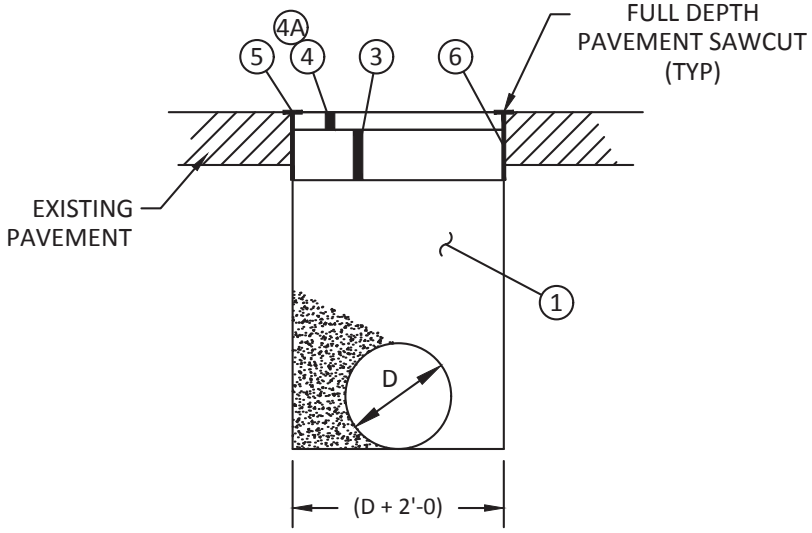
NOTE:

1. MONUMENET BOX SHALL BE NEENAH R-1968 TYPE 36-B OR EAST JORDAN IRON WORKS 8371
2. PIN TO BE SET BY REGISTERED SURVEYOR, AND MEASURED IN X,Y,Z STATE PLANE COORDINATES

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MONUMENT BOX INSTALLATION	ROADWAY RDWD-17.0 Revised 12/31/2018



UTILITY TRENCHES WITHIN PAVEMENT INFLUENCE



ASPHALT PAVEMENT REPAIR

① ITEM 912, COMPACTED GRANULAR MATERIAL

② ITEM 911, COMPACTED BACKFILL

③ ITEM 301, ASPHALT CONCRETE BASE (7.5" MIN)

④ 1.5" ITEM 441, ASPHALT CONCRETE WEARING COURSE, TYPE 1 (448) PG64-22

④A 1.5" ITEM 441 ASPHALT CONCRETE WEARING COURSE, TYPE 1 (448) PG 70-22

⑤ ITEM 423, CRACK SEAL (HOT APPLIED)

⑥ ITEM 407, TACK COAT

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL PAVEMENT REPAIR AND BACKFILL WITHIN RIGHT-OF-WAY	ROADWAY RDWD-18.1 Revised 12/31/2018

1. EXCAVATIONS WITHIN THE PUBLIC STREET PAVEMENT REQUIRE A FULL-DEPTH PAVEMENT SAW CUT THAT EXTENDS THROUGH THE ENTIRE ASPHALT AND/OR CONCRETE PAVEMENT SECTION, AND AROUND THE ENTIRE PERIMETER OF THE EXCAVATED AREA.

2. BACKFILL WITHIN A PAVED AREA OR WITHIN THE INFLUENCE OF THE PAVEMENT SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 912, COMPACTED GRANULAR MATERIAL. COMPACTION EQUIPMENT SHALL BE WALK BEHIND OR SELF-PROPELLED CAPABLE OF GENERATING A MINIMAL 3,500 LB COMPACTION FORCE.

3. EXCAVATIONS THE INFLUENCE OF THE PAVEMENT BUT WITHIN THE RIGHT-OF-WAY ARE TO BE BACKFILLED PER ITEM 911 COMPACTED BACKFILL USING COMPACTED NATIVE MATERIAL WITH USE OF MECHANICAL COMPACTION EQUIPMENT.

4. EXCAVATIONS THAT UNDERMINES THE CURB OR PAVEMENT EDGES, REQUIRE THE USE OF FCDF (FLOWABLE CONTROLLED DENSITY FILL) AS DIRECTED BY THE CITY. CURB AND UNDERDRAINS DISTURBED BY EXCAVATION ARE TO BE REPAIRED AS DIRECTED.

5. EXCAVATIONS WHICH ARE TOO NARROW FOR THE USE OF MECHANICAL COMPACTION EQUIPMENT MAY BE FILLED WITH FCDF UPON CITY APPROVAL. WHEN FCDF IS USED, PAVEMENT SHALL NOT BE PLACED UNTIL ALL BLEED WATER HAS EVAPORATED OR OTHERWISE BEEN REMOVED FROM THE SURFACE.

6. ALL PUBLIC STREETS REQUIRE A 9-INCH MINIMUM DEPTH ASPHALT PAVEMENT REPAIR, OR ACTUAL PAVEMENT THICKNESS, WHICHEVER IS GREATER. THE EDGES OF PAVEMENT REPAIRS SHALL BE TACKED PER ITEM 407 AND SEALED PER ITEM 423 CRACK SEAL.

7. WHERE CONCRETE PAVEMENT IS REQUIRED, PAVEMENT REPAIRS SHALL BE PROTECTED UNTIL CONCRETE REACHES THE MINIMUM REQUIRED DESIGN STRENGTH. TYPE MS CONCRETE MAY BE UTILIZED WHERE ACCESS TO TRAFFIC MUST BE RESTORED WITHIN 24-HOURS.

8. SIDEWALKS, GRASS AREAS AND TREES ARE TO BE PROTECTED FROM EQUIPMENT AND MATERIALS. DAMAGED AREAS ARE TO BE REPAIRED OR REPLACED BY CONTRACTOR AS REQUIRED BY CITY.

9. OPEN EXCAVATIONS IN ANY STREET MUST BE PROTECTED WITH STEEL PLATES HELD IN PLACE WITH PINS OR ASPHALT MATERIAL AND MARKED WITH AN ORANGE CONE OR BARREL AT THE EDGE OF PLATE. THE PUBLIC WORKS DEPARTMENT (740/203-1810) MUST BE NOTIFIED OF ALL PLATE LOCATION INSTALLATIONS AND REMOVALS.

10. ALL LANE/ROAD CLOSURES REQUIRE THE SUBMISSION OF A MAINTENANCE OF TRAFFIC APPLICATION WITH PROPOSED DETOUR DETAILS SUBMITTED FOR APPROVAL. DETOURS UTILIZING STATE OR COUNTY ROADS OUTSIDE THE CITY LIMITS REQUIRE THE APPROVAL OF THOSE JURISDICTIONS AS WELL.

11. WORK IN THE RIGHT-OF-WAY REQUIRING A TRAVEL LANE(S) TO BE BLOCKED MUST HAVE APPROPRIATE ADVANCE WARNING SIGNAGE, CONES, BARRELS AND FLAGGERS IN PLACE AT ALL TIMES. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING, ERECTING, MAINTAINING AND REMOVING ALL TRAFFIC CONTROL DEVICES TO MEET THE MINIMUM STANDARDS SET FORTH IN THE MUTCD CURRENT EDITION, AND MUST BE IN PLACE PRIOR TO COMMENCING ANY WORK.

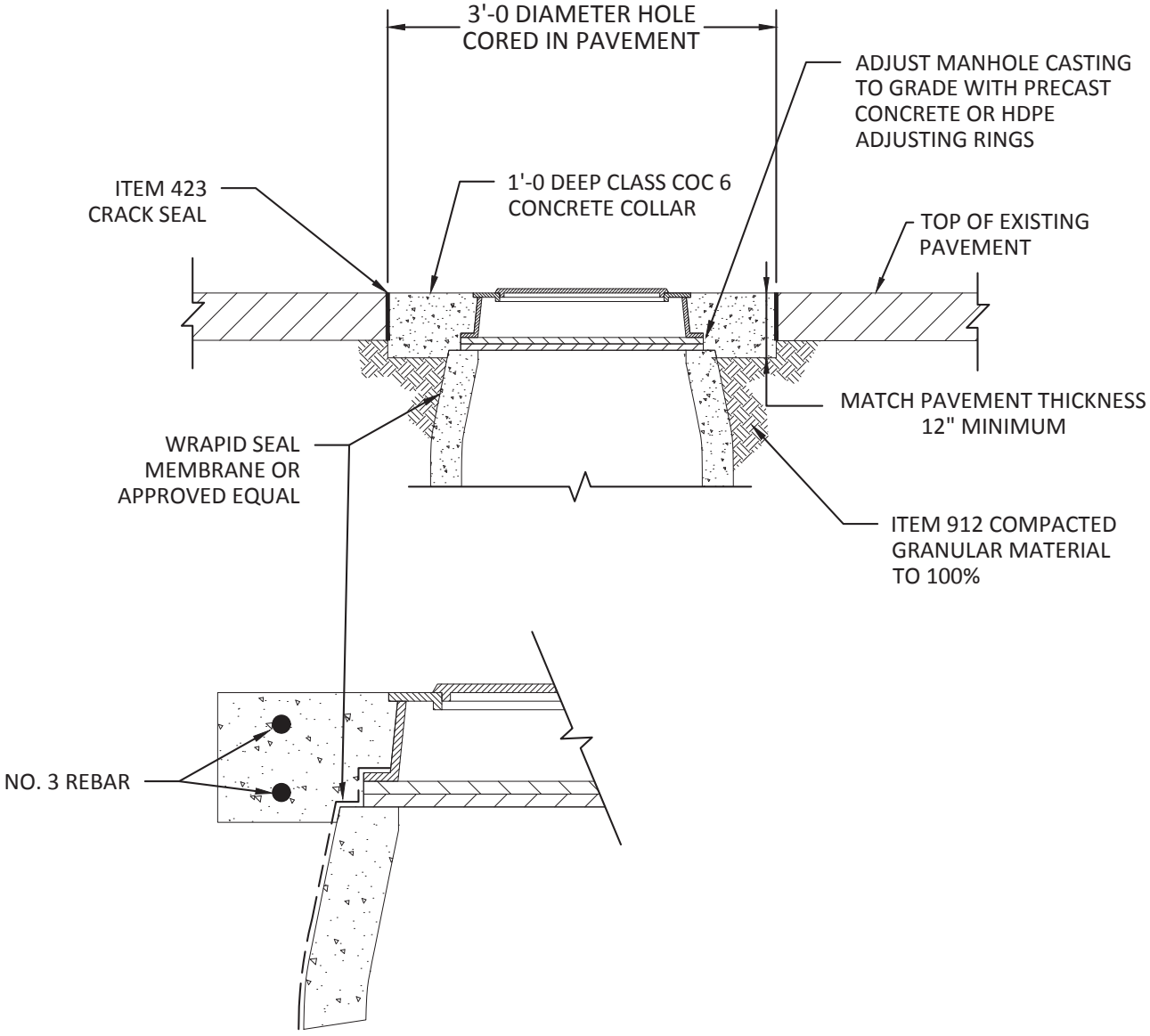
12. PUBLIC STREETS SHALL BE KEPT SWEPT CLEAN OF LOOSE DIRT, STONE AND MUD AT ALL TIMES.

13. ADVANCE NOTIFICATION TO O.U.P.S. AND ALL PRIVATE UTILITY OWNERS IS THE RESPONSIBILITY OF THE CONTRACTOR.

14. ALL WORK MUST BE INSPECTED BY THE CITY INCLUDING SIDEWALK, DRIVEWAY & CURB FORMS, UTILITY TAPS, TRENCH BACKFILL AND ASPHALT ROAD REPAIRS. INSPECTIONS CAN BE ARRANGED BY CONTACTING THE PUBLIC WORKS DEPARTMENT AT 740.203.1810 NO LESS THAN 24-HOURS IN ADVANCE OF THE WORK.

15. ALL PAVEMENT MARKINGS THAT ARE REMOVED AS PART OF THE EXCAVATION ARE TO BE REPLACED PER ITEM 641.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL STANDARD PAVEMENT REPAIR NOTES	ROADWAY RDWD-18.2 Revised 12/31/2018

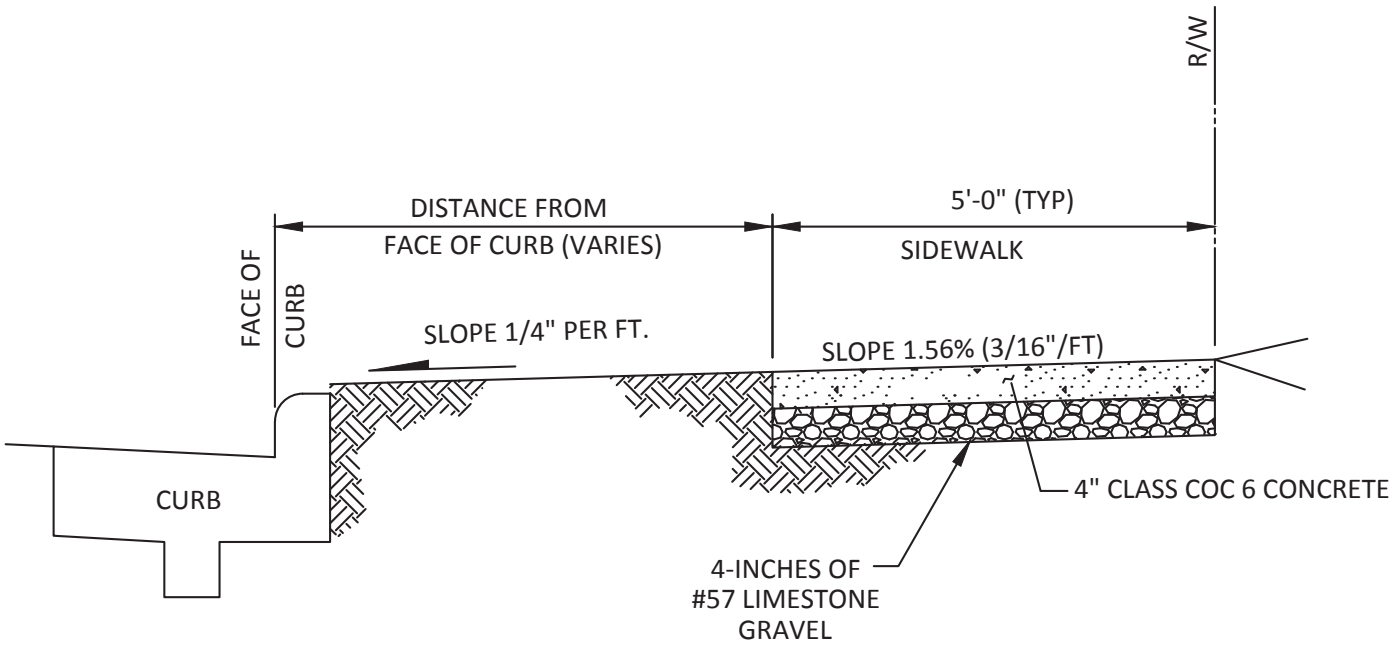


NOTES:

1. WHEN MAKING SIGNIFICANT INCREASE TO HEIGHT OF MANHOLE, SUITABILITY OR EXISTING MANHOLE MATERIALS SHALL BE EVALUATED. WHERE EXISTING MATERIALS ARE NOT DEEMED SUITABLE, OR AS DIRECTED BY THE CITY, A COMPLETE MANHOLE REPLACEMENT OR RECONSTRUCTION FROM THE MANHOLE BASE SHALL BE REQUIRED.

2. ADJUSTMENTS TO GRADE SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING METHODS:
   a. WHEN ADJUSTMENT CANNOT BE MADE WITH ADJUSTING RINGS: CAREFULLY REMOVE AND CLEAN THE EXISTING CASTING; ADJUST THE HEIGHT OF SUPPORTING WALLS AS NECESSARY, AND RESET THE EXISTING FRAME IN A BED OF MORTAR OR CONCRETE. WHEN ADJUSTING PRECAST CONCRETE STRUCTURES, REMOVE AND REPLACE PRECAST CONCRETE SECTIONS AS NECESSARY.
   b. WHEN RAISING WITH ADJUSTING RINGS: CAREFULLY REMOVE AND CLEAN THE EXISTING CASTING; FURNISH AND INSTALL PRECAST CONCRETE OF HDPE ADJUSTING RINGS IN ACCORDANCE WITH THE PLAN DETAILS. 9-INCHES IS THE MAXIMUM ALLOWABLE HEIGHT OF STANDING ADJUSTING RINGS (EXISTING AND NEW STRUCTURES)

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MANHOLE CASTING ADJUSTMENT IN PAVEMENT	ROADWAY RDWD-18.3 Revised 12/31/2018



NOTES:

1. SIDEWALKS SHALL BE CONSTRUCTED PER CMS ITEM 608 WITH CONCRETE CLASS COC 6, ITEM 499.

2. WHERE THE SIDEWALK CROSSES RESIDENTIAL DRIVEWAYS THE CONCRETE SHALL BE 6-INCHES DEEP AND 8-INCHES DEEP AT COMMERCIAL DRIVEWAYS. LENGTH AND SLOPE OF DRIVEWAY RAMPS ARE VARIABLE ACCORDING TO THE DISTANCE OF THE SIDEWALK FROM THE CURB, SEE STANDARD DRAWINGS. CLASS MS (MEDIUM SET) CONCRETE MAY BE SPECIFIED FOR WORK IN DRIVEWAY AREAS WHERE ACCESS IS TO BE RESTORED WITHIN 24 HOURS.

3. ALL CONCRETE SHALL BE PLACED IN ONE COURSE, HAVE A BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL, AND 1/4-INCH RADIUS EDGE TOOLED JOINTS AND EDGES. ALL JOINTS AND EDGES SHALL BE RETRACED.

4. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE 1/2-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS A DRIVEWAY APPROACH, AROUND STRUCTURES, AGAINST THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN APPROVED EQUIVALENT SHALL BE USED AROUND RADII.

5. SIDEWALK SECTIONS TO BE REPAIRED MUST BE SAWCUT FULL-DEPTH AT THE NEAREST JOINTS AND REMOVED.

6. WATER AND GAS VALVES BOXES IN THE SIDEWALK AREA SHALL BE ADJUSTED TO PROPER GRADE BY THE OWNER OF UTILITY.

7. ROOF DRAINS SHALL BE EXTENDED UNDER THE SIDEWALK AND THROUGH THE CURB.

8. FORMS SHALL BE 2-INCH NOMINAL THICKNESS LUMBER OR RIGID METAL.

9. CONCRETE SHALL BE PROTECTED WITH A WHITE-TINTED CURING COMPOUND FOLLOWING FINAL FINISHING.

10. NOTIFY THE ENGINEERING OFFICE WHEN FORMS WILL BE READY FOR INSPECTION, AT LEAST 24 HOURS BEFORE CONCRETE IS TO BE PLACED. IN NO CASE MAY CONCRETE BE PLACED WITHOUT APPROVAL OF FORM WORK BY THE INSPECTOR.

11. NO CONCRETE SHALL BE PLACED UNTIL THE AMBIENT TEMPERATURE IS 35 DEGREES FAHRENHEIT MINIMUM AND RISING. CONCRETE SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 451.061 OF ITEM 451.

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

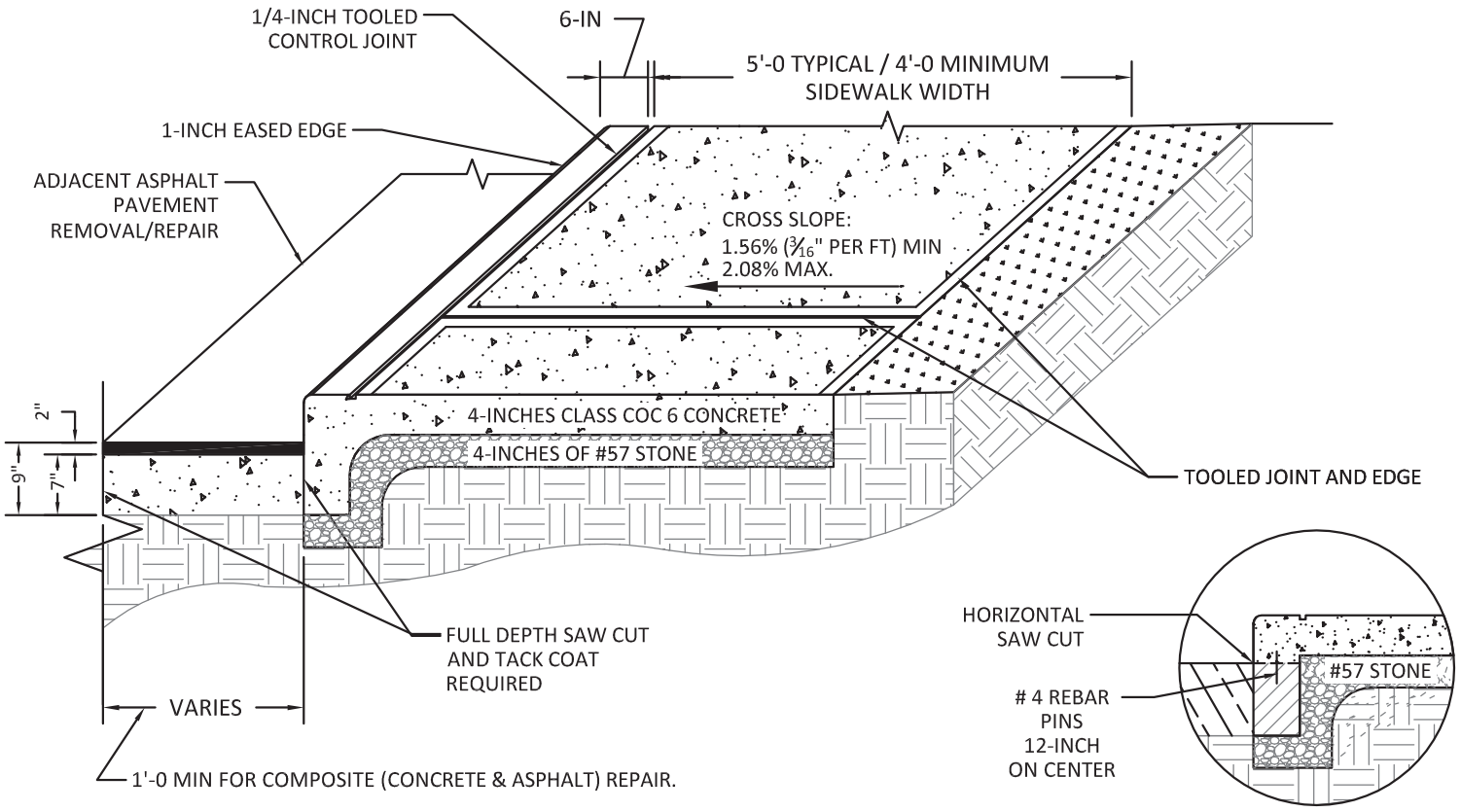
STANDARD DETAIL

STANDARD SIDEWALKS SPECIFICATIONS

ROADWAY

RDWD-19.1

Revised 12/31/2018



ISOLATED REPAIR DETAIL

NOTES:

1. FOR PAVEMENT REMOVAL, THE CONTRACTOR SHALL SAWCUT EXISTING PAVEMENT AND REMOVE CURB, PAVEMENT, AND SIDEWALK. 9-INCH PAVEMENT REPAIR SHALL BE COMPLETED WITH 7-INCH CLASS COC 6 CONCRETE BASE AND A 2-INCH ITEM 441 ASPHALT WEARING COURSE.

2. FOR ISOLATED SIDEWALK/CURB REPAIRS, THE CURB MAY BE SAWCUT FLUSH WITH PAVEMENT BY THE CONTRACTOR WITH NEW CURB/WALK DOWELED TO REMAINING CURB PER DETAIL. (NO PAVEMENT REMOVAL REQUIRED).

3. SIDEWALKS SHALL BE CONSTRUCTED PER CMS ITEM 608 WITH CONCRETE CLASS COC 6, ITEM 499.

4. WHERE DRIVEWAYS CROSS THE SIDEWALK THE CONCRETE SHALL BE 6-INCHES DEEP FOR RESIDENTIAL OR 8-INCHES FOR COMMERCIAL. LENGTH AND SLOPE OF DRIVEWAY RAMPS ARE VARIABLE. SEE STANDARD DRAWING RDWD 12. CLASS MS (MEDIUM SET) CONCRETE MAY BE SPECIFIED FOR WORK IN DRIVEWAY AREAS WHERE ACCESS IS TO BE RESTORED WITHIN 24 HOURS.

5. ALL CONCRETE SHALL BE PLACED IN ONE COURSE, HAVE A BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL, AND WITH 1/4-INCH RADIUS EDGE TOOLED JOINTS AND EDGES.

6. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE 1/2-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS A DRIVEWAY APPROACH, AROUND STRUCTURES, AGAINST THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN APPROVED EQUIVALENT SHALL BE USED AROUND RADII.

7. SIDEWALK SECTIONS TO BE REPAIRED MUST BE SAWCUT FULL-DEPTH AT THE NEAREST JOINTS AND REMOVED.

8. WATER AND GAS VALVES BOXES IN THE SIDEWALK AREA SHALL BE ADJUSTED TO PROPER GRADE BY OWNER OF UTILITY.

9. FORMS SHALL BE MADE OF LUMBER 2-INCH NOMINAL THICKNESS OR RIGID METAL.

10. CONCRETE SHALL BE PROTECTED WITH A WHITE-TINTED CURING COMPOUND FOLLOWING FINAL FINISHING.

11. NOTIFY THE ENGINEERING OFFICE WHEN FORMS WILL BE READY FOR INSPECTION, AT LEAST 24 HOURS BEFORE CONCRETE IS TO BE PLACED. IN NO CASE MAY CONCRETE BE PLACED WITHOUT APPROVAL OF FORM WORK BY THE INSPECTOR.

12. NO CONCRETE SHALL BE PLACED UNTIL THE AMBIENT TEMPERATURE IS 35 DEGREES FAHRENHEIT MINIMUM AND RISING. CONCRETE SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 451.061 OF ITEM 451.

EST 1808
CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

INTEGRAL CURB & WALK

ROADWAY

RDWD-19.2

Revised 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

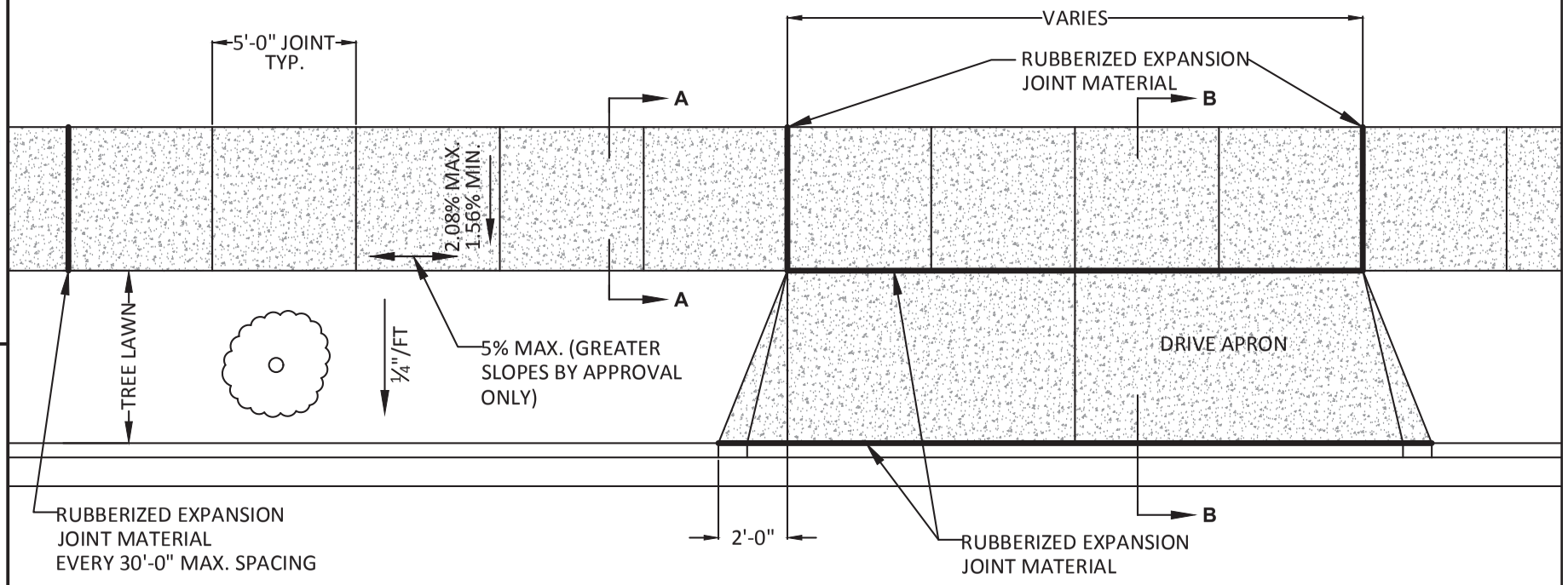
STANDARD DETAIL

TYPICAL SIDEWALK AND DRIVEWAY APPROACH

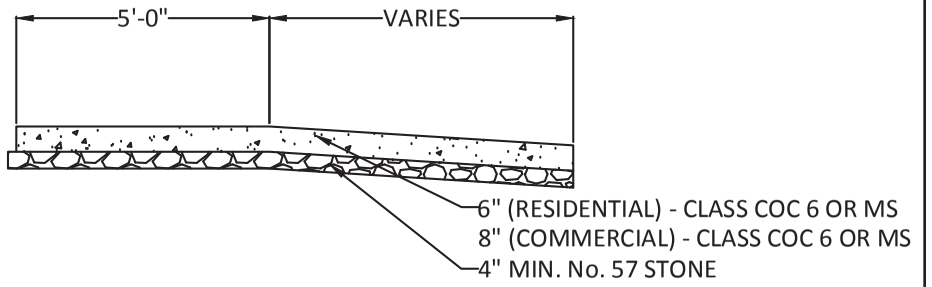
ROADWAY

RDWD-19.3

Revised 12/31/2018



CROSS SECTION A-A

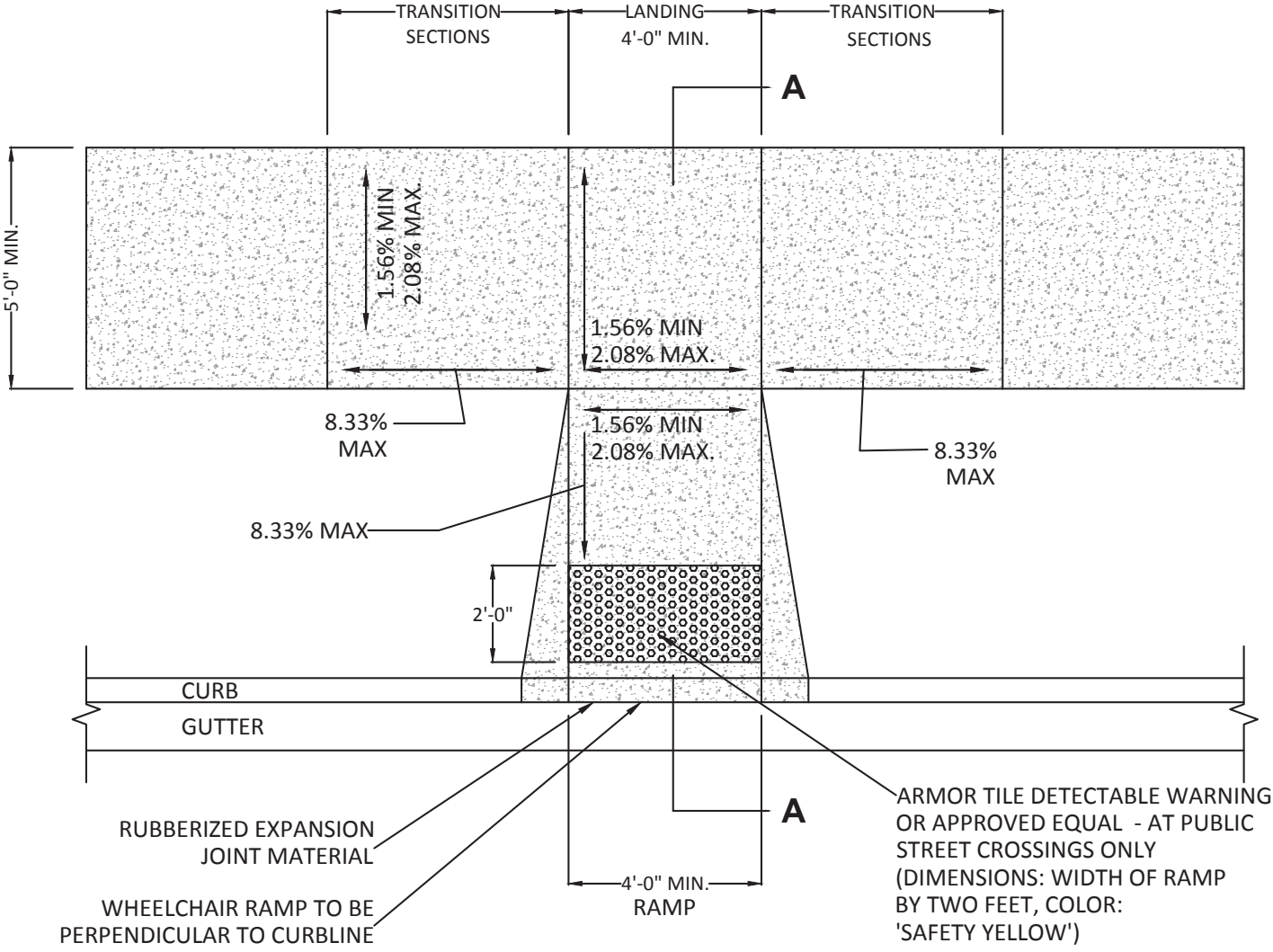


CROSS SECTION B-B

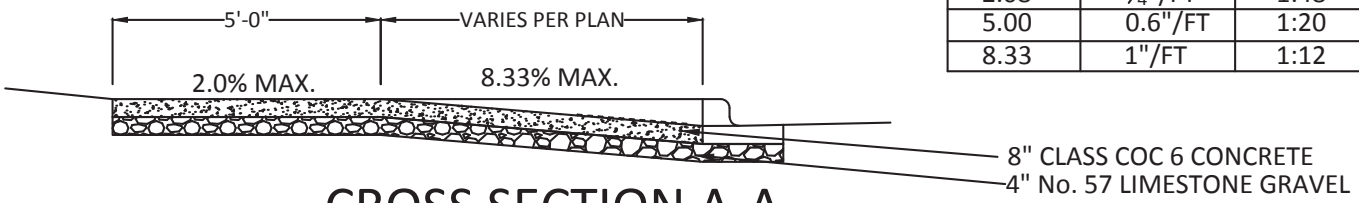
NOTES:

1. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE 1/2-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS A DRIVEWAY APPROACH, AROUND STRUCTURES, AGAINST THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN A EQUIVALENT SHALL BE USED AROUND RADII.
2. SIDEWALK POURED IN CONJUNCTION WITH DRIVEWAY SHALL HAVE 1/4 -INCH RADIUS EDGE TOOLED JOINTS AND EDGES WITH A BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL. RUBBERIZED EXPANSION JOINT MATERIAL IS NOT REQUIRED WITH MONOLITHIC POUR BETWEEN SIDEWALK AND DRIVEWAY.

LOCATION PER APPROVED PLAN



%	IN/FT	SLOPE
1.56	3/16"/FT	1:64
2.08	1/4"/FT	1:48
5.00	0.6"/FT	1:20
8.33	1"/FT	1:12



CROSS SECTION A-A

NOTES:

1. ALL JOINTS AT CURB RAMP LANDING SHALL BE SAW CUT.
2. RUBBERIZED EXPANSION JOINT MATERIAL SHALL BE 1/2-INCH REFLEX RUBBERIZED EXPANSION JOINT MATERIAL OR APPROVED EQUAL AND PLACED WHEREVER NEW CONCRETE WALK ABUTS THE BACK OF CURB, AND AT A MAXIMUM TRANSVERSE INTERVALS OF 30-FT. FOARMTECH CONCRETE EXPANSION JOINT FOAM OR AN APPROVED EQUIVALENT SHALL BE USED AROUND RADII.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

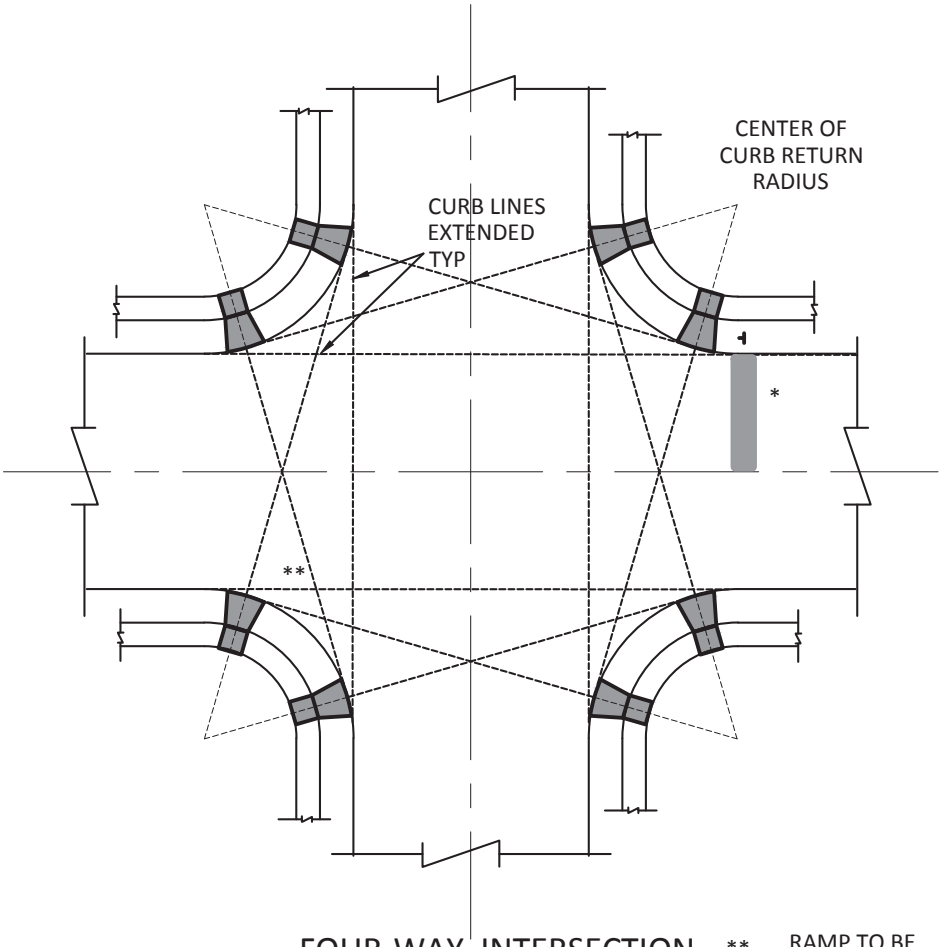
STANDARD DETAIL

ADA COMPLIANT WHEELCHAIR RAMP

ROADWAY

RDWD-19.4

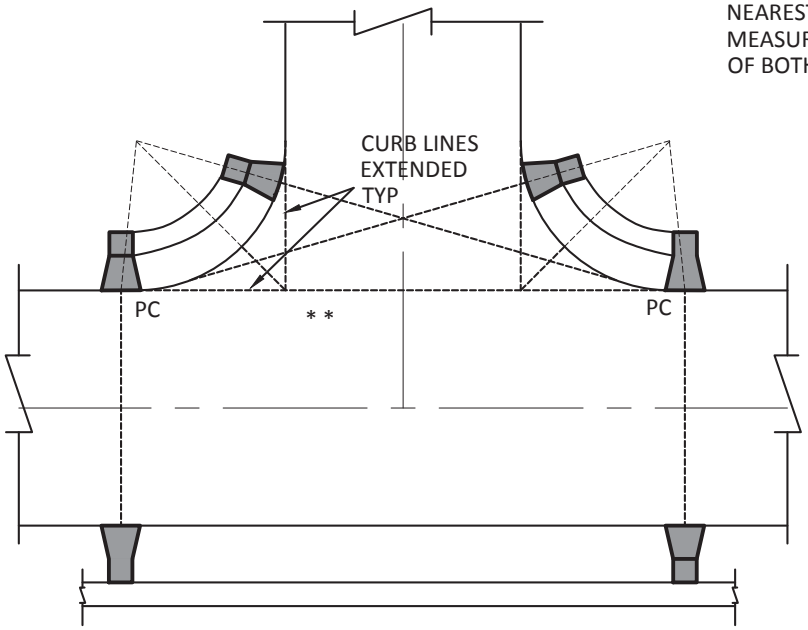
Revised 12/31/2018



FOUR-WAY INTERSECTION

** RAMP TO BE PERPENDICULAR TO RADIAL CURB LINE TYP.

* STOP BAR SHALL BE PLACED 4 FEET IN ADVANCE OF THE NEAREST CROSSWALK LINE MEASURED FROM CENTER OF BOTH LINES.



"TEE" INTERSECTION

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

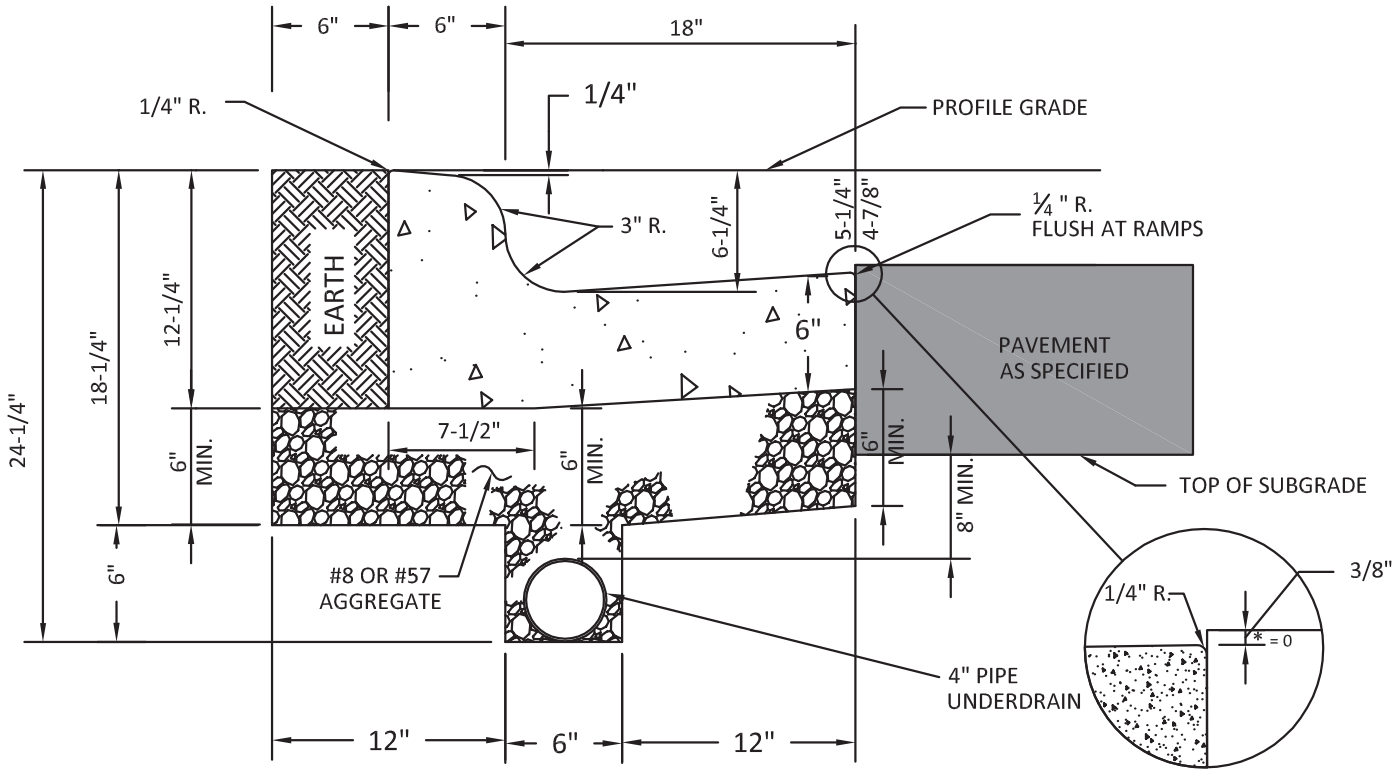
STANDARD DETAIL

CURB RAMP LOCATIONS

ROADWAY

RDWD-19.5

Revised 12/31/2018



NOTES:

1. THE PAVEMENT SHALL BE FLUSH AT THE GUTTER IN FRONT OF CURB RAMPS. CURB RAMPS SHALL BE BUILT AS COC STANDARD DRAWING 2319

2. 1.26 C.F. CONCRETE PER L.F.

3. IF THE SUBGRADE IS MORE THAN 7" BELOW THE BOTTOM OF THE CURB, THE UNDERDRAIN SHALL BE ADJUSTED TO KEEP THE TOP OF THE UNDERDRAIN AT LEAST 2" BELOW THE SUBGRADE.

4. SUBGRADE COMPACTION SHALL BE COMPLETED BEFORE UNDERDRAIN INSTALLATION.

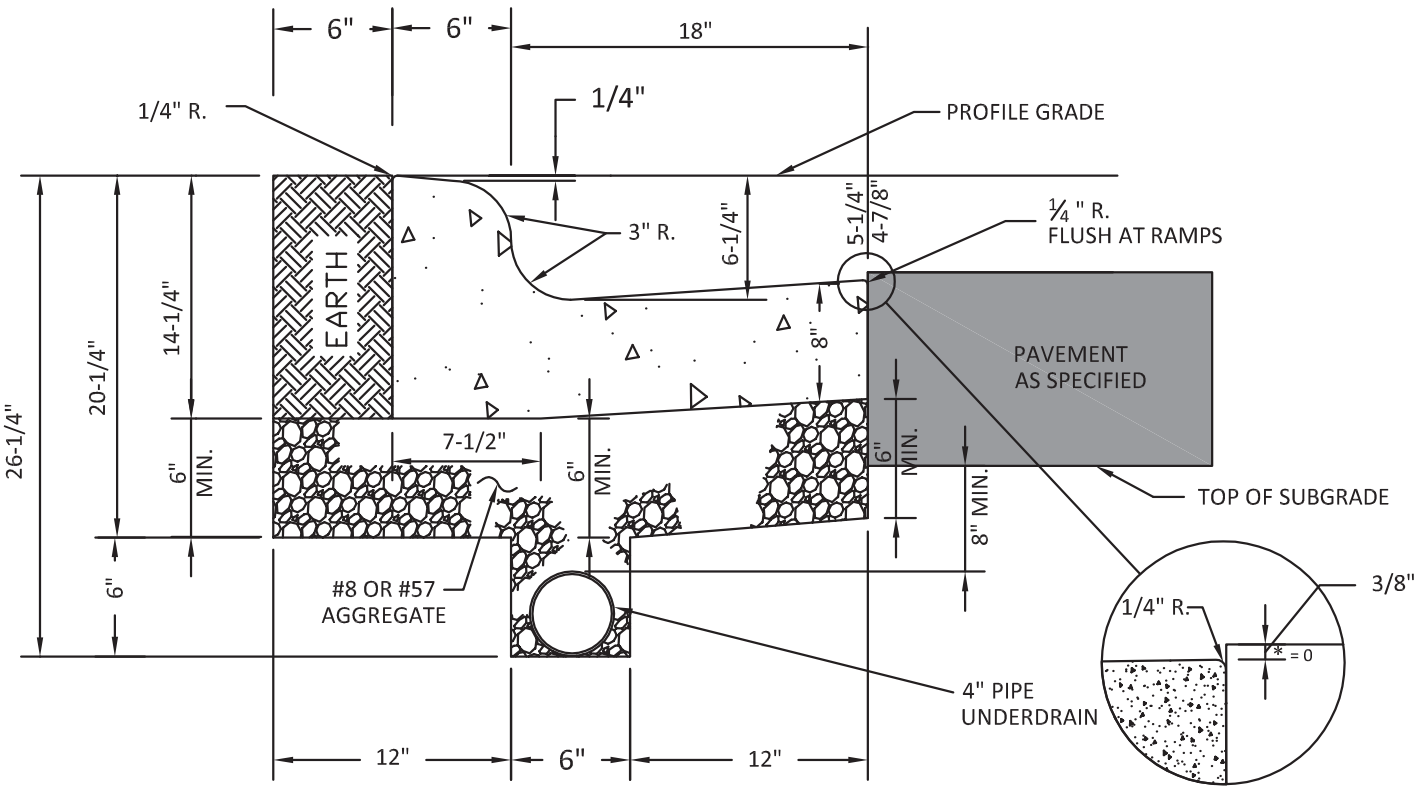
5. NOTE: WHEN CURB AND GUTTER INLET IS INSTALLED, THE TOP OF THE BONNET SHALL BE THE SAME AS THE TOP OF CURB ELEVATION. THE EDGE OF PAVEMENT SHALL BE ⅜ " HIGHER THAN THE GRATE WHEREVER THEY MEET/TOUCH.

6. FOR REPLACEMENT WORK, THE CURB SHALL BE REMOVED AT AN EXISTING JOINT OR NO CLOSER THAN 5 FEET FROM AN EXISTING JOINT.

7. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED BEHIND THE CURB WHEN A CONCRETE WALK, DRIVE, OR OTHER ITEM IS ADJOINING IT.

8. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED AT A JOINT LOCATED A MINIMUM 5-FT AND MAXIMUM 10-FT EACH SIDE OF CURB INLETS.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL STANDARD CONCRETE COMBINED CURB & GUTTER, ITEM 609	ROADWAY RDWD-20.0 Revised 12/31/2018



NOTES:

1. THE PAVEMENT SHALL BE FLUSH AT THE GUTTER IN FRONT OF CURB RAMPS. CURB RAMPS SHALL BE BUILT AS COC STANDARD DRAWING 2319

2. 1.59 C.F. CONCRETE PER L.F.

3. IF THE SUBGRADE IS MORE THAN 7" BELOW THE BOTTOM OF THE CURB, THE UNDERDRAIN SHALL BE ADJUSTED TO KEEP THE TOP OF THE UNDERDRAIN AT LEAST 2" BELOW THE SUBGRADE.

4. SUBGRADE COMPACTION SHALL BE COMPLETED BEFORE UNDERDRAIN INSTALLATION.

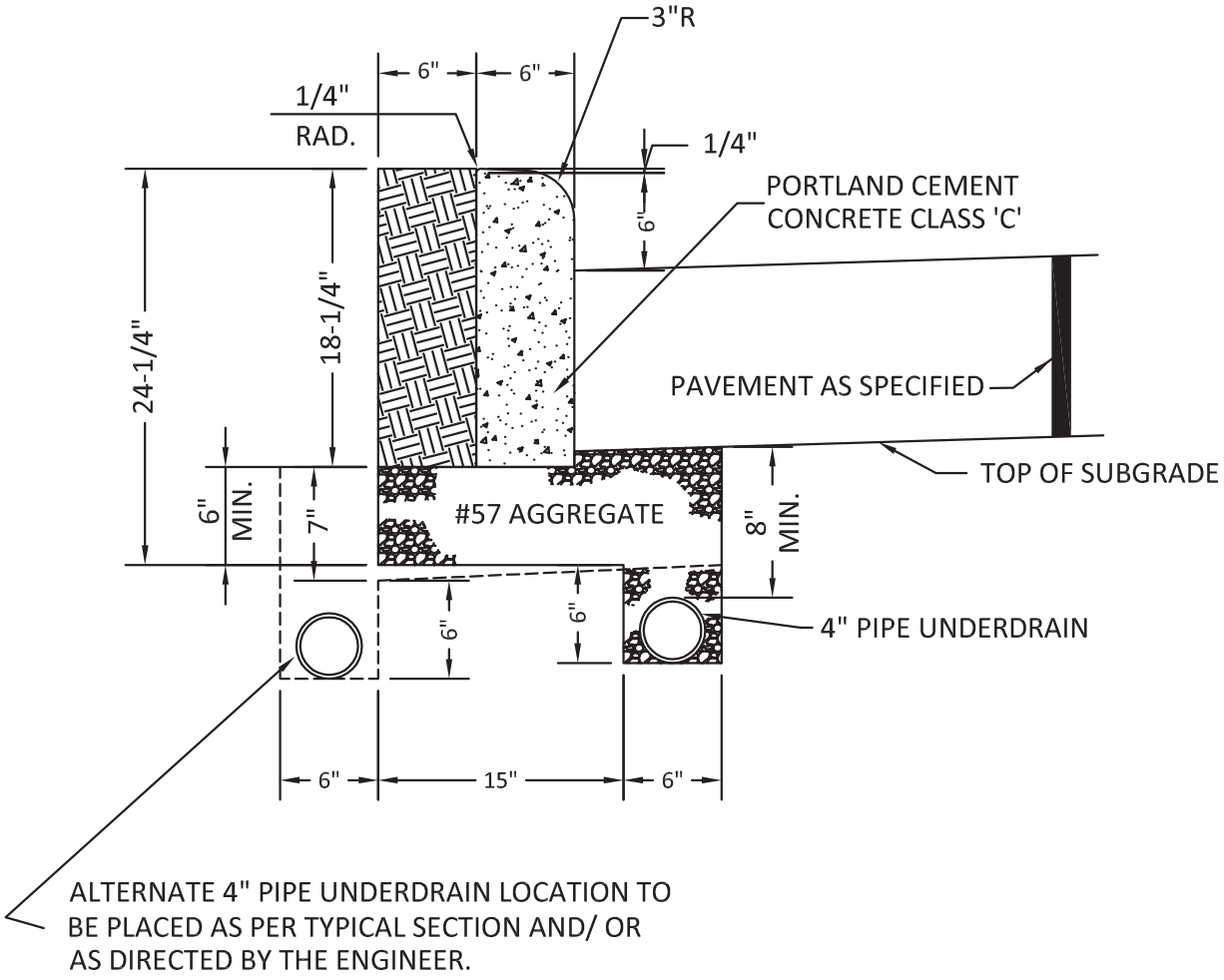
5. NOTE: WHEN CURB AND GUTTER INLET IS INSTALLED, THE TOP OF THE BONNET SHALL BE THE SAME AS THE TOP OF CURB ELEVATION. THE EDGE OF PAVEMENT SHALL BE ⅜ " HIGHER THAN THE GRATE WHEREVER THEY MEET/TOUCH.

6. FOR REPLACEMENT WORK, THE CURB SHALL BE REMOVED AT AN EXISTING JOINT OR NO CLOSER THAN 5 FEET FROM AN EXISTING JOINT.

7. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED BEHIND THE CURB WHEN A CONCRETE WALK, DRIVE, OR OTHER ITEM IS ADJOINING IT.

8. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED AT A JOINT LOCATED A MINIMUM 5-FT AND MAXIMUM 10-FT EACH SIDE OF CURB INLETS.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL SPECIAL 8" CONCRETE COMBINED CURB & GUTTER, ITEM 609	ROADWAY RDWD-21.0 Revised 12/31/2018



NOTES:

1. THE PAVEMENT SHALL BE FLUSH AT THE GUTTER IN FRONT OF CURB RAMPS. CURB RAMPS SHALL BE BUILT AS COC STANDARD DRAWING 2319

2. 0.74 C.F. CONCRETE PER L.F.

3. IF THE SUBGRADE IS MORE THAN 7" BELOW THE BOTTOM OF THE CURB, THE UNDERDRAIN SHALL BE ADJUSTED TO KEEP THE TOP OF THE UNDERDRAIN AT LEAST 2" BELOW THE SUBGRADE.

4. SUBGRADE COMPACTION SHALL BE COMPLETED BEFORE UNDERDRAIN INSTALLATION.

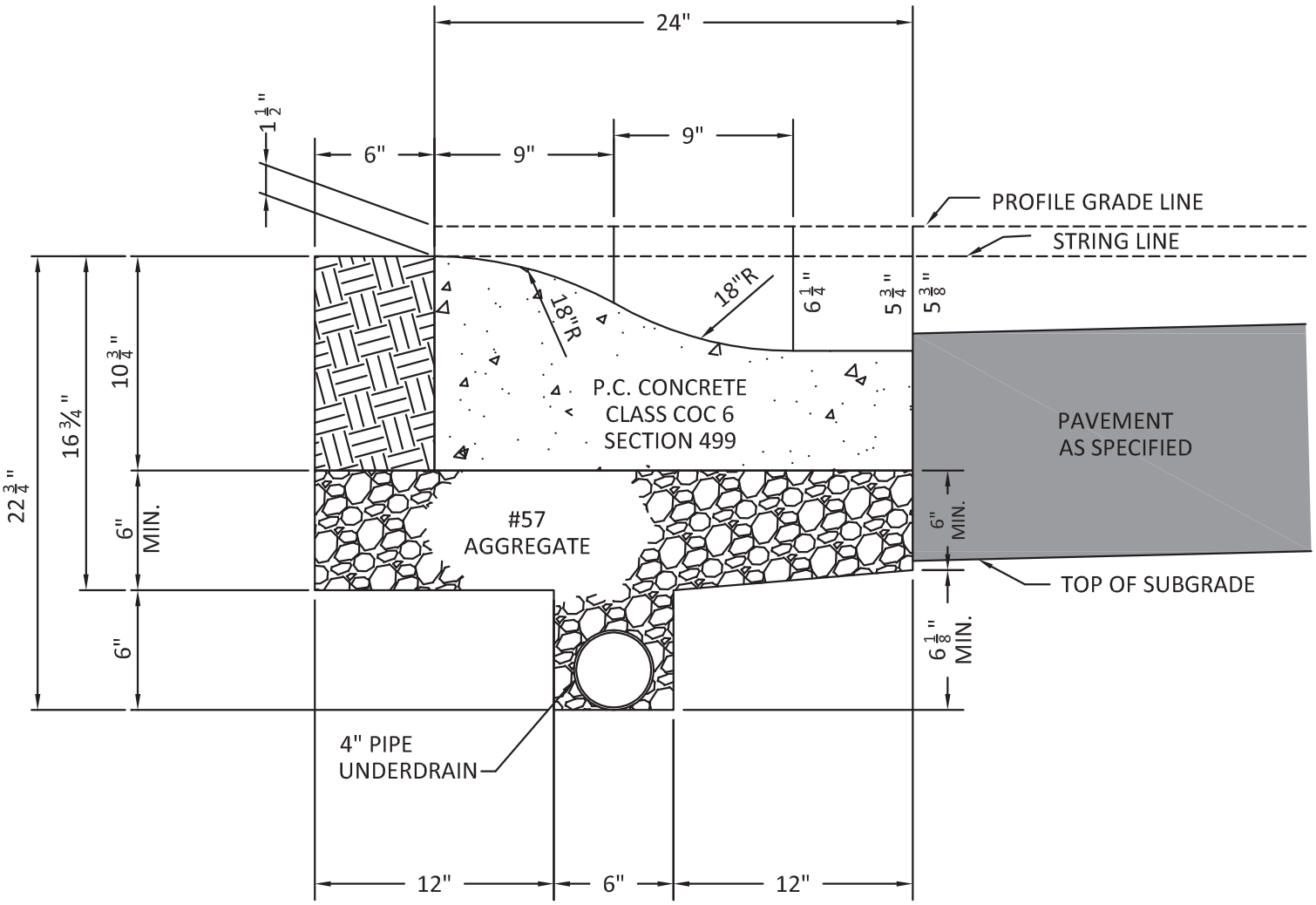
5. NOTE: WHEN CURB AND GUTTER INLET IS INSTALLED, THE TOP OF THE BONNET SHALL BE THE SAME AS THE TOP OF CURB ELEVATION. THE EDGE OF PAVEMENT SHALL BE ⅜ " HIGHER THAN THE GRATE WHEREVER THEY MEET/TOUCH.

6. FOR REPLACEMENT WORK, THE CURB SHALL BE REMOVED AT AN EXISTING JOINT OR NO CLOSER THAN 5 FEET FROM AN EXISTING JOINT.

7. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED BEHIND THE CURB WHEN A CONCRETE WALK, DRIVE, OR OTHER ITEM IS ADJOINING IT.

8. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED AT A JOINT LOCATED A MINIMUM 5-FT AND MAXIMUM 10-FT EACH SIDE OF CURB INLETS.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL STRAIGHT 18-INCH CONCRETE CURB	ROADWAY RDWD-22.0 Revised 12/31/2018



NOTES:

1. THE PAVEMENT SHALL BE FLUSH AT THE GUTTER IN FRONT OF CURB RAMPS. CURB RAMPS SHALL BE BUILT AS COC STANDARD DRAWING 2319

2. 1.33 C.F. CONCRETE PER L.F.

3. IF THE SUBGRADE IS MORE THAN 7" BELOW THE BOTTOM OF THE CURB, THE UNDERDRAIN SHALL BE ADJUSTED TO KEEP THE TOP OF THE UNDERDRAIN AT LEAST 2" BELOW THE SUBGRADE.

4. SUBGRADE COMPACTION SHALL BE COMPLETED BEFORE UNDERDRAIN INSTALLATION.

5. NOTE: WHEN CURB AND GUTTER INLET IS INSTALLED, THE TOP OF THE BONNET SHALL BE THE SAME AS THE TOP OF CURB ELEVATION. THE EDGE OF PAVEMENT SHALL BE ⅜ " HIGHER THAN THE GRATE WHEREVER THEY MEET/TOUCH.

6. FOR REPLACEMENT WORK, THE CURB SHALL BE REMOVED AT AN EXISTING JOINT OR NO CLOSER THAN 5 FEET FROM AN EXISTING JOINT.

7. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED BEHIND THE CURB WHEN A CONCRETE WALK, DRIVE, OR OTHER ITEM IS ADJOINING IT.

8. ½" RUBBERIZED EXPANSION MATERIAL SHALL BE INSTALLED AT A JOINT LOCATED A MINIMUM 5-FT AND MAXIMUM 10-FT EACH SIDE OF CURB INLETS.

EST 1808
CITY OF DELAWARE OHIO
Public Works Department

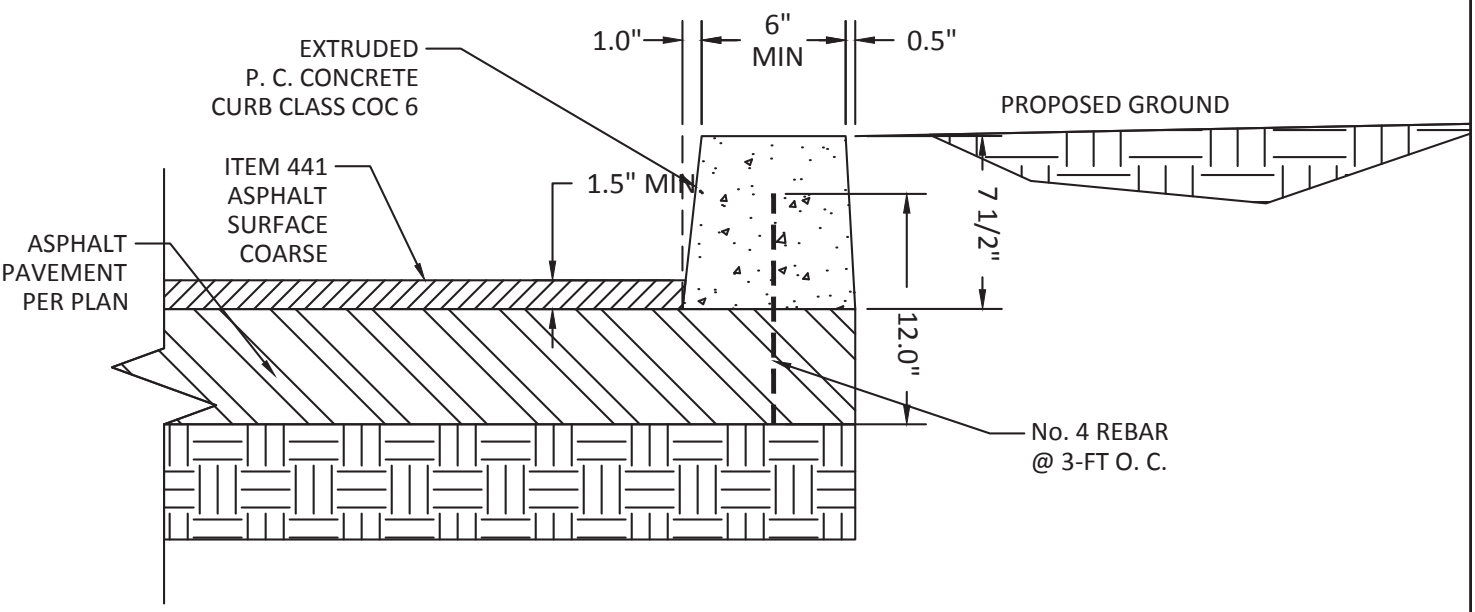
STANDARD DETAIL

CONCRETE MOUNTABLE CURB

ROADWAY

RDWD-23.0

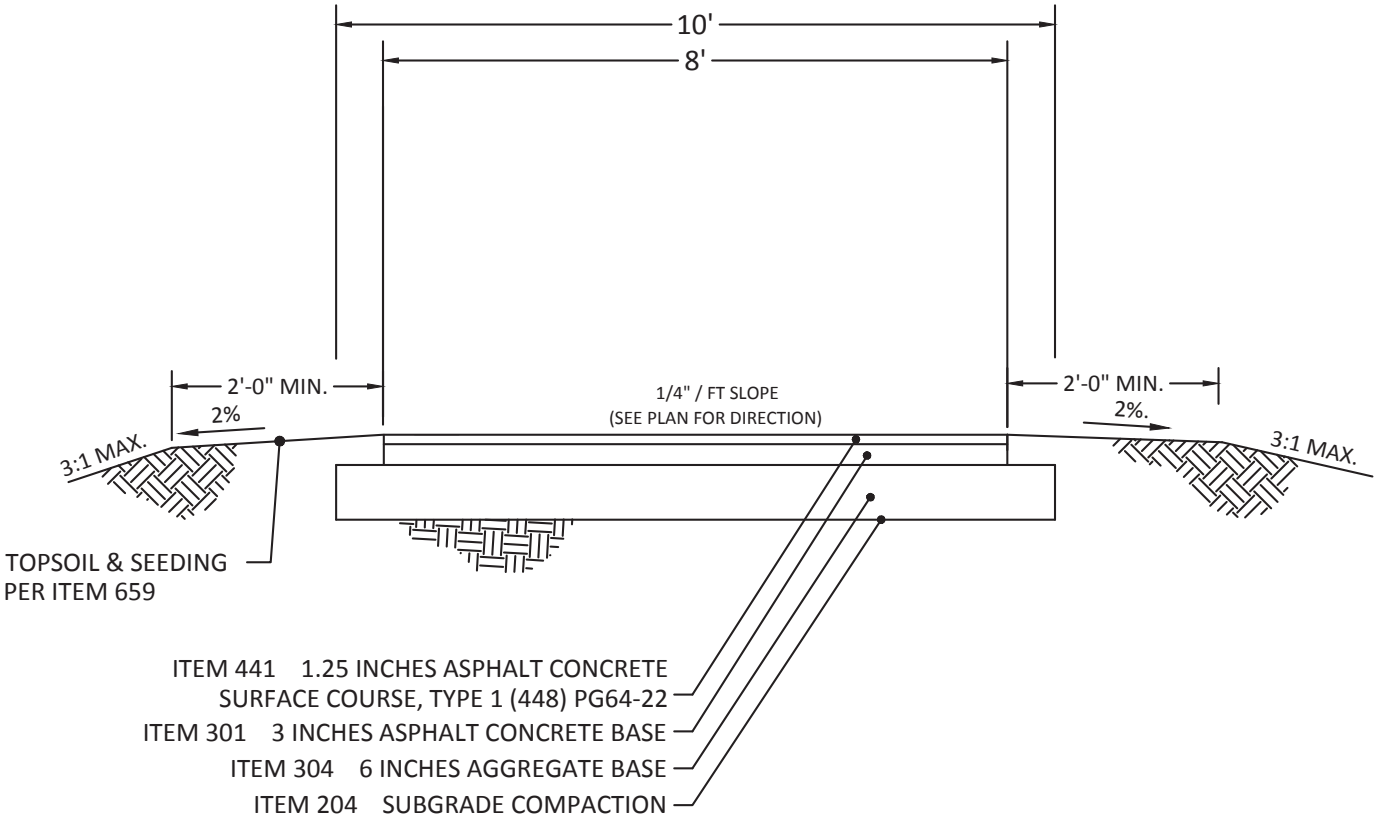
Revised 12/31/2018



NOTES:

1. EXTRUDED CURBING IS PERMITTED IN PRIVATE COMMERCIAL PARKING LOTS AND CONDOMINIUM/ARARTMENT SITES ONLY. IN NO INSTANCE WILL IT BE PERMITTED ON PUBLIC ROADWAYS.
2. EXTRUDED CURBING IS NOT PERMITTED AGAINST ANY MAIN TRAVEL DRIVEWAYS.
3. EXTRUDED CURBING IS PERMITTED ALONG THE PERIMETER OF PARKING LOTS, AT THE END OF PARKING STALLS WHERE PAVEMENT IS ABUTTING LAWN AREAS, AND AROUND LANDSCAPE ISLAND IN PARKING LOTS.
4. THE CURB SHALL BE 7.5-INCHES IN HEIGHT AND SHALL BE PINNED WITH 12-INCH NO. 4 REBAR 3-FT O. C.
5. THE TOP COURSE OF ASPHALT SHALL BE PLACED AFTER PLACEMENT OF THE CURB TO AID IN ANCHORING THE CURB.
6. A 6-INCH REVEAL IS REQUIRED.

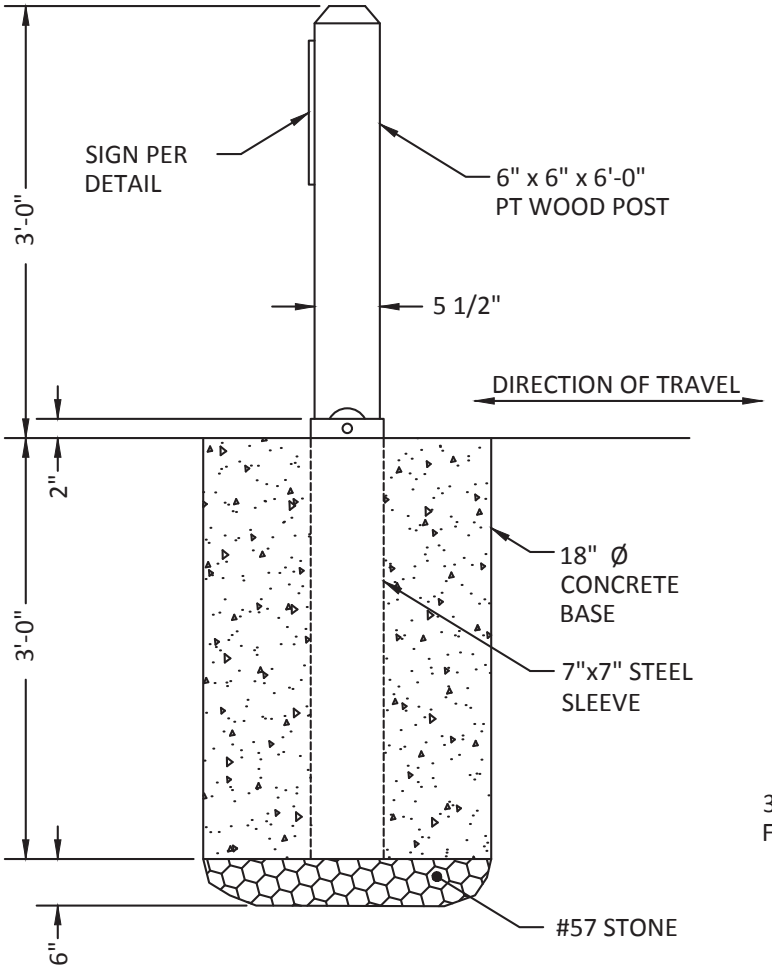
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL EXTRUDED CONCRETE CURB	ROADWAY RDWD-24.0 Revised 12/31/2018

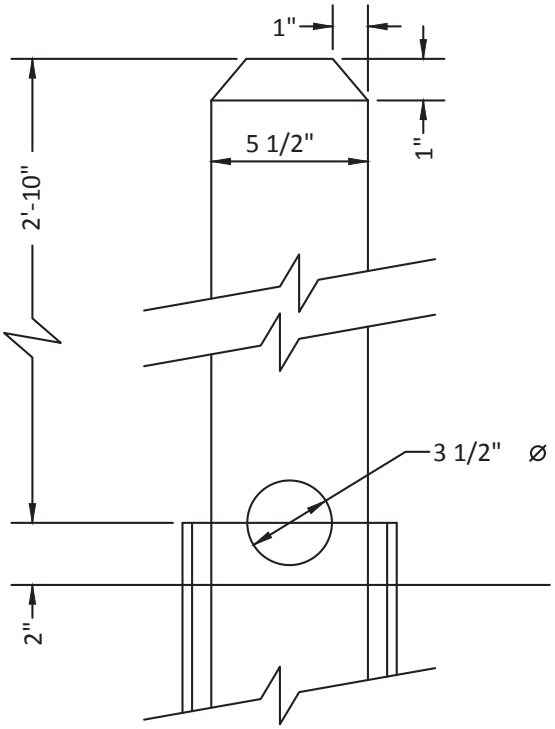


NOTES:

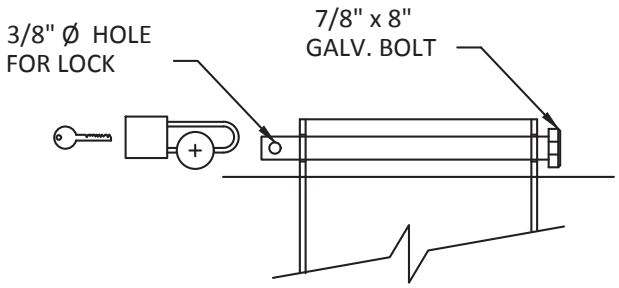
1. ITEM NUMBERS REFER TO THE CITY OF COLUMBUS CONSTRUCTION AND MATERIAL SPECIFICATIONS.
2. ALL DISTURBED AREAS SHALL BE SEEDED, MULCHED AND FERTILIZED PER ITEM 659.
3. 2'-0" GRADED SECTION TO EACH SIDE OF PAVEMENT SHALL BE CLEAR OF OBSTRUCTIONS.
4. MINIMUM VERTICAL CLEARANCE TO OBSTRUCTIONS SHALL BE 8'-6".
5. RAMPS SHALL BE ADA COMPLIANT AND SHALL BE CONSTRUCTED AT ALL ROAD CROSSINGS.
6. GEOTEXTILE FABRIC TO BE ADDED AS NECESSARY AND/OR AT THE DIRECTION OF THE CITY OF DELAWARE.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MULTI-USE PATH ASPHALT PAVEMENT SECTION	ROADWAY RDWD-25.0 Revised 12/31/2018

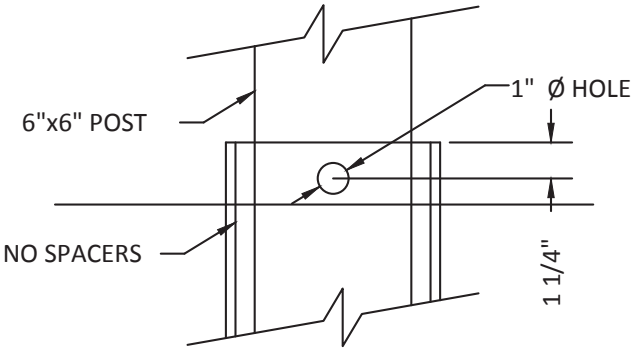




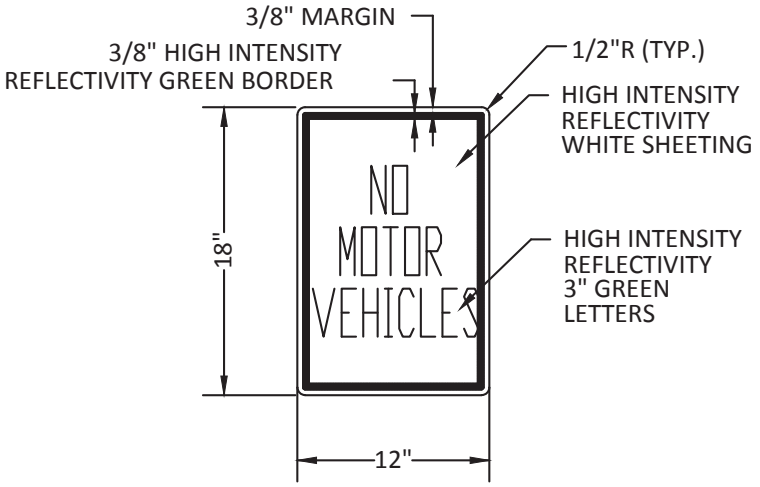
POST DETAIL



OPTIONAL REMOVABLE BOLT/LOCK



STEEL TUBE DETAIL



ATTACH SIGN TO BOLLARD WITH 2 ~ 3" LAG BOLTS

SIGN DETAIL

EST 1808
CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

REMOVABLE / BREAK-AWAY BOLLARD DETAIL

ROADWAY

RDWD-28.0

Revised 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

STANDARD DETAIL

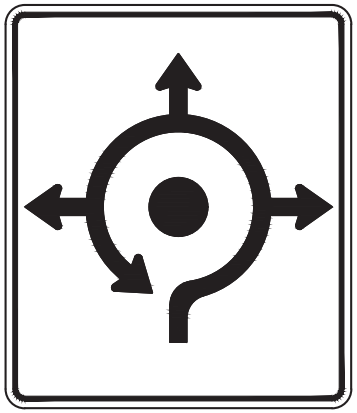
ROUNDABOUT SIGNAGE

ROADWAY

RDWD-30.0

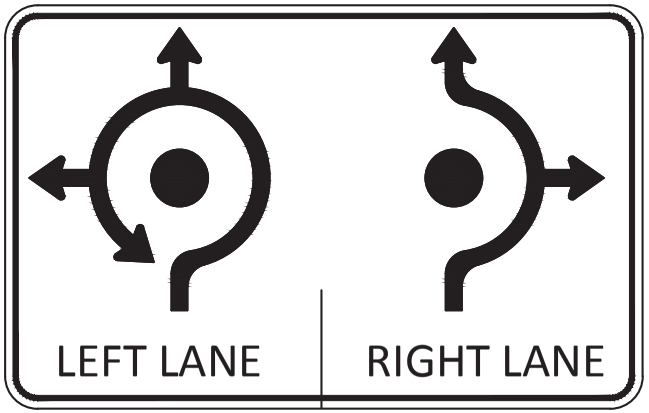
Revised 12/31/2018

SPEC.



SINGLE LANE ROUNDABOUT

SPEC.



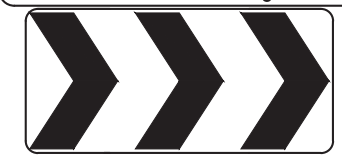
DUAL LANE ROUNDABOUT

W2-6

*

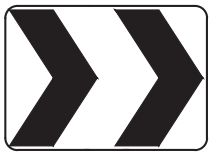
W3-1

R6-1R



R6-4a

or



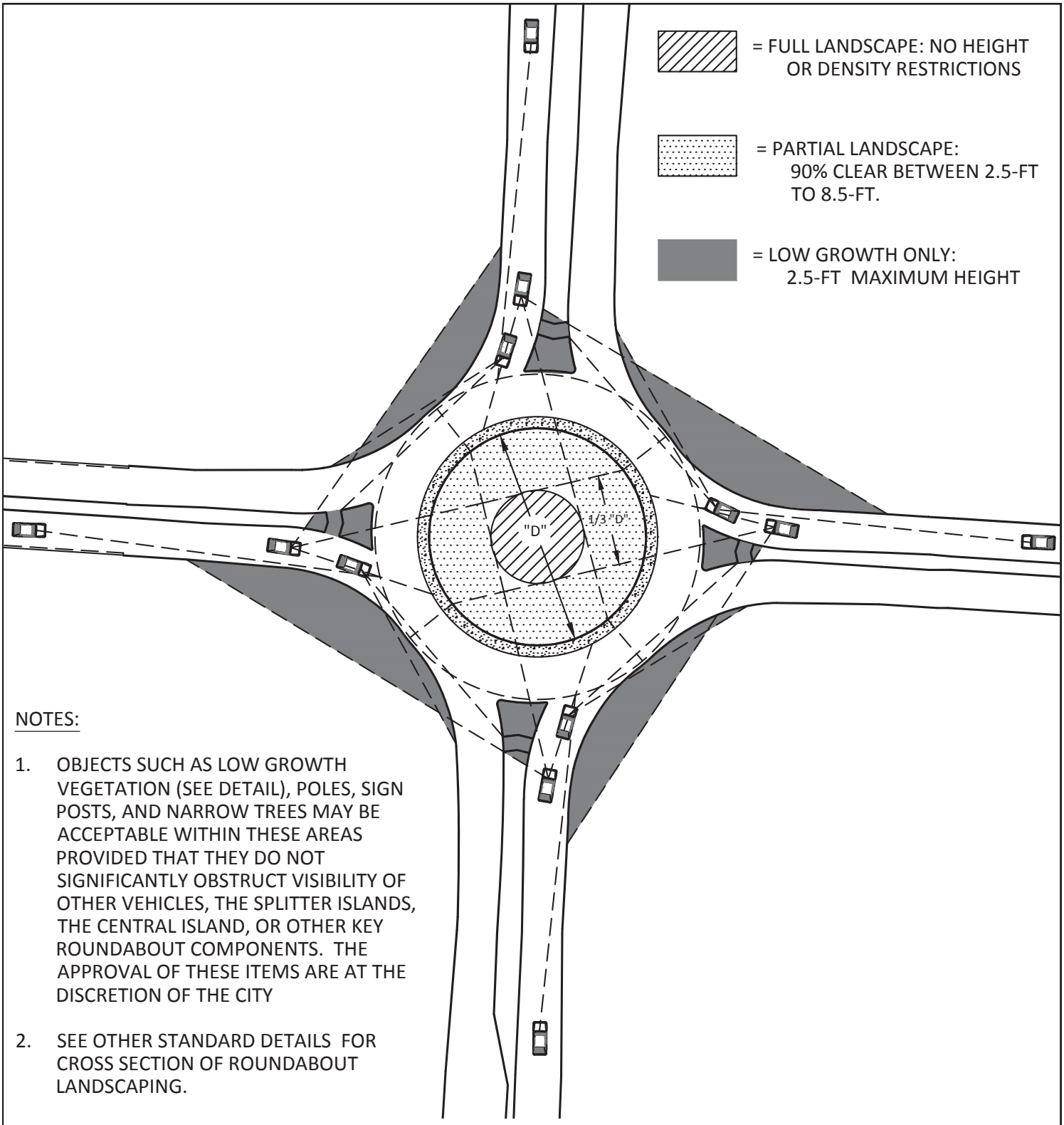
R6-4

R1-2

SPEC

*** Replace with street name placard when applicable W16-H8P**

Note: Signage at roundabouts shall be per the most current edition of the OMUTCD with exception as shown on this sheet.



NOTES:

1. OBJECTS SUCH AS LOW GROWTH VEGETATION (SEE DETAIL), POLES, SIGN POSTS, AND NARROW TREES MAY BE ACCEPTABLE WITHIN THESE AREAS PROVIDED THAT THEY DO NOT SIGNIFICANTLY OBSTRUCT VISIBILITY OF OTHER VEHICLES, THE SPLITTER ISLANDS, THE CENTRAL ISLAND, OR OTHER KEY ROUNDABOUT COMPONENTS. THE APPROVAL OF THESE ITEMS ARE AT THE DISCRETION OF THE CITY
2. SEE OTHER STANDARD DETAILS FOR CROSS SECTION OF ROUNDABOUT LANDSCAPING.
3. RECORDED RIGHT-OF-WAY FOR THE ROUNDABOUT AND A MAINTENANCE AGREEMENT WITH THE CITY FOR THE LANDSCAPING IS REQUIRED.
4. ALL DESIGNERS MUST SUBMIT A SIGHT DISTANCE/LANDSCAPING EXHIBIT SIMILAR TO THIS EXAMPLE. THIS EXHIBIT MUST BE DESIGNED PER FHWA'S MOST CURRENT BASIS OF DESIGN, WHICH TO DATE IS FHWA-RD-00-067.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

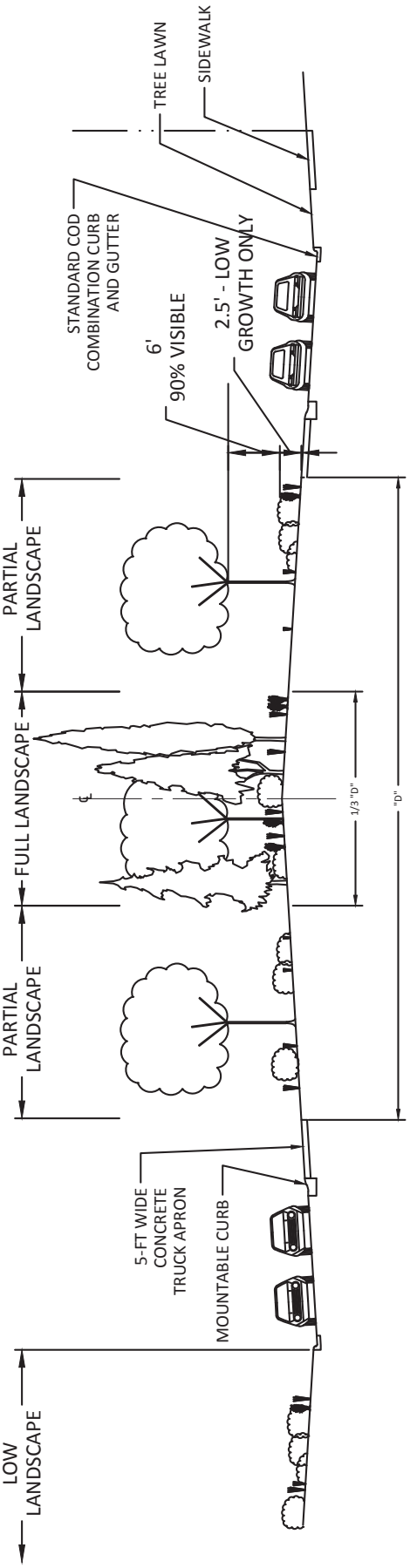
STANDARD DETAIL

ROUNDABOUT SIGHT DISTANCE/ LANDSCAPING EXHIBIT

ROADWAY

RDWD-31.0

Revised 12/31/2018



EST 1808
CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

ROUNDABOUT SIGHT DISTANCE/ LANDSCAPING CROSS SECTION

ROADWAY

RDWD-32.0

Revised 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

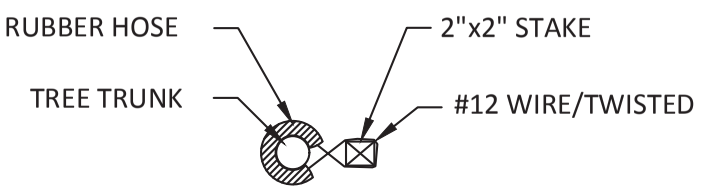
STANDARD DETAIL

STREET TREE DETAILS

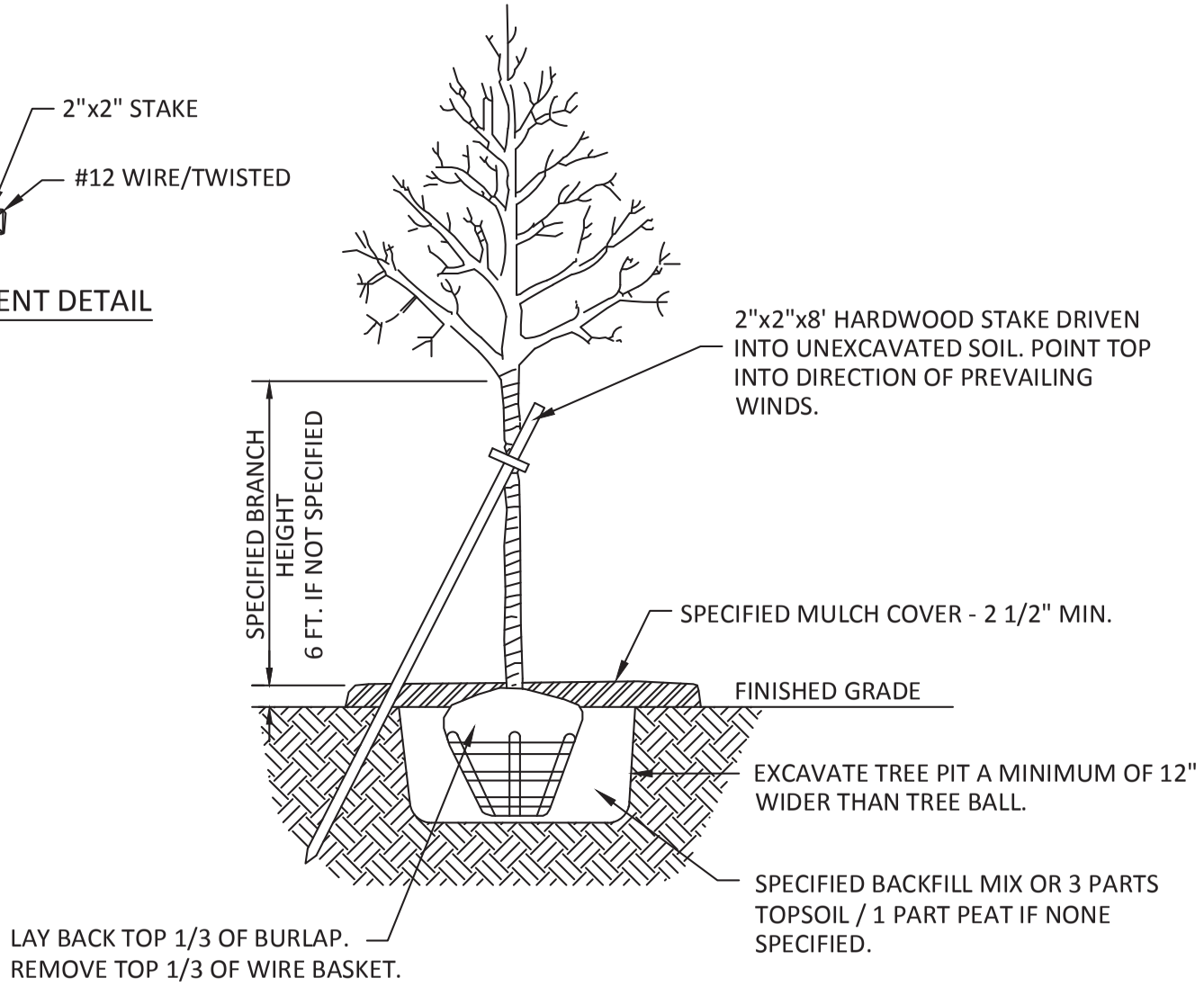
ROADWAY

RDWD-33.1

Revised 12/31/2018



STAKE ATTACHMENT DETAIL



TREE PLANTING DETAIL

TREES UP TO 3" CALIPER

-NO SCALE-

TREE PLANTING INSTRUCTIONS
CITY OF DELAWARE, OHIO

I SITE PREPARATION

A. DIG PLANTING HOLE NO DEEPER THAN DEPTH OF ROOT BALL, LEAVING BOTTOM OF HOLE FIRM.

B. DIG HOLE WIDTH AT LEAST ONE FOOT LARGER THAN THE DIAMETER OF THE ROOT BALL.

II PLANTING

A. REMOVE THE TOP THIRD OF THE WIRE SHIPPING BASKETS, ALL PLASTIC COVERS, SHIPPING COLLARS, AND NYLON ROPES. REMOVE TOP OF BURLAP BY PULLING AWAY BURLAP FROM TOP OF ROOT BALL AND TUCK INTO HOLE. NO PLASTIC BURLAP PERMITTED. UNTANGLE BRANCHES.

B. ROLL OR LIFT TREE INTO HOLE BY MOVING THE ROOT BALL, NOT BY LIFTING THE TRUNK.

C. PLUMB TREE UPRIGHT IN CENTER OF PLANTING HOLE.

D. TREE SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL IS NO MORE THAN THREE INCHES ABOVE EXISTING GRADE. NEVER PLANT DEEPER THAN THE GRADE.

E. IF EXCAVATED SOIL CONTAINS MORE THAN 30% CRUSHED STONE OR OTHER DEBRIS, BACKFILL WITH CLEAN TOPSOIL.

F. WATER THOROUGHLY DURING AND AFTER BACKFILLING, USING THE FOLLOWING METHOD:

(1) BACKFILL THE HOLE 1/3 TO 1/2 FULL;

(2) APPLY WATER UNTIL THE SOIL IS THOROUGHLY SETTLED AROUND ROOT BALL, ALLOWING NO AIR POCKETS TO REMAIN;

(3) COMPLETE BACKFILLING TO FINISHED GRADE;

(4) APPLY MULCH;

(5) THOROUGHLY SOAK WITH WATER.

III MULCHING

A. MULCH THREE INCHES DEEP OVER THE ROOT BALL AND HOLE.

B. LEAVE THREE INCH CIRCLE OF BARE SOIL AROUND TRUNK.

C. SPREAD MULCH TO AN EVEN DEPTH AROUND TREE; DO NOT PYRAMID SOIL OR MULCH AROUND TRUNK.

Light Fixtures:

Light fixtures for either Residental Street Light ~~or Collector Street Lighting shall be as follows~~:

1. **LED Model:**

GVD2 P30 30K AS M CMC 3 R S GL P7 FPD85 PSC

GranVille LED (GVD2) Custom Match Color= RP009P022 Delaware Green: GranVille 174; II LED (GVD 2), LED Performance Package 30, 3000 Series CCT, Auto-Sensing Voltage (120-277), Modern Style - Swing Open Design, Custom Match Color, handled through Custom BOM Group, Asymmetric Type III, Ribs & Bands, Painted Cast Aluminum Standard, Gold, Dimming photocontrol receptacle - 7 PIN, (FPD85) Factory programmed to 85 percent of base, Shorting Cap

Unique Solutions, A Division of Holophane

Newark, Ohio 43055

www.holophane.com

GVD3 P30 30K MVOLT MS CMC GL3 RB ST TGL PR7E FPD75 SH

Granville LED Classic: Granville LED Classic, LED Performance Package 30, 3000 series CCT, Auto-sensing voltage (120 thru 277), Modern style swing open design, Custom Match Color, Glass asymmetric, type III, Ribs and bands, Standard, Gold trim, 7 pin NEMA photocontrol external, Factor programmed to 75 percent of base, Shorting cap

Note, this model may also be used in collector street light design provided the photometric and IES requirements are met.

All street lighting (residential or collector) is required to be a designed street lighting sytem.

Electrical Installation Requirements

Fixtures must be wired and installed per ODOT CMS Items 625 and 725, COC Section 1000, as well as per the current edition of the National Electrical Code (N.E.C.- NFPA 70), manufacture's specifications, and the following requirements:

1) Conduit

a. Shall be 1 $\frac{1}{2}$ -inch schedule 40 PVC or 1.5-inch cable in duct, installed a minimum 24-inch below grade
b. Under driveways shall be located a minimum distance of 1-FT beyond pavement edge
c. All trenches shall be backfilled with suitable native material to within ninety-eight (98) percent of the maximum dry density

2) Circuit Cable (also referred to as "Street Light Wiring")

a. Conductors shall be no less than #4 THWN copper 600 Volt for the hot and neutral and not less than #8 AWG copper 600 Volt for the ground. Max. voltage drop 5%
b. 120 system shall be (HOT) black, (NEUTRAL) white, (GROUND) green
c. 240 system shall be (HOT) black, (HOT) red, (GROUND) green
d. Shall have no splices, except at noted locations. Splices shall be be made in pull boxes only where circuit crosses the street to a light pole, and shall be waterproof and have a compression connection
e. Install auxillary ground #6 copper to a grounding electrode in pole footer. $\frac{5}{8}$ -inch x 8-inch rod

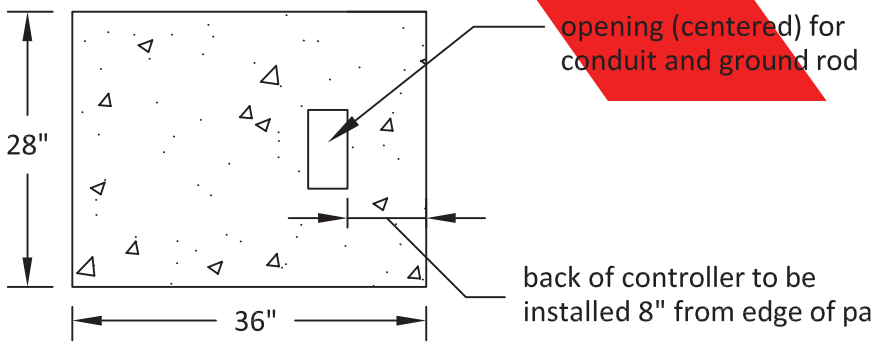
3) Cable in Pole

a. From the fuse kit to the pole shaft the cable shall be #10 THWN copper
b. Each pole shall have in-line connect kit fused with a 5-amp fuse on the hot side and in-line connector kits with a **solid** dummy slug on the neutral side. Little fuse, Homac kit brand, or approved equal
c. The circuit ground, ground from the luminaire and the ground going to the pole, shall be connected by a compression connection.

4) Controller

a. The controller cabinet shall be as follows:
   1. Milbank 12-inch commercial pedestal, slim line 63-inch tall (Model number CP3A5111WKALSP1) ; or approved equal
   2. Brushed aluminum finish with ringless meter socket with horn bypass and stainless steel latch
   3. 100 amp, 120/240 volt, single phase, 2 pole, with either a NEC compliant main breaker or 6 individual breakers with contactor, as determined by the City
   4. Pad mounted. See schematic below for details. The concrete pad base (precast or poured) shall be approximately 36" x 28" x 8" thick with a sufficient opening for the conduit and ground rod.
b. Install a $\frac{5}{8}$-Inch (five eighths) by 8-FT copper clad rod in the opening of the pad, utilizing a minimum #6 solid copper to attach the ground rod to the ground bar of the enclosure
c. Install a Hand-Off Auto (HOA) Selector Switch
d. Provide to City a break away lock to secure cabinet
e. For the photo electric control installed at the first street light, contacts shall be installed in the Milbank below the overcurrent device(s) and HOA switch(es) installed

Controller Concrete Pad Base Schematic



EST 1808 CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

ELECTRICAL INSTALLATION REQUIREMENTS FOR RESIDENTIAL STREET LIGHTING

ROADWAY

RDWD-34.2

Revised 12/31/2018

Electrical Installation Requirements

Fixtures must be wired and installed per ODOT CMS Items 625 and 725, COC Section 1000, as well as per the current edition of the National Electrical Code (N.E.C.- NFPA 70), manufacture's specifications, and the following requirements:

1) Conduit

a. Shall be $1\frac{1}{2}$-inch schedule 40 PVC, installed a minimum 24-inch below grade
b. Under driveways shall be located a minimum distance of 1-FT beyond pavement edge
c. All trenches shall be backfilled with suitable native material to within ninety-eight (98) percent of the maximum dry density

2) Circuit Cable (also referred to as "Street Light Wiring")

a. Conductors shall be no less than #4 THWN copper 600 Volt for the hot and neutral and not less than #8 AWG copper 600 Volt for the ground. Max. voltage drop 5%
b. 120 system shall be (HOT) black, (NEUTRAL) white, (GROUND) green
c. 240 system shall be (HOT) black, (HOT) red, (GROUND) green
d. Shall have no splices, except at noted locations. Splices shall be be made in pull boxes only where circuit crosses the street to a light pole, and shall be waterproof and have a compression connection
e. Install auxillary ground #6 copper to a grounding electrode in pole footer. $\frac{5}{8}$-inch x 8-inch rod

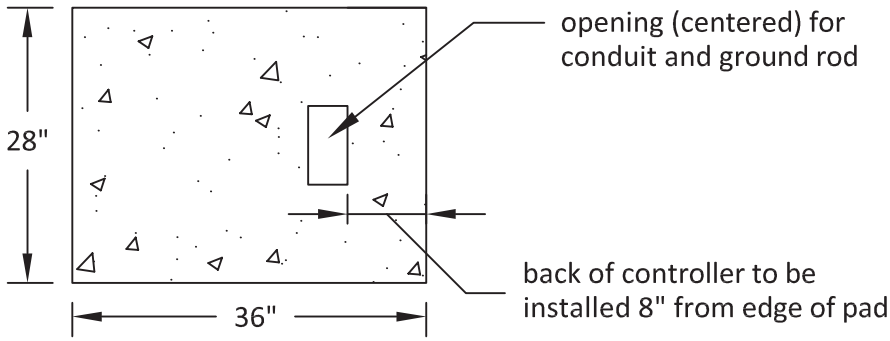
3) Cable in Pole

a. From the fuse kit to the pole shaft the cable shall be #10 THWN copper
b. Each pole shall have in-line connect kit fused with a 5-amp fuse on the hot side and in-line connector kits with a **solid** dummy slug on the neutral side. Little fuse, Homac kit brand, or approved equal
c. The circuit ground, ground from the luminaire and the ground going to the pole, shall be connected by a compression connection.

4) Controller

a. The controller cabinet shall be as follows:
   1. Milbank 12-inch commercial pedestal, slim line 63-inch tall (Model number CP3A5111WKALSP1) ; or approved equal
   2. Brushed aluminum finish with ringless meter socket with horn bypass and stainless steel latch
   3. 100 amp, 120/240 volt, single phase, 2 pole, with either a NEC compliant main breaker or 6 individual breakers with contactor, as determined by the City
   4. Pad mounted. See schematic below for details. The concrete pad base (precast or poured) shall be approximately 36" x 28" x 8" thick with a sufficient opening for the conduit and ground rod.
b. Install a $\frac{5}{8}$-Inch (five eighths) by 8-FT copper clad rod in the opening of the pad, utilizing a minimum #6 solid copper to attach the ground rod to the ground bar of the enclosure
c. Install a Hand-Off Auto (HOA) Selector Switch
d. Provide to City a break away lock to secure cabinet
e. For the photo electric control installed at the first street light, contacts shall be installed in the Milbank below the overcurrent device(s) and HOA switch(es) installed

Controller Concrete Pad Base Schematic



EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL ELECTRICAL INSTALLATION REQUIREMENTS FOR RESIDENTIAL STREET LIGHTING	ROADWAY RDWD-34.2 Revised 04/29/2019

Electrical Installation Requirements *(Continued)*

5) Power Service

a. It is the responsibility of the contractor to coordinate with the power utility for the location of the control center and power feed for the control center. All costs associated with making the connection shall be the responsibility of the contractor. The cost of the workmanship shall be included in the various items bid.

b. The meter is to be obtained from the power service provider and installed in the controller cabinet. An address for the service location shall be obtained from the City of Delaware.

c. The contractor shall furnish and install all equipment necessary to complete electrical service to the roadway facilities. The contractor shall also make necessary arrangements with the supplying agency for connections to establish electrical service.

6) Pull Box

a. Shall be approximately 11" (L) x 18" (W) x 18" (D), having a cover labeled 'ELECTRIC' to designate the circuits contained, rated Performance Tier 15, Oldcastle 1118 or approved equal.

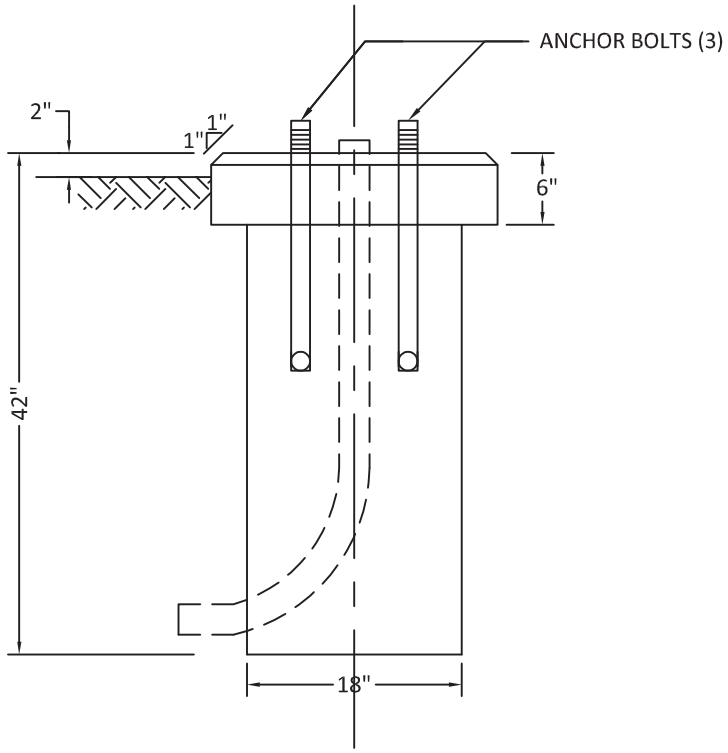
b. A 6" gravel base shall be provided below the pull box

c. Pull boxes shall be provided at each location where a conduit is routed in a new direction to provide access for maintenance operations. Additional pull boxes shall be provided and installed as found required by the City of Delaware.

6) Photo electric control

a. Shall be mounted in the first light pole in the circuit. Three control wires for the photo control shall be a minimum #12 thwn stranded copper black, red, white, and can be installed in the same conduit.

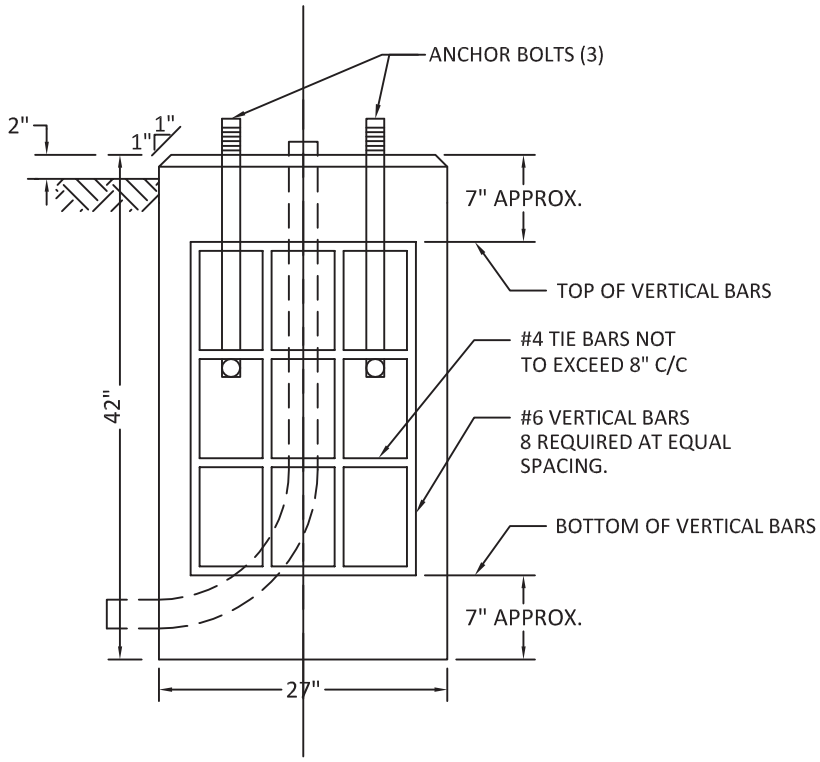
b. Shall be rated for 120 Volt minimum, twist lock. Dark to Light, GE, Tork, or approved equal.



FOUNDATIONS SHALL BE:

- 42" DEEP
- 18" DIAMETER
- TOP OF CONCRETE FOUNDATION SHALL BE FORMED INTO A 24" X 24" X 6" SQUARE WITH A 1" CHAMFER
- FOUNDATION TOP IS 4" ABOVE CURB ELEVATION.
- POLE SHALL BE ANCHORED TO AN 18" BY 42" CONCRETE FOOTING, USING THE THREE GALVANIZED ANCHOR BOLTS PROVIDED WITH THE POLE, PER THE ANCHOR BOLT DIAMETER AND SPACING SPECIFIED BY THE POLE MANUFACTURER.

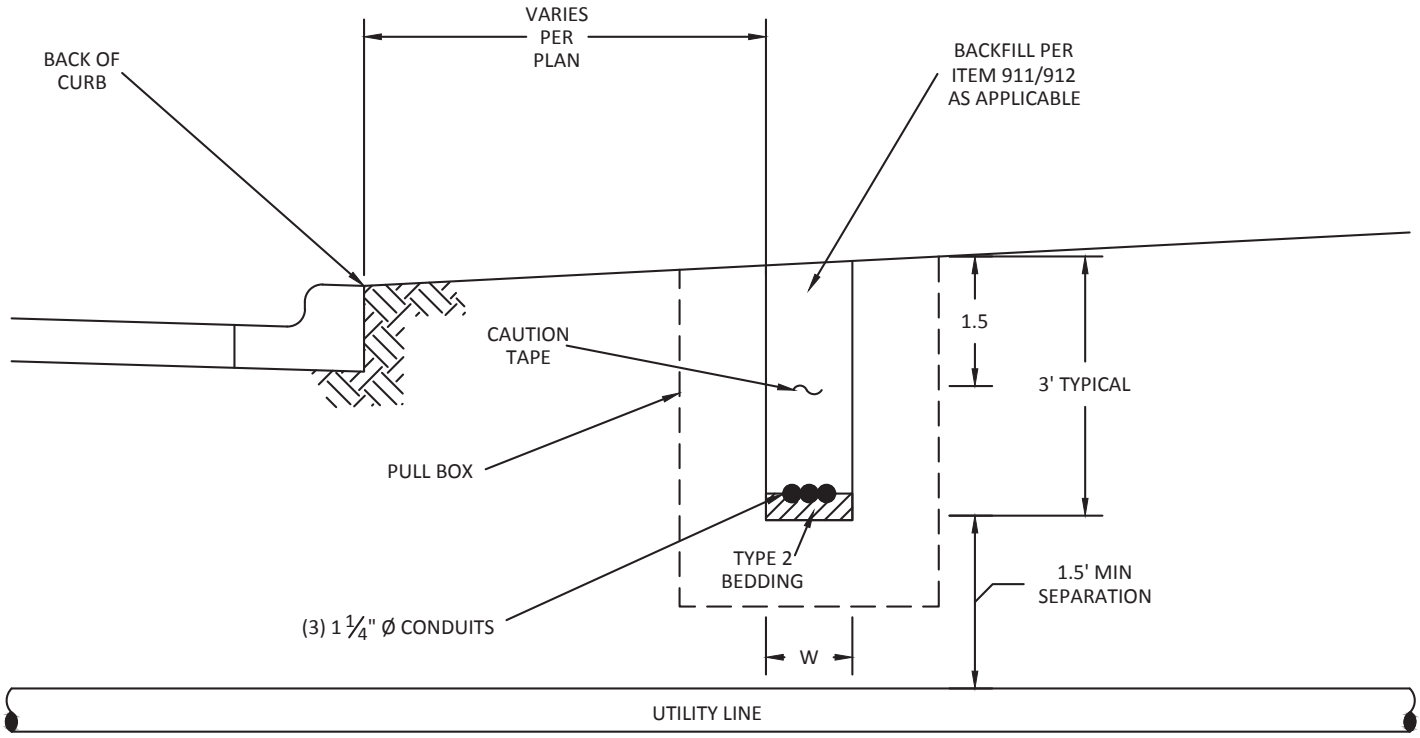
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL LIGHT POLE FOUNDATION FOR RESIDENTIAL STREET LIGHTING	ROADWAY RDWD-34.4 Revised 12/31/2018



FOUNDATIONS SHALL BE:

- 42" DEEP
- 27" DIAMETER
- REINFORCED WITH #6 REBAR WITH #4 TIE BARS AS PER PLAN DETAIL; DESIGN TO BE APPROVED BY PUBLIC WORKS DEPARTMENT
- TOP OF CONCRETE FOUNDATION SHALL BE FORMED INTO A SQUARE WITH A 1" CHAMFER
- FOUNDATION TOP IS 4" ABOVE CURB ELEVATION.
- POLE SHALL BE ANCHORED TO A 27" BY 42" CONCRETE FOOTING, USING THE THREE GALVANIZED ANCHOR BOLTS PROVIDED WITH THE POLE, PER THE ANCHOR BOLT DIAMETER AND SPACING SPECIFIED BY THE POLE MANUFACTURER.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL LIGHT POLE FOUNDATION FOR COLLECTOR STREET LIGHTING	ROADWAY RDWD-34.5 Revised 12/31/2018



NOTE: TRENCH WIDTH 'W' MUST BE WIDE ENOUGH TO ACCOMMODATE AVAILABLE BACKFILL COMPACTION EQUIPMENT TO MEET COMPACTION REQUIREMENTS.

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

STANDARD DETAIL

FIBER OPTIC CONDUIT INSTALLATION DETAIL

ROADWAY

RDWD-35.1

Revised 12/31/2018

NOTES FOR AERIAL INSTALLATION:

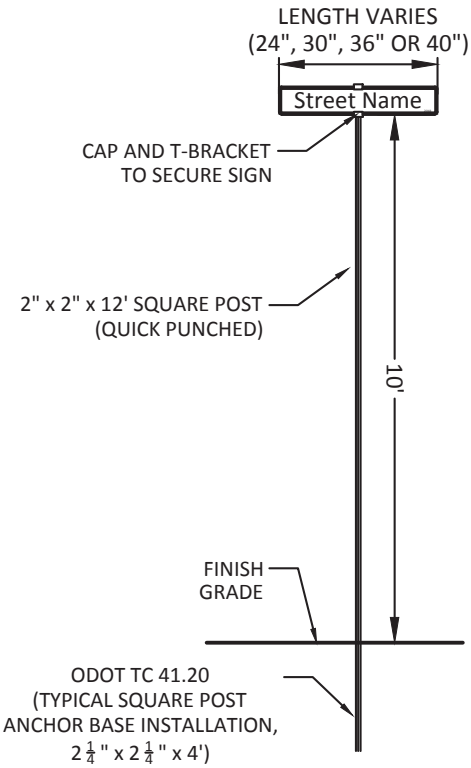
1. FOR AERIAL CONSTRUCTION, INCORPORATE A SLACK LOOP EVERY SEVEN SPANS, AND AT LOGICAL LOCATIONS TO SPLICE OFF THE MAIN FIBER LINE AS DETERMINED BY THE PUBLIC WORKS DEPARTMENT AND THE DEPARTMENT OF INFORMATION TECHNOLOGIES .
2. VENDOR MUST INSTALL RISER U-GUARDS WHEN ASCENDING OR DESCENDING FROM A SUPPORT POLE.
3. SUBSURFACE - FOR SUBSURFACE CONSTRUCTION, THE CONDUIT SHALL BE:
   a. THREE, 1-1/4 INCH (MINIMUM) SDR 11 HDPE CONDUITS.
   b. CONDUITS ARE TO BE BLUE, ORANGE ,AND GREEN, UNLESS OTHERWISE SPECIFIED
   c. PULL-BOX TO BE 48 X 30 X 36 DEEP, POLYMER CONCRETE BOX W/20K METAL OR METAL CLAD LID, BOLT DOWN
   d. SHOP DRAWINGS OF PULL-BOX AND LID TO BE APPROVED BY THE PUBLIC WORKS DEPARTMENT PRIOR TO INSTALLATION
   e. PULL-BOX SPACING OF NO MORE THAN 1000 FEET BETWEEN BOXES, AND WHERE SPECIFIED AT LOGICAL PLACES TO SPLICE INTO THE FIBER.
   f. TRACE WIRE MUST BE USED THROUGHOUT SYSTEM AND IS TO BE PLACED IN THE SOLID ORANGE CONDUIT
   g. IF TRENCHING, PLASTIC CAUTION TAPE IS TO BE PLACED OVER THE CONDUIT AT A DEPTH OF 18 INCHES. NEWLY INSTALLED PULL-BOXES MUST BE MARKED WITH 4 X 4 WYE POLES PAINTED ORANGE AT THE TOP - TO REMAIN UNTIL FIBER IS INSTALLED (WITH TRACER WIRE)
   h. CONCRETE ENCASE CONDUIT AT ALL ROAD CROSSINGS TO THE TOP OF SUBGRADE
   i. MINIMUM VERTICAL SEPARATION SHALL BE 1.5 FEET BETWEEN FIBER CONDUIT AND ALL OTHER UTILITIES

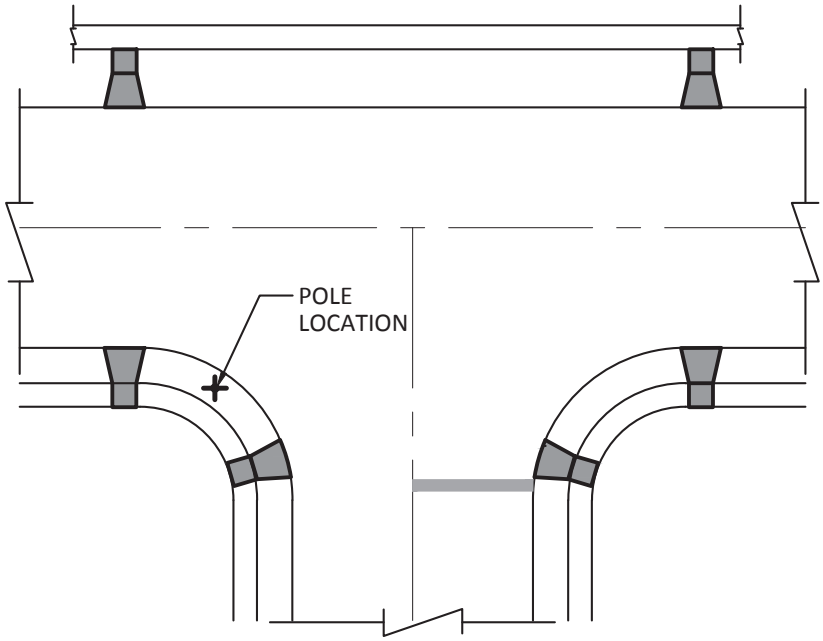
NOTES ALL PROJECTS:

1. CONTRACTOR SHALL PROVIDE RECORD DRAWINGS IN THE FORMAT SPECIFIED BY THE CITY OF DELAWARE GIS DEPARTMENT WHEN CONSTRUCTION IS COMPLETE, AND ACCEPTED.

NOTES REGARDING THE FIBER:

1. FIBER TO BE INSTALLED IS 144 STRAND FIBER OPTIC CABLE.
2. ALL SPLICING MUST BE COLOR CODED BETWEEN DIFFERENT CABLES. I.E., RED TUBE FIBERS MUST BE SPLICED TO RED TUBE FIBERS, ETC.
3. ALL CONTRACTORS THAT ARE TO INSTALL FIBER LINE THAT ARE TO BE APPROVED BY THE CITY.





SIGN PLACEMENT

NOTES:

1. SIGNS SHALL BE TWO SIDED MADE ON 8" ALUMINUM BLADES WITH RADIUS CORNERS AND STANDARD LENGTHS OF 24", 30", 36" OR 40"
2. FOR LOCAL STREETS WITH POSTED SPEED LIMITS AT 25 MPH OR LESS, LETTERING SHALL INCLUDE UPPER CASE LETTERS AT 4" AND LOWER CASE AT 3". FOR STREETS WITH POSTED SPEED LIMITS GREATER THAN 25 MPH, LETTERING SHALL BE 6" FOR UPPER CASE 4.5" FOR LOWER CASE.
3. STREET NAME SIGNS SHALL BE COVERED ON BOTH SIDES WITH BLUE PRISMATIC SHEETING (3M SCOTCHLITE FILM - #3875 BLUE), MEETING THE RETROREFLECTIIVITY REQUIREMENTS OF THE OMUTCD SECTION 2A.07 AND HAVE A 10 YEAR WARRANTY.
4. SIGN LETTERING SHALL BE OF WHITE PRISMATIC SHEETING, MEETING THE RETROREFLECTIIVITY REQUIREMENTS OF THE OMUTCD 2A.07
5. LETTERING SHALL BE MADE IN THE FHWA APPROVED STANDARD FONT AND IN COMPLIANCE WITH THE OMUTCD
6. SIGNS SHALL INCLUDE A WHITE ½-INCH WHITE BORDER AT THE EDGE OF THE SIGN MADE OF WHITE PRISMATIC SHEETING.
7. SIGN POSTS SHALL BE MADE OF 2" SQUARE POST, WITH A MINIMUM CLEARANCE FROM GRADE TO BOTTOM OF SIGN OF 10'-0
8. SIGNS SHALL BE SECURED TO POLE WITH A GALVANIZED CAP AND TEE BRACKETS
9. SIGN POLES SHALL BE INSTALLED ON THE LEFT SIDE OF THE STREET, OPPOSITE FROM THE STOP SIGN WITHIN THE TREE LAWN RADIUS AREA, AND WITH THE EDGE OF THE SIGN 2'-0 FROM THE BACK OF CURB
10. ALL STREET SIGNS SHALL BE INSTALLED AS REQUIRED IN ADVANCE OF OPENING ANY STREET TO PUBLIC ACCESS
11. THE YEAR OF INSTALLATION SHALL BE ½ -INCH WHITE LETTERING LOCATED IN BOTTOM RIGHT CORNER OF ONE SIDE
12. LUBRICATE ALL BOLTS AND SCREWS (ALUMINUM OR STEEL) FOR SIGN INSTALLATION WITH A COMPOUND TO PREVENT SEIZING.

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

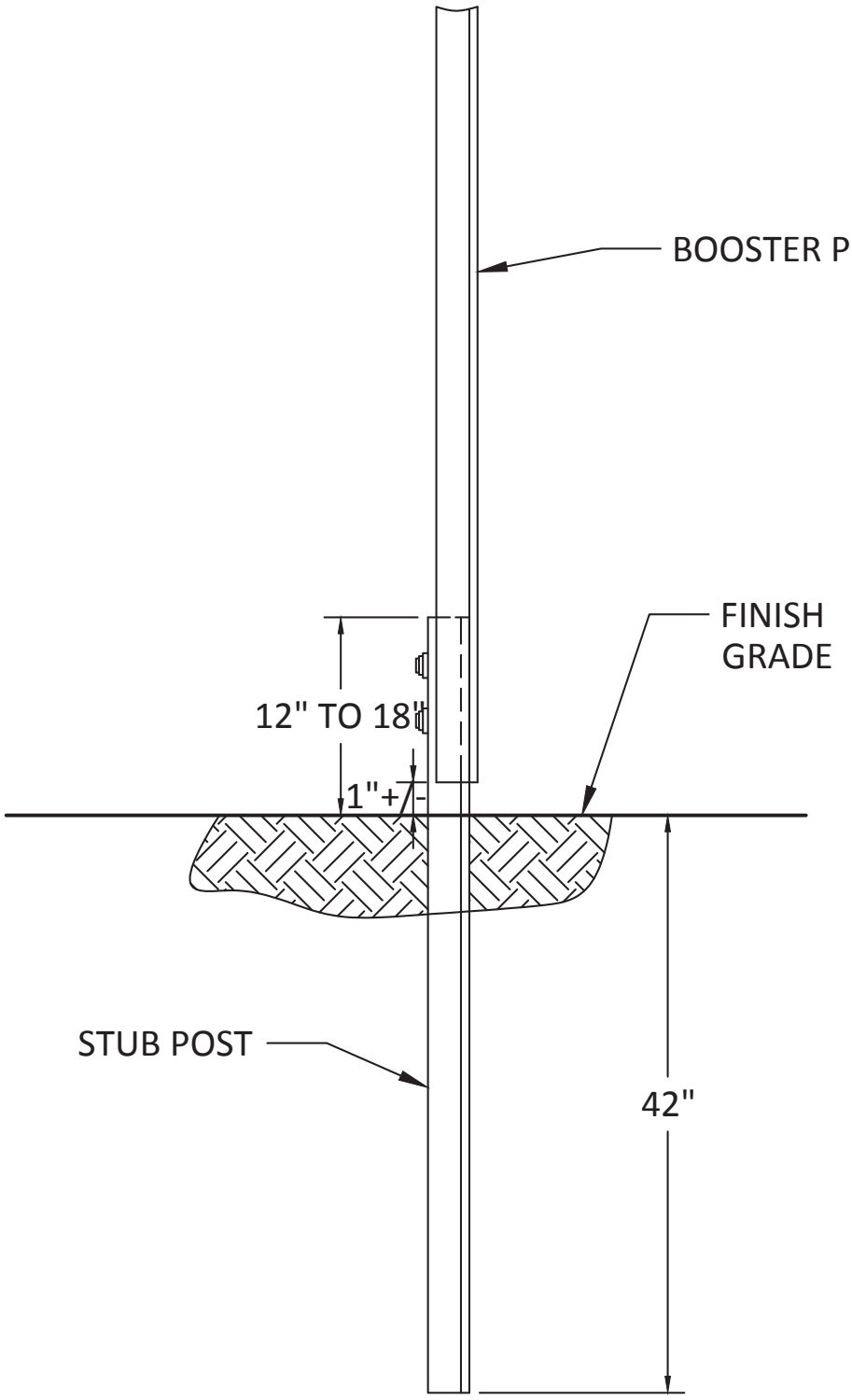
STANDARD DETAIL

STREET NAME SIGN DETAIL

ROADWAY

RDWD-36.0

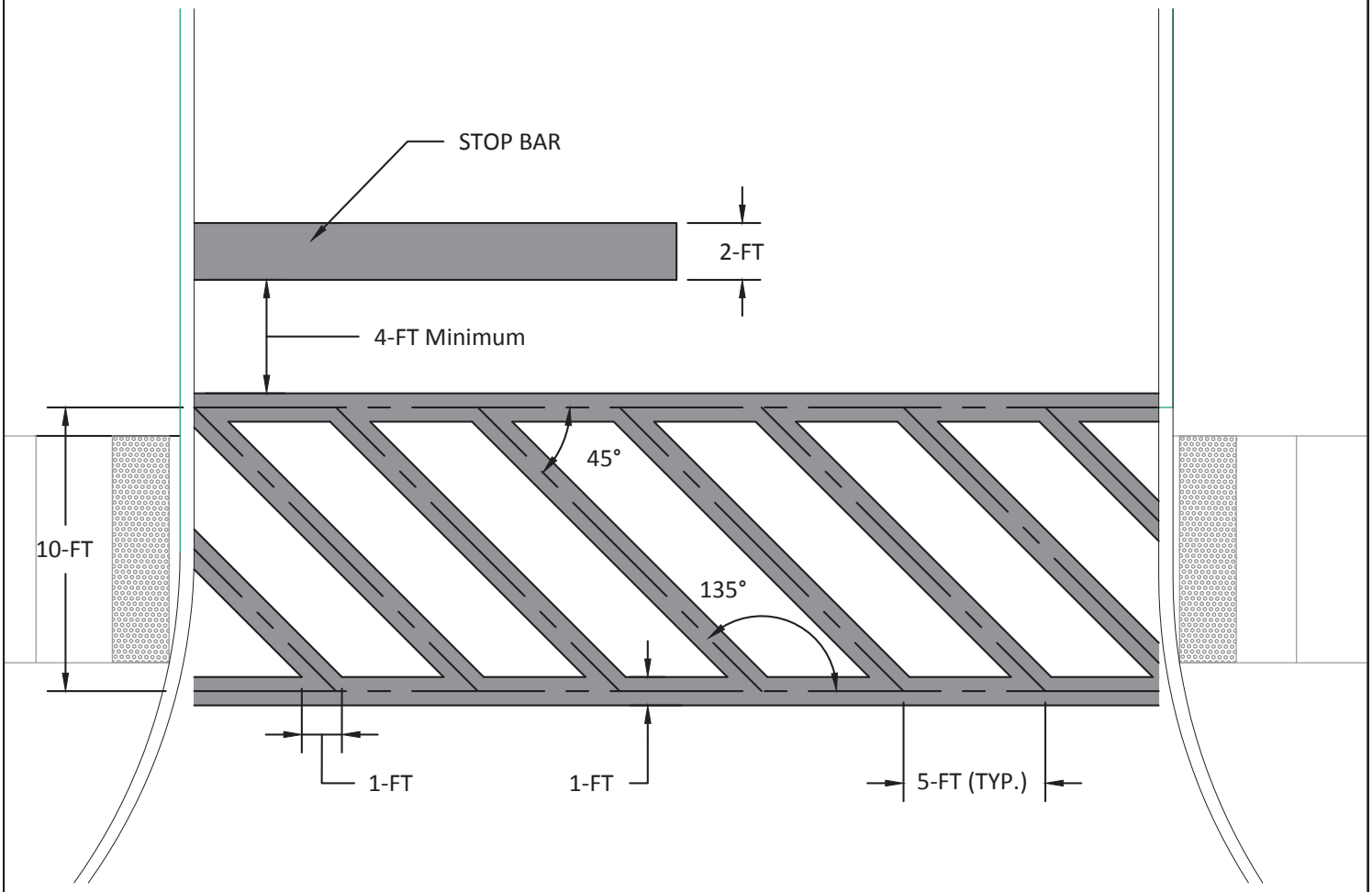
Revised 12/31/2018



NOTES:

1. ALL SIGNS AND SIGN SUPPORTS SHALL BE PER ODOT CMS 630.
2. BOLTS SHALL BE STEEL AND SHALL BE LOCATED IN THE TOP HOLE OF THE STUB POST.
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY.
4. ALL POST SHALL #3 U-CHANNEL POST.
5. BOOSTER POST SHALL BE MOUNTED IN FRONT OF STUB POST.
6. LUBRICATE ALL BOLTS AND SCREWS (ALUMINUM OR STEEL) FOR SIGN INSTALLATION WITH A COMPOUND TO PREVENT SEIZING.

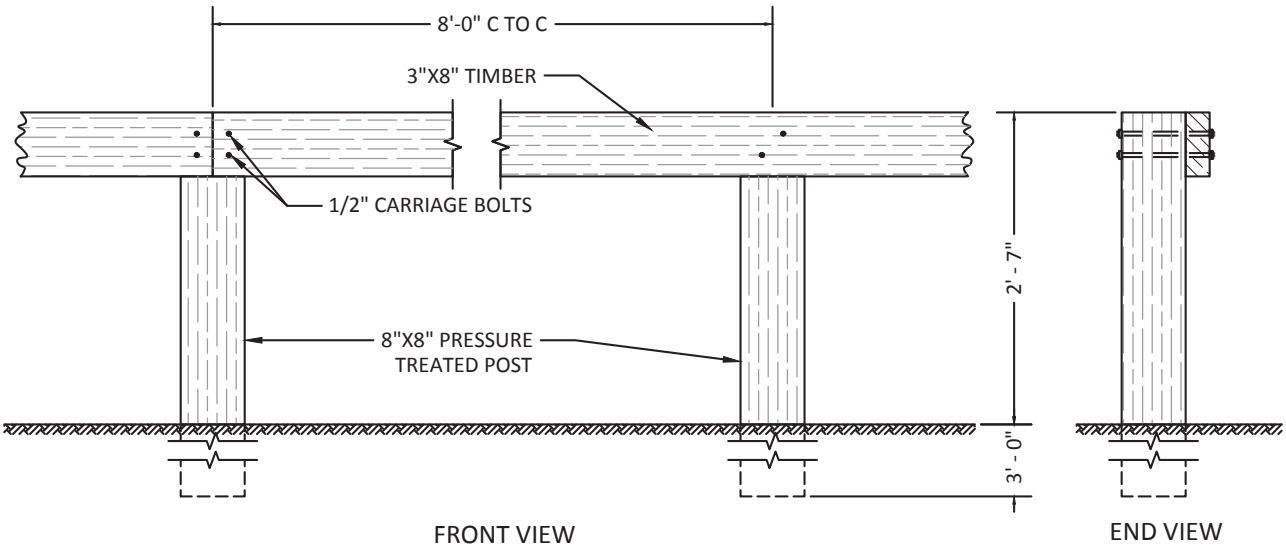
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL SIGN POST INSTALLATION	ROADWAY RDWD-37.0 Issued 12/31/2018



Not To Scale
centerlines and outlines are shown for clarification only

Notes:
1. Stop bar shall be placed 4-FT in advance of the nearest crosswalk line
2. All crosswalk lines shall be 1-FT wide
3. All crosswalks shall be 10-FT wide from centerline to centerline
4. All crosswalks shall be laid out starting at the right hand side, closest to the stop bar, of the crosswalk

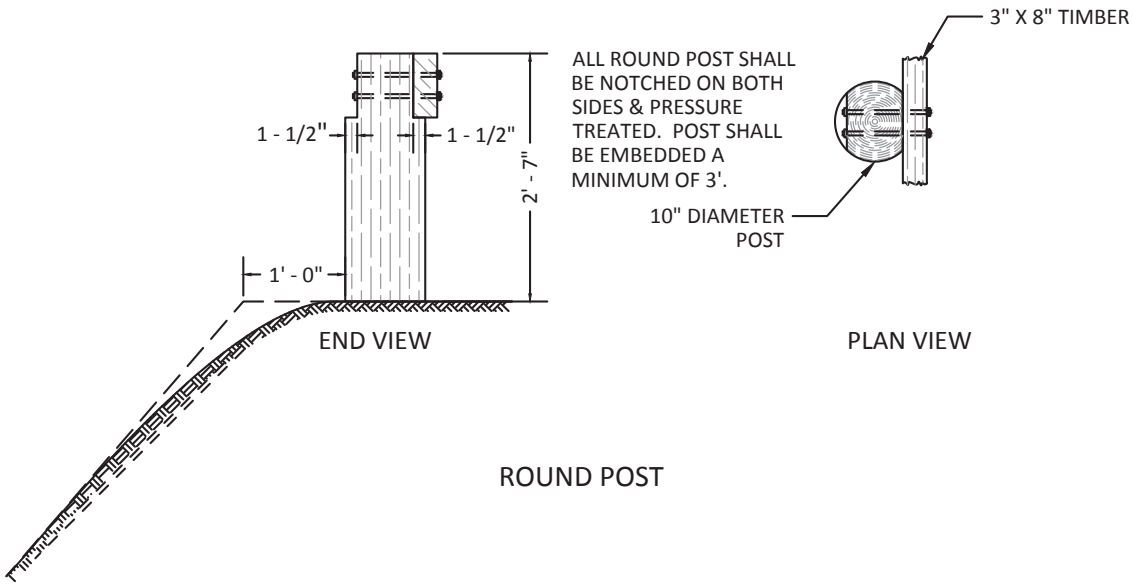
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL ENHANCED CROSSWALK	ROADWAY RDWD-38.0 Issued 12/31/2018



FRONT VIEW

END VIEW

SQUARE POSTS



END VIEW

PLAN VIEW

ROUND POST

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL WOOD GUARD RAIL	ROADWAY RDWD-39.0 Issued 12/31/2018

CITY OF DELAWARE OHIO

Public Works Department

UTILITIES
STANDARD DRAWINGS

12/31/2018 Edition

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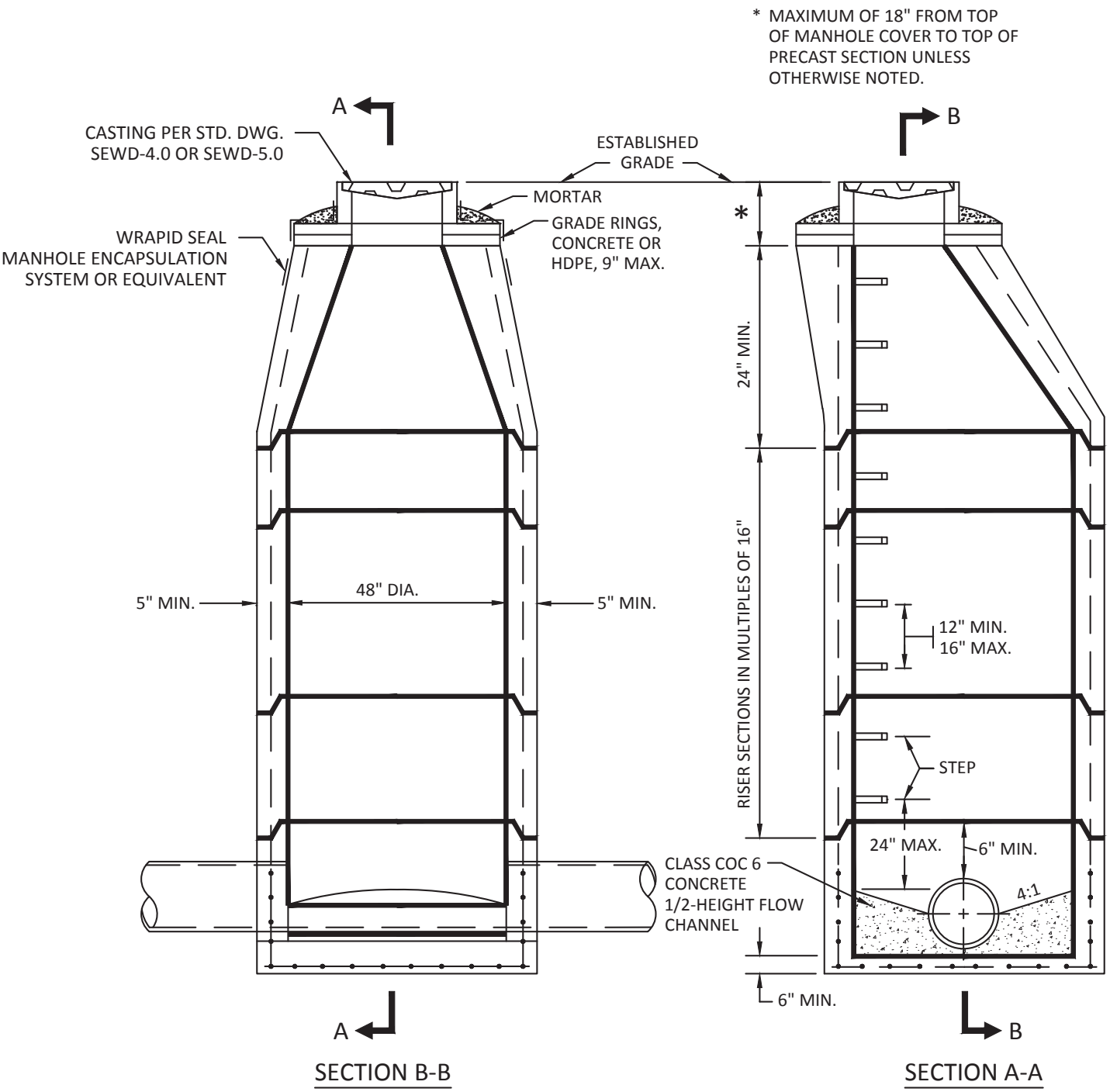


NOTE:

1. PRECAST MANHOLE SECTIONS SHALL BE USED AT ALL LOCATIONS UNLESS APPROVED OTHERWISE BY THE CITY.
2. JOINTS BETWEEN MANHOLE SECTIONS SHALL INCLUDE EITHER A ROUND RUBBER GASKET CONFORMING TO ASTM C443 OR BUTYL RUBBER SEALANT CONFORMING TO ASTM C990 AS MANUFACTURED BY CONSEAL SEALANTS, INC. OR APPROVED EQUAL.
3. STORM SEWER MANHOLES SHALL HAVE CONNECTIONS PER GENERAL NOTE STM-7.
4. SANITARY SEWER MANHOLES SHALL HAVE FLEXIBLE WATERTIGHT CONNECTIONS IN ACCORDANCE WITH CMS 706.16.
5. MANHOLES MUST BE IN ACCORDANCE WITH ASTM C-478.
6. PRECAST WALLS SHALL HAVE A MINIMUM THICKNESS OF 5 INCHES AND REINFORCED SUFFICIENTLY TO PERMIT SHIPPING AND HANDLING WITHOUT DAMAGE.
7. FINISH MANHOLE CHANNEL ACCORDING TO STANDARD DRAWING SEWD-6.0.
8. FOR MANHOLES LOCATED IN ROADWAYS, CONE SECTION SHALL BE ROTATED TO POSITION THE CASTING AS NEAR AS POSSIBLE TO THE CENTER OF THE DRIVING LANE.
9. PROVIDE ANTI-FLOTATION COLLAR WHERE REQUIRED TO PREVENT BUOYANCY.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

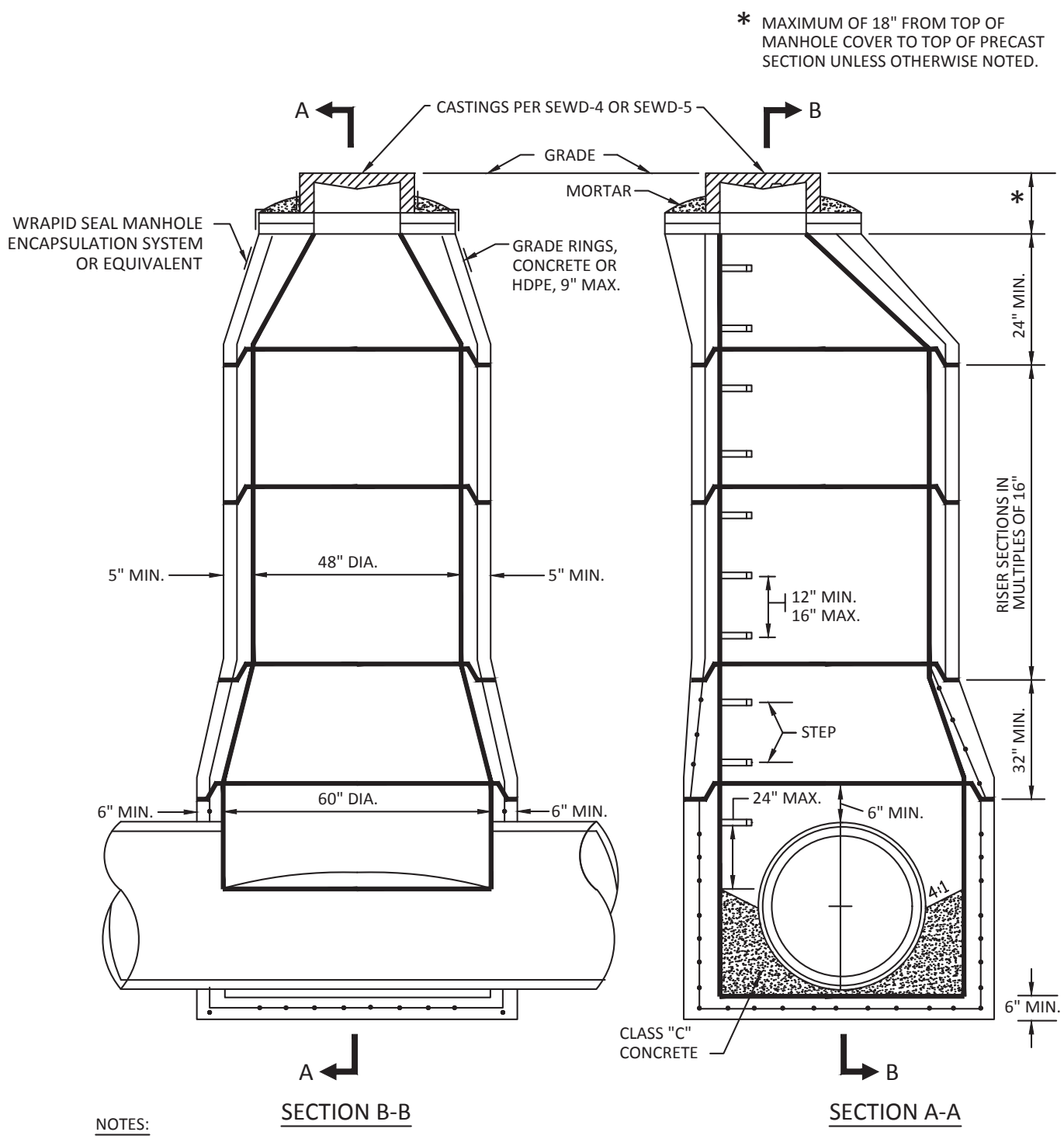
TYPE "C" MANHOLE

48" PRECAST BASE / 8-INCH THROUGH 27-INCH PIPE

UTILITIES

SEWD-1.0

Rev. 12/31/2018



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9. PROVIDE ANTI-FLOTATION COLLAR WHERE REQUIRED TO PREVENT BUOYANCY.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

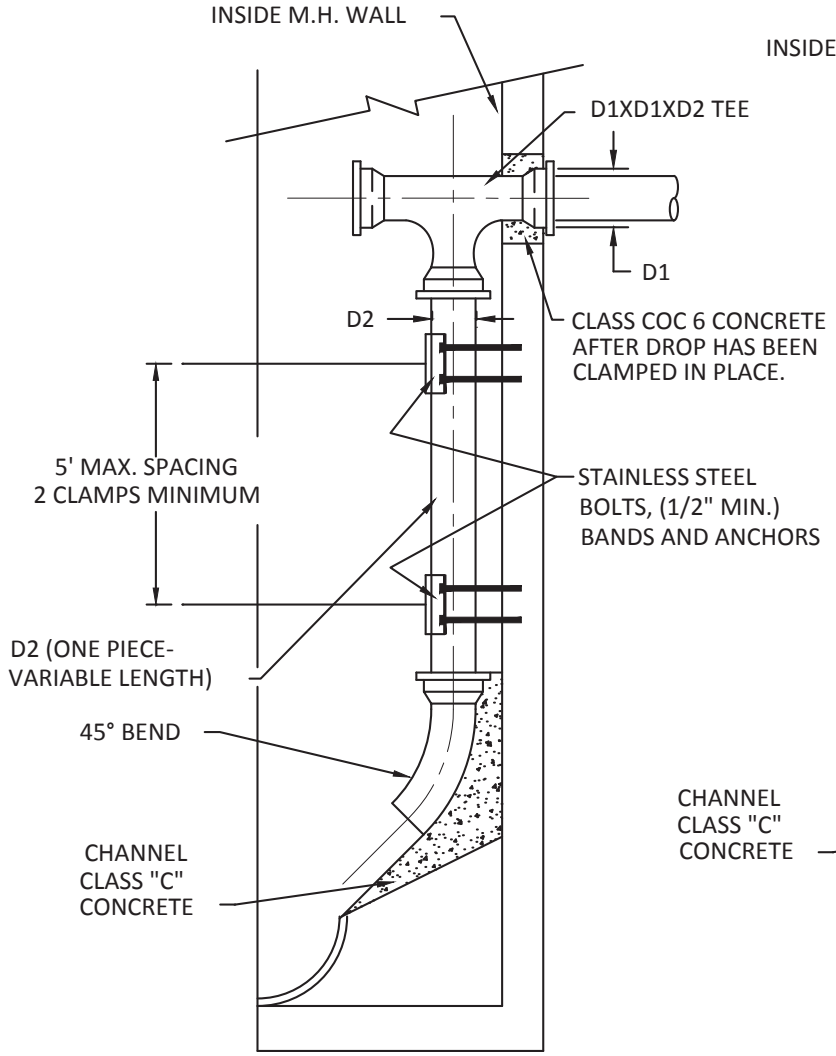
TYPE "D" MANHOLE

60-INCH PRECAST BASE / 30-INCH THROUGH 42-INCH PIPE

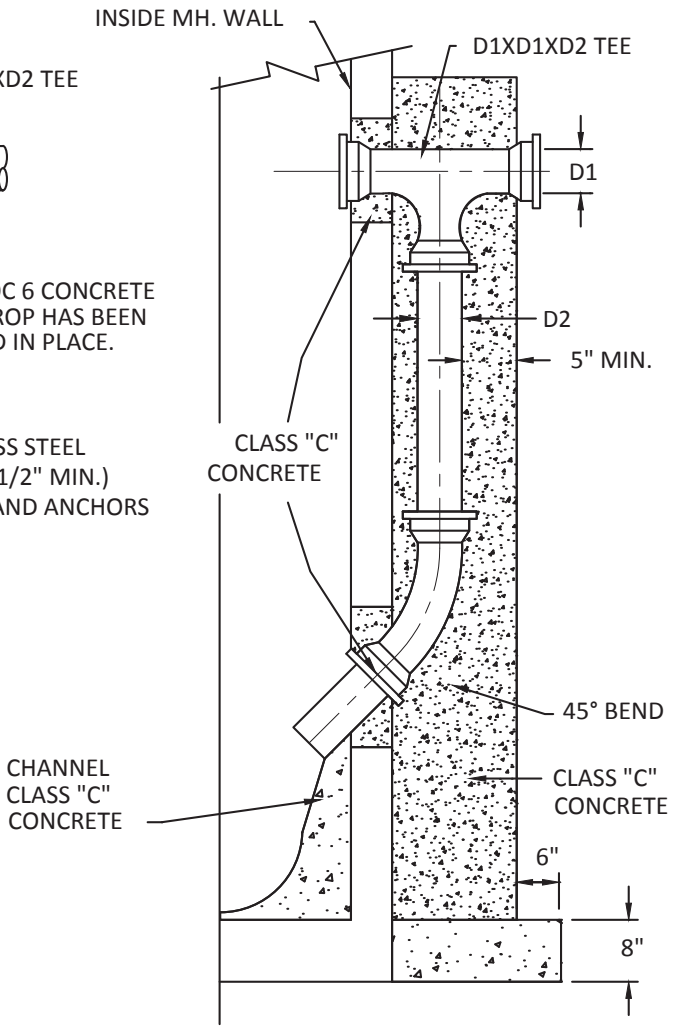
UTILITIES

SEWD-2.0

Rev. 12/31/2018



INSIDE DROP
(HALF SECTION)



OUTSIDE DROP
(HALF SECTION)

NOTES:

1. DROP IS REQUIRED WHEN INVERT DIFFERENTIAL IS 24" OR GREATER.
2. HEIGHT OF DROP PIPE IS TO BE AS SHOWN ON THE PLANS OR WILL BE DETERMINED AT THE TIME OF CONSTRUCTION.
3. ALL WORK AND MATERIALS REQUIRED TO CONSTRUCT THE INSIDE OR OUTSIDE DROP SHOULD BE INCLUDED FOR PAYMENT UNDER ITEM 604, MANHOLES, OR ITEM 901, PIPE SEWERS COMPLETE IN PLACE.
4. WHERE CALLED FOR, AND UNLESS OTHERWISE REQUIRED BY THE PLANS, THE OUTSIDE DROP WILL BE CONSTRUCTED WITH NEW MANHOLES.
5. MATERIALS FOR THE TEE, DROP PIPE AND BEND SHALL BE OF ONE TYPE AND BE ONE OF THE FOLLOWING - INSIDE DROP: DUCTILE IRON OR PVC. OUTSIDE DROP: DUCTILE IRON OR PVC.
6. OUTSIDE DROP PIPES REQUIRE A 5" THICK (MINIMUM) CLASS "C" CONCRETE ENCASEMENT ON THREE SIDES OF PIPE AND TIED TO MANHOLE WALL WITH 5/8"-"U" RODS X 6" LONG @ 12".
7. INSIDE DROP MAY BE USED ON NEW CONSTRUCTION PROVIDED THAT 60" BASE AND RISER SECTIONS ARE USED.
8. IN LIEU OF A TEE FITTING FOR INSIDE DROPS, DROP BOWL AND HOOD ASSEMBLY BY DURAN-RELINER OR APPROVED EQUAL MAY BE UTILIZED IN CONJUNCTION WITH A FLEXIBLE WATERTIGHT CONNECTION FOR THE INCOMING SEWER.

PIPE DIAMETER	
D1	D2
8"	8"
10"	8"
12"	8"
15"	10"
18"	10"
21"	10"
21"	12"
24"	12"

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

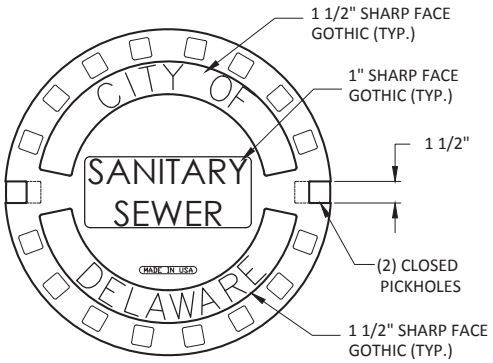
STANDARD DETAIL

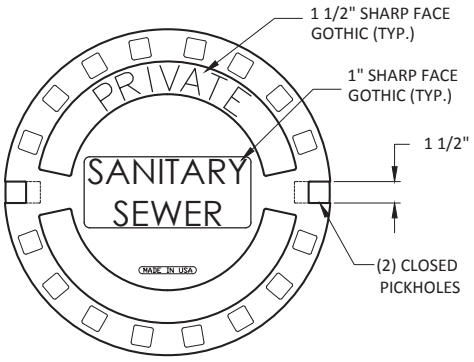
INSIDE & OUTSIDE DROP PIPES FOR
SANITARY SEWER MANHOLES

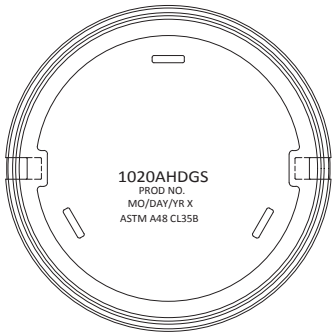
UTIILITIES

SEWD-3.0

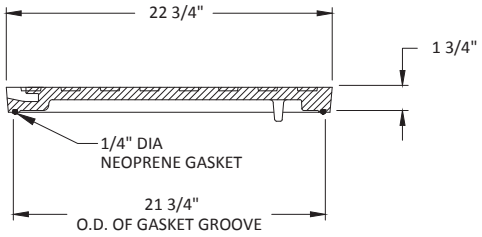
Rev. 12/31/2018



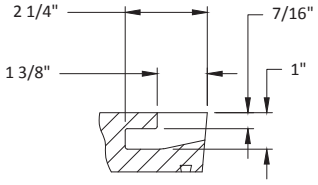




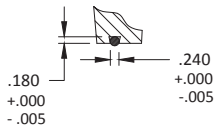
BOTTOM VIEW



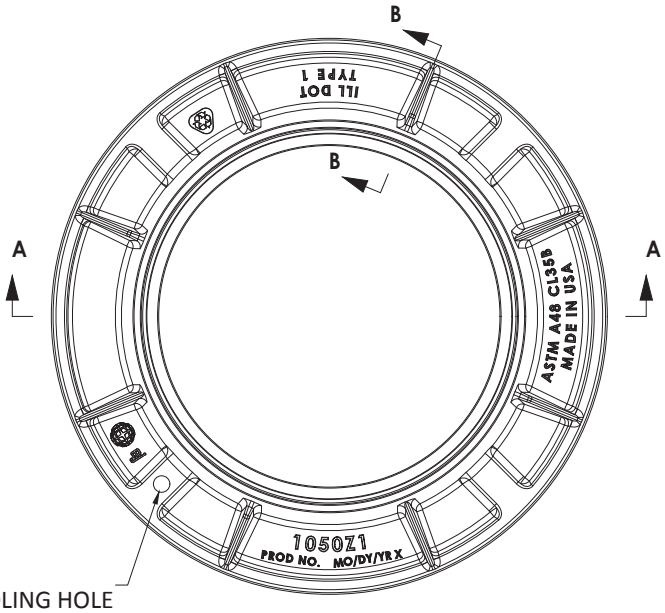
COVER SECTION

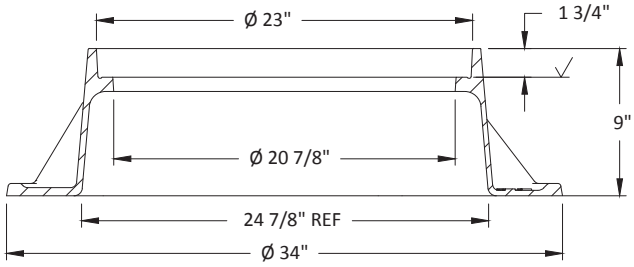


PICKHOLE DETAIL

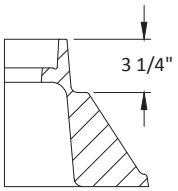


GROOVE DETAIL





SECTION A-A



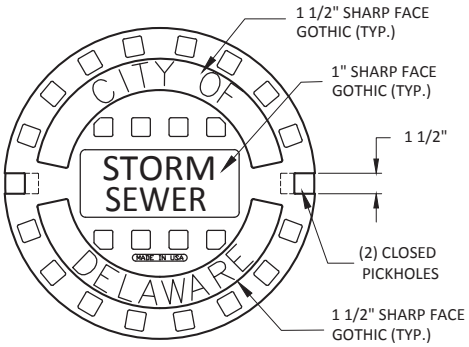
SECTION B-B

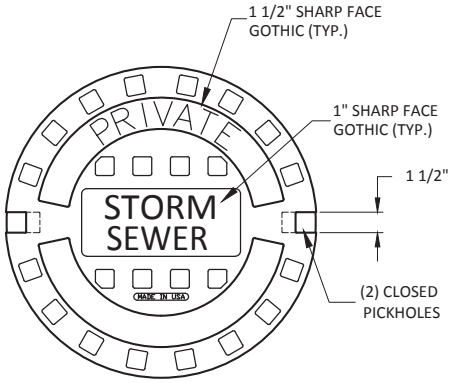
FRAME

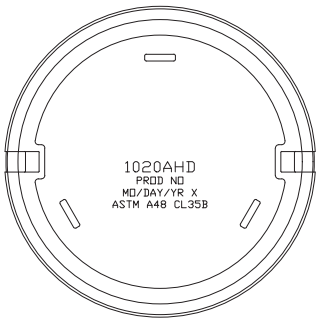
NOTE:

1. DIMENSIONS SHOWN ARE EQUIVALENT DECIMALS OF 1/8 INCH FRACTIONAL SIZES. TOLERANCES SHALL BE ACCEPTED FOUNDRY STANDARDS AS OUTLINED IN THE IRON CASTINGS HANDBOOK PUBLISHED BY THE AMERICAN CAST METALS INSTITUTE. ALL CASTINGS SHALL MEET THE REQUIREMENTS OF 604.02.
2. COVERS SHALL BE EAST JORDAN IRON WORKS EJ 1020 AGS, NEENAH R-1530, OR APPROVED EQUAL.
3. FRAMES SHALL BE EAST JORDAN IRON WORKS EJ 1050 ZA, NEENAH R-1530, OR APPROVED EQUAL.

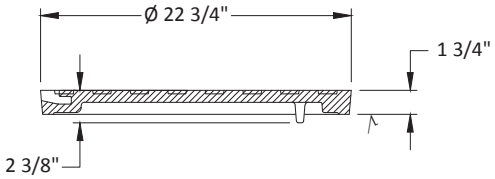
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MANHOLE FRAME & COVER CASTINGS (SANITARY SEWERS)	UTILITIES SEWD-4.0 Rev. 12/31/2018



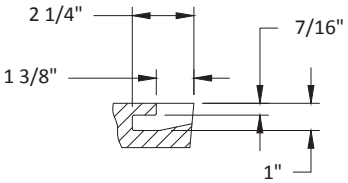




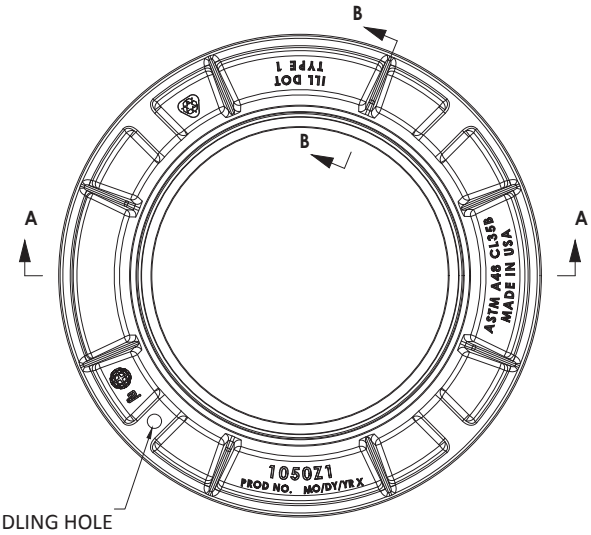
BOTTOM VIEW

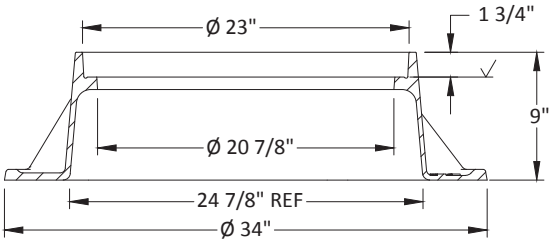


COVER SECTION

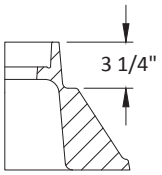


PICKHOLE DETAIL





SECTION A-A



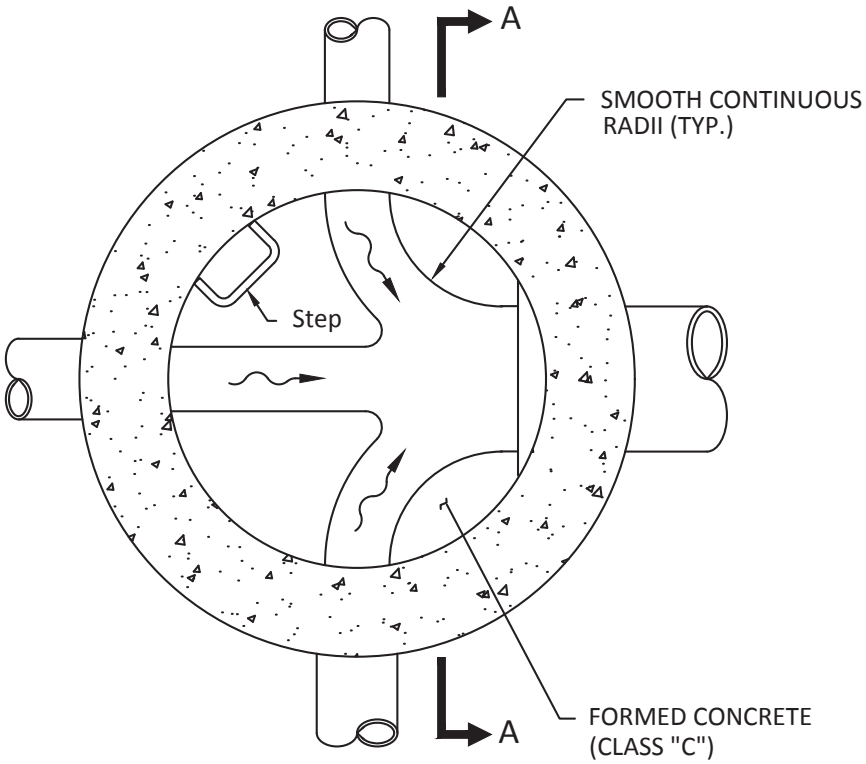
SECTION B-B

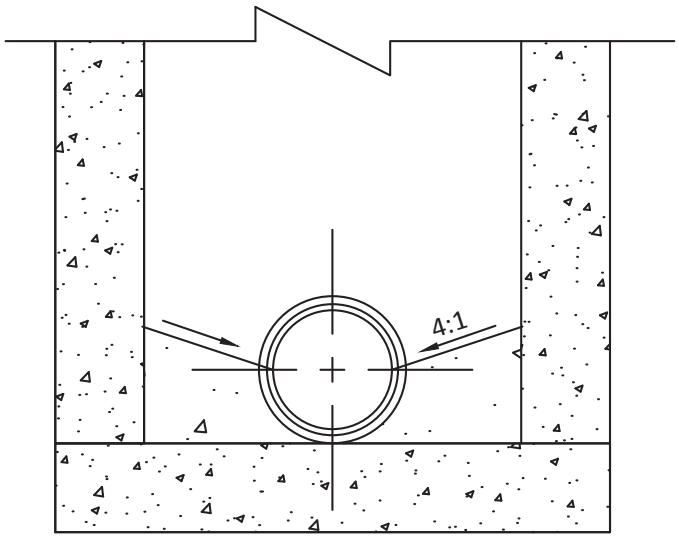
FRAME

NOTE:

1. DIMENSIONS SHOWN ARE EQUIVALENT DECIMALS OF 1/8 INCH FRACTIONAL SIZES. TOLERANCES SHALL BE ACCEPTED FOUNDRY STANDARDS AS OUTLINED IN THE IRON CASTINGS HANDBOOK PUBLISHED BY THE AMERICAN CAST METALS INSTITUTE. ALL CASTINGS SHALL MEET THE REQUIREMENTS OF 604.02.
2. COVERS SHALL BE EAST JORDAN IRON WORKS EJ 1020 AGS, NEENAH R-1530, OR APPROVED EQUAL.
3. FRAMES SHALL BE EAST JORDAN IRON WORKS EJ 1050 ZA, NEENAH R-1530, OR APPROVED EQUAL.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MANHOLE FRAME & COVER CASTINGS (STORM SEWERS)	UTILITY SEWD-5.0 Rev. 12/31/2018





SECTION A-A

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

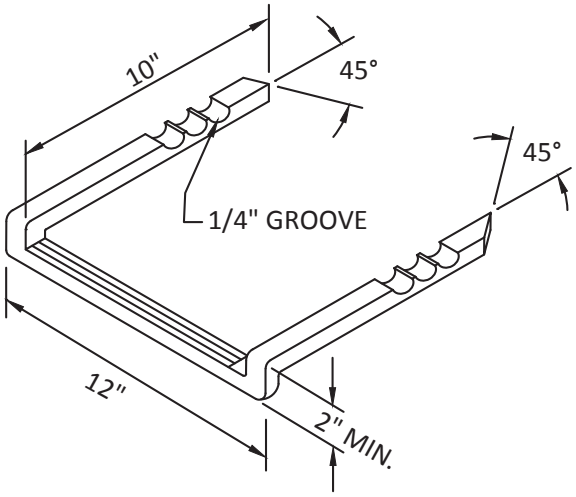
STANDARD DETAIL

PRECAST MANHOLE BASE CHANNELIZATION DETAIL

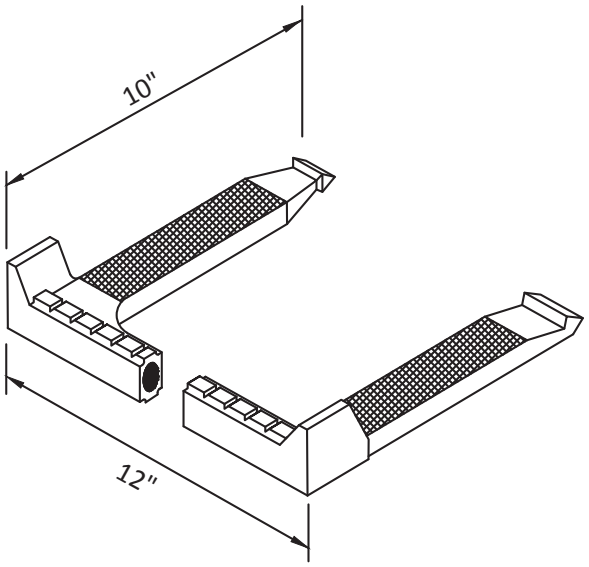
UTILITIES

SEWD-6.0

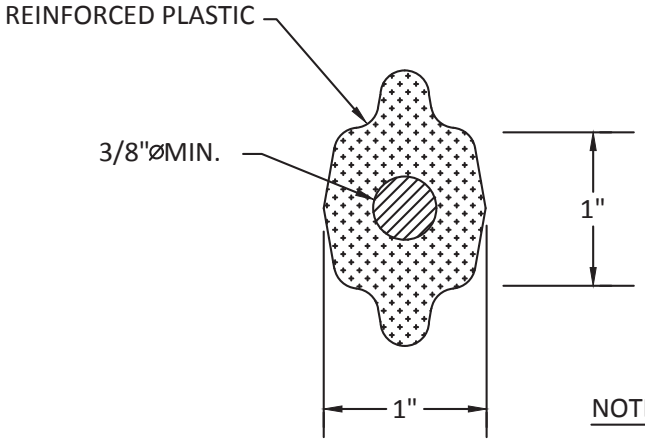
Rev. 12/31/2018



ALUMINUM STEP
ITEM 711.30



POLYPROPYLENE STEP
ITEM 711.31

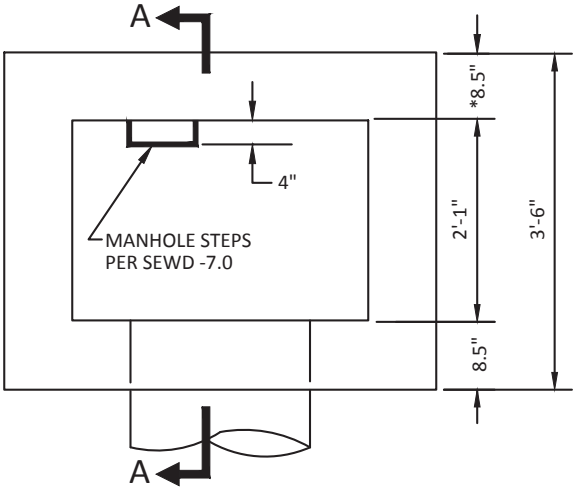


NOTE:

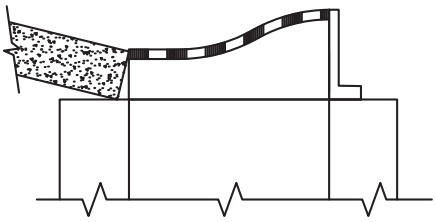
1. STEPS SHALL MEET THE REQUIREMENTS OF ASTM C-478, AND SHALL BE INSTALLED WITH A UNIFORM VERTICAL SPACING OF 12-INCHES TO 16-INCHES.

2. STEPS SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1-INCH FOR FERROUS METAL AND 3/4-INCHES FOR ALUMINUM.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL MANHOLE STEPS	UTILITIES SEWD-7.0 Rev. 12/31/2018

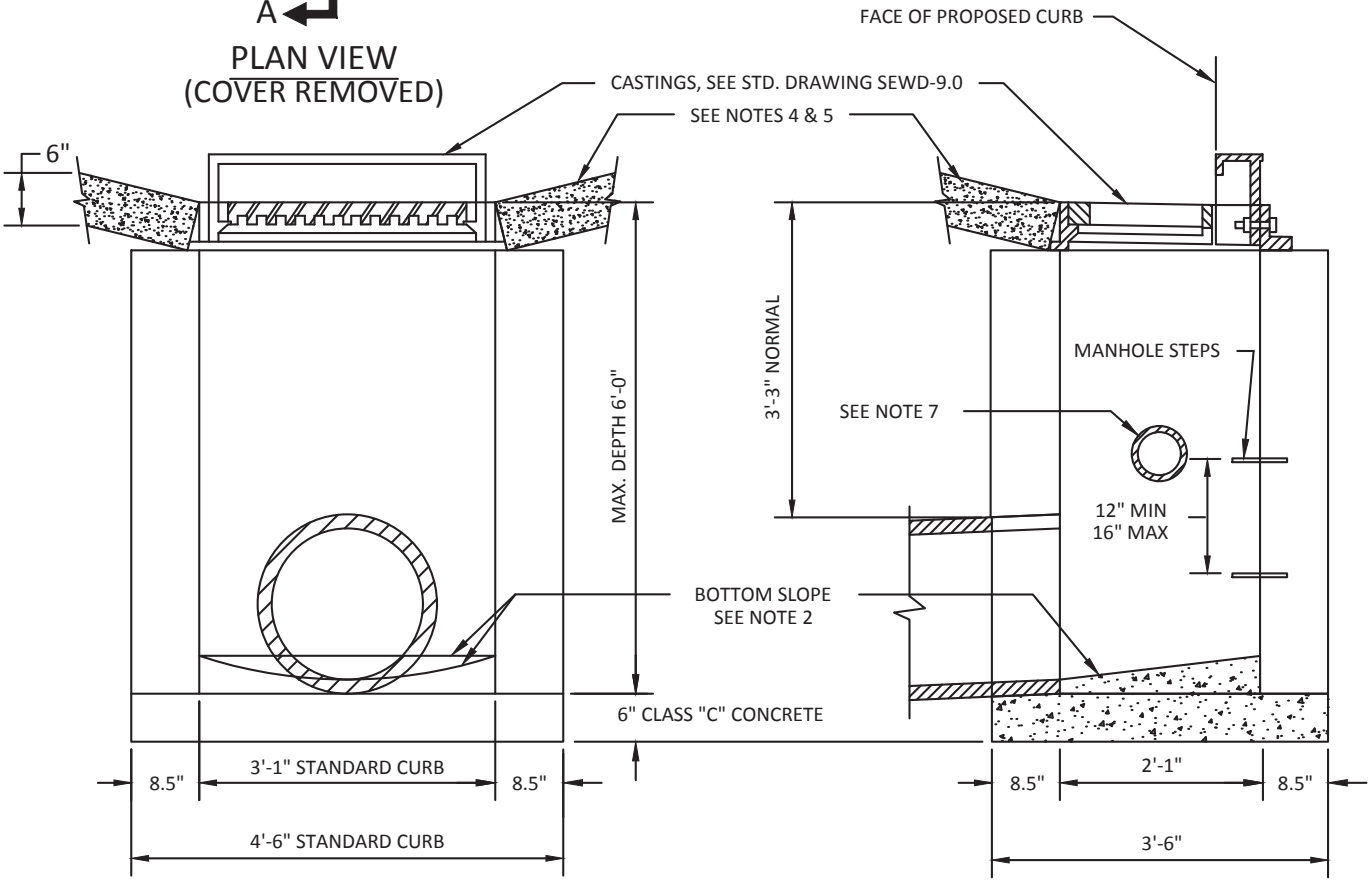


PLAN VIEW
(COVER REMOVED)



MOUNTABLE INLET

(EXISTING AREAS ONLY)



ELEVATION

SECTION A-A

NOTE:

1. CURB & GUTTER INLETS SHALL BE PRECAST UNLESS APPROVED OTHERWISE BY THE CITY.
2. PRECAST WALLS SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES AND BE REINFORCED SUFFICIENTLY TO PERMIT SHIPPING AND HANDLING WITHOUT DAMAGE.
3. THE INLET BOTTOM SHALL BE SHAPED TO PROVIDE SLOPE OF 3" TO 4" TO OUTLET PIPE. THE CROSS SECTIONAL FORM OF BOTTOM AND LONGITUDINAL SLOPE IS TO BE ADAPTED TO LOCATION OF OUTLET PIPE AS DIRECTED.
4. OUTLET PIPE MAY BE LOCATED IN FRONT OR BACK AND SHALL BE DIRECTED TOWARDS THE CENTER OF THE INLET.
5. THE EXISTING GUTTER WITHIN THE AREA AROUND THE INLET WHERE CUT OUT, SHALL BE REPLACED WITH CLASS "C" CONCRETE OR ASPHALTIC CONCRETE PAVING AS ORDERED.
6. THE BACKFILLING WITHIN PROPOSED PAVED AREAS SHALL BE IN ACCORDANCE WITH ITEM 912.
7. WALLS MAY BE BRICK, PRECAST SOLID CONCRETE BLOCKS, CAST IN PLACE CLASS "C" CONCRETE, OR PRECAST CONCRETE.
8. PLACE 4" CURB DRAIN STUBS 30" BELOW TOP OF CURB OR AS DIRECTED.
9. MAXIMUM PIPE DIAMETERS ARE 18" INTO SIDE WALLS AND 24" INTO FRONT OR BACKWALL.

EST 1808
CITY OF
DELAWARE
OHIO

Public Works Department

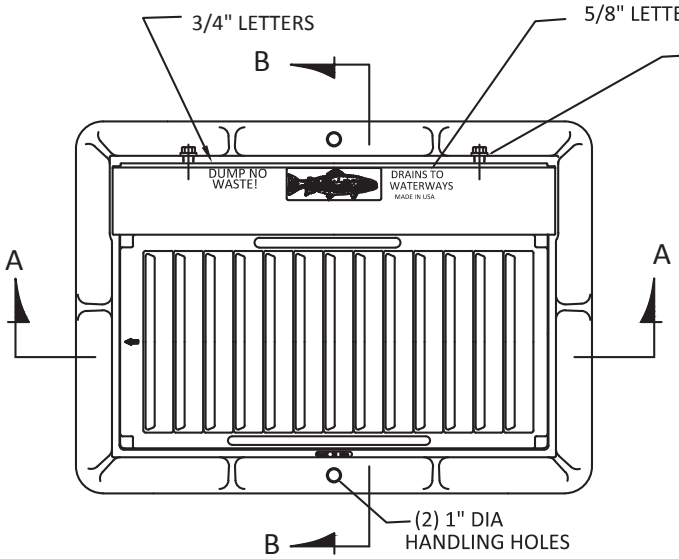
STANDARD DETAIL

CURB & GUTTER INLET

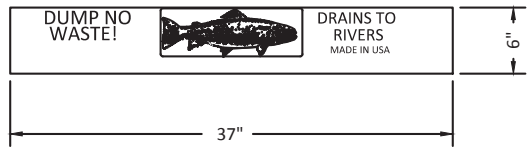
UTILITIES

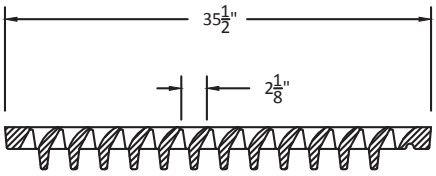
SEWD-8.0

Rev. 12/31/2018



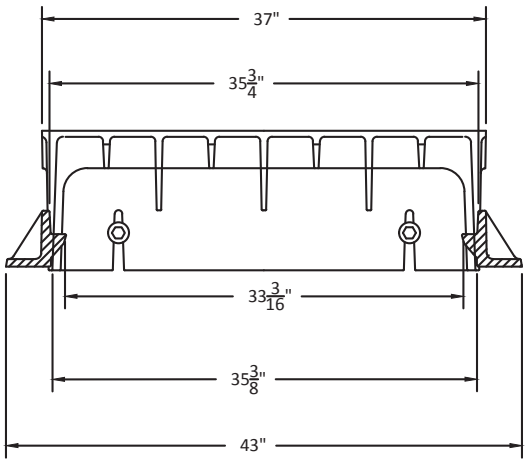
TOP VIEW



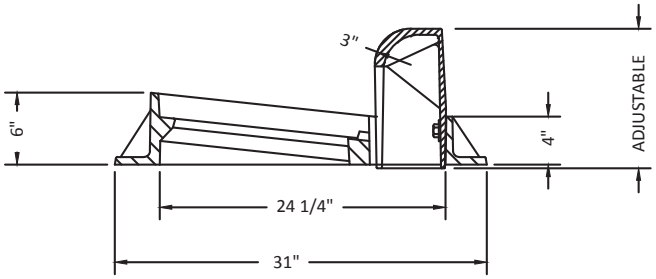


EAST JORDAN IRON WORKS
7030 CATCH BASIN CURB INLET

HEAVY DUTY WITH TYPE M4 GRATE AND T1 BACK
APPROXIMATELY 260 SQ INCHES IN OPEN AREA
CURB BACK ADJUSTS FROM 3 1/4" TO 9"
"DUMP NO WASTE!" AND FISH IMAGE



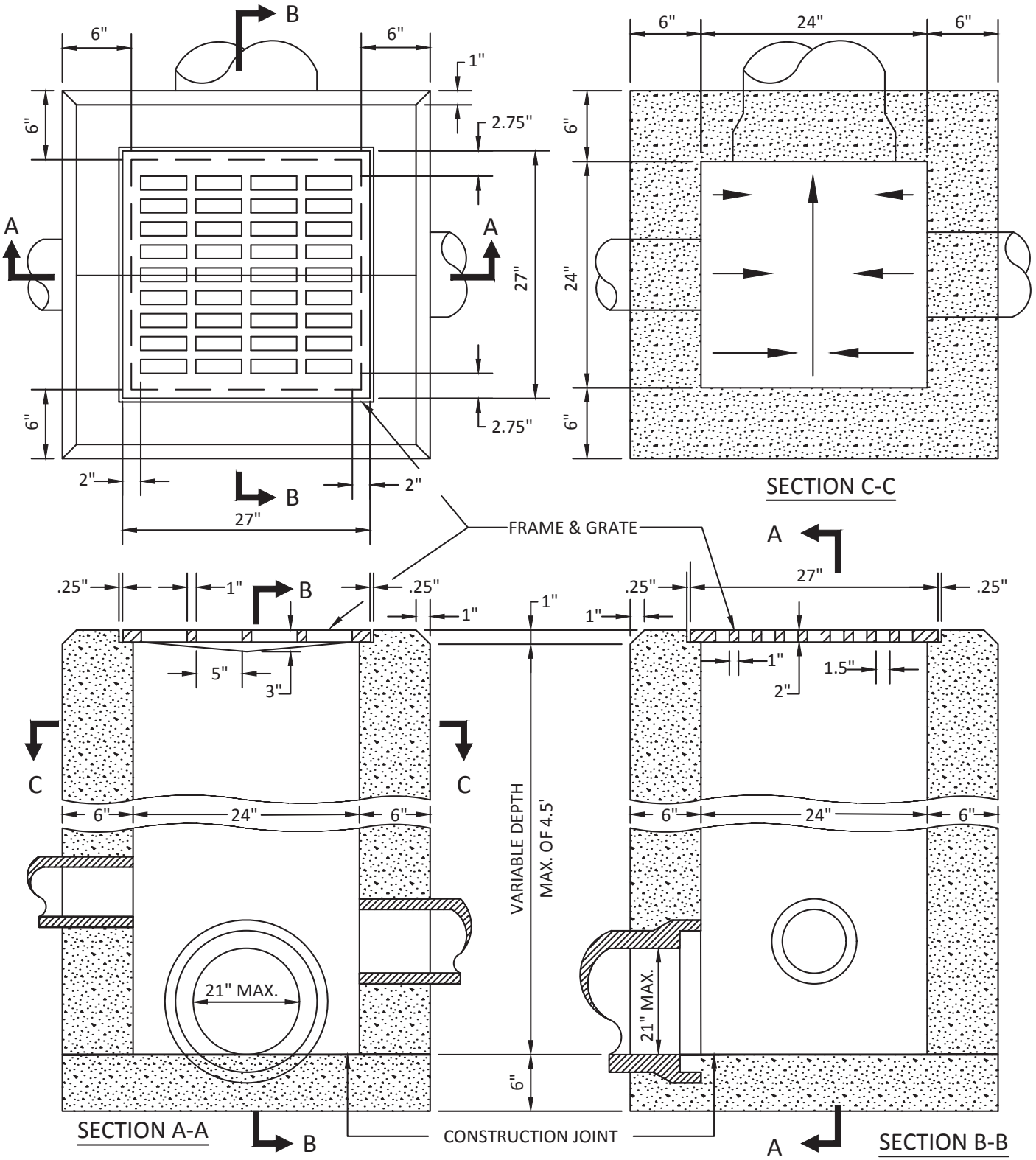
SECTION A-A



CURB ADJUSTMENT
6" TO 10"

SECTION B-B

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL CAST IRON FRAME & GRATE FOR CURB & GUTTER INLET (STD. CURB)	UTILITIES SEWD-9.0 Rev. 12/31/2018



NOTES:

1. ALL BASINS TO BE PRECAST CONCRETE WITH MINIMUM WALL THICKNESS OF 6 INCHES AND BE REINFORCED SUFFICIENTLY TO PERMIT SHIPPING AND HANDLING WITHOUT DAMAGE.
2. GRATE SHALL BE EAST JORDAN IRON WORKS 5115M2, NEENAH 4852, OR APPROVED EQUAL.
3. IN NON-TRAFFIC APPLICATIONS GRATE MAY BE USED WITHOUT A FRAME. IN TRAFFIC APPLICATIONS, USE ANGLE FRAME, EAST JORDAN IRON WORKS 5115Z, NEENAH 1883-0018, OR APPROVED EQUAL.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

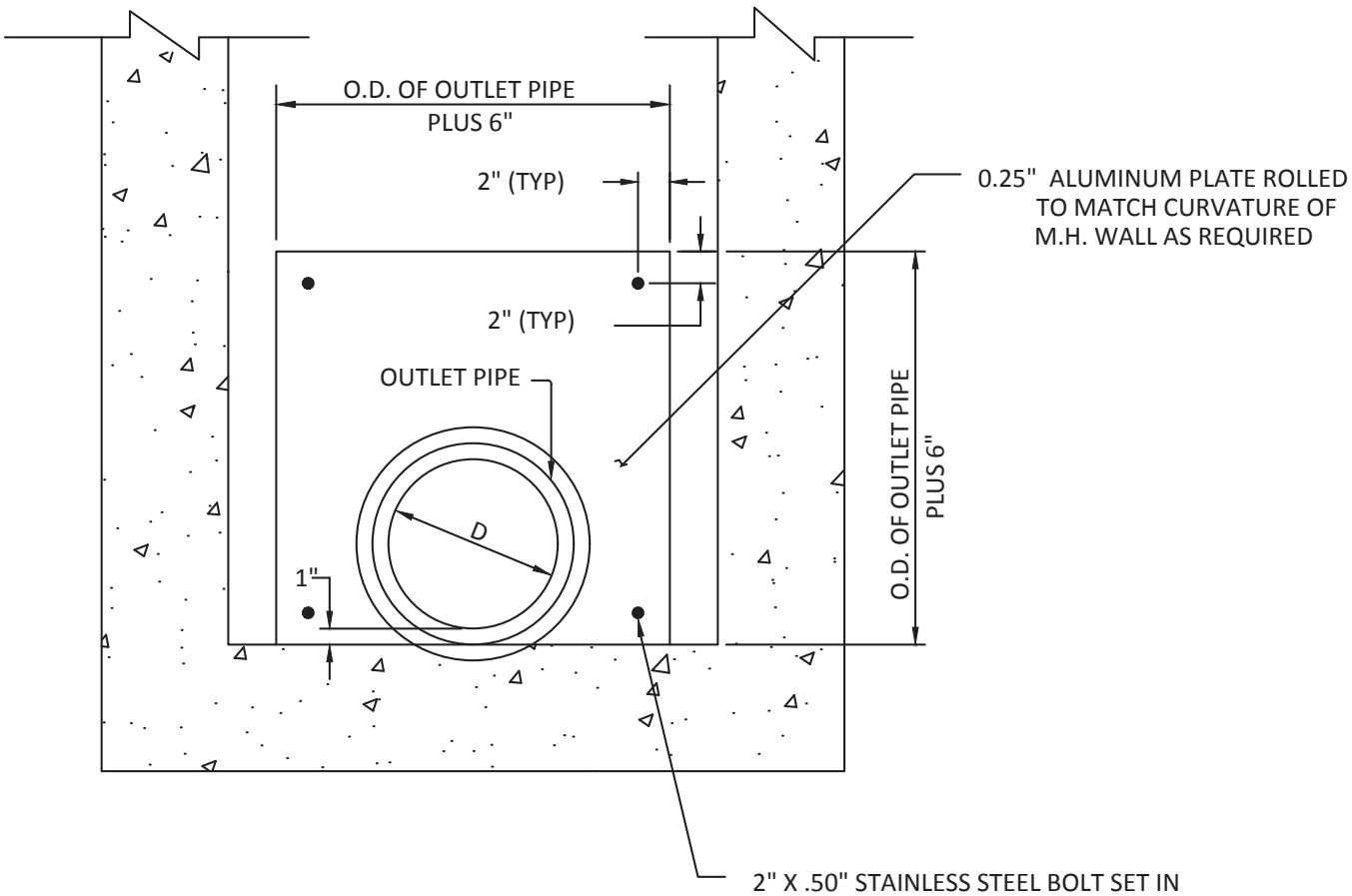
STANDARD DETAIL

STANDARD 2-FT x 2-FT CATCH BASIN

UTILITIES

SEWD-10.0

Rev. 12/31/2018



ORIFICE SIZING EQUATION

$$Q = CA(2GH)^{0.5}$$

Q = PEAK DISCHARGE RATE, CFS

C = COEFFICIENT OF DISCHARGE. DIMENSIONLESS, (USE NOMINAL VALUE OF 0.60)

A = CROSS SECTIONAL AREA OF ORIFICE SQUARE FEET.

G = ACCELERATION DUE TO GRAVITY, 32.16 FT/SEC/SEC

H = HEAD ON THE OFFICE, FEET

ORIFICE PLATE TO BE SET ON OUTLET PIPE WALL AT EACH BASIN INDICATED ON PLAN.

SEE PLANS FOR ORIFICE DIAMETER (D)

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

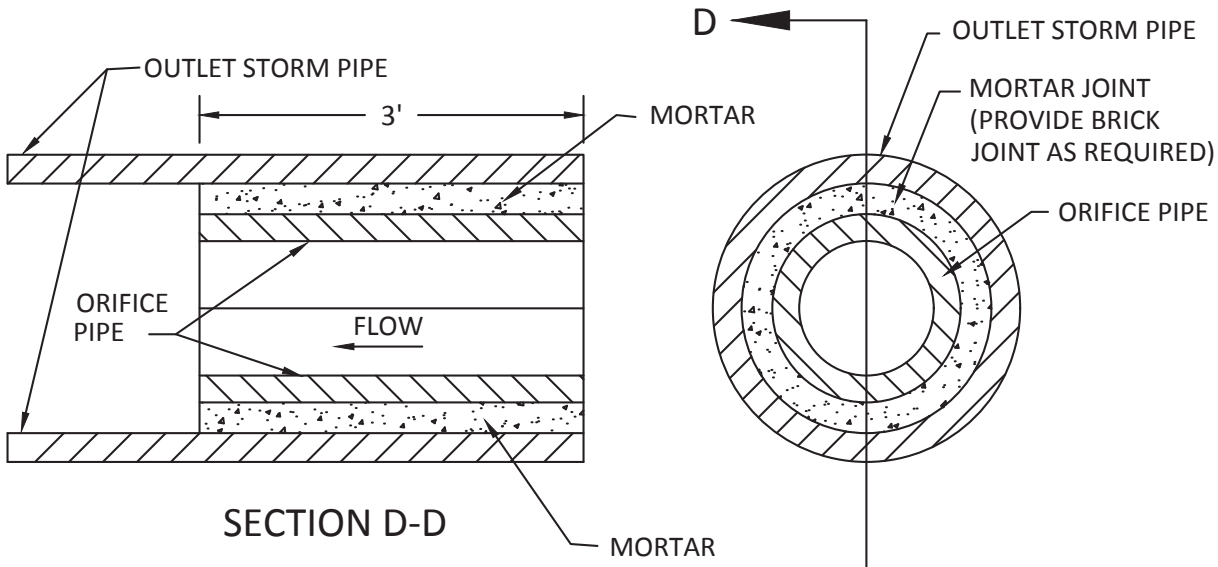
STANDARD DETAIL

OUTLET CONTROL ORIFICE PLATE

UTILITIES

SEWD-11.1

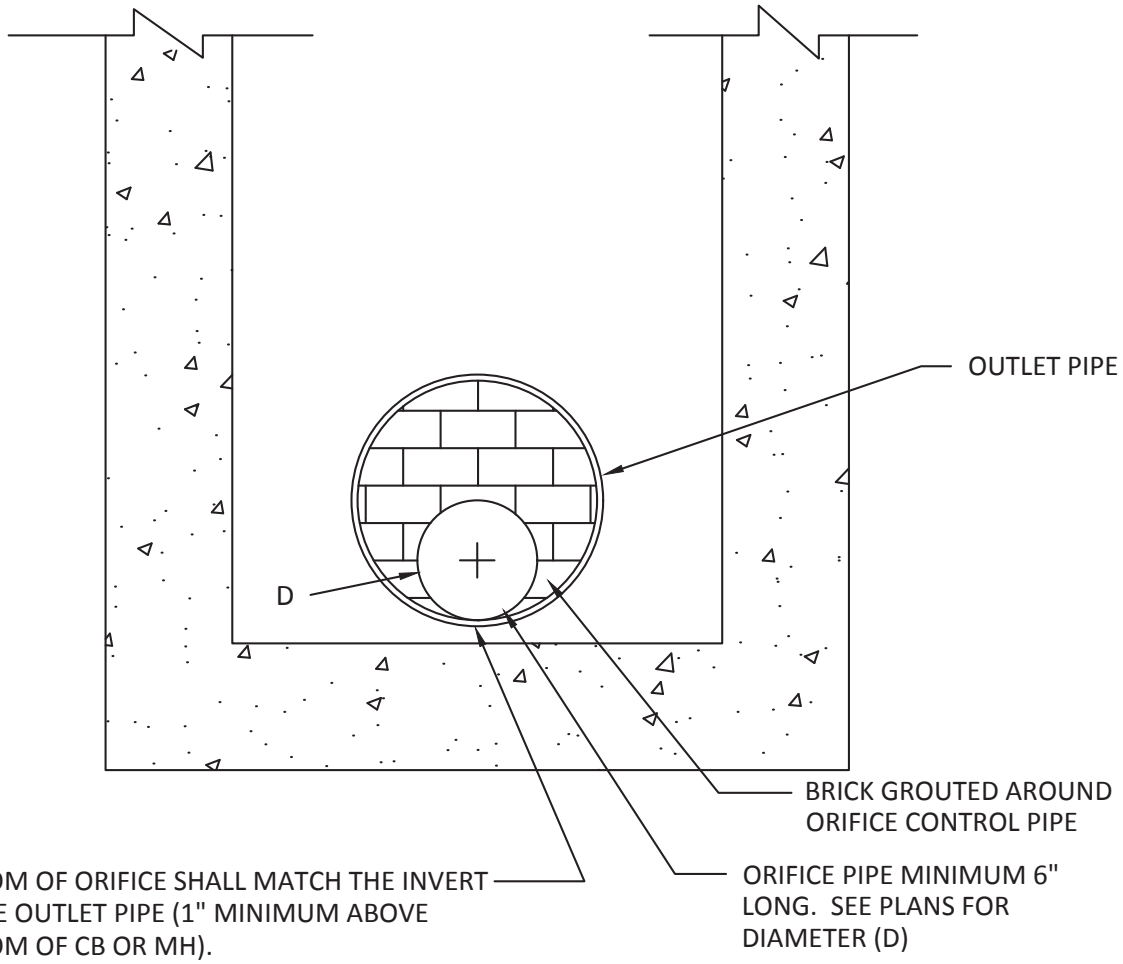
Rev. 12/31/2018



SECTION D-D

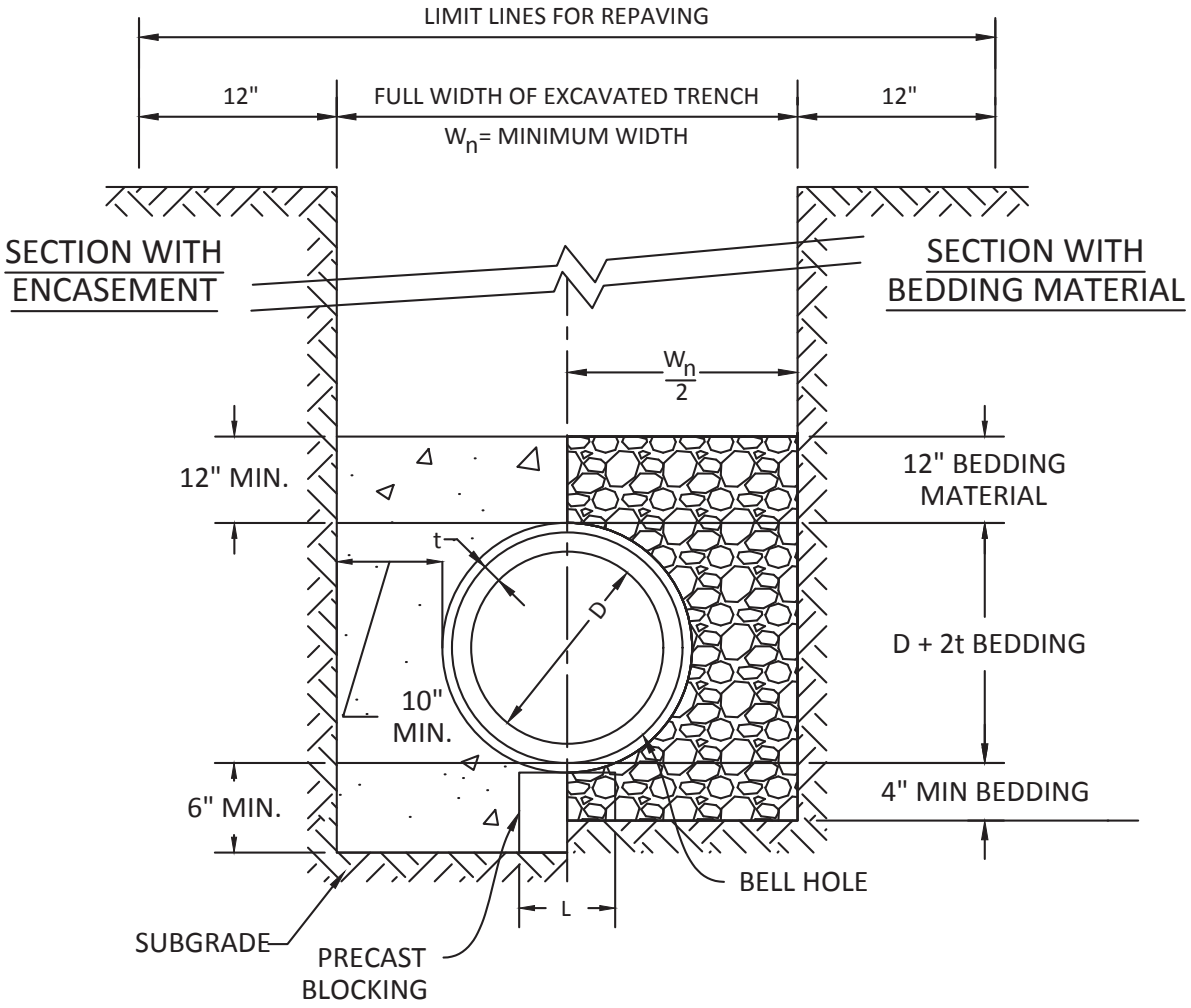
BASIN OUTLET ORIFICE DETAIL

(OFFSITE BASIN)
NO SCALE



ORIFICE PIPE TO BE SET ON OUTLET PIPE WALL AT
EACH BASIN INDICATED ON PLAN.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL OUTLET CONTROL ORIFICE PIPE	UTILITIES SEWD-11.2 Rev. 12/31/2018



DIA	Wn	L
6″	30″	12″
8″	30″	12″
10″	30″	12″
12″	32″	12″
15″	36″	12″
18″	40″	12″
21″	44″	12″
24″	48″	12″
27″	52″	12″
30″	56″	15″
36″	64″	18″
42″	72″	21″
48″	80″	24″
60″	96″	30″

NOTES:

1. SECTION SYMMETRICAL ABOUT C/L
2. DIMENSIONS ARE EXPRESSED IN INCHES.
3. ENCASEMENTS TO BE CLASS "A" CONCRETE, ITEM 905.
4. ON SANITARY SEWER CONSTRUCTION TRENCH DAMS ARE REQUIRED AS SPECIFIED UNDER 901.11
5. PROVIDE EMBEDMENT IN ACCORDANCE WITH THE RECOMMENDATIONS OF ASTM D2321, 7.5.
6. THE PIPE SHALL BE SUPPORTED BY 12" CONCRETE BLOCKING WHEN CONCRETE ENCASEMENT IS REQUIRED.
7. BLOCKING SHALL HAVE THE LENGTH SHOWN IN THE CHART OR OF SUFFICIENT LENGTH SO THAT THE PIPE LOAD ON THE SUBGRADE SHALL NOT EXCEED 3,000 LBS/SF. SEE CHART FOR MINIMUM BLOCKING LENGTHS.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

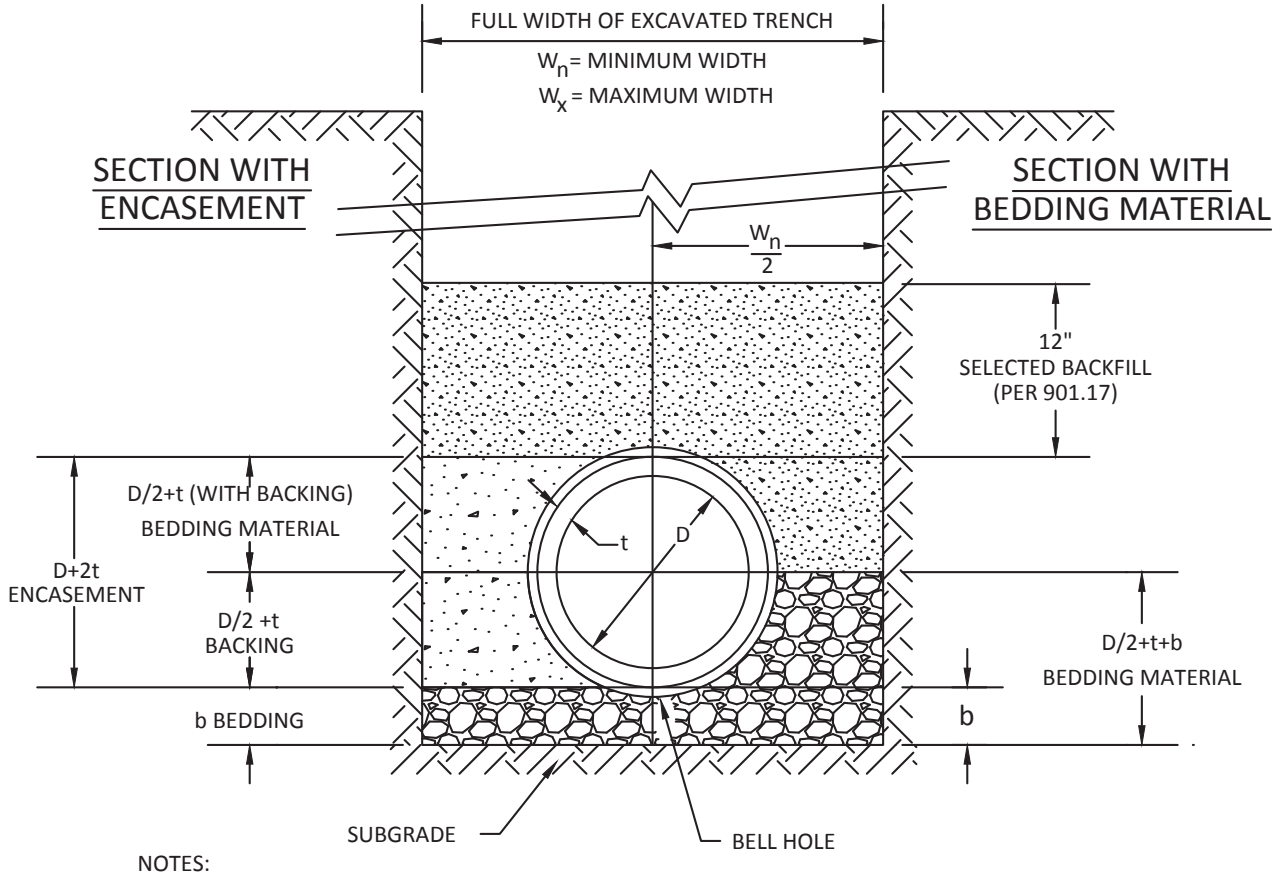
TYPE 1 BEDDING

FOR FLEXIBLE SEWER PIPE 6-INCHES TO 60 INCHES IN DIAMETER

UTILITIES

SEWD-12.0

Rev. 12/31/2018



NOTES:

1. SECTION SYMMETRICAL ABOUT C/L
2. *DIMENSIONS ARE EXPRESSED IN INCHES.
3. BACKING OR ENCASEMENTS TO BE CLASS "A" CONCRETE, ITEM 905.
4. ON SANITARY SEWER CONSTRUCTION TRENCH DAMS ARE REQUIRED AS SPECIFIED UNDER 901.11.
5. PAYMENT FOR CONCRETE BACKING AND ENCASEMENT SHALL BE BASED ON MINIMUM TRENCH WIDTH (W_n).

SMALL DIAMETERS
b = 4"

D*	W_n*	W_x*
6	24	48
8	27	48
10	30	48
12	32	48
15	36	50
18	40	53
21	44	57
24	48	60
27	52	64

MID DIAMETERS
b = 6"

D*	W_n*	W_x*
30	57	67
33	61	71
36	64	74
42	71	81
48	78	88
54	87	95
60	96	102
66	105	127

LARGE DIAMETERS
b = 6"

D*	W_n*	W_x*
72	116	134
78	123	141
84	130	148
90	136	155
96	143	162
102	151	169
108	160	176

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

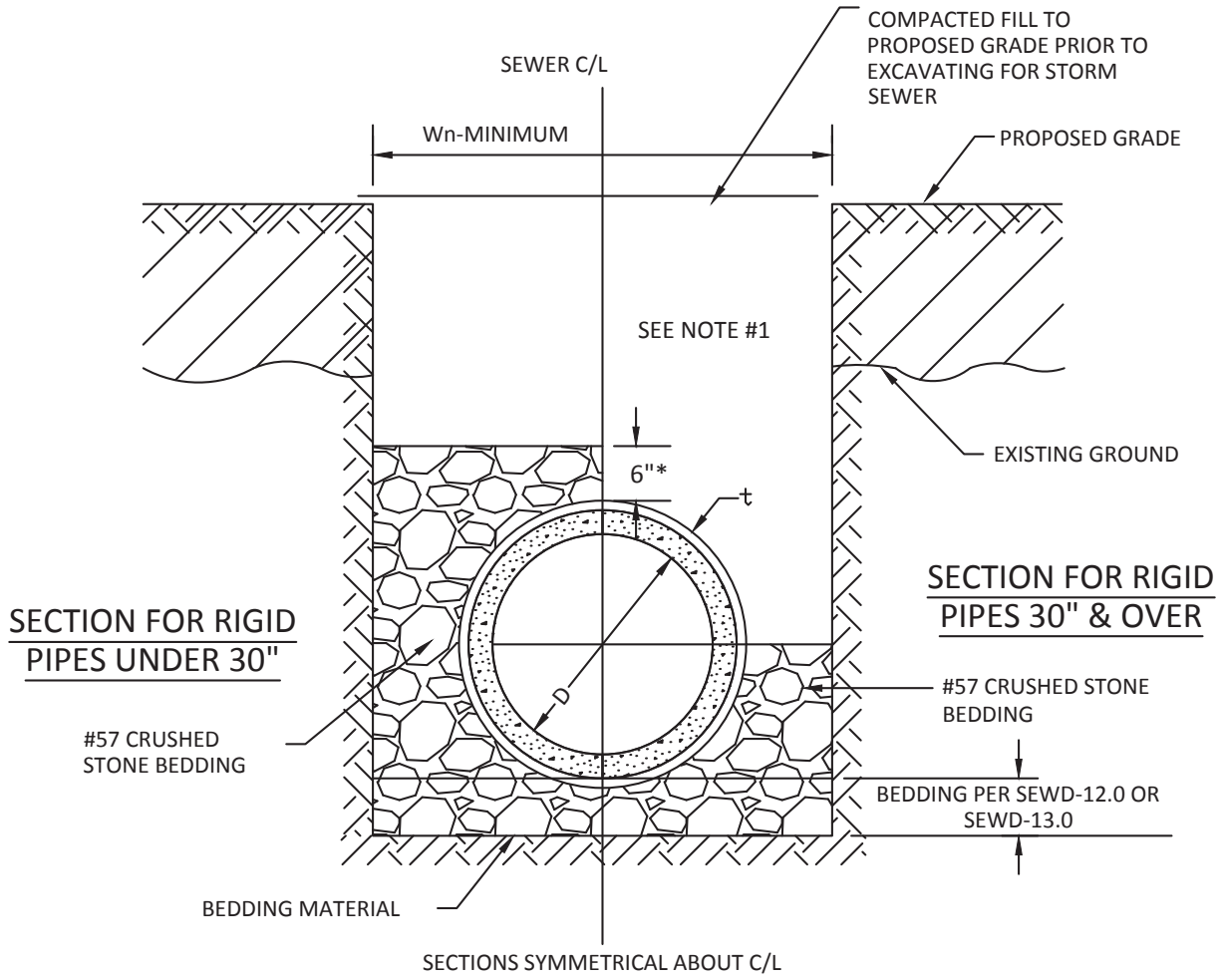
TYPE 1 BEDDING

FOR RIGID SEWER PIPE 6-INCHES TO 108-INCHES DIAMETER

UTILITIES

SEWD-13.0

Rev. 12/31/2018



*12" FOR ALL FLEXIBLE PIPES REGARDLESS OF SIZE.

NOTES:

1. BACKFILL OF TRENCH FROM TOP OF #57 CRUSHED STONE BEDDING TO THE TOP OF TRENCH SHALL BE COMPACTED TO 98% MAXIMUM DRY DENSITY IN ACCORDANCE WITH SECTION 911. NO GRITS WILL BE ALLOWED.
2. THE COMPACTION REQUIREMENT WILL BE STRICTLY ENFORCED BY THE CITY.
3. THE C/L OF THE PROPOSED STORM SEWER SHOULD BE OFFSET FROM THE PROPERTY LINE.
4. THE COST OF THE #57 CRUSHED STONE BEDDING, COMPACTED FILL AND BACKFILL SHALL BE INCLUDED IN ITEM 901.
5. MINIMUM WIDTH OF TRENCH (Wn) ARE AS SHOWN ON DRAWINGS SEWD-12.0 OR SEWD-13.0.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

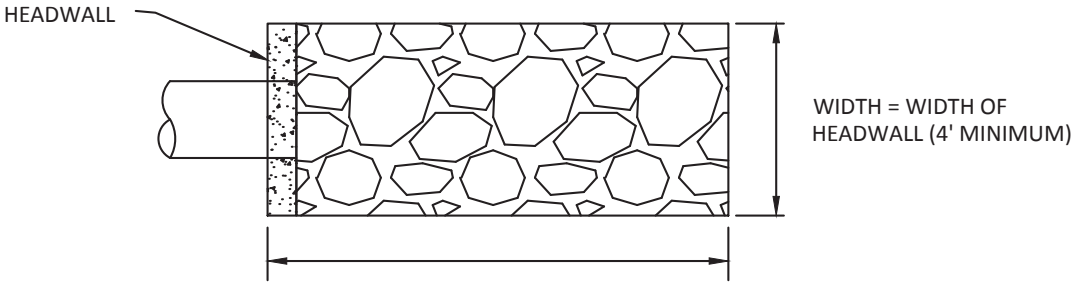
TYPICAL TRENCH DETAIL

FOR STORM SEWERS OUSIDE R/W WITH COVER OF 30-INCHES OR LESS

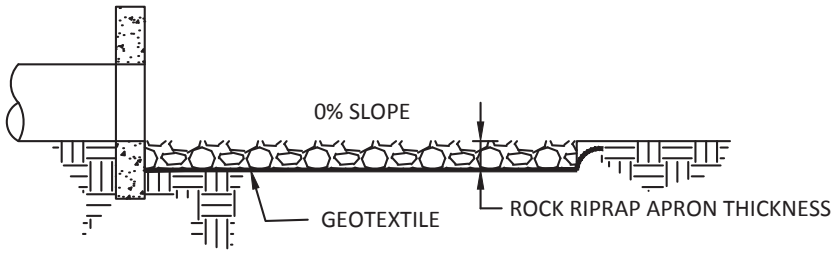
UTILITIES

SEWD-14.0

Rev. 12/31/2018



PLAN VIEW



PROFILE

1. THE SUBGRADE FOR THE FILTER AND RIPRAP SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES AS SHOWN ON THE PLAN.

2. THE RIPRAP SHALL CONFORM TO THE GRADING LIMITS AS SHOWN ON THE PLAN.

3. GEOTEXTILE SHALL BE WOVEN OR NONWOVEN MONOFILAMENT YARN AND SHALL MEET THE FOLLOWING:
   - ~ THICKNESS 20-60 MILS
   - ~ GRAB STRENGTH 90-120 LB.
   - ~ ASTM D-1777 AND ASTM D-1682

4. RIPRAP MAY BE PLACED BY EQUIPMENT BUT SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE.

TYPE OF ROCK OR RIPRAP	SIZE OF ROCK	
	50% BY WEIGHT	85% BY WEIGHT
TYPE D	> 6 IN.	3 - 12 IN.
TYPE C	> 12 IN.	6 - 18 IN.
TYPE B	> 18 IN.	12 - 24 IN.
TYPE A	> 24 IN.	18 - 30 IN.

ROCK CHANNEL PROTECTION

GENERAL

ROCK CHANNEL PROTECTION IS USED TO CONTROL EROSION AT THE OUTLET OF CULVERTS AND STORM SEWERS, OR FOR LINING DITCHES OR STEEP GRADES.

ROCK CHANNEL PROTECTION IS REQUIRED AT ALL STORM PIPE OUTLETS. A MINIMUM DEPTH OF 18-INCHES IS REQUIRED THE WIDTH OF THE ENDWALL AND THE MINIMUM LENGTH IS 5-FEET. THE MINIMUM TYPE IS TYPE C.

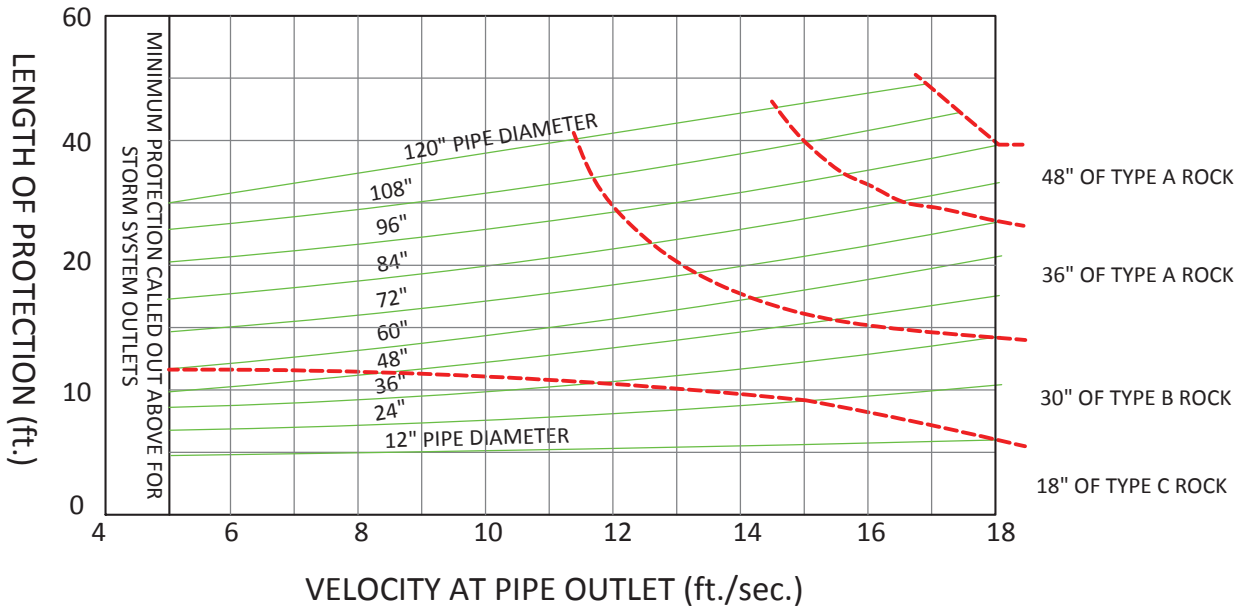
TYPES

THERE ARE FOUR TYPES OF ROCK CHANNEL PROTECTION THAT ARE USED IN VARIOUS SITUATIONS. THE USE OF THE PROPER TYPE AT CULVERT AND STORM SEWER OUTLETS CAN BE DETERMINED FROM THE FIGURE BELOW. TYPE A IS GENERALLY USED BEYOND THE OUTLET OF THE LARGER CONDUITS HAVING OUTLET VELOCITIES IN EXCESS OF 12 FEET PER SEC. AND TYPE B OR TYPE C FOR CONDUITS HAVING LESSER VELOCITIES. THE TYPE AND QUANTITY OF ROCK CHANNEL PROTECTION PROVIDED IN THE PLANS SHALL BE BASED ON THE PIPE ALTERNATE REQUIRING THE LARGEST SIZE AND QUANTITY OF ROCK CHANNEL PROTECTION. TYPE C AND TYPE D MAY BE USED TO LINE ROADSIDE DITCHES, AS REQUIRED, WHERE THE DITCHES ARE OUTSIDE THE DESIGN CLEAR ZONE WIDTH OR LOCATED BEHIND GUARDRAIL. ITEM 670 SEEDING AND EROSION CONTROL WITH MATTING MAY BE USED IN DITCHES AND CHANNELS IN LIEU OF ROCK WHERE AVERAGE FLOW VELOCITIES ARE LESS THAN 10 FEET PER SECOND AND CHANNEL SLOPES ARE LESS THAN 10%.

FILTER

A FILTER SHALL BE PROVIDED UNDER ALL ROCK CHANNEL PROTECTION.

A FABRIC FILTER IS REQUIRED OVER GRANULAR FILTER MATERIAL WHERE THE PROTECTED SLOPE IS STEEPER THAN 3:1. THE COST OF THE FILTER SHALL BE INCLUDED IN THE UNIT PRICE BID OF ITEM 601 ROCK CHANNEL PROTECTION WITH FILTER.



EST 1808 CITY OF DELAWARE OHIO

Public Works Department

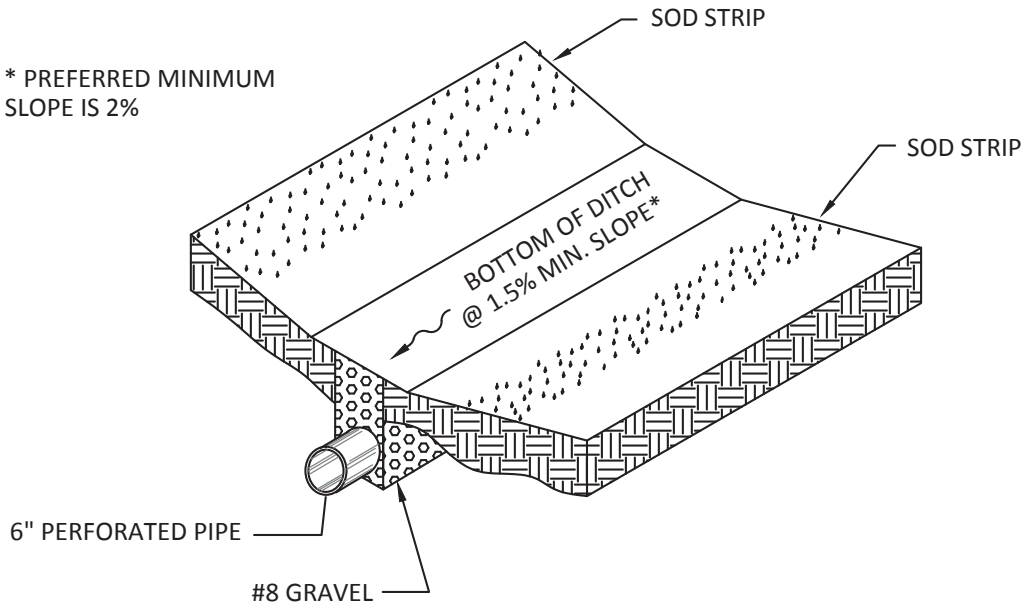
STANDARD DETAIL

ROCK CHANNEL PROTECTION DETAILS AND NOTES

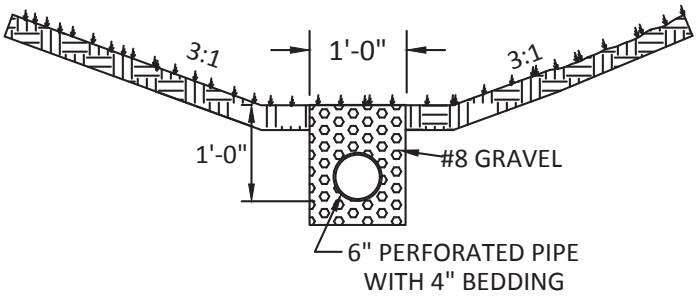
UTILITY

SEWD-15.2

Rev. 12/31/2018

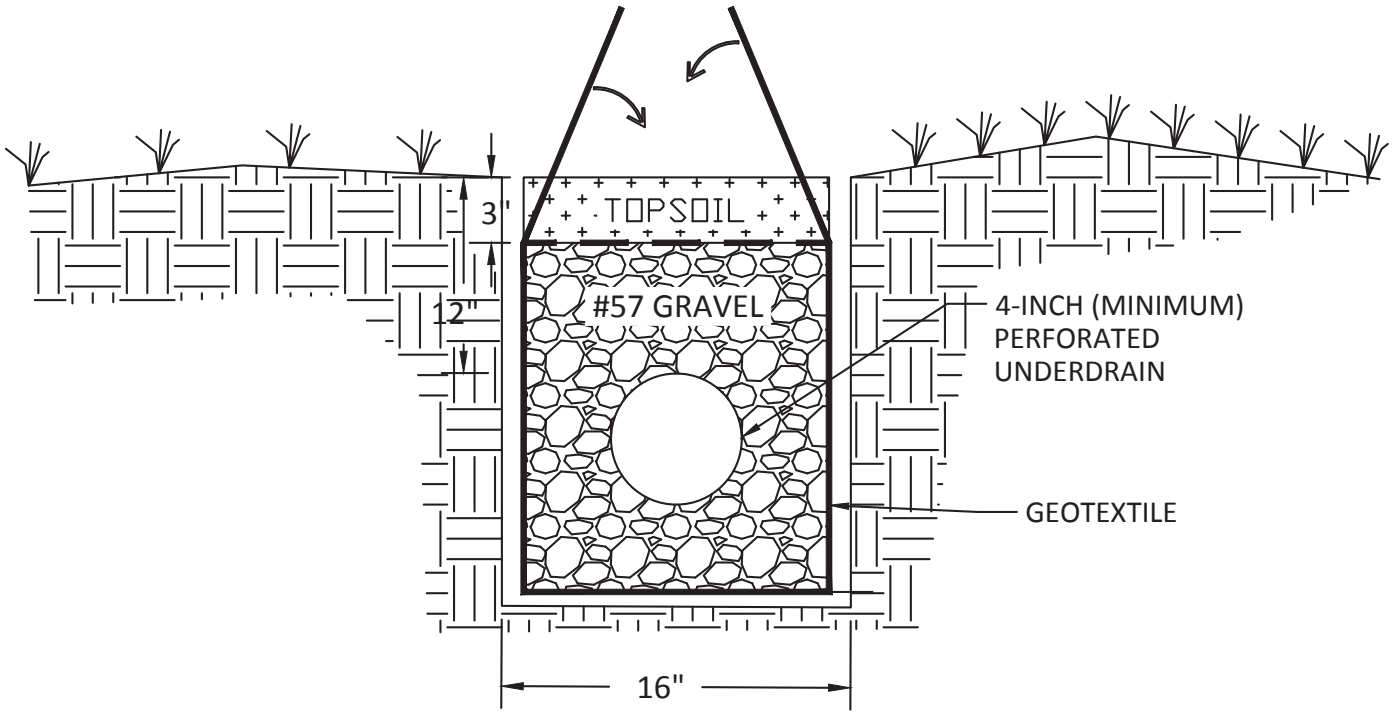


ISOMETRIC VIEW



DITCH FRENCH DRAIN DETAIL

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL DRAINAGE DETAIL FRENCH DRAIN	UTILITIES SEWD-16.1 Rev. 12/31/2018



NOTES:

1. ALL SWALES WITH LESS THAN 2% RUNNING SLOPE SHALL HAVE AN UNDERDRAIN THE ENTIRE LENGTH OF THE SWALE. THE UNDERDRAIN SHALL TERMINATE IN A STORM STRUCTURE.

2. ALL DRY DETENTION BASINS WITH A BOTTOM SLOPE OF LESS THAN 5% SHALL HAVE A SERIES OF UNDERDRAINS INSTALLED THAT OUTLET TO THE BASIN OUTLET STRUCTURE.

3. THE UNDERDRAIN TRENCH IS TO BE BACKFILLED WITH # 57 STONE

4. TRENCH TO BE CAPPED WITH 3-INCHES OF TOPSOIL.

5. TRENCH TO BE LINED WITH GEOTEXTILE PER THIS DETAIL

6. GEOTEXTILE FABRIC TO BE TYPE A AND MEET THE FOLLOWING SPECIFICATIONS:

MINIMUM TENSILE STRENGTH	85 lbs
MINIMUM PUNCTURE STRENGTH	25 lbs
MINIMUM TEAR STRENGTH	25 lbs
APPARENT OPENING SIZE:	≤0.3 mm

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

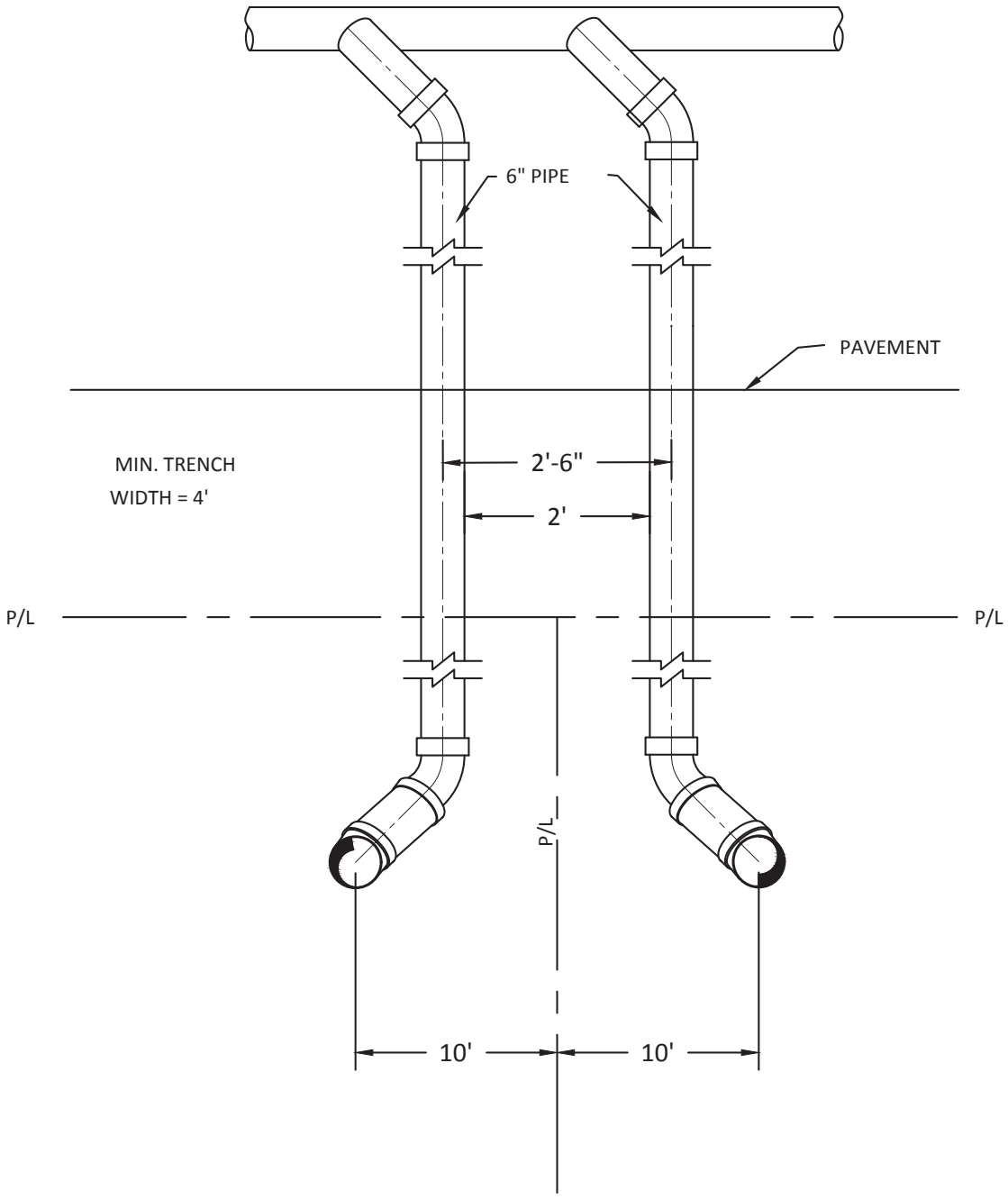
UNDERDRAIN DETAIL

(FOR USE UNDER SWALES AND DRAINAGE BASINS)

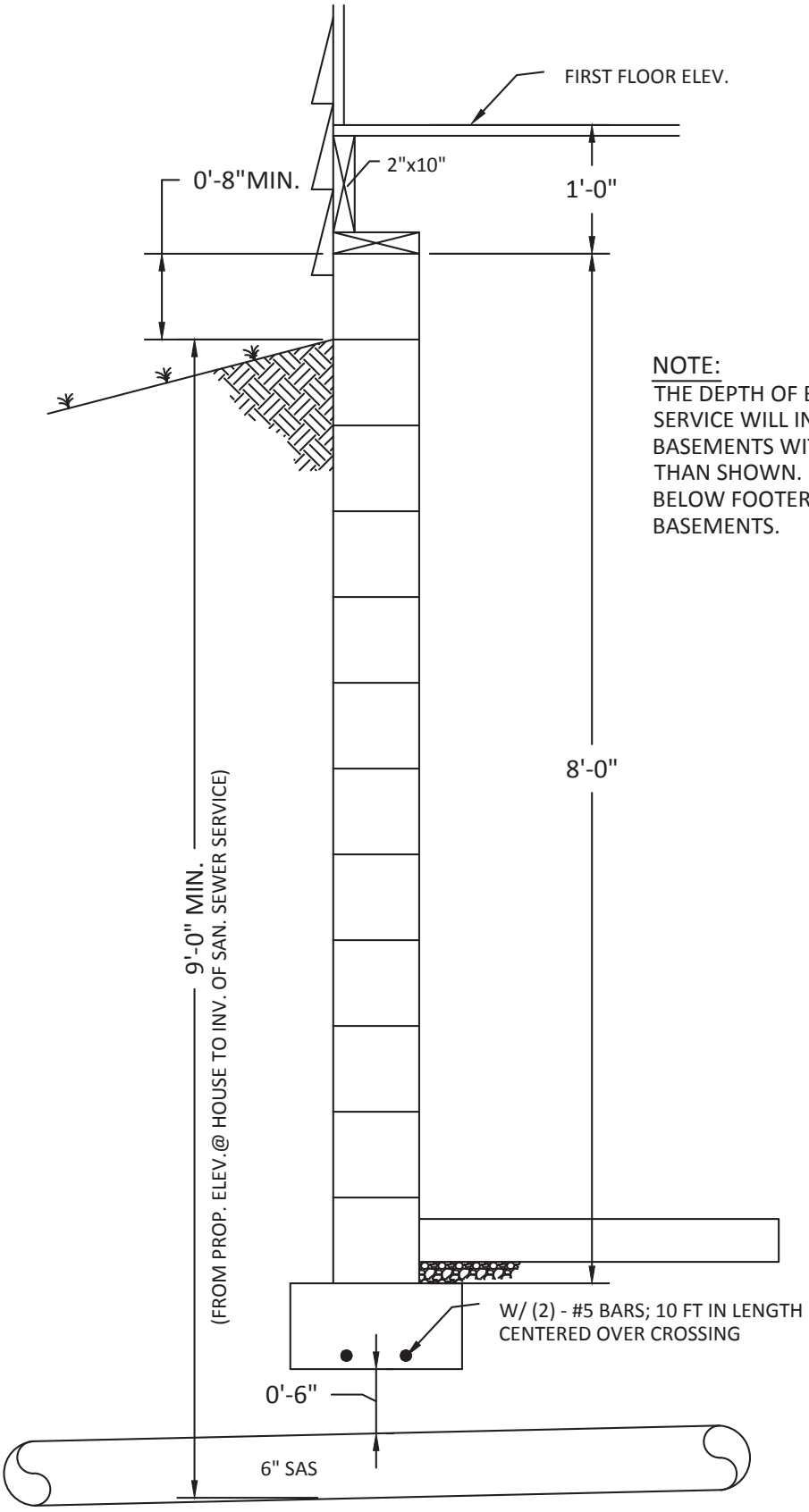
UTILITIES

SEWD-16.2

Rev. 12/31/2018



EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL SANITARY LATERAL STREET CROSSING (2 LATERALS IN 1 TRENCH)	UTILITIES SEWD-17.0 Rev. 12/31/2018



NOTE:
THE DEPTH OF BURY FOR THE SANITARY SERVICE WILL INCREASE FOR BASEMENTS WITH GREATER DEPTH THAN SHOWN. PROVIDE CLEARANCE BELOW FOOTER AS SHOWN FOR DEEPER BASEMENTS.

EST 1808
CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

MINIMUM DEPTH OF SANITARY SEWER SERVICE

UTILITIES

SEWD-18.0

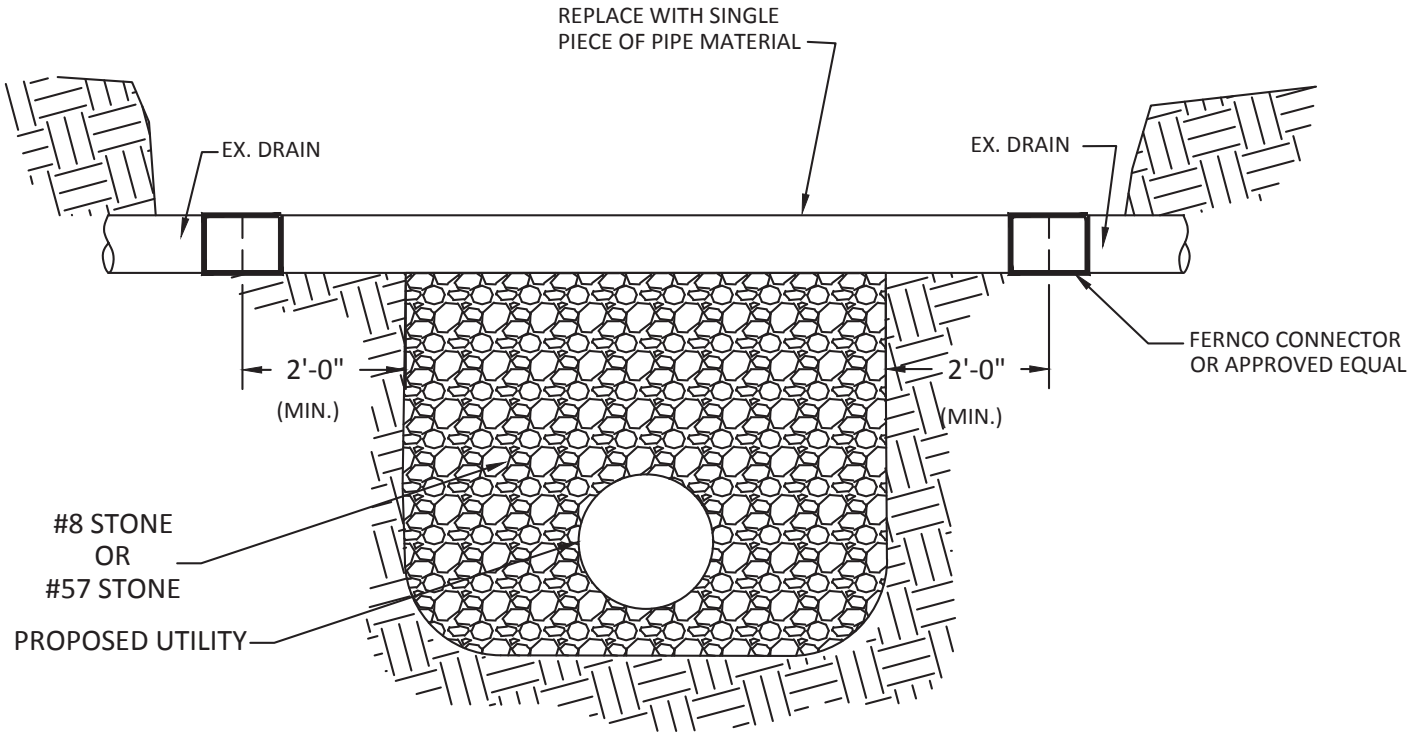
Rev. 12/31/2018

MINIMUM ROAD & CURB UNDERDRAIN REPLACEMENT MATERIAL SHALL BE:

PERFORATED CONCRETE: ITEM 706.06 (ODOTCMS)
CONCRETE DRAIN TILE : TILE 706.07 (ODOTCMS)
VITRIFIED CLAY: ITEM 706.08 (ODOTCMS) PERFORATED
PVC: ITEM 707.17 (ODOTCMS) HEAVY DUTY
CORRUGATED POLYETHYLENE SLOTTED DRAIN: ITEM 707.16 (ODOTCMS)

MINIMUM DRAIN TILE REPLACEMENT MATERIAL SHALL BE:

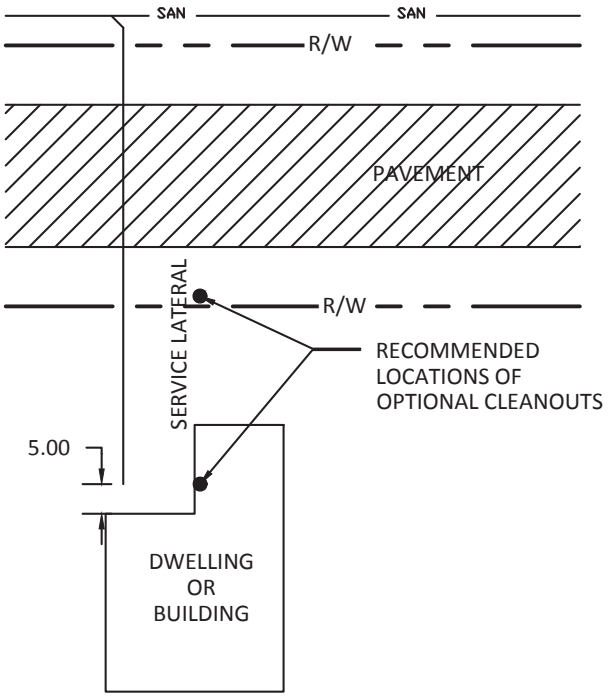
PVC: ASTM 2241, SDR 26
DUCTILE IRON: AWWA C151, CLASS 50
STEEL PIPE: ASTM 139-B
CONCRETE: ITEM 706.02 (ODOTCMS)
POLYETYLENE: ITEM 707.16, S.S. 944 (ODOTCMS)



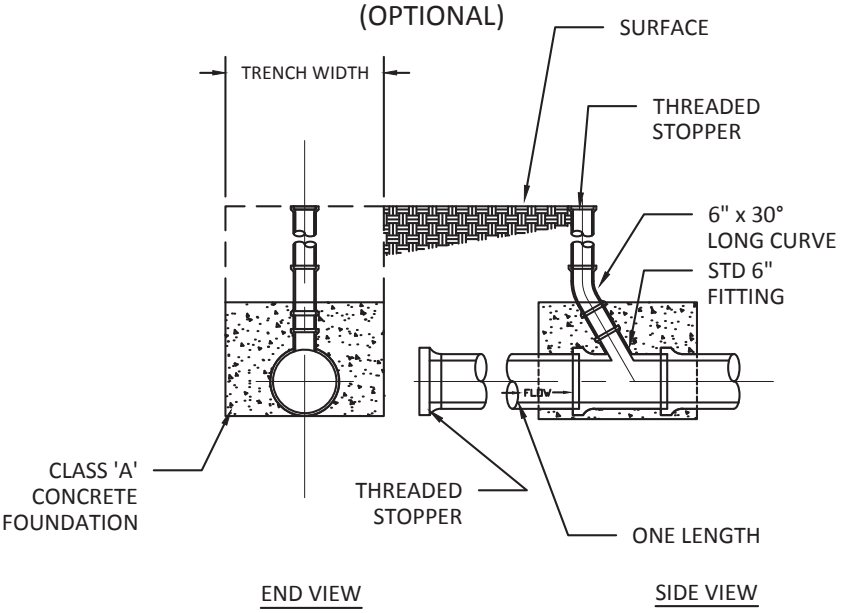
NOTES:

1. INSIDE DIAMETER OF REPLACEMENT PIPE SHALL BE EQUAL TO OR GREATER THAN INSIDE DIAMETER OF EXISTING TILE OR UNDERDRAIN.
2. REPLACLEMENT MATERIAL USED SHALL BE EQUAL TO OR BETTER THAN THE EXISTING TILE OR UNDERDRAIN AS DIRECTED BY THE DIVISION OF ENGINEERING SERVICES.
3. PROVIDE FERNCO FITTINGS OR APPROVED EQUIVALENT WHERE EXISTING TILE OR UNDERDRAIN HAS WATERTIGHT JOINTS. PROVIDE 30# FELT OR CONCRETE MORTAR OVER THE UPPER HALF OF THE JOINT WHERE OPEN JOINTS ARE ENCOUNTERED.
4. BACKFILL BETWEEN THE PROPOSED UTILITY AND THE REPLACEMENT TILE OR UNDERDRAIN SHALL BE No. 8 OR No. 57 ANGULAR STONE.

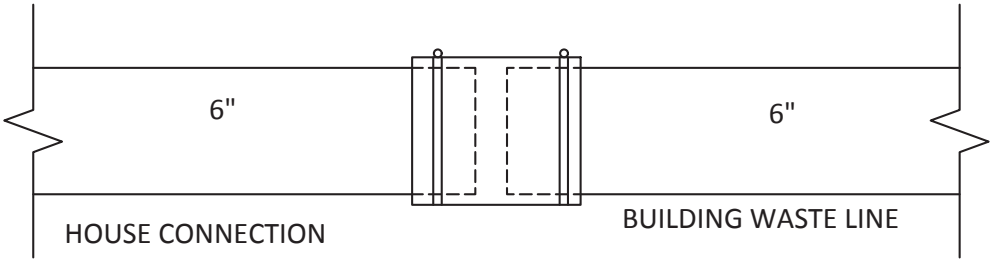
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL FIELD DRAIN TILE & UNDERDRAIN REPLACEMENT	UTILITIES SEWD-19.0 Rev. 12/31/2018



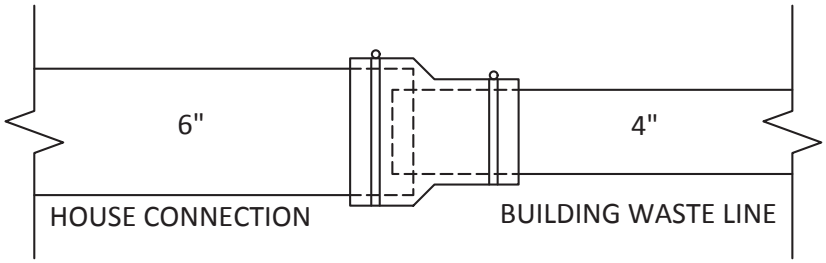
CLEANOUT
(OPTIONAL)



ALLOWABLE CONNECTION -
SANITARY HOUSE CONNECTION TO BUILDING WASTE LINE OF DIFFERING MATERIAL



FLEXIBLE COUPLING



FLEXIBLE REDUCING COUPLING

NOTE:

1. WHEN MAKING CONNECTION TO EXISTING BUILDING WASTE LINE OF A DIFFERENT MATERIAL, UTILIZE FLEXIBLE COUPLINGS, FERNCO SERIES 1000 OR APPROVED EQUAL.
2. WHEN MAKING CONNECTION TO EXISTING BUILDING WASTE LINE OF THE SAME MATERIAL (I.E. PVC TO PVC), UTILIZE SOLID SLEEVE COUPLING.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL TYPICAL SANITARY HOUSE CONNECTION SERVICE	UTILITIES SEWD-20.0 Rev. 12/31/2018

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CITY OF DELAWARE OHIO

Public Works Department

WATER
STANDARD DRAWINGS

12/31/2018 Edition

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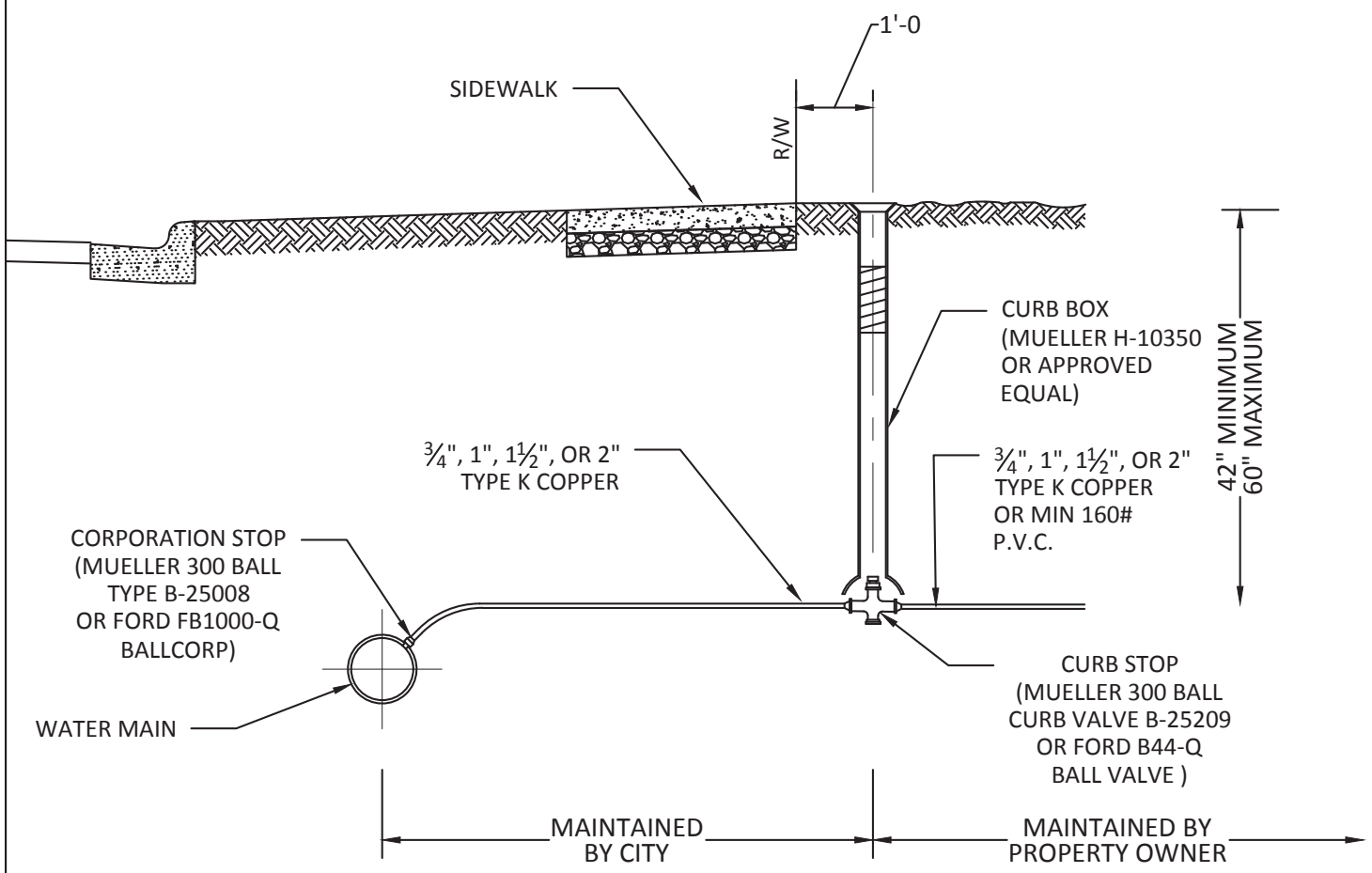
NOTES:

1. USE OF THIS DETAIL ONLY APPLIES TO PRIVATE WATER SYSTEMS NOT CONTAINING INDIVIDUAL METERS AT EACH SERVICE. FOR DOMESTIC WATER SERVICES ON PUBLIC WATER SYSTEMS, SEE WTRD-1.2.
2. THE CURB BOX SHALL BE PLACED 1'-0 FROM THE EDGE OF THE SIDEWALK OR 2'-0 INSIDE THE RIGHT-OF-WAY OR EASEMENT LINE WHEN NO SIDEWALK IS PRESENT OR PROPOSED.
3. THE CURB STOP SHALL BE INSTALLED WITH VALVE OPENING FACING THE STRUCTURE TO BE SERVED. THE CURB STOP SHALL TURN '¼ TURN' CLOCKWISE ON TO OFF POSITION (TYPICAL).
4. CURB BOXES SHALL BE PLACED A MINIMUM OF 20'-0 FROM ANY EXISTING OR PROPOSED FOUNDATION OR STRUCTURE.



EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL DOMESTIC WATER SERVICE PRIVATE WATER MAINS	WATER WTRD-1.1 Rev. 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

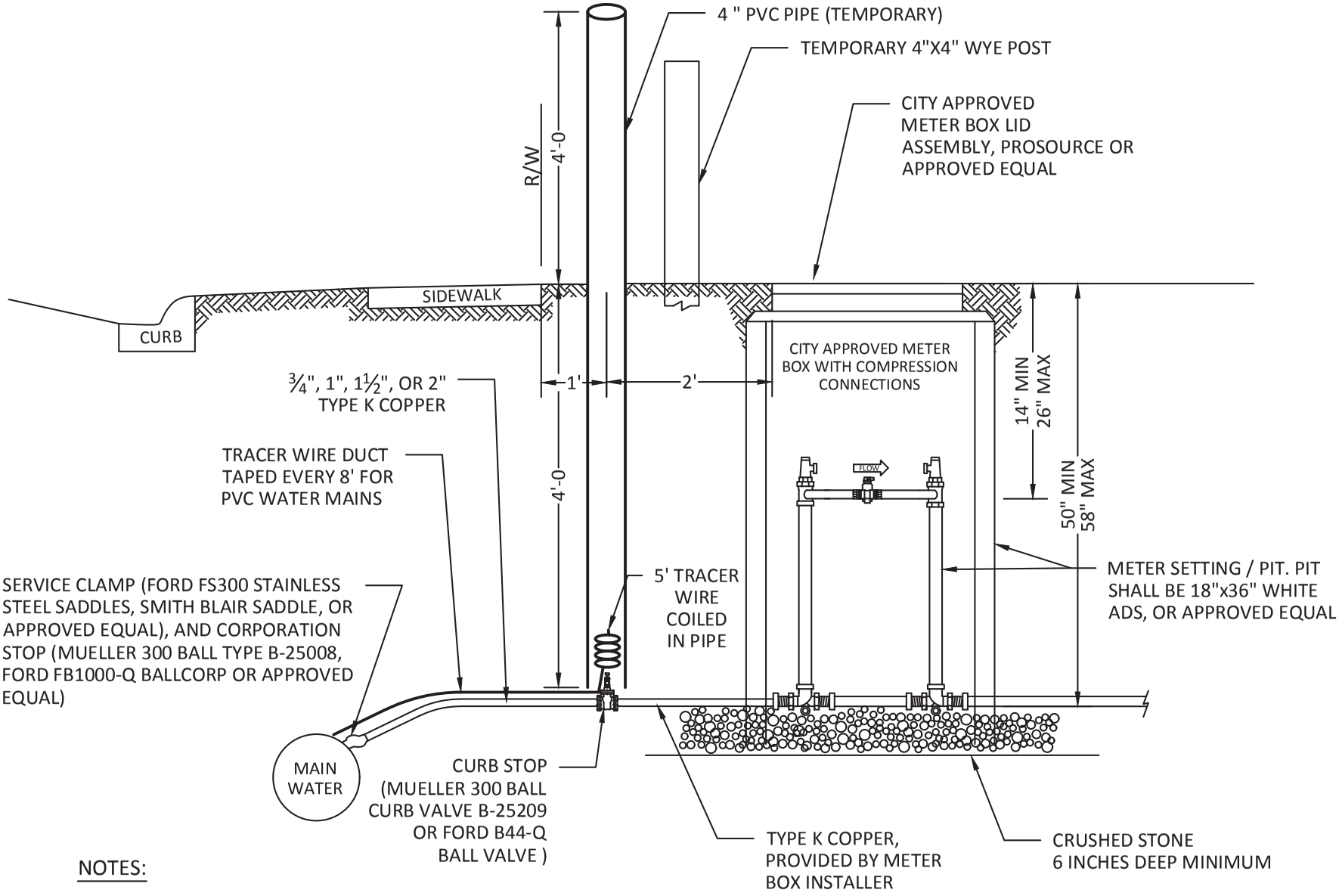
STANDARD DETAIL

DOMESTIC WATER SERVICE PUBLIC WATER MAINS

WATER

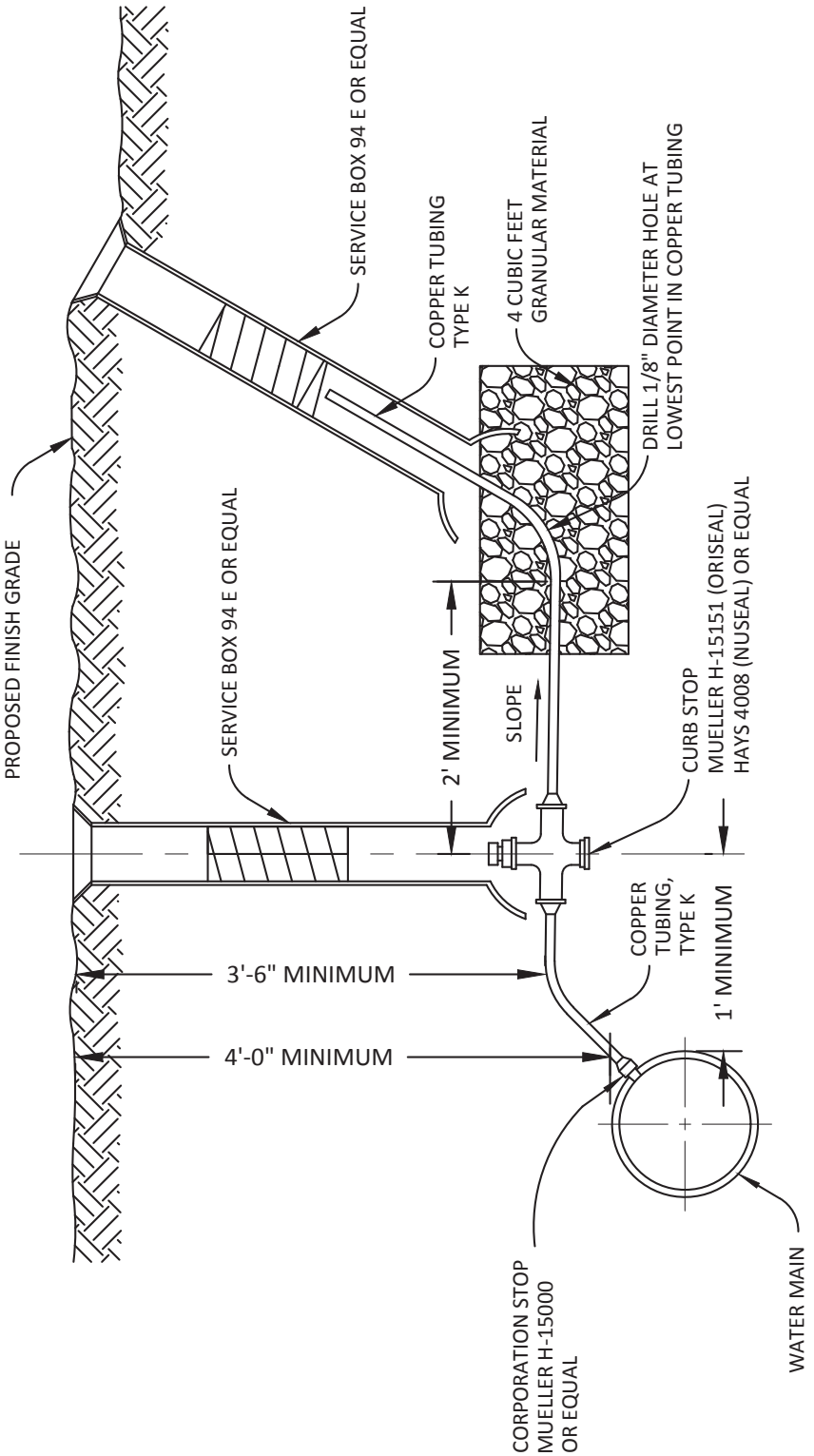
WTRD-1.2

Rev. 12/31/2018



NOTES:

1. THIS DETAIL APPLIES TO PUBLIC WATER SYSTEMS, ONLY.
2. THE METER BOX INSTALLATION MUST BE INSPECTED PRIOR TO BACKFILLING AND METER INSTALLATION.
3. TRACER WIRE IS TO BE EXTENDED TO METER PIT ONCE INSTALLED.
4. TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES OR APPROVED EQUAL.
5. THE CURB STOP SHALL BE INSTALLED WITH VALVE FACING THE STRUCTURE TO BE SERVED. THE CURB STOP SHALL TURN '¼ TURN' CLOCKWISE ON TO OFF POSITION.



EST 1808
CITY OF DELAWARE OHIO
Public Works Department

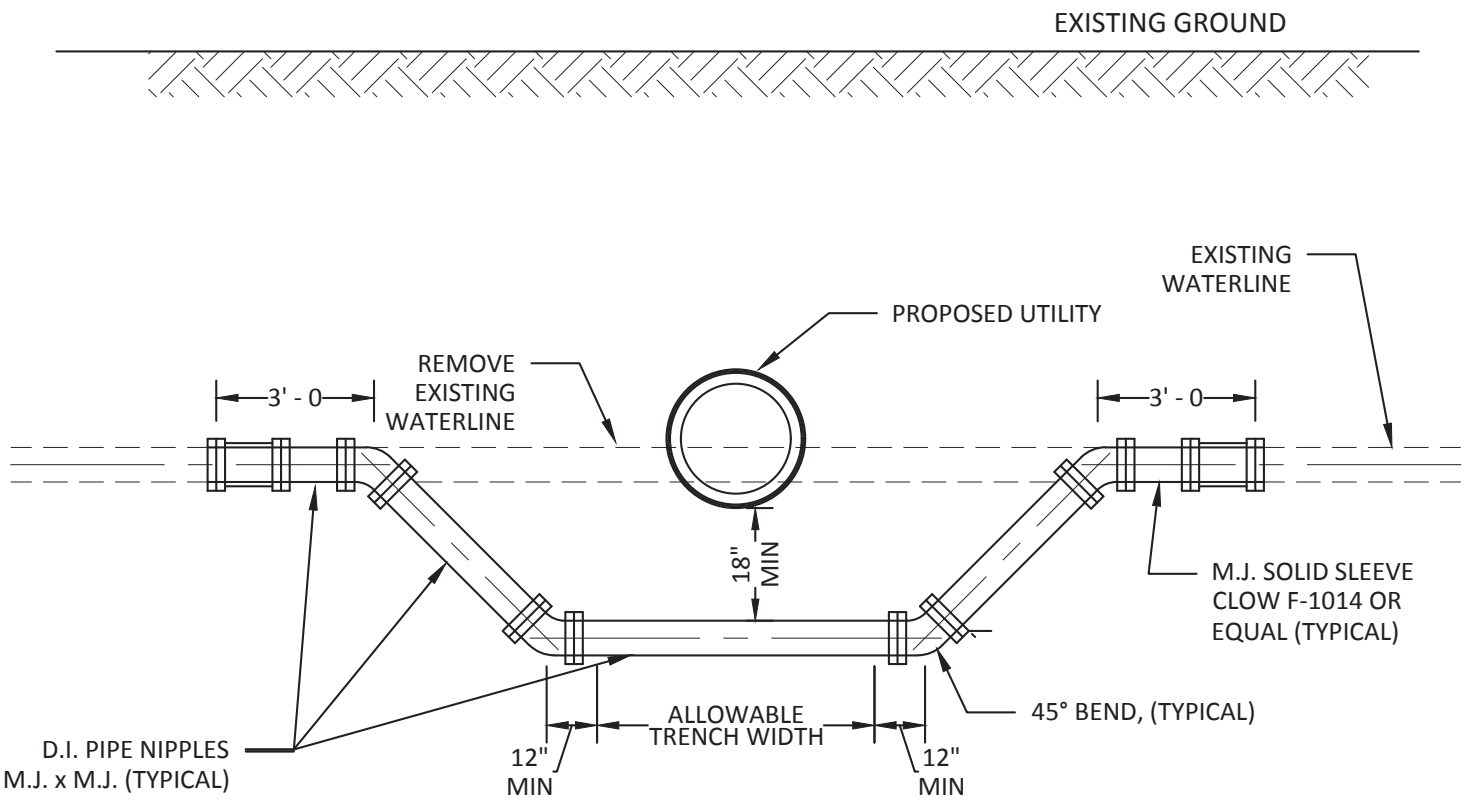
STANDARD DETAIL

TYPICAL AIR RELEASE

WATER

WTRD-2.0

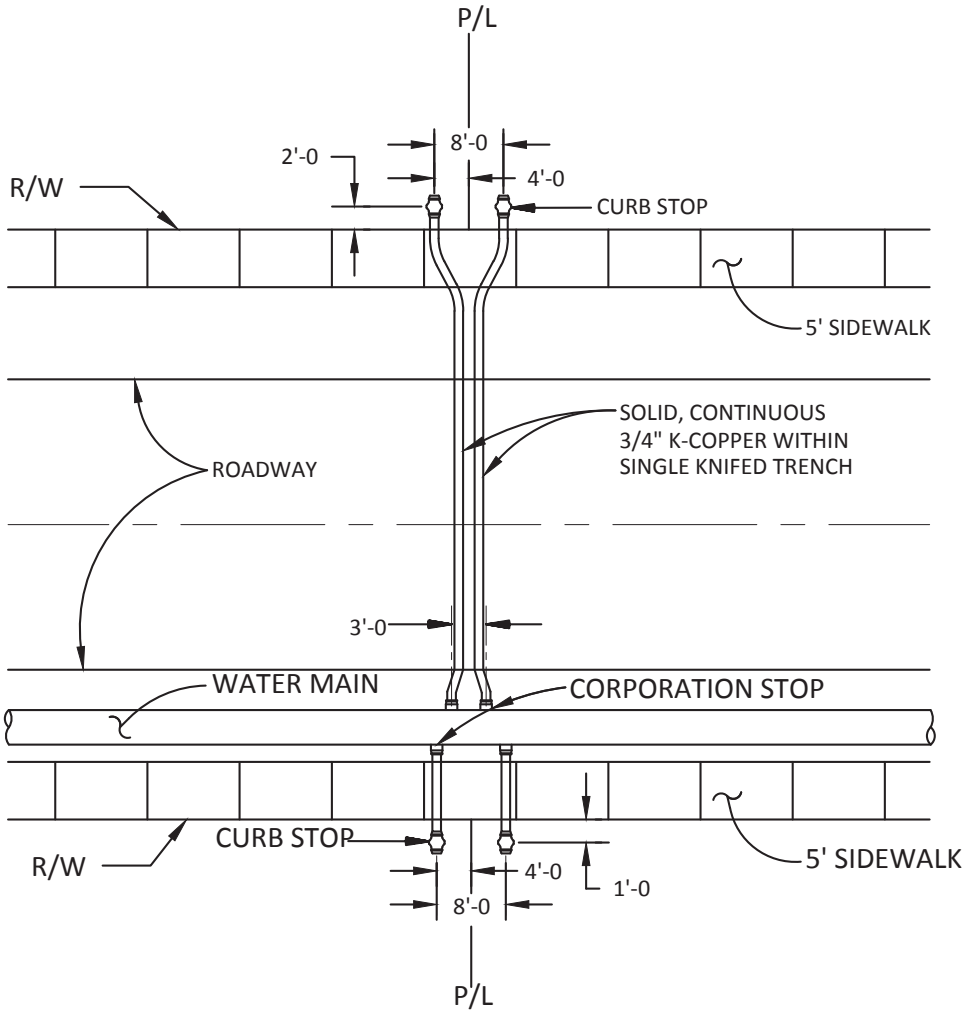
Rev. 12/31/2018



NOTES:

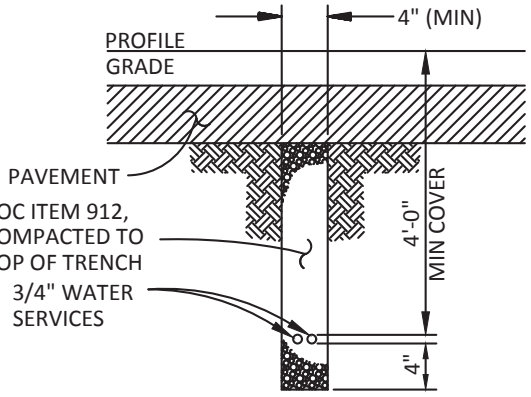
1. THIS DETAIL APPLIES TO LOWERING OF EXISTING WATER MAINS, NOT FOR US IN PROPOSED WATER MAIN PROFILES.
2. TIME AND DURATION OF SHUT DOWN SHALL BE DETERMINED BY THE CITY OF DELAWARE (COD).
3. NOTIFY THE COD - PUBLIC UTILITIES DEPARTMENT 48 HOURS PRIOR TO THE SHUT DOWN, SO THE COD CAN NOTIFY ALL WATER CUSTOMERS AFFECTED BY THE PROPOSED WORK AT LEAST 24 HOURS IN ADVANCE TO THE SHUTDOWN.
4. ALL BENDS SHALL BE SECURED BY RETAINING GLANDS, RODDING OR OTHER METHODS AS APPROVED BY THE COD TO RESTORE MAIN TO SERVICE AS SOON AS POSSIBLE. CONCRETE BACKING SHALL THEN BE PLACED IN ACCORDANCE WITH COD STANDARD DETAILS.
5. THE RELOCATED LINES SHALL BE LAID TO THE NEW LINE AND GRADE, TESTED AND DISINFECTED PRIOR TO SHUT DOWN OF EXISTING MAIN AND CONNECTION OF THE RELOCATED LINES TO THE EXISTING MAIN.
6. ALL WATER LINES SHALL BE DISINFECTED BY SWABBING WITH A 5 PERCENT HYPOCHLORITE SOLUTION IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE AWWA C-601.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL TYPICAL WATER LINE LOWERING	WATER WTRD-3.0 Rev. 12/31/2018



PLAN

NOT TO SCALE



WATER SERVICE TRENCH DETAIL

NOT TO SCALE

NOTE:
MINIMUM DEPTH - 4'-0"
BELOW FINISHED GRADE

NO SPLICES PERMITTED
IN COPPER LINE BETWEEN
CORPORATION AND CURB
STOPS

EST 1808
CITY OF
DELAWARE
OHIO

Public Works Department

STANDARD DETAIL

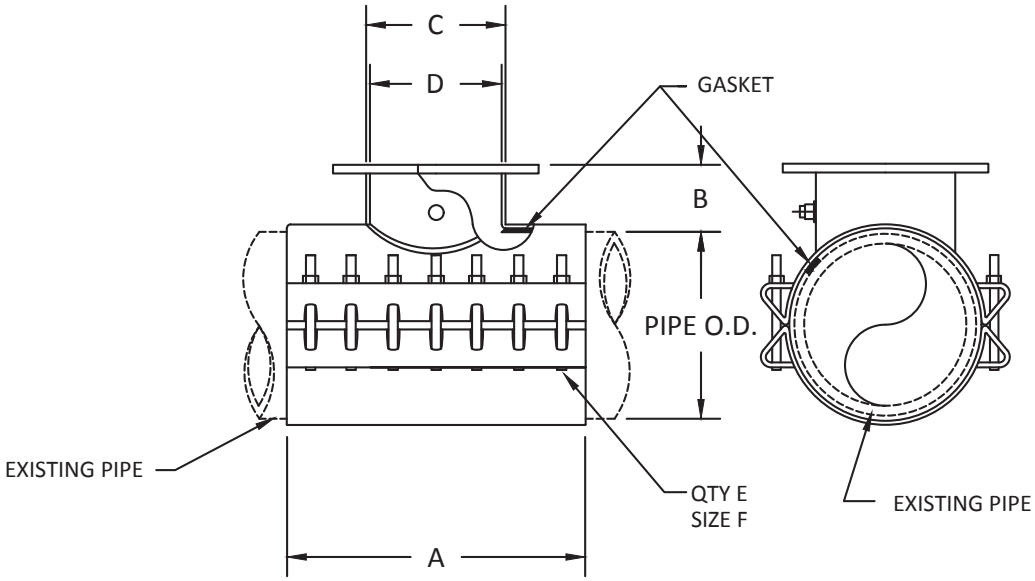
WATER SERVICE STREET CROSSINGS

(2 SERVICES IN ONE TRENCH)

WATER

WTRD-4.0

Rev. 12/31/2018



FLANGE SIZE (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E	F (in.)
3	12	5	4-1/32	3-1/2	6	3/4
4	12	5	5-1/32	4-1/2	6	3/4
6	12	5	7-1/32	6-1/2	6	3/4
8	16	5-1/8	9-1/32	8-1/8	8	3/4
10	20	5-1/2	11-1/16	10-1/4	10	3/4
12	24	5-3/4	13-1/16	12-1/4	12	3/4

FOR OUTLETS 14" AND LARGER THE MANUFACTURER OF THE TAPPING VALVE MUST BE SPECIFIED TO ASSURE PROPER ALIGNMENT RECESS DIMENSION.
SIZE ON SIZE TAPPING SLEEVE REQUIRES 1/2" UNDERSIZE CUTTER TO ASSURE PROPER CUTTER CLEARANCE AND COMPLETE SEVERANCE OF THE COUPON
ON NOMINAL PIPE SIZE 7.45 AND SMALLER DIMENSION D IS 6-1/8"

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

FULL BODY WATER TAP

WATER

WTRD-6.0

Rev. 12/31/2018

Length of Pipe (ft)	Allowable Leakage (gallons per hour)									
	Pipe Size (inches)									
	6	8	12	16	20	24	30	36	42	48
50	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.15	0.17	0.20
100	0.05	0.07	0.10	0.13	0.17	0.20	0.25	0.30	0.35	0.40
200	0.10	0.13	0.20	0.26	0.33	0.40	0.50	0.60	0.70	0.79
300	0.15	0.20	0.30	0.40	0.50	0.60	0.74	0.89	1.04	1.19
400	0.20	0.26	0.40	0.53	0.66	0.79	0.99	1.19	1.39	1.59
500	0.25	0.33	0.50	0.66	0.83	0.99	1.24	1.49	1.74	1.99
600	0.30	0.40	0.60	0.79	0.99	1.19	1.49	1.79	2.09	2.38
700	0.35	0.46	0.70	0.93	1.16	1.39	1.74	2.09	2.43	2.78
800	0.40	0.53	0.79	1.06	1.32	1.59	1.99	2.38	2.78	3.18
900	0.45	0.60	0.89	1.19	1.49	1.79	2.23	2.68	3.13	3.57
1,000	0.50	0.66	0.99	1.32	1.66	1.99	2.48	2.98	3.48	3.97
2,500	1.24	1.66	2.48	3.31	4.14	4.97	6.21	7.45	8.69	9.93
5,000	2.48	3.31	4.97	6.62	8.28	9.93	12.41	14.90	17.38	19.86
7,500	3.72	4.97	7.45	9.93	12.41	14.90	18.62	22.34	26.07	29.79
10,000	4.97	6.62	9.93	13.24	16.55	19.86	24.83	29.79	34.76	39.72

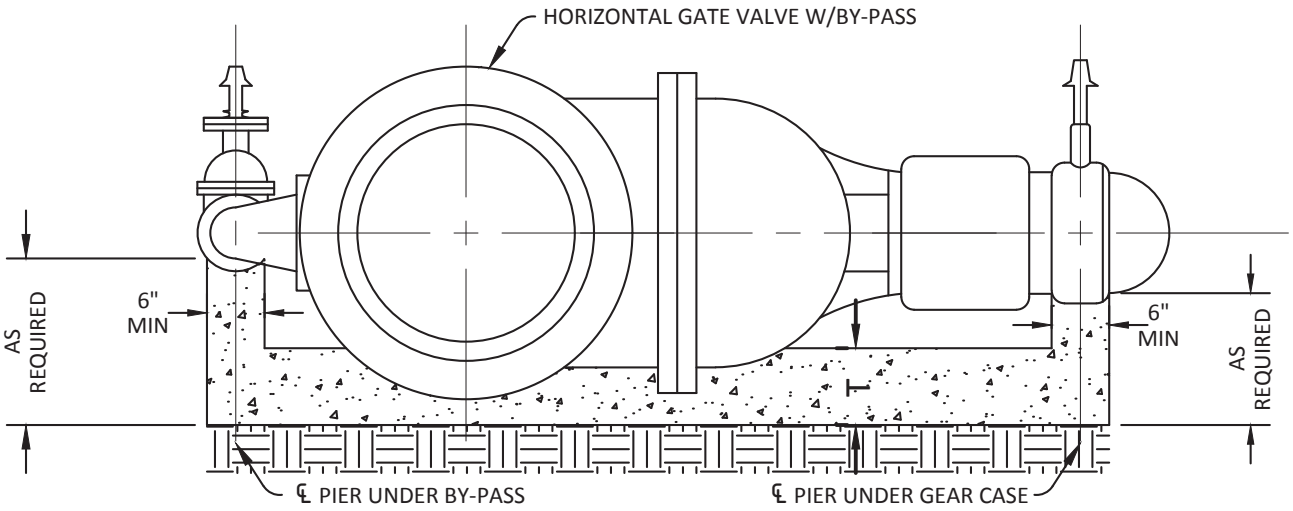
FORMULA: $L = \frac{SD\sqrt{P}}{148{,}000}$

WHERE:

L= ALLOWABLE LEAKAGE (GAL./HR.)
S= LENGTH OF PIPE TESTED IN FEET.
D= NOMINAL PIPE DIAMETER IN INCHES.
P= TEST PRESSURE (150 PSI)

NOTE:

1. THESE CALCULATIONS ARE BASED ON "AWWA C-600-10" SPECIFICATIONS, SECTION 4, HYDROSTATIC TESTING, DATED DECEMBER 1, 2005.
2. WHEN TESTING AGAINST CLOSED METAL-SEATED VALVES, AN ADDITIONAL LEAKAGE PER CLOSED VALVE OF 0.0078 GAL./HR./IN. OF NOMINAL VALVE SIZE WILL BE ALLOWED.



NOTES:

1. DIMENSIONS SHALL BE VARIED AS DIRECTED TO SUIT MAKE OF VALVE FURNISHED.
2. WIDTH SHALL BE AS REQUIRED TO ALLOW ACCESS TO BOLTS. (6" MIN.)
3. T = 6" MINIMUM
4. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

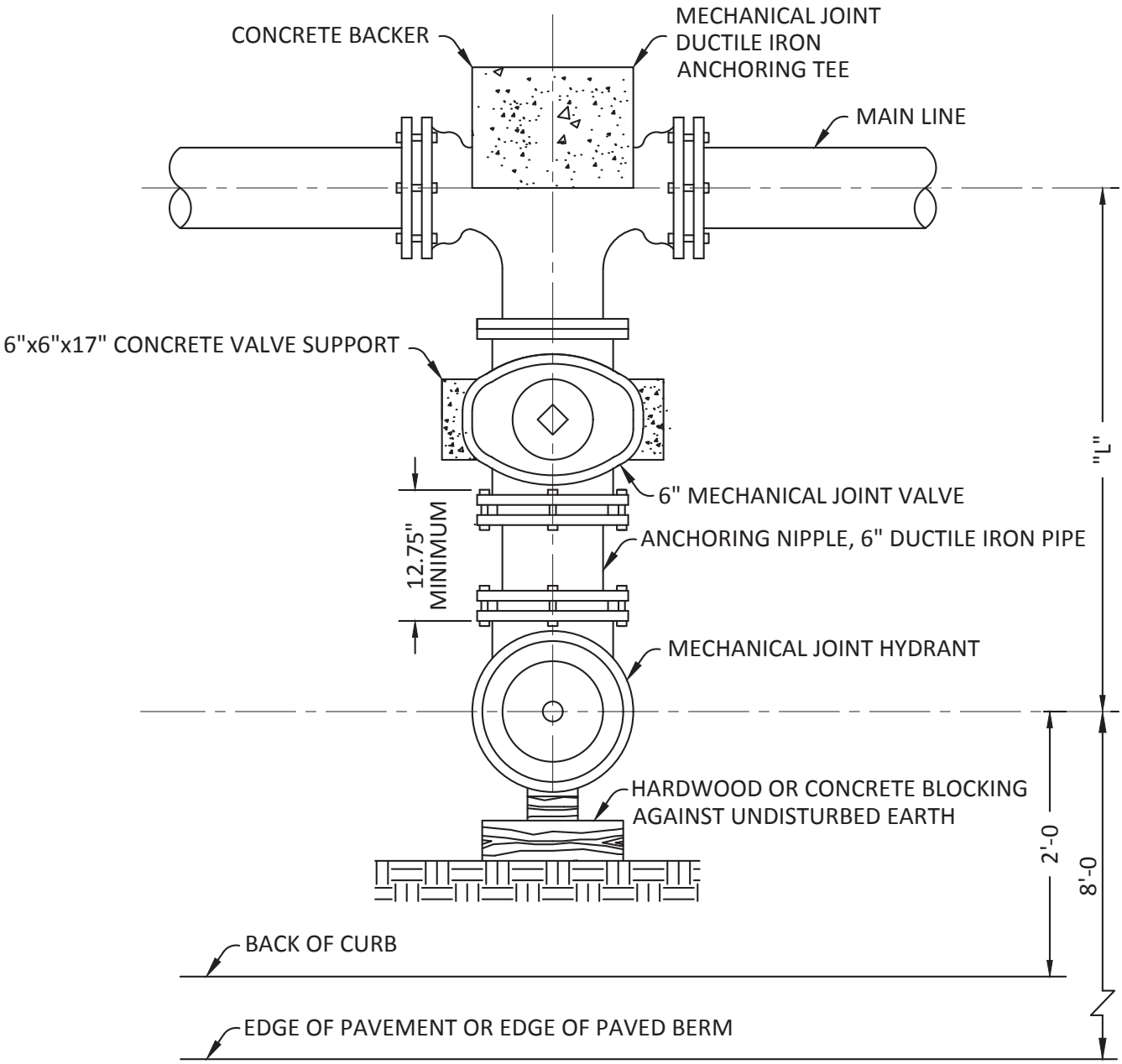
CONCRETE VALVE SUPPORT

HORIZONTAL GATE VALVER W/BY-PASS

WATER

WTRD-8.0

Rev. 12/31/2018



MAIN LINE	DIMENSION "L" (MINIMUM)
6"	35"
8"	36"
12"	39"
16"	42"

NOTES:

1. FIRE HYDRANT SHALL HAVE A MAXIMUM BURY DEPTH OF 7'-0.
2. MODIFICATION OF THE HYDRANT LEAD TO MEET THIS REQUIREMENT SHALL BE MADE IN THE SECTION FROM THE VALVE TO THE HYDRANT AS PER STANDARD DETAIL WTRD-10.
3. FIRE HYDRANTS SHALL BE SET A MINIMUM OF 6'-0 FROM ALL DRIVEWAY OPENINGS.
4. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

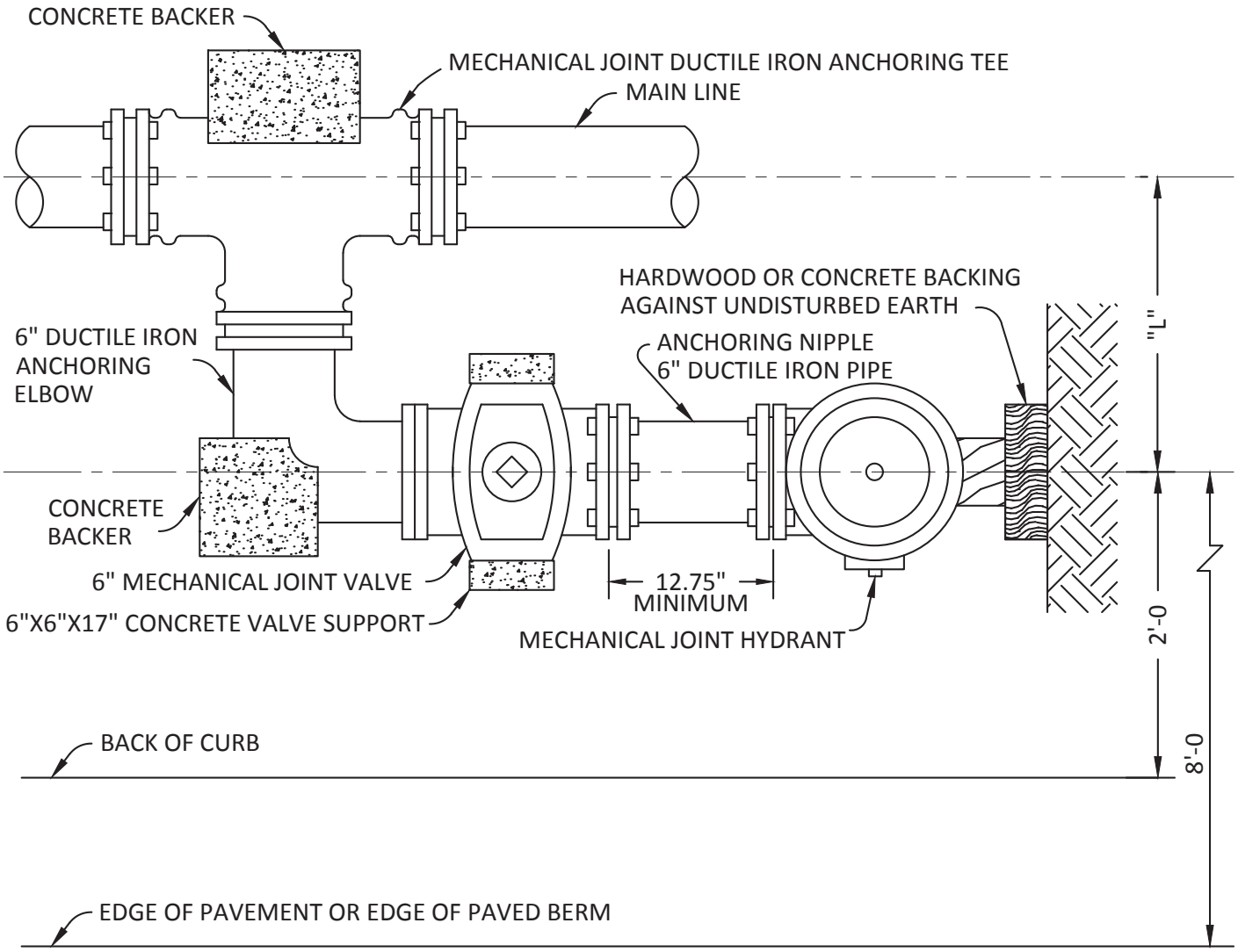
STANDARD DETAIL

TYPICAL HYDRANT SETTING TYPE "A"

WATER

WTRD-9.0

Rev. 12/31/2018



MAIN LINE	DIMENSION "L"	
	TYPE "B"	TYPE "B" MOD.
6"	24"	19"
8"	25"	20"
12"	28"	23"
16"	31"	26"

TYPE"B": LONG SIDE BEND TO TEE
TYPE"B MODIFIED": SHORT SIDE BEND TO TEE (REQUIRES APPROVAL PRIOR TO SPECIFYING IN PLANS)

NOTES:

1. FIRE HYDRANTS SHALL BE SET A MINIMUM OF 6'-0 FROM ALL DRIVEWAY OPENINGS.
2. FIRE HYDRANT SHALL HAVE A MAXIMUM BURY OF 7'-0. MODIFICATION OF THE HYDRANT LEAD TO MEET THIS REQUIREMENT SHALL BE IN THAT SECTION FROM THE VALVE TO THE HYDRANT.
3. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

SPECIAL HYDRANT SETTING
TYPE "B" AND "B" MODIFIED

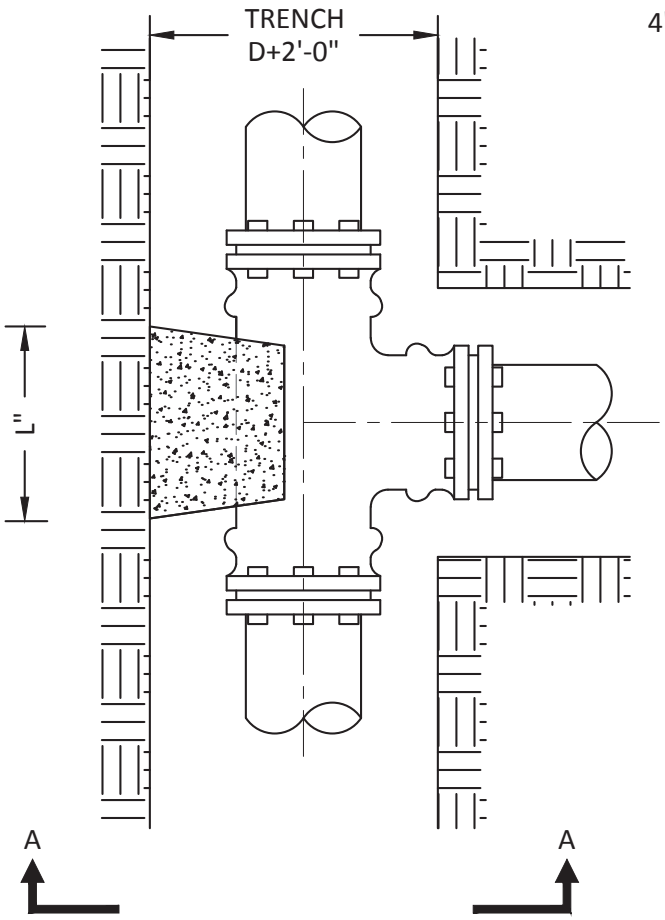
WATER

WTRD-10.0

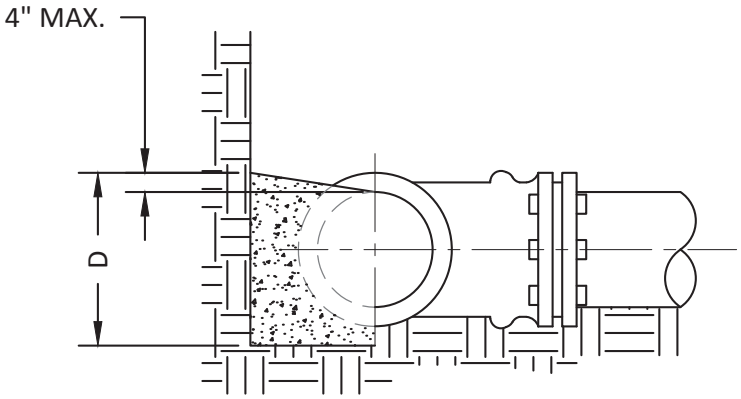
Rev. 12/31/2018

RUN	BRANCH																							
	3"			4"			6"			8"			12"			16"			20"			24"		
	L	D	V	L	D	V	L	D	V	L	D	V	L	D	V	L	D	V	L	D	V	L	D	V
3"	12	5	0.5																					
4"	10	6	0.5	11	8	0.8																		
6"	9	7	0.5	11	8	0.8	18	12	1.9															
8"	8	8	0.5	10	9	0.7	18	12	1.9	23	16	3.5												
12"	6	12	0.6	8	12	0.8	18	12	1.9	23	16	3.5	38	22	8.7									
16"	6	16	0.8	6	16	0.8	14	16	2.0	20	18	3.3	36	23	8.7	49	30	13.6						
20"	6	20	1.0	6	20	1.0	11	20	1.9	18	20	3.3	35	24	8.7	46	32	13.6	60	38	26.5			
24"	6	24	1.2	6	24	1.2	9	24	1.9	15	24	3.3	30	28	8.7	42	36	14.0	54	42	26.3	68	48	45.4

NOTES:
1. REINFORCING STEEL WILL BE USED AS REQUIRED BY THE ENGINEER
2. DIMENSIONS "L" AND "D" ARE PROVIDED IN INCHES
3. THE APPROXIMATE VOLUME OF CONRCETE "V" IS IN CUBIC FEET.



PLAN VIEW



SECTION A-A

NOTES:

1. BACKER DESIGNED FOR 3000 PSF SOIL BEARING.
2. CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH.
3. PROVIDE CLEARANCE FOR REMOVAL OF BOLTS.
3. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

BACKING FOR TEES

WATER

WTRD-11.0

Rev.12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

STANDARD DETAIL

BACKING FOR VERTICAL BENDS

(OVER BENDS ONLY)

WATER

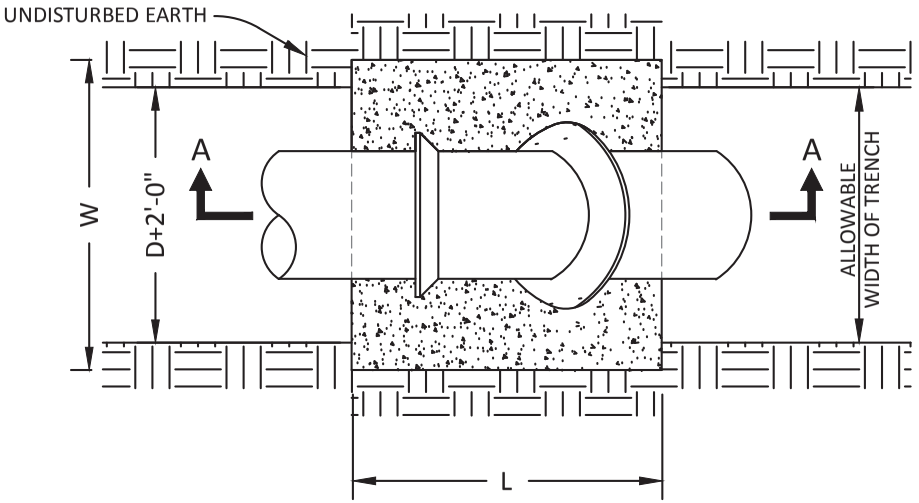
WTRD-12.0

Rev. 12/31/2018

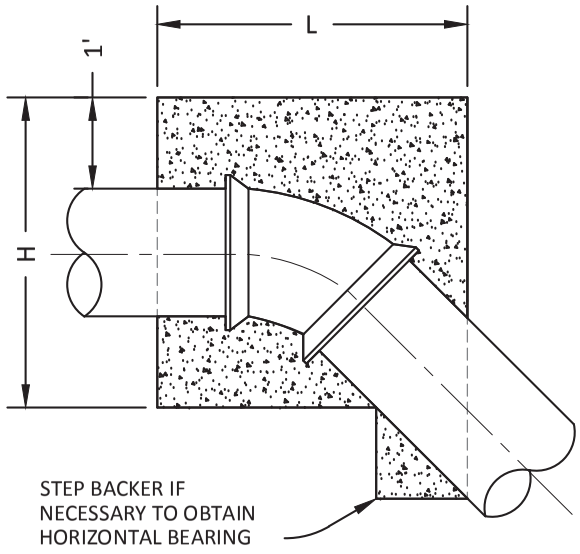
SIZE OF PIPE	DEGREE OF BEND											
	11 ¼°				22 ½°				45°			
	L"	W"	H"	V (c.f.)	L"	W"	H"	V (c.f.)	L"	W"	H"	V (c.f.)
3"	12	18	12	1.5	13	25	16	3.0	18	30	19	5.9
4"	12	24	16	2.6	16	30	18	5.0	22	36	24	11.0
6"	12	48	18	6.0	15	43	36	13.4	30	55	24	22.9
8"	12	63	24	10.5	18	57	34	20.2	36	57	33	39.2
12"	20	54	36	22.6	37	62	37	49.0	48	62	51	87.9
16"	31	65	38	44.3	60	65	39	88.1	65	65	65	159.2
20"	45	70	40	72.8	56	70	60	136.2	72	76	78	247.0
24"	41	72	54	92.3	67	74	69	198.0	88	84	84	359.1
REINFORCING STEEL WILL BE USED AS REQUIRED BY THE ENGINEER												

NOTES:

1. BACKER TO BE CENTERED HORIZONTALLY IN BEND.
2. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.

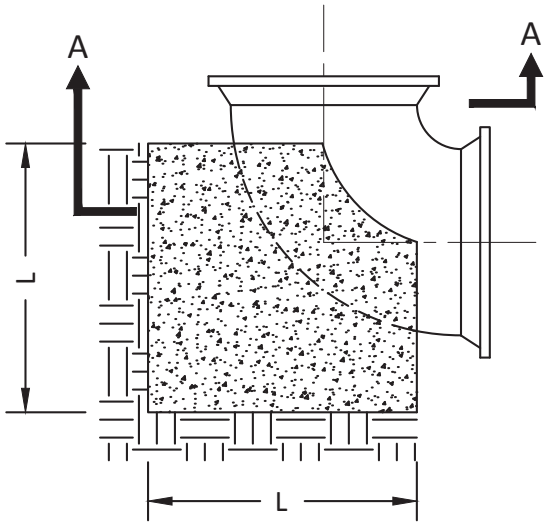


PLAN VIEW

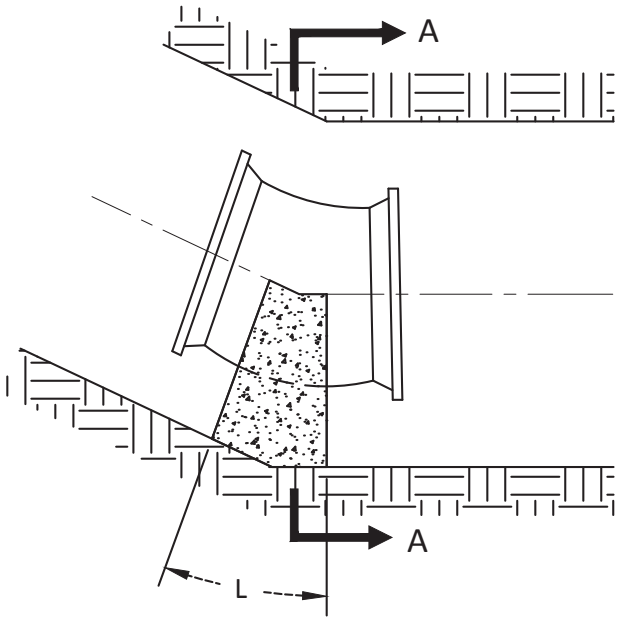


SECTION A-A

SIZE OF PIPE	DEGREE OF BEND											
	11 ¼°			22 ½°			45°			90°		
	L"	D"	V (c.f.)	L"	D"	V (c.f.)	L"	D"	V (c.f.)	L"	D"	V (c.f.)
3"	4	3	0.1	6	4	0.2	10	4	0.3	10	4	0.3
4"	5	4	0.2	9	5	0.4	14	5	0.6	14	5	0.6
6"	8	6	0.5	12	7	0.7	20	8	1.4	18	9	1.7
8"	9	8	0.7	16	9	1.4	24	12	2.7	25	11	4.0
12"	14	12	1.8	24	14	3.6	36	18	6.8	32	18	10.7
16"	18	16	3.4	32	18	6.7	36	32	13.4	41	26	25.4
20"	25	20	6.4	30	30	11.5	49	36	20.5	50	32	46.5
24"	27	24	9.0	39	34	18.4	60	42	35.0	58	40	77.7
REINFORCING STEEL WILL BE USED AS REQUIRED BY ENGINEER												

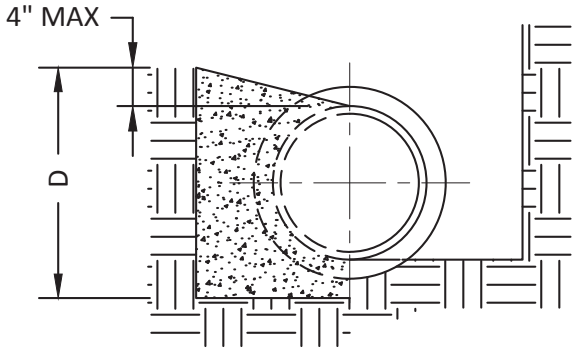


90° BENDS



BENDS LESS THAN 90°

NOTES:
1. BACKER DESIGNED FOR 3000 PSF SOIL BEARING.
2. CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH.
3. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.



SECTION A-A

EST 1808 CITY OF DELAWARE OHIO
Public Works Department

STANDARD DETAIL

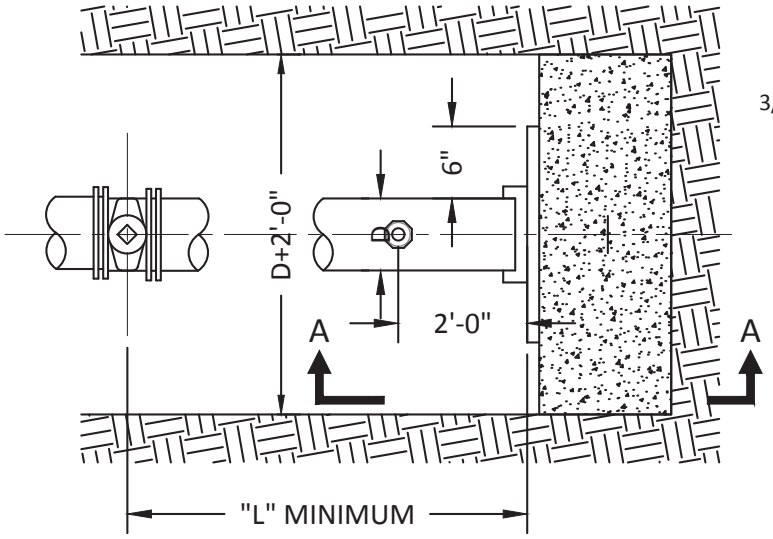
BACKING FOR BENDS

HORIZONTAL AND VERTICAL SAG

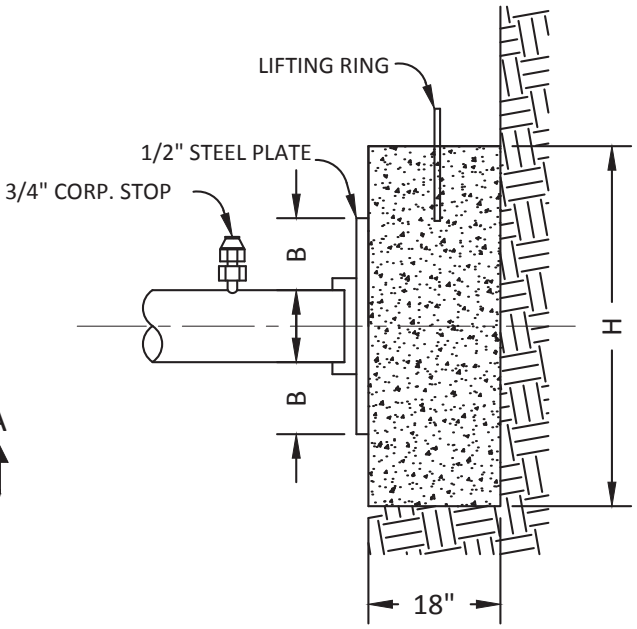
WATER

WTRD-13.0

Rev. 12/31/2018

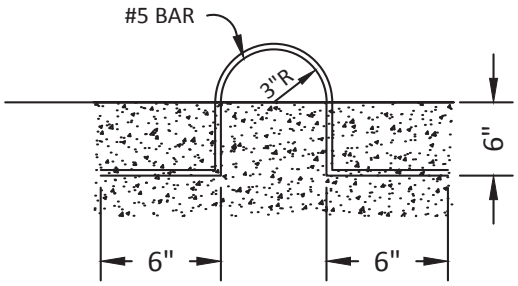


PLAN VIEW



SECTION A-A

PIPE DIAMETER	H	B	L	VOLUME CU. FT.
3"	5"	1"	10'	1.43
4"	6"	1"	10'	1.76
6"	8"	1"	10'	2.52
8"	12"	1"	10'	4.00
12"	23"	3"	18'	8.64
16"	37"	3"	18'	15.39



LIFT RING DETAIL

NOTES:

1. BACKER DESIGNED FOR 3000 PSF SOIL BEARING.
2. END OF PIPE CAPPED OR PLUGGED.
3. GREASE STEEL PLATE WHERE IN CONTACT WITH CONCRETE BACKER.
4. PLACE CONCRETE AGAINST UNDISTURBED SOIL.
5. THOROUGHLY COMPACT BACKFILL BETWEEN VALVE AND END OF PIPE.
6. A LAYER OF POLYETHYLENE SHEETING REQUIRED BETWEEN CONCRETE AND WATERLINE, VALVES, ETC.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

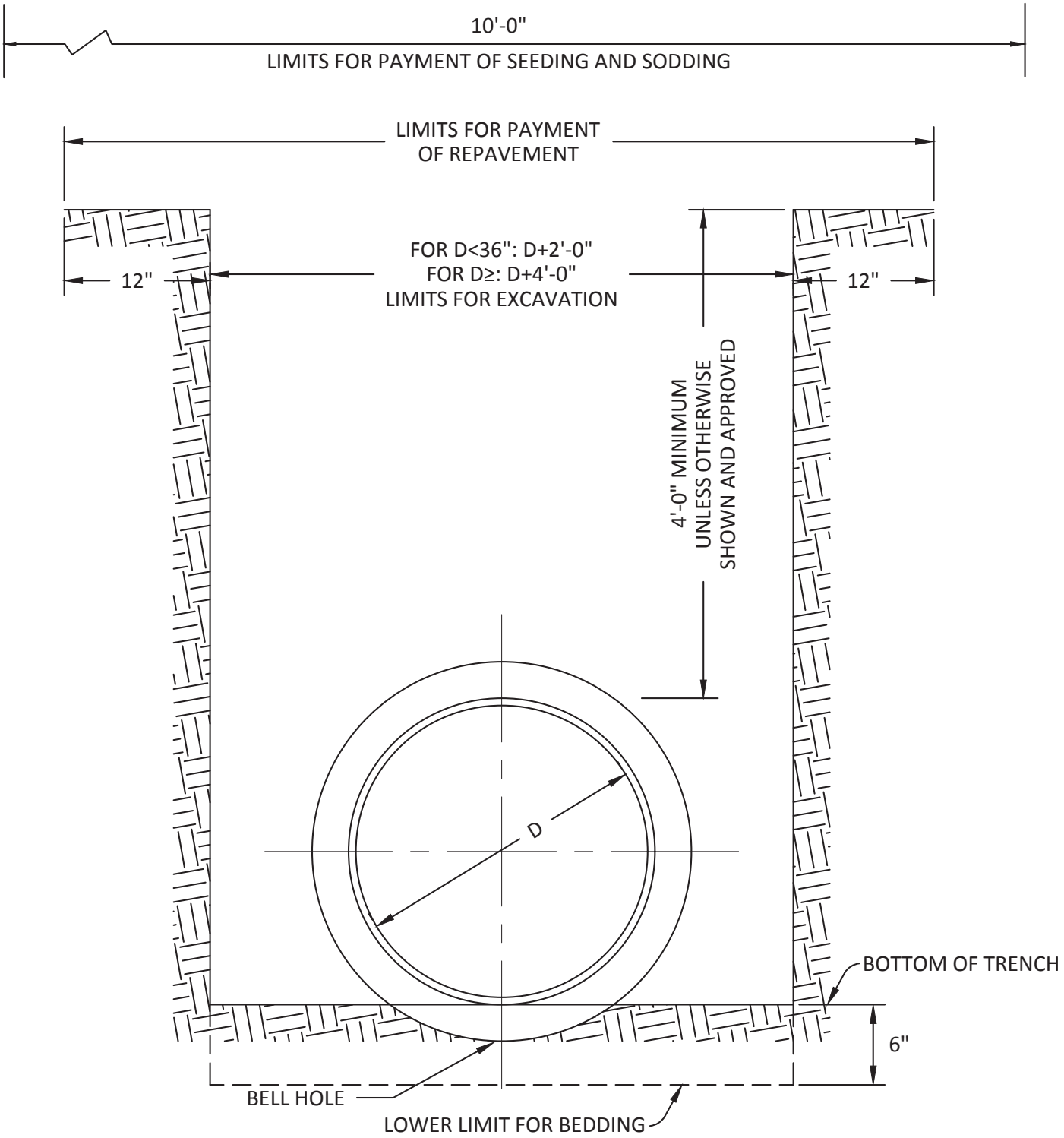
STANDARD DETAIL

THRUST BLOCK DETAIL

WATER

WTRD-14.0

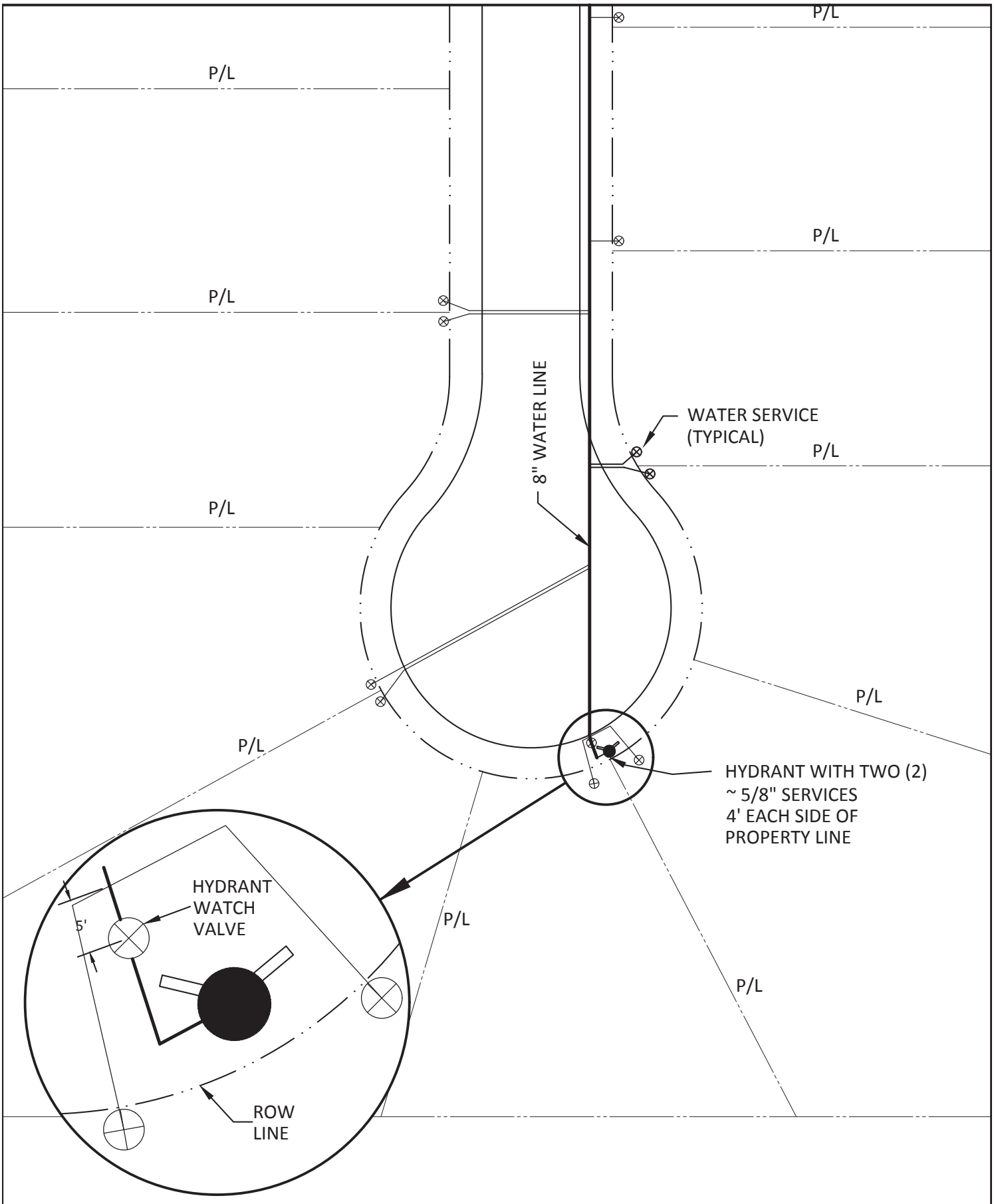
Rev. 12/31/2018



NOTES:

1. FOR 16" DIAMETER AND SMALLER WITH 10' OR LESS DEPTH OF COVER, PROVIDE 6" BEDDING IF ROCK OR UNSUITABLE MATERIAL IS FOUND AT THE BOTTOM OF TRENCH EXCAVATION.
2. FOR 16" DIAMETER AND SMALLER WITH OVER 10' DEPTH OF COVER, PROVIDE 6" BEDDING.
3. FOR ALL PIPE LARGER THAN 16" DIAMETER, PROVIDE 6" BEDDING.
4. BEDDING SHALL BE NO. 57 STONE.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL TYPICAL WATER TRENCH	WATER WTRD-15.0 Rev. 12/31/2018



EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

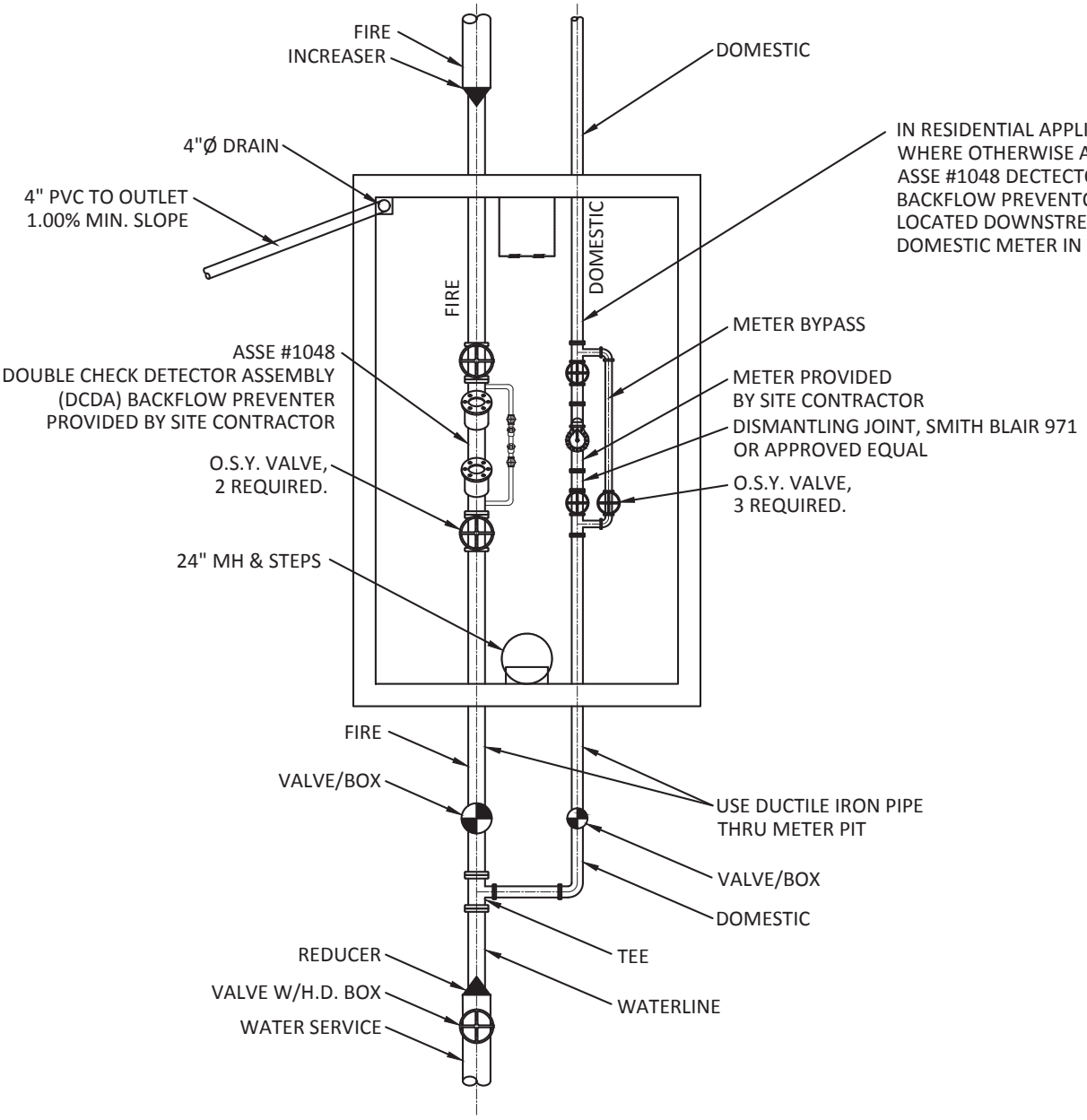
STANDARD DETAIL

WATER SERVICE DETAIL FOR CUL-DE-SAC

WATER

WTRD-16.0

Rev. 12/31/2018



METER VAULTS - 3" THROUGH 12"

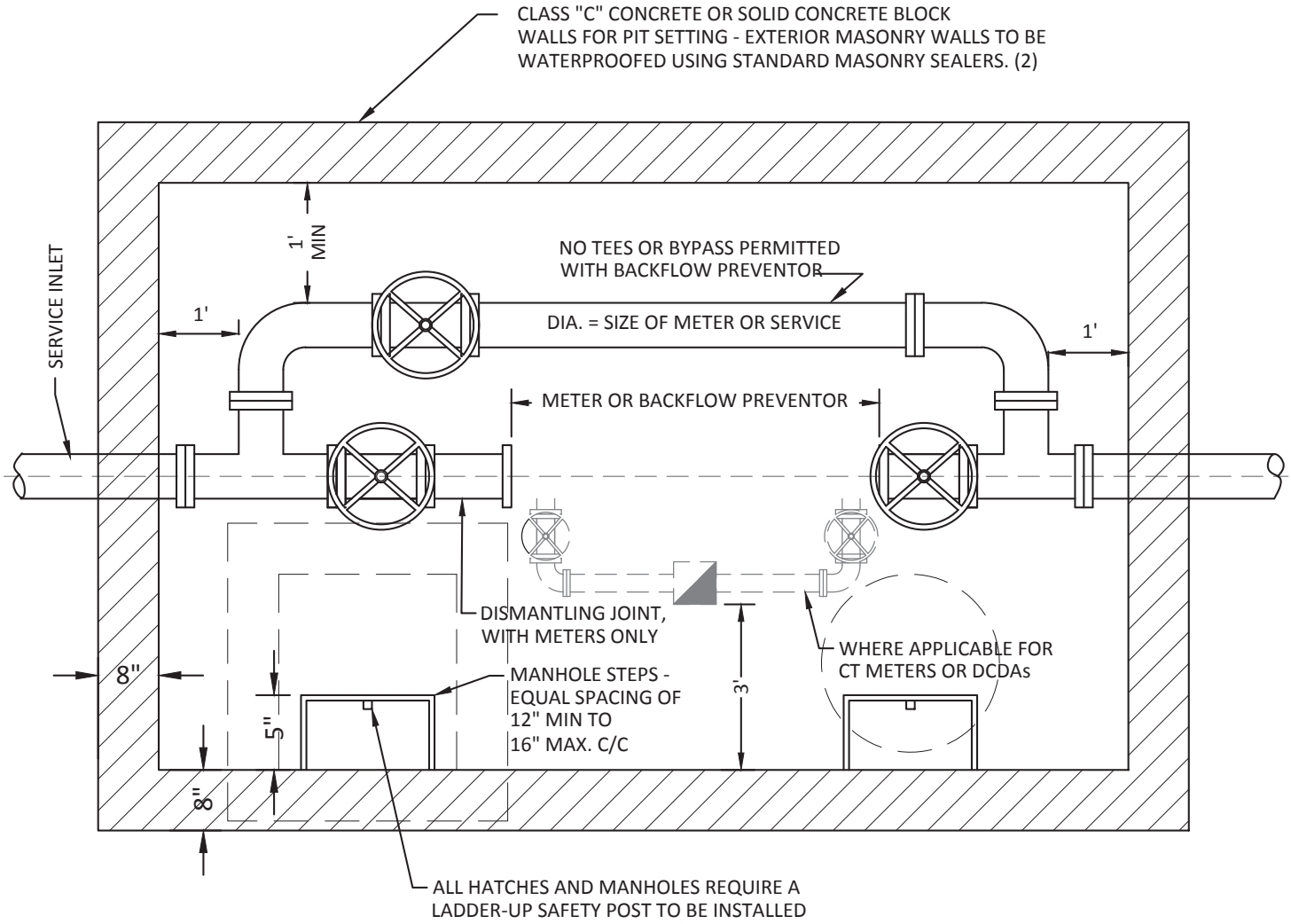
MATERIAL

1. THE ISOLATION VALVES SHALL BE FLANGED RESILIENT WEDGE OS & Y TYPE VALVES, AMERICAN FLOW CONTROL SERIES 2800 OR PRE-APPROVED EQUAL.
2. ALL 2" AND LARGER METERS SHALL HAVE A FLANGED Z-PLATE STRAINER DIRECTLY PRIOR TO THE WATER METER.
3. ALL VAULTS SHALL HAVE GRAVITY DRAIN.
4. BACKFILL FOR THE METER VAULT SHALL BE ODOT #57 STONE.
5. THE PROPERTY OWNER SHALL CONTACT THE CITY TO OBTAIN CURRENT INFORMATION ON WHERE TO PURCHASE 3" AND LARGER DOMESTIC WATER METERS. THE METER IS TO BE SENT TO THE CITY OF DELAWARE 2 DAYS PRIOR TO THE INTENDED INSTALLATION DATE: DEPARTMENT OF PUBLIC UTILITIES, WATER DISTRIBUTION DIVISION.

INSTALLATION

1. THE METER VAULT IS TO BE INSTALLED PER THE CITY OF DELAWARE DRAWINGS AND SPECIFICATIONS.
2. THE PROPERTY OWNER SHALL CONFIRM THAT THE ELEVATION OF THE GRAVITY DRAIN DISCHARGE POINT WILL DRAIN THE VAULT.
3. THE CITY OF DELAWARE WILL DELIVER THE WATER METER TO THE JOB SITE UPON REQUEST BY THE PROPERTY OWNER.
4. THE METER IS TO BE INSTALLED SUCH THAT THERE ARE 5 PIPE DIAMETERS OF STRAIGHT PIPE UPSTREAM OF THE METER STRAINER (INCLUDING THE VALVE) TO THE TEE AND 3 PIPE DIAMETERS OF STRAIGHT PIPE DOWNSTREAM OF THE METER (FROM THE METER TO THE VALVE).
5. ALL MECHANICAL JOINTS WITHIN THE METER VAULT SHALL BE FACTORY MANUFACTURED FLANGES; NO UNI-FLANGES ARE PERMITTED.
6. ALL JOINTS AND FITTINGS LOCATED ON THE SUPPLY SIDE WITH 20 FEET OF THE METER VAULT SHALL BE RESTRAINED USING AN APPROVED MECHANICAL JOINT RESTRAINT.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL 3" TO 12" DUAL METER SETTING DETAIL	WATER WTRD-17.0 Rev. 12/31/2018

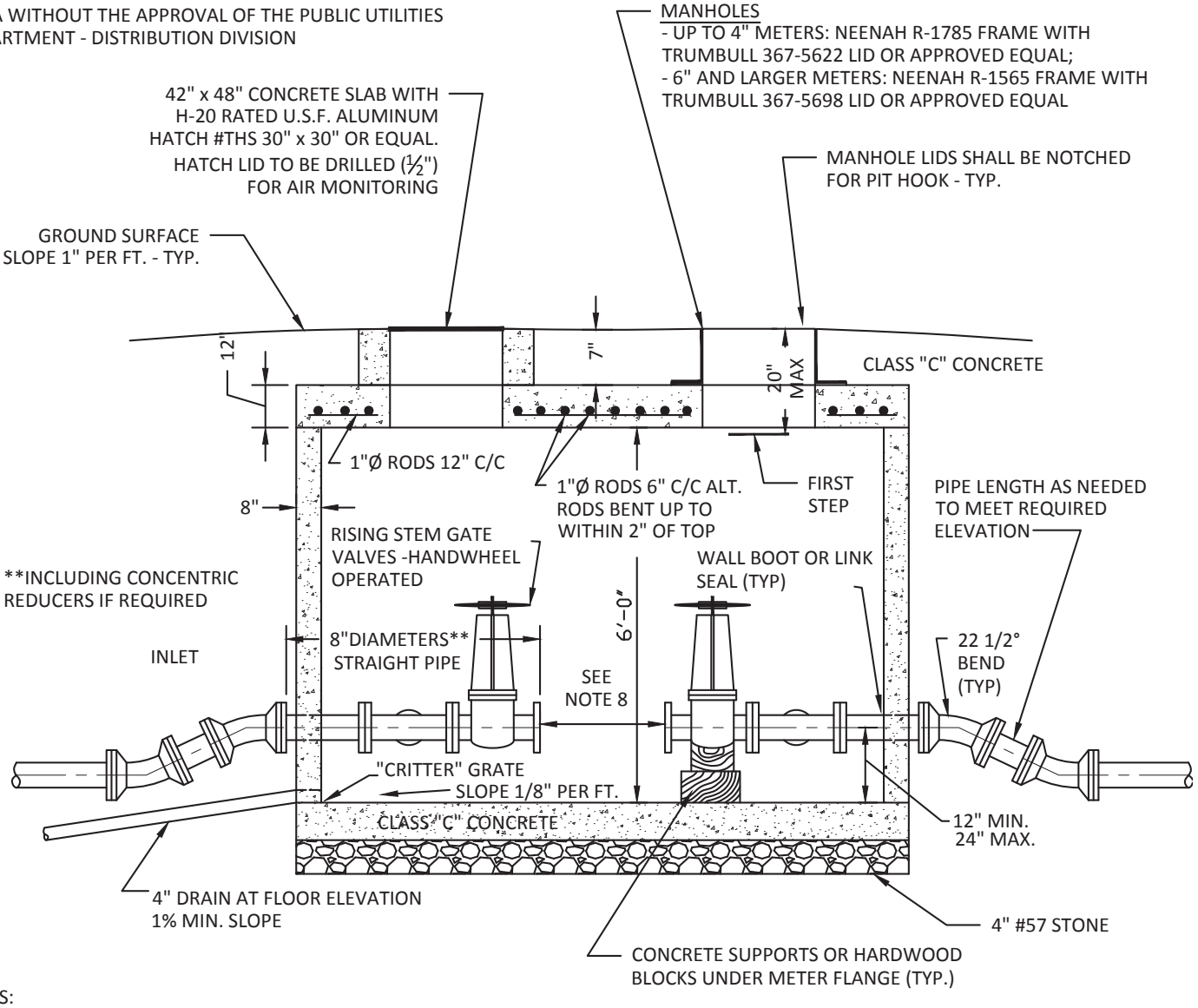


NOTES:

1. METERS SHALL BE EITHER A COMPOUND TURBINE (BADGER OR APPROVED EQUAL) OR ULTRASONIC (OCTAVE BY MASTER METER OR APPROVED EQUAL), AND SHALL BE APPROVED BY THE PUBLIC UTILITIES DEPARTMENT.
2. BACKFLOW PREVENTORS SHALL BE ASSE 1048 COMPLIANT DOUBLE CHECK DETECTOR ASSEMBLYS (DCDA) AND SHALL BE APPROVED BY THE PUBLIC UTILITIES DEPARTMENT.
3. AN APPROVED PRECAST METER PIT MAY BE USED IN LIEU OF A CONSTRUCTED PIT FOR OUTSIDE SETTINGS.
4. PROVIDE A DISMANTLING JOINT BETWEEN THE METER AND VALVE ON THE INLET SIDE, SMITH-BLAIR 971 OR APPROVED EQUAL.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL METER VAULT 3" TO 12"	WATER WTRD-18.1 Rev. 12/31/2018

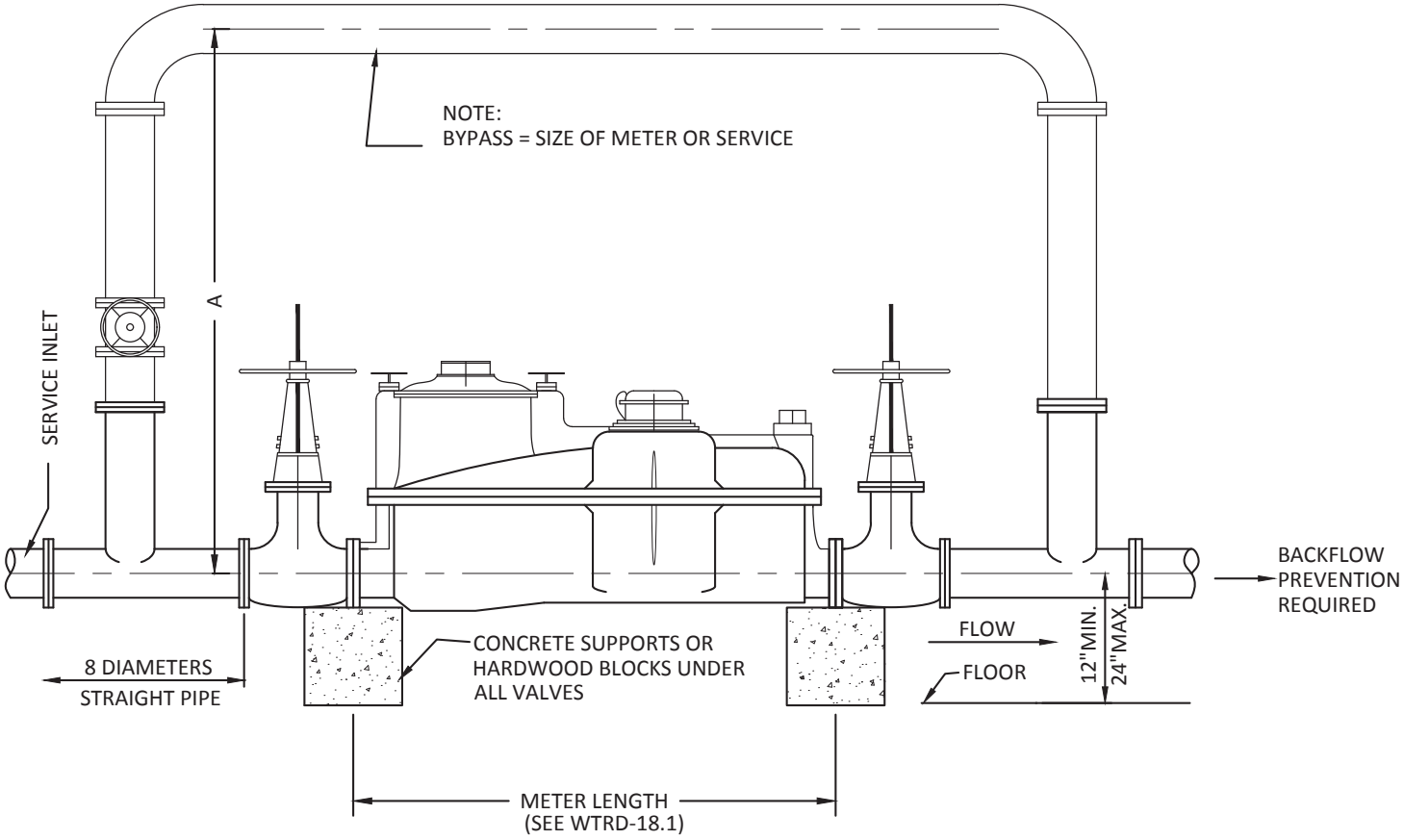
NOTE:
METER VAULTS SHALL NOT BE INSTALLED IN A PAVED AREA WITHOUT THE APPROVAL OF THE PUBLIC UTILITIES DEPARTMENT - DISTRIBUTION DIVISION



NOTES:

1. A SUMP PUMP WILL BE REQUIRED WHEREVER ADEQUATE DRAINAGE IS NOT AVAILABLE.
2. USE OF A PUMP MUST BE APPROVED BY THE PUBLIC UTILITIES DEPARTMENT
3. ALL VALVES 3" AND LARGER SHALL BE A RESILIENT WEDGE VALVE AND SHALL BE EQUIPPED WITH AN OUTSIDE SCREW AND YOKE ASSEMBLY (O.S. & Y.).
4. THE VAULT FLOOR SHALL BE A MIN. OF 18" ABOVE THE FLOW LINE OF THE DRAINAGE DITCH OR STORM SEWER.
5. THE OWNER OR AGENT SHALL PURCHASE THE WATER METER NEEDED AND DELIVER IT TO THE PUBLIC UTILITIES DEPT. 3080 US 23 NORTH, DELAWARE,OH. THE OWNER SHALL CONTACT THE PUBLIC UTILITIES DEPT. 48 HOURS PRIOR TO THEIR NEED FOR THE METER TO BE DELIVERED TO THE SITE.
6. ALL MECHANICAL JOINTS WITHIN THE METER VAULT SHALL BE FACTORY MANUFACTURED FLANGES; NO UNIFLANGES ARE PERMITTED.
7. ALL JOINTS AND FITTINGS LOCATED ON THE SUPPLY SIDE WITHIN 20 FEET OF THE METER VAULT SHALL BE RESTRAINED USING AN APPROVED MECHANICAL JOINT RESTRAINT.
8. THE LENGTH BETWEEN VALVES SHALL BE AS NEEDED TO ACCOMODATE BACKFLOW PREVENTOR OR METER AND DISMANTLING JOINT, SEE STANDARD DETAIL WTRD-18.1.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL METER SETTING 3" THROUGH 12" METERS	WATER WTRD-18.2 Rev. 12/31/2018



NOTES:

1. TEES AND BYPASS NOT REQUIRED FOR DCDA OR METERS LESS THAN 2"
2. BYPASS MUST BE INSTALLED IN VERTICAL POSITION
3. WALL CLEARANCE: THERE SHALL BE A MINIMUM SIDE CLEARANCE OF 24" FOR ALL METER TYPES AND SIZES FROM THE NEAREST PIPE EXTERIOR TO THE NEAREST BUILDING WALL AND/OR OBSTRUCTION. THIS MINIMUM SIDE CLEARANCE SHALL BE MAINTAINED FROM INLET VALVE TO OUTLET VALVE.
4. VALVING: 3" AND LARGER SHALL BE GATE VALVES WITH OUTSIDE STEMS AND YOKES (O.S.& Y.).

CLEARANCE REQUIRED "A"		
METER SIZE	CT	FMCT
3"	42"	48"
4"	45"	52"
6"	54"	60"
8"	N/A	70"
10"	N/A	78"
12"	N/A	86"

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

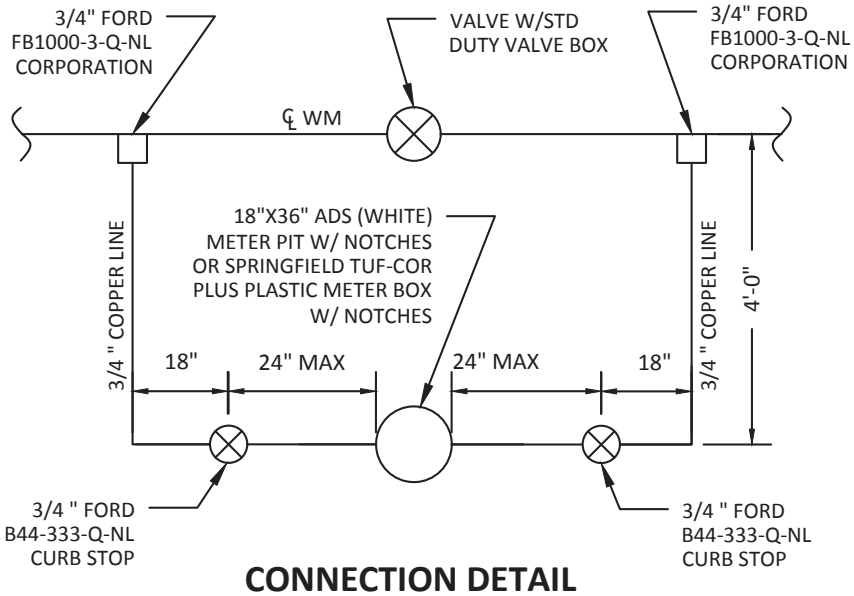
STANDARD DETAIL

METER SETTING FOR INSIDE BUILDINGS 3" THROUGH 12" (DOMESTIC OR PROCESS)

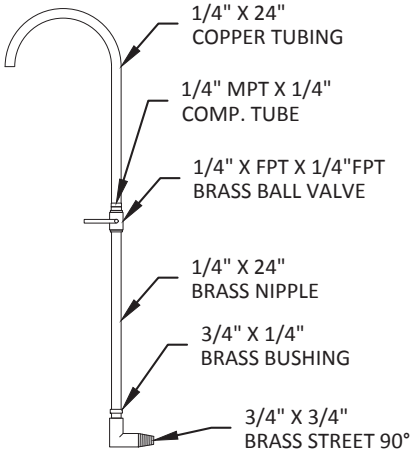
WATER

WTRD-18.3

Rev. 12/31/2018

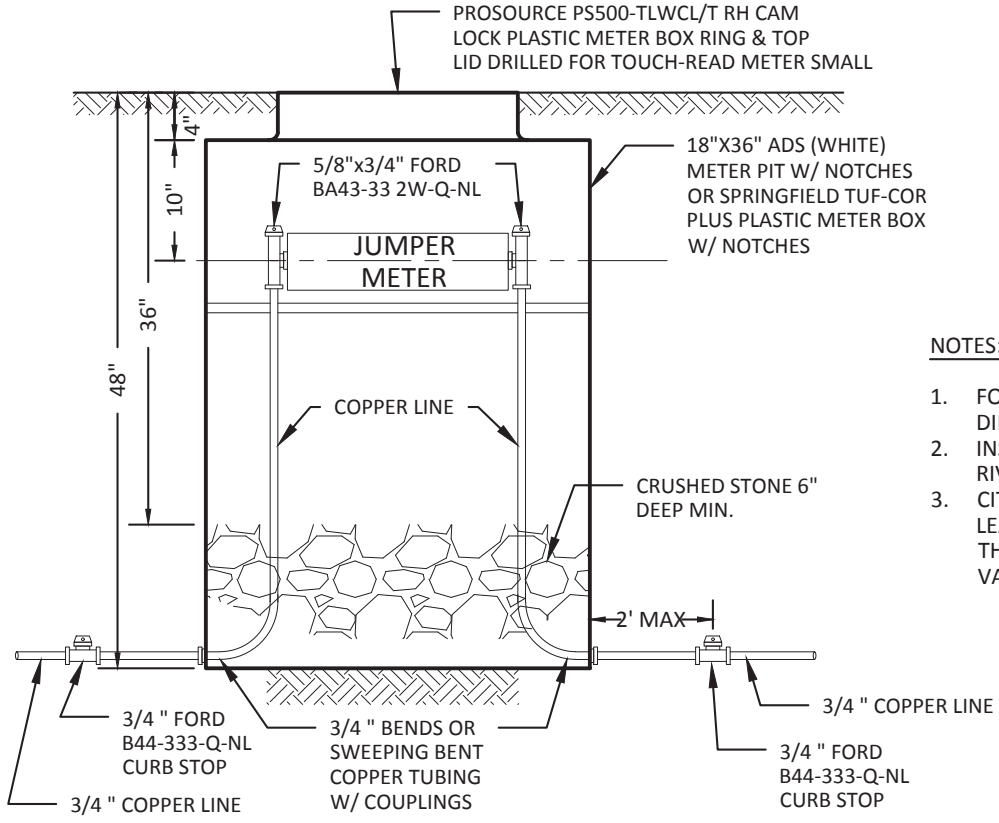


CONNECTION DETAIL



REMOVABLE SAMPLING FIXTURE FOR INSPECTION

CONTRACTOR SHALL PROVIDE TO CITY, DO NOT INSTALL IN PIT.



NOTES:

1. FOR USE AT RIVER CROSSINGS OR WHERE DIRECTED BY THE CITY.
2. INSTALLATON TO BE ON SUPPLY SIDE OF RIVER CROSSING.
3. CITY TO PROVIDE METER WHEN TESTING FOR LEAKGE. CONTRACTOR SHALL INSTALL THREADED PLUGS INTO THE METER ANGLE VALVES AT TIME OF CONSTRUCTION.

INSPECTION METER PIT DETAIL

EST 1808
CITY OF
DELAWARE
OHIO
Public Works Department

STANDARD DETAIL

INSPECTION METER PIT DETAILS

WATER

WTRD-19.0

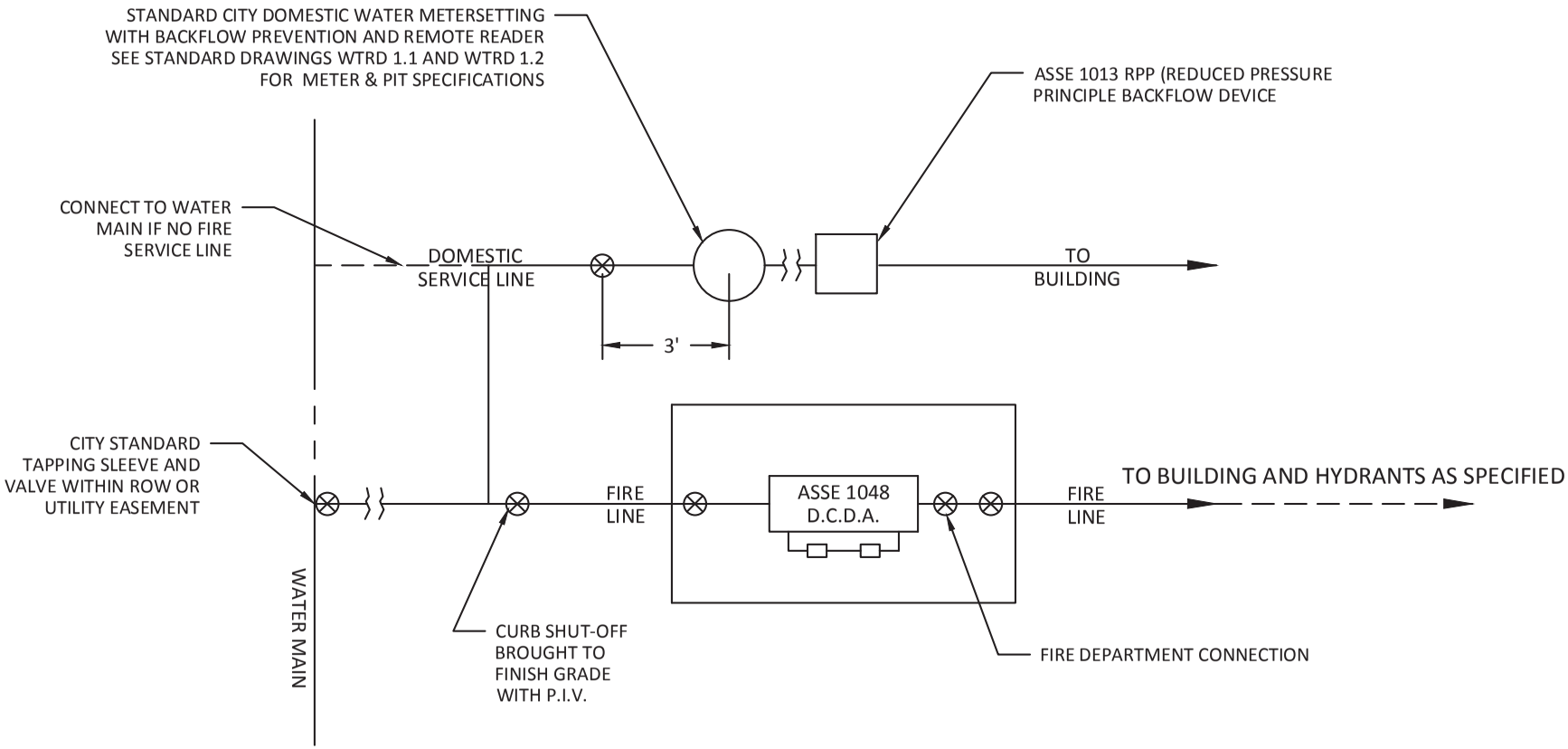
Rev. 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

DOMESTIC AND FIRE SERVICE METER CONFIGURATION

NO SCALE



NOTE: THE CITY PROVIDES $\frac{5}{8}$" METERS ONLY

STANDARD DETAIL

5/8" TO 2" METERS FOR DOMESTIC AND FIRE SERVICE

WATER

WTRD-20.0

Rev. 12/31/2018

CITY OF DELAWARE OHIO

Public Works Department

EROSION CONTROL STANDARD DRAWINGS

12/31/2018 Edition

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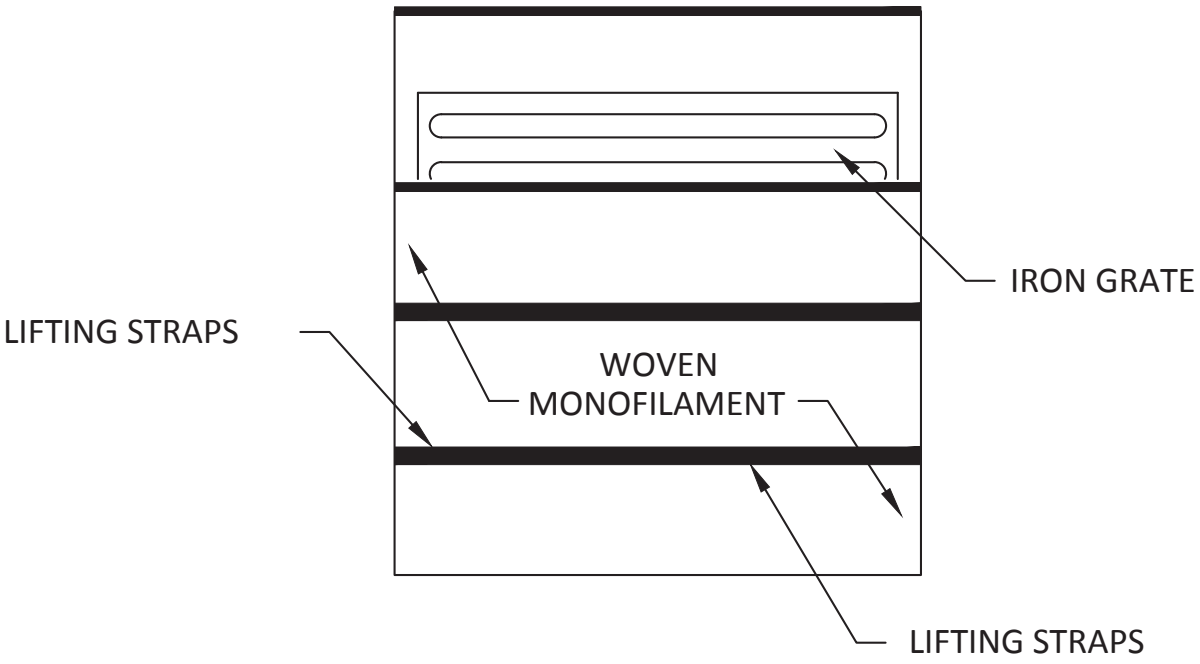
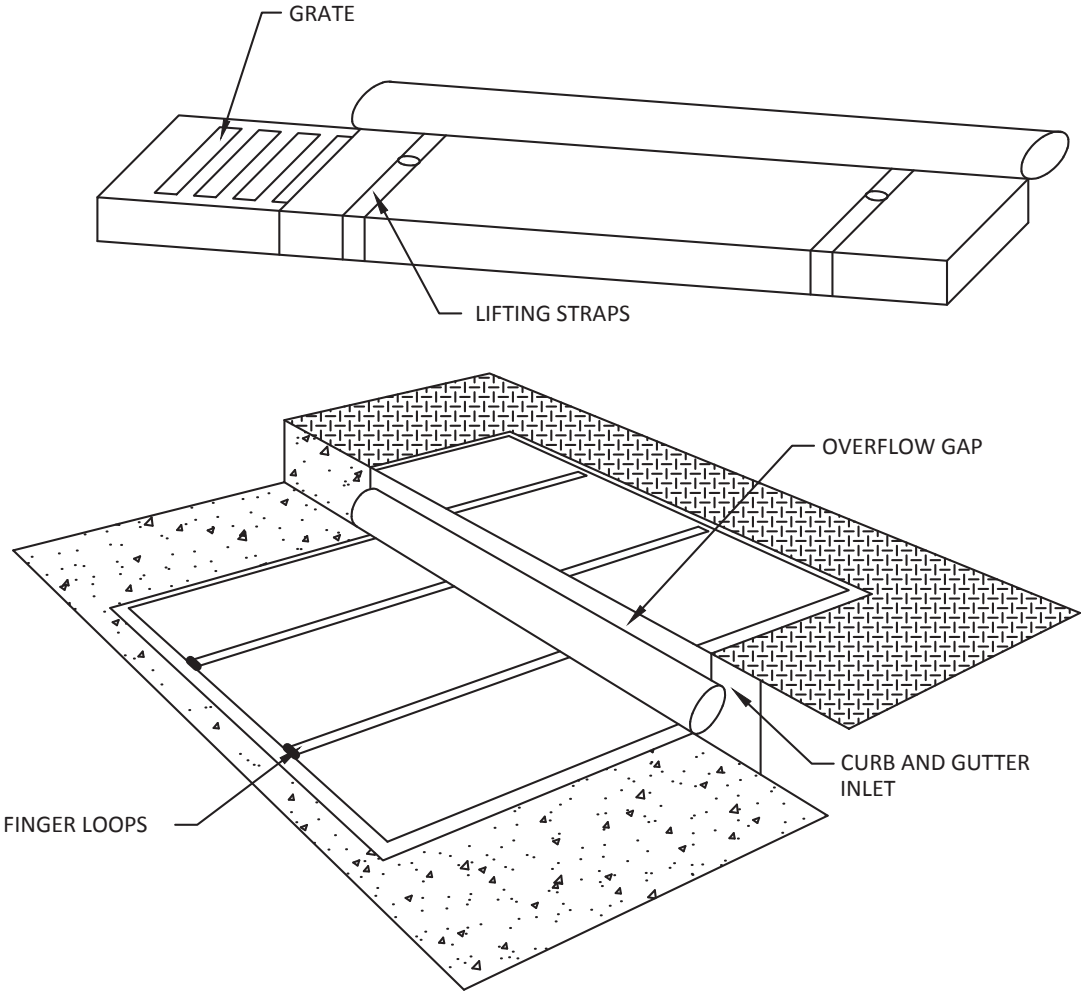


CATCH BASIN SEDIMENT FILTER

MAINTENANCE: REMOVE DRIED SEDIMENT FROM SURFACE OF UNIT WITH A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. REMOVE FINE MATERIAL FROM INSIDE ENVELOPE AS NEEDED.

TO INSPECT CATCH BASIN: REMOVE UNIT WITH GRATE INSIDE, INSPECT CATCH BASIN AND REPLACE UNIT.

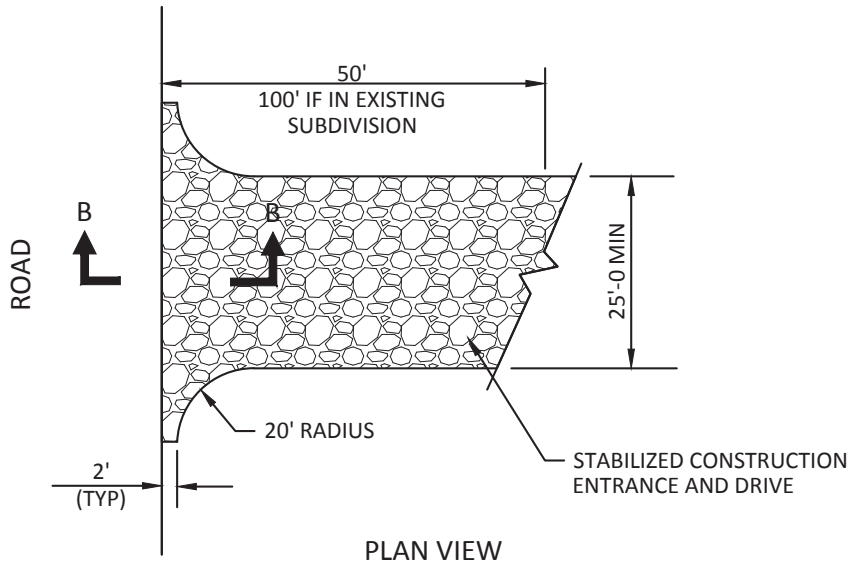
EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL CATCH BASIN SEDIMENT FILTER	EROSION ERSD-1.0 Rev. 12/31/2018



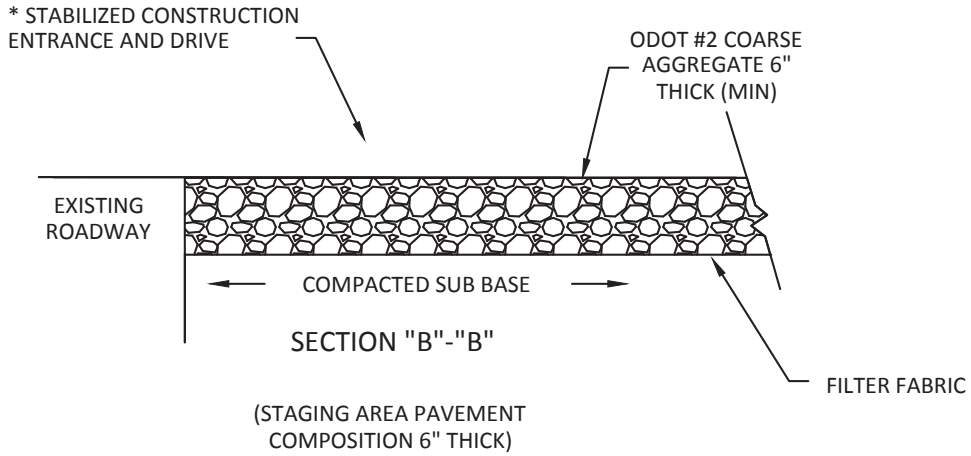
CURB & GUTTER INLET SEDIMENT FILTER

MAINTENANCE: WITH A STIFF BRISTLE BROOM SWEEP SILT AND OTHER DEBRIS OFF SURFACE AFTER EACH EVENT.

INSTALLATION: STAND GRATE ON END. SLIDE THE BEAVER DAM BAG ON WITH DAM ON TOP OF THE GRATE. PULL ALL EXCESS DOWN. LAY UNIT ON ITS SIDE. CAREFULLY TUCK FLAP IN. PRESS VELCRO STRIPS TOGETHER. INSTALL THE UNIT MAKING SURE FRONT EDGE OF GRATE IS INSERTED IN FRAME FIRST THEN LOWER BACK INTO PLACE. PRESS VELCRO DOTS TOGETHER WHICH ARE LOCATED UNDER LIFTING STRAPS. THIS INSURES STRAPS REMAIN FLUSH WITH GUTTER.



PLAN VIEW



SECTION "B"-"B"

(STAGING AREA PAVEMENT
COMPOSITION 6" THICK)

STABILIZED CONSTRUCTION ENTRANCE DETAIL

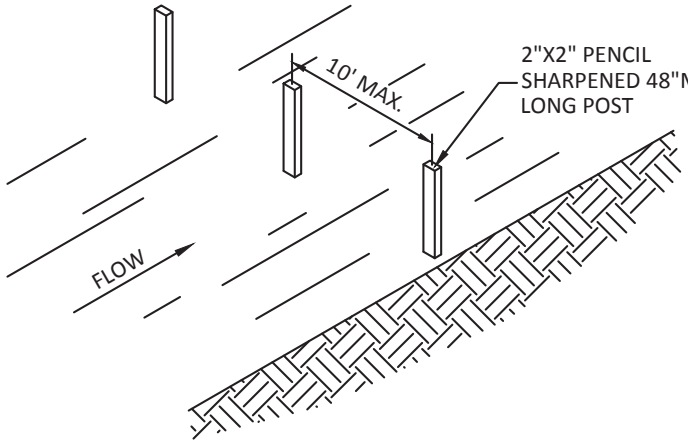
THE EARTHWORK CONTRACTOR SHALL INSTALL AND MAINTAIN THE CONSTRUCTION ENTRANCE AND STAGING AREA. THE EARTHWORK CONTRACTOR SHALL PERIODICALLY ADD CLEAN STONE AND MAINTAIN THE GRAVEL EDGES FOR THE DURATION OF THE PROJECT. WHEN THE CONSTRUCTION ENTRANCE AND DRIVE ARE NO LONGER NEEDED, THE EARTHWORK CONTRACTOR SHALL REMOVE THE GRAVEL AND RESTORE THE GROUND TO ITS ORIGINAL CONDITION.

A 304 STONE CAP MAY NOT BE USED IN THE FIRST 50' OFF OF THE ROADWAY BUT CAN BE USED PAST THIS POINT

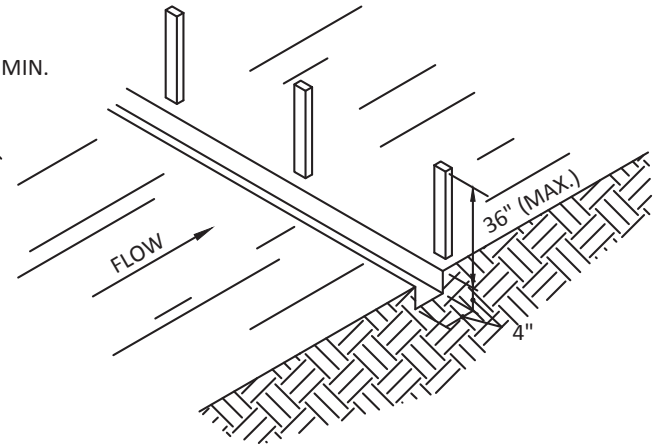
* WHEN A CONSTRUCTION ENTRANCE IS INSTALLED ADJACENT TO A PUBLIC ROAD WITH A POSTED SPEED LIMIT OVER 35 MPH, THE FIRST 50'-0 OF THE ENTRANCE SHALL BE PAVED WITH 3" OF ITEM 301 ASPHALT CONCRETE.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL STANDARD CONSTRUCTION ENTRANCE	EROSION ERSD-3.0 Rev. 12/31/2018

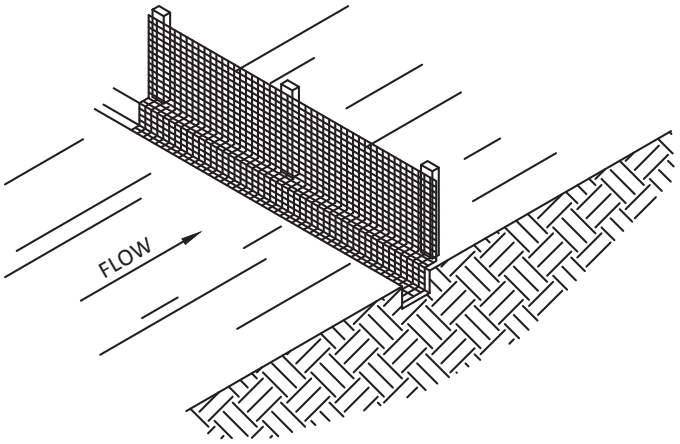
1.) SET THE STAKES.



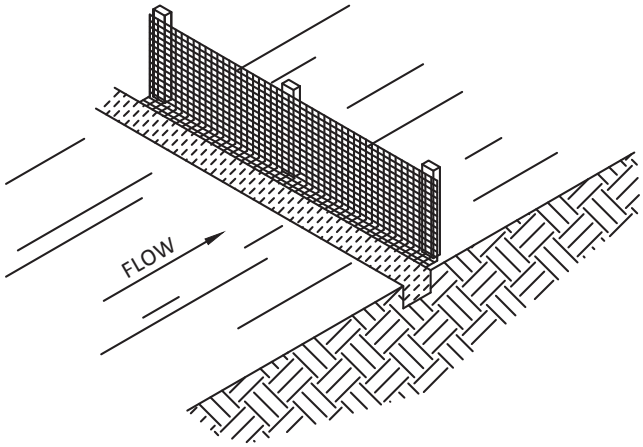
2.) EXCAVATE A 4"X4" TRENCH
UPSLOPE ALONG THE LINE STAKES.



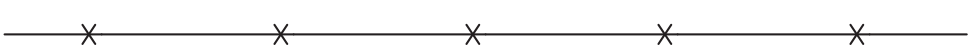
3.) STAPLE FILTER MATERIAL TO STAKES
AND EXTEND IT INTO THE TRENCH.



4.) BACKFILL AND COMPACT THE
EXCAVATED SOIL.



SILT FENCE INSTALLATION DETAIL



EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL SILT FENCE INSTALLATION DETAIL	EROSION ERSD-4.0 Rev. 12/31/2018

Public Works Department

CITY OF DELAWARE OHIO EST 1808

FABRIC DITCH CHECK DETAILS

STANDARD DETAIL

EROSION

ERSD-5.0

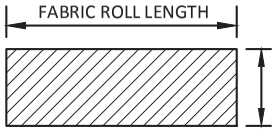
Rev. 12/31/2018

MATERIALS GUIDE:

1. 2" X 2" PINE STAKES, SHARPENED
   (2" x 4" & 4" x 4" STAKES FOR HIGH FLOW)
   (2" x 6" AND 6" x 6" STAKES FOR HEAVY DUTY HIGH FLOW)
2. WOVEN MONOFILAMENT GEOTEXTILE FABRIC
   (100-250 GPM/SQ FT FLOW RATE)
   OR HIGH FLOW FABRIC
   (HIGH SPUN TYPAR FOR ADDITIONAL PONDING)
3. 9/16" WIRE STAPLES AND 6" SOD STAPLES
4. STRAW/COCONUT FIBER BLANKET
5. ODOT #57 STONE

INSTALLATION GUIDE:

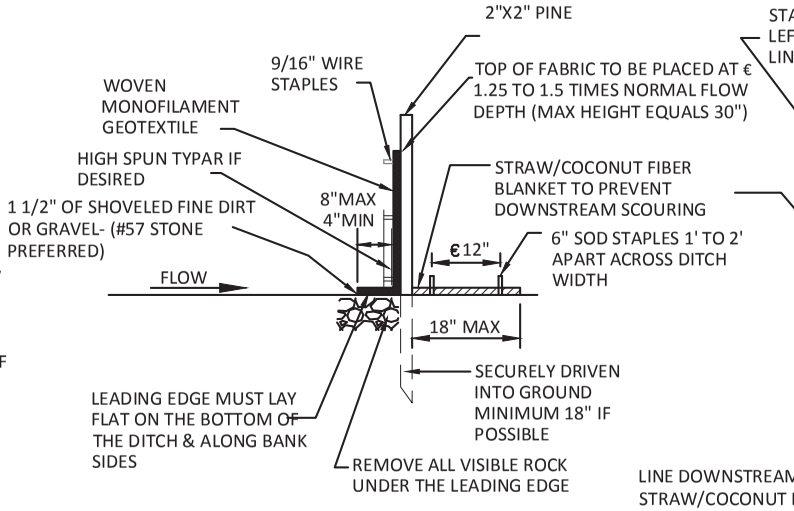
1. DETERMINE REQUIRED HEIGHT OF FABRIC - IN GENERAL REQUIRED HEIGHT EQUALS 1.25 TO 1.5 TIMES NORMAL FLOW DEPTH OF DITCH
2. INSTALL STAKES PER DIAGRAMS
3. USE 4' CARPENTER LEVEL TO MARK STAKES AT TOP OF FABRIC LOCATION (TOP OF FABRIC TO BE LEVEL ALONG THE WIDTH OF DITCH)
4. STAPLE TOP EDGE OF FABRIC TO STAKES AT LEVEL MARKS
5. TRIM EXCESS FABRIC TO PROVIDE A LEADING EDGE THAT LIES FLAT AND FLUSH WITH DITCH BOTTOM
6. HIGH SPUN TYPAR FABRIC TO STAKES AT LEVEL MARKS END IF ADDITIONAL PONDING IS DESIRED OR IF SUPER FINES ARE OF CONCERN
7. STAPLE BOTTOM OF FABRIC AT DITCH BOTTOM; CHECK TO ENSURE A TIGHT FIT
8. SHOVEL DIRT OR GRAVEL TO COMPLETELY COVER LEADING EDGE
9. PLACE STRAW/COCONUT FIBER AT DOWNSTREAM END; SECURE WITH SOD STAPLES; TRIM EXCESS MATERIAL SO THAT IT LIES FLAT AND FLUSH WITH DITCH BOTTOM
10. FABRIC ROLL DIMENSIONS TO BE BASED ON INSTALLATION REQUIREMENTS - ALL EXCESS TO BE TRIMMED WITH SHARP UTILITY KNIFE OR SCISSORS
11. ANY INSTALLATION FOLDS MUST BE CAREFULLY TRIMMED AND OVERLAPPED TO AVOID WRINKLES OR UNDESIRABLE IRREGULARITIES



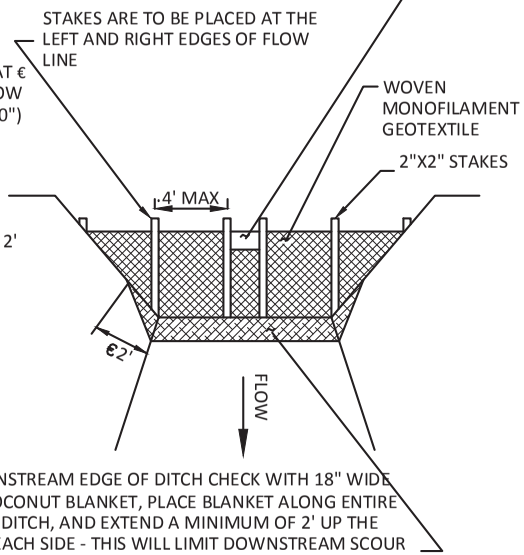
FABRIC ROLL WIDTH EQUALS DESIRED HEIGHT OF FABRIC TO BE INSTALLED IN DITCH PLUS LENGTH OF LEADING EDGE

MAINTENANCE GUIDE:

1. AFTER FIRST RAIN, REPLACE ANY MISSING ROCK AND DIRT AT LEADING EDGE
2. INSPECT FABRIC DITCH CHECK AFTER HEAVY RAINS
3. REMOVE SEDIMENT DEPOSITS FROM FABRIC DITCH CHECK WHEN THE TOP OF SEDIMENT REACHES 75% OF FABRIC HEIGHT



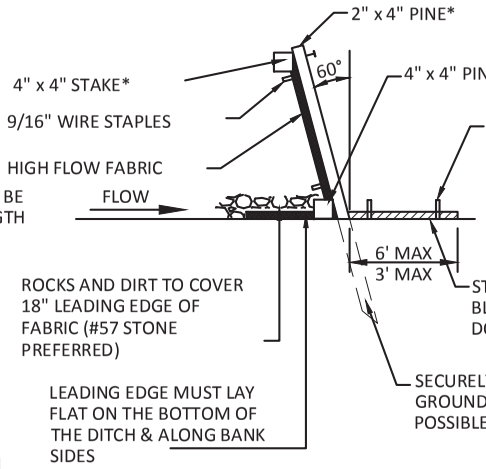
WHERE PONDING AVAILABILITY AND DITCH HEIGHT IS LIMITED, A NOTCH OVER FLOW LINE MAY BE CUT INTO FABRIC BETWEEN 2 CLOSELY SPACED STAKES TO PREVENT END AROUND SCOURING



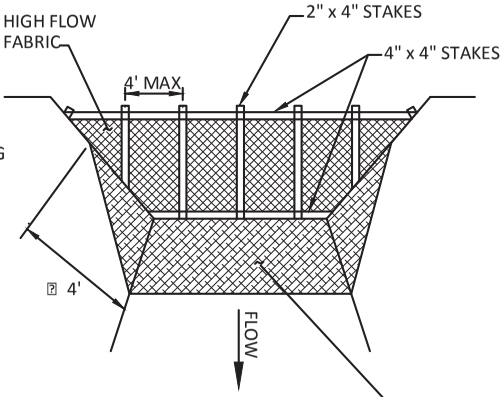
LINE DOWNSTREAM EDGE OF DITCH CHECK WITH 18" WIDE STRAW/COCONUT BLANKET, PLACE BLANKET ALONG ENTIRE WIDTH OF DITCH, AND EXTEND A MINIMUM OF 2' UP THE BANK ON EACH SIDE - THIS WILL LIMIT DOWNSTREAM SCOUR

ALPINE MODERATE FLOW FABRIC DITCH CHECK

WHERE DESIRED HEIGHT EXCEEDS FABRIC ROLL WIDTH FABRIC TO BE OVERLAPPED BY A MINIMUM OF 12". PLACE 2"X6" OR 4"X4" BOARD BEHIND OVERLAP.

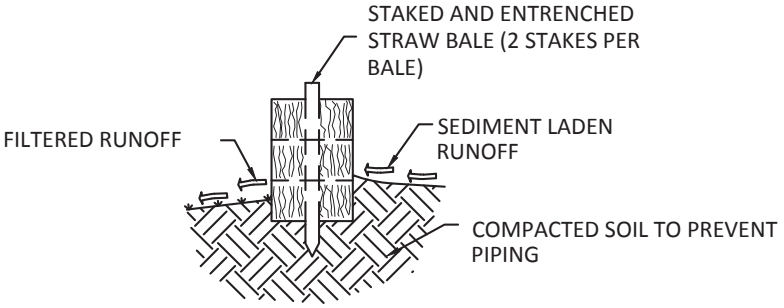


*IF HEIGHT OF THE BARRIER EXCEEDS 7 FEET, USE 6"X6" AND 2"X6" STAKES

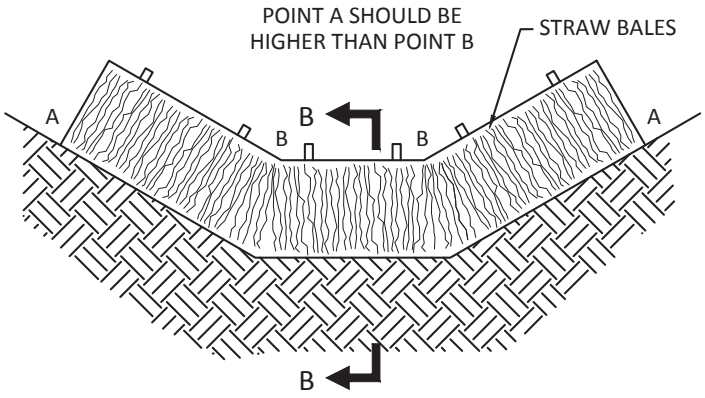


LINE DOWNSTREAM EDGE OF DITCH CHECK WITH 18" WIDE STRAW/COCONUT BLANKET, PLACE BLANKET ALONG ENTIRE WIDTH OF DITCH, AND EXTEND A MINIMUM OF 4' UP THE BANK ON EACH SIDE - THIS WILL LIMIT DOWNSTREAM SCOUR

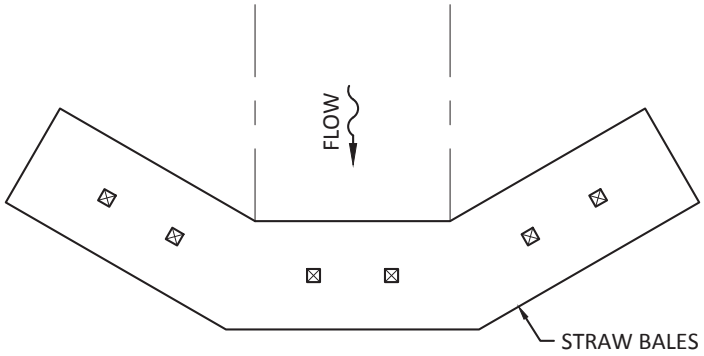
ALPINE HIGH FLOW FABRIC DITCH CHECK



SECTION B-B



ELEVATION VIEW



PLAN VIEW

SEDIMENT BARRIER IN DRAINAGE WAY

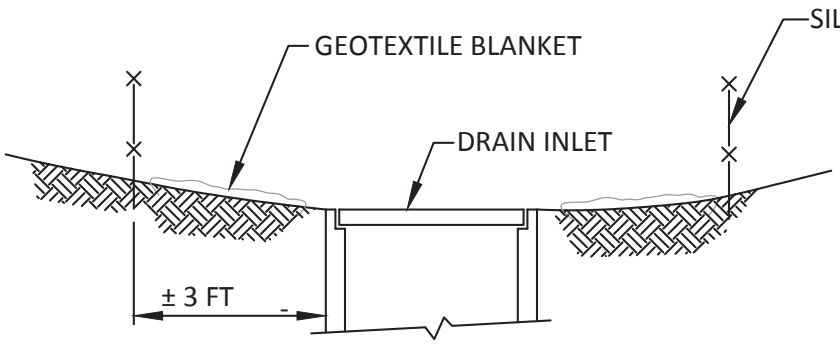
CONTRACTOR SHALL PLACE SEDIMENT BARRIERS AS LOCATED ON THIS SHEET IMMEDIATELY AFTER CONSTRUCTION OF DRAINAGE SWALES.

THE DITCH SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.

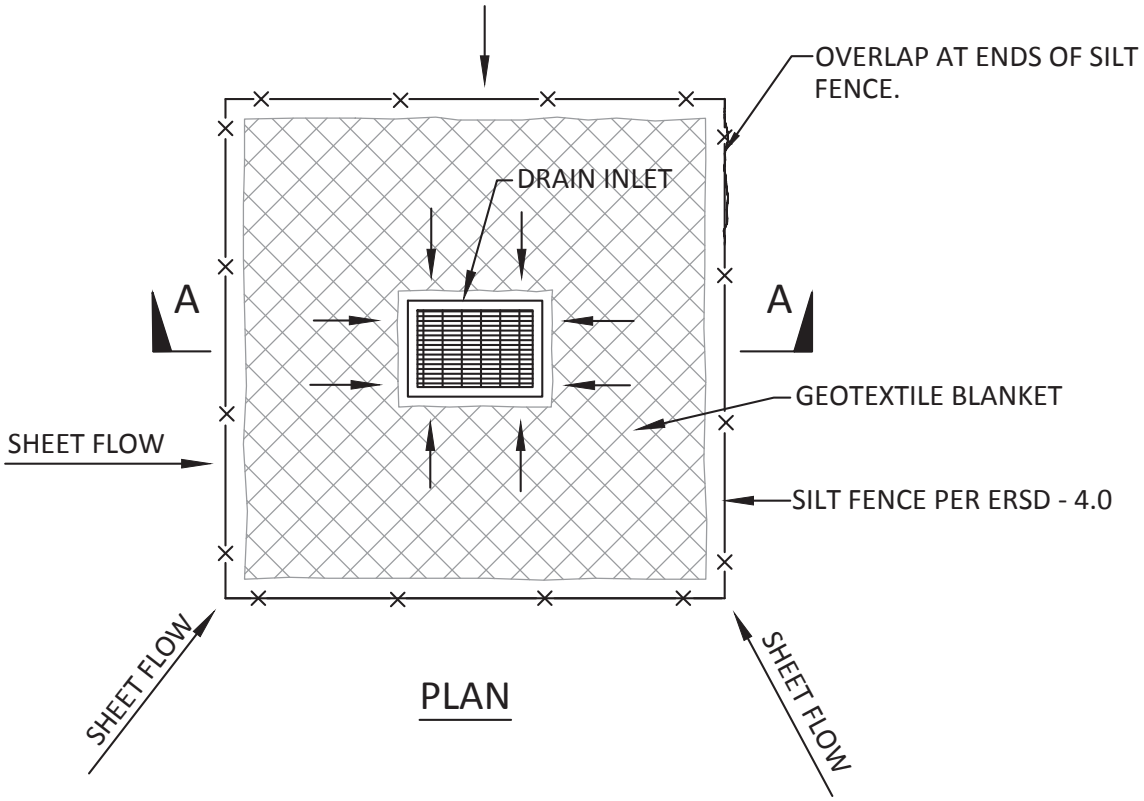
SEDIMENT SHALL BE REMOVED AND THE BALES RESTORED TO THEIR ORIGINAL DIMENSION WHEN THE SEDIMENT HAS ACCUMULATED TO HALF THE DESIGN DEPTH OF THE TRAP. SEDIMENT REMOVED SHALL BE DEPOSITED IN SUCH A MANNER THAT IT WILL NOT ERODE.

SEDIMENT FILTERS SHALL BE REMOVED WHEN ITS DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL STRAW BALE DITCH CHECK	EROSION ERSD-6.0 Rev. 12/31/2018



SECTION A-A

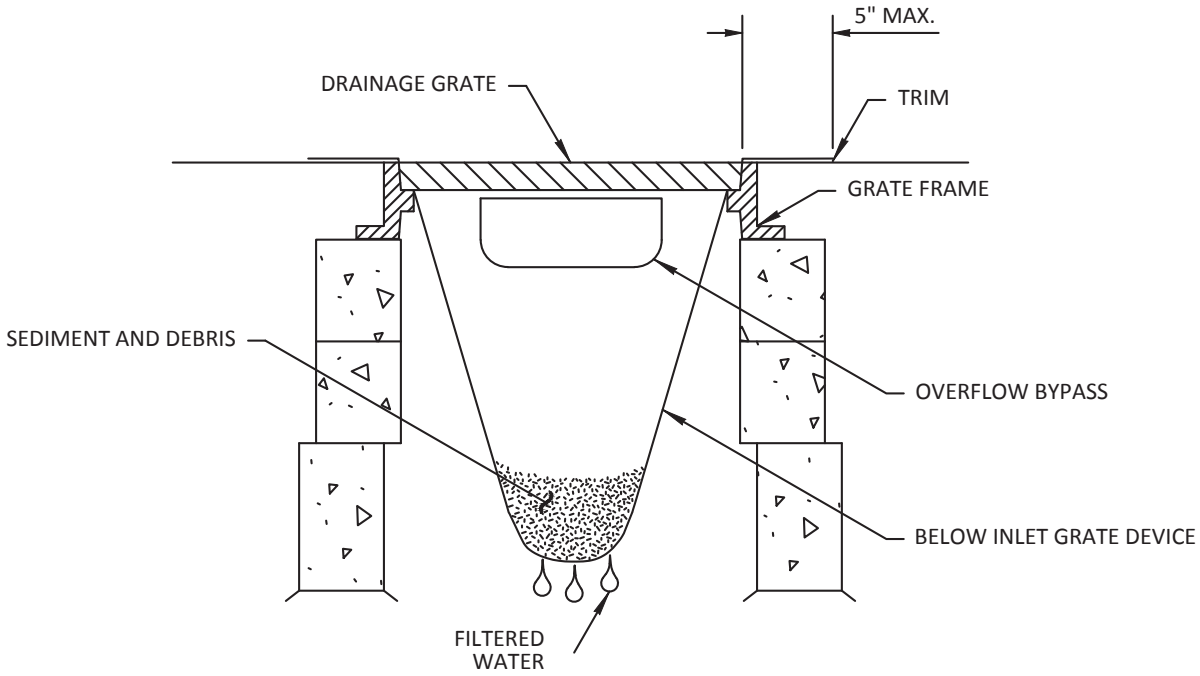


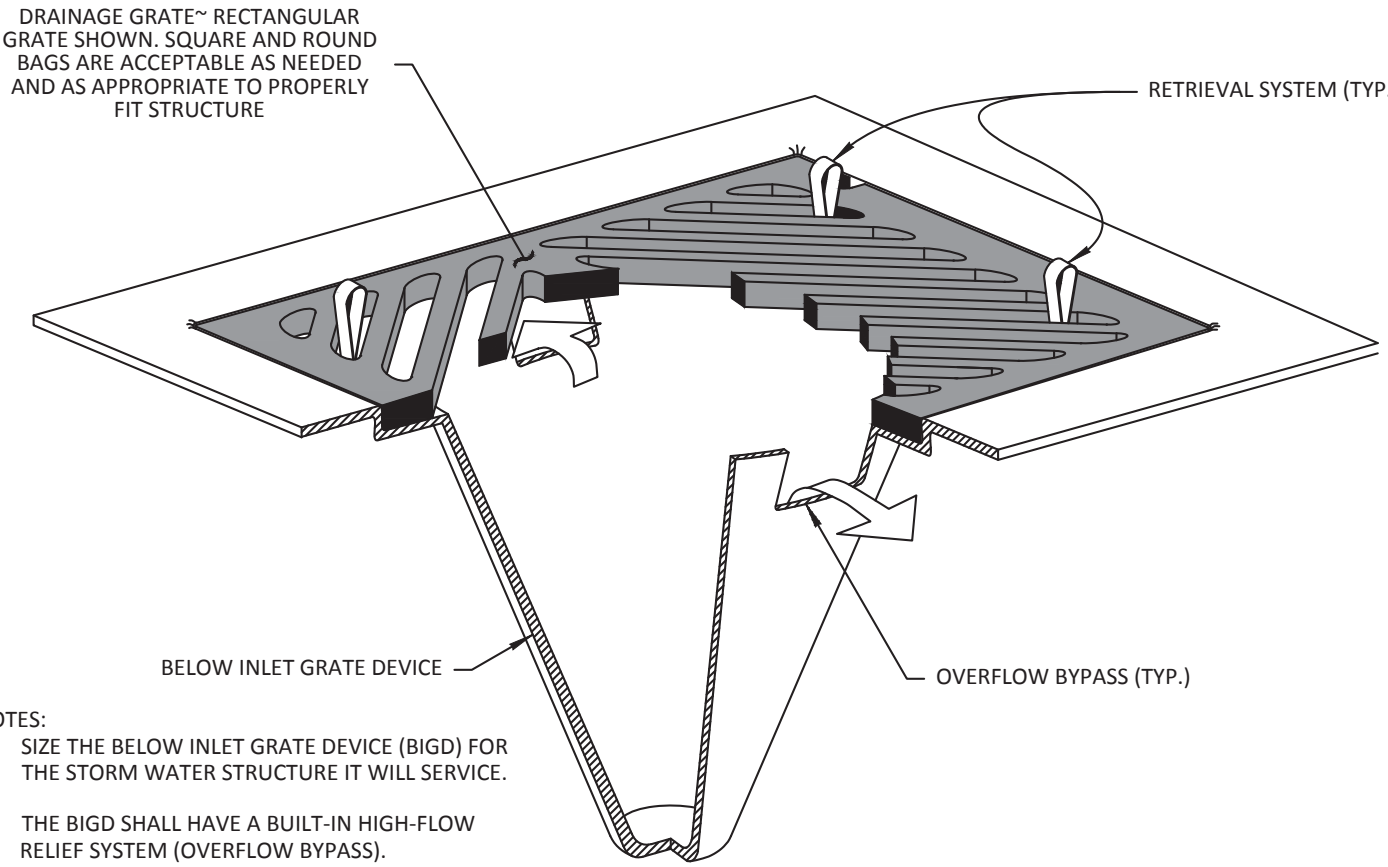
PLAN

NOTES:
1. FOR USE IN AREAS WHERE GRADING HAS BEEN COMPLETED AND FINAL SOIL STABILIZATION AND SEEDING ARE PENDING.
2. NOT APPLICABLE IN PAVED AREAS.
3. NOT APPLICABLE WITH CONCENTRATED FLOWS.

NOT TO SCALE

EST 1808 CITY OF DELAWARE OHIO Public Works Department	STANDARD DETAIL SILT FENCE INLET PROTECTION	EROSION ERSD-7.0 Rev. 12/31/2018





NOTES:

1. SIZE THE BELOW INLET GRATE DEVICE (BIGD) FOR THE STORM WATER STRUCTURE IT WILL SERVICE.
2. THE BIGD SHALL HAVE A BUILT-IN HIGH-FLOW RELIEF SYSTEM (OVERFLOW BYPASS).
3. THE RETRIEVAL SYSTEM MUST ALLOW REMOVAL OF THE BIGD WITHOUT SPILLING THE COLLECTED MATERIAL.

EST 1808 CITY OF DELAWARE OHIO

Public Works Department

STANDARD DETAIL

BELOW INLET GRATE DEVICE INLET PROTECTION

EROSION

ERSD-8.0

Rev. 12/31/2018

SEDIMENT AND EROSION CONTROL NOTES

IN ORDER TO CONTROL SEDIMENT POLLUTION OF WATER RESOURCES THE OWNER OR PERSON RESPONSIBLE FOR THE DEVELOPMENT AREA SHALL USE CONSERVATION PLANNING AND PRACTICES TO MAINTAIN THE LEVEL OF CONSERVATION ESTABLISHED BY THE FOLLOWING STANDARDS:

1. ALL STRUCTURAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING FOR ALL SITES.

2. SEDIMENT CONTROL PRACTICES SHALL BE FUNCTIONAL THROUGHOUT EARTH-DISTURBING ACTIVITIES. PERIMETER CONTROLS, AND OTHER PRACTICES INTENDED TO TRAP SEDIMENT SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING AND WITHIN SEVEN DAYS FROM THE START OF GRUBBING. THEY SHALL CONTINUE TO FUNCTION UNTIL THE UPSLOPE DEVELOPMENT AREA IS RESTABILIZED.

3. ALL STORM SEWER, SANITARY SEWER, WATER MAIN AND SERVICE TRENCHES SHALL BE MULCHED AND SEEDED WITHIN 14 DAYS AFTER BACKFILL, IN INSTALLATION IS THROUGH STABILIZED AREAS.

4. ALL TEMPORARY DIVERSIONS, SEDIMENT BASIN EMBANKMENTS, AND EARTH STOCKPILE SHALL BE SEEDED AND MULCHED FOR TEMPORARY VEGETATIVE COVER WITHIN 7 DAYS AFTER GRADING. STRAW, HAY MULCH, OR EQUIVALENT IS REQUIRED.

5. ALL STORM SEWER INLETS SHALL BE PROTECTED BY SEDIMENT TRAPS (INLET PROTECTION) WHICH WILL BE MAINTAINED AND MODIFIED AS REQUIRED AS CONSTRUCTION PROGRESSES. SEDIMENT TRAPS ARE NOT TO BE REMOVED AFTER SEEDING AND MULCHING IS ESTABLISHED.

6. ANY DISTURBED AREA NOT STABILIZED WITH SEEDING, SODDING, PAVING, OR BUILT ON BY NOVEMBER 1ST OR AREAS DISTURBED AFTER THAT DATE, SHALL BE MULCHED IMMEDIATELY WITH HAY OR STRAW AT THE RATE OF 2 TONS PER ACRE AND OVER-SEEDED BY APRIL 15TH.

7. DENUDED AREAS SHALL HAVE SOIL STABILIZATION APPLIED WITHIN SEVEN DAYS IF THEY ARE TO REMAIN DORMANT FOR MORE THAN FOURTEEN (14) DAYS. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE, AND SHALL ALSO BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS WHICH MAY NOT BE AT FINAL GRADE, BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN FORTY-FIVE DAYS.

8. STREET FLOW RUNOFF FROM DENUDED AREAS SHALL BE FILTERED.

9. ALL STORM SEWER INLETS WHICH ACCEPT WATER RUNOFF FROM THE DEVELOPMENT AREA SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER WILL NOT ENTER THE STORM SEWER SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.

10. THE INLET STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS AS AS NEEDED.

11. TEMPORARY SEDIMENT TRAP: SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

12. DIVERSION: BARE AND VEGETATED DIVERSION CHANNELS SHOULD BE INSPECTED REGULARLY TO CHECK FOR POINTS OF SCOUR OR BANK FAILURE; RUBBISH OR CHANNEL OBSTRUCTIONS; RODENT HOLES, BREACHING OR SETTLING OF THE RIDGE; EXCESSIVE WEAR FROM PEDESTRIAN OR CONSTRUCTION TRAFFIC. REPAIR DAMAGE AND REMOVE DEPOSITS OR SEDIMENT FROM THE DIVERSION CHANNEL AND VEGETATIVE FILTER STRIP. RESEEDING AND FERTILIZING SHOULD BE DONE AS NEEDED.

13. MEASURES SHALL BE TAKEN TO PREVENT SOIL TRANSPORT ONTO SURFACES WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, OR ONTO PUBLIC ROADS.

14. CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER WHICH WILL MINIMIZE EROSION. CONSIDERATION SHALL BE GIVEN TO THE LENGTH AND STEEPNESS OF THE SLOPE, SOIL TYPE, UPSLOPE DRAINAGE AREA, GROUNDWATER CONDITIONS, AND SLOPE STABILIZATION.

15. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL GROUND COVER IS ACHIEVED WHICH, IN THE OPINION OF THE CITY, PROVIDES ADEQUATE COVER AND IS MATURE ENOUGH TO CONTROL SOIL EROSION SATISFACTORILY AND TO SURVIVE ADVERSE WEATHER CONDITIONS.

16. ALL TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE DISPOSED OF WITHIN THIRTY DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY PRACTICES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE CITY. TRAPPED SEDIMENT SHALL BE PERMANENTLY STABILIZED TO PREVENT FURTHER EROSION.

17. ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE DESIGNED AND CONSTRUCTED TO MINIMIZE MAINTENANCE REQUIREMENTS. THEY SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.

18. ALL EROSION CONTROL MEASURES WILL BE CHECKED BY THE OWNER'S REPRESENTATIVE WEEKLY AND WITHIN 24 HOURS AFTER EACH RAINFALL TO ASSURE THAT THE MEASURES ARE FUNCTIONING ADEQUATELY. SEDIMENT THAT IS COLLECTED WILL BE DISTRIBUTED ON THE PROTECTED PORTION OF THE SITE AND STABILIZED. ALL STOCKPILES OF EARTH AND TOPSOIL WILL BE PROTECTED WITH TEMPORARY SEEDING OR OTHER MEANS TO PREVENT EROSION.

19. CONSTRUCTION ROAD STABILIZATION / CONSTRUCTION ENTRANCES: BOTH TEMPORARY AND PERMANENT ROADS AND PARKING AREAS MAY REQUIRE PERIODIC TOP DRESSING WITH NEW GRAVE. SEEDED AREAS ADJACENT TO THE ROADS AND PARKING AREAS SHOULD BE CHECKED PERIODICALLY TO ENSURE THAT A VIGOROUS STAND OF VEGETATION IS MAINTAINED. ROADSIDE DITCHES AND OTHER DRAINAGE STRUCTURES SHOULD BE CHECKED REGULARLY TO ENSURE THAT THEY DO NOT BECOME CLOGGED WITH SILT OR OTHER DEBRIS.

20. SILT FENCE: CONTRACTOR SHALL PLACE SILT FENCE AS LOCATED IN THIS PLAN SET.

21. THE HEIGHT OF A SILT FENCE SHALL NOT EXCEED 36-INCHES (HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE TO THE STRUCTURE).

22. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL AND CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST WITH A MINIMUM 6-INCH OVERLAP AND SECURELY SEALED.

23. POSTS SHALL BE SPACED A MAXIMUM OF 10-FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 12-INCHES). EXTRA STRENGTH FABRIC SHALL BE USED.

24. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 4-INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER. THE FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE AND 8 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.

25. THE TRENCH SHALL BE BACKFILLED AND SOIL COMPACTED OVER THE FILTER FABRIC.

26. IT MAY BECOME NECESSARY TO REMOVE PORTIONS OF THE SILT FENCE DURING CONSTRUCTION TO FACILITATE THE GRADING OPERATIONS IN CERTAIN AREAS. HOWEVER, THE SEDIMENT FENCE SHALL BE IN PLACE IN THE EVENING OR DURING ANY INCLEMENT WEATHER.

27. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

28. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER IS STILL NECESSARY THE FABRIC SHALL BE REPLACED PROMPTLY.

29. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.

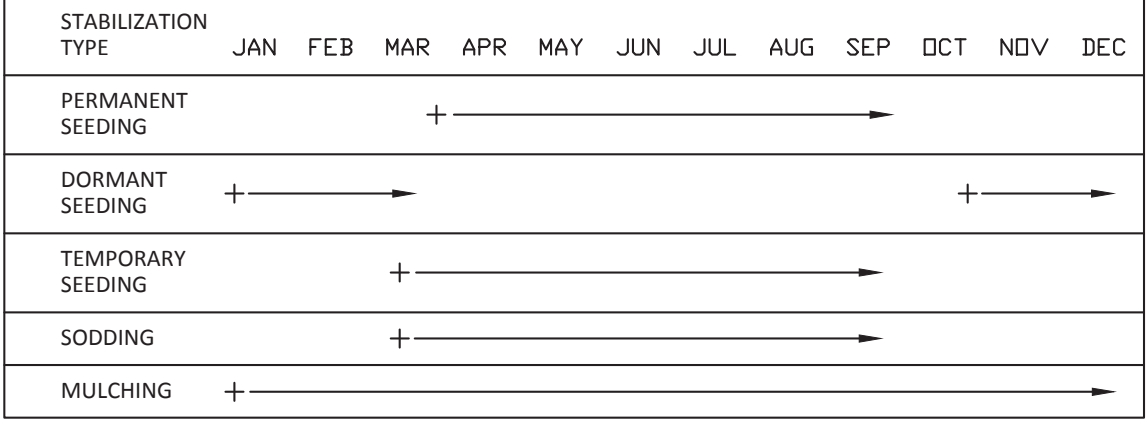
30. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE PREPARED AND SEEDED.

31. SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

32. AT THE COMPLETION OF CONSTRUCTION, ALL TEMPORARY SEDIMENT CONTROLS SHALL BE REMOVED AND ALL DENUDED AREAS SHALL BE STABILIZED.

33. ADDITIONAL EROSION AND SEDIMENTATION CONTROL MANAGEMENT PRACTICES MAY BE REQUIRED DUE TO UNFORESEEN CONDITIONS, THESE ADDITIONAL ITEMS SHALL BE INSTALLED AS DIRECTED BY THE CITY OF DELAWARE PUBLIC WORKS DEPARTMENT.

SOIL PROTECTION CHART



PERMANENT STABILIZATION	
AREA REQUIRING PERMANENT STABILIZATION	**TIME FRAME TO APPLY EROSION CONTROLS**
ANY AREAS THAT LIE DORMANT FOR ONE YEAR OR MORE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE
ANY AREAS WITHIN 50-FEET OF A SURFACE WATER OF THE STATE AND AT FINAL GRADE	WITHIN 2 DAYS OF REACHING FINAL GRADE
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN DAYS OF REACHING FINAL GRADE IN THAT AREA

TEMPORARY STABILIZATION	
AREA REQUIRING TEMPORARY STABILIZATION	**TIME FRAME TO APPLY EROSION CONTROLS**
ANY DISTURBED AREAS WITHIN 50-FEET OF A SURFACE WATER OF THE STATE AND NOT AT FINAL GRADE	WITHIN TWO DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR MORE THAN 14 DAYS
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREAS THAT WILL BE DORMANT FOR MORE THAN 14 DAYS, BUT LESS THAN ONE YEAR, AND NOT WITHIN 50 FEET OF A STREAM	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS MUST BE STABILIZED AT LEAST SEVEN DAYS PRIOR TO THE TRANSFER OF PERMIT COVERAGE FOR THE INDIVIDUAL LOT(S)
DISTURBED AREAS THAT WILL BE IDLE OVER WINTER	PRIOR TO THE ONSET OF WINTER WEATHER

TEMPORARY SEEDING & MULCHING FOR EROSION CONTROL

SEED TYPE	SEEDING DATES	PER 1000 SQ FT	PER ACRE
TALL FESCUE & ANNUAL RYEGRASS	MARCH 1 TO SEPTEMBER 15	2 POUNDS & 0.5 POUNDS	80 POUNDS & 20 POUNDS
SMALL GRAIN STRAW		100 POUNDS OR 2 OR 3 BALES	2 TONS OR 50 BALES
FERTILIZER		10 POUNDS OF 12-12-12 OR THE EQUIVALENT	450 POUNDS OF 12-12-12 OR THE EQUIVALENT
TEMPORARY SEEDING			
ANNUAL RYEGRASS OR WHEAT	SEPTEMBER 15 TO OCTOBER 30	3 POUNDS	2 BUSHELS
SOIL PROTECTION			
SMALL GRAIN STRAW MULCH	OCTOBER 30 TO MARCH 1	2 TO 3 BALES	2 TONS