

TOWN OF TOLLAND PUBLIC IMPROVEMENTS MANUAL



**Town of Tolland
21 Tolland Green
Tolland CT 06084**

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I. GENERAL

1. INTRODUCTION

A. Authority

These public improvement standards have been promulgated in accordance with Article IV of the Tolland Town Code.

B. Purpose

This manual has been compiled for the guidance of developers, contractors, sub-contractors and all other persons involved in the construction and installation of improvements associated with roadways and utilities intended to be owned or maintained by the Town of Tolland. The specifications in this manual are intended to clarify and more specifically define the requirements and standards of the Tolland Zoning, Subdivision, and Low Impact Development and Stormwater Management Design Manual. Town Commissions and staff may also use the requirements and specifications in this manual as guidance for roads, drives, utilities, and other improvements on private property.

The requirements and specifications in this manual have been developed as minimum requirements. Situations may arise that have not been addressed by these specifications and shall be addressed on a case-by-case basis with approval of the Town Engineer and/or the Director. Deviations from the requirements and specifications may be allowed if approved by the Town Engineer, at the applicant's expense. Additional requirements may apply as the result of conditions of approval from other governing boards, commissions or agencies. The Town Engineer and/or Director shall have the final say in all requirements related to the construction of improvements that are, or will be, owned or maintained by the Town of Tolland. In cases of conflict between referenced standards or specifications, the requirements of this manual shall govern, except in those cases where such requirement may be in violation with applicable laws, regulations, or codes.

Users of manual should contact the Town of Tolland for clarification of any specific requirement or specification contained within this manual, as required. Users of this manual are advised to seek clarification early and before designs are completed or commitments are made. Special design cases not covered herein should be discussed with the Town Engineer and/or Director prior to beginning final design.

C. Definitions

- 1) AASHTO: American Association of State Highway Transportation Officials.
- 2) Applicant: Person or organization applying for approval to construct a public improvement.
- 3) Bond: A surety to protect against disruptions or financial loss due to failure to complete work or to correct work that has not been construction in accordance with applicable standards or specifications.
- 4) Contractor: Person or organization overseeing and performing the specified work.
- 5) DEEP: Connecticut Department of Energy and Environmental Protection.
- 6) Developer: Person or organization responsible for the proper completion and maintenance of the proposed/specified improvements until accepted by the Town.

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- 7) Director: The Director of Public Works for the Town of Tolland, or his/her authorized representative.
- 8) CTDOT: The Connecticut Department of Transportation.
- 9) DPW: The Tolland Department of Public Works.
- 10) Drawings: Plans prepared by the Developer's Engineer and approved by all required boards, commissions and agencies.
- 11) Engineer: An engineer licensed by the State of Connecticut and retained by the Developer or Contractor to design and prepare construction documents for the proposed/specified improvements.
- 12) Form 817: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, latest edition (including supplements as may be issued or posted).
- 13) Land Surveyor: A land surveyor licensed by the State of Connecticut (Professional Land Surveyor) and licensed to perform professional land surveying in the State of Connecticut.
- 14) Public Improvements: All work, labor, materials, equipment and appliances necessary for the proper construction of features to be owned or maintained by the Town of Tolland. Features include but are not limited to roadways, sidewalks, signs, pavement marking, street lighting, storm drainage systems, stormwater detention and/or retention systems, sanitary sewer systems, utilities, monumentation, rights-of-way, easements, etc.
- 15) Public Improvements Manual: This manual, the Town of Tolland Manual of Specifications and Construction Methods for Public Improvements, as amended.
- 16) PZC: The Tolland Planning and Zoning Commission.
- 17) State Specifications: State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, latest edition (including supplements as may be issued or posted).
- 18) Sub-Contractor: Person or organization hired by a Contractor to perform portions of the specified work.
- 19) Town: The Town of Tolland, Connecticut.
- 20) Town Engineer: Licensed engineer retained by the Town to provide engineering consultation on behalf of the Town, or other persons or organization acting, as his/her authorized representative.
- 21) Wetlands Commission: The Tolland Inland Wetlands & Watercourses Commission.
- 22) WPCA: The Tolland Water Pollution Control Authority. The Town of Tolland is authorized to discharge to the Town of Vernon Water Treatment Plant and is subject to their jurisdiction as relates to such discharges.

D. Related Documents

Note: all documents are intended to represent the latest revision/amendment.

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- 1) Connecticut Department of Energy and Environmental Protection, Connecticut Guidelines for Soil Erosion and Sediment Control, Bulletin 34, 2002.
- 2) Connecticut Department of Energy and Environmental Protection, 2004 Stormwater Quality Manual.
- 3) Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 817.
- 4) Connecticut Department of Transportation Highway Design Manual.
- 5) Connecticut Department of Transportation Drainage Manual.
- 6) Connecticut Department of Transportation Vegetation Management Guidelines.
- 7) Illuminating Engineering Society of North America (IESNA).
- 8) New England Interstate Water Pollution Control Commission, Guides for the Design of Wastewater Treatment Works, Technical Report (TR-16), 1998 Edition.
- 9) Town of Tolland, Inland Wetland and Watercourses Regulations.
- 10) Town of Tolland Subdivision Regulations.
- 11) Town of Tolland Zoning Regulations.
- 12) Town of Tolland Low Impact Development and Stormwater Management Design Manual.
- 13) Tolland Water Pollution Control Authority Sewer Regulations.
- 14) Town of Tolland Sewer Ordinance.
- 15) All other applicable local, state or federal laws, regulations, etc.

2. ADMINISTRATIVE PROCEDURES

A. Subdivisions

All proposed public improvements associated with the subdivision of land shall first be approved by the Planning & Zoning Commission. Application for approval shall be submitted to the Planning & Building Department in accordance with Town regulations.

Plans prepared, sealed, and signed by a Connecticut-licensed professional engineer and Connecticut-licensed professional land surveyor, as appropriate to plan type, shall be submitted with the application. Projects involving roadway or drainage installations shall include a plan and profile of the full length of the proposed improvements.

A pre-construction meeting shall be held between the Town Engineer and/or the Director and Contractor(s) prior to start of any construction. The Contractor shall be responsible for obtaining all permits from the Tolland Department of Public Works for work within Town owned rights-of-way, easements, or other land. The Contractor or Sub-contractors performing work within Town owned rights-of-way, easements, or other land shall be properly bonded and insured to the satisfaction of the Town Engineer and/or the Director. In addition to required performance Bonds, a minimum \$5,000 Drain Layers Bond shall be required for all storm and sanitary sewer installations.

Construction of improvements shall be subject to the inspection and approval of the Town Engineer and/or the Director. Additional design by the Engineer, testing to verify material specifications, and quality of construction shall be required in accordance with the specifications of this Public Improvements Manual and related documents. The Developer shall be responsible for the maintenance of all improvements until accepted by the Town in accordance with the Subdivision Regulations and/or Zoning Regulations.

Bond amount, and 3) deeds for all rights-of-way, easements, open space and other land to be conveyed to or maintained by the Town. Improvements shall not be accepted until the Developer receives approval from the Town Engineer and/or Director, recommendation from the Planning & Zoning Commission and favorable vote from the Town Council.

B. Residential Lot Construction

Residential construction on approved building lots may require one or more permits from the Planning & Building Department. A plot plan prepared by a licensed Connecticut professional engineer and Connecticut-licensed land surveyor may also be required. Work involving soil disturbance may require the Developer or Contractor to provide a cash Bond to insure proper erosion and sedimentation control measures are maintained during construction (Erosion and Sedimentation Control Bond). When required by the Town, the Developer shall provide an estimate of the cost of implementation of all erosion and sedimentation control measures designed by the Engineer. The actual amount of the Erosion and Sedimentation Control Bond shall be determined by the Town.

C. Business and Industrial Site Construction

Business or industrial construction on approved building lots may require approval from the Planning and Zoning Commission. It is the responsibility of the Developer to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations. All associated improvements located on or within Town-owned land, rights-of-way, or easements shall conform to the requirements of this manual. The Contractor shall be responsible for obtaining all permits and/or approvals from the Town for any work on or within Town-owned land, rights-of-way, and easements, prior to commencing any work.

D. New Driveway and/or Curb Cut

All work within a Town right-of-way, including the construction of a new driveway(s) shall require a zoning permit from the Town and in cases where a curb cut is included, require additional approvals from the Town Engineer and/or Director. It is also the responsibility of the Developer to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations. Application forms may be obtained at the Town Hall. All work shall be inspected by the Town Engineer and/or Director and shall meet his/her satisfaction. Resurfacing of existing driveways does not require a permit unless grading and/or drainage is changed in any way.

E. Roadway Widening, Extension or Improvement

All proposed improvements to Town roadways associated with subdivision, site plans or special use permit approvals or other development shall be performed in accordance with the requirements of this manual. The Contractor shall be responsible for obtaining all permits from the Town prior to the start of any construction. It is also the responsibility of the Developer to confirm if other permits/approvals are required from the Town, and to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations. All details of the improvements shall be designed by the Engineer and approved by the Town Engineer and/or Director.

F. Sidewalk Construction

Sidewalk construction within the Town right-of-way or other Town-owned land may require approved by the Planning and Zoning Commission and shall conform to the requirements of this manual. The Contractor shall be responsible for obtaining permits from the Department of Public Works prior to the start of any construction. All details of the improvements shall be designed by the Engineer in accordance with the requirements of this manual and approved by the Town Engineer and/or Director.

G. Connection to Municipal Storm Drainage System

Unless otherwise prohibited by state statute, all connections to Town-owned drainage systems must be approved by the Town Engineer and/or Director. The Contractor shall be responsible for obtaining permits from the Department of Public Works prior to the start of any construction. It is also the responsibility of the Developer to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations. The Engineer shall provide calculations to the Town Engineer and/or Director verifying the existing system has capacity to accommodate the proposed connection(s). Depending on downstream conditions, the Town Engineer and/or Director may require the use of detention and/or retention systems to reduce peak flow rates and/or volumes to match pre-development conditions. The design of any detention and/or retention systems to reduce peak flow rates and/or volumes shall be completed by a Connecticut-licensed professional engineer in accordance with applicable standards/methodologies. All proposed improvements shall be in accordance with the requirements of this manual.

H. Connection to Existing Sanitary Sewer System

No connection can be made to an existing sanitary sewer unless an application for a connection is first filed with the WPCA. This requirement applies to any type of connection regardless of whether it is for a new or existing building, or to repair or replace an existing building service lateral.

The Developer, or their representative (in most cases, the Contractor or other person who will be performing the work), must obtain a connection application, fill it out completely, and submit it to the WPCA for processing. Consult the WPCA for the amount of the application fee. Contractor must provide proof of valid State of Connecticut Drain Layer's License.

An accurate plan(s) depicting the scope of the proposed work must accompany the application. All proposed improvements shall be in accordance with the requirements of this manual. Plans should include (at a minimum) house and street locations; property lines; type, size, slope, depth and cover over pipe; location of all fittings; type and depth of bedding material; location of building drain connection and all cleanouts.

I. Extension of Existing Sanitary Sewer Main

Proposals for sewer system extensions are generally more complex than building service connections and require approval from a number of Town boards, commissions, agencies and departments. In some cases, permits must be obtained from state and federal agencies. The Developer is responsible for coordinating his work with the requirements of all agencies having jurisdiction over the project. The Town of Tolland is authorized to discharge to the Town of Vernon Water Treatment Plant. All extensions are subject to review by, and must be approved by, the Town of Vernon.

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The specific requirements for design plans submitted for review by the Town Engineer and/or Director, acting on behalf of the WPCA, are as follows:

- 1) Location map drawn at a minimum scale of 1" = 1000'.
- 2) Grading plan drawn at a scale of 1" = 40', showing existing and proposed contours along with all proposed improvements. The plan must include all proposed pipes with size, type, slope, and invert elevations. The location of all structures, fittings, cleanouts, connections, etc. shall also be shown on the plan. The plan should also show all utilities and services within the project area, and include all notations and related information as required to illustrate the proposed work. A north arrow shall be provided on each sheet.
- 3) Plan and Profile drawn at a scale of 1" = 40' horizontal and 1" = 4' vertical, showing all portions of the proposed sewers, utilities, and buildings served. A north arrow shall be provided on each sheet.
- 4) Details for all proposed construction conforming to the standard details provided in this manual.

J. Insurance and Bonding

The Contractor must provide Certificate(s) of Insurance to the Town demonstrating that insurance has been secured in the types and amounts required by the Town (on the Town's form or as otherwise approved by the Town). Insurance must be provided by a carrier rated at least "A-" by A.M. Best and licensed to conduct business in the State of Connecticut.

The Contractor who will perform the work must hold a current five thousand (\$5,000) dollar Drain Layer's/Excavator's Bond for work in the Town of Tolland (on the Town's form or as otherwise approved by the Town). The surety must be a corporate surety licensed to sign Bonds in the State of Connecticut and must be rated at least "A" by A.M. Best.

A homeowner may request to construct his or her own building service lateral if they can provide reasonable proof of competency in drain laying, proof of adequate homeowner's insurance that will cover the work involved, and only if the work is performed entirely within the limits of their own property. In addition, if a homeowner is granted permission to perform the work, they will be required to obtain a five thousand-dollar (\$5,000) Drain Layer's/Excavator's Bond (on the Town's form or as otherwise approved by the Town) before any work can begin.

K. As-Built Drawings

Prior to acceptance by the Town of any public improvements, the Developer shall provide as-built drawings to the Town Engineer and/or Director and the appropriate commission (as may be required) for the Town's records. Submission of acceptable as-built drawings may also be a condition of land-use approvals. It is the responsibility of the Developer to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations which may be in addition to the requirements defined herein. Refer to additional requirements found in the Subdivision Regulations. All costs associated with as-built drawings shall be the responsibility of the Developer.

As-built drawings shall be prepared and signed/sealed by a Connecticut-licensed land surveyor. As-built drawings shall be drawn to a scale of 1" = 40' or 1" = 20' and shall be printed as 24"x36" sheets unless an alternate scale/format is specifically approved by the Town based on the specific nature of the work. Improvements, including road construction, storm sewer, or sanitary sewer

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installation shall include a profile drawn to a scale of 1" = 40' horizontal and 1" = 4' vertical. The accuracy of the information on all as-built plans shall conform to "Class A-2" for horizontal accuracy and "Class "T-2" for vertical accuracy as defined in the Regulations of Connecticut State Agencies, Section 20-300 b-1 to 20-300 b-20 "Minimum Standards for Surveys and Maps in the State of Connecticut".

Where construction includes handicapped accessibility, as-built drawings shall include sufficient horizontal and vertical data to demonstrate compliance with all applicable requirements.

Unless waived by the Planning Director or Director, as-built plans shall note the following:

- 1) Trenches with either temporary or permanent sheathing, or concrete encasing. Areas where bedrock (ledge rock), a high-water table, or unsuitable materials were found shall also be indicated on the plans.
- 2) All sanitary lateral connections accurately located to the main sewer either by station measurement from manholes or by cross-from house corners. The lateral location at the right-of-way line, and where practical, the house connection, shall also be depicted. The information shall be accurately noted or plotted on the as-built plan and profile sheets.
- 3) The location of all sanitary piping and structures, wyes, tees, and chimneys along with correct pipe invert elevations and structures' top of frame elevations. The type and diameter of all pipes shall be clearly labeled.
- 4) The location of all drainage piping, manholes, catch basins, and other structures, along with correct pipe invert elevations and structures' top of frame elevations. The type and diameter of all pipes shall be clearly labeled.
- 5) Spot-grades and contours depicting the finished grade elevations of new construction such as roadways, sidewalks, ramps, aprons, etc. shall be included on the plan view.
- 6) Elevations based on the North American Vertical Datum (NAVD) of 1988. A bench mark with an elevation shall be shown on the plans.
- 7) Horizontal datum based on the North American Datum (NAD) of 1983 Connecticut State Plane Coordinate System. At least two permanent points with coordinates shall be included on the as-built plan.
- 8) Additional requirements that may be required based on specific to type of improvements constructed as indicated in this manual.

No Bonds shall be released until the above information is furnished by the Developer to the Town Engineer and/or the Director. Release of Bond(s) may also require approval by the Planning and Zoning Commission and/or Town Council.

In addition to paper hard copies of the as-built plans, the applicant shall provide plans to the Town Engineer and/or Director in digital format. Digital files shall be AutoCAD.dwg or AutoCAD.dxf format. All other digital data submission requirements shall be in accordance with the Zoning Regulations.

II. MATERIALS

1. RELATED DOCUMENTS

- A. Numerical references in this section refer to the State Specifications. It is the responsibility of the Developer to verify references to the State Specifications to account for changes and supplements issued by the CTDOT.
- B. Unless otherwise specified, all materials shall conform to State Specifications.
- C. If there is any conflict between the State Specifications and this manual, the requirements of this manual shall prevail.

2. EARTH PRODUCTS

- A. Processed Aggregate: Processed Aggregate shall conform to M.05.01. Coarse aggregate shall be crushed traprock unless otherwise approved by the Town Engineer. If bank run gravel or reclaimed aggregate is requested for use a coarse aggregate alternative, the Engineer shall provide pavement section design calculations to the Town Engineer for review and approval.
- B. Granular Fill: Granular Fill shall conform to M.02.01
- C. Bedding Material: for use as bedding around drainage pipe shall conform to M.08.03.
- D. Common Fill: Common Fill for use as general fill where no other material is called-for on the plans shall consist of earth materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GP-GC, SW, SP, and SM that are free of clay. Common fill is subject to the approval of the Town Engineer and may be either material removed from on-site excavations or borrow pits or imported from off-site, approved sources. It shall have physical properties such that it can be readily spread and after it has been placed and properly compacted, it will form a dense, stable fill.

3. STONE PRODUCTS

- A. Crushed Stone: Crushed Stone for use as bedding around pipe or under structures shall be $\frac{3}{4}$ " traprock conforming to M.01.01, No. 6 stone.
- B. Riprap: Riprap used for slope stabilization or outlet protection shall conform to M.12.02. Appropriate size (modified, intermediate, standard, or special riprap) shall be determined by the Engineer.

4. ROADWAYS

- A. Bituminous Concrete: All Bituminous Concrete used for roadways and curbing shall conform to M.04.

5. CONCRETE

- A. Portland Cement Concrete shall conform to M.03.02 "Class F". Exposed concrete shall contain not less than 4% or more than 6% entrained air.
- B. Brick and Mortar: for construction of manhole inverts shall conform to the following:
 - 1) Brick: Solid block, ASTM C139.
 - 2) Mortar: shall conform to M.11.04.

6. PIPE

- A. Reinforced Concrete Pipe (RCP): Shall conform to M.08.01-7. In special circumstances and/or in any instance where the cover over pipe is less than 2 feet, the Town Engineer may require use of Class V or "special design" RCP.
- B. Polyethylene Pipe (CPEP): CPEP shall conform to M.08.01-18, smooth interior surface, "Type S".
- C. Perforated Polyethylene Pipe (Perforated CPEP): Perforated CPEP shall conform to M.08.01-18, smooth interior surface, "Type SP".
- D. Flared End Sections: Flared End Sections shall be RCP unless otherwise approved by the Town Engineer. Polyethylene flared end sections may be permitted at the discretion of the Town Engineer when properly anchored to a concrete footing.
- E. Polyvinyl Chloride (PVC) Pipe: Unless otherwise approved by the Town Engineer, PVC drainage pipe shall conform to the following:
 - 1) Pipe 4-inch to 15-inch diameter: ASTM D3034, SDR-35. Elastomeric gasket joints, retained gaskets, part of a complete pipe section and supplied as such.
 - 2) Pipe 18 inch to 36-inch diameter: ASTM F679. Elastomeric gasket joints, retained gaskets, part of a complete pipe section and supplied as such.
 - 3) PVC Cell classification: 12454 or 12364, ASTM D1784.
 - 4) Pipe shall have a minimum pipe stiffness that equals or exceeds 46 psi (PS 46).
 - 5). Pipe shall be marked along the outside of the barrel with the following:
 - a. The manufacturer's name or trademark.
 - b. The standard to which it conforms/ASTM Designation.
 - c. Pipe size.
 - d. Material designation code/PVC cell classification.
 - e. SDR number or schedule number.
 - 6) Standard length of pipe: maximum of 20 feet with the following exceptions.
 - a. Length of 6-inch pipe shall be a maximum of 13 feet unless otherwise approved by Engineer.
 - b. Pipe used in house connections and/or laterals shall not exceed 6.5 feet in length unless otherwise approved by Engineer.
 - 7) PVC Plastic Gravity Joints and Jointing Material.
 - 8) Joints: ASTM D3213, gasketed, bell-and-spigot, push-on type.
 - 9) Gaskets: ASTM F477. Since each pipe manufacturer has a different design for push-on joints, gaskets shall be part of a complete pipe section and provided as such. Gaskets may be factory

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installed or field installed as recommended by the pipe manufacturer. Lubricant shall be as recommended by the pipe manufacturer.

10) Fittings: SDR-35, ASTM D3034 and ASTM F1336, specifications as pipe.

7. GEOTEXTILES

A. Geotextiles: shall conform to M.08.01-19.

8. LIGHTING

A. Lighting shall be designed and installed to the satisfaction of the Town.

B. All lighting shall be Full-Cutoff as defined by the Illuminating Engineering Society of North America (IESNA).

C. All wiring for lighting shall be underground, with conduit, and configured in accordance with all applicable codes and standards. Identification ribbon shall be placed to delineate all subsurface conduit.

III. EXECUTION

1. GENERAL

- A. Unless otherwise specified, all construction techniques and materials shall conform to State Specifications.
- B. If there is any conflict between the State Specifications and The Tolland Public Improvements Manual, The Tolland Public Improvements Manual shall prevail.

2. ROADWAYS

- A. The following provisions apply to the extension of existing Town roadways and the construction of new roadways intended for acceptance by the Town of Tolland. Refer to additional requirements found in the Subdivision Regulations. The requirements herein may be modified under special circumstances only with the approval of the Planning and Zoning Commission, in consultation with the Town Engineer.
- B. General Requirements
 - 1) Prior to any roadway construction, the Applicant's contractor shall submit a construction schedule to the Town Engineer for approval.
 - 2) Paving shall not take place between November 1 and April 1 without approval of the Town Engineer.
 - 3) Each phase of construction shall be inspected and approved by the Town Engineer or authorized representative prior to beginning the next phase of construction. The Applicant's contractor shall notify the Town Engineer at least 48 hours prior to requiring an inspection.
 - 4) If deemed necessary due to field conditions, the Town Engineer reserves the right to require additional construction methods and/or materials as needed to ensure proper construction of the road.
 - 5) The Applicant shall retain the services of a professional engineer and surveyor licensed in the State of Connecticut to periodically inspect construction progress.
- C. Subgrade shall be stable and prepared per applicable portions of the State Specifications. If rock, ledge or any other unsuitable material is encountered, it shall be removed to 6-inches below subgrade and replaced with suitable material as approved by the Town Engineer.
- D. Any borrow materials used for fill shall be approved by the Town Engineer. The Applicant shall submit sieve analysis of all borrow materials to the Town Engineer for review and approval.
- E. All utility services shall be installed prior to placement of the roadway binder course.
- F. Drainage
 - 1) Underdrains shall be installed at the direction of the Town Engineer.
 - 2) All drainage and utilities to be constructed below pavement shall be installed and tested prior to the installation of the subbase. All manhole/catch basin frames, gate valves and similar structures shall be set at final grade prior to paving.

- G. If water is encountered during utility installation or roadway construction, dewatering measures shall be provided.
- H. No more than 2 inches of compacted bituminous concrete pavement shall be placed with each pass of the paver.
- I. When widening an existing Town roadway, match existing material thicknesses if greater than the minimum thicknesses specified in this manual.
- J. While binder surface remains exposed, all exposed structures within the pavement shall be protected with a ¼" per foot shim, prior to the winter maintenance season.
- K. Protection of the Work: Sections of the newly finished bituminous work shall be protected from traffic to prevent damage.
- L. Prior to acceptance of the roadway, any paved areas which have settled shall be removed, compacted and repaved to the satisfaction of the Town Engineer and/or Director.
- M. As-Built Plans - The Applicant's engineer or surveyor shall submit an as-built plan(s) to the Town and certify that roadways, grading, and utilities that were constructed are consistent with the approved design plans. As-Built Plans of completed roadways shall include, but not be limited to:
 - 1). All utility locations and sizes.
 - 2). Stormwater structure locations, top of frame elevations, invert elevations and pipe sizes.
 - 3). Sanitary sewer structure locations, top of frame elevations, invert elevations and pipe sizes.
 - 4). All aboveground structures within the right of way.
 - 5). Location of curbing, sidewalks and right of way lines.
 - 6). Grading in 2-foot intervals.

Refer to other as-built requirements this manual. It is the responsibility of the Developer to comply with applicable requirements of the Planning and Zoning Commission and all associated regulations which may be in addition to the requirements defined herein. Refer to additional requirements found in the Subdivision Regulations. All costs associated with as-built drawings shall be the responsibility of the Developer.

3. TRENCHING

- A. Trench excavation consists of the removal and satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, to the dimensions shown on the plans or as ordered by the Town Engineer and/or Director, and backfilling, in accordance with this manual and the State Specifications for the construction of pipe culverts, endwalls, catch basins, drop inlets, manholes, drainage piping, underdrains and outlets, sewers, service pipes, and similar underground construction.
- B. Construction methods for trench excavation shall conform to Section 2.05.03 of the State Specifications.
- D. The Contractor shall properly design and furnish all labor, materials, equipment, and tools necessary to construct permanent or temporary excavation support systems, including, but not

necessarily limited to, sheet piling, trench shields, trench boxes, trench shoring, pneumatic/hydraulic shoring, steel sheeting or sheeting using other materials, sloping, and benching.

- C. All water encountered in the trench must be drained, pumped or bailed out, and the trench must be kept dry for the pipe laying. All necessary precautions shall be taken by the Contractor or Developer to prevent the entrance of mud, sand or other obstructing material into the pipe. Upon completion of the work, any such materials which may have entered the pipe must be cleaned out and the sewer left clean and unobstructed. All dewatering operations shall be in accordance with the State Specifications and all applicable regulations and permits.

4. PIPE INSTALLATION

- A. All work associated with new pipe or relaying of existing pipe shall be in accordance with the State Specifications and the details in this manual. In addition, all work associated with new sewer pipe or relaying of existing sewer pipe shall be in accordance with the Town of Tolland WPCA Sewer Regulations and the details in this manual.
- B. Pipe shall be of the sizes, type and material indicated by the Drawings with no substitutions. All pipe shall be laid, supported, jointed, tested and backfilled as indicated or required for the particular job, location or condition by the Drawings or other applicable documents. All pipe, when in place, shall be precisely true to the line and grade indicated on the Drawings or as directed by the Town Engineer, and shall be sound, well laid, jointed, bedded and free from defects.
- C. Pipe laying in general shall start at the downstream end and progress upstream with bell or groove ends placed upstream. If, however, due to restrictions imposed by land acquisition and/or other construction activities, construction may be done in sections as approved by the Town Engineer.
- D. Diligent care shall be exercised to insure complete support of the pipe both under it and at its sides. Under no circumstances shall large stones be permitted to rest on the pipe at any point. If stone bedding is required, it shall be wrapped in nonwoven filter fabric.
- E. Where stubs for future connections are indicated on the plans or required by the Town Engineer, a cap shall be furnished and installed at the dead end of the stub.
- F. Straight runs (not with bends) of sewer line pipes and laterals over 50 feet in length shall be laid to line and grade by the use of lasers only. Such laser equipment shall be furnished by the Contractor and operated by competent personnel. Equipment and operating procedures shall be subject to the approval of the Town Engineer.
- G. Details of gasket attachment and joint formation will, in general, follow the directions of the manufacturer of the joint material and of the pipe, based upon the design thereof and their experience with such joints elsewhere, all subject to the approval of the Town Engineer.
- I. In general, 90° bends in laterals are discouraged. Where necessary, two 45° elbows will be used.

5. BACKFILLING

- A. Prior to initiating work, the Contractor shall furnish the Town Engineer and/or Director with material sieve analysis and Proctor maximum dry density analysis from an approved independent testing laboratory. All costs associated with testing shall be the responsibility of the Developer.

Tolland Public Improvements Manual

- B. After completion of piping and completion of any prescribed tests and inspections, the fill and/or embankment around the pipe or structures shall be brought to the subgrades shown on the Drawings. If native material is unsuitable, approved materials must be used as directed by the Town Engineer. The fill shall conform to the requirements of this manual and shall be deposited in layers and compacted by machinery or other approved methods in accordance with the State Specifications.
- C. After completion and inspection of underground piping, drains and conduits, trenches shall be backfilled with suitable excavated material or imported material, as appropriate. All backfill shall be placed in layers of not more than 6 in deep after compaction and shall be thoroughly compacted by means of vibrators or by pneumatic tampers. Hand tampers shall be used only with permission of the Town Engineer and/or Director. The backfill shall be brought to the surface of the surrounding ground and neatly graded, except that where excavation of the top of the trench; and the remainder shall be filled with topsoil to 3/4 in above adjacent areas as directed by the Engineer. Marking tape shall be installed in the trench at the depth and to the requirements set forth in this manual.
- D. Where trenching in paved areas, the trench shall be sawcut and backfilled to within the depth from the surface required to replace the removed sidewalk or pavement structure, which shall then be replaced. The edges of all trenches in paved surfaces shall be sawcut to neat lines prior to paving. All trenches in existing paved surfaces, which parallel the curb, shall be no more than 1 1/2 ft from the curb, or when no curb is present, the apparent edge of road. The exception shall be to avoid existing appurtenances such as catch basins, water gates, manholes etc. Where a trench is placed through a concrete sidewalk, the entire section of sidewalk between joints shall be replaced in accordance with the requirements of this manual.
- E. Trench backfill material shall be tested by on-site nuclear compaction method or approved equal. Backfill under paved areas shall have a minimum dry density of 95% of the maximum density of the material used. Backfill under unpaved areas shall have a minimum dry density of 90% of the maximum density of the material used. On-site tests shall be performed once per every 500 cubic yards of trench backfill, every vertical lift and at least once daily. All costs associated with testing shall be the responsibility of the Developer.
- F. Trenches shall be backfilled as soon as possible after pipes have been laid in the trench and no trench shall be left open overnight unless otherwise directed by the Town Engineer. Traffic must be maintained on town roads at all times unless otherwise directed by the Town Engineer.

6. SIDEWALKS

- B. Concrete sidewalks shall be constructed in accordance with Section 9.21 of the State Specifications and the details in this manual.

7. STRUCTURES

- A. Structures, including but not limited to manholes, catch basins, and separator tanks, shall be constructed, in the locations shown on the Drawings. The outside of sanitary structures shall be treated with bitumastic dampproofing. All structures shall be constructed of precast concrete units unless otherwise approved. All joints shall be sealed watertight. Inverts, where required, shall be constructed of brick and mortar unless otherwise approved. Backfill around manholes shall be done in 12" layers, each layer shall be firmly compacted with pneumatic tampers or other approved tamping devices. In some locations puddling may be substituted for tamping with the prior approval of the Town Engineer.

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- B. Sand & Oil Water Separators shall be installed in all locations, where in the opinion of the Town Engineer, there is a potential for discharges of oil and/or sediment to the sanitary sewer system. Separators are required prior to discharging vehicle service floor drains to the sanitary sewer lateral. Tanks shall have a minimum capacity of 1,000 gallons. After installation of the Separator, the Contractor or Developer shall obtain any appropriate permits from the DEEP.
- C. FOG Interceptors, recovery units, pretreatment systems, etc. shall be installed in accordance with the Town of Tolland WPCA Sewer Regulations.

8. INSPECTION AND TESTING

- A. The Developer or Contractor shall provide testing to verify compliance with compaction and/or other specifications by approved laboratories or methods in accordance with State Specifications and/or applicable ASTM or AASHTO testing methods. All costs associated with testing shall be the responsibility of the Developer.
- B. The Contractor or Developer shall furnish all labor, equipment and materials required to check for leaks in the pipe, as required by the Town Engineer and/or Director. All work is to remain completely uncovered and the area safely protected until an official inspection is made by a representative of the Water Pollution Control Authority. Work that has been covered for emergency access or any other reason shall not be accepted until it has been re-excavated and inspected.
- C. Leakage tests for all sewer pipes shall be carried out in a manner approved by the Director per the requirements of the Town of Tolland WPCA Sewer Regulations.

9. CONSTRUCTION ADMINISTRATION

- A. The Contractor or Developer shall provide the Town with Bonds in the amount required and/or approved by the Town Engineer and/or Director, prior to start construction if such Bonds are required. The Contractor is responsible for providing adequate proof of insurance and bonding to the Town Engineer and/or Director for work within Town-owned land or right-of-way, or when bonds and insurance are otherwise required.
- B. The Town of Tolland is not responsible for health safety. The Contractor shall conduct all construction activities in conformance with applicable regulations, including, but not limited to, those relating to personal protection and safety, traffic control, barricades, warning signs, excavation safety, sheeting, shoring, and stabilization. In the performance of his/her work, the Contractor or Developer shall furnish such additional safeguards, safety devices and protective equipment and shall take such actions as the contracting officer or developer may determine are reasonably necessary to protect the life and health of employees and of the public. The Contractor or Developer shall be responsible for conforming to all O.S.H.A. regulations and procedures.
- C. Prior to commencement of work, the Contractor shall hold a pre-construction meeting with the Town Engineer and/or Director to discuss construction sequencing and requirements.
- D. The Contractor shall abide by all applicable noise ordinances during construction operations.
- E. All work involving public improvements must be inspected and approved by the Town Engineer and/or Director prior to backfilling or continuing with the next phase of construction. The Contractor is responsible for scheduling an inspection with the Department of Public Works at least 48 hours prior to completion of the work. For work that will begin on Monday, notice must be given no later than the preceding Thursday. Failure to give proper notice will result in a delay in

Tolland Public Improvements Manual

receiving permission to start or continue the work. Work that has been completed without inspections may be rejected.

- F. Work within state highways requires a permit from DOT. A copy of the permit shall be submitted to the Town Engineer and/or Director prior to start of construction within a state highway.
- G. The Contractor's attention is called to the fact that there are existing, in all Town streets in which work may be carried out, various underground utilities. Before beginning work on the town street, the Contractor or Developer shall be responsible to contact "Call Before You Dig" at 1-800-922-4455 to mark utility locations. The Contractor or Developer shall make his own investigations and determinations relative to underground structures and he/she shall conduct his work so that all utilities shall be properly supported and maintained at all times.
- H. The work shall be arranged so that one lane shall be left open for traffic and not more than 300 feet of trench shall be open on a town-maintained street at any one time. No individual driveway shall be blocked for a continuous period in excess of 72 hours. In case of emergencies or other extenuating circumstances, the Contractor may be required to provide temporary access to any driveway during the period when the trench is open across from that driveway.
- I. No construction work on public improvements shall be done during unfavorable weather conditions, unless specifically approved by the Town Engineer and/or Director.
- J. The Contractor shall carry on the work in such a way as to obstruct the town streets as little as possible, and so as not to shut off passage of vehicles and pedestrians at any time.
- K. The Contractor shall take all necessary precautions to prevent injury to the public or to his workmen, such as providing crossing plank, fencing off his work, using barricades and barrels with reflective striping and flashers at night, etc.
- L. All materials and workmanship shall be subject to the supervision and inspection of the Town and of its Town Engineer or other authorized representatives. Instructions as to the details of the work shall be carried out, and rejected materials and work shall be promptly removed at any time discovered.
- M. The proposed changes provide the Town with improvements equal to or superior in quality to the approved design.
- N. The Engineer has submitted two (2) sets of redlined plans clearly showing the approved design (in black) and the proposed changes in red. The plans shall be accompanied by applicable calculations as required to determine adequacy of the proposed design.
- O. Changes which provide benefit to the Contractor and/or Developer, but offer no significant advantage to the Town shall only be considered if submitted for review prior to the start of construction.
- P. It shall be left to the discretion of the Planning Director whether proposed changes require a modification of any permits issued by Town commissions.

IV. DESIGN STANDARDS

1. SOIL EROSION AND SEDIMENT CONTROL

- A. Soil Erosion and Sediment Control shall comply with applicable portions of the Town of Tolland Zoning Regulations.

2. ROADWAYS

A. Classification of Roadways

Roadways in the Town of Tolland shall be classified into four (4) categories based on their function and capacity. The descriptions indicated below are for general guidance only. Refer to the Tolland Plan of Conservation and Development for road classifications and confirm any recent changes with the Planning Director.

1) Arterial Roads

- a. Roadways that are characterized by a capacity to quickly move relatively large volumes of traffic and provide limited access to abutting properties.
- b. Generally, design speeds and capacity are high.

2) Collector Roads

- a. Roadways that are characterized by a roughly even distribution of their access and mobility functions. Generally, Collector Roads function as a conveyance for traffic traveling from town to town or population cluster to cluster.
- b. Generally, design speeds and capacity are higher than Primary Local and Secondary Local Roads.

3) Primary Local Roads

- a. Roadways characterized by moderate access to both residences and businesses located along its length; Roadways functioning as a conveyance for through traffic on a neighborhood to neighborhood scale.
- b. Generally, design speeds are less than 30 mph and capacities are less than that of Collector Roads.

4) Secondary Local Roads

- a. Roadways characterized by mainly providing access to residences within a single neighborhood; roads that will not create inter-neighborhood cut throughs or dead-end roads without future interconnection potential.
- b. Generally, design speeds are less than 25 mph and capacities are less than that of Primary Local Roads.

B. Right-of-Way

1) State Arterial and Collector Roads

- a. The right-of-way of State Arterial and Collector Roads shall be defined by the CTDOT's Right-of-Way Survey. If a Right-of-Way Survey does not exist, the right of way shall be established by the Department of Transportation. The Town shall request that the front right-of-way be established at least 30 feet from the centerline of the traveled way, notwithstanding any other property information indicating that the right of way line is a greater distance from the centerline of the traveled way.

2) Town Collector Roads

- a. The right of way of new Town Collector Roads shall be established at least 30 feet from the centerline of the traveled way, notwithstanding any other property information indicating that the right of way line is a greater distance from the centerline of the traveled way.

3) Primary and Secondary Local Roads

- a. The right-of-way of new Primary Local and Secondary Roads shall be established at least 25-feet from the centerline of the traveled way, notwithstanding any other property information indicating that the right-of-way line is a greater distance from the centerline of the traveled way.
- b. All new Primary and Secondary Local Roads shall have a minimum right-of-way width of 50-feet. The paved surface of the roadway shall be centered in the right-of-way.

C. Design of Town Roadways and Intersections

- 1) General - The latest version of the CTDOT's "Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction Form 817 (CTDOT Form 817)", as amended, is included for reference. Construction shall comply with the provisions of ConnDOT Form 817, except where more stringent requirements are stated. The Town of Tolland reserves the right to require more stringent practices/specifications if it is deemed that it would serve the best interest of the community.

2) Intersections

a. Minimum Separation Distance Between Intersections

Intersections of new roads with other new roads or existing roads shall have a minimum separation distance (as measured from the centerline of one intersection to the centerline of another intersection) of:

- 350' from any intersection on a Collector Road.
- 250' from any intersection on a Primary Local Road.
- 150' from any intersection on a Secondary Local Road.

Additional separation distance between intersections, other than that noted above, may be required due to design speeds, geometry and/or sight distance.

b. Intersections of Primary and Secondary Local Roads with Collector Roads

Intersections shall generally meet at a 90-degree angle or radial to the curvature of the Collector Road, if applicable. In no case shall such an intersection be greater than 5° from the right-angle line or radial line.

This line of approach shall extend at least 80 feet (measured along the centerline of the road, beginning at the point of intersection) prior to transitioning into a horizontal curve.

c. Intersections of Primary and Secondary Local Roads with other Primary and Secondary Local Roads

Intersections shall generally meet at a 90-degree angle or radial to the curvature of the intersected road, as applicable. In no case shall such an intersection be greater or less than 10° from the 90-degree angle line or radial line.

This line of approach shall extend at least 75 feet (measured along the centerline of the road, beginning at the point of intersection) prior to transitioning into a horizontal curve

d. Intersection Grading

Intersections shall be located a point where the existing road has a grade of 5% or less. Intersections of roadways with grades of greater than 5% shall require special approval from the Planning & Zoning Commission and the Town Engineer.

The line of approach (measured 75 feet from the point of intersection) of new intersecting roads shall not exceed 3%.

e. Transition Radii at Intersections

- Intersections of Collector Roads with other Collector Roads shall have minimum transition radii of 25-feet.
- Intersections of all Roads with Primary Local Roads shall have transition radii of 25-feet.
- Intersections of all Roads with Secondary Local Roads shall have transition radii of 20-feet.

f. Sightlines at Intersections

- 1) Adequate sightlines shall be provided at all intersections and shall meet the guidelines set forth in the CTDOT's Highway Design Manual.
- 2) Alterations to existing conditions, including but not limited to grading, vegetation removal, easements and provisions to maintain such features may be required and shall be provided by the Applicant.

3) Roadways

a. Roadway Design

The following criteria shall be incorporated in the design of proposed roads and extensions of existing roads:

	Minimum Grade	Maximum Grade	Roadway Width
Collector Road	1.5%	8.0%	28 feet
Primary Local Road	1.5%	8.0%	24 feet
Secondary Local Road	1.5%	8.0%	22 feet

Any reduction or increase in the above roadway widths shall require approval by the Planning & Zoning Commission and Town Engineer. Reductions shall not negatively impact public safety or emergency response.

b. Cul-de-sacs

Dead-end roads shall terminate in a cul-de-sac either centered along the alignment of the road or offset to one side.

Cul-de-sacs shall have a paved radius of 45-feet to facilitate the reversal of traffic flow.

Primary Road cul-de-sacs shall have a minimum right of way radius of 35.5 feet and shall be concentric with the paved cul-de-sac.

Secondary Road cul-de-sacs shall have a minimum right of way radius of 36.5 feet and shall be concentric with the paved cul-de-sac.

c. Vertical and Horizontal Alignments

In no such case shall a roadway grades exceed 10%. Roadways with grades greater than 8% shall require approval by the Planning & Zoning Commission and the Town Engineer. Roadway grades greater than 8% shall only be considered if the proposed increased grade reduces environmental impact or the need for additional cut or fill.

Roadway grades shall mimic the existing topography wherever possible. Horizontal and vertical alignments shall be designed to minimize cuts and fills.

The overall design of the roadway and adjacent lots should promote lots being at or above roadway grade.

Secondary Local Roads shall be designed to promote slower traffic speeds. The maximum length of any horizontal tangent or curve with a centerline radius of 400-feet or greater shall be 500 feet. Horizontal curves with a center line radius of 200-feet or less shall be used to transition these elements. Alternative traffic calming methods in lieu of these design guidelines may be used with the approval of the Town Engineer.

d. Grading and Right-of-Way Improvements

Roadways and rights-of-way shall be selectively cleared of existing vegetation per CTDOT's Vegetation Management Guidelines (latest revision) to promote pedestrian safety and to facilitate stormwater management and/or as otherwise required by the Town.

Cut and fill slopes shall be stabilized with a minimum of 4-inches of topsoil and turf establishment or other vegetation as accepted by the Planning & Zoning Commission.

A 5-foot wide snow shelf shall be provided adjacent to all roadways. Slopes of snow shelves shall not exceed 12:1 (horizontal to vertical).

Roadway cross-slopes shall be $\frac{1}{4}$ " per foot.

All slopes within the right of way shall not exceed 4:1 (horizontal to vertical) without approval of the Town Engineer.

No cut or fill slope shall exceed 2:1 (horizontal to vertical).

e. Roadway Pavement Markings

A 4-inch wide, white pavement stripe, 10 feet from the centerline of the roadway shall be painted on both sides of the road.

No centerline marking shall be permitted.

A 12-inch wide white stop bar shall be painted at all stop sign/traffic signalization locations.

Additional roadway markings may be required.

Roadway pavement markings not listed above shall be approved by the Town Engineer.

f. Roadside Safety

Roadside safety configurations and roadside safety hardware shall be designed and installed in accordance with the CTDOT Highway Design Manual and Highway Standard Drawings.

g. Traffic Calming Measures

The Town reserves the right to require traffic calming measures if it is deemed that geometry, proximity to Collector Roads and/or other factors may contribute to excessive speeds or impede pedestrian safety.

3. DRIVEWAYS

A. Residential and commercial driveways shall be designed in accordance with the Town of Tolland Zoning Regulations.

B. No building or structure to be served by a newly constructed or relocated driveway shall be used or occupied, in whole or in part, until such driveway has been constructed in accordance with the

applicable specifications and requirements and a permit therefore approved by the Zoning Enforcement Officer (ZEO).

4. STORM SEWERS

- A. Stormwater management systems shall be designed in accordance with the Town of Tolland Low Impact Development and Stormwater Management Design Manual and applicable portions of the Town of Tolland Zoning Regulations.
- B. When connecting to an existing drainage system, the Town Engineer may require a capacity analysis of the existing drainage system to verify the system can accommodate additional flows. The Engineer shall submit supporting calculations to the Town Engineer prior to construction of the drainage system.
- C. Drainage Structures
 - 1) CTDOT Type "C" catch basins shall be used on roads with curbing. Catch basin top shall match type and style of curbing. Catch basin spacing shall be determined by a gutter flow analysis in accordance with the DOT Drainage Manual. The width of flow during the design storm event shall not exceed 1/2 the outside travel lane width.
 - 2) CTDOT Type "C-L" catch basins shall be designed to provide sufficient grate inlet capacity assuming 1/2 of the grate is clogged. Double grate structures or additional structures shall be used to increase inlet capacity or reduce contributing flow in order to meet this requirement. Inlet capacity for Type "C" catch basins may be computed assuming no clogging but neglecting the capacity of the curb inlet.
 - 3) Catch basin tops shall be designed flat with no built in cross-slope. This way, the top may be shimmed to match the actual roadway cross-slope.
 - 4) Standard-sized catch basins shall have no more than one pipe entering each side of the structure. Pipes entering at a skew may require a reduction in the number of pipe connections at the discretion of the Town Engineer. Structures with pipe connections greater than 24 inches inside diameter shall be CTDOT double grate structures or customized structures. The Contractor shall submit engineered drawings to the Town Engineer for approval of all customized structures prior to ordering.
 - 5) Deep Sump Catch Basins, with the invert of the outlet pipe set a minimum of four (4) feet above the bottom, shall be used in accordance with the LID manual.

of the structure. shall be used

5. SANITARY SEWERS

- A. Pipe Sizing - All sanitary sewers, including outfalls, shall be designed with a full flow capacity twice the estimated flow 25 years hence. The Engineer shall take into consideration nearby undeveloped property which could in the future connect to the proposed system. Pipes shall be sized to accommodate the peak hourly flow. Sizing calculations shall also take into consideration, expected infiltration rates. All sanitary sewer mains shall be at least 8 inches in diameter.
- B. System Capacity - When connecting to an existing sewer system, the WPCA may require a capacity analysis of the existing system to verify the system can accommodate additional flows. The Engineer shall submit supporting calculations to the WPCA prior to construction of the sewer

system. Analysis shall include an inventory of all connected uses and estimated wastewater generation based on accepted industry standards.

C. Pipe Slope

- 1) The size and slope of the building sewer shall be subject to the approval of the Director of Public Works. All sanitary sewers shall be designed with such hydraulic slope as will give a velocity of not less than 2.5 feet per second when flowing full or half-full based on Manning's Formula, with an "n" value equal to 0.013 for gravity sewer pipes.
- 2) In some cases, where pipes are expected to flow less than half full, particularly between the first two upstream manholes, the Town Engineer may require a minimum slope of 0.6%.
- 3) The use of oversized sewers in order to justify flatter slopes shall not be permitted. Where larger than minimum required pipe sizes are proposed, the design engineer shall submit computations of minimum velocity based on actual minimum, average and maximum day and peak hourly flow for each section of the sewer pipe.
- 4) In order to minimize the effect of scouring of the pipe by hard or gritty material, all sanitary sewers shall be designed with such hydraulic slopes as will give a mean velocity of not more than 10 feet per second when flowing full or half full based on Manning's Formula with an "n" value equal to 0.013 for gravity sewer pipes.
- 5) Inside Drop manholes may be required to limit pipes to the maximum grades shown above.

D. Cover Over Pipe

- 1) The minimum cover over sewer pipes shall be as follows:

Pipe Material	Sewer Mains	Laterals (traffic areas)	Laterals (lawn areas)
PVC SDR35	5 ft.	3 ft.	2 ft.
C900 Heavy Duty PVC	3 ft.	2 ft.	2 ft.
Ductile Iron (Class 52)	3 ft.	2 ft.	1 ft.

- 2) Pipes with less than 3 feet of cover shall be insulated. Concrete encasement may be ordered at the discretion of the Town Engineer to provide additional protection under traffic areas. The Town Engineer may also approve reduced cover requirements in order to provide service to areas with failing septic systems if it is in the Town's best interest to do so.
- 3) Maximum cover shall be in accordance with pipe manufacturer's specifications.

E. Manholes

- 1) Manholes shall be provided at the end of each street sewer line and at intersections and changes of direction or grade. Distances between manholes shall not exceed 300 feet, unless approved by the Town Engineer. Pipe materials shall be uniform between structures. A structure shall be required to transition between pipe materials unless otherwise approved by the Town Engineer.

Tolland Public Improvements Manual

F. House Sewer Lines

- 1) The building sewer shall be cast-iron soil pipe, vitrified clay sewer pipe, polyvinyl chloride pipe or other suitable material approved by the Director. All pipe materials shall conform to the latest standard specifications of the ASTM as approved by the Director.
- 2) Laterals shall have a minimum diameter of 6 inches to avoid stoppages. The grade on all laterals for new construction shall be at least 1/4 inch per foot and no more than 10%. In cases of septic system failures, sewer repairs or lots in existence prior to the adoption of these regulations, the Town Engineer and/or Director may approve a slope of 1/8 inch per foot if it is in the best interest of the Town to do so.
- 3) Refer to additional requirements in the Town of Tolland WPCA Sewer Regulations and the details in this manual.

G. Pump Stations

- 1) The use of wastewater pumping stations shall be discouraged wherever gravity sewers can be constructed. Projects shall take into consideration, and accommodate flows from future developments where possible to avoid the need for additional pump stations. Pump station design shall be approved by the WPCA prior to start of construction. The applicant shall submit preliminary design drawings to the Town Engineer and/or Director for review and comment prior to submitting final drawings to the WPCA for approval. In general, pump station design shall comply with the Guides for Design of Wastewater Treatment Works (TR-16) by the New England Interstate Water Pollution Control Commission, 1998 Edition, as amended.

H. Grinder Pumps

- 1) Individual grinder pumps may be utilized to connect to the sanitary sewer system where gravity connections are not feasible. Unless otherwise approved by the Town Engineer, all force mains from grinder pumps shall discharge to a gravity lateral or manhole outside the Town's right-of-way.
- 2) Grinder pumps shall be located at least 75 feet from any potable water supply well. Exceptions to this separating distance due to lot size or other site restrictions must be reviewed and approved by the local Health Director, with oversight by the State Department of Public Health. No exceptions to the required separating distance will be granted for new development.

STANDARD DETAILS



Town of
Tolland
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TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

TYPICAL ROADWAY SECTION

SCALE: NONE

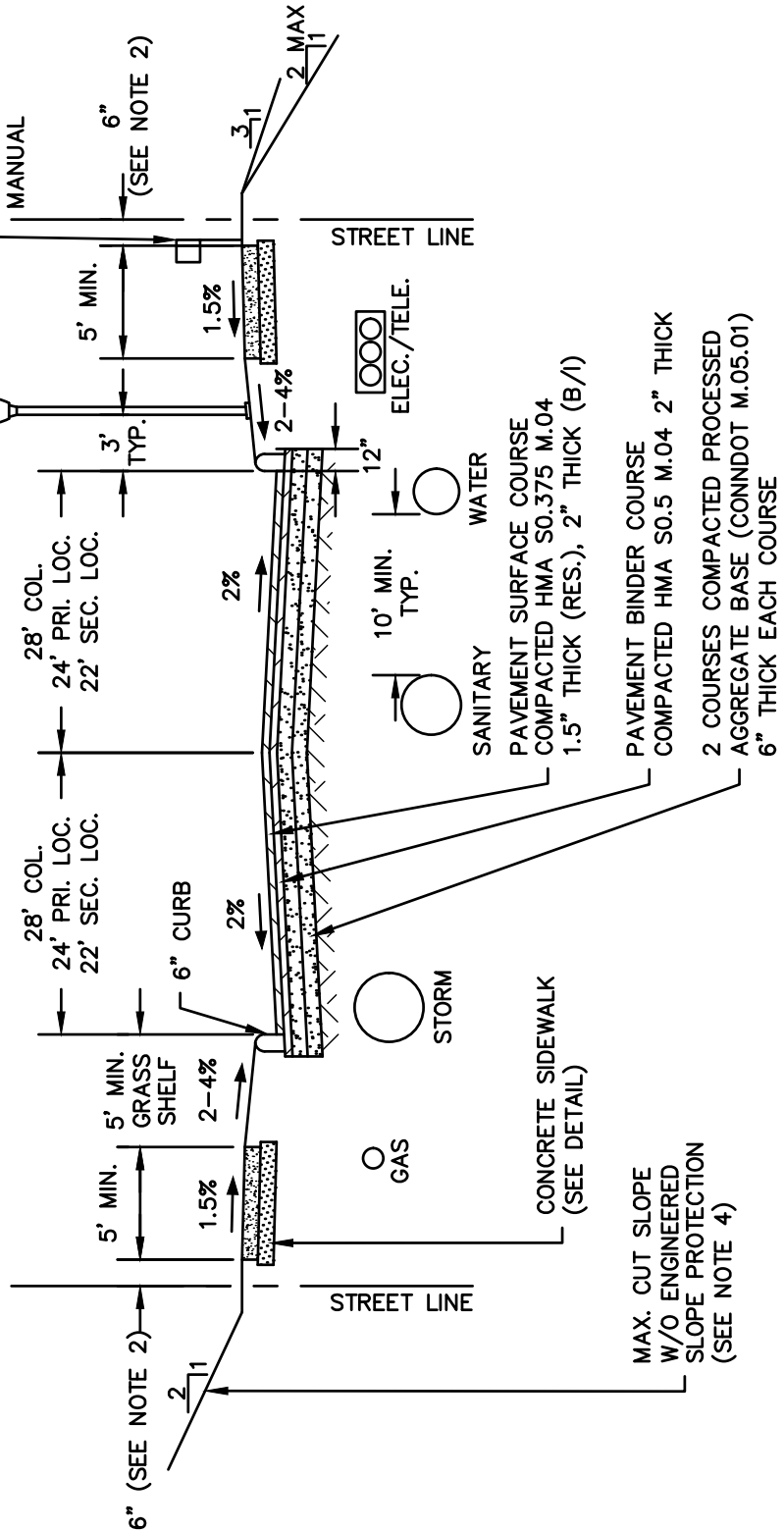
DETAIL 1-1

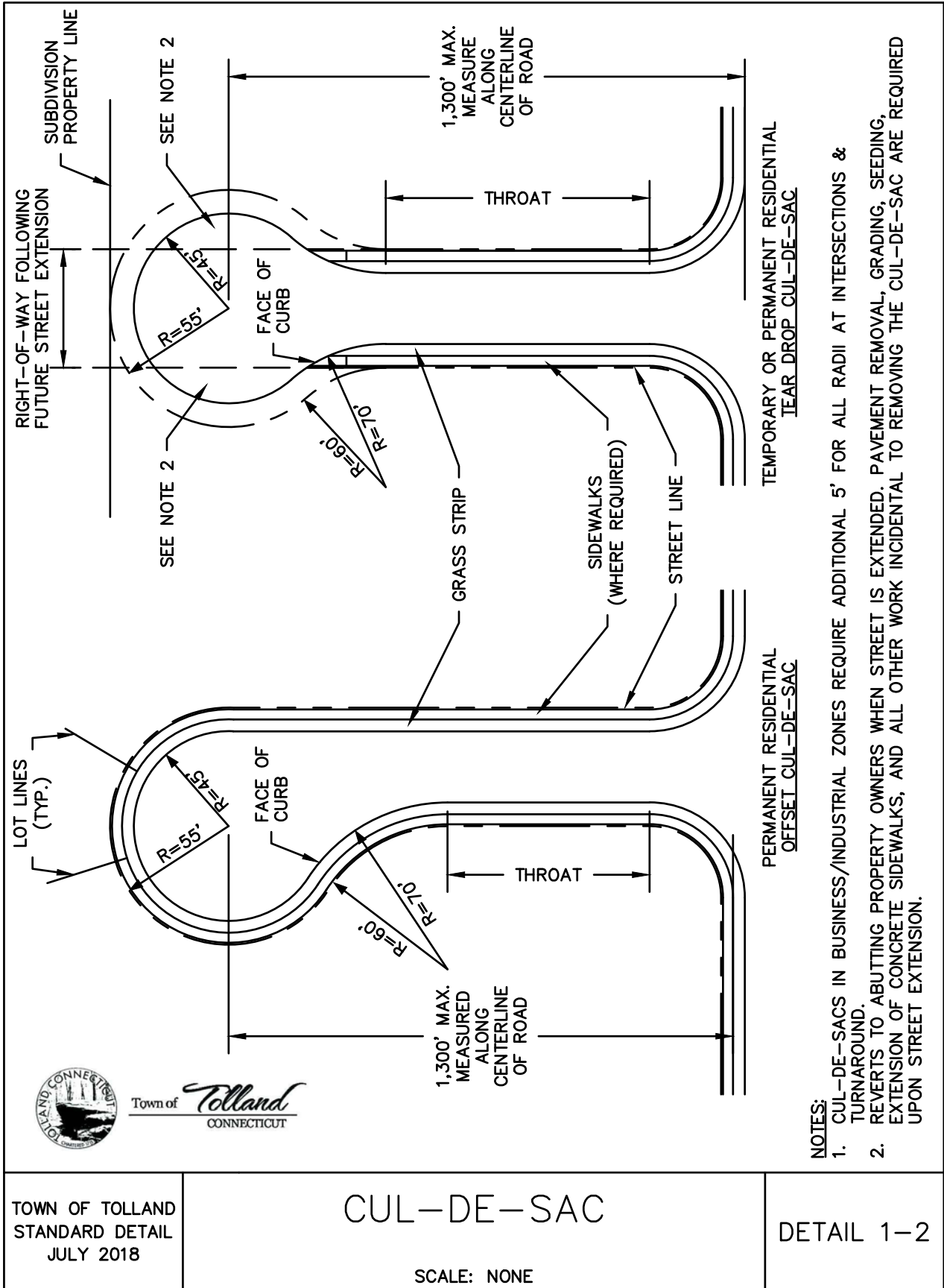
NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. TOWN ENGINEER MAY REQUIRE SIDEWALKS TO BE LOCATED BEYOND LIMITS OF STREET LINE WITHIN SIDEWALK/GUIDE RAIL EASEMENTS IN ORDER TO MAINTAIN 5' MIN. SNOW SHELF.
3. FOR WOODEN GUIDERAIL, SEE DETAIL. FOR METAL BEAM RAIL, SEE CONNDOT STANDARD DETAILS.
4. ENGINEERED SLOPE PROTECTION METHODS SHALL BE SUBJECT TO APPROVAL BY THE TOWN ENGINEER OR DIRECTOR OF PUBLIC WORKS.

STREET LIGHTING AND
OTHER ABOVE GROUND
UTILITY STRUCTURES ARE
TO BE AT LEAST 3' FROM
FACE OF CURB

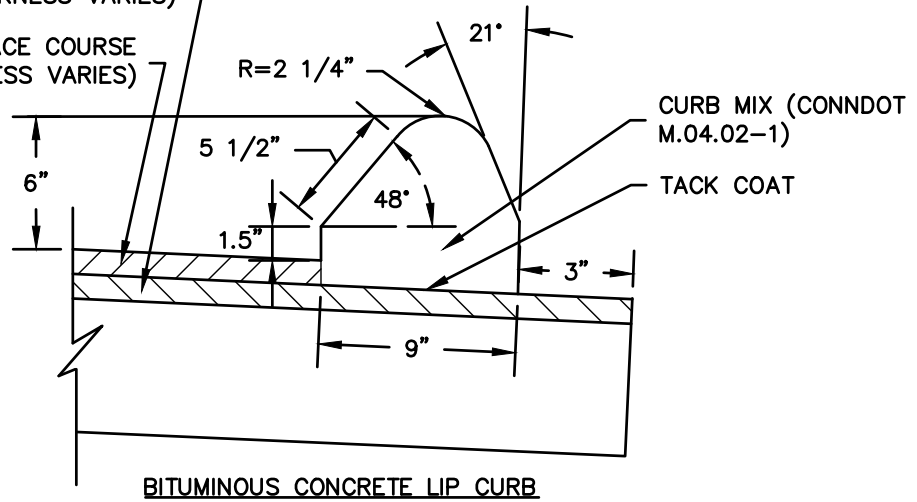
GUIDERAIL PER
PUBLIC
IMPROVEMENTS
MANUAL





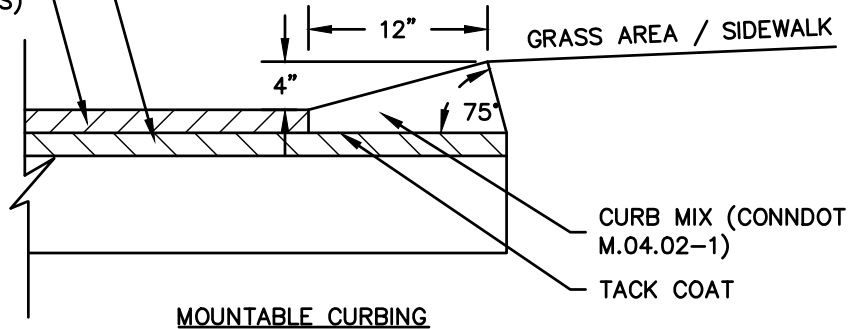
PAVEMENT BINDER COURSE
(TYPE AND THICKNESS VARIES)

PAVEMENT SURFACE COURSE
(TYPE AND THICKNESS VARIES)



PAVEMENT BINDER COURSE
(TYPE AND THICKNESS VARIES)

PAVEMENT SURFACE COURSE
(TYPE AND THICKNESS VARIES)



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.



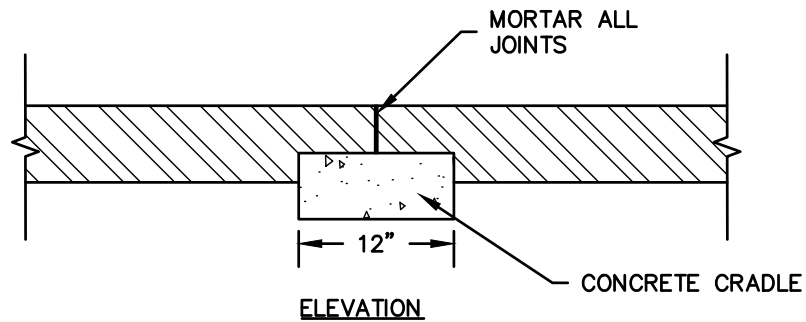
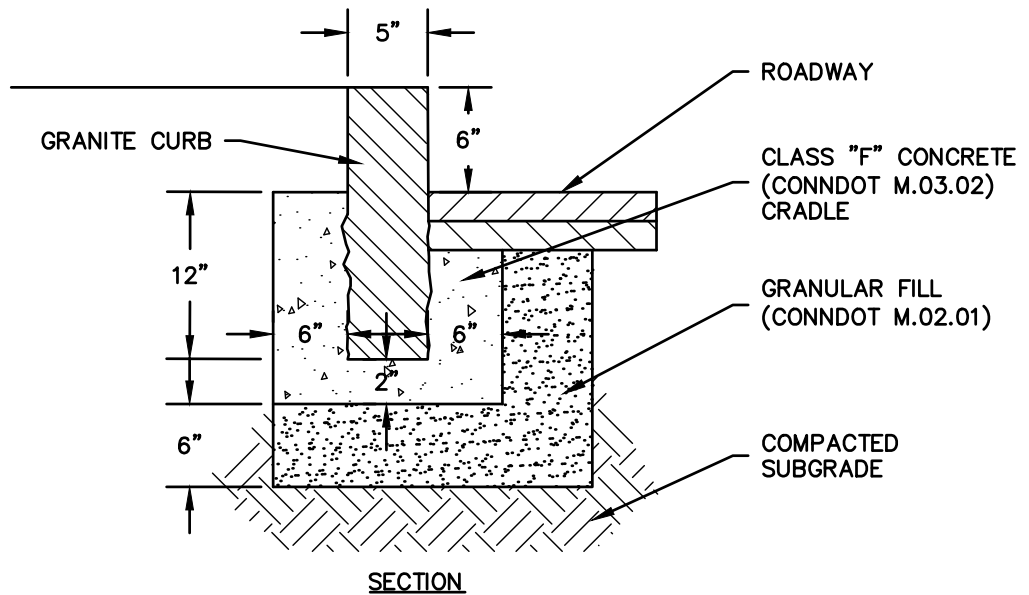
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
JULY 2018

BITUMINOUS CONCRETE CURBING

SCALE: NONE

DETAIL 1-3



NOTES:

1. FINISH: SAWN TOP, SPLIT FACE, WITH 8" SMOOTH QUARRY SPLIT FROM TOP.
2. BREAKBACK: 9" FOR CURB LENGTHS 6' OR MORE, 6" FOR CURB LENGTHS LESS THAN 6'.
3. MINIMUM SECTION LENGTH IS 6'.
4. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
5. GRANITE CURBING TO BE INSTALLED IN HISTORICAL AREAS.
6. WHERE GRANITE CURBING ABUTS A SIDEWALK, A BOND BREAKER SHALL BE INSTALLED.



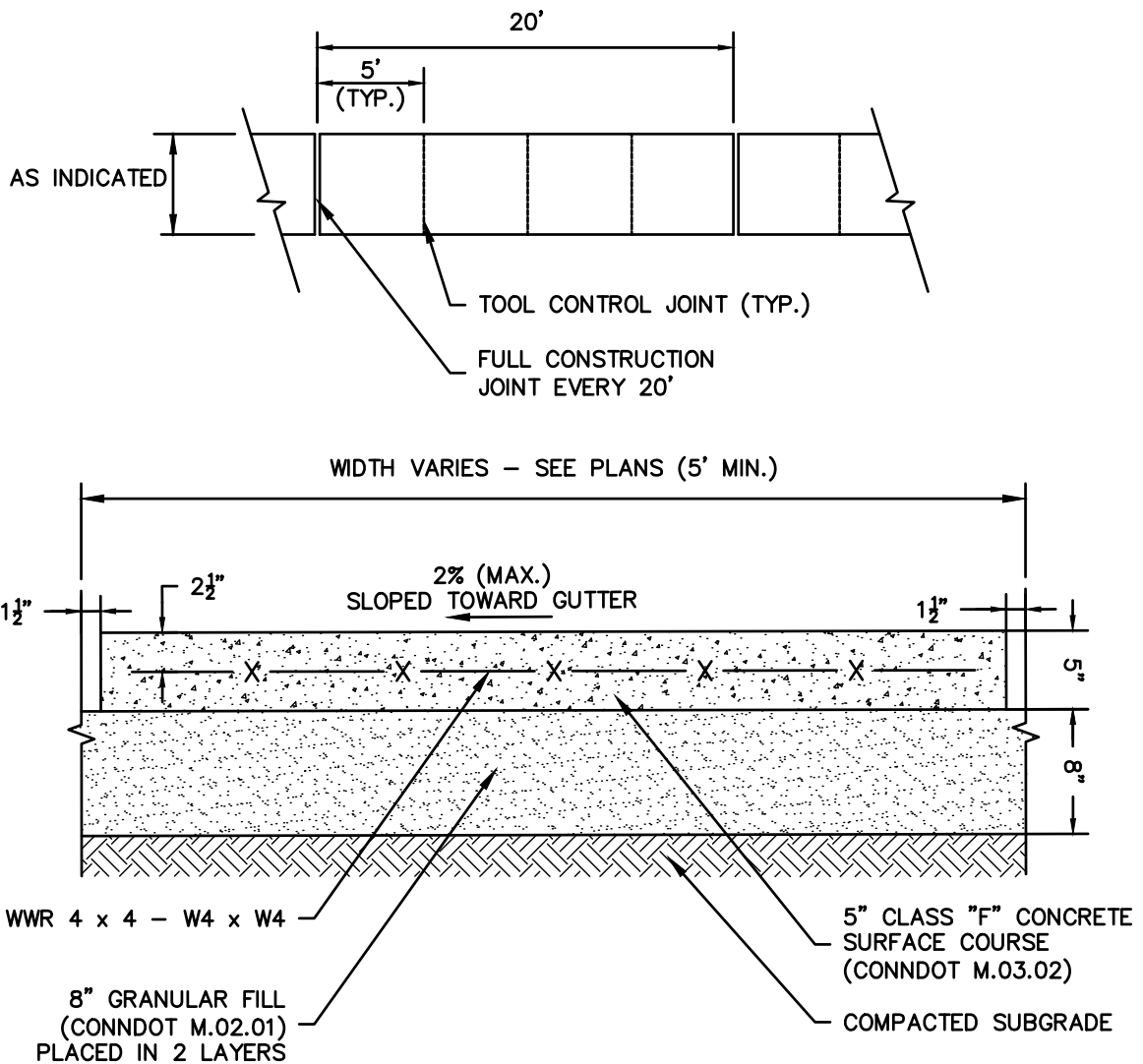
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

GRANITE CURB

SCALE: NONE

DETAIL 1-4



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. TOOLED CONTROL JOINTS SHALL BE 1/4 OF SLAB THICKNESS. TOOL JOINTS EARLY IN FINISHING PROCESS AND RE-RUN TO ENSURE GROOVE BOND HAS NOT OCCURRED.
3. FULL-DEPTH JOINTS SHALL INCORPORATE FULL-DEPTH JOINT FILLER PER SPECIFICATIONS.
4. SIDEWALK SHALL HAVE LIGHT BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL.
5. AT DRIVEWAYS, SIDEWALKS SHALL BE 8" THICK WITH 6" X 6" 10/10 WWR.



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CONCRETE SIDEWALK

DETAIL 1-5

SCALE: NONE

NOTES (SEE DETAILS 1-7 TO 1-14):

1. MAXIMUM SLOPES OF ADJOINING GUTTERS AND ROAD SURFACES IMMEDIATELY ADJACENT TO THE SIDEWALK RAMP SHOULD NOT EXCEED 5%. THE MAXIMUM GRADE DIFFERENCE BETWEEN THE GUTTER AND CURB RAMP SHALL NOT EXCEED 13%.
2. RAMP GRADE SHALL BE UNIFORM, FREE OF SAGS AND ABRUPT GRADE CHANGES.
3. ALL RAMPS SHALL BE CONSTRUCTED OF CLASS "F" CONCRETE IN ACCORDANCE WITH CONNECTICUT STANDARD SPECIFICATIONS.
4. SIDEWALK RAMPS SHALL HAVE A COARSE BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP. THE SURFACE OF ALL SIDEWALK RAMPS SHALL BE STABLE, FIRM AND SLIP RESISTANT. SURFACE DISCONTINUITIES SHALL NOT EXCEED 1/4" MAX. VERTICAL DISCONTINUITIES BETWEEN 1/4" AND 1/2" MAX. SHALL BE BEVELED 1:2 MINIMUM APPLIED ACROSS THE ENTIRE LEVEL CHANGE.
5. DIAGONAL SIDEWALK RAMPS AT MARKED CROSSINGS SHALL BE WHOLLY CONTAINED WITHIN THE MARKINGS, EXCLUDING ANY FLARED SIDES. DIAGONAL AND PERPENDICULAR RAMPS SHALL HAVE THE RAMP CUT PERPENDICULAR TO THE TANGENT OF THE CURB RADIUS FOR THE DESIGNATED ACCESSIBLE ROUTE. BOTH LONGITUDINAL SIDES OF THE RAMP SHOULD BE THE SAME LENGTH. SKEWED RAMPS SHOULD BE AVOIDED. FLARES ARE NOT CONSIDERED PART OF PEDESTRIAN ACCESS ROUTE. DIAGONAL RAMPS SHOULD NOT BE INSTALLED WHERE CURB RADII IS LESS THAN 20'.
6. REMOVAL OF EXISTING SIDEWALK FOR NEW RAMP INSTALLATIONS SHALL BE TO THE NEAREST EXPANSION OR CONTRACTION JOINT. 8.3% MAXIMUM SLOPE MAY NOT BE ACHIEVABLE DUE TO EXISTING SIDEWALK GRADE. IN RECOGNITION OF THIS, A LIMIT OF 15' FOR REMOVAL SHALL BE USED UNLESS OTHERWISE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER. SAW CUT REQUIRED FOR DUMMY JOINTS SHALL BE INCLUDED IN THE COST OF "CONCRETE SIDEWALK RAMP" OR "CONCRETE SIDEWALK".
7. EXPANSION JOINTS IN CONCRETE SHALL MATCH THOSE IN ADJACENT SIDEWALKS BUT IN NO CASE SHALL THE SPACING BETWEEN EXPANSION JOINTS EXCEED 12' UNLESS OTHERWISE NOTED.
8. CONCRETE SIDEWALK RAMPS, SHALL BE PAID FOR UNDER THE ITEM "CONCRETE SIDEWALK RAMP", AS DEFINED BY THE CONSTRUCTION LIMITS ON THE PLANS AND SHALL BE FIELD VERIFIED.
9. SIDEWALK RAMPS SHALL BE CONSTRUCTED WITH THE TOE AT THE GUTTER CAST INTEGRALLY WITH RAMP UNLESS DIRECTED OTHERWISE BY THE ENGINEER. CURB REMOVAL AND CAST IN PLACE CURBING (SHOWN IN DETAILS AS GREY) REQUIRED FOR THE RAMP, SHALL BE INCLUDED WITH PAY ITEM "CONCRETE SIDEWALK RAMP". CURBING OUTSIDE LIMITS OF RAMP OR LANDING SHOWN ON DETAILS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH CONNECTICUT STANDARD SPECIFICATIONS.
10. PREFERRED LOCATION TO INSTALL DETECTABLE WARNING STRIP SHALL BE 6" FROM THE EDGE OF ROAD ALONG THE FULL WIDTH OF THE RAMP.
11. TO PERMIT WHEELCHAIR WHEELS TO ROLL BETWEEN DOMES, ALIGN DOMES ON A SQUARE GRID IN THE DIRECTION OF RUNNING SLOPE (PERPENDICULAR TO CURB OR SLOPE BREAK). THE TRANSITION FROM RAMP TO GUTTER SHALL BE FLUSH WITHOUT A LIP.
12. WHERE COMMERCIAL DRIVEWAYS ARE PROVIDED WITH TRAFFIC SIGNALS AND THE SIDEWALK IS CONTINUOUS THROUGH DRIVEWAY, DETECTABLE WARNINGS ARE REQUIRED AT THE JUNCTION BETWEEN THE PEDESTRIAN ROUTE AND DRIVEWAY.
13. CONSTRUCT A SIDEWALK CURB WHEN THERE IS INSUFFICIENT BUFFER AVAILABLE TO GRADE OR WHEN CALLED FOR IN PLANS. PAID FOR WITH SIDEWALK RAMP WHEN REQUIRED FOR RAMP.
14. THE TOP AND BOTTOM OF RAMPS SHOULD BE PROVIDED WITH A 4' x 4' MINIMUM LEVEL LANDING AREA WITH A CROSS SLOPE LESS THAN OR EQUAL TO 2% IN ANY DIRECTION.
15. UTILITY POLES, LUMINAIRE, PEDESTRIAN OR SIGNAL POLES, GRATES, ACCESS COVERS, AND OTHER APPURTENANCES SHALL NOT BE LOCATED ON RAMPS, LANDINGS, BLENDED TRANSITIONS, AND AT GUTTERS WITHIN THE PEDESTRIAN ACCESS ROUTE.
16. APPROACH SIDEWALK WIDTHS, GRASS STRIP OR UTILITY STRIP WIDTHS MAY VARY.
17. THE RUNNING OR CROSS SLOPES ON LANDINGS AT MID BLOCK CROSSING MAY BE WARPED TO MEET STREET OR HIGHWAY GRADE.
18. FOR PERPENDICULAR CURB RAMPS A MIN. 4' x 4' LEVEL LANDING SHALL BE PROVIDED AT THE TOP OF CURB RAMP. WHERE THE LEVEL LANDING IS RESTRICTED AT THE BACK OF SIDEWALK THE LEVEL LANDING SHALL BE 4' x 5' WITH THE 5' DIMENSION PROVIDED IN THE DIRECTION OF THE RAMP RUN.
19. FOR PARALLEL CURB RAMPS, A MIN. 4' x 4' LEVEL LANDING SHALL BE PROVIDED AT THE BOTTOM OF CURB RAMP. IF THE LEVEL LANDING IS RESTRICTED ON 2 OR MORE SIDES, THE LEVEL LANDING SHALL BE 4' x 5' WITH THE 5' DIMENSION PROVIDED IN THE DIRECTION OF THE PEDESTRIAN STREET CROSSING.
20. WHEN WIDTH OF SIDEWALK IS >48" AND A PERPENDICULAR SIDEWALK RAMP IS INSTALLED, THE FLARED SIDES SHALL BE 10% MAX. IF WIDTH OF SIDEWALK IS <48" THE FLARED SIDES MUST NOT EXCEED 8.33% (12:1).
21. OPTIONAL RAMP, WHEN REQUIRED, SHALL BE PAID FOR AS PART OF CONCRETE SIDEWALK RAMP.



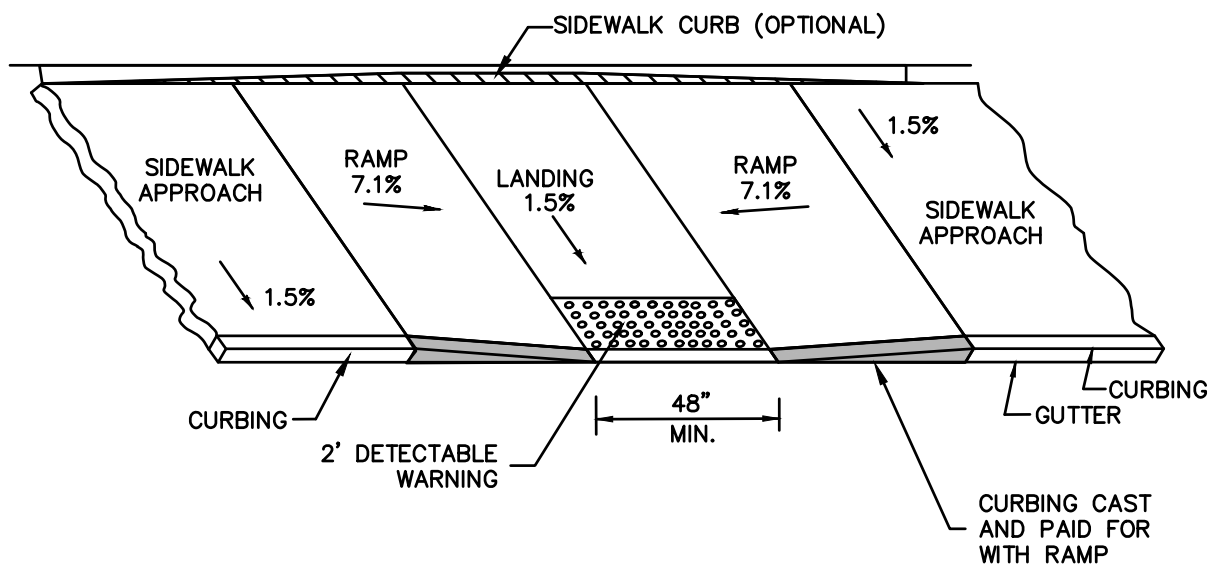
Town of *Tolland*
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FEBRUARY 2017

SIDEWALK RAMP NOTES

DETAIL 1-6

SCALE: NONE



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.

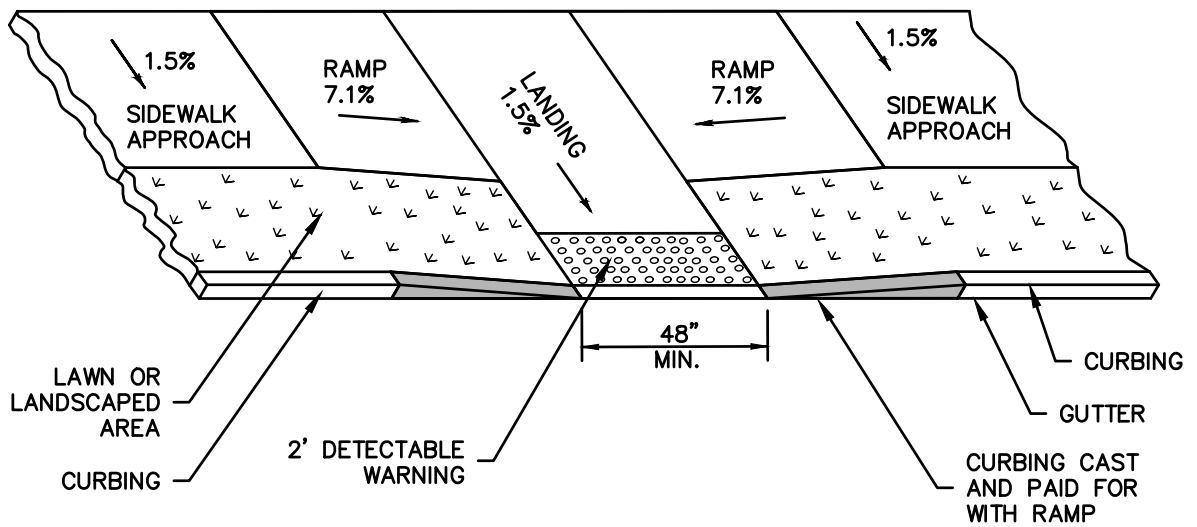


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PARALLEL SIDEWALK RAMP (TYPE 1) SCALE: NONE

DETAIL 1-7



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.

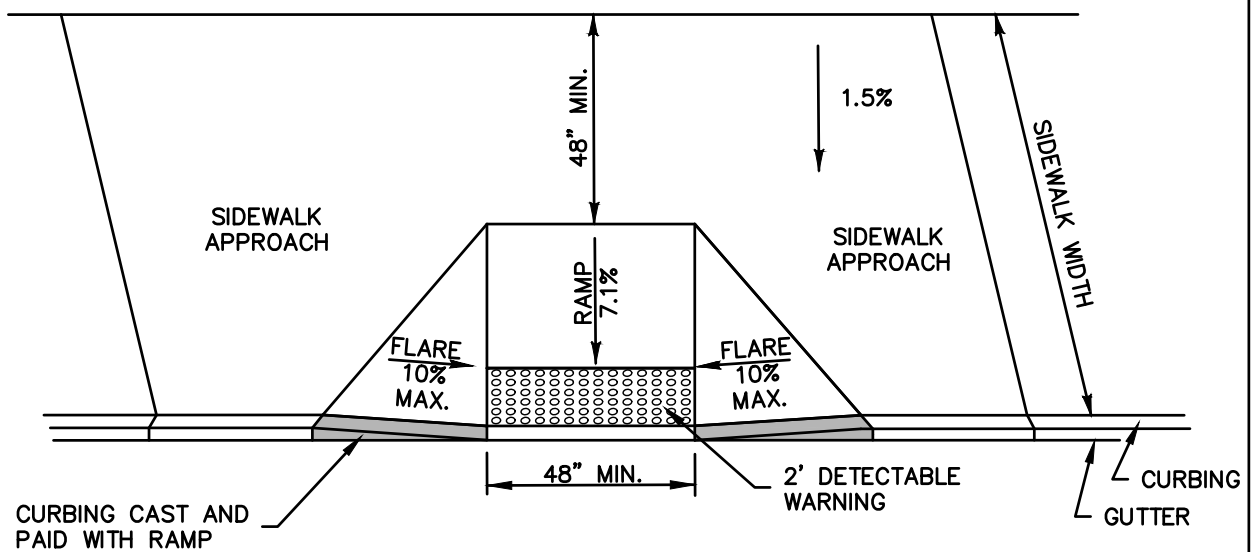


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PARALLEL SIDEWALK RAMP
(TYPE 1a)
SCALE: NONE

DETAIL 1-8



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK NOTES.



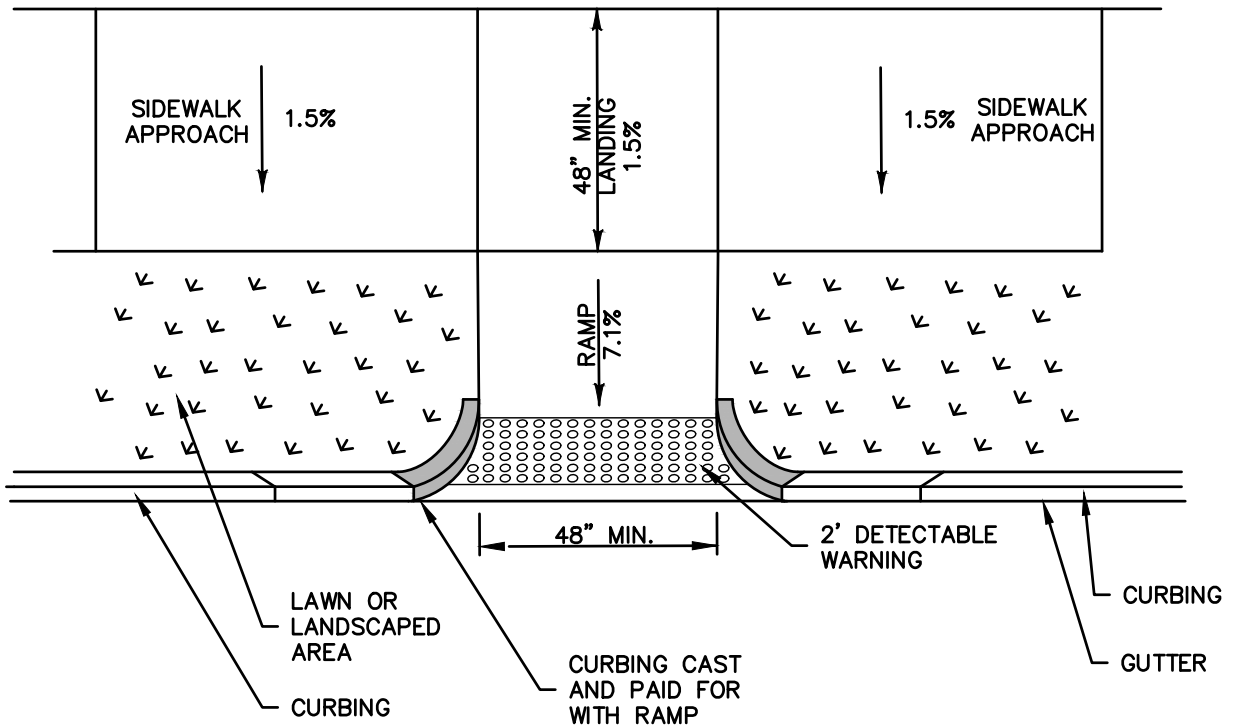
Town of *Tolland*
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PERPENDICULAR SIDEWALK RAMP (TYPE 2)

SCALE: NONE

DETAIL 1-9



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.



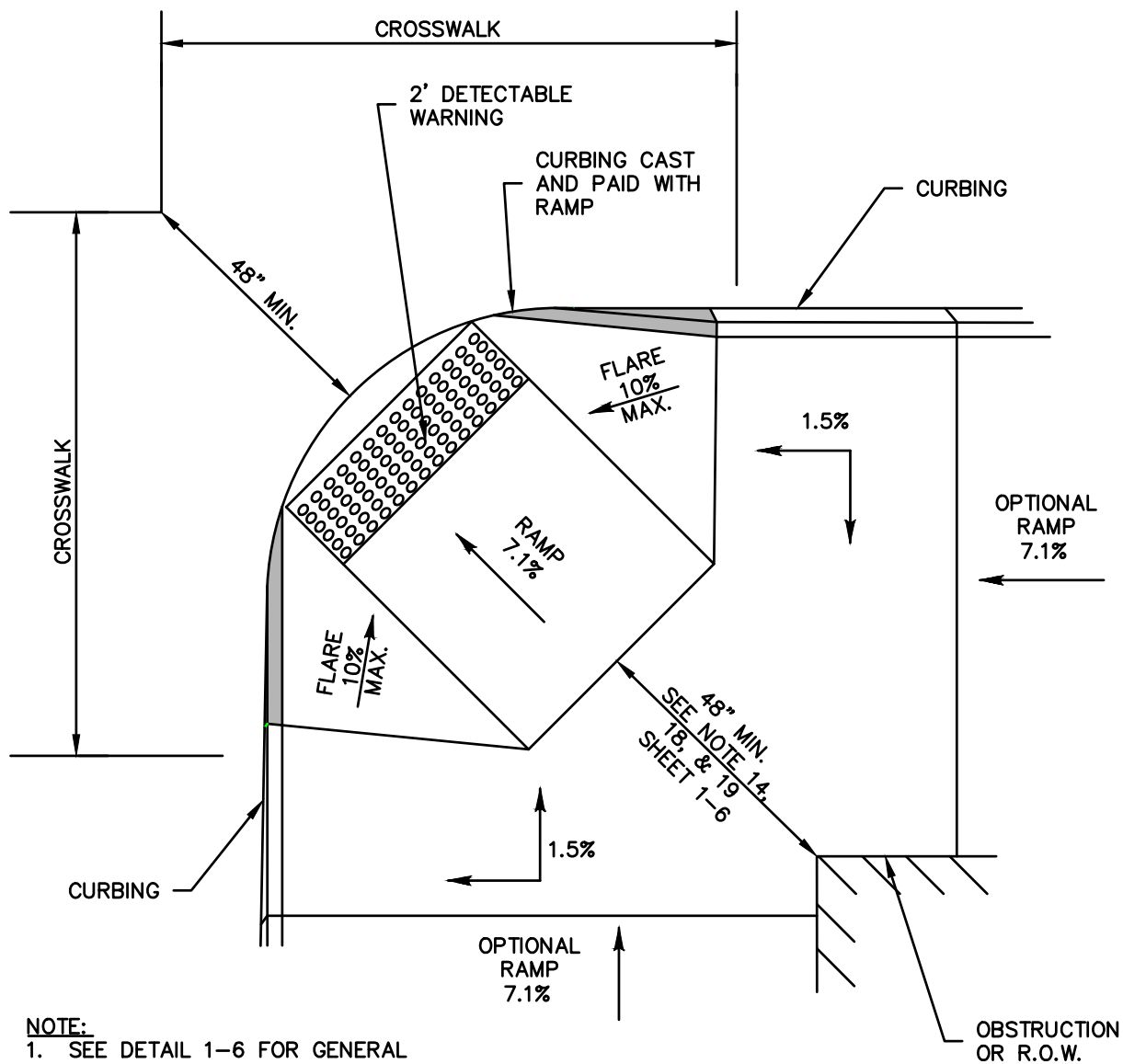
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PERPENDICULAR SIDEWALK RAMP (TYPE 2a)

SCALE: NONE

DETAIL 1-10

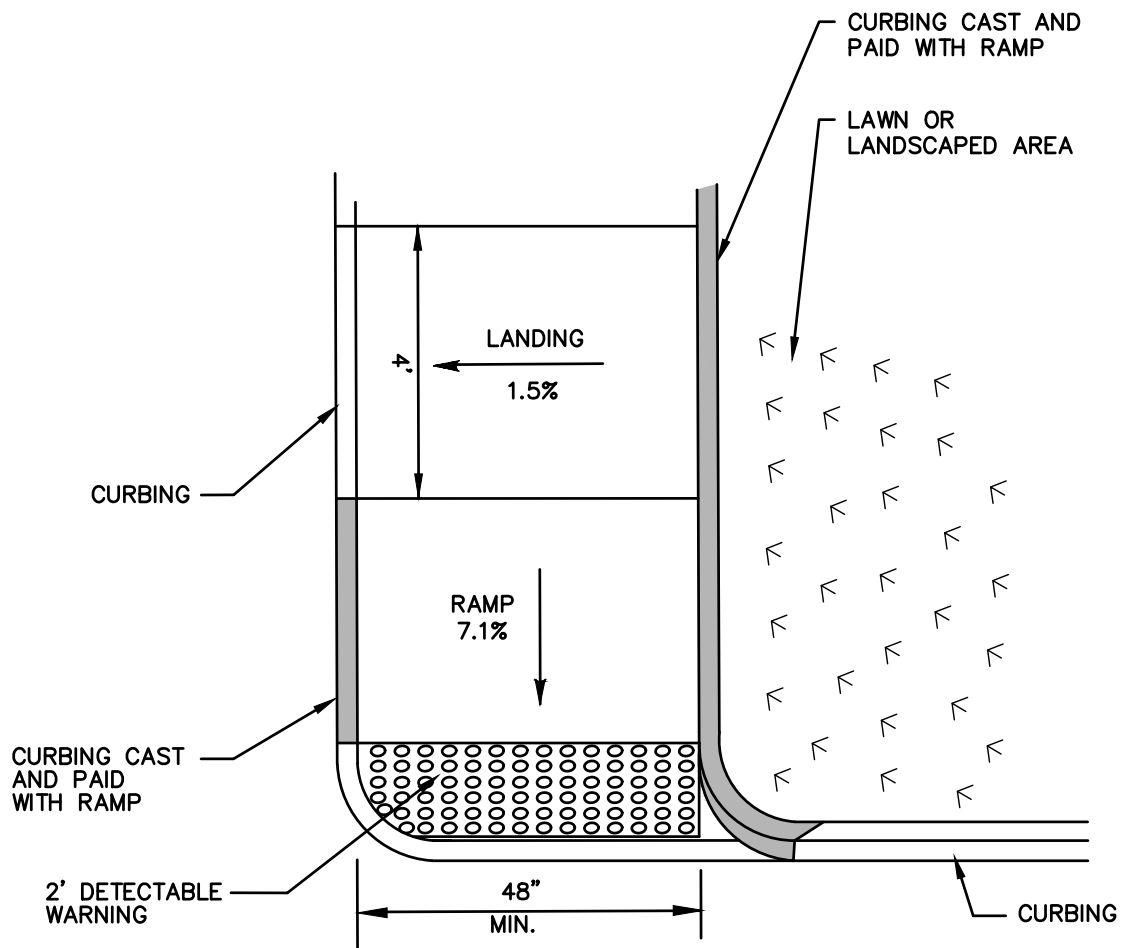


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DIAGONAL SIDEWALK RAMP (TYPE 4) SCALE: NONE

DETAIL 1-11



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.



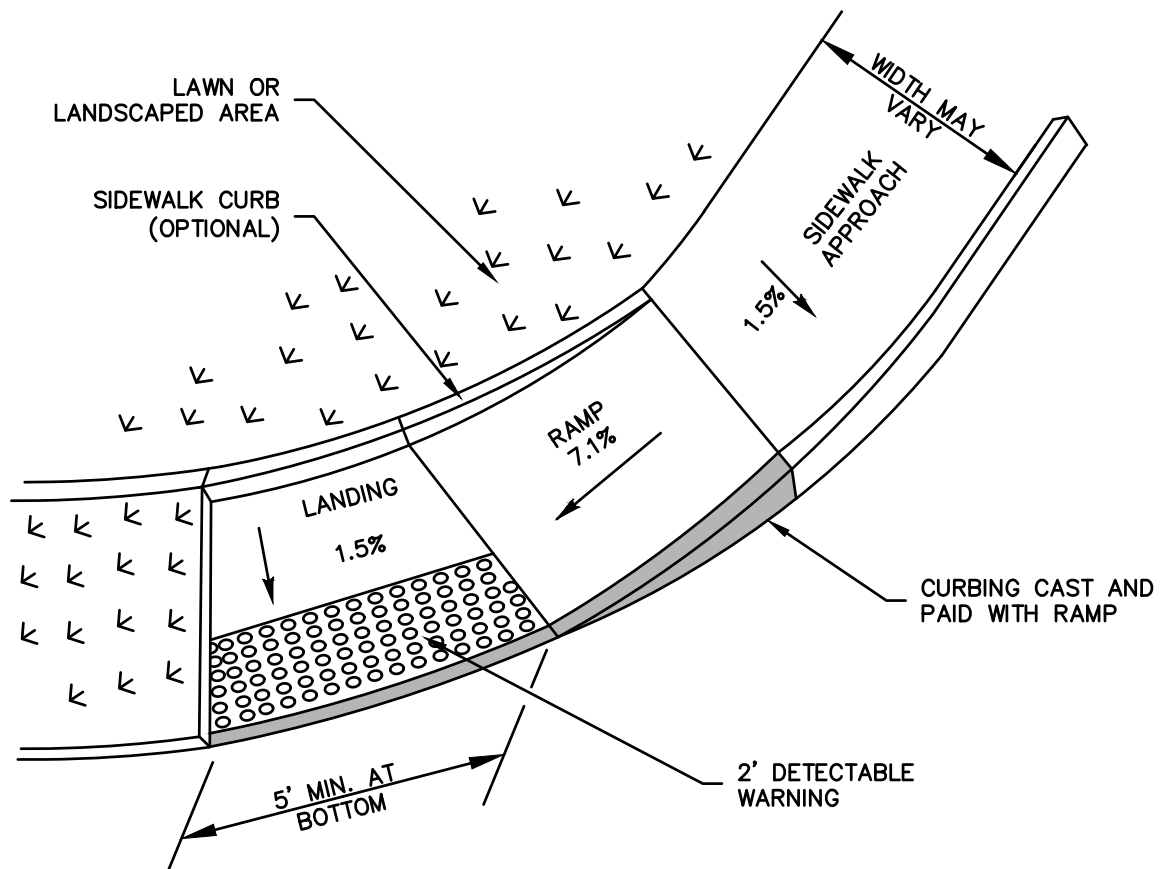
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PERPENDICULAR SIDEWALK RAMP (TYPE 4a)

SCALE: NONE

DETAIL 1-12



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.



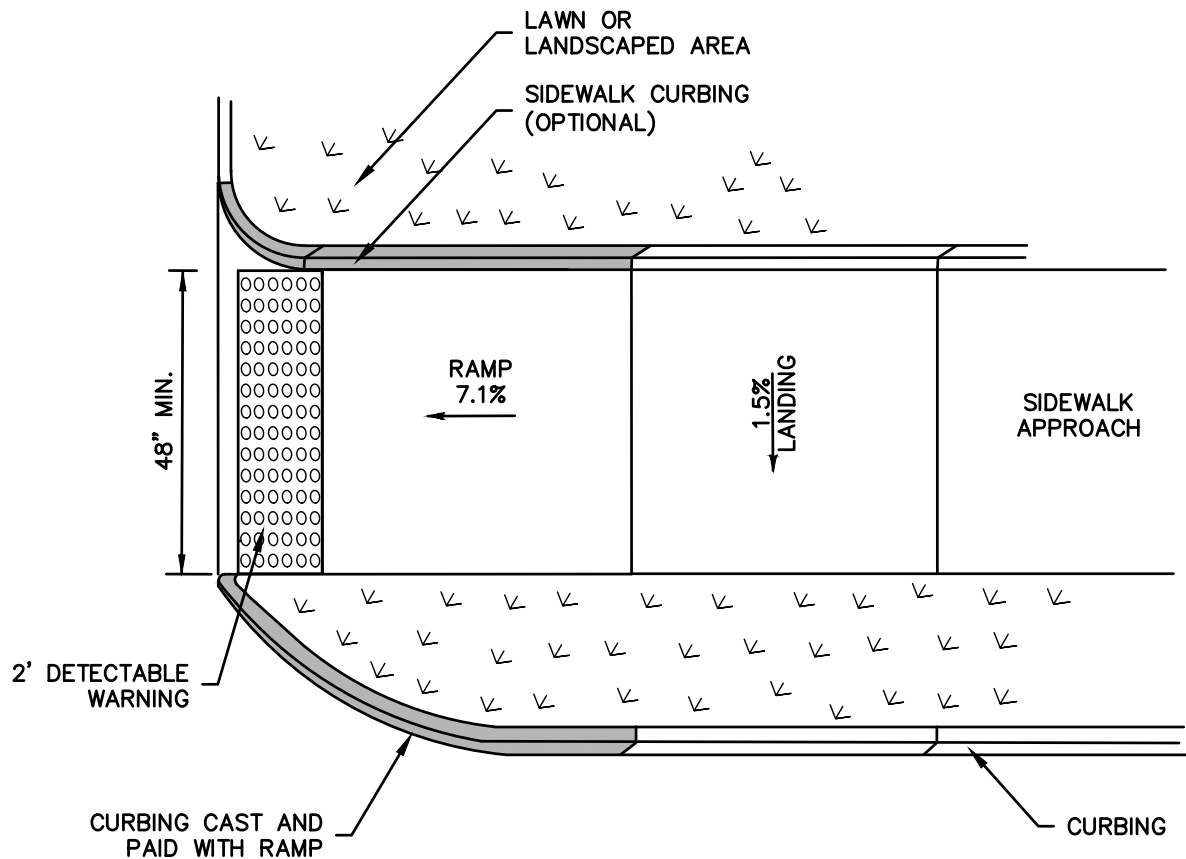
Town of *Tolland*
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SINGLE PARALLEL SIDEWALK RAMP (TYPE 4c)

SCALE: NONE

DETAIL 1-13



NOTE:

1. SEE DETAIL 1-6 FOR GENERAL SIDEWALK RAMP NOTES.



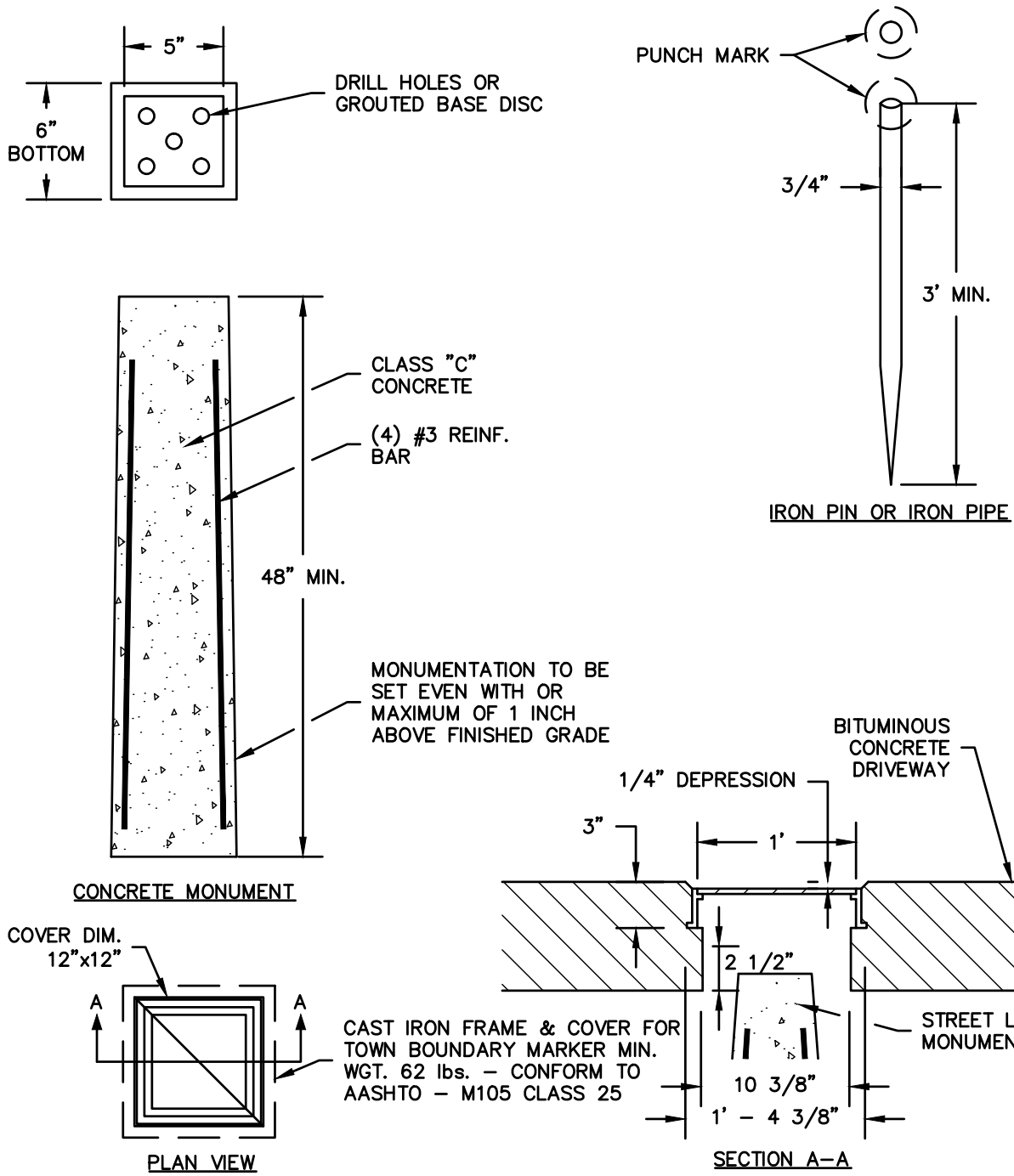
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PERPENDICULAR SIDEWALK RAMP (TYPE 4e)

SCALE: NONE

DETAIL 1-14



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CONNECTICUT

STREET LINE MONUMENT IN DRIVEWAY COVER DETAIL

NOTES:

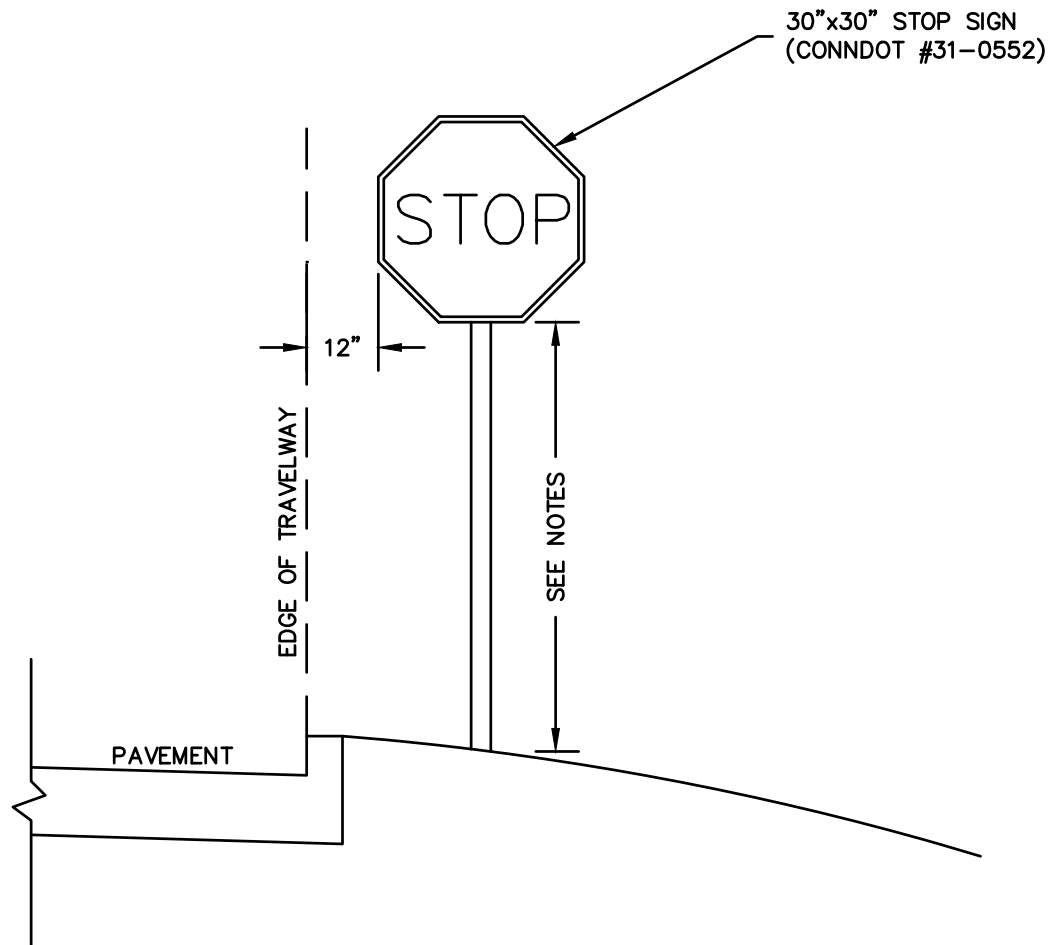
1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.

TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

MONUMENTATION

SCALE: NONE

DETAIL 1-15



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. MOUNTING HEIGHT: NO LESS THAN 5 FT. (TYP.) 7 FT. MIN. IN PARKING OR PEDESTRIAN AREAS.



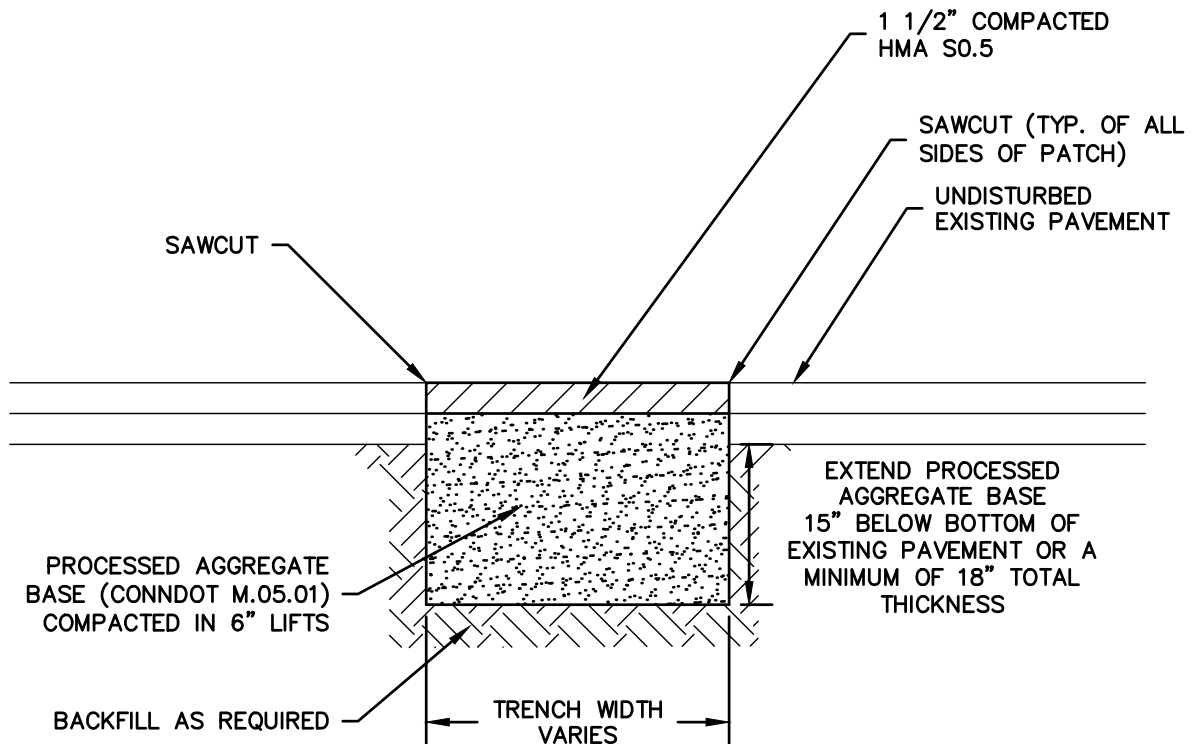
Town of *Tolland*
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STOP SIGN

SCALE: NONE

DETAIL 1-16



Town of *Tolland*
CONNECTICUT

NOTES:

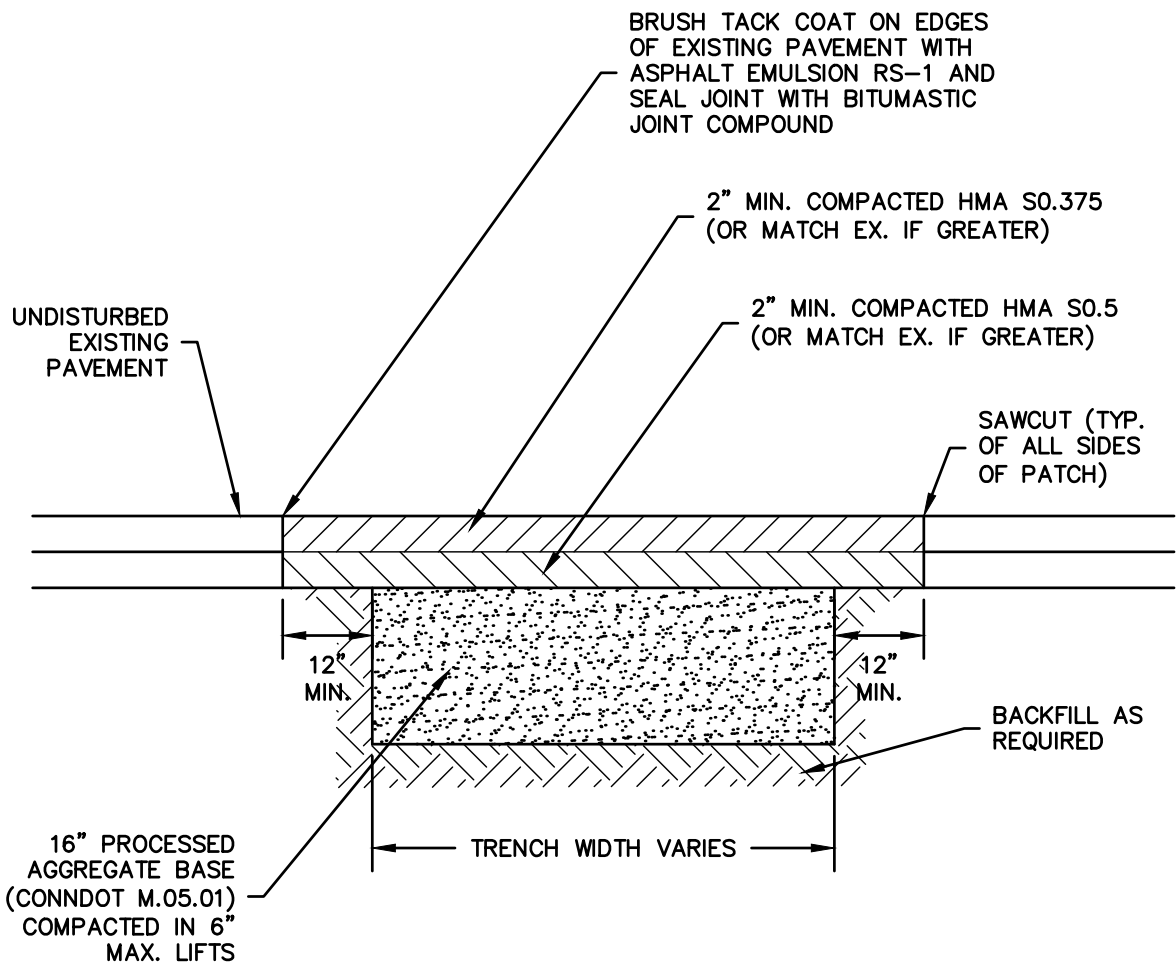
1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.

TOWN OF TOLLAND
STANDARD DETAIL
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TEMPORARY PAVEMENT PATCH

SCALE: NONE

DETAIL 1-17



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. ALL SAWCUT AND SEALED JOINTS TO BE EITHER PARALLEL WITH, OR PERPENDICULAR TO, THE CENTERLINE OF THE PIPE.



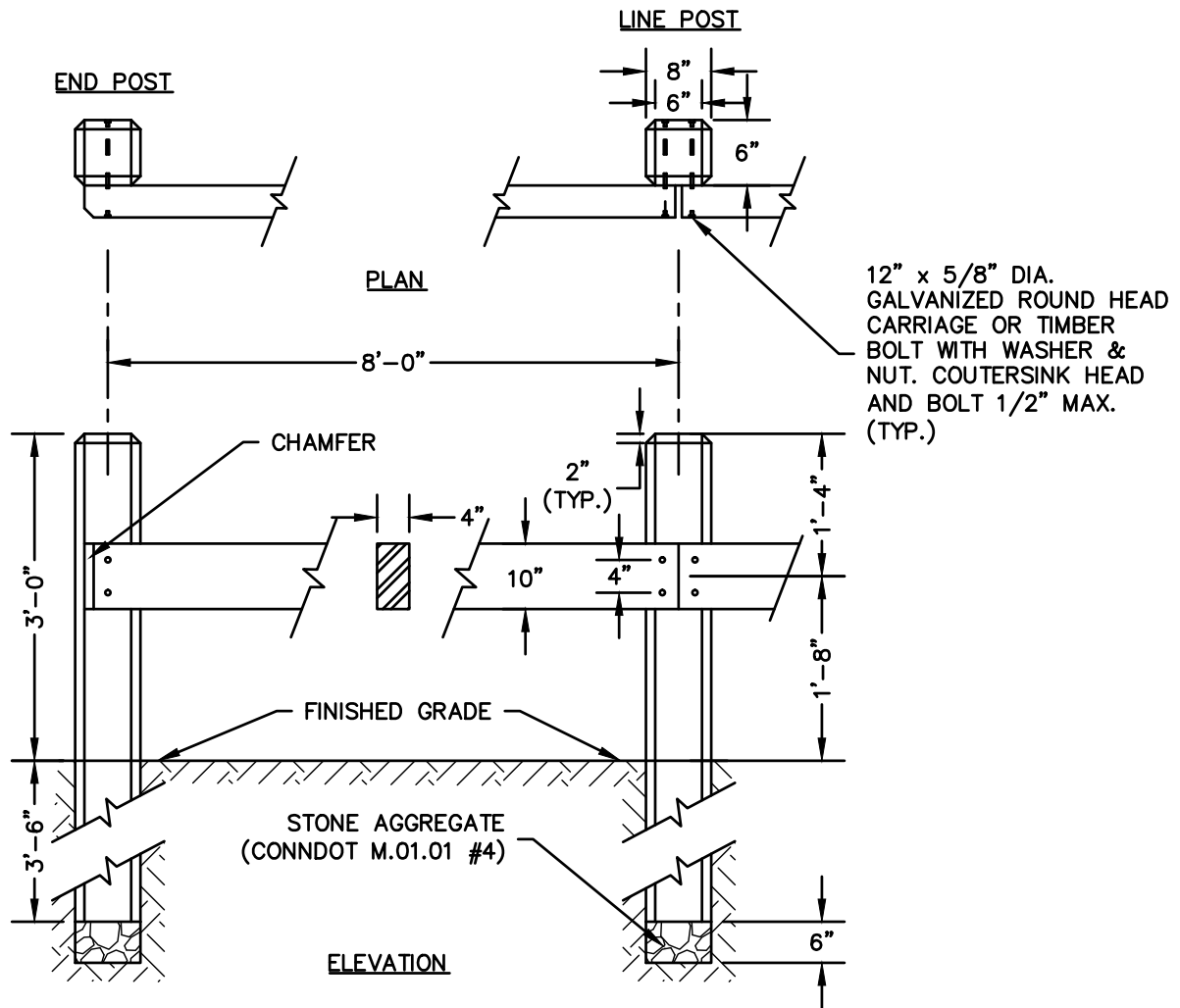
Town of *Tolland*
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FEBRUARY 2017

PERMANENT PAVEMENT PATCH

SCALE: NONE

DETAIL 1-18



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. ALL TIMBER SHALL BE PRESSURE TREATED.
3. ALL HARDWARE TO BE HOT-DIP GALVANIZED, ASTM A153. NUTS: ASTM A563. BOLTS: ASTM A307 GRADE A.
4. NOT A CRASHWORTHY GUIDE RAIL. USE ONLY OUTSIDE OF THE CLEAR ZONE FOR DECORATIVE PURPOSES.



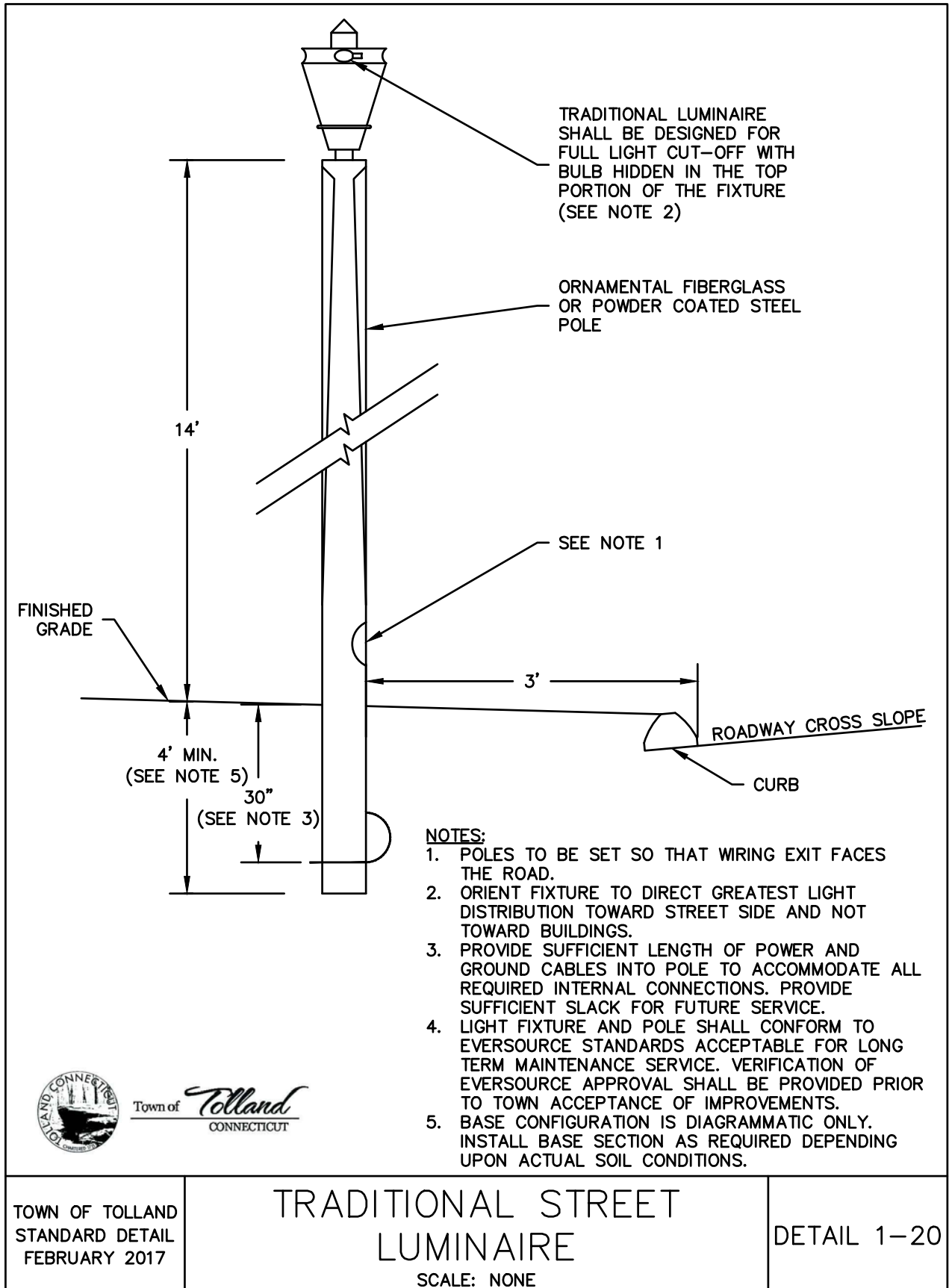
Town of *Tolland*
CONNECTICUT

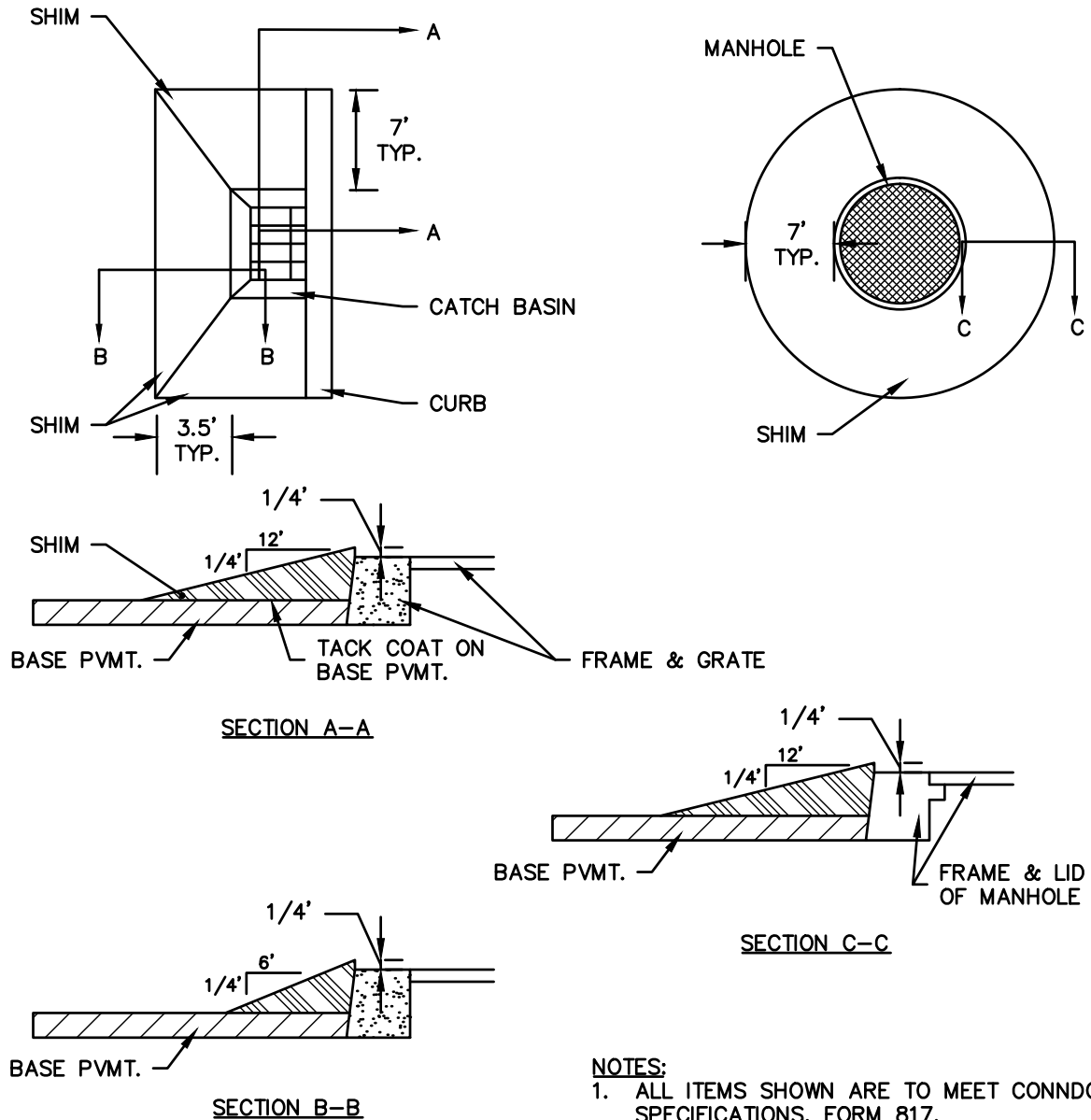
TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

DECORATIVE TIMBER GUIDERAIL

SCALE: NONE

DETAIL 1-19





NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS, FORM 817.
2. SHIM MATERIAL TO BE BITUMINOUS CONCRETE CURB MIX OR APPROVED EQUAL PER CONNDOT SPECIFICATIONS FORM 817.
3. WIDTH OF SHIMS AS SHOWN ON PLAN VIEWS ARE BASED ON TYPICAL 1-1/2" EXPOSURE OF STRUCTURE. ACTUAL WIDTHS MAY VARY BASED ON FIELD CONDITIONS.
4. TACK COAT TO BE APPLIED PRIOR TO PLACEMENT OF SHIM. COATING TO BE APPLIED PER FORM 817 M04.01.4.



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TEMPORARY SHIM

SCALE: NONE

DETAIL 1-21



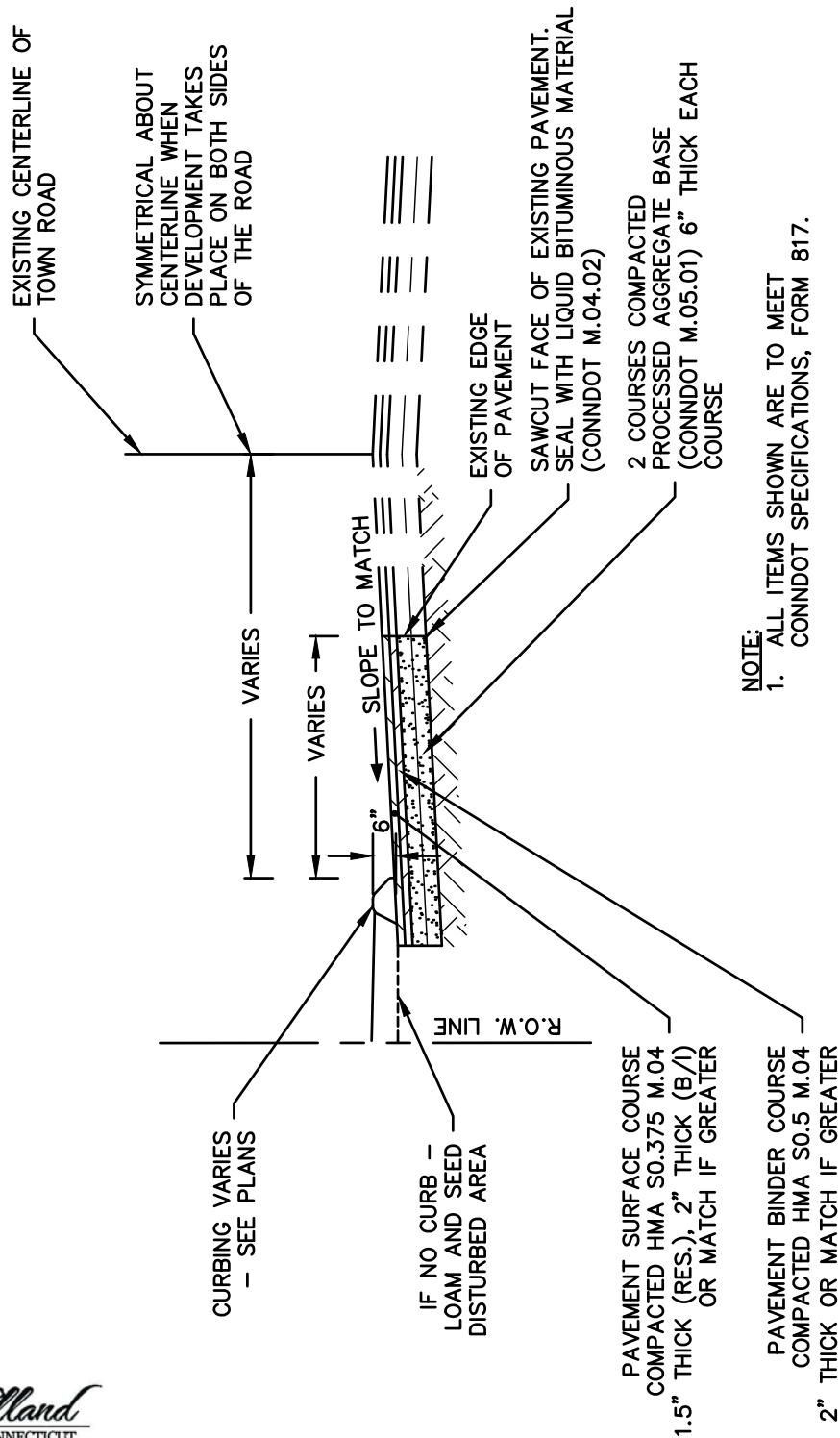
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CONNECTICUT

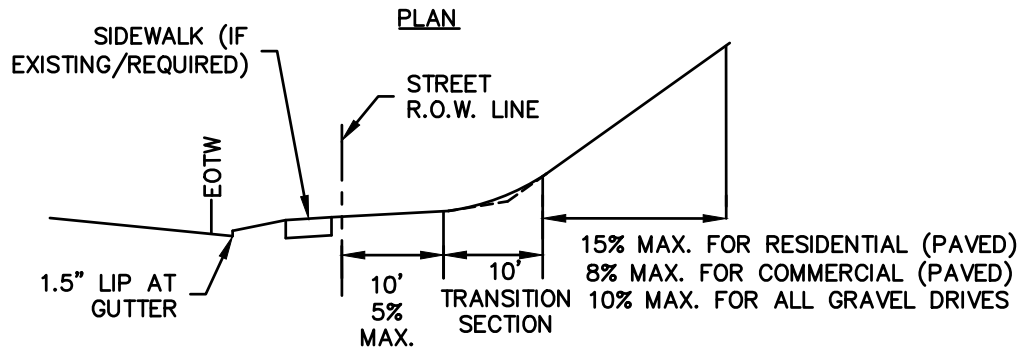
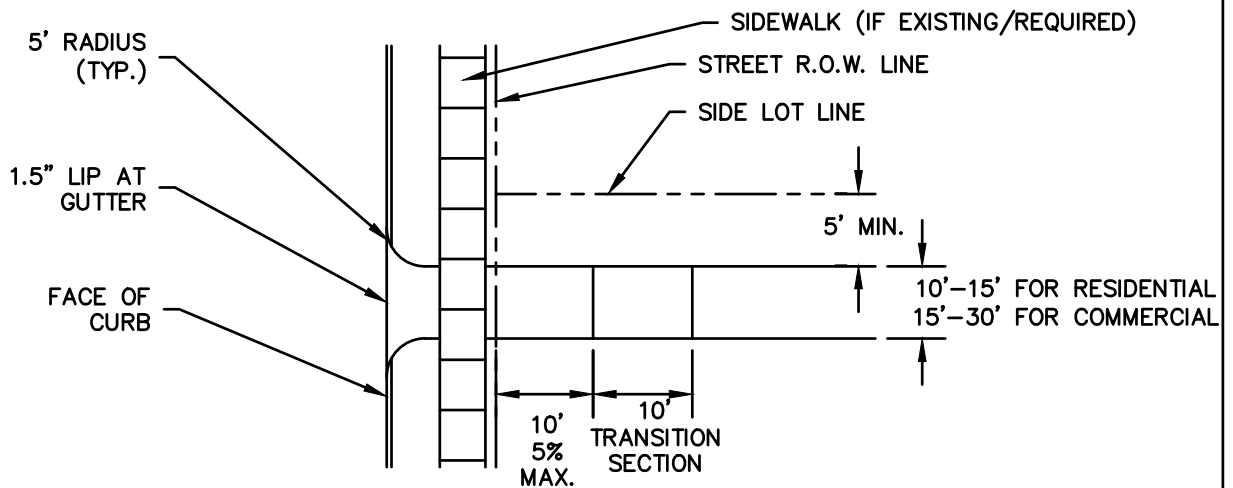
TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

ROADWAY WIDENING

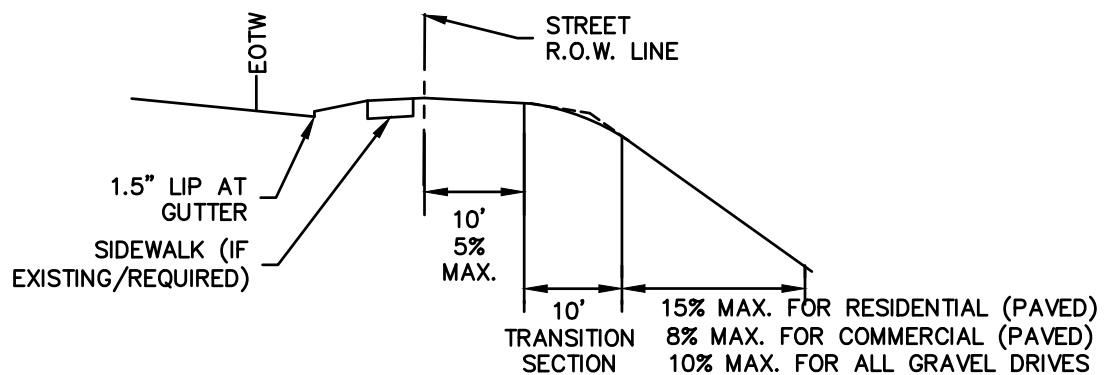
SCALE: NONE

DETAIL 1-22





SECTION - SAG CURVE IN DRIVE



SECTION - CREST CURVE IN DRIVE



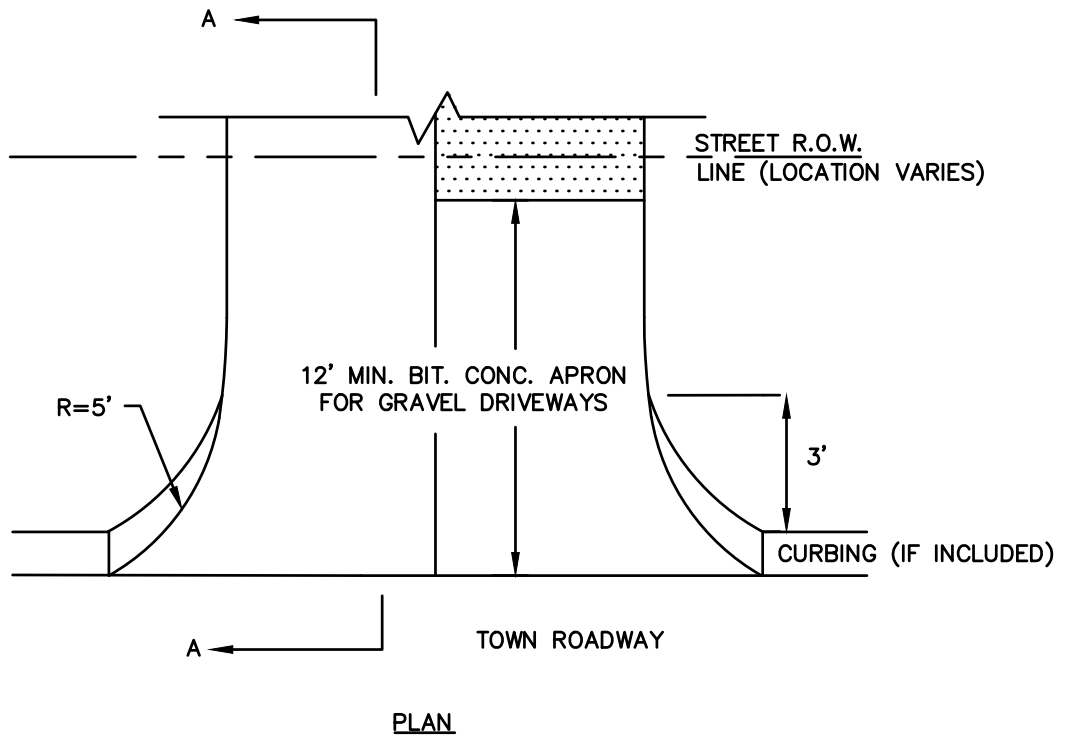
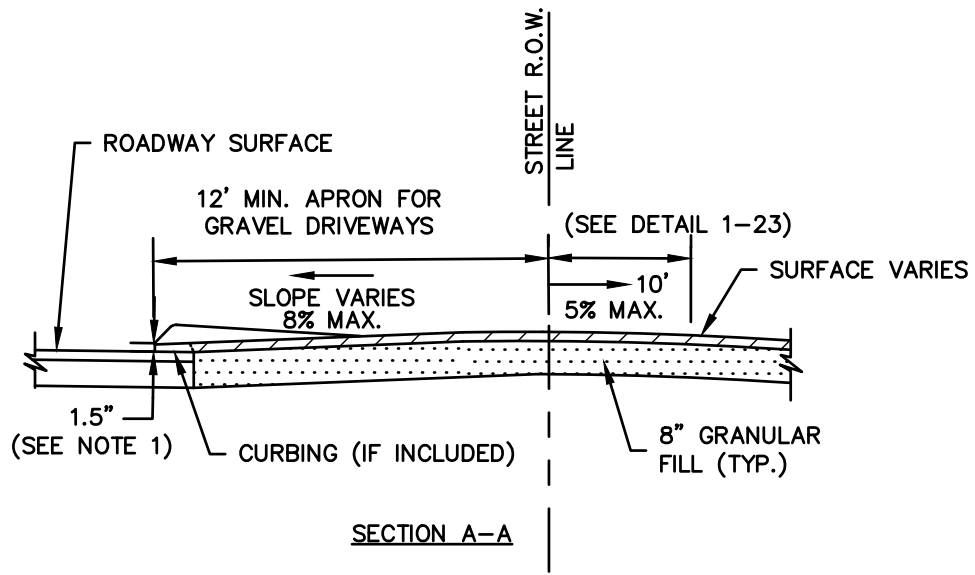
Town of *Tolland*
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TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2019

TYPICAL DRIVEWAY

SCALE: NONE

DETAIL 1-23



NOTE:

1. APRON SHALL BE CONSTRUCTED WITH A MINIMUM 1.5 INCH LIP AT TOWN ROAD GUTTER LINE. IF APRON IS CONSTRUCTED PRIOR TO PLACEMENT OF TOP/SURFACE COURSE OF A ROAD TO BE DEDICATED TO THE TOWN, LIP SHALL BE DIMENSIONED SUCH THAT AFTER COMPLETION OF THE ROAD, A 1-INCH LIP IS MAINTAINED.



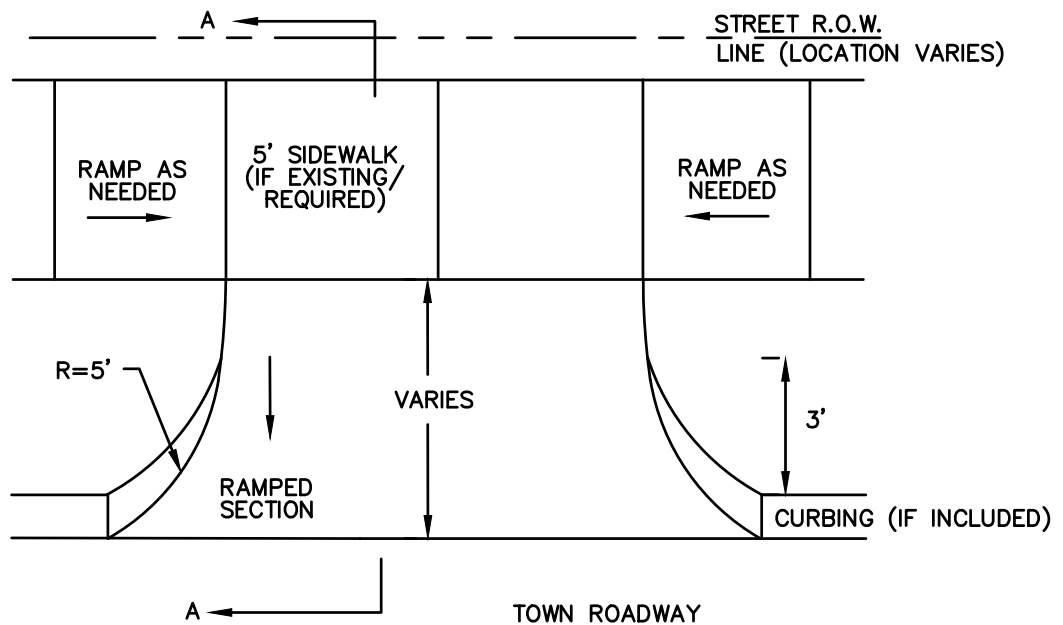
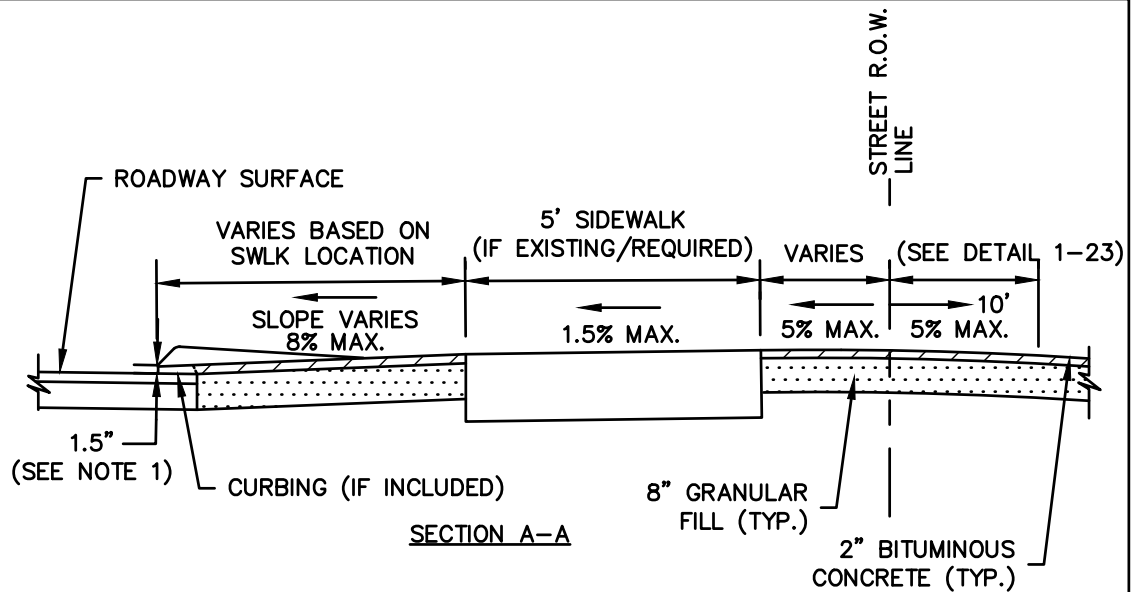
Town of *Tolland*
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STANDARD DETAIL
FEBRUARY 2019

TYPICAL DRIVEWAY APRON

SCALE: NONE

DETAIL 1-24



NOTE:

1. APRON SHALL BE CONSTRUCTED WITH A MINIMUM 1.5 INCH LIP AT TOWN ROAD GUTTER LINE. IF APRON IS CONSTRUCTED PRIOR TO PLACEMENT OF TOP/SURFACE COURSE OF A ROAD TO BE DEDICATED TO THE TOWN, LIP SHALL BE DIMENSIONED SUCH THAT AFTER COMPLETION OF THE ROAD, A 1-INCH LIP IS MAINTAINED.



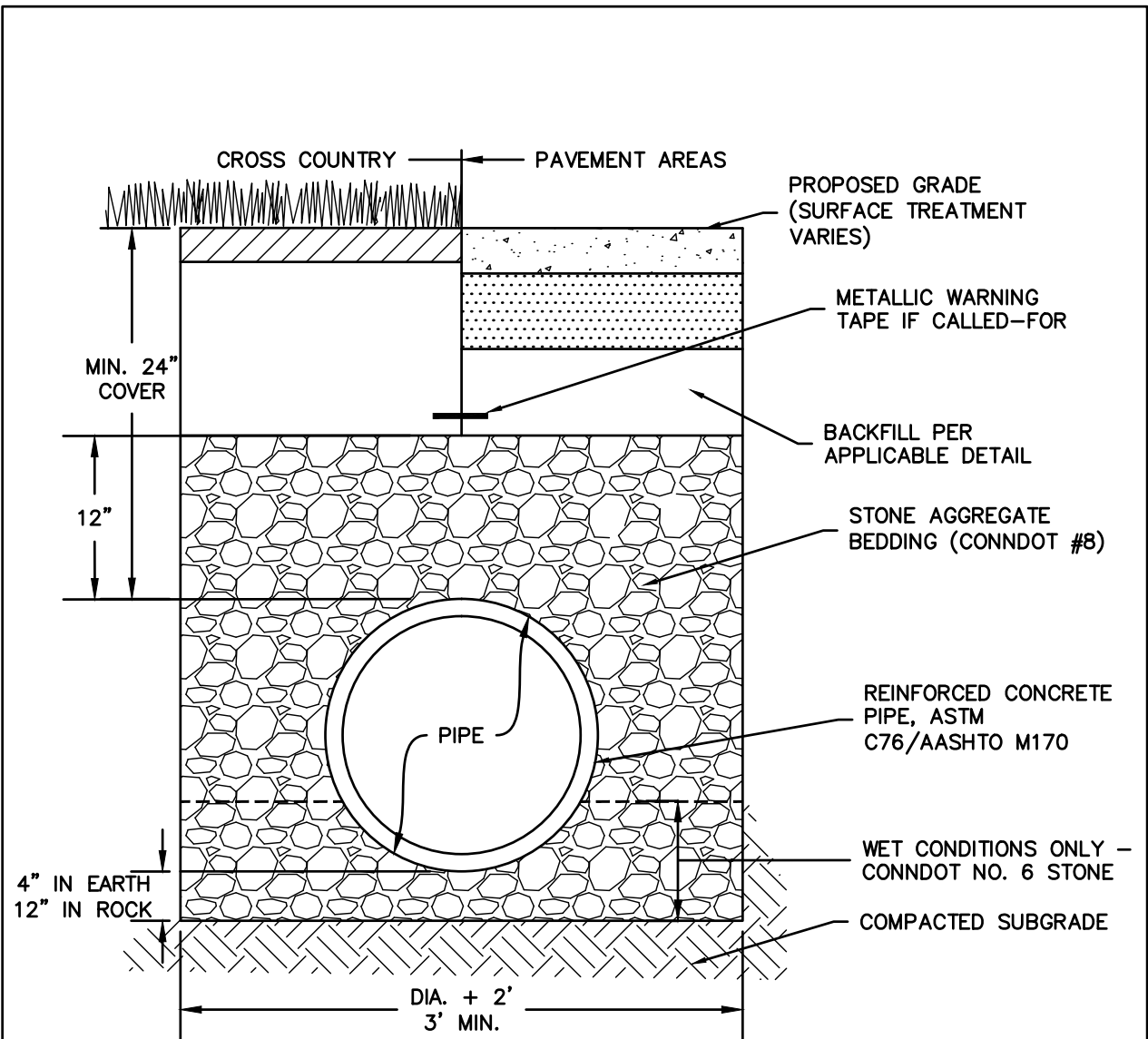
Town of *Tolland*
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TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2019

TYPICAL DRIVEWAY APRON WITH SIDEWALK

SCALE: NONE

DETAIL 1-25



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL WHEN REQUIRED.
3. WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL.

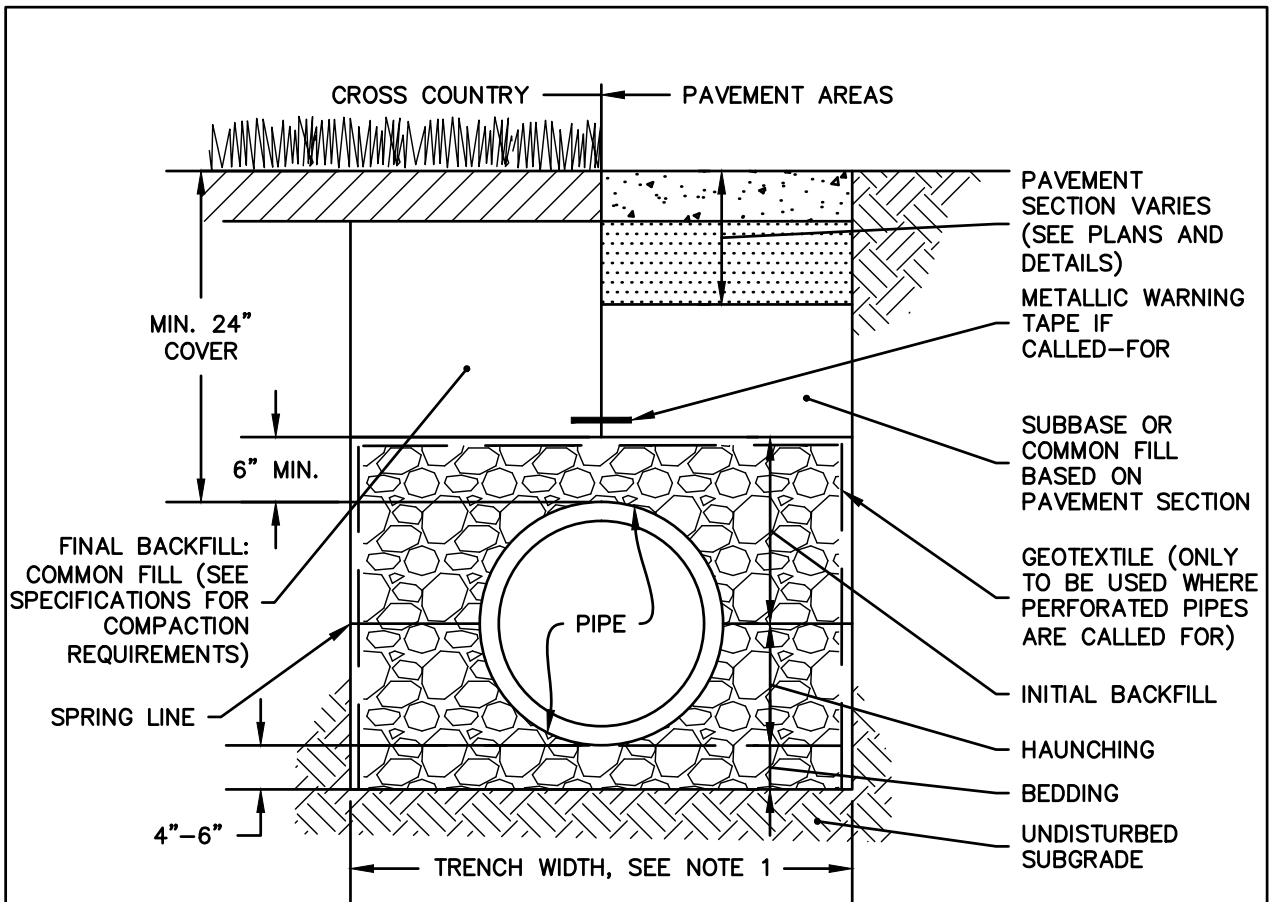


Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

STORM DRAIN TRENCH
(RCP)
SCALE: NONE

DETAIL 2-1



NOTES:

1. WHERE TRENCH WALLS ARE STABLE OR SUPPORTED, PROVIDE A WIDTH SUFFICIENT, BUT NO GREATER THAN NECESSARY, TO ENSURE WORKING ROOM TO PROPERLY PLACE AND COMPACT HAUNCHING AND OTHER EMBEDMENT MATERIALS. UNLESS OTHERWISE SPECIFIED BY THE PIPE MANUFACTURER, THE SPACE BETWEEN THE PIPE AND TRENCH WALL MUST BE WIDER THAN THE COMPACTION EQUIPMENT USED IN THE PIPE ZONE. MINIMUM WIDTH SHALL BE NOT LESS THAN THE GREATER OF EITHER THE PIPE OUTSIDE DIAMETER PLUS 16 INCHES OR THE PIPE OUTSIDE DIAMETER TIMES 1.25, PLUS 12 INCHES.
2. WHERE PERFORATED PIPES ARE CALLED-FOR, BEDDING, HAUNCHING, AND INITIAL BACKFILL SHALL BE STONE AGGREGATE (CONNDOT NO. 6).
3. WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL PER THE SPECIFICATIONS. AS AN ALTERNATIVE, AND AT THE DISCRETION OF THE ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL UNDER SOME CIRCUMSTANCES.
4. BEDDING, HAUNCHING, AND INITIAL BACKFILL SHALL BE STONE AGGREGATE (CONNDOT NO. 6, NO. 67, OR NO. 8) OR OTHER MATERIALS MEETING THE REQUIREMENTS OF ASTM D2321 FOR CLASS IA, IB, II, OR III UNLESS OTHERWISE INDICATED BY THE PIPE MANUFACTURER.



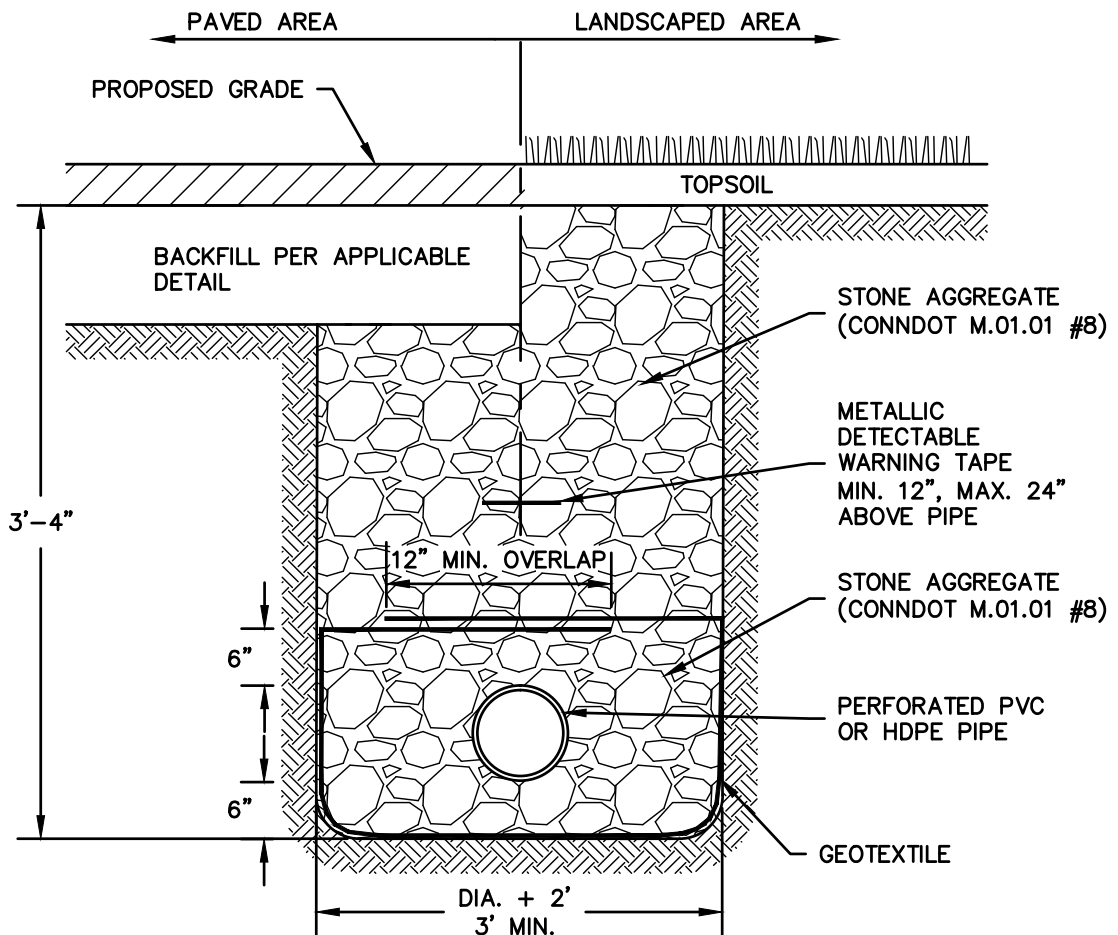
Town of *Tolland*
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STORM DRAIN TRENCH (THERMOPLASTIC PIPE)

SCALE: NONE

DETAIL 2-2



NOTES:

1. PERFORATIONS TO BE PLACED UP FOR PIPES WHICH ALSO CARRY SURFACE WATER AND DOWN FOR PIPES WHICH CARRY ONLY SUBSURFACE WATER UNLESS OTHERWISE DIRECTED.
2. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.



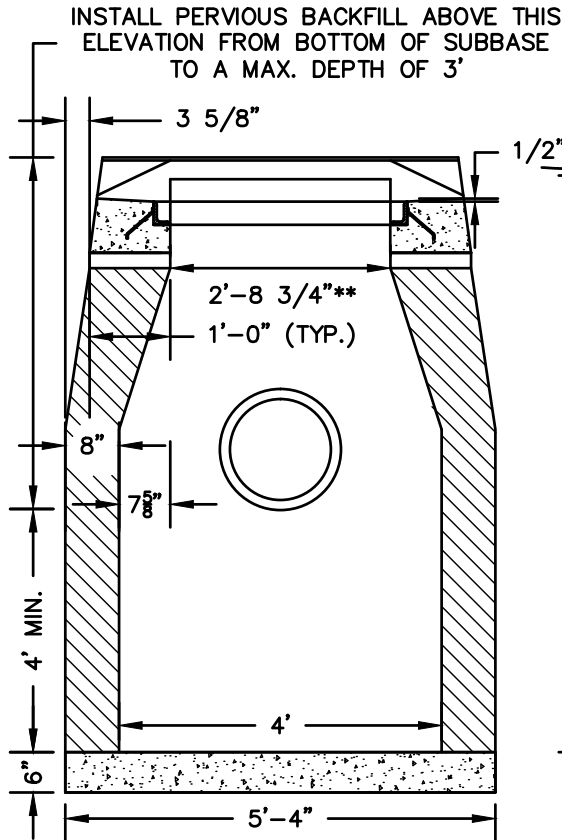
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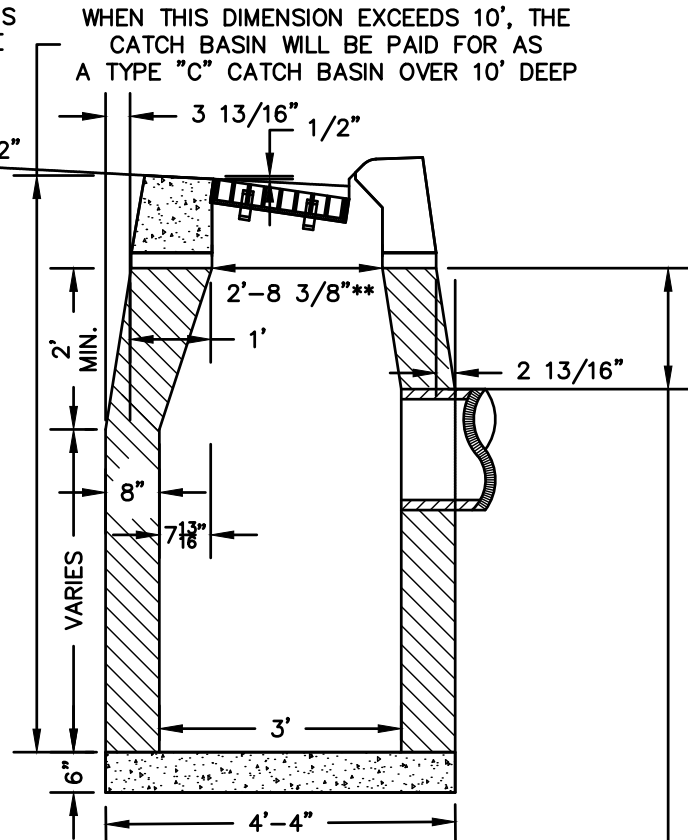
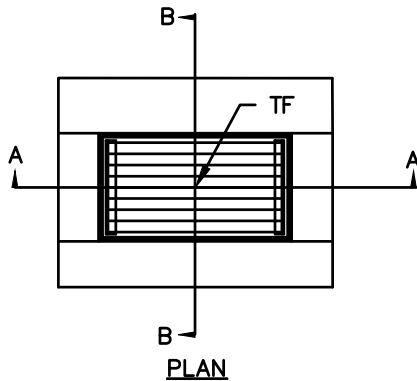
UNDERDRAIN

SCALE: NONE

DETAIL 2-3



SECTION A-A



SECTION B-B

UNLESS SPECIFICALLY ORDERED OTHERWISE, MINIMUM DEPTH UNDER TRAVELWAY IS 1'-7 1/2" AND UNDER UNTRAVELED AREAS IS 3" (TYP.)



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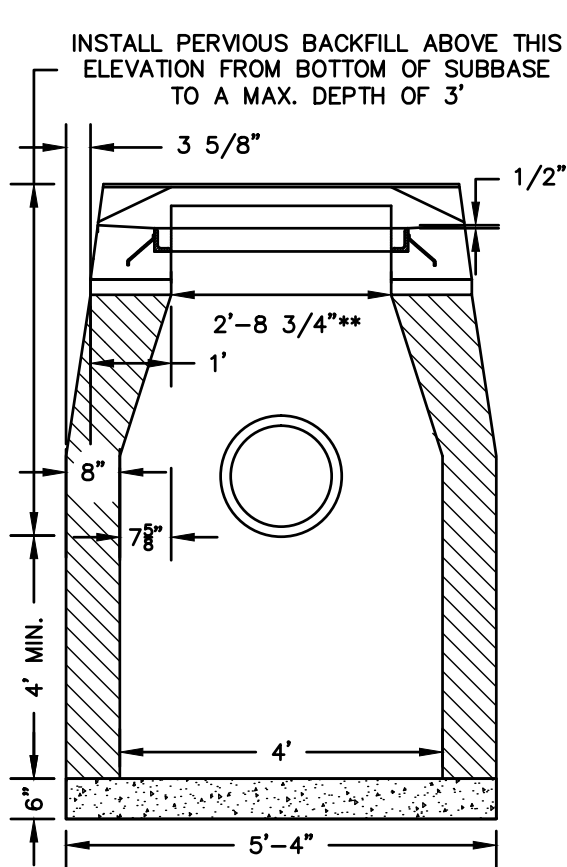
SEE DETAIL 2-8 FOR CATCH BASIN GENERAL NOTES.

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JULY 2018

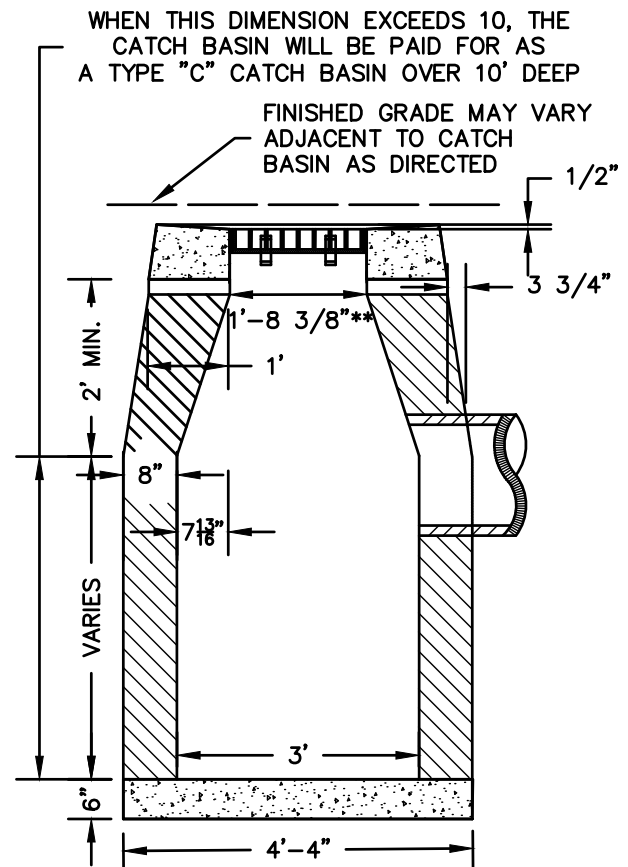
TYPE "C" CATCH BASIN

SCALE: NONE

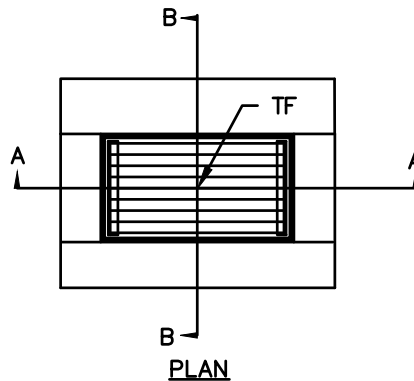
DETAIL 2-4



SECTION A-A



SECTION B-B



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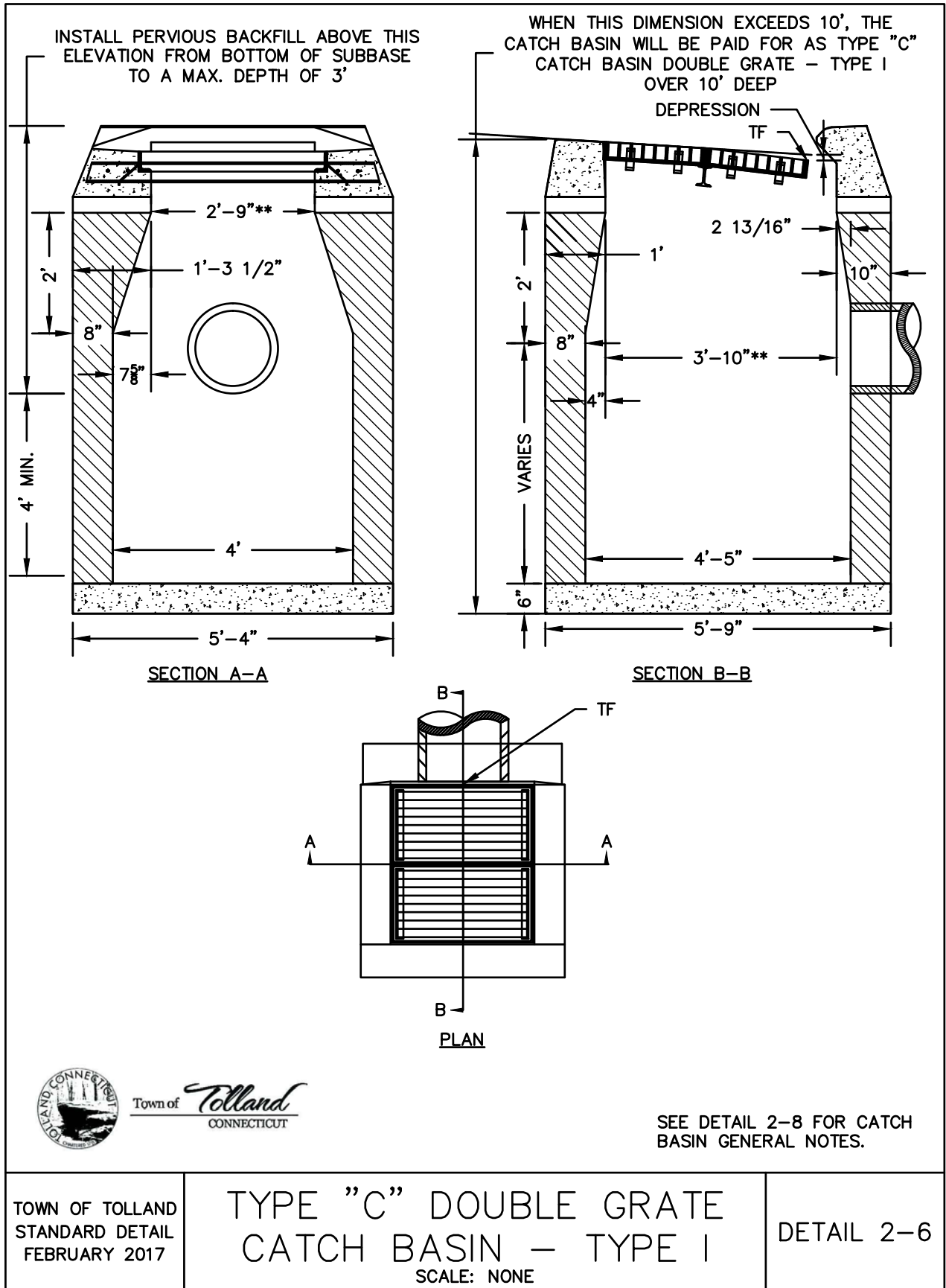
SEE DETAIL 2-8 FOR CATCH BASIN GENERAL NOTES.

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STANDARD DETAIL
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TYPE "C-L" CATCH BASIN

SCALE: NONE

DETAIL 2-5



ELEVATION FROM BOTTOM OF SUBBASE TO A MAX. DEPTH OF 3'

2'-9" **

1'-3 1/2"

8"

7 5/8"

4' MIN.

4'

5'-4"

The diagram illustrates a cross-section of a manhole structure. At the top, a horizontal line indicates the 'ELEVATION FROM BOTTOM OF SUBBASE TO A MAX. DEPTH OF 3\''. Below this, a trapezoidal structure is shown. The top width of the structure is labeled '2'-9" **'. The height of the structure is labeled '1'-3 1/2"'. The bottom width of the structure is labeled '4\''. The total width of the structure at the base is labeled '5'-4"'. The structure is shown with a concrete or masonry wall, indicated by diagonal hatching. A circular opening is shown in the center of the structure, with a diameter of '8"'. The structure is shown with a base layer of '7 5/8"'. The structure is shown with a minimum depth of '4\' MIN.'.

WHEN THIS DIMENSION EXCEEDS 10', THE
CATCH BASIN WILL BE PAID FOR AS TYPE "C"
CATCH BASIN DOUBLE GRATE - TYPE I
OVER 10' DEEP

DEPRESSION

TF

2 13/16"

1'

8"

3'-10" **

4"

4'-5"

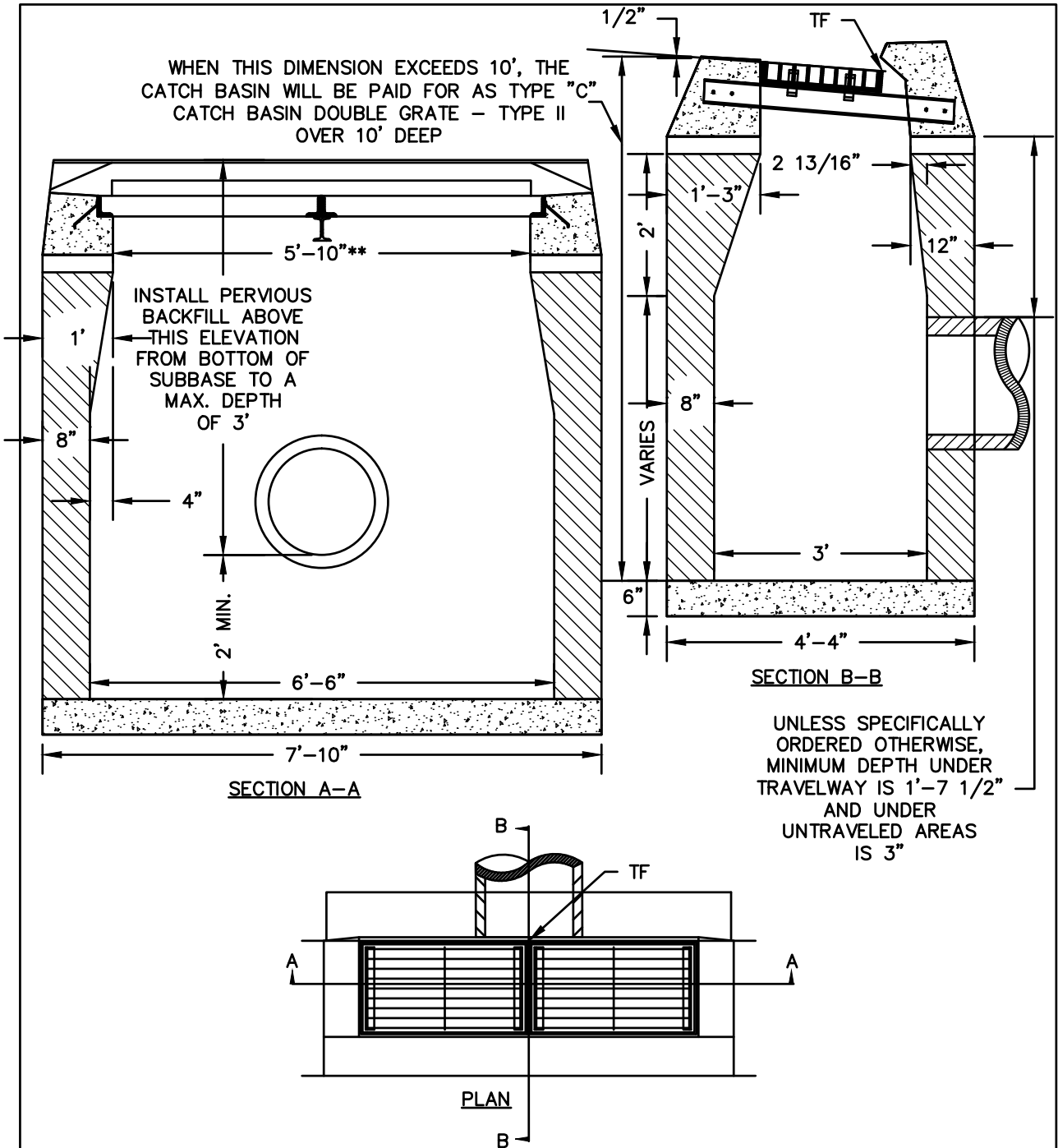
5'-9"

6"

VARIES

10"

DETAIL 2-6



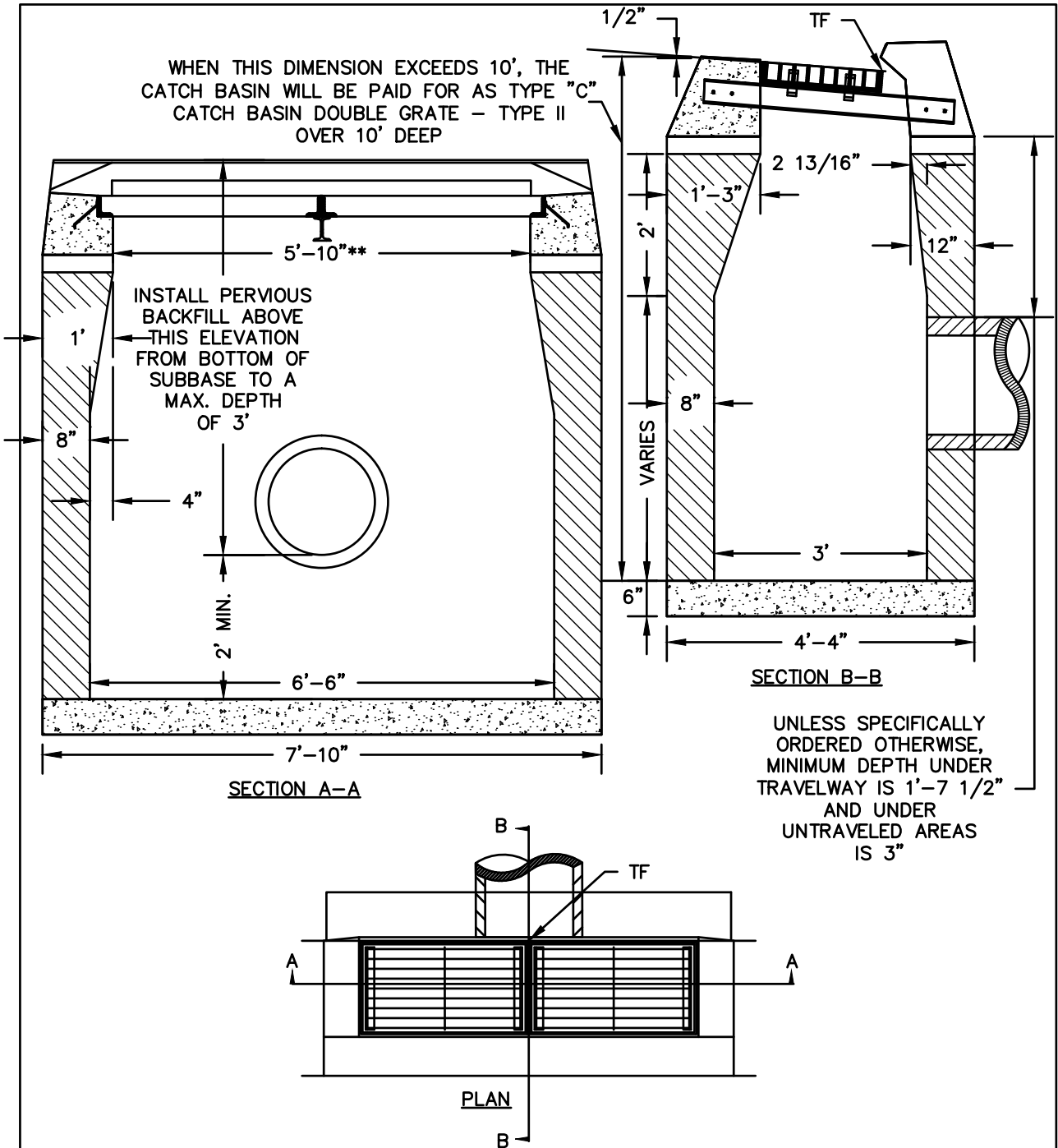
Town of *Tolland*
CONNECTICUT

SEE DETAIL 2-8 FOR CATCH
BASIN GENERAL NOTES.

TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

TYPE "C" CATCH BASIN
DOUBLE GRATE - TYPE II
SCALE: NONE

DETAIL 2-7



Town of *Tolland*
CONNECTICUT

SEE DETAIL 2-8 FOR CATCH
BASIN GENERAL NOTES.

TOWN OF TOLLAND
STANDARD DETAIL
JULY 2018

TYPE "C" CATCH BASIN
DOUBLE GRATE - TYPE II
SCALE: NONE

DETAIL 2-7

NOTES (SEE DETAILS 2-4 TO 2-7):

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.
2. INSTALLATION OF CATCH BASINS SHALL BE IN ACCORDANCE WITH CONNDOT STANDARD SHEET HW-507_01.
3. ALL CATCH BASIN GRATES SHALL BE CONNDOT TYPE A. FOR DETAILS OF FRAME AND GRATE SEE CONNDOT STANDARD SHEET HW-507_08.
4. USE APPROPRIATE CONCRETE TOP FOR CURBING SHOWN ON PLANS. IF CURBING IS NOT SPECIFIED ON THE PLANS, IT SHALL BE CONSTRUCTED AS DIRECTED BY THE ENGINEER.
5. ALL CATCH BASINS SHALL BE SET ON 12" OF COMPACTED STONE AGGREGATE (CONNDOT M.01.01 #4).
6. ALL FACES OF STRUCTURES IN CONTACT WITH CONCRETE PAVEMENT SHALL BE COVERED WITH A LAYER OF TAR PAPER OR APPROVED EQUAL. THE COST FOR THE PAPER SHALL BE INCLUDED IN THE BID PRICE FOR THE TYPE OF CATCH BASIN INSTALLED.
7. USE 6' ON UPGRADE SIDE OF CONTINUOUS GRADE AND 1' ON DOWNGRADE SIDE OF CONTINUOUS GRADE OR AS DIRECTED.
8. IF MASONRY UNITS ARE REQUIRED, THE BASIN SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE OVER ALL DIMENSIONS SHOWN HERE AND SECTION 5.07 OF THE STATE OF CONNECTICUT'S STANDARD SPECIFICATIONS. CORBELLING SHALL BE PERMITTED TO A MAXIMUM OF 3" NO PROJECTION SHALL EXTEND INSIDE THE LIMITS NOTED BY **.
9. WALL THICKNESS OF ALL CATCH BASIN'S OVER 10' DEEP SHALL BE INCREASED TO 12" THICK. INSIDE DIMENSION SHALL REMAIN THE SAME. 12" THICKNESS WILL START AFTER THE FIRST 10'.
10. TO CONVEY SUBSURFACE DRAINAGE, OPENINGS SHALL BE FORMED IN THE FOUR WALLS AT OR IMMEDIATELY ABOVE THE BOTTOM OF THE PERVIOUS BACKFILL.
11. MINIMUM CONCRETE COMPRESSIVE STRENGTH OF $F'_c = 4,400$ PSI SHALL BE OBTAINED PRIOR TO SHIPPING.
12. LATEST STATE OF CONNECTICUT'S STANDARD SPECIFICATIONS AND SUPPLEMENTALS SHALL GOVERN.
13. SPACER MAY BE CMU OR PRECAST WITH REQUIRED REINFORCING (RECOMMENDED BY THE MANUFACTURER) AS NEEDED TO PROVIDE PROPER GRADE SHOWN ON PLANS.
14. TOP OF FRAME (TF) ELEVATION SHALL BE MEASURED IN THE CENTER OF GRATE AT GUTTER LINE FOR TYPE "C" CATCH BASINS AND IN THE CENTER OF THE GRATE FOR TYPE "C-L" CATCH BASINS.
15. ALL TYPE "C" CATCH BASIN TOPS SHALL BE FULL HEIGHT BITUMINOUS CURB.

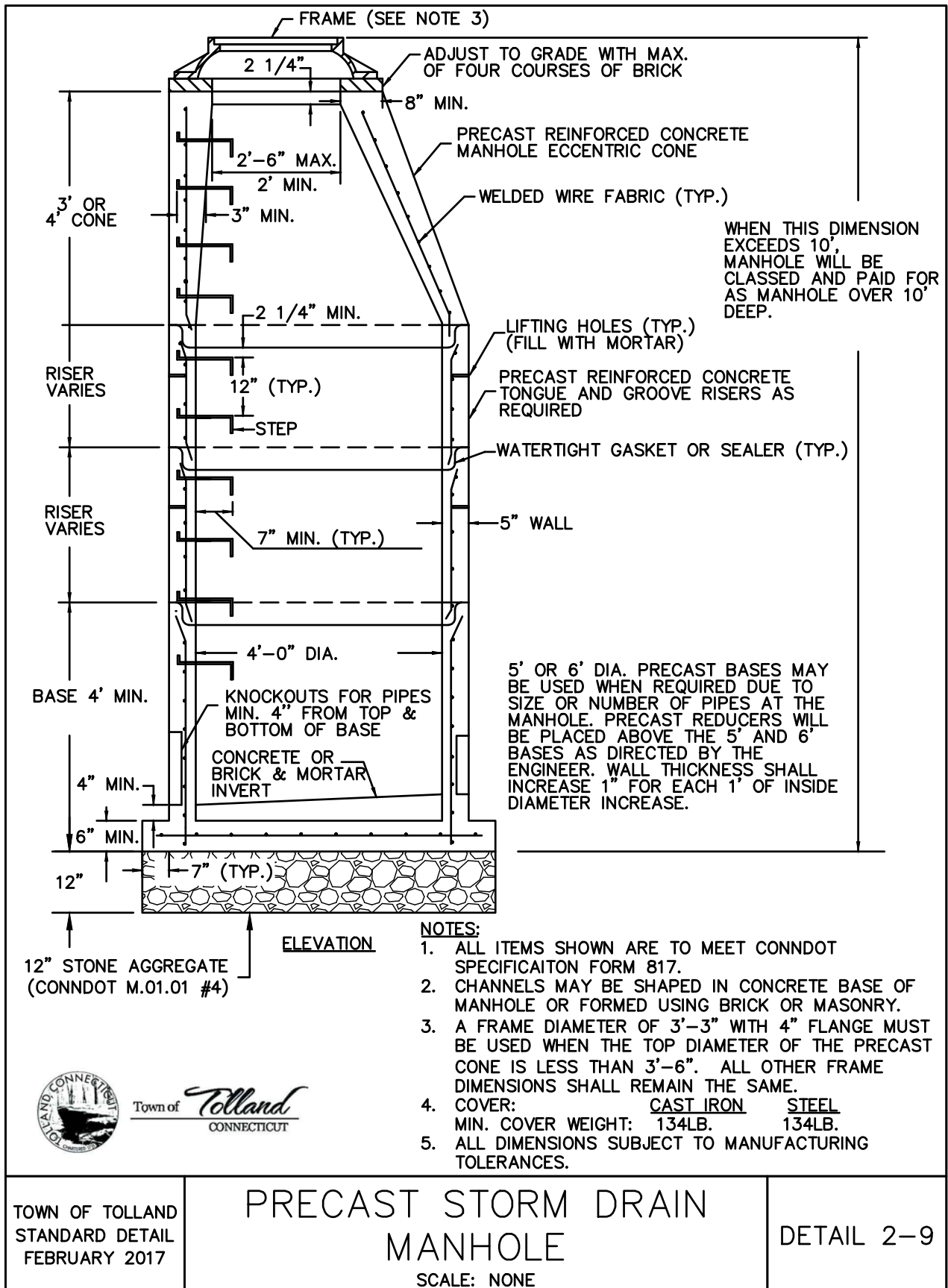


Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
JULY 2018

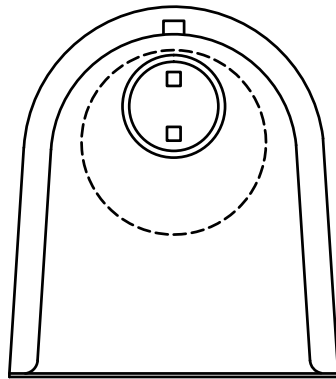
CATCH BASIN GENERAL
NOTES
SCALE: NONE

DETAIL 2-8

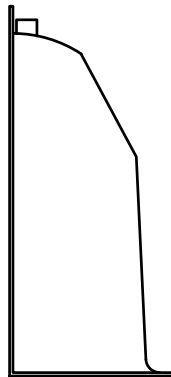


NOTES:

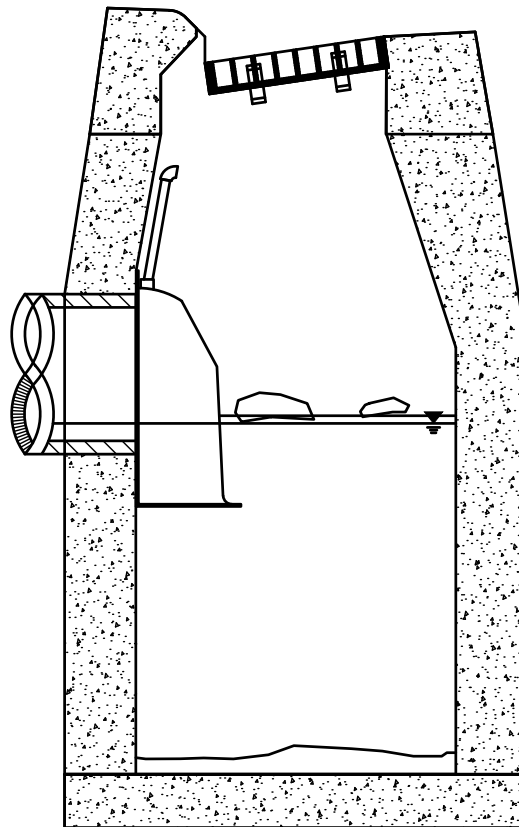
1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION FORM 817.
2. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE EQUAL TO $\frac{1}{2}$ THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES LESS THAN 12" I.D.
3. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
4. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE SMOOTH AND CLEANED OF ANY LOOSE MATERIAL.
5. SECURELY ATTACH HOOD TO STRUCTURE WALL WITH STAINLESS STEEL ANCHORS AND SEAL WITH OIL-RESISTANT GASKET PER MANUFACTURER'S INSTRUCTIONS.



FRONT VIEW



SIDE VIEW



TYPICAL MOUNTING VIEW



Town of *Tolland*
CONNECTICUT

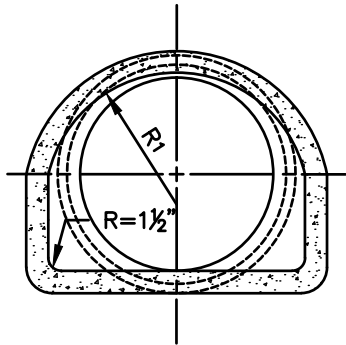
TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CATCH BASIN/AREA DRAIN SNOUT APPARATUS

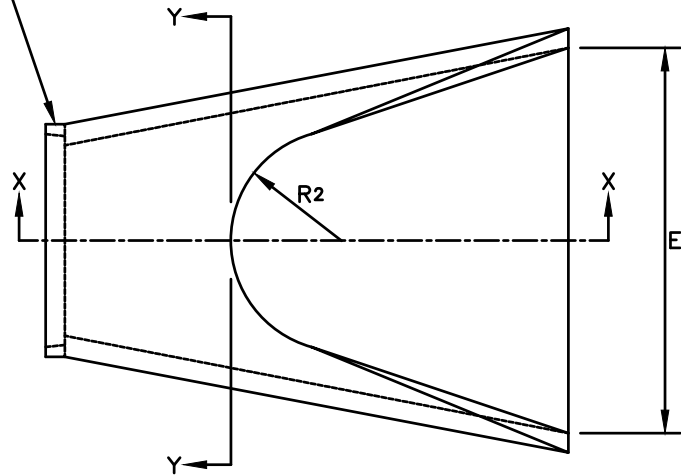
SCALE: NONE

DETAIL 2-10

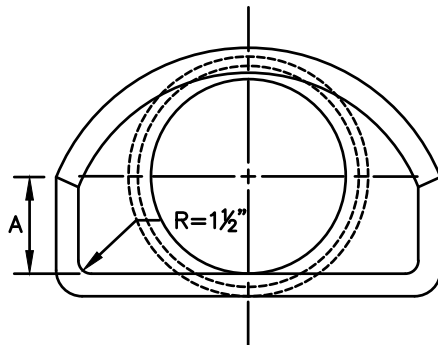
JOINTS SHALL BE TONGUE
AND GROOVE OR BELL AND
SPIGOT AS REQUIRED TO
CONFORM TO PIPE INSTALLED



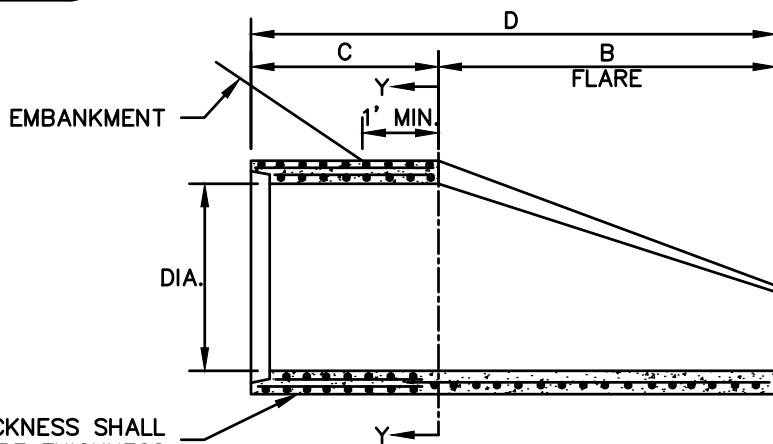
SECTION Y-Y



PLAN



END VIEW



WALL THICKNESS SHALL
CONFORM TO PIPE THICKNESS

SECTION X-X



Town of *Tolland*
CONNECTICUT

SEE DETAIL 2-11B FOR
CONCRETE FLARED END NOTES.

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CONCRETE FLARED END

DETAIL
2-11A

SCALE: NONE



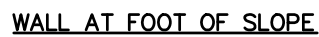
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CONCRETE FLARED END NOTES SCALE: NONE

DETAIL
2-11B

DIMENSIONS FOR REINFORCED CONCRETE CULVERT END										FLARE REINFORCEMENT	
DIA.	A	B	C	D	E	F	R1	R2	MIN. AREA OF LONG. STEEL SQ. IN. PER FT.	MIN. AREA OF TRANS. STEEL SQ. IN. PER FT.	ONE LAYER ONLY IN CENTER OF WALL
12"	4"	2'-0"	4'-0 ³ / ₈ "	6'-0 ³ / ₈ "	2'-0"	1'-7 ¹⁵ / ₁₆ "	10 ¹ / ₄ "	9"	0.048	0.048	0.048
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2'-0 ⁵ / ₁₆ "	1'-0 ¹ / ₂ "	11"	0.054	0.054	0.054
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2'-5"	1'-3 ¹ / ₂ "	1'-0"	0.060	0.060	0.060
21"	9"	2'-11"	3'-2"	6'-1"	3'-6"	2'-7 ¹ / ₂ "	1'-4"	1'-1"	0.066	0.066	0.066
24"	9 ¹ / ₂ "	3'-7 ¹ / ₂ "	2'-6"	6'-1 ¹ / ₂ "	4'-0"	2'-9 ³ / ₁₆ "	1'-4 ¹ / ₁₆ "	1'-2"	0.072	0.072	0.072
30"	1'-0"	4'-6"	1'-7 ³ / ₄ "	6'-1 ³ / ₄ "	5'-0"	3'-1"	1'-6 ¹ / ₂ "	1'-3"	0.084	0.084	0.084
36"	1'-3"	5'-3"	2'-10 ³ / ₄ "	8'-1 ³ / ₄ "	6'-0"	3'-11 ¹ / ₁₆ "	2'-0 ⁵ / ₁₆ "	1'-8"	0.096	0.096	0.096
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4'-5 ⁷ / ₁₆ "	2'-3 ¹ / ₂ "	1'-10"	0.108	0.108	0.108
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	4'-8 ¹ / ₂ "	2'-4 ¹ / ₂ "	1'-10"	0.120	0.120	0.120
54"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5'-5 ¹ / ₂ "	2'-9 ¹ / ₈ "	2'-0"	0.132	0.132	0.132
60"	2'-9"	5'-0"	3'-3"	8'-3"	8'-0"	6'-0 ¹ / ₂ "	3'-0 ¹ / ₁₆ "	2'-0"	0.144	0.144	0.144



DIMENSIONS FOR ONE ENDWALL BASED ON S=D+2"					
D	S	H	L	BATTER	B
IN.	FT.-IN.	FT.-IN.	FT.-IN.	IN./FT.	FT.-IN.
12"	1'-2"	4'-6"	4'-6"	2½"	1'-11¼"
15"	1'-5"	4'-9"	5'-6"	2½"	1'-11⅞"
18"	1'-8"	5'-0"	6'-6"	2½"	2'-0½"
24"	2'-2"	5'-6"	8'-6"	2½"	2'-1¾"
30"	2'-8"	6'-0"	10'-6"	2½"	2'-3"
36"	3'-2"	6'-6"	12'-6"	3"	2'-7½"
42"	3'-8"	7'-0"	14'-6"	3"	2'-9"
48"	4'-2"	7'-6"	16'-6"	3"	2'-10½"

NOTES:

1. ALL ITEMS ARE TO MEET CONNDOT SPECIFICATION FORM 817.
2. ALL EDGES OF EXPOSED SURFACES TO BE CHAMFERED APPROXIMATELY 1".
3. EXPOSED HEIGHT OF BACK OF WALL ABOVE SLOPE TO BE 7" FOR SLOPE OF 1½:1 & 4:1, 9" FOR SLOPE OF 2:1.
4. WHEN ONE ENDWALL IS TO BE USED FOR TWO PIPES, THE DIMENSIONS OF THAT ENDWALL SHALL CONFORM TO THAT REQUIRED FOR THE LARGER PIPE, EXCEPT THE DIMENSION "L" SHALL BE INCREASED BY THE OUTSIDE DIAMETER OF THE SMALLER PIPE PLUS ONE FOOT.



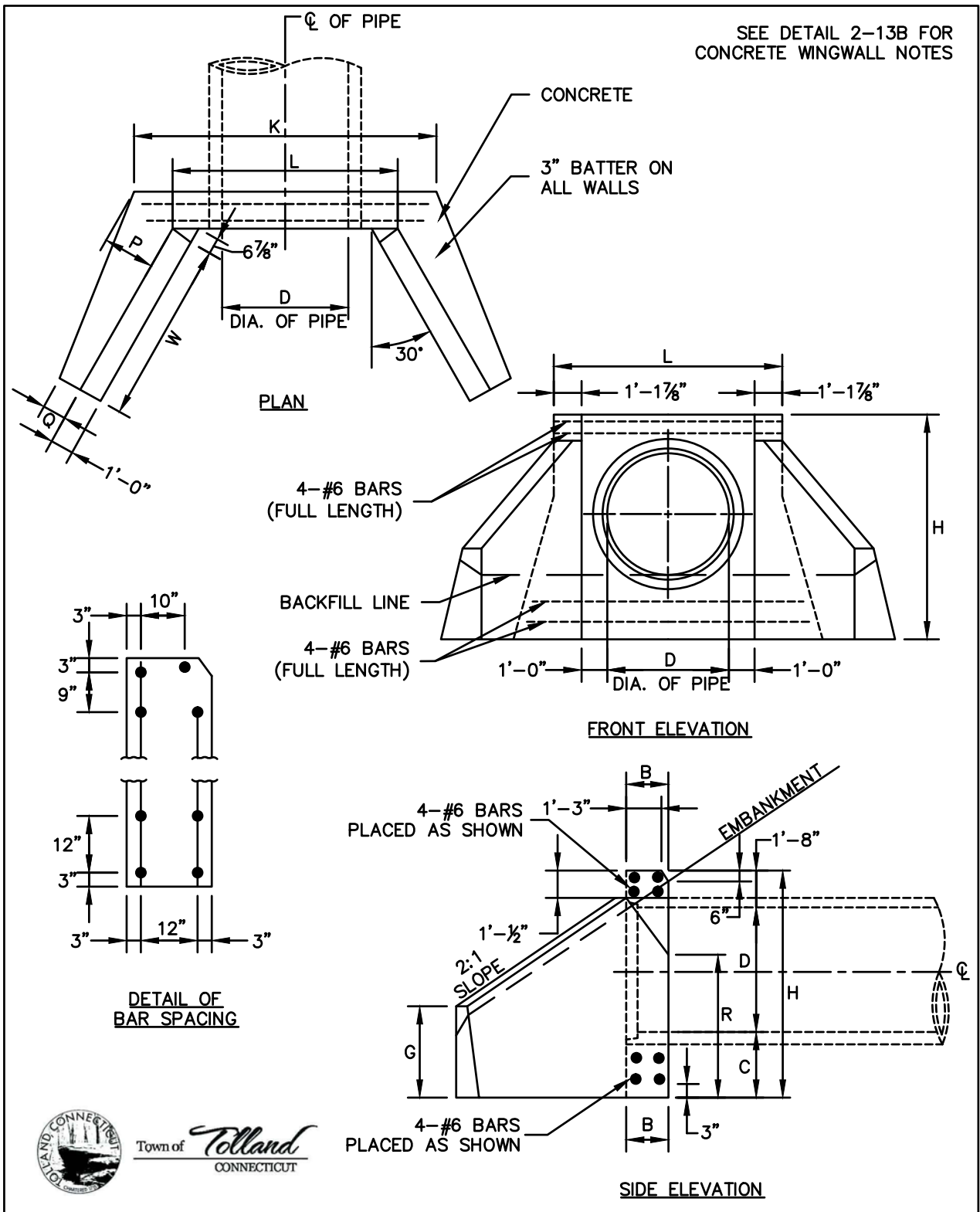
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CONCRETE ENDWALL

SCALE: NONE

DETAIL 2-12



TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CONCRETE WINGWALL

SCALE: NONE

DETAIL
2-13A

DIMENSIONS FOR ONE WING TYPE ENDWALL										
D	B	C	G	H	K	L	P	Q	R	W
36"	1'-6"	2'-0"	3'-3"	6'-8"	9'-1½"	7'-3¾"	1'-4⅞"	0'-9¾"	3'-4⅞"	5'-5¾"
42"	1'-6"	2'-0"	3'-3"	7'-2"	9'-10½"	7'-9¾"	1'-6¾"	0'-9¾"	3'-10½"	6'-7¾"
48"	1'-7"	2'-6"	3'-9"	8'-2"	10'-10"	8'-3¾"	1'-9¾"	0'-11¼"	4'-9"	7'-9½"
60"	1'-7"	2'-6"	3'-9"	9'-2"	12'-4½"	9'-3¾"	2'-0¾"	0'-11¼"	5'-9"	10'-1¼"
72"	1'-7"	2'-6"	3'-9"	10'-2"	13'-10¾"	10'-3¾"	2'-3¾"	0'-11¼"	6'-9"	12'-5"

NOTES:

1. ALL ITEMS ARE TO MEET CONNDOT SPECIFICATION FORM 817.
2. ENDWALL SYMMETRICAL ABOUT ϕ OF PIPE.
3. REINFORCEMENT TO BE PLACED FOR PIPES 48" DIA. AND GREATER.
4. ALL EDGES OF EXPOSED SURFACES TO BE CHAMFERED APPROXIMATELY 1".
5. WHEN ONE ENDWALL IS TO BE USED FOR TWO PIPES, THE DIMENSIONS OF THAT ENDWALL SHALL CONFORM TO THAT REQUIRED FOR THE LARGER PIPE, EXCEPT THE DIMENSION "L" SHALL BE INCREASED BY THE OUTSIDE DIAMETER OF THE SMALLER PIPE PLUS ONE FOOT.



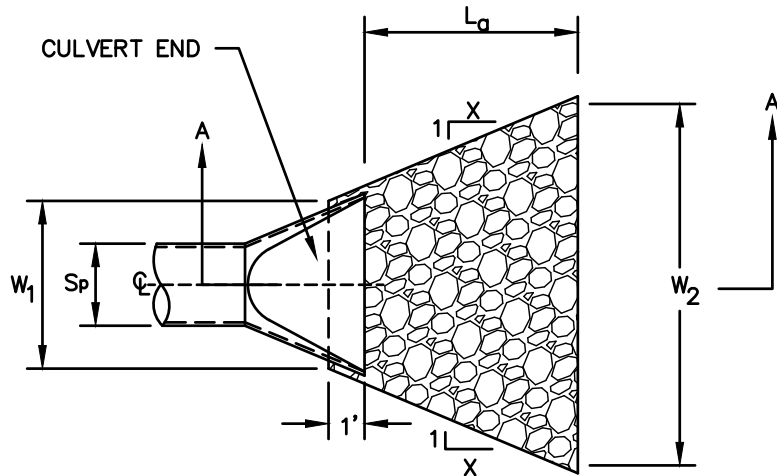
Town of *Tolland*
CONNECTICUT

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STANDARD DETAIL
MARCH 2017

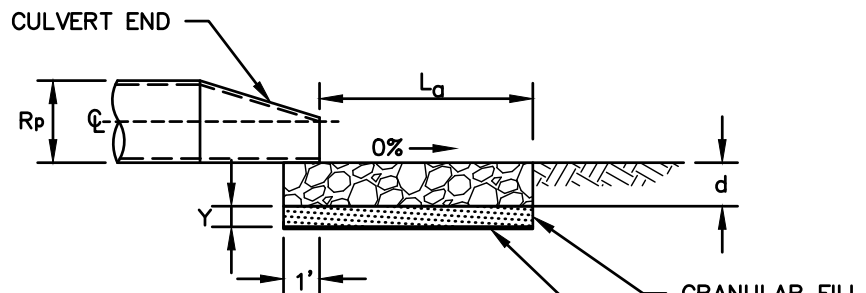
CONCRETE WINGWALL NOTES

SCALE: NONE

DETAIL
2-13B



PLAN VIEW



SECTION A-A

GRANULAR FILL

GEOTEXTILE FABRIC

LEGEND

- MAX. INSIDE PIPE SPAN (NON-CIRCULAR SECTIONS)
 $S_p = \begin{cases} \text{INSIDE PIPE DIAMETER (CIRCULAR SECTIONS)} \\ \text{MAX. INSIDE PIPE RISE (NON-CIRCULAR SECTIONS)} \end{cases}$
 $R_p = \begin{cases} \text{INSIDE PIPE DIAMETER (CIRCULAR SECTIONS)} \\ \text{LENGTH OF RIPRAP MEASURED FROM THE END OF THE CULVERT END SECTION.} \end{cases}$
 $L_a = \begin{cases} 12'' - \text{MODIFIED RIPRAP} \\ 18'' - \text{INTERMEDIATE RIPRAP} \\ 36'' - \text{STANDARD RIPRAP} \end{cases}$
 $Y = \begin{cases} 6'' - \text{MODIFIED \& INTERMEDIATE RIPRAP} \\ 12'' - \text{STANDARD RIPRAP} \end{cases}$

OUTLET ID	APRON TYPE	X	W_1	W_2	L_a	Y	RIPRAP TYPE



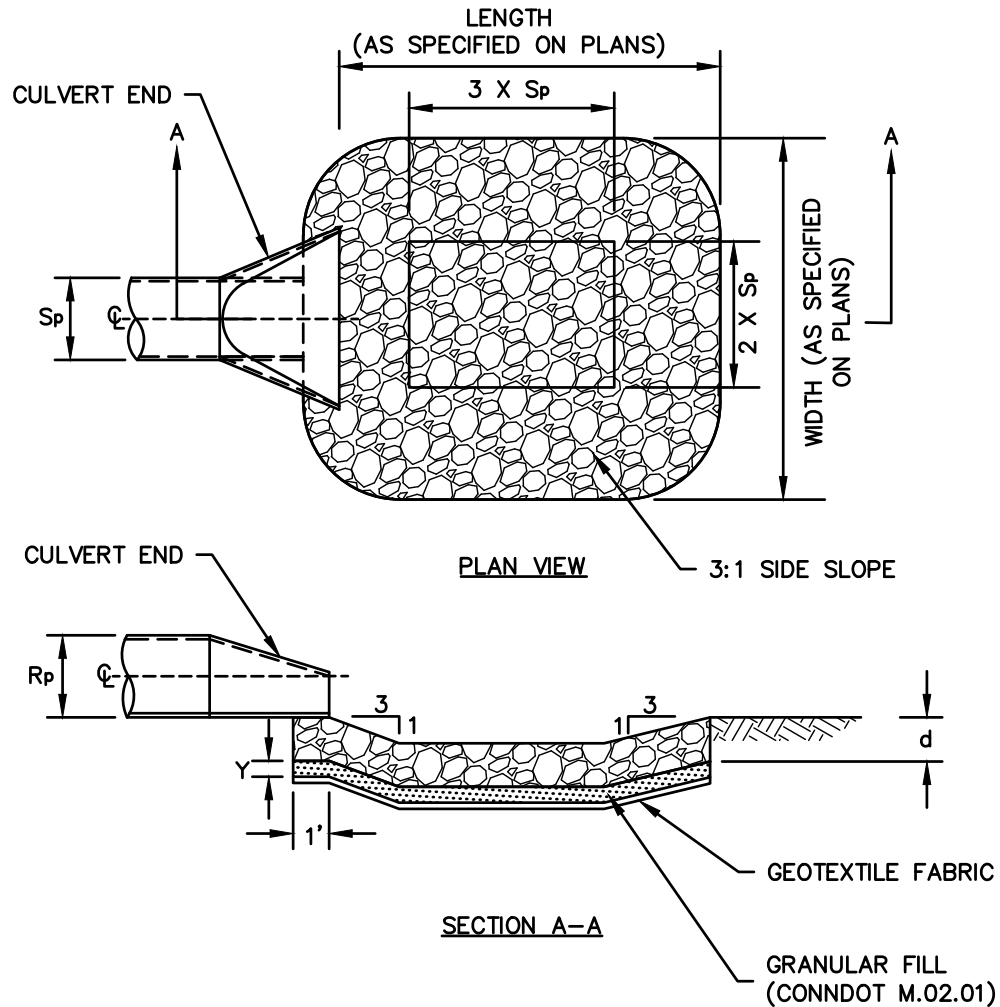
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

RIP RAP APRON

SCALE: NONE

DETAIL 2-14



LEGEND

- Sp = { MAX. INSIDE PIPE SPAN (NON-CIRCULAR SECTIONS)
INSIDE PIPE DIAMETER (CIRCULAR SECTIONS)
- Rp = { MAX. INSIDE PIPE RISE (NON-CIRCULAR SECTIONS)
INSIDE PIPE DIAMETER (CIRCULAR SECTIONS)
- d = { 12" - MODIFIED RIPRAP
18" - INTERMEDIATE RIPRAP
36" - STANDARD RIPRAP
- Y = { 6" - MODIFIED & INTERMEDIATE RIPRAP
12" - STANDARD RIPRAP



Town of *Tolland*
CONNECTICUT

NOTES:

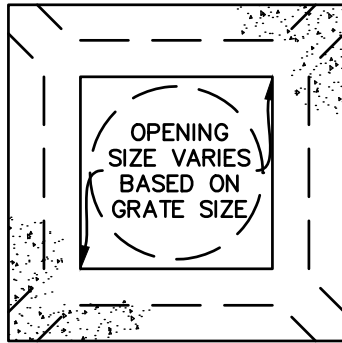
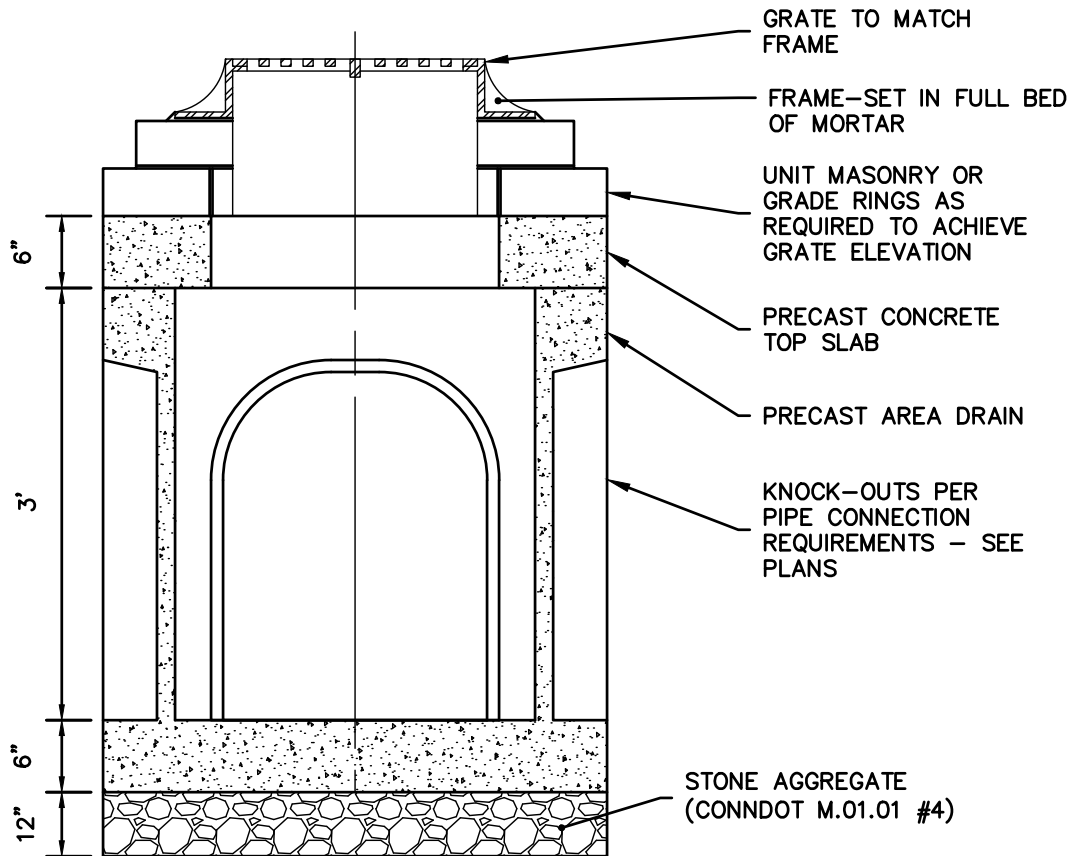
- ALL MATERIALS ARE TO MEET CONNDOT SPECIFICATIONS FORM 817 AS AMENDED.

TOWN OF TOLLAND
STANDARD DETAIL
FEBRUARY 2017

PREFORMED SCOUR HOLE TYPE 1 & TYPE 2

SCALE: NONE

DETAIL 2-15



PLAN VIEW (TOP SLAB)

NOTES:

1. INLET SHALL BE 30"x30" CONCRETE AREA DRAIN, AS MANUFACTURED BY ARROW CONCRETE, OR ENGINEER APPROVED EQUAL. [HEIGHT OF DRAIN BOX SHALL BE 3' (MODEL #ADBK03) UNLESS DEPTH OF INVERT PIPE OUT REQUIRES THE USE OF 4' DRAIN BOX (MODEL #ADBK04)]
2. CONCRETE STRENGTH SHALL BE 4,000 PSI AT 28 DAYS.
3. REINFORCING STEEL - ASTM 615 AND A82 OR A185 SPECIFICATIONS.
4. H-20 DESIGN LOADING PER AASHTO HS-20-44.
5. BUTYL RUBBER JOINT SEALANT - ASTM C990-91.
7. FRAME AND GRATE PAIR SHALL BE ONE OF THE FOLLOWING:
 - A. STANDARD GRATE SHALL BE NEENAH INLET FRAME/GRATE R-2570 OR ENGINEER APPROVED EQUAL.
 - B. ADA STANDARD GRATE SHALL BE NEENAH INLET FRAME/GRATE R-2569 OR ENGINEER APPROVED EQUAL.
 - C. STANDARD BEEHIVE GRATE SHALL BE NEENAH INLET FRAME/BEEHIVE GRATE R-2564 OR ENGINEER APPROVED EQUAL.



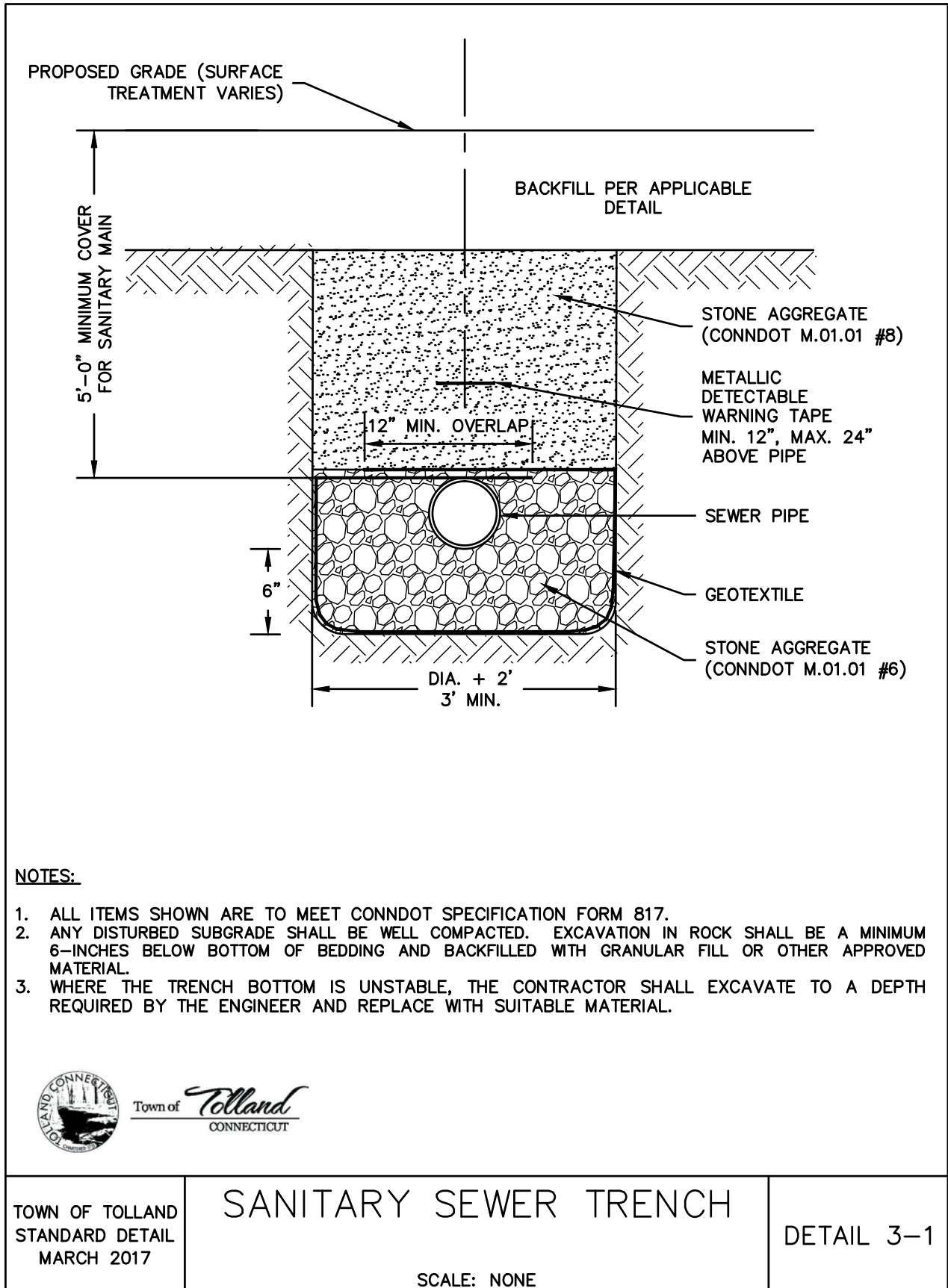
Town of *Tolland*
CONNECTICUT

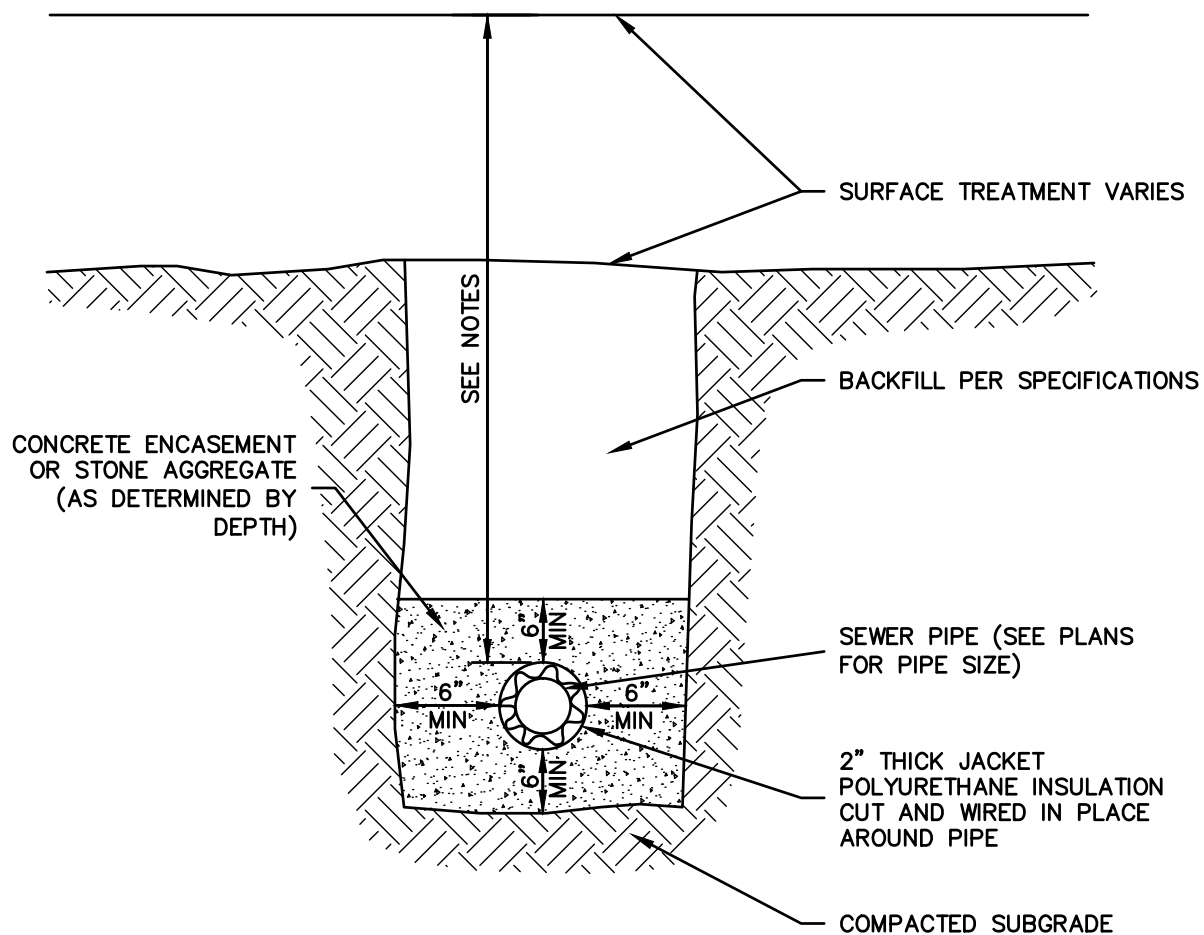
TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CONCRETE AREA DRAIN

SCALE: NONE

DETAIL 2-17





NOTES:

1. SEWER PIPE SHALL BE INSULATED WHEN COVER IS LESS THAN THREE (3) FEET, UNLESS INDICATED OTHERWISE ON PLANS, OR AT THE DISCRETION OF THE TOWN ENGINEER.
2. PROVIDE CONCRETE ENCASEMENT IN VEHICULAR AREAS WHEN COVER IS LESS THAN TWO (2) FEET.
3. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION FORM 817.



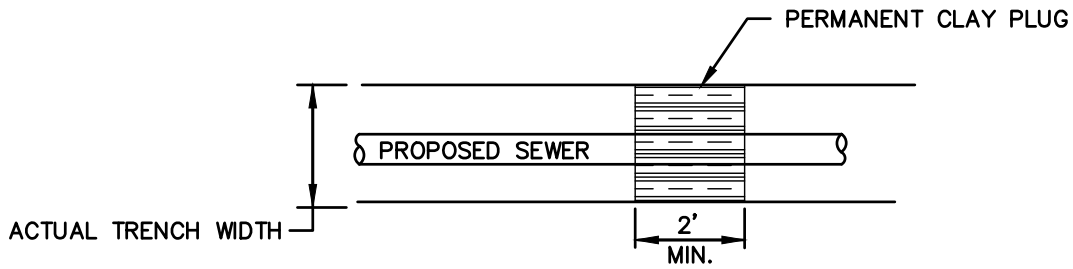
Town of *Tolland*
CONNECTICUT

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MARCH 2017

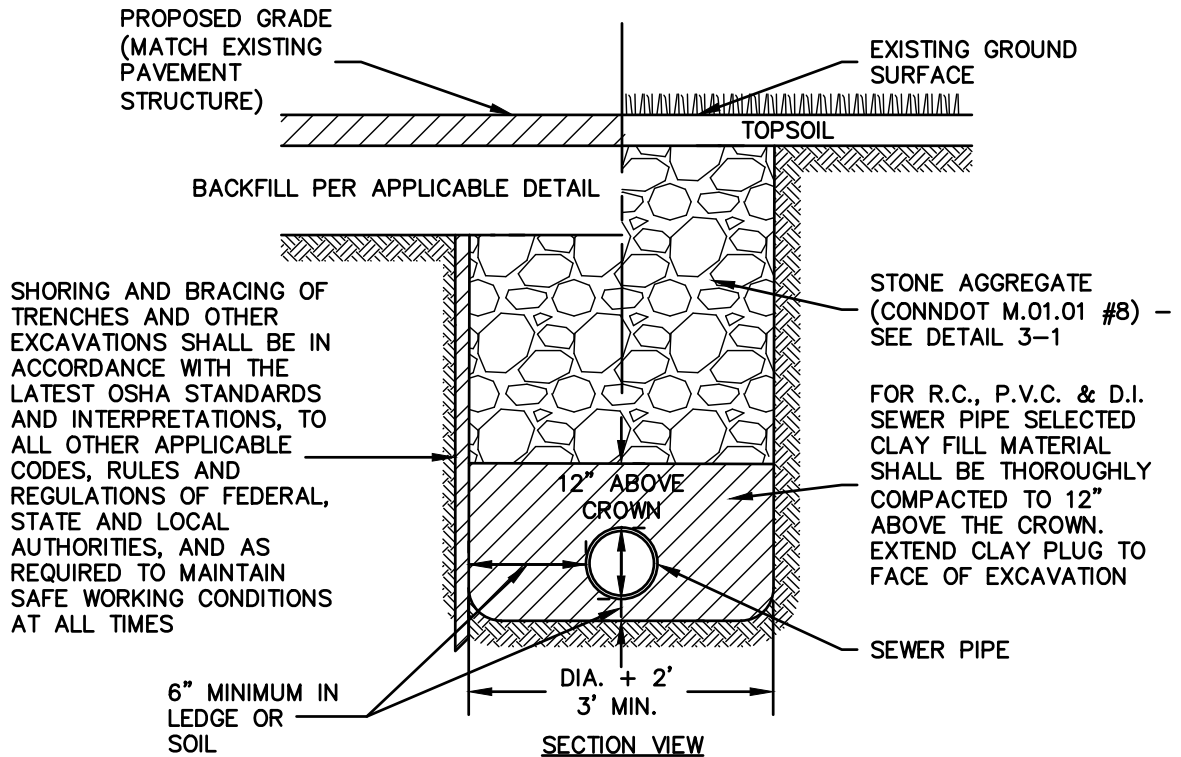
SANITARY SEWER INSULATION

SCALE: NONE

DETAIL 3-2



PLAN VIEW



NOTE:

1. PLACE IMPERVIOUS DAMS BETWEEN MANHOLES, 100' ON CENTER, OR AS DIRECTED BY THE ENGINEER.



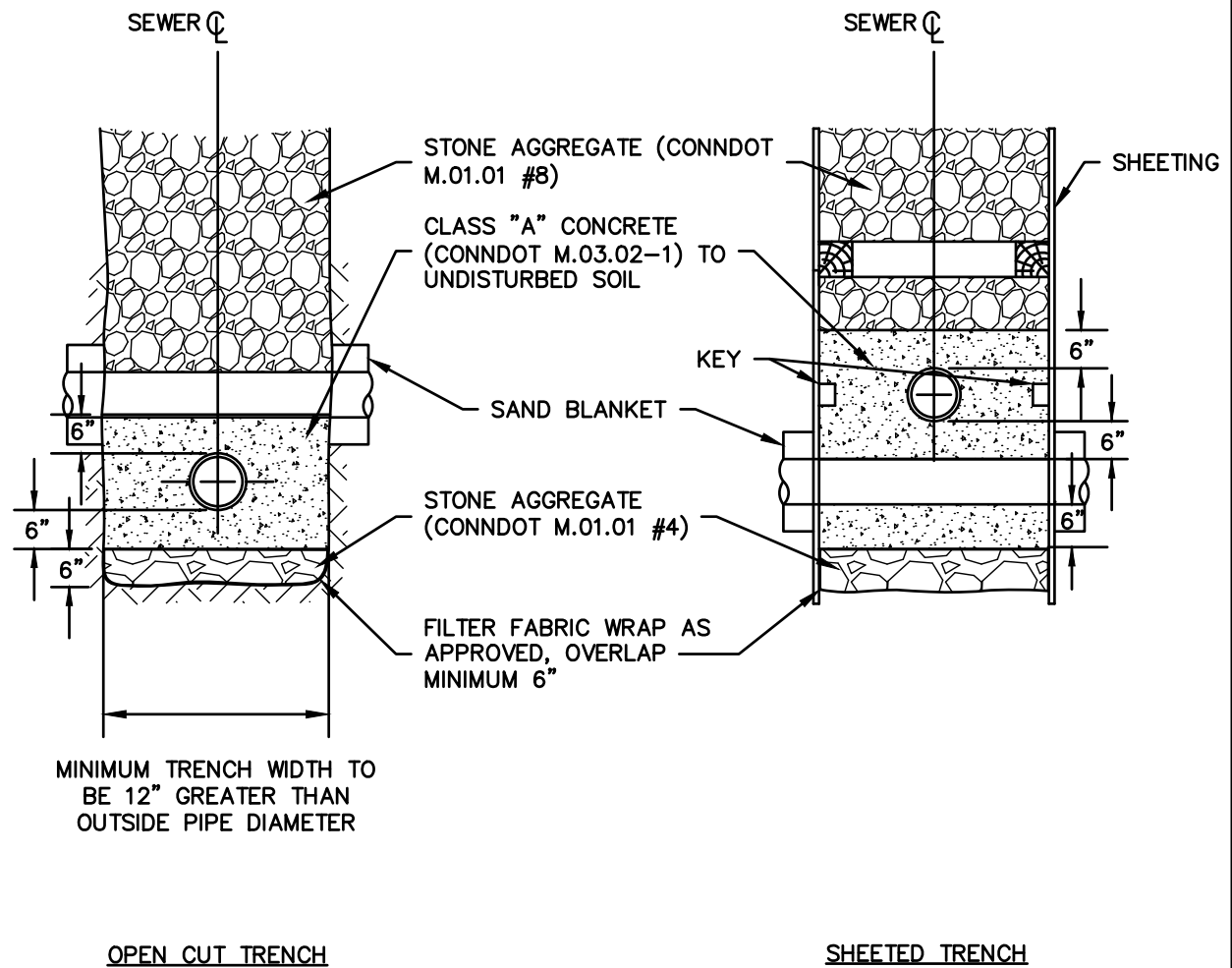
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

IMPERVIOUS CHECK DAM

DETAIL 3-3

SCALE: NONE



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION FORM 817.



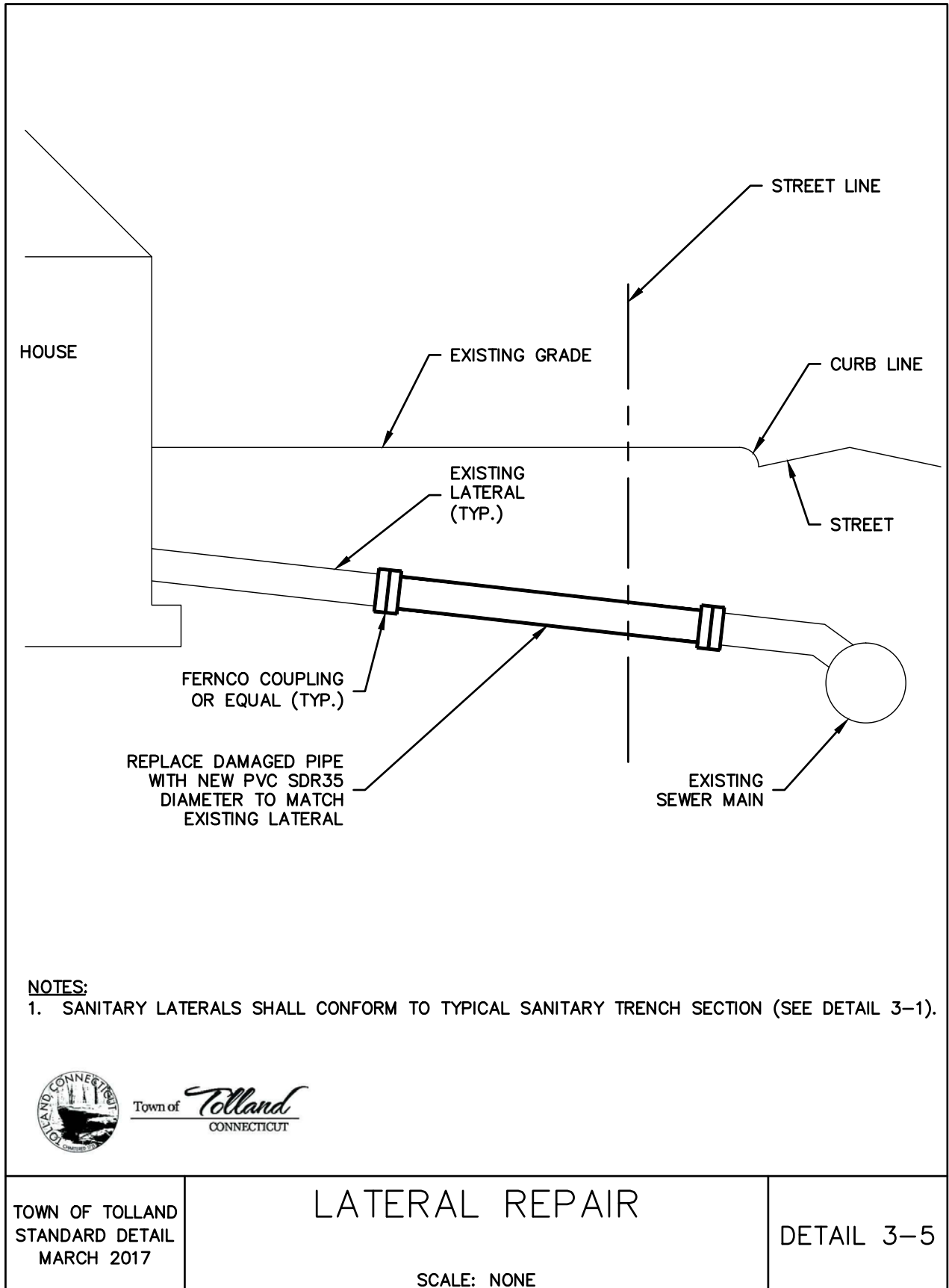
Town of *Tolland*
CONNECTICUT

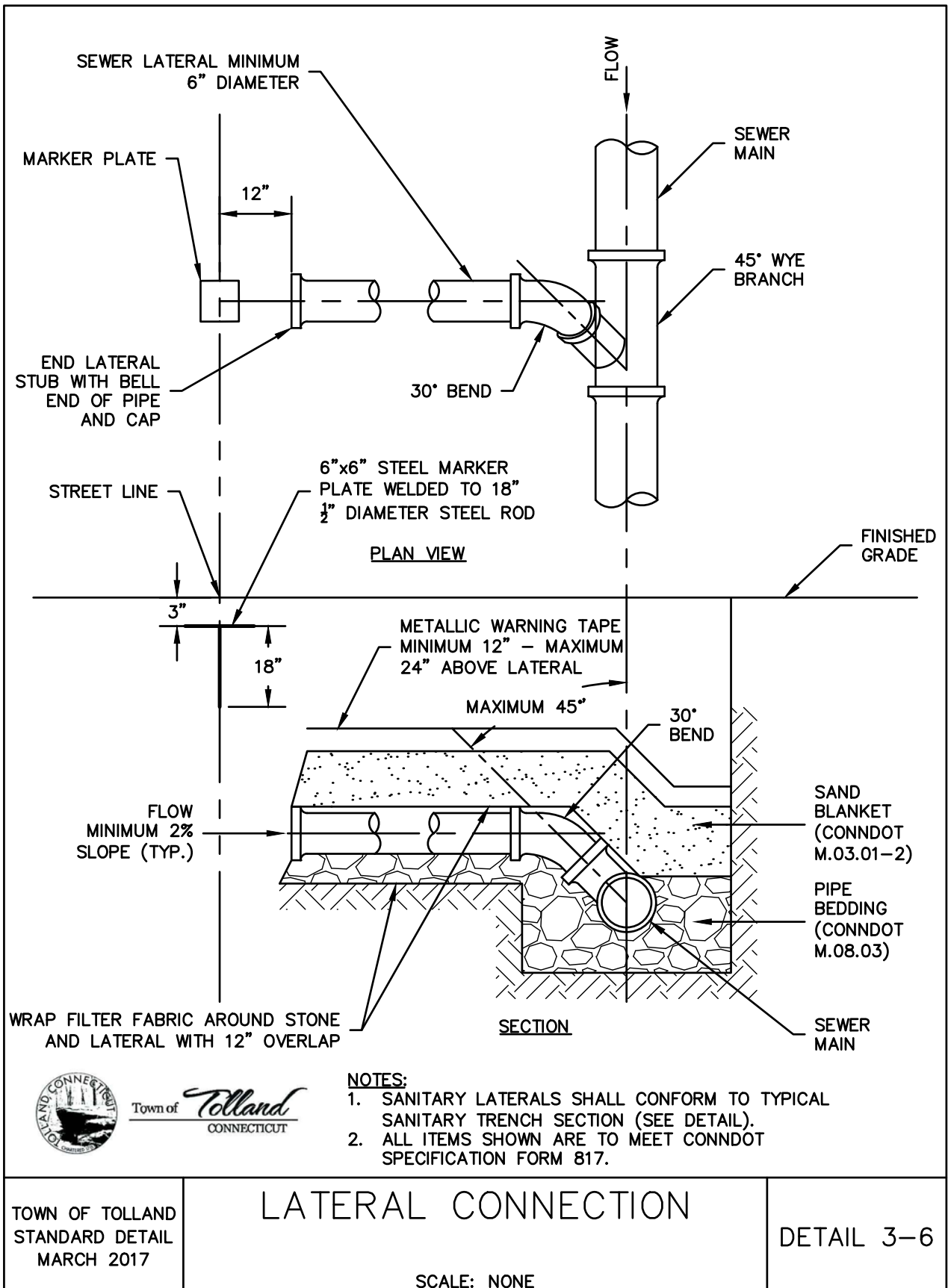
TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

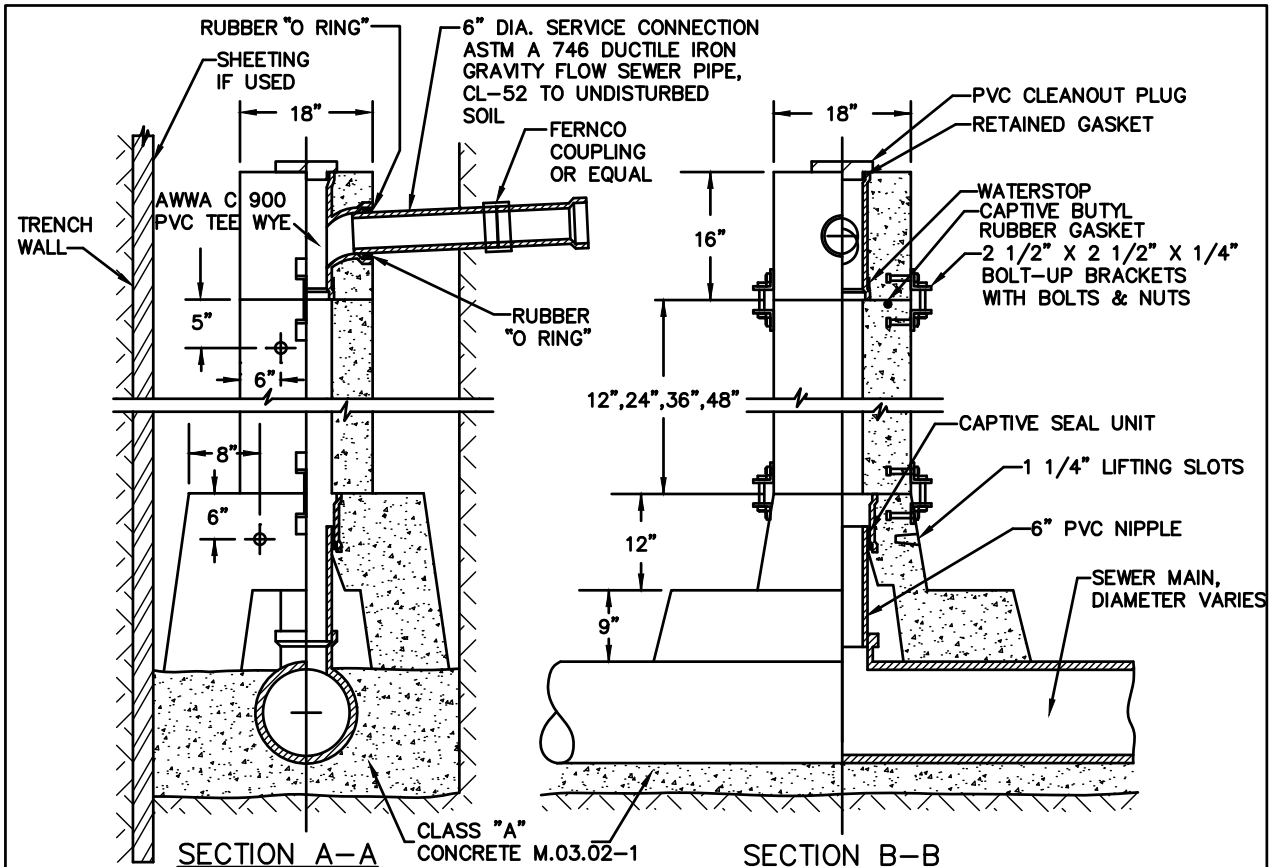
CONCRETE CRADLE & ENCASEMENT

SCALE: NONE

DETAIL 3-4

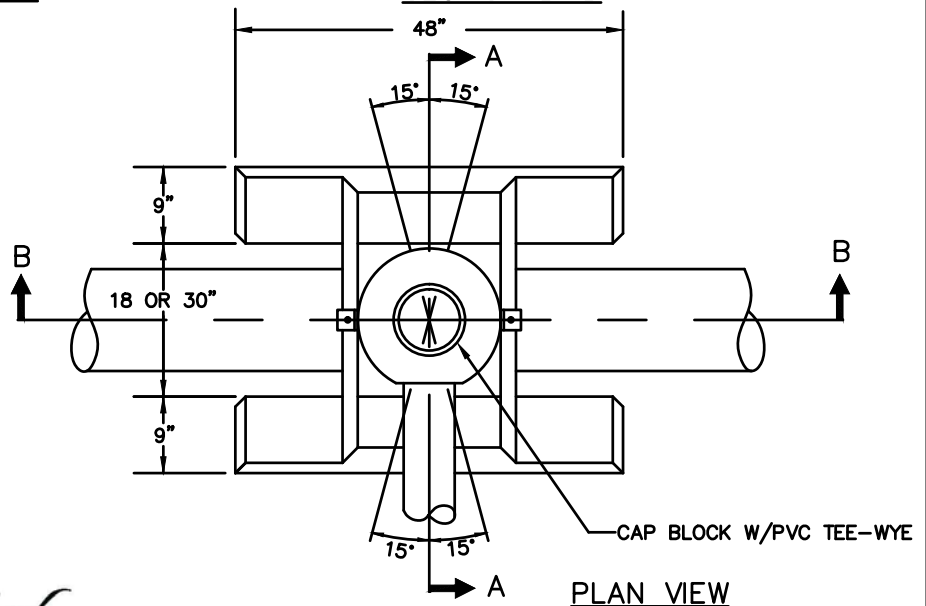






NOTES:

1. PRECAST CONCRETE CHIMNEY TO BE USED ONLY WHEN AUTHORIZED BY THE TOWN ENGINEER.
2. CHIMNEY TO BE PRECAST SEWER DISTRIBUTED BY ARROW CONCRETE PRODUCTS, OR APPROVED EQUAL.

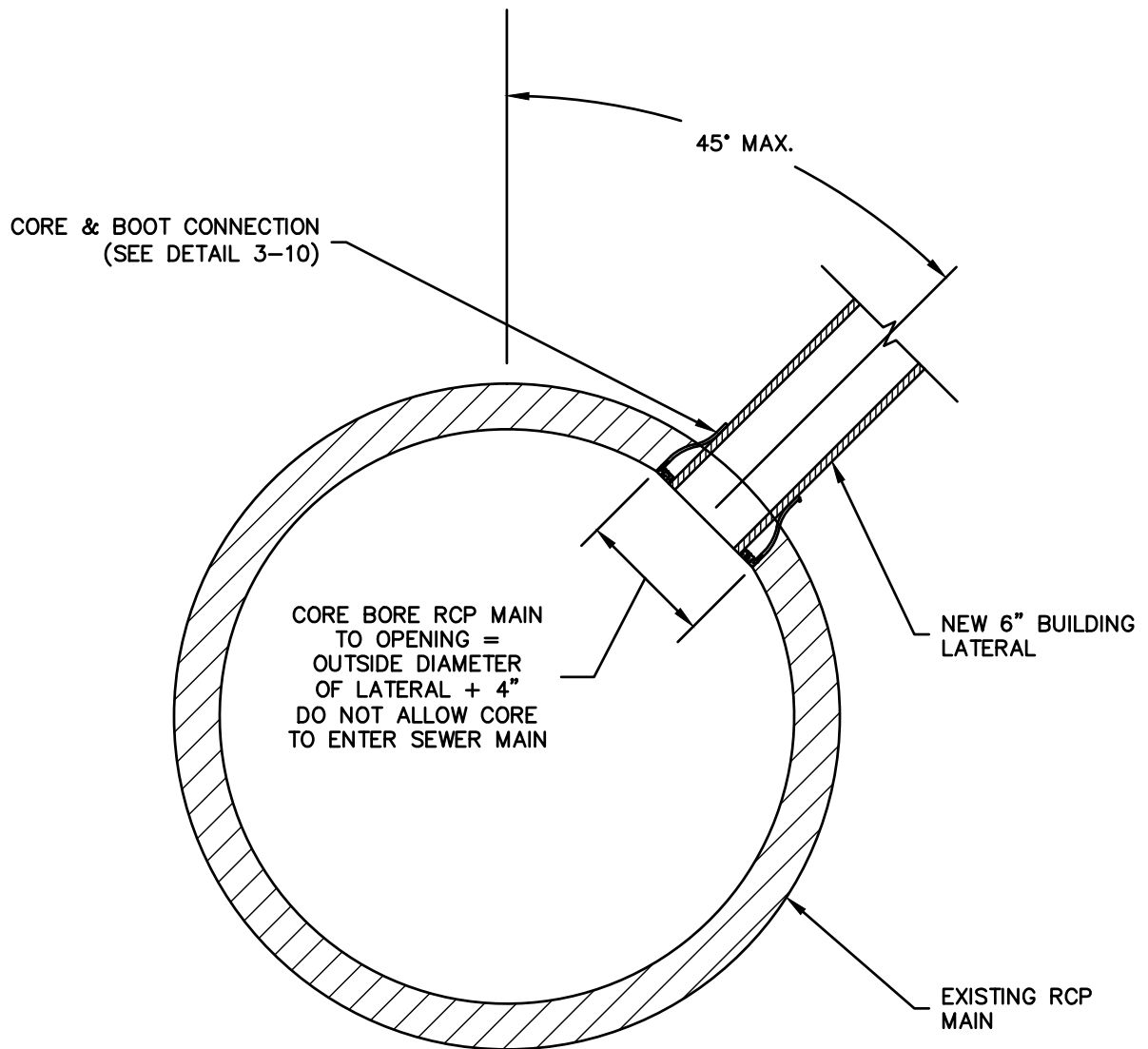


Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

PRE-CAST CONCRETE CHIMNEY SCALE: NONE

DETAIL 3-7



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.



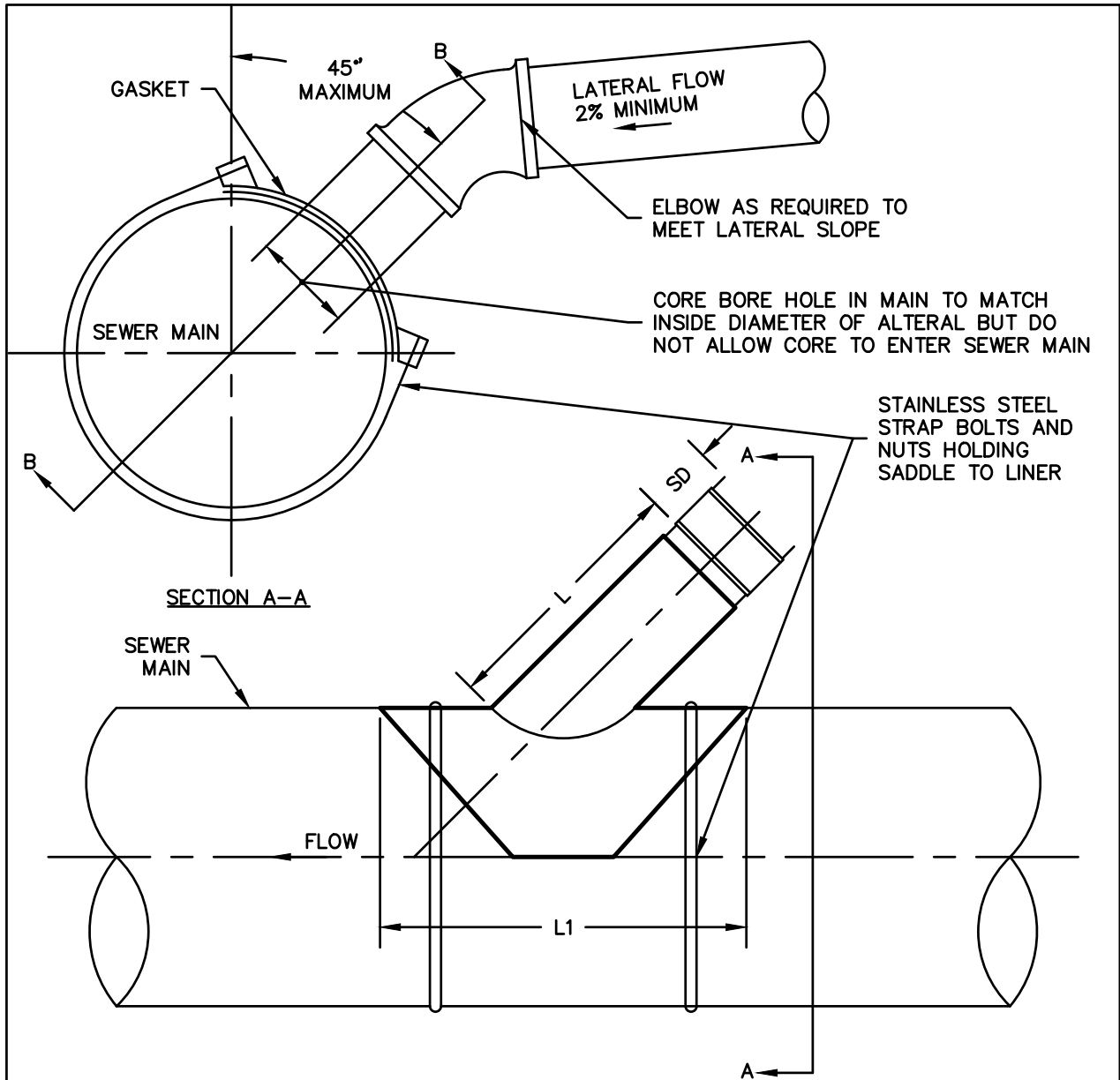
Town of *Tolland*
CONNECTICUT

TOWN OF TOLLAND
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MARCH 2017

CORE-BORED LATERAL CONNECTION

SCALE: NONE

DETAIL 3-8



NOTES:

1. TAPPING SADDLE MANUFACTURED BY GENERAL ENGINEERING CO., FREDERICK, MD, OR APPROVED EQUAL. MODEL DEPENDS ON SPECIFIED SIZE OF EACH PIPE.



Town of *Tolland*
CONNECTICUT

FITTING SPECIFICATIONS (IN.)

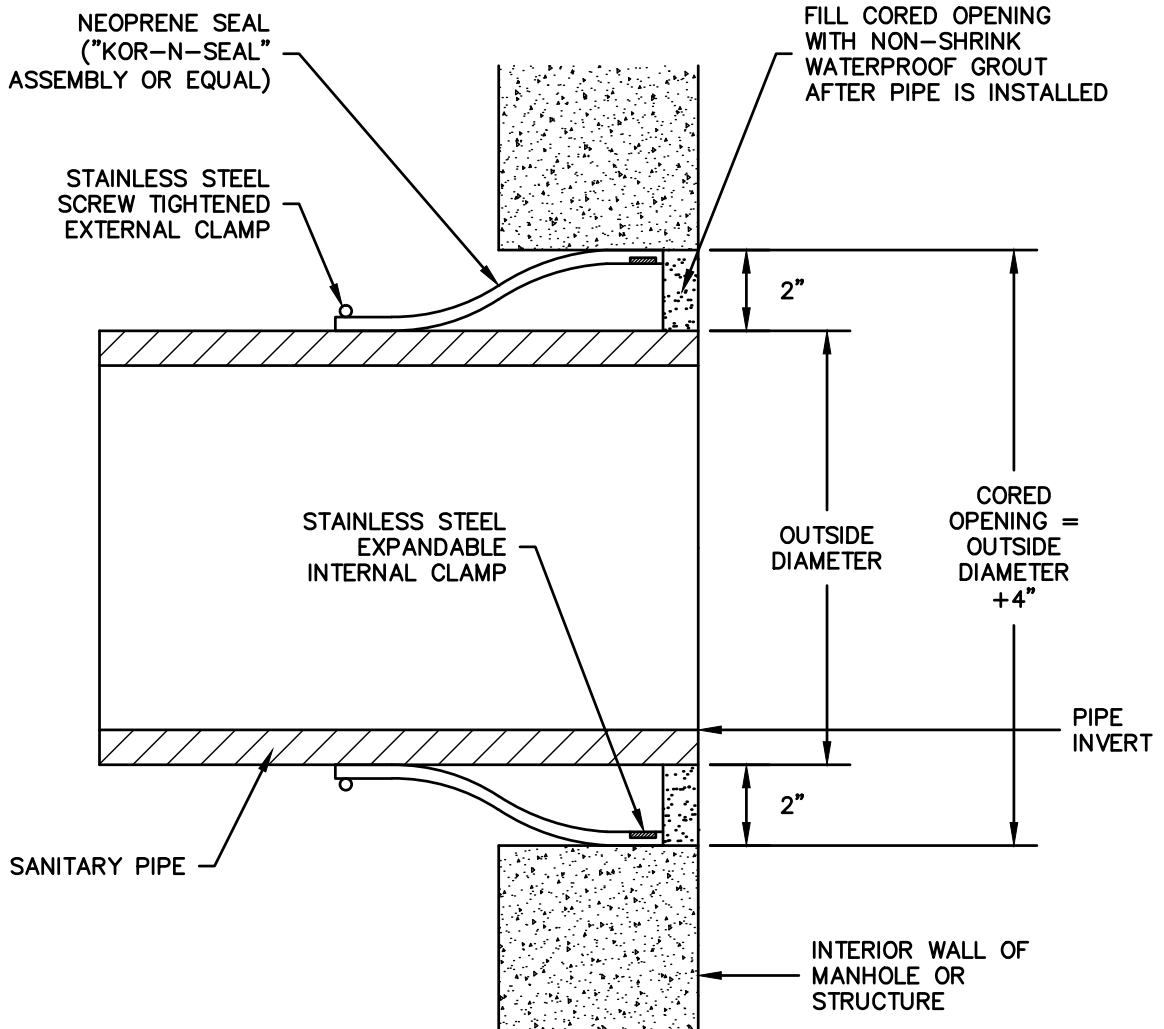
SIZE	(SD)	(L)	(L1)
8"x6"	3.75	13.375	13.50
10"x6"	3.75	14.875	13.50
12"x6"	3.75	16.125	13.50
15"x6"	3.75	18.125	13.50
18"x6"	3.75	20.625	13.50

TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

TAPPING SADDLE

SCALE: NONE

DETAIL 3-9



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION, FORM 817.



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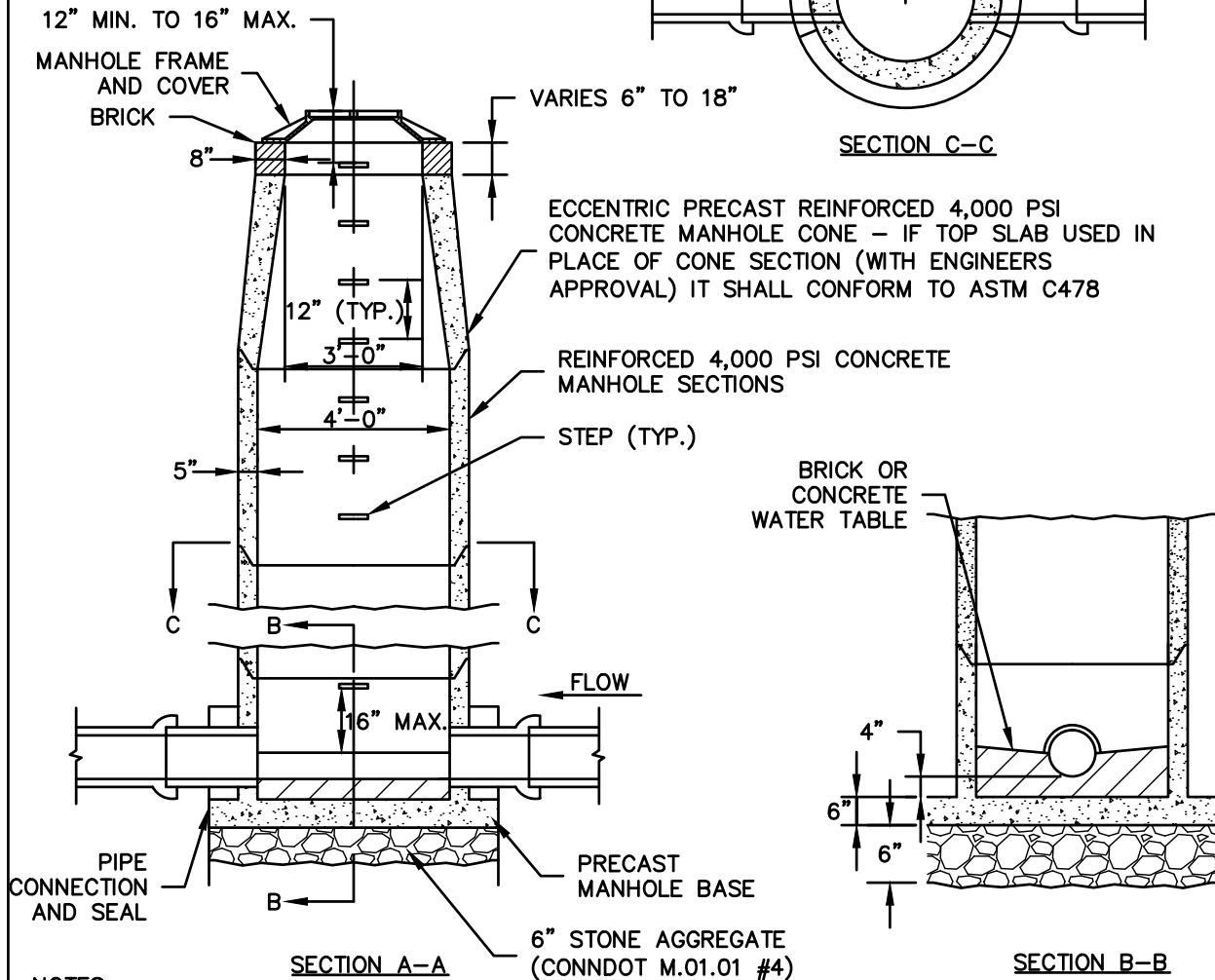
TOWN OF TOLLAND
STANDARD DETAIL
MARCH 2017

CORE & BOOT CONNECTION

DETAIL 3-10

SCALE: NONE

CONNECTION OF PIPES TO MANHOLE WALL
TO BE MADE WITH BRICK OR CONCRETE
MASONRY, OR ELASTOMERIC TYPE OF
SEAL APPROVED BY THE ENGINEER



NOTES:

1. MAXIMUM 18" PIPE TO BE INSTALLED IN MANHOLE. FOR PIPES LARGER THAN 18" USE 60" PRECAST MANHOLE BASE WITH 48"x60" MANHOLE TAPER.
2. MAXIMUM DEPTH OF R.C. PIPE MANHOLES WITH 5" THICK WALL IS 30 FEET.
3. ALL JOINTS REQUIRED IN THE CONSTRUCTION OF THE MANHOLE SHALL BE MADE WITH BUTYL RUBBER GASKETS (ASTM C433).
4. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION, FORM 817.



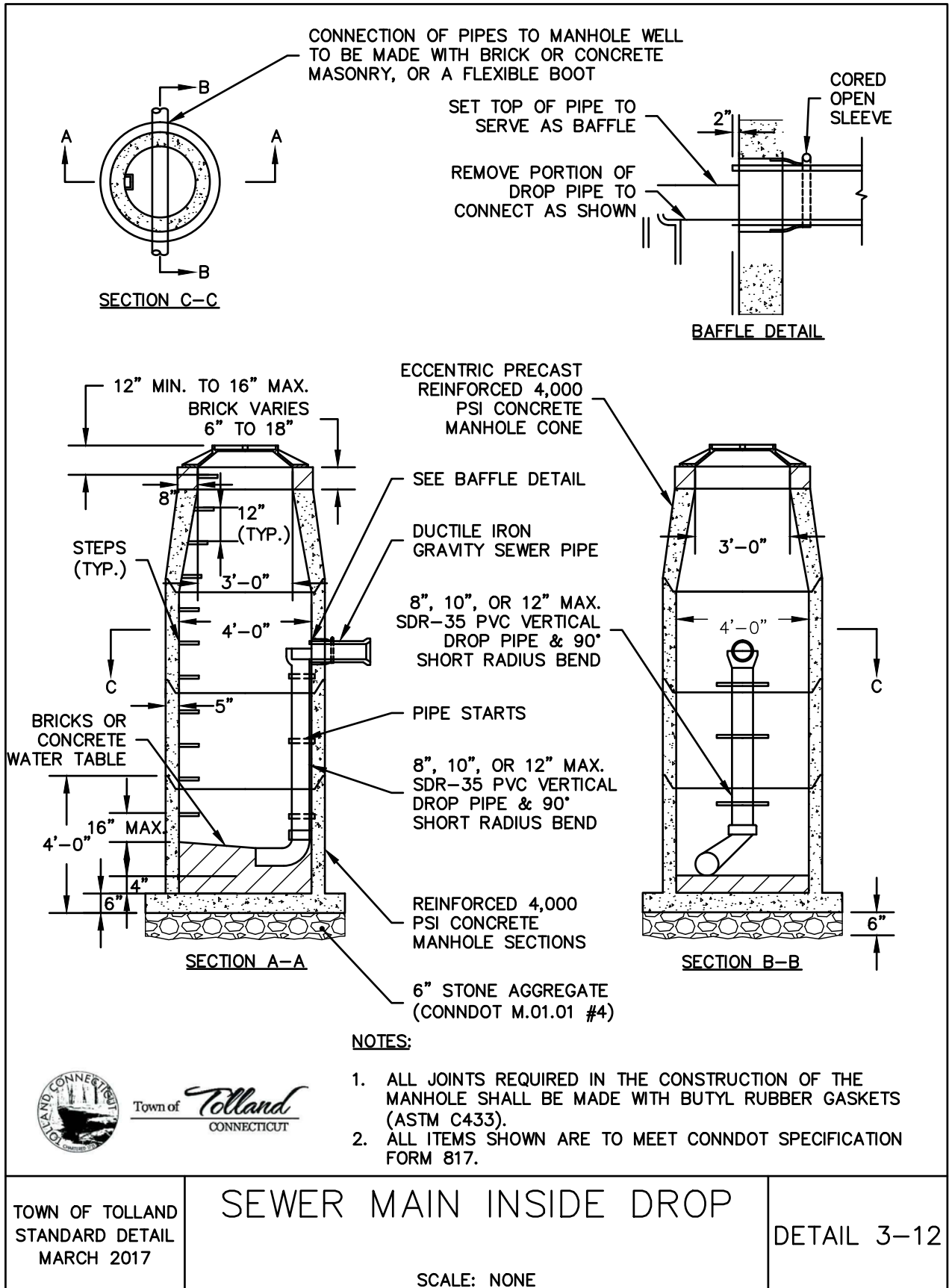
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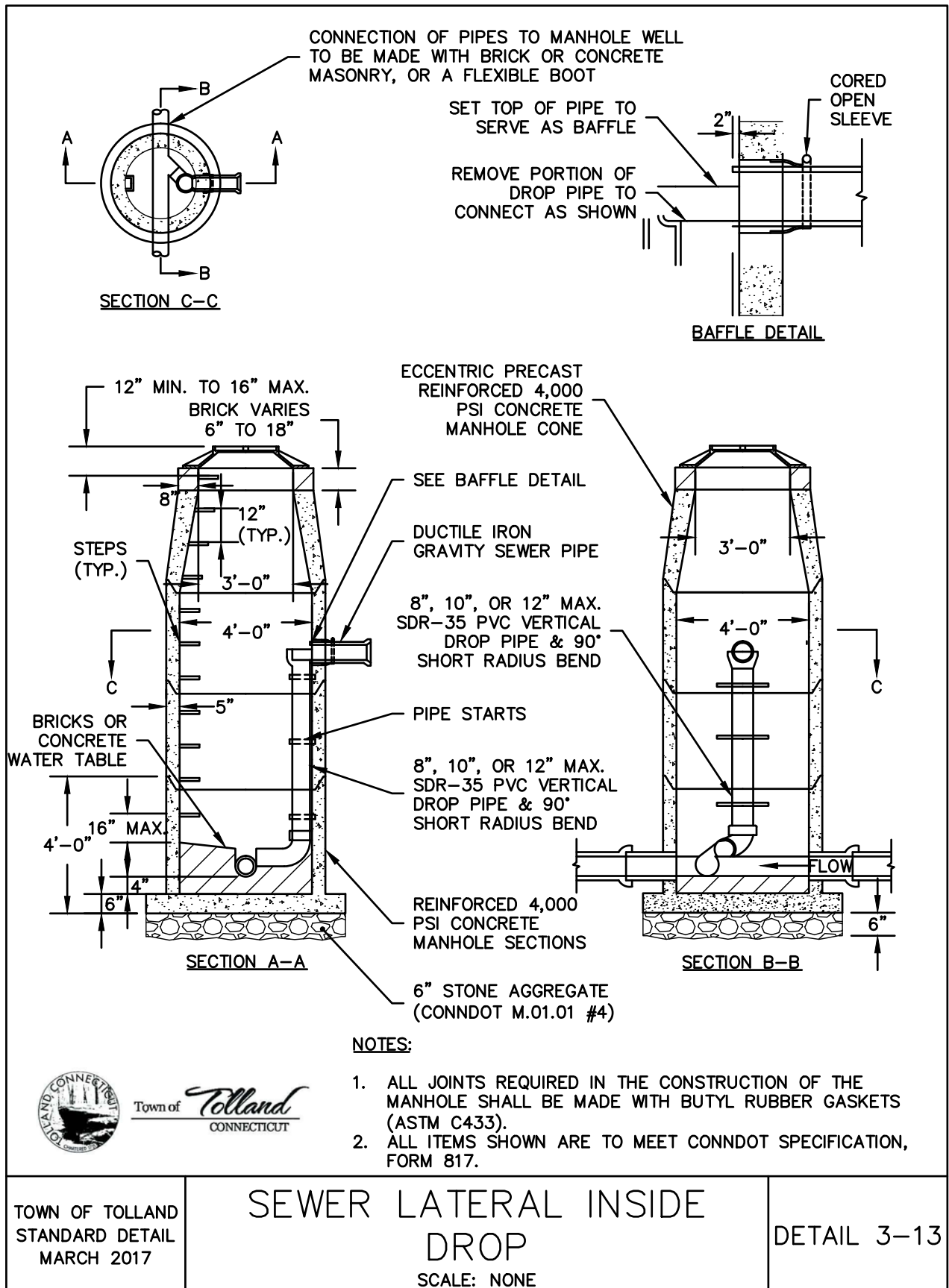
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PRE-CAST SANITARY MANHOLE

SCALE: NONE

DETAIL 3-11





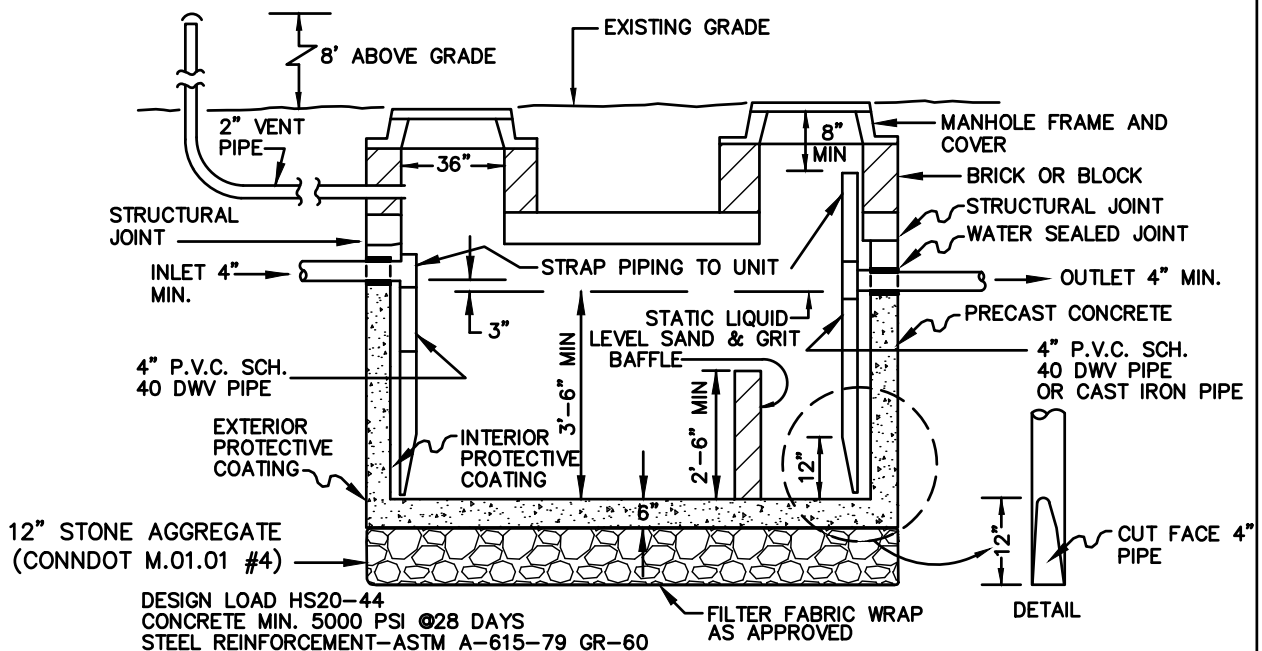
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SEWER LATERAL INSIDE DROP

SCALE: NONE

DETAIL 3-13



NOTES:

1. TANK SHALL HAVE A MINIMUM CAPACITY SUFFICIENT TO PRE-TREAT THE MAXIMUM DAILY FLOW PROPOSED AND NO LESS THAN 1,000 GALLONS. TANK SHALL BE CONSTRUCTED OF PRE-CAST CONCRETE, UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
2. INTERIOR OF THE TANK AND EXTENSION TO GRADE MANHOLES SHALL BE COATED WITH AN EPOXY PETROLEUM RESISTANT SEALANT. EXTERIOR OF THE TANK AND EXTENSION GRADE MANHOLES SHALL BE COATED WITH A WATERPROOF FOUNDATION SEALANT. THIS INCLUDES THE TANK EXTERIORS TOP AND BOTTOM.
3. STRUCTURAL SEAM OF THE TANK SHALL BE FILLED ON WITH NON-SHRINKING CEMENT OR WATER PLUG AND COATED WITH A WATERPROOF SEALANT.
4. VOIDS BETWEEN INLET AND OUTLET PIPING OF THE TANK SHALL BE GROUTED WITH NON-SHRINKING CEMENT AND COATED WITH A WATERPROOF SEALANT.
5. THE TANK SHALL HAVE EXTENSIONS TO GRADE ABOVE THE INLET AND OUTLET PIPING. THE EXTENSION SHALL HAVE FRAMES AND MANHOLE COVERS. THE MANHOLES, EXTENSIONS AND ACCESSSES TO THE TANK SHALL BE AT LEAST 24 INCHES IN DIAMETER.
6. THE OUTLET PIPING SHALL UTILIZE A TEE-PIPE ON THE INTERIOR OF THE TANK. THE TEE-PIPE SHALL BE EQUIPPED WITH A STAND PIPE RISER EXTENDING UP THE EXTENSION TO GRADE BUT NO CLOSER THAN EIGHT (8) INCHES FROM THE MANHOLE COVER. THE TEE-PIPE SHALL EXTEND SIX (6) TO TWELVE (12) INCHES FROM THE BOTTOM OF THE TANK.
7. THE INLET EXTENSION TO GRADE SHALL BE PROVIDED WITH A VENT LINE WHICH EXTENDS EIGHT (8) FEET ABOVE FINISHED GRADE AND PROPERLY SECURED TO THE BUILDING. THE SIZE OF THE VENT SHALL BE HALF THE SIZE OF THE OUTLET DISCHARGE LINE.
8. THE INCOMING PIPE SHALL NOT INCLUDE ANY SOURCES OF DOMESTIC WASTEWATER.
9. THE OUTLET PIPE SHALL BE AT LEAST THE SIZE OF THE INLET PIPE OR GREATER AND AT A MINIMUM SHOULD BE 4" IN DIAMETER.
10. THE CONCRETE COVERS PROVIDED BY THE OIL SEPARATOR MANUFACTURERS MUST BE REMOVED AND DISCARDED.



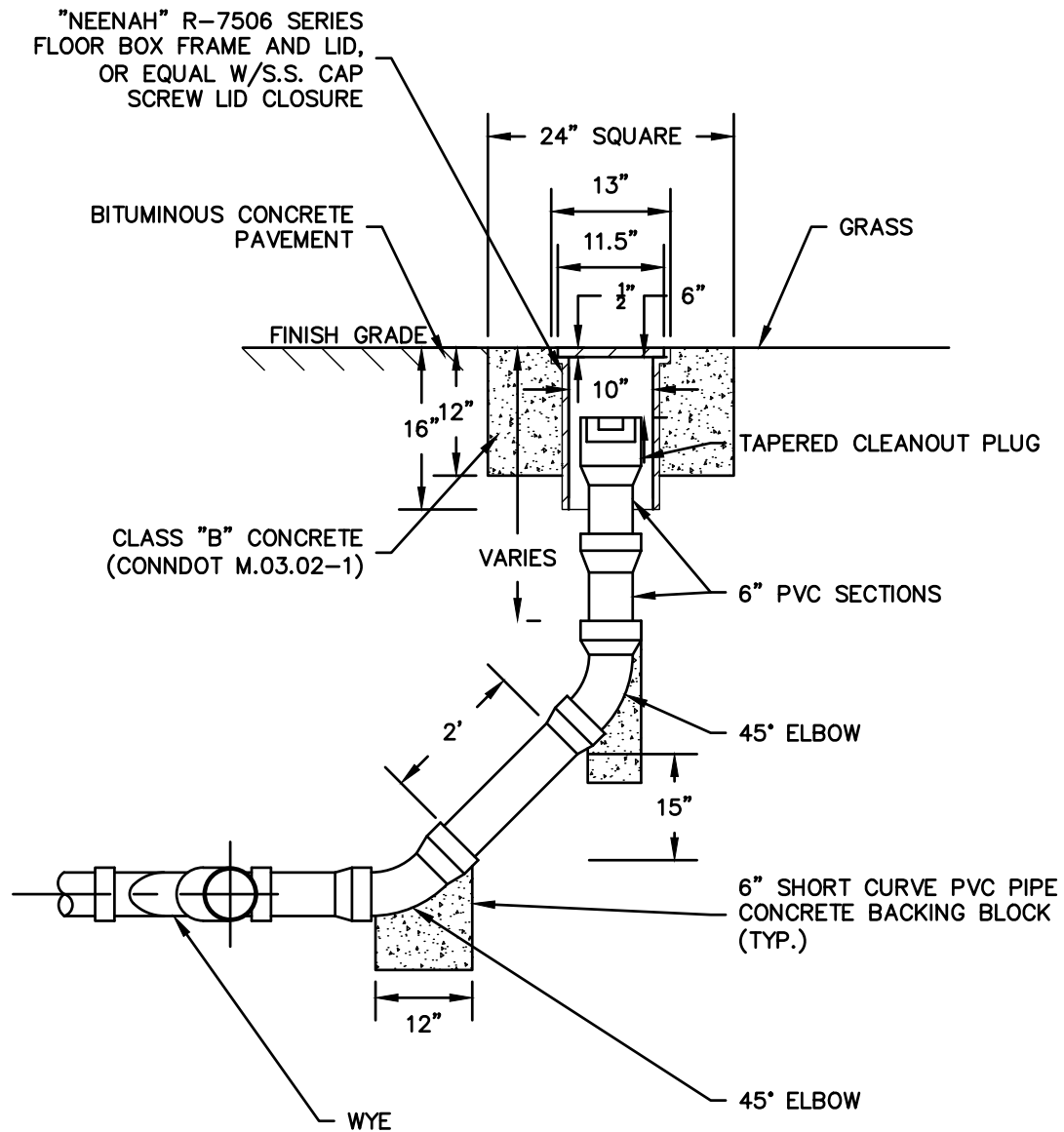
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SAND & OIL WATER SEPARATOR

SCALE: NONE

DETAIL 3-14



NOTES:

1. INSTALL CLEANOUTS AT BENDS OF 45° OR LESS AND EVERY 100± ALONG SANITARY LATERALS.
2. 6" PVC SEWER PIPE AND FITTINGS TO BE ASTM D-3033 OR D-3034 SDR-35.
3. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION, FORM 817.



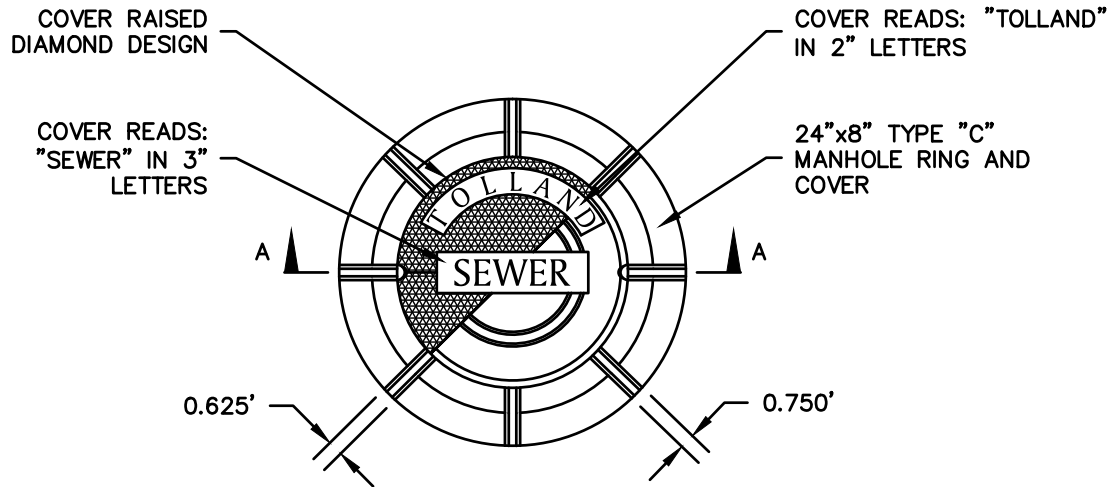
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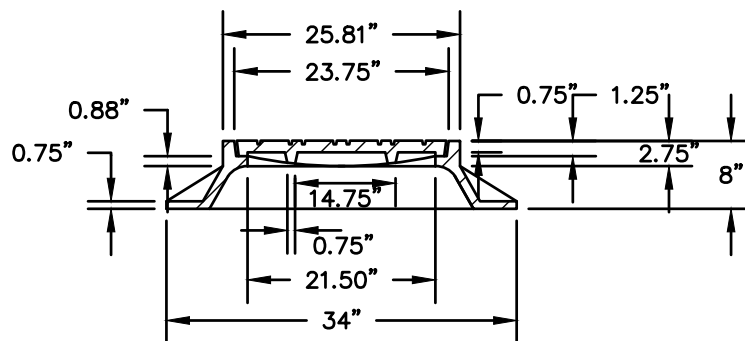
CLEANOUT

SCALE: NONE

DETAIL 3-16



PLAN



SECTION A-A

FRAME AND COVER DETAILS

NOTES:

1. CHANNELS MAY BE SHAPED IN CONCRETE BASE OF MANHOLE OR FORMED USING CONCRETE MASONRY.
2. A FRAME DIAMETER OF 3'-3" WITH 4" FLANGE MUST BE USED WHEN THE TOP DIAMETER OF THE PRECAST CONE IS LESS THAN 3'-6". ALL OTHER FRAME DIMENSIONS SHALL REMAIN THE SAME.
3. COVER: CAST IRON OR STEEL, MIN. WEIGHT 134 LB.
4. ALL DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.
5. FRAME AND GRATE SHALL BE H-20 LOAD RATED.



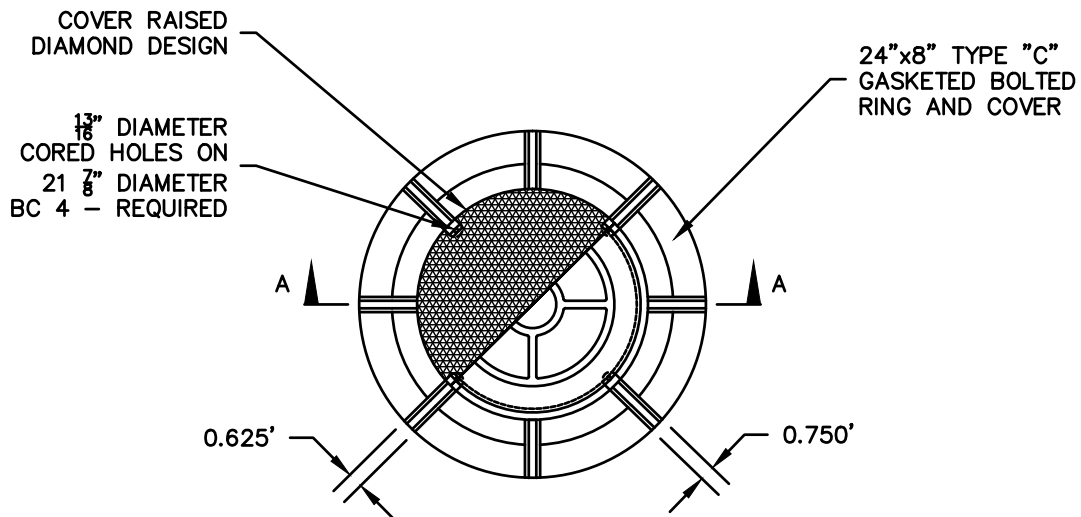
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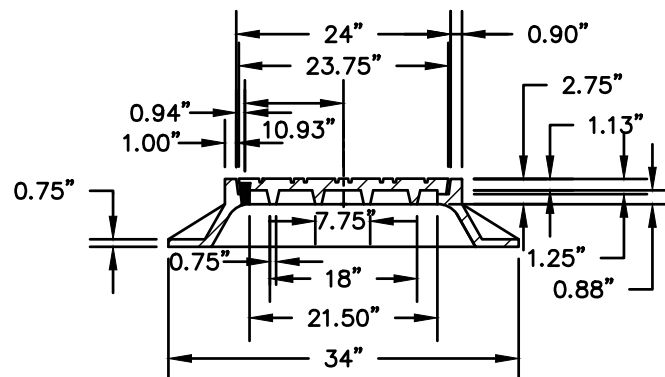
STANDARD SEWER MANHOLE
FRAME & COVER

SCALE: NONE

DETAIL 3-17



PLAN



SECTION A-A

FRAME AND COVER DETAILS

NOTES:

1. CHANNELS MAY BE SHAPED IN CONCRETE BASE OF MANHOLE OR FORMED USING CONCRETE MASONRY.
2. A FRAME DIAMETER OF 3'-3" WITH 4" FLANGE MUST BE USED WHEN THE TOP DIAMETER OF THE PRECAST CONE IS LESS THAN 3'-6". ALL OTHER FRAME DIMENSIONS SHALL REMAIN THE SAME.
3. COVER: CAST IRON OR STEEL, MIN. WEIGHT 134 LB.
4. ALL DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.
5. FRAME AND GRATE SHALL BE H-20 LOAD RATED.



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LOCKABLE MANHOLE FRAME & COVER

SCALE: NONE

DETAIL 3-18

COVER RAISED
DIAMOND DESIGN

TOP VIEW

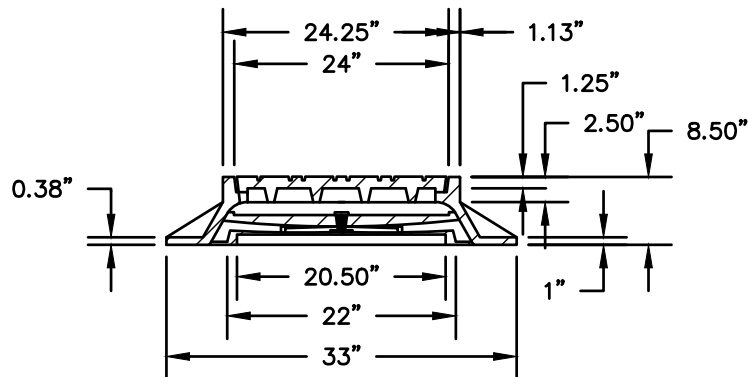
24"x9" TYPE "B"
WATERTIGHT MANHOLE
RING, COVER, LOCKING
BAR, AND INNER COVER

A

A

BOTTOM VIEW

PLAN



SECTION A-A

FRAME AND COVER DETAILS

NOTES:

1. CHANNELS MAY BE SHAPED IN CONCRETE BASE OF MANHOLE OR FORMED USING CONCRETE MASONRY.
2. A FRAME DIAMETER OF 3'-3" WITH 4" FLANGE MUST BE USED WHEN THE TOP DIAMETER OF THE PRECAST CONE IS LESS THAN 3'-6". ALL OTHER FRAME DIMENSIONS SHALL REMAIN THE SAME.
3. COVER: CAST IRON OR STEEL, MIN. WEIGHT 134 LB.
4. ALL DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.
5. FRAME AND GRATE SHALL BE H-20 LOAD RATED.



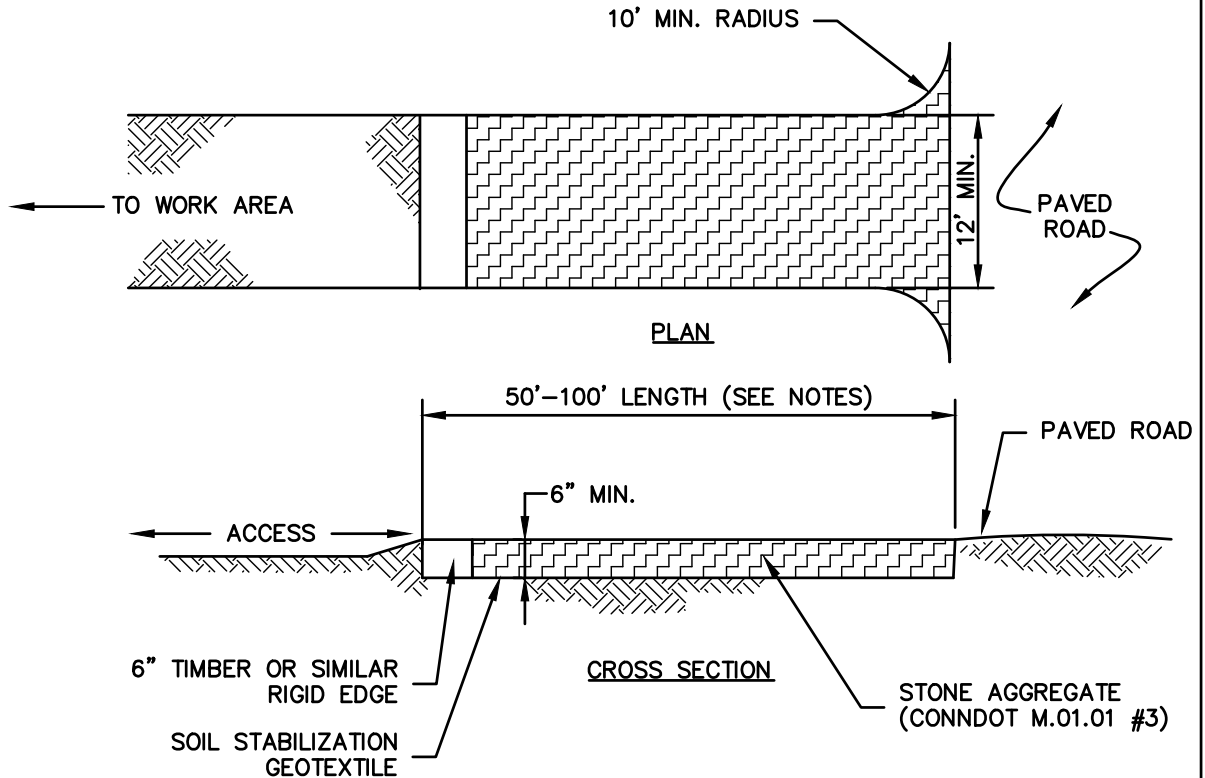
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WATERTIGHT MANHOLE
FRAME & COVER

SCALE: NONE

DETAIL 3-19



NOTES:

1. REMOVE TOPSOIL AND ORGANICS PRIOR TO CRUSHED STONE PLACEMENT.
2. INSTALL SUBBASE OF FREE DRAINING BACKFILL OR ROAD STABILIZATION GEOTEXTILE AS NECESSARY ON UNSTABLE SOILS.
3. LENGTH SHALL BE 50 FOOT MINIMUM. WHERE TRACKED SEDIMENTS CONTAIN LESS THAN 80% SAND, LENGTH SHALL BE 100 FOOT MINIMUM.
4. IF THE GRADE OF THE CONSTRUCTION ENTRANCE DRAINS TO THE PAVED SURFACE AND IT EXCEEDS 2% SLOPE, CONSTRUCT ENTRANCE AT LEAST 15 FEET FROM ITS ENTRANCE ONTO THE PAVED SURFACE WHILE DIVERTING RUN-OFF WATER TO A SETTLING OR FILTERING AREA.
5. CONSTRUCT ANY DRAINAGE AND SETTLING FACILITIES REQUIRED TO ACCOMMODATE VEHICLE WASHING OPERATIONS. DIVERT ALL WASH WATER AWAY FROM ENTRANCE TO THE SETTLING AREA.
6. MAINTAIN ENTRANCE IS A CONDITION THAT WILL PREVENT WASHING OF SEDIMENT ONTO PAVED SURFACES.



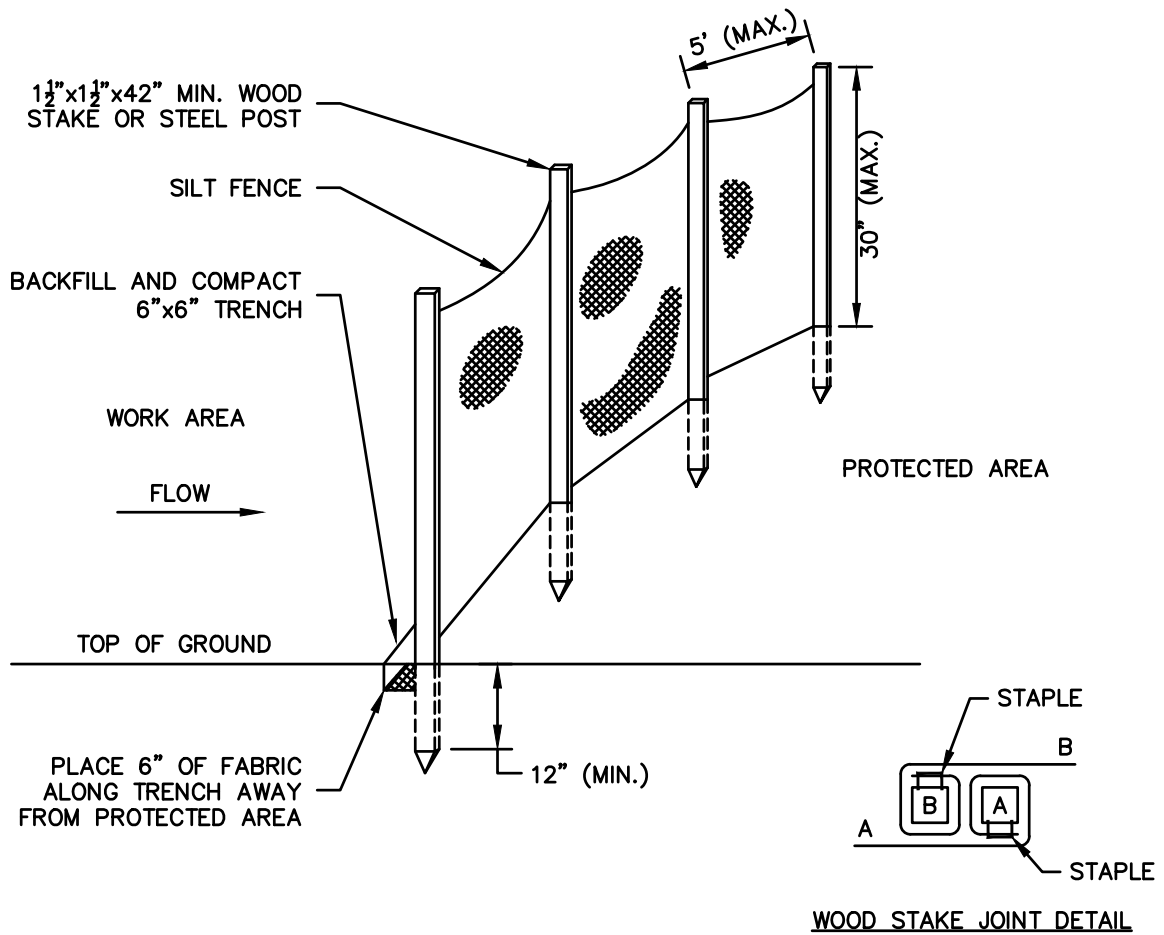
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FEBRUARY 2017

CONSTRUCTION ENTRANCE ANTI-TRACKING PAD

SCALE: NONE

DETAIL 4-1



NOTES:

1. ALL MATERIALS ARE TO MEET CONNDOT SPECIFICATIONS FORM 817 AS AMENDED.
2. FOR SLOPE & SWALE INSTALLATIONS, EXTEND FENCE UP SLOPE SUCH THAT BOTTOM ENDS OF FENCE WILL BE HIGHER THAN THE TOP OF THE LOWEST PORTION OF FENCE.
3. FOR FENCE INSTALLED ON LEVEL TERRAIN INSTALL WING SECTIONS PERPENDICULAR TO MAIN BARRIER AT 50'-100' INTERVALS.



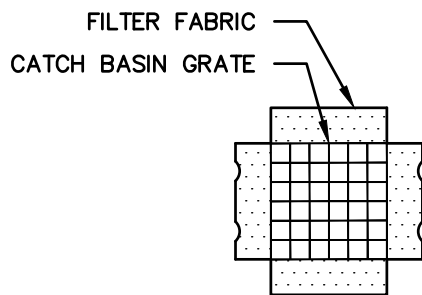
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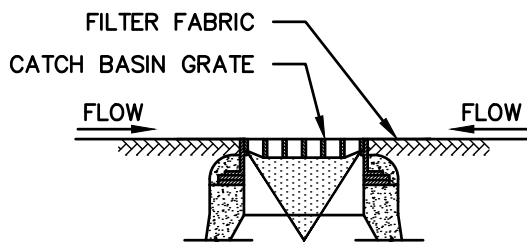
SILT FENCE

SCALE: NONE

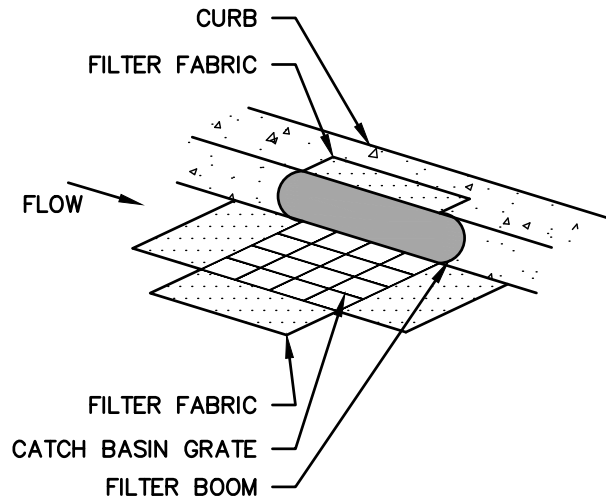
DETAIL 4-2



TYPE "C-L" CATCH BASIN - PLAN VIEW



TYPE "C-L" CATCH BASIN - SECTION VIEW



TYPE "C" CATCH BASIN

NOTES:

1. PROVIDE INLET PROTECTION TO ALL EXISTING CATCH BASINS IN THE VICINITY OF CONSTRUCTION. PROTECT NEW CATCH BASINS AS THEY ARE CONSTRUCTED.
2. GRATE TO BE PLACED OVER FILTER FABRIC.



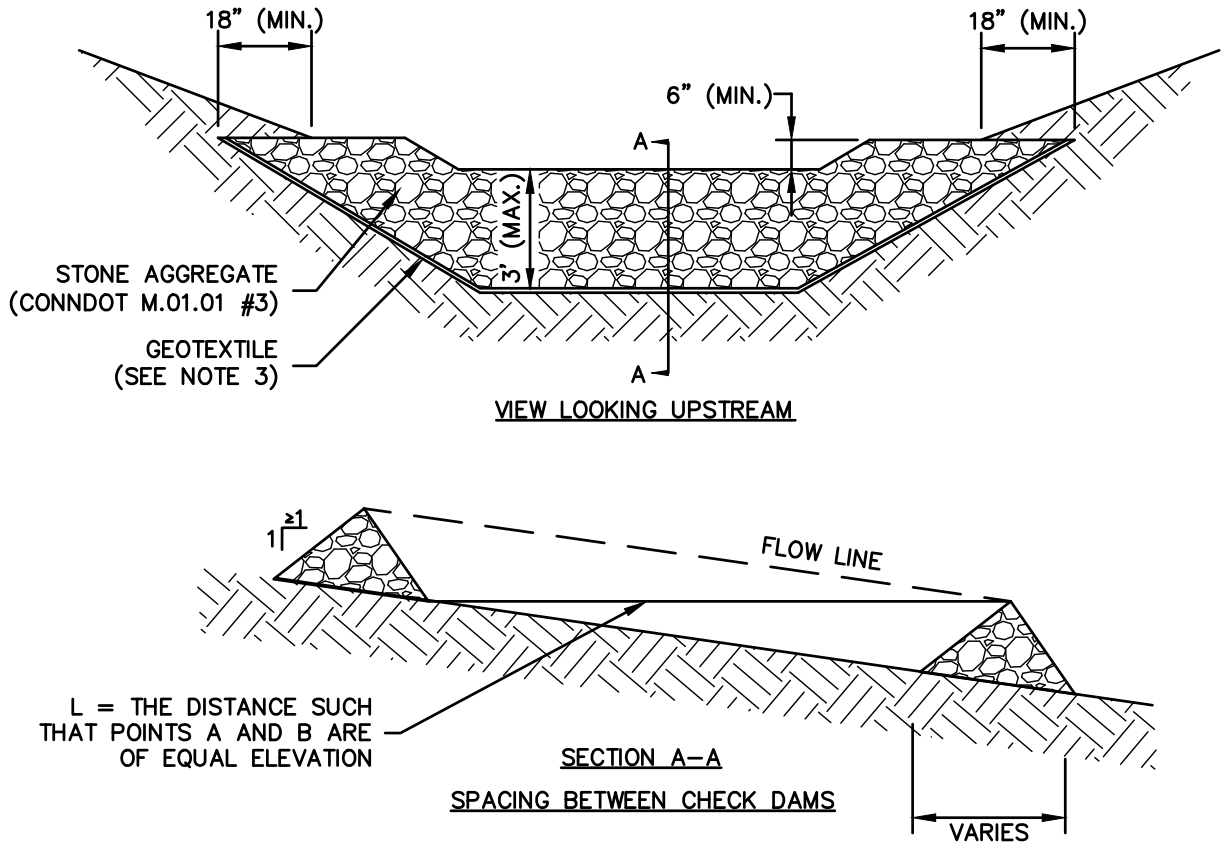
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CATCH BASIN INLET PROTECTION

SCALE: NONE

DETAIL 4-3



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATIONS FORM 817.
2. KEY STONE INTO THE DITCH BANKS AND EXTEND INTO THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW FROM FLANKING THE CHECK DAM.
3. THE MAXIMUM SPACING BETWEEN CHECK DAMS SHALL BE SUCH THAT THE TOE OF THE UPSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE TOP OF THE CENTER OF THE DOWNSTREAM CHECK DAM.
4. A GEOTEXTILE FABRIC MAY BE INSTALLED UNDER THE STONE CHECK DAMS IF NECESSARY TO PROVIDE A STABLE FOUNDATION AND FACILITATE REMOVAL.



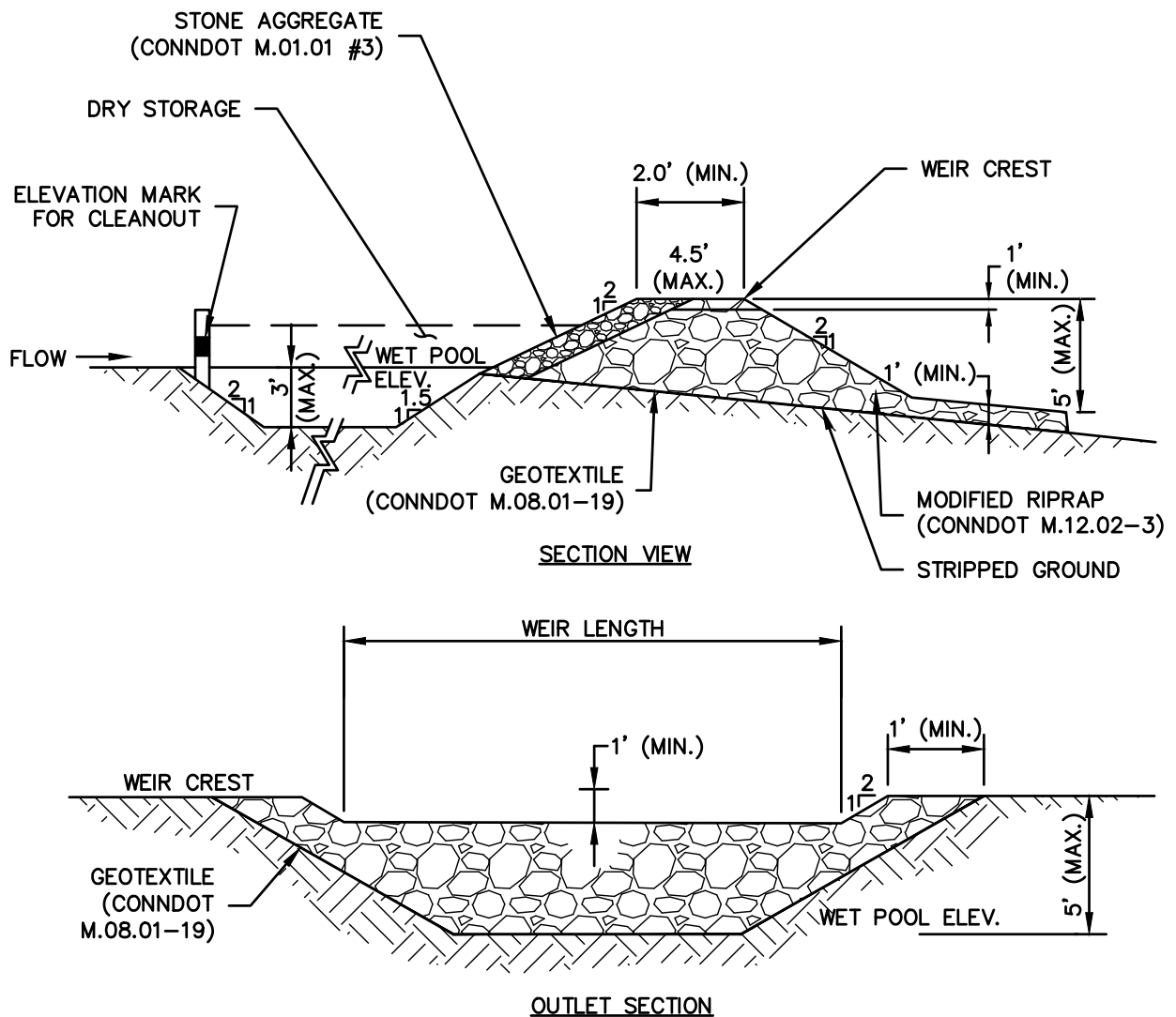
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FEBRUARY 2017

STONE CHECK DAM

SCALE: NONE

DETAIL 4-4



NOTES:

1. ALL ITEMS SHOWN ARE TO MEET CONNDOT SPECIFICATION FORM 817.
2. STABILIZE EARTHEN EMBANKMENT BY SEEDING OR PROVIDE STONE SLOPE PROTECTION IMMEDIATELY AFTER INSTALLATION.
3. NON-OVERFLOW PORTIONS AND ABUTMENTS OF TEMPORARY SEDIMENT TRAPS MAY BE CONSTRUCTED OF COMPACTED EARTHFILL.



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TEMPORARY SEDIMENT TRAP

DETAIL 4-5

SCALE: NONE