TOWN OF
WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

July 2023

TOWN OF WINDSOR
9291 OLD REDWOOD HIGHWAY
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WINDSOR, CA. 95492

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PART I

DESIGN GUIDELINES & DESIGN CRITERIA

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PART I – DESIGN GUIDELINES & DESIGN CRITERIA

SERIES 100 – GENERAL INFORMATION

DEFINITIONS

In these standards, the following names shall have the following definitions:

APPROVED - means accepted or acceptable under an applicable specification, drawing, notes, plan, or standard stated or cited in these Design and Construction Standards or accepted as suitable for the proposed use under procedures and authority of the Town Manager or their authorized agent.

BIOSWALE (BIORETENTION OR INFILTRATION TRENCH) - drainage features constructed to maximize storm water retention while concurrently filtering pollutants, silts, and debris and replenishing the natural water aquifer.

BUILDING DRAIN - that part of the lowest piping of a drainage system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the building sewer beginning at a point two (2) feet outside the building wall, as measured along the pipe line.

BMP (BEST MANAGEMENT PRACTICES) - good housekeeping practices that are implemented in the Storm Water Pollution Prevention Plan (SWPPP), and other storm water control programs.

BUILDING (STRUCTURE) - is a structure built, erected and framed of component structural parts designed for the housing, shelter, enclosure, or support of persons, animals or property of any kind.

CONTRACTOR - any contractor licensed by the State of California to enter into contracts for and to perform the work of installing sewer under Town jurisdiction, or the owner of private property doing his own house sewer work on his private property only.

EARTHWORK CONSTRUCTION - includes preparational construction of roadway, sidewalk, utility trenches, foundations, park area facilities, storm water features, and the safe implementation of related construction.

GRADE - 1) the slope or fall of a line of pipe in reference to a horizontal plane. 2) the vertical location of the ground surface.

LID (LOW IMPACT DEVELOPMENT) - systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or filtering of storm water to help protect water quality.

OTHER SPECIFICATIONS - wherever in these standards other specifications are mentioned, it shall be understood that the materials or methods mentioned therewith shall conform to all requirements of the latest revision of the specifications so mentioned.

PLUMBING SYSTEM - all plumbing fixtures and traps, or soils, waste, special waste and vent pipes within a building and to a point two (2) feet outside the building foundation thereof.

SEWERS -

Building Sewer - that portion of the service sewer between the lateral sewer and the point of connection to the building drain of the structure.

Lateral Sewer - that portion of the service sewer (4" diameter minimum) within a public road right of way or easement. (That portion between the main sewer and the property line, or the edge of the easement) and terminating in the building sewer.

Main Sewer - (Public Sewer) a public sewer which has been or is being constructed to accommodate one (1) or more service sewers.

Service Sewer - the privately owned and maintained (4” diameter minimum) sewer line which links the sanitary or waste plumbing (building drain) of a house or other building with the main sewer. The service sewer begins at its point of connection with main sewer and terminates at its point of connection to the building drain and includes the lateral sewer and the building sewer. The point of connection to the building drain shall be two (2) feet or less form the point where the plumbing first extends outside the foundation.

Trunk Sewer - a public sewer which has been or is being constructed to accommodate more than one (1) main sewer and is not used for building sewer connections.

TOWN - The Town of Windsor (TOW), a municipal corporation in the County of Sonoma, State of California.

TOWN ENGINEER - The Town Engineer or their authorized agent acting within the scope of his or her authority.

PERMITS - prior to performing construction including Building, Earthwork, trenching, all utility, and any work that could impact public safety – a Building permit, Encroachment permit, and all other required permits from other agencies is required.

The Developer, Agency, Homeowner (Applicant) shall contact the TOW Public Works Department and/or Building Department for permit application, procedure and review.

All permits and plans must be reviewed, approved, signed, and dated by the TOW Building Official, Town Engineer, or their representative prior to commencing any construction activity. All fees shall be paid prior to performing permit related activity or before any meter is set and connected.

No building sewer or lateral sewer shall be installed, altered or repaired nor any connection made thereto, until a permit for the work has been obtained from the Town and the necessary fees paid.

Sewer permits can be issued prior to main line construction but trenches and laterals cannot be constructed or inspected until all main line constructions is completed, tested and approved by the inspector and accepted by the Town.

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GENERAL

Street design and construction shall conform to Caltrans Standards except as amended by these Town Standards.

Street and right-of-way, widths, curb return radii, curb, gutter, sidewalk and handicap ramp dimensions shall be as shown in the Town Standard Drawings.

Street classifications and widths shall be those shown in the General Plan as amended.

DESIGN

1. Geometrics

Minimum cross slope shall be 2%. Maximum cross slope shall be 4% except for traveled ways of major collectors and arterials which shall not exceed 3%.

Minimum street grade with curb and gutter shall be 0.5%.

Minimum street grade without curb and gutter shall be 0.7%.

Vertical curves shall be used to connect grade profiles where the algebraic difference in grade rates exceeds one percent. The length of vertical curve required shall be determined by the following sight distance requirements using Caltrans design practices.

Minimum centerline curve radius shall be 250 feet.

Miscellaneous

Where connecting to existing streets, saw cuts shall be a minimum of one foot (1 ft.) into the existing structural section asphalt.

Barricades shall be placed at the ends of stubbed streets.

Temporary asphalt conforms meeting handicap requirements must be placed at the ends of sidewalk except where right-of-way or unmitigable physical obstruction exists. Wood barricades shall be placed in those cases.

2. Striping and Marking

Arterials and collector streets shall be striped, marked and signed in accordance with State Standards.
Crosswalks, stop bars and other markings shall be thermoplastic except for bicycle path markings, which shall be painted.

Where local streets intersect collectors or arterials, the local streets shall have no less than 50 feet of centerline marking, Detail 23 or Detail 21 (thermoplastic).

Centerlines of knuckles will be striped from 50 before the BCR to 50 past the ECR, Detail 23.

PART I – DESIGN GUIDELINES & DESIGN CRITERIA

SERIES 300 – EARTHWORK CONSTRUCTION, ASPHALT PLACEMENT, STORM DRAIN, LID, & BMP STANDARDS

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DESIGN

1. Drainage Design

Drainage facilities shall be constructed to meet Sonoma County Water Agency criteria.

The minimum slopes of pipes allowed are:

Diameter	Minimum Slope
15"	0.00375
18"	0.0030
24"	0.0020
30"	0.0015
36"	0.0012
42"	0.0009
48" and larger	0.0008

Storm drain pipes within Town maintained roads shall be minimum 18" diameter, except laterals may be 15" in diameter.

Minimum cover over pipe shall be 24". For pipes with less than 24" cover in traveled way Class 5 pipe and "D" load calculations are required. The maximum allowable cover shall be limited to 11 feet for all pipe sizes.

PART I – DESIGN GUIDELINES & DESIGN CRITERIA

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PURPOSE

To provide guidelines for design of projects for the sewer utility projects and thereby reduce the time required for plan processing. These guidelines do not include, but may reference, those additional conditions which may be promulgated by all other pertinent ordinances, codes and official policies set forth by the Town or other government agencies. These guidelines are intended to establish minimum acceptable design criteria. More stringent requirements may be imposed by the Town Engineer based on specific project conditions.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts that differ with these criteria, to verify additional requirements imposed, to perform any necessary calculations or studies and to resolve specific design problems with the appropriate agency, Department or Division.

SEWER SYSTEM

1. Requirements for Improvement Plans and Subdivision Maps

A. Provide a detailed utility plan showing onsite and offsite sewer systems and their connections to existing Town maintained sewer facilities. Show any septic systems existing or to be abandoned.

B. For subdivisions, annotate the local agency information sheet of the Subdivision Map with information that is needed to notify property owners of requirements for connection to Town Sewer System. These include, but are not limited to:

1. Payment offers prior to issuance of Building Permits;
2. Lots requiring installation of sewer backflow protection;
3. Private sewage grinder pumps; and
4. Public sewer access requirements such as gates or access roads. The appropriate information may be obtained from the Town Engineer.

C. It is common for a project on one property to be dependent on the construction of sewer by another project or phase of the same project. Sewer system designs shall incorporate any off-site sewer that is required for the connection to an existing public main.

D. In general, sewer mains must be designed at least across one-half of the property frontage or to the most upstream service connection, whichever is greater; or

E. Where the project is required to provide new street improvements over the sewer alignment and the sewer will serve properties upstream of the project, the sewer main must be designed across the full property frontage or to the limits of the street improvements, whichever is greater.

2. Sewer Mains - General

A. Sewer systems shall be designed in public streets whenever possible. When not in public streets, the following conditions must be met:

1. Ductile iron pipe must be used from manhole to manhole when outside of roadways; and
2. In general, lateral connections will not be allowed in easements but, where necessary, must be accessible and easy to locate; and
3. Bolt-down lids are required on all manholes located in easements, on school grounds, through parks and on any trunk sewers larger than 12 inches diameter.

B. Private sewer systems vs. public sewer systems - In general, public sewer systems shall be used only when they serve multiple lots and suitable access can be provided for maintenance reasons. Private sewer systems will only be used when they serve single lots or when they serve multiple lots and adequate access cannot be provided for public maintenance purposes.

C. Extent of sewer main improvements shall include any offsite downstream sewer system improvements needed to serve the project. All improvements must be shown on the improvement plans, including upgrades to existing mains that may be required as a result of an approved capacity study or modeling effort.

D. When a sewer main extension ends at a manhole and the sewer will be extended further in the future to serve future developments, the design shall include a 3 foot long section of sewer main stubbing out of the manhole in the direction of future development with a plug or cap for future connection.

E. Streets with both water and sewer mains must be at least 20 feet wide (face-of-curb to face-of-curb.) Streets with one utility (water or sewer only) must be at least 16 feet wide.

3. Connection to an Existing Public Sewer

A. Unaccepted connections of new mains to existing mains should be isolated from the collection system by a positive sealing plug. This plug shall be installed in the outlet of the closest manhole on the new main to the existing main. All labor and expense for this shall be borne by the contractor. Failure to comply with this requirement may result in administrative civil penalties as specified in Section 12-4-260 of the Town's Municipal Code.

B. A proposed sewer design must show a point of connection to an existing public sewer main. Sewer system designs shall incorporate the design of any off-site sewer that is required for the connection to the public main. Appropriate portions of prior Town approved plans shall be referenced in the plans for the proposed improvements. If easements from third parties are needed for the proposed offsite sewer construction, those easements must be secured by the applicant before approval of the tentative map. Tentative map applications will not be deemed complete without secured off-site easements.

C. Connect new mains to the existing mains at existing manholes or by constructing a new manhole at the point of connection.

D. Where an existing sewer main is to be extended, remove the existing plug, cleanout, or rodding inlet and, unless the new connection is in close proximity to an existing manhole, install a new manhole. The main may be extended without installation of a manhole only if it is on the same line and grade, the pipe size and material are the same, and the manhole spacing is adequate.

E. Elevations of inverts on sewer mains connecting to existing sewer mains will be as follows:

1. Side sewer mains connecting to an existing main at an angle of 30 degrees or greater shall have an invert grade at least 0.1' higher than the existing.
2. Connect sewer mains so that the crown of the smaller main is no lower than the crown of the larger main.
3. Connections to Trunk Sewers will be made so that the invert grade of the new

main will be no lower than the crown of the Trunk Sewer.

4. Materials

A. Gravity sewer mains shall be Polyvinylchloride (PVC) SDR35 or SDR26; or ductile iron pipe.

B. Proposed materials for construction of 18" and larger diameter gravity mains require Town Review and Town Engineer's approval.

C. If a gravity sewer main is installed outside of a paved roadway, ductile iron pipe is required.

D. All ductile iron pipes shall be polyethylene encased.

E. Use of Asbestos Cement Pipe is **NOT** allowed under any circumstances.

F. Sewer force mains shall conform to the materials requirements for water mains. Non-metallic pipes require tracer wire (Section V. General Construction Notes 4)

5. Alignment

A. All sewer mains shall be designed to follow the separation standards as specified in Section 64572 of the California Code of Regulations Title 22. Any sewer main not meeting the separation requirements as specified in Section 64572 shall apply for a waiver from the State Water Resources Control Board, Division of Drinking Water in accordance with Section 64551.100 of Title 22.

B. Public sewer mains outside the public street shall be kept to a minimum.

C. Horizontal separation from storm drains shall be minimum five feet clear, except at crossings.

D. Horizontal separation from other utilities, such as gas, underground electric, underground television cable, etc., shall be a minimum of four feet clearance between the pipes, except at crossings.

E. Horizontal and vertical curves in gravity sewer mains will not be allowed unless specifically authorized by the Town Engineer.

F. In general, public sewer mains shall run parallel to street centerlines. All public mains to be a minimum five feet clear from all structures, building overhangs, gutters, property lines or edge of easements, and 3 feet clear from all monuments and lips of gutter. The alignment shall be designed so that 48-inch manholes are centered a minimum of 3 feet from the lip of gutter and 60-inch manholes are centered a minimum of 4 feet from lip of gutter.

G. In curved streets, the design of the sewer system shall be such that the sewer alignment shall stay on one side of the centerline to allow installation of other facilities without transverse crossings. Provide an alignment such that no part of the sewer main is less than 1 foot from the lip

of gutter.

H. All sewer main trenches that are parallel to, and deeper than the footing of any adjacent structure must be at least 45 degrees from the footings as required by the Uniform Plumbing Code. Any exceptions must be approved in writing by the Town Engineer.

6. Size

A. Mains shall be sized to provide adequate capacity and a minimum 2 feet per second velocity.

B. The minimum public sewer main shall be 8-inches in diameter.

C. The minimum private sewer main is 6-inches in diameter.

D. Public sewer mains will be sized to serve the entire tributary area at buildout densities conforming to the General Plan. Engineering studies may be required to provide trunk and/or collection system calculations, or a wastewater model may be required.

E. Design flows shall be based on the following criteria:

1. Use population densities as shown in Table 1, "Sewer Contribution Table." Average domestic flow shall be 125 gallons per person per day.
2. Multiply average flow as determined in Table 1 by the Peak Load Factor from Table 2, "Sewage Peak Load Factor vs Population", to obtain the design flow.
3. Pubic sewers shall be designed to carry infiltrated water at the rate of 7% of the design flow in addition to the design flows as calculated per (2) above.

7. Cover

A. Minimum cover for all gravity sewers shall be 24-inches.

B. Where cover is less than 36-inches, ductile iron pipe must be used. A design exception must be approved by the Town Engineer for all sewer mains with cover less than 36-inches. Additional measures may be required. These may include, but not be limited to, concrete encasement or flowable backfill.

C. Cover over a sewer main is defined as the distance from the top of the pipe to finished grade.

8. Manholes and Cleanouts

A. A manhole is required at every horizontal or vertical change in alignment.

B. The maximum distance between manholes shall be 300 feet.

C. A manhole is required at the end of every main, except as otherwise specific in "D" below.

D. Cleanouts may be installed in lieu of manholes at the end of a sewer main where the distance is less than 200 feet to the nearest manhole and the sewer main size is 8" or less.

E. The number of manholes shall be minimized.

F. 60-inch diameter manholes are required for all sewer mains larger than 18-inch in diameter, or deeper than 8 feet.

G. Private sewer mains must connect to the public sewer main at a manhole.

H. Provide sufficient drop in pipe inverts through the manhole to compensate for energy loss caused by a change in the alignment. A minimum drop of 0.10 feet is required for deflection angles greater than 30 degrees.

I. When pipe size increases in a manhole, the inlet crown shall be at least as high as the outlet crown.

J. Manholes will be designed such that the angle in the horizontal plain between the downstream and any incoming sewer is a minimum of 90 degrees.

9. Drop Manholes

A. Sewer system designs shall minimize the number of drop manholes.

B. Standard drop manhole installations are required when the drop in the manhole is greater than 2 feet.

C. When one drop connection is required in a manhole, a 60-inch diameter manhole shall be used. When two or more drop connections are required in one manhole, a 72-inch diameter manhole shall be used.

10. Accessibility

A. Manholes shall be located in paved roadways wherever feasible.

B. All-weather vehicle access is required to every manhole.

C. Sewer easements shall be a minimum of 15 feet in width.

D. All access roads shall be a minimum 12 feet in width.

E. Acceptable types of all-weather access roads are:
   1. 6-inches of blue shale for slopes up to 10%.
   2. 2-inches of hot mix asphalt on 6-inches of Class 2 aggregate base for slopes in excess of 10%.

F. All access roads longer than 100 feet must have an approved turn-a-round.

G. The maximum grade allowed at any point on an access road shall be 15%. The maximum cross slope shall be 5%.

11. Slope

A. Design all gravity sewers to achieve a minimum velocity of 2 feet per second when flowing full. Use n = 0.013 for new PVC pipe. Use n = 0.015 for the existing system if the material is not PVC or is unknown.

B. The sewer shall be designed with a slope able to serve the entire tributary area being served by the pipe. The preferred minimum slope is 0.5%. Where conditions require, flatter slopes may be approved by the Town Engineer, in accordance with the flowing:
   1. 8-inch sewer minimum slope shall be 0.35%
   2. 12-inch sewer minimum slope shall be 0.20%
   3. 15-inch sewer minimum slope shall be 0.15%

C. The maximum slope of any sewer main shall be 15%.

D. Slopes through manholes:
   1. When sewers of uniform slope pass through a manhole, the slope will be maintained through the manhole and the invert of the center of the manhole shall be specified on the plans.
   2. When sewers change slope at a manhole, incoming and outgoing invert elevations shall be specified on the plans.
   3. Sufficient drop through a manhole shall be provided to compensate for energy losses caused by change of alignment. A minim of 0.1 feet is required for a change of alignment greater than 30 degrees.

12. Sewer Laterals

A. Provide a separate sewer lateral for each lot.

B. Each building shall have an independent connection to a sewer main except where the Town Engineer determines that it will not be detrimental to the interest of the applicant or the Town. Multiple structures may be connected to the same building sewer lateral when located on the same parcel. When more than one residential or commercial lot is served by a single lateral, the lateral must meet the private sewer main standards and be privately maintained.

The applicant for multiple connections to the same building sewer shall provide a to-scale prepared plan. Preparation of the plan by a California licensed professional Civil Engineer is recommended but not required. The plan shall show the following:

1. The location of all physical features such as buildings, trees, creeks, paved areas, building drain outlets, etc.
2. Existing and proposed sewers, including size, alignment, lengths, grades, elevations, cleanouts, etc.
3. Ground elevations at critical points sufficient to determine that the system is capable of serving all buildings, while maintaining adequate grade and cover. All elevations shall be on National Geodetic Vertical Datum (NGVD).

C. Calculations shall be submitted with plans verifying adequacy of piping size for proposed fixture unit loading. See the California Uniform Plumbing Code for criteria.

D. All laterals must connect to the sewer main with a wye connection. All bends, where permitted, shall be made with long radius fittings.

E. Minimum slope of sewer laterals shall be 2% or ¼-inch per foot, unless otherwise approved by the Town Engineer.

F. Sewer Laterals shall be sized in accordance with the latest edition of the California Uniform Plumbing Code, but in no case shall be smaller than 4-inches.

G. Whenever a building has a finished floor elevation of 12-inches or less above the rim elevation of the nearest upstream manhole or cleanout, a backwater check valve shall be installed in the building sewer lateral at a location approved by the Town Engineer. Backwater check valves shall be cast iron or cast bronze. Backwater check valves shall be approved by Town Engineer prior to installation. All backwater check valves shall be privately owned and maintained.

H. Cleanouts shall be the same size as the line they are intended to serve and shall be provided as follows:

1. At the point of connection to the building drain.
2. At any single turn greater than forty-five (45) degrees.
3. At intervals along the building sewer lateral when the cumulative total of deflections from the point of connection to the sewer main or from another cleanout exceeds forty-five (45) degrees.
4. At intervals, not to exceed one hundred (100) feet along the building sewer.
5. Cleanouts shall be extended to grade and protected by "Christy" F-8 curb valve boxes, or equal, except that in areas subjected to traffic or where located in traffic areas or sidewalks, "Christy" G-5 traffic valve boxes, or equal, with cast iron lids shall be used. These cleanouts located in traffic areas shall have a 12 inch deep concrete collar poured around the valve box with a minimum outside diameter of at least 20 inches greater than the OD of the top of the box.

I. Lateral sewer piping and construction shall conform to Town Standard Plan No. 411 and

the requirements contained herein.

Private sewer laterals shall be a minimum of 4-inches in diameter and shall be one of the following:

Ductile Iron Pipe, ANSI A21.51
Acrylonitrile-Butadiène-Styrène (ABS Pipe SDR 35)
Polyvinylchloride (PVC Pipe SDR35)

The pipe manufacturer's written instructions shall be closely followed in all piping installations.

Any gas, water or electric services or other pipes paralleling a sewer pipe shall be separated from said sewer pipe by a minimum horizontal clear distance of 18-inches. Such pipes placed in the same trench as a sewer pipe, if above the elevation of said sewer pipe, shall be placed on a solid shelf excavated at one side of the common trench. The bottom of any water service pipe placed in the same trench as a sewer pipe shall be at least 12-inches above the top of said pipe.

J. Where an existing building is disconnected from a septic tank and reconnected to a new sewer service, the connection to the new sewer shall be made within 5 feet of the building. No portion of the existing piping from the building drain to the septic tank shall be utilized for connecting to the new service sewer unless said piping is exposed and tested to permit the Town to determine that it meets all of the Town's requirements for new construction.

K. When an application is made to connect to an existing building sewer lateral, constructed prior to 1970, or if the Town has reason to believe that the sewer lateral is deficient in any respect, the Town Engineer may require the contractor to excavate and/or test the sewer prior to connection, and to repair or replace the sewer lateral, if necessary, to make sure that it complies with these sewer standards.

L. Sewer laterals shall be located on the property frontage, defined as either the front or side property line of a parcel that abuts a street.

M. Sewer laterals shall not be located in easements when gravity service can be provided to the property frontage.

N. All sewer laterals, from the property line or edge of easement to the point of connection with the main line or manhole, will generally be perpendicular to the curb alignment or easement and will have an angle of intersection with the downstream section of sewer of no less than 90 degrees. No lateral alignment adverse to the flow of the main will be allowed.

O. Locate sewer laterals outside of driveway areas whenever possible. In general, sewer laterals shall be in the center third of a lot when driveway locations are unknown, and a minimum of 10 feet from trees whenever possible. For hillside areas, sewer lateral shall be on the low side of the frontage when not in a proposed driveway.

13. Proximity to Wells

Building sewers shall not be located closer than 50 feet from an individual domestic well. However, said clearance can be reduced to 25 feet if the building sewer is constructed of cast iron. Where special hazards are involved, the distance required shall be increased, as may be directed by the Sonoma County PRMD Well and Septic Division. Also, see Bulletin # 74 "Water Well Standards", State of California, the Resource Agency Division of Water Resources for additional requirements.

14. Abandonment of Sewer Mains and Services:

A. When a sewer pipe is to be abandoned within specific limits, all sewer structures, pipes and appurtenances within said limits shall also be abandoned. All pipes abandoned within 3 feet below subgrade shall be removed and disposed of. Pipes lower than 3 feet below subgrade shall be either removed, or the ends of all pipes shall be filled at the ends with concrete slurry and plugged. For all sewer lines 12-inches in diameter or larger, or for any sewer line that crosses a creek or sensitive area, all sewer pipes shall be backfilled with CLSM.

B. Any existing sewer mains and service laterals that will not be used shall be abandoned and the following must be noted on the Improvement Plans:

6. Sewer laterals in streets that have been constructed or have had an asphalt overlay within the last five (5) years shall be plugged behind the curb line or outside the edge of pavement.
7. Sewer laterals in streets that have not been constructed or received an asphalt overlay in the last five (5) years shall be abandoned by excavating at the main, removing the wye, and repairing the main per current Town Specifications. If the connection to the main is a tap or saddle, it shall be removed and a full circle repair clamp installed. When a wye is removed that is within 18-inches of a pipe joint, the repair will be extended to include the joint.

15. Easements

A. An easement must be provided over any public sanitary sewer when it is installed outside a public right-of-way.

B. The easement must be a minimum of 15 feet wide if it only contains a sewer main, or 20 feet wide (or wider, as determined by the Town Engineer) if it contains another facility, such as water, storm drain, or other utility. The easement shall be dedicated as a "public sewer easement" to the Town if it contains sewer only. It will be dedicated to the Town as a "public utilities easement" if it contains more than one utility.

C. Easements must be configured to encompass all publicly-maintained appurtenances, such as service laterals up to the cleanout, and shall be generally centered above the facility. Separate access easements may be required, depending on site conditions. When sanitary sewers are to be

installed along a property line the easement shall be wholly contained on one parcel.

D. All property restrictions placed as a result of dedication of easements shall be so noted on the supplemental sheet of the Final or Parcel Map, or on the Easement Deed if the easement is not dedicated as part of a land division. Typical required notes, as applicable, are as follows:

1. No structures may encroach on, above, or below the surface of the ground in any public easement. This includes footings of foundations, eaves from the roof of any adjacent structure, pools, ponds or outbuildings on slabs or foundations. Decks, sheds, or other structures which may be easily removed for maintenance of the sewer system may be allowed at the discretion of the Town Engineer.
2. No trees may be planted in a public sewer easement without first obtaining approval of the Town Engineer. Trees may be allowed to the extent that damage to the sewer system does not occur from root intrusion and adequate access can be provided for maintenance and repair vehicles.
3. The Town will not be responsible for repairs or replacement of trees, landscaping or structures not specifically approved by the Town Engineer.

16. Sewer Force Mains

A. Locator boxes shall be placed at every horizontal change in alignment or at a minimum of 500 foot spacing. No. 12 insulated copper wire shall be laid on top of, and along the entire length of all non-metallic pipe, and will be extended to the surface at all box locations and manholes sufficient for locator equipment to be attached. The wire shall be fastened to the top of the pipe so as not to be displaced or broken during backfilling (e.g. affixing the wire to the pipe with duct tape at approximately 10 feet intervals.)

B. Boxes shall conform to valve box requirements per the Water Standard Plans with the lids clearly marked “sewer."

C. Private force mains must connect to the sewer system and may not discharge directly into sewer manholes. Public force main connections must be detailed on the plans and also may not discharge directly into sewer manholes.

D. Provide details for a swab launching station for force main preventative maintenance. Launching facility will be detailed on lift station plans and must accommodate using lift station pumps for propulsion. Provide necessary isolation valving.

17. Industrial Waste Discharge Permits

A. Most commercial uses require Industrial Waste Discharge Permits.

B. Required grease traps, grease and sand traps, grease interceptors, and sampling structures or appropriate references to Town Standard Plans must be shown on the plans submitted for permit approval.

C. Trash enclosures and other outdoor pad areas used for washing will be plumbed to the sanitary sewer system at grease interceptor or other connection point approved by the Town Engineer. Preventive measures will be taken to eliminate the intrusion of any rainwater or surface runoff into the sewer system to comply with California Building Code 1101.3.

D. A fixed roof will be installed over the wash area. The Town Engineer may consider alternatives to a roof where it is not feasible.

18. Lift Stations

A. General Requirements

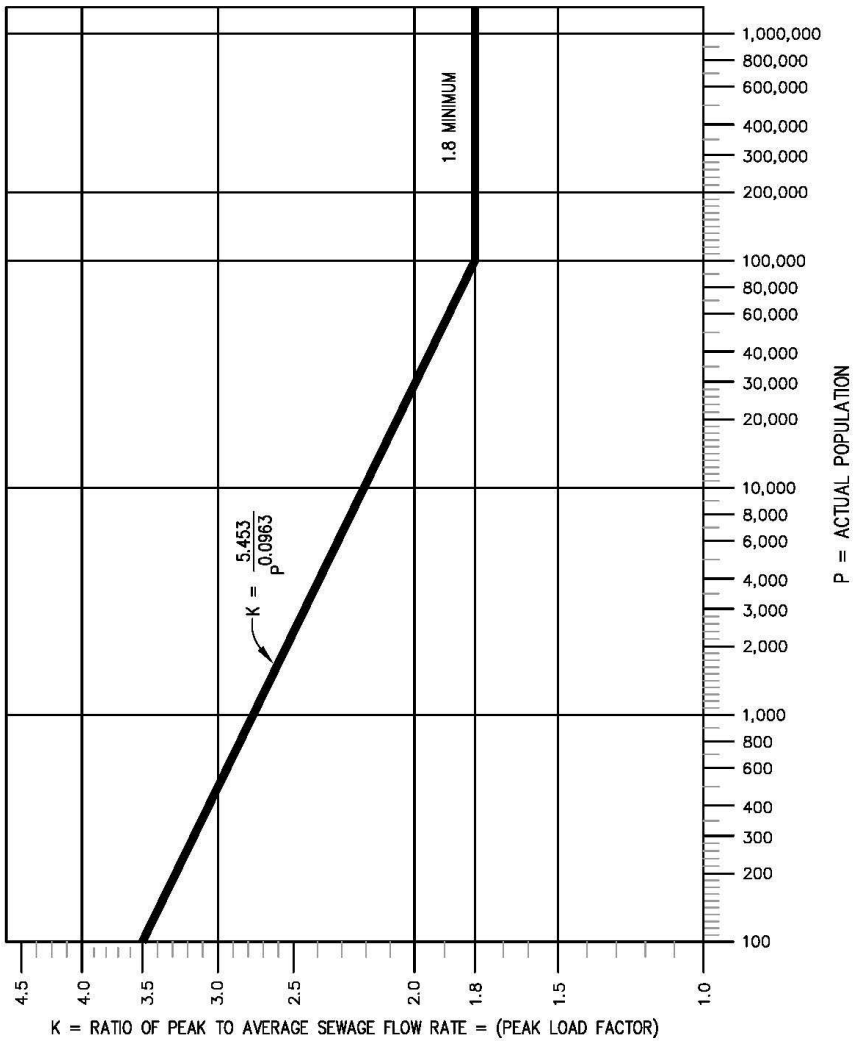
1. Lift Stations will not be allowed where an acceptable gravity route exists.
2. Design the lift station to serve the entire tributary area at build-out and with appropriate peaking and infiltration allowances. See Tables 1 and 2 following for design flows and peaking factors.
3. Lift stations must be site designed vertical, dry pit, using non-clogging, submersible centrifugal pump.
4. Pumps shall be single speed, and capable of passing a 3" diameter sphere.
5. Lift stations are not allowed in the public right of way.
6. Lift stations must be completely fenced for security.
7. Provide a 12-foot paved access road with double swing gate to allow service vehicles to be parked off the street and clear of sidewalks. Turnarounds are required for pump stations constructed on heavily travelled streets.
8. Provide 1-inch minimum water service at pump station site.
9. Provide calculations to determine the need for hydrogen sulfide suppression.
10. Provide a minimum of two pumps and controls to alternate lead and lag pumping. The Town Engineer may require three or more pumps in a lead, lag standby arrangement.
11. For each type of pump, provide one spare rotating mechanism. Pump types and manufacturer shall be approved by the Town.
12. Provide one set of routine service replacement parts such as wear rings, bearings and seals.
13. Provide meters to record run time for each pump.
14. Provide flow meter for the discharge of the pump station.
15. Design of lift station enclosure shall be coordinated with the Town Building Official and Fire Service with respect to occupancy class and electrical and HVAC system designs.
16. As applicable, all pump stations shall be designed to include connection to the Town's SCADA system.
17. Testing of the pump station shall be done with Town personnel prior to acceptance of the improvements. Testing shall include controls, pumps, switching from lag/lead, volume of water pumped, verification of remote SCADA control, functionality of rails and pump removal, operation of all valving, water tightness of wet well, grouting of all pipes penetrating wet well walls, float operation and verification of auto on and off functions, power connections and other testing as may be required by Town Engineer.
18. Operational manuals shall be included prior to acceptance of the improvements.

TABLE 1

SEWER CONTRIBUTION TABLE		
Windsor Land Use	WINDSOR DU/Ac	People/Ac
Rural Residential	0.2	0.65
Estate Residential	3	9.75
Very Low Density	6	19.5
Low Density	8	26
Medium Density	16	52
High Density	32	72
Retail Commercial	16	32
Service Commercial	0.8 FAR	32
Gateway Commercial	0.8 FAR	32
General Business	12	24
Town Center Mixed Use	32	64
Boulevard Mixed Use	32	64
Neighborhood Commercial Mixed Use	16	32
Light Industrial	0.5 FAR	16
Heavy Industrial	0.5 FAR	16
Parks and Recreation	0.1 FAR	16
Open Space	0.05 FAR	16
Public/Quasi-Public	1.0 FAR	16

TABLE 1

TABLE 2



SEWAGE PEAK LOAD
FACTOR vs POPULATION

TABLE 2

PART I – DESIGN GUIDELINES & DESIGN CRITERIA

SERIES 500
WATER SYSTEM DESIGN STANDARDS

PURPOSE 500-1

WATER SYSTEM 500-1
1. Materials 500-1
2. Alignment 500-2
3. Size 500-3
4. Cover 500-3
5. Connection to an Existing Main 500-3
6. Valving 500-4
7. Service Laterals and Water Meters 500-4
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9. Backflow Devices 500-6
10. Pressure 500-7
11. Specialty Items 500-7
12. Special Conditions 500-8

PURPOSE

To provide guidelines for the design of water utilities projects and thereby reduce the time required for processing the plans. These guidelines do not include, but may reference, additional conditions which may be promulgated by all other pertinent ordinances, codes, and official policy set forth by the Town. These guidelines are intended to impose minimum acceptable design criteria. Requirements that are more stringent may be imposed at the discretion of the Town Engineer based on specific project conditions.

It is the responsibility of the design engineer to initiate written requests for approval of any design concepts contrary to these criteria, to verify additional requirements imposed, perform any necessary calculations or studies, and resolve specific design problems with the appropriate agency and/or District.

WATER SYSTEM

1. Materials

A. Service laterals shall be constructed per applicable Town standards.

B. 6-inch thru 12-inch water mains shall be Polyvinyl Chloride (PVC), Pressure Class 150, DR18 per AWWA Standard C900, minimum, or ductile iron pipe, Pressure Class 350

per AWWA Standard C151, minimum. Where the normal static pressure exceeds 100 psi, ductile iron pipe or PVC Pressure Class 200, DR 14 must be used.

C. 14-inch, 16-inch, or 18-inch diameter water mains shall be ductile iron pipe per AWWA Standard C151 or PVC per AWWA Standard C905, DR25 with a pressure rating of 165 psi or as shown on plans and specifications. Where the normal static pressure exceeds 100 psi, ductile iron pipe or PVC per AWWA Standard C905, DR 18 with a pressure rating of 235 psi must be used.

D. 20-inch diameter and larger water mains shall be concrete cylinder pipe, wrapped steel pipe, or ductile iron pipe.

E. Asbestos cement pipe shall not be allowed under <u>any</u> circumstances.

F. Ductile iron pipe must be polyethylene encased and have approved cathodic protection. (See Section 12A, Special Conditions)

2. Alignment

A. Typical alignment shall be in accordance with the provisions of STD. PLAN NO. 502.

B. Public water mains outside the public street are not allowed without special permission from the Town Engineer.

C. Minimum allowable radius for 8-inch diameter water mains is 250 feet and for 12-inch diameter water mains is 350 feet.

D. New mains must match the grade and centerline offset of existing water mains where possible.

E. Maintain a constant distance from centerline wherever possible.

F. Install felt expansion material between pipes with 1-inch or less vertical clearance.

G. Minimum clear horizontal separation from existing gas, electrical, and telephone lines shall be 3 feet between outside diameter of pipes.

H. Minimum clear horizontal separation from a metallic pipeline with an induced current shall be 5 feet.

I. Minimum clear horizontal and vertical separations from a sewer, recycled water or storm drain shall be per Section 64572 of Title 22 California Code of Regulations and per STD. PLAN NO. 414.

3. Size

A. Water mains must be sized to meet minimum Fire Code requirements. (See Section 8, Fire Hydrants)

B. For residential or commercial installations, public and private mains shall be a minimum of 8-inches in diameter.

C. For industrial installations, looped systems shall be a minimum of 8-inches in diameter. A dead-end system requires a minimum of 12-inch diameter pipe.

D. The Town Engineer may require increased pipe size for overall system benefit.

4. Cover

A. Definition: Cover is the distance from the top of the pipe to finished grade.

B. Where cover is greater than 30 inches, but less than the standard cover, Class 50 Ductile iron pipe is required.

C. The minimum cover for all water main construction, under any circumstances, is 30 inches.

D. Where cover exceeds 8 feet, special permission from the Town Engineer is required.

E. Service laterals must have minimum cover in accordance with the approved standards.

5. Connection to an Existing Main

A. In most major streets, or in new streets, the new water main must be bored and jacked into place. Conditions shall be verified with the Town Engineer.

B. For connecting 2-inch diameter pipes and smaller, use a hot tap.

C. Cut-in tee must be used if additional valves are required on the existing main. If the new lateral is larger than existing main, the tee shall be the size of the new lateral and reduced to the size of the existing main.

D. Size-on-size taps are allowed up to 8-inch in accordance with the approved standards.

E. 12-inch size-on-size taps are allowed only under emergency situations and with the specific approval of the Town Engineer.

F. A mechanical joint tapping sleeve for all size-on-size taps and must be used in accordance with approved Town standards.

6. Valving

A. Valve installations at intersections shall be in accordance with the provisions of STD. PLAN NO. 502.

B. All hydrants must be on separately valved laterals which are connected to the public main.

7. Service Laterals and Water Meters

A. Size of water meter shall be determined by the Town Engineer using the current AWWA guidelines.

1. Maintain a minimum 5 feet of separation from the sewer lateral.
2. Meter boxes shall not be placed in driveway or sidewalks except in commercial applications where buildings front on public sidewalks.
3. Private sewer force mains shall have a minimum 5 feet separation from water meters, backflow preventers and detector check assemblies.
4. Recycled water laterals and meters shall have a minimum 5 feet separation from water meters.

B. Residential (single unit)

1. One meter per building or address with individual 1-inch services
2. Where residential fire sprinklers are required, backflow devices shall be required to separate the systems on the site.

C. Apartments

1. Each building/complex will be master metered.
2. Separate irrigation meters for common areas are required.

D. Condominiums

1. Each unit must be individually metered.
2. Individual meters must be clustered.
3. Separate irrigation meters for common areas are required.

E. Mobile Home Parks

1. In parks where spaces are individually owned, separate metered services are required for each mobile home.

2. In parks where spaces are rented or leased master meters will be required.
3. Separate irrigation meters for common areas are required.

G. Commercial
1. Size of the meter and service are based on calculations approved by the Town in accordance with AWWA standards.
2. A separate meter is required for irrigation.
3. A minimum 2-inch service lateral is required for a shell building or light industrial.
4. A minimum 8-inch fire protection service is required for industrial lots and shopping centers and must be approved by the Town Engineer.
5. Commercial installations will require backflow prevention. (See Section 9, Backflow Devices)

H. Irrigation
1. Separate irrigation meters must be provided for all commercial users, condominiums, apartment complexes and mobile home parks.
2. All irrigation services must have reduced pressure backflow devices, except for single family dwellings.
3. Irrigation meter size shall be determined by the maximum flow required at any one control valve.
4. Sizing of irrigation meters shall be coordinated with the Town Engineer.
5. Backflow devices specified on the irrigation plan must conform to STD. PLAN NO. 510 and must be on the current USC Approved List of Devices.

I. Private Fire Systems
1. Before combustible materials may be stored or constructed on site, the applicable Fire District must approve fire flow and access.
2. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by applicable Fire District Personnel.
3. Lateral size must be the same or larger than the size required for the sprinkler system or the private hydrant system.
4. All private fire systems require double detector check backflow assemblies in accordance with STD. PLAN NO. 511 and STD. PLAN NO. 512.
5. Double detector check backflow assemblies are required on all fire systems.
6. On residential systems, reduced pressure backflow assemblies must be installed where fire system connects to the domestic water system.
7. Fire Department connection location and configuration must be approved by the Fire Department.

8. Fire Hydrants

A. Before combustible materials may be stored or constructed on site, the Fire Department must approve fire flow and access. Before a fire hydrant may be placed in service, a high velocity flush of the fire hydrant shall be witnessed and approved by the Town.

B. Location of fire hydrants must be approved by the applicable Fire District.

C. Each hydrant must be on a separately valved main line section.

D. Whenever possible, locate hydrants at street intersections.

E. If it is not possible to locate at an intersection, locate the hydrant near a property line or where it will minimize interference with property use.

F. Locate hydrants a minimum of 10 feet from the edge of all driveways.

G. Residential areas
   1. Space fire hydrants every 500 foot, or as approved by the Fire Chief.
   2. Evenly distribute hydrants throughout the project.
   3. No building may be more than 250 feet from the nearest hydrant or as approved by the Fire Chief.
   4. Approximately one fire hydrant is needed for every two acres in a residential development.

H. Commercial and Industrial Areas
   1. General hydrant spacing shall be every 300 feet or as approved by the Fire Chief.
   2. Evenly distribute hydrants throughout the project.
   3. No building may be more than 150 feet from the nearest hydrant.

I. Minimum fire flow required at all fire hydrants
   1. Residential and commercial areas - 1,500 gallons per minute with a 20 psi residual.
   2. Industrial areas - 2,500 gallons per minute with a 20 psi residual.
   3. Or as required by Appendix Ill-A of the Uniform Fire Code, whichever is greater.

9. Backflow Devices

A. Backflow devices are required to be installed by State of California Administrative Code, Title 17.

B. All backflow devices that are installed must be a reduced-pressure backflow device, Wilkins 975XL2, or approved equal, and must be on the USC approved list.

C. Reduced-pressure backflow assemblies must be installed as near as possible to the water meter as shown on STD. PLAN NO. 510.

D. Where residential fire sprinklers are installed, private double detector check valve backflow preventers are required where the fire service connects to the domestic service. The backflow preventer must be accessible for testing and maintenance.

E. Properties with private sewer lift stations must have reduced pressure backflow assemblies on their water systems.

F. All irrigation services require reduced-pressure backflow assemblies.

G. Parcels with a private well must have a reduced-pressure backflow device installed on each service.

10. Pressure

A. Maximum allowable main line pressure is 120 psi measured at a fire hydrant.

B. Maximum allowable service pressure measured at a faucet is 80 psi.

C. Minimum service pressure measured at meter is 20 psi, unless otherwise approved by the Town Engineer.

D. If the service pressure exceeds the maximum of 80 psi, an individual private pressure regulator will be required on the service line.

E. Fire flows must be calculated in areas of low pressure.

F. For calculating pressures in high level zones, calculate the maximum pressure using the elevation of the reservoir at one half full.

G. Pressure in the aqueduct zone shall be calculated using the high and low setting of pressure reducers at the aqueduct turnout.

11. Specialty Items

A. Air relief valves.

1. Air relief valves are required at locations in the system that are one or more pipe diameters higher than the remainder of the system, such as over a hilltop.
2. Air relief valves are not required in residential areas if services are installed at or near the crown within one pipe diameter vertically of the high point.

B. Pressure reducing valves shall be installed to maintain overall system balance.

C. Surge or pressure relief valves shall be installed where pressure could potentially reach above the maximum allowable.

D. Manual blow offs are required at the end of every main where fire hydrants are not provided.

12. Special Conditions

A. The need for cathodic protection will be determined by the Town Engineer for each project. This may require soils reports or other additional information.

B. Delineated fault zones.
1. Ductile iron pipe must be installed in delineated fault zones and extend to 100 feet outside each side of the delineated fault boundaries.
2. Pumper connections or fire hydrants shall be installed approximately 50 feet outside each side of the delineated fault zone.
3. Flextend assembly, as manufactured by EBAA Iron, Inc. of Eastland, Texas, or approved alternative, with valve must be installed adjacent to and on the fault side of the pumper connection or fire hydrant.
4. A valve must be located between the Flextend assembly and the fire hydrant or pumper connection.

C. Abandoned water mains and services.
1. All service laterals must be abandoned at the main; remove saddle and replace with a Full Circle Stainless Steel Clamp, not less than 12 inches in length.
2. Valve boxes for abandoned valves must be removed.
3. Abandoned mains, valves and risers located within the street structural section must be removed.
4. For flanged or mechanical joint tees, remove the valve and install a blind flange or mechanical joint plug under Town inspection.
5. For push-on tees, the tee, valve and concrete thrust block must be removed and the main repaired with approved pipe and suitable couplings.6. All water mains 12 inches in diameter and larger, within the public right-of-way, must be broken every 50 feet and filled with sand slurry.

7. Where a fire hydrant is to be abandoned, the hydrant barrel, break off riser, and check valve are to be removed, the bury is to be capped or plugged, and the lateral abandoned at main as stated above. Abandonments of fire hydrants must be approved by the Fire District.

D. Private water mains versus public water mains
   1. Public water mains may not be constructed outside the street right-of-way without specific approval of the Town Engineer.
   2. Fire hydrants required on site to serve one lot will be private systems.
   3. Fire hydrants required on site to serve two or more lots, or properties, will be public systems.

E. Water mains installed outside of the paved roadway must be ductile iron pipe and shall have suitable access.

F. Regulation of Wells
   1. No new dwellings, business structures or other construction requiring domestic water shall be constructed within the Town without connecting to the Town water system. Existing or new wells may be used for irrigation of lands only, subject to Town regulations.
   2. No construction placement, reconstruction, destruction or abandonment of any well shall occur except upon receipt by the Town of an appropriate permit from the Sonoma County Permit and Resource Management Department and in accordance with Town regulations.

PART I – DESIGN GUIDELINES & DESIGN CRITERIA

SERIES 600
RECYCLED WATER STANDARDS

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DEFINITIONS

These Recycled Water Design Guidelines and Design Criteria are to be used in conjunction with and referenced to the Town of Windsor's Design and Construction Standards. In these standards, the following terms shall have the following definitions:

Air-gap Separation - means a physical break between a supply pipe and a receiving vessel which shall be at least double the diameter of the supply pipe, measured vertically above the top rim of the vessel, and in no case less than one inch.

Cross-connection means any actual or potential unprotected connection between any part of a water system used or intended to supply potable water and any source or system containing recycled or other water or substance that is not safe, wholesome and potable for human consumption.

Cross-connection Specialist means an American Water Works Association or University of Southern California certified Cross-Connection Control Specialist who is approved by the Town Engineer.

Dual-plumbed System means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:(a) To serve plumbing fixtures (excluding fire suppression systems) within a building, or (b) Outdoor landscape irrigation at individual residences.

Recycled Water – normally, disinfected tertiary recycled water as defined in Chapter 3 of Division 4 of Title 22 of the California Code of Regulations, as may be amended from time to time.

Recycled Water Mains means recycled water lines and appurtenances owned, or to be owned by the Town (or other municipal agency). The Town shall determine what facilities are recycled water mains from time to time. The Town's determination in regard to these matters shall be final and conclusive.

Recycled Water Service Area means the property, or portion of property, on which recycled water is available from the Town for irrigation or other approved uses in lieu of potable water.

Recycled Water Service Connection means the point of connection of the user's recycled water service line with the recycled water main of the Town, which shall normally be the downstream end of the recycled water meter connection.

Recycled Water Use Permit means a permit issued by the Town of Windsor to the User which grants permission to use recycled water and requires the User to use recycled water in accordance with the Town's regulations and standards for the use of recycled water and all applicable state and local regulations.

Unauthorized Discharge means any amount of recycled water that leaves the designated use area.

User's Recycled Water Site Supervisor means a qualified person, normally designated by an agricultural, commercial, or industrial recycled water user, who shall be knowledgeable in the construction and operation of on-site recycled water facilities and irrigation systems, and in the applicable guidelines, criteria, standards, rules and regulations for the use of recycled water.

WORK WITHIN TOWN RIGHT-OF-WAY

Issuance of an Encroachment Permit and associated insurance requirements and surety (i.e. bonding or cash deposit) is required prior to any work within Town right-of-way. The Contractor is responsible for providing all traffic control. Contractor shall obtain an encroachment permit from the Town of Windsor, 8400 Windsor Road, Bldg. 100, Windsor, CA 95492-0100 before start of work. The Contractor shall comply with all requirements of the permit.

PROCEDURES

Contractor shall give the Town of Windsor Public Works Department 48 hours' notice before starting work. Call (707) 838-1230 (Public Works Inspections) or contact at 8400 Windsor Road, Windsor, CA. 95492-0100 for Inspection Services.

Work hours are limited to from Monday through Friday 7:00 A.M. to 7:00 P.M. Inspection will be available Monday through Friday from 7:30 A.M. to 4:30 P.M.

All underground improvements shall be installed and approved prior to paving.

PERMITS

Contractor shall obtain all agencies required permits and pay all fees prior to commencement of any work.

The property owner must enter into and abide by all of the terms of a Recycled Water Use Permit service agreement with the Town of Windsor. This special permitting agreement must be signed by the property owner and approved by the Town prior to construction or installation of landscaping or other recycled water use improvements and connection to the Town's recycled water system.

PURPOSE

The purpose of these Standards is to provide guidelines for the design of recycled water utilities projects and thereby reduce the time required for processing the plans. These guidelines do not include, but may reference, additional conditions which may be promulgated by all other pertinent ordinances, codes, and official policy set forth by the Town. These guidelines are intended to

impose minimum acceptable design criteria. More stringent requirements may be imposed at the discretion of the Town Engineer based on specific project conditions.

DETERMINATION OF USE

The Town treats and distributes disinfected tertiary recycled water to facilities within its recycled water service area. It is the policy of the Town to require the use of recycled water in lieu of potable water where the use or potential future use of recycled water is feasible, appropriate, and acceptable to the Town and applicable regulatory agencies for the purposes of landscape and turf irrigation, or for other permitted uses. The Town shall determine whether a given parcel or site will be furnished with recycled water or potable water for non-potable use. The determination shall be in accordance with the standards of treatment and water quality requirements for the proposed use with the intent of the Town to protect the public health, and with the availability and/or feasibility of making recycled water available. The property owner must enter into and abide by all of the terms of a Recycled Water User's Permit service agreement with the Town of Windsor. This special permitting agreement must be signed by the property owner prior to construction or installation of landscaping or other recycled water use improvements and connection to the Town's recycled water system.

For new projects in the Town's potential recycled water service area, the Town may require that landscape irrigation systems be installed so that the conversion to recycled water service may be initiated when recycled water service becomes available. Such irrigation systems may be connected to a separate potable water irrigation service until the recycled water service becomes available.

DESIGN INFORMATION

It is the responsibility of the design engineer to identify and initiate written requests for approval of any design concepts contrary to these criteria, to verify additional requirements imposed, perform any necessary calculations or studies, and resolve specific design problems with the appropriate agency and/or the Town. Before design, the design engineer/developer should obtain the following information from the Town:

- Approval to use recycled water for the proposed system
- Verification of the location and size of the proposed points of connection
- Design pressures and available flow to the proposed facilities

DESIGN OF DUAL-PLUMBING SYSTEMS

"Dual-plumbed Site" refers specifically to either 1) dual plumbed buildings that have toilets, urinals, trap primers and other allowed uses that are served by recycled water while the remaining fixtures are served by potable water, or 2) single family residences that use recycle water for outside irrigation. The co-existence of these two water systems requires extra caution to prevent

un-authorized plumbing modifications that can lead to a cross-connection between the recycled water and potable water systems, which is absolutely prohibited by state laws.

The design of a recycled water plumbing system for a dual-plumbed building, including the preparation of plans and specifications, shall be under the direction of a professional engineer or architect licensed with the State of California and qualified to perform plumbing design work. The registered architect or professional engineer shall stamp and sign the drawings. Designers and installers of dual plumbed projects using, recycled water shall refer to all applicable regulations for "Dual-plumbed Sites", including California Administrative Codes Title 22 and Title 24, for additional information on design, construction and inspection requirements.

The design and plans for a dual-plumbed site shall be reviewed by the Town. For dual plumbed sites, an additional site-specific engineering report is required by California Administrative Code Title 22 Section 60314. An additional copy of the engineering report and set of plans and specifications shall be included in the submittal package to the Town. The Town will forward the additional copy to the California Department of Public Heath (CDPH). In addition to approval by the Town Engineer, the designer shall also obtain the approval of the CDPH.

TESTING AND COMMISSIONING OF THE SYSTEM

Prior to the initial connection of a dual-plumbed facility to the Town's recycled water system, the owner shall have the on-site recycled water plumbing inspected and tested as outlined below for possible cross connections with the potable water system to verify that construction or retrofit work was performed correctly. The initial cross-connection inspection and test shall be performed by a cross-connection specialist. A written report documenting the successful results of the testing shall be submitted to the Town.

ONGOING INSPECTION AND TESTING

After initial connection of a recycled water service at dual-plumbed sites, periodic inspections must be conducted at least annually. Such inspections shall be performed by a cross-connection specialist and include at a minimum, the visual inspection of all back-flow prevention devices, pump rooms, exposed piping, valves, pressure reducing stations, points of connection, sprinklers, controllers, storage facilities, signs, tags, and labeling. The Site Supervisor's maintenance records may also be inspected.

Periodic cross-connection testing must be conducted at least once every four (4) years at dual-plumbed sites, unless visual inspections or major on-site water system changes reveal a need for more frequent testing. Other recycled water use sites that do not fall under the categories defined as "dual plumbed sites" may also be required to perform periodic cross-connection tests if the site's use characteristics indicate a greater risk of potential cross-connections, or if any reuse site undergoes significant modifications of the potable or recycled water systems. The Town and the CDPH will make the determination if such testing is required.

SYSTEM TESTING METHODS

The Town has several approved methods for conducting the cross-connection control test. The method used for the test will be based on the site considerations. The initial cross-connection test used for all new use sites and for periodic testing of dual plumed buildings shall be the Town's Cross-Connection Control Test Method 1, which is based on the California Pluming Code procedures for testing dual plumbed buildings. The periodic cross-connection test for single family residences that have outside recycle water irrigation systems shall be the Town's Cross-Connection Control Test Method 2, which is the method that has been developed to conduct at sites containing occupied residences.

RECYCLED WATER FACILITIES

1. Reference Codes and Standards

- Town of Windsor Municipal Code Title XII, Chapter 7, "Recycled Water Service" (Ordinance No. 2001-150); and Town Municipal Code Title XII, Chapter 3, Article 9, "Water Efficient Landscape Ordinance" (Ordinance 2009-259).
- Town of Windsor Design and Construction Standards.
- California Administrative Code Title 22, including Division 4, Chapter 3, "Water Recycling Criteria," and Chapter 16, "California Waterworks Standards".
- California Administrative Code Title 17, including Division 1, Chapter 5, Subchapter 1, Group 4, "Drinking Water Supply – Back Flow Prevention".
- California Administrative Code Title 24, including Part 5 "California Plumbing Code" and incorporating the most recent changes of the Uniform Plumbing Code (UPC).
- State of California Department of Public Health (CDPH), "Guidelines for Use of Recycled Water and Requirements"
- California Regional Water Quality Control Board (RWQCB) Waste Discharge Permit Requirements.
- California – Nevada Section, American Water Works Association (AWWA) "Guidelines for Distribution of Non-Potable Water"; "Guidelines for the Retrofit of Facilities Using Disinfected Tertiary Recycled Water" and "Manual 22 -Sizing Water Service Lines and Meters"; (M22)
- University of Southern California Foundation for Cross- Connection Control and Hydraulic Research, "Manual of Cross-Connection Control" (USC List of Backflow Prevention Devices)

2. Offsite and Onsite Facilities

A. Offsite Recycled Water Facilities - Normally consists of those facilities or piping systems that are or will be owned, operated, and maintained by the Town of Windsor.

B. Onsite Recycled Water Facilities – Normally consists of those facilities or piping systems located downstream of the service meter that are owned, operated, and

maintained by the property owner. Onsite recycled water facilities shall be subject to rules and regulations set forth by the Town for recycled water.

3. Recycled Water Facilities – General

A. The installation and use of recycled water facilities shall be limited to those uses permitted by State law, and to those uses approved by the Town for the recycled water service area. All recycled water facilities and use shall conform to the requirements set forth herein and to the most current provisions of the Town's Municipal Code and Waste Discharge Permit, State regulations and all other regulatory requirements applicable to the use of recycled water.

B. All recycled water facilities shall be separate and independent of any potable water system. Cross connections between potable water facilities and recycled water facilities are prohibited. This includes direct piping between the two systems, regardless of the presence of valves, backflow prevention devices, or other appurtenances.

C. In general, recycled water shall not be installed in the same trench with other utilities. Recycled pipelines shall be designed to be installed below the potable pipelines where these utilities run parallel to each other or cross. In the event that it is not possible to maintain relative positions, special construction shall be required according to the Town and CDPH standards and as directed by the Town Engineer. See Section 7 "Alignment" for additional separation requirements.

D. Recycled water mains shall not be designed with laterals for fire hydrants, wharf heads, or other appurtenances that would allow recycled water to be used for other than approved uses unless these facilities are expressly approved by the Town Engineer.

E. Recycled water mains shall not be designed with temporary connections to a potable water system unless expressly approved by the Town Engineer. When permitted, temporary connections shall be designed according to the requirements of the Town and to Town standards.

F. In those areas where the Town has determined that recycled water will be supplied in the future but is not currently available, recycled water irrigation facilities shall be installed as required by the Town and as detailed in these Standards. Provisions for future connection to the permanent recycled water facilities shall be included in the initial installation of the system as directed by the Town. In the interim, the new recycled system may be supplied with potable water via a temporary connection as directed by the Town. This temporary service connection shall be provided in accordance with Town Standards and shall incorporate a master backflow prevention device located and installed and field tested as required for a potable water irrigation system. Connections between potable water mains and recycled water piping shall only be permitted when the recycled water piping is to temporarily convey potable water. In the future, the property owner shall be

responsible for planning and constructing the system modifications to remove the temporary service and install to a permanent connection to the recycled system when it becomes available.

4. Offsite Recycled Water Facilities Design Criteria

A. All offsite (public) recycled water mains and associated facilities must be located in public right-of-way or public utility easements conforming to Town Standards and as approved by the Town Engineer. The minimum width of easements shall be 15 feet if it only contains a recycled water main or 20 feet wide if it contains another facility, such as sewer, storm drain, or other utility. Any and all rights-of-way or easement dedications must be made to the Town, at the property owner's expense prior to final acceptance of the project by the Town. The property owner shall provide all legal descriptions and deeds and shall submit the documents to the Town Engineer for review and approval. Easements shall be dedicated as a "public utilities easement".

B. Easements must be configured to encompass and allow for the maintenance of all publicly maintained appurtenances, such as service laterals and meters and will be generally centered over the facility. Separate access easements may be required depending on site conditions. When recycled water mains are to be installed along a property line the easement will be wholly contained on one parcel.

C. All property restrictions placed as a result of dedication of easements will be so noted on the Subdivision Map or on the Easement Deed if the easement is not dedicated as part of a subdivision.

D. In most major streets, or where the street surface is less than five years old, installations methods other than open cutting may be required. The Encroachment Officer or the Town Engineer as appropriate will determine the method based on the requirements for the work and the condition of the existing street.

E. Recycled water mains installed at a slope of 15 percent or greater will be designed with restrained joints. The Design Engineer must provide adequate drainage measures to protect the trench from erosion.

F. Offsite recycled water mains located between lots shall require an access easement or pedestrian walkway as determined by the Town Engineer.

G. All private (onsite) recycled water mains, laterals, and privately-owned appurtenances must be located within the private property and shall be clearly identified as private on-site plans submitted for Town approval.

5. Onsite Recycled Water Design Criteria

A. In order to protect the public drinking water supply, onsite recycled water facilities shall be designed to include backflow prevention on the potable water supply per the requirements of the Town standards. More stringent requirements for backflow prevention may be required when special facilities, such as booster pumping or chemical injection, are shown as part of the onsite recycled water facilities on approved plans. At a minimum, a reduced pressure (RP) backflow prevention device shall be provided at all potable water points of connection to the site according to Town STD PLAN NO. 510.

B. The following restrictions apply to design and use of recycled water irrigation facilities:

1. Vernal pools shall not be irrigated or disturbed.
2. No irrigation within three (3) feet of the drip line of an oak tree.
3. No irrigation within fifty (50) feet of any well used for domestic drinking water supply.
4. No overhead sprinkler irrigation within thirty (30) feet of creeks, property lines of parcels not irrigated with recycled water, or traveled easements used by adjoining neighbors not irrigating their parcel with recycled water.
5. Application of recycled water shall not exceed the soil absorption rate and result in excessive ponding or any runoff.

C. Recycled water irrigation facilities shall be designed to apply irrigation water in a manner compatible with the vegetation, ground slope, and infiltration rates of the soil types and agronomic uptake rates of the plantings within the approved use area. Where varying soil types are present, the system design shall be compatible with the lowest infiltration rate present.

D. Recycled water irrigation facilities shall be designed to provide a physical separation between adjacent areas irrigated with potable water. The means of separation shall be provided by either a separation distance of ten (10) feet, concrete mow strips, approved fence, or other approved means. Where concrete mow strips or other means are used, they shall be shown on the plans.

E. Except for recycled water delivered exclusively for agricultural use, the retrofit of existing irrigation facilities must meet the same requirements as new facilities (see Health and Safety Code 116815 (a)). The piping materials and markings for systems designed to deliver recycled water exclusively for agricultural use shall be determined by the Town Engineer in consultation with DPH on a case-by-case basis.

F. Drinking fountains, outdoor eating areas, and other similar facilities (e.g., snack bars) located within the approved recycled water use area must be protected from overspray or contact with recycled water. Protection may be achieved by relocating the

irrigation system or relocating or modifying the protected facilities. The method used to protect drinking fountains and other similar facilities from contact with recycled water shall be approved by the Town and CDPH.

G. Irrigation of surface water bodies is prohibited. Installation of new irrigation systems in close proximity to surface waters shall incorporate additional design features such as setbacks and berms as appropriate to eliminate the potential for runoff to surface water bodies. Existing irrigation systems in close proximity to surface waters shall be inspected and adjusted to eliminate the potential for runoff prior to retrofit. Additional runoff protection measures such as setbacks shall be incorporated as needed and as required by the Town.

H. Recycled water irrigation facilities must be designed to minimize overspray and ponding and prohibit runoff. Designers must specify appropriate irrigation devices to prevent overspray in narrow areas. New landscape sites are subject to the Town's "Water Efficient Landscape Ordinance" (Ordinance 2009-259) which includes provisions that assure that irrigation design will not result in significant overspray, runoff and ponding. For new and retrofit sites, the following design requirements must be met to provide this assurance:

1. Separate irrigation stations shall be provided with automatic system control devices that can be easily adjusted for different water requirements, solar exposures, microclimates and slopes to prevent ponding and runoff.
2. Sprinklers shall be adjusted, or systems modified to minimize overspray on to adjacent pavement, sidewalks, and other non-landscaped areas.
3. Pressure regulation shall be installed to assure operation at the manufacturers' optimal operating pressure.
4. Sprinkler heads shall have matched precipitation rates within each valve circuit.
5. Rain shut-off devices shall be installed on each irrigation controller.
6. Check valves shall be installed, where applicable, to prevent low head drainage.
7. In the event that, during an irrigation system Coverage Test, noticeable overspray, runoff and/or ponding is observed, irrigation system components shall be adjusted, or removed and relocated as required to comply with recycled water use requirements.

I. Recycled water facilities (onsite) design plans shall contain a legend showing the pertinent data for the materials to be used in the system construction. For an irrigation system, the data shall include pipe schedules (listing pipe sizes and materials of construction), valve types (including quick-coupling type valves), and the following information for each type of sprinkler device:

1. Manufacturer and model number
2. Sprinkler radius in feet

3. Operating pressure in psi
4. Flow in gpm
5. Sprinkler pattern

J. Recycled water facilities (onsite) design plans shall contain detailed information regarding existing conditions at the site and proposed improvements including the following, if applicable:

1. Points of connection
2. Routing of all pipes
3. Gate valves
4. Air/vacuum release valves
5. Control valves
6. Quick-coupling valves
7. Blowoffs and low point drain valves
8. Routing of control wiring
9. Control stations and the area controlled by each station
10. Signage plan and sign details
11. Cross connection test station locations and detail
12. Location of mow strips, fences, walls, or other barriers
13. Adjacent parcels, lots, home sites, or areas irrigated with potable water

K. Recycled water facilities (onsite) design plans shall clearly detail pertinent site improvements including backflow prevention devices, all potable water pipelines, buildings, walls, exterior drinking and decorative fountains, ponds, swimming pools, eating areas, or any other permanent facilities in the design area. If none of the items listed in this paragraph are present in the design area, it shall be specifically stated on the plans that none exist.

6. Material Requirements for Town-owned Pipes and Appurtenances

Unless otherwise required by State law, the Town Municipal Code, or specified herein, the design, materials and construction for all off-site recycled water systems shall conform to the specifications for potable water systems as detailed within the Town of Windsor Design and Construction Standards and the Standard Construction Drawings.

A. MARKING/LABELING/SIGNAGE - All recycled water mains, service laterals, plumbing, valves, pipes, appurtenances, irrigation parts, and associated components shall be:

1. Marked and/or labeled as required by Health and Safety Code Section 116815, which mandates that all pipes designed to carry recycled water shall be colored purple or distinctively wrapped with purple tape, and
2. In addition to the above, all recycled water system components shall also comply with all additional marking and labeling requirements specified herein, including the following:

a. Colored pipe shall be integrally colored purple (pantone #512) and embossed or integrally stamped/marked with continuous wording "RECYCLED WATER – DO NOT DRINK" printed on opposite sides of the pipe.
    1) Where purple pipe or fittings cannot be used, they shall be continuously wrapped with minimum 5 mil thick poly wrap tape integrally colored purple (pantone #512) with continuous wording "RECYCLED WATER – DO NOT DRINK" or approved equal.
b. All buried recycled water pipes shall also have purple detectable warning tape approved by the Town Engineer installed a minimum of six inches and a maximum of twelve inches above the pipe. The warning tape shall be a minimum width of three inches and include the wording "RECYCLED WATER - DO NOT DRINK". The tape shall be centered over the pipe and installed continuous for the entire length.
c. All fittings, appurtenances, and mechanical equipment shall be painted purple.

3. If sleeves or bags are required or used around recycled water fittings or pipes, they shall be used in addition to, and not in place of, any and all requirements in these Recycled Water Standards. Any sleeves or bags if used shall be colored purple (pantone #512) and embossed or integrally stamped/marked with continuous wording "RECYCLED WATER – DO NOT DRINK" as required and approved by the Town Engineer.
4. Recycled water advisory signs shall be designed, labeled and located in accordance with the requirements of Title 22, Division 4, Chapter 3, Article 4, section 60310 (g). In addition, all signage shall also meet the following additional requirements:
    a. The installation and mounting of all recycled water signs shall conform to Town standard details.
    b. Signs shall be placed at all decorative fountains, at ingress and egress points of recycled water irrigation use areas and in dual-plumbed buildings and any other locations required by the Town Engineer.
    c. Recycled water advisory signs for dual plumbed buildings shall include room entrance signs, equipment room signs, and valve access door signs that conform to the requirements of the California Plumbing Code, Chapter 16A for Recycled Water Systems.

5. Locator wire shall be installed on all buried mains and services including valves, fittings, and appurtenances. Locater wire shall be No. 10 (AWG) insulated copper tracer wire and shall be laid on top of and along entire length of all buried facilities and extended to the surface at all valve

locations, blowoffs, and meter boxes sufficiently for locator equipment to be attached. The wire shall be fastened to the top of the pipe so as not to be displaced by backfilling procedure.

B. MAINS AND FITTINGS – Unless otherwise approved by the Town Engineer, the minimum size for a mainline shall be 4-inches. In general, all mains, fittings and appurtenances shall be designed and rated for a minimum working pressure of 150 psi, plus a 100 psi surge allowance. Where the normal main line pressure may exceed 150 psi, pipe, fittings, and appurtenances shall be rated for 200 psi minimum. All mains shall conform to the following requirements:

1. Recycled Water pipe 4-inch to 12-inch diameter shall be either:
   a. Polyvinyl Chloride (PVC) Class 150, minimum, per AWWA Standard C900-97 and shall be furnished with either bell ends or couplings designed to effect an elastomeric pressure seal or fusible Class 150, or
   b. Ductile Iron Pipe (DIP) per ANSI/AWWA C151/A21.51

2. Recycled Water pipe 14-inch to 18-inch diameter shall be either:
   a. Gasketed joint or fusible Polyvinyl Chloride (PVC) Class 235 (DR18) minimum, per AWWA Standard C905-97, or
   b. Ductile Iron Pipe (DIP) per ANSI/AWWA C151/A21.51 rated for a minimum working pressure of 150 psi, plus a 100 psi surge allowance.

3. Asbestos cement pipe shall not be allowed under any circumstances.
4. All fittings shall be ductile iron pipe (DIP) fittings, Class 150, per ANSI/AWWA C110/A21.11. Fittings shall be bituminous coated outside per AWWA C110 and cement mortar lined inside per AWWA C104.
5. Ductile iron pipe and fittings must be polyethylene encased and have approved cathodic protection as required by the Town Engineer. (See Section 16A.)
6. Recycled water mains in delineated fault zones shall be ductile iron pipe (DIP) and shall extend to a minimum of 100 feet outside each side of the delineated fault zone.
7. Restrained joints shall be ductile iron in accordance with the applicable requirements of the ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision and shall be compatible with the type and pressure class of pipe used.

C. SERVICES - All recycled water services shall be designed and constructed to applicable Town Standards including the following:

1. Recycled water service pipe 2-inch diameter and smaller shall be fusible polyvinyl chloride (PVC) pipe, Schedule 40, or polyethylene (PE) tubing, SDR 9 per ASTM D-2737 with a pressure rating of 200 psi.

2. Recycled water service pipe 3-inch diameter and larger shall be Fusible Polyvinyl Chloride (PVC) Class 150, minimum, per AWWA Standard C900-97, or Ductile Iron Pipe (DIP) per ANSI/AWWA C151/A21.51

D. VALVES AND APPURTENANCES – Valves 16-inch and smaller shall be gate valves and valves 18-inch and larger shall be butterfly valves. All valves and appurtenances which control or release recycled water (except sprinklers, bubblers, and emitters) shall be installed in approved purple valve boxes with bolt-down purple covers and molded labels that read "RECYCLED WATER". In situations where a potable system is being converted to non-potable, all existing valve boxes to be used for recycled water shall be removed and replaced with a new, approved purple valve box and all associated valves and appurtenances shall be marked with warning labels affixed. Warning labels shall be purple weather resistant durable material permanently affixed onto the valve/appurtenance with rivets or bolts, etc. Warning labels shall be constructed of a weatherproof material with the warning permanently stamped or molded into the label and having the words, "RECYCLED WATER - DO NOT DRINK", and "AGUA IMPURA - NO TOMAR".

1. All new and existing system components including meters, pumps, valves, strainers, backflow preventers, air/vacuum blow offs and drains shall be marked with clearly visible recycled water identification tags. Identification tags shall be purple (pantone 512) with hot stamped black letters that read "RECYCLED WATER – DO NOT DRINK" and "AGUA IMPURA- NO TOMAR" in conformance with the Town standard.

7. Alignment

A. Installation of public recycled water mains outside of the public street shall not be allowed without special permission from the Town Engineer.

B. Minimum pipeline separation shall be maintained between recycled water mains and potable water utilities in conformance with the California Waterworks Standards Section 64572 for water main separation. See STDPLAN NO. 414 for detail.

C. The vertical separation specified for parallel water pipelines is required only when the horizontal distance between a recycled water main and the other potable or raw water main is less than ten feet

D. Recycled water main crossings over or under other underground facilities shall be designed as close to 90 degrees to the facility as possible.

E. If crossing a new or existing potable water main or raw water supply main, a new recycled water main shall be constructed at no less than 45-degrees to and at least one foot below the potable or raw water main. No pipe connection joints shall be made in the potable water main within eight horizontal feet of the recycled water main.

F. Recycled water mains shall not be installed in the same trench as and shall be at least 4 feet horizontally from sanitary sewers, storm drains, and other underground utilities such as gas, electrical conduit, telephone, and communications lines, except at crossings.

G. Minimum clear horizontal separation between a recycled water line and a metallic pipeline with an induced current shall be 5 feet.

H. Recycled water mains shall be designed a minimum of 5 feet from all structures, such as manholes or drop inlets.

I. Recycled water mains shall be designed a minimum of 5 feet clear from the edge of easements.

J. If the separation requirements from potable water mains in this Section are not feasible, written approval is required from the Town Engineer and CDPH for use of special construction methods intended to minimize the potential for contamination including, but not limited to, sleeving the newly installed main in a casing, or utilizing upgraded piping material.

K. Where vertical conflicts exist, the potable water main shall be placed above the recycled water main. If the recycled water main must go over an existing potable water main, approval is required from the Town Engineer and CDPH for use of special construction methods including, but not limited to, providing a continuous pipe section or sleeve on the newly installed main a minimum of 20 feet long centered at the crossing.

L. Recycled water mains over or under other utilities shall be in accordance with Town of Windsor STD PLAN NO. 412 and STD PLAN NO. 414, except that PVC pipe shall be allowed with ductile iron fittings.

M. Recycled water mains shall be designed with service laterals perpendicular to the main. A service lateral shall be designed for each lot or area to be served with recycled water.

N. Recycled water mains shall be designed with the ability to generally drain to blowoffs. On-site recycled water piping systems shall be designed to drain to low point drains to facilitate system inspection and testing. Consult with the Town of Windsor for specific design requirements.

O. The design engineer shall pothole and survey all existing utilities or other existing structures critical to vertical alignment prior to approval of the plans by the Town Engineer.

8. Size

A. Recycled water mains will be sized according to criteria generally consistent with those specified for potable water systems and in accordance with the Town's planning and development requirements for the recycled water distribution system. The Town Engineer may require increased pipe size or additional facilities for overall system benefit.

B. Recycled water mains shall generally be a minimum of 4-inches in diameter.

C. Recycled water mains sizes of 10-inches and 14-inches in diameter shall not be used except with special permission of the Town Engineer.

D. Recycled water mains shall be sized for a maximum velocity of 5 feet per second.

E. Service laterals shall be a minimum of 3/4-inches in diameter. Larger sized laterals may be required.

F. Recycled water service laterals from the main to the meter shall be sized based on a maximum velocity of 15 feet per second.

9. Cover

A. Definition: Cover is the distance from the top of the pipe to finished grade.

B. The standard installation for offsite recycled water facilities shall generally be consistent with those specified for potable water systems and be in accordance with General Construction Recycled Water Notes, or as shown on the approved plans.

C. Service laterals must have minimum cover in accordance with the Town Standards.

D. The minimum depth of cover from finished grade shall be 30 inches for 4-inch mains; 36 inches for 6-inch and 8-inch mains; and 44 inches for 12-inch and larger mains. The minimum cover for all recycled water main construction, under any circumstances, is 30 inches. Where cover is greater than 30 inches, but less than the standard cover, Class 50 Ductile iron pipe is required.

E. The minimum depth of cover from finished grade to on-site recycled water piping shall be: 30 inches for 3-inch and 4-inch pressurized lines, and 24 inches for pressurized lines 2.5-inches and smaller; and 18inches for intermittent pressure lines and irrigation control wiring.

F. Where cover exceeds 8 feet, special permission from the Town Engineer is required.

10. Connection to an Existing Main

A. Under no circumstances shall cross-connection between the potable water system and the recycled water system be allowed.

B. For connecting 2-inch diameter pipes and smaller, use a hot tap.

C. Cut-in tee must be used if additional valves are required on the existing main. If the new lateral is larger than existing main, the tee shall be the size of the new lateral and reduced to the size of the existing main.

D. Size-on-size taps are allowed up to 8-inch in accordance with the approved standards.

E. Use of 12-inch size-on-size taps are allowed only under emergency situations and with the specific approval of the Town Engineer.

F. A mechanical joint tapping sleeve must be used in accordance with approved Town standards.

11. Recycled Water Valving

A. Valving at intersections shall be in accordance with the provisions of STD PLAN NO. 502 and as required by the Town Public Works Department.

B. The maximum valve spacing on any recycled water main shall be 500 feet unless otherwise required by the Town Public Works Department.

C. Recycled water main valves must be located outside of concrete areas whenever possible to facilitate repairs.

D. All valves must be tagged with a recycled water identification tag with the words "WARNING – RECYCLED WATER – DO NOT DRINK" on one side and "AVISO – NO TOMAR" on the other in accordance with STD PLAN NO. 612. Identification tags shall be permanent plastic tags affixed to the valve designed to withstand exposure to weather, sunlight, and immersion.

12. Recycled Water Service Laterals and Meters

A. All properties shall be provided Town recycled water service via meters located at the frontage of a public street unless otherwise approved by the Town Engineer,

1. The Town may allow meters to be located on private street frontages and/or within public utility easements if the Town Public Works

Department evaluation concludes that it is reasonable under the circumstances. However, meters must be readily accessible.

B. Meter manifolds other than those shown in Standard Drawings shall be detailed on the plans and approved by the Town Public Works Department.

C. Service laterals sizes 1.5-inch and larger shall have a valve and valve box in the public street or right of way at the connection with the main and a meter stop valve upstream of the meter to facilitate system isolation and testing and prevention of unauthorized discharge in accordance with STD PLAN NO. 603 AND STD PLAN NO. 604.

D. Design meter boxes to be located out of traveled ways and a minimum of 10 feet from street trees whenever possible.

E. Landscape Irrigation Meters

1. Meters shall be installed on all services.
2. Provide separate irrigation meters for mixed residential and commercial uses and common areas of all condominium, town home, Planned Unit Developments, apartment complexes, and mobile home parks. All meters must be within public right-of-way or easements and multiple meters shall be clustered where possible.
3. Irrigation meter size shall be determined by the maximum flow required at the meter and shall be based on AWWA Manual M22 criteria. Calculations for sizing service laterals and meters for recycled water irrigation facilities shall be submitted with the landscape plans for review and approval by the Town Public Works Department. Recycled water demand shall be based on the estimated gallons required to maintain the planned landscape in a healthy condition for Windsor's climate. Along with landscape and irrigation plans, the applicant must submit the planned square footage of recycled water irrigated areas and categories of plants to be used as selected from the following:
    a. High water use plants: turf, annuals, and container plants;
    b. Moderate water use plants: ornamental trees, shrubs ground covers, and perennials primarily irrigated by sprinklers. (Note that there may be some use of drip or bubblers in this category but not a predominance.)
    c. Low water use plants: drought tolerant plants recognized as having a plant factor of 0.3 or less and irrigated primarily through drip emitters.

F. Agricultural and Municipal Irrigation

1. Where required by the Town Engineer, recycled water service for high volume agricultural or municipal irrigation facilities shall have a metered irrigation turn-out as required for the service and as approved by the Town.
2. Irrigation Turnouts shall be designed accordance with STD PLAN NO. 607 AND STD PLAN NO. 608 and service requirements and shall include a recycled water meter or metering control valve, pressure control valve, self-flushing screen, lockable valves on inlet and outlet ends, thermal anti-frost blanket and lockable cage.

13. Backflow Prevention Devices

A. All properties where a recycled water service line(s) is provided, regardless of whether the property is receiving recycled water service or not, shall have approved backflow prevention devices installed on the domestic water service(s) to the property prior to the installation of the recycled water service line(s). Backflow device type, and installation requirements shall comply with CCR Title 22 as well as Windsor Municipal Code and Windsor Design and Construction Standards.

B. Backflow Prevention for Recycled Water System

1. Backflow prevention shall be installed on the user's recycled water service upstream of system applications, when necessary in the opinion of the Town Engineer to protect the quality of the recycled water in the Town's distribution system.
2. Recycle water applications that require backflow prevention on the recycled water service include booster pumping systems, chemical feed systems, certain industrial processes, and on-site storage. At a minimum, a reduced pressure (RP) backflow prevention device shall be provided upstream of the system application and shall conform to STD PLAN NO. 510.

C. All RP backflow devices will be inspected quarterly and tested annually by the Town at the water customer's expense.

D. All backflow devices that are installed must be on the current University of Southern California's Approved List of Devices identified in the Manual of Cross-Connection Control and shall be tested and certified in-place after installation by a Cross-connection Specialist.

14. Service Pressure

A. All irrigation and other systems utilizing recycled water shall be designed based on actual system pressures. The designer shall measure existing system pressure and submit measurements as part of initial submittal.

B. In the event that system pressures are expected to exceed 80 psi, a pressure reducing valve shall be installed on the service downstream of the meter to limit service pressure to 80 psi maximum. In the event service pressure is expected to be below 35-psi; booster pumps shall be included to increase the service pressure unless otherwise approved by the Town Engineer.

15. Specialty Items

A. Air Relief Valves - Air relief valves are required at all isolated high points in the system that are one pipe diameter or more above the remainder of the system and near the upper end of dead end legs.

1. Recycled water line air relief valves shall be constructed in accordance with Town STDPLAN NO.-530; with the exception that all pipe and valve covers shall be constructed to recycled water standards (i.e. purple pipe and covers).

B. Blowoffs - Blowoffs shall be installed at low points to facilitate draining the system and at dead end legs. Local low points, such as at utility crossings, will not require blowoffs. Where possible, blowoffs shall be located within 150 feet of a sanitary sewer manhole.

1. Blowoffs shall conform to the applicable requirements of STD PLAN NO. 515 and STD PLAN NO. 517.

C. Quick Coupling Valves

1. New quick coupling valves should be 3/4-inch or 1-inch nominal size and of brass construction rated for a normal working pressure of 150 psi with permanently attached, purple rubber or vinyl locking covers with the words “RECYCLED WATER”. New quick coupling valves shall be Rainbird Model 33-DNP or 44-NP or approved equal.
2. Recycled water quick coupling valve shall have a special coupler key that differs from site potable water valve lock keys.
3. Quick couplers and keys for all publicly maintained areas shall be as specified by the Town Engineer.

D. Cross Connection Control (CCC) Test Station

1. Dual plumbed systems shall have a CCC Test Station installed on the onsite recycle water system, in a lockable box or vault downstream of the recycled

water meter in accordance with the requirements of the California Plumbing Code.

2. CCC Test Stations for dual plumbed buildings shall be installed at the low point where the recycle water piping enters the building and shall include a drain port and fitting for connection of pressure gauge testing equipment. Drain ports shall be sized to drain the building recycled water piping and shall be a minimum size of 3/4-inch. CCC Test Stations shall be in a locked box or wall enclosure with approved advisory signs.

16. Special Conditions

A. The need for cathodic protection shall be determined by the Town Engineer for each project. This may require soils reports or other additional information.

B. Ductile iron pipe must be installed in delineated fault zones and extend to 100 feet outside each side of the delineated fault boundaries.

C. Abandonment of Recycled Water Mains and Services

1. All recycled water mains 12-inches in diameter and larger, within the public right-of-way must be removed or broken every 50 feet and filled with sand slurry.
2. Any existing recycled water mains and laterals that will not be used must be abandoned and must be shown on the approved plans with appropriate notation.
3. For all services, remove the valve and saddle and install a full circle clamp on main under Town inspection.
4. For flanged or mechanical joint tees, remove the valve and install a blind flange or mechanical joint plug under Town inspection.
5. For push-on tees, the tee, valve and concrete thrust block must be removed and the main repaired with approved pipe and suitable couplings.
6. Valve boxes for abandoned valves must be removed.
7. Abandoned mains, valves and risers located within the street structural section must be removed.

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PART II

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SERIES 100 – GENERAL INFORMATION

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Contractor shall give the Town of Windsor Public Works Department 48 hours notice before starting work. Call (707) 838-1006 or contact at 8400 Windsor Road, Windsor, CA. 95492-0100 for Inspection Services.

Work hours are limited to from Monday through Friday 7:00 A.M. to 7:00 P.M. Inspection will be available Monday through Friday from 7:30 A.M. to 3:00 P.M.

All underground improvements shall be installed and approved prior to paving.

WORK WITHIN TOWN RIGHT-OF-WAY

Issuance of an Encroachment Permit and associated insurance requirements and surety (i.e. bonding) is required prior to any work within Town right-of-way. The Contractor is responsible for providing all traffic control. Contractor shall obtain an encroachment permit from the Town of Windsor, 8400 Windsor Road, Bldg. 100, Windsor, CA 95492-0100 before start of work. The Contractor shall comply with all requirements of the permit.

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CONSTRUCTION

1. Asphalt Concrete

Type "A" surface course asphaltic concrete shall conform to Section 39 of the State Standard Specifications, meeting the one-half (½") inch maximum, medium grading aggregate requirements. Aggregate shall be proportioned by weight and properly mixed according to the provisions of Section 39-3 State Standard Specifications and shall be placed at the locations and thickness shown on the plans.

Asphalt binder shall be steam refined paving asphalt, having a viscosity grade of AR-4000.

Asphalt Emulsion

Asphalt emulsion for the application of the tack coat shall be applied with a distributor, which shall be kept on the job site during all phases of paving. Asphaltic emulsion shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced and to other surfaces designated by the Engineer.

Spreading Equipment

Asphalt pavers shall be self-propelled mechanical spreading and finishing equipment, provided with a screed of strike-off assembly capable of distributing the material to not less than the full width of a traffic lane. Screed action shall include any cutting, crowding or other practical action which is effective on the mixture without tearing, shoving or gouging, and which produced a surface texture of uniform appearance. The screed shall be adjustable to the required section and thickness. The paver shall be provided with a full width roller or tamper or other suitable compacting devices. Pavers that leave ridges, indentations or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation shall not be used.

The asphalt paver shall operate independently of the vehicle being unloaded and shall be capable of propelling the vehicle being unloaded in a satisfactory manner and if necessary, the load of the haul vehicle shall be limited to that which will insure satisfactory spreading. While being unloaded, the haul vehicle shall be in contact with the machine at all times, and the brakes on the haul vehicle shall be in contact with the machine at all times, and the breaks on the haul vehicle shall not be depended upon to obtain contact between the vehicle and the machine.

Dumping of material in a window and then placing the material in the asphalt paver with loading equipment will not be permitted, unless the asphalt paver is of such design that the material will fall into a hopper which has a movable bottom conveyor to feed the screed and the loading

equipment is constructed so that substantially all of the material deposited on the roadbed is picked up and deposited in the paving machine.

Pneumatic Rollers

In addition to the requirements for pneumatic rollers in Section 39-5.02 of the State Standard Specifications, the roller shall be equipped so that the air pressure in all tires may be regulated uniformly by the operator while the roller is in motion.

Rolling Agents

A rolling agent in the proportions recommended by the manufacturer of such agent shall be added to the lubricating water used in the pneumatic-tire roller. The use of rolling agents and lubricating water will not be required if the pneumatic-tire roller is equipped with a tire heating device that will preheat the tire to a temperature of 105 degrees Fahrenheit.

Spreading, breakdown and compaction shall be in accordance with Section 39-6 of the State Standard Specifications and shall be completed while the temperature of the asphaltic concrete is 225 degrees Fahrenheit.

2. Concrete

All Portland cement concrete used for construction of curbs, gutters, sidewalks, and driveways shall be Class A concrete. The maximum slump shall be 3"; minimum compressive strength at 28 days shall be 3,000 lbs. per square inch.

All expansion joints material for installation in curb, gutters, sidewalks and driveways shall conform to Town Standard Plans.

Curing Compound

Curing compound shall conform to AASHTO Designation M-148 Type II, white pigmented, and shall consist of a practically colorless, impervious liquid which will thoroughly seal the surface of the concrete and will not impart a slippery surface thereto. The liquid shall contain a coloring matter which does not permanently alter the natural color of the concrete, but which colors sufficiently at the time of application to indicate the areas covered. The use of any membrane material which would impart slippery surface to the pavement or alter its natural color will not be permitted. The colorless impervious liquid shall contain not less than twenty-five percent (25%) solids.

Adhesive

Adhesives used to bind new concrete to existing concrete or asphaltic concrete surface shall be used only after approval of the Town Engineer.

Forms

Forms shall be true and shall have a smooth, straight upper edge. Timber forms shall be surfaced on the side placed next to the concrete, shall have true surfaced upper edge and shall be not less than one and five-eights inches (1 5/8") after being surfaced. All forms shall be thoroughly cleaned and coated with form oil to prevent the concrete from adhering to them. The depth of forms for back of curbs shall be equal to the full back face height of curb. Lower rear edge of front face form for curb shall be milled to a 1" radius. Forms shall be carefully set to alignment and grade and shall conform to the required dimension. Forms shall be held rigidly in place. Clamps, spreaders and braces shall be used where required to insure rigidity in the forms. Benders or thin plank forms may be used on grade changes or for curb returns. Back forms for curb returns may be made of ½" thick benders cleated together for the full depth of the curb. Side forms for sidewalks, local depressions and driveways shall not be removed less than 12 hours after the finishing has been completed.

Finish

All exposed surfaces shall have a medium broom finish.

3. Curb and Gutter

In constructing curbs, entrances shall be provided for driveways to replace former facilities. The entrances shall be of the dimensions shown on the Standard Plans.

Weakened plane joints shall be constructed at 20-foot intervals, except that when Portland cement concrete pavement is adjacent thereto, or to be constructed adjacent thereto, the joints shall coincide with the weakened plan joints in the adjacent pavement. The joints shall be constructed to a minimum depth of one and one-half inches. Scoring shall be with a tool which will leave the corners rounded and insure free movement of the concrete at the joint, or by sawing the hardened concrete and covering the exposed area with curing compound.

Expansion joints, ¼" wide, shall be constructed at each side of structures, at the ends of curb returns, ends of driveways and elsewhere on 60 foot centers. Where possible, expansion joints in curb and gutter shall be set co-linear with the joints of the sidewalk. Expansion joint filler shall be pre-molded material conforming to the Standard Plans. Expansion joint material shall be shaped to the cross section of the curb and gutter and shall be installed at right angles to the curb face. A construction joint shall be installed when the delay between successive pours exceed the time of initial set.

Concrete shall be placed and compacted in forms without segregation. Prior to the removal of the forms, the surface shall be finished true to grade by means of a straight edge float, no less than 10 feet in length, operated longitudinally over the surface of the concrete. Form clamps shall be constructed so as not to interfere with the operation of this float. Immediately after removing the front curb form, the face of the curb shall be troweled smooth and then finished with a steel

trowel. The top shall be finished and front and back edges rounded as shown on the Standard Plans. After the face of the curb has been troweled smooth, it shall be given a final brush finish with brush strokes parallel to the line of the curb. The top and face of the finished curb shall be true and straight and the top surface of the curb shall be of uniform width, free from bumps, sags, or other irregularities. When a straight edge ten feet (10') long is laid on top of the face of the curb, or on the surface of the gutter, the surface shall not vary more than 0.01 foot from the edge of the straightedge, except at grade changes or curves. Where the grade is less than one percent (1%), a water flow test will be required to determine depressions in the gutter. Exposed surfaces of curbs and gutters shall be cured by the pigmented curing compound. The Contractor shall clean, at his own expense, all discolored concrete. The concrete may be cleaned by abrasive blast cleaning.

Repairs shall be made by removing and replacing the entire unit between scoring lines or joints. Repaired sections shall be doweled to existing curb and gutter by the use of dowels or, when the repair length is ten feet or more, by application of epoxy adhesive to the existing concrete.

4. Sidewalk and Driveway

Fresh concrete shall be struck off and compacted until a layer of mortar has been brought to the surface. The surface shall be finished to grade and cross sectioned with a wood or aluminum float, troweled smooth and finished with a broom.

The surface of the sidewalk shall be marked into rectangles of not more than five (5) lineal feet in length, with one-half inch (½") scoring tool which will leave the edges round. Driveway approaches shall be scored at the bottom of the curb breakdowns and evenly across the apron.

Expansion joints one-quarter inch (¼") wide shall be constructed at all returns and opposite expansion joints in adjacent, where driveways abut driveway approaches, and as shown on the Standard Plans. Expansion joint filler shall be shaped to fit the concrete that is being placed.

Base Material

Base material under concrete sidewalk and curb and gutter shall be Class II aggregate base and conform to the provision in Section 26-1.02B of the State Standard Specifications and shall be placed and compacted in conformance with the requirements specified in the Standard Plans.

5. Pavement Striping, Marking & Markers

Centerline and lane line markings shall be raised pavement markers. Stop bars, crosswalks, pavement symbols and pavement markings shall be thermoplastic. Edge lines and bike lane striping and marking shall be no less than two coats of water borne paint.

Where centerline markers have been removed on existing streets temporary markers shall be placed prior to the end of the work day. Temporary marking shall be 4" yellow reflective paint or tape no more than sixteen feet on center.

On existing Town streets, permanent centerline marking shall be placed within 72 hours of placing the surfacing.

CU STRUCTURAL SOIL STANDARD SPECIFICATION

1. Description

CU-Structural Soil® shall consist of supplying and installing structural soil in planter areas as designated on the plans. Structural soil is a mixture of gravel, soil and admixtures as described below. The system also includes installation of a geotextile fabric liner. Prior to construction, a subdrain system below the planters and connecting to the storm drain system shall be installed.

2. Materials

CU-Structural Soil® shall be as manufactured by TMT Enterprises of San Jose, CA or other manufacturers/suppliers licensed by AMEREQ INC./CU-Soil Division who holds the patent for Cornell University Structural Soil®

Structural Soil® shall consist of the following materials:

1. Crushed Rock
2. Clay Loam
3. Soil Binder (Hydrogel)
4. Water

Crushed Rock shall conform to the following requirements:

Crushed Rock Gradation (C202)

Sieve Size	% Passing
1-1/2”	100
¾”	26
No. 4”	4
No. 40	0.5

Crushed Rock Quality Tests

Quality Characteristic	Test Method	Acceptance Limits
LA Rattler (500 Rev.)	CT 211	50 maximum
Moisture Content	CT 226	10% +/- 3%
Coarse Durability	CT 229	35 minimum
pH	ASTM D 4972	5.5 to 6.5
Soluble Salt Level		Less than 300 ppm
Fractured Faces	CT 205	90% two or more

Clay Loam shall conform to ASTM D2487 Soils Classification SW-SC: Well-graded Sand with Silty Clay. Soil composition shall conform to the following:

Soil Composition (USDA Classification System)

Component	Size Range	Percentage of Mix
Gravel	½" to No. 10	0 to 5
Sand	No. 10 to No. 200	20 - 45
Silt	No 200 to No 270	20 - 35
Clay	Finer than 270	2 +/- 1

Soil/Loam Quality Characteristics

Characteristic	Range
pH	5.5 – 6.5
% Organic Matter (dry wt.)	2% - 5%
Soluble Salt	<1.0 mmho/cm
Cation Exchange Capacity (CEC)	>10
Carbon/Nitrogen Ration	<33.1

The Clay Loam shall have a pH between 6.0 and 7.8, Salinity less than 3 ds/m, and exchangeable sodium percentage (ESP) less than 15%.

Binder/ Hydrogel: Cross linked potassium copolyment hydrogel as manufactured by Gelscape by Amereq Corp. Congers, NY or approved equal.

Water: Potable

3. CU Soil Mixing

All CU Structural Soil® mixing shall be performed by an approved suppler using appropriate soil measuring, mixing and batching equipment of sufficient capacity and capability to assure proper quality control and consistent mix rations. No jobsite mixing will be allowed. Supplier shall provide batching and testing records. Tests for material weight, water content and mix proportions shall be supplied for each 25 tons of material.

Proportions of the CU Structural Soil® shall conform to the following table:

Component	Units of Weight	Percentage by Weight
Crushed Rock	100 lbs (dry)	75 -78
Clay/Loam	15-18 lbs (dry)	22-25
Binder/Hydrogel	0.035 (dry)	0.03
Water	Optimum per ASTM D698	
Other Amendments	As recommended by test analysis	

Contractor shall prepare batches of the structural soil not to exceed 400 cubic yards. Keep each batch stockpiled separately. Provide test reports for each batch of 400 cubic yards or less.

4. Submittals

At least 30 days prior to ordering materials, the installing contractor shall submit to the Engineer representative samples; certificates; manufacturer's literature and current license; and test results for the materials specified herein. No materials shall be ordered until the required information has been reviewed and approved by the Engineer.

Supplier shall submit samples of one cubic foot of crushed rock, one half cubic foot of clay loam prior to mixing, and one cubic foot sample of mixed CU-Structural Soil® to the Engineer. Contractor shall provide split samples to their own Quality Control laboratory for independent testing. Submit test reports to Engineer as required herein.

Provide test reports for crushed rock indicating compliance with specified requirements.

Submit a soil test analysis report from an approved laboratory for the clay/loam. Soil & Plant Laboratory Inc., PO Box 153, 352 Matthew Street, Santa Clara, CA 95050 (408) 727-0330 is an approved laboratory for this purpose.

Provide a chemical analysis including the following:

a. pH and buffer pH
b. Cation Exchange Capacity (CEC)
c. Carbon/Nitrogen Ratio

d. Percent organic content by weight determined by the loss of ignition oven dried sample. Test samples shall be oven dried to a constant weight at a temperature of 230°F. plus or minus 9 degrees.

e. Nutrient levels including nitrogen, phosphorus, potassium and soluble salt in ppm. Include recommendations to alter soil fertility including fertilizers or pH adjustment required for healthy plant growth. Amendment recommendations shall include amounts and types of amendments. Soil Analysis Test A05-3 by Soil and Plant Laboratory, Inc. will satisfy this requirement for the clay/loam component.

For structural soil sample, provide maximum density and optimum moisture per ASTM D698 using a 6-inch mold and without removing any oversize material. Measure the dry weight percentage of stone in mixture. The approved CU-Structural Soil® sample shall be the standard measure of quality for the delivered material.

5. Installation

Do not proceed with installation of CU Structural Soils® until all subsurface drain lines, walls, burg footing, irrigation lines and utility work in the area have been installed and tested. All subsurface drainage systems shall be fully operational prior to placing CU Structural Soils®.

Excavate to the proposed sub-grades to the dimensions and slopes as shown on the drawings. Keep excavations free of all construction debris, trash, rubble and foreign material. Protect adjacent improvements from damage or staining by the soil.

Place geotextile fabrics as shown on Town standard plans. Laps shall be a minimum of 12 inches and lapped materials shall be soil stapled in place. Provide at least 18 inches of material for lap at top of soil installation.

Deliver CU-Structural Soil® at or near optimum compaction moisture content as determined by ASTM D698. Do not place in frozen, wet or muddy sites. Protect CU-Structural Soil® from exposure to excess water and from erosion at all times. Cover stockpiles of CU-Structural Soil® with plastic until placed. Do not allow excess water to enter site prior to compaction.

Spread the CU Structural Soil® in loose lifts not to exceed 12 inches. Compact CU Structural Soil® with a single pass of a small vibraplate. Bring material to grades indicated on the drawings, smooth surface and lightly compact with single pass of small vibraplate.

After fine grading, cover the CU Structural Soil® with plastic and protective plywood covers to prevent loss of moisture and contamination of the structural soil.

6. Subsurface Drains

This work shall consist of furnishing and installing perforated and non-perforated plastic pipe and appurtenances and furnishing and placing permeable material and filter fabric as shown on the plans or as directed by the Engineer. The work shall conform to the provisions in Sections 68-1.02K through 68-1.03 of the Standard Specifications and these Special Provisions.

Non-perforated pipe shall be smooth-wall PVC, SDR 35 conforming to the requirements of AASHTO Designation M278. Plastic tubing shall not be used.

The Contractor shall furnish to the Town a Certificate of Compliance for each shipment of PVC pipe and fittings before any pipe is installed.

Permeable Material shall be Class 2 conforming to Section 68-1.025, "Permeable Material," of the Standard Specifications.

Geotextile Fabric shall conform to Section 68-1.028, "Filter Fabric," of the Standard Specifications. Filter fabric must weigh a minimum of 4.0 ounces per square yard, have a minimum flow rate of 130 gallons per minute per square foot and have an Apparent Opening Size (ASTM D 4751) of 70. Non-woven fabric shall be Mirafi 140N, US 135 NW, Geotex 401 or equal.

7. Root Barrier Fabric

Root barrier fabric shall be Typar Geotextiles, "Biobarrier" or approved equal. Biobarrier shall be the inner geotextile wrap with nodules facing inward toward the CU-Soil as shown on the Town standard plans.

PART II – STANDARD SPECIFICATIONS

SERIES 300 – EARTHWORK CONSTRUCTION, ASPHALT PLACEMENT, STORM DRAIN, LID, & BMP STANDARD SPECIFICATIONS

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1. Storm Drain Construction 300-2
2. Grading Standards 300-3
3. Erosion Control 300-18

SERIES 300 – EARTHWORK CONSTRUCTION, ASPHALT PLACEMENT, STORM DRAIN, LID, & BMP

1. Storm Drain Construction

Pipe

Storm drain conduits shall be reinforced concrete pipe conforming to Caltrans Standard Specification Section 65. Cast in place concrete pipe and High Density Polyethylene (HDPE) and Polyvinyl Chloride (PVC) SDR 35 plastic storm drain conduit are accepted alternates to Class III RCP only. However, cast in place pipe shall not be used in existing roadways and HDPE and PVC may not be used within the traveled way of industrial, collector or arterial streets. HDPE pipe shall have silt tight gasketed couplings and PVC pipe shall have rubber gaskets. Excavation and backfill for plastic pipe shall conform to the provisions in Section 19-3 of the Caltrans Standard Specifications dated July 1992 and as shown for metal pipe on Standard Plan 162F.

Backfill

Pipe backfill material, filled and compacted to the spring line of the pipe, shall conform to the following specification:
Reinforced concrete pipe and cast-in-place storm drain pipe shall be placed and backfilled in accordance with Caltrans Standard Plans Drawing A62-D.
Material shall have a minimum durability index of 35 and a minimum sand equivalent of 20. Material shall be free of organic material.

Sieve Size	Percent Passing	
	Min.	Max.
3/4"	100	100
3/8"	80	100
No. 4	30	70
No. 16	5	40
No. 200	0	4

Installation of Pipe

Pipe laying shall proceed upgrade without break from structure to structure as shown on the drawings, and each pipe length shall be checked to grade.

Each length of pipe shall be laid on a firm bed and have a true bearing for its length. Adjustment of pipe to line and grade shall be made by fine grading the bedding material. No wedging or blocking to support the pipe will be permitted.

When pipe laying is not in progress, the forward end of the pipe shall be kept effectively closed with an approved temporary barricade.

Storm Drain Manholes

Storm drain manholes shall consist of a precast unit or a cast-in-place unit in conformance with Section 51 of the State Standard Specifications, or a combination thereof.

Manholes shall be fitted with either an eccentric cone or a flat "reducer" slab. Manholes shall be adjusted to match the finished grade with no less than two precast grade rings fitted with a cast iron frame and cover not less than 24" in diameter.

The inside diameter of the manhole shall be of such a size that it accommodates the outside diameter of the largest adjoining pipe, however, in no cast shall the inside diameter of any manhole be less than 48 inches. All pipe ends shall be rounded and all joints grouted. No pipe ends shall extend into the barrel of the manhole.

When the flow line of the manhole is over seven (7) feet below the top of the cover the inside of the manhole will be no less than 60 inches in any direction.

Adjust Manholes to Paving Grade

Existing manholes located within the street right-of-way shall be adjusted to conform to finished pavement grades in accordance with Standard Plans.

Curb Inlets

Curb inlets to be installed shall be in conformance with Town of Windsor Standard Plans and the details as shown on the plans and as directed by the Town Engineer.

Base Material

Base material under curb inlets shall be 4" of base conforming to the provisions in Section 26-1.02A of the State Standard Specifications and shall be placed and compacted in conformance with the requirements specified in said section.

2. Grading Standards

Earthwork Construction shall be placed and tested in accordance with this section, unless otherwise stated by the Town Engineer, or her/his representative. These standards are to be considered the minimums and may be augmented by the Town Engineer, as necessary.

Fill (definition for these standards)

Any soil, rock, or other grading and trench material placed, or previously moved by human forces shall be defined as fill.

Clearing and Grubbing

Protected trees or plants, archeological areas, wetland zones, water drainages, endangered species, and any other 'areas of concern' must be properly addressed prior to commencing clearing or site work. All differing conditions or findings observed during the clearing and construction phases must be brought to the attention of the Town Engineer.

Prior to fill placement, all surface vegetation, boulders, and unacceptable buried debris (structures, tanks, etc.) shall be cleared and removed to a minimum of 5' (feet) outside of proposed fill or site improvement areas, unless otherwise noted on plans. All vegetation, and any other debris removed from within the cleared area shall be hauled off of the site, unless otherwise approved by the Town Engineer. The exposed surface shall then be prepared as described under "General Fill Placement".

Fill Density Testing

The Modified Proctor (ASTM D 1557) shall be used as the laboratory compaction reference, with the nuclear gauge (ASTM D 6938) used for field density determination (percent compaction), unless approved or otherwise stated by the Town Engineer.

Fill Placement

The applicant/contractor is responsible to construct the roadway section, pad fill, sidewalk grade, trench bottom, and all other fill areas to meet material, compaction, and other specifications.

Prior to placing fill (except for trench bottoms: refer to 'Trench Fill') the existing surface shall be prepared by scarifying to a minimum depth of 6" (inches)**,** concurrently removing greater than 3" size material, organics, and other debris. The scarified zone shall then be moisture conditioned to between -1% and +2% of optimum moisture, and then compacted to a minimum density of 90% (per ASTM D 1557).

Native or Imported Fill shall contain no material with dimensions greater than 3" size, unless specifically approved. Fill that contains more than 30% of the material larger than ¾" size cannot be tested using the Modified Proctor and Nuclear Gauge methods (per ASTM D 1557) and shall be placed under Full-Time Observation (refer to the 'Oversize Material Placement' section).

Imported soil must meet the same criteria as on-site material, unless otherwise approved by the Town Engineer.

Plastic Soil, defined herein as material having a Plasticity Index ≥15 (or an Expansion Index ≥50) shall not be placed within 12" of footing or pad foundations. Roots, wood and other debris shall be removed from fill soil. Fill shall contain no more than 2% organic material.

All fill shall be placed in horizontal lifts. Loose lift thickness shall be limited to 8" maximum, unless the type of compaction equipment being utilized is proven capable of compacting thicker lifts. Use of thicker fill lifts may only be approved by the Town Engineer. In all cases, the full thickness (depth) of fill must meet compaction specifications, as confirmed by density tests.

Compaction shall be achieved by using proper compaction equipment for the structure type, the soil/material type being placed, and site conditions. Should the Town Engineer have concerns regarding the compaction process, the work shall be stopped.

A small vibra-plate shall not be used to compact loose fill lift thickness more than 3".

Unstable fill bottoms must be stabilized prior to placing fill

One method to stabilize soft or overly wet material is to Over-Excavate (OX) overly wet/unstable soils; spread, mix, and dry them back—and then re-compact the material between -1% and +2% of optimum moisture to the required density.

Another option is to OX the subgrade 18" below the bottom of the unstable zone, place *woven geotechnical fabric* for stabilization (Mirafi 600X or equivalent) with a minimum of 18" overlap at fabric edges. Then compact back 18" of Aggregate Base (AB) in approximate 3 lifts, with the density increasing by the 2nd or 3rd lift to the planned degree of compaction.

Other stabilization options may be considered for approval by the Town Engineer.

General Fill (90%)

All non-structural fill placed is considered General fill (unless otherwise stated in these standards) and shall be compacted to a minimum 90% at -1% and +2% of optimum moisture.

Structural Fill (95%)

All structural fill shall be compacted to a minimum of 95% at -1% and +2% of optimum moisture. Material placed within 6" beneath concrete sidewalk, curb and gutter, paved pathway, foundation bottom, or any material determined necessary for structural support shall be considered structural fill, and shall consist of approved aggregate base (or other material as specified).

Prior to placing Aggregate Base, the existing Subgrade shall be scarified 6", moisture conditioned to between -1% and +2% of optimum moisture and compacted to 95% of the maximum density, unless otherwise approved by the Town Engineer.

Controlled Low Strength Material (2 sack cement-sand slurry) may be approved to be used as structural support or trench backfill.

Roadway Fill (95%)

The upper 6" of material immediately beneath the aggregate base section shall be defined as the "Subgrade" (SG) section. The surface of the subgrade after passing String Lining/GPS Surveying (± ½") shall be considered the finished subgrade (FSG). Each of the 6" SG and the full AB sections shall be moisture conditioned to -1% and +2% of optimum moisture and compacted to a minimum of 95%. Preparation and compaction shall be performed as described under "General Fill Placement". Aggregate Base (AB) shall conform to Caltrans Class 2, ¾" AB specifications, with gradation, R-Value, and SE as shown below.

Class 2 Aggregate Gradation (Caltrans Test CT-202)

Sieve size	Percentage passing
1"	100
3/4"	90 - 100
No. 4	35 - 60
No. 30	10 - 30
No. 200 (fines)	2 - 9

R-Value = Minimum 78 (Caltrans Test CT-301)

Sand Equivalent = Minimum 25 (Caltrans Test CT-217)

(Recycled AB is acceptable, if specifically approved by the Town Engineer.)

Pavement Stability

All Roadway, parking, and other paved areas be stable; free of soft, segregated, nesting, or pumping areas prior to paving. Stability of the subgrade and aggregate base sections shall be confirmed visually by Town Public Works Inspector, (or QA/QC), and by "proof rolling". Proof rolling shall be performed with a fully loaded water truck.

Should a roadway or other area to be paved continue to be unstable; OX of the soft/wet/unstable subgrade and/or native soils shall be performed as described herein, unless other method(s) are approved by the Town Engineer.

One method to stabilize soft or overly wet material is to Over-Excavate (OX) the overly wet/unstable soils; spread, mix, and dry them back, and then re-compact the material at -1% and +2% of optimum moisture to the required density.

Another is to OX the subgrade 18" below the bottom of the unstable zone, place woven geotechnical fabric for stabilization (Mirafi 600X or equivalent) with a minimum of 18" overlap at fabric edges. Then compact back 18" of Aggregate Base (AB) in approximate 3 lifts, with the density increasing by the 2nd or 3rd lift to the planned degree of compaction.

The contractor is responsible to construct the roadway or other paved section (and underlying material) to form a stable surface, meeting compaction specifications.

Asphalt Paving

No Hot Mix Asphalt (HMA) shall be placed until the surface to receive the HMA has been approved by the Town Public Works Inspector. Contractor QC sampling and testing of the HMA during placement shall be performed per Caltrans Volume 1, Division V, Section 39 of current Caltrans Standard Specifications. As an alternative, the Town Engineer may approve any portion of the "Asphalt Placement Standards" to be incorporated into smaller projects.

Asphalt Type

½" HMA Type A with PG 64-16 oil binder. Gradation and Job Mix Formula (JMF) compliance per most current Section 39 of Caltrans Standard Specifications.

Tack Coat

Asphalt binder shall be SS-1 type emulsion, unless otherwise specified by the Town Engineer. Tack coat shall be placed between existing pavement courses & along all asphalt and concrete contacts.

Asphalt Production

The contractor shall be responsible for hiring a qualified manufacturer and supplier for all asphaltic products. It is the contractor's responsibility to assure that the materials produced and supplied by the asphalt plant conform to these specifications.

Placement and Compaction

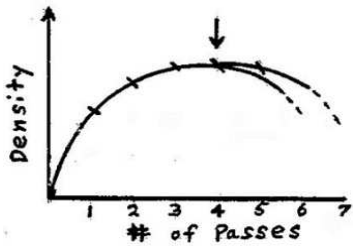
All pavement must be placed and compacted in two equal layers (unless the total thicknesses is 2½" or less), unless otherwise directed by the Town Engineer. Asphalt shall not be placed if the ground temperature is below 550F, on a wet or unclean surface, or if rain is predicted.

The temperature of the asphalt shall not exceed 325oF (prior to discharge/ or during placement). The upper layer shall not be placed over the lower layer until the temperature of the lower layer has dropped below 115oF. If the second layer of asphalt is being placed within 8 hours of the first layer, no asphalt binder shall be necessary, as long as the surface of the lower layer remains clean.

All compaction of the asphalt shall fall within the "Rolling Pattern Guidelines" listed herein, unless otherwise approved by the Town Engineer. Adjustments within the rolling pattern guidelines will be determined by the use of a nuclear gauge and temperature readings.

The nuclear gauge will be used to determine the "break-over" point of the asphalt (as determined by the highest wet density reading of a nuclear gauge) to help guide in the number of passes necessary per rolling sequence. A pass shall be considered "one coverage" by the roller in one direction.

Establishing A Rolling Pattern
(use with Rolling Pattern Guidelines)



Rolling Pattern Guidelines

During the *Compaction Rolling Sequence* after 2 passes, take a wet density reading with nuclear gauge in 'back scatter mode' or with a thin lift gauge. Mark the test location. After each consecutive pass take a reading at the same location. The highest density reading prior to a leveling off or lowering density will be the number of passes used for compaction (the "Break Over Point").

Rolling Sequence	Compactor Type	Temperature	No of Passes
Breakdown (static)	8 ton steel drum (min)[1]	2500F to 3250F	2 to 3
*Compaction (Vibratory)	Pneumatic Tired Roller[1,2]	175oF to 2500F	4 to 7 *
Finish (Vibratory)	8 ton steel drum (min)[1]	115oF to 175oF	2 to 4

[1] A combination steel drum/rubber tired roller may be substituted with Town Approval. Smaller trench compaction may require only a medium sized steel drum vibratory compactor.

[2] Min 6 ton pneumatic roller, with overlapping tires - inflated to manufactures max psi.

Note: A "vibra plate" may not be used to compact asphalt (except for edge smoothing). Only equipment approved by Town Engineering Department shall be used. Smaller rollers may be accepted upon Town Engineer approval.

Once an acceptable rolling pattern has been determined, the contractor shall not vary from it unless the monitoring by the QC engineering firm suggests differently. The QC engineering firm's field technician shall regularly monitor (by use of the nuclear gauge and temperature gun readings) the rolling/compaction operation, and as necessary, recommend rolling pattern change.

The contractor shall employ a qualified engineering lab to perform Quality Control (QC). The QC lab shall be on-site during the placement and compaction (Rolling Pattern) to guide the contractor.

It shall be the QC engineering firm's responsibility to monitor and document the rolling/compaction operation, and then present their observations in the final project report.
The Town of Windsor may utilize their Quality Assurance (QA) laboratory at any time to confirm the QC observations and data. Should conflicting data or observations occur, the final acceptance will be made by the Town Engineer based on our QA lab recommendations and results.

HMA Finish Surface

The final surface tolerance/deviation shall not exceed ¼", with transverse joints not exceeding ⅜"—as measured with a 10' straight edge. A quick test is to flood the newly paved surface with a water truck; no puddled water exceeding the aforementioned depths should remain. At the discretion of the Town Engineer, any areas that have not met rolling pattern, gradation, JMF, or surface tolerance, may be removed and or repaired to meet Town of Windsor Asphalt Placement Standards.

On specified projects, the Town of Windsor Engineer may determine to use the State of California Department of Transportation (Caltrans) most current specifications from Volume I, Section 39, or portions thereof, in lieu of a Rolling Pattern.

Roadway Cut

All cut portions of roadway shall be scarified to a minimum of 6", with all material larger than 3" size removed. This scarified zone shall than be moisture conditioned to -1% and +2% of optimum moisture and compacted to a minimum of 95%. The SG shall be stable—free of soft, segregated, nesting, or pumping areas.

Trench Fill

<u>Outside of paved or concrete areas:</u>
The bottom of all trenches shall be compacted to 90% unless otherwise approved by the Town Engineer. Utility trenches shall be "bedded" below the pipe(s) with a minimum 3" layer of sand, and then compacted to a minimum of 90%. Bedding shall be placed around pipes and conduits (haunches), then filled to a minimum of 6" over the top, and compacted to a minimum of 90%. The jetting of sand will not be allowed unless the Town Engineer specifically approves it. Bedding sand shall be non-plastic with no more than 12% fines and be well graded (per ASTM D 2487). Small vibra-plates will only be accepted for compacting sand, soil, or aggregate thicknesses 3" or less (unless other wise approved for bedding zones).

Trench areas shall be backfilled and compacted to a minimum of 90% with native or approved material. Trenches may be backfilled with 2 sack cement-sand slurry if prior approval is given by the Public Works Inspector.

Inside of paved or concrete areas:
The bottom of all trenches shall be compacted to 90% unless otherwise approved by the Town Engineer. Bedding shall be placed around pipes and conduits (haunches), minimum 3" below, then filled to a minimum of 6" over the top, and compacted to a minimum of 90%. Trenches beneath structural areas (such as paved roadways, building pads, passing under walls, etc.) shall be compacted to a minimum of 90% to within 6" of the top of the subgrade soil. The upper 6" subgrade zone, and the overlying A.B. layer (if necessary) shall be placed between -1% and +2% of optimum and compacted to a minimum of 95% density.

Unstable and/or saturated trenches shall be enveloped or underlain with either Mirafi 140N (or non-woven filter fabric equivalent) or Mirafi HP270 (or woven geotextile fabric equivalent), respectively. The non-woven fabric is typically used in potentially saturated trenches to limit fines from migrating. The woven fabric may be used for prevention of saturated fines migration and/or stabilization.

Trenches may be backfilled with 2 sack cement-sand slurry if prior approval is given by the Town Engineer. 'T-cut' may be waved by the PW Inspector if the existing asphalt is cut smooth/even. However, full depth HMA shall be placed over the 2 sack cement-sand slurry. Slurry thickness over 24" shall be vibrated.

All High Voltage Electrical Trenches shall have conduit encased a minimum of 6" beneath and horizontally, and covered over the top 18" with red colored 2 sack cement-sand slurry or concrete. The red dye shall be added during the batch mixing, not painted on or mixed in the trench. The Town Engineer or PW Inspector may require red coloring added to cement-sand slurry backfill in electrical or communication trenches to enhance safe location during future excavation.

Open Trenches and Excavations

Open or unfinished trenches or other excavations outside of roadways shall be securely covered when no workers are present and enclosed by orange safety fence, or heavier secure fencing as required.

Temporary covering for trenches in roadways shall be "non-skid" steel plate, pinned with steel stakes on all sides, and finished with compacted cut-back (cold patch) around the edges for smooth vehicle passage. It is the contractor's responsibility to have the aforementioned trench plates in position prior to the end of each work day, and to maintain temporary patches and plates until final HMA is placed. All restoration is required within 10 days of job completion, unless approved by the Town Engineer. All pavement excavations must be fully restored with HMA which has been placed over a properly compacted and/or cement-sand slurry backfill.

Trenches completed in paved areas shall be 'T' cut 12" each side with clean saw cut. If the trench has been backfilled with 2 sack cement-sand slurry, the "T" cut may be waived. Existing AB, AC, and/or concrete sections shall be matched for thickness and material type, unless otherwise specified. SS-1 (or approved equivalent) shall be brushed or sprayed to cover all existing contact surfaces of concrete or asphalt prior to placing HMA.

Trench Safety

Excavations must comply with OSHA 29 CFR Part 1926, Subpart P
Trench inspections of excavations (per Cal/OSHA, Article 6. Excavations,3.l), including trench walls, the adjacent areas, and protective systems shall be made daily (or more often as necessary) by a competent person. The competent person shall inspect for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other dangerous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence.

Competent Person Cal/OSHA (Definition): "One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them". The Town Engineer or Public Works Inspector may immediately stop work when OSHA safety standards are not being followed or if worker or public safety becomes a concern.

Concrete Structural Fill

A minimum 6" layer of Aggregate Base shall be compacted to a 95% or greater immediately beneath all concrete structures, including; Driveways, sidewalks, curb and gutter, catch basins, and other drainage structures. Thicker sections of AB must be placed when called out as stated in the project plans, specifications, or geotechnical report. AB shall conform to Class 2 AB as listed under 'Roadway Fill' of this Earthwork Standard. Prior to placing the AB the upper 6" of the subgrade shall be compacted to 95%.

Concrete Spec's and Testing

"Standard" concrete (sidewalk, curb & Gutter, and other non-structural supporting) shall be 3,000 psi, ¾", Type II/V. "Structural" load bearing concrete (including slabs, footings, piers, and other steel re-enforced concrete) shall meet a minimum compression strength of 4,000 psi (3/4" or 1" maximum as job specified), Type II/V.

All concrete formed with steel must have a minimum of 2" separation from all concrete finish (including footing bottoms and side walls). Steel placement shall be inspected and approved by TOW Inspector (or approved special inspector) prior to scheduling/pouring concrete. All concrete with steel shall be vibrated during pour.

All field concrete testing shall be performed by an ACI Certified Grade 1 Technician. Should the material delivered or being placed not meet the project and these standards, the QC, QA, or Town Inspector may reject the material. The material may not be placed (and not re-routed back to the project), or shall be fully removed; as determined by the Town Engineer.

All concrete shall be tested per ASTM C94, ACI 301, and ACI 318 procedures, unless otherwise directed or approved by the Town Engineer. A minimum of one set of four cylinders shall be taken per each day, or each separate area of concrete poured; and 1 set per each 50 yds^3 thereafter. Four cylinders shall be made for Compression tests (breaks), and shall be made at: (1) 7day, (2) 28 day, and (1) 'hold' (to be used if necessary, at a later specified time). The 28-day compression average must meet or exceed the submitted mix deign. Unacceptable material shall be removed, and fully replaced at the expense of the contractor. No visually cracked sidewalk, slab, or other structural concrete shall be accepted, and must be removed and replaced at the contractors cost.

All concrete mix designs must be submitted to TOW Public Works per "Materials and Submittals" as described in these Standards.

Foundation Excavations

Prior to placement of steel or concrete into foundation bottoms, the foundation excavation must be observed and approved by the Town Public Works Inspector or approved Special Inspector. The foundation must be firm, free of loose material, water, debris, or any other unacceptable material.

Foundations must be excavated to the width and depth per plan or project recommendations, and must be founded into dense native soil, or compacted fill. Foundations shall not be founded in plastic soil (P.I. 15 or greater per ASTM D 4813), unless otherwise recommended and designed by a geotechnical engineer. Expansion Index Test(s) may be required to confirm whether the soil has expansive potential, which should then be addressed by the Town or geotechnical engineer.

Footings, slabs on grade, or other foundations shall not be poured/placed on dried, cracking and/or desiccated soil. Differential support conditions are a concern where foundations span cut and fill soils, or foundations cross native rock and engineered fill. A geotechnical engineer shall be consulted to determine if overexcavation or other methods are necessary to help mitigate differential settlement.

Slope Fill and Construction

Fill constructed against existing slopes steeper than 5:1 shall have a keyway constructed at the slope toe. The keyway width shall be ½ the slope height, or a minimum of 1½ the width of the compaction equipment used. The key bottom shall be excavated sloped into the slope at a

minimum of 2%. The toe of the key shall be excavated into dense soil or bedrock formation to a minimum depth of 18", or as approved by the Town Engineer or the project Geotechnical Engineer. The Key bottom shall be inspected by the Town Inspector or the Project Geotechnical Engineer prior to placing fill.

As slope fill is placed, horizontal Benches shall be cut into acceptable dense native soil or compacted fill. Compaction and placement shall be as described under "Fill Placement". No material with dimensions greater than 3" shall be placed within 1 foot of the slope face.

Oversize Material Placement

"Oversize Material Placement" shall apply when more than 30% of the material is greater than ¾" size, and therefore cannot be tested per ASTM D 1557. Rocks with diameters of 3" or more may be placed in deeper fill areas, as approved by the Town Engineer. The rock fill lift thickness will be governed by the largest acceptable size material within the fill. Due to the generally untestable nature of the rock fill material, no density testing shall be performed. However, during the placement and compaction of the rock fill, full-time observation is required.

Predominantly granular material shall be used as matrix soil in rock fills (the matrix soil shall be defined as the material finer than ¾" size). The matrix soil shall have an SE of >32 (Sand Equivalency per Caltrans Test CT-217). The rock fill shall be placed so no voids are visible between the irreducible material, and no nesting is apparent. The matrix soil within the rock fill shall be compacted at 2% to 8% above optimum moisture.

Observation trenches shall be excavated as necessary (no less than one per every other lift) to visually confirm adequate densification, and to help confirm that the rock fill is free of nested material and/or voids. Should voids, nesting, loose material, or improper moisture content be observed, the unacceptable portion of rock fill shall be remixed and recompacted.

Density Testing Frequency

Trench:
Field density tests in fill shall be taken at intervals no less than every 2 vertical feet or 100 lineal feet of fill placed; for trenches shorter in length than 100', a minimum of two density tests will be necessary. All test locations shall be chosen by the testing agency or the TOW Public Works Inspector, not by the contractor.

General Fill:
Field density tests in fill shall be taken at intervals no less than every 2 vertical feet, or 100 yds^3, whichever amount is placed first. No less than two density tests shall be taken on any fill area.

All test locations shall be chosen by the testing agency or the TOW Public Works Inspector, not by the contractor.

Fill shall not be compacted over unacceptable fill, debris, or unprepared native soil.

Materials and Submittals

All materials to be used on construction projects must be submitted for review and approval to TOW Public Works or Building Departments—prior to use. Submittals must include information on the material description, the manufacturer, product specifications, quantity, and any other product information required by the Town Engineer or Building Official.

Aggregates, geotechnical fabrics, pipes, concrete, asphalt, steel and all other project specific materials (that are not specified here in these standards) shall meet the requirements specified in the project geotechnical report, project plans, contract documents, or project special provisions.

Sampling and Testing of Soil and Aggregate

All sampling procedures for soil and aggregates shall be performed in accordance with current ASTM standard or Caltrans most current test methods, unless otherwise approved by the Town Engineer. Laboratory and field sampling, testing, inspection or observations, shall be performed by experienced technicians, or other qualified personnel, as approved by the Town Engineer.

Quality Control (QC) and Quality Assurance (QA)

Quality Control (QC) refers to the qualified engineering field and lab personnel performing testing and inspection for the general contractor or their sub-contractors. Quality Assurance (QA) refers to the Town of Windsor's selected engineering (or other professional) firm that performs QC review; including sampling, material testing, inspection, and construction procedure documentation and review for the Town of Windsor Public Works and Building Departments.

The contractor shall hire an engineering laboratory to sample, test, and document earthworks operations (including backfill, grading, compaction tests, and all other materials inspections) required by TOW Standards and/or the project specifications. The engineering laboratory shall perform as contractor Quality Control (QC).

It is the Contractor and QC engineering firm's responsibility to understand current Town of Windsor Public Works Standards and communicate test results to the TOW Public Works in a timely manner. Stoppage of work due to delayed QC test data are the contractor's responsibility.

The contractor shall stop placing, and/or remove any unacceptable material upon notification by the QC engineering lab that the material is out of specifications. Placement shall not resume until the material is confirmed to the TOW Public Works to be back within project specs.

Any fill areas with a density test failure, or fill placed in a manner deemed unacceptable by the TOW Public Works Department, their representative, or the QC engineering firm, shall be reworked to meet these standards. Fill shall not be placed over unacceptable fill, or unprepared native soil.

The engineering lab (QC) shall submit all testing, sampling, and field observation documentation to the TOW Public Works Engineering Department, as specified in the subheading of this section titled "reports".

The TOW Public Works reserves the right to hire an engineering laboratory of their choice to perform (QA) testing and review. The QA shall have the final determination regarding acceptability of Materials and Procedures. TOW Public Works Department and their QA representative shall be allowed access to all work areas. The QC shall share all project test data, and related project material information with TOW Public Works or their QA. The contractor, or QC shall contact TOW Public Works or their QA to allow for concurrent testing and/or equal splitting of samples, as necessary.

Procedures not conforming to project requirements, or materials not meeting project specifications will be considered rejected and shall be corrected and/or removed immediately; unless otherwise approved by the Town Engineer.

Daily Reports

Communication of daily field or lab test data shall be communicated verbally or electronically to the PW Inspector. Depending on the project scope and size, adjustments to the daily/weekly reporting procedures may be made by TOW Public Works Department.

At the request of the TOW Public Works Department, QC daily field reports, QC lab reports, or other QC inspection/testing/observation information, shall be submitted for Town Public Works Department review during the construction of a project. Should QC information not be submitted as requested by the Town Engineer or is deemed incomplete or inaccurate; the project may be stopped by the Town Engineer until the required information is submitted.

Final Reports

Within 30 days of completion of an earthwork project, the permittee (or their representative) must submit a PDF report to the TOW Public Works Department. The report shall include daily reports, lab and field data related to the project. Lesser sized reports and or test result data may be accepted dependent on project size; however, any changes to the requirements in this section must be prior approved by Town Engineer.

The final laboratory/field report shall be signed by a registered civil or geotechnical engineer, or a NICET Level IV Technician (Materials or Geotechnical), unless otherwise approved by the Town Engineer.

Final reports shall include a statement that "All earthwork and materials placed were completed in general accordance with Town of Windsor "Design and Construction Standards". Any exceptions or non-compliances shall be stated in the report. All reports shall be submitted to the TOW Public Works Department within 30 days after the completion of construction.

ADA Ramps and Crossings, and other Details

The most current Caltrans Details (including the most current A88A and A88B) shall be implemented during all construction, unless otherwise approved by the Town Engineer.

Entrance/Exit Cobble (Refer to TC-1 in the CASQA Stormwater BMP Handbook)

3" to 6" size angular cobble stone shall be placed over a woven geotechnical fabric (Mirafi 600X or equivalent). Prior to the placement of the woven fabric, the area of placement shall be excavated to allow for a minimum of 12" thick section of cobble to be placed. This area of cobble entry shall be a minimum of 12' wide by 50' in length. The cobble entry shall be maintained by the contractor to remove mud/dust or other material buildup from within the 6" section.

Storm Water and Pollution Control (Refer to current EPA and CASQA Stormwater Standards and BMP's)

Construction work within the Town of Windsor shall fully comply with all current EPA Storm Water Pollution Prevention Plan (SWPPP), the California Department of Transportation Storm Water Management Plan, The California Regional Water Quality Control Board, National Pollutant Discharge Elimination System (NPDES), CASQA Best Management Practices (BMP), and current Town of Windsor Standard Plans, along with all other environmental quality and monitoring necessary. This includes all LID Structures.

Health and Safety (Refer to Federal OSHA and Cal OSHA current Standards)

At any time that the Public Works Inspector or the Town Engineer's representative deem that the materials, workmanship, or other activities are a safety concern, the job may be stopped immediately.

During the construction process, all applicable "OSHA Standards for the Construction Industry" shall be followed, including (but not limited to) 29 CFR Part 1926, Subpart P – Excavations. The Contractor performing the work shall supply a "Competent Person" per all CAL/OSHA Safety Requirements, not limited to, but including excavations.

All construction equipment and materials shall be safely fenced off from public access during the entirety of the project. Knowing and following Cal OSHA Safety Standards is the

contractor's responsibility. TOW Public Works may stop construction on a project at any time until safety concerns have been corrected.

During construction the contractor shall supply the work area (job site) with a minimum of one porta-toilet, and more as necessary or directed by the TOW Public Works Inspector for larger projects.

Dust Control (Refer to: Northern Sonoma County Air Pollution Control District, "Rule 430")

Fugitive Dust and airborne particulate must be limited in all areas that a contractor is performing construction, or where equipment is driven to access the work area.

A) "The handling, transporting, or open materials in such a manner which allows or may allow unnecessary amounts of particulate matter to become airborne, shall not be permitted"
B)"Reasonable Precautions must be taken to prevent particulate matter from becoming airborne", including, but not limited to:
* 'Covering open bodied trucks…'
* 'The prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or by other means.'

The Town of Windsor Public Works may stop a project until dust and debris have been properly controlled, and an acceptable method of dust control has been established.

Traffic Control (Reference the current CA MUTCD)

Traffic Control Plans (TCP's) must be submitted to Town of Windsor Public Works Department for review prior to beginning any work that may in anyway affect the flow or safety of either pedestrian, vehicular, or bicycle traffic. All TCP's must be specific to the location of the construction site. All TCP's must be reviewed and approved by the Town Engineer or their representative prior to receiving any related Encroachment, Building, or other affected Town permit.

To ensure that the traffic control device practitioner is designing TCP's and performing 'Work Zone Traffic Control' safely, the most current California Manual on Uniform Traffic Control Devices (CA MUTCD) shall be referenced. The most current edition of the Work Area Control Handbook (WATCH) is a good reference.

CA MUTCD, and other related information is available on the Internet at the following web link: https://dot.ca.gov/programs/safety-programs/camutcd

Prior to a Contractor being approved to perform Work Zone Traffic Control, the Town Engineer may require documentation to help confirm the qualification, experience, flagger certification, and training necessary to perform the planned project. Any traffic control contractor that does

not follow the approved TCP, or puts the public in danger in any way, can be removed from a project by the Town Inspector or Engineer at any time. The job will be stopped until the necessary TCP procedures and a qualified contractor is approved.

Should the Town Engineer or PW Inspector become concerned about a change in traffic, pedestrian, weather, lighting, or any other condition that may adversely affect safety; the work may be stopped immediately. The Traffic Management Contractor shall make all corrections required by the Town Engineer, prior to re-commencing work.

Plans and Permit

A grading permit shall be issued by the Town of Windsor Building Department prior to any grading.

Grading Plans shall be prepared by or under the direction of a person licensed to perform civil engineering in the State of California.

Grading Plans shall include the following information:

Benchmark
Existing grades (contours)
Proposed grades contours or spot elevations
Limits of grading
Typical sections or details showing how drainage will be dealt with at all the limits of grading and property lines
Swale and building pad typical plans or details
Existing trees to be saved or removed and fencing around trees to be saved.

All Grading Plans shall also reference the title, preparer and date of the Soils Report on which the plans are based and state that all work shall conform to the report. If the report is not to be used in its entirety, the provisions to be used shall be stated on the plans.

All Grading Plans shall also include a SWPPP & LID plan.

All Grading shall conform to the Town Tree Preservation Standards.

The Contractor shall be responsible for coordinating his work with the Geotechnical Engineer. All grading shall be performed to the satisfaction of the Geotechnical Engineer and shall be in conformance with the preliminary Soils Report filed with the Building Department and the current International Building Code (IBC), Appendix J, Grading.

3. Erosion Control

All graded areas and exposed soil within this project shall be seeded for erosion control by the contractor. Seed and mulch will be applied by October 1st (or before the first rain of the season,

whichever comes first) to all cut and fill slopes within or adjacent to project roads. Seed and fertilizer will be applied hydraulically or by hand at the rates specified below. On slopes, straw will be applied by blower or by hand and anchored in place by punching. All critical earthwork operations shall be performed during the dry weather season, from May 1st to October 1st unless otherwise approved by the Town Engineer in writing and it must comply with state construction general permit and the TOW's Municipal Stormwater NPDES Permit. The clearing of existing vegetation shall be confined within the limits of actual earthwork. Incremental development shall be required to ensure that the amount of land cleared at any time is limited to the area that can be developed during the construction period. Stormwater shall not be allowed to flow directly down unprotected slopes. Energy dissipating structures and erosion control devices shall be placed at all drainage outlets that discharge to natural channels. All sediment traps shall be maintained by the owner until such time that the Town or Sonoma County water agency accepts maintenance responsibility.

Item	Pounds per Acre
"Blando Brome"	30
Annual Rye Grass	20
Fertilizer (16-20-0 & 15% Sulphur)	500
Straw Mulch	4000 or 3500 lbs. of wood cellulose

Any existing septic system and existing wells shall be destroyed under permit from Sonoma County Permit and Resource Management Department.

PART II – STANDARD SPECIFICATIONS

SERIES 400
SEWER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

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SERIES 400 - SEWER SYSTEM
CONSTRUCTION STANDARD SPECIFICATIONS

1. Materials

Sewer pipe shall be ductile iron pipe or polyvinylchloride pipe.

2. Polyvinylchloride (PVC) Pipe

PVC solid wall sewer pipe and fittings for gravity sewers shall be made from all new, rigid, un-plasticized polyvinylchloride in accordance with the most recent version of ASTM Standard Specifications D3034 and F679 and shall have a wall thickness of at least SDR 35. Joints shall consist of an integral thickened bell-and-rubber ring and shall conform to the most recent version of ASTM D3212. Gaskets shall conform to the latest version of ASTM F477. Joints shall be assembled using only manufacturers recommended lubricant.

All pipe shall have a home mark to indicate full penetration of the spigot when the joint is made.

All PVC pipe entering or leaving a concrete structure shall have a standard manhole gasket, as supplied by the pipe manufacturer, firmly clamped around the pipe exterior and cast into the structure base or near the structure wall center as a water stop.

After pipe installation and placement/compaction of backfill, but prior to placement of pavement, all pipe shall be cleaned, CCTV video inspected and mandrelled to measure for defects in workmanship or obstructions. Defects in workmanship or obstructions shall include, but not be limited to deflections, sags, joint offsets, protruding gaskets, evidence that pipes were not fully stabbed together at the joint and lateral pipe intrusions. A rigid mandrel, with an effective circular cross section having a diameter of at least 95% of the specified base inside diameter shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. All obstructions encountered by the mandrel shall be corrected by the Contractor. Obstructions due to deflection shall be corrected by replacement of the over-deflected pipe, not by re-rounding in place. Any workmanship details shall be corrected by the Contractor.

If a section of pipe fails to meet the mandrel test and is reinstalled and fails the second time, said section(s) of pipe shall be replaced with an approved rigid pipe material.

If required by the Town Engineer, the manufacturer shall furnish to the Town a 5% deflection mandrel and proving ring as shown in STD. PLAN NO. 415, “Plastic Sewer Pipe Deflection Mandrel” of the Town Standards for the Town's retention and use.

The average inside diameter for PVC Solid Wall Sewer Pipe shall be the "average outside diameter" minus 2.12 times the "Minimum Wall Thickness" (see ASTM D3034 and F679).

If required by the Town Engineer, the Contractor shall re-test the solid wall pipe using a mandrel with an effective circular cross section having a diameter of at least 95% of the specified average inside diameter eleven (11) months after recordation of Notice of Completion of a Town Sewer Contract or after the acceptance by the Town Council of the subdivision. Any pipe which fails to pass the mandrel test shall be replaced at the expense of the Contractor. The Town reserves the right to determine the longitudinal limits of any pipe that is required to be replaced. Pipe replacement shall be guaranteed by the project maintenance bond.

3. Ductile Iron Pipe (DIP)

Ductile iron pipe shall be cement lined, new pipe conforming to ANSI/AWWA C151/A21.51-96 or most recent issue, if any, as sponsored by the American Water Works Association for thickness class 50 Ductile Iron Pipe. The pipe shall be furnished with bell and spigot ends, "Tyton Joints", or mechanical joints except where specifically specified on the plans.

All Ductile iron pipe buried underground shall be encased in polyethylene film in the tube form. Polyethylene material and installation procedure for the encasement shall conform to ANSI/AWWA C105/A21.5-18 or most recent issue, if any. Installation Method "A" as described in aforementioned specification shall apply.

Couplings for connection to the sewer main shall be of a type approved by the Town.

4. Excavation and Backfill

Excavation and backfill shall be as shown on STD. PLAN NO. 501, "Standard Trench Detail" of the Town Standards.

All stumps and large roots encountered during trenching operations shall be removed to the satisfaction of the Town. The trench shall be opened sufficiently ahead of the pipe laying operations to reveal obstructions. Trench crossings shall be provided as necessary to accommodate public travel and to provide convenient access to adjacent properties. Flow shall be maintained in any sanitary sewers, storm drains, water lines, or water courses encountered in trenching.

All cutting, handling and disposal of asbestos cement pipe shall be done in accordance with the Contractor's State Licensing Law and all applicable laws and regulations.

5. Existing Manholes

Existing manholes and cleanouts located within the public right of way shall be adjusted to conform to finished pavement grades in accordance with the details shown on the plans.

Prior to the removal of an existing manhole frame, a platform shall be constructed in the manhole above the top of the sewer to prevent any dirt or debris from falling into the sewer. The platform shall remain in place until all work on the manhole has been completed and the asphalt concrete has been placed around the manhole. Prior to the removal of the platform from the manhole, all dirt and debris shall be removed.

Lowering of the manhole ring and cover shall be accomplished by the removal of existing concrete grade rings below the manhole ring or by removing the upper section of manhole barrel and substituting with a shorter section of barrel.

In the event that the portion of barrel section to remain is cracked or damaged or otherwise made unsuitable for use, the entire section shall be removed and replaced with a new section of barrel. Trimming of taper sections will not be permitted.

All sections of the manhole shall be set in cement mortar or in approved gasket material. Trim excess gasket material and plaster inside joints smoothly. Manhole sections set in cement mortar shall be smoothly plastered inside and out.

After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint before the close of that work day.

Within two working days of paving, all manholes and cleanouts shall be adjusted to grade as noted in STD. PLAN NOS. 401 and 402, and inspected.

6. Pipe Laying

Where ground water occurs in a trench, pumping shall continue until backfilling has progressed to a sufficient height to prevent floatation of the pipe. Water shall be disposed of in such a manner as to comply with State Standards with respect to turbidity, cause no property damage or not be a hazard to public health or the environment. All de-watering plans/operations shall be approved by the Town Engineer prior to commencement of de-watering. Water from trench de-watering operations shall not be disposed of into the public sewer.

Where projects consist of construction of new mains or extensions of existing mains, contractors must make provisions to keep flow from entering the sewer collection system. This shall include the installation of a positive sealing plug on the outlet of the new mains closest manhole to the existing main. Additionally, if any new laterals enter the new main between the existing main and the closest manhole on the new main, each lateral shall be individually plugged with a positive sealing plug. The Contractor shall be held responsible to periodically check that all plugs are holding tight. The Contractor shall ensure that the water contained in the new main is not contaminated with human or hazardous waste, prior to removal of any plugs. The Contractor shall make provisions to dewater the new mains without disposal into the sewer collection system and without cause of property damage or hazard to the public health or environment. Failure to comply may result in penalties.

Where construction consists of constructing a new main or extension of an existing main, the downstream end of the new main shall be securely closed with a tight fitting plug until the connection is approved by the Town.

If the new sewer main is connecting to an existing main at a location other than an existing manhole, the Contractor shall pothole the existing sewer main to verify invert grades and locations.

Sewer pipe shall be installed on the alignment and grade as shown on the plans and in accordance with the Standard Specifications, or as directed by the Town Engineer. Existing sewer laterals shall be removed replaced and reconnected at the locations shown on the plans, or as directed by the Town Engineer. Existing lateral connections found in the field but not shown on the plans must be immediately brought to the attention of the Town Engineer staff.

Sewer pipe shall be laid in straight lines and on uniform rates of grade between points where changes in alignment or grade are shown on the plans. The interior of the pipe shall be free of foreign matter before lowering into the trench.

The pipe manufacturer's written instructions covering the installation of his pipe shall be closely followed unless otherwise directed by the Town or these Special Provisions. The trench shall not be backfilled until authorized by the Town. Pipe laying shall precede upgrade with the spigots pointing in direction of flow.

Electro-optical grade setting devices must be used and shall be operated by a person proficient in its operation.

Any section of pipe found to be defective or which has had grade or joints disturbed shall be re-laid by the Contractor at Contractor’s expense.

Proper implements, tools and facilities satisfactory to the Town shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings and accessories shall be carefully lowered into the trench by means of derrick, ropes, or other suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. The pipe and accessories shall be inspected for visible defects prior to lowering into trench. Any visibly defective or unsound pipe shall be replaced.

The line and grade of existing utilities shall not be altered. Any leakage caused in existing utilities by reason of the Contractor's operations shall be immediately repaired at the Contractor's expense.

Existing storm drains shall be supported or removed and replaced at the Contractor's option. In any case, the Contractor shall be responsible for maintaining the existing line and grade of the storm drains.

Existing water lines shall be supported in place with service maintained during construction. The Contractor shall be responsible for any damage resulting from improper backfilling.

Existing Sewer lines shall be supported in place with service maintained during construction. The Contractor may, at Contractor's option, remove and replace any sewer laterals which are not in use during construction. The Contractor shall be responsible for damage to sewer lines during construction and any damage resulting from improper backfilling.

7. Sewer Laterals and Services

Sewer lateral inverts shall be set above the midpoint of the sewer main.

A. Grades and Alignment

1. Sewer laterals shall be run at a uniform slope of not less than 1/4 inch per foot toward the main sewer. Where it is impractical to obtain a uniform slope of 1/4 inch per foot slope due to the depth of the main sewer or to the structural features or the arrangement of any building or structure, a reduction of slope may be approved to not less than 1/8 inch per foot by the Town Engineer.

B. Pipe Cover and Clearance

2. Lateral sewers in public rights-of-way shall be installed at sufficient depth to serve the parcel involved, but in no case less than three (3) feet of cover at the property line.
3. On-site sewer laterals shall have a cover of eighteen (18) inches minimum from finished grade. Where cover is less than eighteen (18) inches, ductile iron pipe shall be used. Where building sewers cross driveways, ductile iron pipe shall be used.
4. In particular situations, such as bridge crossings, sewers may be installed above-ground. Special approval from the Town Engineer will be required. In such cases ductile iron pipe shall be used along with special supports, and anchors, as required by the Town Engineer. In such cases the contractor shall prepare a drawing to scale showing the proposed construction and special details for the Town Engineer's approval prior to commencing work.

8. Sewer Structures

Manholes shall be standard precast concrete manholes as detailed on STD. PLAN NO. 401 and STD. PLAN NO. 402. Mains larger than 18 inches in diameter or deeper than 8 feet require 60-inch diameter manholes. Precast concrete manhole bases must be from the list approved by the Town.

Manhole bases may be poured-in-place concrete on undisturbed earth. The bases shall be poured full thickness against the side of the manhole excavation or to dimensions shown on the plans. The manhole excavation site shall be dewatered before pouring.

Pre-cast manhole bases, conforming to Town STD. PLAN NO. 401 and 402 in dimensions and the requirements outlined below for materials may be used. Such pre-cast bases shall be placed on a minimum 12-inch thick cushion of drain rock, as specified in STD, PLAN NO. 401 and STD, PLAN NO. 402. The drain rock shall extend a minimum of 6 inches beyond the outside edges of the base.

Concrete for manhole bases shall be Class A Portland cement concrete conforming to the applicable requirements. The Portland cement shall be Type V conforming to ASTM Designation C150 or low-alkali-Type II cement meeting the requirements for Type V cement.

Where steel reinforcement is required in manhole base construction, such reinforcement shall be furnished and placed as shown on the plans and in accordance with the applicable provisions.

The base slab and initial riser section shall be connected with integrally poured concrete to create a watertight joint. Flow channels shall be constructed as shown on the plans. Changes in size or grade shall be made gradually and changes in direction by smooth curves. All finished surfaces shall be smoothly troweled with a steel trowel. All manhole barrels and taper section shall be precast concrete sections using Type V Portland cement complying with ASTM Designation C150 or low-alkali Type II cement meeting the requirements for Type V cement.

The 48-inch and 60-inch diameter barrels and taper sections shall be constructed in accordance with the applicable provisions of ASTM Designation C478 and shall be inspected by the Town to determine that the interior surfaces are smooth and free of pockets or depressions. The inside face of all barrels, tapers and rings shall be aligned with and flush to adjacent sections.

Manhole frames and covers shall be in accordance with the Town STD. PLAN NO. 410.

At locations where sewer is to be installed into or out of existing manholes, the manhole wall and base shall be chipped to accept the new size of pipe and to form a flow channel in the manhole base. The Contractor shall dry pack around the pipe between the pipe and the chipped-out opening. The Contractor shall also backfill the area around the pipe with concrete to insure a watertight connection.

Mainline cleanouts shall be installed per STD. PLAN NO. 404 at the locations shown on the Plans.

All joints in manholes shall be sealed by means of a preformed, self-bonding, self-sealing plastic gasket, such as "Ram-Nek", manufactured by the K.T. Snyder Company, Houston, Texas, or approved equal. Joint seals shall be installed in full compliance with the manufacturer's current recommendations. All manholes shall be water-tight prior to grouting.

After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint before the close of that work day.

Within five working days of paving, all manholes and cleanouts shall be adjusted to grade and inspected.

9. Testing of Sewers

Testing of all portions of the sewer including manholes and grease traps will be required. Low pressure air testing is required. The inspector can allow water testing on a case-by-case basis.

The following procedure shall be used for air testing.

1. Clean pipe to be tested by propelling a snug fitting inflated rubber ball through the pipe with water. Remove any debris.
2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
3. If the pipe to be tested is submerged in ground water, the Town Inspector may require that gauge pressures be increased to compensate for groundwater hydrostatic pressure.
4. Add air slowly to the portion of the pipe installation under test until the internal pressure is raised to 5.0 psig.
5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.
6. After an internal pressure of 5.0 psig. is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
7. After the two minute period, disconnect the air supply.
8. When pressure decreases to 5.0 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. The minimum allowable time in seconds shall be based on the diameters and lengths of pipe under test. The Contractor will be allowed to manually bleed air as required to drop the internal pressure to 5.0 psig. to start test, if desired.

Air test data sheets and nomograph with directions for computing the specification time are available at the office of the Town Engineer.

If water testing is approved by the Town Inspector, the following procedure shall be used:

1. Manholes, grease traps and other structures shall be filled with water to the rim of the frame casing.
2. Structures shall lose no more than 2 inches over a period of 30 minutes.

For either exfiltration or infiltration test, the maximum leakage shall not exceed 250 gallons per inch of pipe diameter per mile per 24 hours as measured over a period of 30 minutes minimum. Should the leakage exceed the maximum allowable rate, the Contractor shall repair, overhaul, or rebuild the defective portion of the sewer line to the satisfaction of the Town Engineer at no

additional cost to the Town. After repairs have been completed by the Contractor, the line shall be retested as specified above, all at no cost to the Town.

The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at Contractor's option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place and compacted.

In the event that the exfiltration test prescribed above is impractical due to wet trench conditions, these portions of the sewer line where such conditions are encountered will be tested for infiltration. The Town shall determine whether the exfiltration or infiltration test will be used.

Even if the test for leakage is within the prescribed limits, the Contractor shall repair any obvious leaks.

The Contractor shall hire an independent television inspection service to perform a closed-circuit television inspection of all newly constructed sewers and laterals. A video record of the television inspection shall be produced and delivered to the Town in color digital format, together with a typed log of the inspection.

The following conditions shall exist prior to the television inspection:

A. All sewer lines shall be in installed, backfilled and compacted.
B. All structures shall be in place, all channeling complete and all pipelines accessible from structures.
C. All other underground facilities, utility piping and conduit within two feet of the sewer main shall be installed.
D. All compactions required shall be completed.
E. Pipelines to be inspected shall be balled, flushed and mandrel tested.
F. The final air or water test shall have been completed.
G. Immediately before the television inspection, run fresh water into the sewer until it passes through the downstream manhole.
H. No more than 1" deep water will be present at all times during video inspection.

When the above work has been completed, the Contractor shall notify the Town 48 hours in advance of the date for television inspection. During this inspection, the Contractor or its authorized representative shall be present to observe the video pictures as provided by the television camera. Cameras shall be pointed downstream and all video inspections shall run downstream.

The following video tape observations shall be considered defects in the construction of the sewer pipelines and will require corrections prior to acceptance:

A. Off grade - 0.08 feet or more, deviation from grade;

B. Joint separations - over 3/4-inch;
C. Offset joints;
D. Chips in pipe ends - no more than 1/4-inch deep;
E. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, root, etc.);
F. Infiltration;
G. Debris or other foreign objects;
H. Protruding gaskets
I. Other obvious deficiencies when compared to the approved project plans and specifications, these Standard Specifications and the Standard Plans.

The Contractor will be notified in writing of any deficiencies revealed by the television inspection that will require repair, following which the Contractor shall excavate and make the necessary repairs and request a television re-inspection. Television re-inspection shall be at the Contractor's expense.

10. Trench Resurfacing

Trench resurfacing shall be as shown on STD. PLAN NO. 501, "Standard Trench Detail".

PART II – STANDARD SPECIFICATIONS

SERIES 500 – WATER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

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SERIES 500 – WATER SYSTEM
CONSTRUCTION STANDARD SPECIFICATIONS

1. Description

All water mains and related appurtenances shall be constructed in accordance with the Town Water System Design Standards.

2. Pipe

The pipe, except where otherwise specified on the plans, shall either be ductile cast iron or polyvinyl chloride (PVC), all in accordance with the following:

A. Ductile iron pipe shall be cement lined, new pipe conforming to AWWA Standard C151, pressure class 350. The pipe shall be furnished with either bell and spigot ends, "Tyton Joints" or mechanical joints, except where otherwise specified on the plans.

B. Polyvinyl chloride (PVC) Pipe 4-inch through 12-inch shall be minimum class 150, or as shown on the plans and conforming to the requirements of AWWA C900 "Standard for Polyvinyl Chloride Pressure Pipe, 4-inch through 12-inch for Water" and shall be furnished with either bell and spigot ends or couplings designed to effect an elastomeric pressure seal. PVC pipe greater than 12 inches in diameter shall conform to AWWA C905 DR-25, minimum pressure rating 165 psi, or as shown on the plans.

Each and every length of pipe and coupling shall be marked with the manufacturer's name, lot number and the date the pipe was tested. The pipe shall be tested in accordance with the most recent American Water Works Standard Specifications and amendments thereto for the pipe furnished. The testing shall be performed in a State licensed materials testing laboratory where the testing standards meet or exceed State of California testing standards.

Accompanying or preceding each load of pipe delivered, a certificate shall be furnished to the Town certifying that the pipe which is (to be) delivered has been tested and meets the requirements of the American Water Works Association Standard C900/C905 and these Specifications. The certificate shall identify the pipe by manufacturer's name, lot number and date tested by a State certified materials testing laboratory.

Number 10 insulated copper wire shall be laid on top of and along the entire length of all service laterals and mains and shall be extended to the surface at all valve locations, blow-offs and meter boxes sufficiently for locator equipment to be attached.

3. Polyethylene

All water service tubing 2 inches in diameter and smaller shall be polyethylene (PE) SDR 9 conforming to ASTM D-2737 with a water pressure rating of 200 psi.

4. Fittings

All fittings shall be new gray iron or ductile iron fittings conforming to ANSI/AWWA C110/A21.10 or new ductile iron compact fittings conforming to ANSI/AWWA C153/A21.53 or latest revision and shall be compatible with the type and pressure class of pipe used. Gray iron fittings shall be coated inside and outside with a petroleum asphaltic coating conforming to AWWA C110.

Ductile iron fittings shall be cement mortar-lined in accordance with AWWA C104, or latest revision, and shall have a petroleum asphaltic coating conforming to AWWA C110. Ductile iron fittings shall have a minimum pressure rating of 250 psi and shall otherwise meet or exceed the pressure rating of the pipe to be installed and shall have a minimum Class 53 thickness rating.

All exposed nuts, bolts and threads (except stainless steel) shall be painted with Bitumastic paint or approved equal after nuts are tightened.

A. Restrained joint fittings shall be ductile iron in accordance with the applicable requirements of ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision and shall be compatible with the type and pressure class of pipe used.

5. Gate Valves

Gate valves shall conform to AWWA Standard C509, or latest revision, and shall be the resilient seat type with non-rising stem, opening counter-clockwise with O-ring stem seal and suitable ends for connections to type of pipe or fitting used. The working pressure rating of gate valves shall meet or exceed the pressure rating of the pipe specified on the plans. External bolts and nuts shall be 304 stainless or poly wrapped per STD. PLAN NO. 503.

6. Butterfly Valves

Butterfly valves shall conform to AWWA Standard C504, or latest revision, and shall be of the rubber seat type. Valve discs shall rotate 90 degrees for the full open position to the tight shut position. The valve seat shall provide a tight shutoff at a pressure differential of 150 psi upstream and 0 psi downstream in either direction. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the operating nut.

7. Valve Boxes

Each gate valve shall be covered by a precast 8-inch valve box set flush with street surface with cast iron ring and cover marked "WATER". The valve boxes are to be Christy G5, or approved equal.

8. Fire Hydrant and Lateral Assembly

At the location(s) shown on the plans, the Contractor shall provide and install a fire hydrant and lateral assembly per STD. PLAN NO. 504.

No bends will be allowed in fire hydrant laterals without approval of the Town Engineer.

Fire hydrants shall conform to the list of approved fire hydrants shown on STD. PLAN NO. 504.

Residential fire hydrants will have one 2½-inch outlet and one 4½-inch outlet.

Commercial fire hydrants will have two 2½-inch outlets and one 4½-inch outlet.

All hydrants shall be painted in accordance with the specifications shown on STD. PLAN NO. 504.

All hydrants shall be installed plumb.

Before a fire hydrant may be placed in service, a high velocity flushing of the hydrant lateral shall be witnessed and approved by the appropriate Fire District personnel.

9. Asbestos Cement Pipe

The installation of asbestos cement pipe is prohibited. All cutting, handling and disposal of asbestos cement pipe shall be done in compliance with the Contractor's State Licensing Law and all applicable laws and regulations.

10. Excavation and Backfill

Excavation and backfill of the pipeline shall be as shown on STD. PLAN NO. 501.

Excess material from excavation shall become the property of the Contractor and shall be disposed of to the satisfaction of the Town Engineer.

Prior to disposal of any materials or operation of any equipment on site provided by the Contractor for disposal of excess trench excavation owned by him, the Contractor shall submit to the Town Engineer written authorization for such disposal of materials and entry permission signed by the Owners of the disposal site and the required permits.

11. Laying and Handling Pipe Materials

Proper implements, tools and facilities satisfactory to the Town Engineer shall be provided and used by the Contractor for safe, convenient and workmanlike prosecution of the work. All pipe fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe coatings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and the ductile iron pipe rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without

damage to pipe. All pipe stockpiled on the job shall be stored with the ends covered to prevent the entrance of foreign matter.

Whenever it is necessary, either in the vertical or horizontal plane, to avoid obstructions, or when long radius curves are permitted, the amount of deflection shall not exceed the maximum recommended by the pipe manufacturer or that required for satisfactory jointing.

Each length of pipe shall be free of any visible evidence of contamination, dirt and foreign material before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. At times when pipe laying is not in progress, the open ends of any pipe which have been laid shall be closed by approved means to prevent the entrance of small animals or foreign material. Trench water shall not be permitted to enter the pipe.

12. Laying PVC Pipe

Individual pieces of pipe, valves, and fittings shall be joined by placing the rubber rings on the machined ends of the pipe and pulling the couplings, valves or fittings in accordance with the manufacturer's recommendations. The rings shall be checked to be sure they are in the proper position after the coupling is in place. Care shall be taken to ensure proper seating of the rings, and adapters shall be utilized for connections as required by the manufacturer.

Fittings for PVC pipe shall be either the mechanical joint type or the push-on type.

PVC pipe shall be as specified in and installed per the latest revisions of AWWA C900 or C905 as appropriate and in accordance with the manufacturer's recommendations.

13. Laying of Ductile Iron Pipe (DIP)

The flame cutting of pipe by means of oxyacetylene torch shall not be allowed.

Ductile iron pipe shall be as specified in and installed per AWWA C600, or latest revision, and in accordance with the manufacturer's recommendations.

14. Thrust Blocking

All tees, bends, and plugs shall be provided with thrust blocking and/or harness as shown on the plans or in accordance with STD. PLAN NO. 518 and 519.

15. Hydrostatic Test

The hydrostatic test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at its option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place. Each valved section of pipe, or combined sections, as approved by the Town Engineer, shall be subjected to a hydrostatic pressure of not less than

200 psi for 15 minutes, then 150 psi for 30 minutes, for a total duration of 45 minutes. Valves on existing mains in service required to be operated in connection with this job shall be operated only by personnel of the Town. Each section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection, all necessary apparatus, gauges, and measuring devices shall be furnished by the Contractor. The Contractor shall make the taps into the pipe and shall furnish all necessary assistance for conducting the tests. Before applying the test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of the highest elevation, and afterward tightly plugged.

Suitable means shall be provided by the Contractor so that Town can determine the quantity of water leakage under the test pressure. No pipe installation will be accepted until all leakage is stopped. The Contractor shall, at its own expense, locate the cause and repair any leakage.

16. Chlorination and Bacteriological Testing

Chlorination and bacteriological testing must be in accordance with AWWA Standard C651-05, or most current revision.

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe line. The water throughout its length shall, upon test, both chemically and bacteriologically, be proved equal to the water quality served to the public from the existing water supply system.

Should the initial treatment, in the opinion of the Town prove ineffective, the analysis shall be made by a State certified analytical laboratory.

Care shall be taken, and if necessary, provisions shall be made by the Contractor to ensure no chlorinated water from treated pipelines enters any natural surface waters either directly or by way of any storm drainage systems.

Chlorinated water used to disinfect the pipe is the property of the Contractor and its disposal is the responsibility of the Contractor. Chlorinated water used to disinfect the pipe shall be disposed of in accordance with all laws and regulations.

The following criteria must be met prior to disposal of chlorinated water to storm drains or other inland waterways:

A. Water to be disposed of must contain no chlorine residual.

B. pH must be between 6.5 and 7.5.

C. North Coast Regional Water Quality Control Board, at 576-2220, must be notified of discharge.

Discharges not meeting the above criteria may be allowed to be disposed of into the sanitary sewer system, after first meeting the following requirements:

A. The Contractor must obtain permission from the Town Public Works Department, prior to the discharge being disposed of in the sanitary sewer. The payment of any fees required will be the responsibility of the Contractor.

B. The pH of the water must be between 6.0 and 9.5.

Chlorination procedures shall be repeated until confirmed tests show that the water sampled from the newly laid pipe conforms to the above requirements.

There shall be a 24-hour waiting period after blowing off the main prior to taking bacteria samples. The initial bacteria test shall be of the 28-hour duration type, in accordance with the State Department of Health Services requirements. If the initial bacteria test fails, two consecutive passing bacteria tests must be obtained prior to making the tie-in. The first of these two subsequent tests shall be of the 24-hour duration type, and the second shall be of the 72-hour duration type. Bacteria tests are valid for only 30 days. If there is more than a 30-day lapse between a passing bacteria test and the applicable tie in, the bacteria test must be repeated prior to water main tie-in. Sampling and testing are the responsibility of the Contractor.

17. Water Main Tie-Ins

Water main tie-ins are not permitted on Fridays or days preceding a holiday except as authorized by the Town Engineer.

The Contractor shall notify the Town 24 hours prior to individual mainline shutdowns required to facilitate tie-in operations. The Contractor shall schedule tie-in work with the Town at (707) 838-1006. Tie-ins will not be scheduled until a written passing bacteria test has been received by the Town. All shutdowns and valve turning operations shall be performed by Town personnel only. A Town inspector must be present during all tie-in operations. No tie-ins shall be performed without prior authorization of the Town.

Pipe and fittings furnished for tie-ins shall be no smaller than the existing water main to which each tie-in is made.

Contractors or parties who fail to keep field appointments may be billed for Town personnel's waiting or standby time and the Contractor shall bear the costs incurred by the Town for re-notification of its customer.

Interruption of service to commercial customers shall, as much as practical, be coordinated with the customer's needs. The Contractor will contact the customer, consider the customer's interests and inform the Town accordingly.

After-hours work or weekend work is to be avoided whenever possible and any overtime costs shall be borne by the Contractor requesting such after-hours work. Normal working hours are: 8:00 A.M. to 4:30 P.M., Monday through Thursday.

Contractors or parties requiring work of any kind by the Town shall request such services a minimum of 24 hours in advance of the time such services are desired. Work requests, which will involve Town personnel for more than 8 hours and/or extensive number of Town supplied parts, shall be requested a minimum of 7 calendar days in advance.

If it is necessary to interrupt service to any customer, the Contractor shall make the work request an additional 72 hours (three additional working days for a total of five working days in advance notice) in advance of the time such services are desired, to allow the affected customers a minimum of 72 hours of notice.

When installing a cut-in-tee that is larger than the existing pipe, the new assembly must be installed at the depth sufficient to allow the valve to remain below the subgrade of the street which may necessitate lowering the existing pipe.

When a connection is required to an existing water pipe, the Contractor shall provide all excavation, shoring, backfill and trench resurfacing per STD. PLAN NO. 501. Where the connection is to be a "hot tap", the Contractor shall provide and install the tapping valve and sleeve per STD. PLAN NO. 527, and any other hardware required, and make the tap under the Town's inspection. When any joint on an existing water pipe is disturbed, that joint and any proposed hot tap 4 inches in diameter and larger shall be replaced with a "cut-in" tee. When a "cut-in" tee and valve(s) assembly is required on the plans, the Contractor shall provide and install the entire assembly (including valves), and any other hardware necessary under Town inspection, and shall provide all other work and materials necessary to complete the installation to Town Standards.

During the work, the Contractor shall exercise all necessary precautions to prevent the entrance of trench water or any other foreign material into the water main and shall conduct all operations in accordance with the most stringent sanitation practices. The interior of all appurtenances being installed shall be thoroughly swabbed or sprayed with a 1-percent hypochlorite solution prior to installation.

18. Water System Component Reporting

The Contractor shall submit the material type, manufacturer and model number of all water system components to the Town prior to final testing.

19. Construction Water

Construction water shall be obtained from the Town only at the point(s) designated by the Town.

PART II – STANDARD SPECIFICATIONS

SERIES 600 – RECYCLED WATER SYSTEM CONSTRUCTION STANDARD SPECIFICATIONS

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SERIES 600 – RECYCLED WATER SYSTEM
CONSTRUCTION STANDARD SPECIFICATIONS

1. Description

All recycled water mains and related appurtenances shall be constructed in accordance with the Town Design Standards.

2. Procedures

A. Contractor shall give the Town of Windsor Public Works Department 48 hours' notice before starting work. Call (707) 838-1230 (Public Works Inspections) or contact at 8400 Windsor Road, Windsor, CA. 95492-0100 for Inspection Services.

B. Work hours are limited to from Monday through Friday 7:00 A.M. to 7:00 P.M. Inspection will be available Monday through Friday from 7:30 A.M. to 4:30 P.M.

C. All underground improvements shall be installed and approved prior to paving.

D. Work within Town right-of way:

1. Issuance of an Encroachment Permit and associated insurance requirements and surety (i.e. bonding) is required prior to any work within Town right-of-way.
2. The Contractor is responsible for providing all traffic control.
3. Contractor shall obtain an encroachment permit from the Town of Windsor, 8400 Windsor Road, Bldg. 100, Windsor, CA 95492-0100 before start of work.
4. The Contractor shall comply with all requirements of the permit.

E. Permits: Contractor shall obtain all required permits from other agencies and pay all fees prior to commencement of any work.

3. Marking/Labeling/Signage

All recycled water system components, whether public or private, shall meet the requirements of Series 600, Part 1, "Recycled Water Facilities" section 6. A. of these Standards.

4. Pipe

All recycled water pipe shall be colored, marked, and labeled in accordance with these Standards. The pipe, except where otherwise specified on the plans, can either be Ductile Cast Iron or Polyvinyl Chloride (PVC), all in accordance with the following:

A. Ductile Iron Pipe shall be cement lined, new pipe conforming to AWWA Standard C151, pressure class 350. The pipe shall be furnished with either bell and spigot end or Mechanical Joints except where otherwise specified on the plans. All exposed nuts, bolts and threads (except stainless steel) shall be painted with Bitumastic paint or approved equal after nuts are tightened.

1. Where the normal main line static pressure exceeds 150 psi, pipe and fittings shall be rated for 200 psi minimum.
2. Ductile iron pipe (DIP) shall be used in delineated fault zones and extend to 100 feet outside each side of the delineated fault zone.

B. Polyvinyl Chloride (PVC) Pipe 4-inch through 12-inch shall be minimum class 150, or as shown on the plans and conforming to the requirements of AWWA C900 "Standard for Polyvinyl Chloride Pressure Pipe, 4" through 12" for Water" and shall be furnished with either bell ends or couplings designed to effect an elastomeric pressure seal or fusible Class 150.

C. Recycled Water Pipe: 14-inch to 18-inch diameter:

1. Pipe shall be gasketed joint or fusible Polyvinyl Chloride (PVC) Class 235 (DR18) minimum, per AWWA Standard C905-97, or Ductile Iron Pipe (DIP) per ANSI/AWWA C151/A12.51 rated for a minimum working pressure of 150 psi, plus a 100 psi surge allowance.
2. Restrained joints shall be ductile iron in accordance with the applicable requirements of the ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 of latest revision and shall be compatible with the type and pressure class of pipe used.
3. Ductile iron pipe and fittings must be polyethylene encased and have approved cathodic protection as required by the Town Engineer (See Section 17A).

D. Asbestos Cement Pipe: the installation of asbestos cement pipe is prohibited. All cutting, handling and disposal of asbestos cement pipe shall be done in compliance with the Contractor's State Licensing Law and all applicable laws and regulations.

E. All recycled water services shall be designed and constructed to applicable Town Standards including the following:

1. Recycled water service pipe 2-inch diameter and smaller shall be fusible polyvinyl chloride (PVC) pipe, Schedule 40, or polyethylene (PE) tubing, SDR 9 per ASTM D-2737 with a pressure rating of 200 psi.
2. Recycled water service pipe 3-inch diameter and larger shall be Fusible Polyvinyl Chloride (PVC) Class 150, minimum, per AWWA Standard C900-97, or Ductile Iron Pipe (DIP) per ANSI/AWWA C151/A21.51.

F. Each and every length of pipe and coupling shall be marked with the manufacturer's name, lot number and the date the pipe was tested. The pipe shall be

tested in accordance with the most recent American Water Works Standard Specifications and amendments thereto for the pipe furnished. The testing shall be performed in a State licensed material testing laboratory where the testing standards meet or exceed State of California testing standards.

G. Accompanying or preceding each load of pipe delivered, a certificate shall be furnished to the Town certifying that the pipe which is (to be) delivered has been tested and meets the requirements of the American Water Works Association Standard C900/C905 and these Specifications. The certificate shall identify the pipe by manufacturer's name, lot number and date tested by a State certified material testing laboratory.

H. Tracer wire shall be installed on all mains, fittings, valves, appurtenances and services as required in Series 600, Part 1, "Recycled Water Standards", Section 6. A. 5. of these Standards.

5. Valving

A. All valves 16-inch and smaller shall be gate valves. Gate valves shall conform to AWWA Standard C509 or latest revision and shall be the resilient seat type with non-rising stem, opening counter-clockwise with O-ring stem seal and suitable ends for connections to type of pipe or fitting used. The working pressure rating of gate valves shall meet or exceed the pressure rating of the pipe specified on the plans.

B. Butterfly valves shall be used for all lines 18-inch and larger and shall conform to AWWA Standard C504 or latest revision and shall be of the rubber seat type. Valve discs shall rotate 90 degrees for the fully open position to the tight shut position. The valve seat shall provide a tight shutoff at a pressure differential of 150 psi upstream and 0 psi downstream in either direction. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the operating nut.

C. All external bolts and nuts shall be 304 stainless or painted with Bitumastic paint or approved equal after nuts are tightened.

D. Valve Boxes: Each valve shall be covered by a precast 8-inch valve box set flush with street surface with cast iron ring. The valve boxes are to be Christy G5 or approved equal. Color and markings shall be as specified in Series 600, Part 1, "Recycled Water Standards", Section 6. A. of these Standards.

E. Valving at intersections shall be in accordance with the provisions of STD. PLAN NO. 502 and as required by the Town Public Works Department.

F. The maximum valve spacing on any recycled water main shall be 500 feet unless otherwise required by the Town Public Works Department.

G. Recycled water main valves must be located outside of concrete areas whenever possible to facilitate repairs.

H. All valves must be tagged with a recycled water identification tag as specified in Series 600, Part 1, "Recycled Water Standards", Section 6. A. of these Standards.

6. Alignment

A. Installation of public recycled water mains outside of the public street shall not be allowed without special permission from the Town Engineer.

B. Minimum pipeline separation shall be maintained between recycled water mains and potable water utilities in conformance with the California Waterworks Standards Section 64572 for water main separation. See STD. PLAN NO. 414 for detail.

C. The vertical separation specified for parallel water pipelines is required only when the horizontal distance between a recycled water main and the other potable or raw water main is less than ten feet.

D. Recycled water main crossings over or under other underground facilities shall be installed as close to 90 degrees to the facility as possible.

E. If crossing a new or existing potable water main or raw water supply main, a new recycled water main shall be constructed at no less than 45-degrees to and at least one foot below the potable or raw water main. No pipe connection joints shall be made in the potable water main within eight horizontal feet of the recycled water main.

F. Recycled water mains shall not be installed in the same trench as and shall be at least 4 feet horizontally from sanitary sewers, storm drains, and other underground utilities such as gas, electrical conduit, telephone, and communications lines, except at crossings.

G. Minimum clear horizontal separation between a recycled water line and a metallic pipeline with an induced current shall be 5 feet.

H. Recycled water mains shall be constructed a minimum of 5 feet from all structures, such as manholes or drop inlets.

I. Recycled water mains shall be constructed a minimum of 5 feet clear from the edge of easements.

J. If the separation requirements from potable water mains in this Section are not feasible, written approval is required from the Town Engineer and CDPH for use of special

construction methods intended to minimize the potential for contamination including, but not limited to, sleeving the newly installed main in a casing, or utilizing upgraded piping material.

K. Where vertical conflicts exist, the potable water main shall be placed above the recycled water main. If the recycled water main must go over an existing potable water main, approval is required from the Town Engineer and CDPH for use of special construction methods including, but not limited to, providing a continuous pipe section or sleeve on the newly installed main a minimum of 20 feet long centered at the crossing.

L. Recycled water mains over or under other utilities shall be in accordance with Town of Windsor STD. PLAN NO. 412 and STD. PLAN NO. 414, except that PVC pipe shall be allowed with ductile iron fittings.

M. Recycled water mains shall be installed with service laterals perpendicular to the main. A service lateral shall be installed for each lot or area to be served with recycled water.

N. Recycled water mains shall be installed with the ability to generally drain to blowoffs. On-site recycled water piping systems shall be installed to drain to low point drains to facilitate system inspection and testing.

O. The contractor shall pothole and verify the location, size, type and depth of all existing utilities or other structures critical to pipe alignment prior to the start of construction. Any discrepancies found shall immediately be brought to the attention of the Town Engineer.

7. Cover

A. Definition: Cover is the distance from the top of the pipe to finished grade.

B. The standard installation for offsite recycled water facilities shall generally be consistent with those specified for potable water systems and be in accordance with General Construction Recycled Water Notes, or as shown on the approved plans.

C. Service laterals must have minimum cover in accordance with the Town Standards.

D. The minimum depth of cover from finished grade for all recycled water facilities in public easements or rights-of-way shall be 30 inches for 4-inch mains; 36 inches for 6-inch and 8-inch mains; and 44 inches for 12-inch and larger mains. The minimum cover for all recycled water main construction, under any circumstances, is 30 inches. Where cover is greater than 30 inches, but less than the standard cover, Thickness Class 50 ductile iron pipe is required.

E. The minimum depth of cover from finished grade to on-site recycled water piping shall be: 30 inches for 3-inch and 4-inch pressurized lines, and 24 inches for pressurized lines 2.5-inch and smaller; and 18 inches for intermittent pressure lines and irrigation control wiring.

F. Where cover exceeds 8 feet, special permission from the Town Engineer is required.

8. Excavation and Backfill

Excavation and backfill of the pipeline shall be as shown on STD. PLAN NO. 501. Excess material from excavation shall become the property of the Contractor and shall be disposed of to the satisfaction of the Town Engineer. Prior to off-haul and disposal of excess trench excavation owned by Contractor, the Contractor shall submit to the Town Engineer written authorization for such disposal of materials and entry permission signed by the owners of the disposal site and all the required permits.

9. Laying and Handling Pipe Materials

Trained and competent workmen and proper implements, tools and facilities satisfactory to the Town Engineer shall be provided and used by the Contractor for safe, convenient and workmanlike prosecution of the work. All pipe, fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe coatings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and the cast iron pipe rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected, and sound material furnished. Cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to pipe. All pipe stockpiled on the job shall be stored with the ends covered to prevent the entrance of foreign matter. Whenever it is necessary, either in the vertical or horizontal plane, to avoid obstructions, or when long radius curves are permitted, the amount of deflection shall not exceed the maximum recommended by the pipe manufacturer or that required for satisfactory jointing.

Each length of pipe shall be free of any visible evidence of contamination, dirt and foreign material before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. At times when pipe laying is not in progress, the open ends of any pipe which have been laid shall be closed by approved means to prevent the entrance of small animals or foreign material. Trench water shall not be permitted to enter the pipe.

10. Laying Polyvinyl Chloride Pipe (PVC)

Individual pieces of pipe, valves and fittings shall be joined by placing the rubber rings on the machined ends of the pipe and pulling the couplings, valves or fittings in accordance with the

manufacturer's recommendations. The rings shall be checked to be sure they are in the proper position after the coupling is in place. Care shall be taken to ensure proper seating of the rings, and adapters shall be utilized for connections as required by the manufacturer.

Fittings for PVC pipe shall be either the mechanical joint type or the push-on type.

PVC pipe shall be as specified in and installed per the latest revisions of AWWA C900 or C905 as appropriate and in accordance with the manufacturer's recommendations.

11. Laying of Ductile Iron Pipe (DIP)

The flame cutting of pipe by means of oxyacetylene torch shall not be allowed.

Ductile iron pipe shall be as specified in and installed per AWWA C600 or latest revision and in accordance with the manufacturer's recommendations.

12. Thrust Blocking

All tees, bends and plugs shall be provided with thrust blocking and/or harness as shown on the plans or in accordance with STD. PLAN NO. 518 and STD. PLAN NO. 519.

13. Connection to an Existing Main

A. Under no circumstances shall cross-connection between the potable water system and the recycled water system be allowed.

B. For connecting 2-inch diameter pipes and smaller, use a hot tap.

C. Cut-in tee must be used if additional valves are required on the existing main. If the new lateral is larger than existing main, the tee shall be the size of the new lateral and reduced to the size of the existing main.

D. Size-on-size taps are allowed up to 8-inch in accordance with the approved standards.

E. Use of 12-inch size-on-size taps are allowed only under emergency situations and with the specific approval of the Town Engineer.

F. A mechanical joint tapping sleeve must be used in accordance with approved Town standards.

14. Recycled Water Service Laterals and Meters

A. Normally, recycled water, where provided, shall be delivered through meters

located at the frontage of a public street.

B. Service laterals sizes 1.5-inch and larger shall have a valve and valve box in the public street or right of way at the connection with the main and a meter stop valve upstream of the meter to facilitate system isolation and testing and prevention of unauthorized discharge in accordance with STD. PLAN NO. 603 and STD. PLAN NO. 604.

C. Install meter boxes out of traveled ways and a minimum of 10 feet from street trees whenever possible.

D. Multi-Family Residential
   1. Provide separate irrigation meters for public common areas.
   2. Mixed residential and commercial uses must have separate meters.
   3. All meters must be within public right-of-way or easements and multiple meters shall be clustered where possible.

E. Mobile Home Parks
   1. Provide separate irrigation meters for common areas.
   2. Mixed residential and commercial uses must have separate meters.

F. Mixed Residential and Commercial Developments
   1. Mixed residential and commercial uses must have separate meters.

G. Landscape Irrigation
   1. Provide separate irrigation meters for landscaped areas of all commercial recycled water use sites.
   2. Provide separate irrigation meters for common areas of all condominium, town home, Planned Unit Developments, apartment complexes, and mobile home parks.

H. Agricultural and Municipal Irrigation
   1. Irrigation Turnouts shall be constructed in accordance with STD. PLAN NO. 607 and STD. PLAN NO. 608 and service requirements and shall include a recycled water meter or metering control valve, pressure control valve, self-flushing screen, lockable valves on inlet and outlet ends, thermal anti-frost blanket and lockable cage.

15. Backflow Prevention Devices

A. Backflow prevention shall be installed on the user's recycled water service upstream of system applications, when required by the Town Engineer.

B. Recycle water applications that require backflow prevention on the recycled water service include booster pumping systems, chemical feed systems, certain

industrial processes, and on-site storage. At a minimum, a reduced pressure (RP) backflow prevention device shall be provided upstream of the system application and shall conform to STD. PLAN NO. 510.

C. All backflow devices that are installed must be on the current University of Southern California's Approved List of Devices identified in the Manual of Cross-Connection Control.

16. Specialty Items

A. Pressure reducing valves shall be installed immediately downstream of the service meter where static service pressure may exceed 80 psi.

B. Air Relief Valves - Air relief valves are required at all isolated high points in the system that are one pipe diameter or more above the remainder of the system and near the upper end of dead-end legs.

1. Recycled water line air relief valves shall be constructed in accordance with Town STD. PLAN NO. 530, with the exception that all pipe and valve covers shall be constructed to recycled water standards (i.e. purple pipe and covers).

C. Blowoffs - Blowoffs shall be installed at low points to facilitate draining the system and at dead-end legs. Local low points, such as at utility crossings, will not require blowoffs. Where possible, blowoffs shall be located within 150 feet of a sanitary sewer manhole.

1. Blowoffs shall conform to the applicable requirements of STD. PLAN NO. 515 and STD. PLAN NO. 517.

D. Surge or pressure relief valves, as determined by the Town Engineer, shall be installed on off-site mains where system pressure could potentially exceed 100 psi.

E. Quick Coupling Valves

1. New quick coupling valves should be 3/4-inch or 1-inch nominal size and of brass construction with a normal working pressure of 150 psi with permanently attached, purple rubber or vinyl locking covers with the words "RECYCLED WATER". New quick coupling valves shall be Rainbird Model 33-DNP or 44-NP or approved equal.
2. Recycled water quick coupling valve shall have a special coupler key that differs from site potable water valve lock keys.
3. Quick couplers and keys for all off-site areas shall be as specified by the Town Engineer.

F. Cross Connection Control (CCC) Test Station

1. Dual plumbed systems shall have a CCC Test Station installed on the onsite recycle water system, in a lockable box or vault downstream of the recycled water meter in accordance with the requirements of the California Plumbing Code.
2. CCC Test Stations for dual plumbed buildings shall be installed at the low point where the recycle water piping enters the building and shall include a drain port and fitting for connection of pressure gauge testing equipment. Drain ports shall be sized to drain the building recycled water piping and shall be a minimum size of 3/4-inch. CCC Test Stations shall be in a locked box or wall enclosure with approved advisory signs.

17. Special Conditions

A. Ductile iron pipe must be installed in delineated fault zones and extend to 100 feet outside each side of the delineated fault boundaries.

B. Abandonment of Recycled Water Mains and Services

1. All abandoned recycled water mains 12-inches in diameter and larger, within the public right-of-way must be removed or broken every 50 feet and filled with sand slurry.
2. For all abandoned services, remove the valve and saddle and install a full circle clamp on main under Town inspection.
3. For abandoned flanged or mechanical joint tees, remove the valve and install a blind flange or mechanical joint plug under Town inspection.
4. For abandoned push-on tees, the tee, valve and concrete thrust block must be removed and the main repaired with approved pipe and suitable couplings.
5. Valve boxes for abandoned valves must be removed.
6. Abandoned mains, valves and risers located within the street structural section must be removed.

18. Hydrostatic Test

Prior to performing hydrostatic testing, the contractor shall submit a testing plan to the Town Engineer for approval. The testing plan shall include provisions acceptable to the Town Engineer for potential disposal of water used to fill any portion of the system that must subsequently be drained to facilitate repairs. The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at Contractor's option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place. Each valved section of pipe, or combined sections, as approved by the Town Engineer, shall be subjected to a hydrostatic pressure of not less than 200 psi for 15 minutes, then 150 psi for 30 minutes for a total duration of 45 minutes. Valves on existing mains in services required to be operated in connection with this job shall be operated only by personnel of the Town. Each

section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection, all necessary apparatus, gauges and measuring devices shall be furnished by the Contractor. The Contractor shall make the taps into the pipe and shall furnish all necessary assistance for conducting the tests. Before applying the test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of the highest elevation, and afterward tightly plugged.

Suitable means shall be provided by the Contractor so that the Town can determine the quantity of water leakage under the test pressure. No pipe installation will be accepted until all leakage is stopped. The Contractor shall, at contractor's own expense, locate the cause and repair any leakage.

19. Recycled Water Main Tie Ins

Water main tie-ins are not permitted on Fridays or days preceding a holiday except as authorized by the Town Engineer.

The Contractor shall notify the Town 24 hours prior to individual mainline shutdowns required to facilitate tie-in operations. The contractor shall schedule tie-in work with the Town at (707) 838-1006. Tie-ins will not be scheduled until the results showing a passing bacteriologic test have been received by the Town in writing and notice approving the test has been issued by Town Engineer. All shutdowns and valve turning operations shall be performed by Town personnel only. A Town inspector must be present during all tie-in operations. No tie-ins shall be performed without prior authorization of the Town.

Pipe and fittings furnished for tie-ins shall be no smaller than the existing water main to which each tie-in is made.

Contractors or parties who fail to keep field appointments may be billed for scheduled Town staff time. Such charges may include personnel waiting or standby time. The contractor shall also bear the costs incurred by the Town for any re-notification of its customers.

Interruption of service to commercial customers shall, as much as practical, be coordinated with the customer's needs. The Contractor will contact the customer, consider the customer's interests and inform the Town accordingly.

After hours work or weekend work is to be avoided whenever possible and any overtime costs for the Town shall be borne by the contractor requesting such after-hours work. Normal working hours are: 8:00 A.M. to 4:30 P.M. Monday through Thursday.

Contractors or parties requiring work of any kind by the Town shall request such services a minimum of 24 hours in advance of the time such services are desired. Work requests, which will involve Town personnel for more than 8 hours and/or extensive number of Town supplied parts, shall be requested a minimum of 7 calendar days in advance.

If it is necessary to interrupt service to any customer, the contractor shall make the request for such work five working days in advance of the time such services are desired, to allow the customers affected to have a minimum of 72 hours' notice.

When installing a cut-in-tee that is larger than the existing pipe, the new assembly must be installed at the depth sufficient to allow the valve to remain below the subgrade of the street which may necessitate lowering the existing pipe.

When a connection is required to an existing water pipe, the contractor shall provide all excavation, shoring, backfill and trench resurfacing per Town STD. PLAN NO. 501. Where the connection is to be a "hot tap", the contractor shall provide and install the tapping valve and sleeve per Town STD. PLAN NO. 527, and any other hardware required and make the tap under the Town's inspection. When any joint on an existing water pipe is disturbed, that joint and any proposed hot tap 4" and larger shall be replaced with a "cut-in" tee. When a "cut-in" tee and valve(s) assembly is required on the plans, the contractor shall provide and install the entire assembly (including valves), and any other hardware necessary under Town inspection, and shall provide all other work and materials necessary to complete the installation to Town Standards.

During the work, the Contractor shall exercise all necessary precautions to prevent the entrance of trench water or any other foreign material into the water main and shall conduct all operations in accordance with the most stringent sanitation practices. The interior of all appurtenances being installed shall be thoroughly swabbed or sprayed with a 1 percent hypochlorite solution prior to installation.

20. Water System Component Reporting

The Contractor shall submit the material type, manufacturer and model number of all recycled water system components to the Town prior to final testing.

21. Construction Water

Construction water shall be obtained from the Town only at the point(s) designated by the Town.

PART II – STANDARD SPECIFICATIONS

SERIES 700 – PARK & LANDSCAPE SPECIFICATIONS

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PART III

STANDARD DRAWINGS

PART III – STANDARD DRAWINGS

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PART III – STANDARD DRAWINGS

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500 WATER
600 RECYCLED WATER
700 PARK & LANDSCAPE

PART III – STANDARD DRAWINGS

SERIES 100 – GENERAL INFORMATION STANDARD DRAWINGS

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100	Subdivision Construction Notes	04/15	03/23

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GENERAL NOTES:

1. ALL CONSTRUCTION SHOWN ON THESE PLANS SHALL CONFORM TO THE MOST CURRENT TOWN OF WINDSOR (HEREINAFTER "TOWN" OR "TOW") DESIGN AND CONSTRUCTION STANDARDS, AND MOST CURRENT CALTRANS STANDARD SPECIFICATIONS SECTION 39 ON ASPHALT CONCRETE AS AMENDED THROUGH THE DATE OF TOWN APPROVAL OF THESE PLANS (HEREINAFTER "TOWN STANDARDS"), AND TO THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND STANDARD SPECIFICATIONS AS AMENDED THROUGH THE DATE OF TOWN APPROVAL OF THESE PLANS (HEREINAFTER "CALTRANS STANDARDS"). IN THE EVENT OF CONFLICT BETWEEN TOWN STANDARDS AND CALTRANS STANDARDS, TOWN STANDARDS SHALL PREVAIL.

2. ANY DISCREPANCY DISCOVERED BY CONTRACTOR IN THESE PLANS OR ANY FIELD CONDITIONS DISCOVERED BY CONTRACTOR THAT MAY DELAY OR OBSTRUCT THE PROPER COMPLETION OF THE WORK PER THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE TOWN AND THE OWNER IMMEDIATELY UPON DISCOVERY. SAID NOTIFICATION SHALL BE IN WRITING.

3. CONTRACTOR SHALL INDEPENDENTLY REVIEW TOPOGRAPHY, AND TREE CONDITIONS THROUGHOUT THE SITE, AND ASSUME WHOLLY AND UNCONDITIONALLY THE RISK OF COMPLETING THE WORK SET OUT ON THESE PLANS, REGARDLESS OF GEOLOGY, WATER TABLE, OR OTHER CONDITIONS THAT CONTRACTOR MAY ENCOUNTER IN THE COURSE OF THE WORK.

4. WITH RESPECT TO TOWN AND ALL OTHER AGENCIES HAVING JURISDICTION OVER THE CONSTRUCTION TO BE PERFORMED, CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS AND PAY ALL APPLICABLE FEES PRIOR TO COMMENCING ANY CONSTRUCTION.

5. PRIOR TO ANY CONSTRUCTION ON TOWN PROPERTY OR WITHIN TOWN RIGHTS OF WAY OR EASEMENTS, CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE TOWN. CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF SAID PERMIT.

6. A PRECONSTRUCTION MEETING, INCLUDING TOWN, CONTRACTOR REPRESENTATIVES, AND ANY PERTINENT PROJECT CONSULTANTS IS REQUIRED PRIOR TO COMMENCING CONSTRUCTION. CONTACT THE TOWN PUBLIC WORKS DEPARTMENT AT 707-838-3137 TO SCHEDULE PRECONSTRUCTION MEETING.

7. CONTRACTOR SHALL NOTIFY THE TOWN PUBLIC WORKS DEPARTMENT AT 707-838-1230 (OR BY EMAIL AS REQUIRED ON THE ENCROACHMENT PERMIT) TWO FULL TOWN OFFICE DAYS PRIOR TO COMMENCING CONSTRUCTION TO ALLOW SCHEDULING OF TOWN INSPECTION (TOWN OFFICE DAYS ARE MONDAY THROUGH THURSDAY, EXCLUSIVE OF TOWN HOLIDAYS). SUCH NOTICE SHALL ALSO BE PROVIDED PRIOR TO RESUMPTION OF CONSTRUCTION AFTER ANY PERIOD OF INTERRUPTION GREATER THAN SEVEN CALENDAR DAYS.

8. CALL BEFORE YOU DIG/UNDERGROUND SERVICE ALERT: FOR NORTHERN CALIFORNIA USA CALL TOLL FREE AT 811 OR 800-642-2444 AT LEAST TWO FULL WORKING DAYS PRIOR TO ANY EXCAVATION OR GROUND DISTURBING ACTIVITIES.

9. CONTRACTOR SHALL NOT BEGIN ANY EXCAVATION UNTIL ALL EXISTING UTILITIES HAVE BEEN MARKED IN THE FIELD BY THE APPLICABLE UTILITY OPERATOR. CONTRACTOR SHALL NOTIFY THE OPERATORS OF ANY POTENTIALLY AFFECTED UTILITIES AT LEAST TWO FULL WORKING DAYS PRIOR TO COMMENCING ANY EXCAVATION.

10. CONSTRUCTION WORK HOURS SHALL BE LIMITED TO 7:00 AM TO 5:00 PM, MONDAY THROUGH FRIDAY, EXCLUSIVE OF FEDERAL OR TOWN HOLIDAYS. TOWN INSPECTION WILL BE AVAILABLE FROM 7:30 AM TO 11:30 AM AND FROM 1:30 PM TO 4:30 PM, MONDAY THROUGH FRIDAY, EXCLUSIVE OF FEDERAL OR TOWN HOLIDAYS. NO WORK IS PERMITTED ON WEEKENDS UNLESS AUTHORIZED BY THE TOWN ENGINEER.

11. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING NOISE, ODORS, DUST AND DEBRIS TO MINIMIZE IMPACTS ON SURROUNDING PROPERTIES AND ROADWAYS. CONTRACTOR SHALL BE RESPONSIBLE THAT ALL CONSTRUCTION EQUIPMENT IS EQUIPPED WITH MANUFACTURER'S APPROVED MUFFLER BAFFLES. FAILURE TO DO SO MAY RESULT IN THE ISSUANCE OF AN ORDER TO STOP WORK.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUBDIVISION CONSTRUCTION NOTES

STD. PLAN NO. 100

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 - NTS

(2020 STD. NO. NONE)

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GENERAL NOTES CONTINUED:

12. THE CONTRACTOR(S) SHALL BE REQUIRED TO MAINTAIN TRAFFIC FLOW ON AFFECTED ROADWAYS DURING NON-WORKING HOURS, AND TO MINIMIZE TRAFFIC RESTRICTION DURING CONSTRUCTION. CONTRACTOR(S) SHALL BE REQUIRED TO FOLLOW THE PROJECT TRAFFIC CONTROL PLAN, IF ONE HAS BEEN PROVIDED, AND TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH THE LATEST ADOPTED CALTRANS "CA MUTCD" (CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES). TOWN OF WINDSOR EMERGENCY SERVICE PROVIDERS SHALL BE NOTIFIED IN WRITING BY CONTRACTOR(S) AT LEAST 24 HOURS IN ADVANCE OF ANY PROPOSED CONSTRUCTION IN THE PUBLIC RIGHT-OF-WAY WHICH MIGHT AFFECT NORMAL TRAFFIC PATTERNS.

13. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL HALT CONSTRUCTION IMMEDIATELY, NOTIFY THE TOWN OF WINDSOR, AND IMPLEMENT REMEDIATION (AS DIRECTED BY THE TOWN OR ITS AGENT) IN ACCORDANCE WITH ANY REQUIREMENTS OF THE NORTH COAST REGIONAL WATER QUALITY CONTROL BOARD.

14. ANY AND ALL EXCESS MATERIALS SHALL BE CONSIDERED THE PROPERTY OF THE CONTRACTOR AND SHALL BE RECYCLED TO MEET CONSTRUCTION WASTE RECYCLYING REQUIREMENTS BY THE TOWN AND ALL OTHER MATERIALS AND WASTE DISPOSED OF AWAY FROM THE JOB SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

15. ALL EXISTING OVERHEAD UTILITIES (OF 21,000 VOLTS OR LESS) AND PROPOSED UTILITIES, BOTH ONSITE AND ALONG PROJECT FRONTAGES, SHALL BE PLACED UNDERGROUND. THIS DOES NOT INCLUDE SURFACE MOUNTED TRANSFORMERS, PEDESTAL MOUNTED TERMINAL BOXES AND METER CABINETS.

16. UTILITY JOINT TRENCH LOCATIONS SHALL BE FIELD STAKED BY THE CONTRACTOR, AND THEN APPROVED BY THE TOWN PRIOR TO INITIATION OF ANY TRENCHING. THIS REQUIRED APPROVAL BY THE TOWN IS INDEPENDENT OF ANY AUTHORIZATION GRANTED BY THE UTILITY COMPANY, THE DEVELOPER AND/OR CONTRACTOR. TRENCH LOCATIONS WITHIN THE TREE PROTECTION ZONES OF ANY PROTECTED TREES MAY NOT BE APPROVED BY THE TOWN. THE TOWN'S INSPECTOR MAY REQUIRE CONSULTATION BY THE TOWN'S ARBORIST PRIOR TO APPROVAL OF TRENCH LOCATION. FAILURE TO COMPLY WITH THESE REQUIREMENTS MAY RESULT IN AN IMMEDIATE ORDER TO STOP WORK, AS WELL AS INCURRENCE OF CIVIL PENALTIES AS PROVIDED BY TOWN ORDINANCE.

17. SOIL SHALL NOT BE TREATED WITH LIME OR OTHER CEMENTITIOUS MATERIAL WITHOUT PRIOR EXPRESS PERMISSION BY THE COMMUNITY DEVELOPMENT DIRECTOR. BUILDING OFFICIAL, AND/OR TOWN ENGINEER.

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NOTIFICATION FOR INSPECTIONS:

1. INSPECTION AND APPROVAL OF ALL WORK SHALL BE NECESSARY DURING AND AT THE COMPLETION OF EACH OF THE FOLLOWING STAGES OF WORK AND SUCH APPROVAL MUST BE OBTAINED BEFORE SUBSEQUENT STAGES OF WORK MAY BE COMMENCED. ADDITIONALLY, THE INSPECTOR SHALL BE NOTIFIED AT LEAST TWO (48 HRS) WORKING DAYS IN ADVANCE BEFORE ANY OF THE FOLLOWING STAGES OF WORK ARE COMMENCED.

2. ANY CONSTRUCTION OR EXCAVATION REQUIRING INSPECTION THAT IS UNDERTAKEN WITHOUT INSPECTION IS SUBJECT TO RE-CONSTRUCTION AND RE-EXCAVATION AT THE CONTRACTOR'S EXPENSE.

3. INSPECTION MUST BE SCHEDULED FOR THE FOLLOWING WORK:
   A. AFTER ALL EROSION CONTROL BMP'S RELATED TO SWPPP HAVE BEEN INSTALLED, AND BEFORE DEMOLITION OR GRADING BEGINS.

   B. DEMOLITION, GRADING, COMPACTION, AND PREPARATION OF BUILDING PADS, EMBANKMENTS, EXCAVATIONS, AND SUBGRADE.

   C. i. CONSTRUCTION OF SUBGRADE, AGGREGATE BASE, STEEL, AND FORMS FOR ALL CONCRETE STRUCTURES, INCLUDING CURBS, GUTTERS, SIDEWALKS, WALLS AND FOOTINGS.

      ii. EXCAVATION FOR STORM DRAINS, CULVERTS, AND ALL LID FEATURES.

   D. i. PLACING OF CONCRETE IN ALL STRUCTURES, INCLUDING CURBS, GUTTERS, SIDEWALKS, FOOTINGS, AND WALLS.

      ii.. PLACING OF STORM DRAINS, CULVERTS, AND LID FEATURE PIPES.

   E. BACKFILLING FOR ALL STRUCTURES, PIPES, AND UTILITY TRENCHES.

   F. CONSTRUCTION OF ROADSIDE DITCHES AND OTHER DRAINAGE FEATURES.

   G. PLACING AND COMPACTING OF SUBGRADE AND BASE MATERIALS FOR ROADWAYS, CURBS, GUTTERS, AND SIDEWALKS.

   H. PLACING OF PAVEMENT OR SURFACING. WITHIN 48 HOURS OF PAVING, ALL WATER VALVE BOXES AND OTHER "IRON" WILL BE BROUGHT TO GRADE AND INSPECTED.

   I. PLACING OF STRIPING, STREET LIGHTS AND ALL PLACARD OR ELECTRONIC SIGNAGE.

   J. CONSTRUCTION OF LID LANDSCAPE FEATURES. TOWN INSPECTOR SHALL BE CALLED FOR INSPECTION OF TOTAL DEPTH EXCAVATED, PIPING INSPECTION, FILL PLACEMENT, AND FINAL INSPECTION, INCLUDING ALL "PUNCH LIST" ITEMS ONCE COMPLETED.

   K. FINAL CLEAN-UP.

   L. UPON COMPLETION OF CONSTRUCTION, FINAL CONNECTION WILL BE MADE BY THE CONTRACTOR AT THE DEVELOPER'S EXPENSE UNDER INSPECTION BY THE TOWN INSPECTOR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

GRADING NOTES:

1. A GRADING PERMIT SHALL BE OBTAINED FROM THE TOWN OF WINDSOR BUILDING DIVISION PRIOR TO THE START OF ANY EARTHWORK, UNLESS EXEMPT UNDER APPENDIX J 103.2, OF THE ADOPTED CALIFORNIA BUILDING CODE, AND APPROVED BY THE TOWN ENGINEER.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE GEOTECHNICAL ENGINEER. ALL GRADING SHALL BE PERFORMED TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER AND SHALL BE IN CONFORMANCE WITH THE GEOTECHNICAL REPORT, APPENDIX J, AND CHAPTER 18 OF THE CURRENT CALIFORNIA BUILDING CODE, AND TOW DESIGN AND CONSTRUCTION STANDARDS.

3. STREET SUBGRADE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION AS DETERMINED BY ASTM D1557 TO A DEPTH OF NO LESS THAN 6" IN THE ROADWAY SECTION. CLASS 2 AGGREGATE BASE SHALL BE COMPACTED TO 95% OF ASTM D1557. ASPHALT SHALL BE PLACED PER CALTRANS STANDARD SPECIFICATIONS SECTION 39 ON ASPHALT CONCRETE UNLESS OTHERWISE APPROVED BY TOWN ENGINEER.

4. THE USE OF THE SAND CONE METHOD (ASTM D1556) FOR DETERMINING FIELD DENSITIES WILL NOT BE ALLOWED AS A SUBSTITUTE FOR NUCLEAR GAUGE TESTING.ASTM D6938 THE MODIFIED PROCTOR, ASTM D1557 SHALL BE USED AS THE LABORATORY COMPACTION METHOD.

5. ALL GRADED AREAS AND EXPOSED SOIL WITHIN THIS PROJECT SHALL BE SEEDED FOR EROSION CONTROL BY THE CONTRACTOR. SEED AND MULCH WILL BE APPLIED BY OCTOBER 1ST (OR BEFORE THE FIRST RAIN OF THE SEASON, WHICHEVER COMES FIRST) TO ALL CUT AND FILL SLOPES WITHIN OR ADJACENT TO PROJECT ROADS. SEED AND FERTILIZER WILL BE APPLIED HYDRAULICALLY OR BY HAND AT THE RATES SPECIFIED BELOW. ON SLOPES, STRAW WILL BE APPLIED BY BLOWER OR BY HAND AND ANCHORED IN PLACE BY PUNCHING. ALL CRITICAL EARTHWORK OPERATIONS SHALL BE PERFORMED DURING THE DRY WEATHER SEASON, FROM MAY 1ST TO OCTOBER 1ST UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER IN WRITING AND IT MUST COMPLY WITH STATE CONSTRUCTION GENERAL PERMIT AND THE TOW'S MUNICIPAL STORMWATER NPDES PERMIT. THE CLEARING OF EXISTING VEGETATION SHALL BE CONFINED WITHIN THE LIMITS OF ACTUAL EARTHWORK. INCREMENTAL DEVELOPMENT SHALL BE REQUIRED TO ENSURE THAT THE AMOUNT OF LAND CLEARED AT ANY TIME IS LIMITED TO THE AREA THAT CAN BE DEVELOPED DURING THE CONSTRUCTION PERIOD. STORM WATER SHALL NOT BE ALLOWED TO FLOW DIRECTLY DOWN UNPROTECTED SLOPES. ENERGY DISSIPATING STRUCTURES AND EROSION CONTROL DEVICES SHALL BE PLACED AT ALL DRAINAGE OUTLETS THAT DISCHARGE TO NATURAL CHANNELS. ALL SEDIMENT TRAPS SHALL BE MAINTAINED BY THE OWNER UNTIL SUCH TIME THAT THE TOWN OR SONOMA COUNTY WATER AGENCY ACCEPTS MAINTENANCE RESPONSIBILITY.

ITEM	POUNDS PER ACRE
"BLANDO BROME"	30
ANNUAL RYE GRASS	20
FERTILIZER (16–20–0 & 15% SULPHUR)	500
STRAW MULCH	4000 OR 3500 LBS OF WOOD CELLULOSE

6. ANY EXISTING SEPTIC SYSTEM AND EXISTING WELLS SHALL BE ABANDONED UNDER PERMIT FROM THE SONOMA COUNTY ENVIRONMENTAL HEALTH DEPARTMENT.

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUBDIVISION CONSTRUCTION NOTES

STD. PLAN NO. 100

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2020 STD. NO. NONE)

DUST CONTROL NOTES:

1. DUST CONTROL SHALL COMPLY WITH NORTHERN CALIFORNIA AIR POLLUTION CONTROL DISTRICT "RULE 430" FUGITIVE DUST EMISSIONS.

2. CONSTRUCTION EQUIPMENT SHALL BE MAINTAINED IN PROPER WORKING ORDER AND SHALL NOT BE ALLOWED TO IDLE FOR A PERIOD OF LONGER THAN 30 MINUTES.

3. TO MINIMIZE FUGITIVE DUST AND THE RELEASE OF PM10, THE CONTRACTOR SHALL IMPLEMENT A DUST CONTROL PROGRAM COMPLYING WITH NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT "RULE 430". DUST CONTROL MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
   A. ACTIVE CONSTRUCTION SITE SHALL BE WATERED AS NEEDED, PREFERABLY IN THE LATE MORNING AND WHEN WORK HAS CEASED FOR THE DAY.

   B. STOCKPILES OF LOOSE MATERIAL SHALL BE COVERED, BERMED, AND WEIGHTED AT ALL TIMES PER CURRENT CASQA BMP SEDIMENT CONTROLS, EXCEPT WHEN THIS WOULD INTERFERE WITH IMMEDIATE CONSTRUCTION ACTIVITIES.

   C. ALL CLEARING, GRADING, EARTHMOVING OR EXCAVATION ACTIVITIES SHALL CEASE WHEN THE AVERAGE WIND SPEED FOR ONE HOUR EXCEEDS 20 MILES PER HOUR (MPH).

   D. THE AREA DISTURBED BY EXCAVATION OR GRADING SHALL BE KEPT TO THE MINIMUM REQUIRED TO IMPLEMENT THE PROJECT.

   E. WHEN TRAVELING ON EXPOSED SOILS, CONSTRUCTION SITE VEHICLE SPEED SHALL BE LIMITED TO 15 MPH.

   F. HAUL VEHICLES SHALL BE COVERED WHEN NOT ACTIVELY ENGAGED IN SITE CONSTRUCTION ACTIVITY, AND DURING TRANSPORTATION ON PUBLIC ROADWAYS.

   G. STREETS SHALL BE SWEPT REGULARLY AND KEPT FREE OF DIRT AND DEBRIS.

4. ALL PROJECT RELATED, DEBRIS AND WASTE SHALL BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL STATUES AND REGULATIONS.

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STORM WATER MANAGEMENT PRACTICES:

1. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN OF WINDSOR, PHASE I MUNICIPAL STORMWATER NPDES PERMIT AND THE TOW'S STORMWATER ORDINANCE 2016-303, AND COMPLY WITH SITE SWPPP AND TOW MS4 INSPECTIONS AND NPDES REQUIREMENTS:

   A. CONSTRUCTION CREWS SHALL BE INSTRUCTED IN PREVENTING AND MINIMIZING POLLUTION ON THE JOB.

   B. STABILIZE CONSTRUCTION ENTRANCE/EXIT TO PREVENT TRACKING ONTO ROADWAY. ONLY ONE STABILIZED CONSTRUCTION ENTRANCE/EXIT WILL BE ALLOWED PER SITE. VEHICLES ENTERING AND LEAVING CONSTRUCTION SITES SHALL NOT SPREAD POLLUTANTS SUCH AS SEDIMENT, GRAVEL, AND OTHER LOOSE PARTICLES ONTO ADJACENT ROADS. POLLUTANTS ARE WASHED INTO ROADSIDE DITCHES AND ARE A NUISANCE TO DRIVERS AND MAY CAUSE DAMAGE TO VEHICLES, AND DO NOT COMPLY WITH TOW PERMITS.

   C. PROTECT EXPOSED SLOPES AND ADJACENT STREAMS FROM EROSION THROUGH PREVENTATIVE MEASURES. COVER SLOPES TO AVOID CONTACT WITH STORM WATER BY HYDRO-SEEDING MULCH, USE OF PLASTIC SHEETING OR OTHER APPROVED MEANS.

   D. USE BROOMS AND SHOVELS WHEN POSSIBLE TO MAINTAIN A CLEAN SITE. USE OF A HOSE IS NOT ALLOWED, UNLESS FULLY CONTAINED. INTRODUCING WATER AS A CLEANUP METHOD ADDS TO WATER POLLUTION.

   E. DESIGNATE A CONCRETE WASHOUT AREA. DO NOT ALLOW WASH WATER FROM CONCRETE TOOLS OR TRUCKS TO ENTER STORM DRAIN SYSTEMS. MAINTAIN WASHOUT AREA AND DISPOSE OF CONCRETE WASTE ON A REGULAR BASIS.

   F. ESTABLISH A VEHICLE STORAGE, MAINTENANCE, AND REFUELING AREA TO MINIMIZE THE SPREAD OF OIL, GAS, AND ENGINE FLUIDS. USE OF OIL PANS OR BERMED VISQUEEN UNDER STATIONARY VEHICLES IS STRONGLY RECOMMENDED.

   G. GRADING ON HILL SLOPES GREATER THAN 10% BETWEEN OCTOBER 1ST AND APRIL 30TH IS NOT ALLOWED UNLESS A WRITTEN EXCEPTION IS GRANTED BY THE TOW AND WATER QUALITY MONITORING IS COMPLETED DAILY AS REQUIRED BY THE TOW'S MUNICIPAL STORMWATER NPDES PERMIT.

   H. SUBMIT STORMWATER AND INSPECTION REPORTS TO: PWINSPECTION@TOWNOFWINDSOR.COM.

   I. PROTECT DRAIN INLETS FROM RECEIVING POLLUTED STORM WATER THROUGH THE USE OF FILTERS SUCH AS FABRICS, GRAVEL BAGS OR STRAW WATTLES.

   J. BE PREPARED FOR RAIN AND HAVE THE NECESSARY MATERIALS ONSITE BEFORE OCTOBER 1ST.

   K. INSPECT ALL BMPS BEFORE AND AFTER EACH STORM EVENT. MAINTAIN BMPS ON A REGULAR BASIS AND REPLACE AS NECESSARY, THROUGH THE ENTIRE COURSE OF CONSTRUCTION.

   L. CONSTRUCTION SHALL ADHERE TO MINIMUM BEST MANAGEMENT PRACTICES (BMP'S) AS REQUIRED BY THE TOWN TO MINIMIZE THE AMOUNT OF SEDIMENT AND OTHER POLLUTANTS LEAVING THE SITE DURING CONSTRUCTION.

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GENERAL UNDERGROUND NOTES:

1. NO GUARANTEE IS INTENDED THAT UNDERGROUND OBSTRUCTIONS, NOT SHOWN ON THESE PLANS, WILL NOT BE ENCOUNTERED. THOSE SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AND THE CONTRACTOR IS CAUTIONED THAT THE OWNER, THE ENGINEERS, AND THE TOWN OF WINDSOR ASSUME NO RESPONSIBILITY FOR ANY OBSTRUCTIONS EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL COOPERATE WITH ALL UTILITY COMPANIES WORKING WITHIN THE LIMITS OF THIS PROJECT.

2. CONTRACTOR SHALL NOT BEGIN EXCAVATION UNTIL ALL EXISTING UTILITIES HAVE BEEN MARKED IN THE FIELD BY THE APPLICABLE ENTITY RESPONSIBLE FOR THAT PARTICULAR UTILITY. THE CONTRACTOR SHALL NOTIFY EACH APPLICABLE ENTITY AT LEAST 2 FULL WORKING DAYS BEFORE STARTING WORK. PER CALIFORNIA GOVERNMENT CODE 4216.9 ANY PERMITTEE PLANNING TO EXCAVATE OR TRENCH WITHIN THE PUBLIC RIGHT OF WAY IS REQUIRED TO OBTAIN AN INITIAL TICKET BY A REGIONAL NOTIFICATION CENTER: USA NORTH 811 (PHONE 811).

3. CONTRACTOR SHALL UNCOVER EXISTING BURIED UTILITIES WITH UTILITY OWNER TO VERIFY LOCATIONS AND ELEVATIONS OF UTILITIES. BURIED UTILITIES INCLUDE, BUT ARE NOT LIMITED TO WATER MAINS AND LATERALS, SEWER LINES, STORM DRAINS, GAS MAINS AND LATERALS, ELECTRICAL DISTRIBUTION LINES AND TELEPHONE LINES. ALL UTILITIES CONFLICTING WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED PRIOR TO THE START OF CONSTRUCTION, OR NEW UTILITIES SHALL BE PLACED AS TO NOT BE IN CONFLICT WITH EXISTING UTILITIES.

4. THE CONTRACTOR SHALL VERIFY EXISTING INVERTS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. THE PROJECT AND/OR DESIGN ENGINEER MAY ADJUST THE GRADE OF NEW UNDERGROUND CONSTRUCTION ACCORDINGLY WITH CONCURRENCE FROM THE TOWN.

5. ALL UNDERGROUND IMPROVEMENTS SHALL BE INSTALLED AND APPROVED PRIOR TO PAVING.

6. THE CONTRACTOR SHALL STAMP THE LETTER "S" ON THE FACE OF CURB DIRECTLY ABOVE THE SEWER LATERAL, AND THE LETTER "W" ON THE FACE OF CURB DIRECTLY ABOVE WATER SERVICES, AND THE LETTER "B" ON FACE OF CURB DIRECTLY ABOVE A BLOW OFF OR AIR RELIEF VALVE AND THE LETTER "R" DIRECTLY ABOVE RECYCLED WATER SERVICES. AT A DRIVEWAY, THE STAMP SHALL BE PLACED AT THE BACK OF RAMP. THE LETTERS SHALL BE 4" HIGH AND COMPLETELY LEGIBLE.

7. WATER AND SEWER SERVICE LATERALS SHALL BE SEPARATED HORIZONTALLY BY A MINIMUM OF 5 FEET CLEAR.

8. ITEMS SPECIFIED ON THE STANDARD PLANS ARE APPROVED FOR USE BY THE TOWN OF WINDSOR. ALL SUBSTITUTES OR ALTERATIONS SHALL BE SUBMITTED TO THE TOWN OF WINDSOR FOR APPROVAL.

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUBDIVISION CONSTRUCTION NOTES

STD. PLAN NO. 100

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2020 STD. NO. NONE)

SANITARY SEWER NOTES:

1. GRAVITY SEWER PIPE MAINS UP TO AND INCLUDING 12" SHALL BE POLYVINYL CHLORIDE (PVC), SDR 26 (UNLESS OTHERWISE APPROVED), OR DUCTILE IRON PIPE, CLASS 52, POLYETHYLENE ENCASED. MATERIALS FOR PIPES LARGER THAN 12" SHALL BE APPROVED BY THE TOWN ENGINEER.

2. SEWER MAIN INSTALLED OUTSIDE OF PAVED ROADWAYS SHALL BE DUCTILE IRON.

3. ALL SANITARY SEWER MANHOLES SHALL BE A MINIMUM OF 48" IN DIAMETER. UNLESS OTHERWISE NOTED, MANHOLE FRAME AND COVER SHALL HAVE 24" CLEAR OPENING, AND READ "SANITARY SEWER."

4. TRENCH BEDDING AND, BACKFILL FOR INSTALLATION OF SEWER PIPE SHALL BE IN ACCORDANCE WITH TOW STD PLAN NO. 501.

STORM DRAIN NOTES:

1. STORM DRAIN CONDUITS SHALL BE REINFORCED CONCRETE PIPE (RCP) PIPE CONFORMING TO CALTRANS STANDARD SPECIFICATION SECTIONS 65. CAST IN PLACE CONCRETE PIPE, HIGH DENSITY POLYETHYLENE (HDPE), AND POLYVINYL CHLORIDE (PVC) PLASTIC STORM DRAIN CONDUIT ARE ACCEPTED ALTERNATE TO CLASS III RCP ONLY. HOWEVER, CAST IN PLACE PIPE SHALL NOT BE USED IN EXISTING ROADWAYS AND PLASTIC PIPE SHALL NOT BE USED WITHIN THE TRAVELED WAY OF INDUSTRIAL, COLLECTOR OR ARTERIAL STREETS. HDPE PIPE SHALL HAVE SILT TIGHT GASKETED COUPLINGS & PVC PIPE SHALL HAVE RUBBER GASKETS. EXCAVATION AND BACKFILL FOR PLASTIC PIPE SHALL CONFORM TO THE PROVISIONS IN THE STRUCTURE EXCAVATION AND BACKFILL SECTION OF THE LATEST VERSION OF THE CALTRANS STANDARD SPECIFICATIONS, AND AS SHOWN FOR METAL PIPE ON CALTRANS STANDARD PLAN FOR EXCAVATION AND BACKFILL METAL AND PLASTIC CULVERTS. IN ADDITION, PIPE BACKFILL MATERIAL SHALL BE FILLED AND COMPACTED TO THE SPRING LINE OF THE PIPE AND SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

   A. MATERIAL SHALL HAVE A MINIMUM DURABILITY INDEX OF 35 AND A MINIMUM SAND EQUIVALENT OF 20 AND SHALL BE FREE OF ORGANIC MATERIAL.

SIEVE SIZE	PERCENT PASSING	
	MIN	MAX
3/4"	100	100
3/8"	80	100
NO. 4	30	70
NO. 16	5	40
NO. 200	0	4

2. MINIMUM COVER OVER PIPE TO BE 24", THE MAXIMUM ALLOWABLE COVER SHALL BE LIMITED TO 11 FEET FOR ALL SIZES.

3. ALL STORM DRAIN MANHOLES SHALL BE A MINIMUM OF 48" IN DIAMETER. UNLESS OTHERWISE NOTED, MANHOLE FRAME AND COVER SHALL HAVE 24" CLEAR OPENING, AND BE HEAVY DUTY NON-ROCKING. RAISED LETTERS ON TOP OF THE COVER SHALL READ, "STORM DRAIN." PIPES SHALL NOT INTRUDE INTO INSIDE OF MANHOLE. PIPE ENDS SHALL BE ROUNDED.

4. REINFORCED CONCRETE PIPE AND CAST-IN-PLACE STORM DRAIN PIPE SHALL BE PLACED AND BACKFILLED IN ACCORDANCE WITH CALTRANS' STANDARD PLANS DRAWING A62-D. STORM DRAIN MAINS WITHIN TOWN MAINTAINED ROADS SHALL BE MINIMUM 18 INCH DIAMETER, EXCEPT LATERALS WHICH MAY BE 15 IN. DIAMETER.

5. ALL CURB INLETS SHALL BE SUPPLIED WITH A MEDALLION STATING, "NO DUMPING, DRAINS TO CREEK" PER TOW STD PLAN NO. 304.

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WATER SYSTEM NOTES:

1. THERE SHALL BE A FIVE HOUR MAXIMUM SHUTDOWN TIME OF EXISTING MAINS WHILE MAKING CONNECTION. A MINIMUM OF TWENTY-FOUR HOUR WRITTEN NOTICE OR DIRECT COMMUNICATION OF SHUTDOWN SHALL BE GIVEN TO ALL WATER CUSTOMERS BY CONTRACTOR. EXISTING VALVES SHALL BE OPERATED BY TOWN PERSONNEL ONLY. NO WATER MAIN CONNECTIONS ARE PERMITTED ON FRIDAY, WEEKENDS, ON A HOLIDAY, OR ON ANY DAY PRECEDING A HOLIDAY.

2. START EXCAVATION BY EXPOSING END OF EXISTING WATER MAIN TO DETERMINE ITS LINE AND GRADE. START NEW MAIN 8-10 FEET FROM AND ON SAME LINE AND GRADE AS EXISTING MAIN. PIPE LAYING SHALL THEN BE ADJUSTED SO DEPTH OF NEW MAIN CONFORMS TO NOTE NO. 3.

3. MINIMUM DEPTH OF COVER FROM FINISHED GRADE SHALL BE 36" FOR 6" AND 8" MAINS AND 44" FOR 12" AND LARGER MAINS. WHERE COVER IS GREATER THAN 30", BUT LESS THAN THE STANDARD COVER, CLASS 50 DUCTILE IRON PIPE SHALL BE REQUIRED. ALL MAIN LINE VALVES SHALL BE RESILIENT SEATED. 18" OR LARGER MAINLINE VALVES SHALL BE BUTTERFLY VALVES. BLOW OFF VALVES SHALL BE 2" OR 3" GATE VALVES WITH HAND WHEELS.

4. NO. 10 INSULATED COPPER WIRE SHALL BE LAID ON TOP OF AND ALONG ENTIRE LENGTH OF ALL MAINS AND SHALL BE EXTENDED TO THE SURFACE AT ALL VALVE LOCATIONS, BLOW OFFS, AND METER BOXES SUFFICIENTLY FOR LOCATOR EQUIPMENT TO BE ATTACHED. FASTEN THE WIRE TO THE TOP OF THE PIPE SO AS NOT TO BE DISPLACED BY BACKFILLING PROCEDURE (ONE METHOD OF ACCOMPLISHING THIS IS TO AFFIX THE WIRE TO THE TOP OF THE PIPE WITH DUCT TAPE AT APPROXIMATELY 10 FEET INTERVALS).

5. WATER MAINS TO BE CONSTRUCTED WITHIN 10' OF SEWER PIPE REQUIRE SPECIAL INSTALLATION AND DESIGN MUST BE IN ACCORDANCE WITH THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH STANDARDS, AND SPECIFICALLY APPROVED BY THE TOWN OF WINDSOR.

6. ALL TRENCHING, BACKFILL AND RESURFACING REQUIRED FOR INSTALLATION OF WATER SYSTEM FACILITIES SHALL BE PER TOW STD PLAN NO. 501.

7. ONLY TOWN OF WINDSOR PERSONNEL SHALL OPERATE VALVES ON EXISTING WATER MAINS OR WATER SERVICES.

8. UNLESS OTHERWISE SHOWN ON THE PLANS, 1" WATER SERVICE LATERALS SHALL BE INSTALLED IN RESIDENTIAL DEVELOPMENTS, AND 2" WATER SERVICE LATERALS SHALL BE INSTALLED IN COMMERCIAL DEVELOPMENTS.

9. ALL POLYETHYLENE WATER SERVICE TUBING SHALL BE SDR 9, 200 PSI CONFORMING TO ASTM D_2737.

10. ALL METER BOXES, VAULTS AND PITS SHALL BE BEDDED ON A 3" MINIMUM THICK, 3/4" DRAIN ROCK, CLASS 2 AB, OR OTHER TOWN APPROVED CLEAN MATERIAL WITH A SAND EQUIVALENT OF 20 MINIMUM, UNCONTAMINATED BY NATIVE SOIL, AGAINST COMPACTED OR UNDISTURBED BASE. THE GRAVEL BED SHALL EXTEND TO A 4" MINIMUM BEYOND ALL SIDES OF THE METER BOX. BOX SHALL BE SET FLUSH WITH TOP OF CURB, SIDEWALK OR GROUND, WHICHEVER IS APPLICABLE. LOT NUMBERS MUST BE NOTED ON TOP SIDE OF METER BOX WITH A PERMANENT MARKING PEN.

11. METER BOXES SHALL BE LOCATED OUT OF TRAFFIC LOADING AREAS WHENEVER POSSIBLE, OR IF APPROVED BY THE TOWN SHALL BE TRAFFIC RATED (TRAFFICABLE) METER OR VALVE BOXES.

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WATER SYSTEM NOTES CONTINUED:

12. METER MANIFOLDS MUST BE DETAILED AND APPROVED BY THE TOWN OF WINDSOR. IN GENERAL, MANIFOLDS WHERE ALL FITTINGS ARE 2" OR LESS SHALL BE CONSTRUCTED FROM THREADED BRASS PIPE AND FITTINGS FROM THE END OF THE SERVICE LATERAL TO THE METER CONNECTION. NO PLASTIC PIPE SHALL BE USED IN CONSTRUCTING MANIFOLDS OF ANY SIZE. NO MORE THAN SIX METERS MAY BE ON A MANIFOLD OFF OF A SINGLE WATER SERVICE LATERAL, WITH NO MORE THAN 3 ON EITHER SIDE OF THE SERVICE.

13. GASKETS FOR FLANGE FITTINGS SHALL CONFORM TO AWWA STD C115.

14. BEFORE COMBUSTIBLE MATERIALS MAY BE STORED OR CONSTRUCTED ON SITE, THE FIRE DEPARTMENT MUST APPROVE FIRE FLOW AND ACCESS. BEFORE A FIRE HYDRANT MAY BE PLACED IN SERVICE, A HIGH VELOCITY FLUSHING OF THE HYDRANT LATERAL SHALL BE WITNESSED AND APPROVED BY THE TOWN. HIGH VELOCITY FLUSHING SHALL CONSIST OF REMOVING THE HYDRANT AND REPLACING IT WITH A SUITABLE ELBOW AND DIFFUSER. UNDER THE TOWN'S SUPERVISION, THE HYDRANT LATERAL IS FLUSHED UNTIL THE TOWN PERSONNEL ARE SATISFIED THAT THE LINES ARE CLEAR OF DEBRIS. PRIOR TO ACCEPTANCE OF THE ONSITE WATER MAIN BY THE TOWN, 6" METER AND DOUBLE CHECK VALVE ASSEMBLY, CERTIFIED BY THE TOWN, MUST BE INSTALLED.

15. WHEN A CONNECTION IS REQUIRED TO AN EXISTING WATER MAIN, THE CONTRACTOR SHALL PROVIDE ALL EXCAVATION, SHORING, BACKFILL AND TRENCH RESURFACING PER TOW STD PLAN NO. 501. WHERE THE CONNECTION IS TO BE A "HOT TAP", THE CONTRACTOR SHALL PROVIDE AND INSTALL THE TAPPING VALVE AND SLEEVE, UNDER TOWN INSPECTION, AND ANY OTHER HARDWARE REQUIRED AND WILL MAKE THE TAP. NO HOT TAP SHALL BE MADE WITHIN 4 FEET OF A JOINT (MEASURE FROM JOINT TO CENTERLINE OF INTERSECTING PIPE). IF NECESSARY THE JOINT SHALL BE REMOVED, AND THE PROPOSED HOT TAP SHALL BE REPLACED WITH A "CUT–IN" TEE. WHEN A "CUT–IN" TEE AND VALVE(S) ASSEMBLY IS REQUIRED ON THE PLANS, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE ENTIRE ASSEMBLY (INCLUDING VALVES), AND ANY THER HARDWARE NECESSARY UNDER TOWN INSPECTION, AND SHALL PROVIDE ALL OTHER WORK AND MATERIALS NECESSARY TO COMPLETE THE INSTALLATION TO TOWN STANDARDS.

16. AFTER A STREET HAS BEEN OVERLAYED, ALL WATER VALVE BOXES WILL BE MARKED IN WHITE PAINT BEFORE THE CLOSE OF THAT WORKDAY.

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RECYCELD WATER NOTES:

1. CHANGES MADE TO THE APPROVED RECYCLED WATER IRRIGATION OR UTILITY PLANS SHALL BE SUBMITTED TO TOWN OF WINDSOR FOR REVIEW AND APPROVAL AT LEAST 2 WEEKS PRIOR TO START OF CONSTRUCTION.

2. NOTIFY THE TOWN OF WINDSOR INSPECTOR A MINIMUM OF 48 HOURS BEFORE WORK BEGINS. RECYCLED WATER SYSTEM CONSTRUCTION INSPECTIONS INCLUDE:
   A. INSPECTION PRIOR TO WORK OF MATERIALS FOR CONSTRUCTION.
   B. INSPECTIONS DURING CONSTRUCTION AND PIPE PRESSURE TESTING TO VERIFY CONFORMANCE WITH APPROVED PLANS AND TOWN STANDARDS.
   C. FINAL CONSTRUCTION INSPECTION TO CONFIRM INSTALLED FACILITIES MEET ALL REQUIREMENTS.
   D. SITES MUST PASS REQUIRED CROSS–CONNECTION CONTROL INSPECTION AND TEST PERFORMED BY CERTIFIED CROSS–CONNECTION CONTROL SPECIALIST APPROVED BY THE TOWN (IF APPLICABLE)

3. AT LEAST TWO WORKING DAYS PRIOR TO START OF CONSTRUCTION, CONTRACTOR AND THE TOWN OF WINDSOR INSPECTOR SHALL HOLD A PRE–CONSTRUCTION MEETING. TO SCHEDULE MEETING, CONTACT THE TOWN OF WINDSOR AT (707) 838–1006.

4. PROPER BACKFLOW PREVENTION SHALL BE PROVIDED AT ALL POTABLE POINTS OF CONNECTION TO THE SITE. AT A MINIMUM, A REDUCED PRESSURE BACKFLOW PREVENTION DEVICE SHALL BE PROVIDED ACCORDING TO TOW STD PLAN NO. 510.

5. PRIOR TO CONNECTION OF RECYCLED WATER, A CROSS CONNECTION CONTROL INSPECTION AND TEST SHALL BE CONDUCTED FOR ALL DUAL–PLUMBED SITES, AND AS REQUIRED BY THE TOWN FOR OTHER NEW OR RETROFIT RECYCLED WATER USE SITES. INSPECTION AND TESTING SHALL BE BY A CERTIFIED CROSS CONNECTION CONTROL SPECIALIST APPROVED BY THE TOWN. A WRITTEN REPORT DOCUMENTING SUCCESSFUL TEST RESULTS SHALL BE SUBMITTED TO THE TOWN.

6. THE FOLLOWING ARE TOWN OF WINDSOR USE RESTRICTIONS FOR RECYCLED WATER WHICH SHALL BE NOTED ON AND APPLY TO THESE IMPROVEMENT PLANS:
   A. VERNAL POOLS SHALL NOT BE IRRIGATED OR DISTURBED.
   B. NO IRRIGATION WITHIN 3 FEET OF THE DRIP LINE OF AN OAK TREE.
   C. NO IRRIGATION WITHIN 50 FEET OF ANY WELL USED FOR DOMESTIC DRINKING WATER SUPPLY.
   D. NO OVERHEAD SPRINKLER IRRIGATION WITHIN 30 FEET OF CREEKS, PROPERTY LINES OF PARCELS NOT IRRIGATED WITH RECYCLED WATER, OR TRAVELED EASEMENTS USED BY ADJOINING NEIGHBORS NOT IRRIGATING THEIR PARCEL WITH RECYCLED WATER.
   E. APPLICATION OF RECYCLED WATER SHALL NOT EXCEED THE SOIL ABSORPTION RATE OR RESULT IN PONDING OR RUNOFF.
   F. DRINKING FOUNTAINS, FOOD SERVICE AREAS, AND DESIGNATED EATING AREAS MUST BE LOCATED OR PROTECTED SO THAT THEY ARE NOT EXPOSED TO ANY SPRAY OR MIST FROM RECYCLED WATER.

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 100 Series Update\CAD Files\Part III - 100 Series.dwg Layout Name: 100-11 Plot Date: Mar

RECYCELD WATER NOTES CONTINUED:

7. MINIMUM DEPTH OF COVER FROM FINISHED GRADE SHALL BE 30" FOR 4" MAINS; 36" FOR 6" AND 8" MAINS; AND 44" FOR 12" AND LARGER MAINS. WHERE COVER IS GREATER THAN 30", BUT LESS THAN THE STANDARD COVER, CLASS 50 DUCTILE IRON PIPE SHALL BE REQUIRED.

8. MINIMUM DEPTH OF COVER FROM FINISHED GRADE TO ONSITE RECYCLED WATER PIPING SHALL BE: 30" FOR 3"AND 4" PRESSURIZED LINES AND 24" FOR PRESSURIZED LINES 2.5" AND SMALLER; AND 18" FOR INTERMITTENT PRESSURE LINES AND IRRIGATION CONTROL WIRING.

9. MAINTAIN MINIMUM PIPELINE SEPARATION BETWEEN RECYCLED WATER MAINS AND POTABLE WATER MAINS PER CALIFORNIA WATERWORKS STANDARDS TITLE 22 SECTION 64572. RECYCLED WATER MAINS SHALL NOT BE INSTALLED IN THE SAME TRENCH AND SHALL BE AT LEAST 4 FEET HORIZONTALLY FROM AND 1 FOOT VERTICALLY BELOW, ANY PIPELINE CONVEYING POTABLE WATER. A RECYCLED WATER MAIN SHALL CROSS A POTABLE WATER MAIN AT NO LESS THAN A 45–DEGREE ANGLE AND NO PIPE JOINTS SHALL BE ALLOWED IN THE POTABLE WATER MAIN WITHIN 8 HORIZONTAL FEET OF THE CROSSING.

10. WHERE WATER MAIN SEPARATION REQUIREMENTS ARE IMPOSSIBLE TO MAINTAIN AND RECYCLED WATER MAINS RUN PARALLEL OR CROSS POTABLE WATER MAINS, USE SPECIAL CONSTRUCTION METHODS APPROVED BY THE TOWN ENGINEER AND CDPH. SPECIAL METHODS INCLUDE ENCASING RECYCLED WATER MAIN IN A CONTINUOUS PVC SCHEDULE 80 SLEEVE TO A MINIMUM 10 FEET BEYOND THE POINT WHERE THE MINIMUM OF 4 FEET HORIZONTAL AND 1 FOOT VERTICAL SEPARATION CAN BE MAINTAINED. A RECYCLED WATER MAIN HORIZONTAL SEPARATION OF LESS THAN 4 FEET OR CONSTRUCTION IN THE SAME TRENCH AS POTABLE WATER FACILITIES IS NOT ALLOWED WITHOUT SPECIAL PERMISSION FROM CDHP.

11. ALL TRENCH BEDDING AND, BACKFILL AND RESURFACING REQUIRED FOR INSTALLATION OF RECYCLED WATER PIPES SHALL BE PER TOW STD PLAN NO. 501.

12. NO. 10 INSULATED COPPER WIRE SHALL BE LAID ON TOP OF AND ALONG ENTIRE LENGTH OF ALL MAINS AND ONSITE PRESSURE PIPING AND SHALL BE EXTENDED TO THE SURFACE AT ALL VALVE LOCATIONS, BLOWOFFS AND METER BOXES SUFFICIENTLY FOR LOCATOR EQUIPMENT TO BE ATTACHED. FASTEN WIRE TO TOP OF PIPE SO AS NOT TO BE DISPLACED BY BACKFILLING.

13. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED AND MARKED BY AN APPROVED METHOD INCLUDING:

    A. FOR BURIED PIPING USE PURPLE–COLORED (PANTONE 512) PVC PIPE WITH CONTINUOUS WORDING: "RECYCLED WATER" PRINTED ON THE PIPE; PIPE SHALL BE LAID WITH WORDING FACING UPWARDS.

    B. FOR BURIED PIPING USE MARKING TAPE WITH A MINIMUM WIDTH OF 3 INCHES READING: "RECYCLED WATER" BLACK OR WHITE LETTERING ON PURPLE BACKGROUND) RUN CONTINUOUSLY AND PERMANENTLY AFFIXED TO TOP OF PIPING WITH PLASTIC TAPE BANDED EVERY 5 FEET ON CENTER, MINIMUM.

    C. FOR ABOVE GRADE PIPING USE PURPLE COLOR INTEGRAL TO THE PIPE MATERIAL OR MARK PIPE WITH PERMANENT IDENTIFICATION TAPE SUCH AS ADHESIVE, MYLAR PVC TAPE ALONG THE LENGTH OF THE PIPE AND CONTINUOUS WORDING: "RECYCLED WATER." (EXPOSED PURPLE PVC PIPE IS NOT ACCEPTABLE BECAUSE COLOR WILL FADE.)

    D. ALL MECHANICAL EQUIPMENT THAT IS APPURTENANT TO A RECYCLED WATER SYSTEM SHALL BE PAINTED PURPLE TO MATCH MARKING TAPE.

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: C:\Users\spark\AppData\Local\Temp\AcPublish_4132\Part III - 100 Series.dwg Layout Name: 100-12 Plot Date: Jul 12, 2023 at 04:43 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUBDIVISION CONSTRUCTION NOTES

STD. PLAN NO. 100

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2020 STD. NO. NONE)

RECYCELD WATER NOTES CONTINUED:

14. INSTALL ALL NEW VALVES AND APPURTENANCES WHICH MIGHT RELEASE RECYCLED WATER (EXCEPT SPRINKLERS AND EMITTERS) IN PURPLE VALVE BOXES WITH BOLT DOWN PURPLE COVERS WITH MOLDED LABELS THAT READ "RECYCLED WATER." EXISTING VALVE BOXES USED FOR RECYCLED WATER SHALL BE MARKED WITH NAMEPLATES OF PURPLE DURABLE MATERIAL PERMANENTLY AFFIXED TO LID PER TOW STD PLAN NO. 612.

15. ALL RECYCLED WATER METERS, DEVICES, AND VALVES INCLUDING ISOLATION VALVES, IRRIGATION CONTROLLERS, PRESSURE REGULATING VALVES, QUICK COUPLING VALVES, BACKFLOW PREVENTER, SHALL HAVE PERMANENT RECYCLED WATER IDENTIFICATION TAGS PER TOW STD PLAN NO. 612.

16. RECYCLED WATER ADVISORY SIGNS CONFORMING TO THE DETAILS AND SPECIFICATIONS ON THE APPROVED IMPROVEMENT PLANS SHALL BE POSTED AT LOCATIONS SHOWN ON THOSE PLANS AND AS REQUIRED BY THE TOWN ENGINEER.

17. ALL RECYCLED WATER METERS WILL BE SET BY THE TOWN OF WINDSOR AFTER:
    A. THE SITE'S OWNER OR AUTHORIZED REPRESENTATIVE HAS APPLIED FOR RECYCLED WATER SERVICE, ALL FEES HAVE BEEN PAID, AND THE RECYCLED WATER USE PERMIT HAS BEEN ISSUED BY THE TOWN.
    B. THE TOWN OF WINDSOR INSPECTOR MUST INSPECT THE DISCONNECTION OF THE SITE'S RECYCLED WATER SYSTEM FROM THE TEMPORARY POTABLE WATER SUPPLY, AND THEN INSPECT THE CONNECTION OF THE SYSTEM TO THE RECYCLED WATER METER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUBDIVISION CONSTRUCTION NOTES

STD. PLAN NO. 100

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2020 STD. NO. NONE)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 100 Series Update\CAD Files\Part III - 100 Series.dwg Layout Name: 100-13 Plot Date: Jul

PART III – STANDARD DRAWINGS

SERIES 200 - STREET STANDARD DRAWINGS

TABLE OF CONTENTS

STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
201	Typical Street Section	07/09	04/15
202	Typical Curb Return Layout	11/93	12/01
203	Curb, Gutter, Sidewalk and Sidewalk Warp	12/01	07/11
204	Curb Return	05/10	07/11
205	Pedestrian Curb Ramp	10/93	07/09
206	Driveway	07/09	07/11
207	Residential Cul-de-Sac	11/93	12/01
208	Residential Street Knuckle	11/93	12/01
209	Hammerhead Turn Around	11/93	12/01
213	Sidewalk, Curb and Gutter Replacement Details	07/11	07/11
214	Street Widening	07/11	07/11
215	Edge Grinding at Side Street and End of Overlay	07/11	07/11
216	Edge Grind at Gutter and Centerline for Overlay	07/11	07/11
217	AC Conform Detail at Curb and Gutter Replacement	07/11	07/11
218	Angled Parking Bay With Valley Gutter	07/11	07/11
221	Sidewalk Design	11/93	12/01
222	Cross Gutter	11/93	12/01
223	Street Light – Cobra	05/10	08/23

STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
225	Street Light – Decorative (LED)	05/10	08/23
226	Street Light – Decorative (LED) Pendant	07/11	08/23
227	Street Light – Miscellaneous Details	04/06	07/09
230	Stop Sign Post Location	N/A	07/11
231	Street Name Sign	11/93	12/01
232	Standard Barricade	11/93	12/01
233	Stub Future Connection – Street Posting	04/03	04/03
234	Bike Lane Signs	N/A	07/11
239	Standard Permanent Monument	11/93	04/06
240	Cast-in-Place Pier Supported Concrete Retaining Wall	N/A	07/11
241	Assess Gate and Fencing	N/A	07/11
246	Tree Grate and Frame Detail	N/A	07/11
247	Street Tree Planting CU Structural Soil	N/A	07/11
248	Median Island Tree Planting CU Structural Soil	N/A	07/11
249	Street Tree Planting at Angled Parking Bay CU Structural Soil	N/A	07/11
250	Sub-Drain Detail CU Structural Soil	N/A	07/11

SERIES 200 - STREET STANDARD DRAWINGS

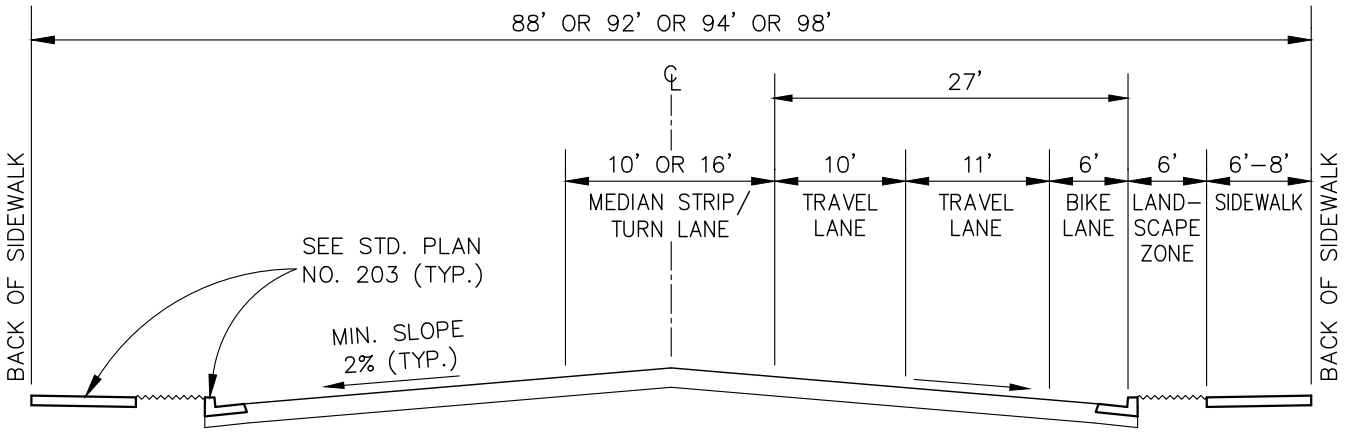
REVISION SUMMARY

Std. Dwg No.	Drawing Description	Rev. No.	Prior Issue Date	Rev. Date	Rev. Description
215	Street Light - Cobra	1	8/09	05/10	Revised location of light to 2.5' behind face of curb. Revised drafting of profile to reflect location and added sidewalk.
216	Street Light – Decorative (H.P.S.)	1	7/09	05/10	Updated manufacturer material callouts for posts and base. Revised pullbox and street light number notes. Revised drafting of profile to reflect location and added sidewalk.
219	Street Light – Decorative (LED)	N/A	N/A	05/10	Added new street light decorative LED standard.
203	Curb, Gutter and Sidewalk Warp	1	12/01	07/11	Added sidewalk warp detail which was removed from Standard 204.
204	Curb Return Detail	1	07/09	07/11	Removed sign detail and sidewalk warp. Added crosswalk, sign locations, street light standards callout and street light location dimensions.
206	Driveway	1	07/09	07/11	Revised driveway minimum distance from curb returns. Added new commercial/ industrial driveway with curb returns and concrete driveway approach.
220	Street Light – Decorative (LED) Pendant	N/A	N/A	07/11	New standard for 30' tall decorative LED street light with mast arm.
221	Bike Lane Signs	N/A	N/A	07/11	New standard for bike lane signs including a bicycle wrong way sign.
222	Combination Street Name and Stop Sign	N/A	N/A	07/11	Moved the sign detail that was on Standard 204 to this new standard drawing.
Standard Drawing Numbers changed/reassigned as of April 2015. The previous 2012 numbers are referenced on the lower right corner of each page					

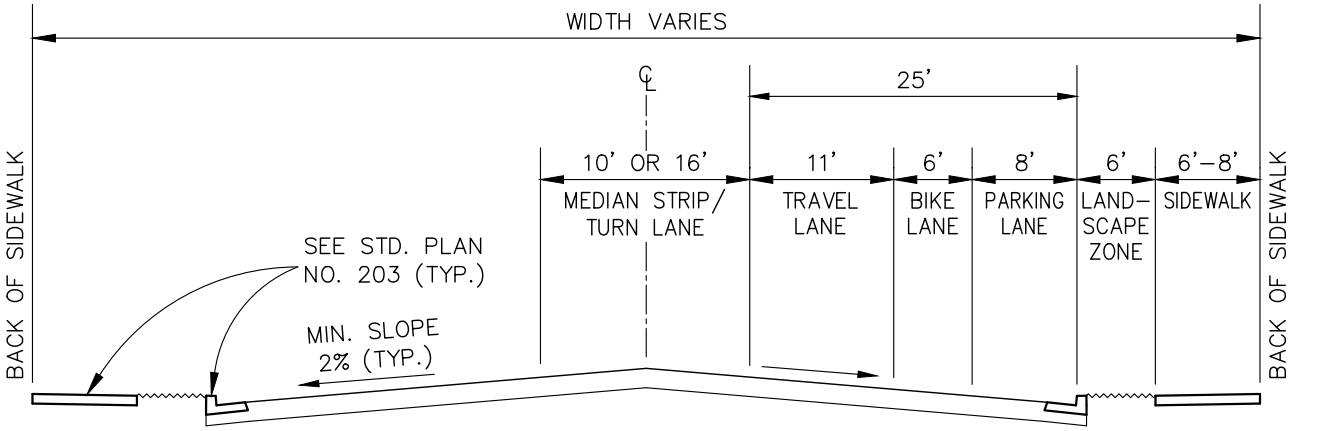
Std. Dwg No.	Drawing Description	Rev. No.	Prior Issue Date	Rev. Date	Rev. Description
223	Angled Parking Bay With Valley Gutter	N/A	N/A	07/11	New standard showing curb and valley gutter requirements for parking bays in the public right-of-way.
224	Street Widening	N/A	N/A	07/11	New standard showing requirements for sawcutting, grinding and widening an existing street.
225	Edge Grinding at Side Street and End of Overlay Conform	N/A	N/A	07/11	New standard showing requirements for grinding and overlays.
226	Edge Grind at Gutter and Centerline for Overlay	N/A	N/A	07/11	New standard showing requirements for grinding and overlays.
227	AC Conform Detail at Curb and Gutter Replacement	N/A	N/A	07/11	New standard showing requirements for replacing existing curb and gutter.
228	Sidewalk, Curb and Gutter Replacement Details	N/A	N/A	07/11	New standards showing requirements for replacement of existing curb & gutter and sidewalk.
229	Cast-In-Place Pier Supported Concrete Retaining Wall	N/A	N/A	07/11	New standard for a concrete retaining wall with a drilled pier foundation.
230	Assess Gate and Fencing	N/A	N/A	07/11	New standard for an access gate to Town easements. Gate and fencing generally conform to Caltrans and all fence materials are black vinyl coated.
402	Tree Grate and Frame Detail	N/A	N/A	07/11	New standard for tree grate and frame typical installation.
403	Street Tree Planting CU Structural Soil	N/A	N/A	07/11	New standard for the use of CU Soil for street tree planting in sidewalk locations.

Standard Drawing Numbers changed/reassigned as of April 2015. The previous 2012 numbers are referenced on the lower right corner of each page

Std. Dwg No.	Drawing Description	Rev. No.	Prior Issue Date	Rev. Date	Rev. Description
404	Median Island Tree Planting CU Structural Soil	N/A	N/A	07/11	New standard for the use of CU Soil for street tree planting in median island locations.
405	Street Tree Planting at Angled Parking Bay CU Structural Soil	N/A	N/A	07/11	New standard for the use of CU Soil for street tree planting in parking bays.
406	Sub-Drain Detail CU Structural Soil	N/A	N/A	07/11	New standard for subdrain used with CU Soil installations.
Standard Drawing Numbers changed/reassigned as of April 2015. The previous 2012 numbers are referenced on the lower right corner of each page					



FIVE LANE BOULEVARD



THREE LANE BOULEVARD

NOTE: SEE STD. PLAN NO. 201-6 FOR CONSTRUCTION NOTES AND 201-7 FOR TYPICAL STREET LAYOUT DESIGN ELEMENTS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL STREET SECTION CROSSTOWN - 5 LANE & 3 LANE

JOHN JAEGER, PUBLIC WORKS DIRECTOR

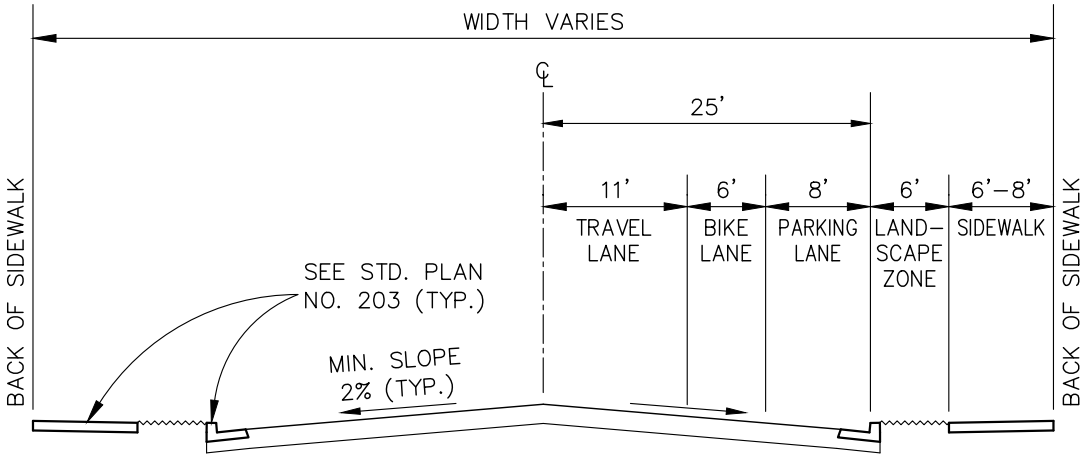
APR 2015 - NTS

STD. PLAN NO. 201

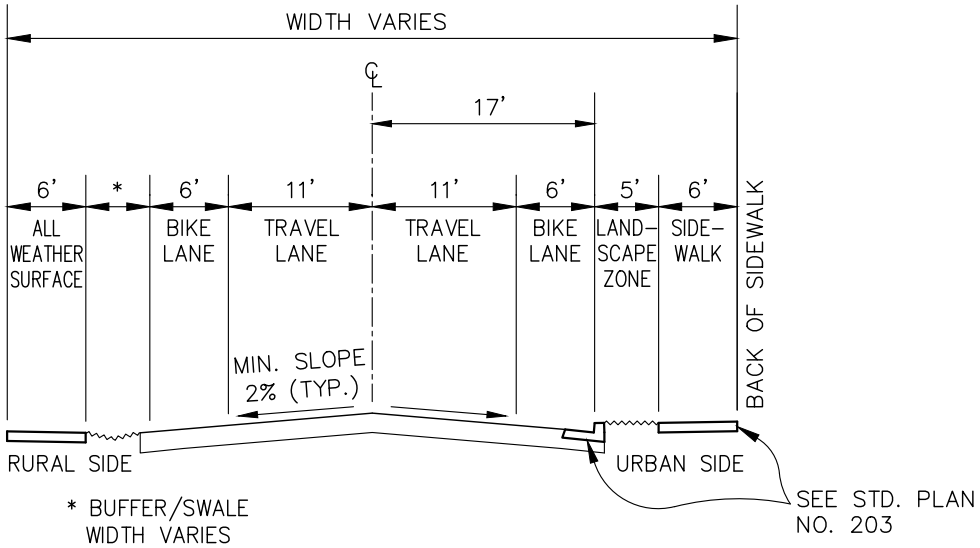
PAGE 1 OF 7

(2012 STD. NO. 202)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 201-1 Plot Date: May 29, 2020 at 02:27 pm



TWO LANE BOULEVARD



RURAL LANE

NOTE: SEE STD. PLAN NO. 201–6 FOR CONSTRUCTION NOTES AND 201–7 FOR TYPICAL STREET LAYOUT DESIGN ELEMENTS.

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 201-2 Plot Date: May 29, 2020 at 02:27 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

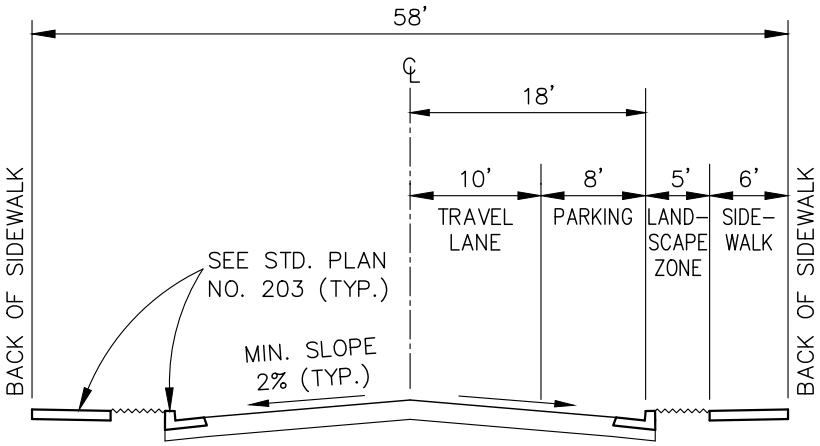
TYPICAL STREET SECTION CROSSTOWN – 2 LANE & RURAL LANE

JOHN JAEGER, PUBLIC WORKS DIRECTOR

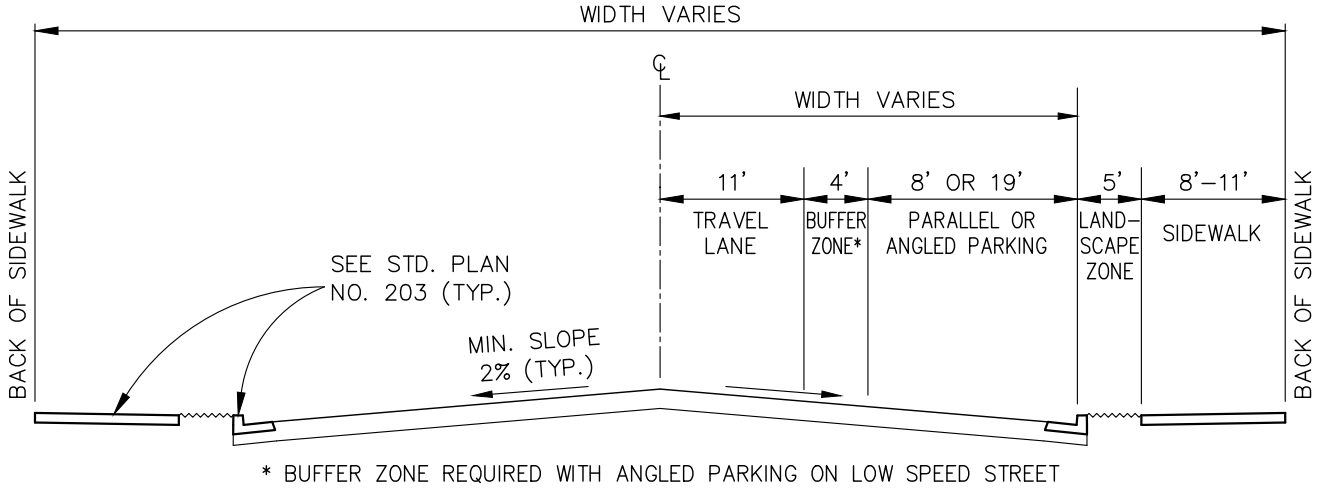
APR 2015 – NTS

STD. PLAN NO. 201

(2012 STD. NO. 202)



CONNECTOR STREET



COMMERCIAL STREET

NOTE: SEE STD. PLAN NO. 201-6 FOR CONSTRUCTION NOTES AND 201-7 FOR TYPICAL STREET LAYOUT DESIGN ELEMENTS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL STREET SECTION LOCAL - CONNECTOR & COMMERCIAL

JOHN JAEGER, PUBLIC WORKS DIRECTOR

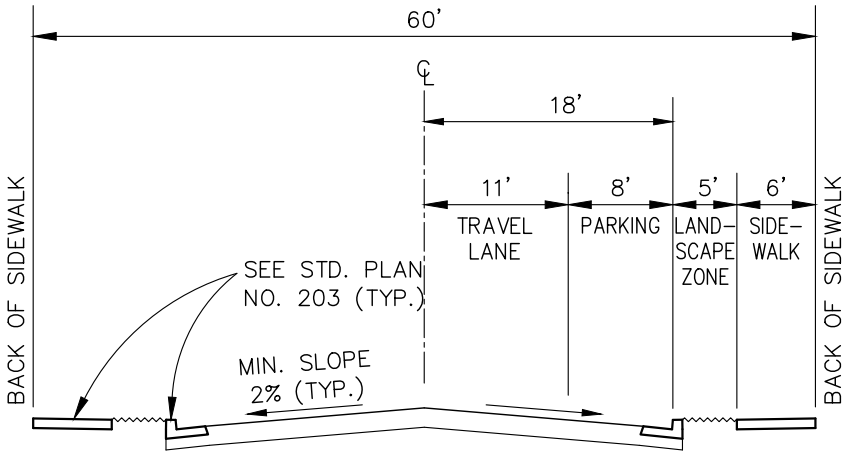
APR 2015 - NTS

STD. PLAN NO. 201

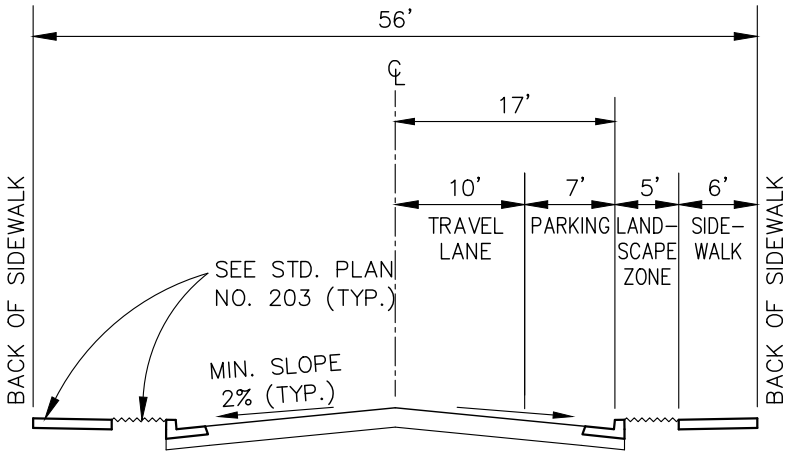
PAGE 3 OF 7

(2012 STD. NO. 202)

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INDUSTRIAL STREET



RESIDENTIAL STREET

NOTE: SEE STD. PLAN NO. 201-6 FOR CONSTRUCTION NOTES AND 201-7 FOR TYPICAL STREET LAYOUT DESIGN ELEMENTS.

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 201-4 Plot Date: May 29, 2020 at 02:27 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

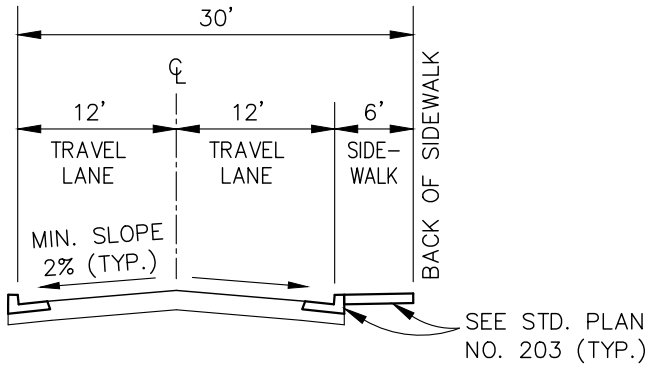
TYPICAL STREET SECTION
LOCAL - INDUSTRIAL & RESIDENTIAL

JOHN JAEGER, PUBLIC WORKS DIRECTOR

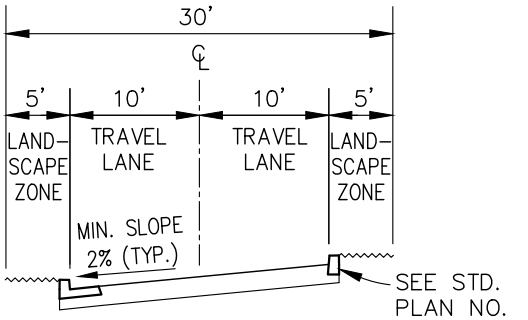
APR 2015 - NTS

STD. PLAN NO. 201

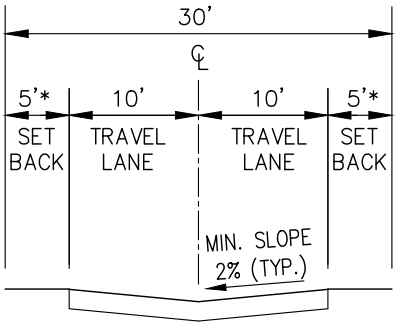
(2012 STD. NO. 202)



NARROW RESIDENTIAL STREET



PRIVATE DRIVEWAY



* SETBACK MAY INCREASE FOR STRUCTURES EXCEEDING TWO STORIES

ALLEY

NOTE: SEE STD. PLAN NO. 201-6 FOR CONSTRUCTION NOTES AND 201-7 FOR TYPICAL STREET LAYOUT DESIGN ELEMENTS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL STREET SECTION LOCAL - NARROW RESIDENTIAL, PRIVATE DRIVEWAY, & ALLEY

JOHN JAEGER, PUBLIC WORKS DIRECTOR

APR 2015 - NTS

STD. PLAN NO. 201

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(2012 STD. NO. 202)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 201-5 Plot Date: May 29, 2020 at 02:27 pm

NOTES:

1. LANDSCAPE PARCELS & PUBLIC UTILITY EASEMENTS MAY BE REQUIRED FOR RIGHT OF WAY WIDTH.
2. PUBLIC UTILITY EASEMENTS MAY BE REQUIRED ON BOTH SIDES OF RIGHT OF WAY.
3. CURB RETURN RADIUS TO BE DETERMINED BASED ON CALTRANS HIGHWAY DESIGN MANUAL TRUCK TURNING TEMPLATES AND AS APPROVED BY THE TOWN ENGINEER.
4. WIDTHS MAY BE ADJUSTED AT THE DISCRETION OF THE TOWN ENGINEER TO ACCOMMODATE BIKE LANES AND/OR PARKING LANES.

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 201-6 Plot Date: May 29, 2020 at 02:27 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL STREET SECTION CONSTRUCTION NOTES

JOHN JAEGER, PUBLIC WORKS DIRECTOR

APR 2015 – NTS

STD. PLAN NO. 201

(2012 STD. NO. 202)

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TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

TYPICAL STREET LAYOUT
DESIGN ELEMENTS

DESIGN AND CONSTRUCTION STANDARDS

APR 2015 - NTS

(2012 STD. NO. 201)

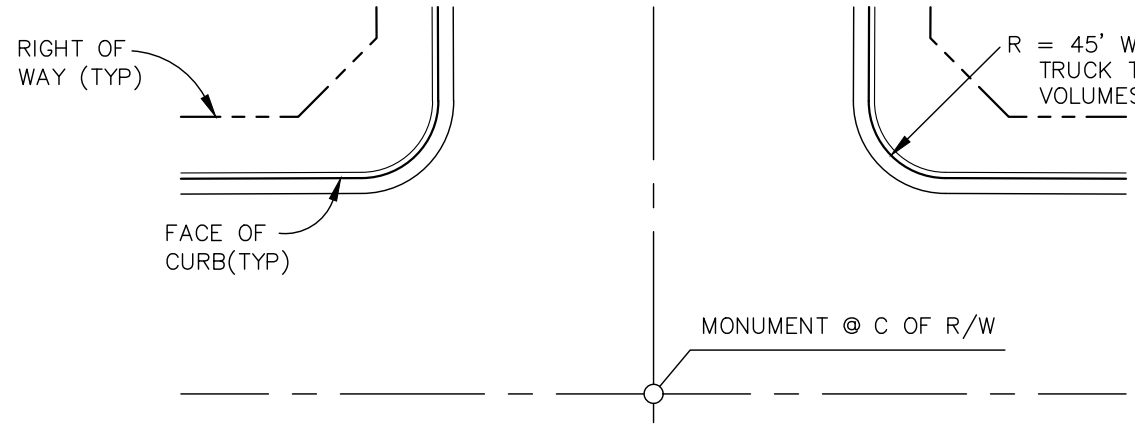
STD. PLAN NO. 201

Summary of Street Design Elements

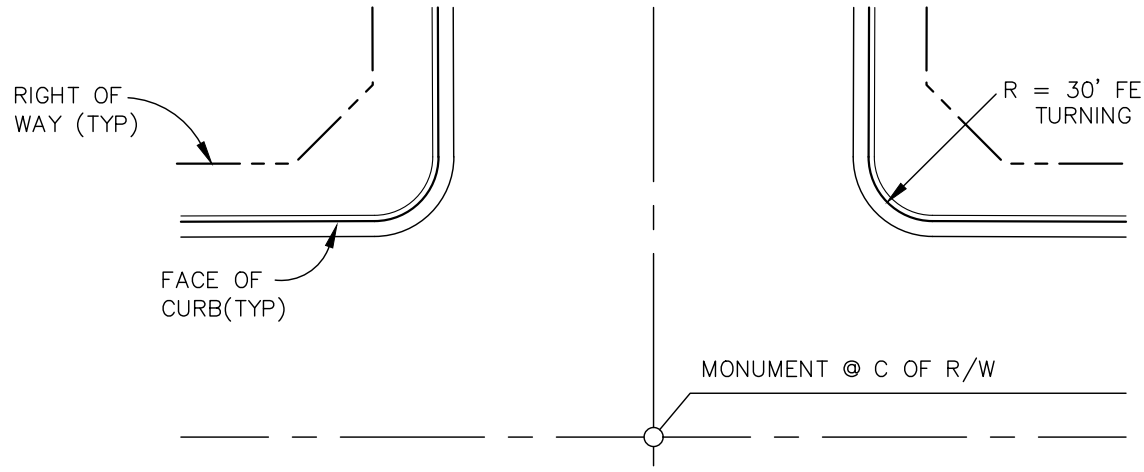
LANE FUNCTION COMPONENT	Crosstown Street Type				Local Street Type						
	Boulevard			Rural Lane	Connector	Commercial Street	Industrial Street	Residential Street	Narrow Residential Street	Private Driveway	Alley
	5 LANE	3 LANE	2 LANE								
	ADT 15,000-35,000	ADT 7,000-15,000		ADT 5,000-15,000	ADT 4,000-8,000	ADT 2,000-7,000	ADT < 2,000	ADT < 2,000	ADT < 200	≤ 4 LOTS	Secondary Access
Pedestrian Areas[A] *(2 of each where used)*[B]											
Landscape Zone (includes Curb)[C]	6	6	6		5	5 (tree well)	5	5			
Sidewalk (excludes landscape)	6–8	6–8	6–8	6 (path)	6	8 or 11[D]	6	6	6[B,E]		
Sub-total pedestrian area width	12–14	12–14	12–14		11	13–16[D]	11	11	6	0	0
Median and Center Lane *(only 1 applies)*											
Turn Lane or Median with Limited Landscaping	10	10		10							
Median with Trees	16	16		16							
Vehicle Travel Lanes *(2 of each where used)*											
Inside Lane	10										
Outside Lane[F]	11	11	11	11	10	11	11	10	12	10[G]	10
Bike Lane/Area	6	6	6	6[H]	Shared	Shared	Shared	Shared	Shared		
Parking Lanes											
No Parking	0[I]			0					0	0	0
Parallel One Side		8				8					
Parallel Both Sides		16	16		16	16	16	14			
Buffer Zone		4[J]	4[J]			4[J]				5[K]	5
Angled Parking One Side[M]			19			19					
Angled Parking Both Sides[M]		38	38			38					
Total Width (to back of walk)	88	Varies	Varies	Varies	58	64	60	56	30	25	20
	92					70					
	94					79					
	98					100					

Notes: Blank table cells indicate that the configuration is not under consideration for this street type. Values are in feet unless otherwise noted.

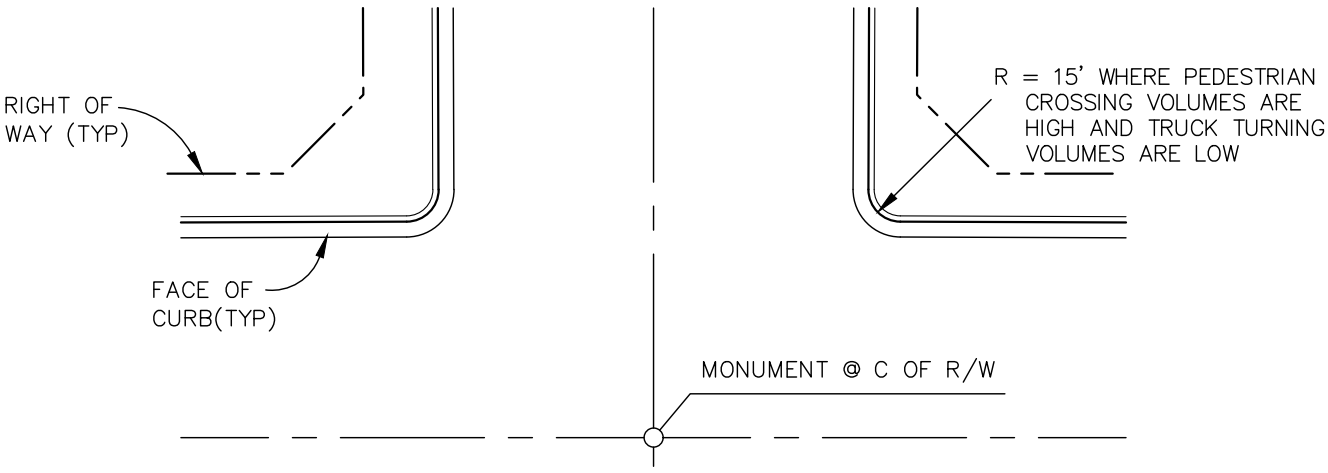
A. Adjacent to pedestrian areas, additional building setbacks may be required based upon zoning and adjacent land use.
B. Only one is used on Narrow Residential Street types and possibly Rural Lanes depending on location.
C. Landscape zones may be planter strips or tree wells. Tree wells are essential adjacent to commercial and multi-family land uses, and a combination of the two, and optional elsewhere.
D. Where building is located at back of sidewalk.
E. Excludes curb width.
F. Outside lane widths must be increased by one foot where bike lanes or parking lanes are not provided, for gutter pans (maximum 12 feet).
G. If drainage design requires curb and gutter increase lane width to 12 feet.
H. Bike lane provided on urban side and possibly on rural side if wide shoulder is present.
I. Unless provided in parking bays.
J. For angled parking.
K. For landscaping.
L. Minimum width to structures.
M. Provided only on low speed streets.



CROSS TOWN STREET INTERSECTION



LOCAL STREET AT CROSS TOWN STREET INTERSECTION



LOCAL STREET INTERSECTION

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL CURB RETURN LAYOUT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

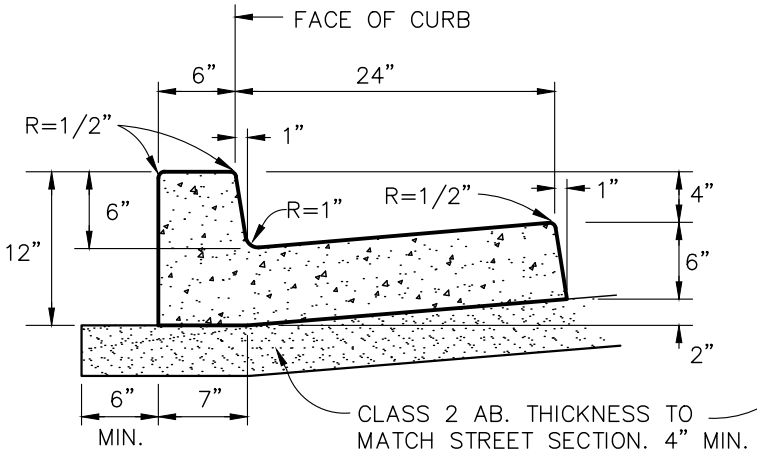
DEC 2001 – NTS

STD. PLAN NO. 202

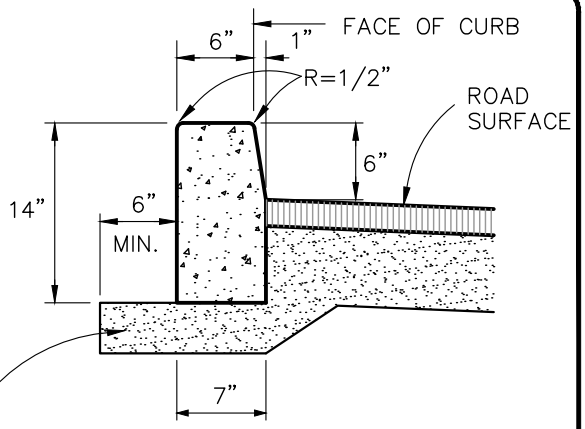
PAGE 1 OF 1

(2012 STD. NO. 201)

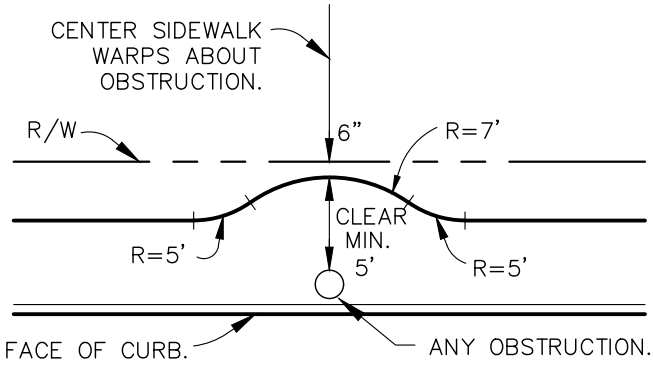
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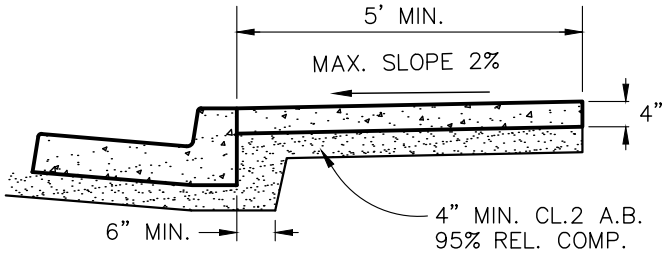
STANDARD CURB AND GUTTER



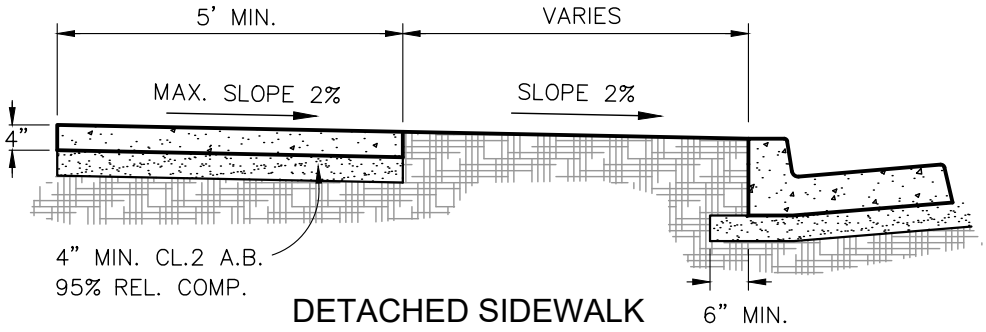
STANDARD VERTICAL CURB



SIDEWALK WARP (CONTIGUOUS SIDEWALK)



CONTIGUOUS SIDEWALK



DETACHED SIDEWALK

NOTES:

1. CONCRETE SHALL BE CLASS "2" AND SHALL CONTAIN NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD.
2. EXPANSION JOINTS, 1/4 INCH WIDE, SHALL BE INSTALLED AT EACH SIDE OF STRUCTURES, AT ENDS OF CURB RETURNS AND AT THE TOP OF DRIVEWAY TAPERS.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 60 FOOT INTERVALS, WITH WEAKENED PLANE JOINTS EVERY 15 FEET.
4. SIDEWALKS SHALL BE SCORED INTO 5 FOOT SQUARES UNLESS SPECIFIED BY ENGINEER.
5. IF EXTRUSION MACHINE IS USED, EXPANSION JOINTS SHALL BE DEEP SCORE 1/3 THE THICKNESS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CURB, GUTTER, SIDEWALK, AND SIDEWALK WARP

JOHN JAEGER, PUBLIC WORKS DIRECTOR

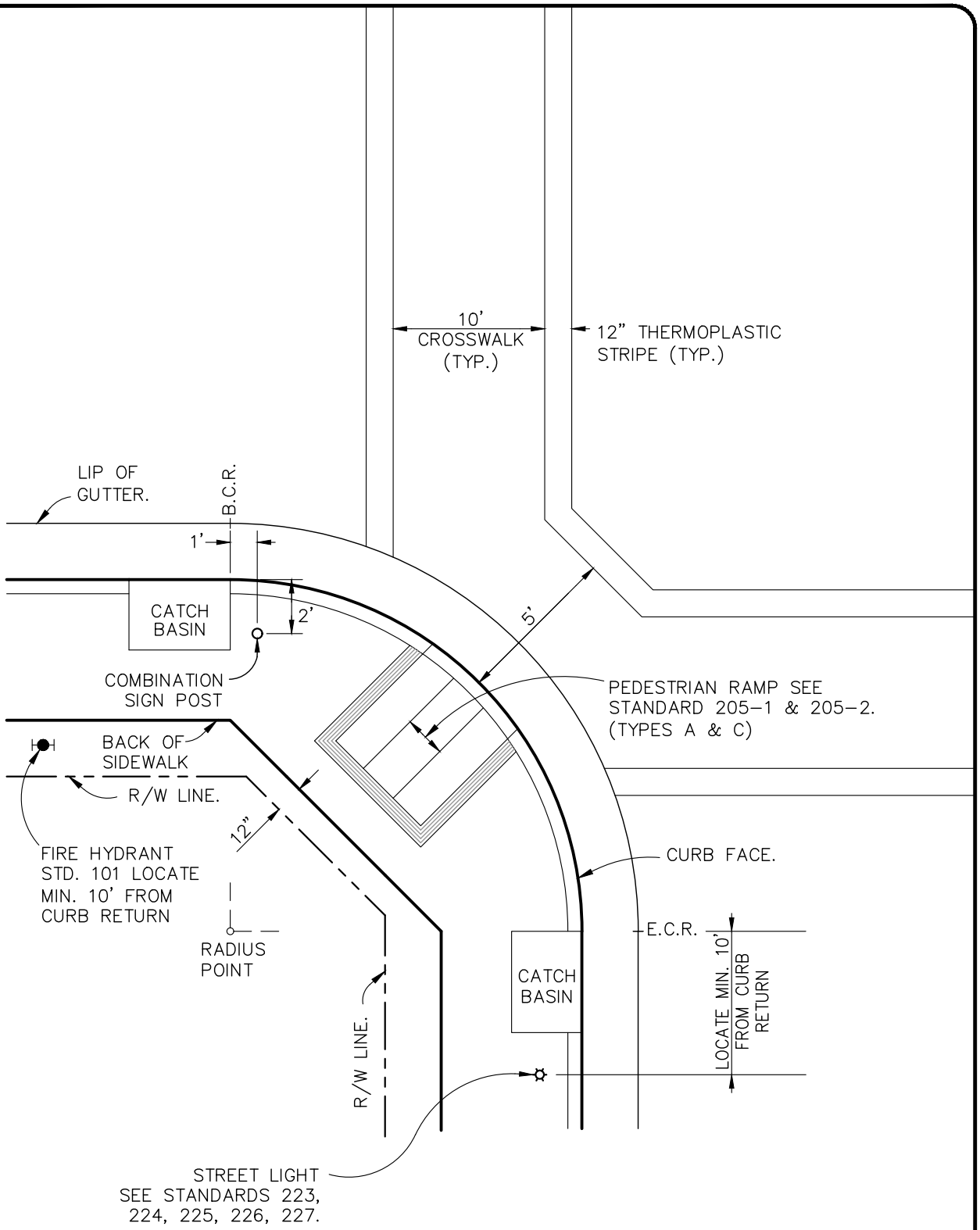
JULY 2011 – NTS

STD. PLAN NO. 203

PAGE 1 OF 1

(2012 STD. NO. 203)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 203 Plot Date: May 29, 2020 at 02:28 pm



TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CURB RETURN

STD. PLAN NO. 204

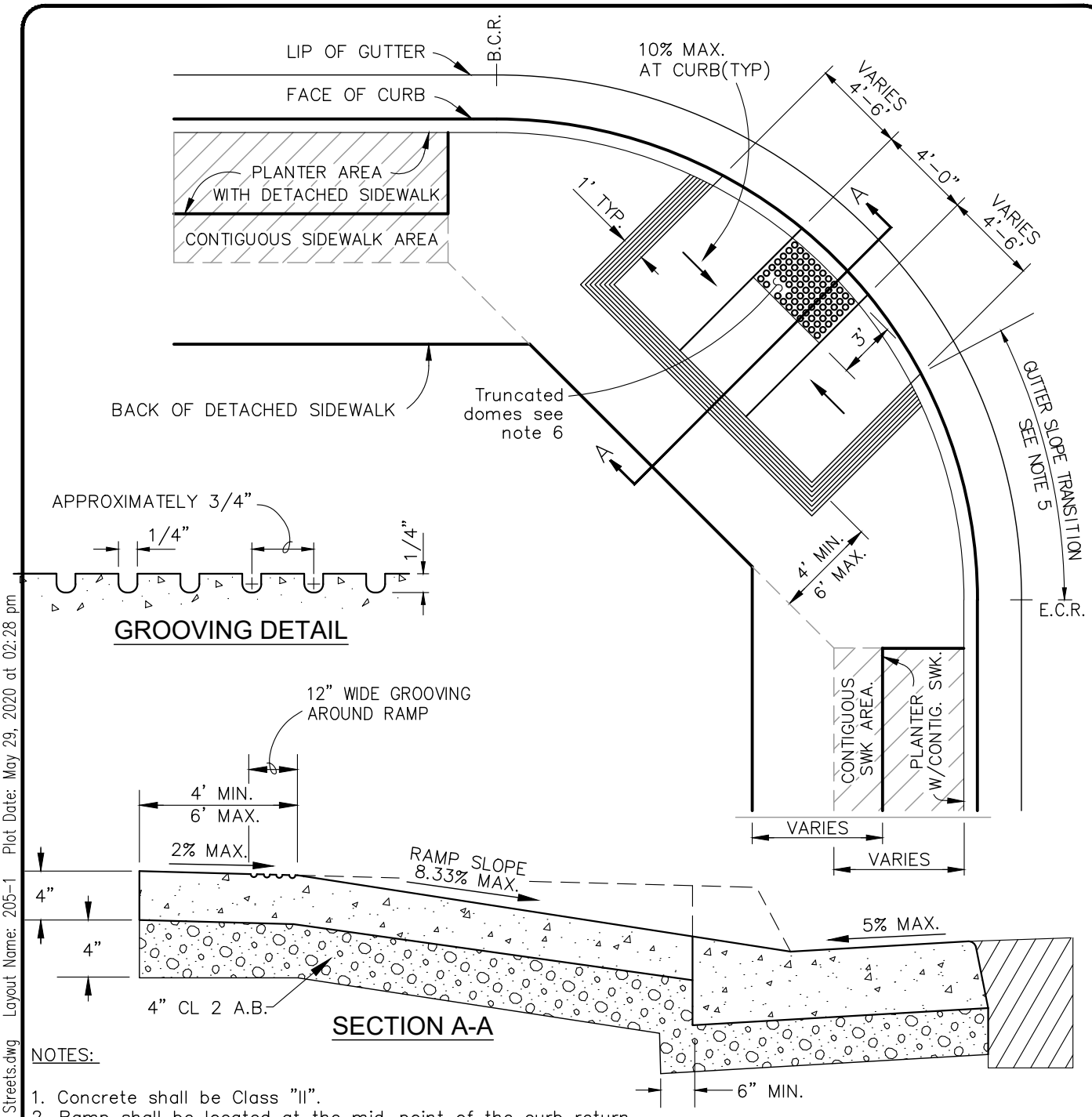
PAGE 1 OF 1

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JULY 2011 – NTS

(2012 STD. NO. 204)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 204 Plot Date: May 29, 2020 at 02:28 pm



NOTES:

1. Concrete shall be Class "II".
2. Ramp shall be located at the mid–point of the curb return.
3. Design shall conform to these requirements, except as otherwise approve by the Town engineer.
4. The curb ramp shall be outlined, as shown, with a 1'–0" wide border with 1/4" grooves approximately 3/4" on center. See grooving detail.
5. Maximum slopes of the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'–0" of the top and bottom of the curb ramp. Adjoining gutter slope transitions from 1" per foot to 5% at the ramp (Typ.)
6. Raised truncated dome detectable warning surface, See page 3 of 3 for detail. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
7. Transitions from ramps and landing to walks, gutters, or streets shall be flush and free of abrupt changes.
8. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PEDESTRIAN CURB RAMP TYPE A

STD. PLAN NO. 205

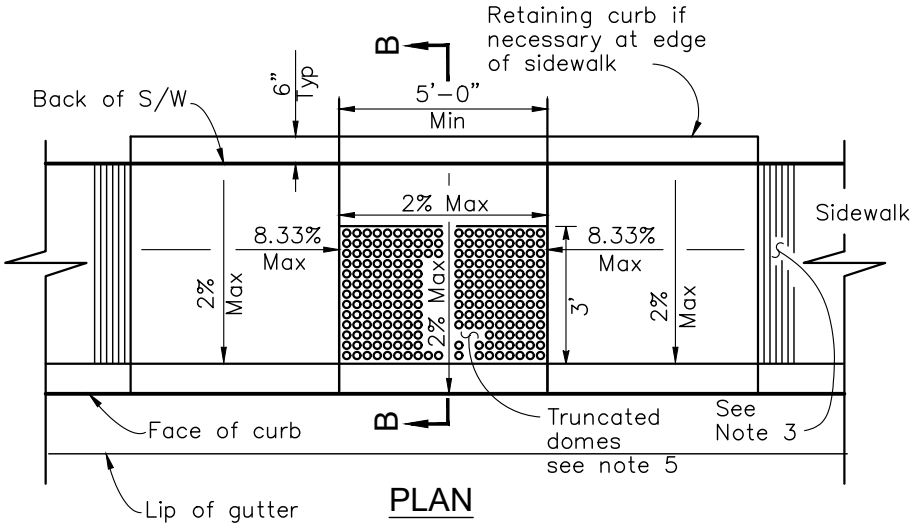
PAGE 1 OF 3

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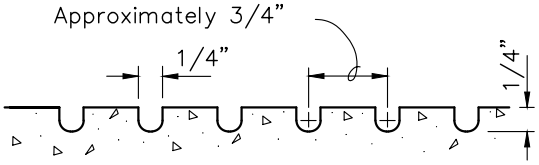
JULY 2009 – NTS

(2012 STD. NO. 205)

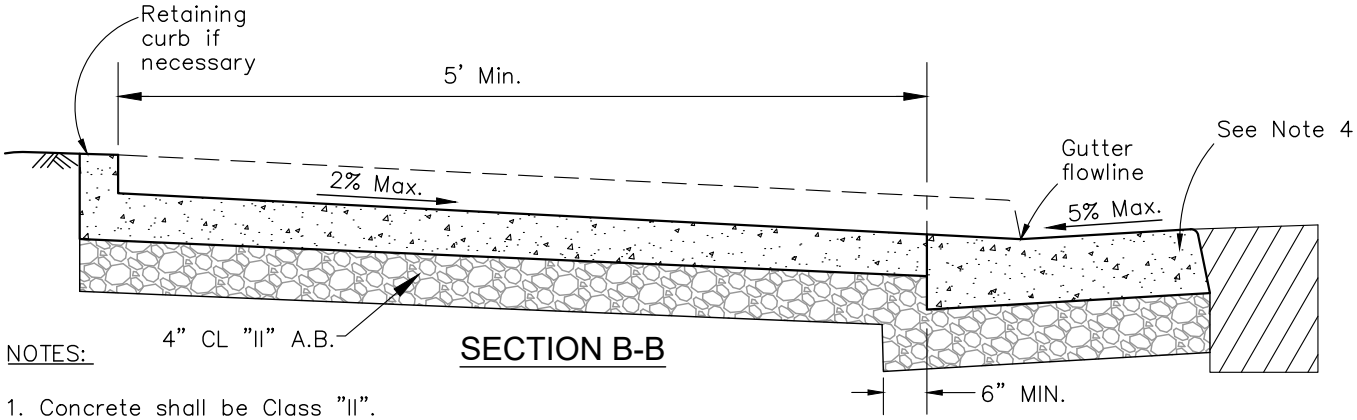
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 205-1 Plot Date: May 29, 2020 at 02:28 pm



PLAN



GROOVING DETAIL



SECTION B-B

NOTES:

1. Concrete shall be Class "II".

2. Design shall conform to these requirements, except as otherwise approve by the Town engineer.

3. The curb ramp shall be outlined, as shown, with a 1'-0" wide border with 1/4" grooves approximately 3/4" on center. See grooving detail.

4. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'-0" of the top and bottom of the curb ramp.

5. Raised truncated dome detectable warning surface, See page 3 of 3 for detail. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.

6. Transitions from ramps and landing to walks, gutters, or streets shall be flush and free of abrupt changes.

7. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PEDESTRIAN CURB RAMP TYPE B

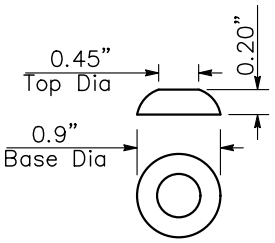
JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2009 – NTS

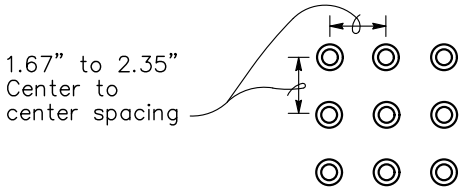
STD. PLAN NO. 205

(2012 STD. NO. 205)

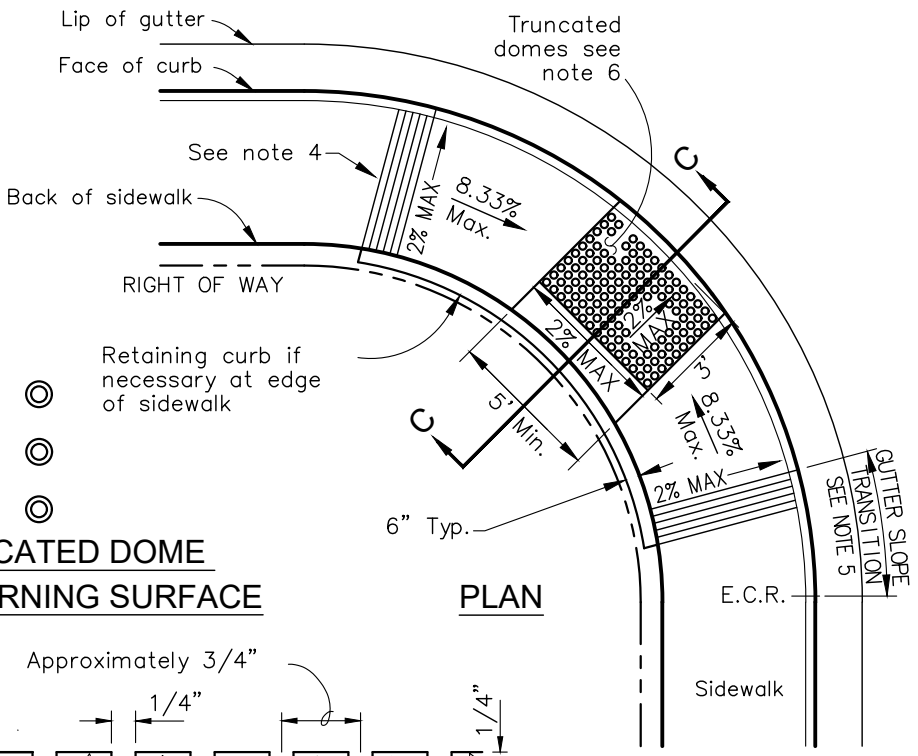
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RAISED TRUNCATED DOME

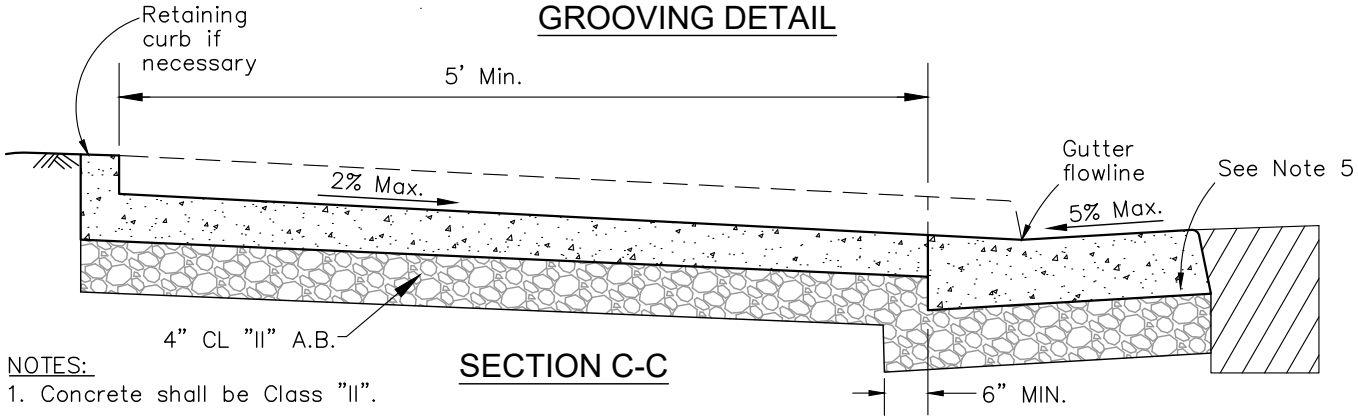


RAISED TRUNCATED DOME DETECTABLE WARNING SURFACE



PLAN

GROOVING DETAIL



SECTION C-C

NOTES:

1. Concrete shall be Class "II".
2. Ramp shall be located at the mid–point of the curb return.
3. Design shall conform to these requirements, except as otherwise approve by the Town engineer.
4. The curb ramp shall be outlined, as shown, with a 1'–0" wide border with 1/4" grooves approximately 3/4" on center. See grooving detail.
5. Maximum slopes of the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'–0" of the top and bottom of the curb ramp. Adjoining gutter slope transitions from 1" per foot to 5% at the ramp (Typ.)
6. Raised truncated dome detectable warning surface, detail above. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.
7. Transitions from ramps and landing to walks, gutters, or streets shall be flush and free of abrupt changes.
8. Utility pull boxes, manholes, vaults and all other utility facilities within the boundaries of the curb ramp will be relocated or adjusted to grade by the owner prior to, or in conjunction with, curb ramp construction.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PEDESTRIAN CURB RAMP TYPE C

STD. PLAN NO. 205

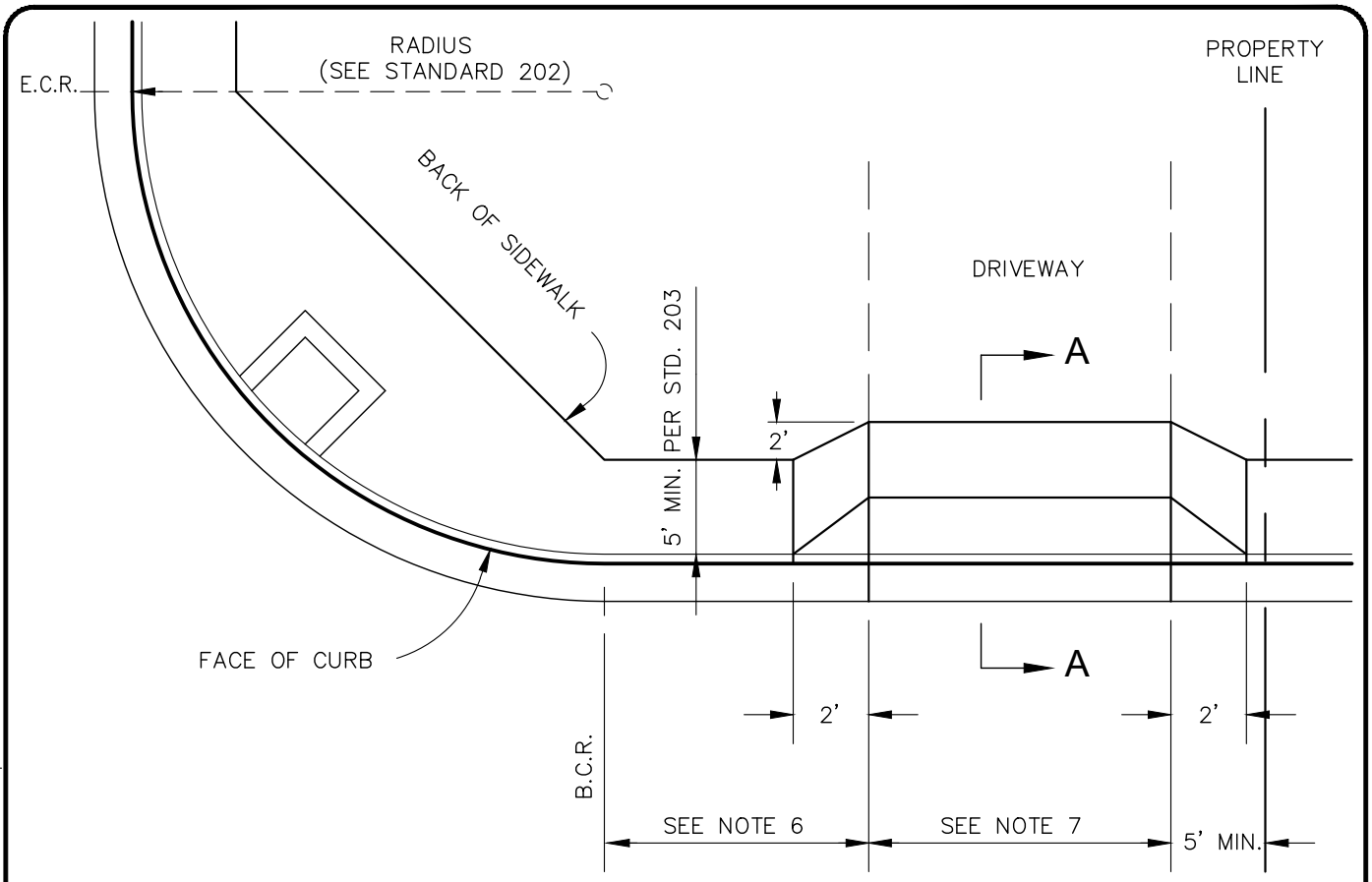
PAGE 3 OF 3

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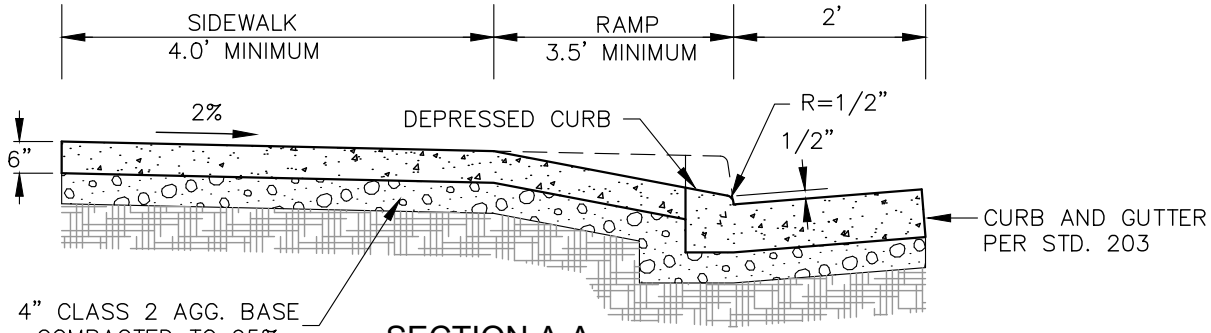
JULY 2009 – NTS

(2012 STD. NO. 205)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 205-3 Plot Date: May 29, 2020 at 02:28 pm



PLAN



SECTION A-A

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE INSTALLED AT THE CENTER OF ALL DRIVEWAYS OVER 20' WIDE.
2. MAXIMUM SIDEWALK CROSS SLOPE 2%.
3. MEANDER SIDEWALK AT OBSTRUCTIONS AND DRIVEWAYS TO MAINTAIN 4.0'' MINIMUM CLEARANCE.
4. ALL CONCRETE SHALL BE CLASS 2.
5. PLACE #4 REBAR AT 12" BOTH WAYS THROUGHOUT COMMERCIAL AND INDUSTRIAL DRIVEWAYS WITHIN THE STREET RIGHT OF WAY.
6. RESIDENTIAL DRIVEWAY RAMP SHALL BE MINIMUM 20' FROM B.C.R. OR AS CLOSE TO FURTHEST PROPERTY LINE AS POSSIBLE. OTHERS SHALL BE 50' MINIMUM WITH THE EXCEPTION OF MINIMUM 75' ON CROSSTOWN STREETS.
7. RESIDENTIAL DRIVEWAY SHALL BE MINIMUM 12', MAXIMUM 16'. ALL OTHERS SHALL BE 24' MINIMUM, 35' MAXIMUM. SEE TOWN OF WINDSOR ZONING CODE 27.30.090 FOR ADDITIONAL GUIDANCE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

DRIVEWAY

STD. PLAN NO. 206

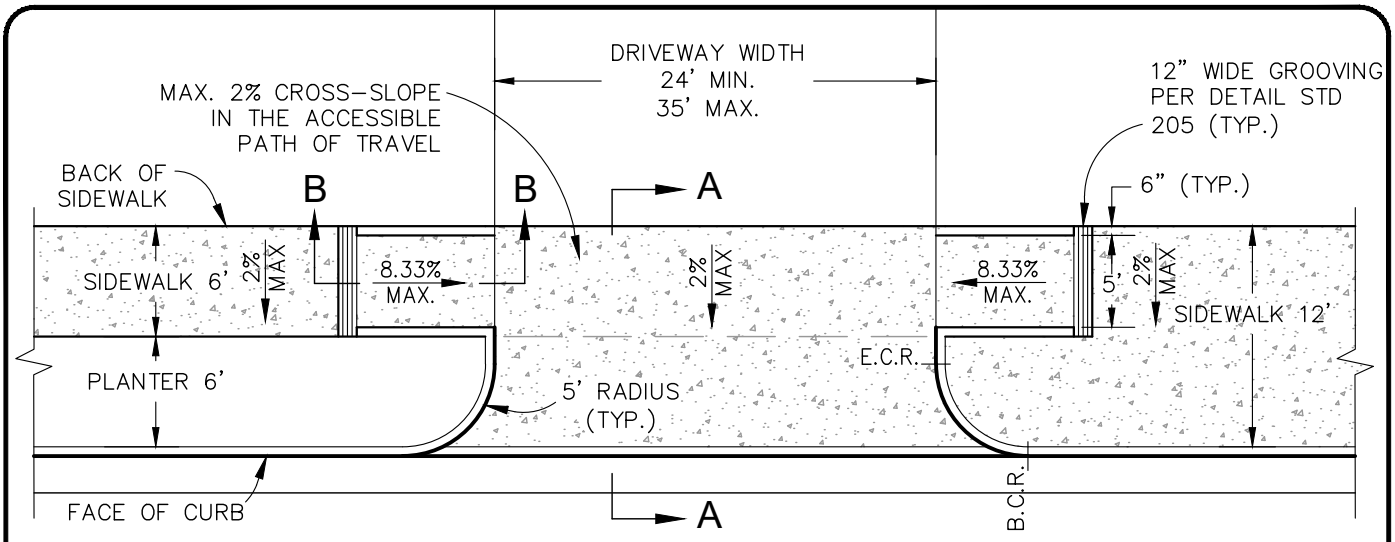
PAGE 1 OF 2

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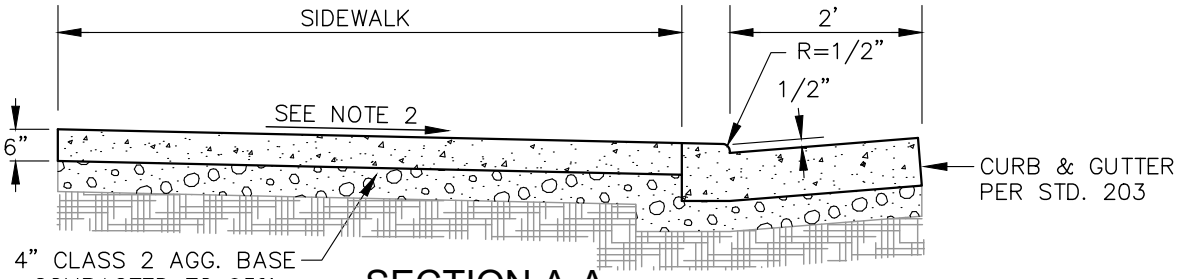
JULY 2011 – NTS

(2012 STD. NO. 206)

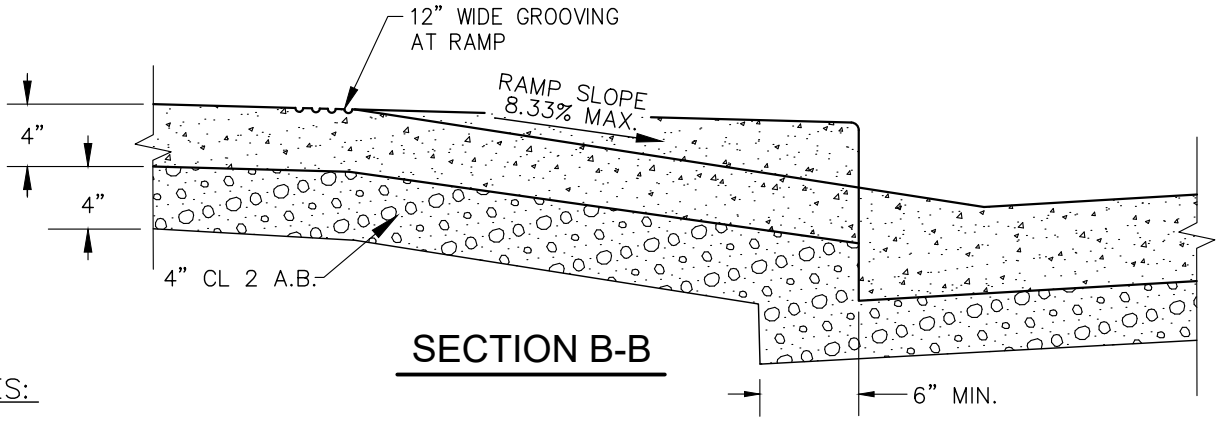
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 206-1 Plot Date: May 29, 2020 at 02:28 pm



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE INSTALLED AT THE CENTER OF ALL DRIVEWAYS OVER 20' WIDE.
2. MAXIMUM CROSS SLOPE 2% IN THE ACCESSIBLE PATH OF TRAVEL.
3. ALL CONCRETE SHALL BE CLASS 2, 6 SACKS PER CUBIC YARD.
4. PLACE #4 REBAR AT 12" BOTH WAYS THROUGHOUT COMMERCIAL AND INDUSTRIAL DRIVEWAYS WITHIN THE STREET RIGHT OF WAY.
5. THIS DRIVEWAY OPTION MAY ONLY BE USED WITH PRIOR APPROVAL OF THE TOWN ENGINEER.
6. COMMERCIAL/RESIDENTIAL DRIVEWAY SHALL BE 50' MINIMUM FROM BCR WITH THE EXCEPTION OF MINIMUM 75' ON CROSSTOWN STREETS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

COMMERCIAL/INDUSTRIAL DRIVEWAY

STD. PLAN NO. 206

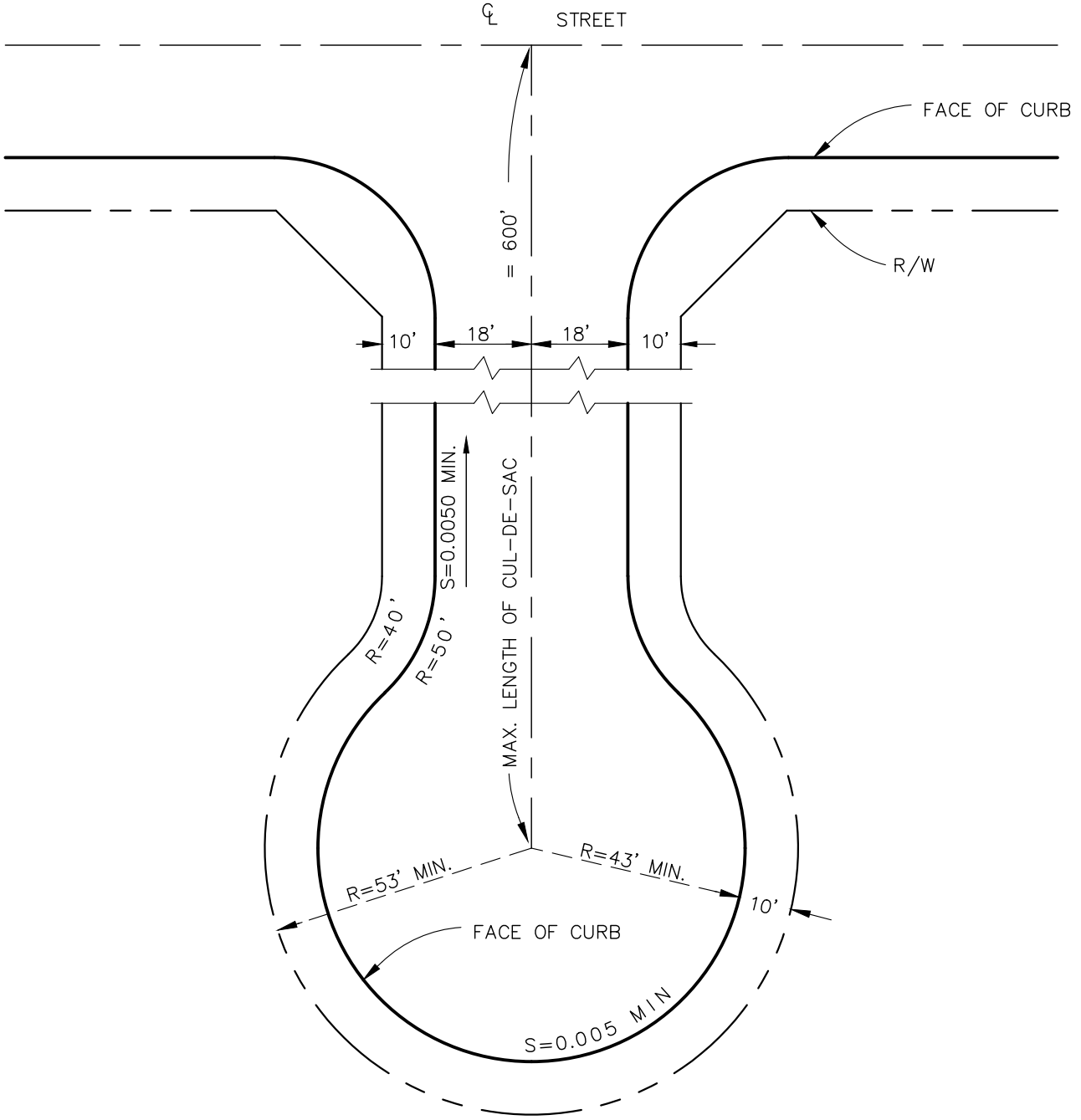
PAGE 2 OF 2

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JULY 2011 – NTS

(2012 STD. NO. 206)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 206-2 Plot Date: May 29, 2020 at 02:28 pm



CROSS SLOPE IN BULB AREA
SHALL BE MIN 2%.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

RESIDENTIAL CUL-DE-SAC

STD. PLAN NO. 207

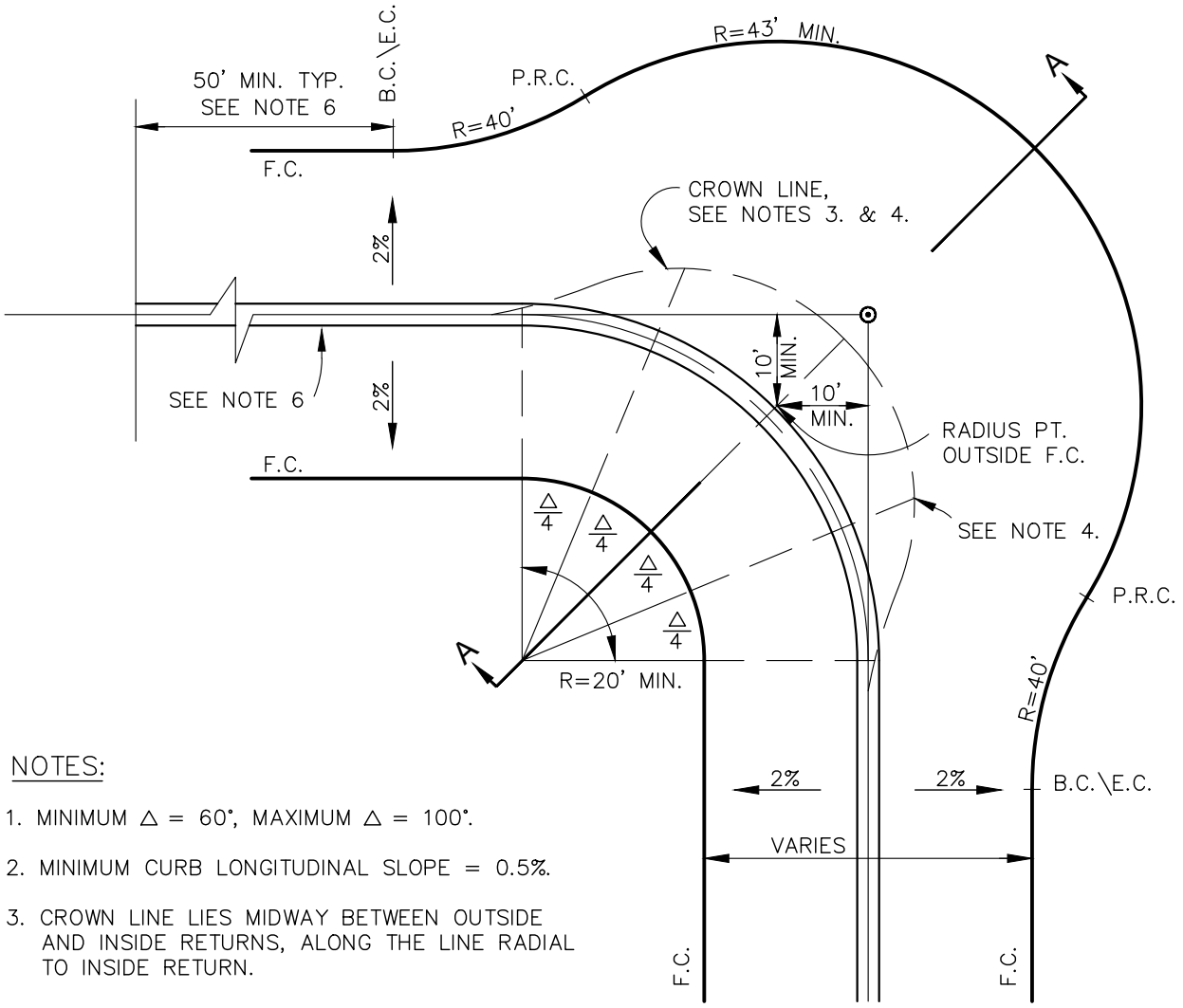
PAGE 1 OF 1

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DEC 2001 – NTS

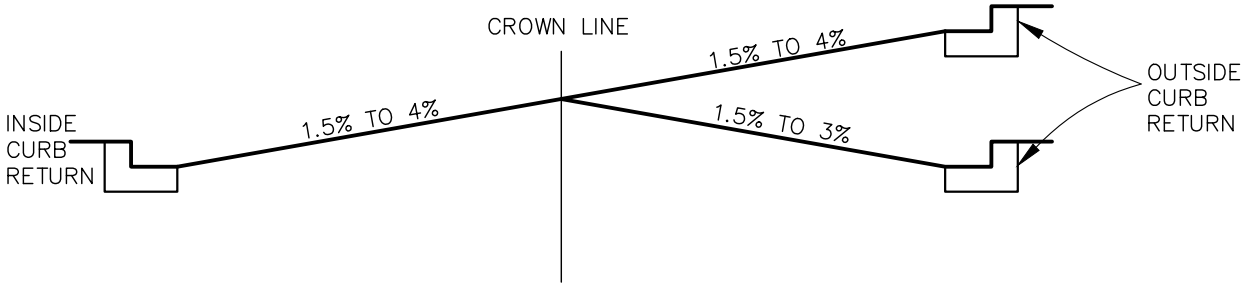
(2012 STD. NO. 208)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 207 Plot Date: May 29, 2020 at 02:28 pm



NOTES:

1. MINIMUM △ = 60°, MAXIMUM △ = 100°.
2. MINIMUM CURB LONGITUDINAL SLOPE = 0.5%.
3. CROWN LINE LIES MIDWAY BETWEEN OUTSIDE AND INSIDE RETURNS, ALONG THE LINE RADIAL TO INSIDE RETURN.
4. CROWN LINE ELEVATION TO BE SHOWN ON THE PLANS AT △/4 POINTS.
5. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE TOWN ENGINEER.
6. PLACE CALTRANS DETAIL 22, CENTERLINE STRIPE AT LEAST 50' BEYOND THE BC/EC'S.



SECTION A-A
MAXIMUM & MINIMUM CROSS SLOPES

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

RESIDENTIAL STREET KNUCKLE

STD. PLAN NO. 208

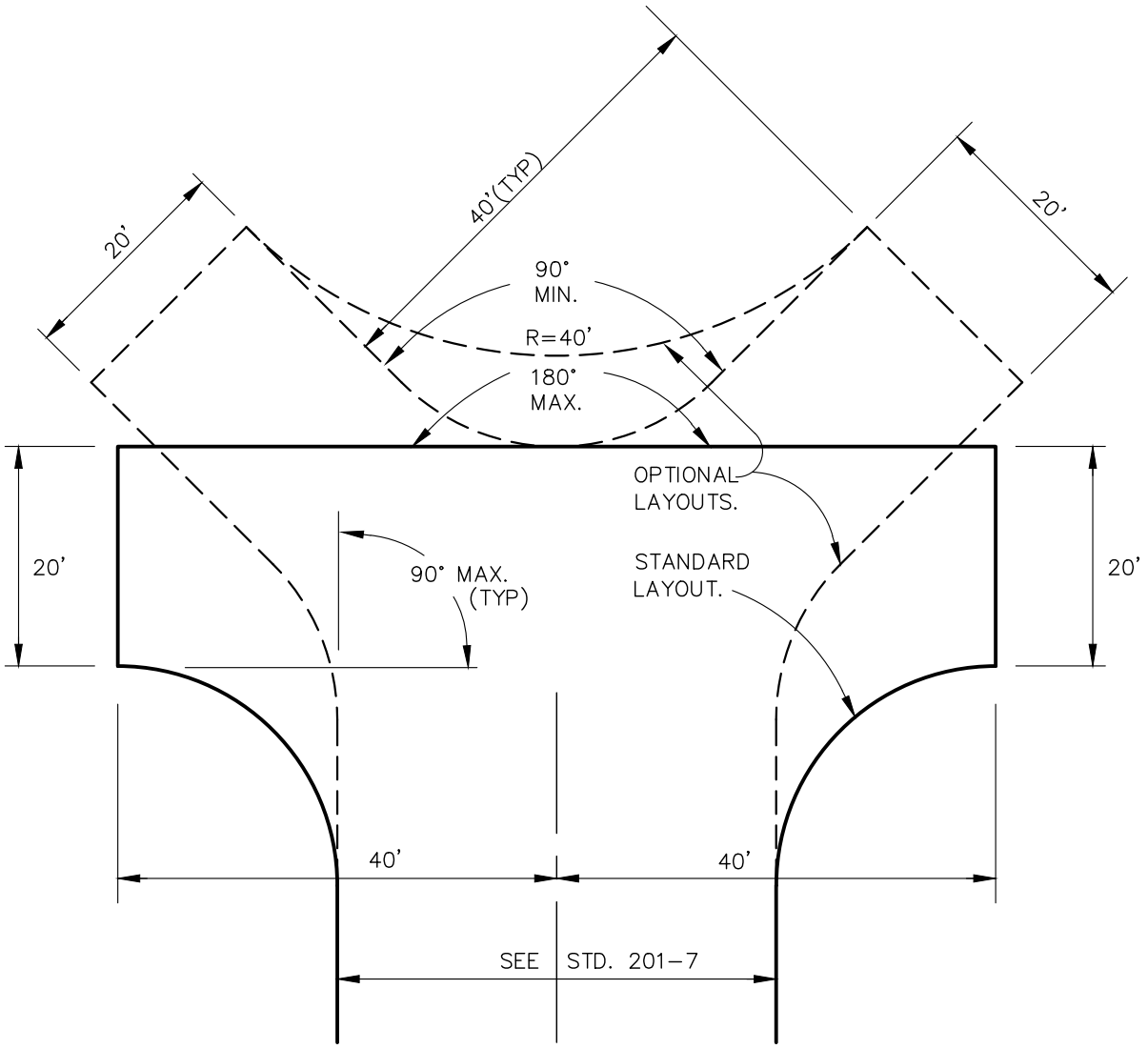
PAGE 1 OF 1

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DEC 2001 – NTS

(2012 STD. NO. 209)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 208 Plot Date: May 29, 2020 at 02:28 pm



NOTES:

1. FOR RESIDENTIAL AND PRIVATE STREETS.
2. TO BE USED ONLY WHEN SPECIFICALLY AUTHORIZED BY THE TOWN ENGINEER AND FIRE PROTECTION DISTRICT.
3. ALL RADII 20', EXCEPT AS NOTED
4. SINGLE SIDED TURNAROUNDS OF EQUIVALENT DIMENSIONS MAY BE USED.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

HAMMERHEAD TURN AROUND

STD. PLAN NO. 209

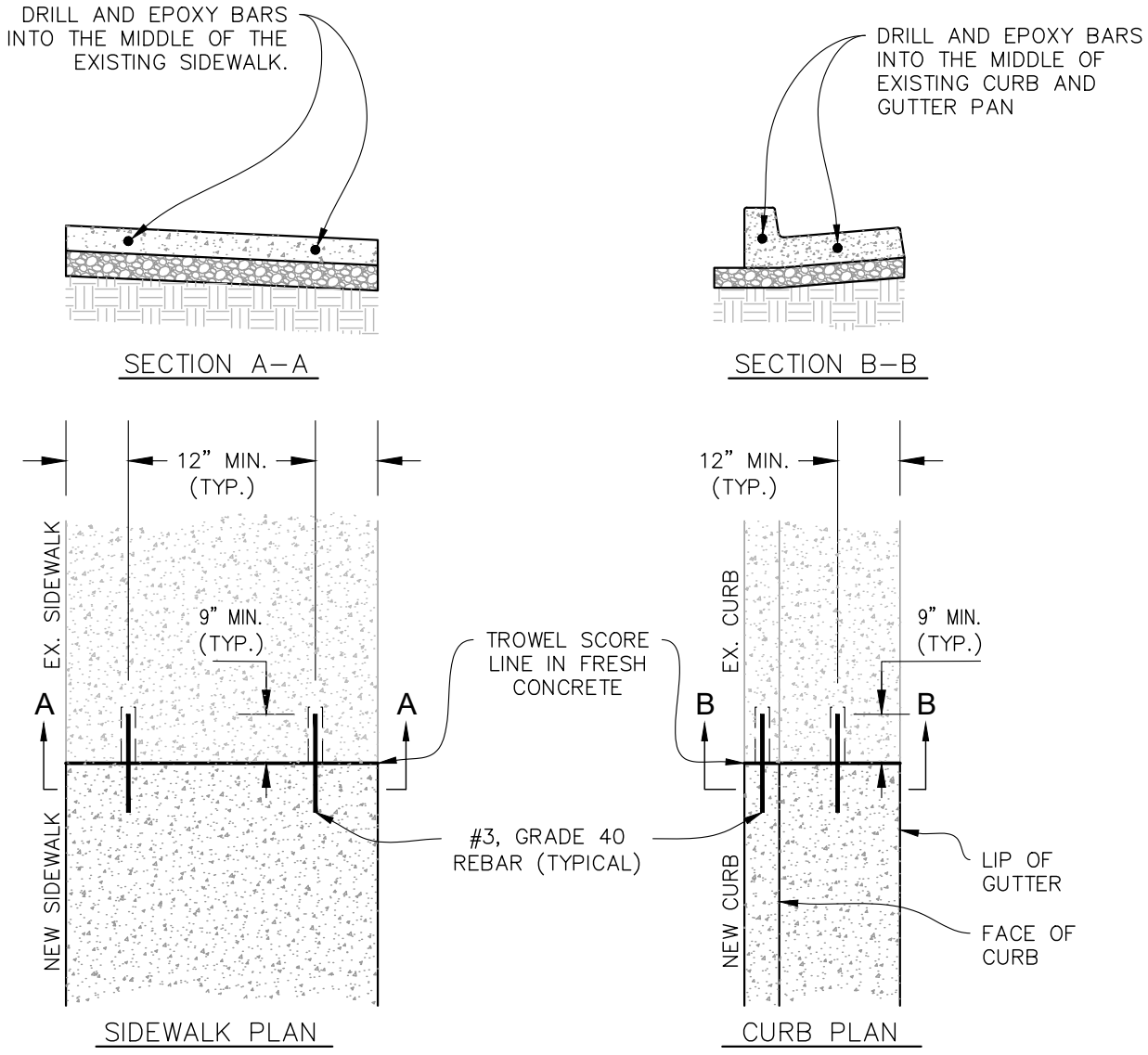
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DEC 2001 – NTS

(2012 STD. NO. 210)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 209 Plot Date: May 29, 2020 at 02:28 pm



NOTES:

1. CURB AND GUTTER AND SIDEWALK CONSTRUCTION SHALL CONFORM TO TOWN STANDARD 203.
2. ALL SOFT OR SPONGY SUB–GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED BY THE TOWN ENGINEER.
3. REINFORCING BARS SHALL BE MINIMUM GRADE 40 AND SHALL CONFORM TO SECTION 52, "REINFORCEMENT" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. EPOXY USED FOR BONDING REINFORCING BARS TO EXISTING CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 95, EPOXY AND SECTION 95–2.03, "EPOXY RESIN ADHESIVE FOR BONDING NEW CONCRETE TO OLD CONCRETE" OF THE CALTRANS STANDARD SPECIFICATIONS.
5. SIDEWALK SHALL BE SAWCUT AND REMOVED TO THE NEAREST CONTROL JOINT (SCORE, EXPANSION OR WEAKENED PLANE JOINT). CURB AND GUTTER SHALL BE SAWCUT AND REMOVED TO THE NEAREST CONTROL JOINT WHEN PRACTICAL AS DIRECTED BY THE TOWN INSPECTOR.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SIDEWALK, CURB & GUTTER REPLACEMENT DETAILS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

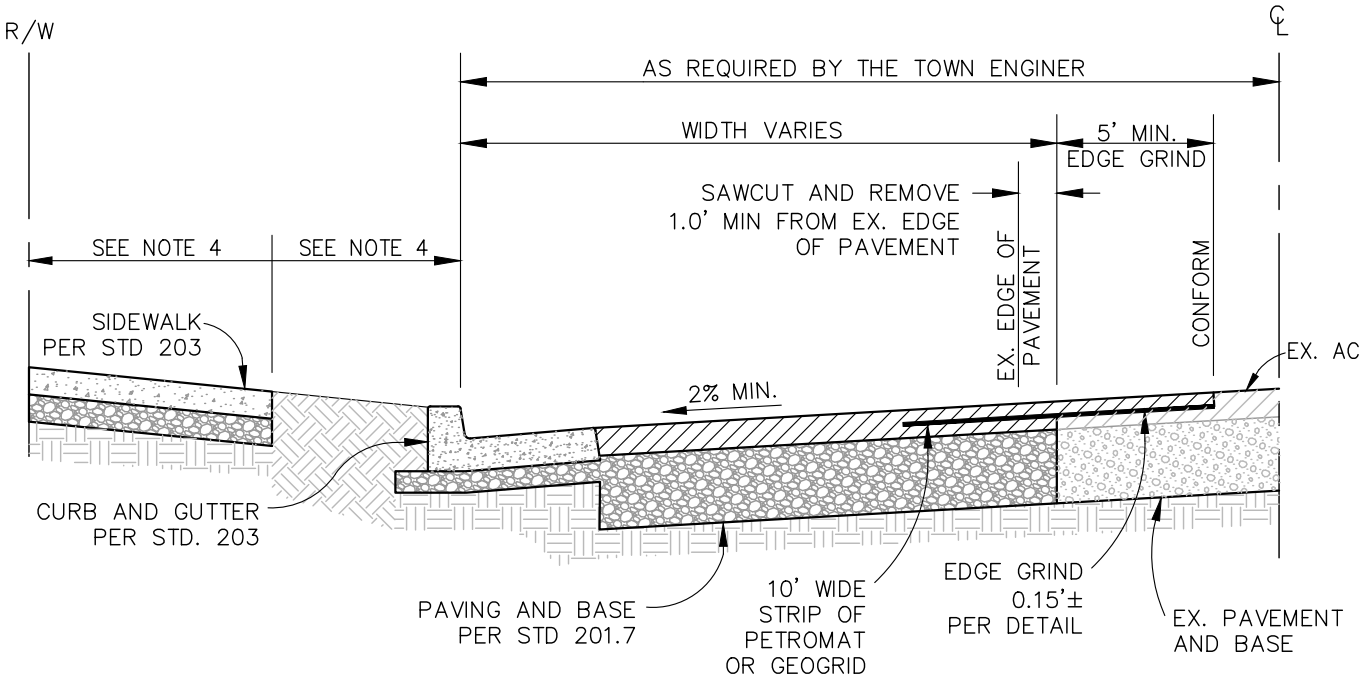
JULY 2011 – NTS

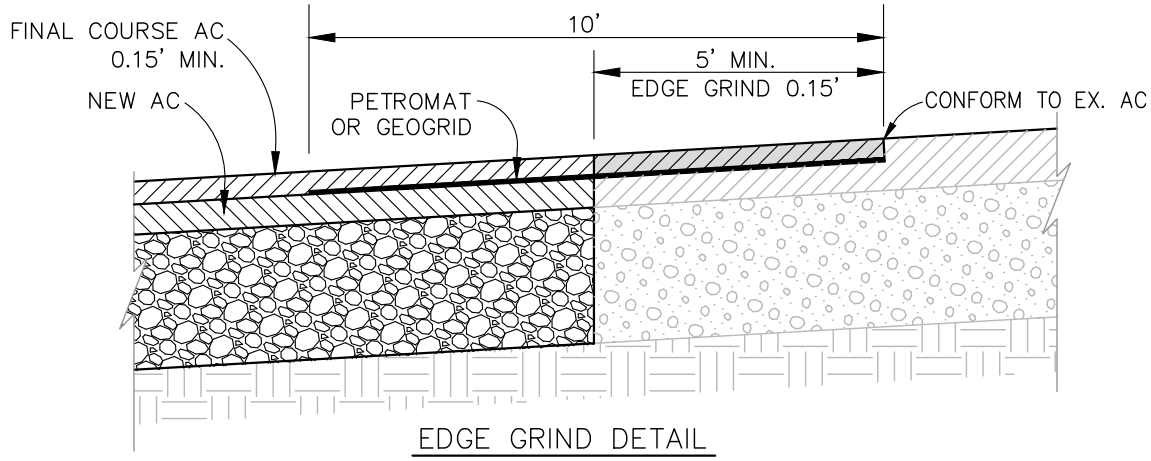
STD. PLAN NO. 213

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(2012 STD. NO. 228)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 213 Plot Date: May 29, 2020 at 02:28 pm





EDGE GRIND DETAIL

NOTES:

1. A TACK COAT, TYPE SS–1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.

2. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39–6 "SPREADING AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.

3. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "ENGINEERING FABRICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROMAT OR APPROVED EQUAL.

4. WIDTH VARIES PER STREET DESIGN GUIDELINES AND/OR STD. 201–7.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET WIDENING

JOHN JAEGER, PUBLIC WORKS DIRECTOR

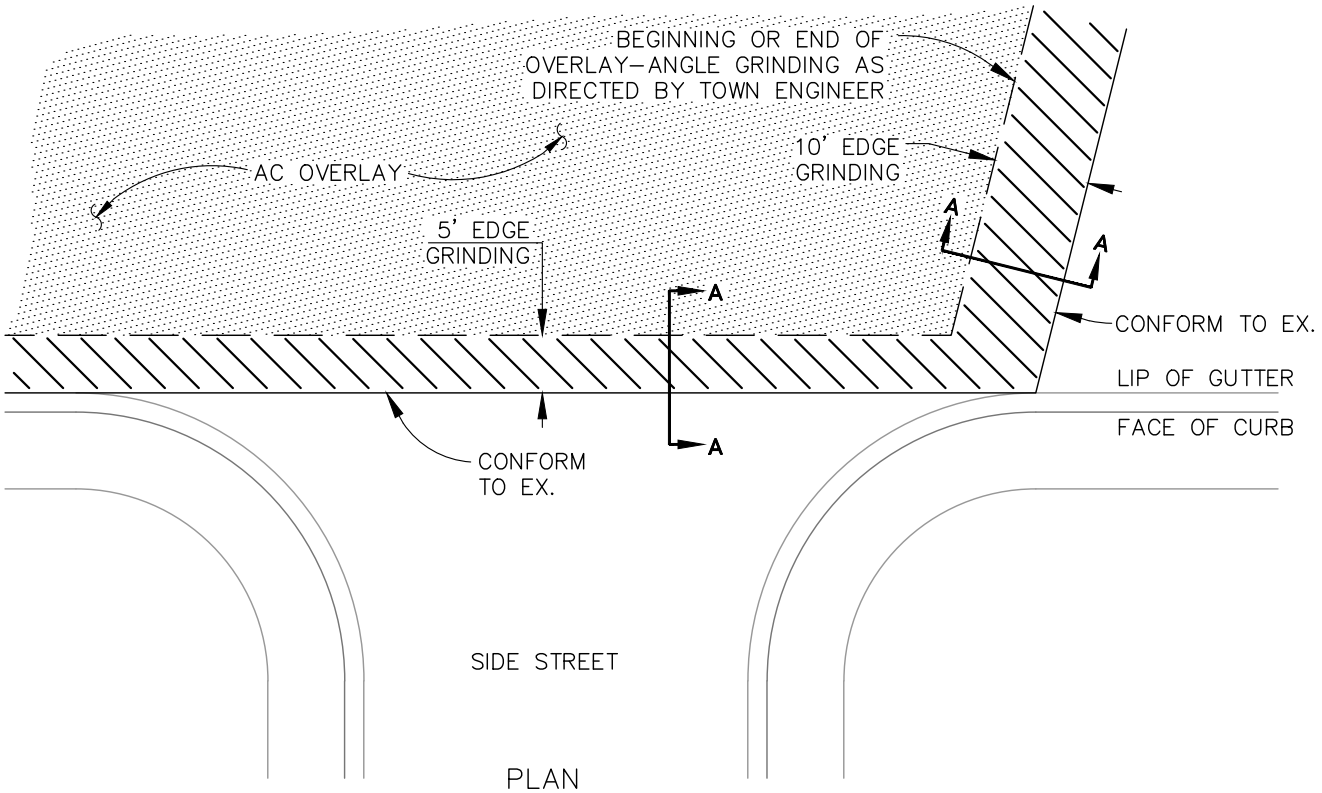
JULY 2011 – NTS

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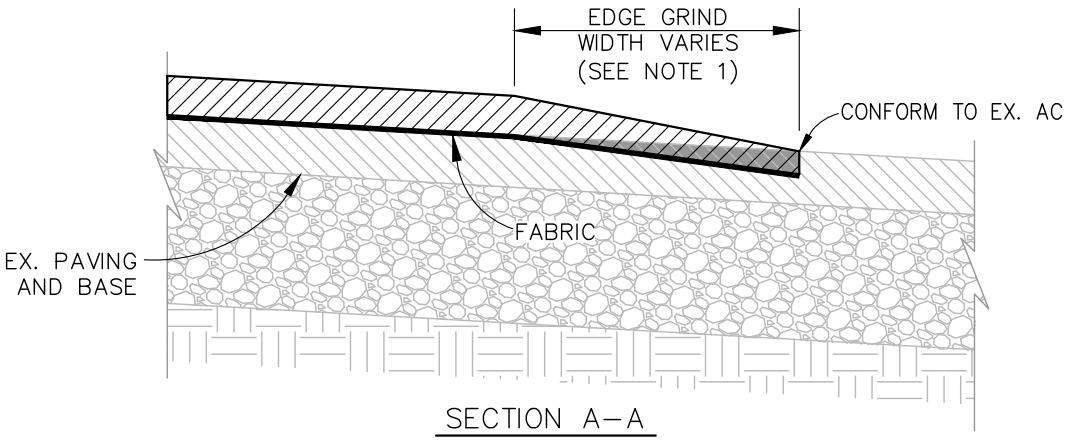
PAGE 1 OF 1

(2012 STD. NO. 224)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 214 Plot Date: May 29, 2020 at 02:28 pm



PLAN



SECTION A–A

NOTES:

1. EDGE GRINDING SHALL BE 10ft WIDE ON STREET TO BE OVERLAID, 5ft WIDE ON SIDE STREETS, AND DEPTH OF 0.15ft±.
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE TOWN ENGINEER.
3. A TACK COAT, TYPE SS–1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39–6 "SPREADING AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.
5. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "ENGINEERING FABRICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROTAC OR APPROVED EQUAL.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

EDGE GRIND AT SIDE STREET AND END OF OVERLAY CONFORM

JOHN JAEGER, PUBLIC WORKS DIRECTOR

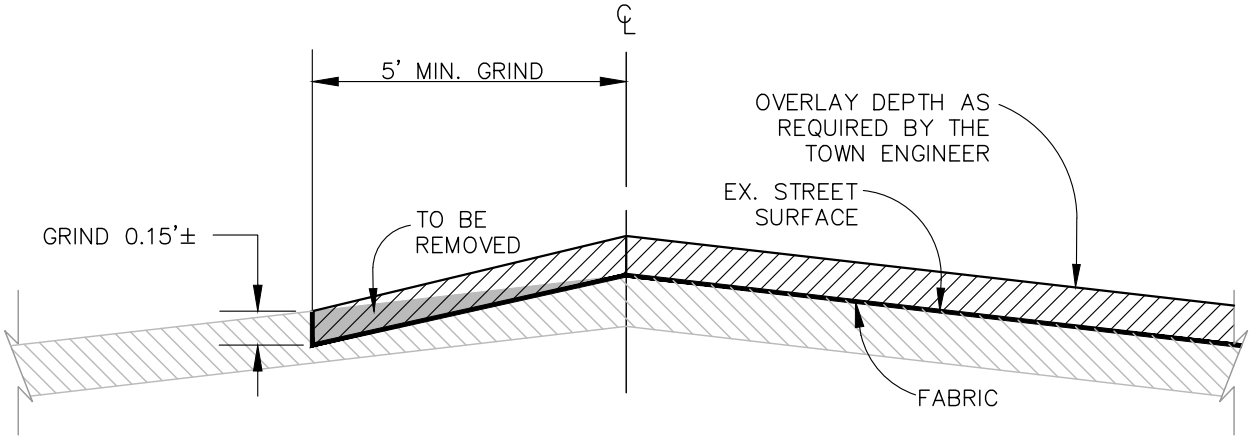
JULY 2011 – NTS

STD. PLAN NO. 215

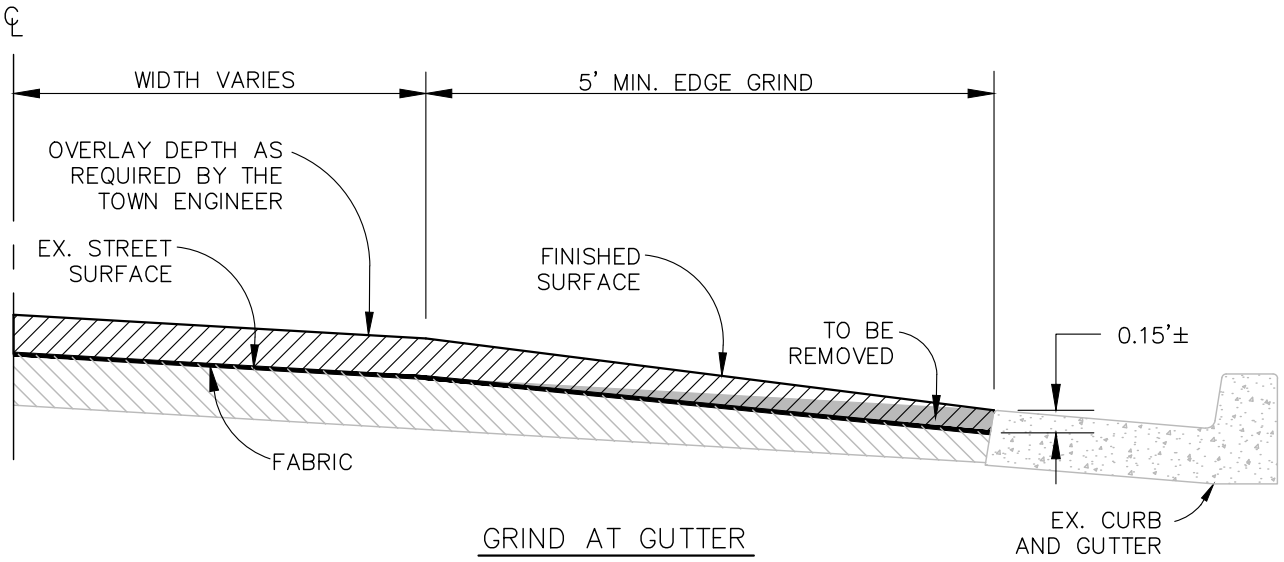
PAGE 1 OF 1

(2012 STD. NO. 225)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 215 Plot Date: May 29, 2020 at 02:29 pm



GRIND AT CENTERLINE



GRIND AT GUTTER

NOTES:

1. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE TOWN ENGINEER.
2. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
3. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-6 "SPREADING AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. GEOTEXTILE FABRICS SHALL CONFORM TO SECTION 88, "ENGINEERING FABRICS" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS. PAVEMENT REINFORCING FABRIC SHALL BE PETROTAC OR APPROVED EQUAL.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

EDGE GRIND AT GUTTER AND CENTERLINE FOR OVERLAY

JOHN JAEGER, PUBLIC WORKS DIRECTOR

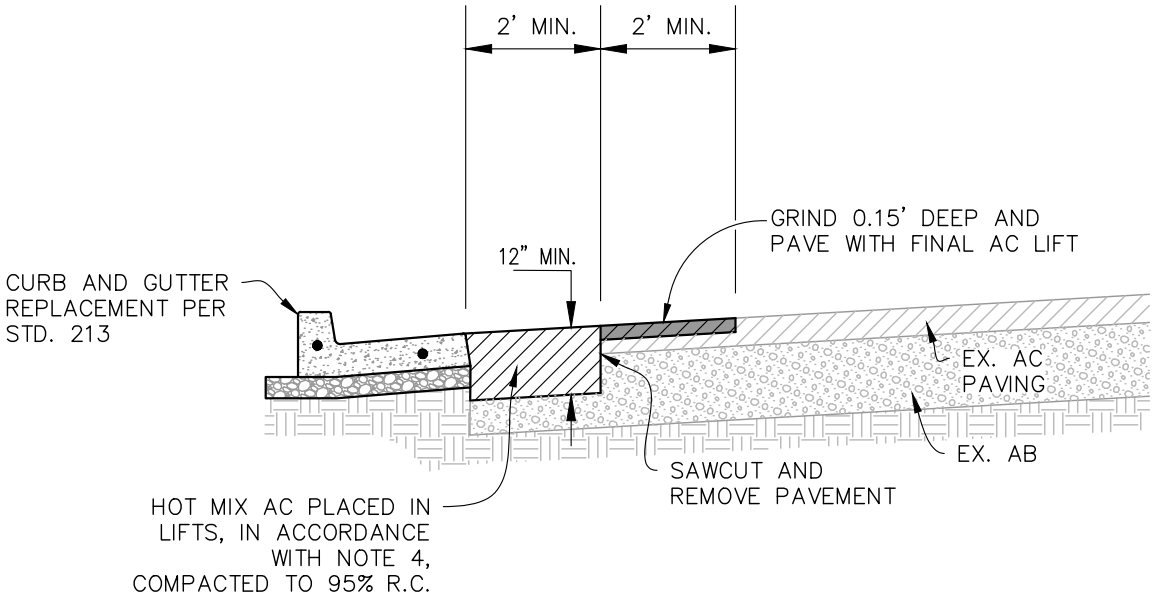
JULY 2011 – NTS

STD. PLAN NO. 216

PAGE 1 OF 1

(2012 STD. NO. 226)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 216 Plot Date: May 29, 2020 at 02:29 pm



NOTES:

1. CURB AND GUTTER CONSTRUCTION SHALL CONFORM TO TOWN STANDARD 203.
2. ALL SOFT OR SPONGY SUB-GRADE MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AS REQUIRED BY THE TOWN ENGINEER.
3. A TACK COAT, TYPE SS-1 SHALL BE APPLIED TO ALL MATING SURFACES ALONG THE LIP OF GUTTER AND AT CONFORMS TO EXISTING PAVEMENT PRIOR TO PLACING NEW HOT MIX ASPHALT CONCRETE PAVEMENT. THE TACK COAT SHALL CONFORM TO SECTION 94, "ASPHALTIC EMULSIONS" OF THE CALTRANS STANDARD SPECIFICATIONS.
4. THE THICKNESS OF HOT MIX ASPHALT CONCRETE LAYERS SHALL CONFORM TO SECTION 39-6 "SPREADING AND COMPACTING" OF THE CALTRANS STANDARD SPECIFICATIONS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

AC CONFORM DETAIL AT CURB & GUTTER REPLACEMENT

STD. PLAN NO. 217

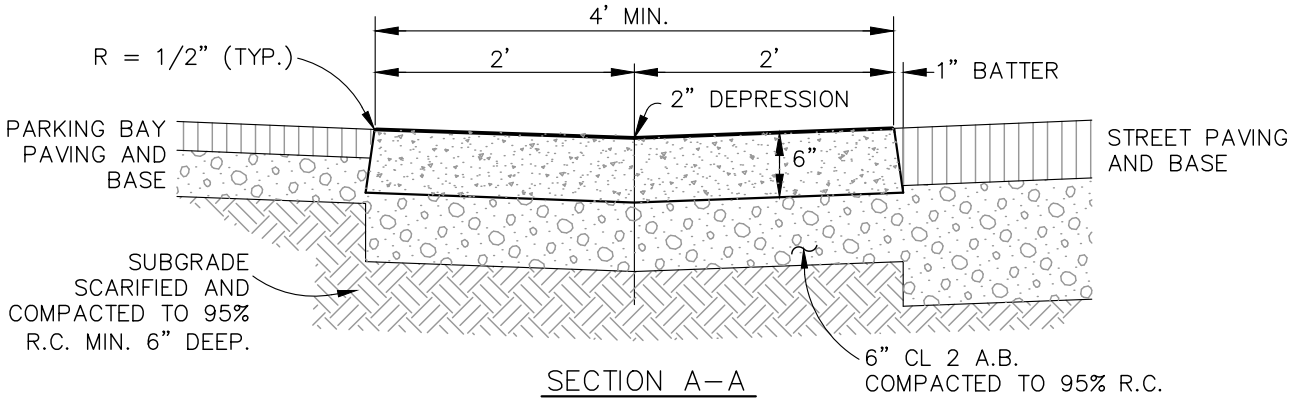
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

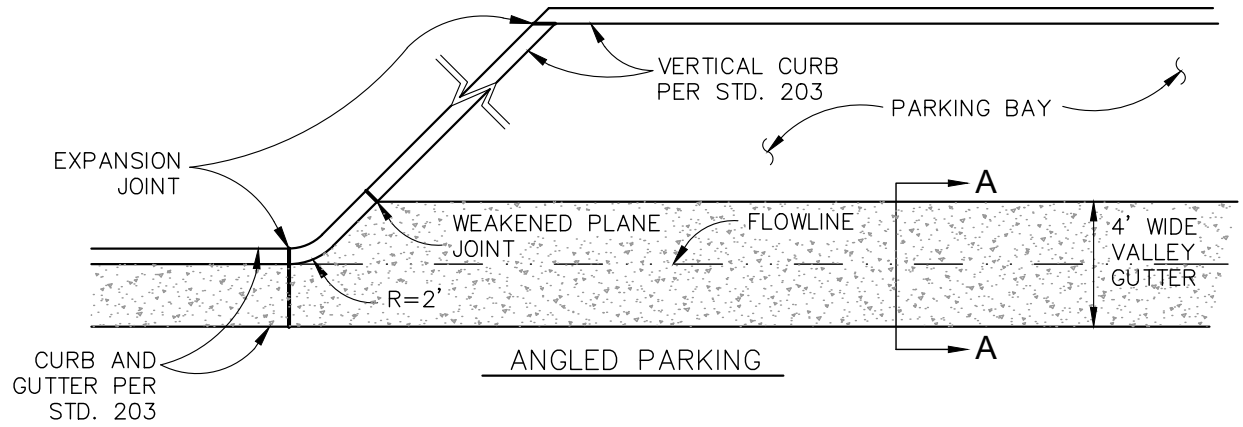
JULY 2011 – NTS

(2012 STD. NO. 227)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\200-219 Streets.dwg Layout Name: 217 Plot Date: May 29, 2020 at 02:29 pm



SECTION A–A



ANGLED PARKING

NOTES:

1. CONCRETE SHALL BE CLASS 2 AND SHALL CONTAIN NOT LESS THAN 6 SACKS OF CEMENT PER CUBIC YARD.
2. EXPANSION JOINTS, 1/4 INCH WIDE, SHALL BE INSTALLED WHERE SHOWN.
3. EXPANSION JOINTS SHALL BE INSTALLED AT 60 FOOT INTERVALS, WITH WEAKENED PLANE JOINTS EVERY 15 FEET.
4. IF EXTRUSION MACHINE IS USED, EXPANSION JOINTS SHALL BE DEEP SCORE 1/3 THE THICKNESS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

ANGLED PARKING BAY WITH VALLEY GUTTER

STD. PLAN NO. 218

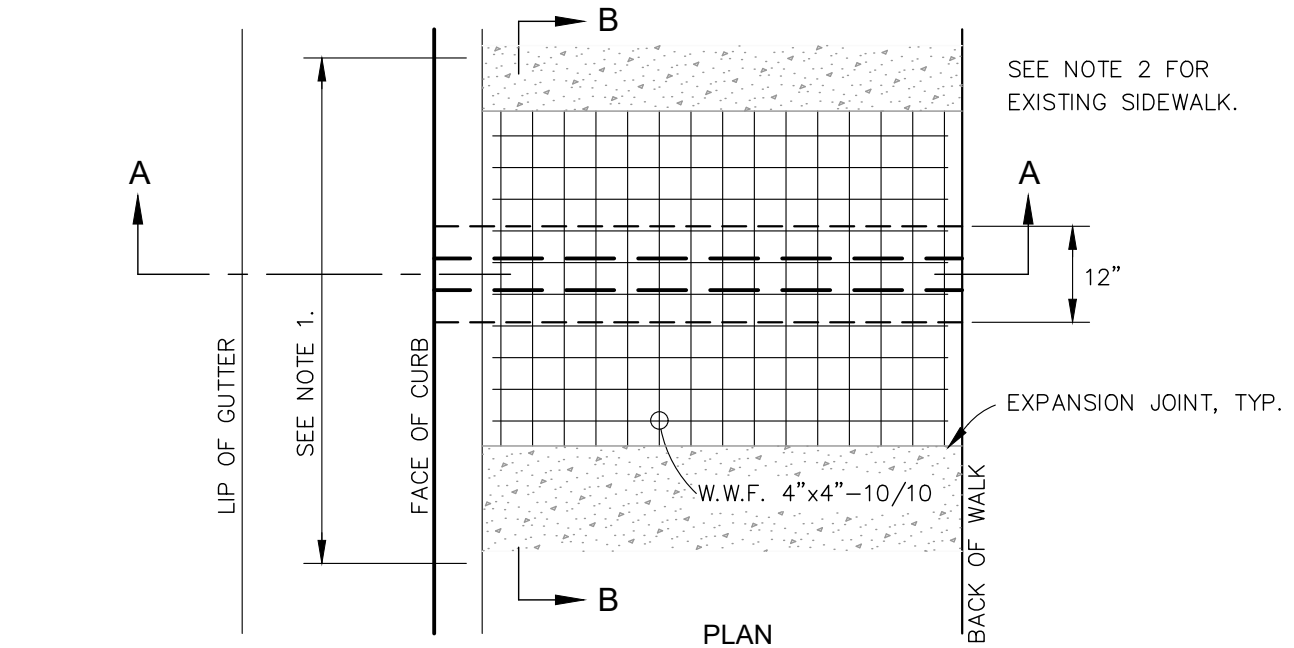
PAGE 1 OF 1

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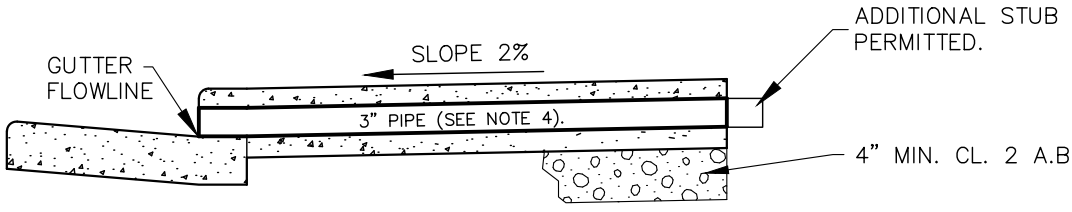
JULY 2011 – NTS

(2012 STD. NO. 223)

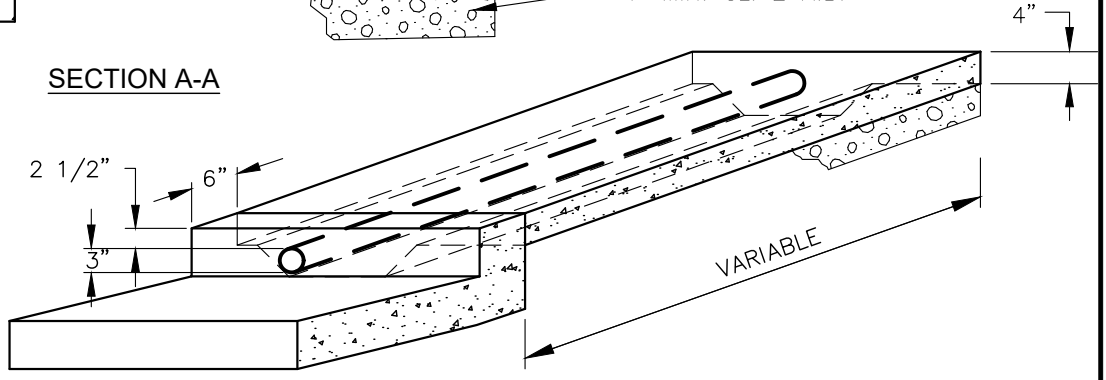
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PLAN



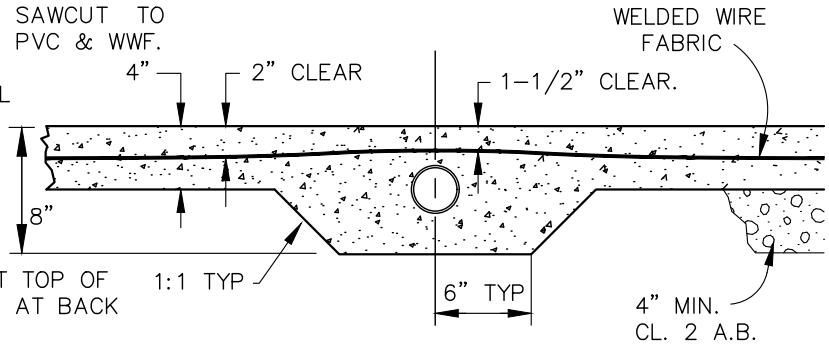
SECTION A-A



NOTES:

1. MINIMUM ONE (1) SIDEWALK DRAIN PER RESIDENTIAL LOT SHALL BE INSTALLED IN NEW SUBDIVISIONS.
2. WELDED WIRE FABRIC (WWF) SHALL BE MIN. 2' WIDE IN NEW SIDEWALK. IF SIDEWALK IS EXISTING, SAWCUT TO NEAREST EXPANSION JOINTS TO PLACE 3" PVC & WWF. WWF TO BE THE WIDTH OF THE REMOVED SIDEWALK SECTION. LENGTH SHALL EQUAL SIDEWALK WIDTH MINUS 4".
3. ON SITE DRAINAGE AND LOCATION OF CURB OUTLETS SHALL BE BY THE OWNER TO THE SATISFACTION OF THE TOWN ENGINEER.
4. DRAIN PIPE SHALL BE INSTALLED SO THAT TOP OF PIPE IS 2 1/2" MIN. BELOW FINISH GRADE AT BACK OF SIDEWALK
5. SIDEWALK DRAIN TO BE 3" SCH 40 HEAVY WALL RIGID POLYVINYL CHLORIDE PIPE OR APPROVED SUBSTITUTE.

CURB OPENING DETAIL



SECTION B-B

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SIDEWALK DRAIN

STD. PLAN NO. 221

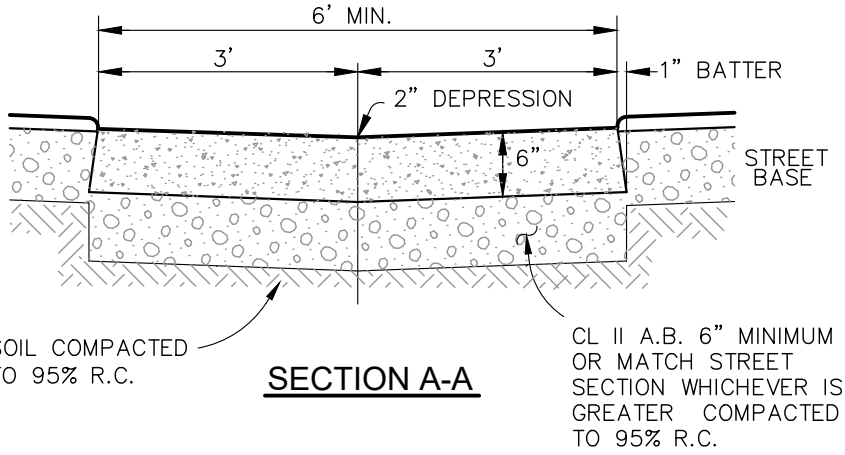
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

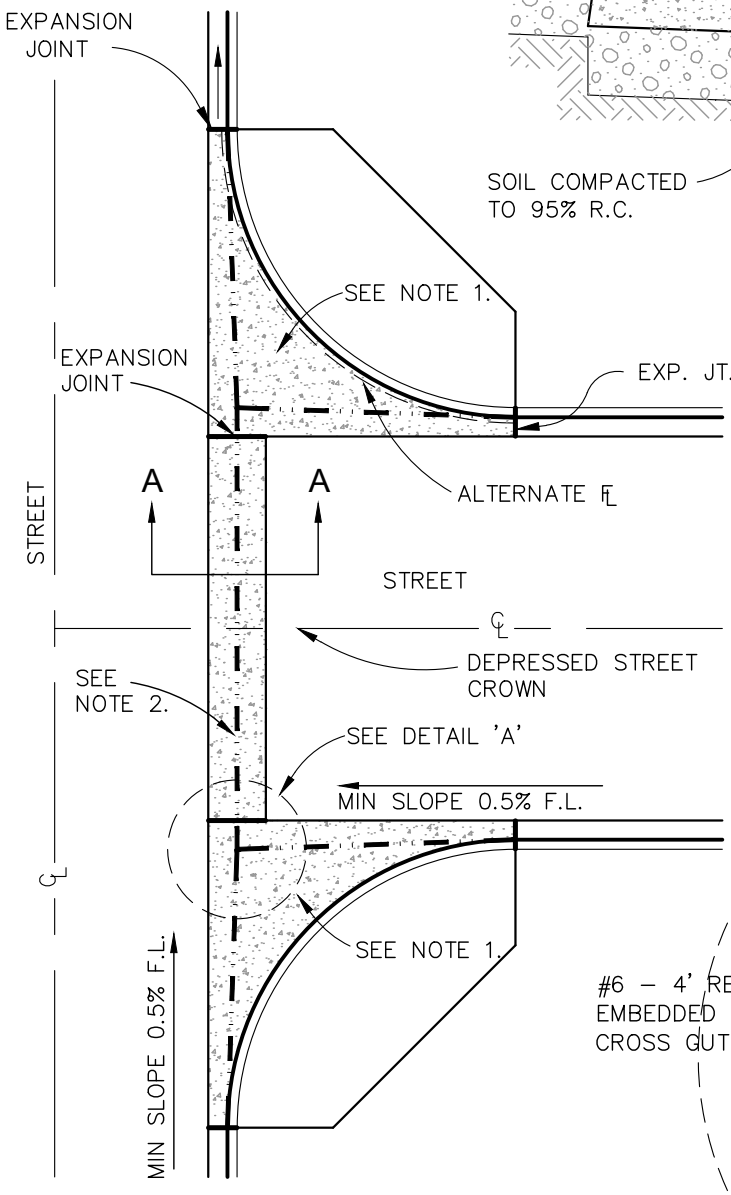
DEC 2001 – NTS

(2012 STD. NO. 207)

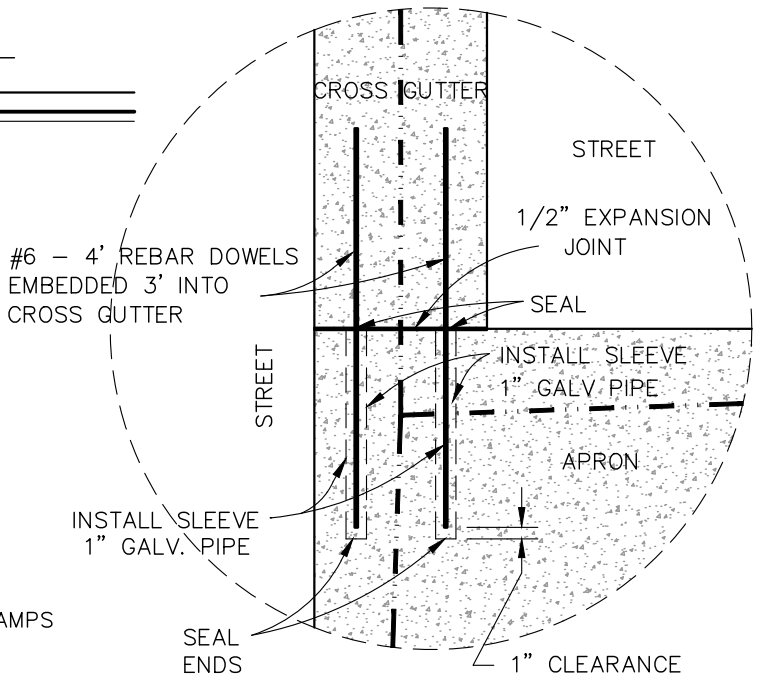
Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 221 Plot Date: May 29, 2020 at 02:49 pm



SECTION A-A



PLAN



DETAIL "A"

TYPICAL BOTH SIDES

NOTES:

1. THE MAXIMUM SLOPE ADJACENT TO CURB RAMPS SHALL CONFORM TO TOWN STD 205.
2. CROSS GUTTER MAY NOT BE LOCATED IN THE ACCESSIBLE ROUTE OF TRAVEL.
3. ALL CONCRETE SHALL BE CLASS "II", 3,000 PSI.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CROSS GUTTER

JOHN JAEGER, PUBLIC WORKS DIRECTOR

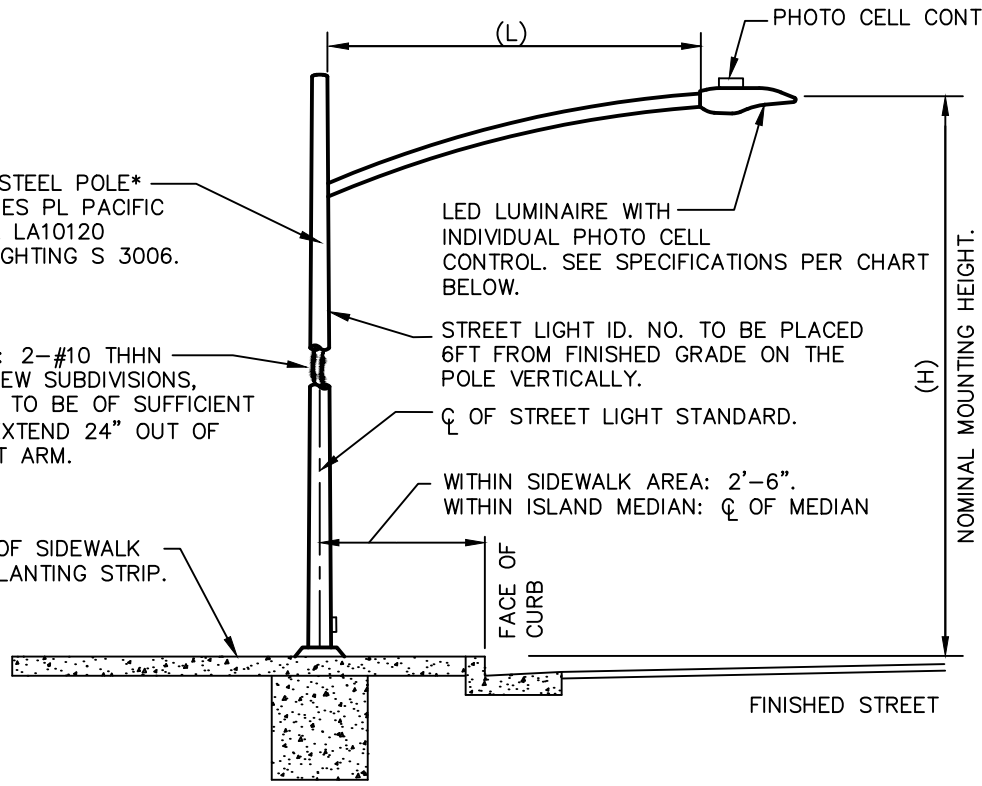
DEC 2001 – NTS

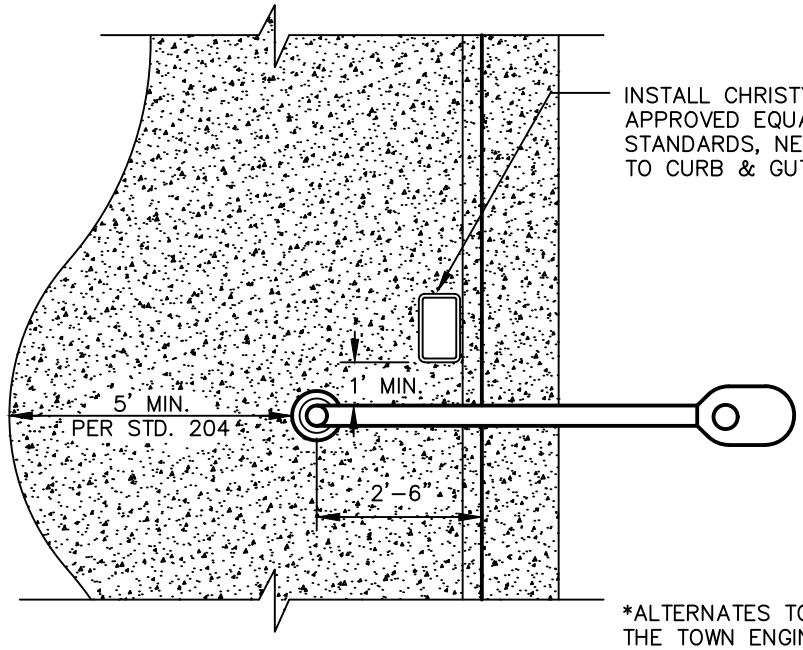
STD. PLAN NO. 222

PAGE 1 OF 1

(2012 STD. NO. 211)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 222 Plot Date: May 29, 2020 at 02:49 pm





*ALTERNATES TO BE SPECIFICALLY APPROVED BY THE TOWN ENGINEER.

STREET CLASSIFICATION	POLE HEIGHT(H)	ARM LENGTH(L)	KELVIN	MAXIMUM SPACING	WATTAGE
ARTERIAL	32'-6"	8'-0"	4000K	100'	49W
COLLECTOR & INDUSTRIAL	28'-0"	6'-0"	4000K	200'	33W
RESIDENTIAL	27'-6"	4'-0"	3000K	200'	26W

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - COBRA

STD. PLAN NO. 223

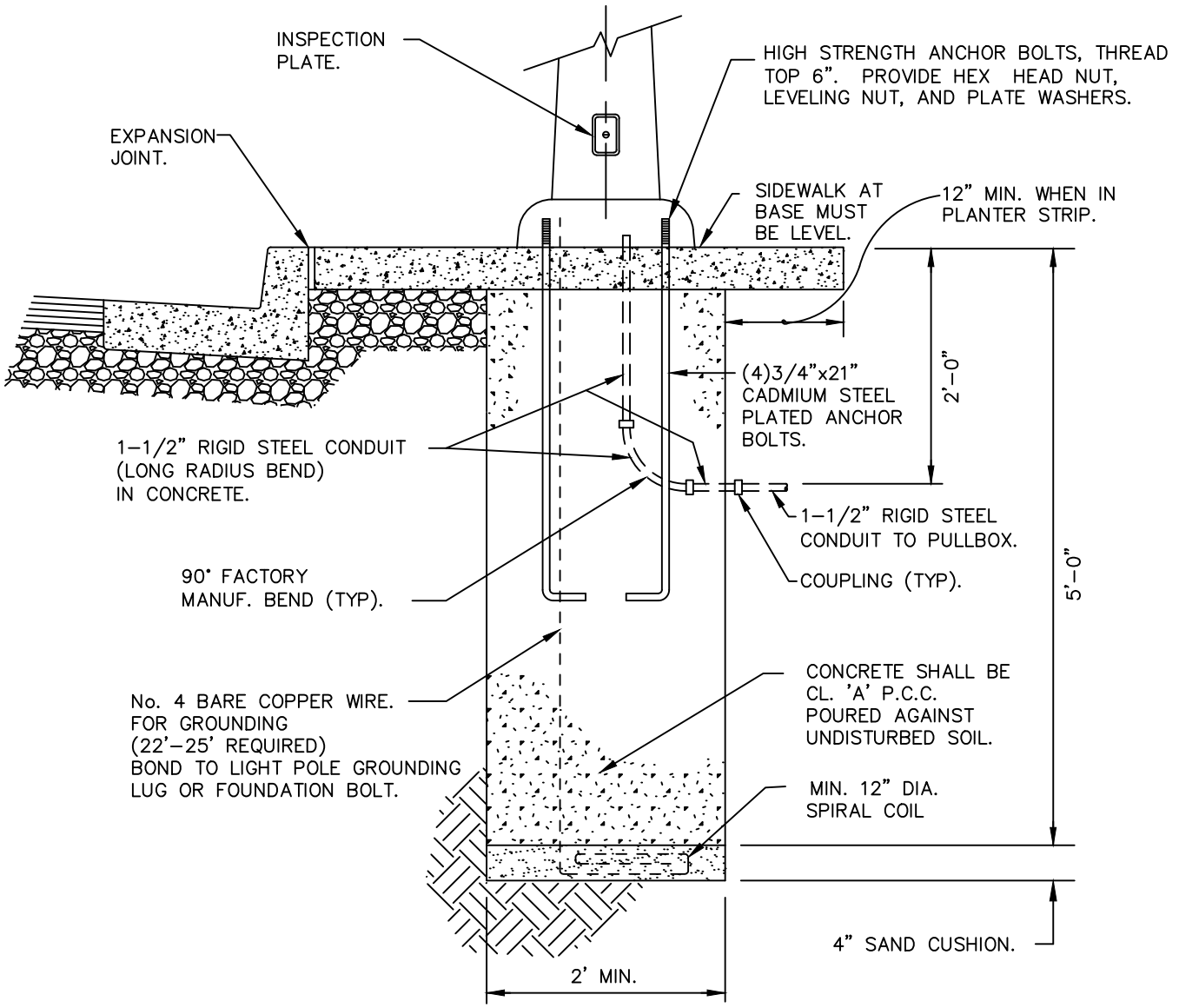
PAGE 1 OF 2

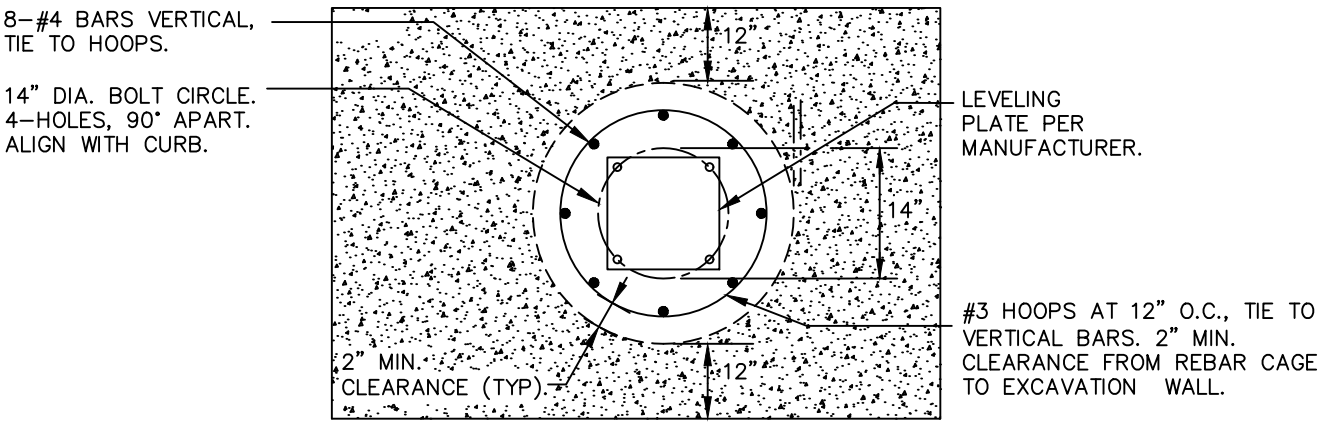
SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

AUG 2023 - NTS

(2020 STD. NO. NONE)

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Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 200 Series Update\CAD Files\Part III - STD Plan 223, 225, & 226.dwg Layout Name: 223-1





FOUNDATION DETAIL

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - COBRA

STD. PLAN NO. 223

PAGE 2 OF 2

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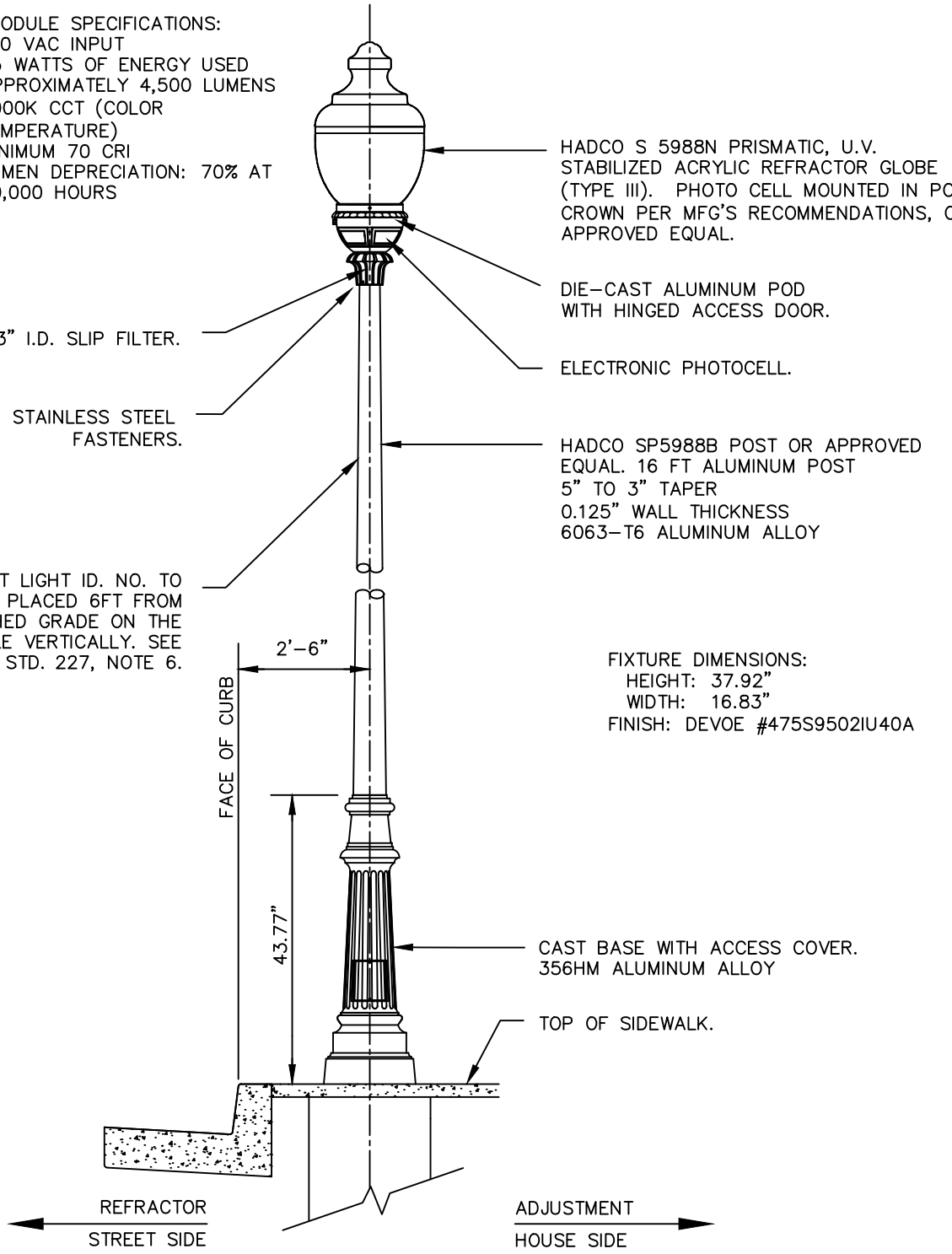
AUG 2023 - NTS

(2020 STD. NO. NONE)

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Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 200 Series Update\CAD Files\Part III - STD Plan 223, 225, & 226.dwg Layout Name: 223-2

LED MODULE SPECIFICATIONS:

- 120 VAC INPUT
- 35 WATTS OF ENERGY USED
- APPROXIMATELY 4,500 LUMENS
- 3000K CCT (COLOR TEMPERATURE)
- MINIMUM 70 CRI
- LUMEN DEPRECIATION: 70% AT 60,000 HOURS



FIXTURE DIMENSIONS:
HEIGHT: 37.92"
WIDTH: 16.83"
FINISH: DEVOE #475S9502IU40A

NOTES:

1. A PULLBOX IS REQUIRED AT EACH STREET LIGHT.
2. SEE TOWN STANDARD #223-1 FOR PULLBOX LOCATION.
3. SPACING TO BE APPROVED BY THE TOWN BASED ON RESULTS OF A PHOTOMETRIC STUDY.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - DECORATIVE (LED)

STD. PLAN NO. 225

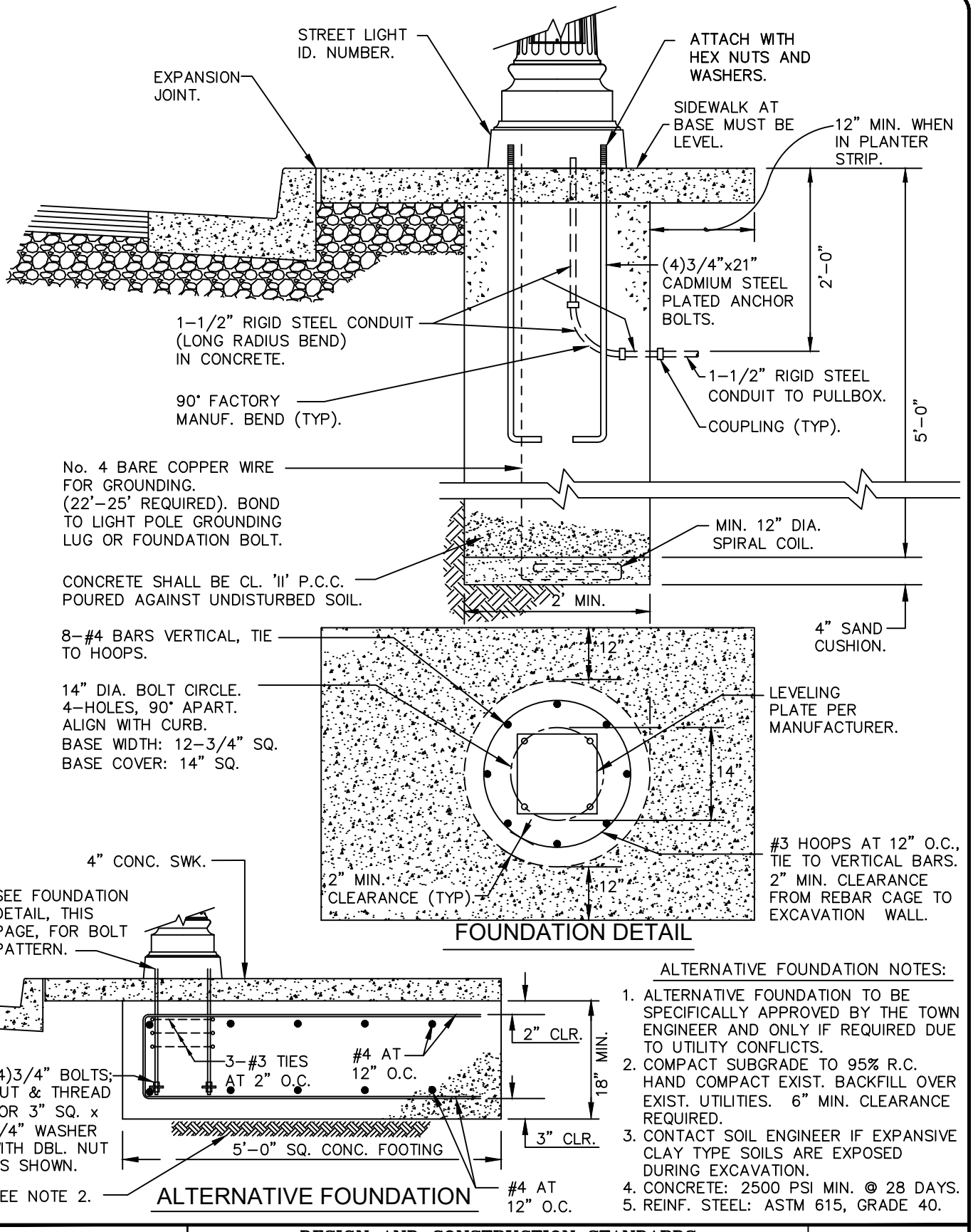
PAGE 1 OF 2

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PUBLIC WORKS DIRECTOR/TOWN ENGINEER

AUG 2023 - NTS

(2020 STD. NO. NONE)

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Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 200 Series Update\CAD Files\Part III - STD Plan 223, 225, & 226.dwg Layout Name: 225-1



ALTERNATIVE FOUNDATION NOTES:

1. ALTERNATIVE FOUNDATION TO BE SPECIFICALLY APPROVED BY THE TOWN ENGINEER AND ONLY IF REQUIRED DUE TO UTILITY CONFLICTS.
2. COMPACT SUBGRADE TO 95% R.C. HAND COMPACT EXIST. BACKFILL OVER EXIST. UTILITIES. 6" MIN. CLEARANCE REQUIRED.
3. CONTACT SOIL ENGINEER IF EXPANSIVE CLAY TYPE SOILS ARE EXPOSED DURING EXCAVATION.
4. CONCRETE: 2500 PSI MIN. @ 28 DAYS.
5. REINF. STEEL: ASTM 615, GRADE 40.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - DECORATIVE (LED)

STD. PLAN NO. 225

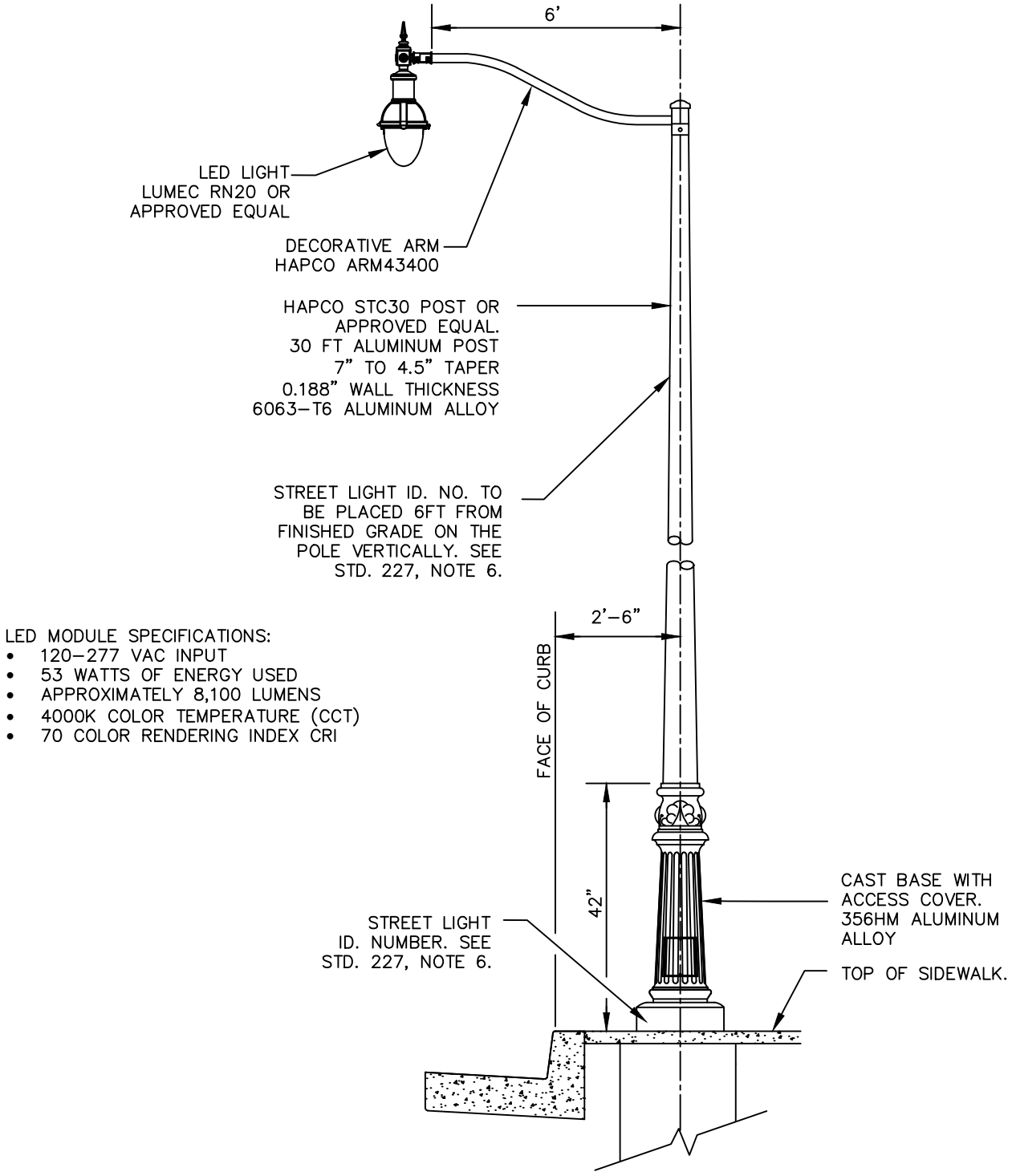
PAGE 2 OF 2

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

AUG 2023 - NTS

(2020 STD. NO. NONE)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 200 Series Update\CAD Files\Part III - STD Plan 223, 225, & 226.dwg Layout Name: 225-2



LED MODULE SPECIFICATIONS:

- 120-277 VAC INPUT
- 53 WATTS OF ENERGY USED
- APPROXIMATELY 8,100 LUMENS
- 4000K COLOR TEMPERATURE (CCT)
- 70 COLOR RENDERING INDEX CRI

NOTES:

1. A PULLBOX IS REQUIRED AT EACH STREET LIGHT.
2. SEE STANDARD #223-1 FOR PULLBOX LOCATION.
3. SPACING TO BE APPROVED BY THE TOWN BASED ON RESULTS OF A PHOTOMETRIC STUDY.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT
DECORATIVE (LED) PENDANT

STD. PLAN NO. 226

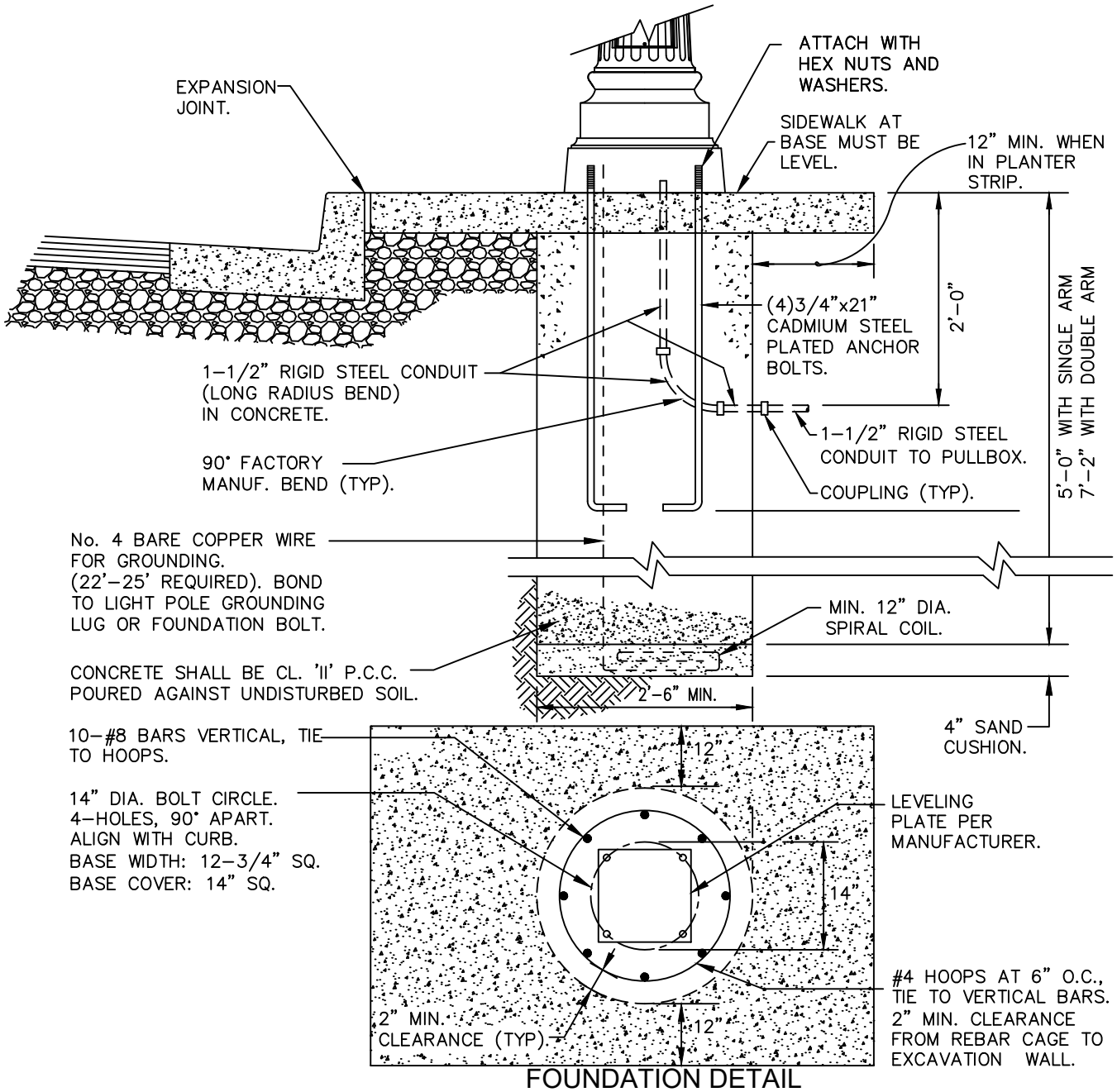
PAGE 1 OF 2

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

AUG 2023 - NTS

(2020 STD. NO. NONE)

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FOUNDATION DETAIL

Xrefs: Images: JEJ2-removebg-preview.png,windsor logo.tif;
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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT DECORATIVE (LED) PENDANT

STD. PLAN NO. 226

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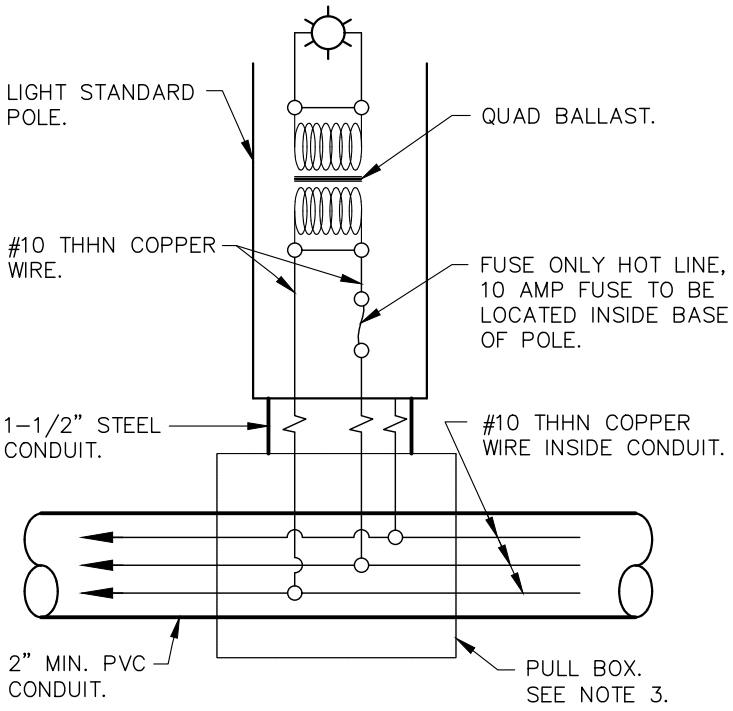
SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

AUG 2023 - NTS

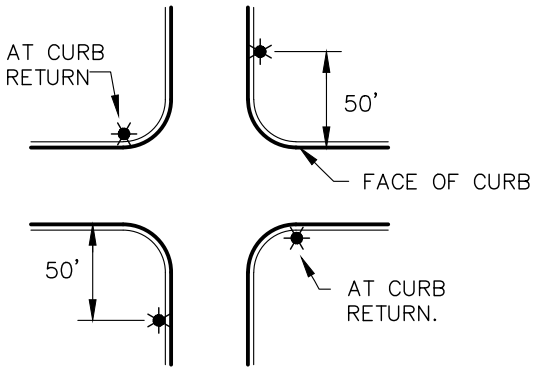
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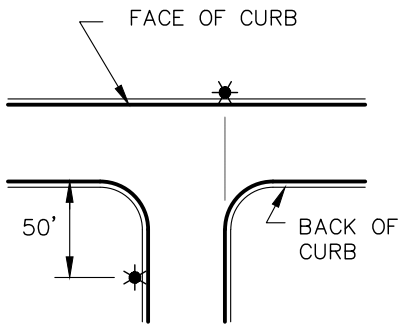
1. STREET LIGHTS SHALL HAVE I.E.S. TYPE III ILLUMINATION PATTERN.
2. ALL WIRING AND EQUIPMENT CONSTRUCTION SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, (N.E.C), AND SECTION 86 OF THE STATE STANDARD SPECIFICATIONS.
3. PULLBOX SHALL BE CHRISTY B16 OR APPROVED EQUAL.
4. FOUNDATION BOLTS SHALL NOT BE CUT OFF FOR ANY REASON. EXTENSION COUPLERS WILL NOT BE PERMITTED.
5. GROUND WIRE SHALL BE ATTACHED TO THE POLE BY A 3/16" OR LARGER BRASS BOLT. WHEN CONDUIT IS METAL, GROUND SHALL ALSO BE BONDED TO THE CONDUIT.
6. STREET LIGHT ID. NUMBER ON STREET SIDE OF BASE COVER SHALL BE SELF ADHESIVE ALUMINUM WITH 2" BLACK CHARACTERS. I.D. NUMBERS TO BE PLACED APPROX. 6 FT ABOVE FINISHED GRADE ON POLE VERTICALLY. ID NUMBERS TO BE ASSIGNED BY THE TOWN.



SCHEMATIC STREET LIGHT WIRING DIAGRAM

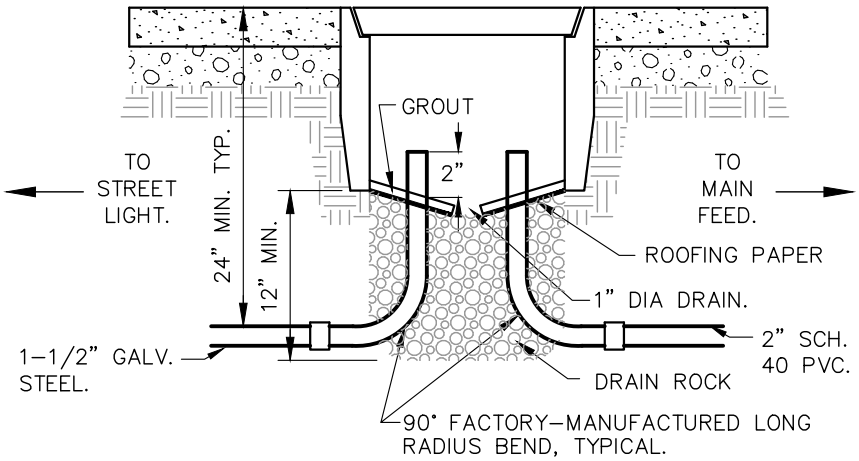


4-WAY INTERSECTION



3-WAY INTERSECTION

SPACING DIAGRAM



PULLBOX DETAIL

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 227 Plot Date: May 29, 2020 at 02:50 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET LIGHT - MISCELLANEOUS DETAILS

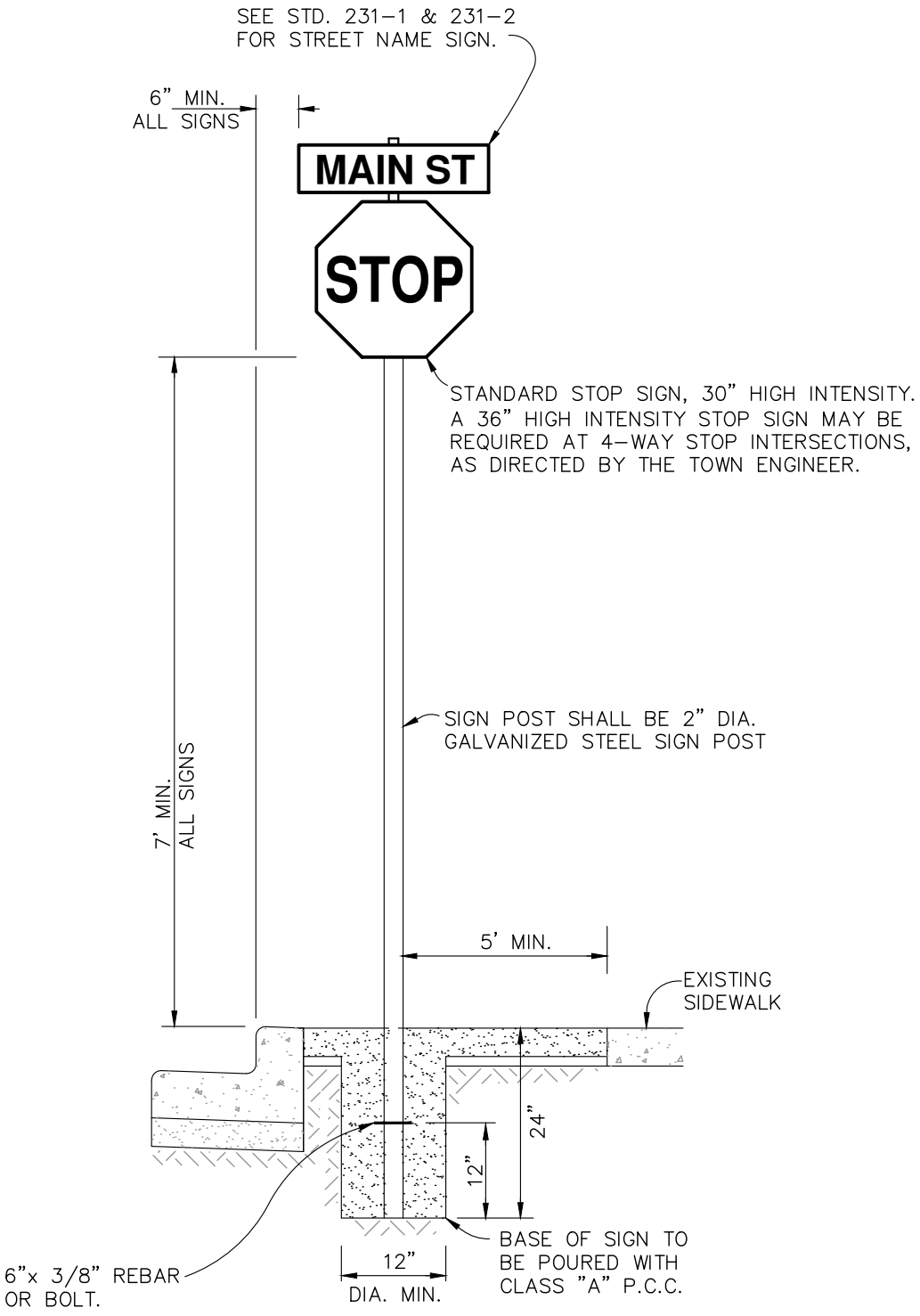
JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2009 - NTS

STD. PLAN NO. 227

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(2012 STD. NO. 217)



Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 230 Plot Date: May 29, 2020 at 02:50 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STOP SIGN POST LOCATION

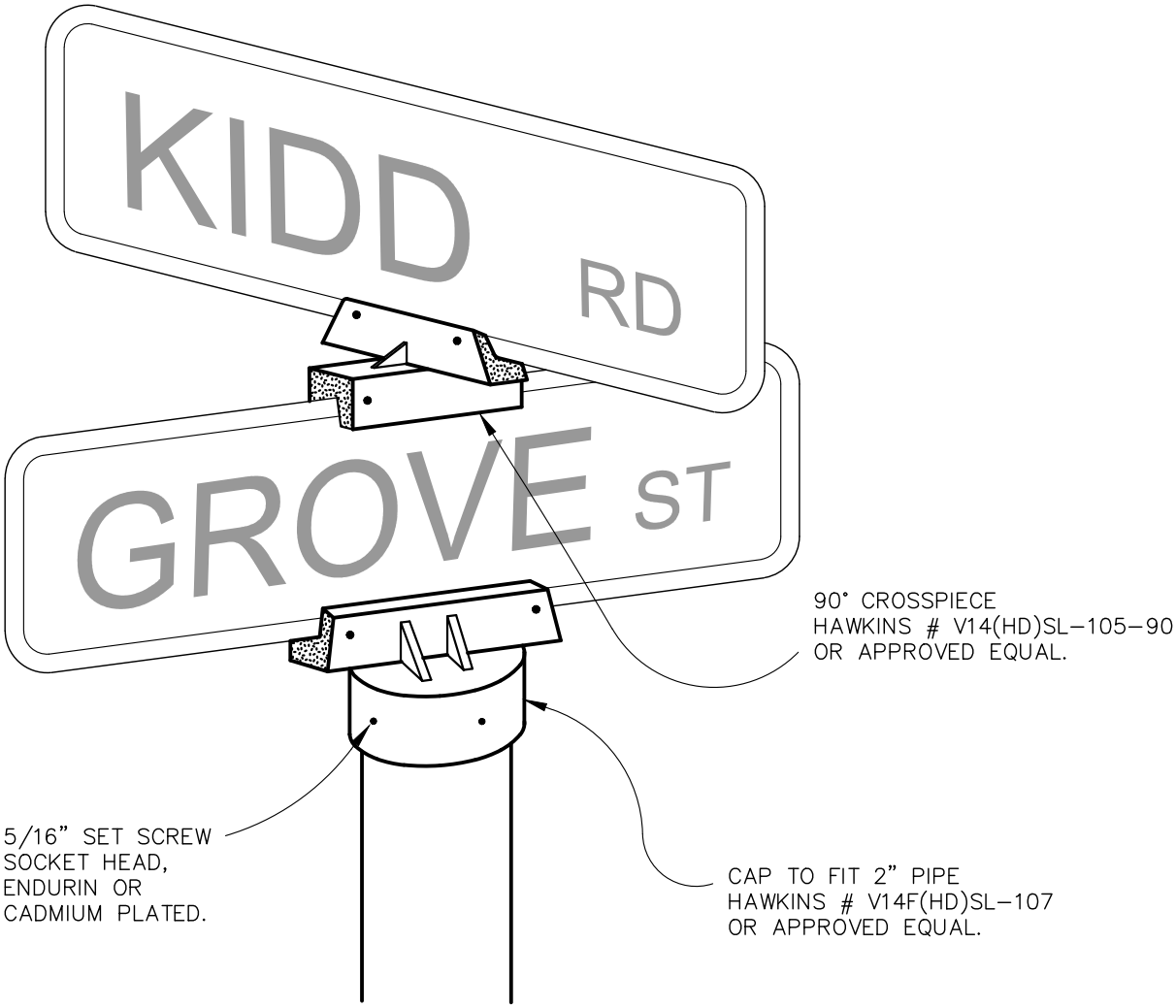
STD. PLAN NO. 230

PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 222)



POLE MOUNTING

NOTES:

1. PUBLIC AND PRIVATE STREET NAMES SHALL NOT BE COMBINED ON THE SAME POLE.
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE TOWN ENGINEER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGN

STD. PLAN NO. 231

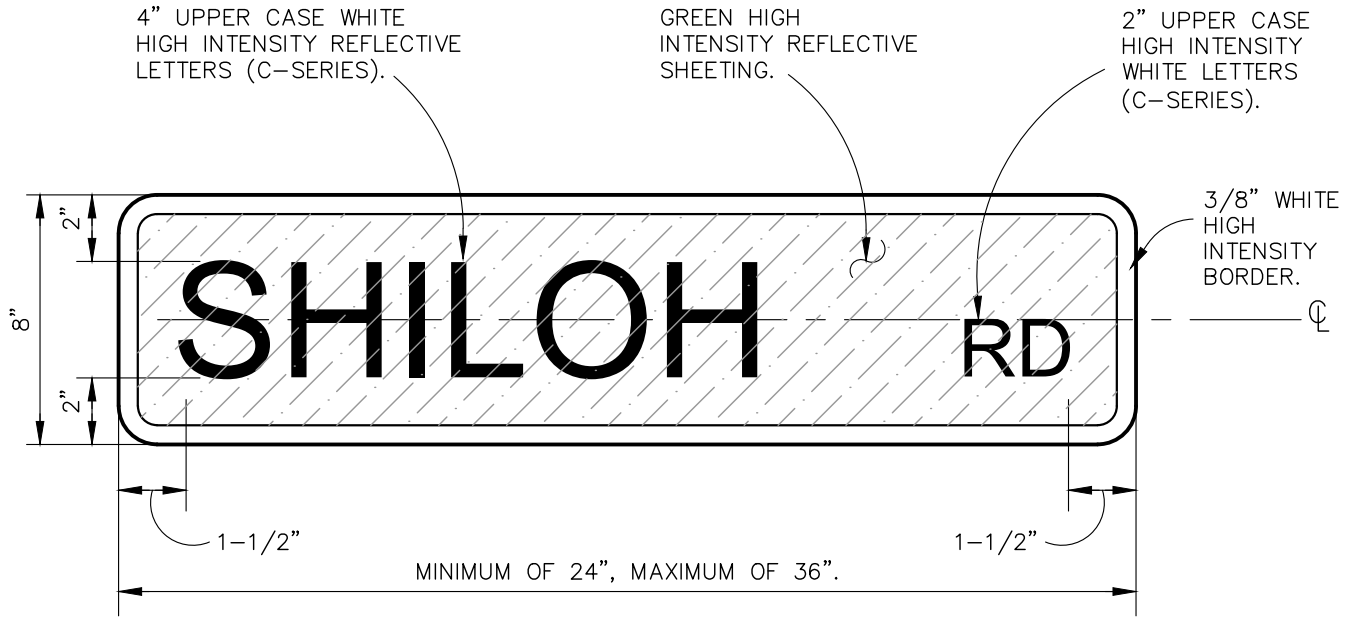
PAGE 1 OF 2

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DEC 2001 – NTS

(2012 STD. NO. 214)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 231-1 Plot Date: May 29, 2020 at 02:50 pm



NOTES:

1. BLANKS ARE 0.080" ALUMINUM PER CALTRANS SPECIFICATIONS.
2. SIGNS TO BE DOUBLE FACED.
3. B-SERIES LETTERING MAY BE USED IF STREET NAME IS TOO LONG FOR MAXIMUM LENGTH SIGN.
4. SIGNS SHALL BE FINISHED WITH "SAFE FACE" PROTECTIVE FINISH.
5. ALL ENDS SHALL BE 1/2" RADIUS MIN.
6. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE TOWN ENGINEER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET NAME SIGN

STD. PLAN NO. 231

PAGE 2 OF 2

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DEC 2001 – NTS

(2012 STD. NO. 214)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 231-2 Plot Date: May 29, 2020 at 02:50 pm

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 232 Plot Date: May 29, 2020 at 02:51 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

STANDARD BARRICADE

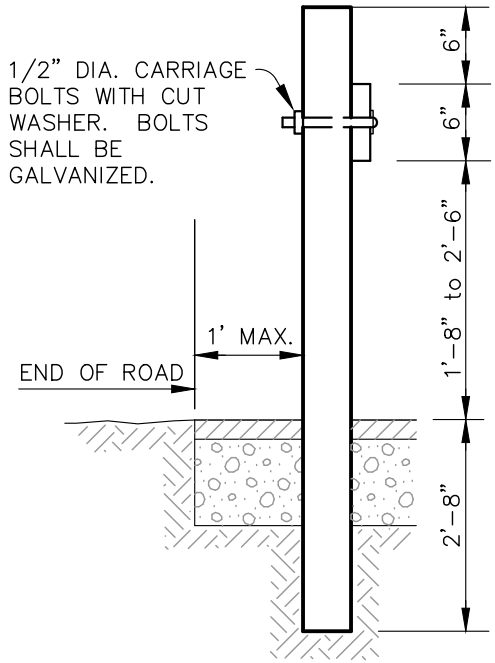
DESIGN AND CONSTRUCTION STANDARDS

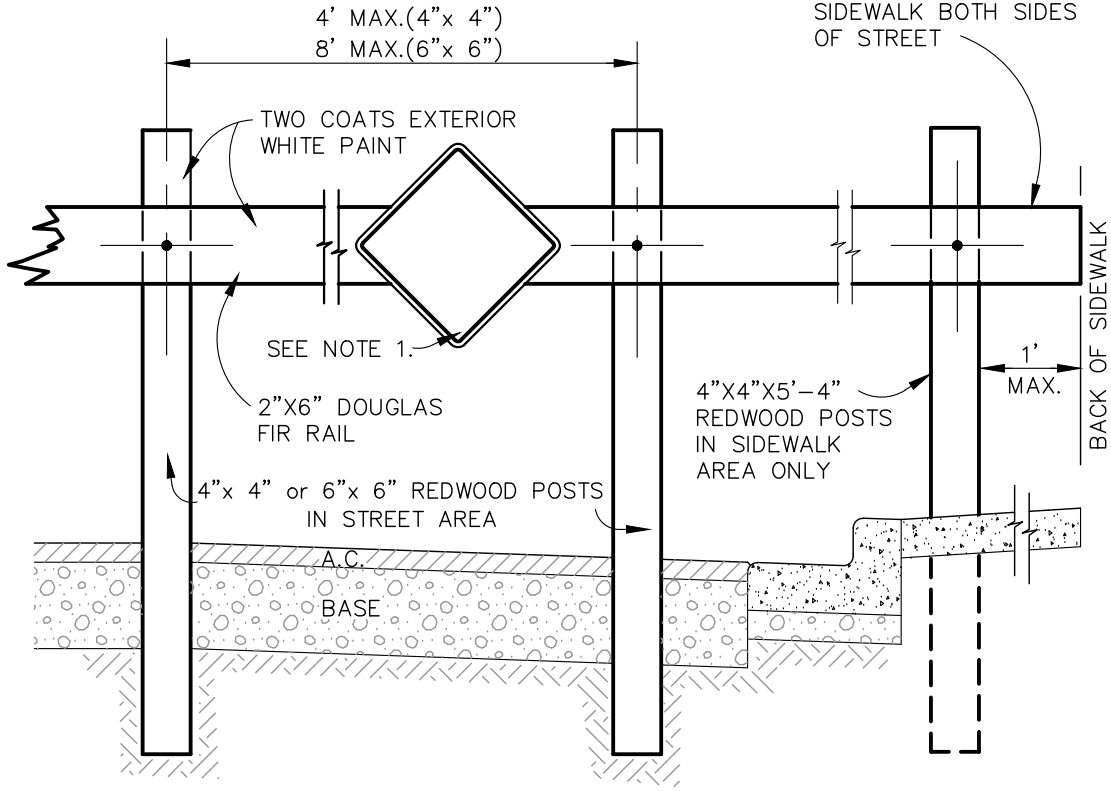
DEC 2001 - NTS

STD. PLAN NO. 232

PAGE 1 OF 1

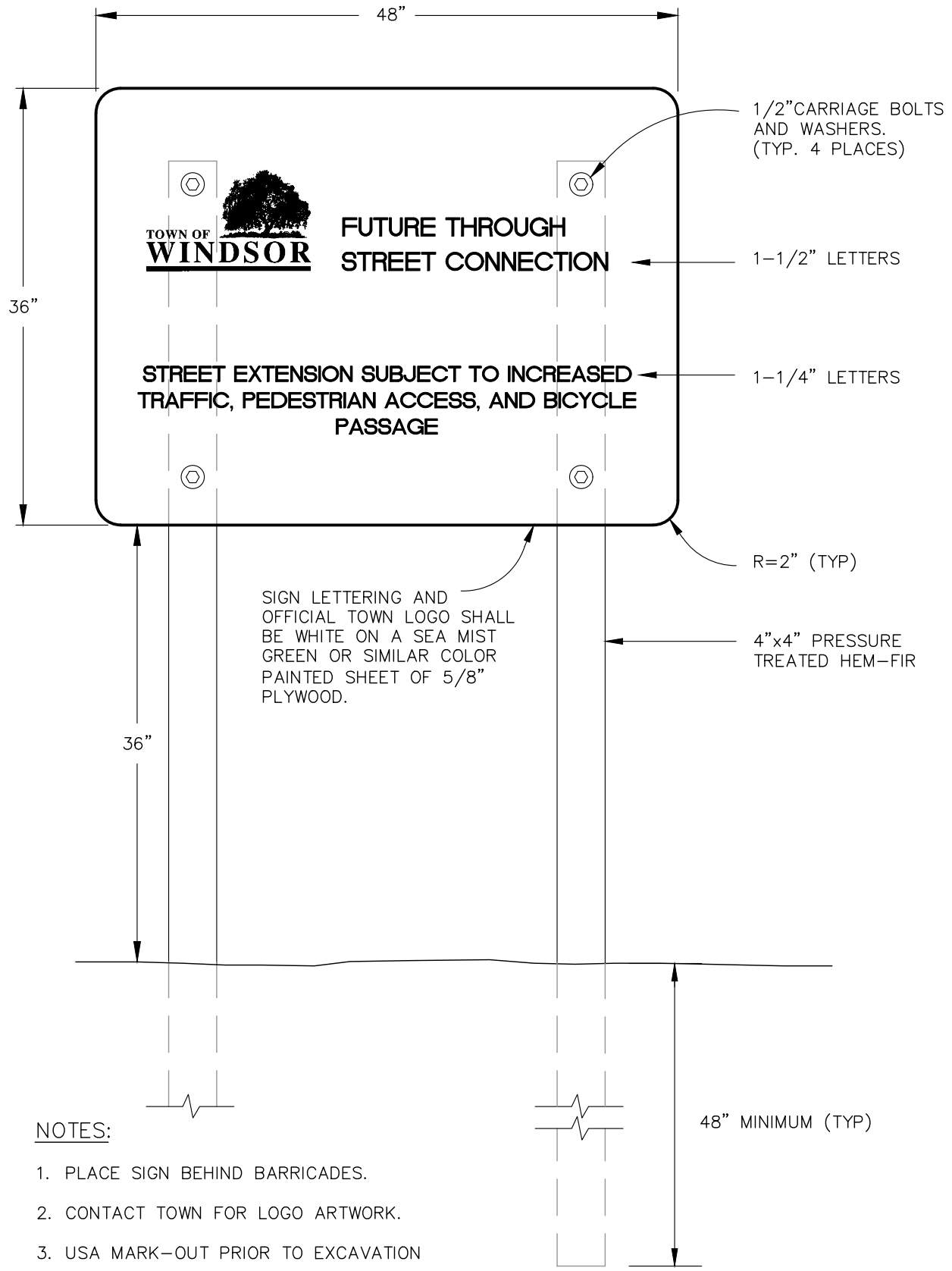
(2012 STD. NO. 213)





NOTES:

1. INSTALL 18" X 18" ALUMINUM TYPE N-2 (CA) OBJECT MARKER, HIGH INTENSITY REFLECTOR RED BACKGROUND WITH BLACK BORDER, NO MORE THAN 8' O.C., MINIMUM 3 LOCATIONS, PER CALTRANS STANDARD PLANS A73B.
2. SIDEWALKS ONLY - INSTALL 4" YELLOW REFLECTORS.
3. INSTALL SIGN BEHIND BARRICADES ON STUB STREETS. SEE TOWN STD. No. 233.
4. USE METAL BEAM BARRICADE FOR INSTALLATIONS OTHER THAN DEAD END STREETS.



NOTES:

1. PLACE SIGN BEHIND BARRICADES.
2. CONTACT TOWN FOR LOGO ARTWORK.
3. USA MARK–OUT PRIOR TO EXCAVATION

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STUB FUTURE CONNECTION STREET POSTING

STD. PLAN NO. 233

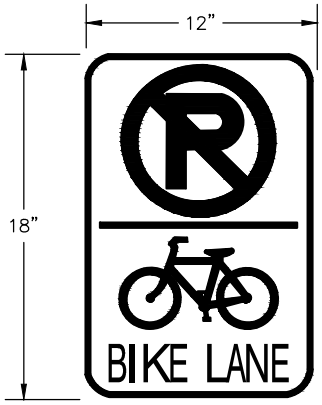
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

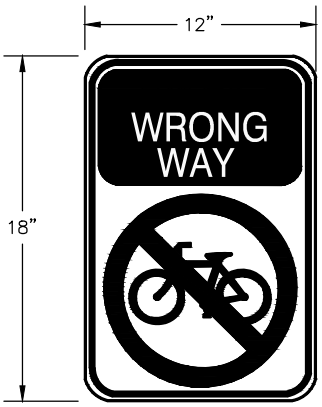
APR 2003 – NTS

(2012 STD. NO. 218)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 233 Plot Date: May 29, 2020 at 02:51 pm



R8–3a/R81
Combination
12" x 18"



R5–6/R5–1
Combination
12" x 18"

NOTES:

1. "NO PARKING"/ "BIKE LANE" COMBINATION SIGN SHALL BE 12" X 18" ALUMINUM, TYPE R8–3a/R81. THE COLORING SHALL BE WHITE BACKGROUND WITH BLACK BORDER, BLACK TEXT, BLACK BIKE SYMBOL AND RED CROSS OUT SYMBOL.

2. "BICYCLE WRONG WAY"/ "NO BICYCLES" COMBINATION SIGN SHALL BE 12" x 18" ALUMINUM, TYPE R5–6/R5–1. THE COLORING SHALL BE RED UPPER BACKGROUND, WHITE LOWER BACKGROUND. BLACK BORDER, WHITE TEXT AND RED CROSS OUT SYMBOL. THIS SIGN MAY BE PLACED FACING WRONG–WAY BICYCLE TRAFFIC, SUCH AS ON THE LEFT SIDE OF A ROADWAY AND MAY BE MOUNTED BACK–TO–BACK WITH OTHER SIGNS TO MINIMIZE VISIBILITY TO OTHER TRAFFIC.

3. ALL SIGNS SHALL BE PRISMATIC REFLECTIVE SHEETING FOR USE ON BIKEWAYS, INCLUDING SHARED–USE PATHS AND BICYCLE LANE FACILITIES.

4. INSTALLATION AND SPACING SHALL BE PER MUTCD 2009 EDITION AND AS APPROVED BY THE TOWN ENGINEER.

Xrefs: Images: JEJ2–removebg–preview.png;windsor logo.tif;
Path: F:\BMAP–STD\Windsor\Stds\Stds Dwgs\220–239 Streets.dwg Layout Name: 234 Plot Date: May 29, 2020 at 03:49 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

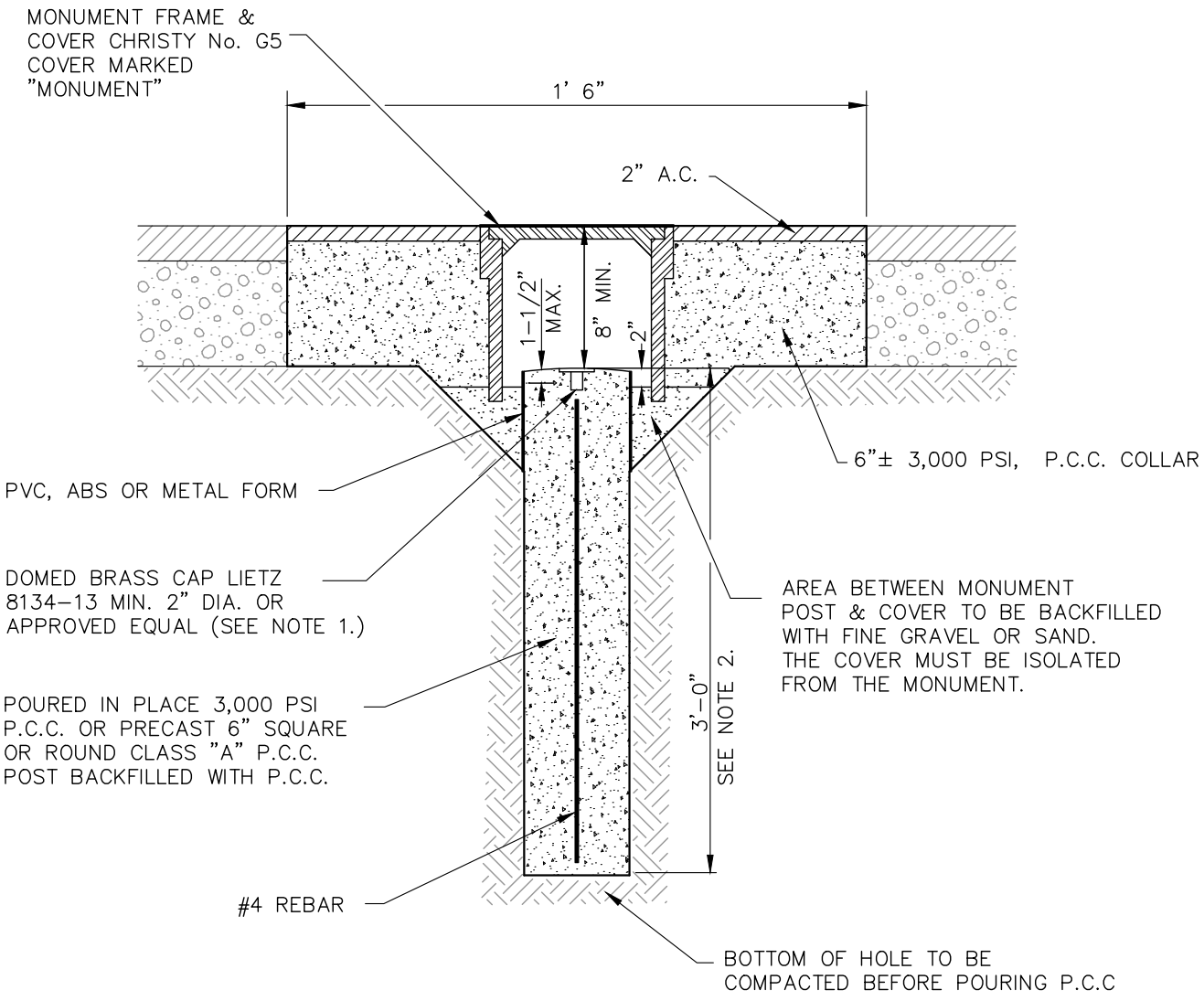
BIKE LANE SIGNS

STD. PLAN NO. 234

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 221)



NOTES:

1. SURVEYOR OR ENGINEER SETTING THE MONUMENT SHALL INDICATE EXACT POINT BY MAKING A CROSS ON THE CAP AND SHALL STAMP YEAR SET AND HIS/HER LICENSE TYPE AND NUMBER.

2. THE DEPTH OF THE MONUMENT POST SHALL BE LENGTHENED AS DICTATED BY THE GROUND CONDITIONS OR AS APPROVED BY THE TOWN ENGINEER. IN SOFT GROUND OR FILL AREAS AS THE MONUMENT POST SHALL BE LENGTHENED TO BED IT ON A STABLE BASE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD PERMANENT MONUMENT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

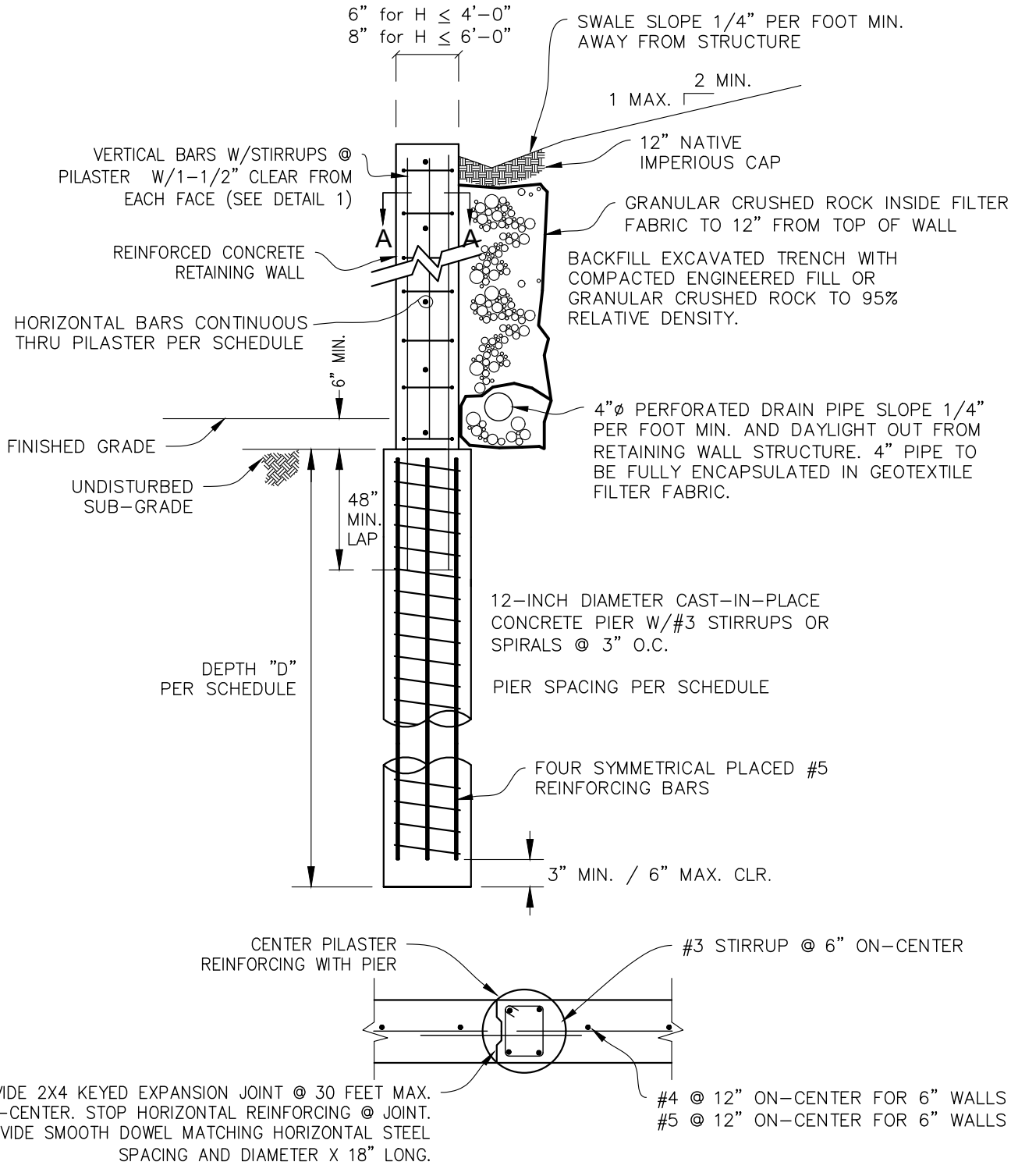
APR 2006 – NTS

STD. PLAN NO. 239

PAGE 1 OF 1

(2012 STD. NO. 212)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\220-239 Streets.dwg Layout Name: 239 Plot Date: May 29, 2020 at 02:51 pm



SECTION A-A

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 240-1 Plot Date: May 29, 2020 at 02:55 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CAST-IN-PLACE PIER SUPPORTED CONCRETE RETAINING WALL

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 - NTS

STD. PLAN NO. 240

(2012 STD. NO. 229)

DRILLED PIER FOUNDATION

DESIGN CRITERIA: (CBC CHAPTER 18)

P(ACTIVE) = 50 P.C.F. 2:1 MAX. BACKFILL

P(PASSIVE) = 100 P.C.F. ACTING ON
2 PIER DIAMETERS

SPECIAL INSPECTION IS REQUIRED PER CBC CHAPTER 17

1704.4 CONCRETE

1704.7 CAST-IN-PLACE DRILLED PIERS

"H" MAX.	"D" MIN.	MAX. PIER SPACING	PILASTER REINFORCING
3'	8'-6"	8'	TWO #4 EACH FACE
4'	10'-0"	6'	TWO #4 EACH FACE
5'	12'-6"	6'	TWO #5 EACH FACE
6'	14'-9"	6'	THREE #5 EACH FACE

NOTES:

1. ALL WORK SHALL BE IN CONFORMANCE CONFORMANCE WITH THE LATEST ADOPTED EDITION OF THE CALIFORNIA BUILDING CODE (CBC).
2. CONCRETE SHALL BE 2500 P.S.I. MINIMUM AT 28 DAYS. DO NOT BACKFILL STEM WALL UNTIL CONCRETE HAS REACHED DESIGN STRENGTH.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 WITH THE FOLLOWING GRADES:
   GRADE 60 FOR ALL BARS
   GRADE 40 FOR ALL STIRRUP & SPIRAL CAGES
4. STEEL SHALL BE KEPT CLEAN AND FREE OF RUST SCALES. ALL REINFORCING STEEL BARS SHALL BE SECURING TIED AT EACH END AND AT AT A MAXIMUM OF 48 ' O.C. LAP ALL BARS 60 DIAMETERS MINIMUM AT SPLICES, CORNERS AND INTERSECTIONS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CAST-IN-PLACE PIER SUPPORTED CONCRETE RETAINING WALL

STD. PLAN NO. 240

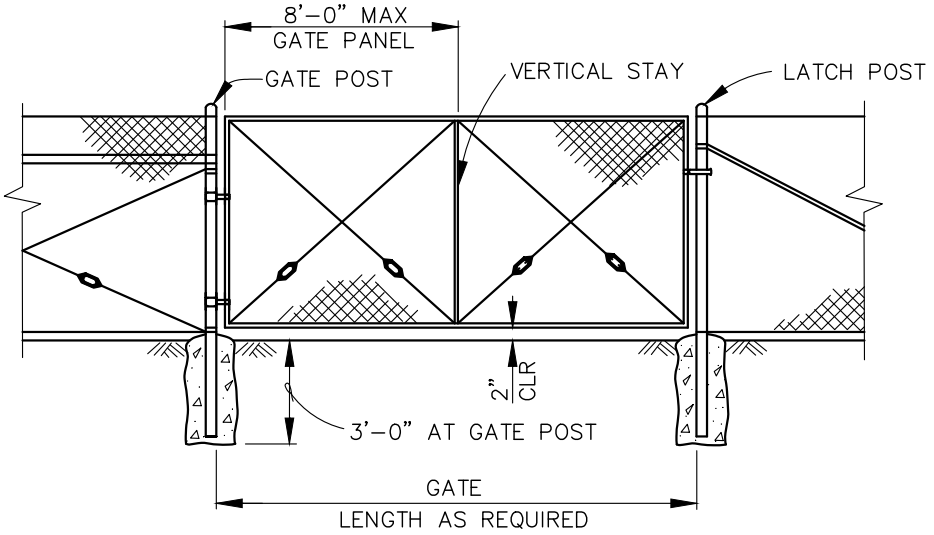
PAGE 2 OF 2

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 - NTS

(2012 STD. NO. 229)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 240-2 Plot Date: May 29, 2020 at 02:55 pm



CHAIN LINK GATE INSTALLATION

GATE POST			
FENCE HEIGHT	GATE WIDTHS	NOMINAL ID	WEIGHT PER FOOT
6'–0" and Less	Up thru 6'–0"	2 1/2"	4.95 LB
	Over 6'–0" thru 12'–0"	4"	10.79 LB
	Over 12'–0" thru 18'–0"	5"	14.62 LB
	Over 18'–0" to 24'–0" Max	6"	18.97 LB

NOTES:

1. ACCESS GATES SHALL CONFORM TO THESE DETAILS AND THE REFERENCED SPECIFICATIONS. DECORATIVE GATES MAY BE ALLOWED BUT MUST BE APPROVED BY THE TOWN ENGINEER IN ADVANCE.
2. CHAIN LINK FENCE SHALL CONFORM TO SECTION 80–4, "CHAIN LINK FENCE" OF THE CALTRANS STANDARD SPECIFICATIONS AND THESE REQUIREMENTS.
3. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH CALTRANS STANDARD PLANS.
4. GATES AND FENCES SHALL BE COATED WITH BLACK VINYL.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

ACCESS GATE AND FENCING

STD. PLAN NO. 241

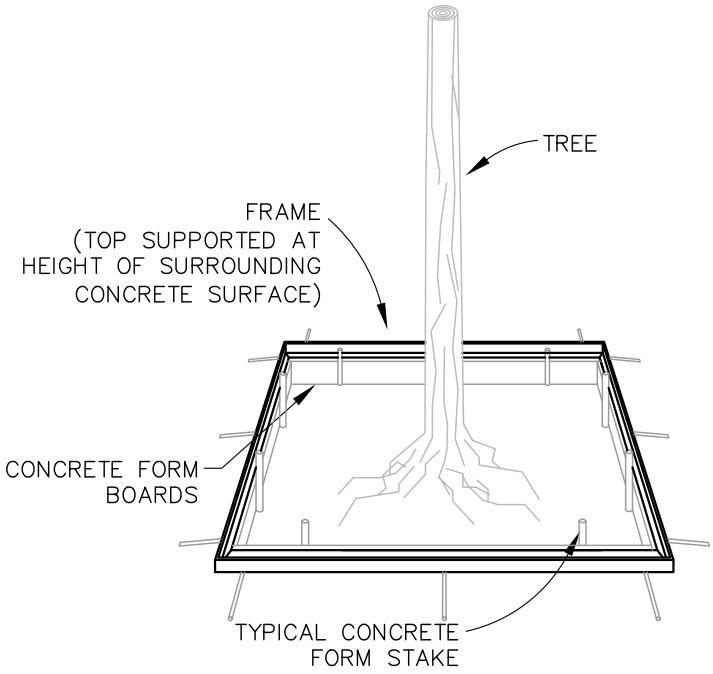
PAGE 1 OF 1

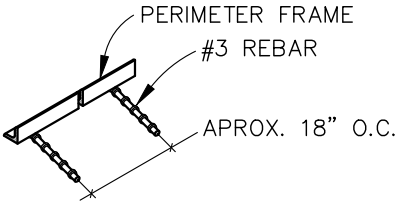
JOHN JAEGER, PUBLIC WORKS DIRECTOR

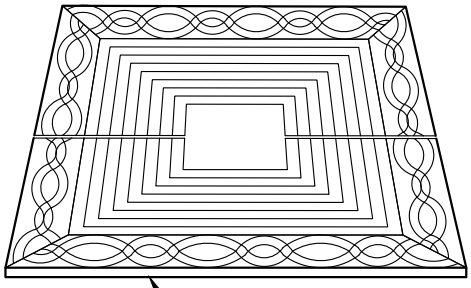
JULY 2011 – NTS

(2012 STD. NO. 230)

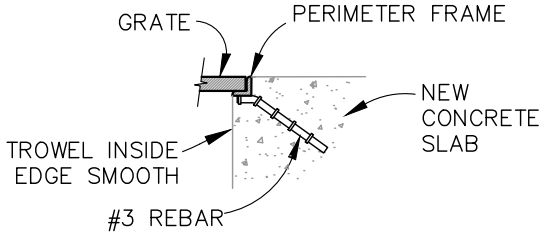
Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 241 Plot Date: May 29, 2020 at 02:55 pm







URBAN ACCESSORIES 4'
SQUARE CHINOOK METAL
TREE GRATE OR EQUAL.



"S" STANDARD USED WITH
NEW SURROUND SLABS

NOTE:
1. TREE FRAME SHALL BE INSTALLED 6" BEHIND BACK OF CURB, PER PAGE 2.

2. TREE GRATE FRAME INSTALLATION: STANDARD "S" FRAME USED AS CONCRETE FORM. STAKES OR SPREADERS REQUIRED TO KEEP FRAME FORM DEFORMING DURING CONCRETE PLACEMENT.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TREE GRATE AND FRAME DETAIL

STD. PLAN NO. 246

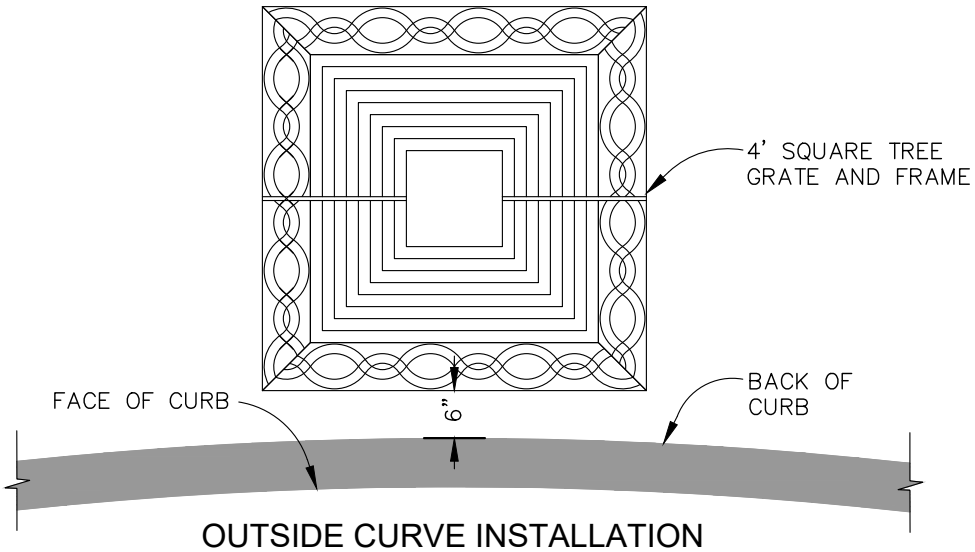
PAGE 1 OF 2

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JULY 2011 – NTS

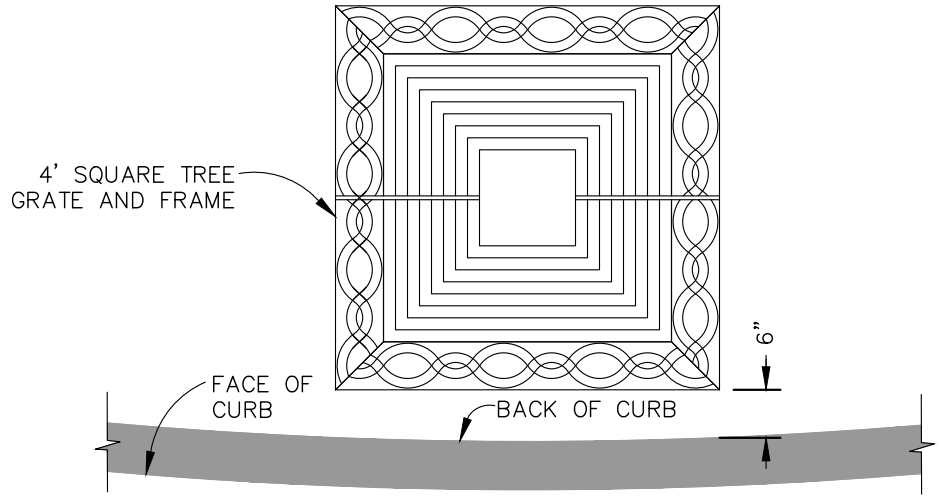
(2012 STD. NO. 402)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 246-1 Plot Date: May 29, 2020 at 02:55 pm



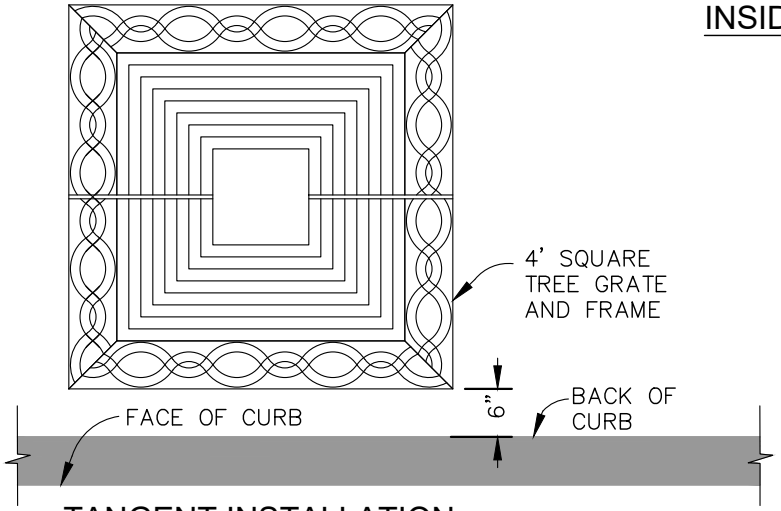
OUTSIDE CURVE INSTALLATION

SCALE: NTS



INSIDE CURVE INSTALLATION

SCALE: NTS



TANGENT INSTALLATION

SCALE: NTS

NOTES:

1. TREE GRATE AND FRAME SHALL BE URBAN ACCESSORIES 4' SQUARE CHINOOK UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
2. SEE TOWN STD. 203 FOR SIDEWALK TO TREE CLEARANCE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TREE GRATE AND FRAME DETAIL INSTALL LOCATION

STD. PLAN NO. 246

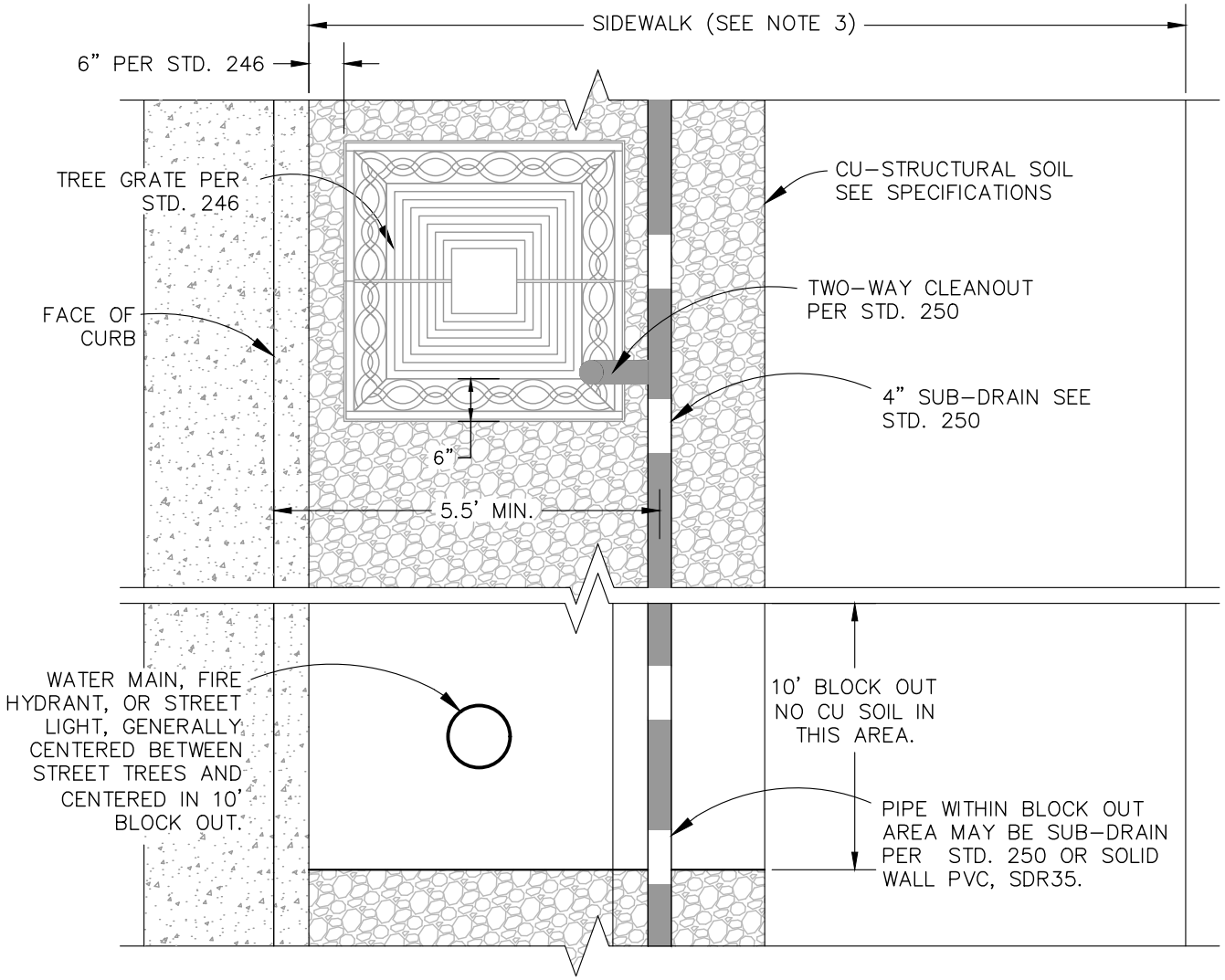
PAGE 2 OF 2

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JULY 2011 – NTS

(2012 STD. NO. 402)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 246-2 Plot Date: May 29, 2020 at 02:55 pm



PLAN

NOTES:

1. SEE STANDARDS SECTION VII FOR MATERIAL SPECIFICATIONS.
2. SEE STD. 250 FOR SUB-DRAIN AND CLEANOUT DETAILS.
3. SIDEWALK WIDTH VARIES, SEE TOWN OF WINDSOR STREET DESIGN GUIDELINES AND STD. 201 FOR MINIMUM SIDEWALK WIDTHS.
4. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 250.
5. CU-STRUCTURAL SOIL SHALL BE CONTINUOUS LONGITUDINALLY ACROSS THE FRONTAGE EXCEPT WHERE BLOCK OUTS ARE REQUIRED. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STURCTRUAL SOIL REQUIRED.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING CU-STRUCTURAL SOIL

STD. PLAN NO. 247

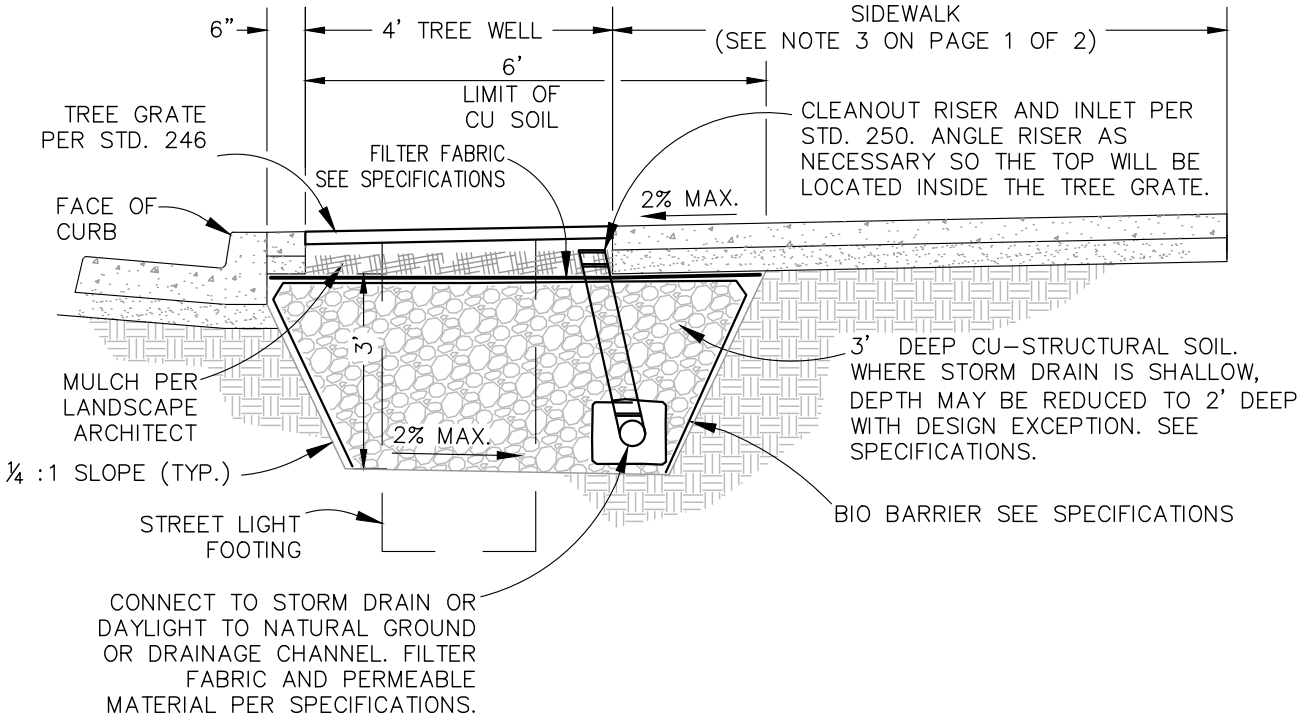
PAGE 1 OF 2

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JULY 2011 – NTS

(2012 STD. NO. 403)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 247-1 Plot Date: May 29, 2020 at 02:55 pm



PROFILE

SCALE: NTS

NOTE:

1. VOLUME CALCULATION:

   V REQUIRED = 2 CUBIC FEET X PROJECTED AREA OF THE CANOPY.

   FOR A TREE WITH 20FT DIAMETER CANOPY, $V = \Pi \times (20/2)^2 \times 2 = 630FT^3$

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING
CU-STRUCTURAL SOIL

STD. PLAN NO. 247

PAGE 2 OF 2

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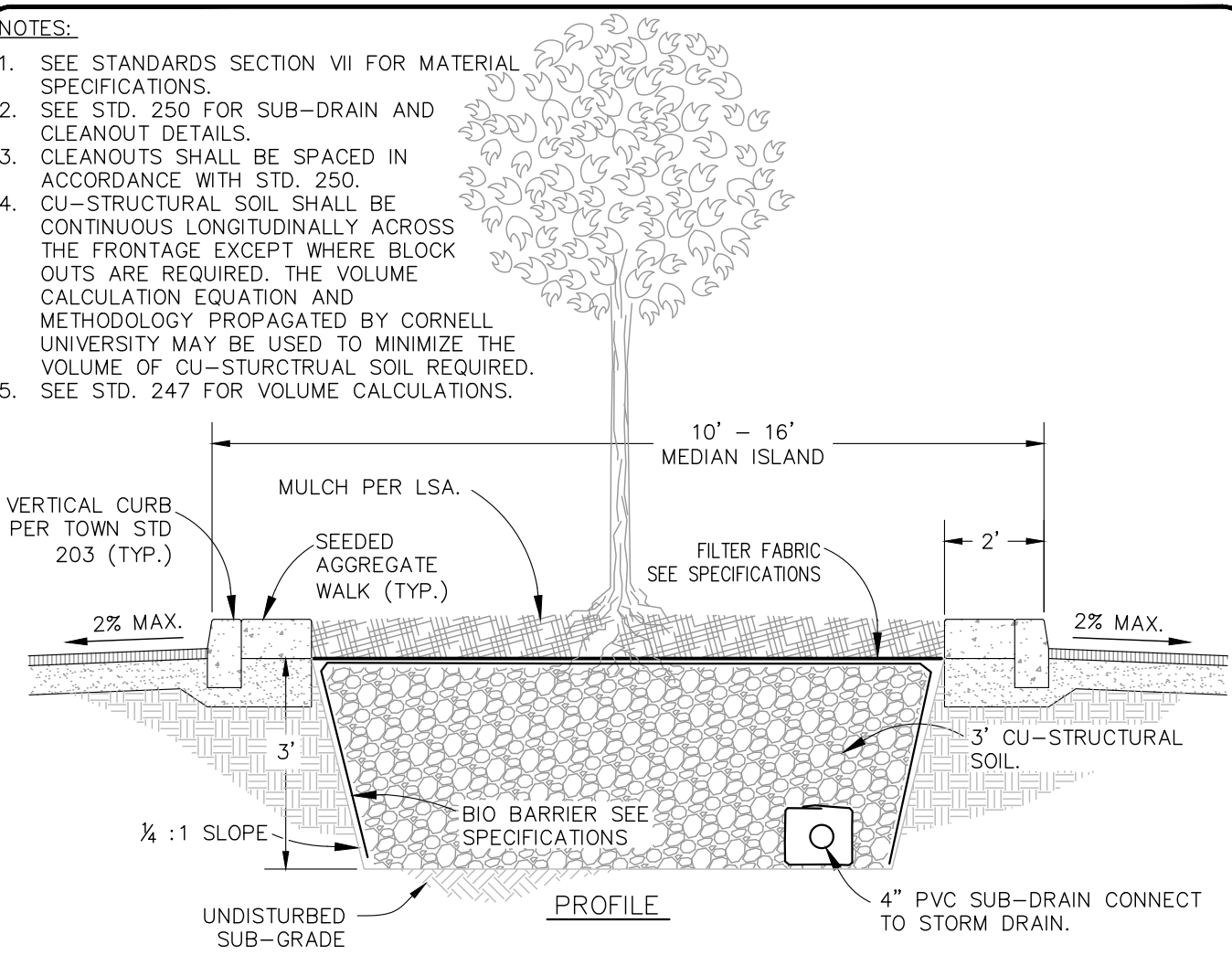
JULY 2011 – NTS

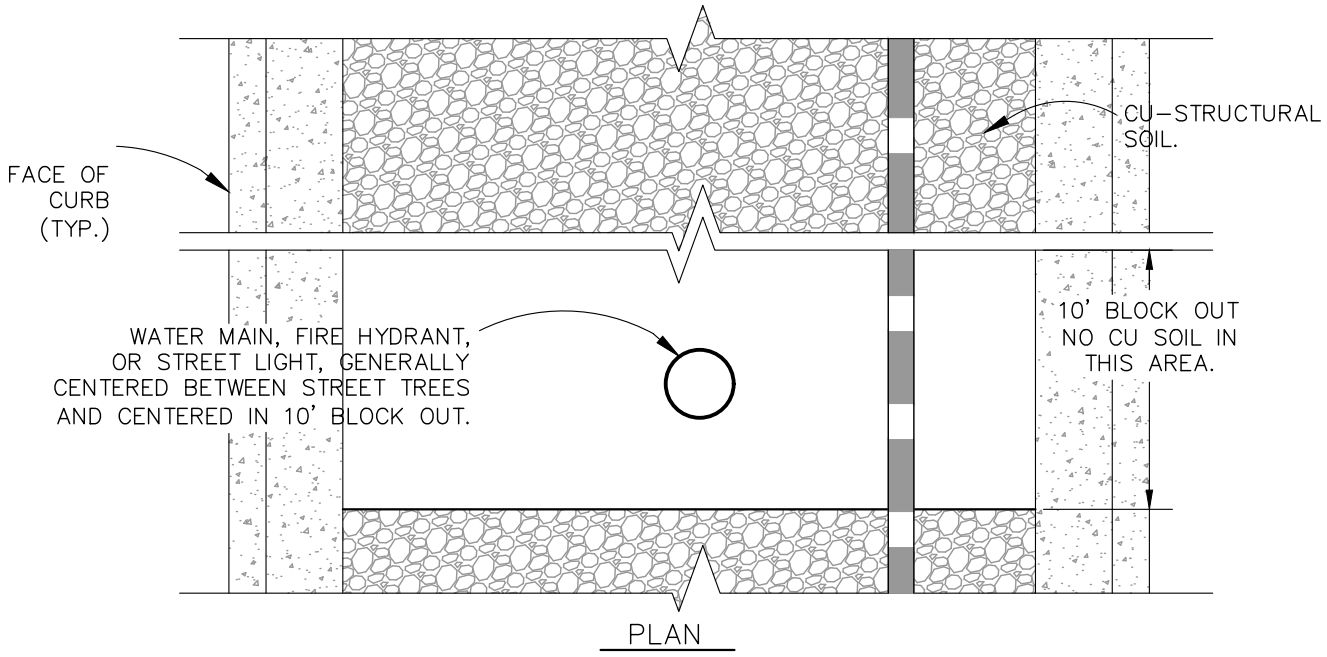
(2012 STD. NO. 403)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 247-2 Plot Date: May 29, 2020 at 02:56 pm

NOTES:

1. SEE STANDARDS SECTION VII FOR MATERIAL SPECIFICATIONS.
2. SEE STD. 250 FOR SUB-DRAIN AND CLEANOUT DETAILS.
3. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 250.
4. CU-STRUCTURAL SOIL SHALL BE CONTINUOUS LONGITUDINALLY ACROSS THE FRONTAGE EXCEPT WHERE BLOCK OUTS ARE REQUIRED. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STURCTRUAL SOIL REQUIRED.
5. SEE STD. 247 FOR VOLUME CALCULATIONS.





TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

MEDIAN ISLAND TREE PLANTING CU-STRUCTURAL SOIL

STD. PLAN NO. 248

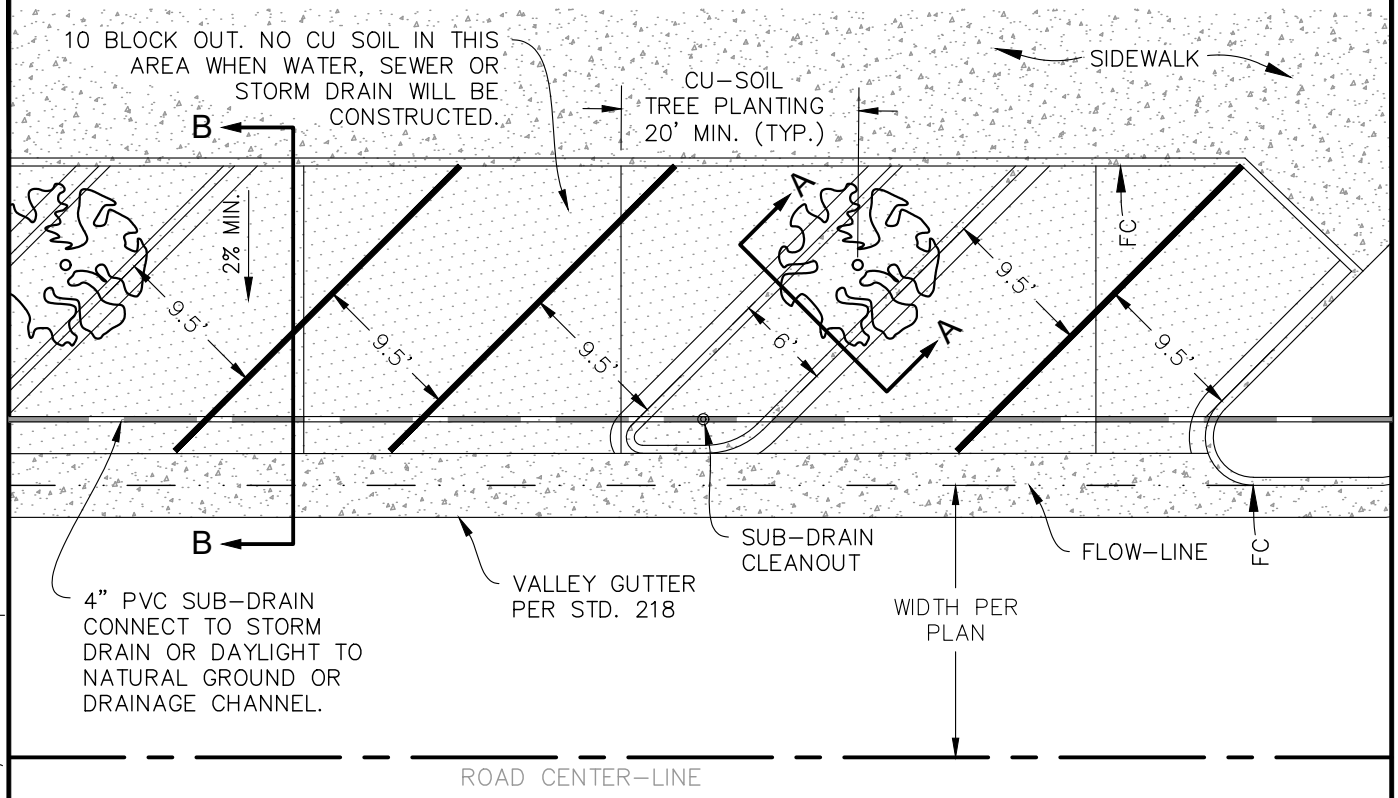
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 404)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 248 Plot Date: May 29, 2020 at 02:56 pm



PLAN VIEW

NOTES:

1. SEE STANDARDS SECTION VII FOR MATERIAL SPECIFICATIONS.
2. SEE STD. 406 FOR SUB-DRAIN AND CLEANOUT DETAILS.
3. SIDEWALK WIDTH VARIES, SEE TOWN OF WINDSOR STREET DESIGN GUIDELINES AND STD. 201 FOR MINIMUM SIDEWALK WIDTHS.
4. CLEANOUTS SHALL BE SPACED IN ACCORDANCE WITH STD. 250.
5. FOR OAK TREE PLANTING, CU-STRUCTURAL SOIL SHALL BE INSTALLED A MINIMUM OF 20' EITHER SIDE OF THE OAK TREE AS SHOWN. THE VOLUME CALCULATION EQUATION AND METHODOLOGY PROPAGATED BY CORNELL UNIVERSITY MAY BE USED TO MINIMIZE THE VOLUME OF CU-STURCTRUAL SOIL REQUIRED.
6. VOLUME CALCULATION:

   V REQUIRED = 2 CUBIC FEET X PROJECTED AREA OF THE CANOPY.

   FOR A TREE WITH 20FT DIAMETER CANOPY, $V = \Pi \times (20/2)^2 \times 2 = 630FT^3$

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING AT ANGLED PARKING BAY CU-STRUCTURAL SOIL

JOHN JAEGER, PUBLIC WORKS DIRECTOR

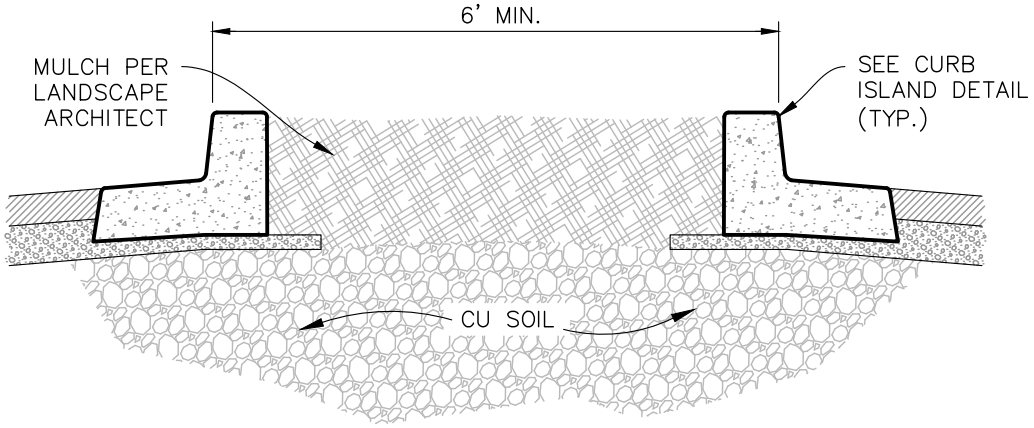
JULY 2011 – NTS

STD. PLAN NO. 249

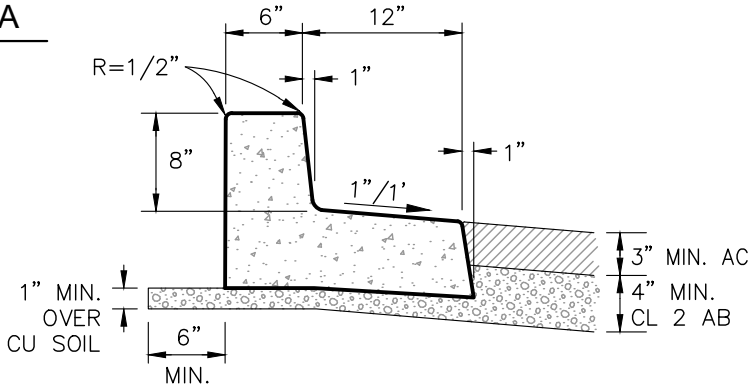
PAGE 1 OF 2

(2012 STD. NO. 405)

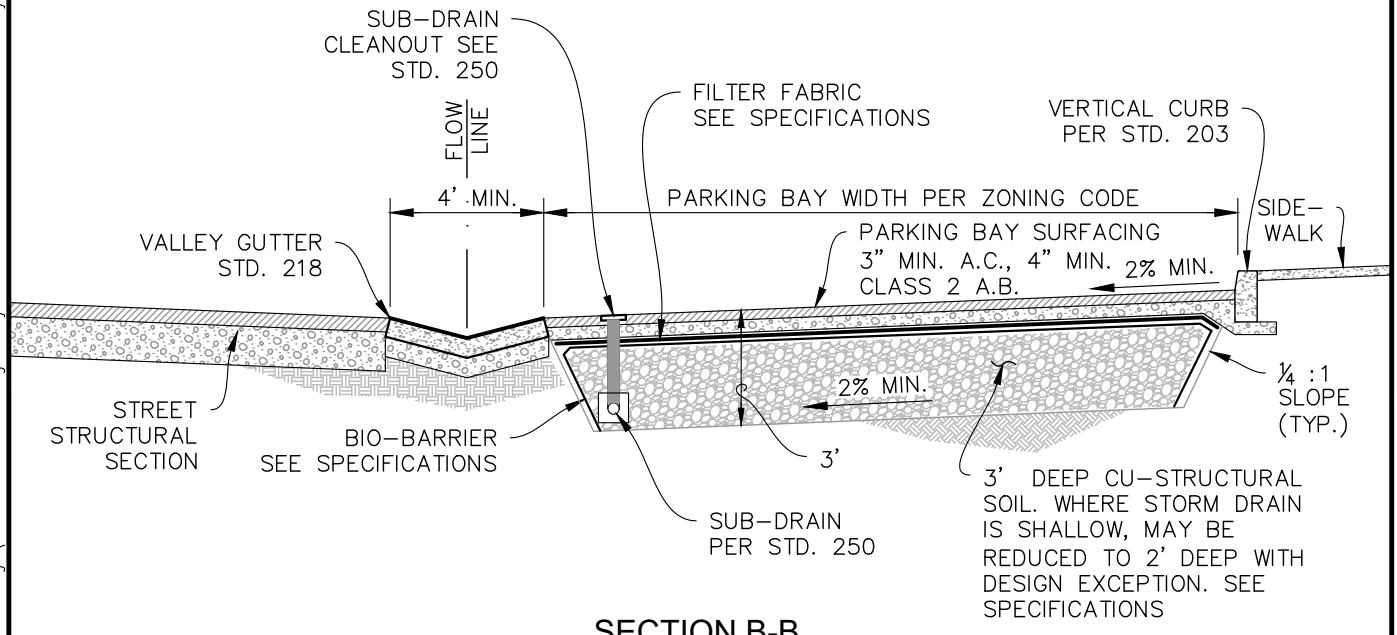
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 249-1 Plot Date: May 29, 2020 at 02:56 pm



SECTION A-A



CURB ISLAND DETAIL



SECTION B-B

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING AT ANGLED PARKING BAY CU-STRUCTURAL SOIL

JOHN JAEGER, PUBLIC WORKS DIRECTOR

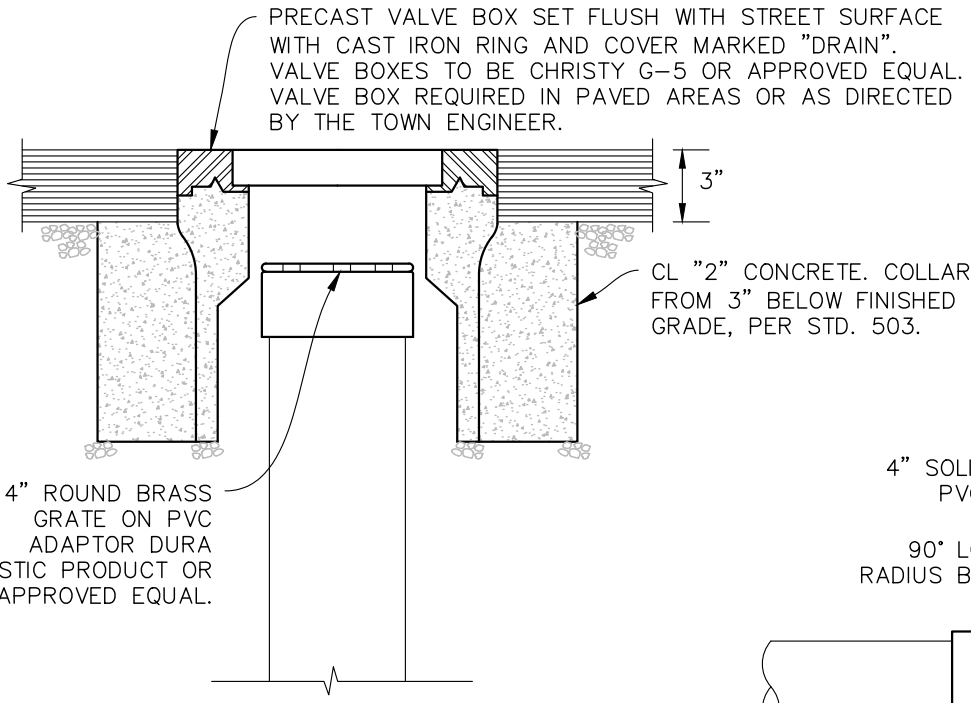
JULY 2011 – NTS

STD. PLAN NO. 249

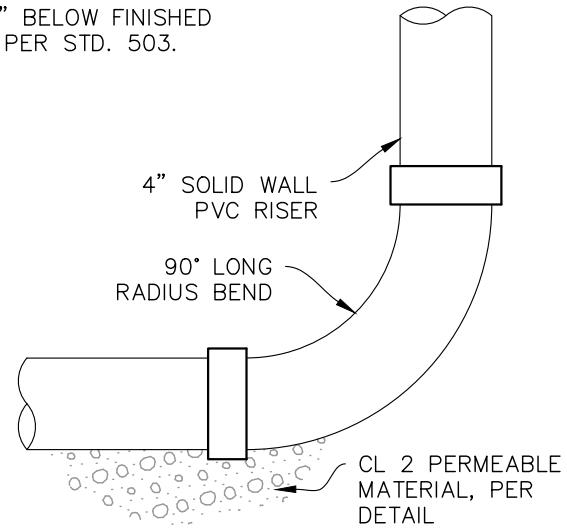
PAGE 2 OF 2

(2012 STD. NO. 405)

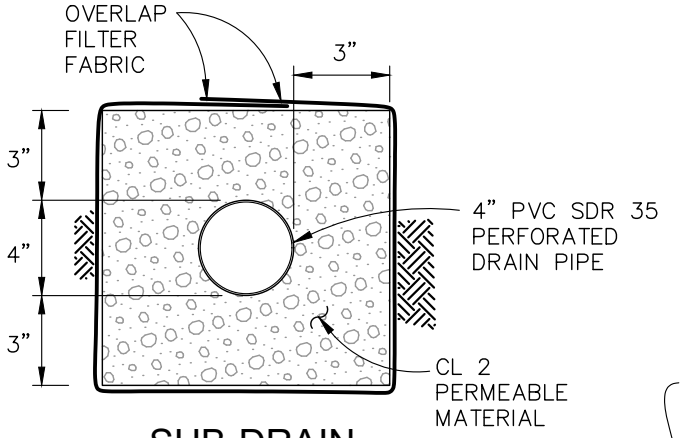
Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 249-2 Plot Date: May 29, 2020 at 02:56 pm



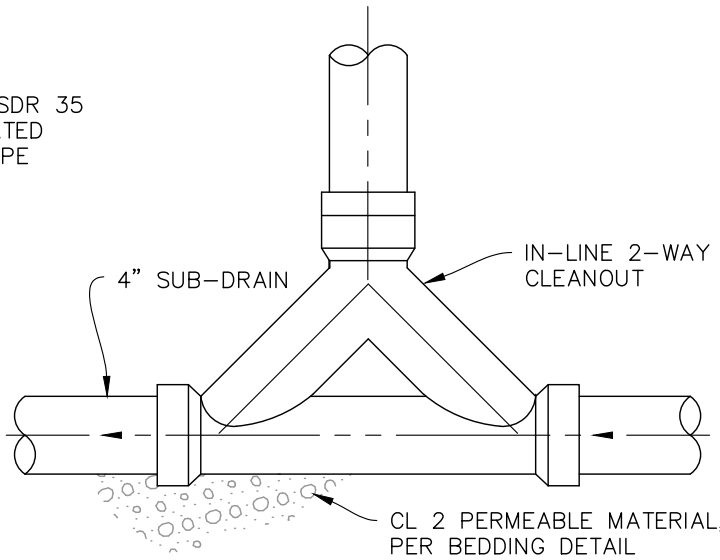
RISER DETAIL



END OF LINE CLEANOUT



SUB-DRAIN BEDDING DETAIL



TWO-WAY CLEANOUT

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SUB-DRAIN DETAIL
CU-STRUCTURAL SOIL

STD. PLAN NO. 250

PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 406)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\240-250 Streets.dwg Layout Name: 250 Plot Date: May 29, 2020 at 02:56 pm

PART III – STANDARD DRAWINGS

SERIES 300 – EARTHWORK CONSTRUCTION, ASPHALT PLACEMENT, STORM DRAIN, LID, & BMP STANDARD DRAWINGS

TABLE OF CONTENTS

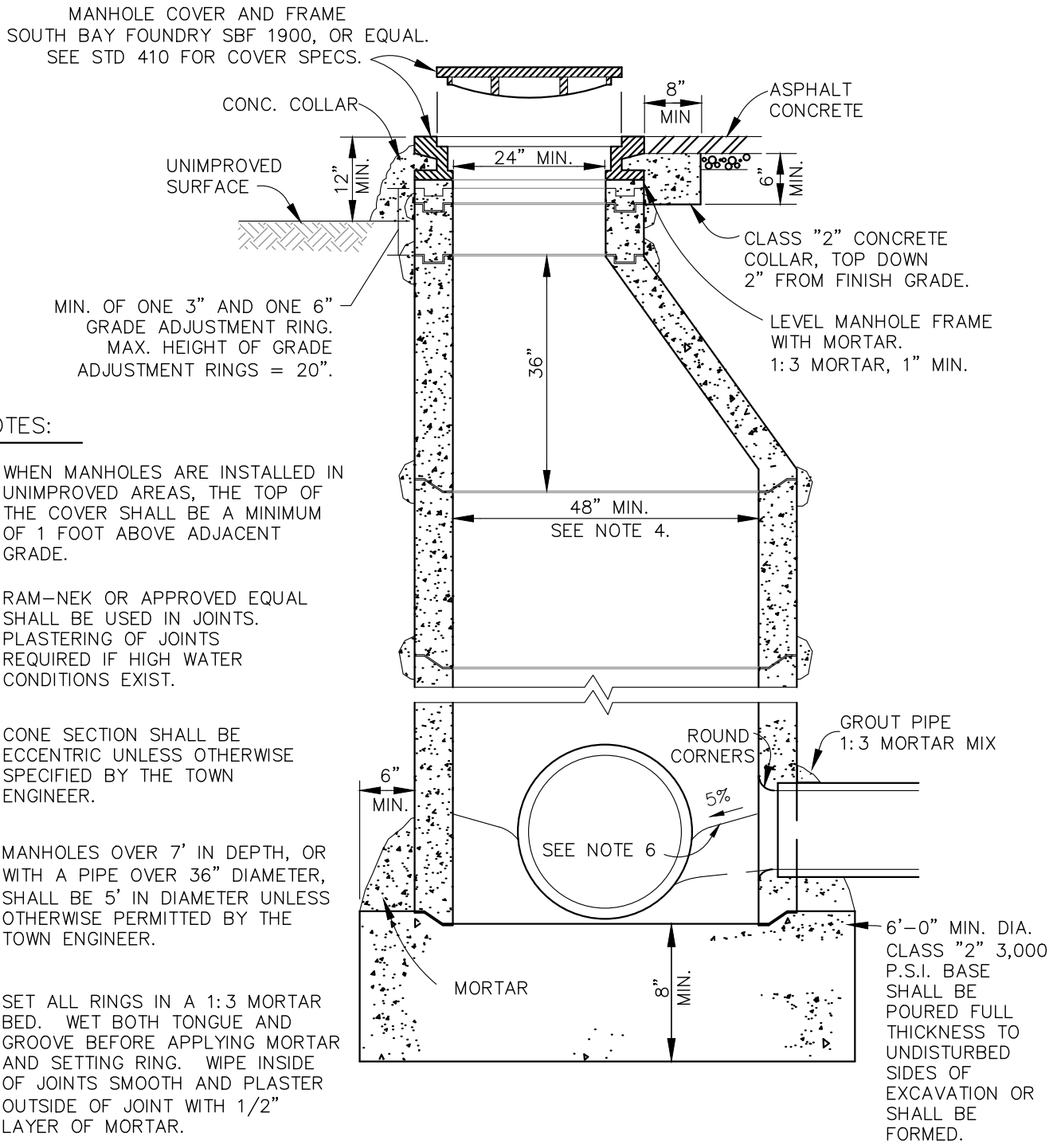
STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
301	Storm Drain Precast Manhole	04/06	07/11
302	Curb Opening Catch Basins	11/93	07/11
303	Precast Catch Basin Cover	11/93	07/11
304	Storm Drain Decal	N/A	07/11
305	Typical Bio-Retention Unit	N/A	07/11
306	Bioswale at Curb and Sidewalk	N/A	03/23

SERIES 300 – EARTHWORK CONSTRUCTION, ASPHALT PLACEMENT, STORM DRAIN, LID, & BMP STANDARD DRAWINGS

REVISION SUMMARY

Std. Dwg No.	Drawing Description	Rev. No.	Prior Issue Date	Rev. Date	Rev. Description
301	Storm Drain Precast Manhole	1	04/06	07/11	Two new sheets added for the installation of a reducer slab and for a shorter cone to facilitate manhole construction when storm drain is shallow.
302	Curb Opening Catch Basins	1	11/93	07/11	Storm drain decal added to existing detail.
303	Precast Catch Basin Cover	1	11/93	07/11	Storm drain decal added to existing detail.
304	Storm Drain Decal	N/A	N/A	07/11	New standard for "Drains to Creek" decal.
305	Typical Bio-Retention Unit	N/A	N/A	07/11	New standard for a typical bio-retention unit.
306	Bioswale at Curb and Sidewalk	N/A	N/A	03/23	New standard for a bioswale.

Standard Drawing Numbers changed/reassigned as of April 2015. The previous 2012 numbers are referenced on the lower right corner of each page



NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF 1 FOOT ABOVE ADJACENT GRADE.
2. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.
3. CONE SECTION SHALL BE ECCENTRIC UNLESS OTHERWISE SPECIFIED BY THE TOWN ENGINEER.
4. MANHOLES OVER 7' IN DEPTH, OR WITH A PIPE OVER 36" DIAMETER, SHALL BE 5' IN DIAMETER UNLESS OTHERWISE PERMITTED BY THE TOWN ENGINEER.
5. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
6. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
7. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN PRECAST MANHOLE

STD. PLAN NO. 301

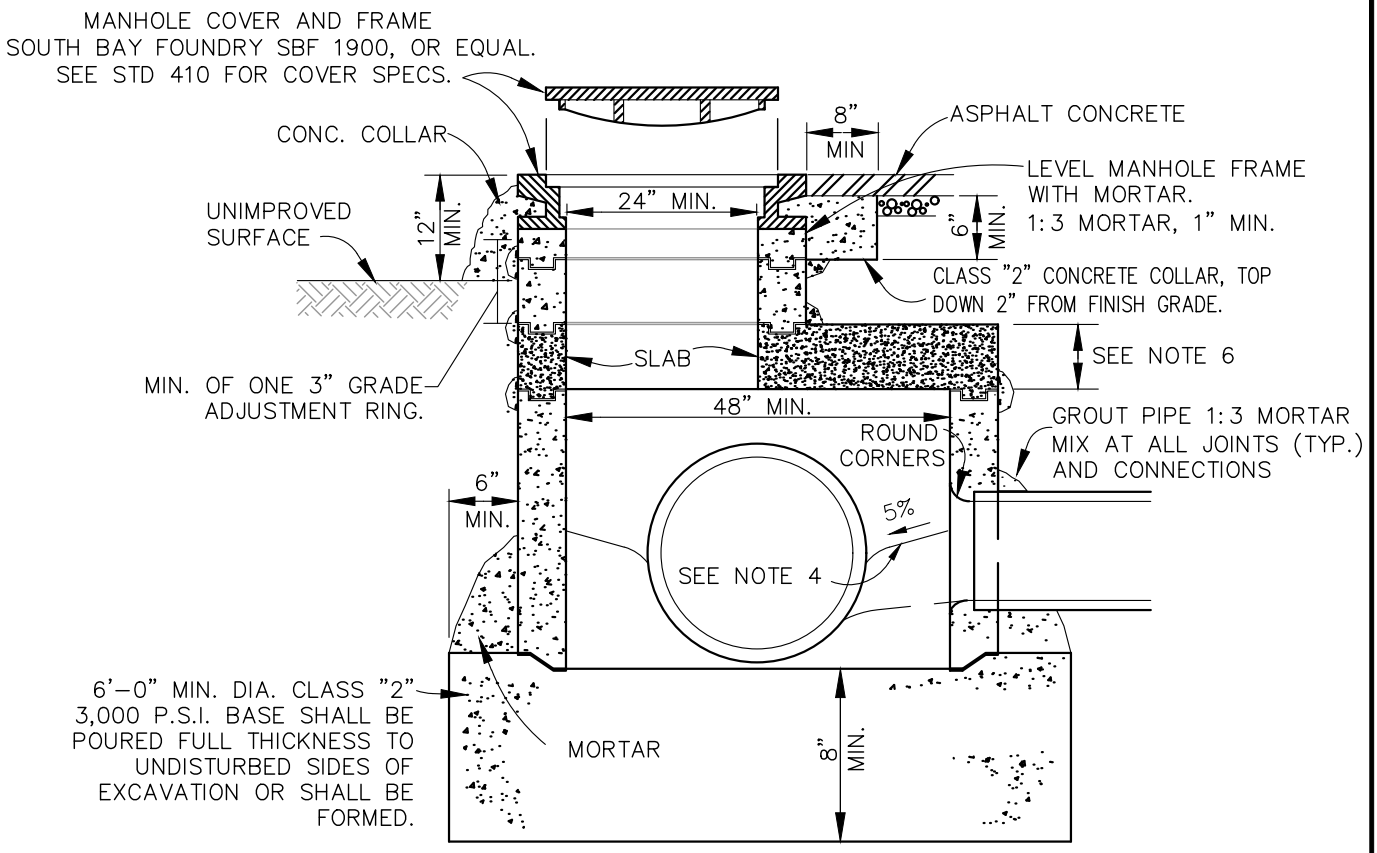
PAGE 1 OF 3

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 301)

Xrefs: Images: Drains to Creek-Grey scale.jpg;JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 301-1 Plot Date: May 29, 2020 at 02:58 pm



NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A INIMUM OF 1 FOOT ABOVE ADJACENT GRADE.
2. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.
3. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
4. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
5. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
6. PRECAST ECCENTRIC REDUCER SLAB DESIGNED AND REINFORCED FOR H20 HIGHWAY LOADING. CONTRACTOR SHALL PROVIDE CERTIFICATE OF COMPLIANCE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN PRECAST MANHOLE REDUCER SLAB

JOHN JAEGER, PUBLIC WORKS DIRECTOR

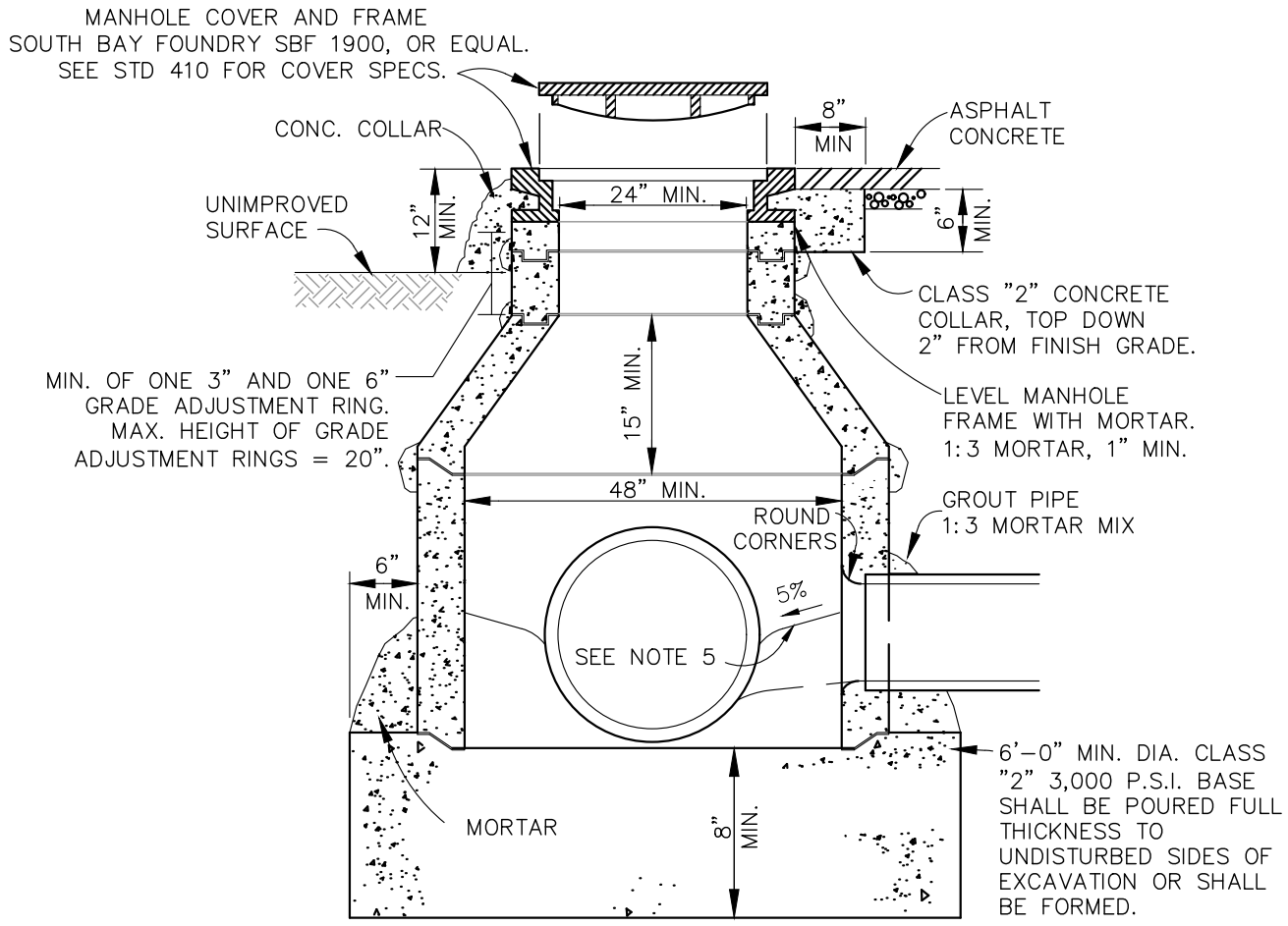
JULY 2011 – NTS

STD. PLAN NO. 301

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(2012 STD. NO. 301)

Xrefs: Images: Drains to Creek-Grey scale.jpg;JEU2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 301-2 Plot Date: May 29, 2020 at 02:58 pm



NOTES:

1. CONCENTRIC CONE SECTION SHALL BE APPROVED BY THE TOWN ENGINEER BEFORE INSTALLATION.
2. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MINIMUM OF 1 FOOT ABOVE ADJACENT GRADE.
3. RAM-NEK OR APPROVED EQUAL SHALL BE USED IN JOINTS. PLASTERING OF JOINTS REQUIRED IF HIGH WATER CONDITIONS EXIST.
4. SET ALL RINGS IN A 1:3 MORTAR BED. WET BOTH TONGUE AND GROOVE BEFORE APPLYING MORTAR AND SETTING RING. WIPE INSIDE OF JOINTS SMOOTH AND PLASTER OUTSIDE OF JOINT WITH 1/2" LAYER OF MORTAR.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER BASE IS POURED, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES. SET RING BASE IN MORTAR.
6. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN PRECAST CONCENTRIC MANHOLE

JOHN JAEGER, PUBLIC WORKS DIRECTOR

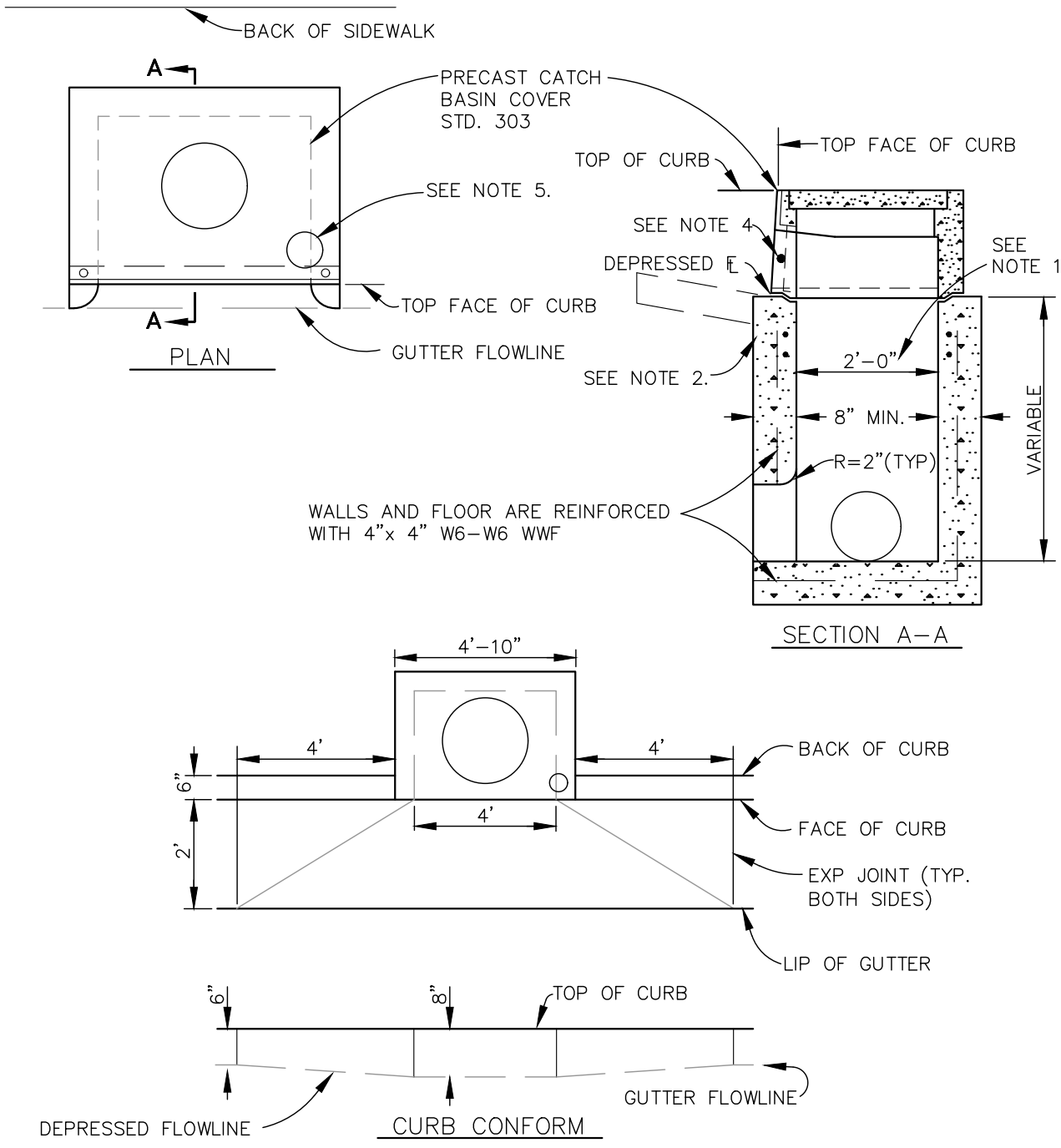
JULY 2011 – NTS

STD. PLAN NO. 301

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(2012 STD. NO. 301)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 301-3 Plot Date: May 29, 2020 at 02:58 pm



NOTES:

1. IF PIPE INTO OR OUT OF THE CATCH BASIN IS LARGER THAN 24", UNIT SHALL BE TAILOR MADE BY SUPPLIER, OR ENGINEERED PLANS SHOWING FIELD FABRICATION SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
2. APPROVED ALTERNATES FOR CURB INLET BASE SECTIONS: US CONCRETE PRODUCTS BASE SECTION MODEL 4A; KRISTAR ENTERPRISES PRECAST CONC. PRODUCTS BASE SECTION MODEL D14,2
3. ALL HOOD, BASE, AND PIPE CONNECTIONS SHALL BE GROUTED.
4. 3/4" GALVANIZED STEEL GUARD ROD MUST BE INSTALLED AT CENTER OF OPENINGS IN EXCESS OF 9" INCHES IN HEIGHT.
5. ATTACH "DRAINS TO CREEK" DECAL PER STD. 304.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CURB OPENING CATCH BASINS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

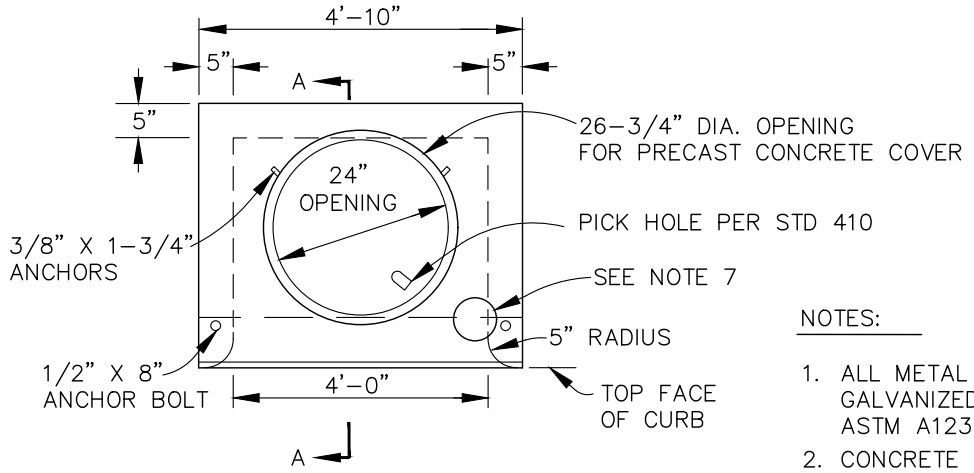
JULY 2011 – NTS

STD. PLAN NO. 302

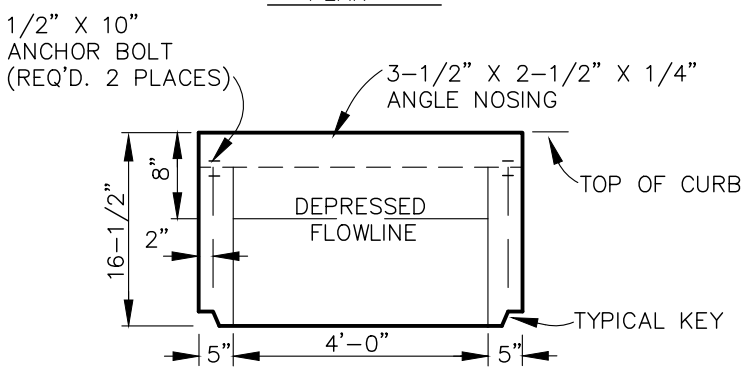
PAGE 1 OF 1

(2012 STD. NO. 302)

Xrefs: Images: Drains to Creek-Grey scale.jpg;JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 302 Plot Date: May 29, 2020 at 02:58 pm



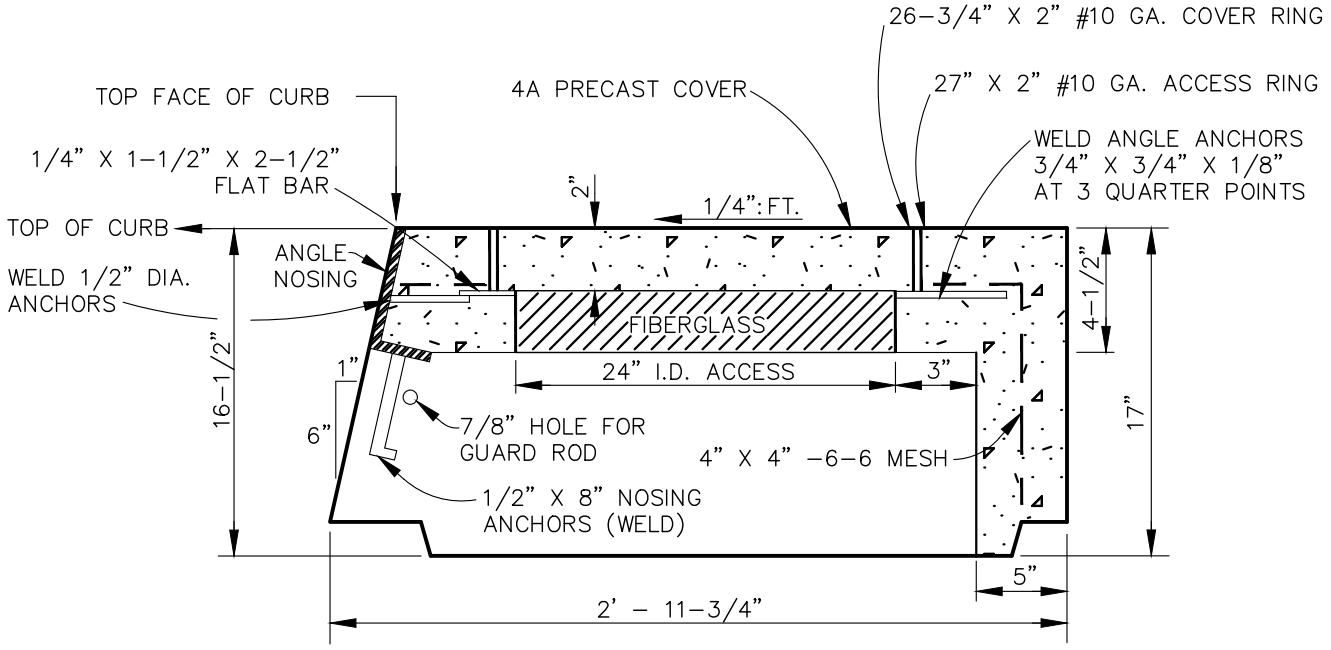
PLAN



NOTES:

1. ALL METAL PARTS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
2. CONCRETE SHALL TEST 3000 PSI AT 28 DAYS.
3. ALL REINFORCING SHALL BE 4" X 4" – 6–6 MESH.
4. WEIGHT OF UNIT COMPLETE = 1500± LBS. COVER ONLY = 100± LBS.
5. 3/4" GALVANIZED STEEL GUARD ROD FOR OPENINGS IN EXCESS OF 9" HEIGHT.
6. BASE MAY BE PRECAST OR CAST IN PLACE TO SUIT.
7. ATTACH "DRAINS TO CREEK" DECAL PER STD. 304.

ELEVATION



SECTION A–A

APPROVED ALTERNATES:
CENTRAL PRE–CAST PRODUCTS MODEL 4A
PHEONIX PRECAST CONC. PRODUCTS MODEL P–2448–C

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PRECAST CATCH BASIN COVER

STD. PLAN NO. 303

PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

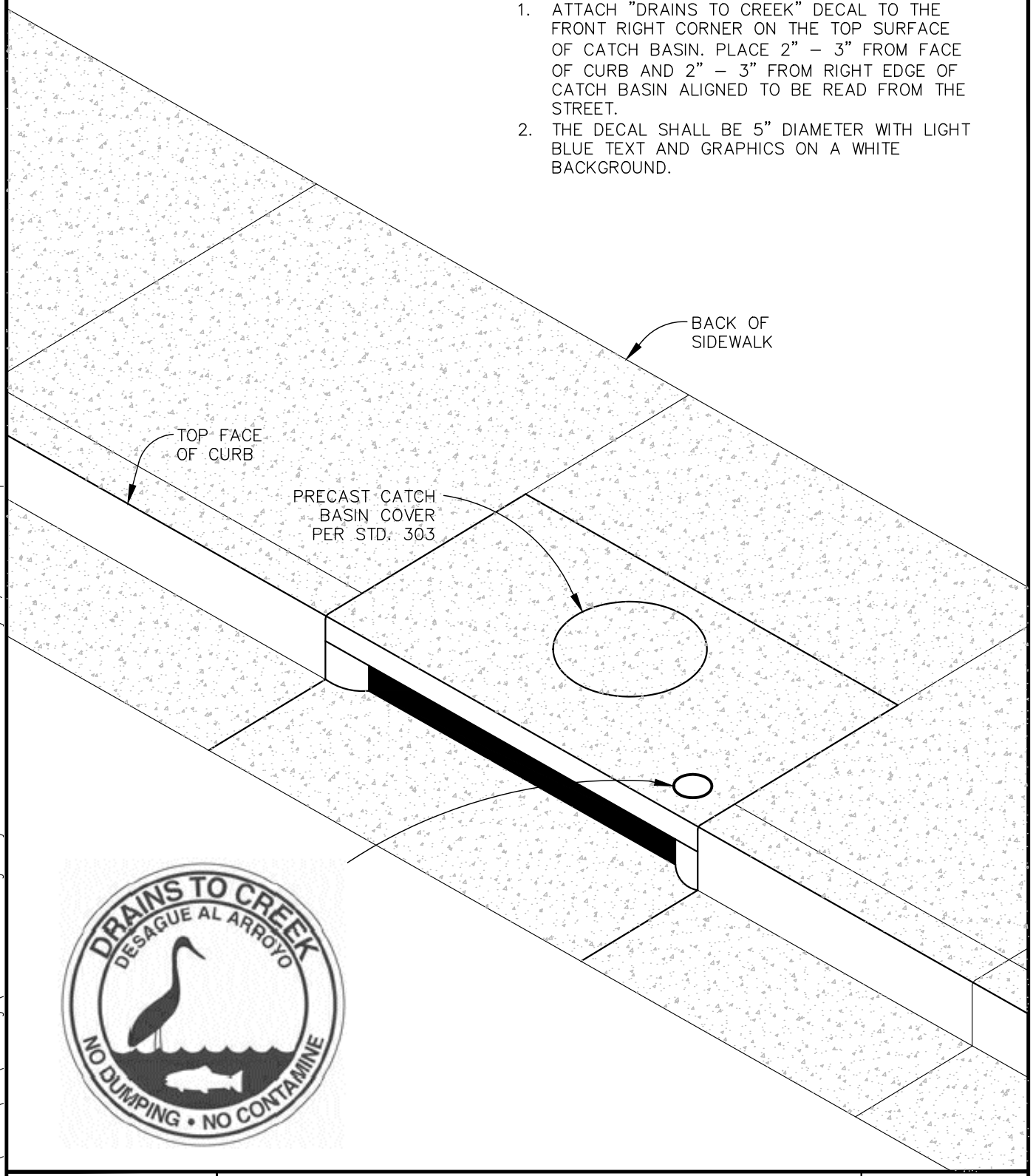
JULY 2011 – NTS

(2012 STD. NO. 303)

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Path: F:\BMAP–STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 303 Plot Date: May 29, 2020 at 02:58 pm

NOTE:

1. ATTACH "DRAINS TO CREEK" DECAL TO THE FRONT RIGHT CORNER ON THE TOP SURFACE OF CATCH BASIN. PLACE 2" – 3" FROM FACE OF CURB AND 2" – 3" FROM RIGHT EDGE OF CATCH BASIN ALIGNED TO BE READ FROM THE STREET.
2. THE DECAL SHALL BE 5" DIAMETER WITH LIGHT BLUE TEXT AND GRAPHICS ON A WHITE BACKGROUND.



TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STORM DRAIN DECAL

STD. PLAN NO. 304

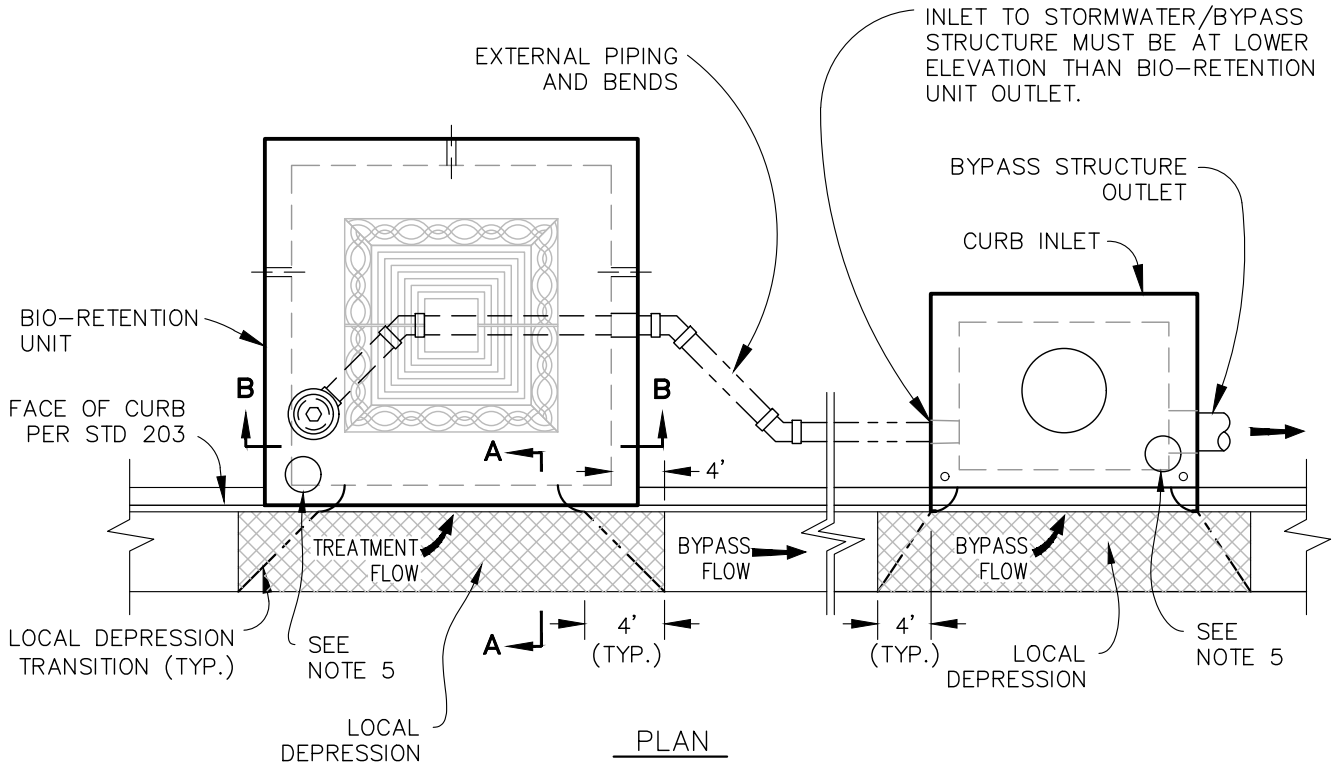
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

JULY 2011 – NTS

(2012 STD. NO. 304)

Xrefs: Images: Drains to Creek-Grey scale.jpg;JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 304 Plot Date: May 29, 2020 at 02:58 pm



NOTES:

1. THE SIZE OF BIO-RETENTION UNIT REQUIRED SHALL BE CALCULATED USING SONOMA COUNTY WATER AGENCY CRITERIA FOR DRAINAGE DESIGN AND MANUFACTURER SIZING RECOMMENDATIONS. THE MINIMUM OPENING WIDTH THAT MAY BE USED IN THE TOWN RIGHT-OF-WAY IS 4-FEET UNLESS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR BY DESIGN EXCEPTION.
2. ONLY EXTERNAL BYPASS BIO-RETENTION UNITS MAY BE USED.
3. FLOW SHALL ENTER THE BIO-RETENTION UNIT IN A CROSS LINEAR DIRECTION. FLOW DIRECTED INTO THE BIO-RETENTION UNIT PERPENDICULAR TO THE BIO-RETENTION UNIT WILL NOT BE ALLOWED.
4. BIO-RETENTION UNITS MAY NOT BE PLACED IN A SUMP CONDITION. BIO-RETENTION UNITS SHALL BE PLACED UPSTREAM OF CURB INLETS AND SHALL BE CONSTRUCTED SUFFICIENTLY HIGHER IN ELEVATION SO THAT ANY PONDING IN FRONT OF THE CURB INLET WILL NOT BACKWATER INTO THE BIO-RETENTION UNIT.
5. ATTACH "DRAINS TO CREEK" DECAL PER STD 304.
6. THE TREE GRATE SHALL BE URBAN ACCESSORIES 4-FOOT SQUARE CHINOOK PER TOWN STD 246.
7. APPROVED ALTERNATES ARE:
   - FILTERRA, STORM WATER BIO-RETENTION FILTRATION SYSTEMS
   - KRISTAR, TREE PODS EQUIPPED WITH FILTERRA FILTER MEDIA, A CONCRETE BASE, A CONCRETE INTERIOR WALL AND A CAST IRON MANHOLE FRAME AND COVER IN THE PRETREATMENT AREA.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL BIO-RETENTION UNIT

STD. PLAN NO. 305

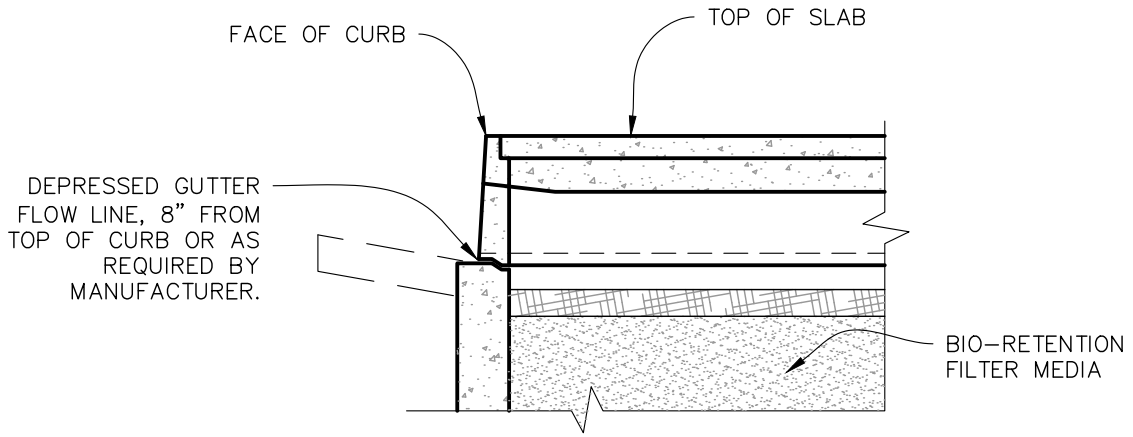
PAGE 1 OF 2

JOHN JAEGER, PUBLIC WORKS DIRECTOR

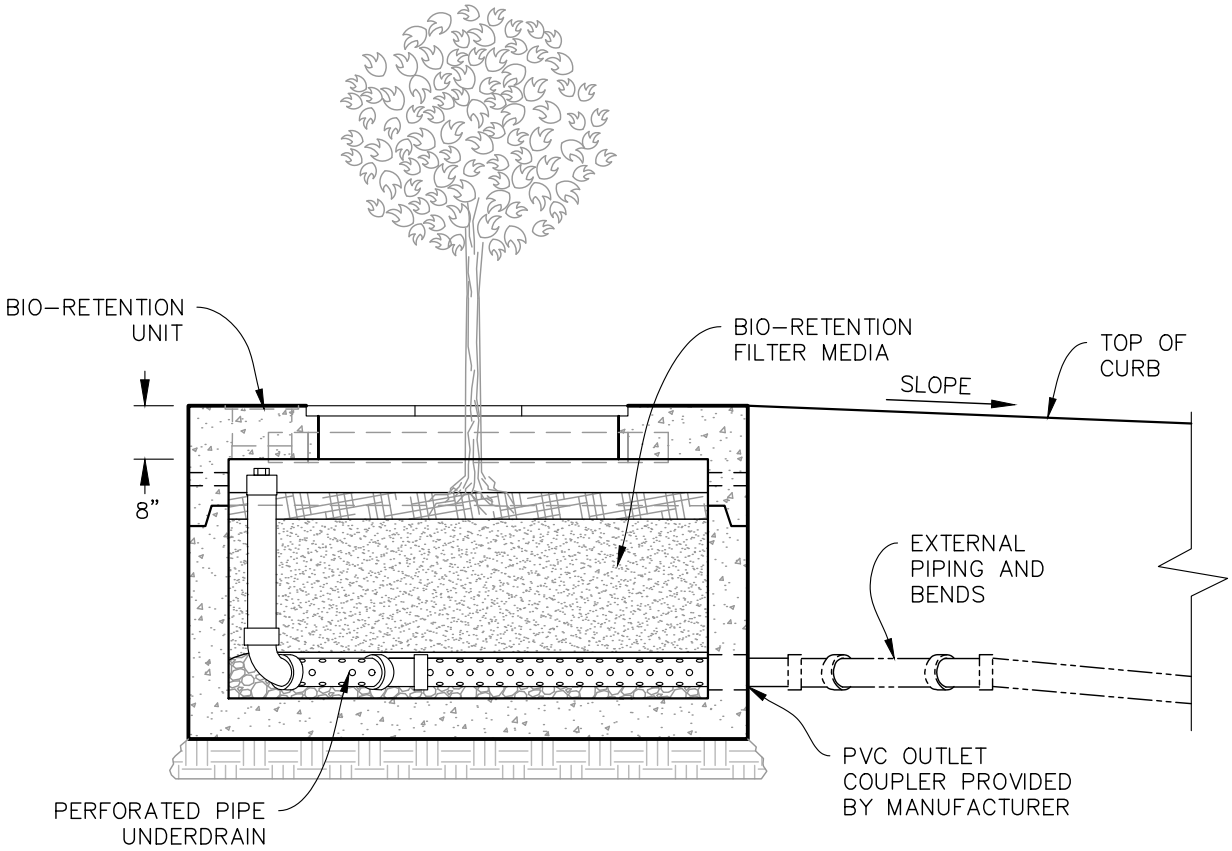
JULY 2011 – NTS

(2012 STD. NO. 305)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 305-1 Plot Date: May 29, 2020 at 02:59 pm



SECTION A–A



SECTION B–B

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL BIO-RETENTION UNIT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

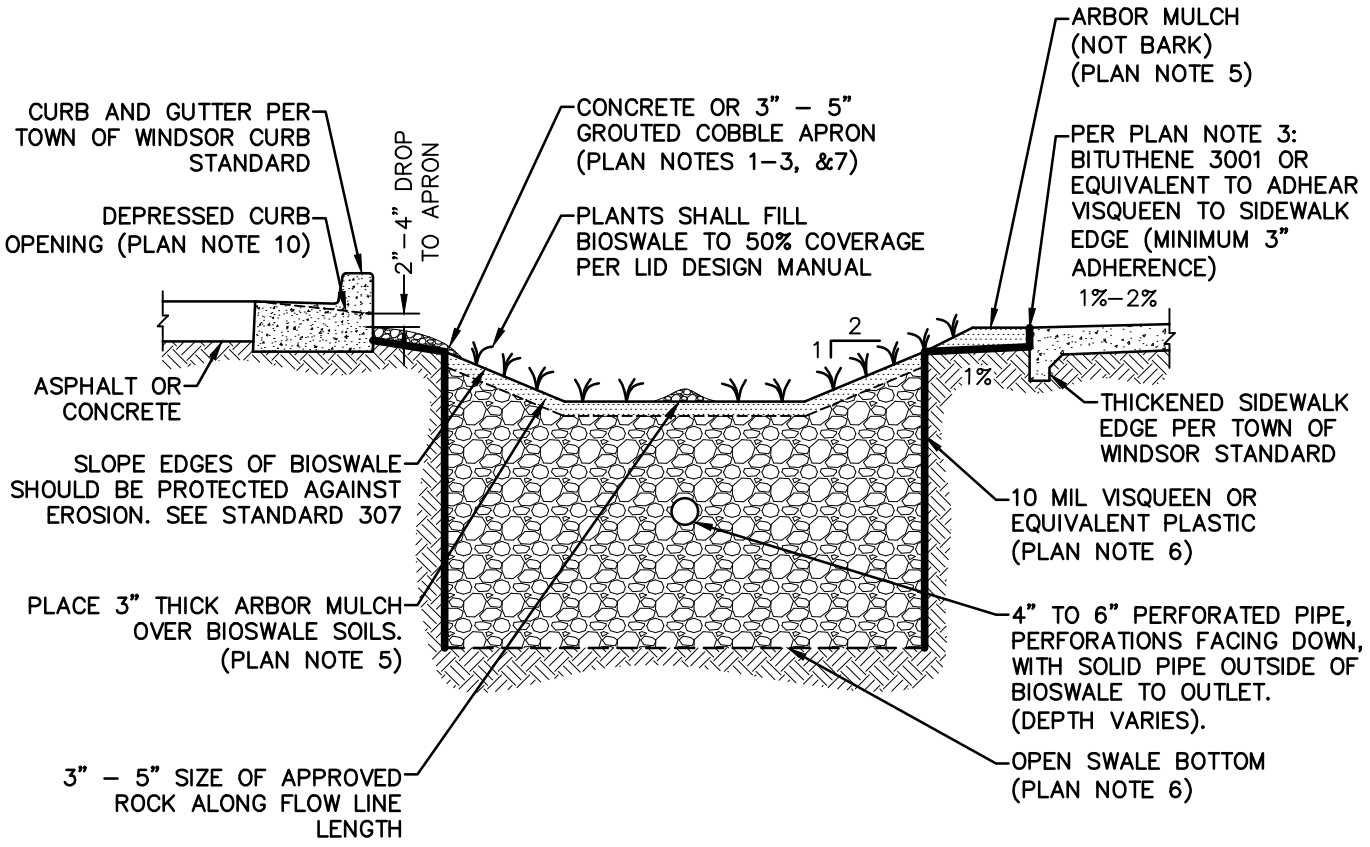
JULY 2011 – NTS

STD. PLAN NO. 305

PAGE 2 OF 2

(2012 STD. NO. 305)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\300 StormDrain.dwg Layout Name: 305-2 Plot Date: May 29, 2020 at 02:59 pm



BIORETENTION AT CURB AND SIDEWALK – SECTION VIEW

Xrefs: Images: JEJ2-removebg-preview.png,windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 300 Series Update\CAD Files\Part III - STD Plan 306.dwg Layout Name: 306A Plot Date: Jul

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

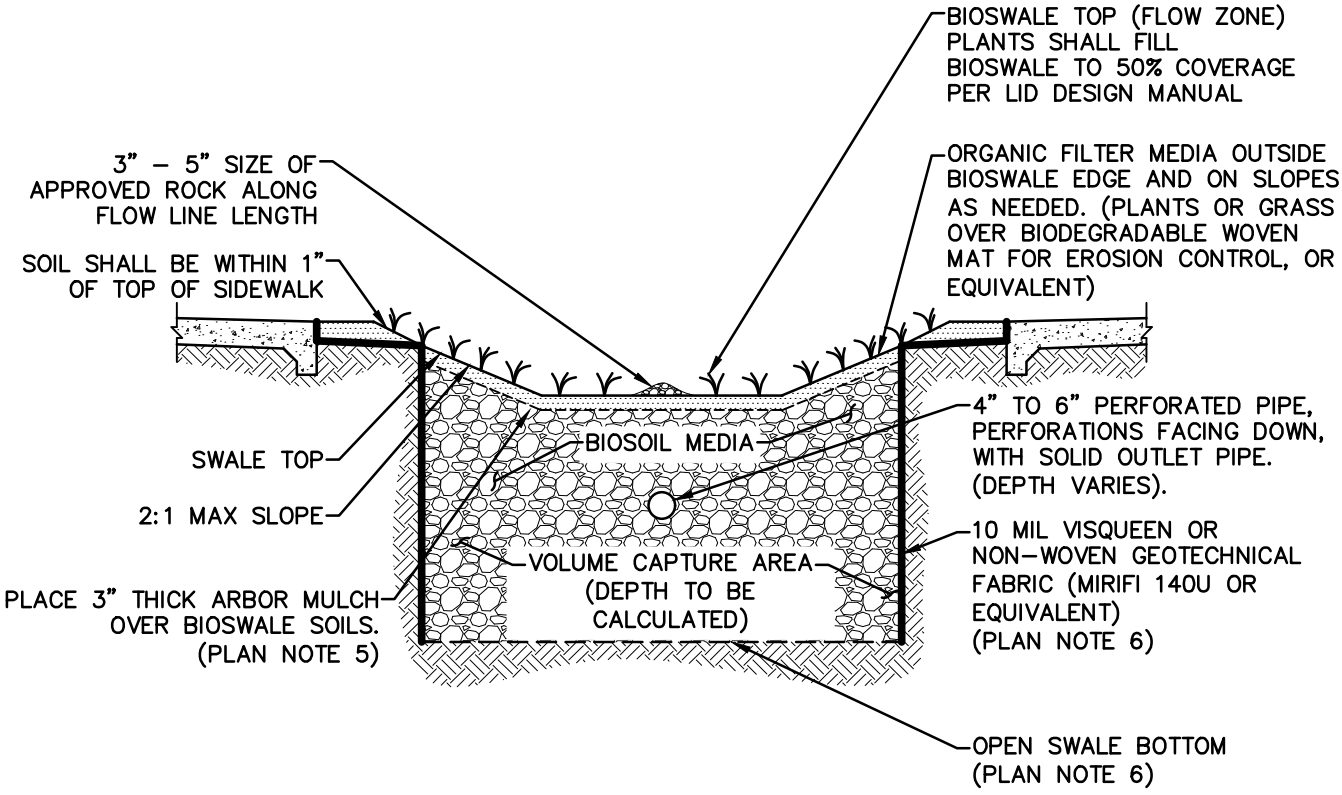
ROADWAY BIOSWALE AT CURB AND SIDEWALK

STD. PLAN NO. 306A

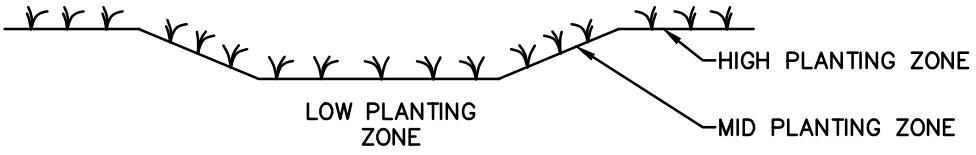
SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2022 STD. NO. 306)



BIORETENTION PLANTING DETAILS – SECTION VIEW



PLANTING ZONES

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PARKING LOT BIOSWALE AT CURB AND SIDEWALK

STD. PLAN NO. 306B

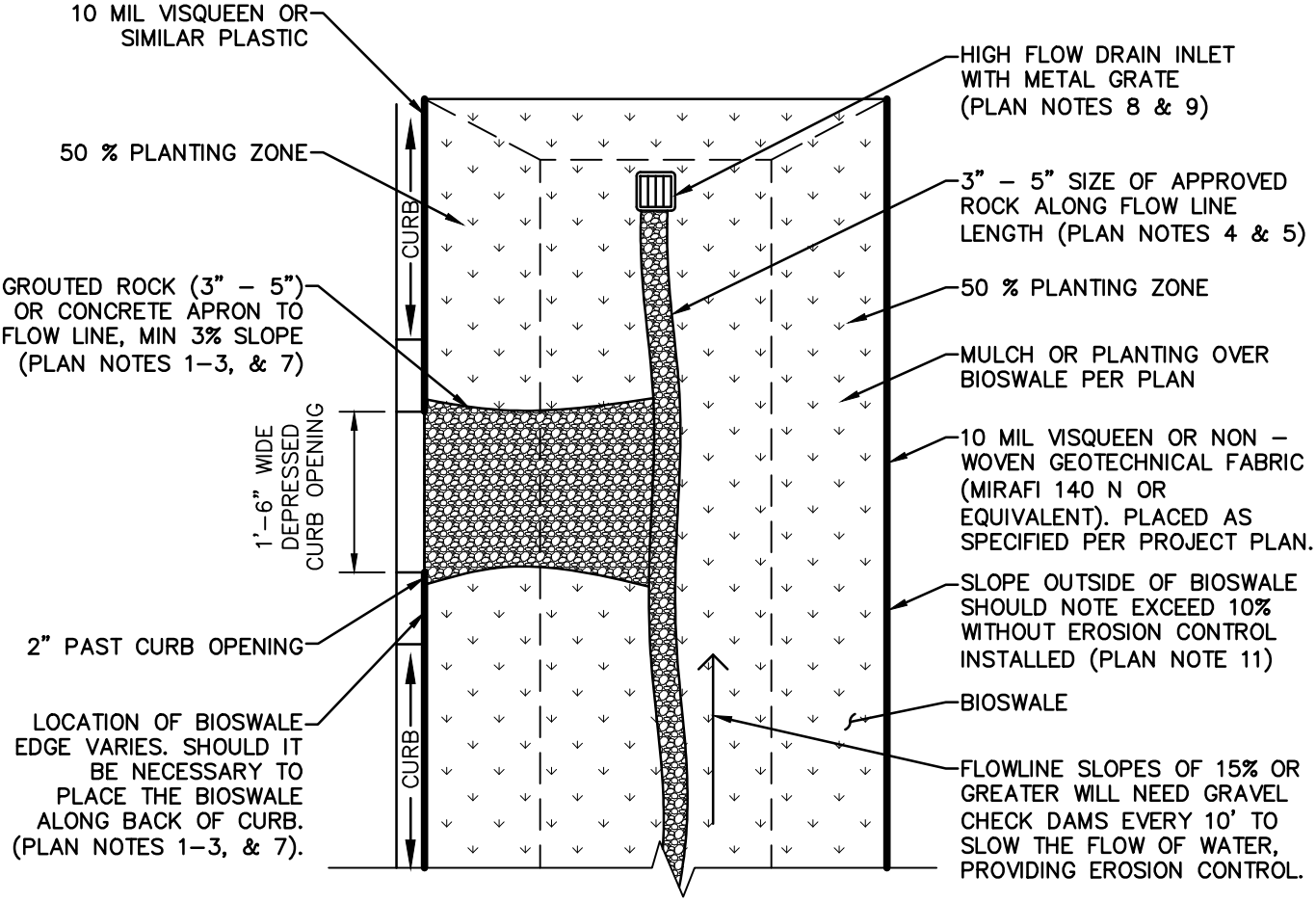
PAGE 2 OF 5

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

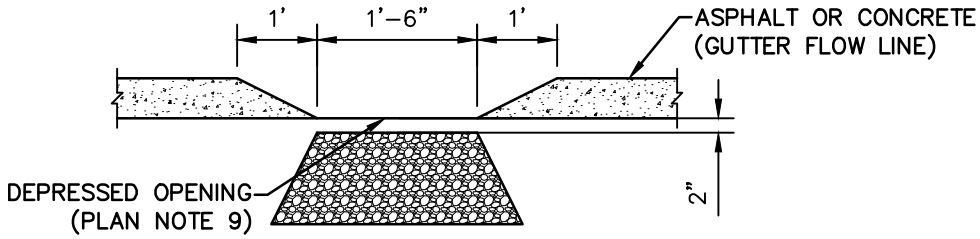
MAR 2023 – NTS

(2022 STD. NO. 306)

Xrefs: Images: JEJ2-removebg-preview.png,windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 300 Series Update\CAD Files\Part III - STD Plan 306.dwg Layout Name: 306B Plot Date: Jul



BIOSWALE DEPRESSED CURB – PLAN VIEW



DEPRESSED CURB DETAIL (TO APRON) – SECTION VIEW

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

GUTTER BIOSWALE AT CURB AND SIDEWALK

STD. PLAN NO. 306C

PAGE 3 OF 5

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2022 STD. NO. 306)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 300 Series Update\CAD Files\Part III - STD Plan 306.dwg Layout Name: 306C Plot Date: Jul

GENERAL NOTES:

A. ALL DETAILS AND STANDARDS SHALL BE AT A MINIMUM IN CONFORMANCE WITH CURRENT COUNTY OF SONOMA/TOWN OF WINDSOR "STORM WATER LID TECHNICAL DESIGN MANUAL".

B. DETAILS AS SHOWN HERIN MAY BE ADJUSTED IN THE FIELD WITH TOWN OF WINDSOR REPRESENTATIVE APPROVAL.

C. ALL WORK MUST BE IN CONFORMANCE WITH CURRENT TOWN OF WINDSOR STANDARDS, AND BE INSPECTED BY PUBLIC WORKS – DURING CONSTRUCTION AND UPON COMPLETION.

PLAN NOTES:

1. AT ANY CURB OPENING WHERE THE VISQUEEN TOUCHES THE BACK OF CURB (AND A CONCRETE OR GROUTED ROCK APRON CANNOT BE USED),THE VISQUEEN SHALL BE ATTACHED IN THE FOLLOWING MANNER: 1" – 2" BELOW TOP OF SIDEWALK OR BACK OF DEPRESSED CURB (MINIMUM 2' EACH SIDE OF DEPRESSED CURB). ADHERENCE SHALL BE BY BITUTHENE 3000 (OR EQUIVALENT). PRIOR TO PLACING THE BITUTHENE, THE EXPOSED CONCRETE SURFACE SHALL BE WIRE–BRUSHED AND BLOWN DUST FREE, AND PRIMED WITH BITUTHENE B2LVC AS NECESSARY. THE VISQUEEN SHALL BE CLEAN AND DRY.

2. 3" – 5" SIZE ROCK FROM TOP OF EDGE OF BIOSWALE TO BIOSWALE TOP FLOW LINE, EXCEPT AT DEPRESSED CURB OPENINGS (THEN NOTE 3). IF SWALE SURFACE IS 100% PLANTED, ROCK CAN BE OMITTED.

3. A) SHALL BE MIN 3" THICK CONCRETE APRON. (APRON SHALL EXTEND BEYOND THE 10 MIL VISQUEEN A MINIMUM OF 2").
   – OR –
   B) APRON SHALL BE COMPRISED OF 3" – 5" ROUNDED COBBLE SET INTO MIN OF 2" THICK NON–SHRINK GROUT. THE COBBLE SHALL BE FIRMLY EMBEDDED, LEAVING ONLY THE UPPER PORTION EXPOSED. (APRON SHALL EXTEND BEYOND THE 10 MIL VISQUEEN A MINIMUM OF 2").

4. PLANTING ZONE GROUND COVER/GRASS LIKE PLANTS FOR EROSION CONTROL. OTHER PLANTINGS MAY BE ALLOWED, AS LONG AS ZONE IS 50% OR MORE PLANTED (COIR MAT AS NECESSARY). ALL SWALES MUST BE PLANTED AND IRRIGATED.

5. MULCH MUST BE COMPOSTED TREE MULCH OR EQUIVALENT, AND SHALL BE PLACED OVER COIR MAT (OR SIMILAR) FOR EROSION CONTROL. NO FLOATING BARK.

6. BOTTOM OF BIOSWALE MAY BE OPEN TO ALLOW FOR INFILTRATION, OR FULLY ENCASED BY VISQUEEN. TO BE DETERMINED BY GEOTECHNICAL REPORT AND DESIGN ENGINEER. OPEN TO NATIVE SOIL UNLESS REQUIRED FOR PRIORITY 3 OR HIGHER.

7. THE APRON (2,500 PSI CONCRETE OR APPROVED NON–SHRINK GROUT) MUST EXTEND BEYOND THE 10 MIL VISQUEEN A MINIMUM OF 2". SLOPE NO STEEPER THAN 10:1. ROCK SHOULD BE 70–90% FIRMLY EMBEDDED INTO THE GROUT, LEAVING ONLY THE UPPER PORTION OF THE ROCK EXPOSED.

8. HIGH FLOW DRAIN INLETS SHALL NOT BE PLACED IN FRONT OF DEPRESSED CURB OPENINGS. OFFSET HIGH FLOW DRAIN INLETS A MINIMUM OF 2', AND ALL INLET OPENINGS SHALL BE A MINIMUM OF 3" ABOVE THE SWALE FLOW LINE. DRAIN COVERS SHALL BE AS RECOMMENDED BY THE DESIGN ENGINEER, AND SHALL MEET CURRENT COUNTY OF SONOMA AND TOWN OF WINDSOR LID TECHNICAL MANUAL REQUIREMENTS.

9. ALL SIDE INLETS SHALL BE PARTIALLY COVERED WITH A TRASH SCREEN TO CAPTURE TRASH, AND MAINTAIN AN OPENING OF AT LEAST 3". TRASH SCREENS SHALL BE NON–CORROSIVE METAL, NOT PLASTIC, AND HAVE 5 MM SCREEN OPENINGS.

10. CURB OPENINGS SHALL BE 18" WIDE AND FLUSH WITH THE GUTTER PAN, UNLESS OTHERWISE APPROVED. CURB OPENINGS SHALL BE SPACED AT INTERVALS NO WIDER THAN 100' AND NO CLOSER THAN 25', UNLESS OTHERWISE APPROVED.

11. PROTECT SLOPES OUTSIDE OF SWALE WITH EROSION CONTROL MEASURES UNTIL AREA IS FULLY LANDSCAPED. SLOPE SHOULD NOT EXCEED 10% UNLESS ALLOWED BY TOWN. BARK CAN NOT BE USED IN BIOSWALE. COMPOSTED MULCH, COIR, ROCK, OR PLANTS CAN BE USED.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

BIOSWALE AT CURB AND SIDEWALK NOTES

STD. PLAN NO. 306D

PAGE 4 OF 5

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2022 STD. NO. 306)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 300 Series Update\CAD Files\Part III - STD Plan 306.dwg Layout Name: 306D Plot Date: Jul

TOWN OF WINDSOR SIMPLE BIORETENTION/BIOSWALE FIELD INFILTRATION TEST

LID SIGN OFF

ONCE BIOSWALE/BIORETENTION STRUCTURAL SOILS ARE INSTALLED THE INSPECTOR WILL DETERMINE IF INFILTRATION TEST(S) ARE REQUIRED. THE TOWN WILL REQUIRE 1–3 TESTS PER PROJECT AS REPRESENTATION OF THE ENTIRE PROJECT BUT HAS THE OPTION TO TEST EVERY FEATURE IF THERE ARE VARIOUS TYPES OF FEATURES OR SOILS WITHIN THE PROJECT. WORK WITH YOUR INSPECTOR TO DETERMINE NUMBER OF TESTS PRIOR TO THE TESTS, SO INSPECTION CAN RUN EFFICIENTLY.

ONCE LID FEATURE IS FULLY INSTALLED: EXCAVATED, PIPED, BACKFILLED WITH PERMEABLE SOILS, PLANTED, IRRIGATED, ROCKED/MULCHED AND READY FOR SIGN OFF, THE TOWN PUBLIC WORKS INSPECTOR WILL REQUIRE INSPECT TO ENSURE FLOW LINE ELEVATIONS ARE CORRECT, 50% PLANTING IS COMPLETE, PLANTS ARE HEALTHY, SOIL EROSION PROTECTION IS INSTALLED, CURB CUT APRONS ARE PROPERLY CONSTRUCTED AND STABLE, AND ALL FEATURES ARE FREE OF WEEDS, SEDIMENT, AND DEBRIS.

EQUIPMENT

1. MEASURING ROD, LATHE, SOIL PROBE, OR RULER WITH READINGS IN MM OR INCHES.
2. LARGE WATER TANK OR NEARBY WATER SUPPLY (AMOUNT OF WATER SHOULD BE ESTIMATED BY THE NUMBER OF TESTS AND THE VOLUME NEEDED TO FILL THE TEST LID FEATURES TO 5–INCHES ABOVE THE FINISHED SOIL LEVEL).
3. STOP–WATCH
4. FIELD SHEET/CLIPBOARD

FIELD INFILTRATION TEST

1. ENSURE TOWN INSPECTOR IS ONSITE FOR TEST.
2. CAP ANY OVERFLOW DEVICE AND OTHER EXIT ROUTES, SO WATER CANNOT ENTER THE OVERFLOW DEVICE OR ANY OTHER EXIT FROM THE FEATURE, IF APPLICABLE.
3. ALLOW THE INSPECTOR TO PLACE A WATER LEVEL MEASURING DEVISE IN LID FEATURE.
4. ADD 100 GALLONS (OR AS APPROPRIATE FOR SIZE OF FEATURE AND SEASON) TO LID FEATURE AND LET SIT FOR 10 MINUTES TO SATURATE SOILS AROUND FEATURE. THIS WATER SHOULD FULLY INFILTRATE, IF NOT, STOP TEST AND DETERMINE WHAT MIGHT BE PLUGGED AND REPAIR.
5. FOR THE TEST, FILL FEATURE TO THE OVERFLOW INLET ELEVATION OR 3–INCHES ABOVE THE SOIL LEVEL.
6. INSPECTOR WILL MEASURE THE HEIGHT OF THE WATER COLUMN ABOVE THE SOIL DEPTH AT TIME 0.
7. INSPECTOR WILL IMMEDIATELY BEGIN TIMER AND MEASURE WATER DEPTH AFTER 5 INCHES OF INFILTRATION OR 1 HOUR.
8. INSPECTOR WILL MEASURE IN SEVERAL LOCATIONS, OR AS INSPECTIOR DEEMS NECESSARY TO ENSURE REPRESENTATION AND WILL CONTINUE TO MONITOR UNTIL WATER HAS INFILTRATED BELOW THE SOIL SURFACE.
9. INSPECTOR WILL INDICATE A PASS OR FAIL AFTER DETERMINING IF THE FLOW RATE IS AT LEAST 5–INCHES PER HOUR.
10. REMOVE CAP FROM OVERFLOW DEVICE.
11. ADD ENOUGH WATER TO OVERFLOW DEVICE TO ALLOW INSPECTOR TO VERIFY PIPING IS CONNECTED TO THE STORM DRAIN SYSTEM PROPERLY, TRASH OR DEBRIS HAVE BEEN CLEARED FROM PIPING AND THAT FLOWS FREELY EXITS ANY OVERFLOW PIPING AS DESIGNED.
12. INSPECTOR WILL RECORD DATA AND IF PASSED, WILL SIGN OFF ON THE BUILDING DEPT. RECORD.
13. END OF TEST



EXAMPLES OF ROUNDED ROCK. COLOR SHOULD CONTRAST WITH THE GROUT, UNLESS OTHERWISE APPROVED.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

BIOSWALE AT CURB AND SIDEWALK NOTES

STD. PLAN NO. 306E

PAGE 5 OF 5

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

MAR 2023 – NTS

(2022 STD. NO. 306)

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PART III – STANDARD DRAWINGS

SERIES 400 – SEWER SYSTEM CONSTRUCTION STANDARD DRAWINGS

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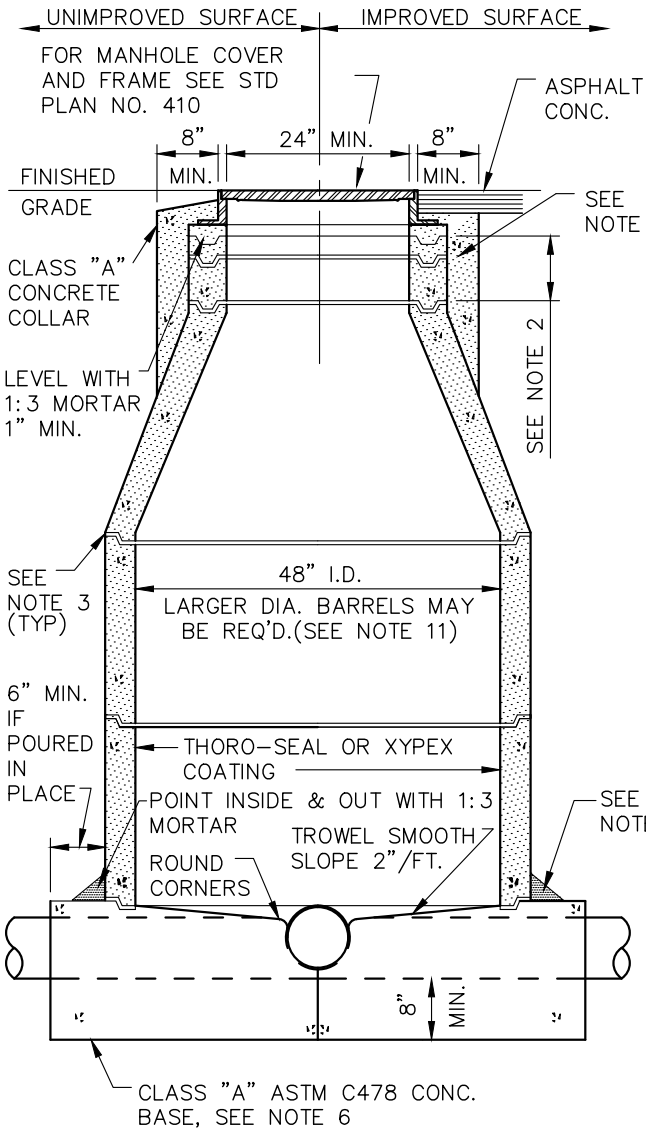
STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
401	Standard 48" Diameter Precast Concrete Manhole Sanitary Sewer	11/93	11/94
402	Standard 60" Diameter Precast Concrete Manhole Sanitary Sewer	11/93	11/94
403	Inside Drop in Sanitary Sewer Manhole	11/93	11/93
404	Permanent Mainline Cleanout	11/93	11/93
405	Temporary Mainline Cleanout	11/93	11/93
406	Temporary Mainline Cleanout	11/93	11/93
407	Abandoned Pipe Plug Detail	11/93	11/93
408	Abandoned Manhole Detail	11/93	11/93
409	Standard Precast Concrete Manhole Reducer Slab Sanitary Sewer	11/93	11/93
410	Standard Manhole Frame and Cover	11/93	11/93
411	Sewer Service Lateral	11/93	07/09
412	Pipe-Pipe Crossing Details	11/93	11/93
413	Pipe-Structure Crossing Detail	11/93	11/94
414	Water, Sewer, Recycled Water & Storm Drain Separation	N/A	04/15
415	Plastic Sewer Pipe Deflection Mandrel	11/93	11/93
416	Precast Grease Interceptor	11/93	11/93

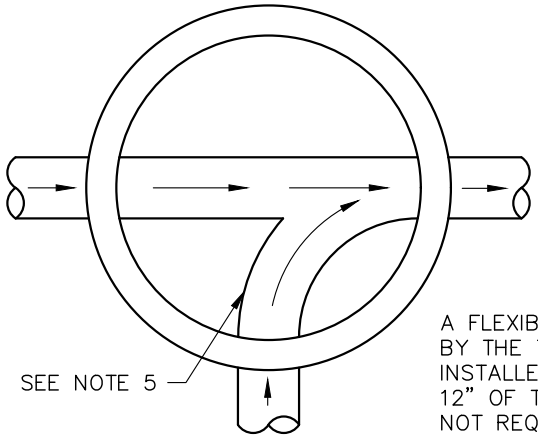
STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
417	Sand and Grease Interceptor	11/93	07/09
418	Sampling Manhole Exterior Use	11/93	11/93
419	Sampling Box Building Interior	11/93	11/93
420	Cleanout Detail at Building	11/93	11/93
421	Typical Service Sewer Connection Detail	11/93	11/93
422	Backwater Check Valve Installation	11/93	11/93
423	Service Sewer Trench Detail	11/93	11/93

SERIES 400 – SEWER SYSTEM CONSTRUCTION STANDARD DRAWINGS

REVISION SUMMARY

Std Number	Title	Revision Description
401	Standard 48” Precast Concrete Manhole Sanitary Sewer	Change in notes regarding base.
402	Standard 60” Dia. Precast Concrete Manhole Sanitary Sewer	Clarified thickness of barrel section
403	Inside Drop in Sanitary Sewer Manhole	Change in detail at base
404	Permanent Mainline Cleanout	Change in detail regarding reinforcing
407	Abandoned Pipe Plug Detail	Deleted
408	Abandoned Manhole Detail	Deleted
409	Standard Precast Concrete Manhole Reducer Slab Sanitary Sewer	Drafting changes to reinforcing
411	Sewer Service Lateral	Changed note on lateral connections to existing mains and specified flexible coupling in detail
412	Pipe Crossing Details	Change in notes
414	Water, Sewer, Recycled Water & Storm Drain Pipeline Separation	Change in note 2
418	Sampling Manhole Exterior Use	Change in notes
419	Sampling Box Building Interior	Change in notes





A FLEXIBLE COUPLING, AS APPROVED BY THE TOWN ENGINEER, SHALL BE INSTALLED IN THE SEWER MAIN WITHIN 12" OF THE BASE OF THE MANHOLE (TYP). NOT REQUIRED WHEN PRECAST BASES ARE MANUF. W/FLEX. CPLGS. ALREADY INSTALLED

MANHOLE BASE

CHANNELIZATION PLAN

NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4 X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
4. CONE SECTION (TAPER) MUST BE CONCENTRIC FOR 48" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY TOWN ENGINEER.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM A DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL TO BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 6" FILLET, 1:3 MORTAR.
8. CLASS "A" CONC. COLLAR SHALL BE 2" BELOW FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE TOWN ENGINEER.
11. 48" I.D. MANHOLE TO BE USED ONLY FOR SEWER MAINS LESS THAN 18" DIAMETER AND LESS THAN 8 FT. DEEP FROM FINISHED GRADE. 60" I.D. MANHOLES PER STD PLAN NO. 402 FOR ALL OTHER APPLICATIONS.
12. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
13. MANHOLE TO BE DEWATERED AND DRY PRIOR TO INSPECTION.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD 48" DIA. PRECAST CONCRETE MANHOLE SANITARY SEWER

STD. PLAN NO. 401

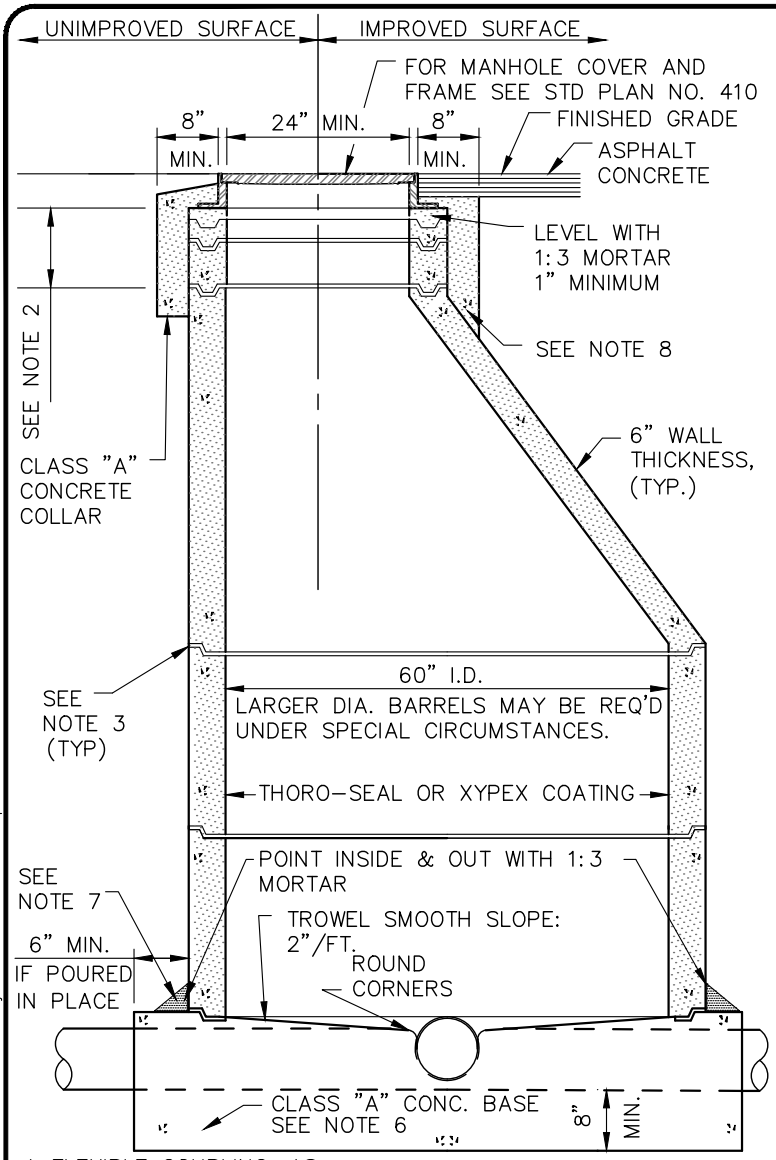
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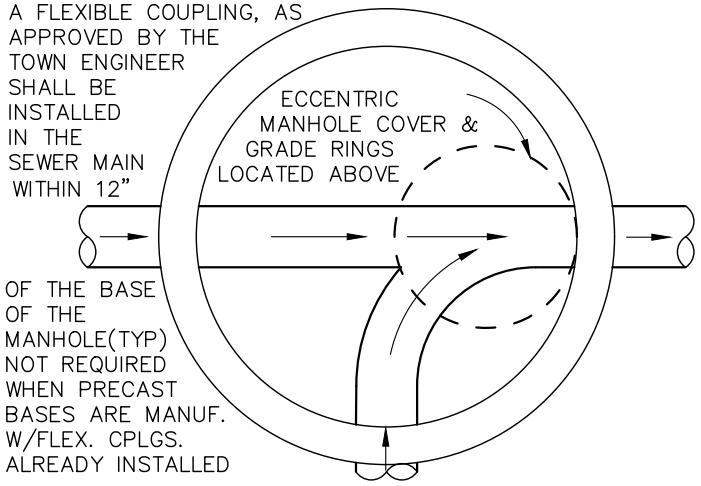
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OCT 2019 – NTS

(2012 STD. NO. 132)

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MANHOLE BASE

CHANNELIZATION PLAN AND LOCATION OF ECCENTRIC MANHOLE COVER

NOTES:

1. WHEN MANHOLES ARE INSTALLED IN UNIMPROVED AREAS, THE TOP OF THE COVER SHALL BE A MIN. OF 1 FOOT ABOVE ADJACENT FINISHED GRADE.
2. MIN. OF ONE 3" AND ONE 6" GRADE ADJUSTMENT RINGS. MAX. HEIGHT OF GRADE ADJUSTMENT RINGS = 20". ALTERNATELY, CONTRACTOR MAY CAST GRADE ADJUSTMENT RINGS IN PLACE.
3. SET ALL BARREL SECTIONS & TAPER SECTIONS IN PLASTIC GASKET, RAM-NEK OR APPROVED ALTERNATE. TYP JOINT 1-1/2" (3/4" X 2-1/2")RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS).
4. CONE SECTION (TAPER) MUST BE ECCENTRIC FOR 60" MANHOLE UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE TOWN ENGINEER.
5. CONSTRUCT ALL FLOW CHANNELS OF PIPE WHEREVER POSSIBLE. AFTER LOWER RING SECTION IS SET, BREAK OUT TOP HALF OF PIPE FLUSH WITH INSIDE FACE OF M.H. WALL AND CONSTRUCT SHELF AND U-SHAPED CHANNEL. MAKE ELEVATION CHANGES GRADUALLY AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
6. POURED-IN-PLACE BASE SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED. PRECAST BASE TO BE FROM DISTRICT APPROVED LIST AND PLACED ON 12" THICK 3/4" DRAIN SUB-BASE INSTALLED AGAINST UNDISTURBED EARTH.
7. JOINT BETWEEN BASE AND BARREL SHALL BE SEALED W/1-1/2" (3/4" X 2-1/2") RAM-NEK SEAL (2 SEALS IN HIGH WATER TABLE AREAS), AND PLASTER 6" FILLET, 1:3 MORTAR.
8. CLASS "A" CONC. COLLAR SHALL BE 2" BELOW FINISHED GRADE.
9. STANDARD MANHOLE BARREL SECTION PER ASTM C478.
10. BARREL AND TAPER SECTIONS MAY BE CAST IN PLACE AS APPROVED BY THE TOWN ENGINEER.
11. 60" I.D. MANHOLE TO BE USED FOR ALL TRUNK AND COLLECTOR SEWERS 18" TO 30" OR WHERE DIMENSION FROM FINISHED GRADE TO THE SEWER FLOW LINE IS GREATER THAN 8'-0", AS INDICATED ON THE DESIGN PLANS.
12. MANHOLES ON TRUNK SEWERS LARGER THAN 30"SHALL BE SIZED BY THE TOWN ENGINEER.
13. ALL SECTIONS OF MANHOLE MUST BE OF IDENTICAL MAKE AND MANUFACTURER.
14. MANHOLE TO BE DEWATERED AND DRY PRIOR TO INSPECTION.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD 60" DIA. PRECAST CONCRETE MANHOLE SANITARY SEWER

STD. PLAN NO. 402

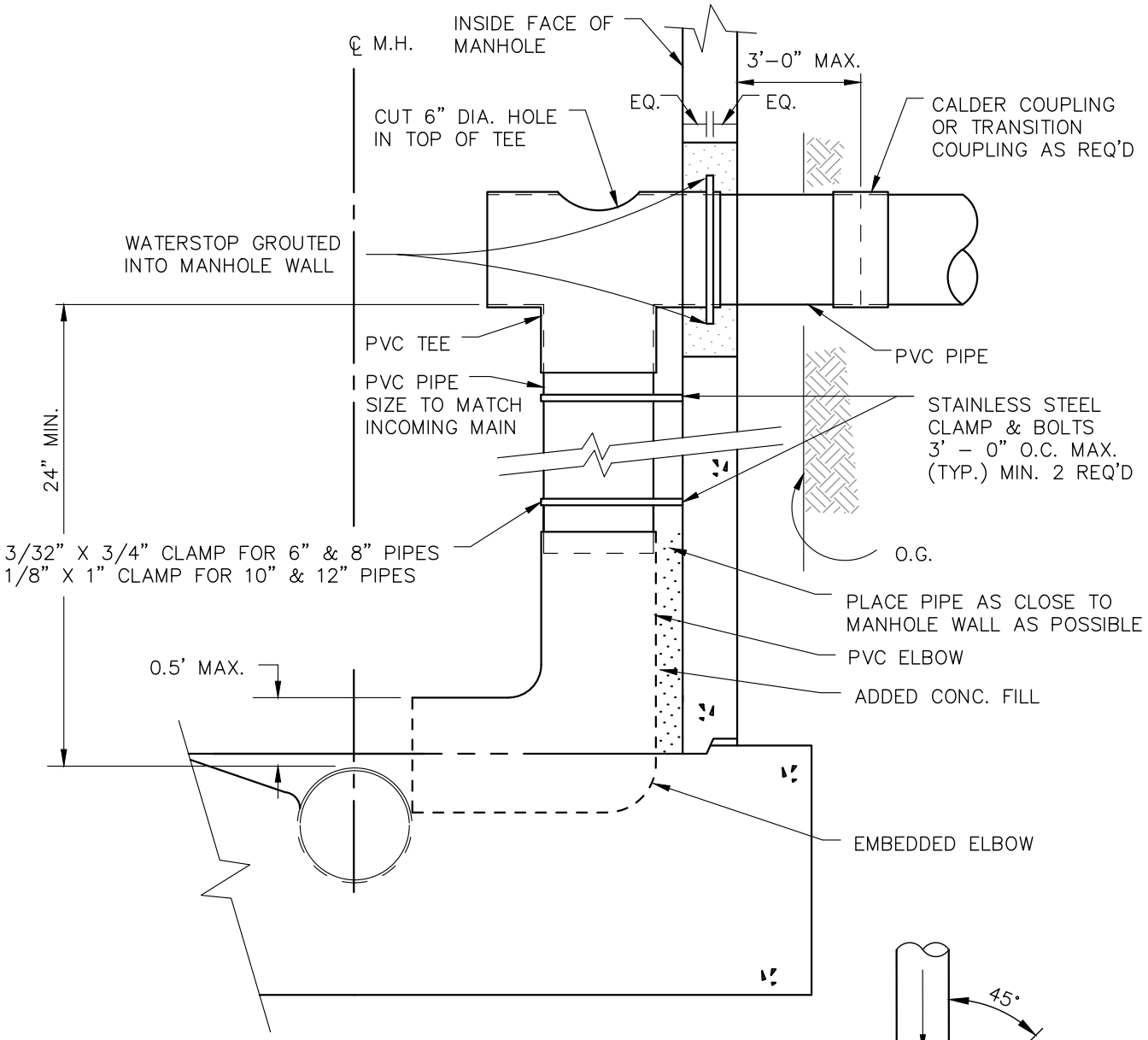
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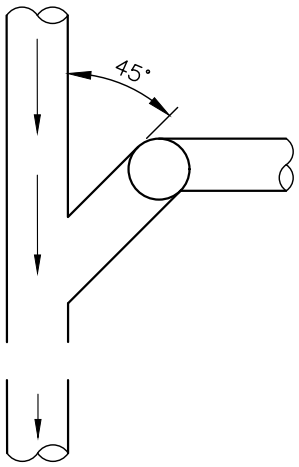
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EMBEDDED ELBOW

ELBOW EMBEDDED AT 45° WITH SEWER FLOW

NOTES:

INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.

NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60 INCHES IN DIAMETER, & INSTALLED IN CONFORMANCE WITH STD PLAN NO. 402.

ENCLOSE ELBOW IN CONCRETE. FORM SMOOTH CHANNEL TO MANHOLE FLOWLINE.

PVC PIPE AND FITTINGS TO BE SDR 35 OR SCH 40.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

INSIDE DROP IN SANITARY SEWER MANHOLE

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OCT 2019 – NTS

STD. PLAN NO. 403

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TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

PERMANENT MAINLINE CLEANOUT

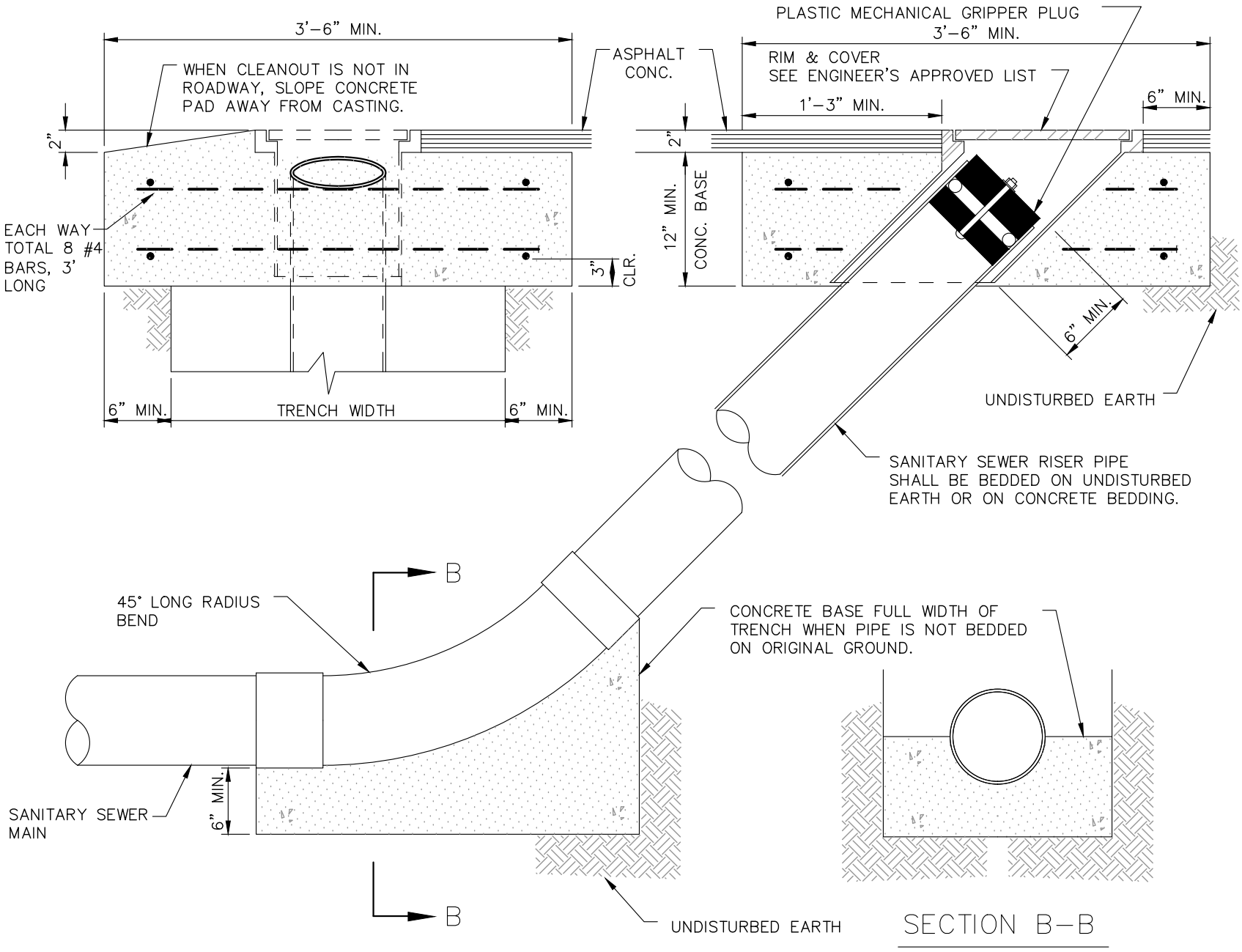
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

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(2012 STD. NO. 135)



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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TEMPORARY MAINLINE CLEANOUT

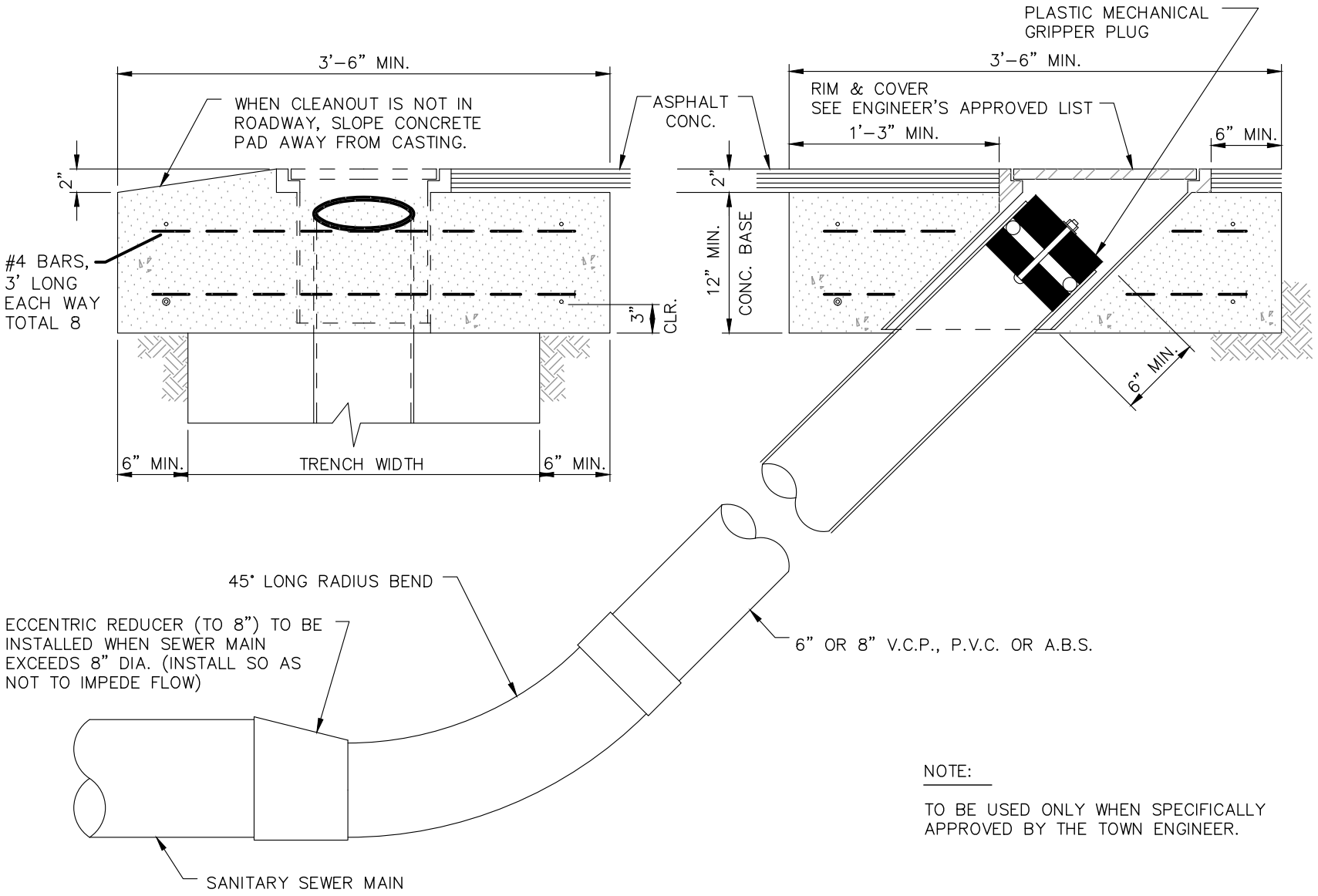
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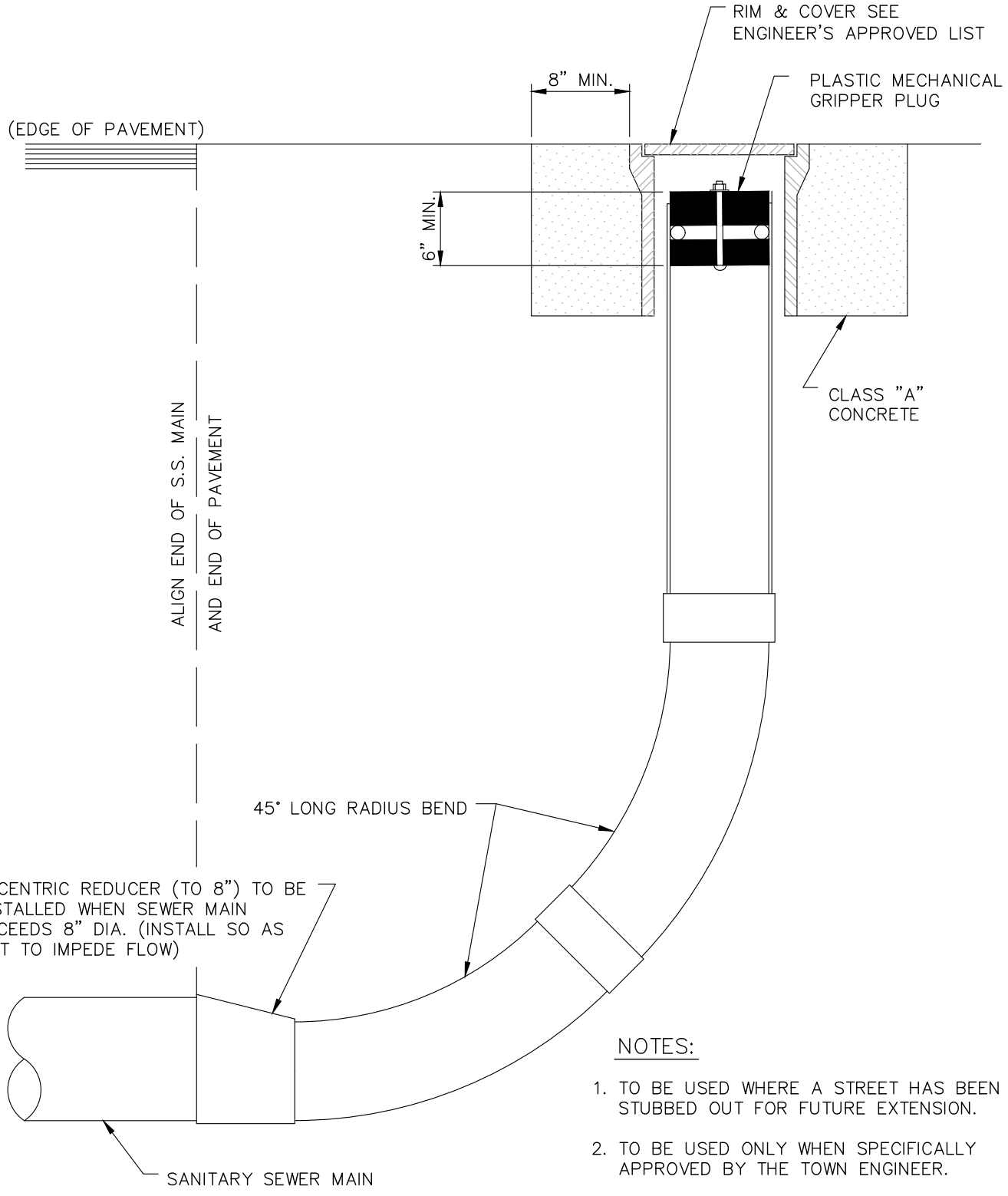
STD. PLAN NO. 405

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NOTE:

TO BE USED ONLY WHEN SPECIFICALLY APPROVED BY THE TOWN ENGINEER.



NOTES:

1. TO BE USED WHERE A STREET HAS BEEN STUBBED OUT FOR FUTURE EXTENSION.
2. TO BE USED ONLY WHEN SPECIFICALLY APPROVED BY THE TOWN ENGINEER.
3. VALVE BOX LID SHALL BE MARKED "SEWER".
4. EASEMENT ACQUISITION MAY BE REQ'D.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TEMPORARY MAINLINE CLEANOUT

STD. PLAN NO. 406

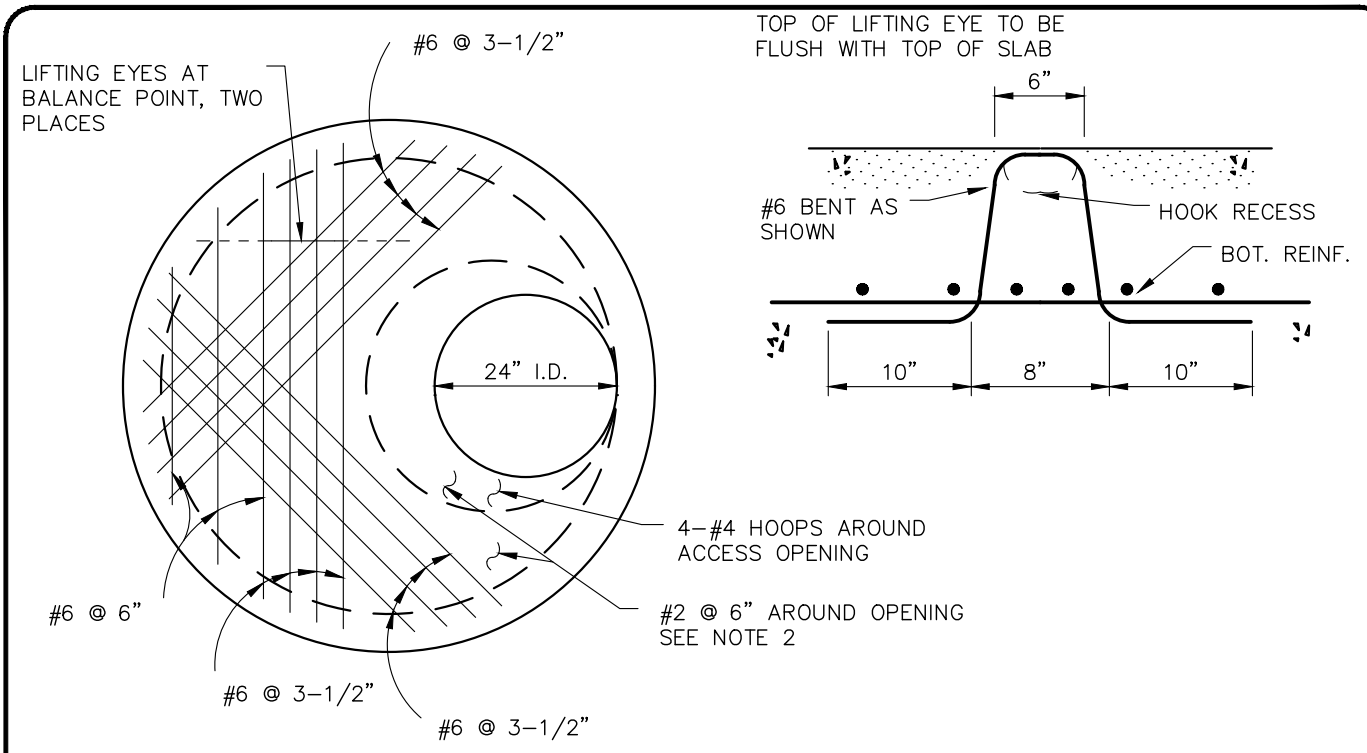
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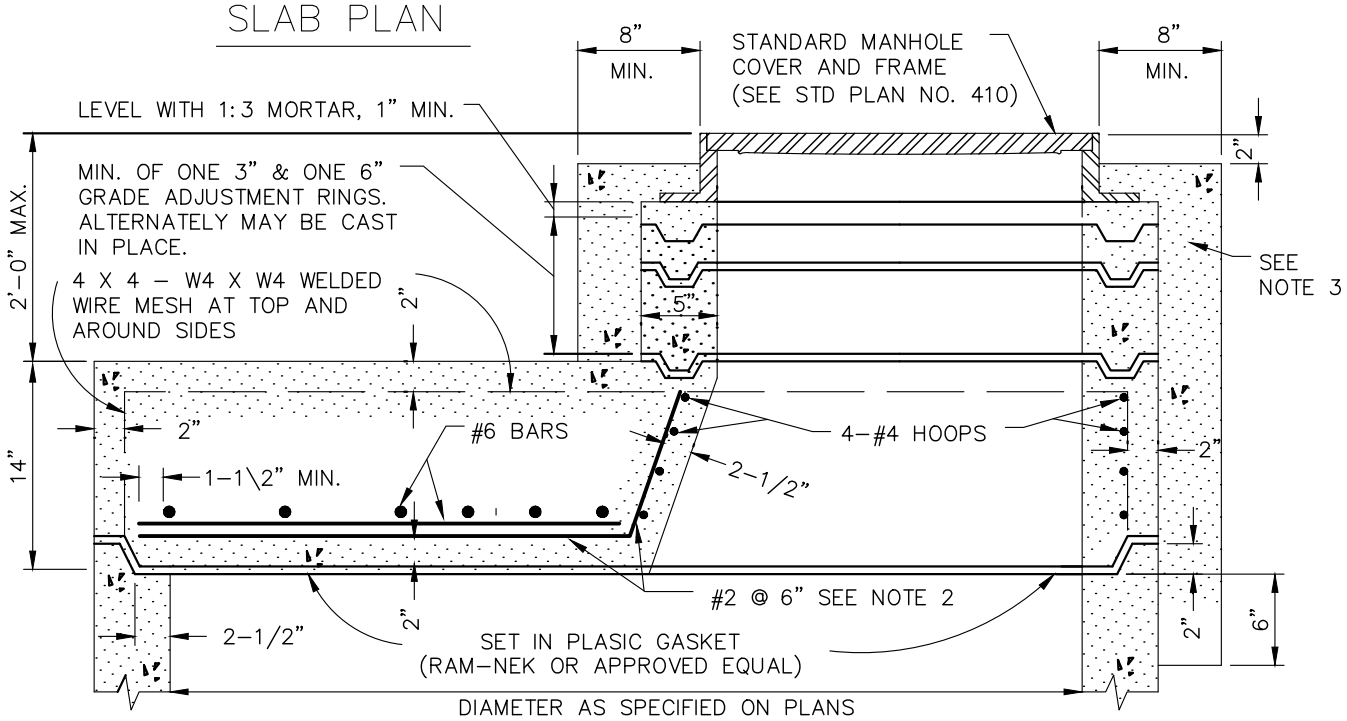
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SLAB PLAN



NOTES:

1. FOR DETAILS AND SPECIFICATIONS OF BASE AND BARREL SECTIONS, SEE STD PLAN NO. 401 OR 402.
2. #2 BARS BENT UP AND SPACED 6" O.C. AROUND 24" OPENING. HORIZONTAL LEGS TO FAN OUT EQUALLY SPACED, TO 2–1/2" CLEAR AT EDGE OF SLAB.
3. CLASS "II" CONC. COLLAR.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD PRECAST CONCRETE MANHOLE REDUCER SLAB SANITARY SEWER

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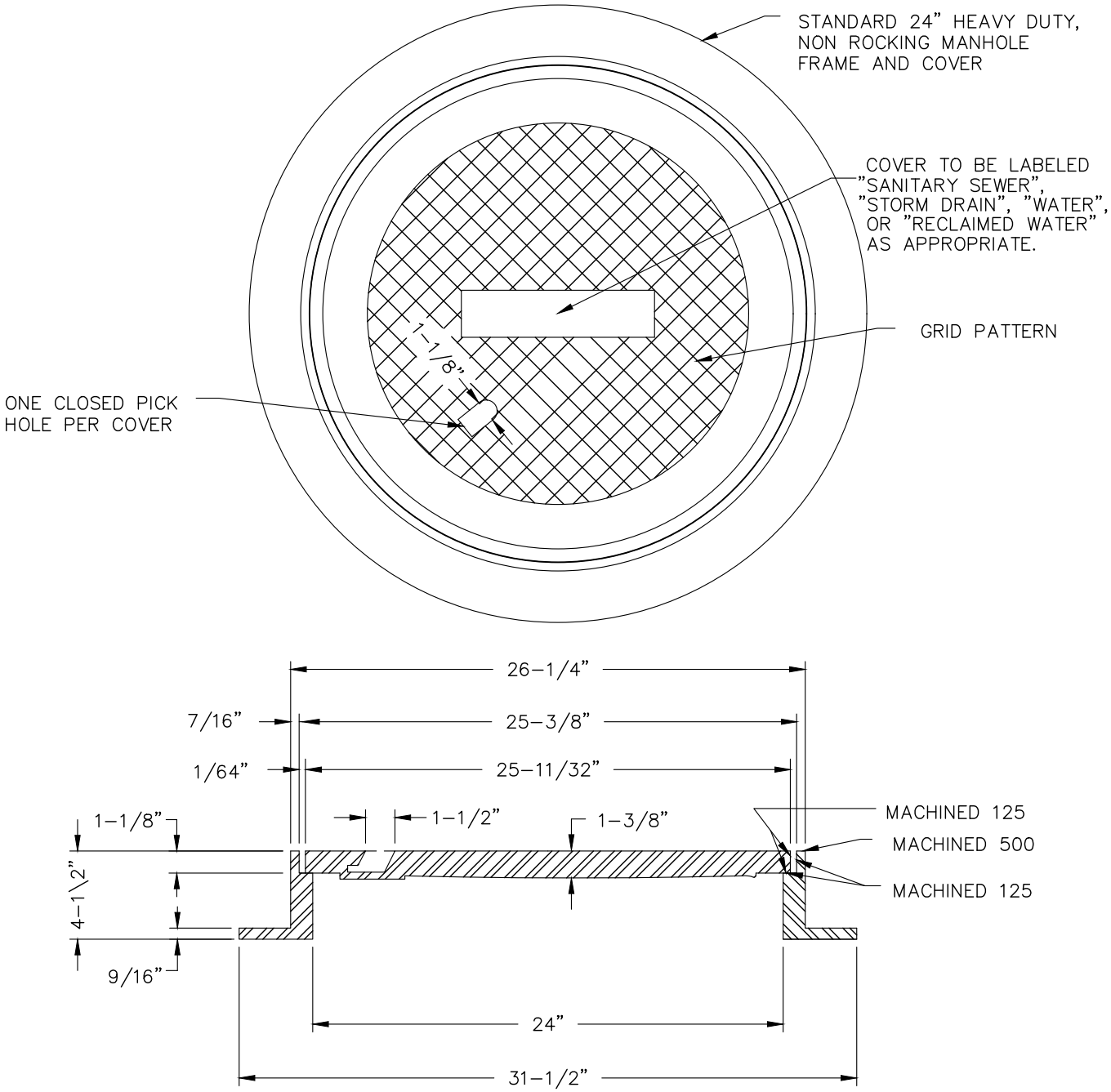
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NOTES:

1. SPECIFY SANITARY SEWER WHEN ORDERING.
   ALL CASTINGS SHALL BE DIPPED IN APPROVED ASPHALT PAINT.

2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000, OR TO UNITED STATES GOVERNMENT SPECIFICATIONS QQI-652B.

3. MINIMUM WEIGHT COMPONENTS: COVER – 130 POUNDS
   FRAME – 135 POUNDS

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD MANHOLE FRAME AND COVER

JOHN JAEGER, PUBLIC WORKS DIRECTOR

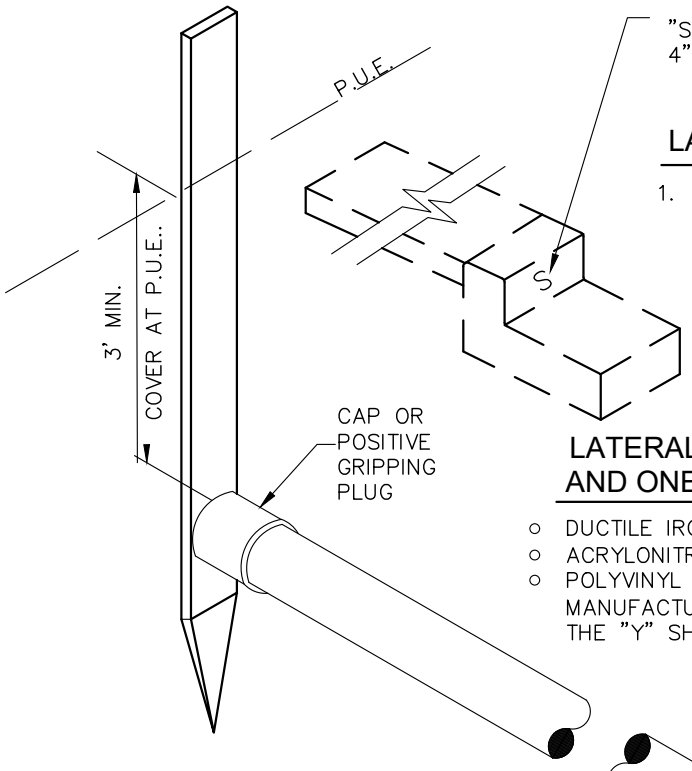
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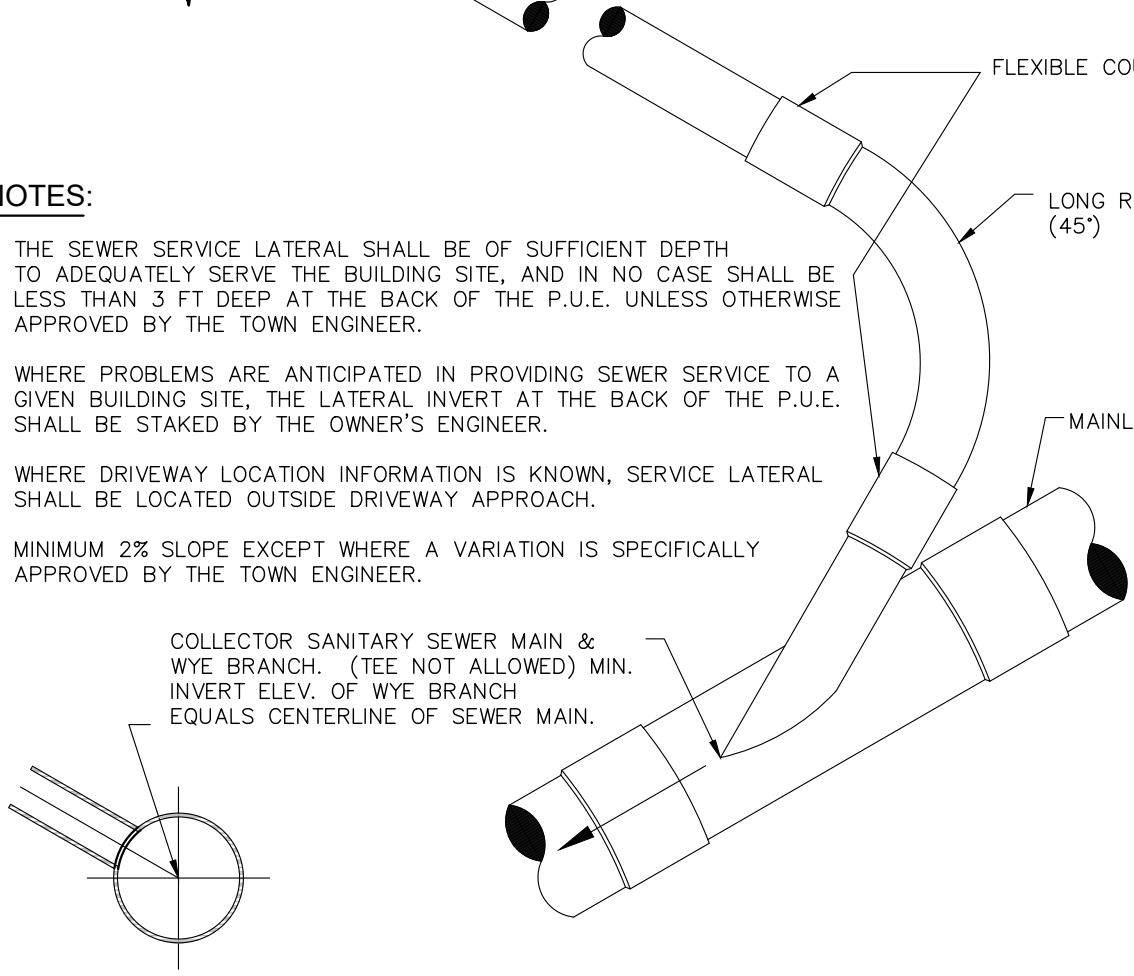


LATERAL CONNECTIONS TO EXISTING MAINS

1. SADDLE WITH RUBBER GASKET AND STAINLESS STEEL STRAPS, GENECO SEALTITE "TYPE U" OR EQUAL.

LATERAL PIPE MATERIAL TO BE 4" MINIMUM AND ONE OF THE FOLLOWING:

- DUCTILE IRON PIPE
- ACRYLONITRILE–BUTADLENE–STYRENE (ABS PIPE, SDR–35)
- POLYVINYL CHLORIDE (PVC) PIPE, SDR 35 WHEN USED WITH A MANUFACTURED "Y" SPECIFICALLY DESIGNED FOR PVC LATERALS. THE "Y" SHALL BE OF THE SAME MATERIAL AS THE SEWER MAIN.



NOTES:

1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL BE LESS THAN 3 FT DEEP AT THE BACK OF THE P.U.E. UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STAKED BY THE OWNER'S ENGINEER.
3. WHERE DRIVEWAY LOCATION INFORMATION IS KNOWN, SERVICE LATERAL SHALL BE LOCATED OUTSIDE DRIVEWAY APPROACH.
4. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE TOWN ENGINEER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SEWER SERVICE LATERAL

STD. PLAN NO. 411

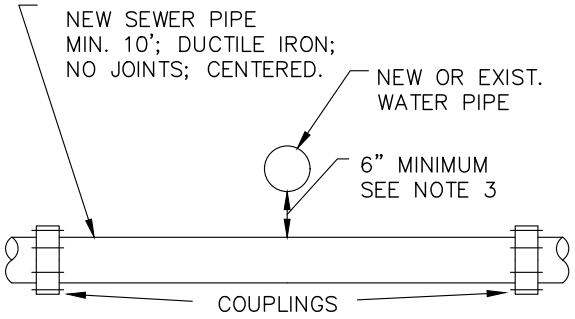
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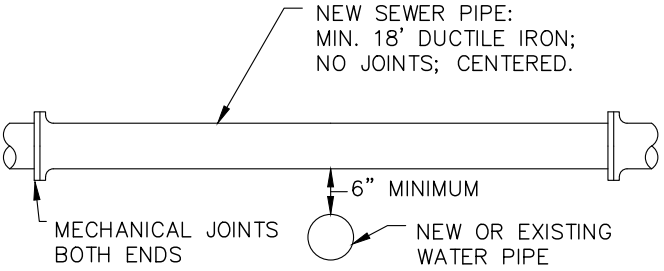
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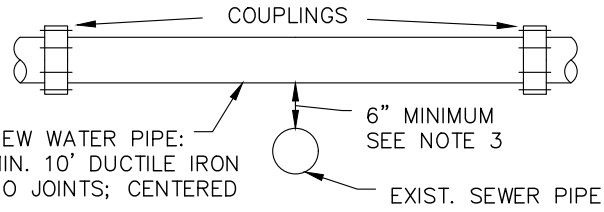
NEW SEWER UNDER NEW OR EXISTING WATER

CASE 1



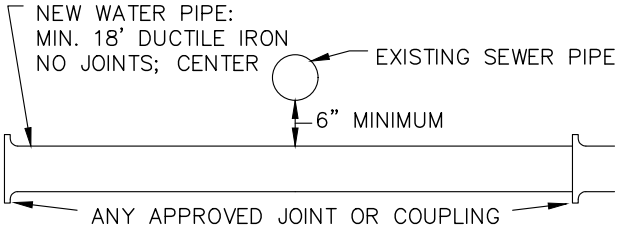
NEW SEWER OVER NEW OR EXISTING WATER

CASE 2



NEW WATER OVER EXISTING SEWER

CASE 3

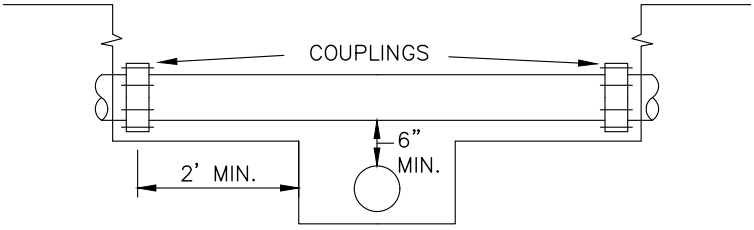


NEW WATER UNDER EXISTING SEWER

CASE 4

NOTES:

1. THIS STANDARD APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS OF LARGER DIAMETER SHALL BE AS APPROVED BY TOWN ENGINEER.
2. ALL NEW DUCTILE IRON SHALL BE WRAPPED IN POLYETHYLENE PER TOWN CONSTRUCTION SPECIFICATIONS.
3. WHERE SEWER CROSSES BELOW A WATER MAIN, WITH 1' OR MORE VERTICAL CLEARANCE, NO SPECIAL INSTALLATION IS REQUIRED.
4. "NEW PIPE UNDER EXISTING–CASE 5" SHALL BE USED WHEN THE EXISTING PIPE HAS A JOINT OVER OR WITHIN 2' OF THE NEW TRENCH.
5. ANY PIPE–PIPE CROSSING WITH LESS THAN 6" VERTICAL CLEARANCE SHALL NOT BE INSTALLED WITHOUT APPROVAL OF TOWN ENGINEER.
6. FOR WATER MAIN LOWERING DETAIL, SEE STD PLAN NO. 522.
7. COUPLINGS TO BE APPROVED BY TOWN ENGINEER.



NEW PIPE UNDER EXISTING

CASE 5 – SEE NOTE 4

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PIPE CROSSING DETAILS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

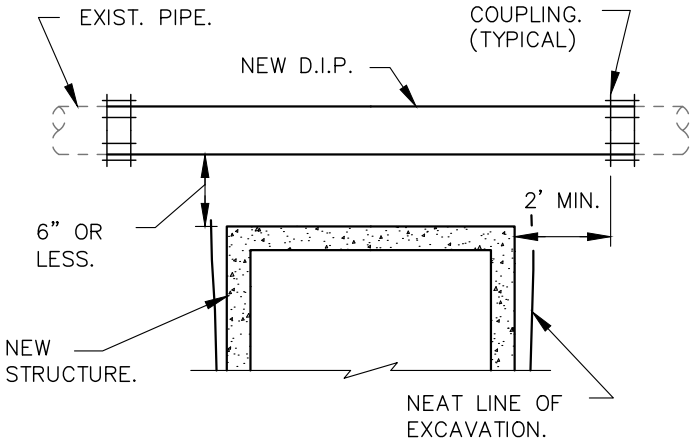
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STD. PLAN NO. 412

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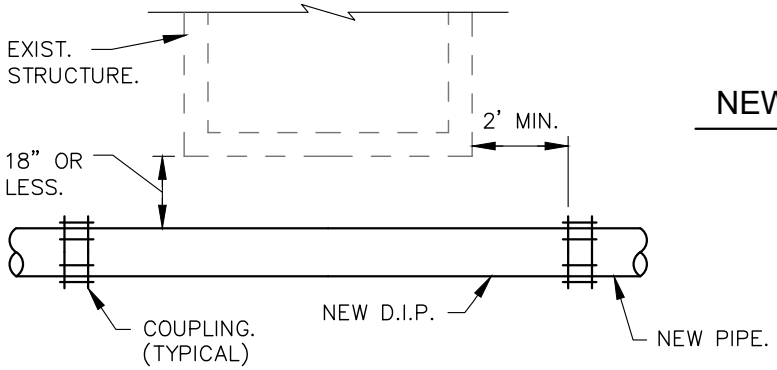
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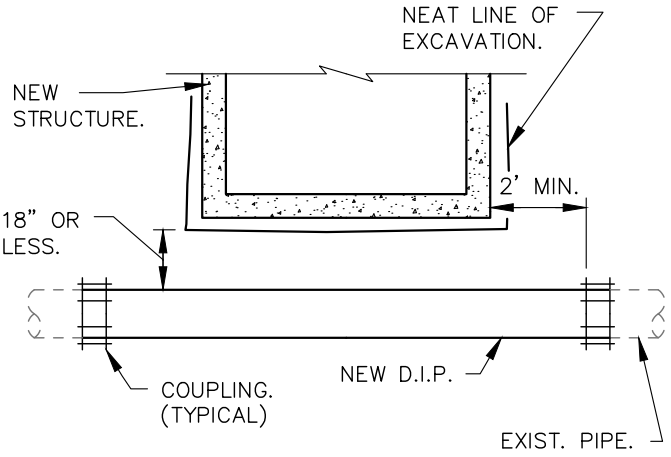
NEW STRUCTURE UNDER EXIST. PIPE

TYPE C



NEW PIPE UNDER EXIST. STRUCTURE

TYPE A



NEW STRUCTURE OVER EXIST. PIPE

TYPE B

NOTES:

1. THIS STD. APPLIES TO PIPES UP TO AND INCLUDING 16" DIAMETER. ALL CROSSINGS INVOLVING PIPES OF LARGER DIAMETER SHALL BE AS APPROVED BY THE TOWN ENGINEER.
2. WHEN PIPES CROSS WITHIN THE DIMENSIONS SHOWN, A NEW DUCTILE IRON PIPE SECTION SHALL BE INSTALLED AS DETAILED.
3. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE FILM IN TUBE FORM.
4. ANY TYPE "A" INSTALLATION REQUIRING MORE THAN ONE LENGTH OF PIPE SHALL BE ENCASED PER STD PLAN NO. 525.
5. SEE TOWN'S APPROVED LIST FOR APPROVED COUPLINGS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PIPE – STRUCTURE CROSSING DETAIL

STD. PLAN NO. 413

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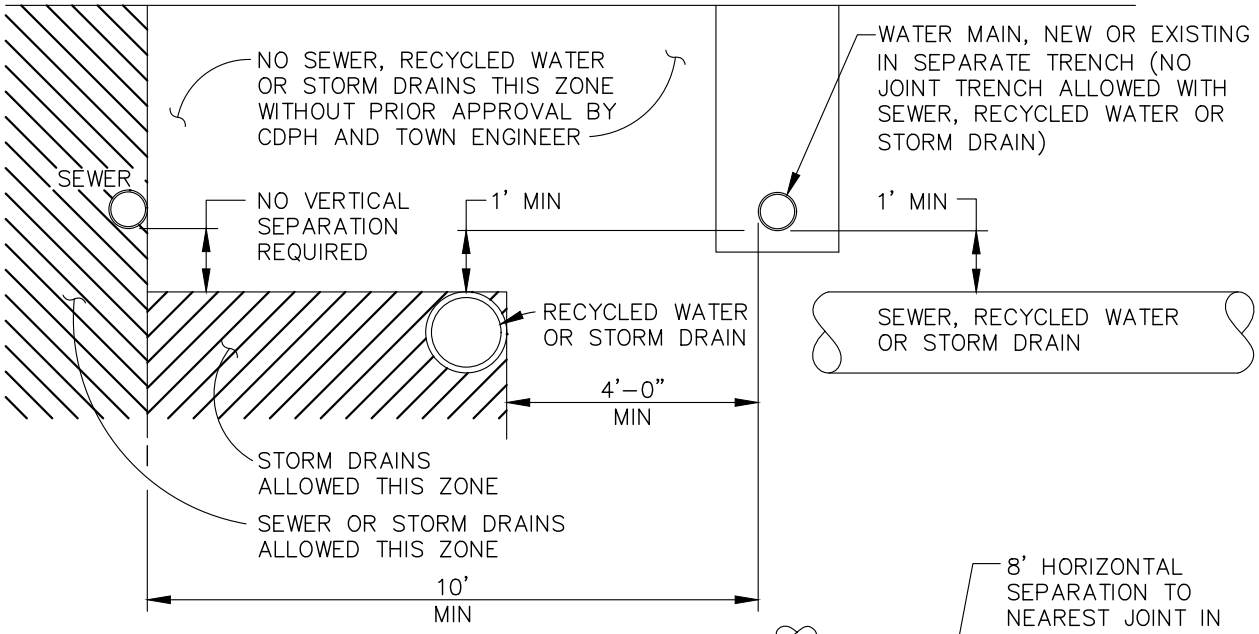
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(2012 STD. NO. 144)

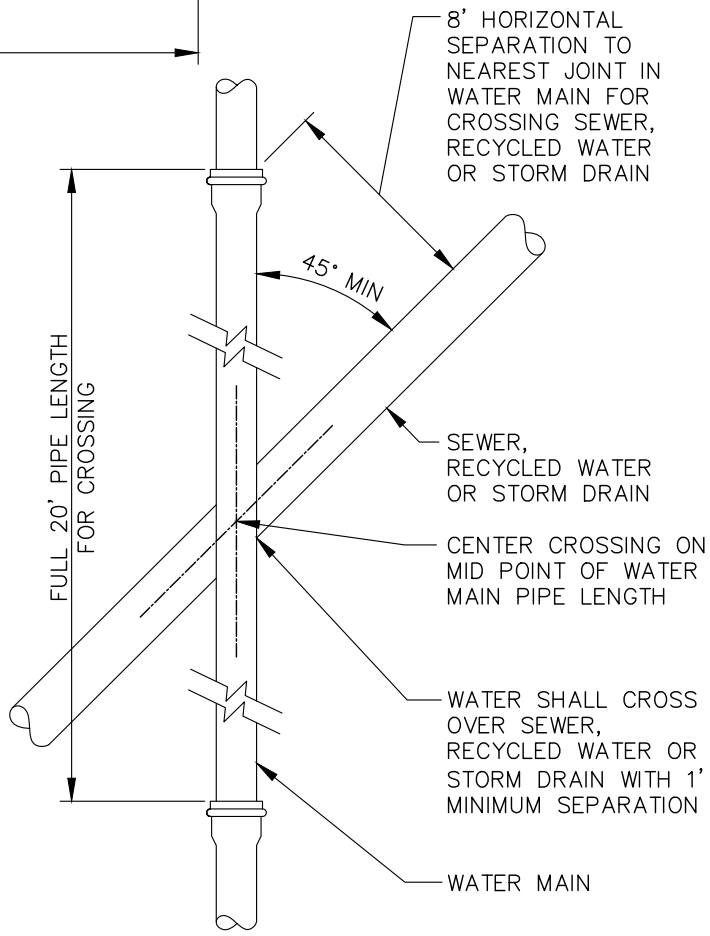
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PARALLEL CONSTRUCTION



SECTION

CROSSINGS



CROSSING PLAN

NOTES:

1. WATER MAIN SEPARATION REQUIREMENTS SHALL BE PER CALIFORNIA WATERWORKS STANDARDS, SECTION 64572.
2. REDUCTIONS OF THESE SEPARATION SPECIFICATIONS MAY BE ALLOWED WITH PRIOR APPROVAL FROM TOWN ENGINEER AND MUST CONFORM TO STATE OF CALIFORNIA WATER RESOURCES CONTROL BOARD, DRINKING WATER REGULATIONS.
3. "RECYCLED WATER" IN THIS DETAIL REFERS TO DISINFECTED TERTIARY RECYCLED WATER.
4. "SEWER" IN THIS DETAIL INCLUDES PIPELINES CONVEYING:
   - UNTREATED SEWAGE
   - PRIMARY AND SECONDARY TREATED SEWAGE
   - DISINFECTED SECONDARY EFFLUENT
   - HAZARDOUS FLUID SUCH AS FUELS, INDUSTRIAL WASTES, AND WASTEWATER SLUDGE

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

WATER, SEWER, RECYCLED WATER & STORM DRAIN PIPELINE SEPARATION

JOHN JAEGER, PUBLIC WORKS DIRECTOR

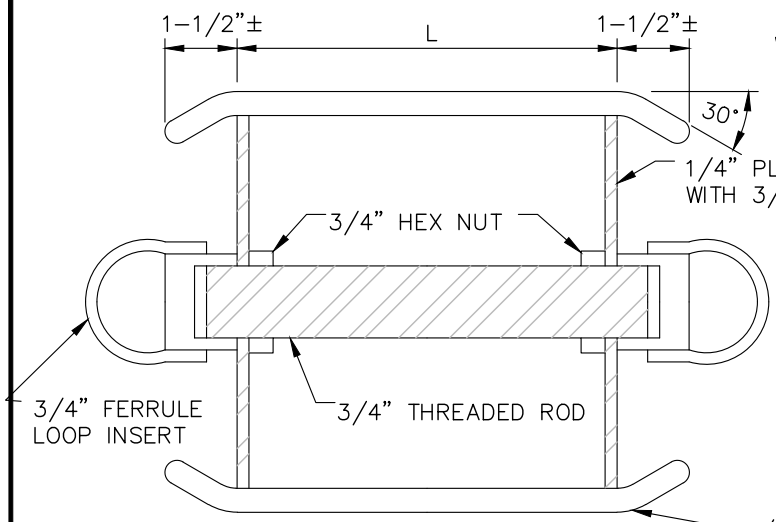
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STD. PLAN NO. 414

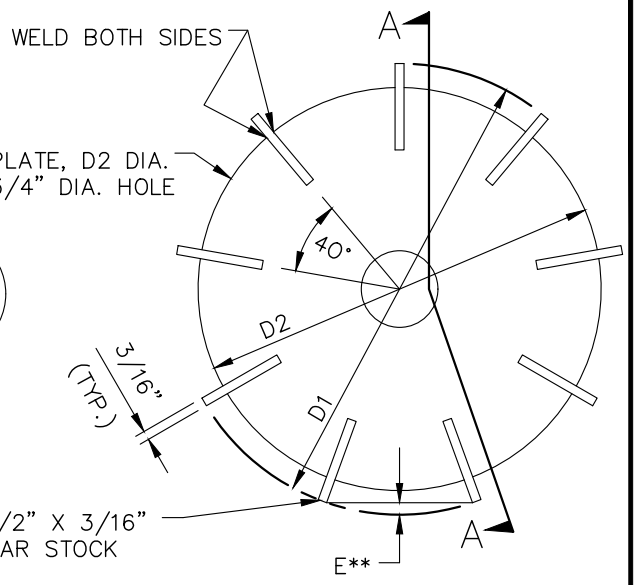
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SECTION A–A



		5% DEFLECTION	
		ABS ASTM D 2751 PVC ASTM D 3034	
		SDR35	
NOM. DIA.	L	D1**	D2***
6"	6"	5.629	4.629
8"	8"	7.537	6.537
10"	10"	9.421	8.421
12"	12"	11.210	10.210
15"	15"	13.729	12.729

** 1. MANDREL DIA. HAS BEEN CALCULATED TO CORRECT CHORD LENGTH ERROR "E".

*** 2. MIN. PLATE DIAMETER

3. A PROVING RING OF THE SPECIFIED DIAMETER (D1) SHALL BE SUPPLIED WITH EACH DEFLECTION MANDREL..

NOTES:

1. MARK ALL MANDRELS WITH ASTM SPECIFICATION NUMBER, SDR NUMBER AND DEFLECTION.

2. THE 1/2" BAR STOCK ON EDGE PROVIDES CLEARANCE TO PASS SMALL AMOUNTS OF SOIL WHICH MAY BE IN PIPE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PLASTIC SEWER PIPE DEFLECTION MANDREL

STD. PLAN NO. 415

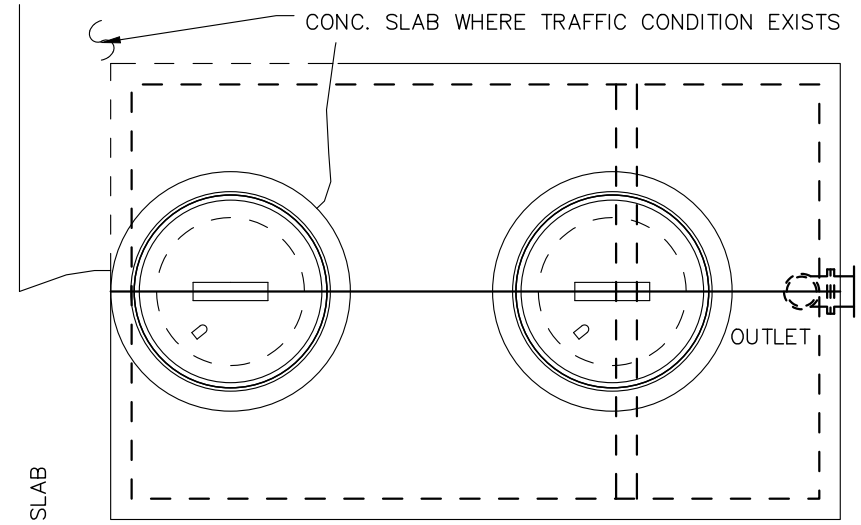
PAGE 1 OF 1

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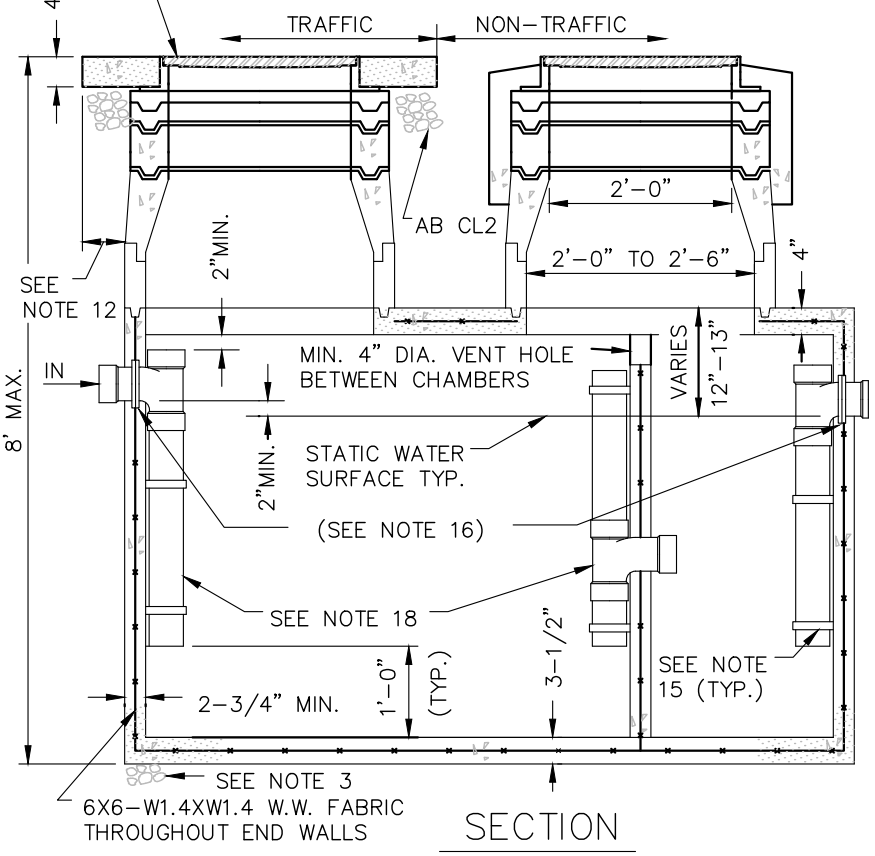
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PLAN



SECTION

NOTES:

1. TANK TO BE PRECAST AS MANUFACTURED BY:
   M.C. NOTTINGHAM
   PACIFIC CONC. PRODUCTS
   SELVAGE CONC. PRODUCTS
   OR TOWN APPROVED EQUAL.
2. POLYETHYLENE TANKS ACCEPTABLE IN NON-TRAFFIC AREAS UPON SPECIFIC APPROVAL OF THE TOWN ENGINEER.
3. 3" MIN. BEDDING MATERIAL PER STD PLAN NO. 501
4. ALL SURFACE WATER MUST DRAIN AWAY FROM MANHOLES.
5. PIPE SHALL BE 6" MAX. DIAMETER PER U.P.C.
6. CONCRETE MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
7. ALL WYE SHALL BE ONE-WAY CLEANOUT WYE EXCEPT AS NOTED. TYPE PER U.P.C.
8. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTE HAULER PUMPER.
9. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC RIGHT-OF-WAY.
10. EXCAVATIONS SHALL BE NEAT LINE TYPICALLY ALL SIDES.
11. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "SAMPLING MANHOLE" PER STD PLAN NO. 418
12. SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK. (TRAFFIC AREA)
13. ALL WASTE MUST ENTER THROUGH INLET FITTING ONLY.
14. TANK TO BE STENCILED ON UPPER LEFT HAND CORNER OF INLET END IN WHITE.
15. STAINLESS STEEL CLAMP & BOLTS 3'-0" O.C. MAX. (TYP.) MIN. 2 REQ'D.
16. A WATER STOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE WALL.
17. TANK CAPACITY TO BE DETERMINED AT THE TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.
18. PIPE & FITTINGS TO BE 4" SCH. 40 PVC.

NOTES: (CONT.)

19. REINFORCING BARS INTERMEDIATE GRADE ASTM A615-62T AND A305-56T, REINFORCING WIRE FABRIC - ASTM A185-61T.
20. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE TOWN.
21. TESTING OF MANHOLES AND GREASE INTERCEPTOR IS REQUIRED IN ACCORDANCE WITH THE SEWER SYSTEM DESIGN STANDARDS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PRECAST GREASE INTERCEPTOR

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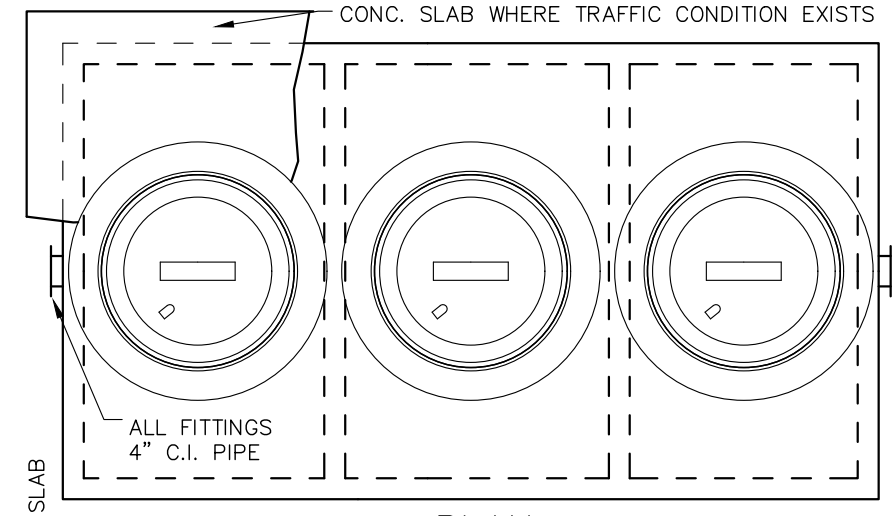
STD. PLAN NO. 416

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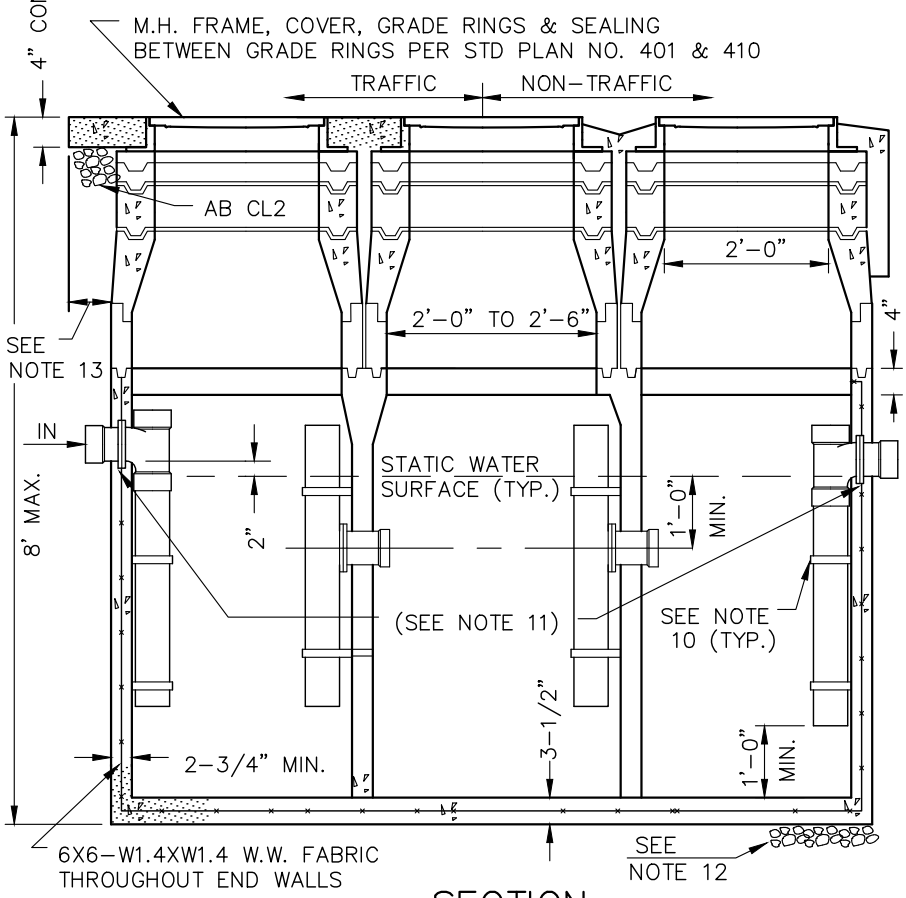
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NOTE: TANK TO BE STENCILED ON UPPER LEFT-HAND CORNER OF INLET END IN WHITE



PLAN



SECTION

NOTES: (CONT.)

18. REINFORCING BAR INTERMEDIATE GRADE ASTM A615-62T & A305-56T.
19. REINFORCING WIRE FABRIC ASTM A185-61T.
20. TESTING OF MANHOLES AND GREASE INTERCEPTOR IS REQUIRED IN ACCORDANCE WITH THE SEWER SYSTEM DESIGN STANDARDS.

NOTES:

1. TANK TO BE PRECAST AS MANUFACTURED BY:
   M.C. NOTTINGHAM
   PACIFIC CONC. PRODUCTS
   SELVAGE CONC. PRODUCTS
   OR TOWN APPROVED EQUAL.
2. ALL GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE PUBLIC R/W.
3. GREASE INTERCEPTORS SHALL BE LOCATED OUTSIDE OF BUILDINGS IN A LOCATION ACCESSIBLE TO WASTE HAULER PUMPER.
4. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBSTITUTED FOR REVIEW BY THE TOWN.
5. PIPE SHALL BE 6" MAX. DIAMETER PER U.P.C.
6. EXCAVATIONS SHALL BE NEAT LINE TYPICALLY ALL SIDES.
7. HEIGHT OF TANK ABOVE FITTINGS VARIABLE. ONE FT. SECTIONS MAY BE ADDED TO REQUIRED F.G.
8. ALL WYE SHALL BE ONE-WAY CLEANOUT WYE EXCEPT AS NOTED. TYPE PER U.P.C.
9. INTERCEPTOR TO BE USED IN CONJUNCTION WITH "SAMPLING MANHOLE" PER STD PLAN NO. 418
10. STAINLESS STEEL CLAMP & BOLTS 3'-0" O.C. MAX. (TYP.) MIN. 2 REQUIRED.
11. A WATER STOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUT ED INTO THE INTERCEPTOR WALL NEAR THE CENTER OF THE WALL.
12. 3" MIN. BEDDING MATERIAL PER STD PLAN NO. 501
13. SLAB TO EXTEND MIN. 24" BEYOND ALL SIDES OF TANK. (TRAFFIC AREA)
14. TANK CAPACITY TO BE DETERMINED AT THE TIME OF INDUSTRIAL WASTE PERMIT APPLICATION.
15. PIPE & FITTINGS TO BE 4" SCH. 40 PVC.
16. CONCRETE MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
17. 17. ALL WASTE MUST ENTER THROUGH INLET FITTING.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SAND AND GREASE INTERCEPTOR

STD. PLAN NO. 417

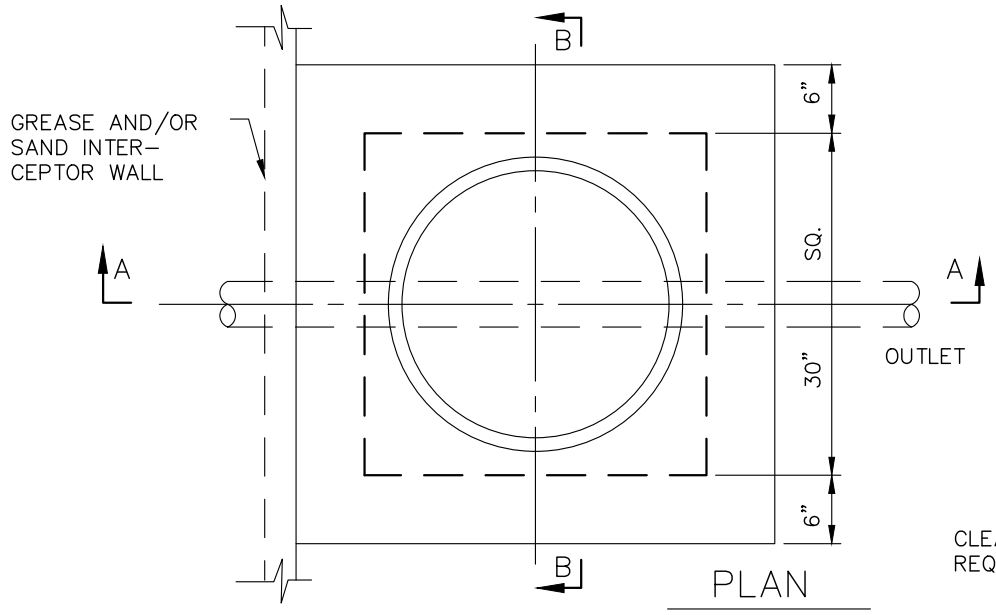
PAGE 1 OF 1

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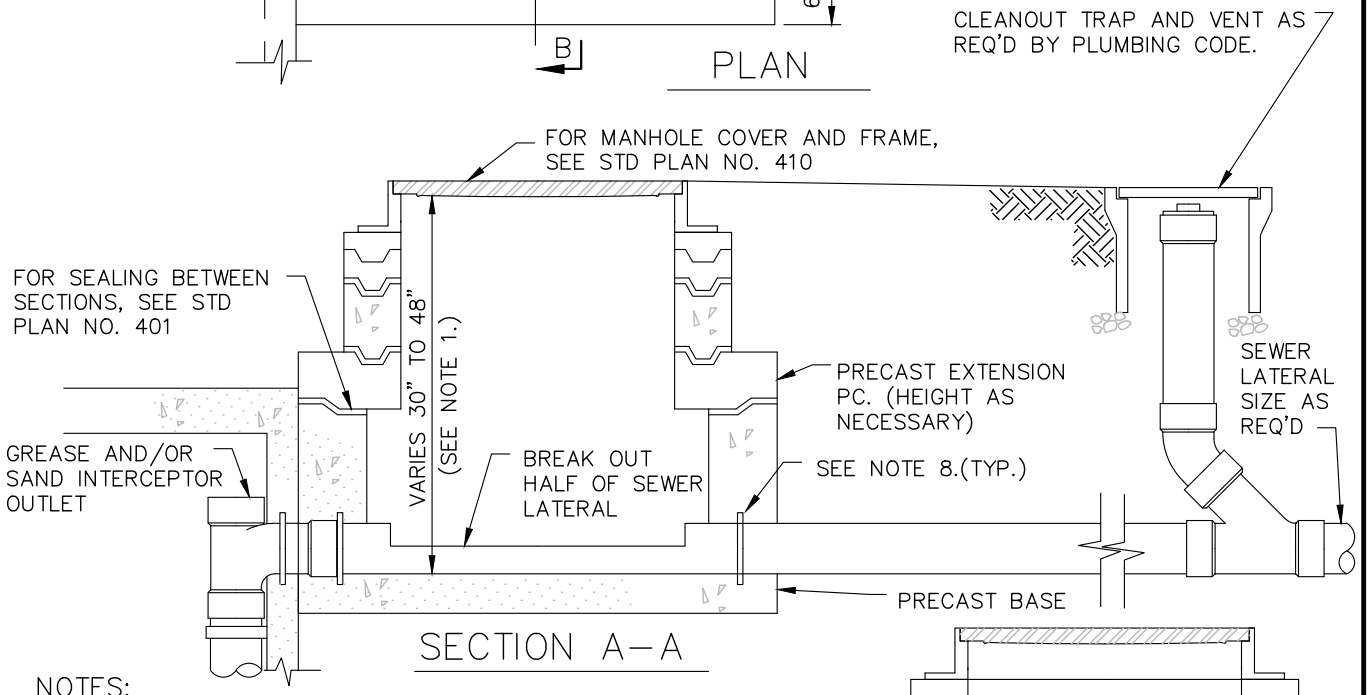
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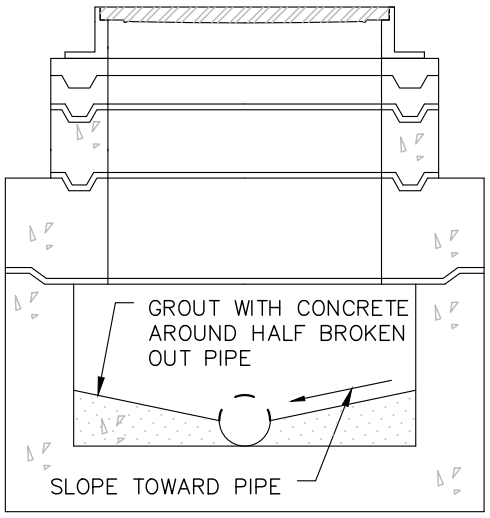
PLAN



SECTION A–A

NOTES:

1. IF LESS THAN 30" REVIEW WITH TOWN FOR ADD'L VAULT REQ'MTS. IF GREATER THAN 48" INSTALL SAMPLING M.H. SIM. TO STD PLAN NO. 401 WITH FLOW–THROUGH CUT–AWAY PIPE AS PER THIS STD.
2. SAMPLING M.H. TO BE LOCATED OUTSIDE OF PUBLIC RIGHT–OF–WAY EXCEPT WITH WRITTEN APPROVAL OF THE PUBLIC WORKS ENCROACHMENT OFFICER.
3. AN ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE TOWN.
4. LOCATION SUBJECT TO THE APPROVAL OF THE TOWN ENGINEER.
5. MANHOLE SHALL BE OLD CASTLE PRECAST CONC. DROP INLET BOX #5K WITH #5K X 24" DIAMETER TRANSITION SLAB.
6. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING M.H.
7. SAMPLING M.H. TO BE USED IN CONJUNCTION WITH EITHER STDS. 416 OR 417.
8. A WATERSTOP CONSISTING OF A STD. MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MFR. TO BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.



SECTION B–B

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SAMPLING MANHOLE EXTERIOR USE

STD. PLAN NO. 418

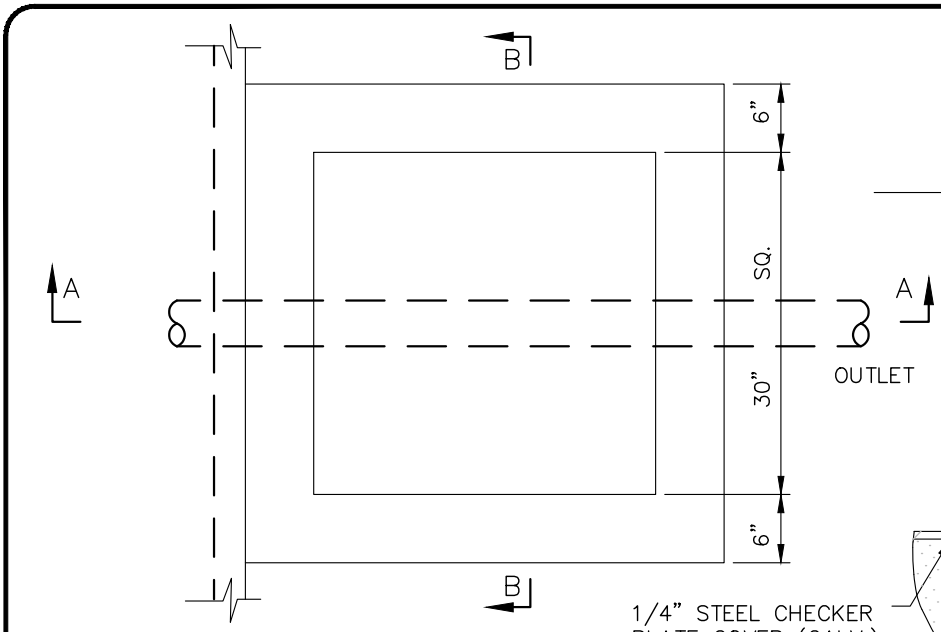
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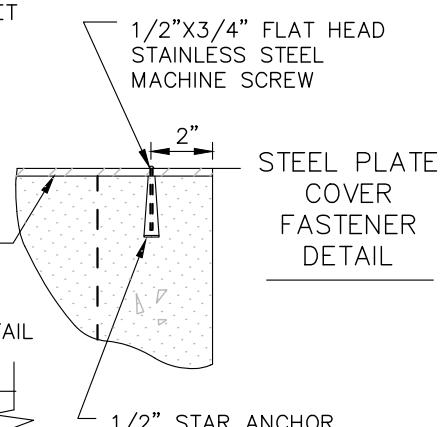
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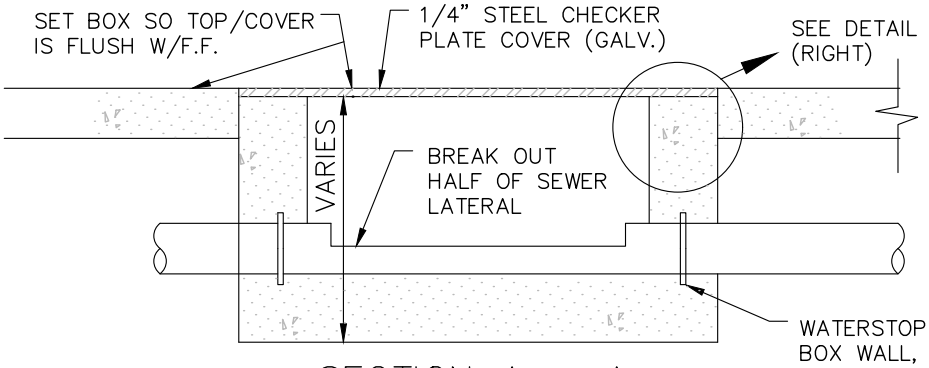
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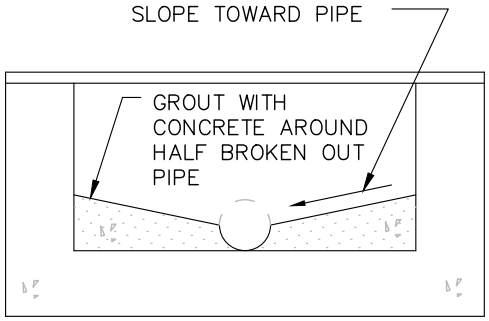




SECTION A – A

NOTES:

1. TO BE USED IN THE INTERIOR OF BUILDINGS IN CONJUNCTION W/SAMPLING MANHOLE AND TO BE UPSTREAM OF THE SAMPLING MANHOLE.
2. LOCATION SUBJECT TO THE APPROVAL OF THE TOWN ENGINEER.
3. TO BE USED ONLY WITH THE APPROVAL OF THE TOWN ENGINEER.
4. ALTERNATE DESIGN BY A REGISTERED ENGINEER MAY BE SUBMITTED FOR REVIEW BY THE TOWN.
5. BOX SHALL BE OLDCASTLE INFRASTRUCTURE MODEL 5K OR APPROVED EQUAL.
6. ALL SURFACE WATER MUST DRAIN AWAY FROM SAMPLING BOX.
7. SAMPLING BOX TO BE USED IN CONJUNCTION WITH EITHER STD PLAN NO. 416 OR 417.
8. A WATERSTOP CONSISTING OF A STANDARD MANHOLE ADAPTER GASKET AS SUPPLIED BY THE PIPE MANUFACTURER SHALL BE GROUTED INTO THE BOX WALL NEAR THE CENTER OF THE WALL.



SECTION B – B

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SAMPLING BOX BUILDING INTERIOR

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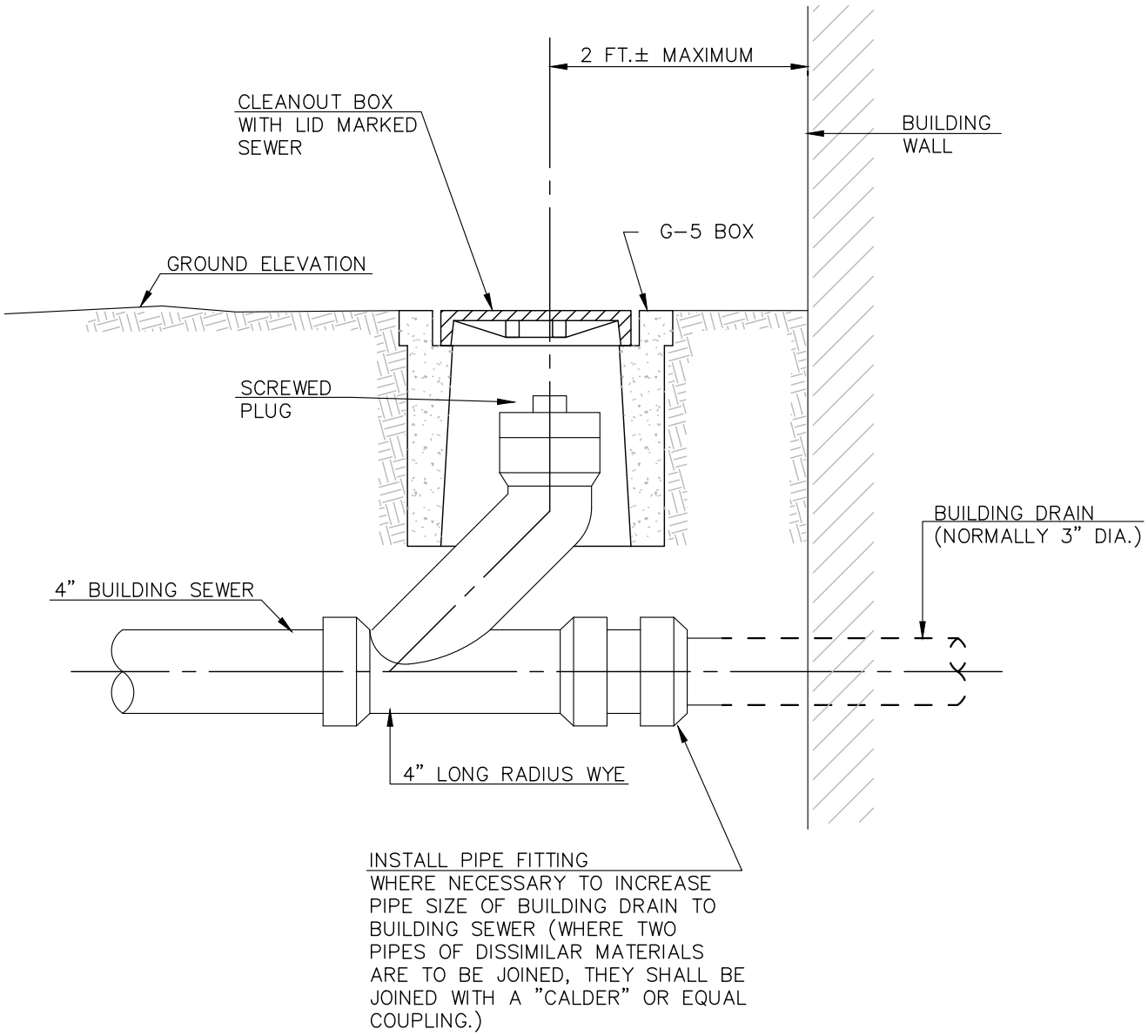
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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

PRIVATE CLEANOUT DETAIL AT BUILDING

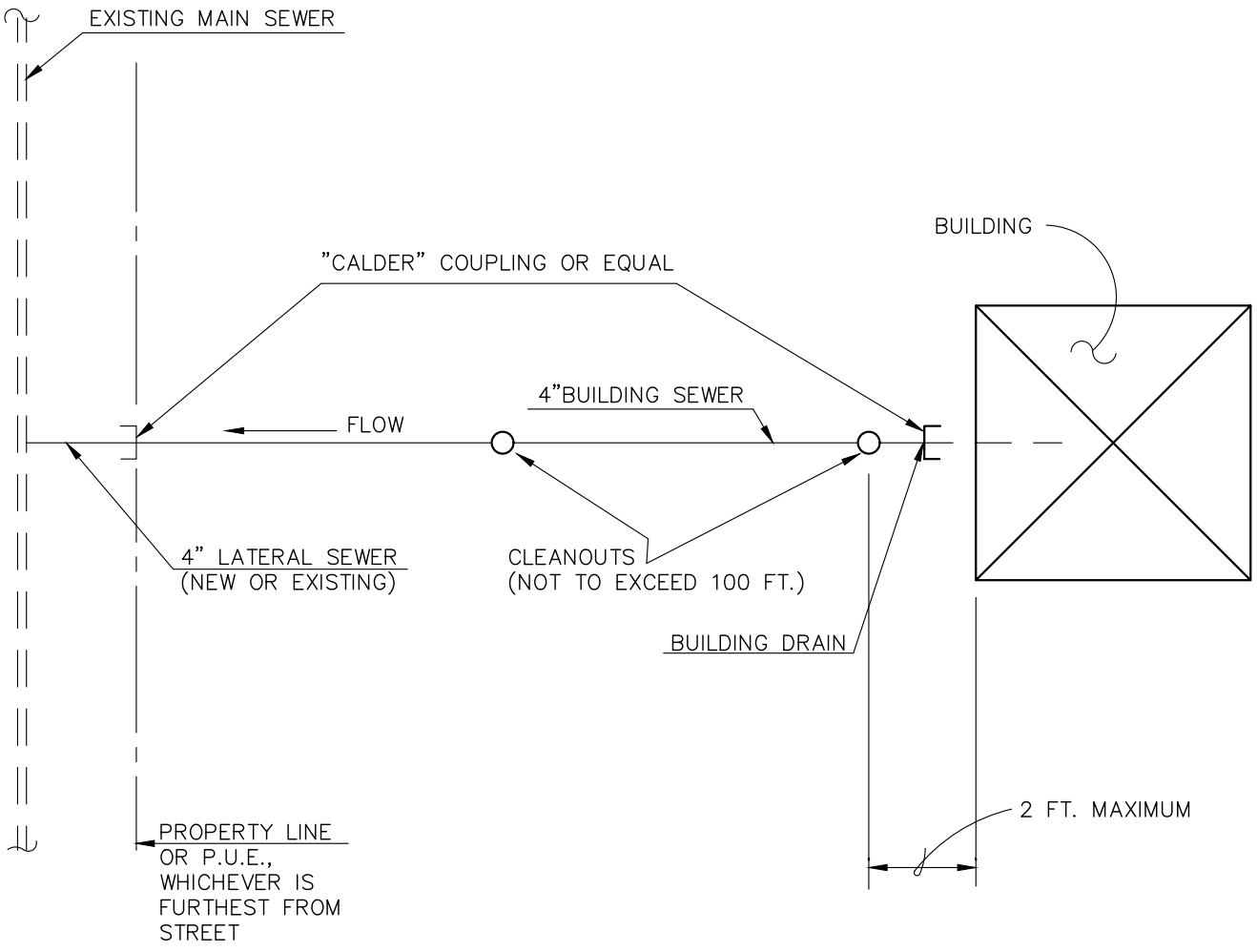
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STD. PLAN NO. 420

(2012 STD. NO. 160)

NOTE: WHERE BUILDING SEWERS ARE LOCATED UNDER DRIVEWAYS, CAST IRON OR DUCTILE IRON SEWER PIPE SHALL BE USED.



PLAN

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL SERVICE SEWER CONNECTION DETAILS

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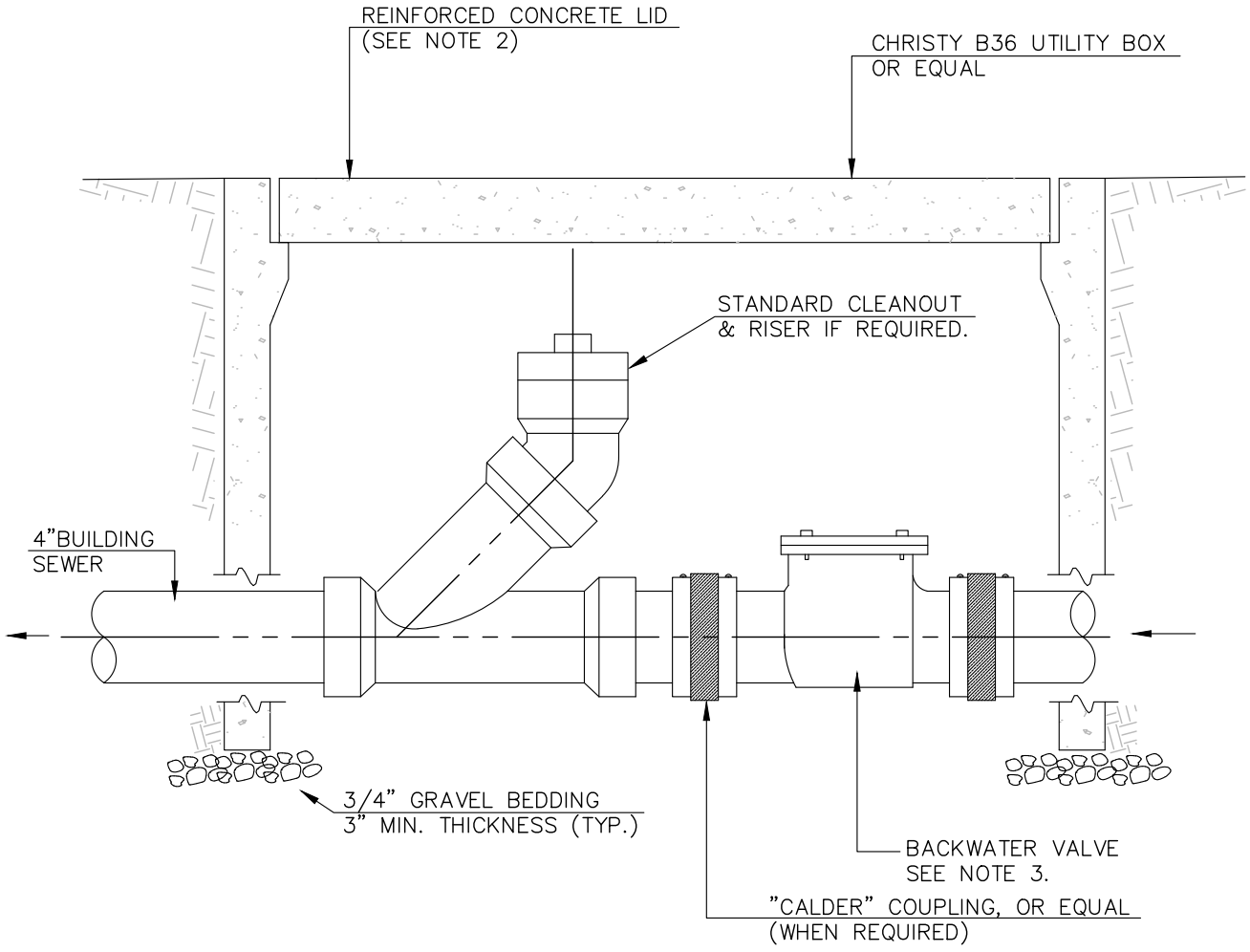
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Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\410-423 Sewer.dwg Layout Name: 421 Plot Date: May 29, 2020 at 03:07 pm



NOTES:

(1) THIS INSTALLATION IS REQUIRED WHEREVER THE LOWEST FINISHED FLOOR ELEVATION IS TWELVE (12") INCHES, OR LESS ABOVE THE TOP ELEVATION OF THE NEAREST UPSTREAM MANHOLE OR CLEANOUT.

(2) IF THE LID IS SUBJECT TO VEHICULAR TRAFFIC, USE LID DESIGNED FOR H-20 TRAFFIC LOADINGS.

(3) BACKWATER VALVE SHALL BE CAST IRON OR CAST BRONZE. VALVE SHALL BE APPROVED BY THE TOWN ENGINEER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

BACKWATER CHECK VALVE INSTALLATION

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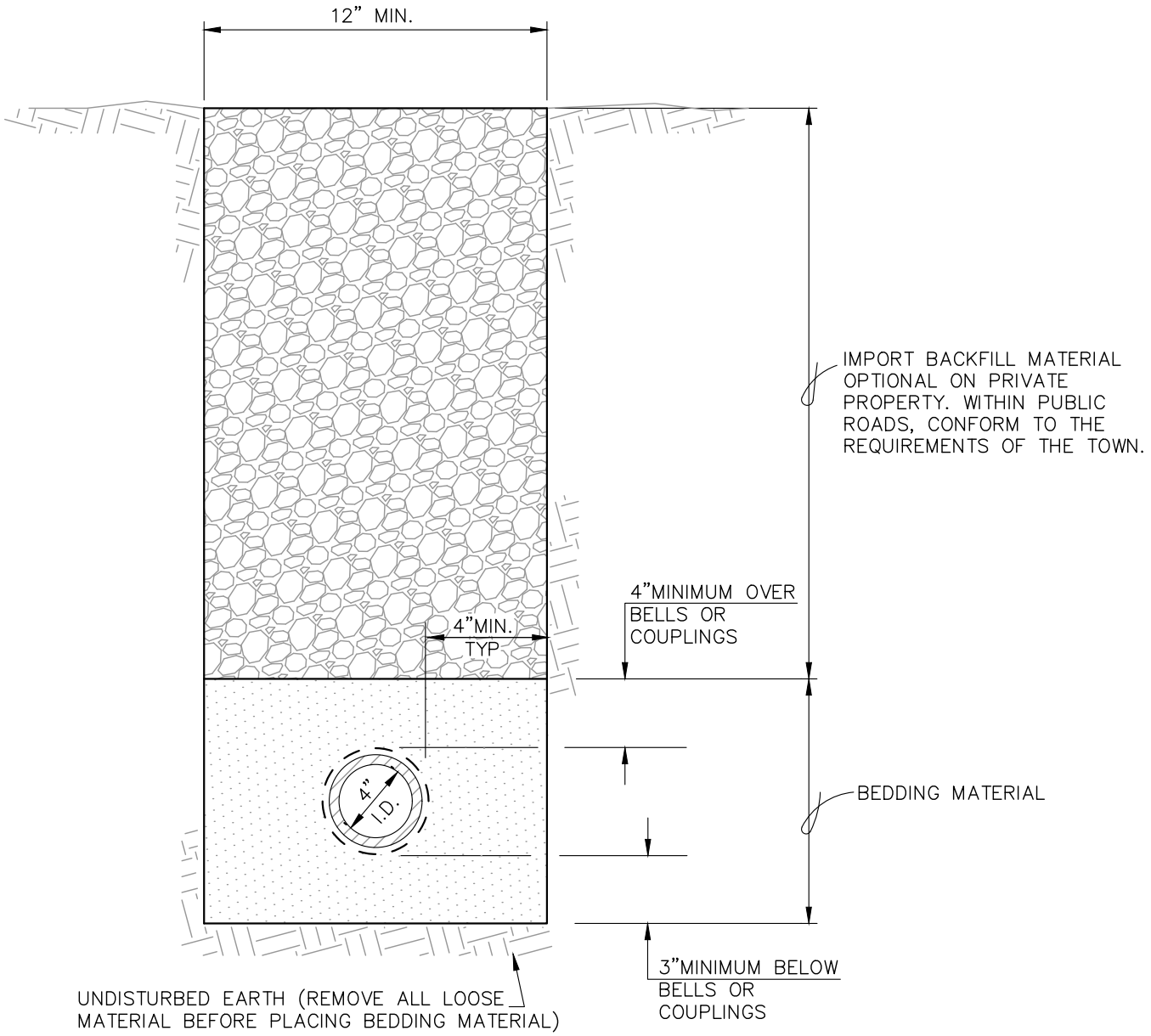
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\410-423 Sewer.dwg Layout Name: 422 Plot Date: May 29, 2020 at 03:07 pm

NOTES:

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE A WELL GRADED MATERIAL AND SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADINGS:

	PERCENT PASSING					
	3"	3/4"	3/8"	NO.4	NO.16	NO.200
PIPE BEDDING		100	80–100	10–50	5–30	0–4
TRENCH BACKFILL		NATIVE MATERIAL MAY BE USED				

IN ADDITION, WHEN TESTED WITH THE FOLLOWING SERIES OF SIEVES, NO MORE THAN 25% OF THE MATERIAL WILL BE RETAINED BETWEEN ANY ADJACENT SIEVES: 3", 2–1/2", 2", 1–1/2", 1", 3/4", 1/2", 3/8", NO. 4, NO. 8, NO. 16, NO. 30, NO. 50, NO. 100, AND NO. 200.



TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SERVICE SEWER TRENCH DETAIL

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PART III – STANDARD DRAWINGS

SERIES 500 – WATER SYSTEM CONSTRUCTION STANDARD DRAWINGS

TABLE OF CONTENTS

STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
501	Standard Trench Detail	11/93	07/09
502	Typical Location of Water Mains and Mainline Valves	11/93	12/02
503	Typical Gate Valve and Valve Box with Riser	11/93	07/09
504	Fire Hydrant	07/09	05/10
505	1” Domestic Water Service	07/09	05/10
506	1-1/2” Domestic Water Service	07/09	05/10
507	2” Domestic Water Service	07/09	05/10
509	4” Water Service Lateral Installation for 4” Meter	11/93	12/02
510	Reduced-Pressure Backflow Preventer	11/93	07/09
511	Double Detector Check Valve Single Service	11/93	07/09
512	Double Detector Check Valve Double Service	11/93	07/09
513	Single Combination Water Service	07/09	06/23
514	Dual Combination Water Service	07/09	06/23
515	Temporary Blow-Off with Main Line Valve	11/93	12/02
516	Temporary Blow-Off with Harness	11/93	11/93
517	6” and 8” Blow-Off	11/93	12/02
518	Concrete Anchor Blocks for Vertical Bends	11/93	11/93
519	Concrete Thrust Blocks	11/93	11/93

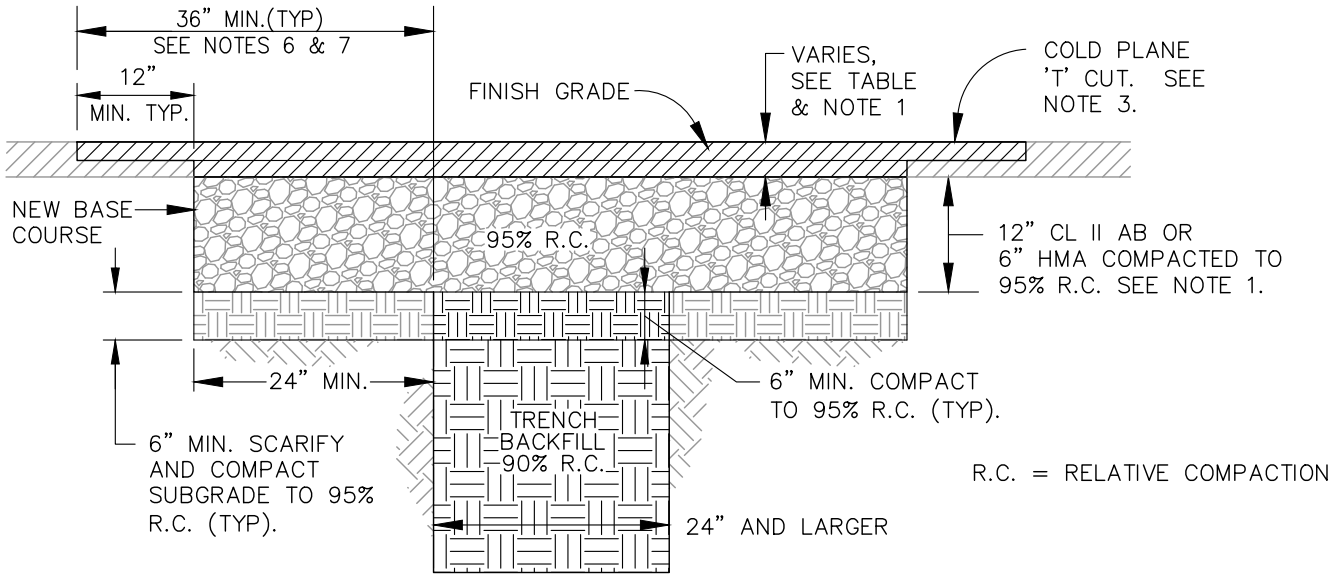
519	Concrete Thrust Blocks	11/93	11/93

STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
520	Typical Harness Installation for Flange Fittings	11/93	12/02
521	Typical Harness Installation	11/93	11/93
522	Typical Water Main Lowering Detail	11/93	07/09
523	Typical Water Main Installation Over Structure	11/93	07/09
524	Temporary Blow-Off and/or Metered Connection Mains Under Construction	11/93	07/09
525	Typical Dirt Stop and Water Main Encasement	11/93	12/02
526	Traffic-Type Pre Cast Water Utility Manhole	11/93	12/02
527	Typical Installation of Butterfly Valve & Tapping Valve	11/93	12/02
528	Typical Installation of Pressure Reducing Valves	11/93	12/02
529	Typical Installation of Surge Anticipator Valve or Pressure Relief Valve	11/93	12/02
530	Typical Installation of Air and Vacuum & Air Release Valves	11/93	12/02

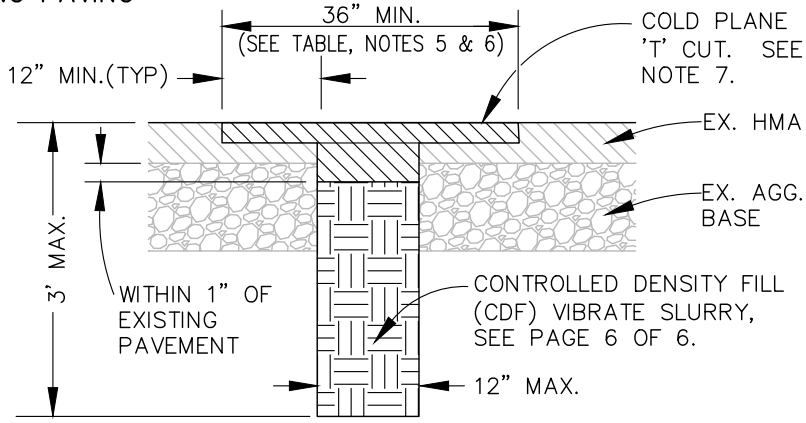
SERIES 500 – WATER SYSTEM CONSTRUCTION STANDARD DRAWINGS

REVISION SUMMARY

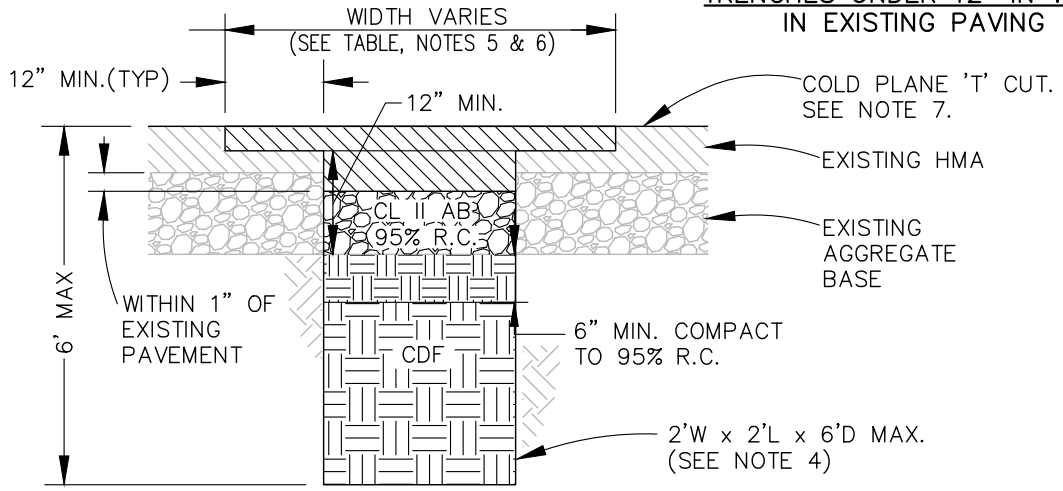
Std Number	Title	Revision Description
501	Standard Trench Detail	Updated notes and Trench HMA Paving Table
502	Typ. Locations of Water Mains and Mainline Valves	Changed valve locations and notes
503	Typ. Gate Valve and Valve Box with Riser	Change in notes
506	1-1/2” Domestic Water Service	Change in notes
507	2” Water Service with Brass and Polyethylene Lateral	Change in notes
509	4” Water Service Lateral Installation for 4” Water Meter/3” meter on 4” Service Lateral	Change in detail at meter and notes
510	Reduced-Pressure Backflow Preventer	Change in notes
514	Dual Combination Water Service	Change in notes
517	Permanent Blowoff	Change in notes
518	Concrete Anchor Blocks for Vertical Bends	Clarification of Note 2 on Page 1 of 2.
522	Typical Water Main Lowering Detail	Detail of anchor blocks
523	Typical Water Main Installation over Structure	Change in anchor detail
528	Typical Installation of Pressure Reducing Valves	Change in notes.
529	Typical Installation of Surge Anticipator Valve or Pressure Relief Valve	Change in notes



TRENCHES OVER 24" IN WIDTH
IN EXISTING PAVING



TRENCHES UNDER 12" IN WIDTH
IN EXISTING PAVING



SMALL HOLES
(ONLY USED IN EXISTING PAVING AREAS)

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL

STD. PLAN NO. 501

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TRENCH HMA PAVING TABLE	
STREET TYPE	MIN. HMA THICKNESS
RESIDENTIAL	0.25'
COLLECTOR	0.35'
ARTERIAL/INDUSTRIAL	0.45'

NOTES:

1. THE STREET STRUCTURAL SECTION SHALL BE HOT MIX ASPHALT (HMA) (SEE TABLE FOR MIN. HMA THICKNESS) ON 12" CLASS II AB OR 6" HMA OR AS SHOWN ON THE PLANS.

2. ALL TESTS: ASTM 1557 (MODIFIED)/D-6938 (NUCLEAR GAUGE)
   DENSITY TESTS: EACH LAYER REQUIRES 1 TEST PER 100 LINEAL FEET (MIN.) AND EVERY 2 VERTICAL FEET. THIS APPLIES TO BEDDING, NATIVE, SUBGRADE AND AGGREGATE BASE.

3. 1-1/2" SURFACE COURSE IF EXISTING HMA IS GREATER THAN OR EQUAL TO 3" THICK. IF HMA IS LESS THAN 3" THICK, REPLACE WITH FULL DEPTH HMA.

4. USE OF CDF IN THIS DETAIL IS ONLY ALLOWED FOR "DRY UTILITIES", NOT FOR WATER, SEWER, STORM DRAIN, OR RECYCLED WATER.

5. IF THE HOLE IS NOT BACKFILLED ON THE SAME DAY OF EXCAVATION, USE TRENCH BACKFILL AND SURFACING DETAIL.

6. NEATLY CUT PAVEMENT AFTER TRENCH IS BACKFILLED TO SUBGRADE. ADDITIONAL PAVEMENT REMOVAL: REMOVE ADDITIONAL PAVEMENT TO A PAINTED LANE STRIPE, A LIP OF GUTTER, EXISTING PAVEMENT PATCH, OR AN EDGE OF THE PAVEMENT IF SUCH STREET FEATURE IS WITHIN 3 FEET OF THE FINAL SAW CUT.

7. FULL TACK COAT COVERAGE ON ALL VERTICAL AND EXISTING (HMA) SURFACES.

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL NARROW TRENCH AND SMALL HOLES

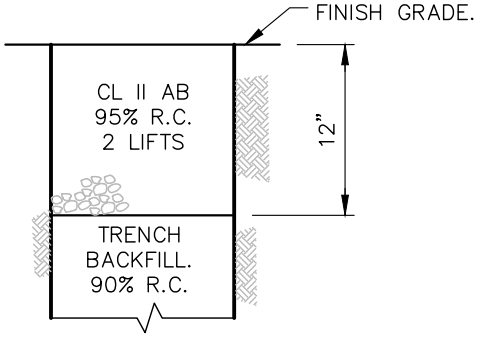
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STD. PLAN NO. 501

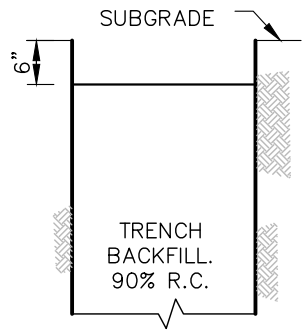
(2012 STD. NO. 115)

TRENCH WIDTH FOR HDPE PIPE	
PIPE SIZE*	TRENCH WIDTH (MAX.)
15"	36"
18"	48"
24"	54"
30"	60"
36"	72"
PIPE MUST BE CENTERED IN THE TRENCH. *INSIDE DIAMETER.	



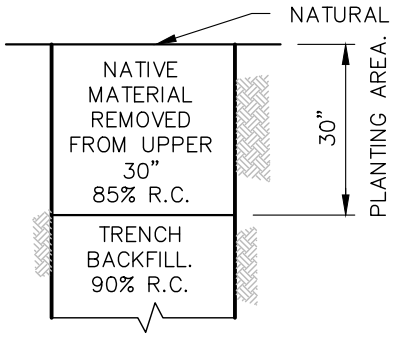
TYPE B

(SHOULDER AREAS)



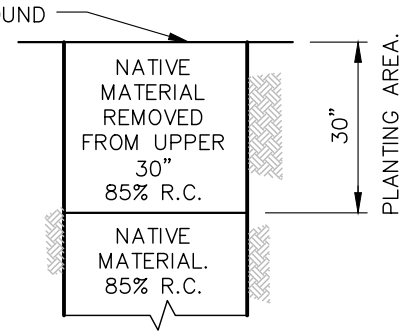
TYPE C

(STREETS UNDER CONSTRUCTION)



TYPE D

(PUBLIC UTILITY EASEMENTS)
(OUTSIDE STREET AREA)

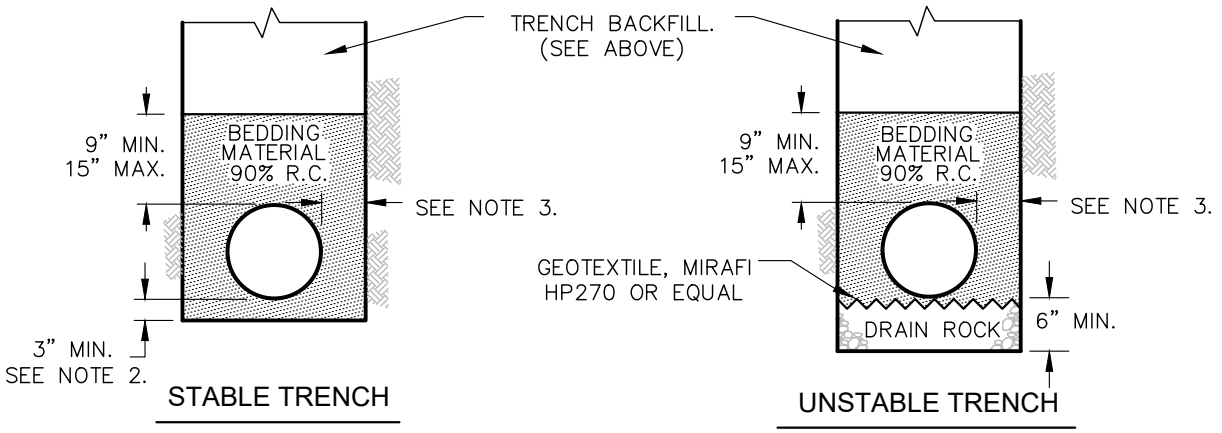


TYPE E

(PUBLIC UTILITY EASEMENTS)
(UNDEVELOPED AREAS)

TRENCH BACKFILL

(TYPE TO BE SHOWN ON PLANS)



PIPE BEDDING

NOTES:

1. RELATIVE COMPACTION IS DESIGNATED AS R.C.
2. ¼ PIPE O.D. MINIMUM WHEN EXCAVATION IS IN ROCKY GROUND.
3. PIPE DIAMETER 18" OR LESS: 6" MIN., 9" MAX. PIPE DIAMETER GREATER THAN 18": 9" MIN., 12" MAX. SEE TABLE ABOVE FOR HDPE PIPE TRENCH WIDTHS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL
TRENCH BACKFILL

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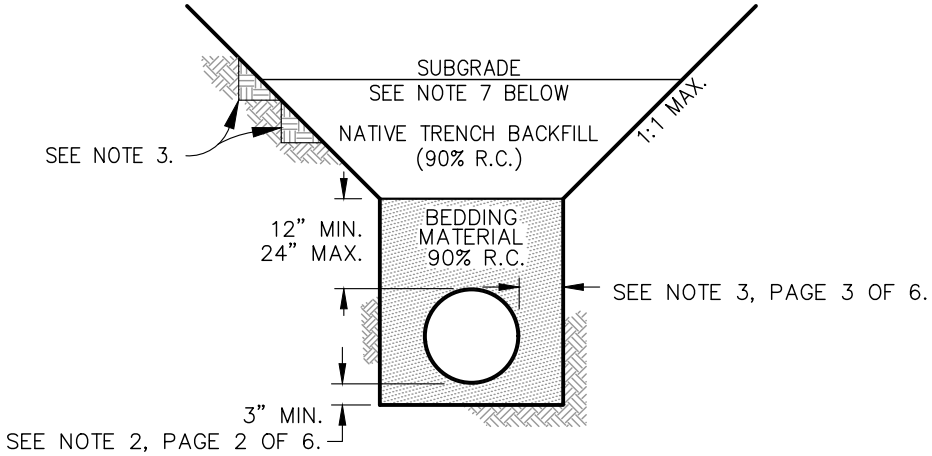
OCT 2019 – NTS

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TYPE F

(NEW STREETS UNDER CONSTRUCTION)

NOTES:

1. ROCKS EXCEEDING 6" SHALL NOT BE PERMITTED WITHIN THE TRENCH SECTION.
2. THE MAXIMUM DEPTH OF NATIVE BACK FILL MATERIAL SHALL NOT EXCEED 10 FEET.
3. EMBANKMENT CONSTRUCTION METHODS SHALL BE USED. ALL SLOPES MUST BE KEYED–IN A MINIMUM OF ONE FOOT AS THE TRENCH IS BACK FILLED.
4. THE MINIMUM EQUIPMENT REQUIRED FOR COMPACTION OF NATIVE BACK FILL MATERIAL SHALL CONSIST OF A SHEEPSFOOT VIBRATORY ROLLER WITH A MINIMUM DRUM WIDTH OF 48", A MINIMUM GROSS WEIGHT OF 4600 LB., OR MUST MEET APPROVAL OF THE TOWN ENGINEER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE PRIVATE SOILS ENGINEER AND THE TOWN INSPECTOR 48 HOURS PRIOR TO EXCAVATION.
6. THE PRIVATE SOILS ENGINEER SHALL PROVIDE TESTING AND OBSERVATIONS ON A FULL TIME BASIS DURING ALL NATIVE BACK FILLING OPERATIONS. THE PRIVATE SOILS ENGINEER IS RESPONSIBLE FOR THE VERIFICATION OF ALL NATIVE BACK FILL WORK INCLUDING COMPACTION AND UNIFORM MOISTURE CONDITIONING, AND THAT MOISTURE CONTENT IS ABOVE OPTIMUM MOISTURE TO THE EXTENT APPROPRIATE FOR THE NATIVE MATERIAL BEING USED.
7. STREETS WHERE NATIVE TRENCH BACK FILL IS USED, TREATED (LIME, CEMENT, FLYASH, ETC.) SUB GRADE SHALL NOT BE USED AS PART OF THE STRUCTURAL SECTION.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL

STD. PLAN NO. 501

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MATERIAL SPECIFICATIONS

DRAIN ROCK MAY BE USED AS BEDDING UNDER PIPE FOR SLOPES LESS THAN 8%. DRAIN ROCK SHALL BE 100% CRUSHED AND SHALL CONFORM TO THE FOLLOWING GRADING:

1–1/2"	1"	1/2"	#4
100	95–100	0–30	0–4

CUT OFF WALLS SHALL BE PROVIDED WHEN SHOWN ON THE PLANS OR REQUIRED BY THE ENGINEER.

PIPE BEDDING FOR SLOPES LESS THAN OR EQUAL TO 8% SHALL HAVE A MINIMUM SAND EQUIVALENT VALUE OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADING:

1"	3/4"	3/8"	#4	#200
100	90–100	65–100	30–100	0–15

PIPE BEDDING FOR SLOPES GREATER THAN 8% SHALL HAVE A MINIMUM SAND EQUIVALENT OF 30 AND SHALL CONFORM TO THE FOLLOWING GRADING:

1"	3/4"	3/8"	#4	#30	#200
100	90–100	65–100	30–100	10–100	0–15

TRENCH BACKFILL SHALL CONFORM TO THE FOLLOWING GRADING AND HAVE A MINIMUM SAND EQUIVALENT VALUE OF 25.

3"	#4	#30
100	40 –100	10–100

WHEN SAND BEDDING IS PROPOSED FOR UTILITY CONDUIT INSTALLATION, THE MATERIAL SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW 5 WORKING DAYS BEFORE CONSTRUCTION.

AGGREGATE BASE SHALL CONFORM TO THE REQUIREMENTS OF SECTION 26 OF THE STATE STANDARD SPECIFICATIONS. HOT MIX ASPHALT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 39 OF THE STATE STANDARD SPECIFICATIONS.

COMPACTION REQUIREMENTS

(AS SHOWN ON PAGES 1 OF 6 – 3 OF 6 AND IN THE FOLLOWING MODIFICATIONS)

DRAIN ROCK SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR.

PIPE BEDDING MATERIAL USED TO GRADE THE TRENCH SHALL BE CONSOLIDATED WITH A SURFACE VIBRATOR WHEN IT IS PLACED OVER DRAIN ROCK OR WHEN DEPTH IS GREATER THAN 6 INCHES.

TRENCH BACKFILL MAY NOT BE COMPACTED BY JETTING.

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STANDARD TRENCH DETAIL

STD. PLAN NO. 501

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USE OF THIS DETAIL IS ONLY ALLOWED FOR "DRY UTILITIES", NOT FOR WATER, SEWER, STORM DRAIN, OR RECYCLED WATER.

CONTROL DENSITY FILL

CONTROL DENSITY FILL SHALL BE A MIXTURE OF PORTLAND CEMENT, SAND, AIR ENTRAINING AGENT AND WATER, BATCHED BY A READY-MIXED CONCRETE PLANT AND DELIVERED TO THE JOBSITE BY MEANS OF TRANSIT MIXING TRUCKS. CONTROL DENSITY FILL MAY ALSO CONTAIN CLASS F POZZOLON (FLY ASH). CONTROL DENSITY FILL SHALL BE FREE OF ASPHALTIC MATERIAL.

MATERIALS

CEMENT SHALL MEET THE STANDARDS AS SET FORTH IN ASTM C-150, TYPE II CEMENT.

FLY ASH SHALL MEET THE STANDARDS AS SET FORTH IN ASTM C-618, FOR CLASS F POZZOLANS. THE FLY ASH SHALL NOT INHIBIT THE ENTRAINMENT OF AIR.

AGGREGATE SIZE SAND ONLY

MIX PROPORTIONS

THE MIX PROPORTIONS SHALL BE DETERMINED BY THE PRODUCER OF THE CONTROL DENSITY FILL TO PRODUCE A FLOWABLE FILL MIXTURE WHICH WILL NOT SEGREGATE. EACH YARD SHALL CONTAIN NOT LESS THAT 50 POUNDS OF PORTLAND CEMENT. THE CONTRACTOR SHALL SUPPLY A MIX DESIGN TWO WEEKS PRIOR TO ANY USE OF CONTROL DENSITY FILL.

MIXTURE PROPERTIES

COMPRESSIVE STRENGTH	75- 100 PSI @ 28 DAYS
SLUMP	3 - 9 INCHES

THE CONSISTENCY OF CDF SHALL BE SUCH THAT ALL TRENCH VOIDS ARE FILLED WITH MINIMUM RODDING OR VIBRATING BUT NOT SO WET AS TO CAUSE EXCESSIVE SHRINKAGE.

PAVING

PERMANENT PAVEMENT MAY BE PLACED DIRECTLY UPON THE CONTROL DENSITY FILL AS SOON AS IT HAS CONSOLIDATED FOR THE SURFACE TO WITHSTAND THE PROCESS OF PAVING WITHOUT DISPLACEMENT. THE SURFACE OF THE CONTROL DENSITY FILL SHALL BE FIRM AND UNYIELDING. ANY VISIBLE MOVEMENT VERTICALLY OR HORIZONTALLY OF THE CONTROL DENSITY FILL UNDER THE ACTION OF CONSTRUCTION EQUIPMENT OR OTHER MAXIMUM LEGAL AXLE LOADS SHALL BE CONSIDERED AS EVIDENCE THAT THE CONTROL DENSITY FILL DOES NOT MEET THIS REQUIREMENT. THE CONTRACTOR SHALL PROVIDE TRENCH PLATES TO ALLOW TRAFFIC FLOW FOR ALL LOCATIONS UNTIL CONTROL DENSITY FILL IS READY TO BE PAVED.

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

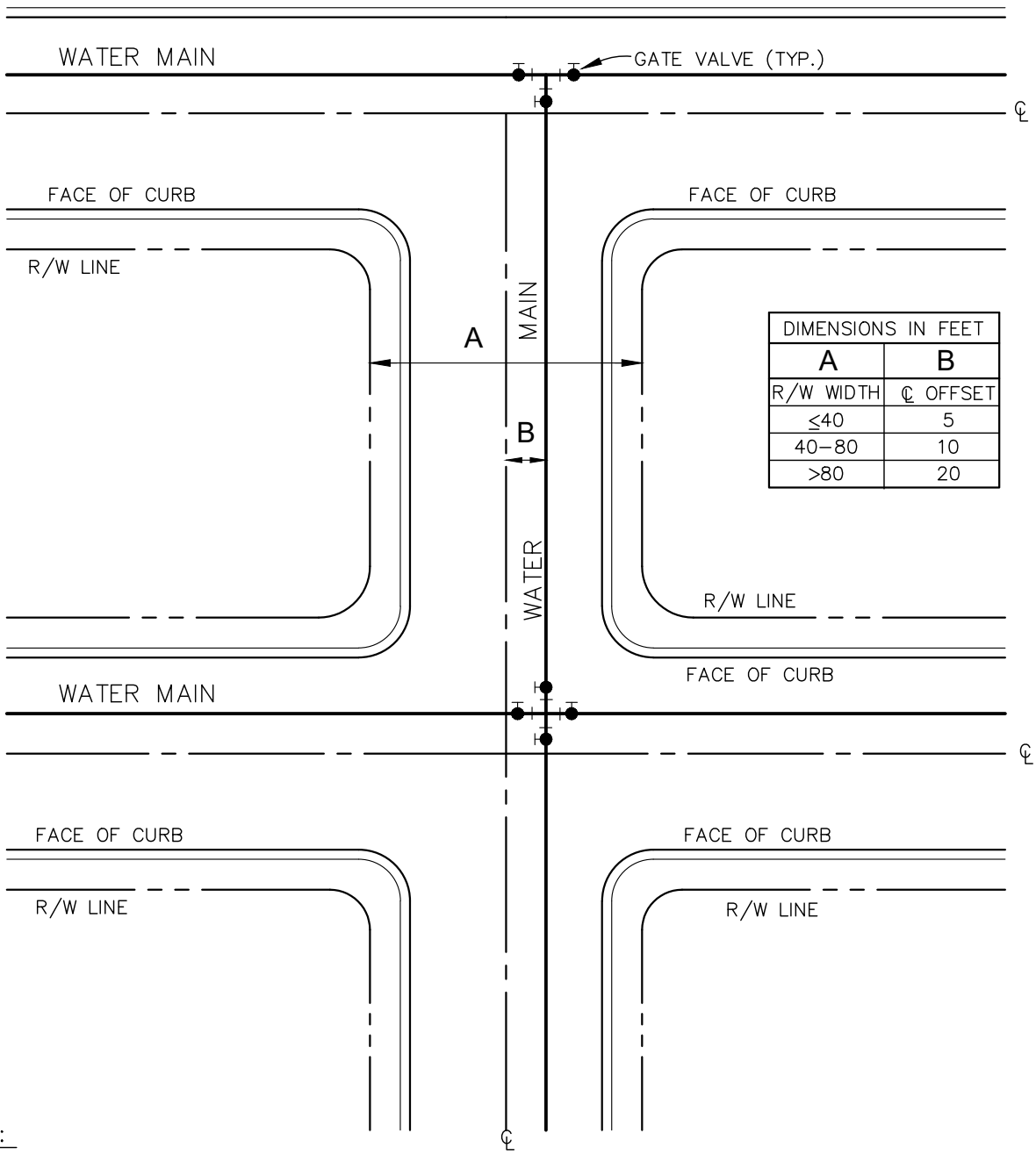
STANDARD TRENCH DETAIL CONTROL DENSITY FILL (CDF)

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DIMENSIONS IN FEET	
A	B
R/W WIDTH	℄ OFFSET
≤40	5
40–80	10
>80	20

NOTES:

1. WATER MAINS SHALL BE LOCATED PARALLEL TO STREET CENTERLINES AT THE OFFSET SHOWN ABOVE UNLESS CONFLICTS WITH OTHER UNDERGROUND FACILITIES CANNOT BE AVOIDED. NON–STANDARD ALIGNMENTS SHALL BE APPROVED BY THE TOWN ENGINEER PRIOR TO INSTALLATION.
2. MAINLINE VALVES, EXCEPT HYDRANT VALVES AND TAPPING VALVES, SHALL BE FLANGE TO FLANGE CLUSTERS AT A 4–WAY CROSS AND 3–WAY TEE, UNLESS OTHERWISE DIRECTED BY THE TOWN ENGNEER.
3. A MINIMUM OF THREE (3) MAINLINE VALVES ARE REQUIRED FOR "T" INTERSECTIONS AND FOUR (4) VALVES ARE REQUIRED FOR CROSS INTERSECTIONS, UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
4. MAINLINE VALVES SHALL BE REQUIRED TO ISOLATE FIRE HYDRANTS, BOTH PUBLIC AND PRIVATE, INTO SEPARATELY VALVED MAINLINE SECTIONS, AND SHALL HAVE A MAX. SPACING OF 500'.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL LOCATION OF WATER MAINS AND MAINLINE VALVES

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 502 Plot Date: May 29, 2020 at 04:15 pm

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 503 Plot Date: May 29, 2020 at 04:15 pm

TOWN OF WINDSOR

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TYPICAL GATE VALVE AND VALVE BOX WITH RISER

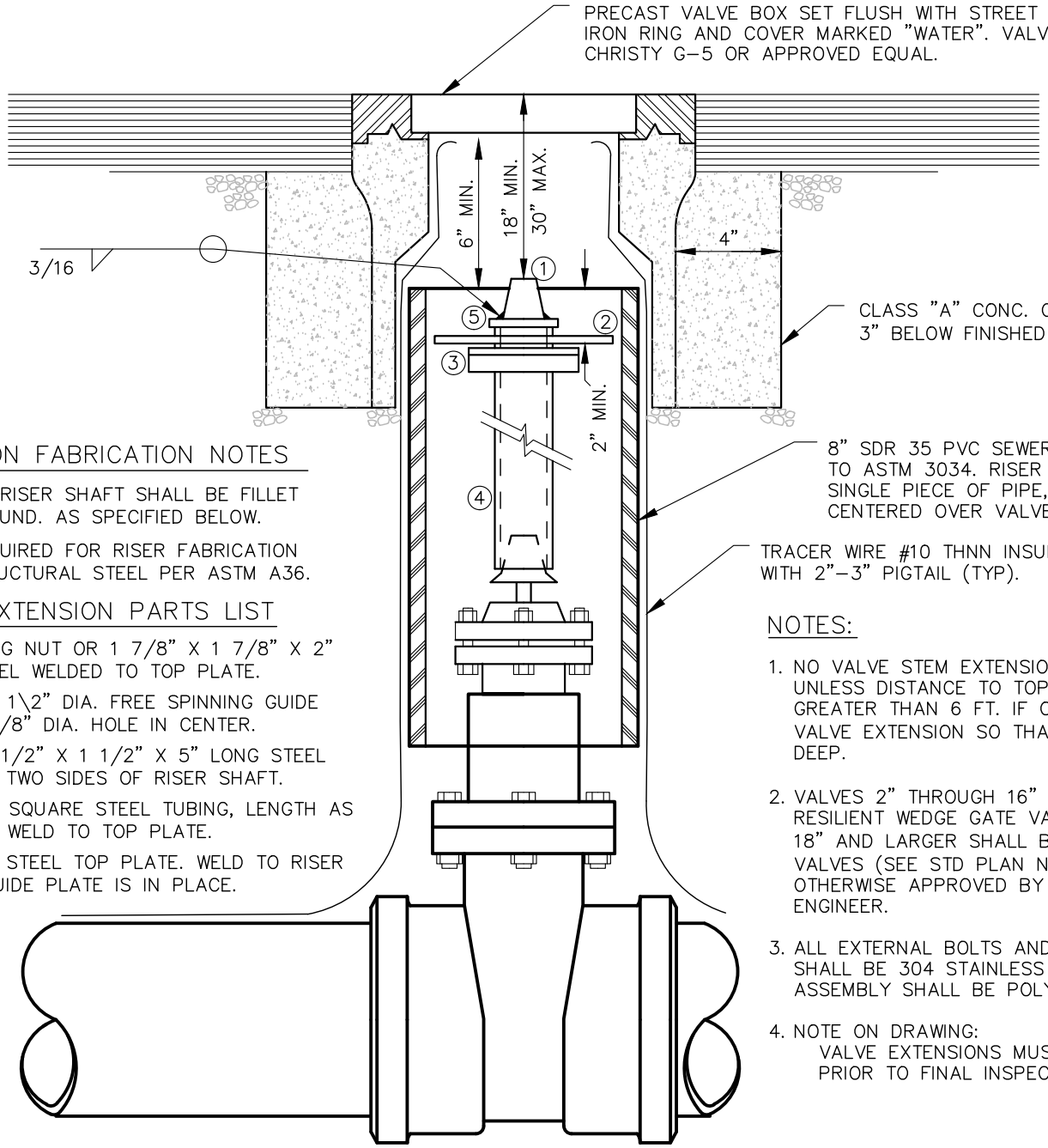
DESIGN AND CONSTRUCTION STANDARDS

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(2012 STD. NO. 110)

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STEM EXTENSION FABRICATION NOTES

1. ALL WELDS TO RISER SHAFT SHALL BE FILLET WELD ALL AROUND. AS SPECIFIED BELOW.
2. ALL STEEL REQUIRED FOR RISER FABRICATION SHALL BE STRUCTURAL STEEL PER ASTM A36.

VALVE STEM EXTENSION PARTS LIST

① VALVE OPERATING NUT OR 1 7/8" X 1 7/8" X 2" HIGH, SOLID STEEL WELDED TO TOP PLATE.

② 3/16" THK. X 7 1\2" DIA. FREE SPINNING GUIDE PLATE WITH 3 5/8" DIA. HOLE IN CENTER.

③ TWO 3/16" X 1 1/2" X 1 1/2" X 5" LONG STEEL ANGLE WELD TO TWO SIDES OF RISER SHAFT.

④ 2 1/2" X 3/16" SQUARE STEEL TUBING, LENGTH AS REQUIRED. EDGE WELD TO TOP PLATE.

⑤ 3" X 3" X 1/4" STEEL TOP PLATE. WELD TO RISER SHAFT AFTER GUIDE PLATE IS IN PLACE.

NOTES:

1. NO VALVE STEM EXTENSION ALLOWED UNLESS DISTANCE TO TOP OF VALVE NUT IS GREATER THAN 6 FT. IF OVER 6 FT INSTALL VALVE EXTENSION SO THAT NUT IS 18"-30" DEEP.
2. VALVES 2" THROUGH 16" SHALL BE RESILIENT WEDGE GATE VALVES AND VALVES 18" AND LARGER SHALL BE BUTTERFLY VALVES (SEE STD PLAN NO. 527) UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.
3. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE 304 STAINLESS STEEL OR VALVE ASSEMBLY SHALL BE POLY WRAPPED.
4. NOTE ON DRAWING:
   VALVE EXTENSIONS MUST BE INSTALLED PRIOR TO FINAL INSPECTION.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 504 Plot Date: May 29, 2020 at 04:15 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

FIRE HYDRANT

DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

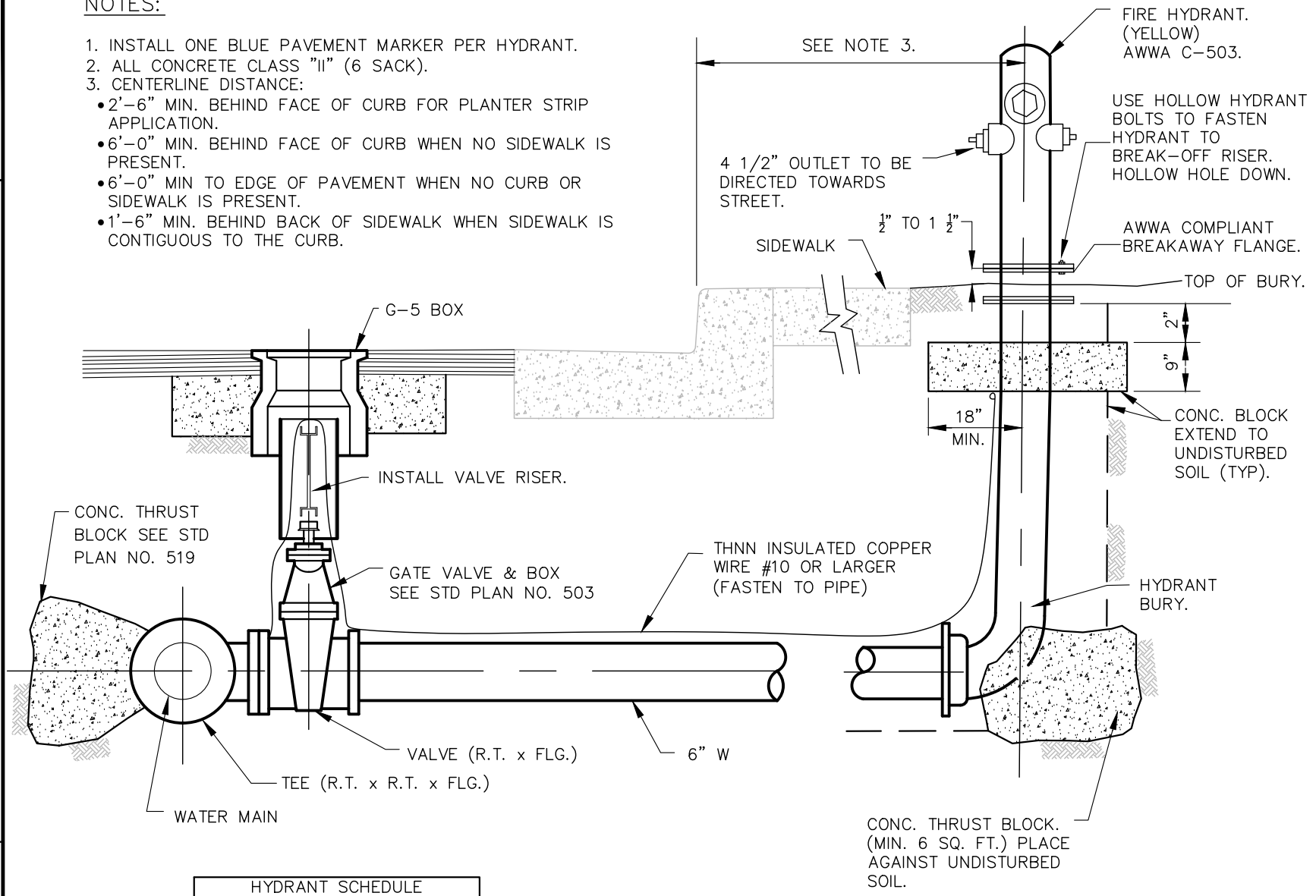
(2012 STD. NO. 101)

STD. PLAN NO. 504

PAGE 1 OF 1

NOTES:

1. INSTALL ONE BLUE PAVEMENT MARKER PER HYDRANT.
2. ALL CONCRETE CLASS "II" (6 SACK).
3. CENTERLINE DISTANCE:
   - 2'-6" MIN. BEHIND FACE OF CURB FOR PLANTER STRIP APPLICATION.
   - 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
   - 6'-0" MIN TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
   - 1'-6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.



HYDRANT SCHEDULE		
TYPE	COMM.	RES.
CLOW	865 OR 960	950

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 505 Plot Date: May 29, 2020 at 04:15 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

1" DOMESTIC WATER SERVICE

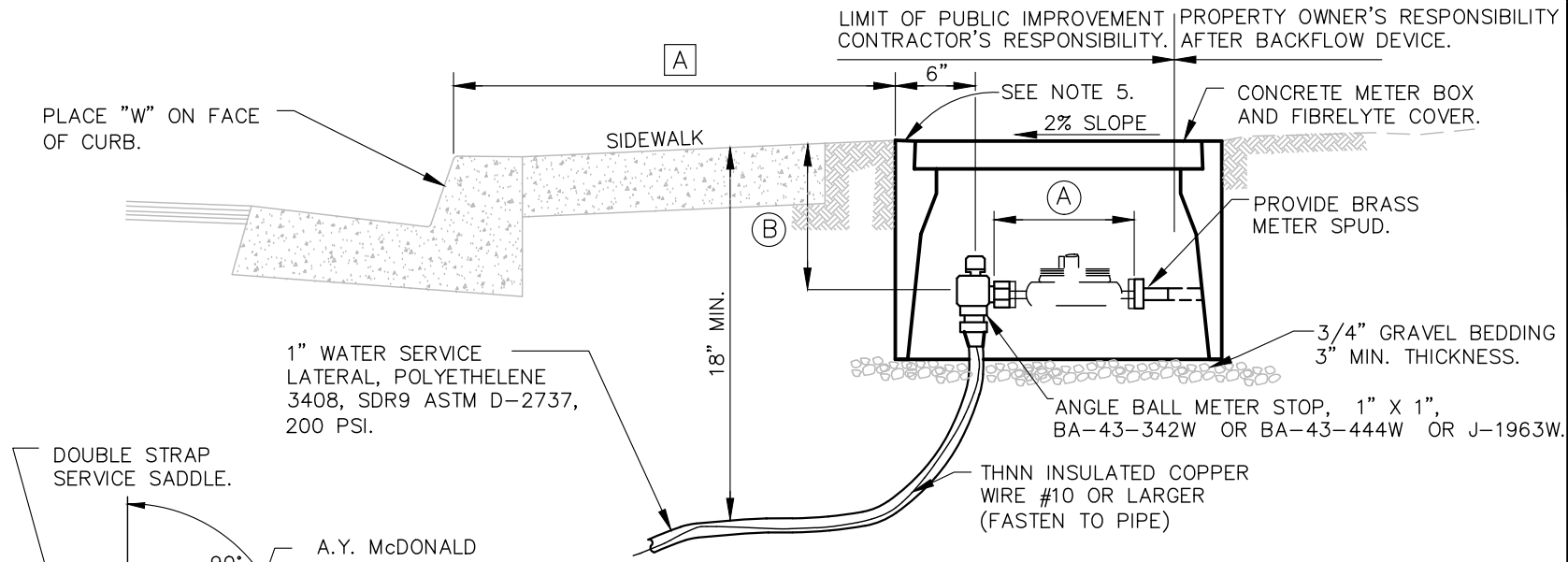
DESIGN AND CONSTRUCTION STANDARDS

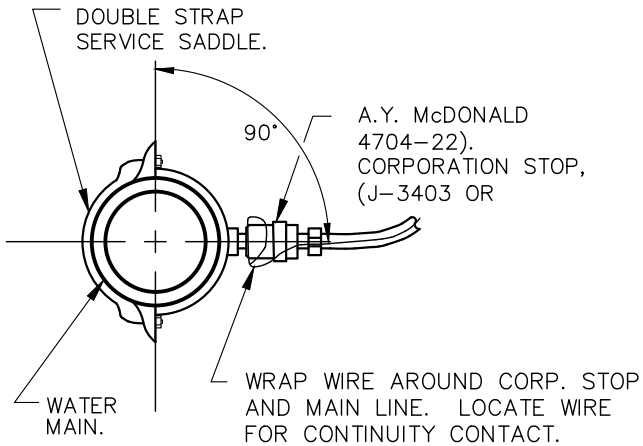
OCT 2019 - NTS

(2012 STD. NO. 102)

STD. PLAN NO. 505

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METER	OLD CASTLE METER BOX	LID		A	B
		NON-TRAFFIC	TRAFFIC		
1"	B-16	FL-16D	B16-61G	11"SCR	10"

MAIN PIPE	SERVICE SADDLE
ACP OR DIP	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

NOTES

1. UNLESS OTHERWISE SPECIFIED ON PLAN, PROVIDE FOR 1" METER INSTALLATION FOR SINGLE FAMILY RESIDENTIAL AND OFFICE COMMERCIAL PROJECTS.
2. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
3. METERS PROVIDED AND SET BY THE PUBLIC WORKS DEPARTMENT.
4. METERS SHALL BE BADGER MODEL #70 1", LCD W/ILC, GAL TORX, NSF-61 LOW LEAD. ITRON 100E PIT ERT W/GEOTEK ½" x 12" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 506 Plot Date: May 29, 2020 at 04:15 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

1-1/2" DOMESTIC WATER SERVICE

DESIGN AND CONSTRUCTION STANDARDS

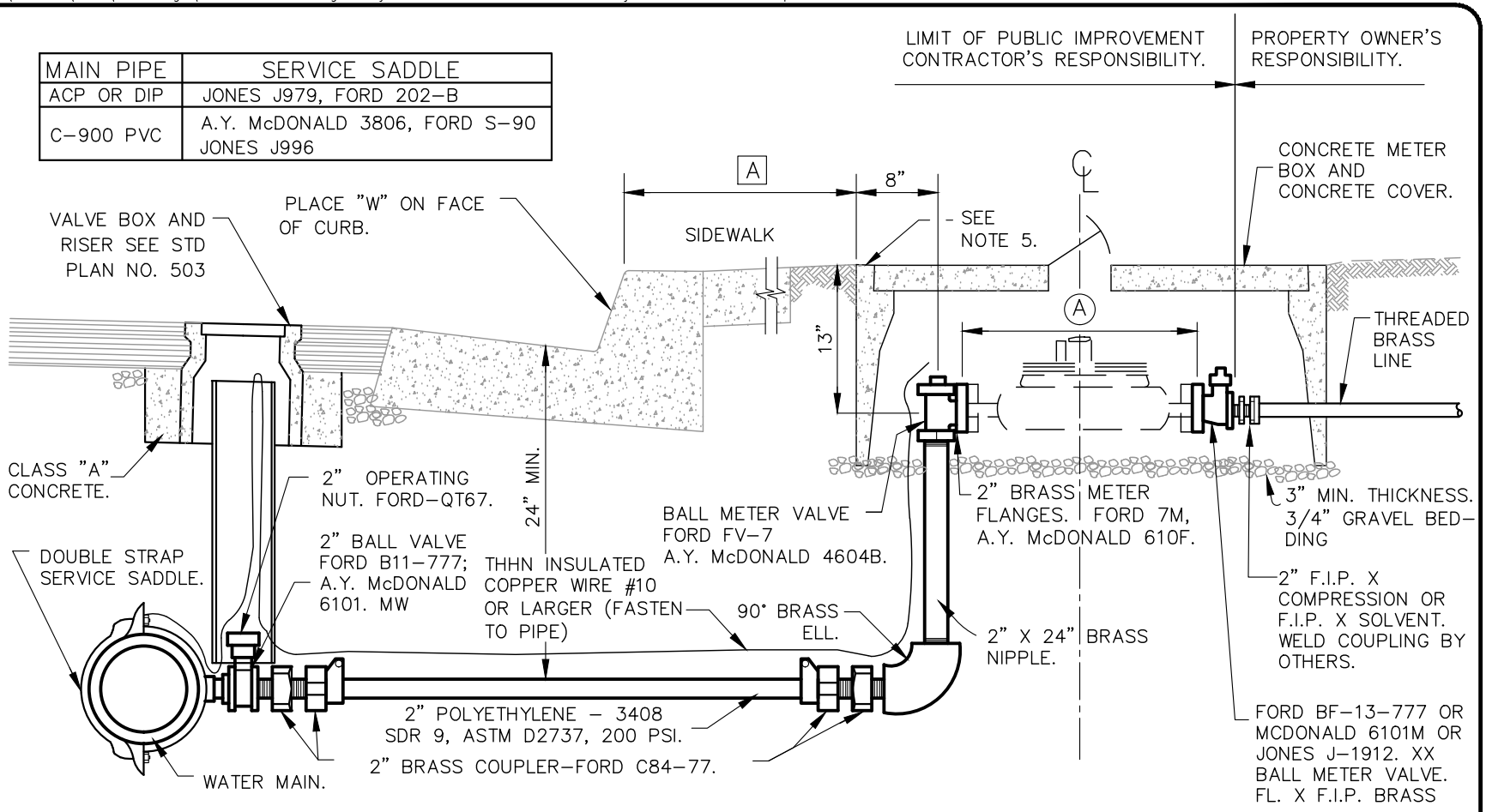
OCT 2019 - NTS

STD. PLAN NO. 506

PAGE 1 OF 1

(2012 STD. NO. 103)

MAIN PIPE	SERVICE SADDLE
ACP OR DIP	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90 JONES J996



NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METERS PROVIDED AND SET BY THE PUBLIC WORKS DEPARTMENT.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER MODEL #70 1", LCD W/ILC, GAL TORX, NSF-61 LOW LEAD. ITRON 100E PIT ERT W/GEOTEK ½" x 12" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

SERVICE	OLD CASTLE METER BOX	LID		(A)
		NON-TRAFFIC	TRAFFIC	
1 1/2"	B-36	B-36E	B36-61G	13"(100 G.P.M.)

[A]
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 507 Plot Date: May 29, 2020 at 04:15 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

2" WATER SERVICE WITH BRASS AND POLYETHYLENE LATERAL

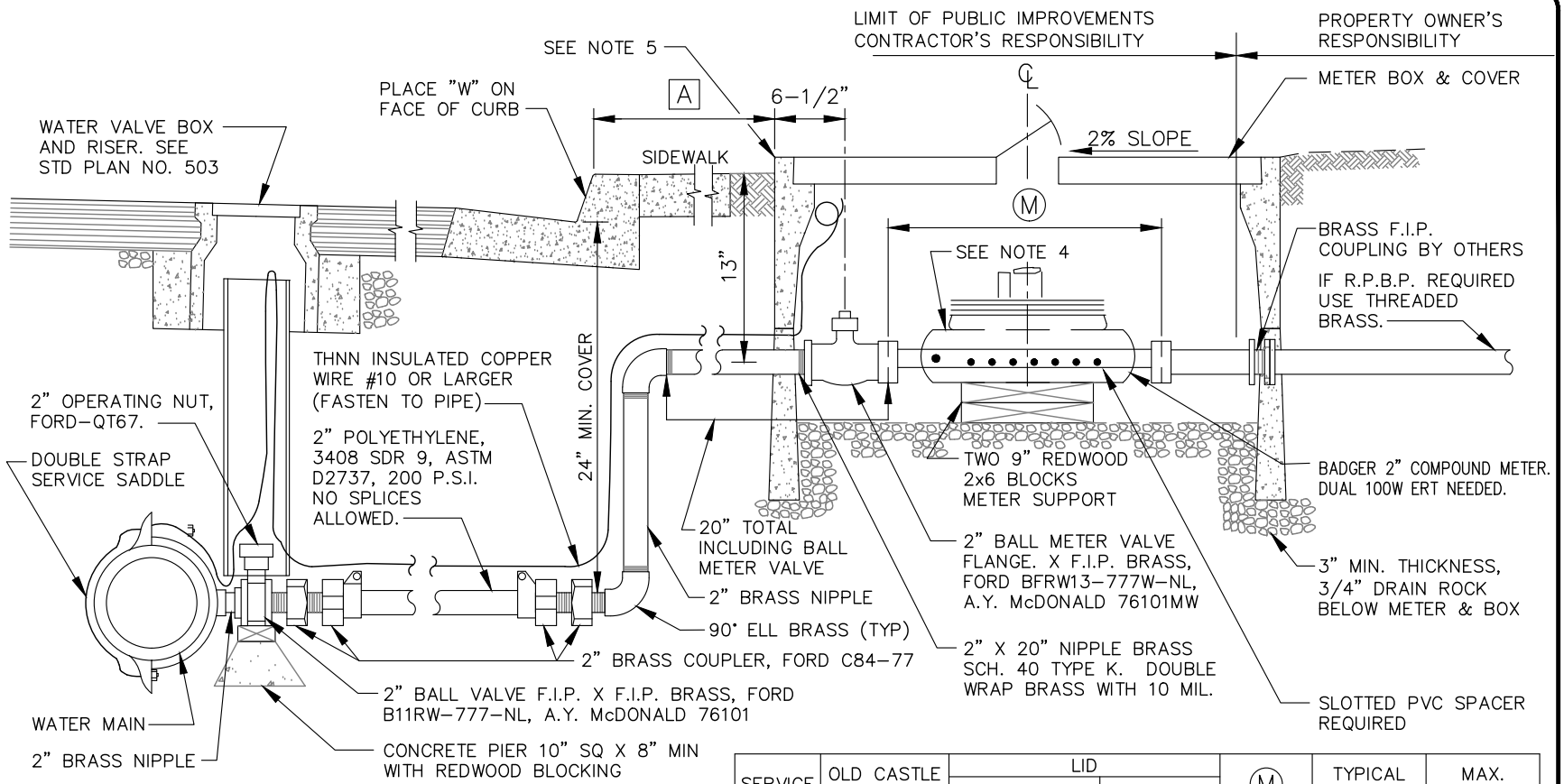
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 104)

STD. PLAN NO. 507

PAGE 1 OF 1



SERVICE	OLD CASTLE METER BOX	LID		M	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
2"*	B-36**	FL-36-G	B-36-61G	15 1/4"	70 G.P.M.	100 G.P.M.

* 2" AND LARGER SHALL BE REVIEWED AND APPROVED BY TOWN ENGINEER.
** METER BOX EXTENSION REQUIRED.

NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METER PROVIDED AND SET BY CONTRACTOR AND REQUIRES PUBLIC WORKS DEPARTMENT INSPECTION.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER MODEL #70 1", LCD W/ILC, GAL TORX, NSF-61 LOW LEAD. ITRON 100E PIT ERT W/GEOTEK ½" x 12" FIBERGLASS ROD.ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
5. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
6. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 508 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

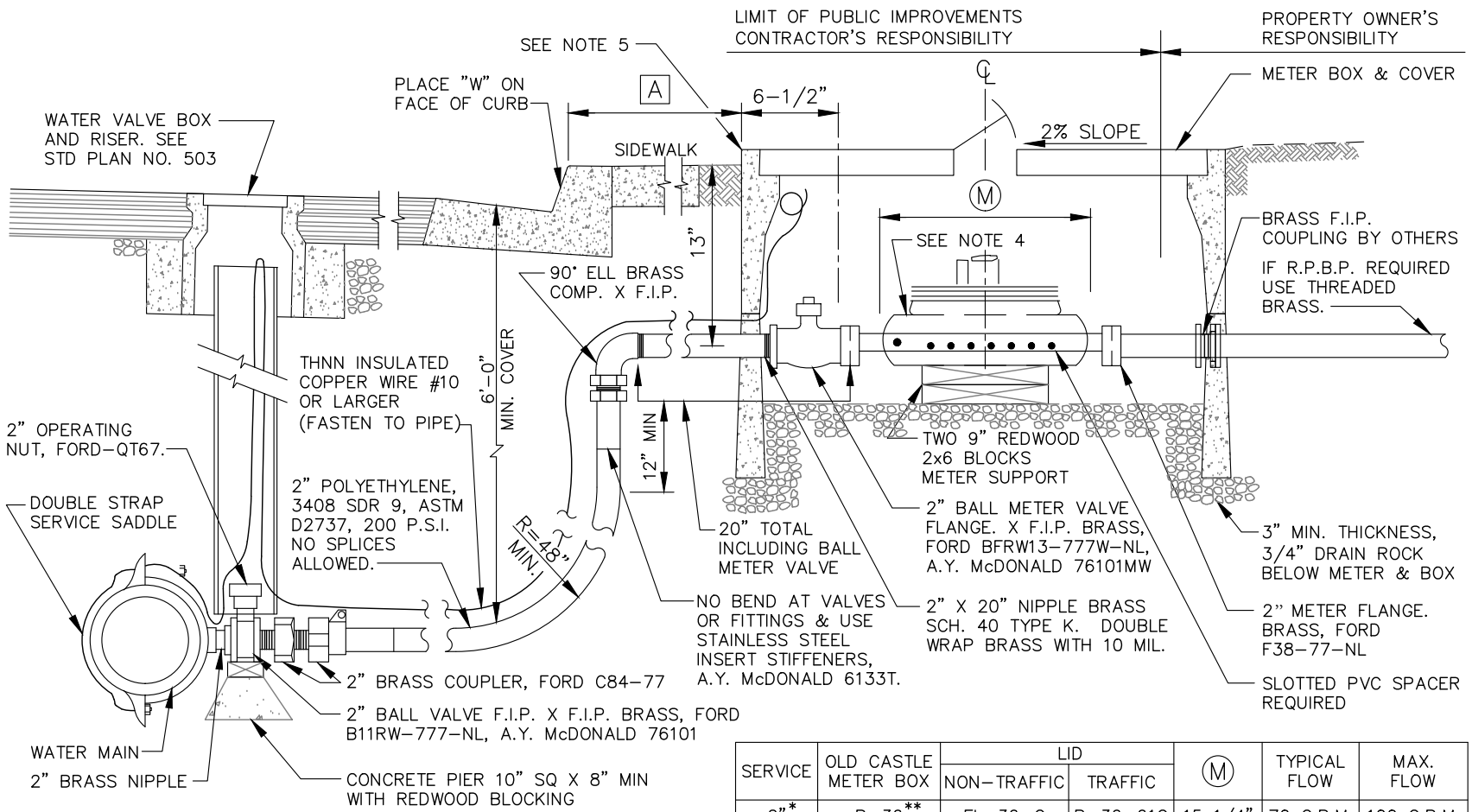
2" WATER SERVICE WITH POLYETHYLENE LATERAL

OCT 2019 - NTS

(2012 STD. NO. NONE)

STD. PLAN NO. 508

PAGE 1 OF 1



SERVICE	OLD CASTLE METER BOX	LID		M	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
2"*	B-36**	FL-36-G	B-36-61G	15 1/4"	70 G.P.M.	100 G.P.M.

* 2" AND LARGER SHALL BE REVIEWED AND APPROVED BY TOWN ENGINEER.
** METER BOX EXTENSION REQUIRED.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METER PROVIDED AND SET BY CONTRACTOR AND REQUIRES PUBLIC WORKS DEPARTMENT INSPECTION.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER MODEL #70 1", LCD W/ILC, GAL TORX, NSF-61 LOW LEAD. ITRON 100E PIT ERT W/GEOTEK ½" x 12" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350
7. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 509-1 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

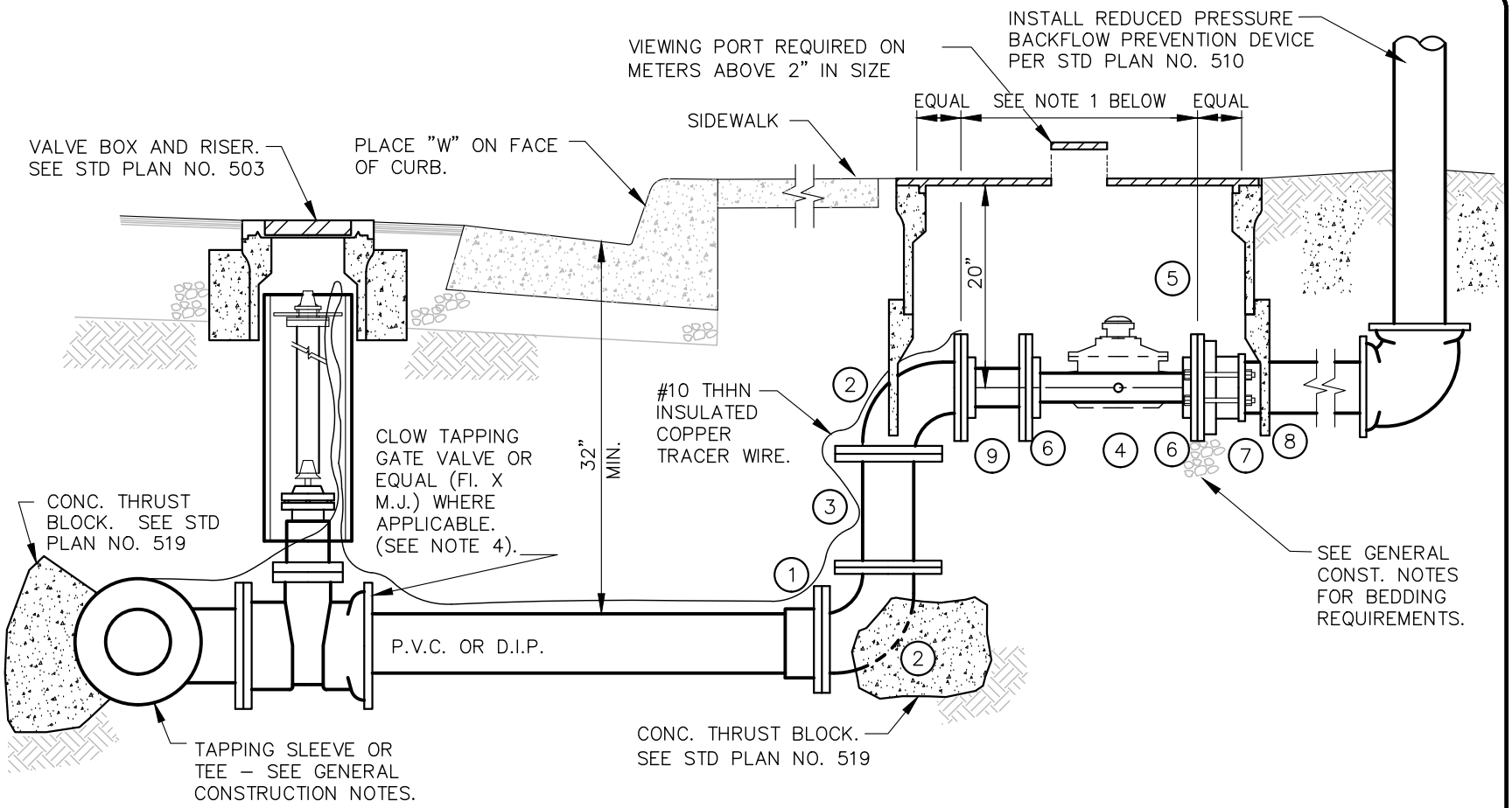
4" METER ON 4" SERVICE LATERAL

OCT 2019 - NTS

(2012 STD. NO. 123)

STD. PLAN NO. 509

PAGE 1 OF 2



NOTES:

1. CONTRACTOR TO INSTALL SCHL. 40 PVC PIPE SPACER WITH 1/2" DIA. HOLES @ 2" O.C. (VERTICALLY DRILLED THRU PIPE).
2. B40 METER BOX MUST BE SET SO THE STEEL COVER IS FLUSH WITH FINISHED SURFACE.
3. SEE GENERAL CONSTRUCTION NOTES.
4. GATE VALVES TO BE RESILIENT SEAT TYPE PER AWWA SPECIFICATION C509 – SEE STANDARD 110.
5. SEE TOWN'S APPROVED LIST FOR TAPPING SLEEVES, METER BOXES AND COVERS.
6. METER TO BE SUPPLIED AND INSTALLED BY DEVELOPER/CONTRACTOR. CONTACT TOWN FOR METER MODEL.
7. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

#	ITEM
1	4" FLANGE ADAPTOR
2	4" X 90° FLANGED ELL – SEE STD PLAN NO. 518
3	4" FLANGED SPOOL – LENGTH AS REQUIRED
4	4" X 20-1/4" SCHL. 40 PVC PIPE (SEE NOTE 1)
5	METER (SEE NOTE 6.)
6	4" SCHEDULE 80 P.V.C. FLANGE
7	4" UNI-FLANGE OR FL. CPLG. ADAPTER
8	4" PE X PE PIECE – LENGTH AS REQUIRED.
9	40" OR 10X DIA. STRAIGHT LENGTH BEFORE 4" METER

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 509-2 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

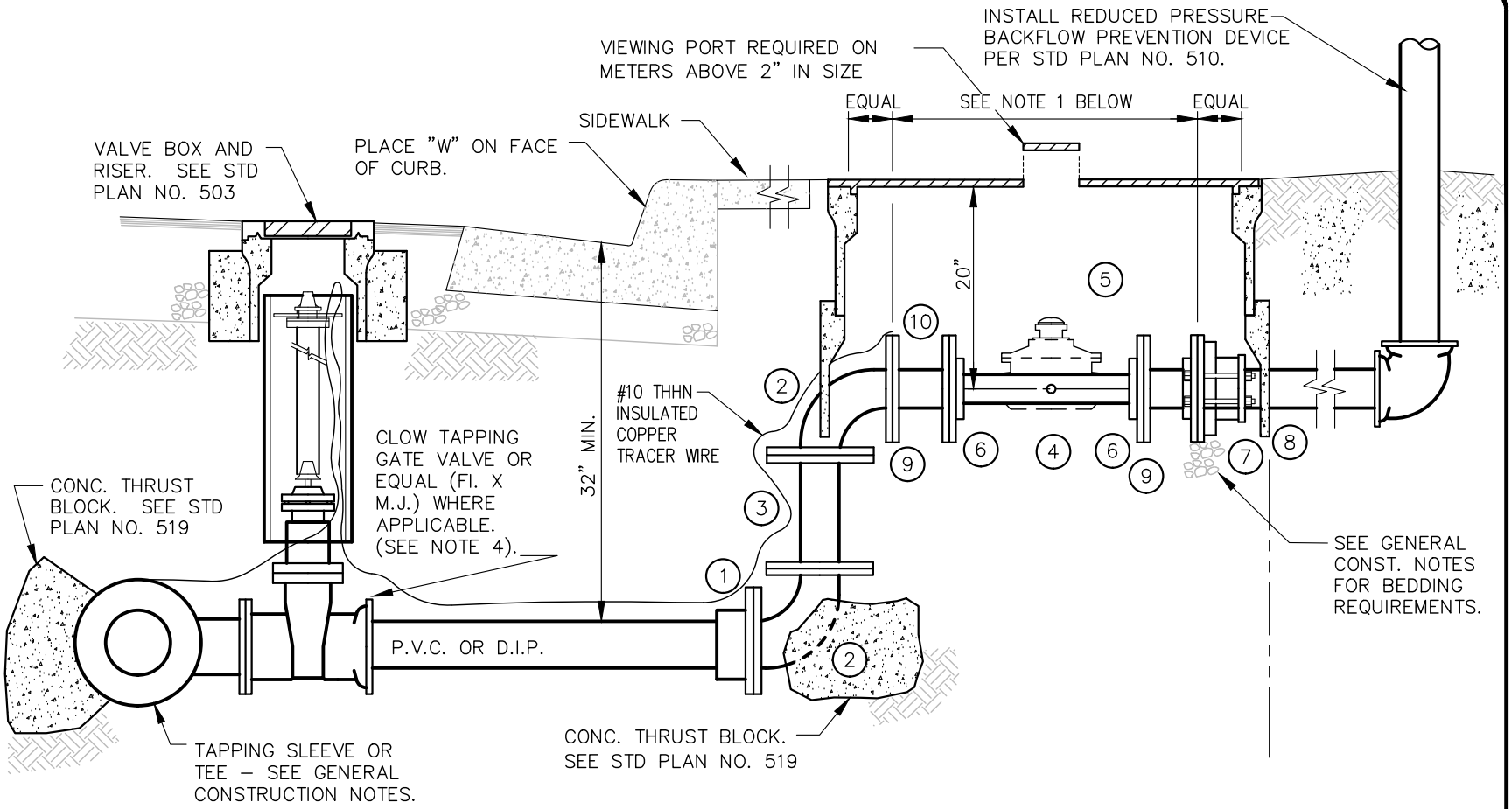
3" METER ON 4" SERVICE LATERAL

OCT 2019 - NTS

(2012 STD. NO. 123)

STD. PLAN NO. 509

PAGE 2 OF 2



NOTES:

1. CONTRACTOR TO INSTALL SCHL. 40 PVC PIPE SPACER WITH 1/2" DIA. HOLES @ 2" O.C. (VERTICALLY DRILLED THRU PIPE).
2. B40 METER BOX MUST BE SET SO THE STEEL COVER IS FLUSH WITH FINISHED SURFACE.
3. SEE GENERAL CONSTRUCTION NOTES.
4. GATE VALVES TO BE RESILIENT SEAT TYPE PER AWWA SPECIFICATION C509 – SEE STD PLAN NO. 503.
5. SEE TOWN'S APPROVED LIST FOR TAPPING SLEEVES, METER BOXES AND COVERS.
6. METER TO BE SUPPLIED AND INSTALLED BY DEVELOPER/CONTRACTOR. CONTACT TOWN FOR METER MODEL.
7. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

#	ITEM
1	4" FLANGE ADAPTOR
2	4" X 90° FLANGED ELL – SEE STD PLAN NO. 518
3	4" FLANGED SPOOL – LENGTH AS REQUIRED
4	4" X 20-1/4" SCHL. 40 PVC PIPE (SEE NOTE 1)
5	METER (SEE NOTE 6.)
6	4" SCHEDULE 80 P.V.C. FLANGE
7	4" UNI-FLANGE OR FL. CPLG. ADAPTER
8	4" PE X PE PIECE – LENGTH AS REQUIRED.
9	4" x 3" FLANGED REDUCER
10	40" OR 10X DIA. STRAIGHT LENGTH BEFORE 4" METER

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 510 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

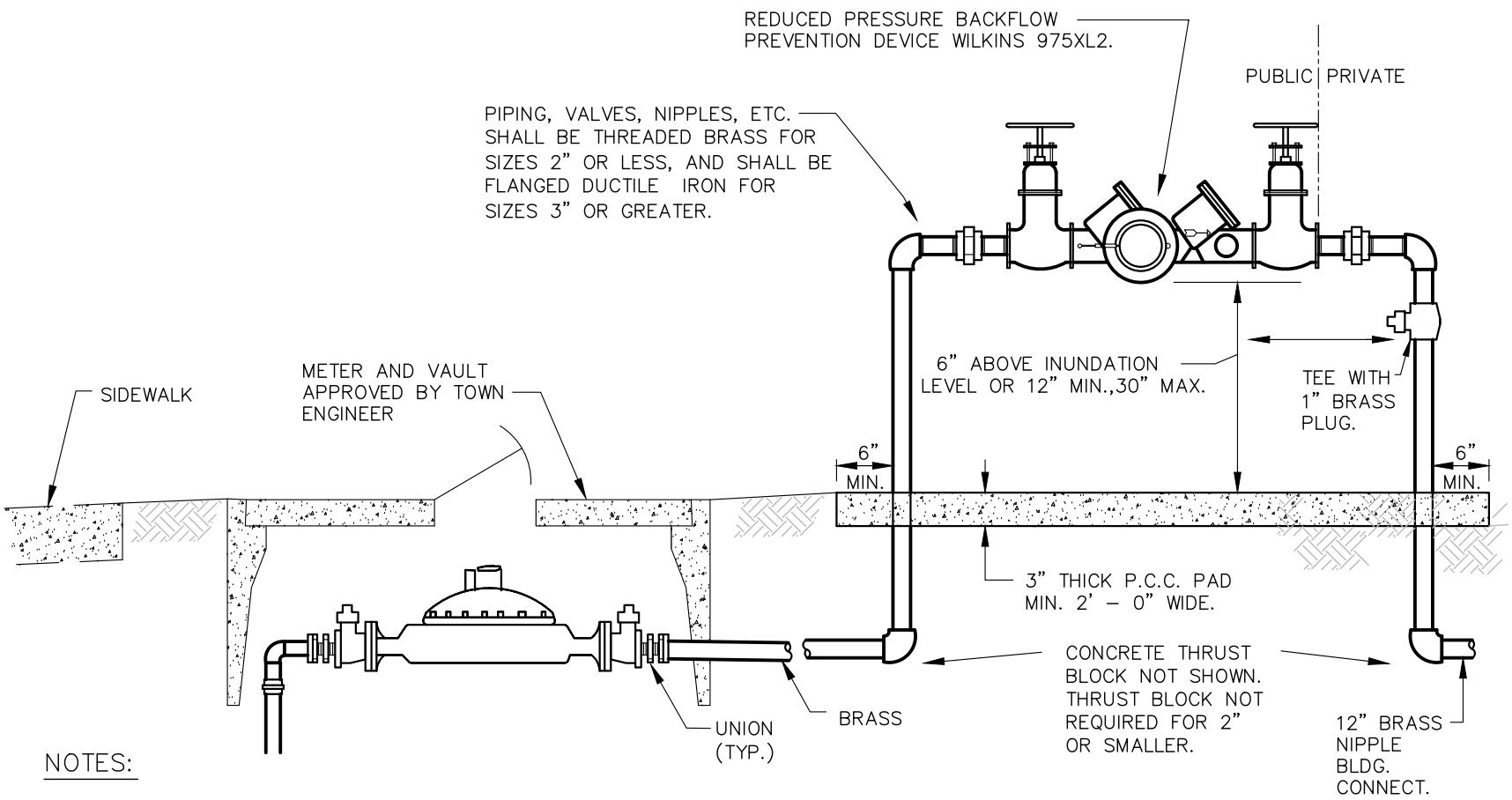
REDUCED-PRESSURE BACKFLOW PREVENTER

OCT 2019 - NTS

(2012 STD. NO. 105)

STD. PLAN NO. 510

PAGE 1 OF 1



NOTES:

1. REDUCED - PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE REQUIRED FOR ANY USE WHERE TOXIC MATERIALS ARE USED OR WHERE POSITIVE PROTECTION FOR THE PUBLIC WATER SUPPLY IS REQUIRED. TYPICAL APPLICATIONS INCLUDE; IRRIGATION SERVICES, COMMERCIAL SERVICES, INDUSTRIAL SERVICES, HOSPITALS, LABORATORIES, MORTUARIES, OR AS DETERMINED BY THE TOWN. (TITLE 17 CALIF. ADMINISTRATION CODE)
2. APPROVED REDUCED-PRESSURE TYPE BACKFLOW PREVENTION DEVICES SHALL BE AS LISTED BY THE UNIVERSITY OF SOUTHERN CALIFORNIA STUDY, LATEST REVISION.
3. BACKFLOW PREVENTION DEVICES SHALL BE INSTALLED ADJACENT TO AND ON THE PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE TO THE WATER METER LOCATION AS PRACTICAL.
4. DEVICE TO BE SAME SIZE OR LARGER THAN SERVICE METER
5. LANDSCAPING OR OTHER SCREENING AROUND THE BACKFLOW DEVICE SHALL BE AS SHOWN ON APPROVED PLANS.
6. CONTRACTOR/DEVELOPER/PROPERTY OWNER MUST SUPPLY A PROFESSIONALLY FABRICATED THERMAL INSULATION BLANKET. OUTER CANVAS OR SAIL CLOTH COVER TO BE DARK GREEN WITH BRASS EYELETS TO ACCOMMODATE LOCK. INSULATION FACTOR R-19 OR BETTER.
7. PHENOLIC OR BRASS PLATE SHALL BE PLACED WITH DESCRIPTION AND/OR ADDRESS INDICATING WHICH BUILDING LINE IS SERVED.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 511 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

DOUBLE DETECTOR CHECK VALVE
SINGLE SERVICE

JOHN JAEGER, PUBLIC WORKS DIRECTOR

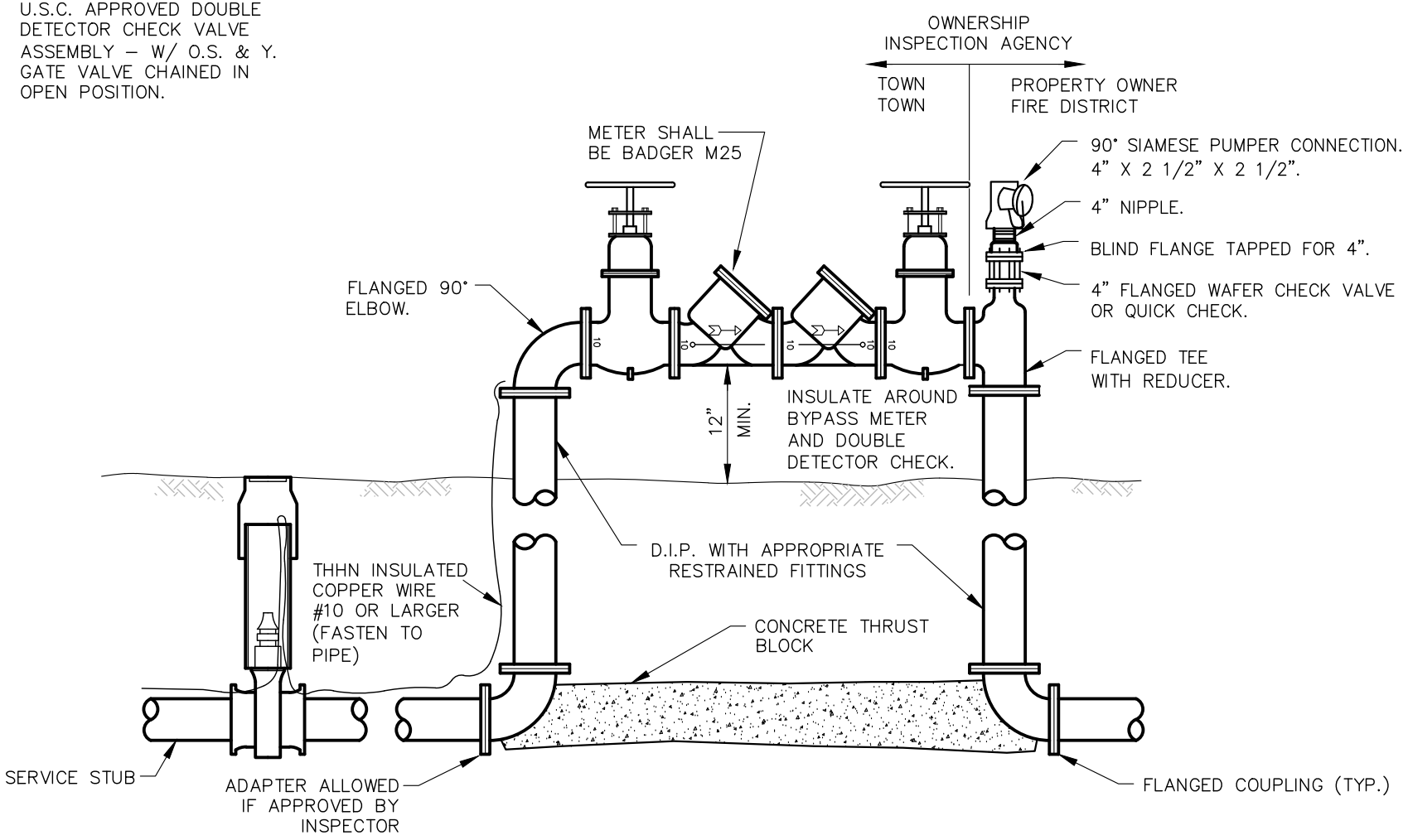
OCT 2019 - NTS

(2012 STD. NO. 106)

STD. PLAN NO. 511

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U.S.C. APPROVED DOUBLE DETECTOR CHECK VALVE ASSEMBLY – W/ O.S. & Y. GATE VALVE CHAINED IN OPEN POSITION.



NOTES:

1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY THE TOWN ENGINEER AND FIRE DEPARTMENT.
3. ALL ABOVE GROUND VALVES AND POST INDICATOR VALVES SHALL BE EQUIPPED WITH TAMPER SWITCH DEVICES AS APPROVED BY THE FIRE DEPT.
4. COMPLETE INSTALLATION SHALL BE PLUMB AND LEVEL.
5. CONTRACTOR/DEVELOPER/PROPERTY OWNER MUST SUPPLY A PROFESSIONALLY FABRICATED THERMAL INSULATION BLANKET. OUTER CANVAS OR SAIL CLOTH COVER TO BE DARK GREEN WITH BRASS EYELETS TO ACCOMMODATE LOCK. INSULATION FACTOR R-19 OR BETTER.
6. PHENOLIC OR BRASS PLATE SHALL BE PLACED WITH DESCRIPTION AND/OR ADDRESS INDICATING WHICH BUILDING LINE IS SERVED.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 512 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DOUBLE DETECTOR CHECK VALVE
DOUBLE SERVICE

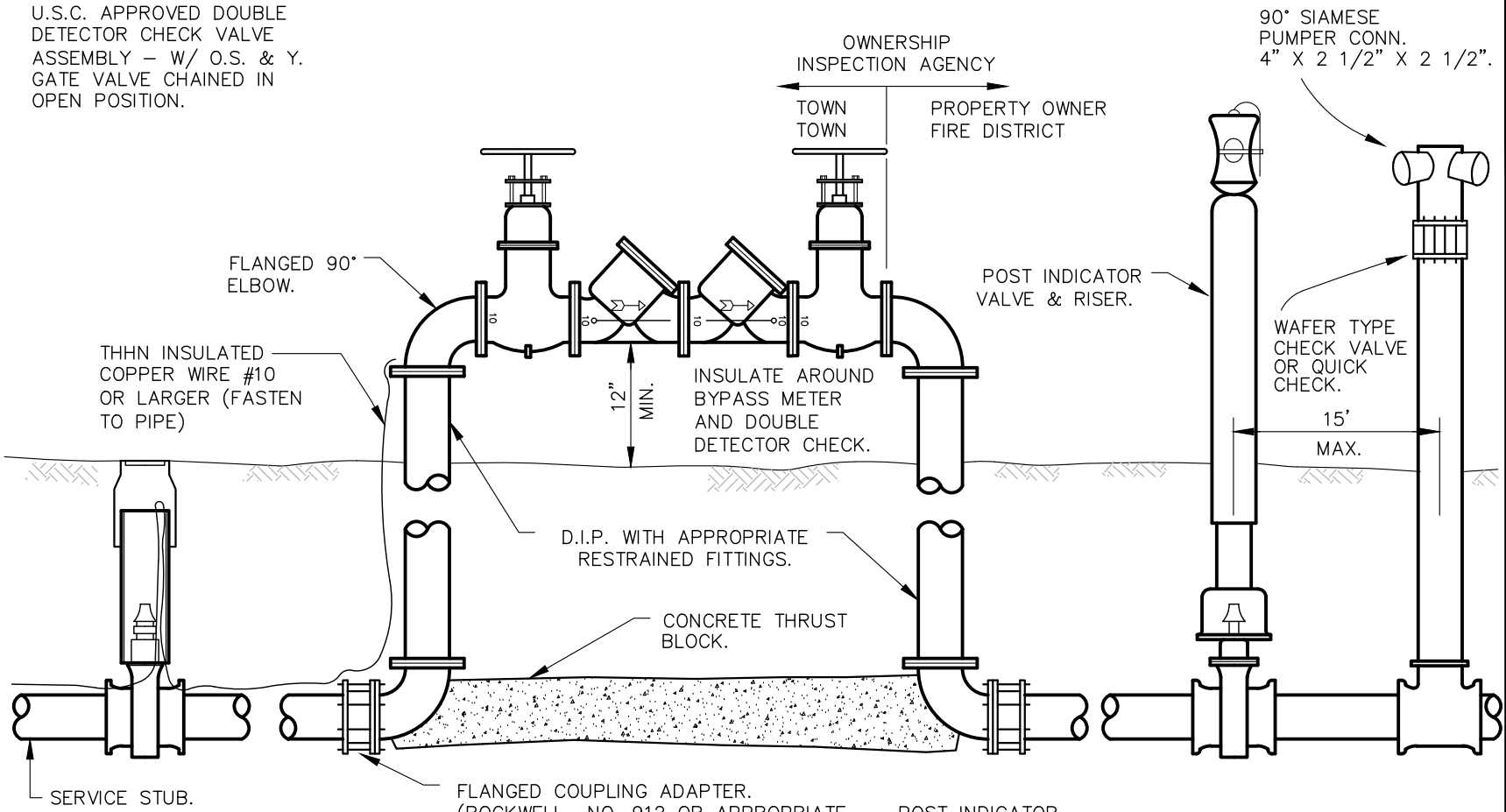
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

STD. PLAN NO. 512

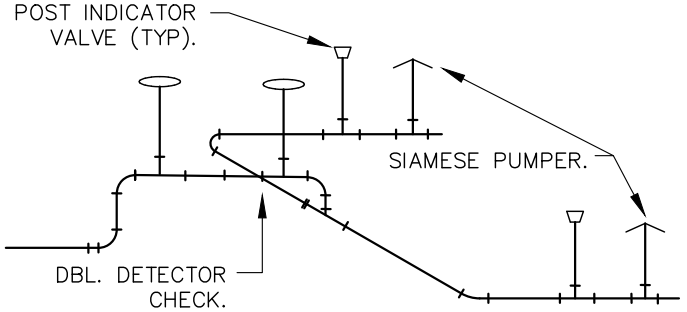
PAGE 1 OF 1

(2012 STD. NO. 107)



NOTES:

1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY THE TOWN ENGINEER AND FIRE DEPARTMENT.
3. ALL ABOVE GROUND VALVES AND POST INDICATOR VALVES SHALL BE EQUIPPED WITH TAMPER SWITCH DEVICES AS APPROVED BY THE FIRE DEPT.
4. COMPLETE INSTALLATION SHALL BE PLUMB AND LEVEL.
5. CONTRACTOR/DEVELOPER/PROPERTY OWNER MUST SUPPLY A PROFESSIONALLY FABRICATED THERMAL INSULATION BLANKET. OUTER CANVAS OR SAIL CLOTH COVER TO BE DARK GREEN WITH BRASS EYELETS TO ACCOMMODATE LOCK. INSULATION FACTOR R-19 OR BETTER.
6. PHENOLIC OR BRASS PLATE SHALL BE PLACED WITH DESCRIPTION AND/OR ADDRESS INDICATING WHICH BUILDING LINE IS SERVED.



ISOMETRIC OF PIPING

Xrefs: Images: windsor logo.tif;
Path: I:\80 – Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III – 500 Series Update\CAD Files\Part III – STD Plan 513 & 514.dwg Layout Name: 513 Plot Dat

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SINGLE COMBINATION WATER SERVICE

STD. PLAN NO. 513

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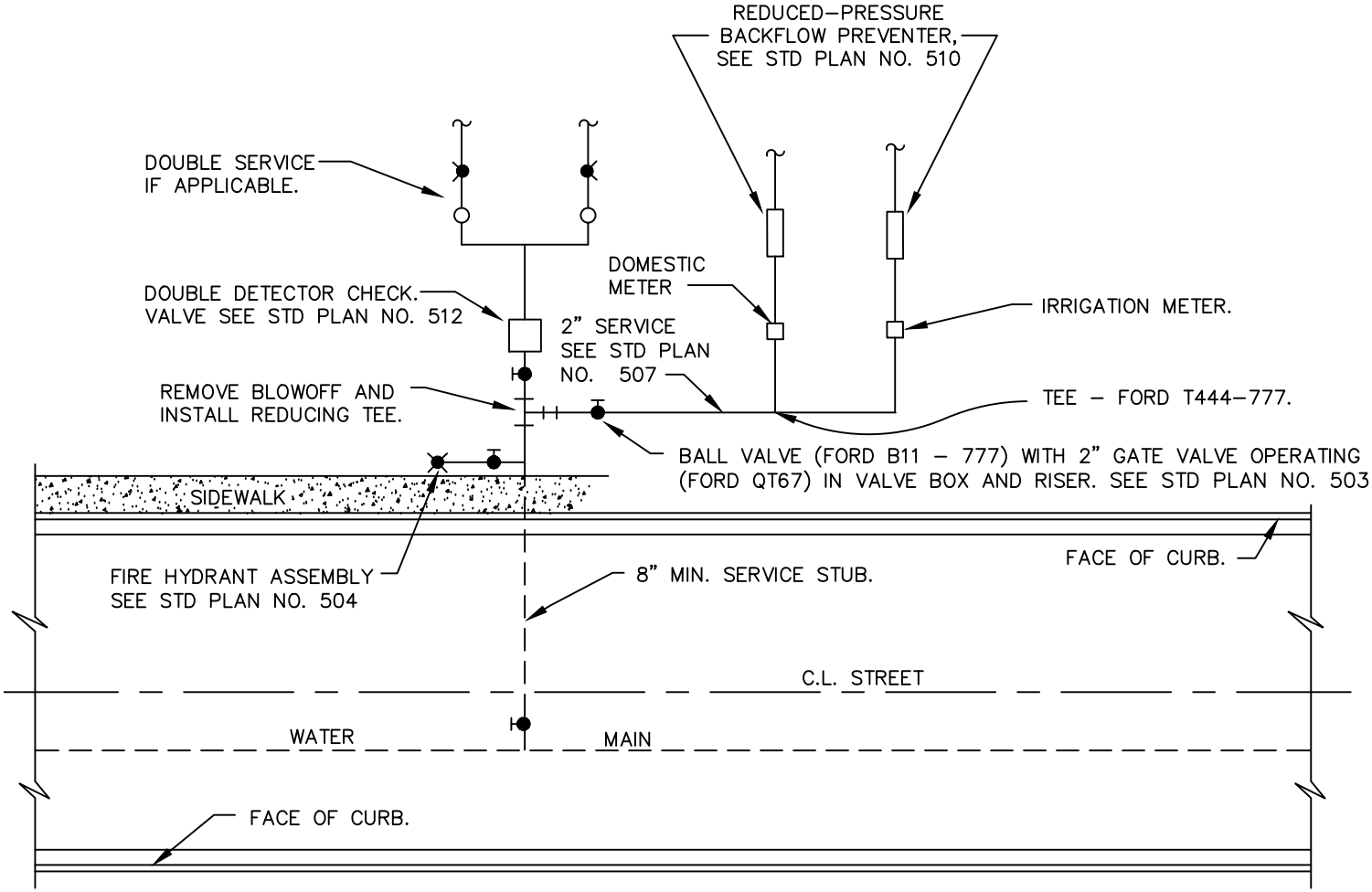
SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

JUNE 2023 – NTS

(2012 STD. NO. 108)

NOTES:

1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY THE TOWN ENGINEER AND FIRE DISTRICT.



SINGLE COMBINATION WATER SERVICE

Xrefs: Images: windsor logo.tif;
Path: I:\80 - Public Works\Land Dev\$ Standards & References\Windsor Design & Construction Standards\2023\Part III - 500 Series Update\CAD Files\Part III - STD Plan 513 & 514.dwg Layout Name: 514 Plot Dat

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

DUAL COMBINATION WATER SERVICE

SHANNON COTULLA
PUBLIC WORKS DIRECTOR/TOWN ENGINEER

JUNE 2023 - NTS

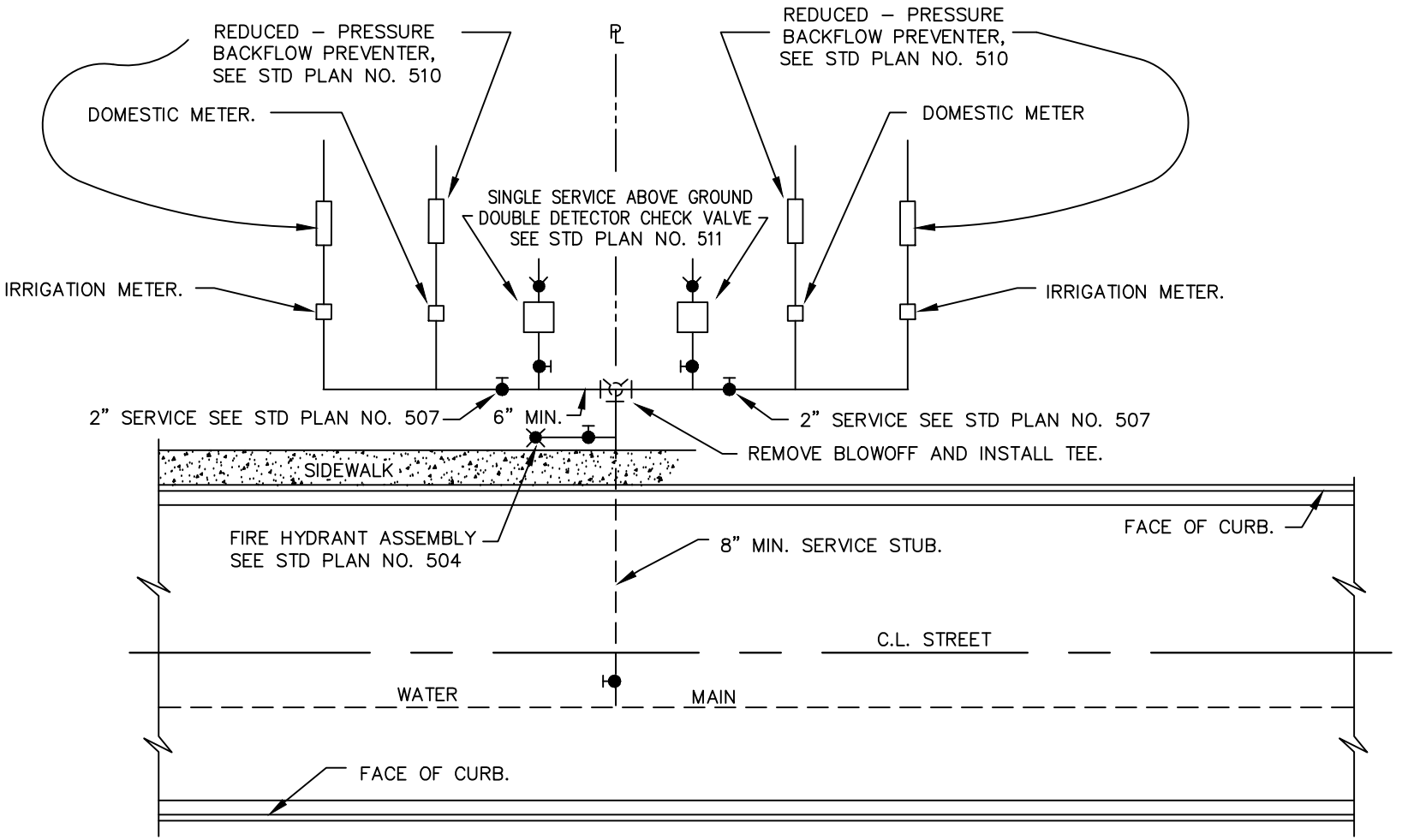
(2012 STD. NO. 109)

STD. PLAN NO. 514

PAGE 1 OF 1

NOTES:

1. INSTALL FIRE HYDRANT WITHIN 50 FEET OF SIAMESE PUMPER CONNECTION, AS SHOWN ON APPROVED PLANS.
2. LOCATION TO BE APPROVED BY THE TOWN ENGINEER AND FIRE DISTRICT.



DUAL COMBINATION WATER SERVICE

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 515 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

TEMPORARY BLOW-OFF WITH MAIN LINE VALVE

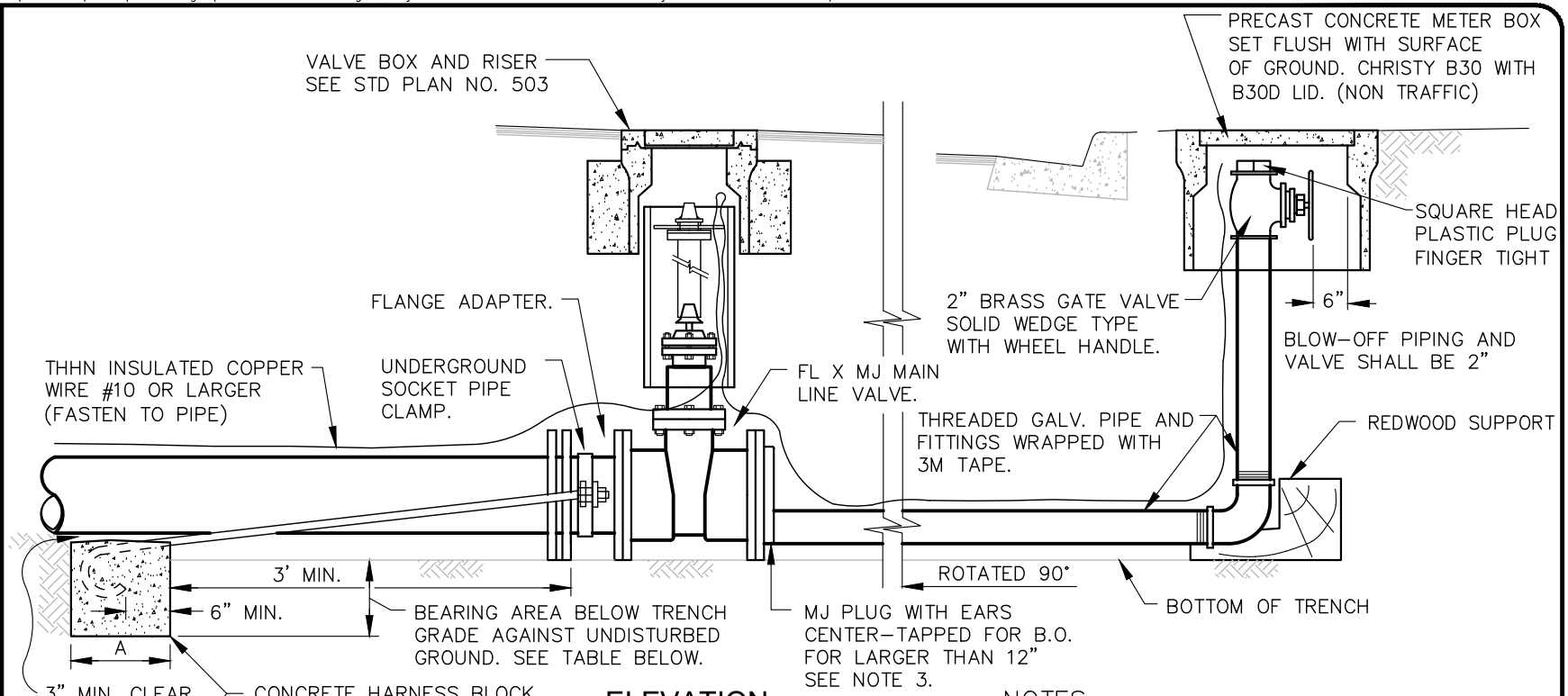
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 111)

STD. PLAN NO. 515

PAGE 1 OF 1



CONCRETE SHALL EXTEND AT LEAST TO THE UNDISTURBED EARTH AT BOTH SIDES OF THE TRENCH.

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	BEARING AREA	A	SIZE B.O.
6"	5/8"	4 SQ. FT.	2'	2"
8"	3/4"	7 " "	3'	2"
12"	1 1/8"	16 " "	3'	2"
OVER 12"	BY THE DESIGN ENGINEER			

NOTES:

1. TO BE INSTALLED IN CASES WHERE MAIN MAY BE EXTENDED IN FUTURE AND NO VALVE EXISTS WITHIN 250 FT.
2. BLOW-OFF SHALL NOT BE INSTALLED WITHIN THE TRAVELED WAY. IF THE MAIN ENDS WITHIN STREET AREA, BLOW-OFF TO BE EXTENDED TO AN AREA OUTSIDE OF THE TRAVELED WAY. LID TO BE HIGHWAY GRADE WITH LOCK DOWN CAPABILITY.
3. FOR 12" PIPE SIZE OR LARGER USE FL X FL MAIN LINE VALVE, PER STD PLAN NO. 503 AND FL X MJ ADAPTER & MJ PLUG TAPPED AT BOTTOM FOR B.O.
4. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.
5. IF MJ X MJ GATE VALVE IS USED, RESTRAINING RODS SHALL BE RUN TO UPSTREAM GLAND AND ATTACHED WITH "DILLIE LUG"(AKA STAR BOLT).

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 517 Plot Date: May 29, 2020 at 04:16 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

PERMANENT BLOWOFF

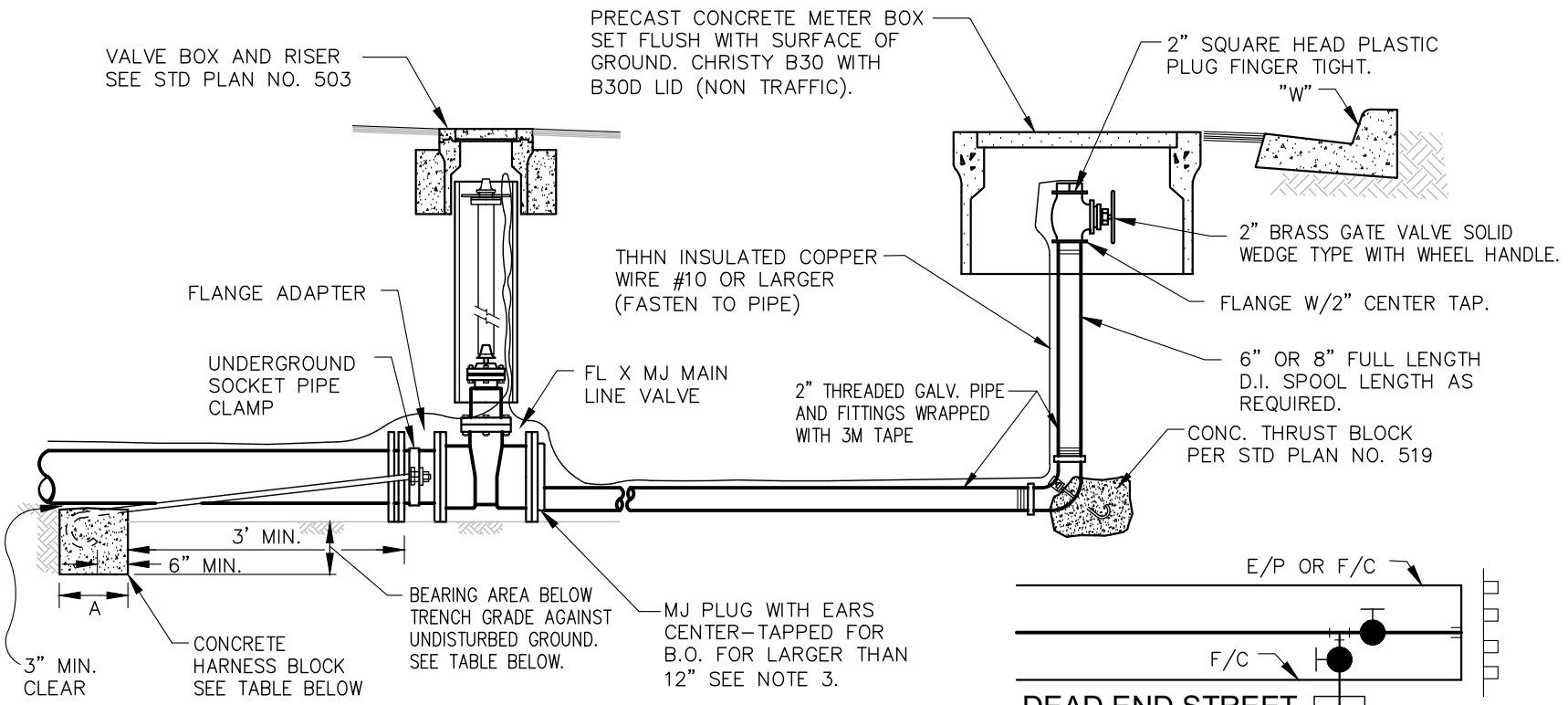
DESIGN AND CONSTRUCTION STANDARDS

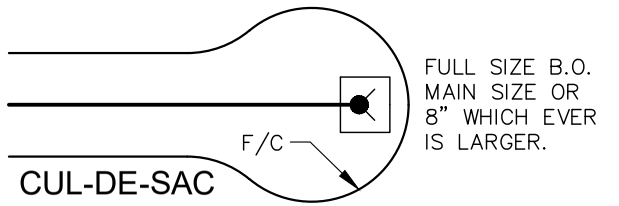
OCT 2019 - NTS

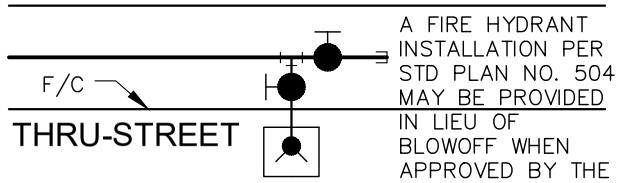
(2012 STD. NO. 121)

STD. PLAN NO. 517

PAGE 1 OF 1





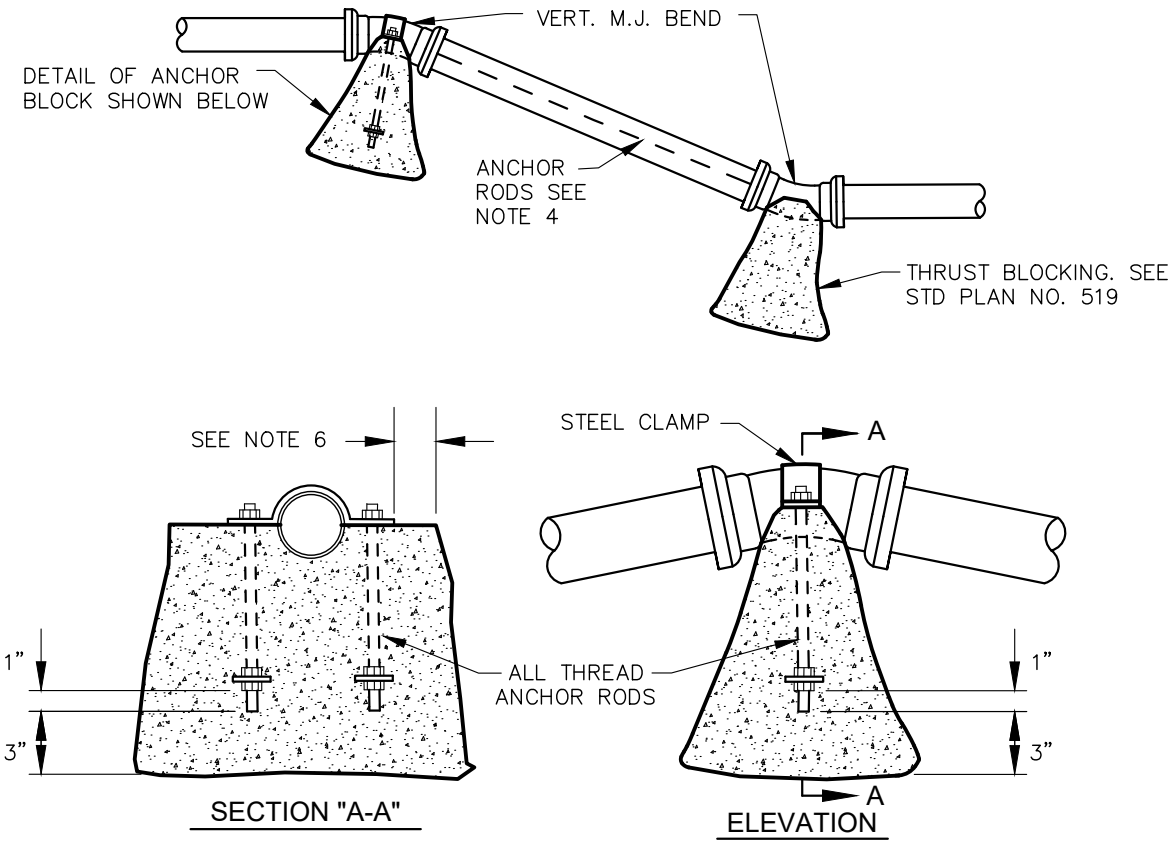


NOTES:

1. SEE SECTION 5, GENERAL CONSTRUCTION NOTES.
2. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.
3. METER BOX SHALL BE CHRISTY B40 WITH HIGHWAY RATED LID WITH LOCK DOWN CAPABILITY.
4. FOR 12" PIPE SIZE OR LARGER USE FL X FL MAIN LINE VALVE, PER STD PLAN NO. 503 AND FL X MJ ADAPTER AND MJ PLUG TAPPED AT BOTTOM FOR B.O.

MINIMUM DIMENSIONS

PIPE SIZE	TIE RODS	BEARING AREA	A	SIZE B.O.
6"	5/8"	4 SQ. FT.	2'	2"
8"	3/4"	7 " "	3'	2"
12"	1 1/8"	16 " "	3'	2"
OVER 12"	BY THE DESIGN ENGINEER			



TYPICAL CONCRETE ANCHOR BLOCK FOR VERTICAL BEND

NOTES:

1. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC OR APPROVED EQUAL, AFTER NUTS ARE TIGHTENED.
2. CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED BY THE CONTRACTOR TO WITHSTAND A THRUST PRODUCED BY THE TEST PRESSURE OF 200 PSI. MINIMUM DIMENSIONS FOR CONCRETE, ANCHOR RODS, AND CLAMPS ARE LISTED IN THE TABLES (ON SHEET 2 OF 2).
3. USE MECHANICAL JOINT RETAINER GLANDS AT ALL FITTINGS.
4. FOR PVC PIPE, ANCHOR RODS (THREADED FULL LENGTH) BETWEEN FITTINGS (MIN. 2 REQUIRED.) MAY BE USED IN LIEU OF RETAINING GLANDS.
5. MINIMUM 3" CLEARANCE FROM END OF ANCHOR ROD TO FACE OF CONCRETE.
6. MINIMUM 2" CLEARANCE FROM EDGE OF CLAMP TO EDGE OF CONCRETE.
7. TOP BOLT TO BE DOUBLE BOLTED TO A SNUG FIT PLUS ONE HALF TURN.
8. EMBEDDED ANCHOR RODS SHALL INCLUDE A 3" x 3" x 1/4" (MINIMUM) WASHER WITH ALL THREAD BOLTS TOP AND BOTTOM, SNUG FIT PLUS ONE HALF TURN, 1" FROM END OF ANCHOR ROD.
9. ALL CONCRETE SHALL BE 2,500 PSI OR GREATER.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

STD. PLAN NO. 518

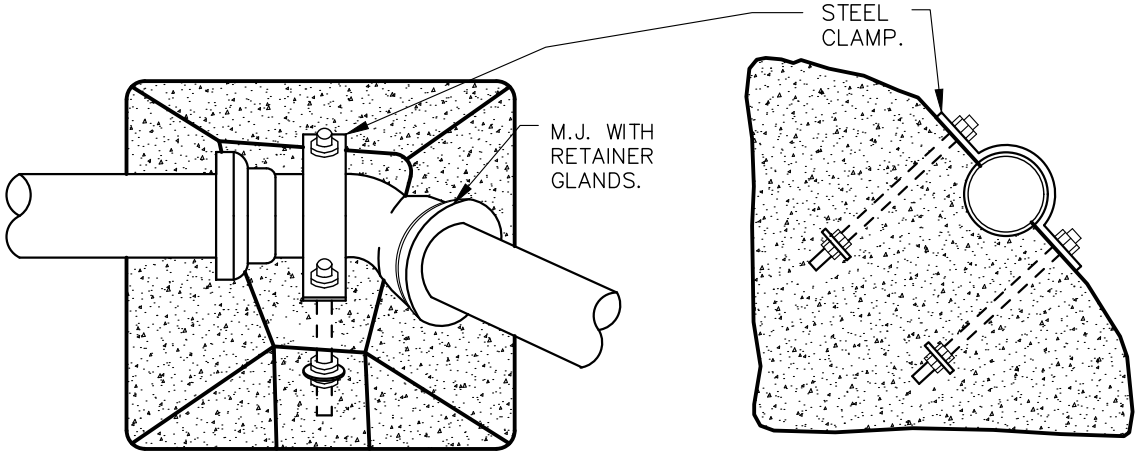
PAGE 1 OF 2

(2012 STD. NO. 113)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 518-1 Plot Date: May 29, 2020 at 04:16 pm

22.5° BEND				
PIPE SIZE	ANCHOR RODø	EMBEDMENT LENGTH	VOLUME OF CONCRETE	STEEL CLAMP
≧ 6"	5/8"	2'–0"	1 CY	3" X 1/4"
8"	3/4"	2'–0"	1.5 CY	3–1/4" X 1/4"
10"	1"	2'–4"	2.3 CY	4" X 1/2"
12"	1 1/8"	3'–0"	3.3 CY	4" X 1/2"
14"	1 3/8"	3'–4"	4.4 CY	5" X 1/2"
16"	1 1/2"	4'–0"	5.8 CY	5 1/4" X 1/2"

45° BEND				
PIPE SIZE	ANCHOR RODø	EMBEDMENT LENGTH	VOLUME OF CONCRETE	STEEL CLAMP
≧ 6"	3/4"	2'–0"	1.6 CY	3–1/4" X 1/4"
8"	1–1/8"	3'–0"	2.8 CY	4" x 1/2"
10"	1–3/8"	3'–4"	4.5 CY	5" x 1/2"
12"	1–5/8"	4'–0"	6.4 CY	5–1/4" x 1/2"
14"	1–7/8"	4'–9"	8.7 CY	5–1/2" X 1/2"
16"	2–1/8"	5'–6"	11.4 CY	6" x 3/4"



TYPICAL CONCRETE ANCHOR BLOCK FOR COMBINATION HORIZONTAL-VERTICAL BEND

NOTES:

1. COMBINATION HORIZONTAL–VERTICAL BENDS REQUIRE SPECIFIC DESIGN CALCULATIONS BASED ON CONFIGURATION. CALCULATIONS SHALL BE SUBMITTED FOR APPROVAL.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

STD. PLAN NO. 518

(2012 STD. NO. 113)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 518-2 Plot Date: May 29, 2020 at 04:16 pm

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\500-519 Water.dwg Layout Name: 519, Plot Date: May 29, 2020 at 04:17 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

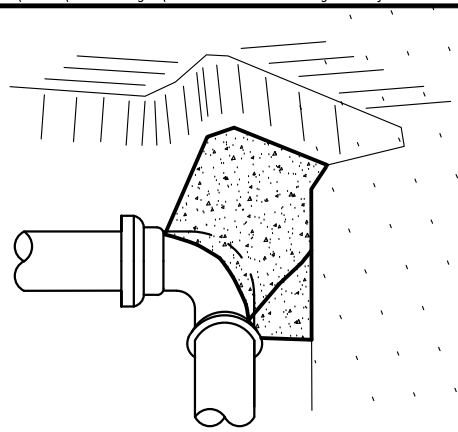
CONCRETE THRUST BLOCKING

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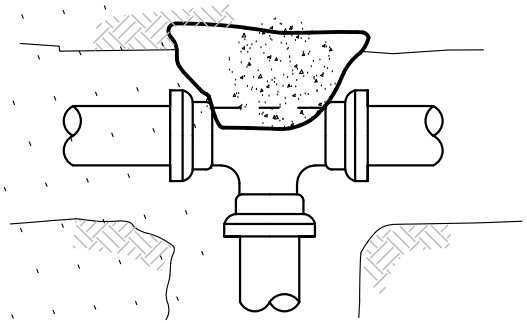
(2012 STD. NO. 114)

STD. PLAN NO. 519

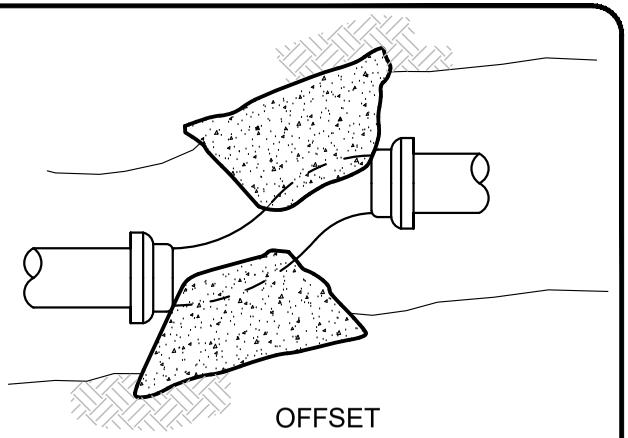
PAGE 1 OF 1



BEND



TEE

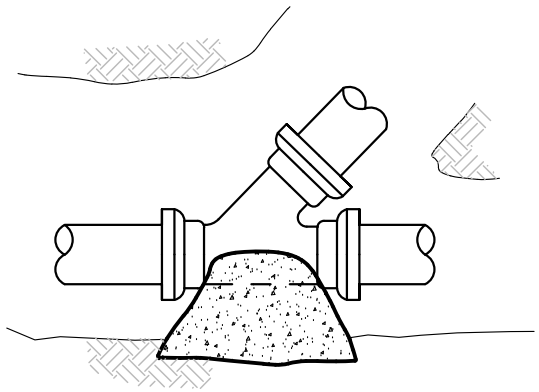


OFFSET

TYPICAL CONC. BLOCKING SHOWN IN PERSPECTIVE

NOTES:

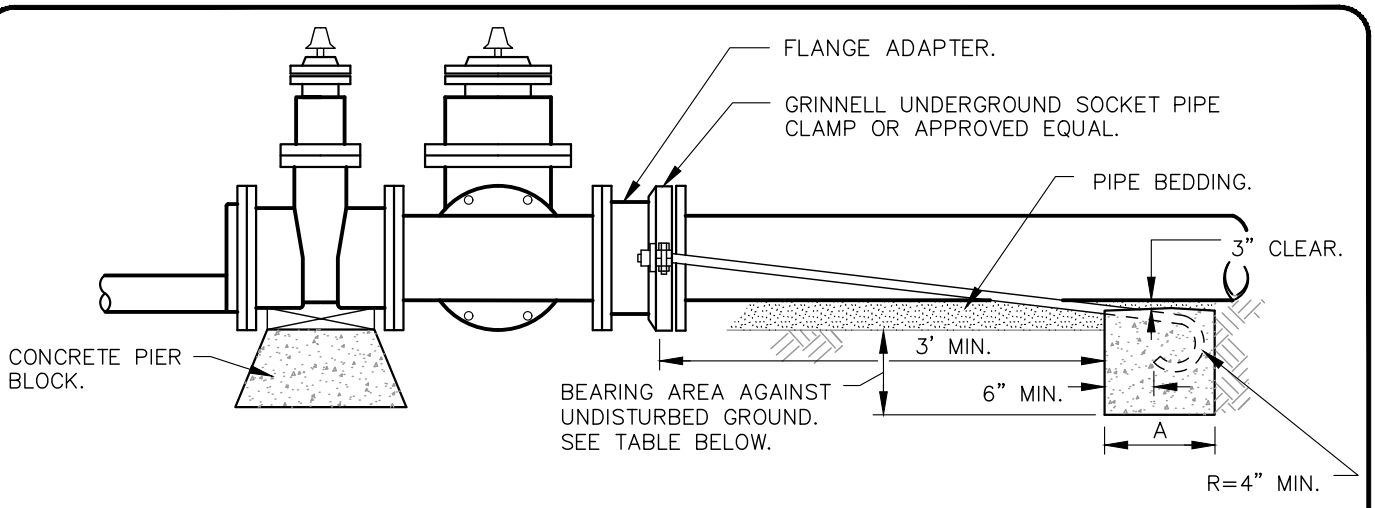
1. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
2. CONCRETE BLOCKING, CAST-IN-PLACE, TO EXTEND FROM BELLS OF FITTINGS TO UNDISTURBED SOIL AND ENTIRE BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
3. IN USING THE THRUST BLOCKING TABLE BELOW, ASSUME 2000 P.S.F. BEARING CAPACITY UNLESS OTHERWISE SHOWN ON THE PLANS. THE DESIGN ENGINEER SHALL SPECIFY THRUST BLOCKING REQUIREMENTS FOR ALL OTHER SOIL BEARING CONDITIONS.
4. FOR PLUGGED LEG(S) OF TEE OR CROSS, USE HARNESS TYPE BLOCKING AS SHOWN ON STD PLAN NO. 520 AND CONCRETE BLOCKING INDICATED IN TABLE BELOW.



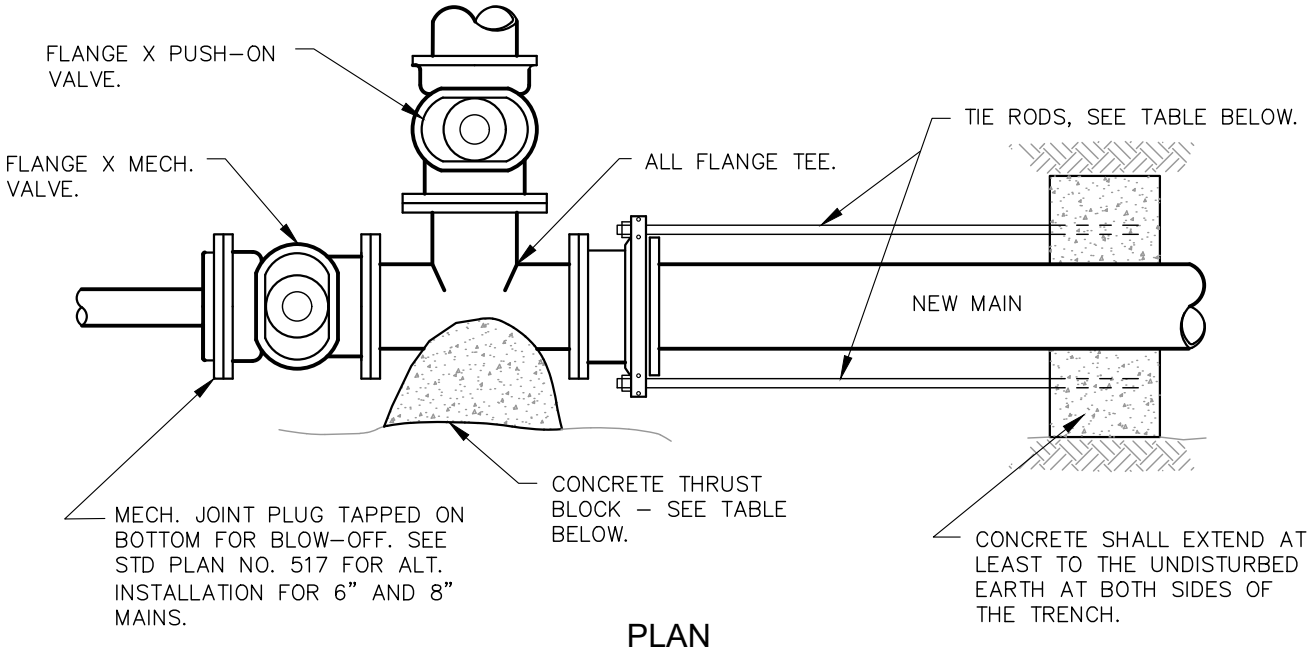
WYE

MIN. REQ'D BEARING AREA IN SQ. FT. PER 100 P.S.I. TEST PRESSURE *						
PIPE SIZE	SOIL BEARING CAPACITY	HARNESS BLOCKS	TEES & DEAD ENDS	90° BENDS	45° BENDS	22-1/2° BENDS
6"	1000 2000	4 2	4 2	6 3	3 2	2 1
8"	1000 2000	7 4	7 4	10 5	5 3	3 2
12"	1000 2000	16 8	16 8	22 11	12 6	6 3
14"	1000 2000	22 11	22 11	30 15	16 8	18 4
16"	1000 2000	28 14	28 14	42 21	21 14	14 7

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100



ELEVATION



PLAN

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	HARNESS BLOCK *	A	THRUST BLOCK **
6"	5/8"	4 SQ. FT.	2'	4 SQ. FT.
8"	3/4"	7 " "	3'	7 " "
12"	1 1/8"	15 " "	3'	16 " "
OVER 12" BY THE DESIGN ENGINEER				

NOTE:

ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.

* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.
** BEARING AREA AGAINST UNDISTURBED GROUND.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL HARNESS INSTALLATION FOR FLANGE FITTINGS

JOHN JAEGER, PUBLIC WORKS DIRECTOR

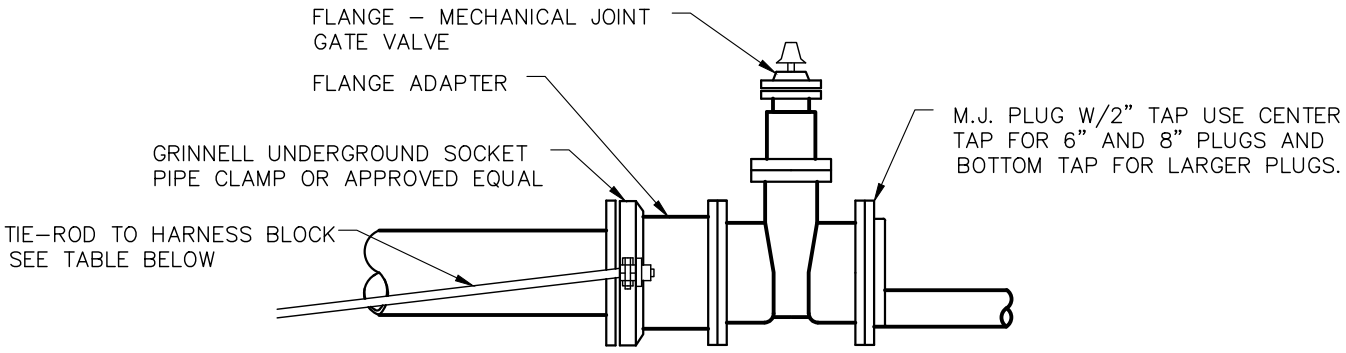
OCT 2019 – NTS

STD. PLAN NO. 520

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(2012 STD. NO. 116)

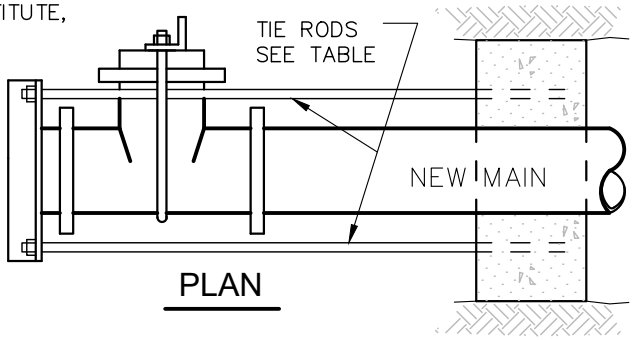
Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 520 Plot Date: May 29, 2020 at 04:12 pm



HARNESS FOR VALVE WITH PLUG

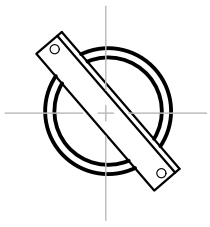
NOTE:

ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR OR APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.

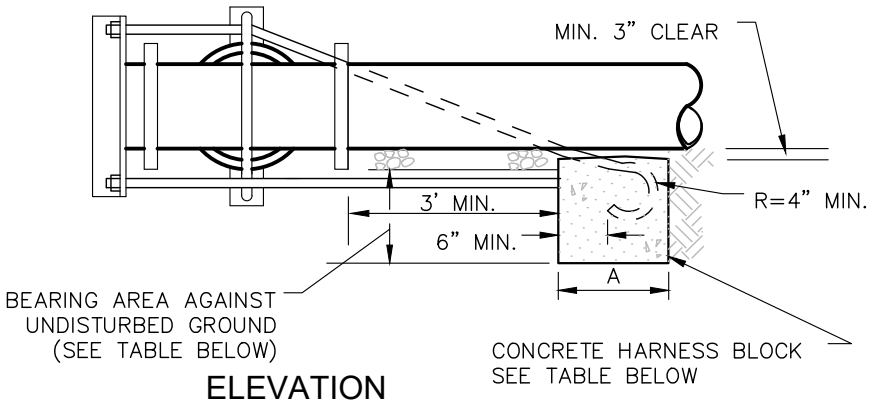


PLAN

PLUGS FOR MAINS 12" AND LARGER SHALL BE TAPPED OFF CENTER AND HELD WITH ANGLE IRON, AS SHOWN. PLUGS WITH EARS AND CENTER TAP MAY BE USED FOR 6" & 8" MAINS.



CONCRETE SHALL EXTEND AT LEAST TO THE UNDISTURBED EARTH AT BOTH SIDES OF THE TRENCH.



ELEVATION

MINIMUM DIMENSIONS				
PIPE SIZE	TIE RODS	ANGLE IRON	* HARNESS BLOCK	A
6"	5/8"	3"X3"X1/4"	4 SQ. FT.	2'
8"	3/4"	3 1/2"X3"X1/4"	7 " "	3'
12"	1 1/8"	4"X3"X1/2"	16 " "	3'
OVER 12"	BY THE DESIGN ENGINEER			

* BEARING AREA BELOW GRADE OF PIPE AGAINST UNDISTURBED GROUND.

TYPICAL FITTING HARNESS

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL HARNESS INSTALLATION

STD. PLAN NO. 521

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JOHN JAEGER, PUBLIC WORKS DIRECTOR

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(2012 STD. NO. 117)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 521 Plot Date: May 29, 2020 at 04:12 pm

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 522 Plot Date: May 29, 2020 at 04:12 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

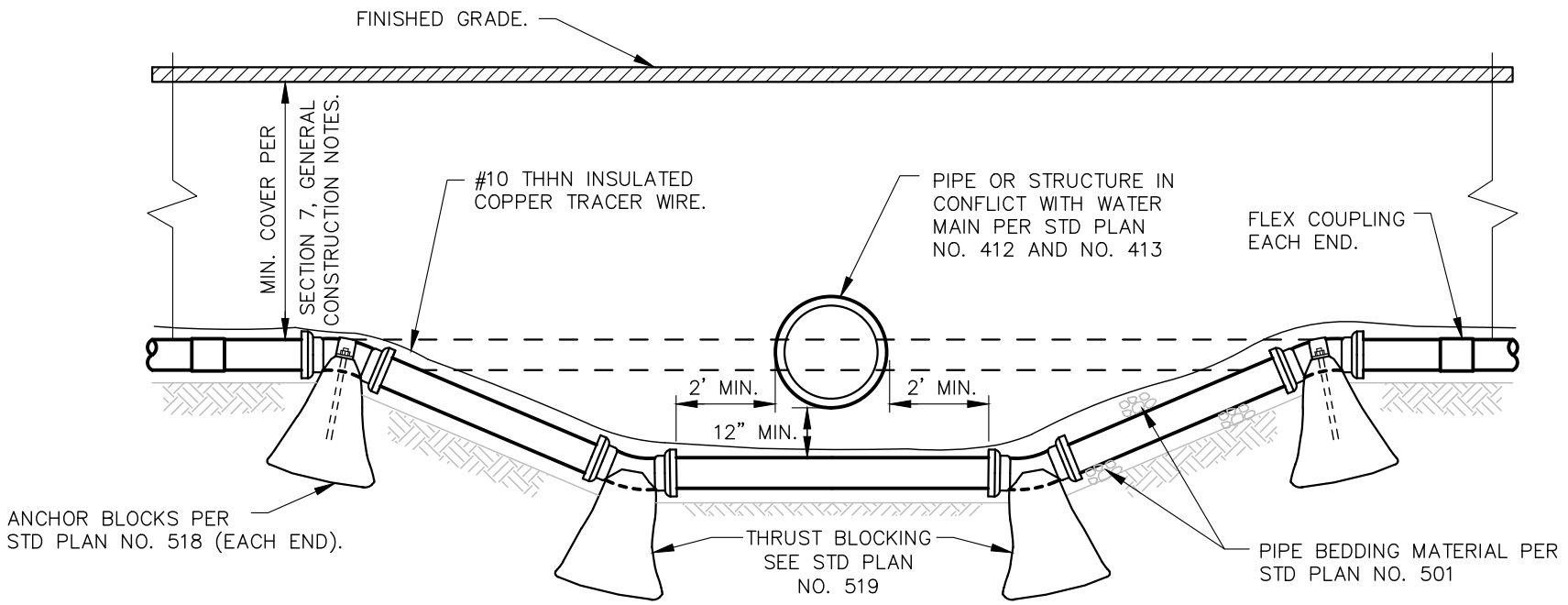
TYPICAL WATER MAIN LOWERING DETAIL

OCT 2019 - NTS

(2012 STD. NO. 118)

STD. PLAN NO. 522

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NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER TOWN STD. CONSTRUCTION SPECIFICATIONS.
2. ONLY MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS OR FLANGED FITTINGS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS.

TYPICAL WATER MAIN LOWERING DETAIL

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 523 Plot Date: May 29, 2020 at 04:12 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

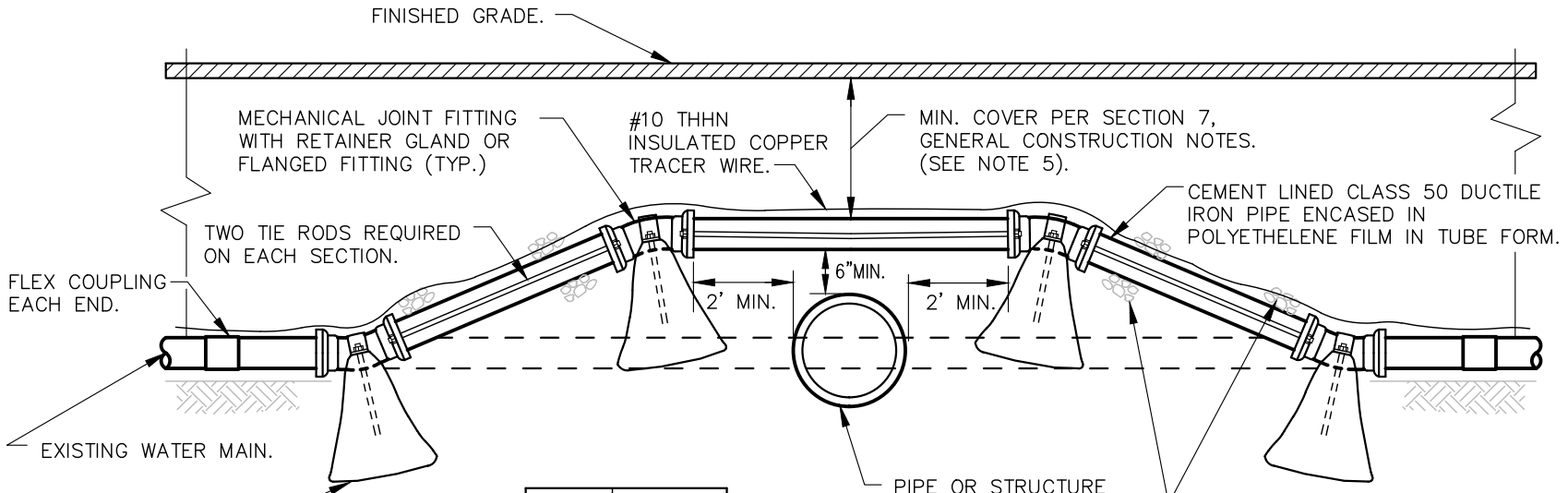
TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

OCT 2019 - NTS

(2012 STD. NO. 119)

STD. PLAN NO. 523

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PIPE SIZE	TIE RODS
6"	5/8"
8"	3/4"
12"	1-1/8"

NOTES:

1. ALL PIPE & FITTINGS SHALL BE DUCTILE IRON & SHALL BE WRAPPED IN POLYETHELENE PER THE TOWN STD. CONSTRUCTION SPECIFICATIONS.
2. ONLY MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS OR FLANGED FITTINGS MAY BE USED.
3. ALL BENDS SHALL BE 45° OR 22-1/2° FITTINGS – NO 90° BENDS ALLOWED.
4. TO BE USED ONLY WITH THE APPROVAL OF THE TOWN ENGINEER.
5. CL. 52 DUCTILE IRON REQUIRED WHERE COVER IS LESS THAN THAT REQUIRED BY THE GENERAL CONSTRUCTION NOTES.

TYPICAL WATER MAIN INSTALLATION OVER STRUCTURE

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 524 Plot Date: May 29, 2020 at 04:12 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL TEMPORARY BLOWOFF AND/OR METERED CONNECTION - MAINS UNDER CONSTRUCTION

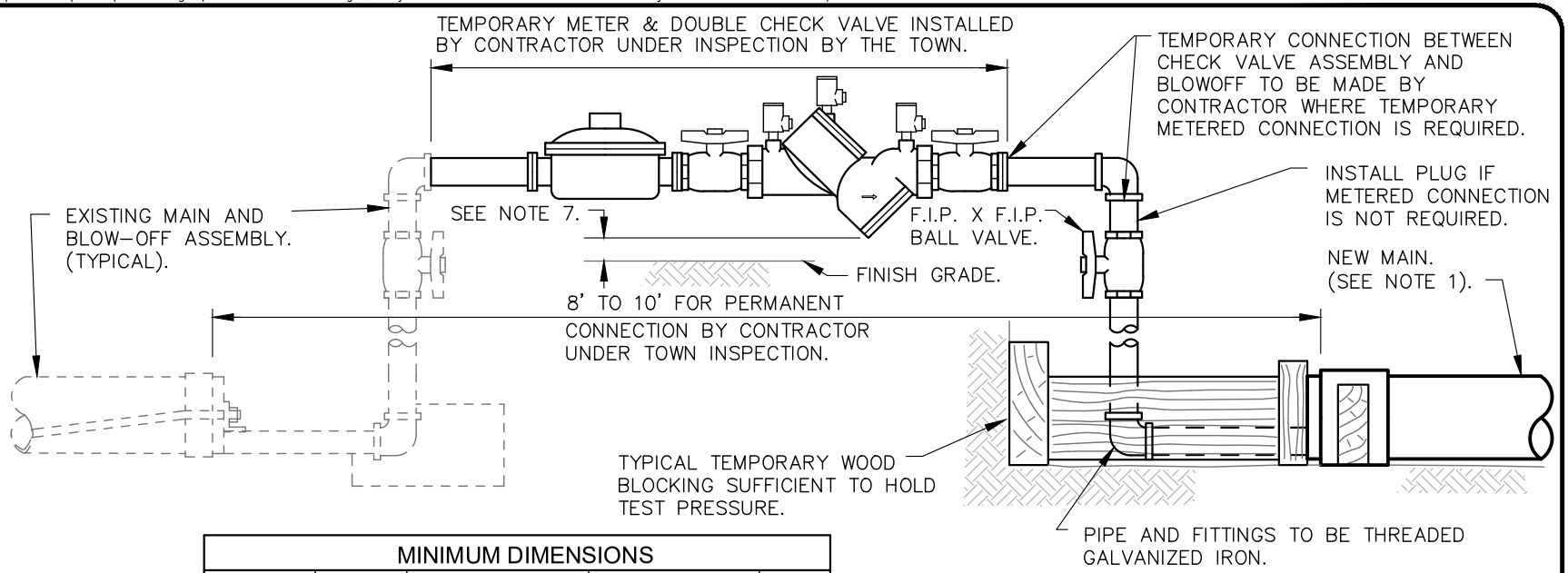
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OCT 2019 - NTS

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(2012 STD. NO. 120)

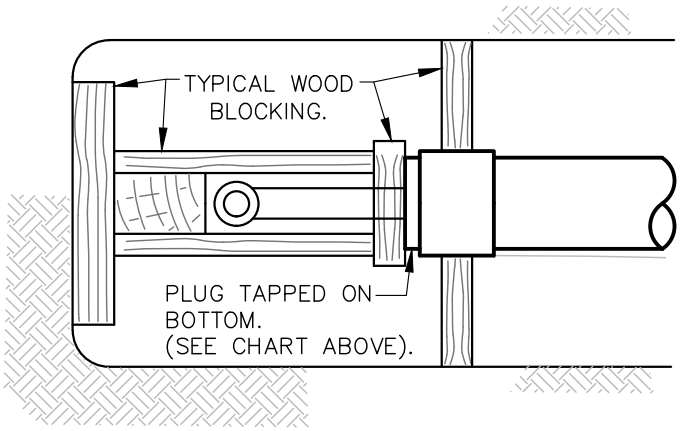


ELEVATION

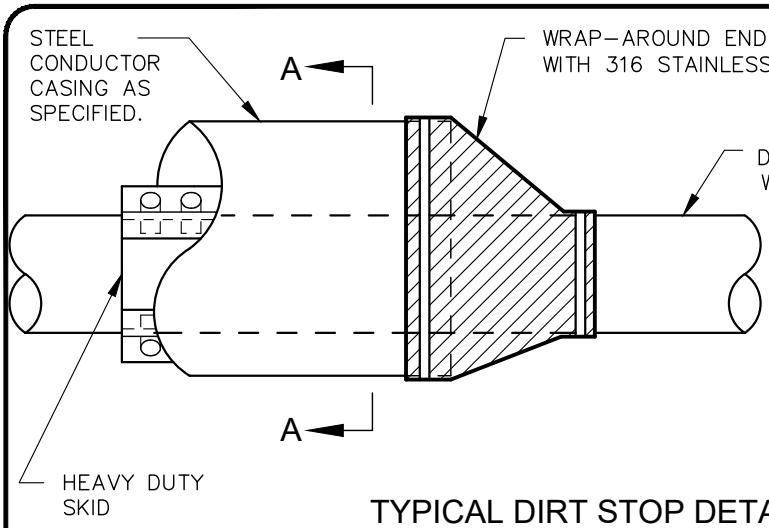
MINIMUM DIMENSIONS					
PIPE SIZE	TIE RODS	ANGLE IRON	BEARING AREA	A	SIZE B.O.
6"	5/8"	3"X3"X1/4"	4 SQ. FT.	2'	2"
8"	3/4"	3 1/2"X3"X1/4"	7 " "	3'	2"
12"	1 1/8"	4"X3"X1/2"	16 " "	3'	2"
OVER 12"	BY THE DESIGN ENGINEER				

NOTES:

1. END OF NEW MAIN TO BE ON SAME LINE AND GRADE AS EXISTING WHERE FEASIBLE.
2. WOOD BLOCKING TO BE FOR THRUST PRODUCED BY TEST PRESSURE PLUS 50 P.S.I.
3. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
4. TWO INCH TEMPORARY CONSTRUCTION METER ACCEPTABLE UNTIL COMBUSTIBLE MATERIALS STORED ON SITE OR CONSTRUCTION ABOVE GRADE BEGINS
5. THE CONTRACTOR SHALL MAKE FINAL TIE-INS AT THE DEVELOPERS EXPENSE UNDER THE INSPECTION OF A TOWN REPRESENTATIVE.
6. SHOULD THE BLOWOFF ON THE EXISTING MAIN BE LOCATED OUT OF THE TRAVELED WAY AS INDICATED ON STD PLAN NO. 515, THE TEMPORARY BLOWOFF PIPING SHALL BE EXTENDED OUT OF THE TRAVELED WAY AND THE RISERS, METER, AND CHECK VALVE WILL BE INSTALLED OUT OF TRAVELED WAY.
7. CLEARANCE TO BE 6" ABOVE INUNDATION LEVEL OR 12" MIN. ABOVE FIN. GRADE.
8. SEE STD PLAN NO. 510, NOTE 6, FOR INSULATION BLANKET REQUIREMENTS.
9. BLOWOFF SHALL NOT BE INSTALLED WITHIN THE TRAVELED WAY. IF THE MAIN ENDS WITHIN THE STREET AREA, BLOWOFF TO BE EXTENDED TO AN AREA OUTSIDE OF THE TRAVELED WAY. LID TO BE HIGHWAY GRADE WITH LOCKDOWN CAPABILITY.
10. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR AN APPROVED SUBSTITUTE, AFTER NUTS ARE TIGHTENED.



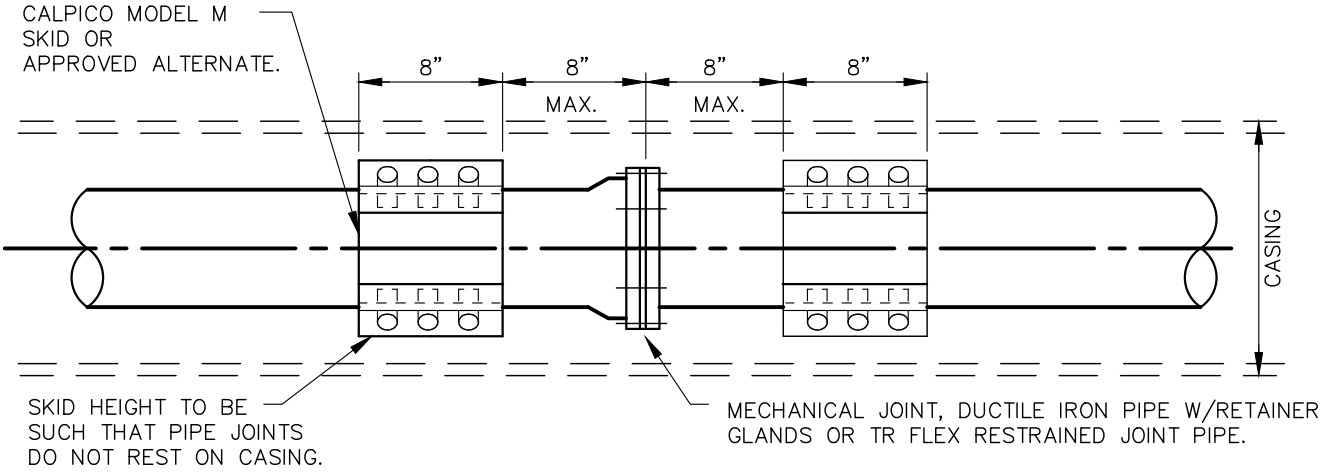
PLAN



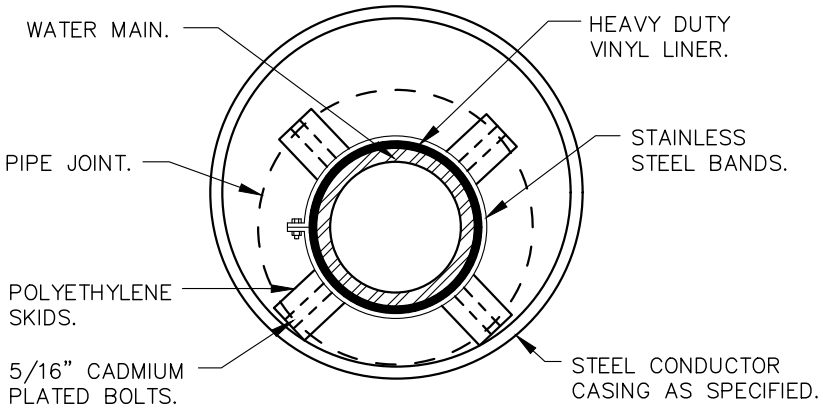
TYPICAL DIRT STOP DETAIL

NOTES:

1. INSTALL PER MANUFACTURERS SPECIFICATIONS.
2. SEE GENERAL CONST. NOTES.
3. WHERE CONDUCTOR CASING IS EXISTING R.C.P., REDWOOD SKIDS MAY BE INSTALLED IN LIEU OF POLYETHYLENE SKIDS WITH APPROVAL BY TOWN ENGINEER.
4. ALL GASKETS AND SEALS TO BE UNIVERSITY OF SOUTHERN CALIFORNIA (USC), APPROVED.



TYPICAL PIPE JOINT AND INSULATOR



MINIMUM SIZE CASING REQUIRED					
PIPE SIZE	6"	8"	12"	14"	16"
CASING SIZE (INSIDE DIA.)	16"	16"	20"	24"	30"
CASING WALL THICKNESS	.250	.250	.250	.250	.375

SECTION "A-A"

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL DIRT STOP AND WATER MAIN ENCASEMENT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

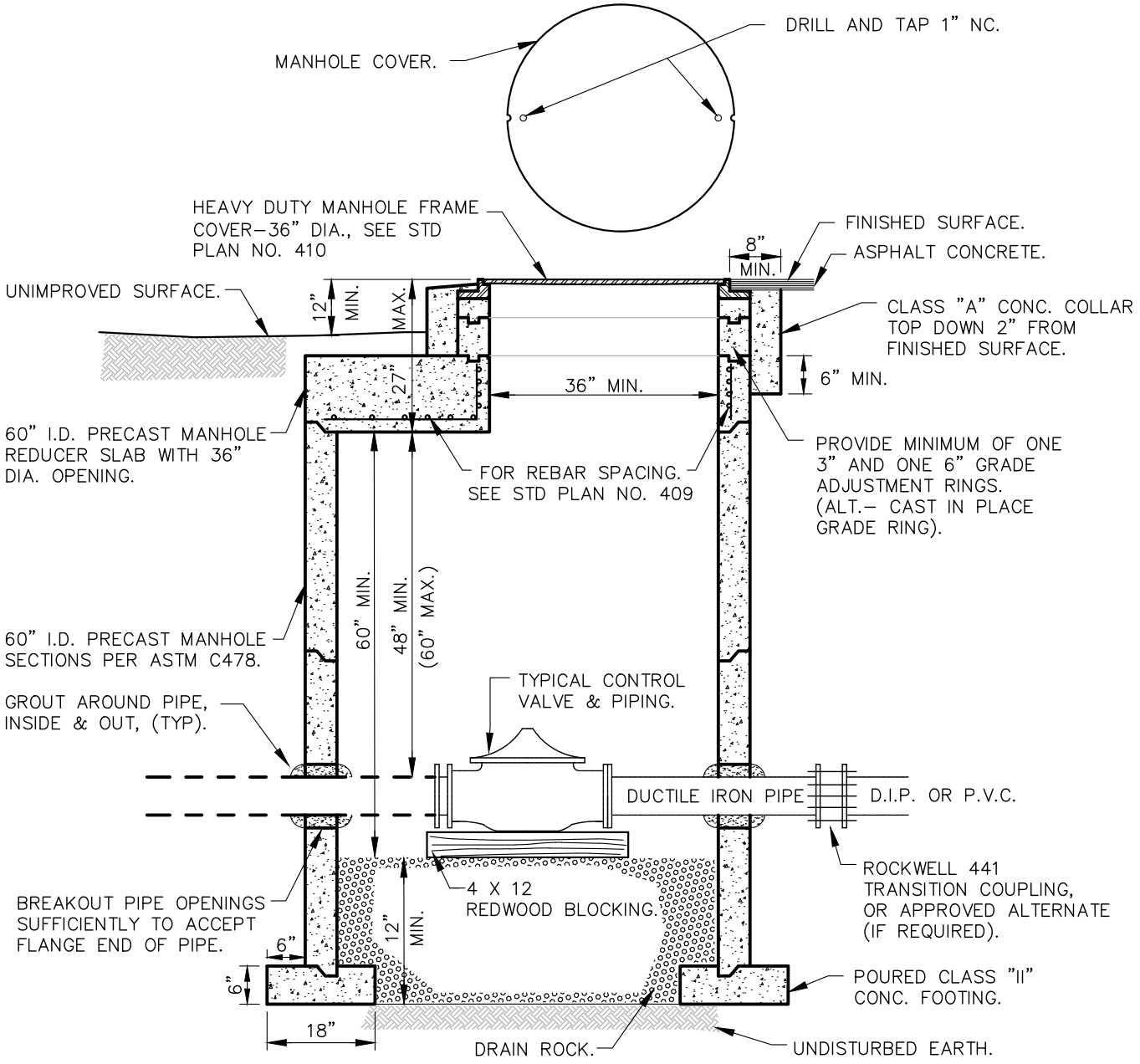
OCT 2019 – NTS

STD. PLAN NO. 525

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(2012 STD. NO. 125)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 525 Plot Date: May 29, 2020 at 04:12 pm



NOTES:

1. PRIOR APPROVAL OF THE USE OF THE MANHOLE–STYLE VAULT MUST BE OBTAINED FROM THE TOWN ENGINEER FOR THE SPECIFIC SIZE AND MODEL VALVE OR APPURTENANCE TO BE INSTALLED.
2. THE MINIMUM MANHOLE I.D. SHALL BE 60".
3. ALL REDUCERS SHALL BE SLAB–STYLE. CONE–TYPE REDUCERS ARE NOT ACCEPTABLE.
4. ALL GATE VALVES SHALL BE INSTALLED ON EXTERIOR OF THE MANHOLE PER STD PLAN NO. 503.
5. SET ALL MANHOLE SECTIONS AND GRADE RINGS IN PLASTIC GASKET, RAM–NEK OR APPROVED ALTERNATES.
6. WHERE POSSIBLE, INSTALL P.V.C. DRAIN PIPE FROM BASE OF MANHOLE TO DAYLIGHT OR TO STORM DRAIN.
7. SEE GENERAL CONSTRUCTION NOTES.
8. IN DESIGNATED FLOOD PLAIN AREAS, A WATERTIGHT MANHOLE SHALL BE INSTALLED WITH CONC. BASE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TRAFFIC – TYPE PRECAST WATER UTILITY MANHOLE

STD. PLAN NO. 526

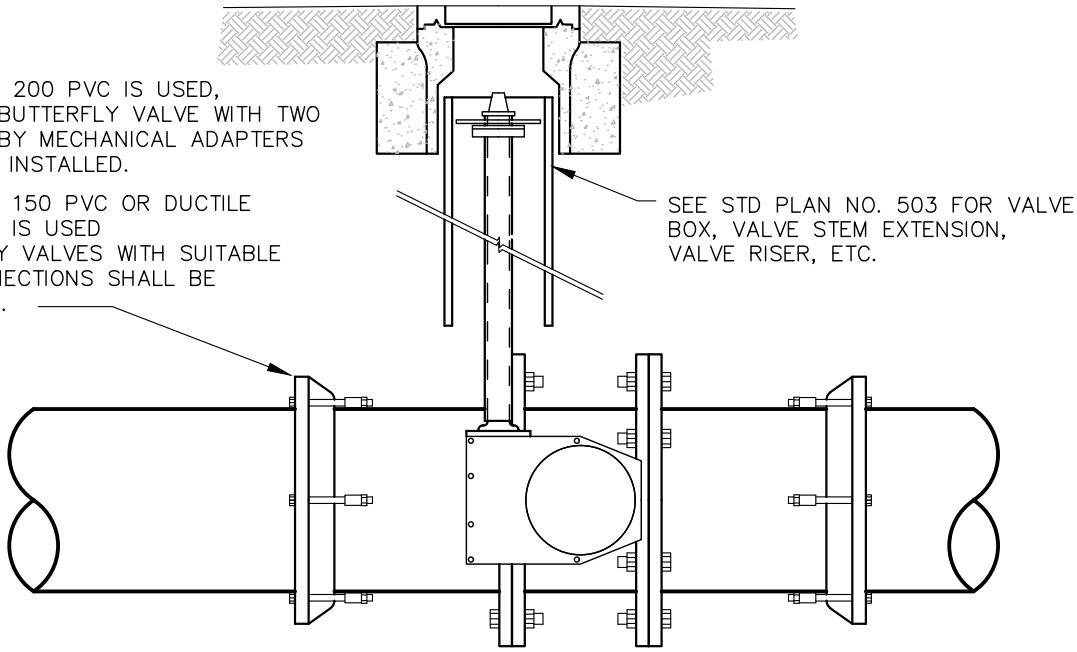
PAGE 1 OF 1

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

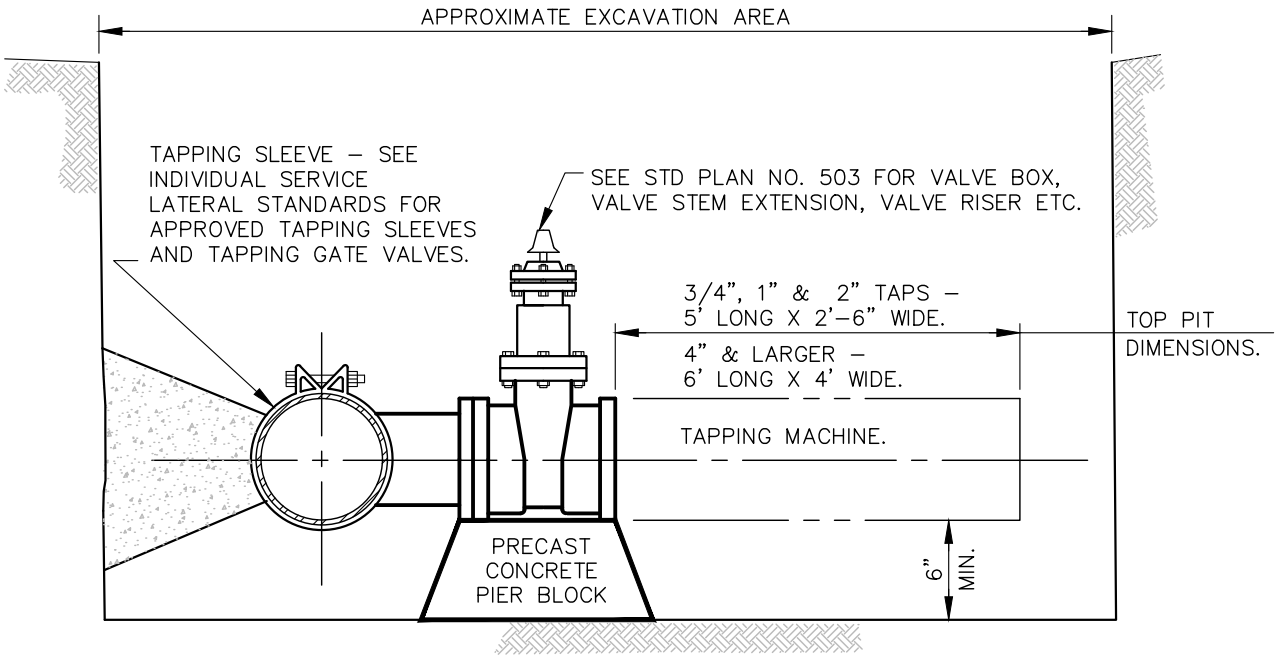
(2012 STD. NO. 126)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 526 Plot Date: May 29, 2020 at 04:12 pm



TYP. BUTTERFLY VALVE INSTALLATION

TO BE USED ON PIPE 18" AND LARGER



TYP. TAPPING SLEEVE & VALVE INSTALLATION

NOTES:

1. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE 316 STAINLESS STEEL AND VALVE ASSEMBLY SHALL BE POLY–WRAPPED.
2. TAPS SHALL BE MADE BY CONTRACTOR UNDER TOWN INSPECTION.
3. ALL BUTTERFLY VALVES SHALL CONFORM TO TOWN SPECIFICATIONS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL INSTALLATION OF BUTTERFLY VALVE AND TAPPING VALVE

JOHN JAEGER, PUBLIC WORKS DIRECTOR

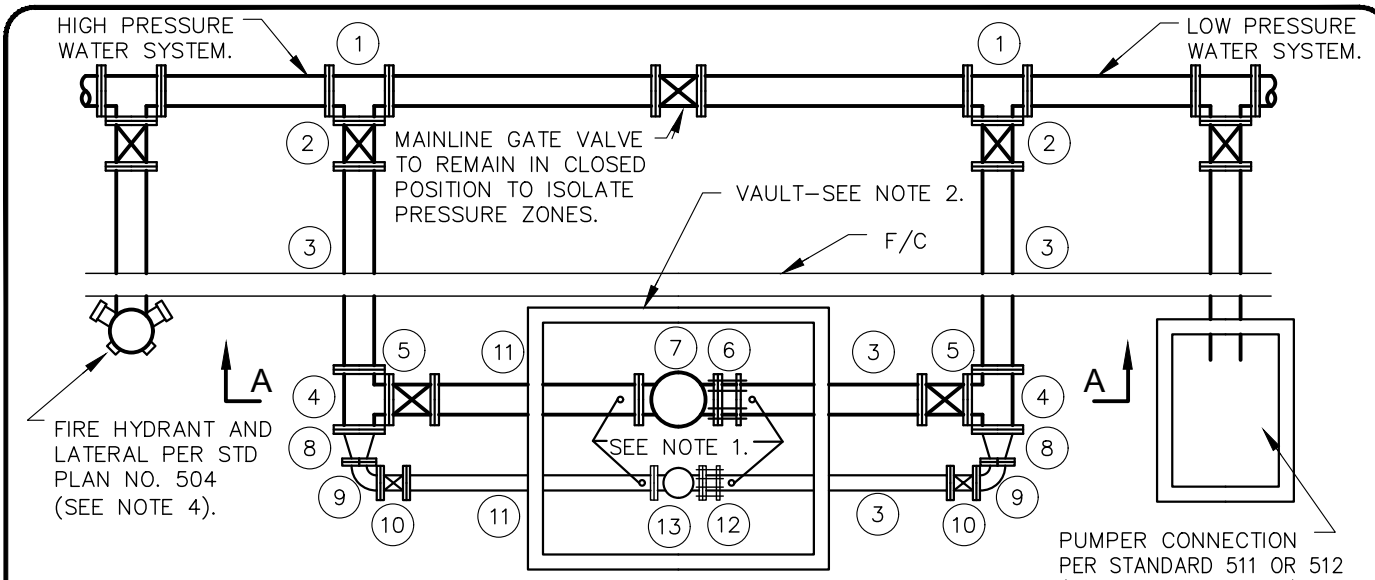
OCT 2019 – NTS

STD. PLAN NO. 527

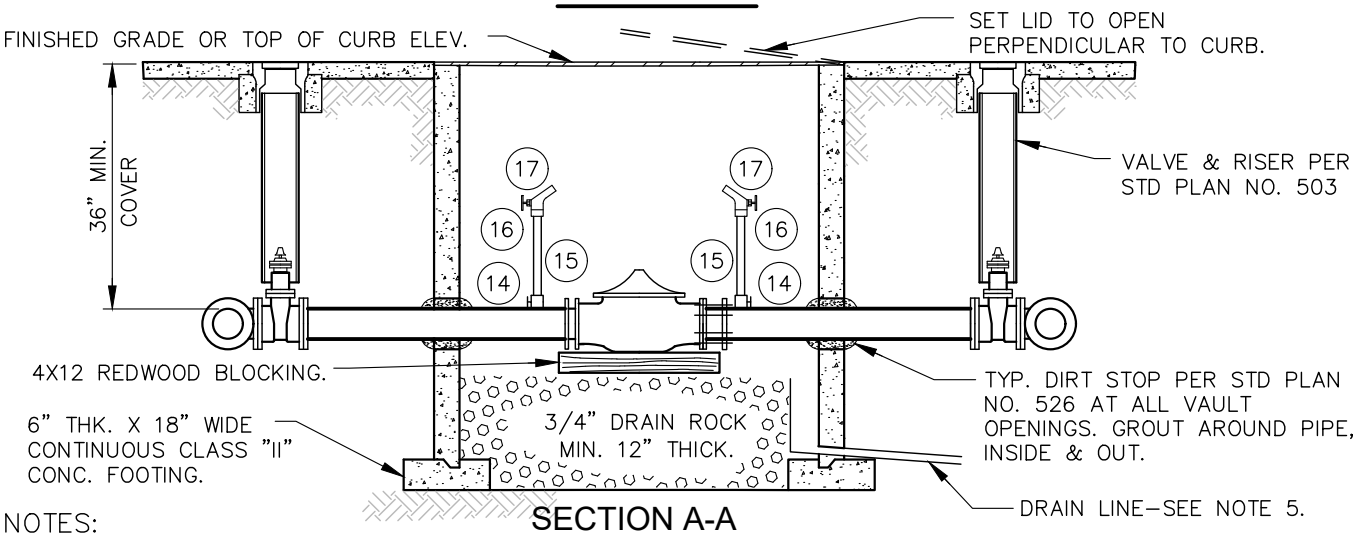
PAGE 1 OF 1

(2012 STD. NO. 127)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 527 Plot Date: May 29, 2020 at 04:13 pm



PLAN VIEW



SECTION A-A

NOTES:

1. MAKE 3/4" TOP TAP – INSTALL RISER AS SHOWN FOR PRESSURE CHECKING.
2. THE PRECAST VAULT & PRESSURE REDUCING VALVES SHALL BE AS APPROVED BY TOWN ENGINEER.
3. THE LOW FLOW BY–PASS (PART NUMBERS 8–13) SHALL BE INSTALLED UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER. IF A SINGLE P.R.V. IS INSTALLED, CENTER IN VAULT AND CHANGE PART NUMBER 4 TO 90° FLANGED ELLS.
4. INSTALL FIRE HYDRANT AND PUMPER CONNECTION ONLY WHEN REQUIRED BY THE TOWN.
5. RUN 2" SCHEDULE 40 P.V.C. DRAIN PIPE FROM A PERFORATED SUMP CANISTER TO AN EXISTING DRAINAGE SYSTEM OR TO DAYLIGHT.
6. VALVES 18" AND LARGER SHALL BE BUTTERFLY VALVES. VALVES 16" AND SMALLER SHALL BE RESILIENT WEDGE GATE VALVES.
7. SEE GENERAL CONSTRUCTION NOTES.
8. ALL PRESSURE REDUCING VALVES TO BE EPOXY FUSED, INSIDE AND OUTSIDE.

PARTS LIST	
#	ITEM
1	MECHANICAL JOINT TEE
2	MECHANICAL JOINT GATE VALVE
3	DUCTILE IRON PIPE – FL. X P.E.
4	FLANGED TEE
5	FLANGED GATE VALVE
6	FLANGED COUPLING ADAPTER
7	FLANGED P.R.V. – HIGH FLOW
8	FLANGED REDUCER
9	FLANGED 90° ELL
10	FLANGED GATE VALVE
11	DUCTILE IRON PIPE – FL. X FL.
12	FLANGED COUPLING ADAPTER
13	FLANGED P.R.V. – LOW FLOW
14	3/4" BALLCORP (FORD F8 1000)
15	3/4" TYPE "K" COPPER TUBING
16	3/4" COMP. X F.I.P. ADAPTER (FORD C14 – 33)
17	3/4" M.L.P. X HOSE BIBB – BRASS
18	3/4" M.L.P. TEE WITH TWO (2) 3/4" F.I.P. X H.B.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

TYPICAL INSTALLATION OF PRESSURE REDUCING VALVES

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

STD. PLAN NO. 528

PAGE 1 OF 1

(2012 STD. NO. 129)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 528 Plot Date: May 29, 2020 at 04:13 pm

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 529 Plot Date: May 29, 2020 at 04:13 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

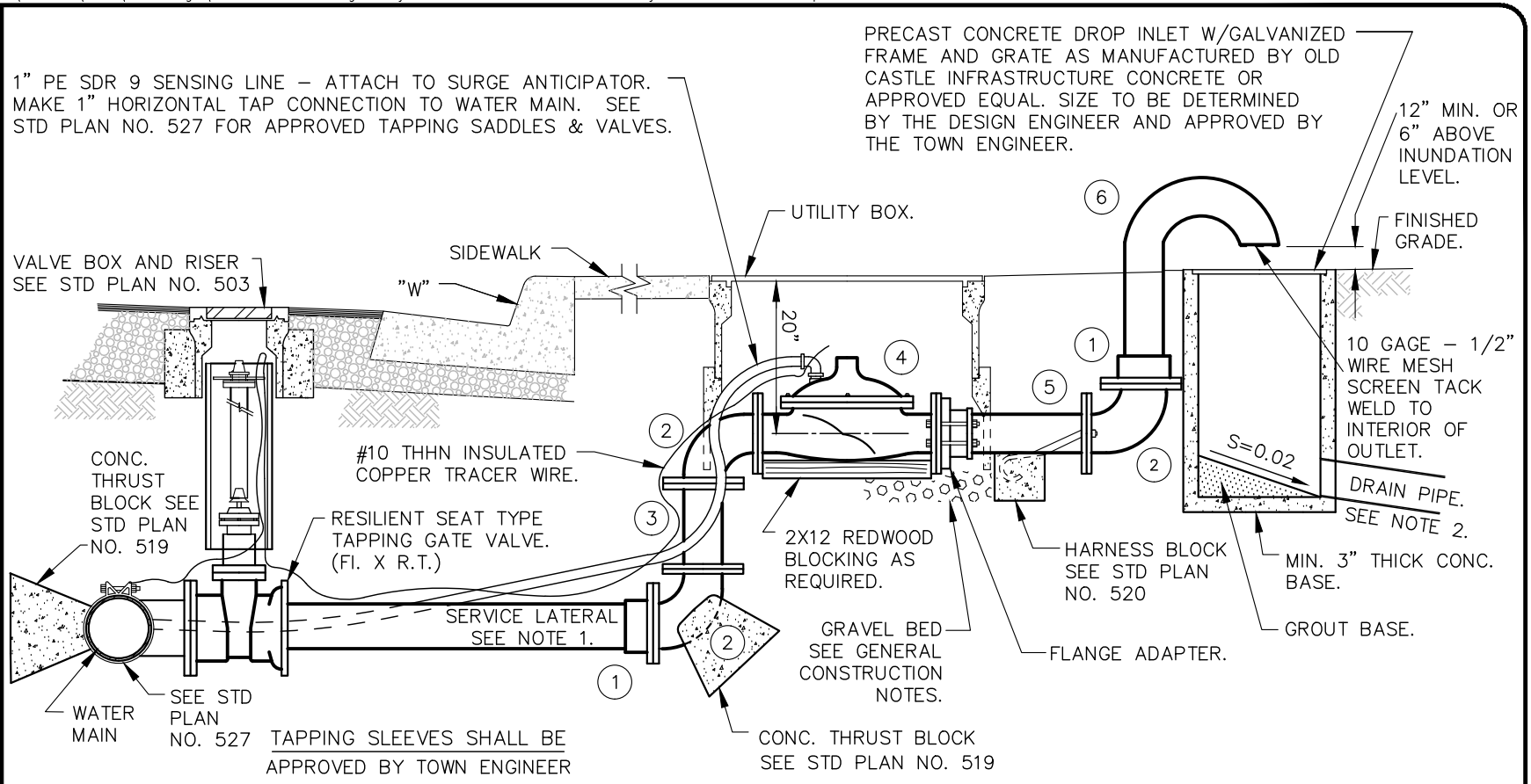
TYPICAL INSTALLATION OF SURGE ANTICIPATOR VALVE OR PRESSURE RELIEF VALVE

OCT 2019 - NTS

STD. PLAN NO. 529

PAGE 1 OF 1

(2012 STD. NO. 130)



NOTES:

1. SERVICE LATERAL PIPE SHALL BE EITHER 4" DIAM. OR EQUAL IN SIZE TO THE SURGE ANTICIPATOR VALVE, WHICHEVER IS GREATER. THE PIPE MATERIAL SHALL BE CI. 150 DUCTILE IRON, UNLESS OTHERWISE SHOWN ON THE PLANS. SHOULD THE SURGE ANTICIPATOR VALVE BE SMALLER THAN 4", INSTALL A FLANGED REDUCER AS REQUIRED ON THE INLET SIDE OF THE VALVE.
2. DISCHARGE WATER SHALL DRAIN EITHER TO AN EXISTING DRAINAGE SYSTEM OR TO DAYLIGHT. THE PROJECT ENGINEER SHALL SUBMIT HIS/HER DESIGN TO THE APPROPRIATE AGENCIES FOR APPROVAL.
3. ALL PIPING & FITTINGS ON THE DISCHARGE SIDE OF THE SURGE ANTICIPATOR VALVE SHALL BE EQUIVALENT IN SIZE TO THE VALVE.
4. DISCHARGE RISER SHALL BE FABRICATED FROM STANDARD WELDED STEEL PIPE. WELDING SHALL CONFORM TO AWWA STANDARD C206. THE RISER ASSEMBLY SHALL BE TAPE COATED PER AWWA STANDARD C209.
5. CONTACT THE TOWN PUBLIC WORKS INSPECTOR FOR SPECIFIC TELEMETRY REQUIREMENTS WHICH MUST BE MET.
6. SEE GENERAL CONSTRUCTION NOTES.
7. SURGE ANTICIPATOR VALVE INSTALLATION IS SHOWN. PRESSURE RELIEF VALVE INSTALLATION IS SIMILAR EXCEPT NO SENSING LINE IS REQUIRED.

PARTS LIST	
(#)	ITEM DESCRIPTION
1	FL. ADAPTER – SIZE AS REQUIRED.
2	C.I. FL. 90° ELL – SIZE AS REQUIRED.
3	D.I. FL. SPOOL – LENGTH AS REQUIRED.
4	SURGE ANTICIPATOR VALVE–CLA MODEL 52–03. PRESSURE RELIEF VALVE–CLA MODEL 50G–01.
5	FL. DIP – LENGTH AS REQUIRED.
6	FABRICATED WELDED STEEL DISCHARGE PIPE. SEE NOTE 4.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\520-530 Water.dwg Layout Name: 530 Plot Date: May 29, 2020 at 04:13 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

TYPICAL INSTALLATIONS OF AIR AND VACUUM & AIR RELEASE VALVES

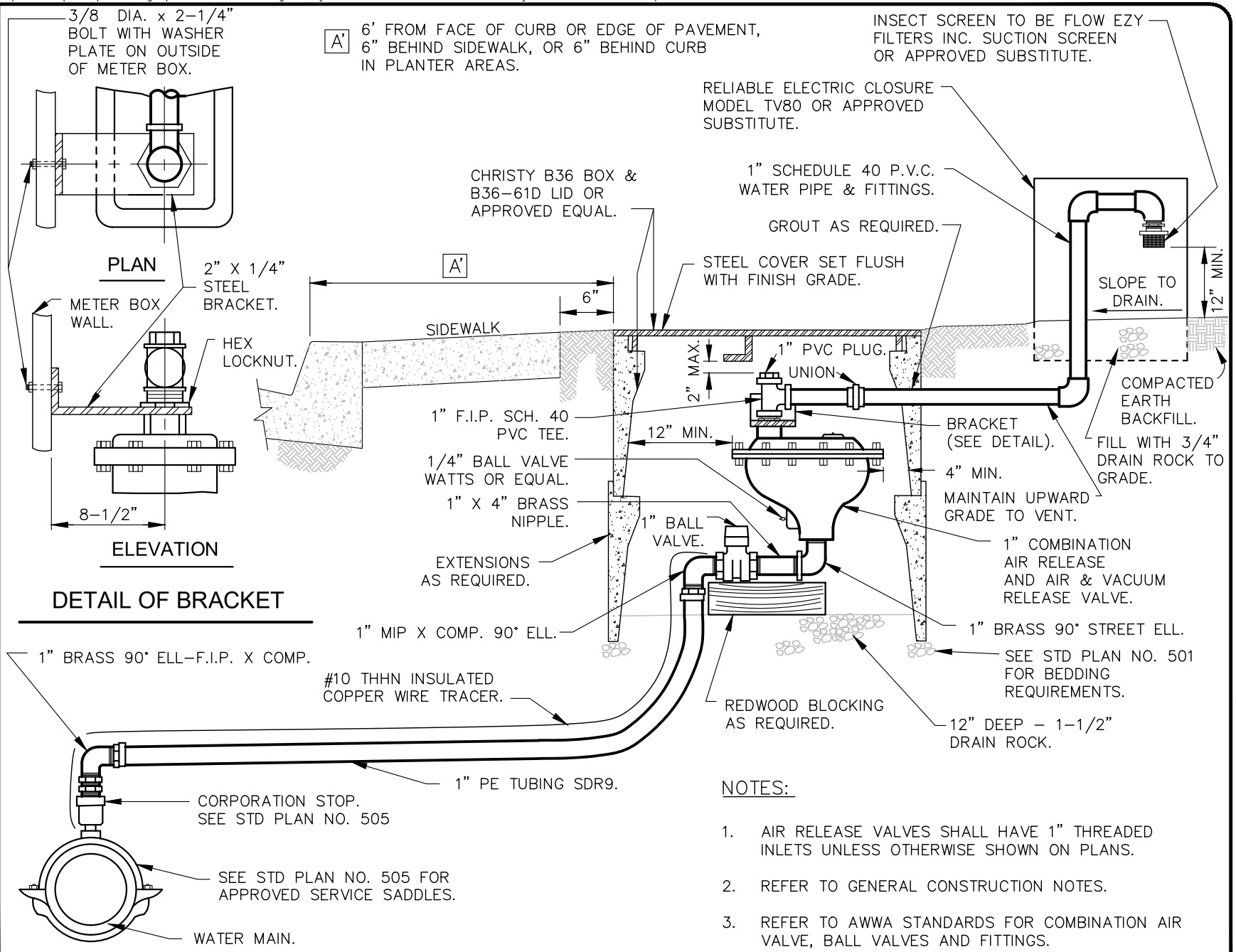
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 131)

STD. PLAN NO. 530

PAGE 1 OF 1



NOTES:

1. AIR RELEASE VALVES SHALL HAVE 1" THREADED INLETS UNLESS OTHERWISE SHOWN ON PLANS.
2. REFER TO GENERAL CONSTRUCTION NOTES.
3. REFER TO AWWA STANDARDS FOR COMBINATION AIR VALVE, BALL VALVES AND FITTINGS.

PART III – STANDARD DRAWINGS
SERIES 600 – RECYCLED WATER SYSTEM CONSTRUCTION STANDARD DRAWINGS

TABLE OF CONTENTS

STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
602	¾" and 1" Recycled Water Service	02/13	04/15
603	1-1/2" Recycled Water Service with Brass and Polyethylene Lateral	02/13	04/15
604	2" Recycled Water Service with Brass and Polyethylene Lateral	02/13	04/15
607	Urban Recycled Water Turnout	02/13	04/15
608	Agricultural Recycled Water Turnout	02/13	04/15
610	Single Recycled Water Service	02/13	04/15
612	Recycled Water Identification Labels and Tags	02/13	04/15
614	Recycled Water Advisory Signs	02/13	04/15
616	Recycled Water Quick Coupling Valve	02/13	04/15

SERIES 600 – RECYCLED WATER SYSTEM CONSTRUCTION STANDARD DRAWINGS

REVISION SUMMARY

Std Number	Title	Revision Description
603	1-1/2" Recycled Water Service with Brass and Polyethylene Lateral	Page 1 of 2 - Added Note 9. Pages 1 and 2 - Changed bury depth from 24" to 36"
604	2" Recycled Water Service with Brass and Polyethylene Lateral	Page 1 of 2 - Added Note 9 Pages 1 and 2 - Changed bury depth from 24" to 36"
607	Urban Recycled Water Turnout	Page 1 of 4 – Clarified Public/Private on detail Page 4 of 4 – Added Town Engineer to notes 3, 6 and 7
608	Agricultural Recycled Water Turnout	Page 4 of 4 – Added Town Engineer to notes 3, 6 and 7
610	Single Recycled Water Service	Changed reference from Std. Dwg. 502 to 602
612	Recycled Water Identification Labels and Tags	Changed wording of Identification Tags and note 2.
614	Recycled Water Advisory Signs	Note 1 – added Town Engineer
616	Recycled Water Quick Coupling Valve	Changed note on 1/2" pipe from requiring stainless steel to galvanized

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 602 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

3/4" & 1" RECYCLED WATER SERVICE

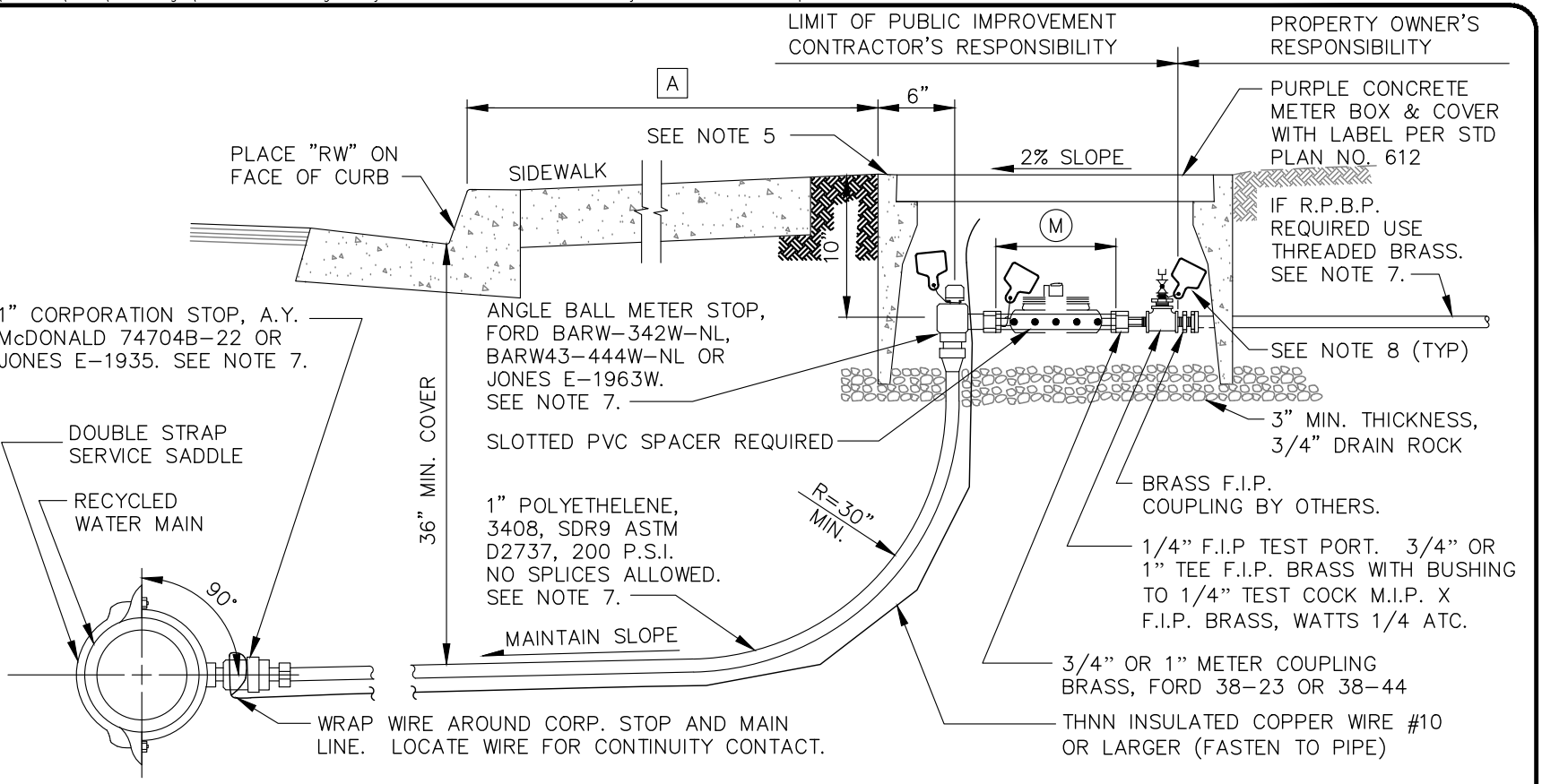
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 502)

STD. PLAN NO. 602

PAGE 1 OF 1



MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90

SERVICE	OLD CASTLE METER BOX	LID		Ⓜ	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
3/4"	B-16	FL-16D	B16-61G	7 1/2"	11 G.P.M.	15 G.P.M.
1"	B-30	FL-30-G	B30-61G	11"	14 G.P.M.	20 G.P.M.

NOTES:

1. UNLESS OTHERWISE SPECIFIED ON PLAN, PROVIDE FOR 1" METER INSTALLATION FOR SINGLE FAMILY RESIDENTIAL AND OFFICE COMMERCIAL PROJECTS.
2. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
3. METERS PROVIDED AND SET BY THE PUBLIC WORKS DEPARTMENT.
4. METERS SHALL BE BADGER METER MODEL #35 3/4" OR #70 1", RTR WITH ILC, GAL. TORX, NSF-61 LOW LEAD. ITRON 100WP PIT ERT WITH GEOTEK 1/2" X 18" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED PURPLE AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.
8. PROVIDE RECYCLED WATER TAGS FOR VALVES AND METERS PER STD PLAN NO. 612.

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 603-1 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

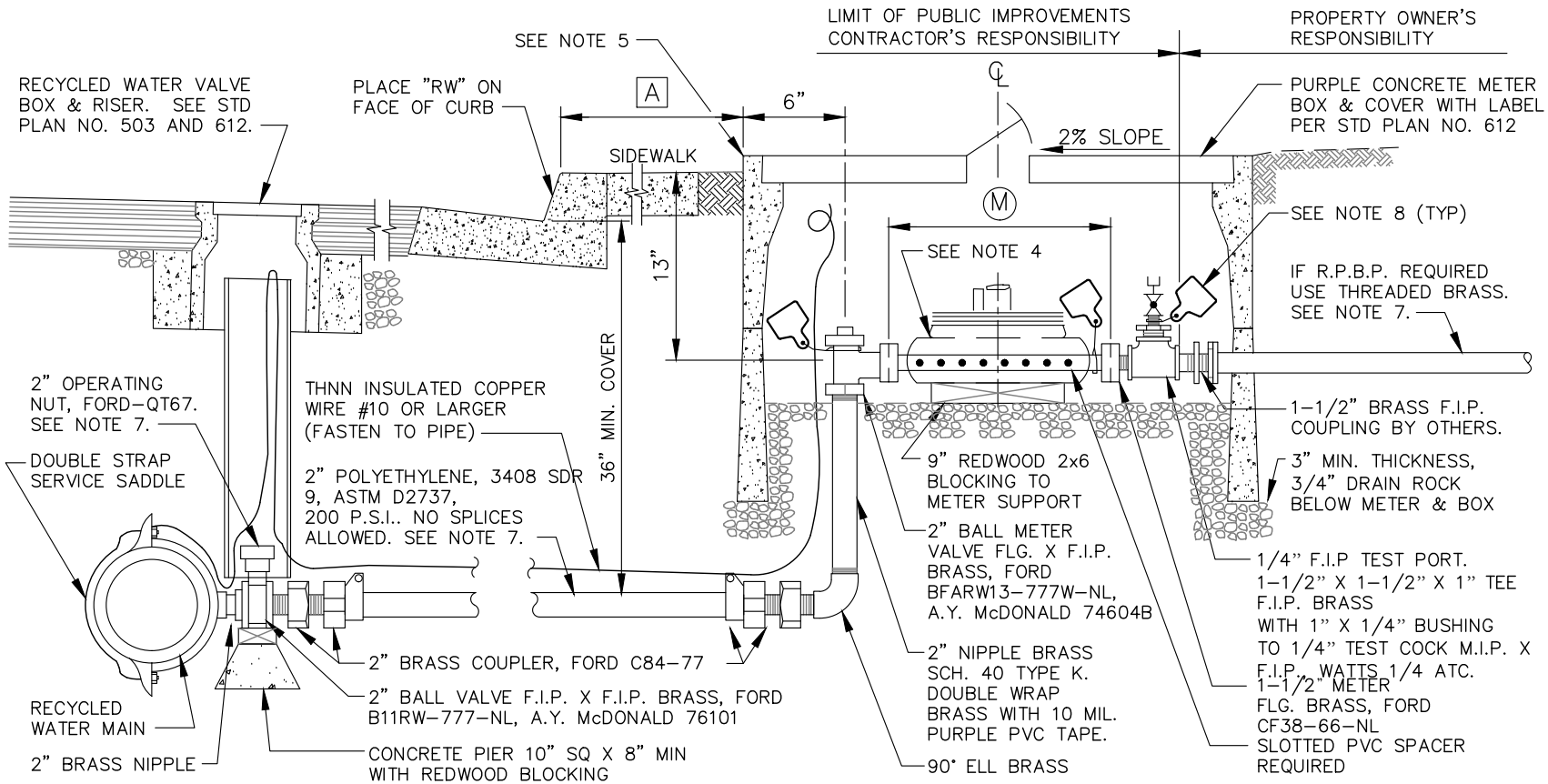
DESIGN AND CONSTRUCTION STANDARDS

1-1/2" RECYCLED WATER SERVICE WITH BRASS AND POLYETHYLENE LATERAL

OCT 2019 - NTS

(2012 STD. NO. 503)

STD. PLAN NO. 603



NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METERS PROVIDED AND SET BY PUBLIC WORKS DEPARTMENT.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER, MODEL #120 1-1/2", RTR WITH ILC, GAL TORX NSF-61 LOW LEAD, WITH ITRON 100WP PIT ERT WITH GEOTEK 1/2" X 18" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED PURPLE AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.
8. PROVIDE RECYCLED WATER TAGS FOR VALVES AND METERS PER STD PLAN NO. 612.
9. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

SERVICE	OLD CASTLE METER BOX	LID		(M)	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
1-1/2"	B-36 *	FL-36-G	B-36-61G	13"	55 G.P.M.	75 G.P.M.

* METER BOX EXTENSION REQUIRED.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 603-2 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

1-1/2" RECYCLED WATER SERVICE WITH POLYETHYLENE LATERAL

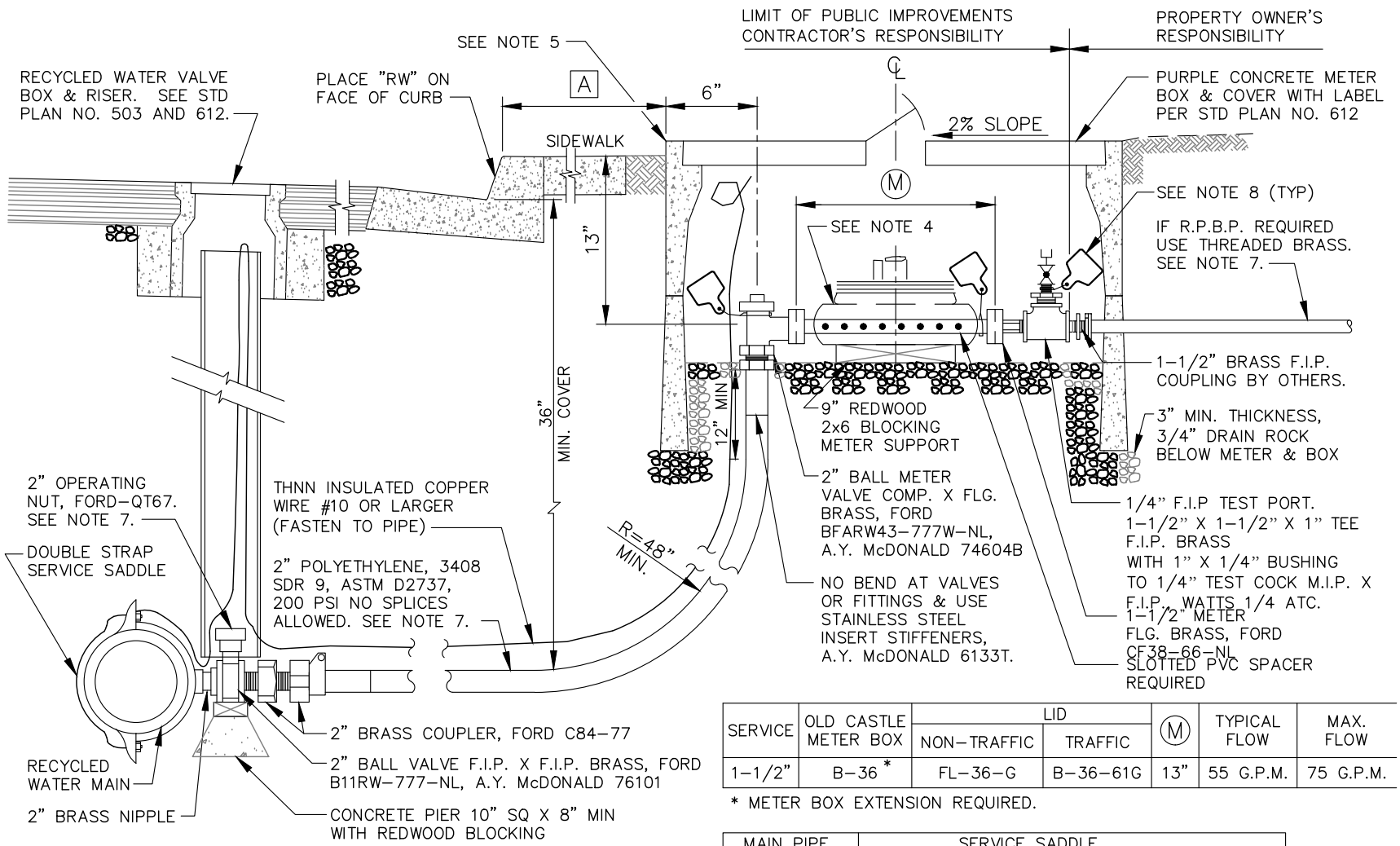
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 503)

STD. PLAN NO. 603

PAGE 2 OF 2



SERVICE	OLD CASTLE METER BOX	LID		Ⓜ	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
1-1/2"	B-36 *	FL-36-G	B-36-61G	13"	55 G.P.M.	75 G.P.M.

* METER BOX EXTENSION REQUIRED.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METERS PROVIDED AND SET BY PUBLIC WORKS DEPARTMENT.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER, MODEL #120 1-1/2", RTR WITH ILC, GAL TORX NSF-61 LOW LEAD, WITH ITRON 100WP PIT ERT WITH GEOTEK 1/2" X 18" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED PURPLE AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.
8. PROVIDE RECYCLED WATER TAGS FOR VALVES AND METERS PER STD PLAN NO. 612.

Ⓐ
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 604-1 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

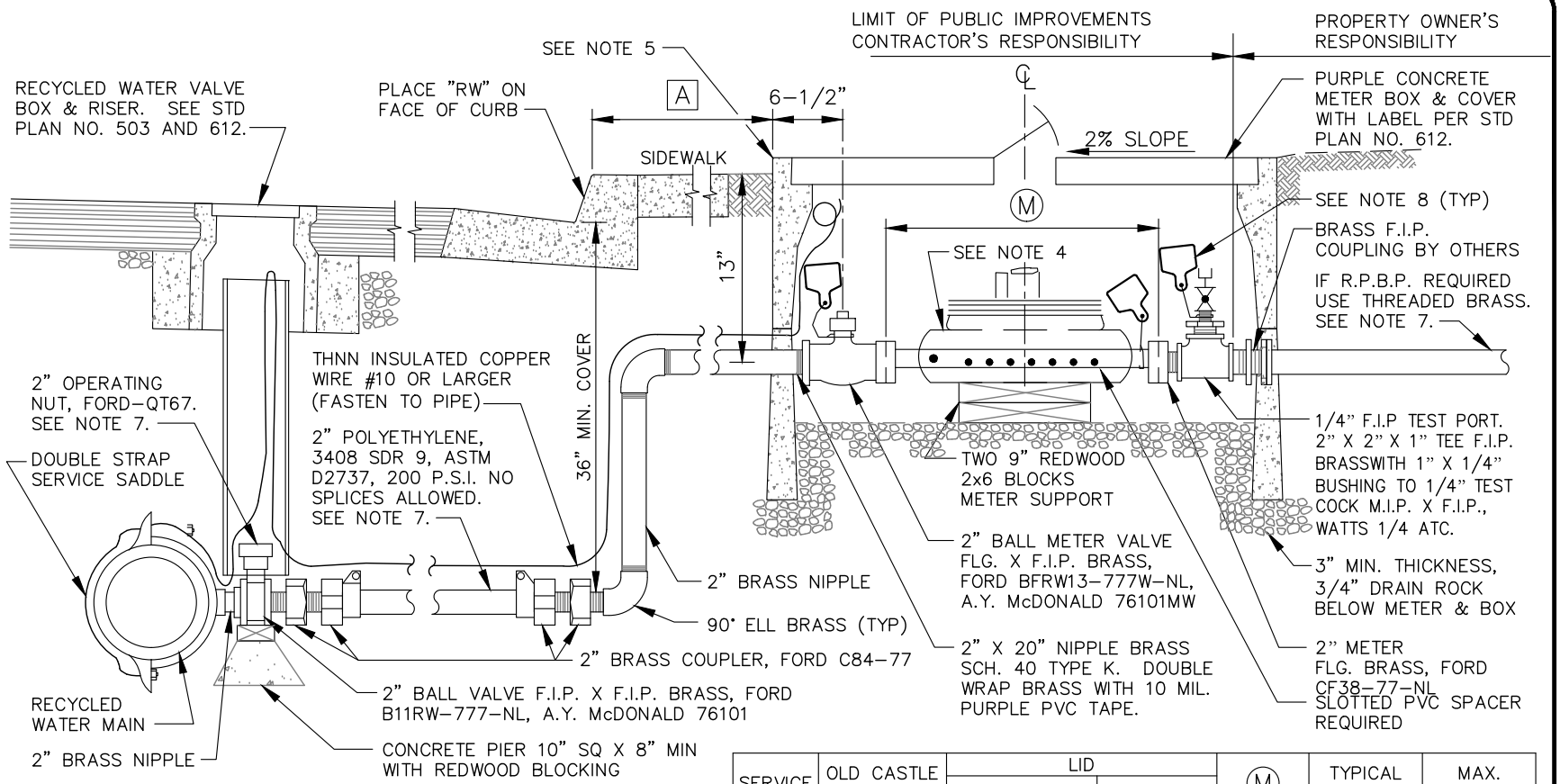
2" RECYCLED WATER SERVICE WITH BRASS AND POLYETHYLENE LATERAL

OCT 2019 - NTS

STD. PLAN NO. 604

PAGE 1 OF 2

(2012 STD. NO. 504)



NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METER PROVIDED AND SET BY CONTRACTOR AND REQUIRES PUBLIC WORKS DEPARTMENT INSPECTION.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER RECORDALL COMPOUND 2", RTR WITH ILC, GAL. NSF-61 LOW LEAD, WITH TWO ITRON 100WP PIT ERTS WITH GEOTEK 1/2" X 18" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED PURPLE AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.
8. PROVIDE RECYCLED WATER TAGS FOR VALVES AND METERS PER STD PLAN NO. 612.
9. REMOTE READ METERS SHALL BE PROGRAMMED TO THE TOWN OF WINDSOR.

SERVICE	OLD CASTLE METER BOX	LID		Ⓜ	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
2"*	B-36**	FL-36-G	B-36-61G	15 1/4"	70 G.P.M.	100 G.P.M.

* 2" AND LARGER SHALL BE REVIEWED AND APPROVED BY TOWN ENGINEER.
** METER BOX EXTENSION REQUIRED.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

Ⓐ
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 604-2 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

2" RECYCLED WATER SERVICE WITH POLYETHYLENE LATERAL

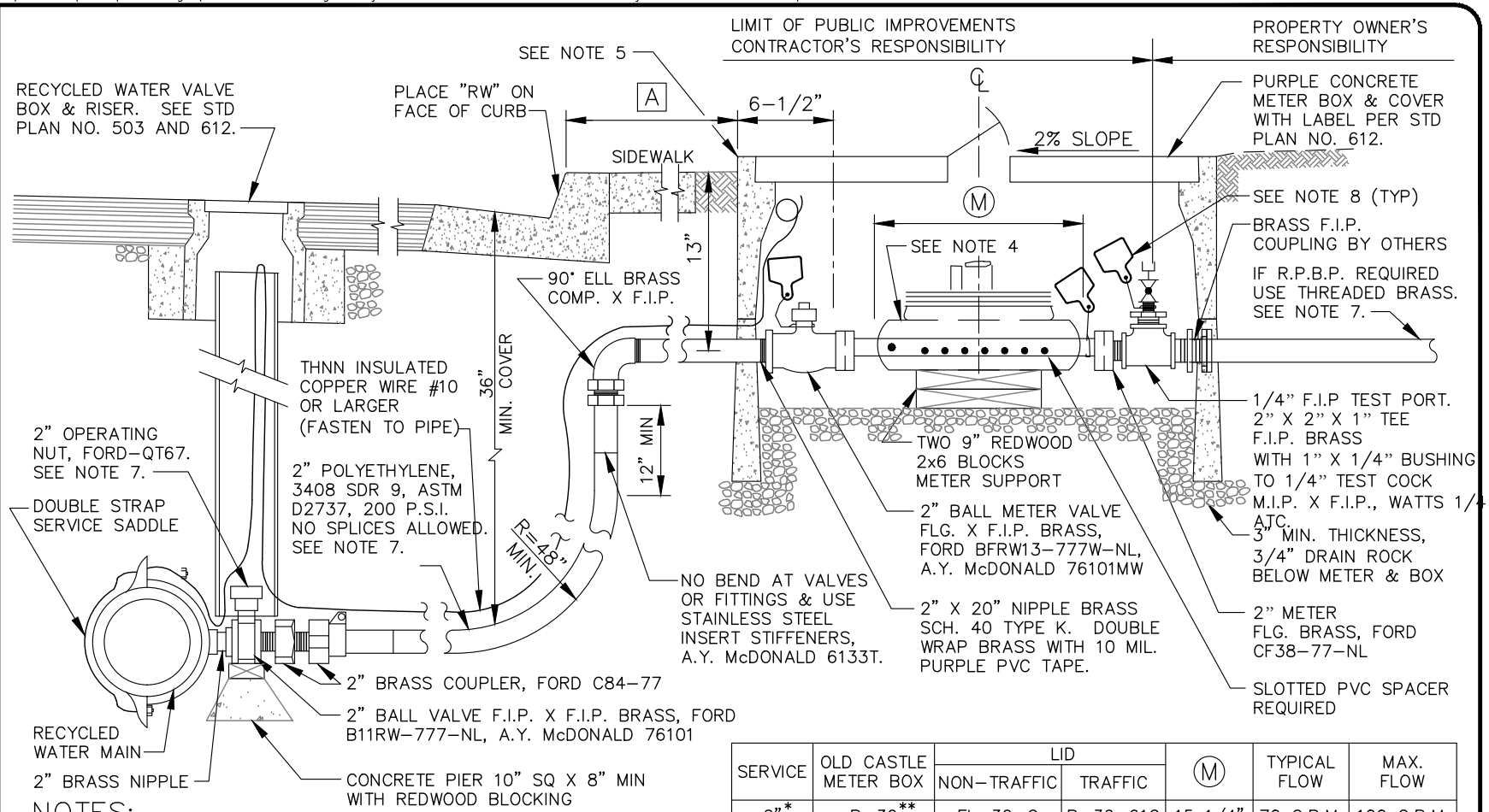
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 504)

STD. PLAN NO. 604

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SERVICE	OLD CASTLE METER BOX	LID		M	TYPICAL FLOW	MAX. FLOW
		NON-TRAFFIC	TRAFFIC			
2"*	B-36**	FL-36-G	B-36-61G	15 1/4"	70 G.P.M.	100 G.P.M.

* 2" AND LARGER SHALL BE REVIEWED AND APPROVED BY TOWN ENGINEER.
** METER BOX EXTENSION REQUIRED.

MAIN PIPE	SERVICE SADDLE
ACP OR D.I.P.	JONES J979, FORD 202-B
C-900 PVC	A.Y. McDONALD 3806, FORD S-90, JONES J996

NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS.
2. METER PROVIDED AND SET BY CONTRACTOR AND REQUIRES PUBLIC WORKS DEPARTMENT INSPECTION.
3. ALL METER BOX LIDS SHALL INCLUDE A READING LID. SEE LID SPECIFICATIONS.
4. METERS SHALL BE BADGER RECORDALL COMPOUND 2", RTR WITH ILC, GAL. NSF-61 LOW LEAD, WITH TWO ITRON 100WP PIT ERTS WITH GEOTEK 1/2" X 18" FIBERGLASS ROD.
5. ADDRESS PAINTED ON OUTSIDE METER BOX RIM BY CONTRACTOR.
6. METERS SHALL BE PLACED A MINIMUM OF 3' FROM OBSTRUCTIONS AND COMPLY WITH ALL REQUIREMENTS ON THE TOWN'S OBSTRUCTION ORDINANCE #2002-155, SECTION 12-350.
7. ALL RECYCLED WATER PIPING AND EQUIPMENT SHALL BE COLOR CODED PURPLE AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.
8. PROVIDE RECYCLED WATER TAGS FOR VALVES AND METERS PER STD PLAN NO. 612.

A
- 6" MIN. BEHIND BACK OF CURB FOR PLANTER STRIP APPLICATION.
- 6'-0" MIN. BEHIND FACE OF CURB WHEN NO SIDEWALK IS PRESENT.
- 6'-0" MIN. TO EDGE OF PAVEMENT WHEN NO CURB OR SIDEWALK IS PRESENT.
- 6" MIN. BEHIND BACK OF SIDEWALK WHEN SIDEWALK IS CONTIGUOUS TO THE CURB.

Xrefs: Images: JEJ2-removebg-preview.png; windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 607-1 Plot Date: May 29, 2020 at 03:55 pm

TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

URBAN RECYCLED WATER TURNOUT

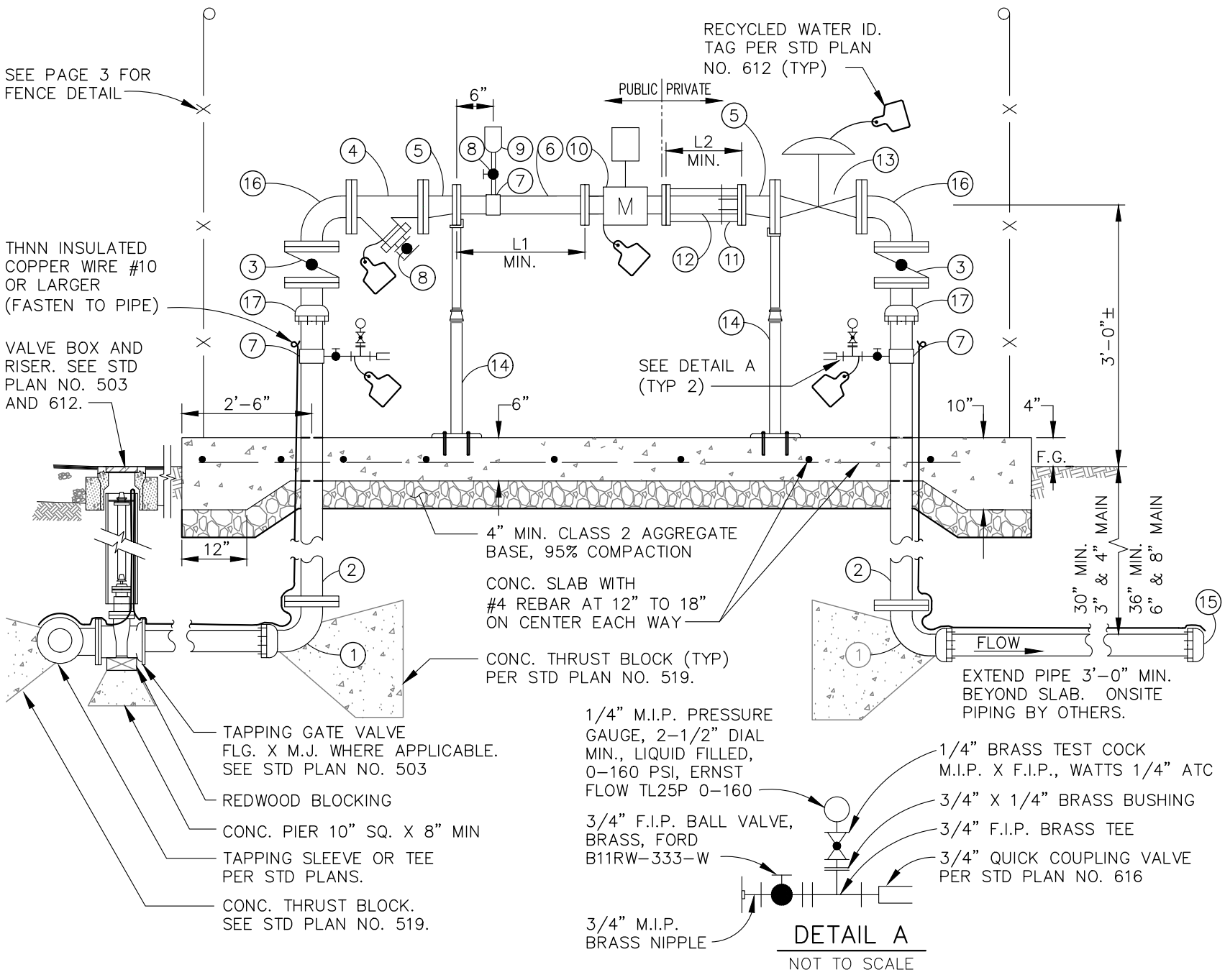
DESIGN AND CONSTRUCTION STANDARDS

OCT 2019 - NTS

(2012 STD. NO. 507)

STD. PLAN NO. 607

PAGE 1 OF 4



DETAIL A

NOT TO SCALE

FITTINGS FOR 3" AND LARGER TURNOUTS

NO.	TURNOUT DIA.				FITTING DESCRIPTION
	3"	4"	6"	8"	
1	3"	4"	6"	8"	FLG. X M.J. 90 DEG. ELL WITH MEGALUG RESTRAINT GLAND
2	3"	4"	6"	8"	FLG. X P.E. DUCTILE IRON PIPE
3	3"	4"	6"	8"	FLG. BUTTERFLY VALVE WITH HAND WHEEL, AWWA C504 RUBBER SEATED–DEZURIK OR HENRY PRATT
4	3"	4"	6"	8"	WYE STRAINER, CAST IRON BODY, 125/150 LB. FLAT FACE FLG., S.S. SCREEN WITH 1/8" PERFORATIONS, F.I.P. BLOWOFF CONNECTION, EPOXY LINED & COATED–WATTS 77F–DI–FDA–125
5	–	4"X3"	6"X4"	8"X6"	FLG. DUCTILE IRON PIPE ECCENTRIC REDUCER
6	3"	3"	4"	6"	FLG. X FLG. DUCTILE IRON PIPE
7	3"	3"	4"	6"	SERVICE SADDLE, DUCTILE IRON–FORD FC 202
8	1"	1"	1"	1"	F.I.P. BALL VALVE, BRASS WITH LOCK WINGS–FORD B11RW–444–W OR A.Y. McDONALD 76101
9	1"	1"	1"	1"	AIR RELEASE VALVE–APCO 145C OR CRISPIN UL20
10	3"	3"	4"	6"	FLOW METER, MAGNETIC WITH ANSI 150 LB. FLG., REMOTE AMPLIFIER & 30' CABLE–BADGER M5000. PROVIDE ERW–1300–202 ITRON 100WP PULSER WITH INTEGRAL CONNECTOR & ANTENNA CONNECTOR. NO SUBSTITUTIONS.
11	3"	3"	4"	6"	FLG. COUPLING ADAPTER WITH 5/8" ALL THREAD TIE RODS, MIN. OF 4
12	3"	3"	4"	6"	FLG. X P.E. DUCTILE IRON PIPE
13	3"	4"	6"	8"	PRESSURE REDUCING, PRESSURE SUSTAINING & EXCESS FLOW SHUTOFF VALVE, GLOBE–STYLE DUCTILE IRON BODY, ANSI 125/150 LB. FLAT FACE FLG., BRONZE INTERNAL TRIM, FUSION EPOXY LINING & COATING–CLA–VAL 90G–20BCSYKC. NO SUBSTITUTIONS.
14	1–1/2"	2–1/2"	2–1/2"	2–1/2"	PIPE SUPPORT, GALV. STEEL ADJUSTABLE STANCHION WITH 6'x6" BASE MIN. & 4 S.S. EPOXY ANCHORS WITH FLANGE BRACKET OR PIPE SADDLE–COOPER IND. B3088T & B3094 OR B3093. SEE NOTE 5.
15	3"	4"	6"	8"	M.J. PLUG, REMOVABLE, RESTRAINED
16	3"	4"	6"	8"	FLG. X FLG. DUCTILE IRON PIPE 90 DEG. ELL
17	3"	4"	6"	8"	M.J. X FLG. ADAPTER WITH MEGALUG M.J. RESTRAINT GLAND

MINIMUM SPOOL LENGTHS BEFORE AND AFTER MAGMETER

NO.	METER DIA.		
	3"	4"	6"
L1	15"	21"	30"
L2	21"	26"	38"

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

URBAN RECYCLED WATER TURNOUT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

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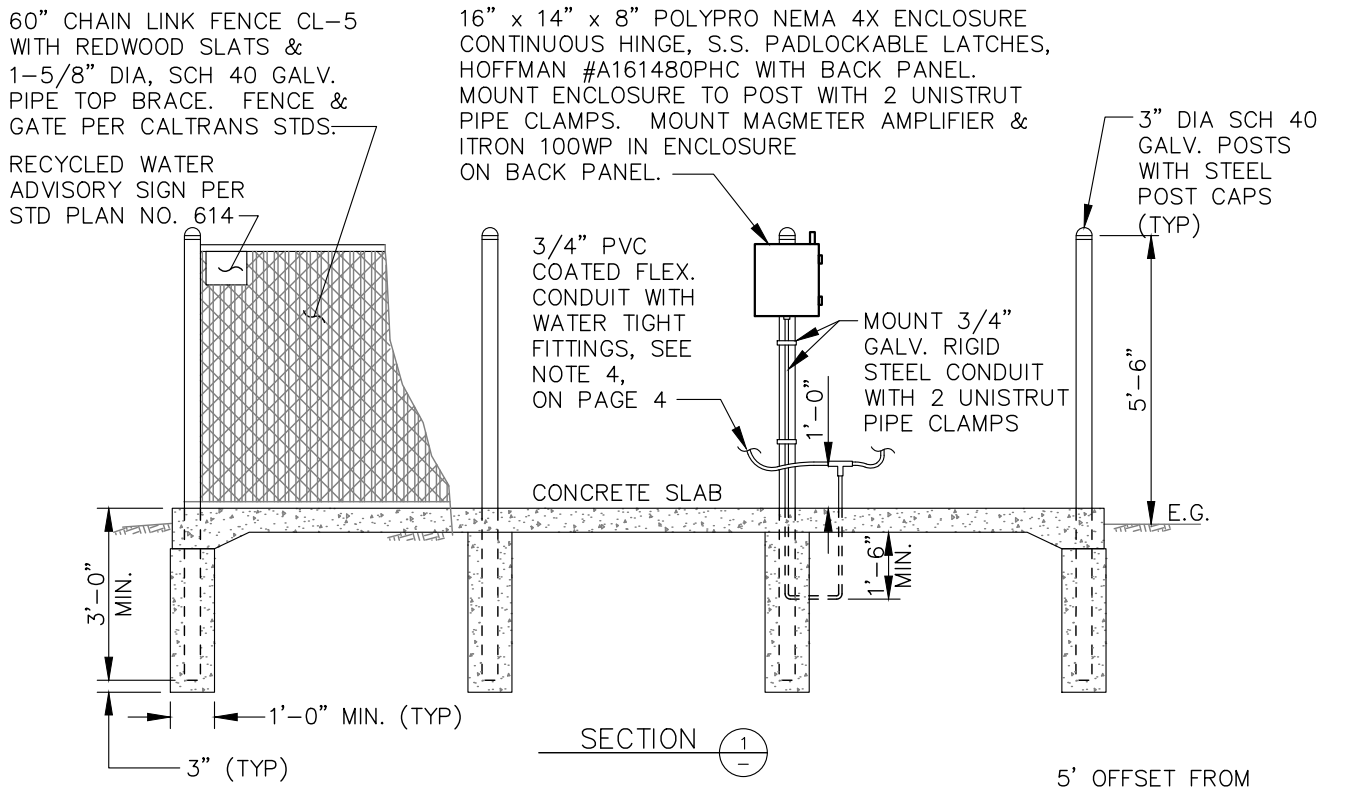
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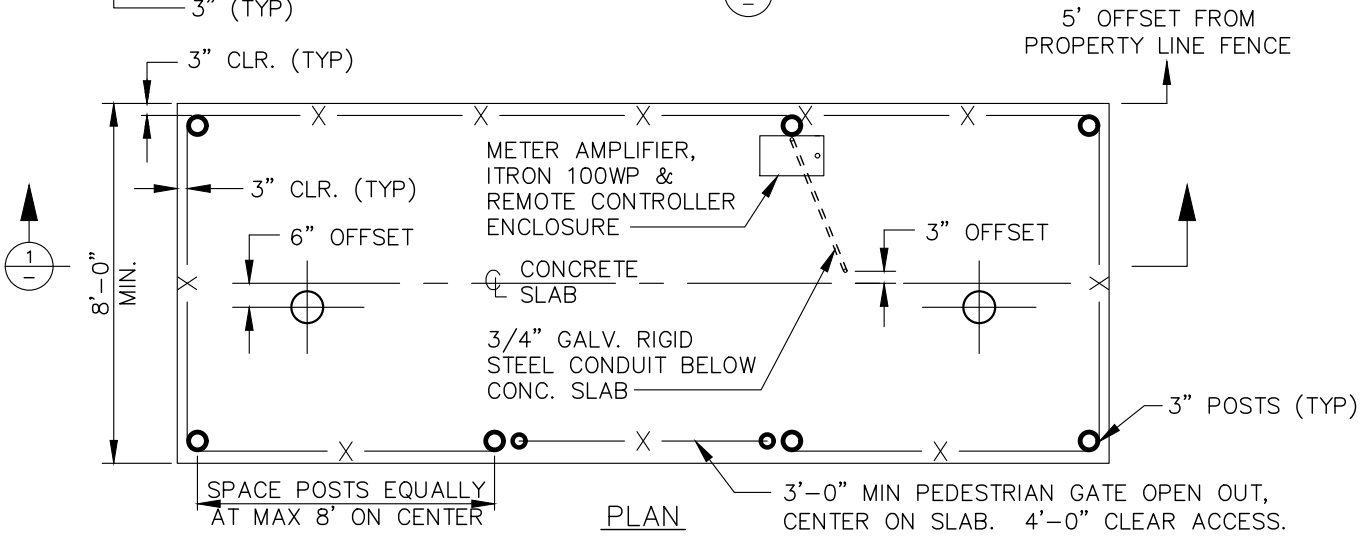
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FLOW CAPACITIES FOR TURNOUT PIPE DIAMETERS

TURNOUT DIA. (1)	METER DIA.	TYPICAL FLOW (2)	MAX FLOW (3)
3"	3"	130	190
4"	3"	230	330
6"	4"	520	750
8"	6"	1000	1,430

(1) SERVICE LATERAL DIAMETER EQUAL TO TURNOUT DIAMETER.
(2) APPROXIMATELY 5 PSI LOSS THROUGH 20' OF SERVICE LATERAL AND TURNOUT.
(3) APPROXIMATELY 10 PSI LOSS THROUGH 20' OF SERVICE LATERAL AND TURNOUT.





FENCE DETAIL

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

URBAN RECYCLED WATER TURNOUT

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JOHN JAEGER, PUBLIC WORKS DIRECTOR

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 607-3 Plot Date: May 29, 2020 at 03:56 pm

NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS, UNLESS "NO SUBSTITUTIONS" IS INDICATED.

2. ALL TURNOUT COMPONENTS INCLUDING FLOW METER SHALL BE PROVIDED BY CONTRACTOR. PRIOR TO INSTALLATION, INITIAL INSPECTION AND APPROVAL OF ALL COMPONENTS AND MATERIALS FOR RECYCLE WATER SYSTEMS IS REQUIRED.

3. ALL RECYCLED WATER PIPING AND APPURTENANCES SHALL BE COLOR CODED PURPLE AND MARKED RECYCLED WATER BY AN APPROVED METHOD. ABOVE-GROUND COMPONENTS NOT AVAILABLE COLOR CODED SHALL BE PAINTED PURPLE (PANTONE 512) UNLESS APPROVE OTHERWISE BY TOWN ENGINEER. EQUIPMENT NAME PLATES AND OTHER MANUFACTURE'S DATA SHALL NOT BE PAINTED.

4. INSTALL CONTROL WIRING IN WATER TIGHT CONDUIT FROM FLOW METER TO METER AMPLIFIER. ROUTE ¾" RIGID STEEL CONDUIT FROM INSTRUMENT ENCLOSURE BELOW GRADE TO T-BOX AT EQUIPMENT. ROUTE ¾" PVC COATED FLEXIBLE CONDUIT FROM T-BOX TO EQUIPMENT.

5. ISOLATE DISSIMILAR METALS. FOR BOLTING BETWEEN DISSIMILAR METALS, USE STAINLESS STEEL BOLTS WITH ISOLATION BUSHINGS AND WASHERS.

6. CONTRACTOR/PROPERTY OWNER MUST SUPPLY A PROFESSIONALLY FABRICATED, REMOVABLE, THERMAL INSULATION BLANKET(S) FOR ENTIRE TURNOUT ASSEMBLY AS APPROVED BY TOWN ENGINEER. OUTER CANVAS OR SAIL CLOTH COVER TO BE DARK GREEN WITH BRASS EYELETS TO ACCOMMODATE LOCKS. INSULATION FACTOR R-19 OR BETTER.

7. SURFACE PREPARATION AND PAINTING SHALL BE PER PAINT MANUFACTURE'S REQUIREMENTS AND AS APPROVED BY TOWN ENGINEER. PAINT PRODUCTS SHALL BE SHERMAN WILLIAMS OR TNEMEC AND BROUGHT TO THE SITE IN ORIGINAL LABELED UNOPENED CONTAINERS. APPLY PAINT ACCORDING TO THE FOLLOWING SCHEDULE:

SURFACE	COAT	TYPE	MANUFACTURER TRADE NAME		DMT. PER COAT
			SHERMAN WILLIAMS	TNEMEC	
UNPRIMED BLAST CLEANED METAL (SURFACE PREP. SSPC SP6 COMMERCIAL BLAST CLEAN)	PRIMER	URETHANE	COROTHANE 1GALVAPAK ZINC PRIMER B65 G11	SERIES 90-97 TNEMEZINC	2.5-3.0
	INTERM.	ACRYLIC	PRO-CRYL UNIVERSAL PRIMER B66 W310	SERIES 115 UNI BOND DF SELF CROSSLINKING	2.0-4.0
	FINISH	ACRYLIC SEMIGLOSS	SHER-CRYL HPA B66 W351	SERIES 1029 ENDURATONE	2.0-3.0
SHOP PRIMED METAL OR FUSION-BONDED EPOXY COATED METAL	TIE	ACRYLIC	PRO-CRYL UNIVERSAL PRIMER B66 W310	SERIES 115 UNI BOND DF SELF CROSSLINKING	2.0-4.0
	FINISH	ACRYLIC SEMIGLOSS	SHER-CRYL HPA B66 W351	SERIES 1029 ENDURATONE	2.0-3.0

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

URBAN RECYCLED WATER TURNOUT

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JOHN JAEGER, PUBLIC WORKS DIRECTOR

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TOWN OF WINDSOR

JOHN JAEGER, PUBLIC WORKS DIRECTOR

DESIGN AND CONSTRUCTION STANDARDS

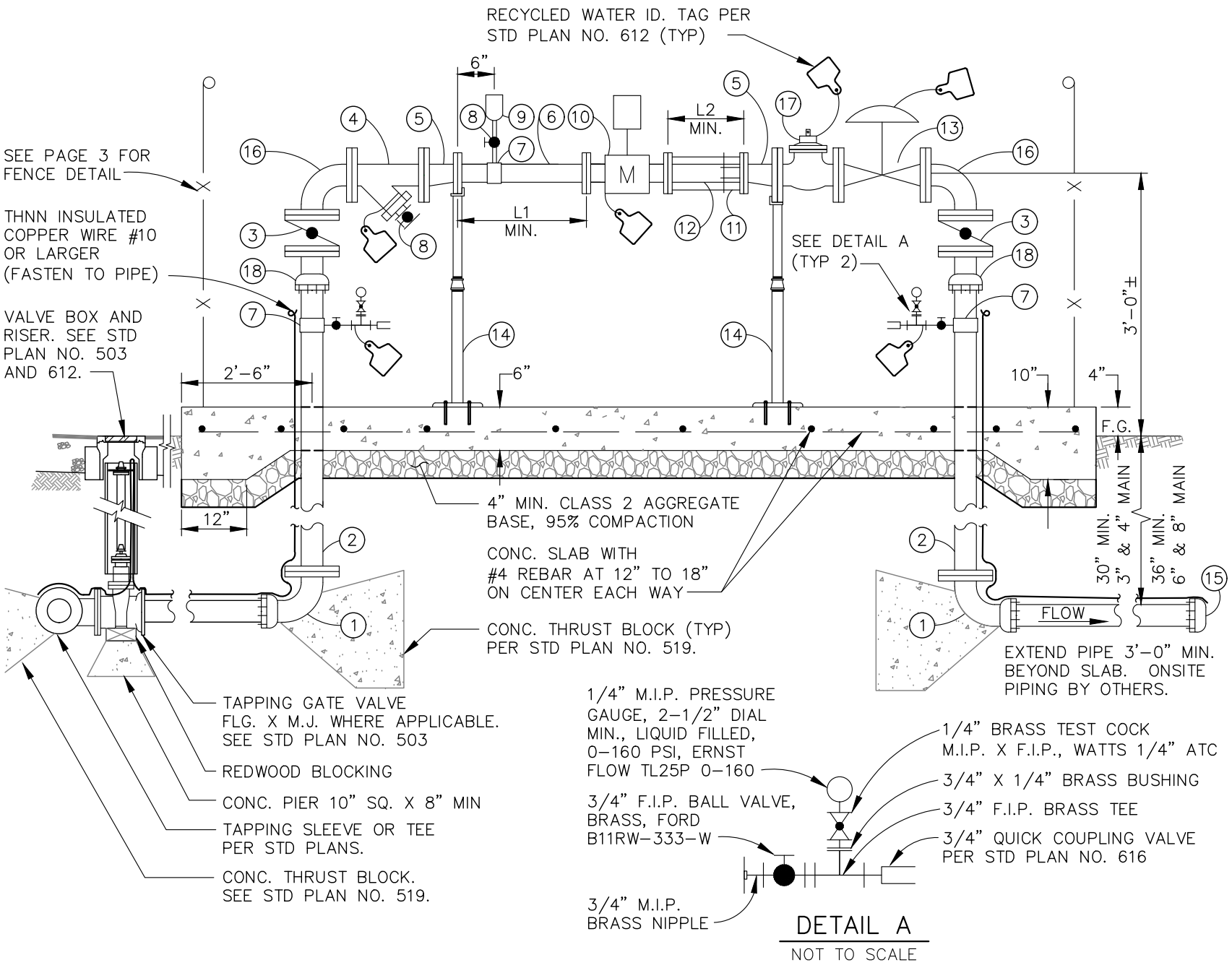
AGRICULTURAL RECYCLED WATER TURNOUT

OCT 2019 - NTS

(2012 STD. NO. 508)

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DETAIL A

NOT TO SCALE

FITTINGS FOR 3" AND LARGER TURNOUTS

NO.	TURNOUT DIA.				FITTING DESCRIPTION
	3"	4"	6"	8"	
1	3"	4"	6"	8"	FLG. X M.J. 90 DEG. ELL WITH MEGALUG RESTRAINT GLAND
2	3"	4"	6"	8"	FLG. X P.E. DUCTILE IRON PIPE
3	3"	4"	6"	8"	FLG. BUTTERFLY VALVE WITH HAND WHEEL, AWWA C504 RUBBER SEATED–DEZURIK OR HENRY PRATT
4	3"	4"	6"	8"	WYE STRAINER, CAST IRON BODY, 125/150 LB. FLAT FACE FLG., S.S. SCREEN WITH 1/8" PERFORATIONS, F.I.P. BLOWOFF CONNECTION, EPOXY LINED & COATED–WATTS 77F–DI–FDA–125
5	–	4"x 3"	6"x 4"	8"x 6"	FLG. DUCTILE IRON PIPE ECCENTRIC REDUCER
6	3"	3"	4"	6"	FLG. X FLG. DUCTILE IRON PIPE
7	3"	3"	4"	6"	SERVICE SADDLE, DUCTILE IRON–FORD FC 202
8	1"	1"	1"	1"	F.I.P. BALL VALVE, BRASS WITH LOCK WINGS–FORD B11RW–444–W OR A.Y. McDONALD 76101
9	1"	1"	1"	1"	AIR RELEASE VALVE–APCO 145C OR CRISPIN UL20
10	3"	3"	4"	6"	FLOW METER, MAGNETIC WITH ANSI 150 LB. FLG., REMOTE AMPLIFIER & 30' CABLE–BADGER M5000. PROVIDE ERW–1300–202 ITRON 100WP PULSER WITH INTEGRAL CONNECTOR & ANTENNA CONNECTOR. NO SUBSTITUTIONS.
11	3"	3"	4"	6"	FLG. COUPLING ADAPTER WITH 5/8" ALL THREAD TIE RODS, MIN. OF 4
12	3"	3"	4"	6"	FLG. X P.E. DUCTILE IRON PIPE
13	3"	4"	6"	8"	PRESSURE REDUCING, PRESSURE SUSTAINING & EXCESS FLOW SHUTOFF VALVE, GLOBE–STYLE DUCTILE IRON BODY, ANSI 125/150 LB. FLAT FACE FLG., BRONZE INTERNAL TRIM, FUSION EPOXY LINING & COATING–CLA–VAL 90G–20BCSYKC. NO SUBSTITUTIONS.
14	1–1/2"	2–1/2"	2–1/2"	2–1/2"	PIPE SUPPORT, GALV. STEEL ADJUSTABLE STANCHION WITH 6'x6" BASE MIN. & 4 S.S. EPOXY ANCHORS WITH FLANGE BRACKET OR PIPE SADDLE–COOPER IND. B3088T & B3094 OR B3093. SEE NOTE 5.
15	3"	4"	6"	8"	M.J. PLUG, REMOVABLE, RESTRAINED
16	3"	4"	6"	8"	FLG. X FLG. DUCTILE IRON PIPE 90 DEG. ELL
17	3"	4"	6"	8"	AUTOMATIC METERING VALVE FOR SEQUENTIAL IRRIGATION, GLOBE–STYLE DUCTILE IRON BODY, ANSI 125/150 LB. FLAT FACE FLG., BRONZE INTERNAL TRIM, POLYESTER LINING & COATING, COPPER & BRASS FITTINGS WITH IRRIGATION CONTROLLER & POWER SOURCE & 30' CABLE–BERMAD IR–0–910–MO–00–G–C–A5–PG–1DS–CB–G34–RZX WITH SUBTV CONTROLLER. NO SUBSTITUTIONS. SEE NOTE 4, PAGE 4.
18	3"	4"	6"	8"	M.J. X FLG. ADAPTER WITH MEGALUG M.J. RESTRAINT GLAND

MINIMUM SPOOL LENGTHS BEFORE AND AFTER MAGMETER

NO.	METER DIA.		
	3"	4"	6"
L1	15"	21"	30"
L2	21"	26"	38"

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

AGRICULTURAL RECYCLED WATER TURNOUT

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

STD. PLAN NO. 608

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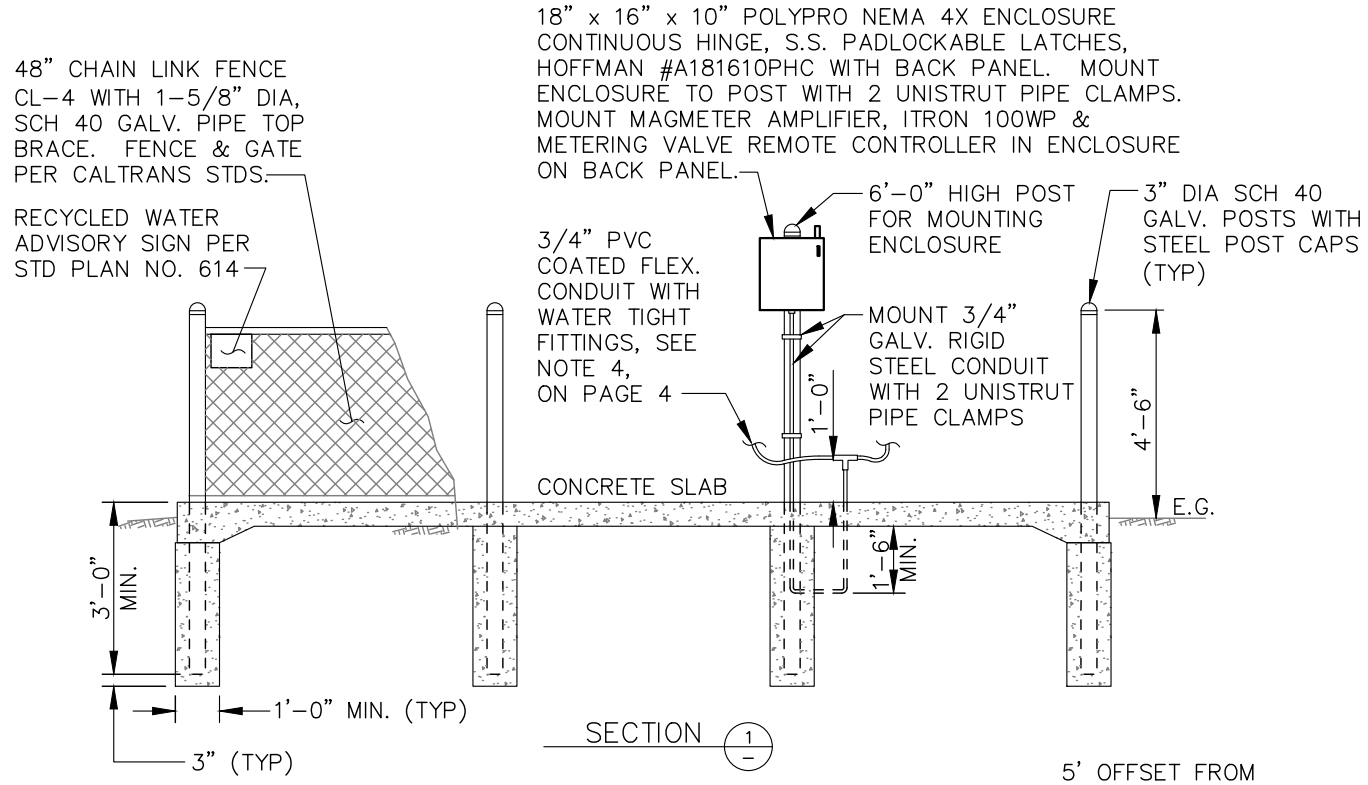
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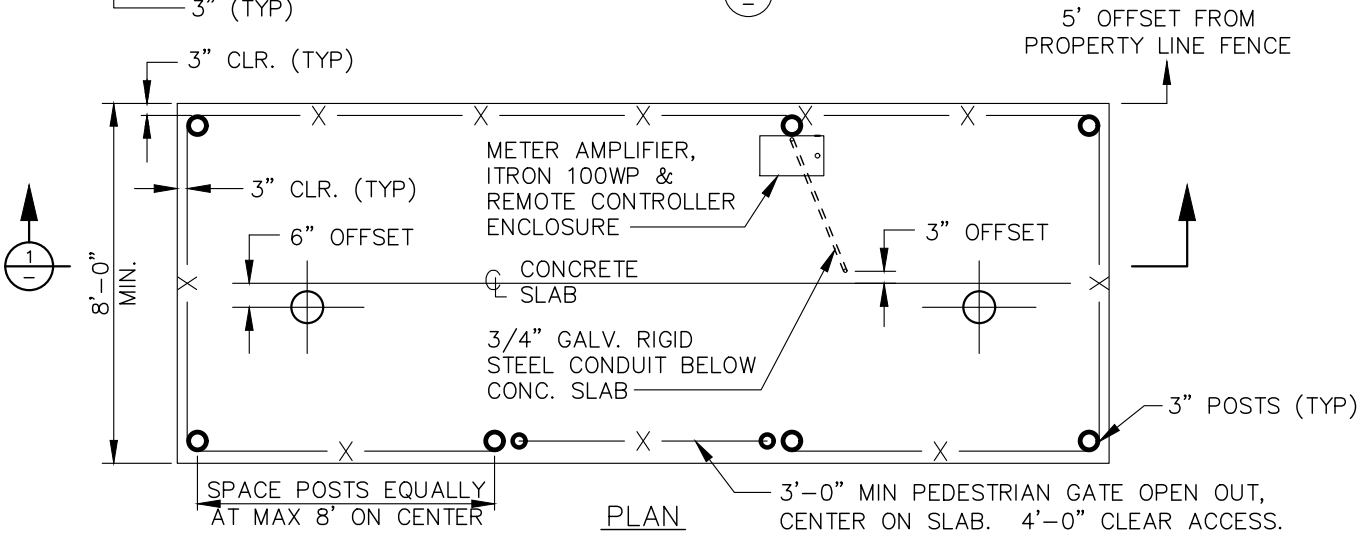
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 608-2 Plot Date: May 29, 2020 at 03:56 pm

FLOW CAPACITIES FOR TURNOUT PIPE DIAMETERS

TURNOUT DIA. (1)	METER DIA.	TYPICAL FLOW (2)	MAX FLOW (3)
3"	3"	130	180
4"	3"	215	300
6"	4"	500	710
8"	6"	900	1,240

(1) SERVICE LATERAL DIAMETER EQUAL TO TURNOUT DIAMETER.
(2) APPROXIMATELY 5 PSI LOSS THROUGH 20' OF SERVICE LATERAL AND TURNOUT.
(3) APPROXIMATELY 10 PSI LOSS THROUGH 20' OF SERVICE LATERAL AND TURNOUT.





FENCE DETAIL
NTS

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

AGRICULTURAL RECYCLED WATER TURNOUT

STD. PLAN NO. 608

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JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

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NOTES:

1. "OR APPROVED EQUAL" APPLIES TO ALL SPECIFIED COMPONENTS, UNLESS "NO SUBSTITUTIONS" IS INDICATED.

2. ALL TURNOUT COMPONENTS INCLUDING FLOW METER SHALL BE PROVIDED BY CONTRACTOR. PRIOR TO INSTALLATION, INITIAL INSPECTION AND APPROVAL OF ALL COMPONENTS AND MATERIALS FOR RECYCLE WATER SYSTEMS IS REQUIRED.

3. ALL RECYCLED WATER PIPING AND APPURTENANCES SHALL BE COLOR CODED PURPLE AND MARKED RECYCLED WATER BY AN APPROVED METHOD. ABOVE-GROUND COMPONENTS NOT AVAILABLE COLOR CODED SHALL BE PAINTED PURPLE (PANTONE 512) UNLESS APPROVED OTHERWISE BY TOWN ENGINEER. EQUIPMENT NAME PLATES AND OTHER MANUFACTURE'S DATA SHALL NOT BE PAINTED.

4. INSTALL CONTROL WIRING IN WATER TIGHT CONDUIT FROM FLOW METER TO METER AMPLIFIER AND FROM METERING VALVE TO VALVE CONTROLLER. ROUTE 3/4" RIGID STEEL CONDUIT FROM INSTRUMENT ENCLOSURE BELOW GRADE TO T-BOX AT EQUIPMENT. ROUTE 3/4" PVC COATED FLEXIBLE CONDUIT FROM T-BOX TO EQUIPMENT. MOUNT WIRING JUNCTION BOX ON METERING VALVE LIFTING EYE FOR CONTROL WIRING.

5. ISOLATE DISSIMILAR METALS. FOR BOLTING BETWEEN DISSIMILAR METALS, USE STAINLESS STEEL BOLTS WITH ISOLATION BUSHINGS AND WASHERS.

6. CONTRACTOR/PROPERTY OWNER MUST SUPPLY A PROFESSIONALLY FABRICATED, REMOVABLE, THERMAL INSULATION BLANKET(S) FOR ENTIRE TURNOUT ASSEMBLY AS APPROVED BY TOWN ENGINEER. OUTER CANVAS OR SAIL CLOTH COVER TO BE DARK GREEN WITH BRASS EYELETS TO ACCOMMODATE LOCKS. INSULATION FACTOR R-19 OR BETTER.

7. SURFACE PREPARATION AND PAINTING SHALL BE PER PAINT MANUFACTURE'S REQUIREMENTS AND AS APPROVED BY TOWN ENGINEER. PAINT PRODUCTS SHALL BE SHERMAN WILLIAMS OR TNEMEC AND BROUGHT TO THE SITE IN ORIGINAL LABELED UNOPENED CONTAINERS. APPLY PAINT ACCORDING TO THE FOLLOWING SCHEDULE:

SURFACE	COAT	TYPE	MANUFACTURER TRADE NAME		DMT. PER COAT
			SHERMAN WILLIAMS	TNEMEC	
UNPRIMED BLAST CLEANED METAL (SURFACE PREP. SSPC-SP6 COMMERCIAL BLAST CLEAN)	PRIMER	URETHANE	COROTHANE 1GALVAPAK ZINC PRIMER B65 G11	SERIES 90-97 TNEMEZINC	2.5-3.0
	INTERM.	ACRYLIC	PRO-CRYL UNIVERSAL PRIMER B66 W310	SERIES 115 UNI BOND DF SELF CROSSLINKING	2.0-4.0
	FINISH	ACRYLIC SEMIGLOSS	SHER-CRYL HPA B66 W351	SERIES 1029 ENDURATONE	2.0-3.0
SHOP PRIMED METAL OR FUSION-BONDED EPOXY COATED METAL	TIE	ACRYLIC	PRO-CRYL UNIVERSAL PRIMER B66 W310	SERIES 115 UNI BOND DF SELF CROSSLINKING	2.0-4.0
	FINISH	ACRYLIC SEMIGLOSS	SHER-CRYL HPA B66 W351	SERIES 1029 ENDURATONE	2.0-3.0

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TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

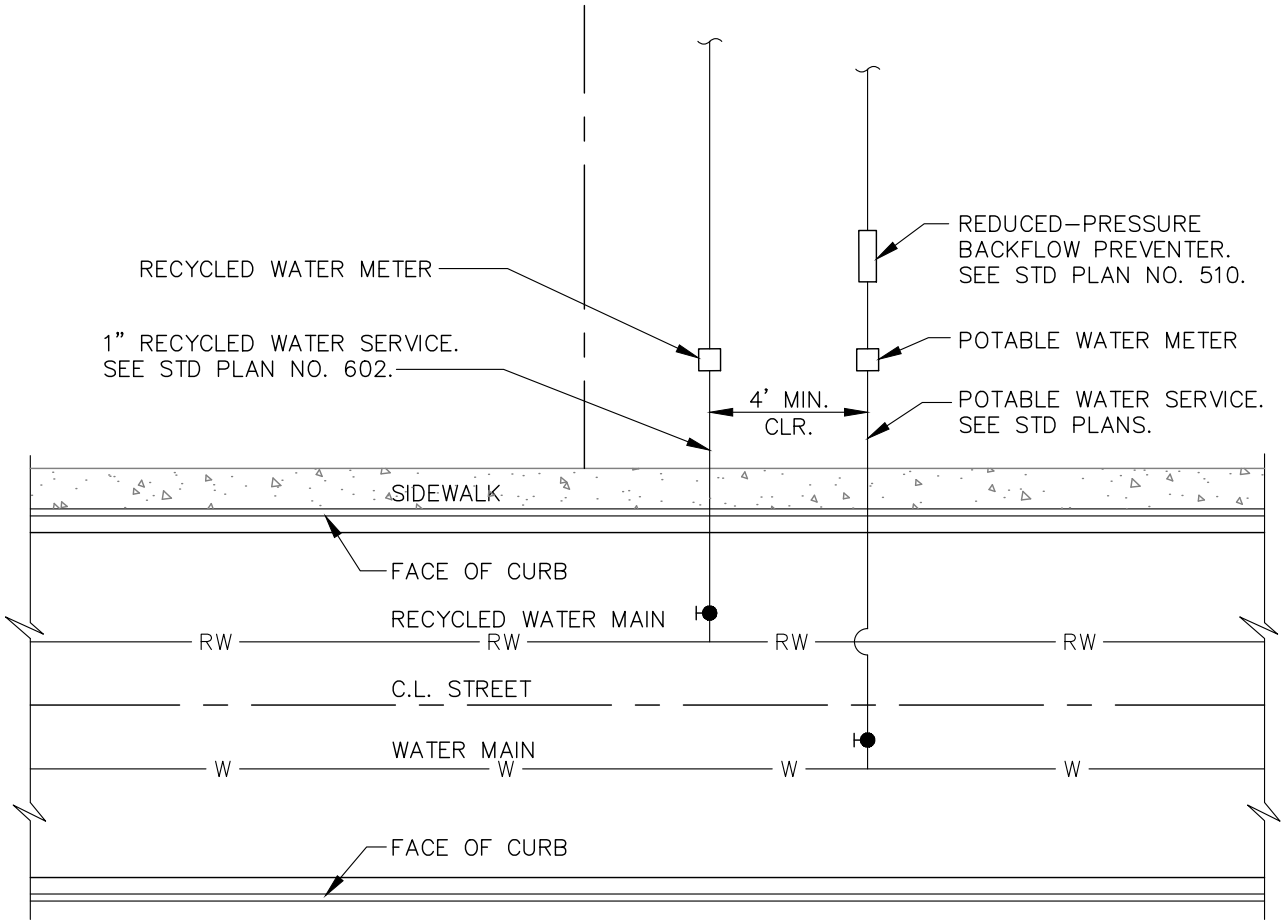
AGRICULTURAL RECYCLED WATER TURNOUT

STD. PLAN NO. 608

JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

(2012 STD. NO. 508)



NOTES:

1. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 4 FEET CLEAR AND VERTICAL SEPARATION OF 1.0 FOOT AT ALL TIMES BETWEEN CONSTANT PRESSURE RECYCLED WATER AND POTABLE WATER LINES WITH THE RECYCLED WATER LINES BELOW THE POTABLE.

2. NO CROSS CONNECTIONS ARE ALLOWED BETWEEN A RECYCLED WATER SYSTEM AND A POTABLE WATER SYSTEM OR ANY ONSITE WATER SYSTEM.

3. THE POTABLE WATER SYSTEM SHALL BE PROTECTED BY AN APPROVED BACKFLOW PROTECTION DEVICE. AT A MINIMUM, A REDUCED PRESSURE BACKFLOW DEVICE IS REQUIRED AT ALL POTABLE WATER POINTS OF CONNECTION TO THE SITE PRIOR TO THE INSPECTION, TESTING, AND CONNECTION OF RECYCLED WATER SERVICE.

4. ALL RECYCLED WATER PIPING, FITTINGS, AND SYSTEM COMPONENTS SHALL BE COLOR CODED PURPLE AND SPECIFICALLY MANUFACTURED FOR RECYCLED WATER USE. IF PURPLE FITTINGS, VALVES, AND APPURTENANCES ARE NOT AVAILABLE, THEN COMPONENTS SHALL BE PAINTED OR COLOR CODED AND MARKED "RECYCLED WATER" BY AN APPROVED METHOD.

5. ALL RECYCLED WATER SERVICE AND ONSITE PIPING, VALVES, FITTINGS, AND SYSTEM COMPONENTS REQUIRE PUBLIC WORKS DEPARTMENT INSPECTION AND APPROVAL PRIOR TO INSTALLATION.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

SINGLE RECYCLED WATER SERVICE

STD. PLAN NO. 610

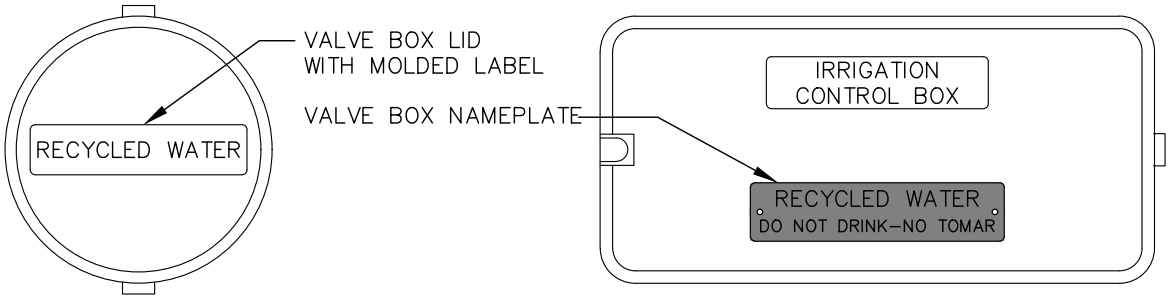
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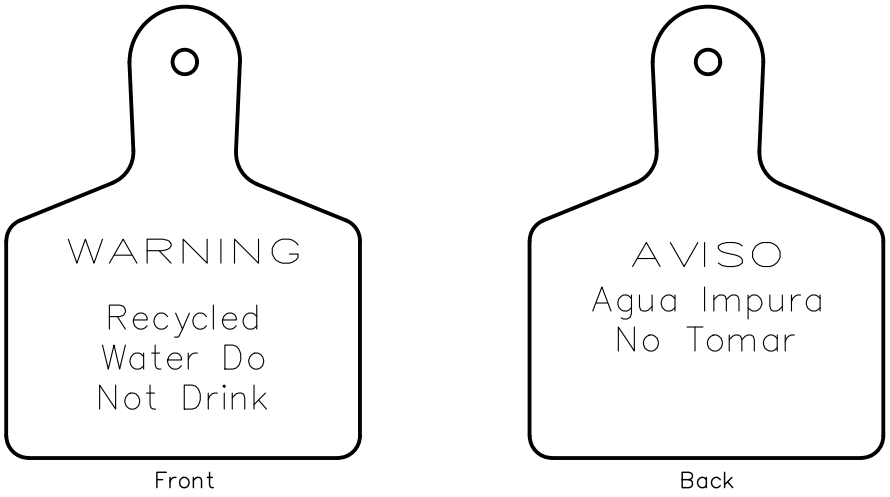
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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 610 Plot Date: May 29, 2020 at 03:56 pm



VALVE BOX LABELS



Front Back

IDENTIFICATION TAGS

NOTES:

1. INSTALL ALL NEW VALVES AND APPURTENANCES IN PURPLE BOXES WITH PURPLE LIDS WITH MOLDED LABELS THAT READ "RECYCLED WATER". FOR VALVES AND APPURTENANCES THAT RELEASE RECYCLED WATER (EXCEPT SPRINKLERS, BUBBLERS AND EMITTERS) PROVIDE BOLT–DOWN LIDS.

2. ALL VALVE BOXES USED FOR RECYCLED WATER SHALL BE MARKED WITH NAMEPLATES AFFIXED TO LID. NAMEPLATES SHALL BE PURPLE WEATHER RESISTANT DURABLE MATERIAL PERMANENTLY AFFIXED TO LID WITH CORROSION RESISTANT FASTENERS. NAMEPLATES SHALL BE CHRISTY'S MODEL NO. 3800 RECYCLED WATER VALVE BOX NAMEPLATES, OR APPROVED EQUAL.

3. RECYCLED WATER IDENTIFICATION TAGS SHALL BE PURPLE (PANTONE 512) WITH HOT STAMPED BLACK LETTERS THAT READ "RECYCLED WATER, DO NOT DRINK" IN ENGLISH AND IN SPANISH. VALVE TAGS SHALL BE CHRISTY'S MODEL NO. ID–MAX.–P2–RC006, OR APPROVED EQUAL.

4. IDENTIFICATION TAGS SHALL BE 3" X 4" IN SIZE, WEATHER RESISTANT DURABLE MATERIAL SUCH AS POLYURETHANE, WITH REINFORCED ATTACHMENT HOLE CAPABLE OF WITHSTANDING 180 POUNDS PULL–OUT RESISTANCE.

5. PERMANENTLY ATTACH IDENTIFICATION TAGS IN A CLEARLY VISIBLE LOCATION USING DURABLE WIRE OR STAINLESS STEEL FASTENERS TO ALL NEW AND EXISTING SYSTEM COMPONENTS INCLUDING METERS, PUMPS, VALVES, STRAINERS, BACKFLOW PREVENTORS, AIR/VACUUM RELIEF VALVES, AND BLOW–OFFS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

RECYCLED WATER IDENTIFICATION LABELS AND TAGS

STD. PLAN NO. 612

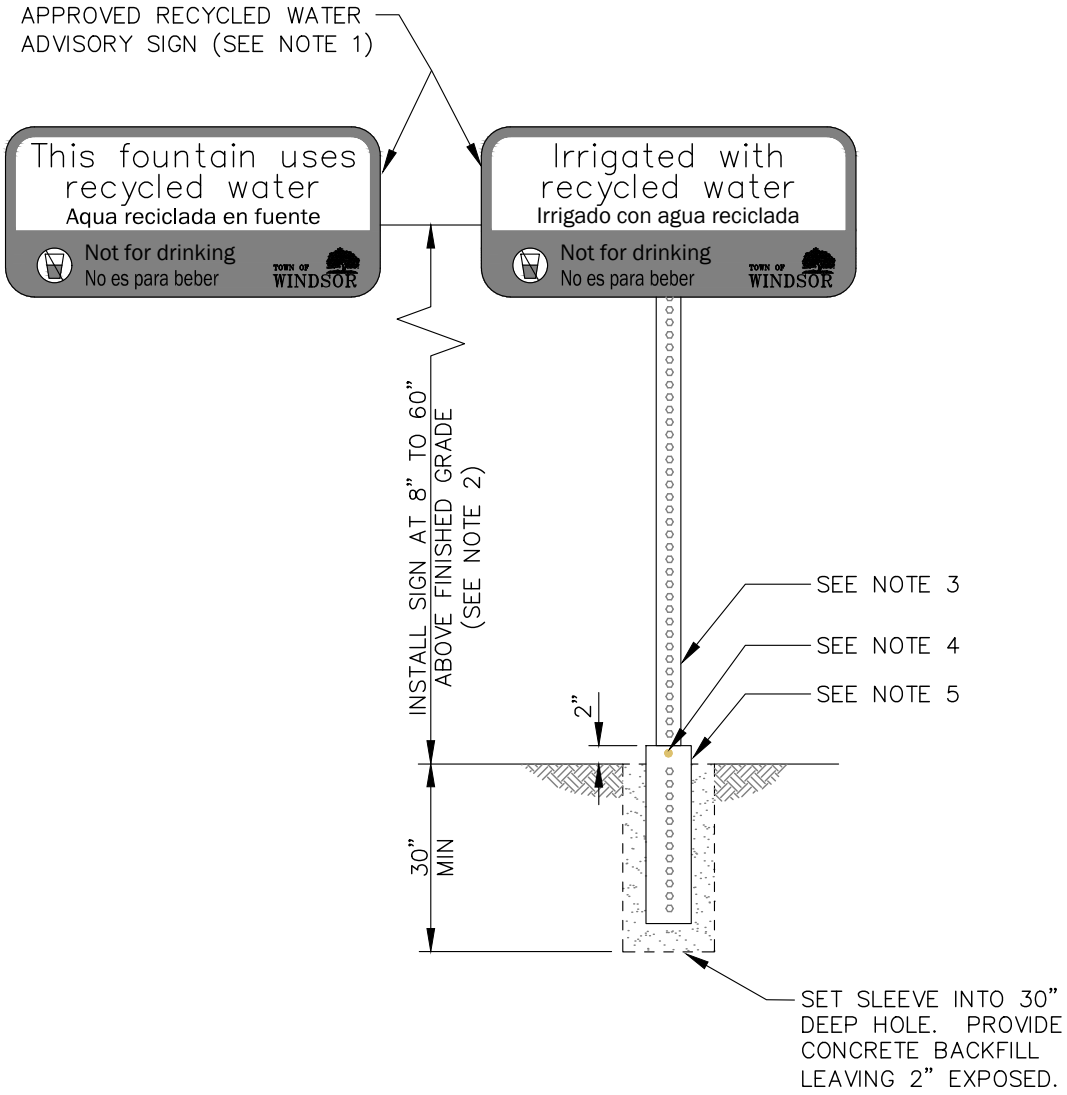
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JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

(2012 STD. NO. 512)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 612 Plot Date: May 29, 2020 at 03:56 pm



NOTES:

1. ALL SITES USING RECYCLED WATER MUST POST VISIBLE ADVISORY SIGNS CONFORMING TO THE TOWN OF WINDSOR STANDARDS AND INSTALLED PER LOCATIONS INDICATED ON THE APPROVED PLANS. THE NUMBER AND PLACEMENT OF ADVISORY SIGNS SHALL BE APPROVED BY TOWN ENGINEER.
2. MOUNT IRRIGATION ADVISORY SIGNS ABOVE HEIGHT OF SURROUNDING LANDSCAPING WHEN PLANTS ARE MATURE.
3. IF REQUIRED FOR MOUNTING PROVIDE A 1–3/4" SQUARE TELESPAR OR QUICK PUNCH SIGN POST (14–GUAGE GALVANIZED STEEL) OR APPROVED EQUAL.
4. INSTALL A 2" SQUARE QUICK PUNCH SIGN SLEEVE FOR SIGN POST (12–GUAGE GALVANIZED STEEL).
5. BOLT SIGN POST TO 2" SLEEVE WITH GALVANIZED HARDWARE SUPPLIED FROM POST MANUFACTURE.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

RECYCLED WATER ADVISORY SIGNS

STD. PLAN NO. 614

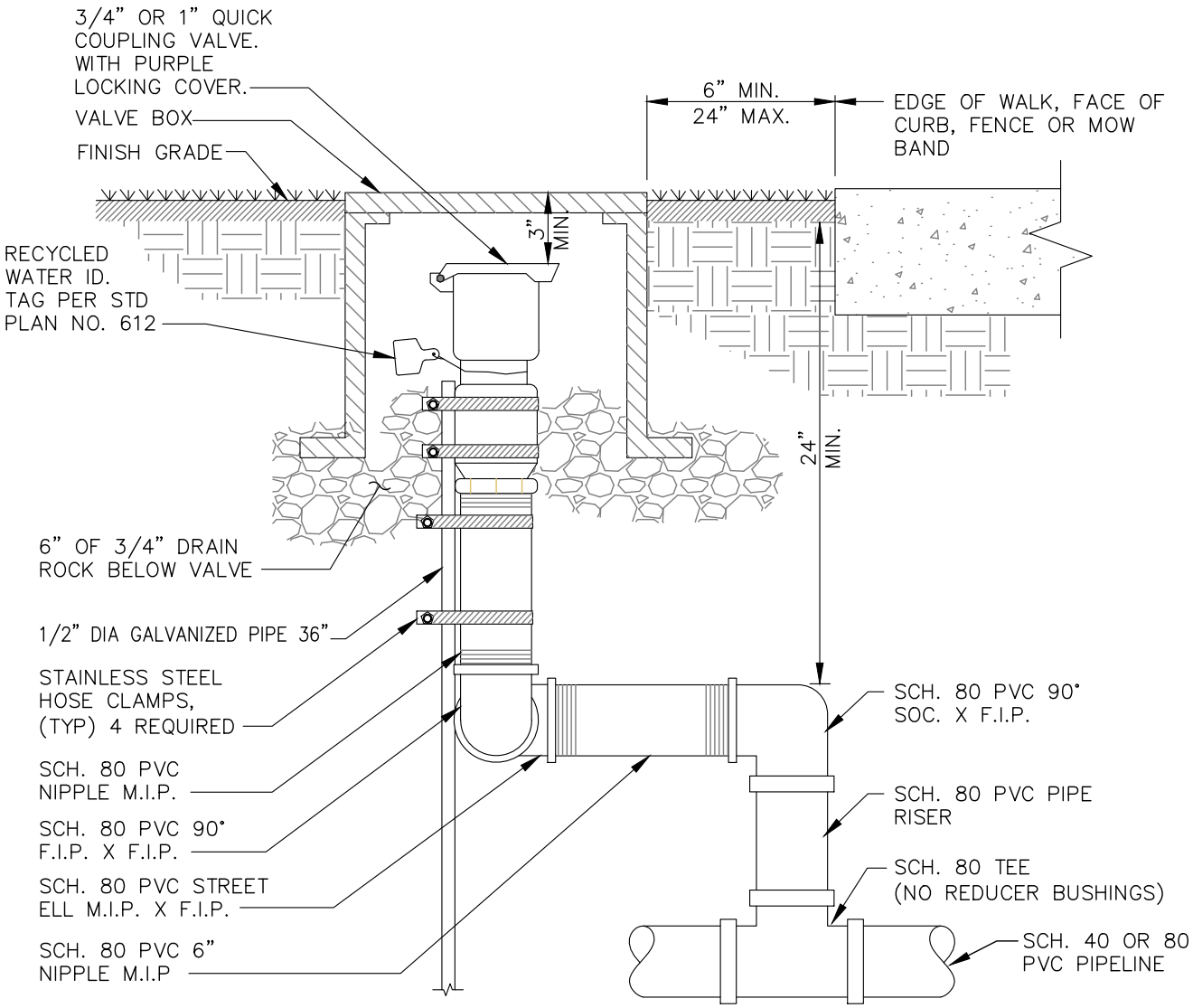
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JOHN JAEGER, PUBLIC WORKS DIRECTOR

OCT 2019 – NTS

(2012 STD. NO. 514)

Xrefs: Images: JEJ2-removebg-preview.png;windsor logo.tif;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 614 Plot Date: May 29, 2020 at 03:56 pm



NOTES:

1. USE RECTANGULAR OR 10" ROUND PLASTIC VALVE BOXES WITH BOLT DOWN LIDS, BROOKS MODEL 1419–12, OR EQUAL. HEAT BRAND OR LABEL VALVE BOX COVER TO IDENTIFY CONTROLLER, STATION AND VALVE TYPE.
2. INSTALL VALVE BOX AT GRADE IN TURF AREAS AND 2" ABOVE GRADE IN SHRUB AREAS.
3. QUICK COUPLING VALVE SHALL BE 3/4" OR 1" RED BRONZE WITH PURPLE LOCKING COVER AND ACME THREAD COUPLER KEY, RAINBIRD MODEL 33–DNP OR 44–NP, OR EQUAL.
3. TAG VALVES WITH STATION NUMBER.
4. FOR SCH. 40 GALVANIZED PIPING CONTACT TOWN ENGINEER.
5. USE TEFLON PASTE ON ALL THREADED PVC AND GALVANIZED STEEL PIPE CONNECTIONS.
6. RECYCLED WATER QUICK COUPLING VALVE SHALL HAVE A SPECIAL COUPLER KEY THAT DIFFERS FROM SITE POTABLE WATER VALVES LOCK KEYS.
7. RECYCLED WATER BOX LIDS SHALL BE COLOR CODED PURPLE WITH IDENTIFICATION LABELS OR NAMEPLATES PER STD PLAN NO. 612.
8. TAG RECYCLED WATER QUICK COUPLING VALVE, COUPLER KEY, AND HOSE WITH RECYCLED WATER IDENTIFICATION TAGS PER STD PLAN NO. 612.
9. USE PURPLE PIPE OR RECYCLED WATER IDENTIFICATION TAPE FOR ALL NEW OR EXPOSED PIPING ON RECYCLED WATER SYSTEMS.

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

RECYCLED WATER QUICK COUPLING VALVE

STD. PLAN NO. 616

PAGE 1 OF 1

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OCT 2019 – NTS

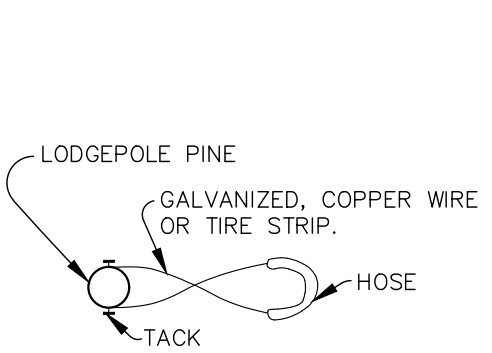
(2012 STD. NO. 516)

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Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\600 RecWater.dwg Layout Name: 616 Plot Date: May 29, 2020 at 03:56 pm

PART III – STANDARD DRAWINGS
SERIES 700 – PARK & LANDSCAPE CONSTRUCTION STANDARD DRAWINGS

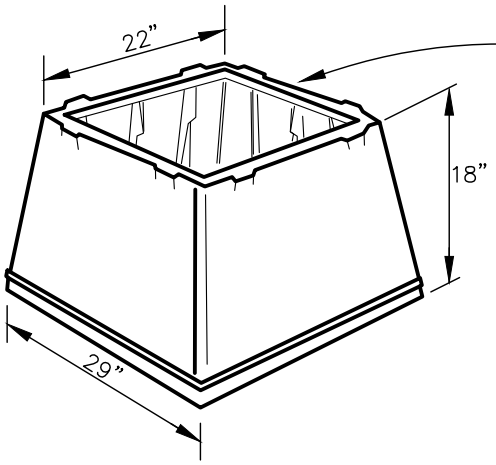
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STD. DWG. NO.	DESCRIPTION	LAST ISSUE DATE	CURRENT DATE
701	Street Tree Planting	11/93	04/15



TREE TIE DETAIL

PLANTING DETAIL



DIMENSIONS SHOWN ARE MINIMUMS.

DEEP ROOT PLANTER

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING

STD. PLAN NO. 701

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JOHN JAEGER, PUBLIC WORKS DIRECTOR

APR 2015 – NTS

(2012 STD. NO. 401)

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\700 StTrees.dwg Layout Name: 701-1 Plot Date: May 29, 2020 at 04:25 pm

GENERAL NOTES

1. TREES SHALL BE OF A SIZE NOT LESS THAN 8 FT. IN HEIGHT NOR LESS THAN 1 INCH CALIPER. A TREE MAY BE REJECTED IT IS NOT OF A SHAPE OR CONDITION ACCEPTABLE TO THE TOWN OF WINDSOR.

2. THE TREE SHALL BE PLANTED IN DEEP ROOT PLANTER BOX. THE PLANTER BOX MUST BE A MINIMUM OF 22 INCHES AT THE TOP, 29 INCHES AT THE BOTTOM AND 18 INCHES DEEP.

3. THE TREE SHALL BE PLANTED IN A HOLE 40 INCHES SQUARE BY 36 INCHES DEEP.

4. INSTALL TWO DEEP WATERING PERFORATED PLASTIC PIPES AS SHOWN. FILL PIPES WITH 3/4 INCH CLEAN DRAIN ROCK.

5. TREES SHALL BE PLANTED IN A MIXTURE OF 1/2 NATIVE SOIL AND 1/2 LEAF MOLD OR REDWOOD MULCH.

6. TREES SHALL BE STAKED WITH TWO 2 INCH BY 8 FT. MINIMUM LODGE POLE PINE STAKES OR EQUAL. STAKES SHALL BE COATED WITH GREEN PRESERVATIVE STAIN. TREES SHALL BE TIED WITH "GRO STRAIT" TREE TIES, OR SIMILAR.

7. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. APART TO A MAXIMUM OF 50 FT. APART DEPENDING ON THE TYPE OF THE TREE. TREES SHALL BE PLANTED A MINIMUM OF 20 FT. FROM CURB RETURNS, 15 FT. FROM STREET LIGHTS AND 6 FT. FROM DRIVEWAYS, SEWER LATERALS AND WATER SERVICES OR AS OTHERWISE APPROVED BY THE TOWN OF WINDSOR.

8. DEEP ROOT PLANTER SHALL BE FABRICATED FROM A HIGH DENSITY AND HIGH IMPACT PLASTIC SUCH AS POLYVINYL CHLORIDE, ABS OR POLYETHYLENE AND HAVE A MINIMUM THICKNESS OF 0.06 INCH. THE PLASTIC SHALL HAVE 1/2 INCH HIGH RAISED VERTICAL RIBS ON THE INNER SURFACE SPACED NOT MORE THAN SIX (6) INCHES APART.

Xrefs: Images: JEJ2-removebg-preview.png;
Path: F:\BMAP-STD\Windsor\Stds\Stds Dwgs\700 StTrees.dwg Layout Name: 701-2 Plot Date: May 29, 2020 at 04:25 pm

TOWN OF WINDSOR

DESIGN AND CONSTRUCTION STANDARDS

STREET TREE PLANTING

STD. PLAN NO. 701

JOHN JAEGER, PUBLIC WORKS DIRECTOR

APR 2015 – NTS

(2012 STD. NO. 401)