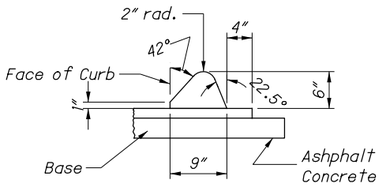
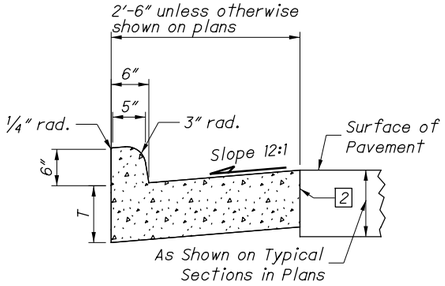
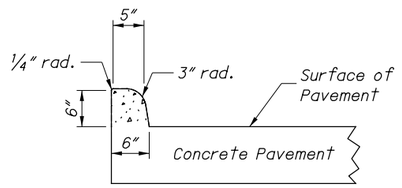


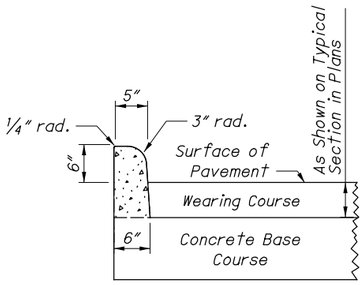
TYPE 1



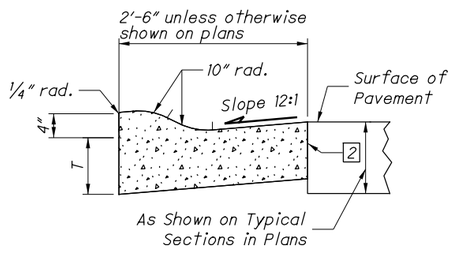
TYPE 2



TYPE 2-A



TYPE 2-B



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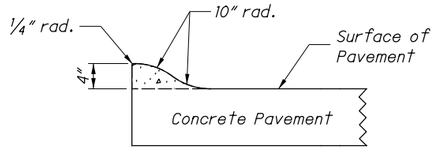

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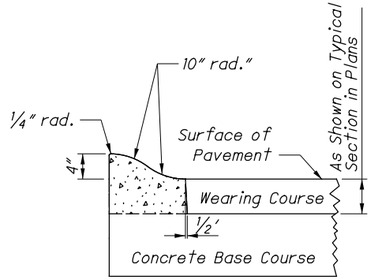

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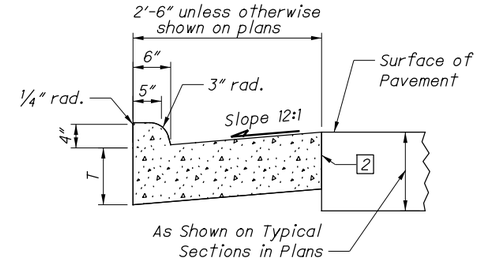
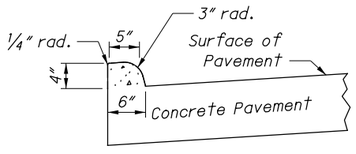
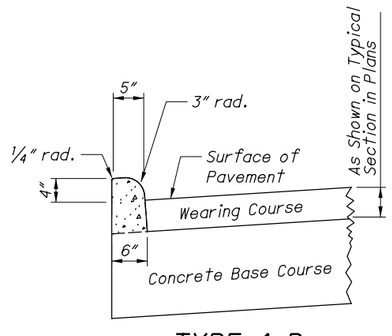


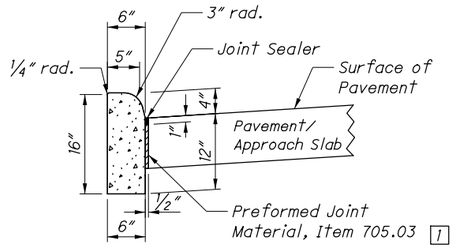
TYPE 4



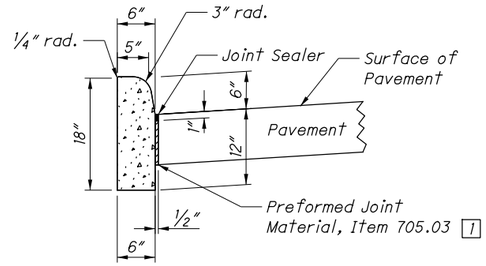
TYPE 4-A



TYPE 4-B



TYPE 4-C



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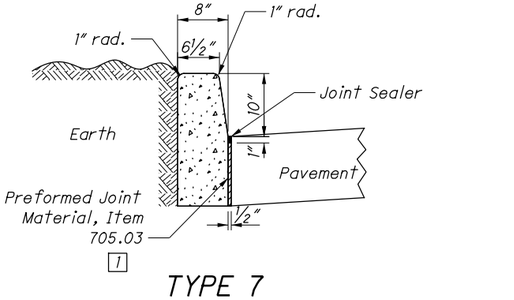
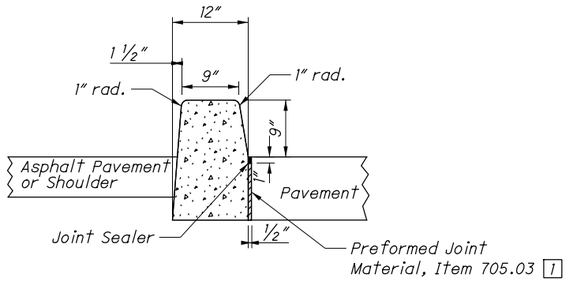


TYPE 7



TYPE 8

NOTES

GENERAL: *This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.*

JOINTS: *1" expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of a least 2" above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints and to the surface of the pavement.*

Transverse expansion joint material shall meet the requirements of Item 705.03.

GUTTER PLATE THICKNESS: *Thickness of gutter plate "T" shall be 9" unless otherwise shown on the plans.*

TOLERANCES: *Dimensional tolerances are as follows:*

Curbs: -1/32" to +1/4".

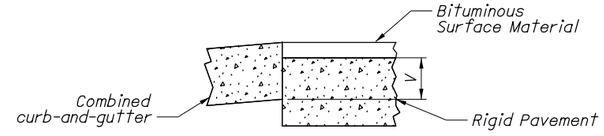
Gutters: 0 to +1/2".

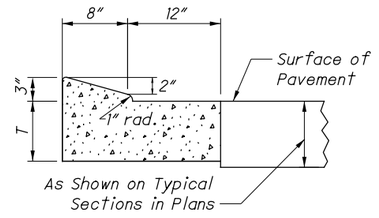
LEGEND

1 *Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.*

2 *Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5'. See SCD BP-2.1 for details of tie bars and hook bolts.*

If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with asphalt concrete, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less than 7".





TYPE 9

THIS DRAWING REPLACES BP-5.1 DATED 7-20-18.

REVISION DATE 1-18-2019

STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR David L. Holstein

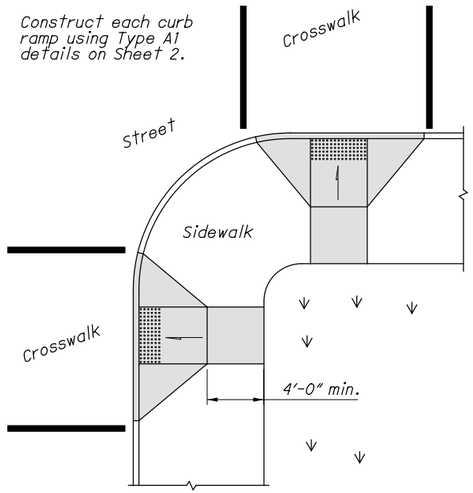
STDS. ENGINEER D. Fisher

OFFICE OF ROADWAY ENGINEERING

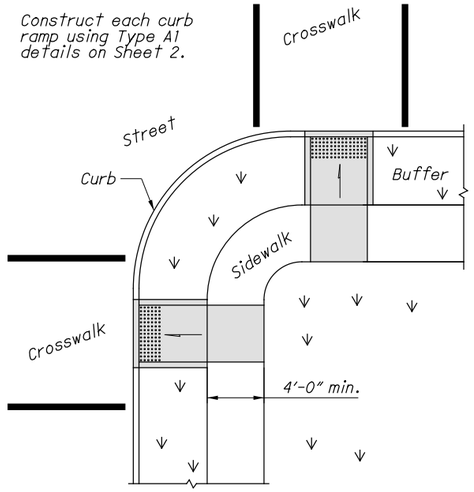
STANDARD ROADWAY CONSTRUCTION DRAWING

CONCRETE CURBS AND COMBINED CURB AND GUTTER

SCD NUMBER BP-5.1

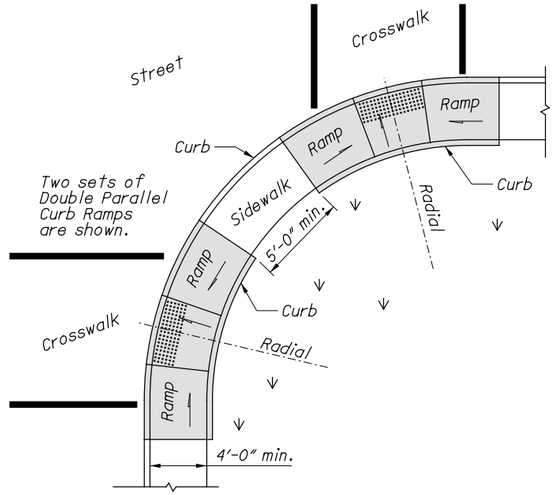


Use curb ramps with flared sides at locations with wide sidewalks.



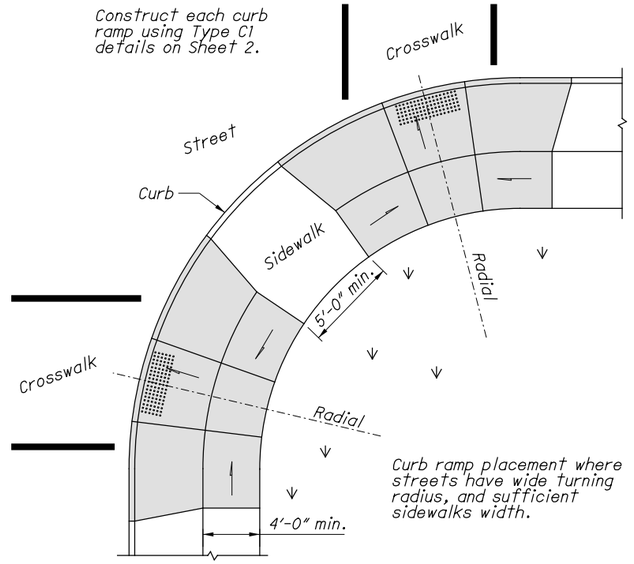
Use curb ramps with returned curbs where buffer is wide enough to accommodate ramp slope.

PERPENDICULAR CURB RAMPS



Place on streets having wide turning radius and where sidewalks are narrow.

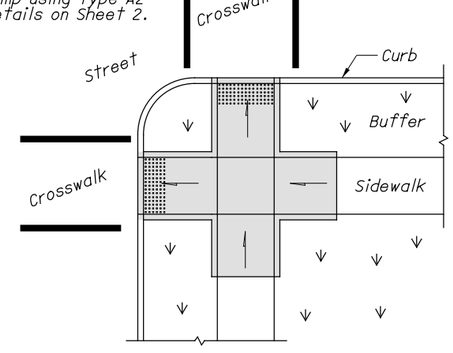
PARALLEL CURB RAMPS



Curb ramp placement where streets have wide turning radius, and sufficient sidewalks width.

COMBINATION CURB RAMPS

PREFERRED CONSTRUCTION PLACEMENT



NOTES

GENERAL: *This drawing shows curb ramp types details and placement examples for curb ramp construction, including the installation of detectable warnings.*

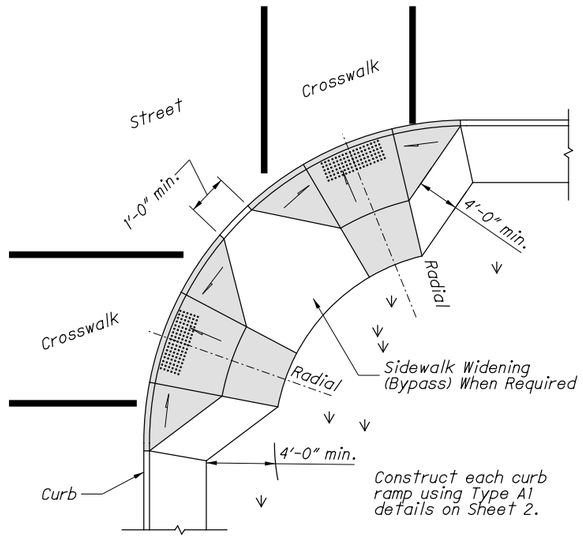
Curb ramp types are shown on Sheet 2 and include Perpendicular, Parallel, and Combined types as specified to be constructed in the locations shown on the project plans.

Curb ramps added to an existing intersection or walk should be individually detailed on the project plans to assure that the design is appropriate for site constraints and all items can be constructed to ADA standards. The contractor may adjust the placement of curb ramps if existing field conditions warrant with the approval of the Engineer.

PAYMENT: *Measure and pay for the ramp area within the shaded limits of this drawing as Item 608 Curb Ramp, Square Foot. This includes the cost of any curb or curb and gutter, detectable warnings, landing areas and any additional materials, installation, grading, forming, and finishing required within the shaded area.*

Work beyond the shaded ramp/landing area is paid for as curb (609) and walk (608). Removal of existing curb, walk (or existing curb ramps) are paid under Item 202.

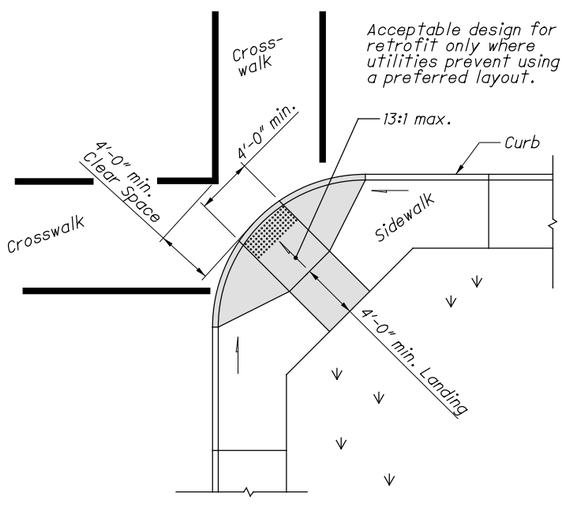
For at-grade crossing locations where only detectable warnings are required in order to acheive ADA compliance, measure and pay for the strip of detectable warnings as Item 608 Detectable Warning, Square Foot. The work to cast the tiles in place will also require removal of existing pavement (Item 202) to the nearest joint, or if no joint exists, a minimum of 4 feet.



Acceptable design on corners with wide turning radius where user is able to maneuver within crosswalk limits so as not to encroach into adjacent traveled lanes.

Construct each curb ramp using Type A1 details on Sheet 2.

PERPENDICULAR RAMPS



Use this design only for existing walks, and when site constraints prohibit other designs. The diagonal Type D ramp may be constructed as either a Perpendicular, Parallel or Combination curb ramp type. Avoid using where curb radii are less than 20'-0".

DIAGONAL RAMP (Type D)

ACCEPTABLE CONSTRUCTION PLACEMENT

THIS DRAWING REPLACES BP-7.1 DATED 7-20-2018.

REVISION DATE 7-17-2020

STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR Brenton Bogard

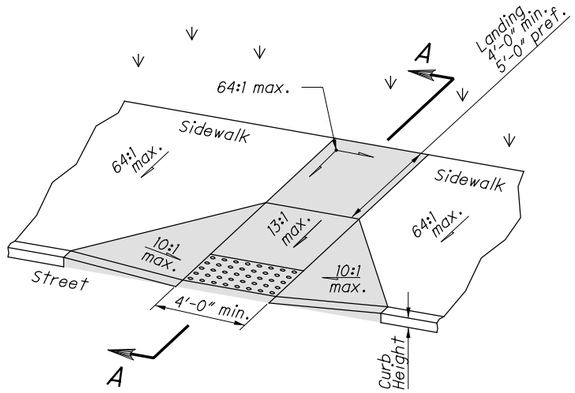
STDS. ENGINEER D. Fisher

OFFICE OF ROADWAY ENGINEERING

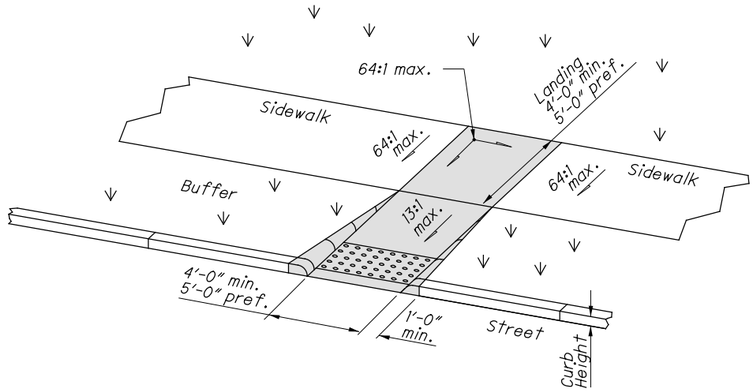
STANDARD ROADWAY CONSTRUCTION DRAWING

NEW CURB RAMPS (with Detectable Warnings)

SCD NUMBER **BP-7.1**

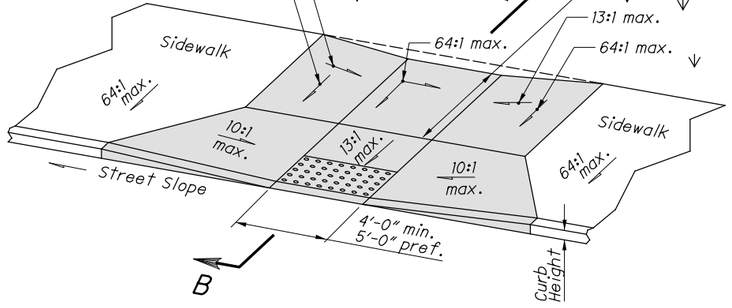


Type A1 (Perpendicular with flared sides)

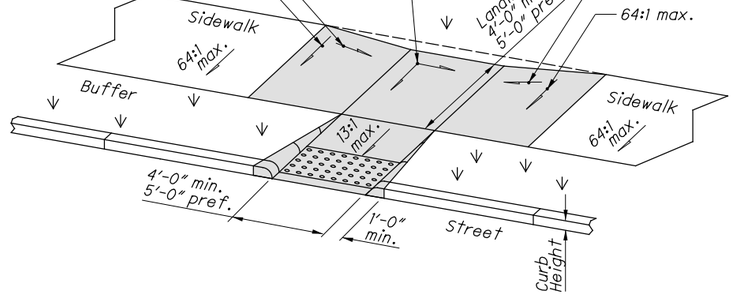


Type A2 (Perpendicular with returned curb)

PERPENDICULAR CURB RAMP DETAILS

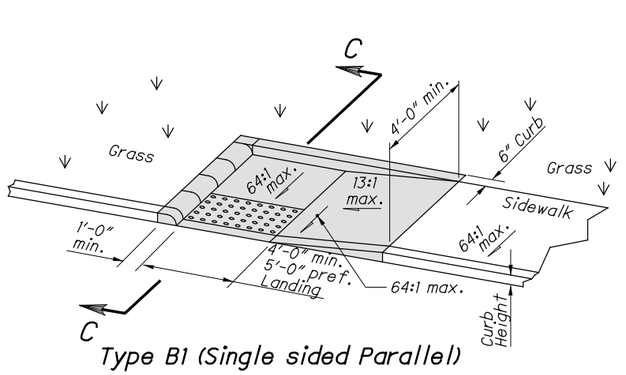


Type C1 (Combined with flared sides)

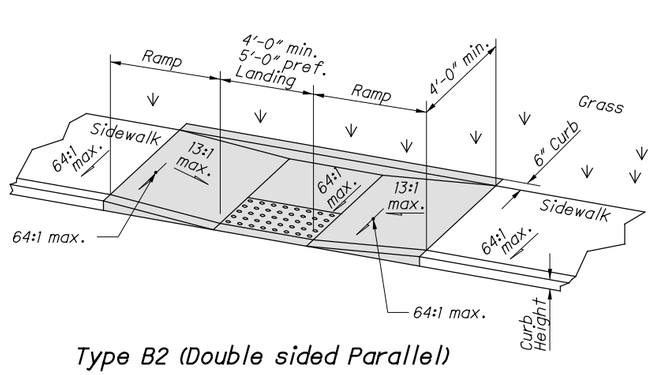


Type C2 (Combined with returned curb)

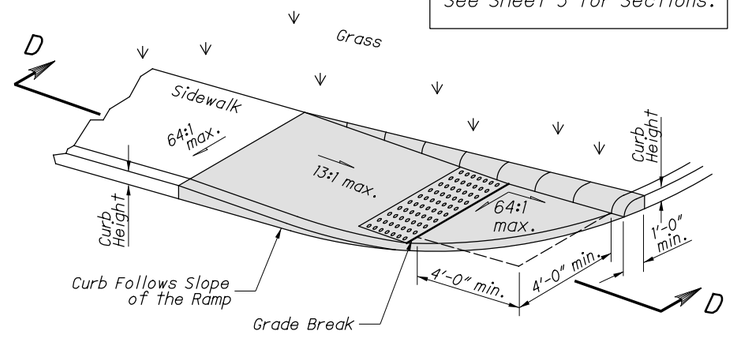
COMBINED CURB RAMP DETAILS



Type B1 (Single sided Parallel)



Type B2 (Double sided Parallel)



Type B3 (Single sided Parallel)

PARALLEL CURB RAMP DETAILS

See Sheet 3 for Sections.

NOTES CONTINUED

The running slope of the curb ramp shall be a 13:1 maximum or flatter. In existing sidewalks, where the maximum ramp slope is not feasible due to site constraints (e.g. utility poles or vaults, right-of-way limits) it may be reduced as follows:

A) 10:1 for a max. rise of 6",
B) 8:1 for a max. rise of 3",
C) 6:1 over a max. run of 2'-0" for historic areas where a flatter slope is not feasible.

To prevent chasing the grade indefinately, the transition from exisiting sidewalk to the shaded curb ramp area is not required to exceed 15 feet in length.

While ramps may be skewed to the crosswalk, the entire lower landing area must fall within the cross walk that the ramp serves and cannot be located in the traveled lane of opposing traffic.

The counter slope of the gutter or street at the foot of a curb ramp, landing, or blended transitions shall be 20:1 ot flatter.

The bottom edge of the ramp shall change planes perpendicular to the landing.

The edge of the curb shall be flush with the edge of the adjacent pavement and gutter and surface slopes that meet grade breaks shall also be flush.

Ramp landings shall be 4' min. x 4' min. with a 64:1 or flatter cross slope and running slope.

DETECTABLE WARNINGS: Install Detectable Warnings on each curb ramp with approved materials, as shown on Sheet 3. Install these proprietary products as per manufacturer's written instructions.

DRAINAGE: Contractor is to ensure the base of each constructed curb ramp allows for proper drainage, without exceeding allowable cross slope or ramp slopes. Vertical change in level exceeding 1/8" between the 1) pavement and gutter, and 2) gutter and ramp, are not allowed.

SURFACE TEXTURE: Texture concrete surfaces by coarse brooming transverse to the ramp slopes to be rougher than the adjacent walk.

JOINTS: Provide expansion joints in the curb ramp as extensions of walk joints and consistent with Item 608.03 requirements for a new concrete walk. Provide a 1/2" Item 705.03 expansion joint filler around the edge of ramps built in existing concrete walks. Lines shown on this drawing indicate the ramp edges and slope changes, and do not necessarily indicate joint lines.

THIS DRAWING REPLACES BP-7.1 DATED 7-20-2018.

REVISION DATE 7-17-2020

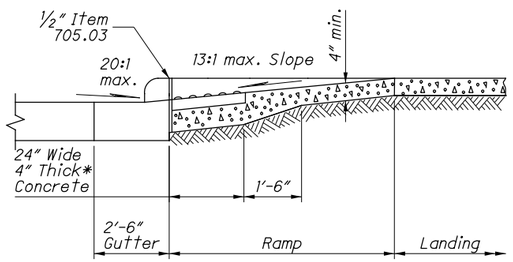
STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR Brenton Bogard

STDS. ENGINEER D. Fisher

OFFICE OF ROADWAY ENGINEERING

STANDARD ROADWAY CONSTRUCTION DRAWING
NEW CURB RAMPS
(with Detectable Warnings)

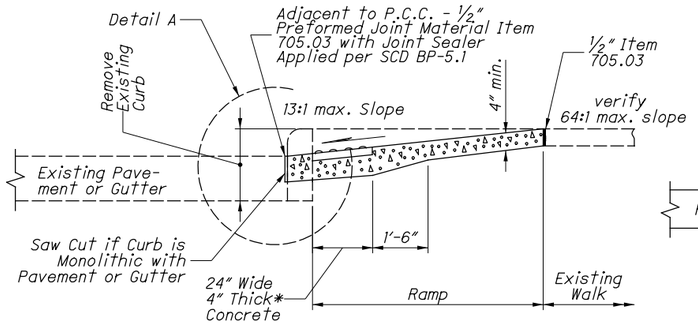
SCD NUMBER BP-7.1



New gutter shown.

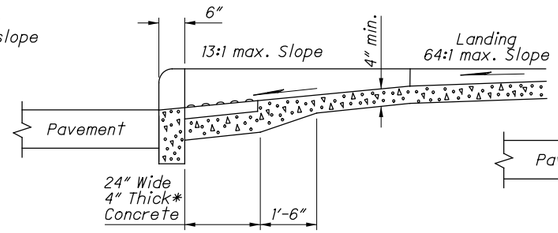
SECTION A-A NORMAL DETAIL

See Sheet 2.



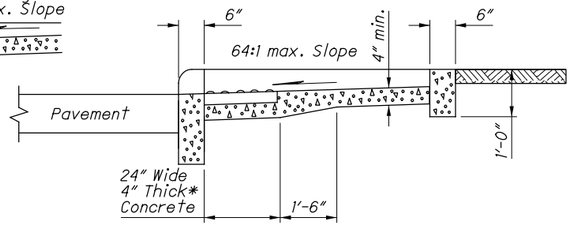
SECTION A-A EXISTING WALK DETAIL

See Sheet 2.



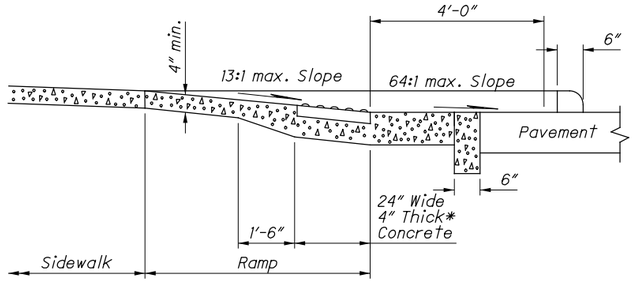
SECTION B-B

See Sheet 2.



SECTION C-C

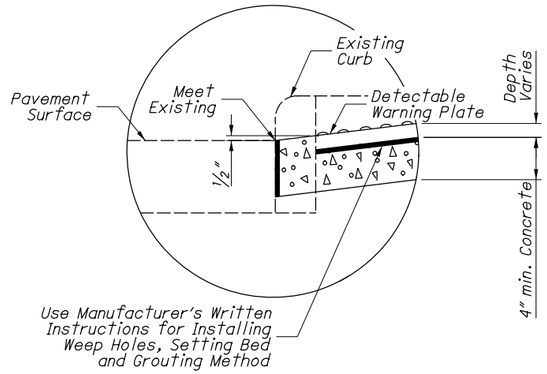
See Sheet 2.



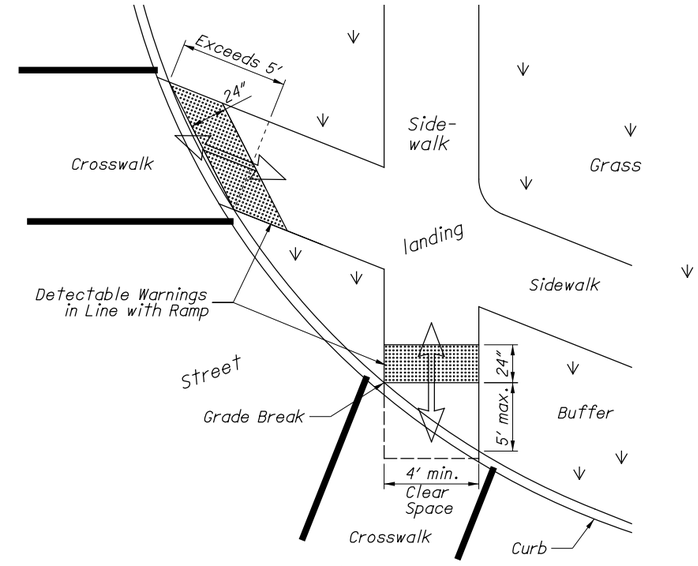
SECTION D-D

See Sheet 2.

*Where possible, pour ramp area integral with the curb, otherwise use 6" thick walk.



DETAIL A



DETECTABLE WARNING ALIGNMENT

DETECTABLE WARNINGS NOTES

GENERAL: *Detectable Warnings are a distinctive surface pattern of truncated domes which are detectable by cane or underfoot to alert people with vision impairments of their approach to streets and hazardous drop-offs.*

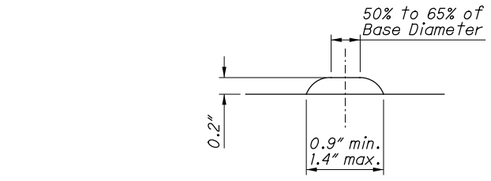
PLACEMENT: *Detectable warnings are to be installed at any location where pedestrians might cross paths with vehicular traffic lanes, such as the base of curb ramps or at blended curbs. A 24" strip of domes is to be installed for the full width of the ramp or walk. Typical street corner placement locations are shown on Sheet 1.*

Some detectable warning products require a concrete border for proper installation. The concrete border should not exceed 2". Where the back of curb edge is tooled to provide a radius, the border dimension should be measured from the end of the radius.

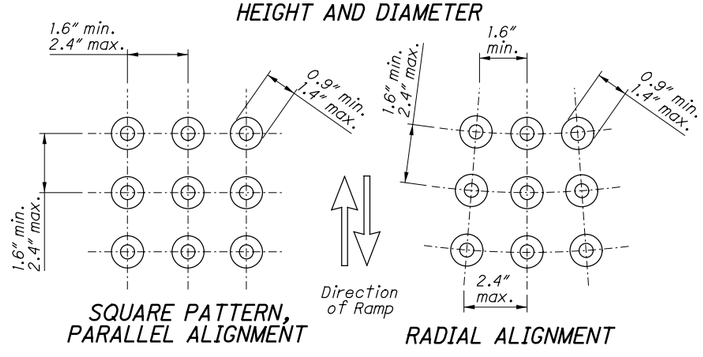
The depth of concrete underneath detectable warning products shall be a minimum of 4". See DETAIL A.

ALIGNMENT: *Truncated domes should be aligned with the primary direction of the ramp as shown on the DETECTABLE WARNING ALIGNMENT Detail. Normally the detectable warnings should be flush with the back of the curb, but for skewed conditions see DETECTABLE WARNING ALIGNMENT Detail. For non-standard layouts, detectable warning materials may have to be mitered and placed segmentally.*

PRODUCTS & COLORS: *Color of the detectable warnings should contrast with surrounding concrete walk and ramp. Black is not an acceptable color. Approved products and guidance on color may be found on the Office of Roadway Engineering Service's Detectable Warnings Approved List. Install products as per manufacturer's printed instructions.*



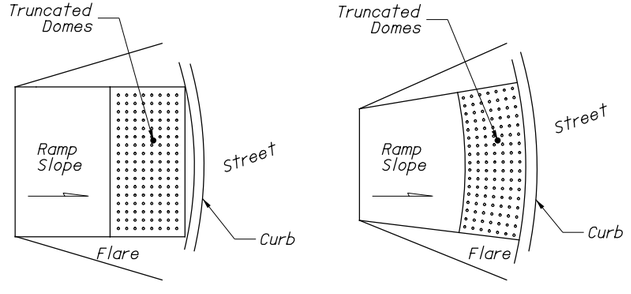
HEIGHT AND DIAMETER



SQUARE PATTERN, PARALLEL ALIGNMENT

RADIAL ALIGNMENT

TRUNCATED DOMES DETAILS



DOME ALIGNMENT ON RADIUSED CURB

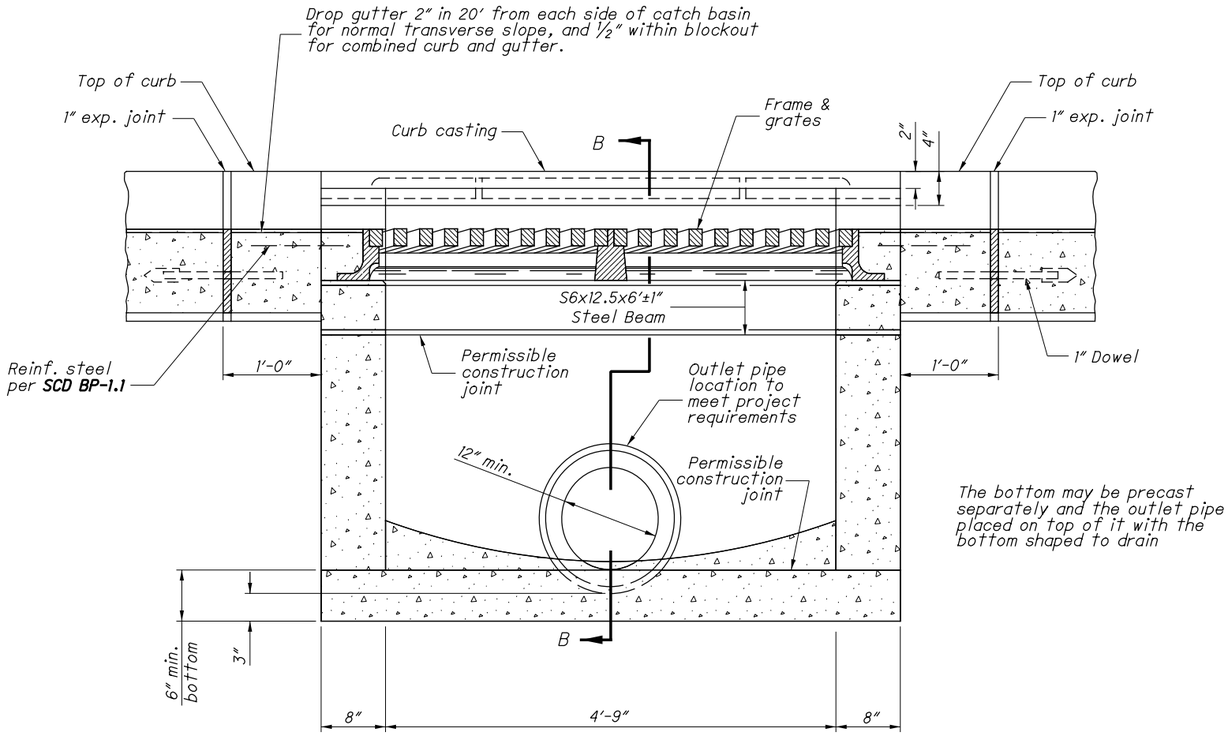
THIS DRAWING REPLACES BP-7.1 DATED 7-20-2018.

REVISION DATE	7-17-2020
STATE OF OHIO DEPARTMENT OF TRANSPORTATION ADMINISTRATOR	Brenton Bogard
STDS. ENGINEER	D. Fisher
OFFICE OF ROADWAY ENGINEERING	

STANDARD ROADWAY CONSTRUCTION DRAWING

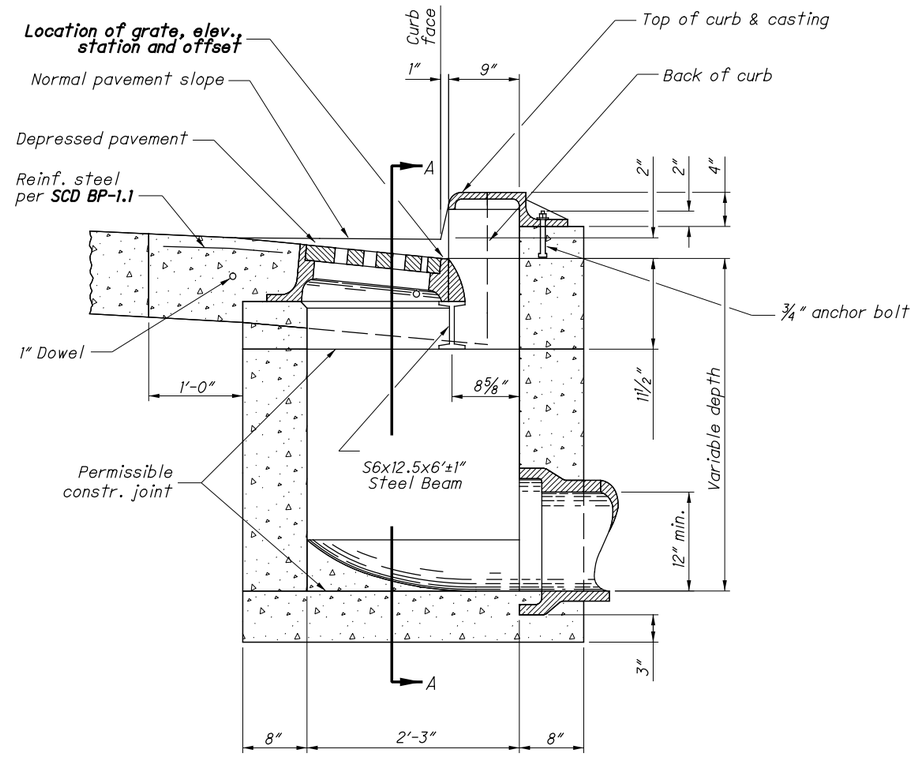
NEW CURB RAMPS (with Detectable Warnings)

SCD NUMBER **BP-7.1**

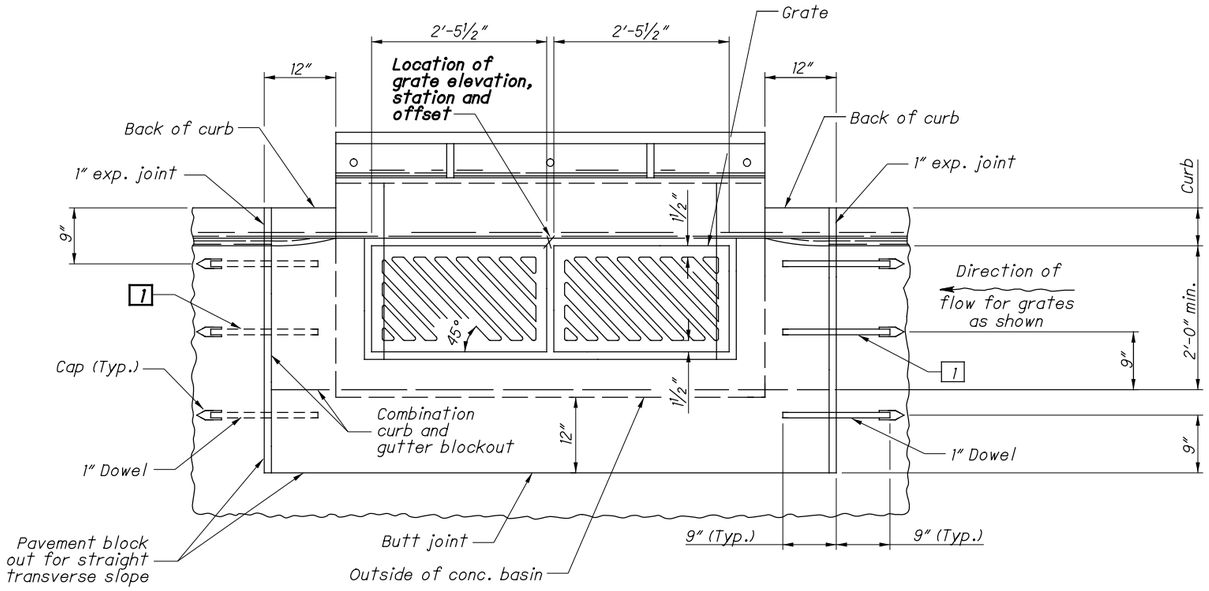


SECTION A-A

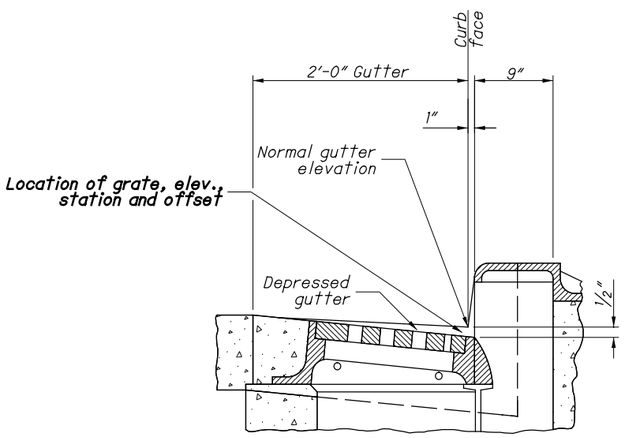
[1] Dowel location for curb & gutter



SECTION B-B
WITH CURB
(2" DEPRESSION)



PLAN OF CATCH BASIN AND PAVEMENT JOINTS



SECTION B-B
WITH CURB & GUTTER
(½" DEPRESSION)

See Sht. 2/2 for NOTES

CATCH BASIN No. 3

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ROADWAY HYDRAULIC ENGINEER
M. Cozzoli

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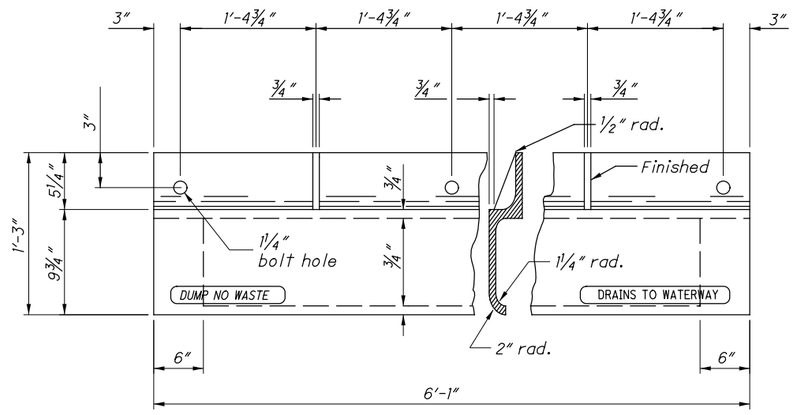
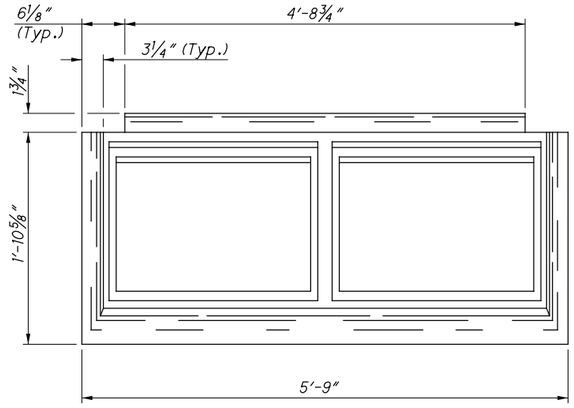
STANDARD HYDRAULIC CONSTRUCTION DRAWING
CATCH BASIN No. 3

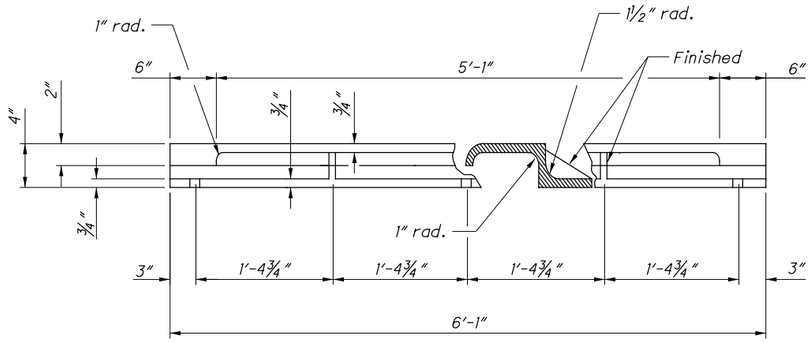
SCD NUMBER
CB-2.1



PLAN & SECTION

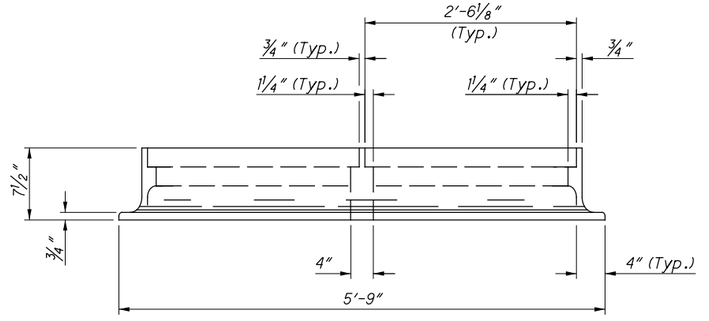


PLAN

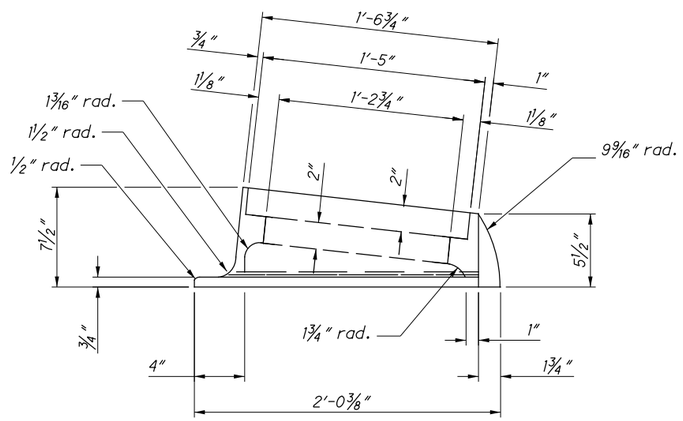


FRONT VIEW & SECTION

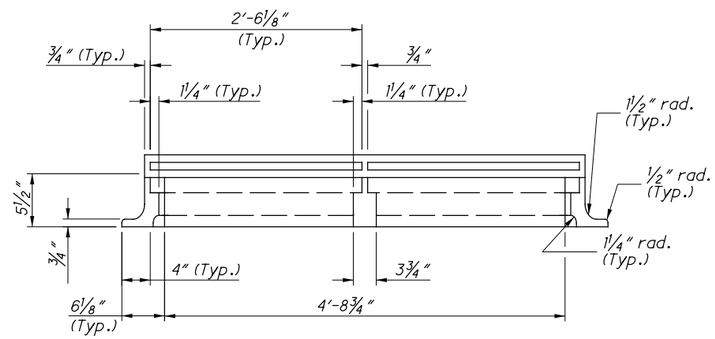
CURB CASTING



FRONT VIEW



END VIEW FRAME



BACK VIEW

FRAME

NOTES

GRATES: *Two required. For details, see* ***SCD CB-2.2.*** *Provide Grate "V" unless the plans specifically require the diagonal grate. If the diagonal grate is specified, place it so that the diagonal bars direct drainage flow toward the curb.*

CASTINGS: *Provide a design essentially the same and equally as strong as the one shown. Minimum weight:*

Curb Casting . . . . . 305 lbs.
Two Grates . . . . . 254 lbs.
Frame . . . . . 590 lbs.
Two Grate "V" . . . . 210 lbs.

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Provide grate openings and dimensions as shown here unless otherwise shown in the plans.

Cast the following text into the top of the curb casting:

"DUMP NO WASTE" *and* ***"DRAINS TO WATERWAY"***

Print text in bold, capital letters at least ¾" high. See example on Plan & Section. "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: *Fit and finish the frame and grate to provide a firm and even seat. No projections are permitted on bearing areas, and the grate must seat in its frame without rocking.*

WALLS: *When used in place of concrete, construct brick side walls with 8" nominal thickness.*

PRECAST CONSTRUCTION: *Permitted, except for the apron. Meet CMS 706.13 concrete requirements. Provide precast walls at least 6" thick with sufficient reinforcing to permit shipping and placement without damage. Reduce the wall thickness from the outside.*

MINIMUM DEPTH: *The minimum depth is per the cover requirements for that pipe type.*

OPENINGS: *Ensure pipe openings are the O.D. of the pipe being supplied plus 2" when fabricated or field cut. Fill any voids per C&MS 611.*

DOWELS: *Furnish four 1"x18" dowels for concrete pavement or gutter blockout. See* ***SCD BP-2.2*** *for dowel details.*

BLOCKOUT: *Pave blockouts with 4000 psi compressive strength concrete in PCC pavement or gutter. Blockouts are paid for as part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of the castings. Cast a 4000 psi compressive strength concrete apron, the size of the 2'-0" gutter blockout, in place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction is made in curb quantities.*

PAYMENT: *All materials and labor, including excavation and backfilling, are paid for under* ***Item 611 - Catch Basin, No. 3.***

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M. Cozzoli

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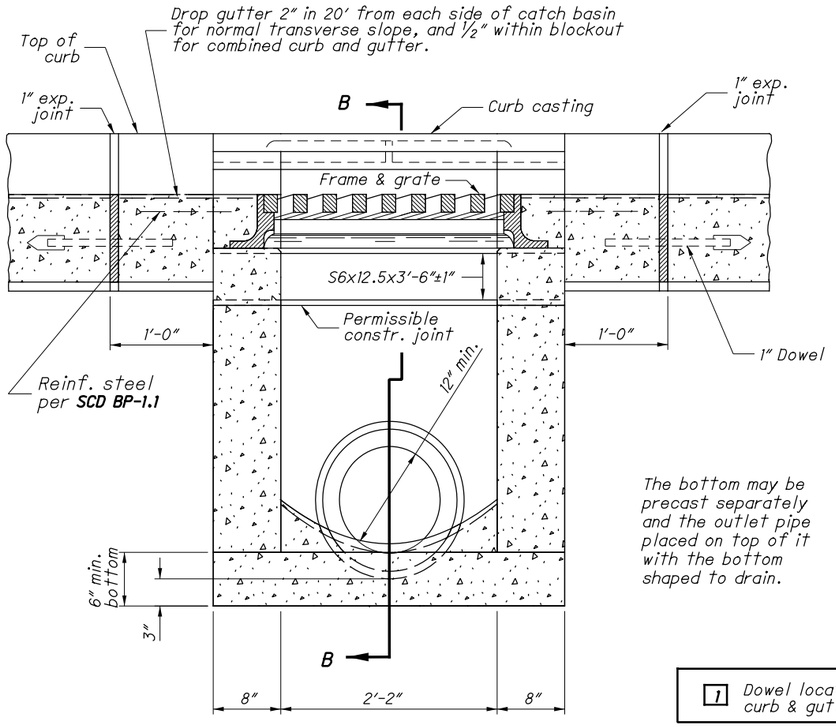
CATCH BASIN No. 3

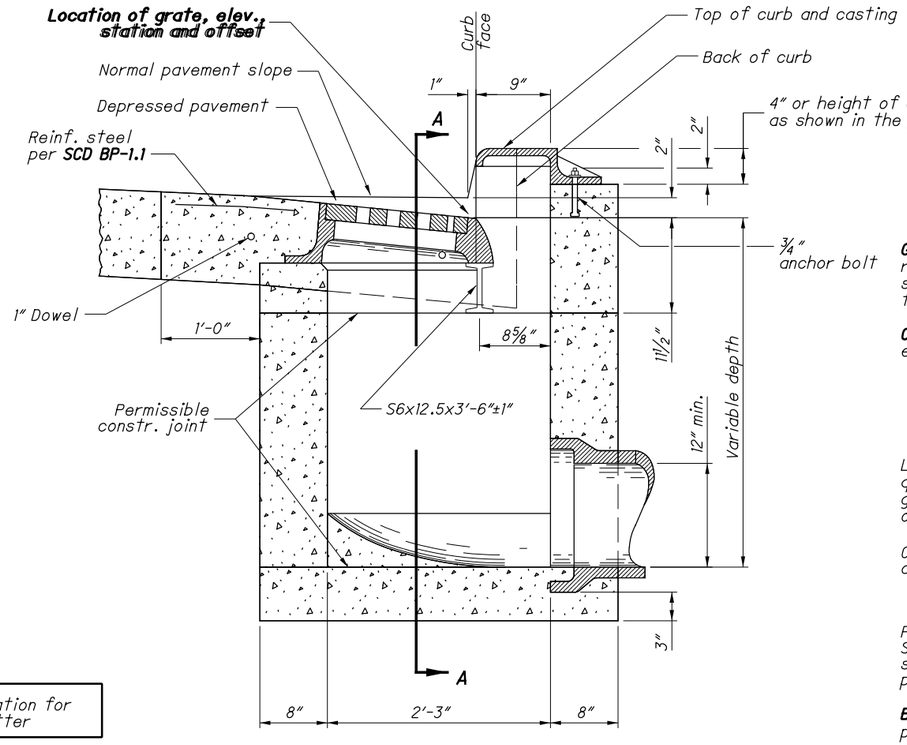
SCD NUMBER
CB-2.1



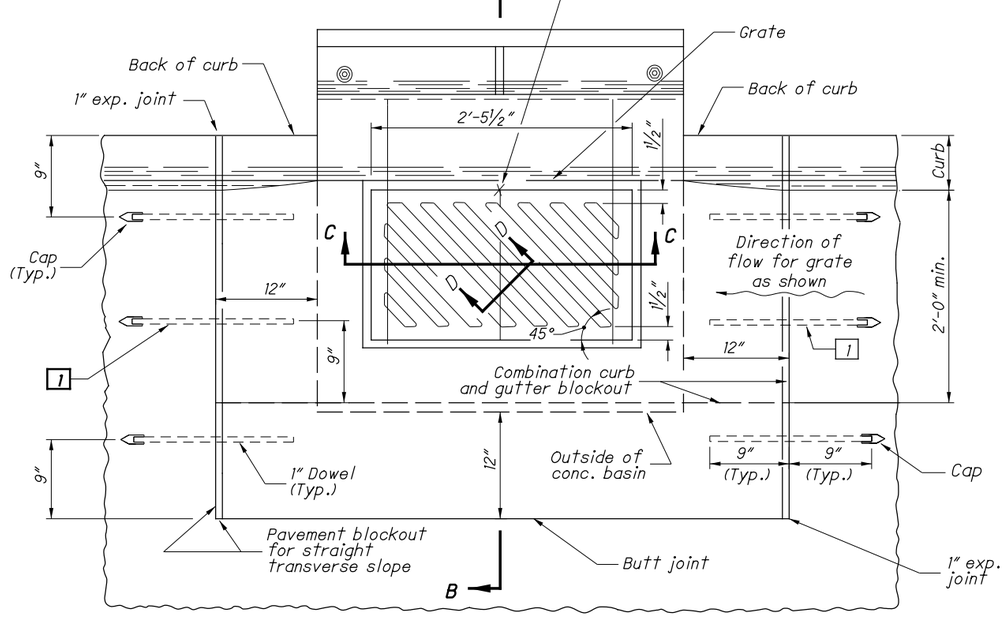
SECTION A-A

The bottom may be precast separately and the outlet pipe placed on top of it with the bottom shaped to drain.

1 Dowel location for curb & gutter

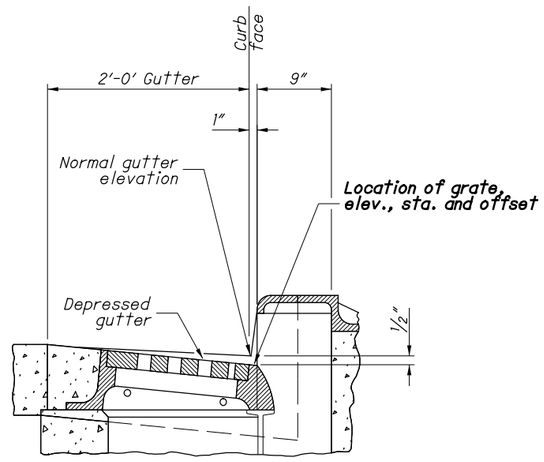


SECTION B-B WITH CURB (2" DEPRESSION)



PLAN OF CATCH BASIN AND PAVEMENT JOINTS

(For SECTIONS C-C and D-D, see Sht. 2/2)



SECTION B-B WITH CURB & GUTTER (½" DEPRESSION)

NOTES

GRATES: Provide Grate "V" unless the plans specifically require the diagonal grate. If the diagonal grate is specified, place it so that the diagonal bars direct the drainage toward the curb.

CASTINGS: Provide a design essentially the same and equally as strong as the one shown. Minimum weight:

Curb Casting . . . . . 170 lbs.
Standard Grate . . . . 127 lbs.
Frame . . . . . 320 lbs.
Grate "V" . . . . . 105 lbs.

Lighter weight frames and grates that meet the requirements of CMS 711.14 may also be provided. Provide grate openings and dimensions as shown here unless otherwise shown in the plans.

Cast the following text into the top of the curb casting:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Print text in bold, capital letters at least ¾" high. See example on Plan & Section. "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: Fit and finish the frame and grate to provide a firm and even seat. No projections are permitted on bearing areas, and the grate must seat in its frame without rocking.

WALLS: When used in place of concrete, construct brick side walls with 8" nominal thickness.

PRECAST CONSTRUCTION: Permitted, except for the apron. Meet CMS 706.13 concrete requirements. Provide precast walls at least 6" thick with sufficient reinforcing to permit shipping and placement without damage. Reduce the wall thickness from the outside.

MINIMUM DEPTH: The minimum depth is per the cover requirements for that pipe type.

OPENINGS: Ensure pipe openings are the O.D. of the pipe being supplied plus 2" when fabricated or field cut. Fill any voids per C&MS 611.

DOWELS: Furnish four 1"x18" dowels for concrete pavement or gutter blockout. See **SCD BP-2.2** for dowel details.

BLOCKOUT: Pave blockouts with 4000 psi compressive strength concrete in PCC pavement or gutter. Blockouts are paid for as part of the pavement or gutter with no deduction in pavement, curb or gutter quantities because of the castings. Cast a 4000 psi compressive strength concrete apron, the size of the 2'-0" gutter blockout, in place in asphalt pavement (no dowels required) with the cost included in the catch basin bid price. No deduction is made in curb quantities.

PAYMENT: All materials and labor, including excavation and backfilling, are paid for under **Item 611 - Catch Basin, No. 3A.**

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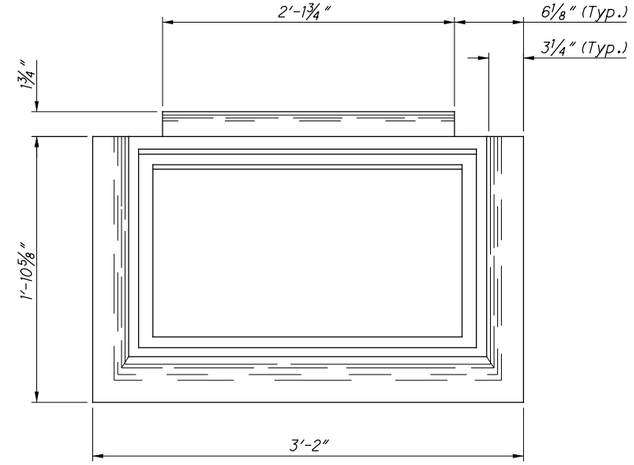
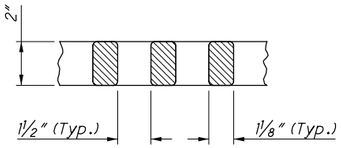
CATCH BASIN No. 3A

SCD NUMBER
CB-2.2

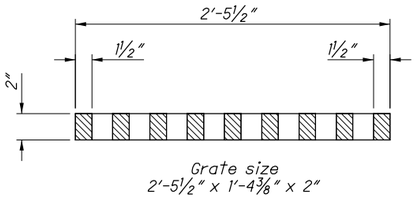
CATCH BASIN No. 3A



PLAN

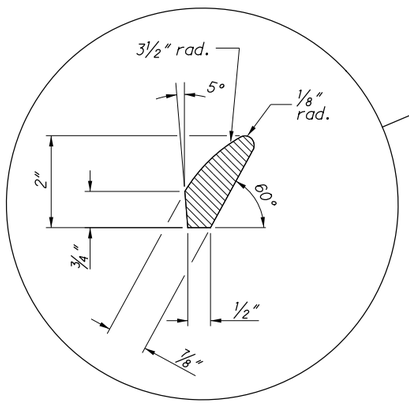


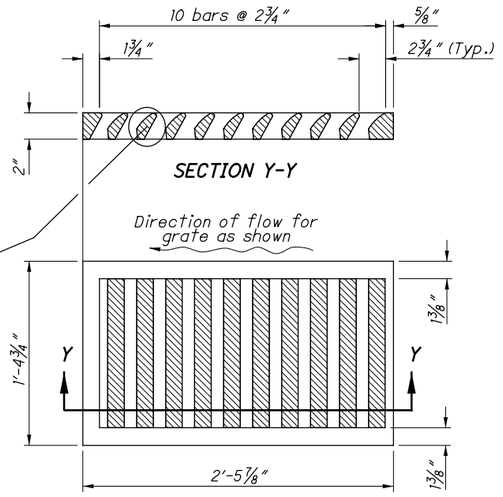
SECTION D-D
(See Sht. 1/2.)



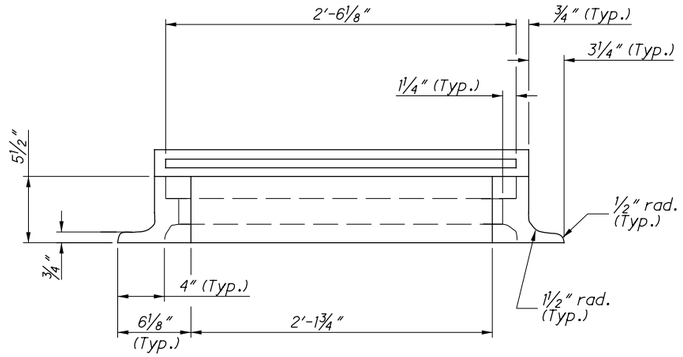
SECTION C-C
DIAGONAL GRATE
(See Sht. 1/2)

⅛" radii
all bar edges

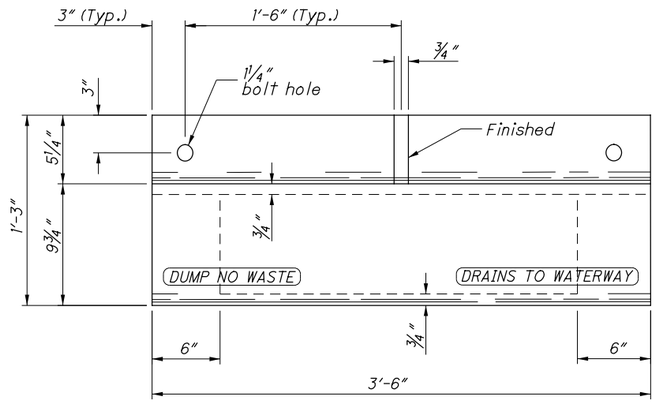




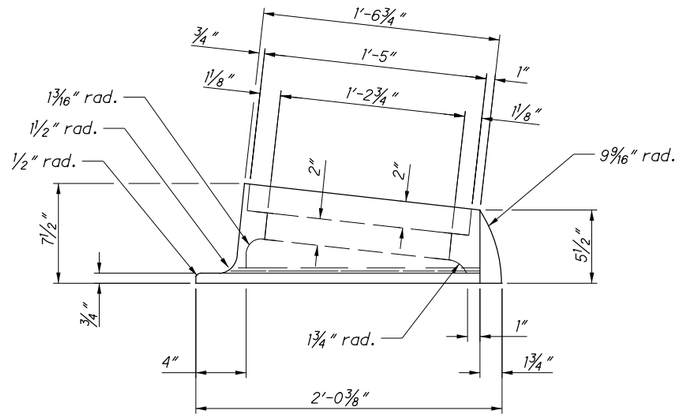
PLAN
GRATE "V"



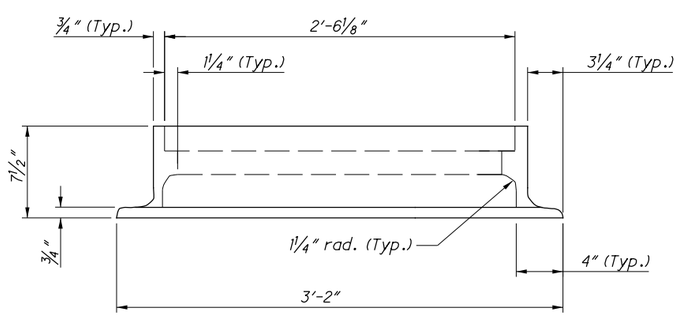
BACK VIEW



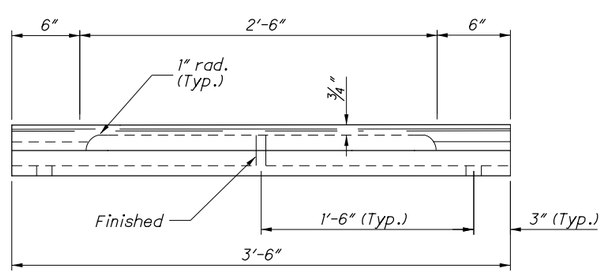
PLAN



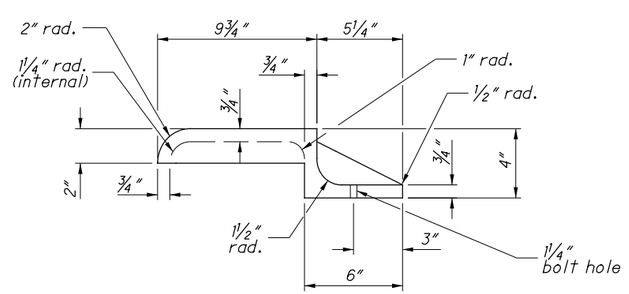
END VIEW FRAME



FRAME
FRONT VIEW



FRONT VIEW
CURB CASTING



END VIEW
CURB CASTING

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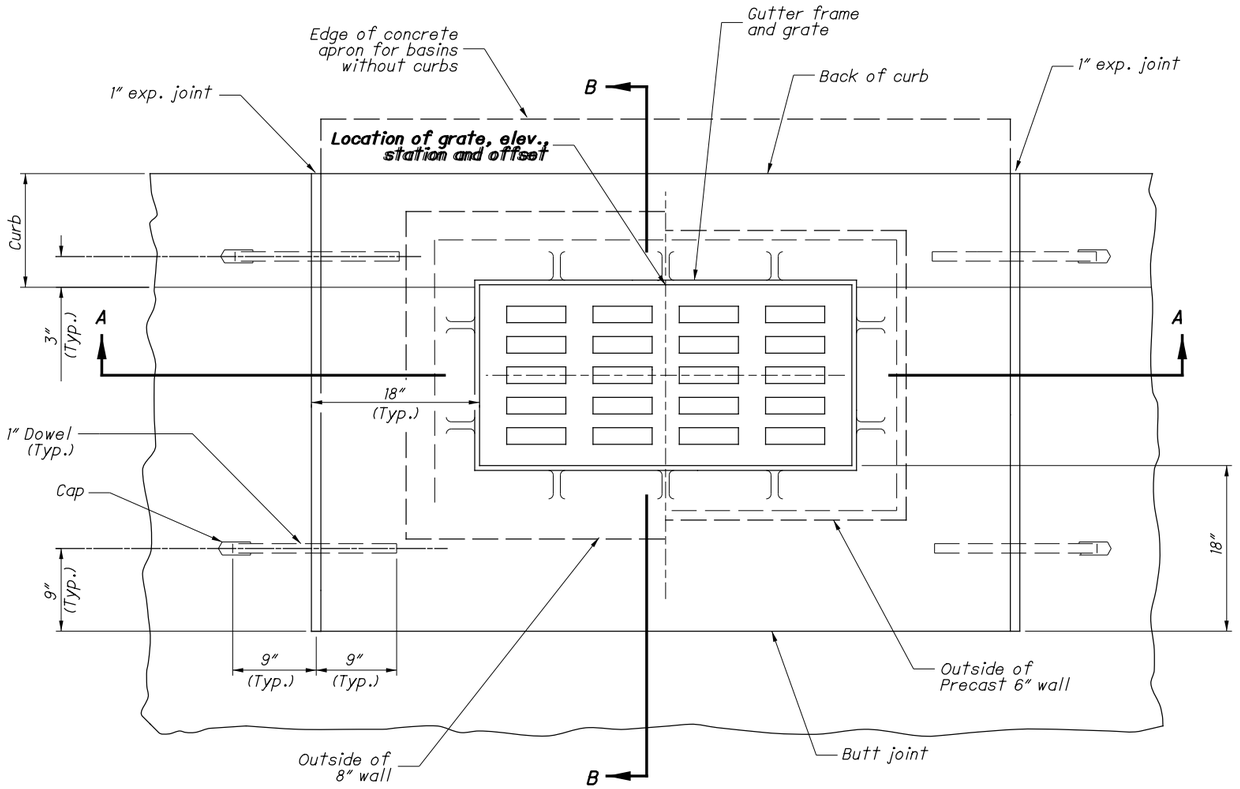
CATCH BASIN No. 3A

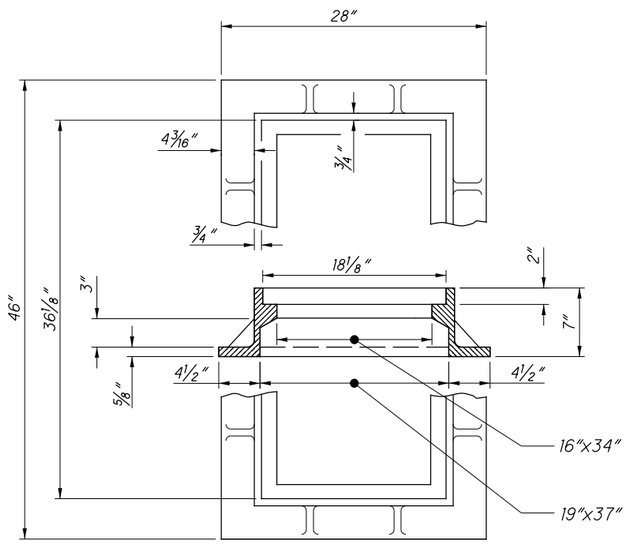
SCD NUMBER
CB-2.2

2 / 2



See Sht. 2/2 for Sections

PLAN OF CATCH BASINS AND PAVEMENT JOINTS



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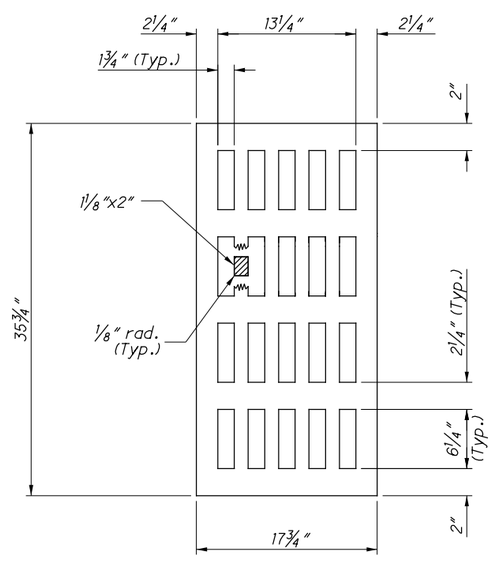

GRATE

NOTES

GRATE AND FRAME: Provide a design essentially the same and equally as strong as the one shown (see construction information table), or meet the requirements of CMS 711.14. Provide grate openings and dimensions as shown here unless otherwise shown in the plans.

Cast the following text into the top of the grate:

"DUMP NO WASTE" and **"DRAINS TO WATERWAY"**

Print text in bold, capital letters at least ½" high. "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

BEARING AREAS: Fit and finish frame and grate to provide a firm and even seat for all portions of the grate in the frame. No projections are permitted on bearing areas of either casting, and the grate must seat in its frame without rocking. Fit, match and mark frame and grate before delivery to the project.

WALLS: Construct brick or cast-in-place walls with a nominal thickness of 8". Provide precast walls at least 6" thick with sufficient reinforcing to permit shipping and handling without damage.

CONCRETE: Use 4000 psi for cast-in-place concrete. Meet the requirements of CMS 706.13 for precast concrete and mark with the catch basin number. Reduce the wall thickness from the outside.

MINIMUM DEPTH: The minimum depth is the outside diameter (O.D.) of the outlet pipe plus 15".

OPENINGS: Ensure pipe openings are the O.D. of the pipe being supplied plus 2" when fabricated or field cut. Fill any voids per C&MS 611.

DOWELS: Furnish four 1"x18" dowels for pavement and curb. See **SCD BP-2.2** for dowel detail.

BLOCKOUT APRONS: Use 4000 psi compressive strength concrete. Cost of apron is not included in catch basin price when located in PCC pavement, and no deduction in normal pavement quantities is made because of blockout. When adjacent paving is asphalt, omit the dowels, and the cost of the concrete apron is included in the catch basin bid price. Cost of curb, if any, is included in CMS 609. For basins without curb, the grate elevation is 1" below the normal pavement slope measured at the center of the grate.

PAYMENT: All materials and labor, including excavation and backfilling, are paid for under **Item 611 - Catch Basin, No. 6.**

CONSTRUCTION INFORMATION
Minimum weight of grate, 210 lbs.
Minimum weight of frame, 265 lbs.

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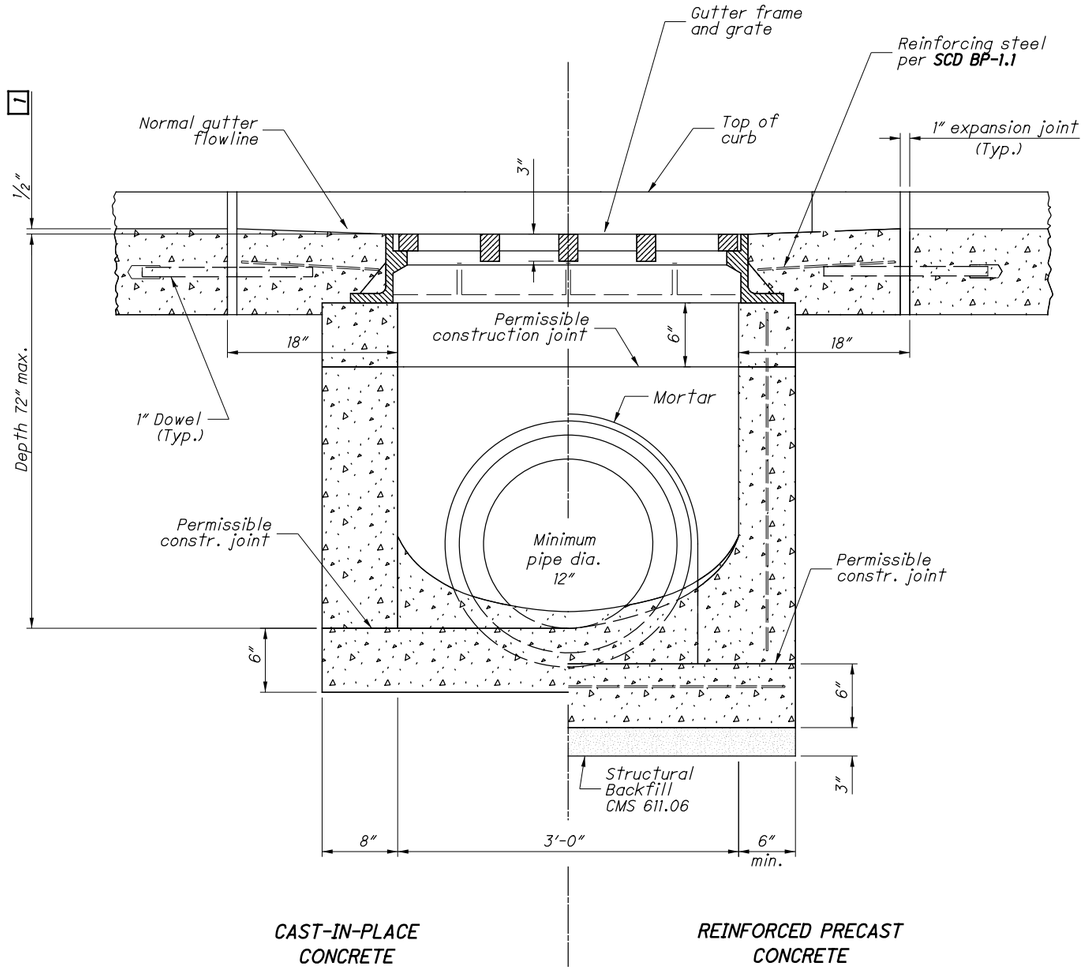
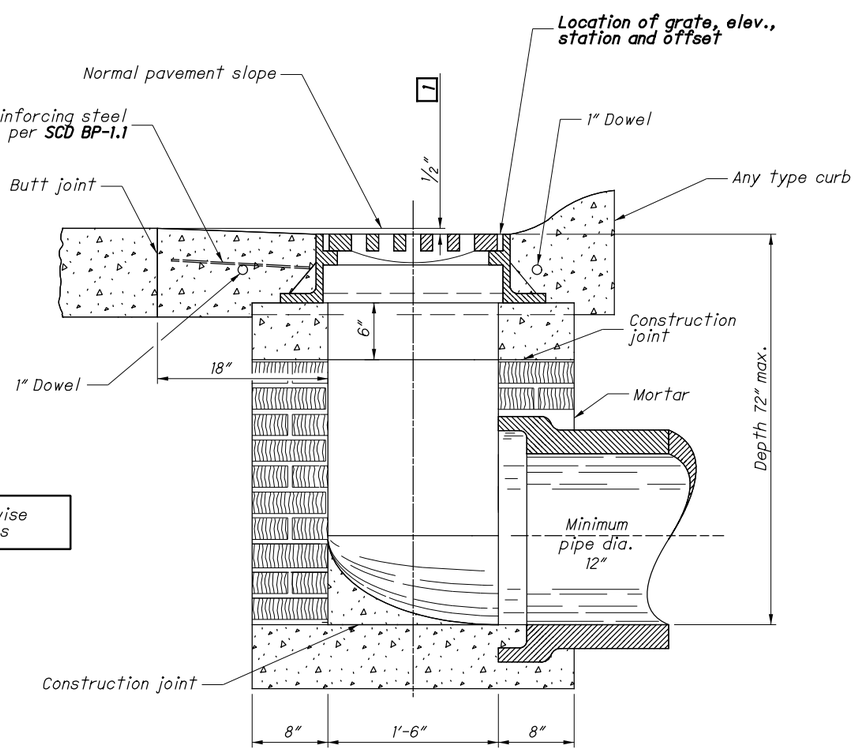


SECTION A-A

(See Sht. 1/2.)

1 Unless otherwise shown on plans



SHOWN WITH BRICK WALLS

SECTION B-B

(See Sht. 1/2.)

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CATCH BASIN No. 6

SCD NUMBER
CB-2.3

GENERAL NOTE:

1. THE STANDARDS SHOWN HEREON ARE TO BE CONSIDERED THE MINIMUM REQUIREMENTS. MODIFICATIONS TO THESE STANDARDS TO BE ONLY AS DIRECTED BY THE ENGINEER.

2. THE UNDERDRAIN REQUIREMENT IS TO BE CONSIDERED THE STANDARD FOR NEW CONSTRUCTION; HOWEVER, THIS REQUIREMENT MAY BE WAIVED BY THE CITY ENGINEER IF SUFFICIENT EVIDENCE IS PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER DOCUMENTING SPECIFIC CONDITIONS THAT WOULD SUPPORT THE ELIMINATION OF THE UNDERDRAIN.

NOTES FOR SIDEWALKS, DRIVE APRONS, CURBS & GUTTER:

1. FLEXIBLE FORMS SHALL BE USED ON ALL CURVES HAVING A RADIUS OF 275' OR LESS UNLESS SLIP FORM METHOD IS USED.

2. CONCRETE SHALL BE ODOT CLASS "QC1". AN APPROVED CURING AGENT SHALL BE APPLIED IMMEDIATELY AFTER FINISHING.

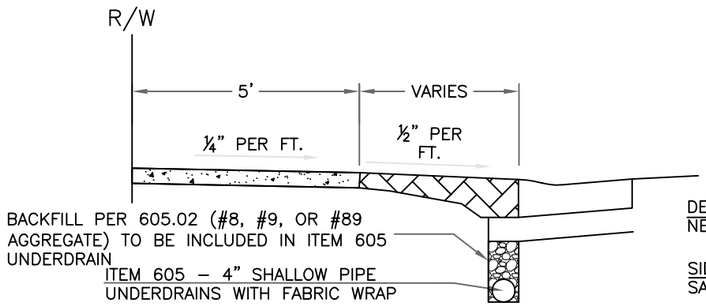
3. ALL JOINTS SHALL BE VERTICAL AND EITHER PERPENDICULAR OR RADIAL TO THE BACK OF CURB.

4. EMBANKMENT BEHIND THE CURB SHALL BE PLACED BEFORE PAVEMENT WORK IS BEGUN.

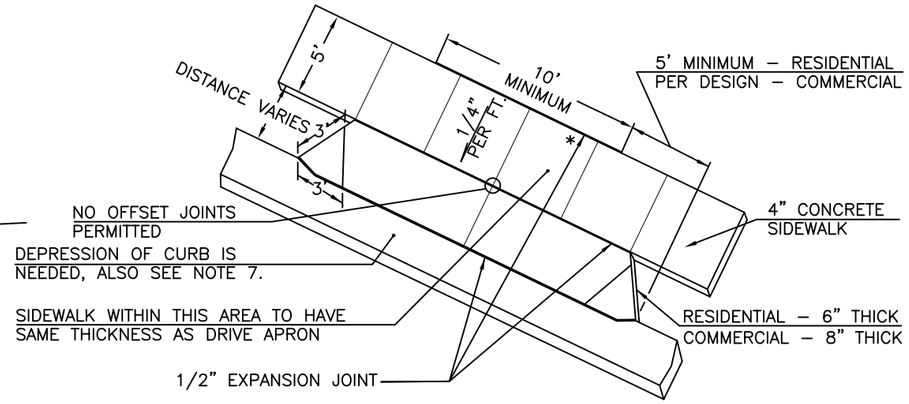
5. DOWELS AND EXPANSION JOINT MATERIAL SHALL BE PLACED AT CATCH BASINS AND COLD JOINTS WHERE NEW CURB ABUTS EXISTING CURB. DOWELS TO BE 18" LONG X ¾" DIAMETER REBAR INSERTED 9" INTO A ¾" DIAMETER HOLE DRILLED INTO THE EXISTING CURB.

6. WIRE MESH IS NOT PERMITTED IN APRONS OR SIDEWALK WITHIN THE RIGHT OF WAY.

7. FOR NEW DRIVE APRONS WITH EXISTING CURB, SAWCUTTING OF THE EXISTING BACK OF CURB MAY BE PERMITTED UNDER SPECIFIC RESTRICTIONS WITH PRIOR APPROVAL FROM THE ENGINEER.

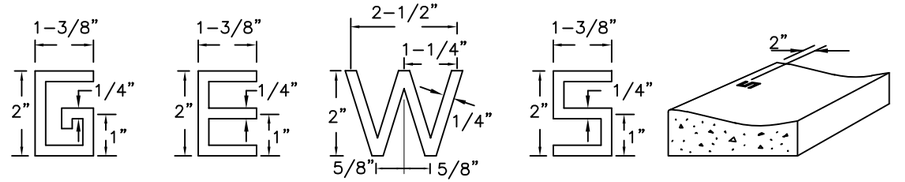


DRIVEWAY STANDARD SECTION



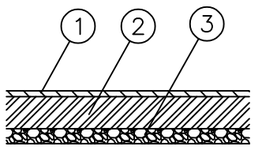
* EXPANSION JOINT MATERIAL NOT REQ'D BETWEEN DRIVEWAY AND SIDEWALK WHEN DRIVEWAY IS NOT CONCRETE

DRIVEWAY DETAIL ISOMETRIC-NO SCALE

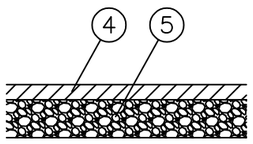


LETTERS TO BE IMPRESSED INTO THE FRESH CONCRETE A DEPTH OF 1/2" DIRECTLY ABOVE POINT WHERE SERVICES CROSS THE CURB.

UTILITY LOCATION DESIGNATION



PERMANENT REPAIR

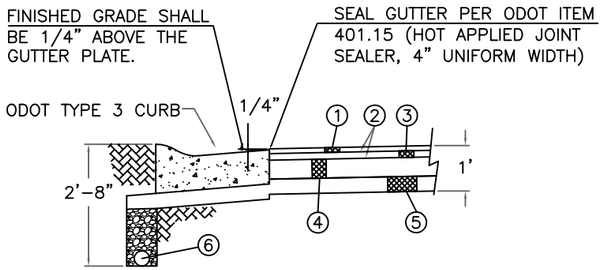


COLD PATCH

1. ITEM 441 – 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE1, (448), PG 64–22
2. ITEM 301 – ASPHALT CONCRETE BASE, PG 64–22 (MATCH EXISTING BASE COURSE OR MINIMUM 4.5" THICKNESS)
3. ITEM 304 – 4" AGGREGATE BASE
4. COLD PATCH – 4" THICKNESS (SEE NOTE BELOW)
5. ITEM 304 – 10" AGGREGATE BASE

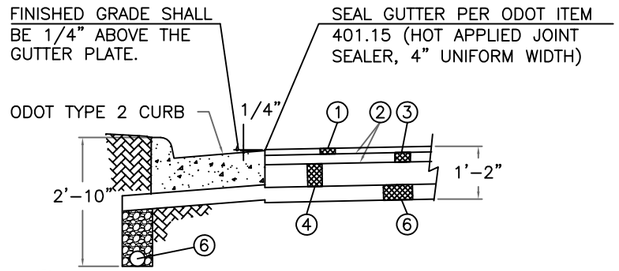
NOTE: WHEN CONDITIONS PROHIBIT PROPER PLACEMENT OF HOT MIX MATERIAL, COLD PATCH SHALL BE USED AND MAINTAINED AS DIRECTED BY THE ENGINEER UNTIL PERMANENT REPAIR CAN BE MADE. ALL PERMANENT REPAIRS SHALL BE MADE PRIOR TO THE FOLLOWING JUNE 1ST.

PAVEMENT PATCH DETAIL



1. ITEM 441 – 1.25" ASPHALT CONCRETE SURFACE COURSE, TYPE1, (448), PG 64–22
2. ITEM 407 – TACK COAT (APPLICATION RATE OF 0.05 TO 0.10 GALLONS/SQUARE YARD)
3. ITEM 441 – 1.75" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
4. ITEM 301 – 5" ASPHALT CONCRETE BASE
5. ITEM 304 – 4" AGGREGATE BASE
6. ITEM 605 – 4" SHALLOW PIPE UNDERDRAINS WITH FABRIC WRAP

LOCAL STREET PAVEMENT SECTION



1. ITEM 441 – 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE1, (448), PG 64–22
2. ITEM 407 – TACK COAT (APPLICATION RATE OF 0.05 TO 0.10 GALLONS/SQUARE YARD)
3. ITEM 441 – 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, (448)
4. ITEM 301 – 6" ASPHALT CONCRETE BASE
5. ITEM 304 – 4" AGGREGATE BASE
6. ITEM 605 – 4" SHALLOW PIPE UNDERDRAINS WITH FABRIC WRAP

ARTERIAL/COLLECTOR STREET PAVEMENT SECTION

DRAWN REN
REVISED 5/1/2019

CITY OF MIDDLETOWN
DIVISION OF ENGINEERING
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ROADWAY STANDARDS

ST 001

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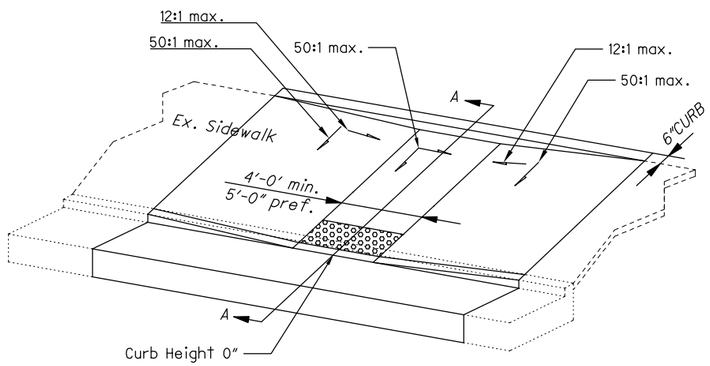
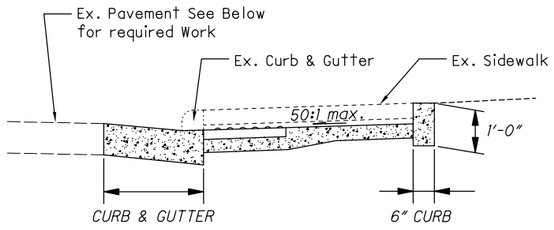
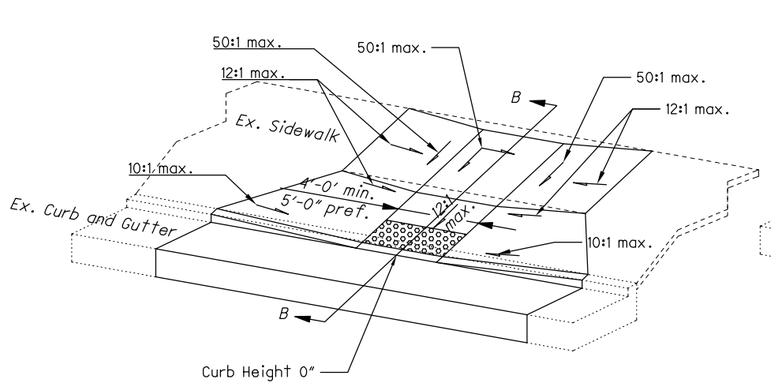
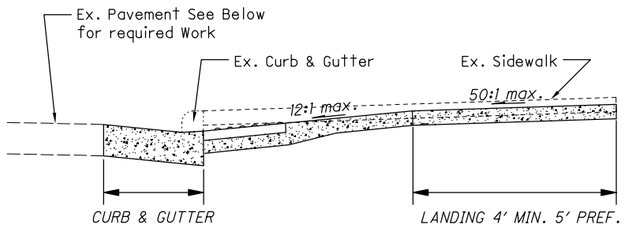




SECTION A-A

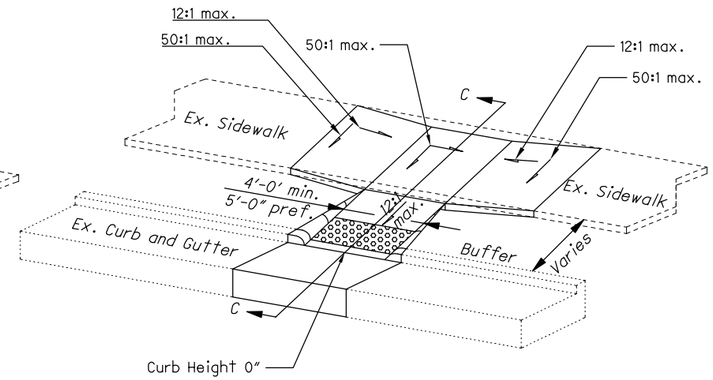
INSERT/RETROFIT TYPE B2
RAMP PER ODOT SCD BP-7.1

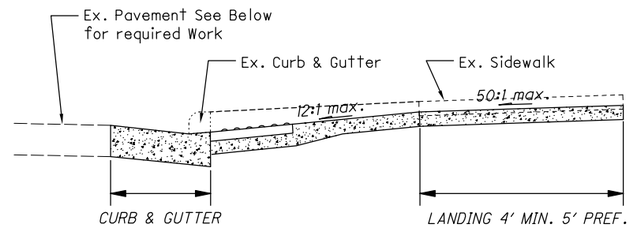




SECTION B-B

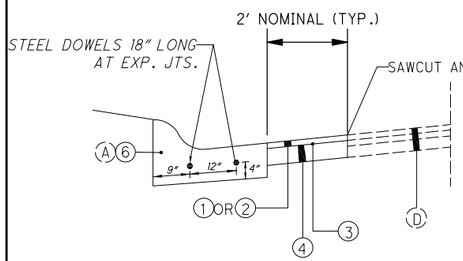
INSERT/RETROFIT TYPE C1
RAMP PER ODOT SCD BP-7.1



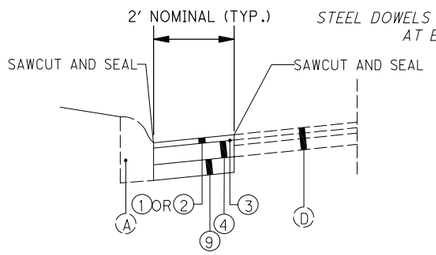


SECTION C-C

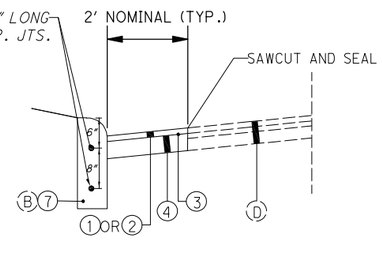
INSERT/RETROFIT TYPE C2
RAMP PER ODOT SCD BP-7.1



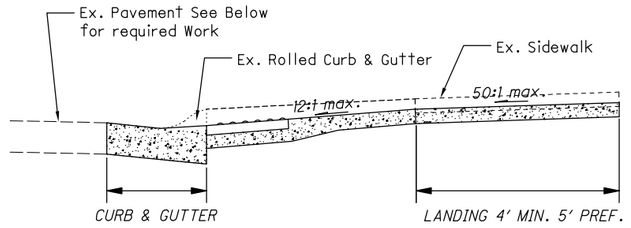
EXISTING CURB AND GUTTER REMOVED AND REPLACED



EXISTING GUTTER PLATE WITH ASPHALT OVERLAY REMOVED AND REPLACED W/ FULL DEPTH PAVEMENT



EXISTING BARRIER CURB REMOVED AND REPLACED

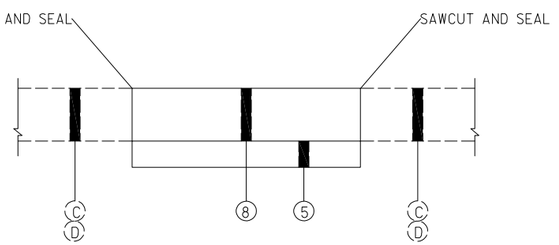


INSERT/RETROFIT RAMP FOR ROLLED CURB AND GUTTER

LEGEND

1. ITEM 441 - 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG 64-22
2. ITEM 441 - 1" ASPHALT CONCRETE SURFACE COURSE, TYPE 1 (448), PG 64-22
3. ITEM 407 - TACK COAT, NON-TRACKING
4. ITEM 301 - 8" ASPHALT CONCRETE BASE, PG64-22
5. ITEM 304 - 4" AGGREGATE BASE
6. ITEM 202 - CURB AND GUTTER REMOVED AND REPLACED. AS PER PLAN
7. ITEM 202 - CURB REMOVED AND REPLACED, AS PER PLAN
8. ITEM 255 - FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS QC1, AS PER PLAN
9. ITEM 304 - VARIABLE THICKNESS AGGREGATE BASE

A. EX. CURB AND GUTTER
B. EX. BARRIER CURB
C. EX. 9" CONCRETE SLAB
D. EX. FULL DEPTH ASPHALT PAVEMENT



ITEM 255 - FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS QC1

DRAWN REN
REVISED 5/27/2022

CITY OF MIDDLETOWN
DIVISION OF ENGINEERING
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RETROFIT CURB RAMPS AND CURB & GUTTER

ST 002

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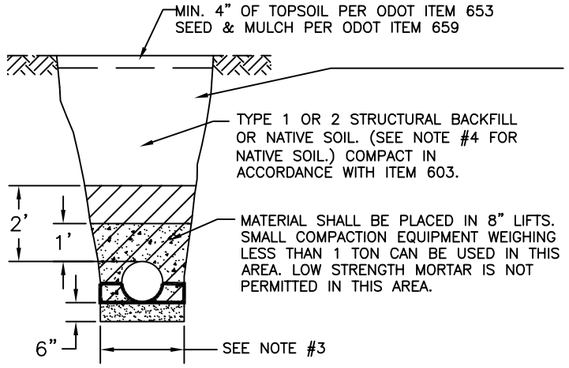
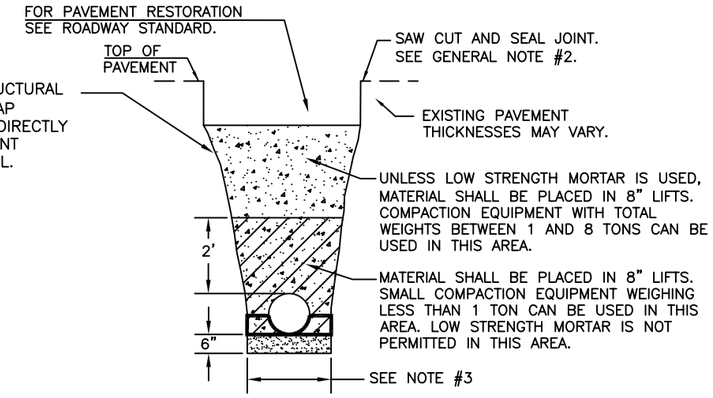


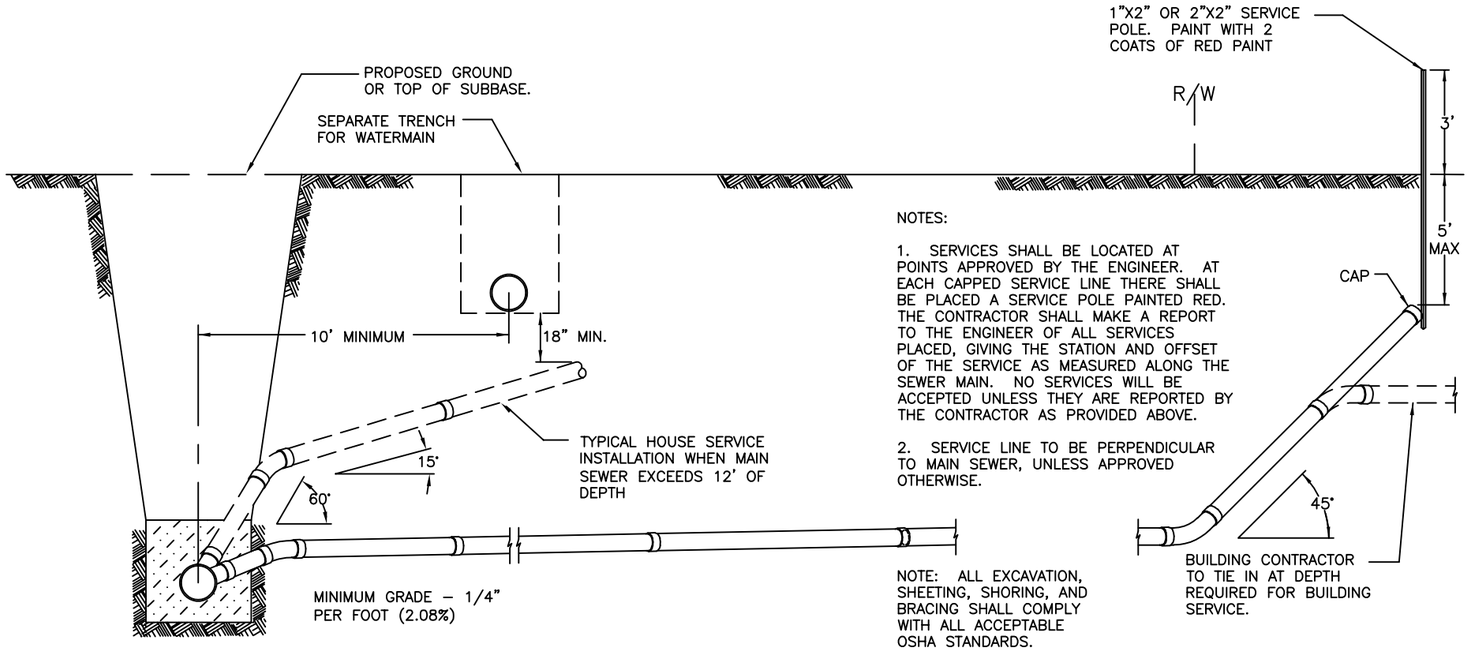
SEWER NOT UNDER PAVEMENT



SEWER UNDER PAVEMENT

LEGEND

- COMPACTED BEDDING, SEE NOTE 7 FOR SEVERE GROUND WATER CONDITIONS.
- SAND (ODOT TYPE 2 STRUCTURAL BACKFILL) OR 304 AGGREGATE BASE (ODOT TYPE 1 STRUCTURAL BACKFILL) OR LOW STRENGTH MORTAR (PER ODOT ITEM 613 TYPE 2)
- CRITICAL AREAS OF COMPACTION – HAND TAMPING, SHOVEL SLICING, ETC. SEE NOTE 8.
- COMPACTION EQUIPMENT WEIGHING LESS THAN 1 TON TO BE USED IN THIS AREA.



NOTES:

1. SERVICES SHALL BE LOCATED AT POINTS APPROVED BY THE ENGINEER. AT EACH CAPPED SERVICE LINE THERE SHALL BE PLACED A SERVICE POLE PAINTED RED. THE CONTRACTOR SHALL MAKE A REPORT TO THE ENGINEER OF ALL SERVICES PLACED, GIVING THE STATION AND OFFSET OF THE SERVICE AS MEASURED ALONG THE SEWER MAIN. NO SERVICES WILL BE ACCEPTED UNLESS THEY ARE REPORTED BY THE CONTRACTOR AS PROVIDED ABOVE.

2. SERVICE LINE TO BE PERPENDICULAR TO MAIN SEWER, UNLESS APPROVED OTHERWISE.

NOTE: ALL EXCAVATION, SHEETING, SHORING, AND BRACING SHALL COMPLY WITH ALL ACCEPTABLE OSHA STANDARDS.

SERVICE LINE DETAILS

NOTES

1. ALL WORK SHALL COMPLY WITH ITEM 611, CURRENT EDITION. OTHERWISE WORK SHALL COMPLY WITH 2010 EDITION ITEM 603. AND THESE STANDARDS.

2. SAW CUT EXISTING ASPHALT AFTER PAVEMENT RESTORATION ODOT ITEM 705.04 HOT APPLIED JOINT SEALER SHALL BE USED TO SEAL PAVEMENT JOINT.

3. TRENCH WIDTH SHALL BE THE DIAMETER OF THE PIPE PLUS TWICE THE WIDTH OF THE HAND COMPACTION EQUIPMENT TO BE USED. NO HOE MOUNTED EQUIPMENT WILL BE ALLOWED WITHIN 2 FEET OF THE TOP OF PIPE.

4. NATIVE SOIL TO BE USED AS BACKFILL SHALL MEET THE REQUIREMENTS OF ODOT ITEM 203 EMBANKMENT; HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS AND COMPACTION TESTING. TEST RESULTS SHALL BE SUBMITTED TO THE CITY ENGINEER. NATIVE SOIL SHALL NOT CONTAIN FROZEN LUMPS, JUNK, DEBRIS, ORGANIC PEAT, LARGE ROCKS, NOR BE HIGHLY SATURATED WITH WATER.

5. WHEN CONDITIONS PROHIBIT PROPER PLACEMENT OF HOT MIX MATERIAL, COLD PATCH SHALL BE USED AND MAINTAINED AS DIRECTED BY THE ENGINEER UNTIL PERMANENT REPAIR CAN BE MADE. ALL PERMANENT REPAIRS SHALL BE MADE PRIOR TO THE FOLLOWING JUNE 1ST.

6. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH THE OMUTCD.

7. TYPE 3 STRUCTURAL BACKFILL (CRUSHED #57's) MAY BE USED AS BEDDING BACKFILL ONLY IF WRAPPED IN GEOTEXTILE FABRIC, TYPE A, TO PREVENT MIGRATION OF FINES FROM ADJACENT SOILS.

8. MATERIAL TO BE PLACED FROM BEDDING UP TO 1/3 OF THE RISE OF THE CONDUIT IN LIFTS NOT TO EXCEED 8" FOR CONDUIT GREATER THAN 24" RISE.

9. MINIMUM COVER SHALL BE 2'. MAXIMUM COVER SHALL BE CONSIDERED ON A CASE BY CASE BASES.

10. MINIMUM PIPE SIZE FOR SERVICES – 6", FOR MAIN LINES – 8".

11. SERVICE LINES SHALL BE OF EXTRA STRENGTH, SOLID WALL SDR 35 PVC OR ABS PIPE, AS PER ASTM D–2751.

12. SANITARY MAIN LINES SHALL BE TRUSS PIPE, SOLVENT WELD, AS MANUFACTURED BY CONTECH ENGINEERING SOLUTIONS.

13. ALL JOINTS SHALL BE CHEMICALLY BONDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, TO FORM A CONTINUOUS FLEXIBLE PIPE. GASKETED JOINTS MAY BE USED IN SPECIFIC CASES IF PRIOR APPROVAL IS GRANTED.

14. SUMP DRAIN LINES SHALL BE 6" SOLID WALL PIPE (SDR 35) AND SHALL HAVE CLEAN–OUTS SPACED AT 150' INTERVALS, OR AS REQUIRED FOR BENDS.

DRAWN REN
REVISED 8/13/2019

CITY OF MIDDLETOWN
DIVISION OF ENGINEERING
ROBERT E. NICOLLS, P.E.

SANITARY AND STORM SEWER STANDARDS

ST 003

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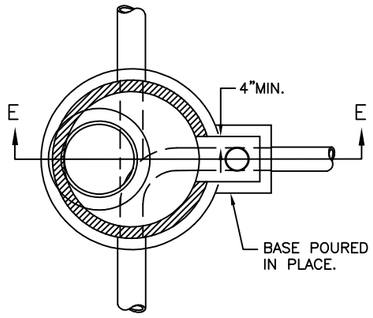
NOTES FOR OUTSIDE DROP MANHOLE

1. DROP TO BE INSTALLED IN SANITARY SEWERS WHERE THE DIFFERENCE IN GRADE IN ELEVATIONS BETWEEN THE PIPE INVERTS EXCEEDS 2 FEET.

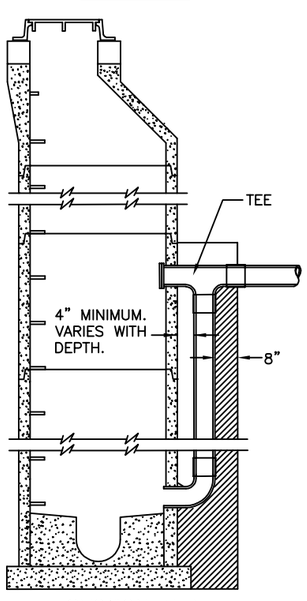
2. THE SERVICE DROP SHALL BE CONSTRUCTED IN ONE OF FOLLOWING MANNERS:
   A) FORMED CLASS "C" CONCRETE
   B) APPROVED PRE-CAST DROP SECTIONS AND BASE

3. THE CONCRETE BASE POURED IN PLACE SHALL EXTEND A MINIMUM OF 4" BEYOND THE EXTREMITIES OF THE DROP SECTION.

4. HOLE FOR CLEANOUT PIPE ENTRANCE SHALL BE MADE WITH A CORE TYPE DRILL.

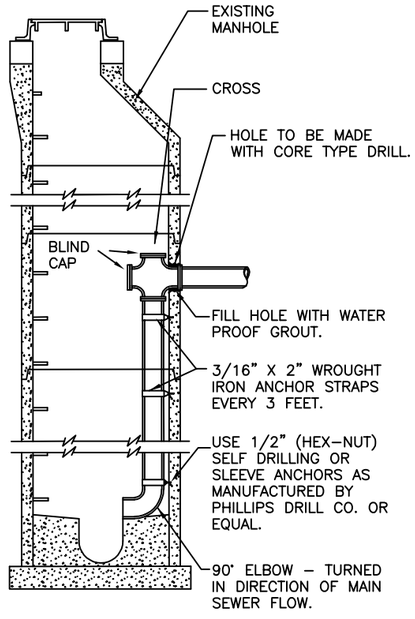


PLAN VIEW

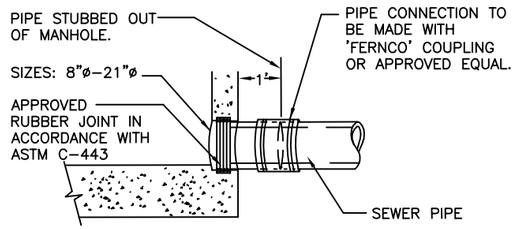


SECTION E-E

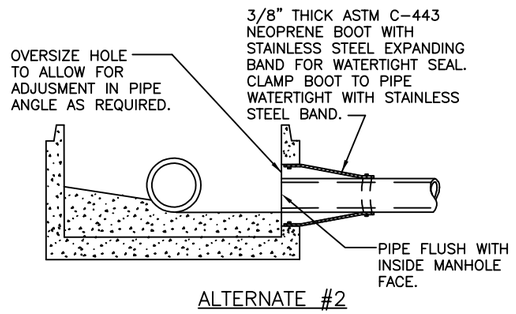
SEWER DROP OUTSIDE MANHOLE



SEWER DROP INSIDE MANHOLE



ALTERNATE #1



ALTERNATE #2

PIPE CONNECTION DETAILS

GENERAL NOTES FOR ALL MANHOLES

1. PROVIDE MANHOLES PER ODOT STANDARD CONSTRUCTION DRAWINGS.

2. MANHOLE BASES THAT ARE POURED IN PLACE SHALL BE CONSTRUCTED OF ODOT CLASS "C" CONCRETE AND SHALL EXTEND 4" BEYOND THE MANHOLE WALLS. THE MANHOLE BASE IS TO BE REINFORCED IF MANHOLE DEPTH EXCEEDS 14'.

3. MANHOLE FRAME TO BE SET IN BED OF MORTAR.

4. SLAB TOP MANHOLE TO BE USED WHEN THE DISTANCE FROM TOP OF THE OUTLET PIPE TO FINISHED GRADE IS LESS THAN 6'-0".

5. THE DEPTH OF A MANHOLE IS MEASURED FROM THE TOP OF CASTING TO THE FLOW LINE OF THE SEWER.

6. SANITARY SEWER MANHOLES TO BE PRECAST CONCRETE ONLY.

7. ALL PARTS OF PRECAST CONCRETE MANHOLES, (I.E. BASE SECTION, BARREL SECTION, CONE, AND SLAB TOPS) SHALL MEET THE REQUIREMENTS OF ASTM C-478.

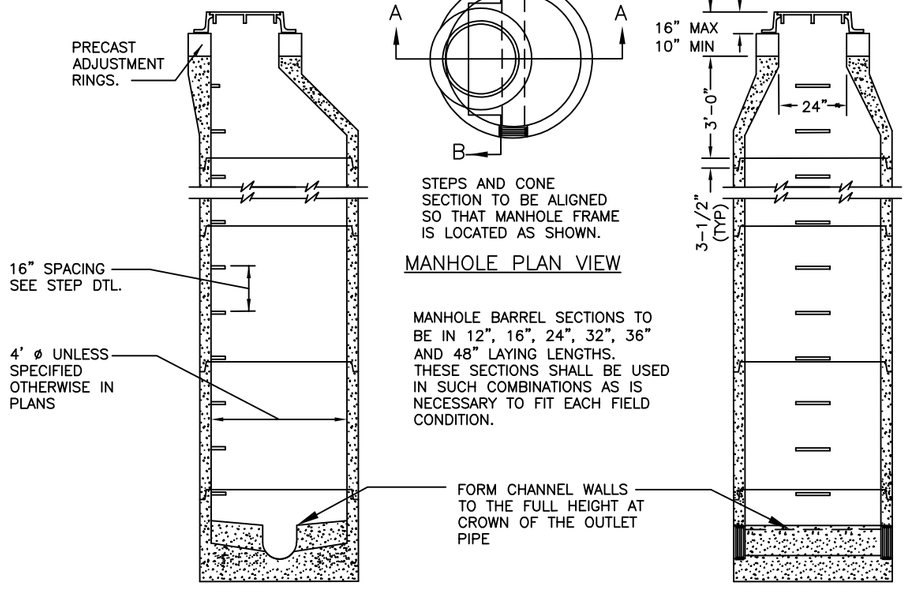
8. SANITARY SEWER MANHOLE JOINTS FOR PRECAST CONCRETE SECTIONS SHALL BE O-RING TYPE GASKETS MEETING THE SPECIFICATIONS OF ASTM C-443.

9. ALL MASONRY CONSTRUCTION OF MANHOLES SHALL HAVE 1/2" CEMENT MORTAR PLASTER ON EXTERIOR WALLS.

10. NEENAH R1767 FRAME AND LID OR APPROVED EQUAL. LETTERING ON LID TO BE SIMILAR TO THAT SHOWN ON NEENAH R1664-A LID, WITH WORDS "SEWER", "WATER", OR "STORM".

11. THE FLOW CHANNEL STRAIGHT THROUGH A MANHOLE SHOULD BE MADE TO CONFORM AS CLOSELY AS POSSIBLE IN SHAPE AND SLOPE TO THAT OF THE CONNECTING SEWERS. THE CHANNEL WALLS SHOULD BE FORMED OR SHAPED TO THE FULL HEIGHT OF THE CROWN OF THE OUTLET SEWER IN SUCH A MANNER AS TO NOT OBSTRUCT MAINTENANCE, INSPECTION, OR FLOW IN THE SEWERS. WHEN CURVED FLOW CHANNELS ARE SPECIFIED IN MANHOLES, INCLUDING BRANCH INLETS, THE MINIMUM SLOPES SHOULD BE INCREASED TO MAINTAIN ACCEPTABLE VELOCITIES.

12. A BENCH SHALL BE PROVIDED ON EACH SIDE OF ANY MANHOLE CHANNEL WHEN THE PIPE DIAMETER(S) ARE LESS THAN THE MANHOLE DIAMETER. THE BENCH SHOULD BE SLOPED NO LESS THAN $\frac{1}{2}$ INCH PER FOOT (4 PERCENT). NO LATERAL SEWER, SERVICE CONNECTION, OR DROP MANHOLE PIPE SHALL DISCHARGE ONTO THE SURFACE OF THE BENCH.



SECTION A-A

MANHOLE PLAN VIEW

SECTION B-B

PRECAST CONCRETE MANHOLE

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REVISED 8/13/2019

CITY OF MIDDLETOWN
DIVISION OF ENGINEERING
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SANITARY AND STORM SEWER STANDARDS

ST 004

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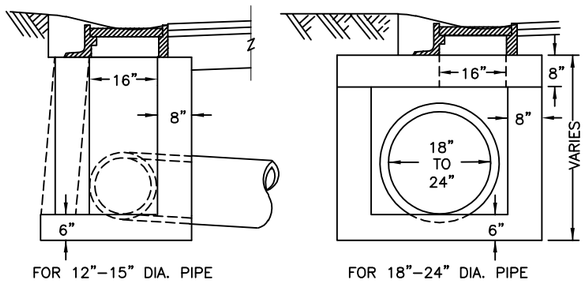


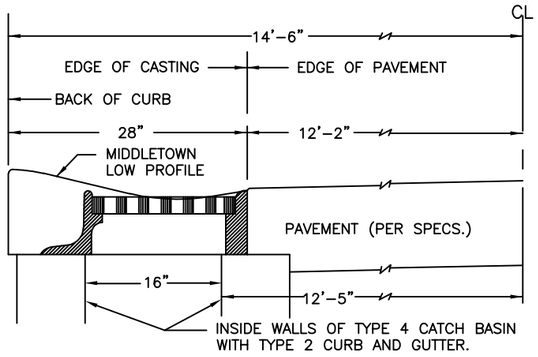
FOR 12"–15" DIA. PIPE

TYPE 4 STANDARD
(SG OR DG)

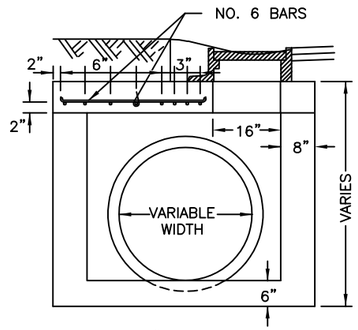
FOR 18"–24" DIA. PIPE

TYPE 4 MODIFIED
(SG OR DG)

NO CURB OPENING
SINGLE GRATE – LIGHT GRADES (LESS THAN 3%)
DOUBLE GRATE – STEEPER GRADES (GREATER THAN 3% AND AT SAGS).

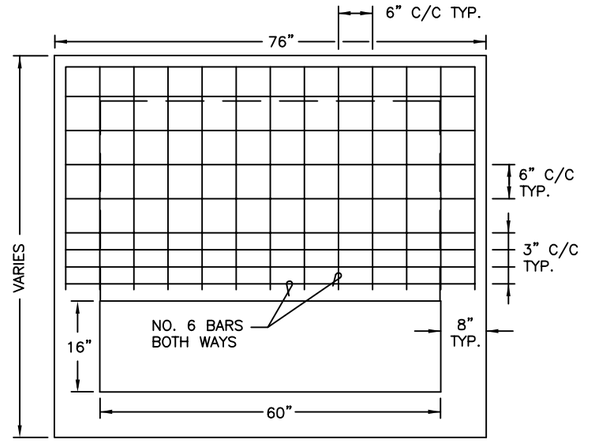


PLACEMENT ON LOCAL STREET



FOR 24"+ DIA. PIPE

TYPE 4 SPECIAL
(DG)



27"–36" PIPE: USE NO. 6 BARS ONE WAY (PARALLEL TO GRATE).
42"–54" PIPE: USE NO. 6 BARS BOTH WAYS AS SHOWN
OVER 54" PIPE: BY DESIGN

MIDDLETOWN TYPE 4–SPECIAL (DOUBLE GRATE) WITH 60"X16" INSIDE OPENING AND VARIABLE WIDTH WITH REINFORCED SLAB TOP AND 8" WALLS

DOUBLE GRATE – SPECIAL CB –
SLAB TOP DETAIL

GENERAL NOTES FOR STORM SEWERS:

1. BOTTOM OF CATCH BASIN TO HAVE 6" MINIMUM THICKNESS AND TO BE CONSTRUCTED OF ODOT CLASS "C" CONCRETE.

2. BRICK, CONCRETE BLOCK, OR CAST–IN–PLACE WALLS SHALL HAVE A MINIMUM THICKNESS OF 8 INCHES. PRE–CAST WALLS SHALL HAVE A MINIMUM THICKNESS OF 6" AND REINFORCING SHALL BE SUFFICIENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

3. BASIN FOUNDATION IN STABLE SOIL SHALL CONSIST OF A CONCRETE BRICK SET TO GRADE UNDER EACH CORNER, PLUS TAMPED SOIL SCREEDED TO THE GRADE OF THESE BRICKS UNDER THE ENTIRE BASIN FLOOR.

4. BASIN FOUNDATION IN UNSTABLE SOIL SHALL CONSIST OF A 6 INCH THICK ODOT CLASS "C" CONCRETE SLAB, SET TO GRADE, EXTENDING 4" BEYOND ALL OUTSIDE WALLS.

5. NON–REINFORCED SLAB TOPS ARE PERMITTED ON TYPE "4"–SPECIAL CATCH BASINS WITH CONDUIT UP TO 24 INCH DIAMETER (SEE NOTES FOR REBAR PLACEMENT IN LARGER TOPS). ALL SLAB TOPS TO BE CONSTRUCTED OF ODOT CLASS "C" CONCRETE WITH A MINIMUM THICKNESS OF 8 INCHES.

6. SPECIFY NEENAH GRATE TYPE R–3462–B(SG) OR R–3463–B(DG), OR APPROVED EQUAL FRAME AND GRATE.

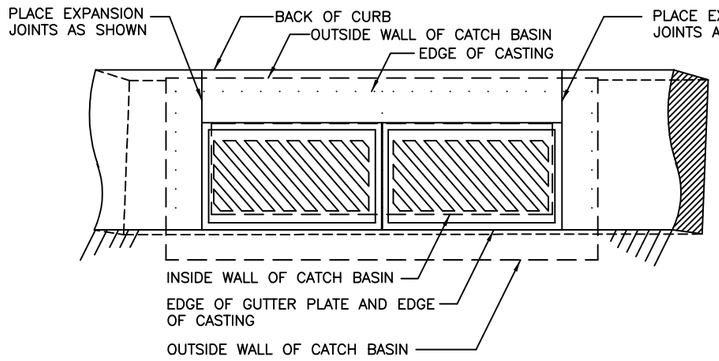
7. STEPS SHALL BE PROVIDED WHERE SHOWN IN THE STANDARD MANHOLE DETAIL WHEN THE CATCH BASIN DEPTH EXCEEDS 60".

8. MAXIMUM CATCH BASIN DEPTH IS 84 INCHES.

9. THE FOLLOWING NOTE SHALL BE ON EACH CATCH BASIN GRATE:

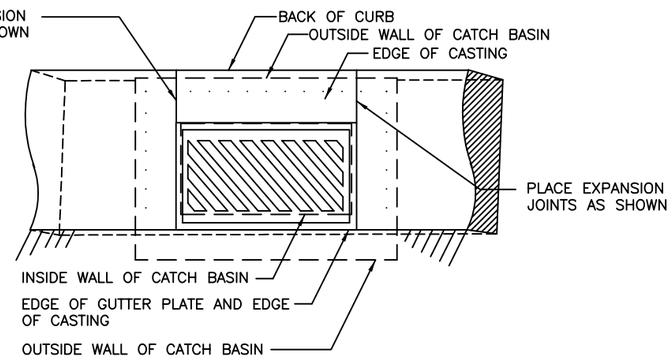
"NO DUMPING – DRAINS TO RIVER"

THE PLACE OF DRAINAGE SHALL BE SPECIFIED IN THE PLANS BY THE ENGINEER.



MIDDLETOWN TYPE 4 – STANDARD (DOUBLE GRATE) WITH 60"X16" INSIDE DIMENSIONS AND 8" THICK WALLS.

PLAN VIEW – DOUBLE GRATE INLET



MIDDLETOWN TYPE 4 – STANDARD (SINGLE GRATE) WITH 30"X16" INSIDE DIMENSIONS AND 8" THICK WALLS.

PLAN VIEW – SINGLE GRATE INLET

AS OF JUNE 2008, THIS DRAWING TO BE USED FOR INFORMATIONAL USE OR RETROFIT PROJECTS ONLY. ODOT STANDARD BASINS TO BE SPECIFIED FOR NEW CONSTRUCTION AND RETROFITS WHERE FEASIBLE.

DRAWN REN
REVISED 8/13/2019

CITY OF MIDDLETOWN
DIVISION OF ENGINEERING
ROBERT E. NICOLLS, P.E.

SANITARY AND STORM SEWER STANDARDS

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GENERAL NOTES FOR WATER MAINS

DUCTILE IRON WATER MAINS

1. DUCTILE IRON PIPE SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST REVISION OF ANSI/AWWA C150/A21.50 FOR A MINIMUM 350 PSI, TYPE 2 LAYING CONDITION AND A DEPTH OF COVER OF 4 FEET.

2. DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF ANSI/AWWA C151/A21.51.

3. PIPE SHALL HAVE STANDARD ASPHALTIC COATING ON THE EXTERIOR. PIPE SHALL ALSO HAVE A CEMENT MORTAR LINING ON THE INTERIOR IN ACCORDANCE WITH ANSI/AWWA C104/A21.4, OF LATEST REVISION.

4. THE PRESSURE CLASS OR NOMINAL THICKNESS, NET WEIGHT WITHOUT LINING, AND CASTING PERIOD SHALL BE CLEARLY MARKED ON EACH LENGTH OF PIPE. ADDITIONALLY, THE MANUFACTURER'S MARK, YEAR IN WHICH THE PIPE WAS PRODUCED, AND THE LETTERS "DI" OR "DUCTILE IRON" SHALL BE CAST OR STAMPED ON THE PIPE.

5. ALL PIPE SHALL BE FURNISHED WITH PUSH-ON TYPE JOINTS, SUCH AS "TYTON" OR "FASTITE". JOINTS SHALL BE IN ACCORDANCE WITH ANSI/AWWA C111/A21.11, OF LATEST REVISION, AND BE FURNISHED COMPLETE WITH ALL NECESSARY ACCESSORIES.

6. FITTINGS SHALL BE EITHER DUCTILE IRON OR GRAY IRON. DUCTILE IRON FITTINGS SHALL CONFORM TO THE LATEST REVISIONS OF EITHER ANSI/AWWA C110/A21.10 OR ANSI/AWWA C153/A21.53. GRAY IRON FITTINGS SHALL BE IN ACCORDANCE WITH ANSI/AWWA C110/A21.10, OF LATEST REVISION. FITTINGS SHALL HAVE A STANDARD ASPHALTIC COATING ON THE EXTERIOR. FITTINGS SHALL ALSO HAVE A CEMENT MORTAR LINING ON THE INTERIOR IN ACCORDANCE WITH ANSI/AWWA C104/A21.4, OF LATEST REVISION.

7. FITTINGS AND ACCESSORIES SHALL BE FURNISHED WITH EITHER MECHANICAL OR PUSH-ON TYPE JOINTS IN ACCORDANCE WITH ANSI/AWWA C111/A21.11, OF LATEST REVISION.

8. COST OF ALL RESTRAINED JOINTS, INCLUDING THE COST OF RETROFITTING RESTRAINED JOINTS ON EXISTING MAIN AS NECESSARY FOR NEW BENDS, VALVES, ETC, AND THE COST OF ALL THRUST BLOCKS, IS TO BE INCLUDED IN THE UNIT PRICE OF THE WATER MAIN.

HYDROSTATIC TESTINGS

1. ALL WORK, INCLUDING INSTALLATION OF ALL TAPS AND PURITY TEST STATIONS, MUST BE COMPLETED PRIOR TO HYDROSTATIC TESTING. OPERATION OF ALL VALVES SHALL BE MADE BY CITY PERSONNEL ONLY.

2. ALL PIPE, FITTINGS, AND ACCESSORIES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH THE LATEST REVISION OF AWWA STANDARD C900. NEWLY INSTALLED DUCTILE IRON AND PLASTIC WATER MAIN SHALL BE DISINFECTED IN ACCORDANCE WITH THE CITY OF MIDDLETOWN WATER AND SEWER RULES AND REGULATIONS.

MAXIMUM PIPE DEFLECTIONS

MAXIMUM PIPE DEFLECTIONS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

CURB STOP

1. CURB STOPS SHALL BE CAST BRASS OR BRONZE FITTED TO RECEIVE COPPER TUBING. THEY SHALL BE OF THE INVERTED KEY TYPE WITH THE FOLLOWING FEATURES:
   (1) GALVANIZED MALLEABLE IRON HANDLE
   (2) ROUND WAY
   (3) GROUND KEY STOPS SET FOR QUARTER TURN TO GIVE FULL OPENING.

2. CURB STOPS SHALL BE MUELLER TYPE H-15200, MUELLER-MARK II 'ORISEAL', FORD 'BALL VALVE', OR APPROVED EQUAL FOR SIZES RANGING FROM 3/4" TO 2".

WATER SERVICE BOX

1. WATER SERVICE BOXES SHALL BE OF THE BEST QUALITY GRAY CAST IRON, BITUMINOUS COATED, AND IN THE BUFFALO PATTERN WITH 2-1/2" DIAMETER SHAFT, ADJUSTABLE FROM 3' TO 4' COVER. THE LID SHALL BE MARKED "WATER" AND SECURED TO THE SHAFT WITH A BRASS OR BRONZE BOLT. THE FOOTPLATE SHALL FIT OVER THE CURB STOP. WATER SERVICE BOXES OF THIS TYPE SHALL BE MUELLER TYPE H-10350, SIZE 93-D, OR APPROVED EQUAL.

ROADWAY VALVE BOX

ROADWAY VALVE BOXES SHALL BE OF THE BEST QUALITY GRAY CAST IRON, BITUMINOUS COATED AND FURNISHED WITH A 5-1/4" DIAM. SHAFT, ADJUSTABLE FROM 4' TO 5'. THE COVER SHALL BE OF THE DROP TYPE WITH THE WORD "WATER" CAST INTO THE TOP. ROADWAY VALVE BOXES SHALL BE CLOW TYPE F-2450 OR APPROVED EQUAL, WITH THE BASE SECTIONS AS FOLLOWS:

6" AND 8" VALVES.....CLOW TYPE F-2465
10" AND LARGER VALVES.....CLOW TYPE F-2434
4" AND SMALLER VALVES.....CLOW TYPE F-2480

CORPORATION STOP

CORPORATION STOPS SHALL BE CAST BRASS OR BRONZE WITH MUELLER THREAD INSERTED INTO THE WATER MAIN. THE OUTLET SHALL BE FITTED TO RECEIVE COPPER TUBING. CORPORATION STOPS SHALL BE MUELLER TYPE H-15000 OR APPROVED EQUAL FOR SIZES RANGING FROM 3/4" TO 2".

WATER METER BOX (REPLACEMENT OF EXISTING ONLY)

WATER METER BOXES SHALL BE OF THE BEST QUALITY GRAY CAST IRON, BITUMINOUS COATED, AND PROVIDED WITH A DOUBLE LID TO PROTECT AGAINST FREEZING. WATER METER BOXES SHALL BE MUELLER MODEL H-10813, OR APPROVED EQUAL.

METER SETTING YOKES (REPLACEMENT OF EXISTING ONLY)

METER SETTING YOKES SHALL BE COPPER WITH VERTICAL INLET AND OUTLET CONNECTIONS SUCH AS MUELLER MODEL H-14062, OR APPROVED EQUAL.

TEMPORARY FIRE HYDRANT

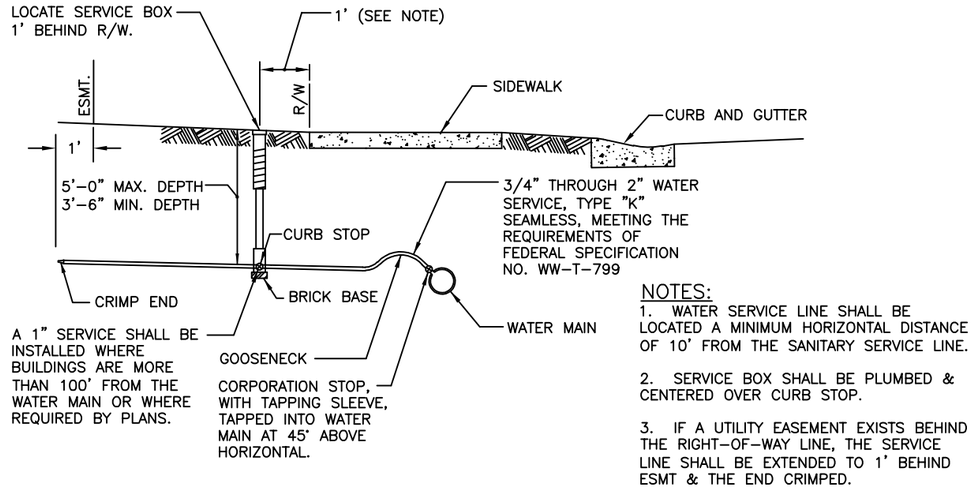
A TEMPORARY FIRE HYDRANT WILL BE REQUIRED AT THE END OF ANY WATERMAIN TO BE EXTENDED IN THE FUTURE.

PIPE SADDLE

PIPE SADDLES SHALL BE CLOW F-1280 OR APPROVED EQUAL. SERVICE TAPS GREATER THAN 2" SHALL REQUIRE TAPPING SLEEVE AND VALVE, CLOW F-5093 OR APPROVED EQUAL.

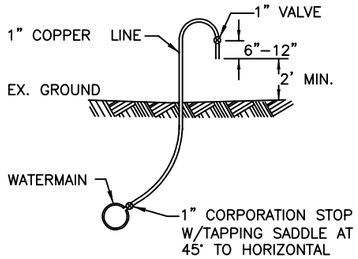
FIRE HYDRANT

ALL FIRE HYDRANTS SHALL BE NATIONAL STANDARD.



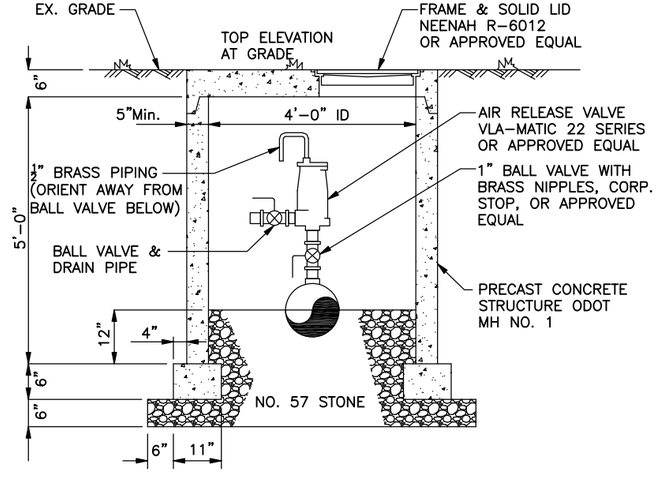
NOTES:
1. WATER SERVICE LINE SHALL BE LOCATED A MINIMUM HORIZONTAL DISTANCE OF 10' FROM THE SANITARY SERVICE LINE.
2. SERVICE BOX SHALL BE PLUMBED & CENTERED OVER CURB STOP.
3. IF A UTILITY EASEMENT EXISTS BEHIND THE RIGHT-OF-WAY LINE, THE SERVICE LINE SHALL BE EXTENDED TO 1' BEHIND ESMT & THE END CRIMPED.

WATER SERVICE BOX IN SIDEWALK
WATER SERVICE INSTALLATION DETAIL



PROVIDE A 1" CORPORATION STOP, 1" COPPER LINE, AND A 1" VALVE OR CURB STOP AT LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS, OR AS DIRECTED BY THE ENGINEER, FOR PURITY TESTING PURPOSES. THE 1" COPPER LINE SHALL EXTEND FROM THE CORPORATION STOP INSTALLED ON THE MAIN, UPWARD TO A BEND AT AN ELEVATION HIGH ENOUGH TO ALLOW THE VALVE OR CURB STOP TO BE ON THE DOWNWARD SWEEP OF THE BEND. THERE SHALL BE A SHORT SECTION OF COPPER LINE (6" MIN. – 12" MAX.) ON THE OUTLET END OF THE VALVE OR CURB STOP. THE END OF THE COPPER LINE SHALL BE A MINIMUM OF TWO FEET ABOVE EXISTING GROUND. PROVISIONS SHALL BE MADE BY THE CONTRACTOR TO FLUSH CHLORINE FROM THE NEW INSTALLATION AT LINE CAPACITY.

PURITY TESTING



AIR RELEASE VALVE STRUCTURE

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WATER MAIN & APPURTENANCES STANDARDS

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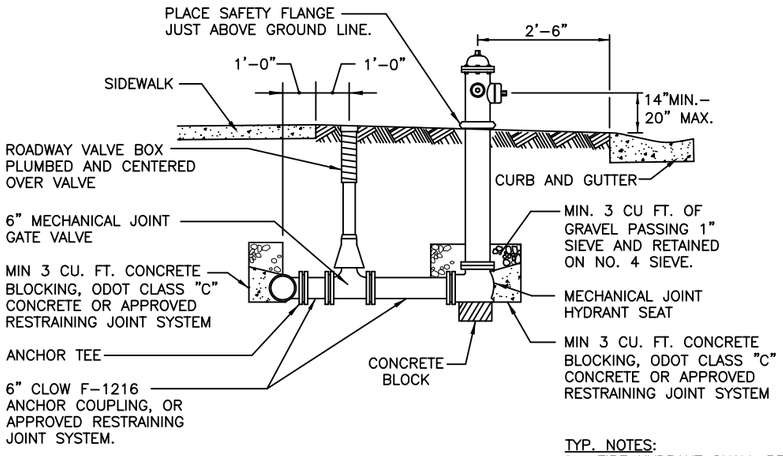
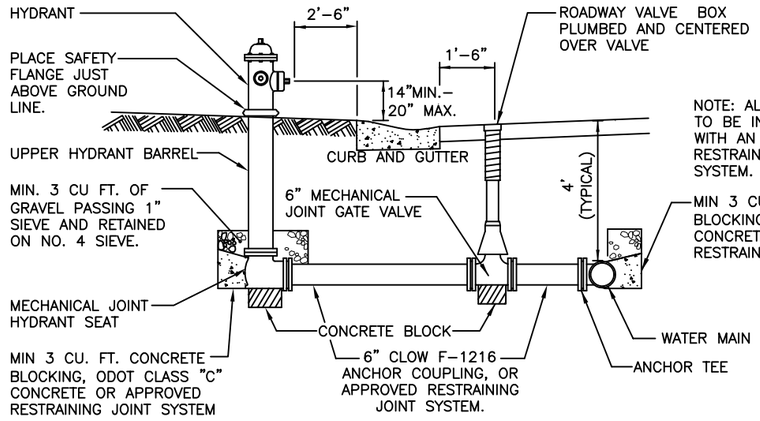


WATER MAIN UNDER SIDEWALK



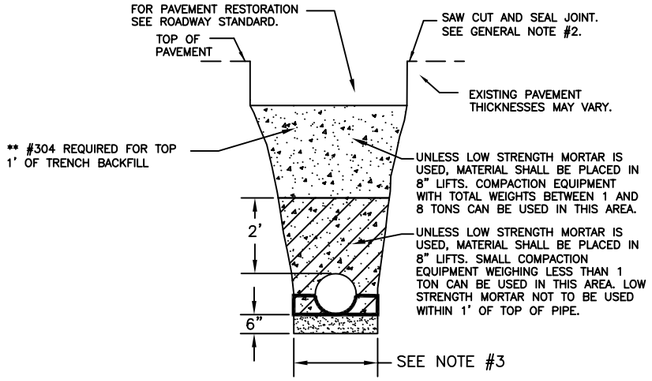
WATER MAIN UNDER STREET PAVEMENT

TYP. NOTES:
1. FIRE HYDRANT SHALL BE MUELLER IMPROVED AWWA TYPE WITH SAFETY FLANGE OR APPROVED EQUAL.
2. FIRE HYDRANT SHALL BE PLACED ON THE NORTH OR EAST SIDE OF THE STREET.

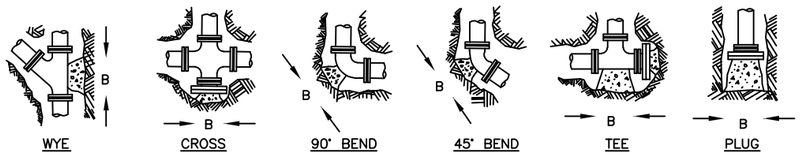
FIRE HYDRANT INSTALLATION DETAIL

LEGEND

- COMPACTED BEDDING PER ODOT ITEM 611.
- SAND (ODOT TYPE 2 STRUCTURAL BACKFILL) OR 304 AGGREGATE BASE (ODOT TYPE 1 STRUCTURAL BACKFILL) OR LOW STRENGTH MORTAR **
- CRITICAL AREAS OF COMPACTION – HAND TAMPING, SHOVEL SLICING, ETC. REQUIRED PER ODOT ITEM 603.
- COMPACTION EQUIPMENT WEIGHING LESS THAN 1 TON TO BE USED IN THIS AREA.



DUCTILE IRON WATER PIPE UNDER PAVEMENT



DETAILS FOR FITTINGS

1. "B" DENOTES BEARING LENGTH. BEARING DEPTH SHALL BE DETERMINED FROM BEARING AREA REQUIRED. B = 1.0' MINIMUM.

2. THE SURFACE OF THE BEARING AREA SHALL BE SMOOTH UNDISTURBED EARTH.

3. ODOT CLASS C CONCRETE SHALL BE USED FOR ALL BLOCKING.

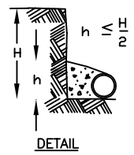
4. HEIGHT OF BLOCKING TO BE LESS THAN OR EQUAL TO 1/2 OF THE DEPTH OF THE TRENCH (H). SEE DETAIL AT RIGHT.

5. CONCRETE ANCHOR BLOCKING WILL BE PERMITTED FOR WORK ON EXISTING MAINS. NEW MAIN INSTALLATION MUST BE RESTRAINED BY RESTRAINING JOINT SYSTEMS OR LOCKING GASKETS SUCH AS "FIELDLOK" OR EQUAL. WHERE SUFFICIENT MECHANICAL RESTRAINED JOINT LENGTH IS NOT AVAILABLE, A COMBINATION OF RESTRAINED JOINTS AND THRUST BLOCKING SHALL BE PROVIDED.

THUST BLOCK BEARING AREA REQUIRED (SQ. FT)

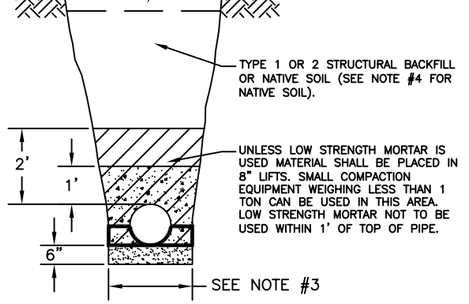
FITTINGS	PIPE SIZE 6"	8"	10"	12"
11-1/4° BEND	1	1	2	2
22-1/2° BEND	2	2	3	4
45° BEND	3	4	6	8
90° BEND	4	7	11	15
TEE OR PLUG	3	5	8	11

AREAS TABULATED ARE FOR SINGLE FITTINGS AND BEARING PRESSURE OF 2000 LB/SF. WHEN MORE THAN ONE FITTING IS USED, THE BEARING AREA SHOULD BE INCREASED PROPORTIONATELY.



DETAIL

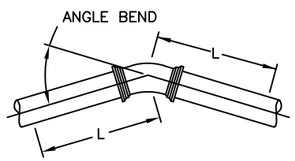
THRUST BLOCK RESTRAINT



DUCTILE IRON WATER PIPE NOT UNDER PAVEMENT

NOTES:
1. A COMBINATION OF RESTRAINED JOINTS AND THRUST BLOCKING MUST BE USED WHERE THE LENGTH FROM ONE BEND TO THE NEXT IS LESS THAN THE RESTRAINED LENGTH SHOWN ON THE FOLLOWING TABLE. (EXAMPLE: A COMBINATION OF RESTRAINED JOINTS AND CONCRETE THRUST BLOCKING IS REQUIRED ON AN 8" MAIN IF THE DISTANCE BETWEEN A 45° BEND AND A TEE IS LESS THAN 48'; 11' FOR AN 8" – 45° BEND AND 37' FOR AN 8" TEE.)

2. COST OF ALL RESTRAINED JOINTS, INCLUDING THE COST OF RETROFITTING RESTRAINED JOINTS ON EXISTING MAIN AS NECESSARY FOR NEW BENDS, VALVES, ETC, AND THE COST OF ALL THRUST BLOCKS, IS TO BE INCLUDED IN THE UNIT PRICE OF THE WATER MAIN.



ANGLE BEND	DIAMETER OF WATERMAIN 6"	8"	10"	12"	14"	16"	LARGER THAN 16"
11-1/4°	*	*	*	*	*	2	BY DESIGN
22-1/2°	2	3	4	5	6	7	
45°	8	11	14	19	23	26	
TEE, 90°	26	37	47	66	77	90	

* RESTRAINT REQUIRED AT FITTING ONLY

TABLE FOR REQUIRED RESTRAINT LENGTHS BASED ON:
100 PSF SOIL UNIT WEIGHT 0.25 SOIL FRICTION COEFFICIENT
150 PSI WATER PRESSURE 1.25 FACTOR OF SAFETY

RESTRAINING JOINT SYSTEMS ARE ACCEPTABLE WHEN DESIGNED IN ACCORDANCE WITH "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE", PUBLISHED BY THE DUCTILE IRON PIPE RESEARCH ASSOCIATION (DIPRA). RESTRAINING GLANDS, MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536-80 SPECIFICATIONS, OR LOCKING GASKETS SUCH AS FIELD LOK, OR EQUAL, SHALL BE USED.

RESTRAINED JOINT LENGTHS
(SEE NOTE THIS DETAIL)

NOTES

1. ALL WORK SHALL COMPLY WITH ODOT CMS, CURRENT EDITION.

2. SAW CUT EXISTING ASPHALT. AFTER PAVEMENT RESTORATION ODOT ITEM 705.04 HOT APPLIED JOINT SEALER SHALL BE USED TO SEAL PAVEMENT JOINT.

3. TRENCH WIDTH SHALL BE THE DIAMETER OF THE PIPE PLUS TWICE THE WIDTH OF THE HAND COMPACTION EQUIPMENT TO BE USED. NO HOE MOUNTED EQUIPMENT WILL BE ALLOWED WITHIN 2 FEET OF THE TOP OF PIPE.

4. NATIVE SOIL TO BE USED AS BACKFILL SHALL MEET THE REQUIREMENTS OF ODOT ITEM 203 EMBANKMENT; HOWEVER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIALS AND COMPACTION TESTING. TEST RESULTS SHALL BE SUBMITTED TO THE CITY ENGINEER. NATIVE SOIL SHALL NOT CONTAIN FROZEN LUMPS, JUNK, DEBRIS, ORGANIC PEAT, LARGE ROCKS, NOR BE HIGHLY SATURATED WITH WATER.

5. WHEN CONDITIONS PROHIBIT PROPER PLACEMENT OF HOT MIX MATERIAL, COLD PATCH SHALL BE USED AND MAINTAINED AS DIRECTED BY THE ENGINEER UNTIL PERMANENT REPAIR CAN BE MADE. ALL PERMANENT REPAIRS SHALL BE MADE PRIOR TO THE FOLLOWING JUNE 1ST.

6. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH THE OMUTCD.

7. NO SLAG MATERIAL SHALL BE USED AS BEDDING OR BACKFILL WITHIN 1' OF ANY WATER MAIN, SERVICE BRANCH, FIRE HYDRANT, ETC.

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