TOWN OF EASTON & EASTON UTILITIES

CONSTRUCTION STANDARDS

AND

SPECIFICATIONS

FOR

WATER, SEWER AND STREETS

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PREFACE

The following design standards, specifications and accompanying details are made available to private Contractors and Developers as standards to be complied with for use on every utility or street construction project within the incorporated area of the Town of Easton and areas served by Easton Utilities. They are binding and must be closely observed. Any exceptions or alterations must be obtained in writing from the Mayor and Council or the Town Engineer.

GENERAL CONDITIONS

1. DEFINITION OF TERMS

A. Whenever in these documents, the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

"Town of Easton" ("Town")
Town of Easton, Talbot County, Easton, Maryland

"Easton Utilities" ("Town")
The entity responsible for serving water, sewer, gas, electric and communications utilities within the "Town of Easton".

"Engineer"
Town Engineer for the Town of Easton or his duly authorized representative.

"Resident Project Representative"
An authorized representative of the Town or Engineer assigned to make any and all necessary observations of the work performed and materials and/or equipment furnished by the Contractor.

"Contractor"
Party responsible for constructing a utility or roadway, acting directly or through his agents or employees.

"Subcontractor"
Any individual, firm or corporation who contracts with a contractor to perform part or all of the latter's contract.

"Shop Drawings"
Drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any subcontractor, manufacturer, supplier or distributor, and which illustrate some portion of the work.

"Surety"
The body corporate, approved by the Town, which is bound with and for the Developer who is primarily liable, and which engages to be responsible for his acceptable performance of the work for which he has contracted.

"Developer"
Person or persons contracting for work which will be connected to or made part of Town of Easton utilities or roads system.

"Drawings"
All drawings or reproduction of drawings, pertaining to the work under the contract, which are furnished or approved by the Engineer.

"Specifications"
The definitions, descriptions, directions, provisions and requirements, contained herein, and all written supplements thereto, made or to be made, pertaining to the contract, and the materials, equipment and workmanship to be furnished under the contract.

"Approved", "As Required", and similar expressions
Meaning shall be construed as "as approved by the Town" and "as required by the Town".

"General Conditions"
Provisions that establish and pertain to the legal responsibilities between the parties involved in the work, namely Town, Engineer and Contractor.

"Bond" or "Contract Bond"
The form of security to be approved by the Town of Easton, furnished by the Developer and his surety.

2. PERMITS, FEES AND NOTICES

A. The Contractor and Developer shall pay taxes, royalties, and fees, and secure licenses and permits that are required, during the time of the contract, by local, county, state and federal laws, ordinances, rules, codes and regulations for the legal performance of the contract.

B. The Contractor shall perform the work in accordance with notices issued by public authorities having jurisdiction over the work.

C. If the Contractor performs work, knowingly or ignorantly, contrary to requirements of local, county, state and federal laws, ordinances, rules, codes and regulations, he shall assume full responsibility therefore and shall bear all costs of suits, actions and damages resulting from his illegal work performed.

3. INDEMNIFICATION OF THE TOWN

A. The Contractor and Developer shall indemnify and hold harmless the Town of Easton and the Engineer, and all who represent them, from and against claims, damage, losses and expenses arising out of the Contractor's performance of the work, provided such claim, damage, loss and expense are attributable to:

(1) Bodily injury, sickness, disease or death, or injury to tangible property, including the loss of use resulting there from, and
(2) Negligence of the Contractor or his subcontractors and others directly related to the project or both.

4. UNAUTHORIZED WORK

Work performed without Engineer's approval, work performed beyond the lines and grades shown on the drawings or as given, except as herein provided, and extra work performed without written authority, will be considered as unauthorized. Work so performed may be ordered by the Engineer removed and replaced at the Contractor's expense.

5. COOPERATION OF CONTRACTOR AND REPRESENTATIVE

The Contractor shall give the work his constant attention to facilitate the progress thereof and shall cooperate with the Engineer and Town of Easton. The Contractor shall have at all times a competent and reliable representative on the work, authorized to receive orders and act for him.

6. LAWS TO BE OBSERVED

The Contractor and Developer shall observe and comply with federal, state, county, and local laws, ordinances, rules, regulations, decrees and orders that are in effect and applicable to the work during the time of construction and he shall see that his subcontractors likewise, meet these requirements. He shall indemnify, and hold harmless, the Town and his representatives against claims and liabilities arising from Contractor and Subcontractor violations of such laws, ordinances, rules, regulations, decrees, and orders, whether such violations be by the Contractor or any Subcontractor, or any of their agents and/or employees.

7. LINES, GRADES AND ELEVATIONS

A. The Developer will indicate necessary bench marks and reference points, from which the Contractor shall lay out the lines, grades, and elevations of the work and shall conform his work thereto. The Town of Easton maintains horizontal and vertical control monuments which shall be referenced on the drawings. Vertical Datum shall be referenced to NAVD 88 and the Horizontal Datum shall reference all benchmarks to NAD 83 (1991) Easton monument. Information can be obtained from the Town Surveyor.

B. The Contractor shall provide for approval by Easton Utilities or the Engineer, as applicable, line and grade stakeout required for proper execution of the work as specified.

C. The Contractor shall furnish Easton Utilities or the Engineer, as applicable, at least five days prior to the start of construction, two record copies of line and grade stakeout data for approval. The furnishing of such record data shall in no way release the Contractor from his responsibility for the completeness and accuracy of stakeout work necessary for construction.

D. All survey and stakeout work shall be done by qualified personnel subject to the approval of Easton Utilities or the Engineer, as applicable,.

E. All proposed sewer cleanouts and water meter assemblies shall be field located by the Contractor prior to the start of construction. Notice shall be given to the Town to observe the location and make any adjustments necessary.

8. SANITARY PROVISIONS

The Developer's Contractor shall provide and maintain in a neat and sanitary condition such sanitary conveniences and accommodations for the use of his employees as may be necessary to comply with the requirements and regulations of the Department of Health or of other bodies or tribunals having jurisdiction thereof. He shall commit no public nuisance.

9. PUBLIC CONVENIENCE AND SAFETY

A. The Developer's Contractor shall conduct the work in a manner that will minimize obstruction to traffic in the area. The safety and convenience of the general public and of the residents and occupants of property along and adjacent to the work shall be provided in an adequate and satisfactory manner. Footways and portions of the highways and streams adjoining the work shall not be obstructed more than absolutely necessary. In no case shall any traveled thoroughfare be closed without permission of the Engineer.

B. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no obstructions shall be placed within 15 feet of hydrant.

C. Gutters shall be kept unobstructed at all times.

10. BARRICADES, DANGER, WARNING AND DETOUR SIGNS

The Developer's Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights, danger signals and signs, provide a sufficient number of watchmen and take all necessary precautions for the protection of the work and safety of the public. Highways closed to traffic shall be protected by effective barricades, on which shall be placed acceptable warning signs. The Contractor shall detour traffic and shall furnish and maintain all detour signs required to direct traffic over the entire route of the detour.

11. RESPONSIBILITY FOR WORK

Until the final acceptance of all the work shall be indicated in writing by the Engineer, the work shall be under the charge of and care of the Developer and his Contractor. They shall take every precaution against destruction of, injury, or damage to the work, or to any part thereof from any other cause whatsoever. The Contractor shall rebuild, repair, restore, and make good, at his own expense, all destruction of injuries or damage to the work or any of the above causes before its final completion and acceptance shall be indicated in writing by Easton Utilities or the Engineer, as applicable.

12. SUBMITTALS

A. The Developer or his Contractor shall submit shop drawings, material certifications, samples and test reports to the Engineer.

B. At completeness of the project, before it is turned over to the Town, and prior to testing, Contractor shall provide four sets of operating manuals of all equipment incorporated into the work. He shall provide spare parts, manuals, and test procedures in printed form to cover the scope of the project.

C. Contractor and manufacturer's representatives of all equipment utilized in the work shall meet at the project to assure proper start-up.

13. TEST OF SAMPLES OF MATERIALS

Tests of materials shall be made at the Developer's or his Contractor's expense, by a certified testing laboratory, in accordance with the officially approved methods as described or designated. The Town reserves the right to conduct verification testing at their expense. The Contractor shall cooperate with and assist the Town in taking samples and packing them for shipment to a laboratory.

14. QUALITY OF MATERIALS AND WORKMANSHIP

A. Materials and workmanship shall be of best possible quality and feasibility for the intended purpose, whether or not a brand name is specified. Materials shall be new and unused.

B. Representative preliminary samples of materials may be requested by the Engineer for examination or testing, or both. Materials may be further inspected by the Engineer during preparation and construction of the work; and materials found to be substandard will be rejected.

C. Contractor shall submit to Engineer samples of alternate materials that require laboratory testing. Such materials shall not be incorporated into the work until Engineer states, in writing, that materials meet requirements of the specifications.

15. AUTHORITY OF ENGINEER

The Engineer shall, in all cases, determine the amount or quantity, quality and acceptability of the work and materials. He shall decide on all questions in relation to said work and the performance thereof.

16. AUTHORITY AND DUTIES OF RESIDENT PROJECT REPRESENTATIVE

Resident Project Representatives (R.P.R.'s) employed by the Town, Easton Utilities or the Engineer, as applicable, shall be authorized to observe all work done and materials furnished.

Such observation may extend to all or any part of the work and to the preparation or manufacturer of the materials to be used. An R.P.R. may be stationed on the work to report to the Engineer as to the progress of the work and the manner in which it is being performed by the Developer's Contractor fail to fulfill the requirements of the specifications and contract. No inspection, or any failure to inspect, at any time or place, however, shall relieve the Contractor from his obligation to perform all the work strictly in accordance with the requirements of the specifications. The R.P.R. shall perform such other duties as are assigned to him. He shall not be authorized to revoke, alter, enlarge, relax or release any requirements of these specifications, nor to approve or accept any portion of work, nor to issue instruction contrary to the drawings and specifications. The R.P.R. shall in no case act as foreman or perform other duties for the Contractor, nor interfere with the management of the work by the latter.

17. INSPECTION OF MATERIALS AND WORK

The Developer's Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work, as performed, is in accordance with the requirements and intent of the specifications and contract. If the Engineer requests it, the Contractor, at any time before acceptance of work, shall remove and/or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the finished work to the standard required by the specifications. Should the work thus exposed or examined prove unacceptable, the removing, replacing and/or making good the parts removed shall be the Contractor's expense.

18. DEFECTIVE MATERIALS AND WORK

All materials not conforming to the requirements of these specifications shall be considered as defective, and all such materials whether in place or not, shall be rejected and shall be removed immediately from the work unless otherwise permitted. No material which has been rejected, the defects of which have been corrected or removed, shall be used until approval has been given. All work which has been rejected or condemned shall be remedied, or if necessary, removed and replaced in an acceptable manner by the Developer's Contractor at his own expense.

19. FAILURE TO REMOVE AND RENEW DEFECTIVE MATERIALS AND WORK

Should the Developer's Contractor fail to refuse to remove and renew defective materials used or work performed previously or to make any necessary repairs in an acceptable manner, and in accordance with the requirements of these specifications, within the time indicated in writing, the Engineer shall have the authority to cause the unacceptable or defective materials or work to be removed and renewed or such repairs to be made at the Developer's expense. Expenses incurred by the Town in making these removals, renewals, or repairs, which the Contractor has failed or refused to make, shall be paid by the Developer or may be charged against the " Bond" or other deposit.

20. CLEAN-UP

A. The Developer's Contractor shall, at his own expense, keep the sites of his operations clean during construction and remove all rubbish as it accumulates.

B. Upon failure of the Contractor to keep sites of his operations clean to the satisfaction of the Town, the Town may, upon 24 hours notice to the Contractor, remove rubbish, as is deemed necessary, and charging the cost thereof to the Developer.

C. On or before the completion of the work, the Contractor shall, without charge therefore, tear down and remove all his buildings and temporary structures built by him, shall remove all rubbish of all kinds from any grounds which he has occupied and shall leave the site of the work in a clean and neat condition.

20. TEMPORARY SUSPENSION OF WORK

The Engineer shall have the authority to suspend the work, wholly or in part, for such period or periods as he may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the suitable execution of the work, or for such time as in necessarily due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract documents. If it should become necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily nor become damaged in any way, and he shall take every precaution to prevent destruction, damage, or deterioration of the work performed, provide suitable drainage by opening ditches, shoulder drains, etc., and erect temporary structures where necessary. The Contractor shall not suspend the work on account of bad weather or other unfavorable conditions, nor permission by the Engineer to continue work during bad or other unfavorable conditions, shall be a cause for the acceptance of work which does not comply in every respect with the contract and specifications.

21. GUARANTEE

The Developer hereby guarantees all of the work for a period of three (3) years after the date of completion and final acceptance thereof by the Town as follows:

A. Against all faulty materials and against all imperfect, careless and unskilled workmanship.

B. That the entire equipment and each and every part thereof shall operate (with proper care and attention) in a satisfactory and efficient manner, and in accordance with the requirements of these contract documents.

C. That all structures shall be watertight and leak proof at every point and in every particular.

D. The Developer agrees to replace, with proper workmanship and materials, and to reconstruct, correct or repair, without cost to the Town, work which is improper, imperfect, does not operate in a satisfactory manner or fails to perform as specified,

or all of these.

E. **The Developer shall post a three (3) years Guarantee Bond equal to five (5) percent of the project cost for use in repair of improper work or defects that arise during the guarantee period. A Letter of Credit shall substitute for the Guarantee Bond.**

F. No use or acceptance by the Town of Easton of the work or any part thereof, nor any failure to use the same, nor any repairs, adjustments, replacements, or corrections made by the Town due to the Developer's failure to comply with his obligations, shall impair in any way the guarantee obligations assumed by the Developer under these documents.

G. It is understood and agreed that in the event the Developer fails to correct or repair any work under the contract which may be found to be improper or imperfect or otherwise fails to fulfill the terms of the Guarantee, the Town may purchase materials, tools and equipment and employ labor, or let a contract as required perform the necessary corrective work by the Town, shall be charged against the Guarantee Bond.

22. SHOP DRAWINGS

The Developer or his Contractor shall furnish shop drawings for all fabricated construction materials required for the work, unless otherwise directed by Easton Utilities or the Engineer, as applicable. Furnish six (6) copies of each shop drawing for approval. The Contractor shall not order materials until receiving shop drawing approval.

23. COOPERATION WITH OTHER CONTRACTORS

A. The Contractor and Developer shall cooperate with and so conduct his operations as not to interfere with or injure the work of other contractors or workmen employed by the Town. He shall promptly make good, at his own expense, any injury or damage which may be done by him or his employees or agents on the work.

B. The Contractor shall suspend such part of the work herein specified, or shall carry on the same in such manner, as may be ordered by the Engineer when necessary to facilitate the work of such other contractors or workmen.

24. AS-BUILT PLANS

A. The As-built process is a method of recording precise construction information on engineering permanent record drawings. The information is gathered during construction by field inspectors to reflect differences from original design drawings. The "corrected" record drawings therefore become an accurate representation of site conditions for future reference.

B. **As-built versus Revision** - As-built information is intended to reflect adjustments to

the proposed design that are a result of actual field construction imperfections. Other changes involving unforeseen issues or obstacles (i.e.field modifications) may sometimes be handled as simple as-built issues as long as the following statements are true.

- The change does not affect the intended function of the utility.
- The change does not affect the intended function of any other utility.
- The change does not affect the location of other related items such as easements.
- All related Town specifications and requirements have been met.
- Approval has been received from the associated Town departments.

All other modifications, necessitated by a variety of reasons (e.g. extensions, grade changes, and alignment changes) must be handled as revisions in accordance with the current Town engineering design revision procedures.

C. As-Built Drawings, for subdivisions, shall be in accordance with the Town of Easton Subdivision Regulations as shown in the Subdivision Regulations Appendix.

D. **Submittals** - After completing the As-built process on a project drawing set, the contractor shall submit the following to the Town of Easton and Easton Utilities Engineering Department for review and approval. One set of As-built plans each in hard copy format for review. Upon approval the Architect/Engineer shall submit, on CD-Rom and hard copy format, final/approved As-Built Documents to the Town of Easton. The CD-Rom shall contain the as-built information on the project and is to include DWG, and PDF formats of the CAD drawing. All Record Drawings require a professional seal (signed and dated) on hard copy sheets. PDF files shall be of these sealed As-Built plans.

25. WORK IN STATE RIGHTS-OF-WAY

The Developer and his Contractor shall construct all work in Maryland rights-of-way in accordance with permit requirements issued by that Agency. The Developer shall supply all information requested by the Town to make application on his behalf.

26. PROJECT INSPECTION BY THE TOWN

The Town of Easton or his agent, shall based on size and scope of a project, require inspection by the Town or Town Engineer on construction activities. Inspection may include the following:

A. Periodic Public Works Department or Engineer's inspections.

B. Part time inspection by R.P.R.

C. Full time inspection by R.P.R.

Prior to issuance of the Public Works Agreement, the Town shall advise the Developer of inspection requirements for the proposed project. The Developer shall pay all costs for

inspection and shall deposit all estimated costs for same with the Town prior to the start of any construction. Not withstanding notice by the Town, the Developer is responsible for all cost of inspection which may be required during the course of the construction as determined by the Town.

27. DESIGN PARAMETERS

These standards provide requirements for design of water, sewer and road systems. These provisions shall not preclude requirements of the Division of Public Health, the Maryland Department of Environment or the Maryland Department of Transportation. The Developer's Engineer shall conform to the more stringent requirements. He shall also obtain all permits required by the respective State.

28. CONSTRUCTION SPECIFICATIONS

Section 2 of these standards provides requirements for construction of utilities and road systems. These requirements shall not preclude requirements of the Division of Public Health, the Maryland Department of Environment or the Maryland Department of Transportation. The Contractor shall conform to the more stringent requirements. He shall also obtain all permits required by the government authorities having jurisdiction.

END OF SECTION

SECTION 1

DESIGN PARAMETERS

SECTION 1.1 - DESIGN PARAMETERS FOR STREETS

1.01.01 GENERAL

A. Where a Developer proposes to construct public streets in the Town of Easton, such streets shall be designed to the Standards defined herein. Streets shall be designed and constructed to Town Standards and conveyed to the Town upon acceptance.

B. Talbot County Soil Conservation District as applicable shall issue permits required for erosion control. Their requirements are in addition to those defined herein.

C. Submit stormwater calculations demonstrating that stormwater systems will convey a 10-year storm without surcharging inlets beyond 8 feet of an inlet.

D. Inlets shall be installed a maximum of 400 feet apart or the length of one block.

1.01.02 PROJECT DRAWINGS

A. TITLE SHEET

1. Title of Project and Address.
2. Phase of Project, if necessary.
3. Developer's Name and Address.
4. Design Engineer's Name and Address.
5. Drawing Index.
6. Approval block for Town Engineer's signature and date.
7. Vicinity Map showing location of Project within the Town of Easton. Typical scale shall be 1 inch equals 1000 feet.
8. Location Map if drawings are for one phase of the development.
9. Design Engineer's Seal and Signature.
10. Certification by the Design Engineer to the accuracy of the drawings.
11. Certification by the Developer approving the drawings.
12. Certification by a Professional Wetland Scientist for wetland determination if hydric soils are present.

B. HORIZONTAL PLAN

1. The scale shall be 1 inch equals 20 feet for small projects up to a maximum of 1 inch equals 50 feet for large projects.
2. North Arrow shall be shown.
3. The existing and proposed legend.
4. All necessary utility notes.
5. Location, elevation and description of all Project Bench Marks referenced to, and using, NAVD 88 monuments. Contact the Town Surveyor for the required

Benchmarks to be utilized.

6. Property lines, lot lines, lot numbers and easements.
7. Location of all existing and proposed structures and buildings with unit numbers.
8. Beginning and end of proposed construction, including phase limits.
9. Existing and proposed street names.
10. Drainage pipe, culverts, swales with inverts, slopes and spot elevation and pipe material.
11. Existing and proposed contours (minimum 1 foot vertical intervals) with major vegetation noted, within the areas of development and extending to off-site areas impacted by construction and related activities.
12. Stationing of roads with curve data, points of tangent and curve.
13. Curbing locations with type denoted plus top and bottom elevations at all elevation changes and minimum 50 foot intervals.
14. Spot elevations and expanded views for all intersections, cul-de-sacs, valley gutter and street reconstruction areas. The scale shall be 1 inch equals 20 feet at intersections with handicap ramps.
15. Light fixture locations.
16. Sign locations.

C. PROFILE

1. Scale shall match plan horizontally. Vertical scale shall be one-tenth (1/10) of the horizontal scale.
2. Drainage pipe and outfall data.
3. All utility crossings.
4. Vertical curve information.
5. Street Names.
6. Stationing, with centerline grades for existing and proposed. Stationing should be at 50 foot intervals and shall include highs, lows and transition points.

D. DETAILS

1. Street cross section.
2. Curbing type.
3. Entrance plan.
4. Storm drainage details.
5. Storm drain profiles.
6. Intersection details (Including spot elevations at corners and changes in slope for the centerline, gutter pan and changes in curb height)
7. Handicapped Ramps (Provide spot elevations at each change of slope & define the cross slopes and running slopes.)
8. Sidewalks
9. Landscaping
10. Lighting

1.01.03 LAYOUT, RIGHT-OF-WAY AND STREET DESIGN

A. The arrangements of the streets shall be such as to provide for the appropriate extension of existing streets.

B. Residential Access Street: This is the lowest order street in the hierarchy. It is intended to carry the least amount of traffic at the lowest speed. Developments should be designed so that all, or the maximum number possible, of the homes will front on this class of street.

C. Residential Sub-collector Street: This is the middle order street in the hierarchy. It will carry more traffic than the residential access street. It should provide an acceptable if not optimum environment for a residential neighborhood.

D. Residential Collector Street: This is the highest order street that could be classed as residential. It will carry the largest volume of traffic at higher speeds. In large residential developments, this class of street may be necessary to carry traffic from one neighborhood to another or from the neighborhood to streets connecting to other areas in the community. This level of street is unsuitable for providing direct access to homes and such access should be avoided.

E. Commercial streets shall be determined by usage.

F. The minimum right-of-way width shall be measured from lot line to lot line and shall be in accordance with the following schedule:

1. Commercial Streets: 60'
2. Residential Collectors: 60'
3. Residential Access Streets: 50'
4. Alleys: 20'
5. Internal roads, alleys, driveways, aisles and parking area in business and industrial developments shall be designed and built to satisfy the requirements of the Town of Easton.

G. Grades of arterial and collector streets shall not exceed four percent (4%). Grades on other streets shall not exceed five percent (5%). No street shall have a minimum grade of less than five tenths of one percent (0.5%).

H. Street intersections shall be as nearly at right angles as is possible and in no case shall be less than seventy (70) degrees. All street realignments to meet this regulation shall start a minimum of 100 feet from the intersection.

I. The block corners at intersections shall be rounded at the curb line with a curve having a radius of not less than twenty feet (20') for Access Streets and not less than twenty-five feet (25') for Collector Streets. Larger radii may be required depending upon usage.

J. Street jogs with center line offsets of less than one hundred twenty-five feet (125') shall be prohibited.

K. A tangent, at least one hundred feet (100') along, shall be introduced between reverse curves on arterial and Collector Streets.

L. When connecting street lines deflect from each other at any point by more than ten (10) degrees they shall be connected by a curve with a radius of not less than one hundred thirty feet (130') for Access Streets and three hundred feet (300') for Collector Streets.

M. All changes in grade, totaling 1% or greater, shall be connected by vertical curves of sufficient length to provide a smooth transition and proper sight distance.

N. Dead-end streets shall not be permitted except to permit future extensions to adjoining tracts. If a dead-end street is of a temporary nature, a temporary turn around shall be provided and provisions made for future extension of the street and reversion of the excess right-of-way, to the adjoining properties. A barricade shall be utilized for all dead end streets.

O. Cul-de-sacs of a permanent nature, if approved, shall not be longer than four hundred (400') feet and shall provide a turn around at the end with a minimum radius of forty (40') feet of pavement and fifty-two (52') feet of right of way.

P. Alleys shall not be longer than six hundred (600') feet.

Q. No street shall have a name which will duplicate or so nearly duplicate as to be confused with the names of existing streets in the Town or within 1 mile of the Town boundary. The continuation of an existing street shall bear the name of the existing street. Street names are subject to Town approval.

R. Street widths shall meet the following standards:

1.	Residential Access Streets:	26 feet Flowline to Flowline
2.	Residential Sub Collector Streets:	36 feet Flowline to Flowline
3.	Residential Collector Streets:	26 feet Flowline to Flowline
4.	Commercial Local Streets	36 feet Flowline to Flowline
5.	Commercial Collector Streets	44 feet Flowline to Flowline
6.	Alley:	20 feet Edge of Paving to Edge of Paving

R. Concrete right-of-way monuments shall be set at each change in direction along the approved right-of-ways and at all intersections.

END OF SECTION

1.02.01 SOILS INVESTIGATION

A. The Developer of a proposed subdivision where roads will be conveyed to the Town of Easton shall employ the services of an Engineer to perform a subsurface investigation for the purpose of obtaining information needed to design the proper pavement section.

B. The Design Engineer shall employ a Geotechnical Engineer registered in the State of Maryland who is qualified and experienced in the field of Geotechnical Engineering and who is actually engaged in the practice of soils mechanics and foundation engineering.

C. Borings shall be made for all proposed streets within the project area. The following guidelines and methods will be followed when performing the field work:

1. Borings shall be accomplished by using hollow stem augers and/or other equipment necessary to obtain soil samples of each stratum encountered.

2. Boring locations shall be placed along the centerline of the street no more than 300 feet apart, with a minimum of two (2) borings per street. Borings shall be located such that all questionable areas shall be investigated. Borings shall also be performed at roadway intersections and cul-de-sacs.

3. Borings shall be performed to a depth of 5 feet below the subgrade of the proposed pavement system.

4. Soil shall be sampled by stratum and at least every one foot of depth of the boring. At each soil composition change, a sample, sufficient in size to perform the required laboratory testing, shall be obtained.

5. When water is encountered, borings should be left open until water level stabilizes and then depth to water should be recorded.

6. A log of each boring should be performed by the Geotechnical field personnel. The following information should be recorded on the boring log.

    a. Name of street.
    b. Location of boring – centerline station and offset measured from the centerline.
    c. Surface elevation.
    d. Date boring was performed.
    e. Depth, vertical arrangement and thickness of each stratum.
    f. Sample number.
    g. Visual soil classification of each stratum.

h. Depth to water (if encountered).

D. The following laboratory tests shall be performed on each material type encountered in the test borings:

1. Practice for dry preparation of soil samples for particle size analysis and determination of soil constants (ASTM Designation D-421).

2. Method of particle-size analysis of soils (ASTM Designation D-422, Sieve Analysis Only).

3. Amount of materials in soils finer than the number 200 sieve (ASTM Designation D-1140).

4. Method of laboratory determination of water content of soils (ASTM Designation D-2216).

5. Classification of soils for engineering purposes (ASTM Designation D-2487).

6. Test method for liquid limit, plastic limit and plasticity index of soils (ASTM Designation D-4318) for cohesive soils.

E. California Bearing Capacity (CBR) testing shall be performed for each street at a minimum distance of 600'. CBR values below 10 shall be considered poor soil conditions. CBR values shall be obtained during the design phase and utilized to design pavement sections.

F. Methods which deviate from any of the above procedures must be submitted to the Town of Easton for approval.

G. Results of the soil investigation submitted to the Town of Easton should contain the following information:

1. A plan view of the proposed streets showing boring locations.

2. Logs containing the required data for all borings and tests made.

3. Test results of all laboratory tests performed.

4. A profile view of each boring plotted to scale showing the AASHTO classification of soils encountered.

5. Pavement design report by a geotechnical engineer.

1.02.02 SUBDIVISION PAVEMENT DESIGN

A. Subdivision streets shall be designed on the following standards and practices.

B. The design of pavement sections for streets shall be based on the type of soils as determined by the soils investigation, the anticipated use of the streets and utilization of streets by construction traffic. Soils investigation shall be performed in accordance with Section 1.04 of these Specifications.

C. Prior to placing the pavement and graded aggregate section, the subgrade shall be prepared and test rolled in the presence of the Town Engineer or his Agent. If the test rolling shows the subgrade to be unstable, the Contractor shall scarify, disc, aerate or add moisture and recompact the subgrade to the extent that when retested it will be stable. If, in the opinion of the Engineer, there are areas to be removed or undercut, they may be ordered to excavate and replace with approved material. The Town may require an extended warranty at the Engineer's discretion if soils are determined to be unsatisfactory.

D. The pavement section of street built to serve a future area of development shall be increased in strength to serve both the present and future traffic loads. If such a street must also serve construction traffic of future development, the pavement section shall again be increased per the recommendation of the Geotechnical Engineer as approved by the Town Engineer.

E. In situations where vehicular traffic utilizes the roadway prior to installation of the surface course, the initial paving section shall be increased to meet or exceed the required structural number. The required structural number shall meet traffic design for residential traffic and construction traffic, as managed by the developer.

1.02.03 SOIL CEMENT

A. The design of a soil cement shall determine the amount of Portland cement to be added to the soil to produce a cement-treated base. The mix design shall be based upon compressive strength and the moisture/density relationship of the mixture.

B. Mix designs shall be determined and certified by a Geotechnical Engineer prior to submitting to the Town for approval.

C. The following laboratory tests shall be performed on the material sampled from each test location:
   1. "Moisture-Density Relations of Soil Cement Mixtures, Method B" (AASHTO T 134)
   2. "Test Methods for Compressive Strengths of Molded Soil-Cement Cylinders, Method A" (ASTM D 1633)

D. Materials – Soil-aggregate, mixing water, cement and fly ash shall conform to the Maryland SHA requirements.

E. The desired compressive strength of the test specimens shall not be less than 300 psi or

greater than 800 psi. A target 28 day strength of 600 psi is recommended.

F. A minimum two inch (2") graded aggregate bond breaking layer shall be placed between the soil cement sub-base and pavement to prevent shrinkage cracking from effecting the surface pavement.

1.02.04 STORM DRAIN SYSTEMS

A. The design of storm drain systems shall be in accordance with the drainage criteria of the State of Maryland Department of Highways rules and regulations and these specifications.

B. Inlets shall be installed in all low points with 400 feet or more of contributing street length.

C. The design engineer shall prepare and submit a storm drainage report and calculations to the Town Engineer.

END OF SECTION

SECTION 1.3 - DESIGN PARAMETERS FOR WATER DISTRIBUTION SYSTEMS

1.03.01 GENERAL

Where water mains are to be installed for residential or commercial development, the Developer is responsible for all improvements. Developer shall hire a Contractor approved by the Town of Easton and Easton Utilities and pay all costs associated with the work. The Developer is also responsible for installation of all service lines inclusive of corporation stops and meter assemblies prior to paving.

1.03.02 PROJECT DRAWINGS

The Developer and his Engineer are responsible for preparation of detailed drawings. These drawings must be approved by Easton Utilities.

A. TITLE SHEET

1. Title of Project and Address.
2. Phase of Project (if necessary).
3. Developer's Name and Address.
4. Design Engineer's Name and Address.
5. Drawing Index.
6. Approval Block for Town Engineer's signature and date.
7. Vicinity Map showing location of Project within the Town. Typical scale shall be 1 inch equals 1000 feet.
8. Location Map if drawings are for one phase of the development.
9. Design Engineer's Seal and Signature.
10. Certification by the Design Engineer to the accuracy of the drawings.
11. Certification by the Developer approving the drawings.
12. Certification by a Professional Wetlands Scientist for wetland determination if hydric soils are present.

B. HORIZONTAL PLAN (WATER MAINS)

1. The scale shall be 1 inch equals 20 feet for small projects up to a maximum of 1 inch equals 50 feet for large projects.
2. North Arrow shall be shown.
3. The existing and proposed legend.
4. All necessary utility notes.
5. Location, elevation and description of all the Project Bench Marks, referenced to, and using, NAVD 88 monuments.
6. Location and sizes of all proposed water lines with stationing.
7. Locations of proposed valves, fittings, and fire hydrants.
8. Property lines and ownership, with details of existing and proposed easements where required.
9. Location of all existing and proposed structures and buildings.

10. Beginning and end of proposed construction.
11. Locations of proposed service lines.
12. Location of all other drainage facilities, sewer facilities, and public utilities.
13. Location of all existing utilities, including water mains, valves, hydrants, services, etc.
14. Provide profiles showing all utility crossings.

C. DETAILS (WATER MAINS)

Standard Construction Details shall be included on the drawings where applicable.

1.03.03 DESIGN CAPACITY

A. WATER MAINS

In determining the required size and capacity of the water main, the following factors should be considered:

1. Estimated average and maximum water demand for the design period.
2. Topography of area.
3. Depth of excavation.
4. Fire fighting requirements.
5. Number of proposed services.
6. The calculations for design of the water mains, when requested, shall accompany the Project Drawings, when submitted to the Town.
7. Hydrant tests or hydraulic field conditions determined by the developer.

B. WATER SERVICE LINES

Individual water services shall be installed to each lot of a subdivision including separate corporation stop, service line, and meter assembly. The PE service lines shall be one continuous piece from the main to the meter and no curb stops shall be utilized. The provision for individual services shall apply whether dwellings are under common ownership or individually owned, unless a variance is granted in writing by Easton Utilities. Townhouses, apartments, duplexes and condominiums are not required to have separate meters, unless the units are going to be classified as owner occupied. All reclassifications of a complex from renter to owner occupied shall be required to install a separate meter for each unit. All office complexes and retail units shall have a separate meter for each unit. Service lines shall be designed by the developer for the use intended.

1.03.04 DESIGN SIZE

A. PRESSURE

All water mains shall be sized after a hydraulic analysis based on flow demands and pressure

requirements. The system shall be designed to maintain a minimum pressure of 23 psi at ground level at all points in the distribution system under all conditions of flow. The normal working pressure in the distribution system should be designed for approximately 50 psi.

B. DIAMETER

The minimum size of water main for providing fire protection shall be 6-inch diameter. Larger mains will be required, if necessary, to allow the withdrawal of the required fire flow while maintaining the minimum residual pressure. All dead end water mains shall be a minimum of 8-inches in diameter.

C. SMALL MAINS

Any departure from minimum requirements shall be justified by hydraulic analysis and future water use and can be considered only in special circumstances.

1.03.05 DEPTH OF WATER MAINS

Minimum depth of water mains shall be 3'-6" as measured from the top of the pipe to finished grade or as indicated in the standard details.

1.03.06 VALVES

Sufficient valves shall be provided on the water mains for isolation during repairs. Valves should be located at not more than one block or 1000 foot intervals in other districts. Also, valves shall be placed on all legs of tee and cross connections.

1.03.07 HYDRANTS

Hydrants should generally be provided at each street intersection and at intermediate points between intersections as required. Generally, hydrant spacing may range from 375 to750 feet depending on the area being served. Fire hydrants shall by installed a maximum of 7 feet from the curb face unless authorized in writing by Easton Utilities. Hydrants shall not be installed outside of the public right-of-way or utility easement, unless authorized in writing by Easton Utilities and property owner.

1.03.08 SERVICE METERS

Each service connection, except fire service, shall be individually metered. Fire services shall be installed with a detector check meter system.

1.03.09 DEAD ENDS

Dead ends shall be minimized by looping of all water mains whenever practical. Hydrants shall be placed at the end of all dead end lines. Blow-offs shall be as shown in the standard details, if approved by Easton Utilities.

1.03.10 SEPARATION OF WATER MAINS, SANITARY SEWERS AND FORCE MAINS

A. HORIZONTAL SEPARATION

Water mains and water laterals shall be laid at least 10 feet horizontally from existing or proposed sewer mains or laterals.

B. VERTICAL SEPARATION

Water mains crossing sewers shall be laid to provide a minimum vertical distance of 12 inches between the outside of the water main and the outside of a storm sewer, sanitary sewer or force main. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required. Additionally, water laterals shall be laid to provide a minimum vertical distance of 12 inches between the outside of the water lateral and the outside of the sewer or force main.

C. SEWER MANHOLES

No water pipe shall pass through or come in contact with any part of a sewer manhole.

D. SPECIAL CONDITIONS

When it is impossible to obtain proper horizontal and vertical separation as stipulated above, concrete encasement shall be required. Transition carrier pipe to ductile iron or use steel casing prior to concrete encasement being installed a minimum of 5 feet each side of the crossing point on the lowest utility, as required by the Engineer.

END OF SECTION

SECTION 1.4 - DESIGN PARAMETERS FOR SANITARY SEWERS

1.04.01 GENERAL

A. Where sewer mains are to be installed for a residential or commercial development, the developer is responsible for all improvements. Developers shall hire a contractor approved by the Town of Easton and Easton Utilities, and pay all costs associated with the work. The Developer shall install sewer laterals with cleanouts in the pipe laying process. Connections to the sewer mains shall be made with wye fittings.

B. Laterals shall be constructed of Schedule 40 PVC. Maintain a minimum of 24-inch cover. Lateral extensions from the cleanout to the house shall conform to County Plumbing Regulations.

1.04.02 PROJECT DRAWINGS

A. TITLE SHEET

1. Title of Project and Address.
2. Phase of Project (if necessary).
3. Developers' Name and Address.
4. Design Engineer's Name and Address.
5. Drawing Index.
6. Approval Block for Town Engineer's signature and date.
7. Vicinity Map showing location of Project within the Town. Typical scale shall be 1 inch equals 1000 feet.
8. Location Map if drawings are for one phase of the development.
9. Design Engineer's Seal and Signature.
10. Certification by the Design Engineer to the accuracy of the drawings.
11. Certification by the Developer approving the drawings.
12. Design calculations and daily flows with total number of units, lots, etc.
13. Certification by a Professional Wetlands Scientist for wetland determination if hydric soils are present.

B. HORIZONTAL PLAN (SANITARY SEWERS)

1. The scale shall be 1 inch equals 20 feet for small projects up to a maximum of 1 inch equals 50 feet for large projects.
2. North Arrow shall be shown.
3. The existing and proposed legend.
4. All necessary utility notes.
5. Location, elevation and description of all the Project Benchmarks referenced to, and using, NAVD 88 monuments.
6. Location, sizes, type and slope of all sanitary sewer lines with stations corresponding to the profiles.

7. Location of all manholes with grades between any elevation of flow line, and all invert elevations.
8. Property lines and ownership, with details of easements where required.
9. Location of all existing and proposed structures and buildings with unit numbers.
10. Beginning and end of proposed structures and buildings with unit members.
11. Location of proposed laterals, wyes, etc.
12. Location of all other drainage facilities and public utilities.
13. Proposed manhole numbers and cleanouts and proposed lot numbers.
14. All existing sanitary sewer facilities (i.e. manholes and pipelines) shall be shown and labeled for inverts and size.

C. PROFILES (SANITARY SEWERS)

1. The horizontal scale shall be identical to the Horizontal Plan and vertically, one-tenth (1/10) of the horizontal scale.
2. Profile of existing and proposed ground surface.
3. Profile of sanitary sewer showing, type and size of pipe, slope, manholes and concrete encasement (if any). Designate manhole diameters if other than 48 inches.
4. Location of all other drainage facilities and public utilities crossing sanitary sewer lines.

D. DETAILS (SANITARY SEWERS)

Standard construction details, as shown in the Standard Detail Section of this Booklet, shall be included on the construction drawings where applicable. Details for construction, other than the Standard Details, shall also be shown on the project drawings.

1.04.03 DESIGN CAPACITY

In determining the required size and capacity of the sanitary sewer, the following factors should be considered:

A. Average and peak hourly domestic sewage flow.

B. Topography of area.

C. Depth of excavation.

D. Pumping requirements if necessary.

The calculations for design of the sanitary sewers shall accompany the Project's Drawings, when submitted for review.

1.04.04 DESIGN FLOW

A. PER CAPITA FLOW

The sanitary sewer system shall be designed on the basis of an average daily flow of 300 gallons per day per equivalent dwelling unit.

B. PEAK DESIGN FLOW

Sanitary sewer shall be designed on a peak flow basis using the ratio of peak to average daily flow as determined from Figure 2.1, the latest edition of the 10-State Standards.

1.04.05 MINIMUM SIZE

A. SANITARY SEWER MAINS

The required size of sanitary sewer mains will vary with the character and size of the Development. The minimum size for sanitary sewer main is six (6) inches.

B. LATERAL CONNECTIONS

Lateral cleanouts are required for use with all laterals.

Each individual dwelling unit and multi-family units, with the exception of structures where each unit may not extend to the ground floor, shall have an individual lateral installed. The minimum diameter of laterals extending from Easton Utilities maintained cleanouts shall be six inches (4") at minimum slope of 2%. Lateral cleanouts shall be placed at the property line and within 5 feet of the foundation. If the lateral is greater than 75 feet in length, additional cleanouts may be required. Cleanouts on private property shall be per the State or County Plumbing Code in effect.

1.04.06 DEPTH OF SEWER

Minimum depth of PVC sewer mains shall be 42 inches as measured from the top of the pipe to finished grade. Any piping not meeting the required minimum depth shall be ductile iron.

1.04.07 SLOPES

All sewers shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.0 feet per second, based on Mannings formula. If possible, pipe slopes should be increased above minimum slope in locations where pipes will carry functional flow.

Using an "n" value of 0.010 for PVC, the following are the minimum slopes which are allowed:

Sewer Size	Minimum Slope in Feet Per 100 Feet
8 inch	0.28
10 inch	0.22
12 inch	0.17
15 inch	0.12
18 inch	0.10

Using an "n" value of 0.013 for Ductile Iron Pipe, the following are the minimum slopes which are allowed:

Sewer Size	Minimum Slope in Feet Per 100 Feet
8 inch	0.40
10 inch	0.28
12 inch	0.22
15 inch	0.17
16 inch	0.14
18 inch	0.12

1.04.08 MANHOLES

A. LOCATION AND SPACING

Manholes shall be installed at the end of each line; at all changes in grade, size or alignment; at all intersections; and at distances not greater than 400 feet.

B. CLEANOUTS

Terminal cleanouts shall not be substituted for manholes. However, terminal cleanouts may be approved under Special Conditions by Easton Utilities on a case by case basis. Under no conditions shall terminal cleanouts be installed at the end of a main line sewer greater than 150 feet from the last manhole.

C. DROPS

A drop pipe should be provided for a sewer entering a manhole at an elevation of 21 inches or more above the manhole invert. Where the difference in elevation between the incoming sewer and the manhole invert is less than 21 inches, the flow channel should be filleted to prevent solids deposition.

D. MINIMUM DIAMETER

The minimum diameter of manholes shall be 48 inches. Larger diameters are required for drop connections in new construction. A minimum access diameter of 24 inches shall be provided.

E. FLOW CHANNELS

The flow channel through manholes shall be concrete or brick and mortar, conforming in shape and slope to that of the sewers. The top of the brick channel shall be at the same elevation as the crown of the main sewer line in the manhole. Channel shall drop a minimum of 0.10 foot from influent pipe to the effluent pipe unless otherwise approved.

END OF SECTION

SECTION 2

CONSTRUCTION SPECIFICATIONS

SECTION 2.1 - EXCAVATION AND BACKFILL FOR PIPELINES AND STRUCTURES

2.01.01 GENERAL

A. The Contractor shall perform all excavation, backfilling, grubbing and grading required for construction and installation of pipelines, structures and appurtenances. Excavation shall include removal of pavement, concrete, rock, earth and debris, regardless of character. Trenches and excavations shall be sheeted, shored and braced by the Contractor, as necessary to allow construction and provide safe working conditions. Additionally, the Contractor shall be responsible for maintaining a dry excavation by dewatering. He shall also support and protect existing utilities and structures encountered in the work, provide traffic control, dispose of surplus and unsuitable excavated materials and restore backfilled areas to original condition or as required by the respective contract drawings and specifications.

B. The condition of all excavations made by the Contractor shall be the responsibility of the Contractor. The Contractor is responsible for direct or indirect damage to existing structures, pipelines, conduits, poles, wires of every description in the vicinity of his work whether above or below ground, or that may be encountered in trench or structure excavation. This responsibility shall include the cost of protection by sheeting, bracing, hand excavation, when warranted, and the expense to repair or replace any existing facility damaged directly or indirectly by construction activities, whether such facility is or is not shown on the drawings.

C. The Contractor shall verify the location and inverts of all existing utilities at the various points of connection and/or crossings prior to starting any work. Any discrepancies in locations or inverts shall be brought to the attention of the Engineer or the Town in order that the designs may be adjusted accordingly. Damages suffered or additional costs incurred by the Contractor as a result of his failure to conform to the requirements of this paragraph shall be the sole responsibility of the Contractor. Connections to existing utilities shall be made by the Contractor at such a time and in such a manner as the Engineer or Town may direct.

D. Excavation and backfill, within an area where a State agency has jurisdiction, shall be done in accordance with requirements and provisions of the permits issued by the agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of these specifications.

2.01.02 PIPELINE TRENCH EXCAVATION

A. The contractor shall excavate, maintain and backfill all excavation necessary for completing the work under the contract.

B. Trenches shall be excavated to the necessary width and depth, as shown on the drawings and as required for the safe installation of the utility, etc.

C. The sides of the trenches shall be practically plumb and shall not be sloped unless approved in writing by the Engineer. Trench sides shall be supported or sheeted, as required, to protect

pavement surfaces, curbing, utilities, etc., and required for safety. Safety regulations shall be as required by State safety codes and OSHA.

D. In paved areas, the Contractor shall remove the paving only as necessary for the excavation of the trench or as detailed. Pavements edges at the trench shall be saw cut neat and straight prior to the start of the excavation. Should the pavement damage result from cave-ins, settlement, etc., the Contractor shall replace such paving.

E. The excavation of all trenches shall be fully completed at least twenty (20) feet in advance of pipe laying, unless otherwise authorized or directed. The Engineer or Town may require the backfilling of open trench, over completed pipelines, or ahead of the pipe laying operation, if in his judgment such action is necessary.

F. Should work be stopped for any reason and any excavation is left open for an unreasonable length of time, the Contractor shall refill the excavation if so directed, and shall not reopen the excavation until he is ready to complete the facility. Should the Contractor refuse or fail to refill any excavation completely within eight (8) hours after a proper notice, the Town shall be authorized to do the work and expenses resulting shall be paid by the Contractor.

G. The Contractor shall complete excavation as nearly as practicable to the lines of the utility to be installed as detailed. All cavities in the bottom of the trench shall be filled to the required level with compacted crushed stone or gravel.

H. Excavated materials shall be graded, hauled, stored and protected as such material found suitable will be required for backfilling, repaving or other purposes. Material classified as unsuitable shall be disposed of by the Contractor.

I. Excavated materials shall not be placed on private property, unless written permission is obtained from the property owner.

J. The Contractor shall be responsible for any damage to curb, gutter, sidewalk, traffic control devices and pavement material. Any damage resulting directly or indirectly shall be replaced in kind by the Contractor. The reuse of disturbed curb, gutter or sidewalk is prohibited. New sections shall be installed to the nearest undisturbed control joint.

2.01.03 PIPELINE TRENCH BACKFILL

A. Materials excavated from the trench shall be used for trench backfill, provided that, in the opinion of the Engineer or Town, the excavated material is suitable for this purpose. Backfill material shall be free from large clumps and stones having any dimension greater than two (2) inches.

B. Suitable material, as approved by the Town Engineer, shall be carefully deposited in the trench by methods which will not damage or disturb the pipeline or structure, and shall be solidly tamped around the pipe or structure. Backfill material shall be placed in 8-inch (or

less) layers. Care shall be taken in the use of mechanical tampers not to injure or move the pipe or to cause the pipe to be supported unevenly.

C. All backfill material shall be compacted to 95% of maximum density at + or -2% of optimum moisture content as determined by the Modified Proctor Test, AASHTO T-180. Materials containing as excess of moisture shall be permitted to dry until the moisture content is within the specified range. Materials too dry shall be wetted uniformly until the moisture content is in the specified range.

D. No compacting shall be done when the material is too wet to be compacted properly. At such times the work shall be suspended until the backfill materials have dried out sufficiently to permit proper compaction or such other precautions shall be taken as may be necessary to obtain proper compaction. The Contractor is responsible for hauling, storing and drying of excavated material to be used in backfill operations.

E. The Engineer may request compaction tests of the backfilled trenches at any time during construction or upon completion of backfill operations. Such testing shall be arranged by the Contractor and performed by an independent testing agency approved by the Engineer. The Contractor shall pay the testing laboratory for all tests performed inclusive of sample collection, preparation and transportation. If the results of any tests shown that backfills do not meet the specified compaction, the Contractor shall correct the condition as directed by the Town.

F. The Contractor shall maintain all refilled excavations in proper condition. Trench surfaces shall be reshaped when necessary. If the Contractor fails to make repairs within forty eight (48) hours after receipt of written notice from the Town, the Town may refill said depression wherever necessary and the cost of so doing will be paid by the Contractor. The Contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time prior to final acceptance.

G. All unauthorized excavations made by the Contractor shall be immediately backfilled in accordance with the requirements of the specifications for trench backfill.

H. After completion of backfilling, all material not used shall be disposed of and all places on the line of the work shall be left clean and in good condition. This cleaning up shall be done by the Contractor. If he fails to do this work within a reasonable time after receipt of notice, it will be performed by the Town and the cost will be assessed to the Contractor.

I. No backfill shall be placed against new concrete or masonry structures until properly cured. In the case of concrete, test reports must indicate that a 2500 psi compressive strength exists.

J. The Contractor shall exercise caution in backfill and compaction to prevent damage to structures.

2.01.04 EXCAVATION BELOW SUBGRADE AND GRAVEL REFILL

Materials below the excavation limit for pipelines and structures (below subgrade), which in the judgment of the Engineer or Town should be removed, shall be removed as directed. All spaces created by the removal of unsuitable material below subgrade shall be refilled and compacted with crushed stone or gravel.

2.01.05 DEWATERING

A. All excavations must be kept free of water below the subgrade of the work while work is in progress. This may be accomplished by ordinary pumping methods or by well points, whichever will produce the required results. The contractor shall be responsible for the fees and permitting associated with dewatering and water discharges, when applicable. Upon removal of dewatering equipment, the Contractor shall backfill all holes and restore disturbed areas to their original condition.

B. Dewatering for the structures and pipelines shall commence when groundwater is first encountered and shall be continued until such time as backfill has been completed. No concrete footings shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight (8) hours. Groundwater shall not be allowed to rise around the pipe until the trench is backfilled.

C. The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed of in such a manner as not to be a menace to the Public Health.

D. The Contractor shall remove any siltation deposits in storm sewer systems, resulting from his dewatering or construction operations. He shall also be responsible for conveyance of dewatering flows and for erosion and sediment control.

2.01.06 SHEETING, SHORING AND BRACING

A. The Contractor shall furnish and install all sheeting, shoring and bracing and other protective systems necessary to insure safe working conditions, to prevent subsiding of earth and caving embankments, and to prevent damage to public and private property and structures. The Contractor is responsible for obtaining proper design of such protective systems. The Contractor shall employ an on-site "Competent Person" as defined by OSHA 1926.650 (b), who is responsible for, but not limited to: the locations and protection of underground installations; recognize and control hazards due to water accumulation; daily inspections of excavations, adjacent areas and protective systems; determine the impact of distress and/or surcharge loads and adjust the protective systems accordingly.

B. Sheeting, shoring, bracing, and other protective systems shall be removed as backfilling progresses, except at such locations as the Town may direct or approve it to be left in place.

The Contractor shall cut off any sheeting left in place, at least eighteen (18) inches below finished grade, and shall remove the material cut off.

C. Where necessary for the protection of any structure or property, sheeting shall be driven to such depth below the bottom of the trench as may be required to protect all existing and/or proposed work.

D. A trench box is an acceptable alternative to sheeting, shoring, or bracing for pipeline installations provided such boxes conform to safety codes, that the boxes have been designed properly and work is monitored by the Contractor's "Competent Person".

2.01.07 SELECT BACKFILL

A. Should the Contractor encounter unsuitable material during excavation, he shall remove and dispose of such material. Disposal is not allowed within Town Limits.

B. Should sufficient suitable material from excavations on the project not be available for backfill, the Contractor shall furnish Select Backfill upon approval of the Engineer. Select fill shall conform to Maryland Department of Transportation.

C. The Contractor shall furnish certification that the borrow meets SHA's requirements for Select Fill.

2.01.08 TEMPORARY PAVING

A. The Contractor shall furnish, place and compact two (2") inches of cold patch as temporary pavement surface over all backfill areas created for pipeline and structure installation located in roadways or driveways. This surface shall be maintained by the Contractor until permanent surface restoration has been performed.

B. Should the Contractor remove existing pavement beyond the width specified or detailed on the plans, or should pavement be disturbed from settlement, slides or other construction activities, the Contractor shall saw cut back the pavement and provide temporary paving in these areas.

C. On Maryland State Highways, County Roads, and all other areas over which the State or County exercises jurisdiction, all pavement restoration shall be done in accordance with the permit requirements of these agencies.

END OF SECTION

SECTION 2.2 - STORM DRAINS AND APPURTENANCES

2.02.01 GENERAL

A. This section covers storm sewer pipe, precast manholes and precast catch basins.

B. Prior to Town acceptance of the storm water system, a video shall be taken of the entire system from within the piping that shows all connections to manholes, inlets and pipes. The video shall be submitted to the Town for approval.

2.02.02 REINFORCED CONCRETE PIPE

A. Pipe shall be manufactured without lifting holes and shall be handled at all times by means of slings or other methods approved prior to start of construction. Defective or damaged pipe shall not be utilized.

B. Pipe manufactured shall meet the applicable strength requirements contained in ASTM Designation C-76, Reinforced Concrete Culvert, Storm Drain and Sewer Pipe, minimum circumferential reinforcement shall be as prescribed for Class III. In non-paved areas, Class IV pipe shall be provided where depth of cover is less than two (2) feet. Where depth of cover in roadways is less than fifteen inches (15") to the bottom of the bituminous concrete, install Class IV, Wall B RCP. RCP shall be used in all paved areas.

2.02.03 HDPE PIPE

Storm drain shall be ADS N12 dual wall pipe per ASTM D2321 for pipe and fittings, or approved equal. Minimum cover shall be 24". HDPE shall not be installed beneath street pavements.

2.02.04 PIPE AND FITTINGS

A. Pipe laying shall not begin until all stakeout and cut sheets have been approved by the Engineer.

B. The Contractor shall utilize proper and suitable tools and equipment for the safe handling and laying of the pipe and fittings in accordance with the manufacturer's standards. Pipe and fittings shall be carefully handled and lowered into the trench.

C. Should the pipe require cutting to fit in the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end perpendicular to the axis of the pipe.

D. Before making joints, each pipe shall be well bedded on a solid foundation and no pipe shall

be brought into position until the preceding length has been thoroughly embedded and secured in place. No pipe shall be laid in wet trench conditions that preclude proper bedding or on a frozen trench bottom, or when in opinion of the Engineer, the trench or weather conditions are unsuitable for proper installation. No wedging or blocking will be permitted in laying any pipe unless by written order from the Engineer.

E. In laying pipe, special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipeline.

F. Pipe and appurtenances shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open end shall be kept closed with a plug until the next length is laid. At the close of work each day, the end of the pipeline shall be tightly closed with an expansion stopper so that no dirt or other foreign substances may enter the line, and this stopper shall be kept in place until pipe laying is again resumed.

G. Manholes shall be built as pipe laying progresses.

H. Manholes and Inlets shall utilize a water stop gasket, as manufactured by ADS, to be grouted into the pipe opening with non-shrink grout when utilizing HDPE pipe. Contractors shall follow the manufacturer's recommendations in regards to the pipe entry angle. Where pipelines enter structures on an angle, form and cast concrete collars.

2.02.05 PRECAST CONCRETE MANHOLES AND INLETS

A. The Contractor shall construct manholes and inlets of precast reinforced concrete risers and base sections as indicated on the plans.

B. Manholes and inlets shall be built as such points on the pipelines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes and inlets shall be built as pipe laying progresses and the Town may stop work entirely on laying pipe if the manhole and inlet construction is delayed to such an extent as to be hazardous to construction or the public.

C. Precast reinforced concrete risers, eccentric cones and bases shall be as detailed on the plans and in conformance with ASTM designation C-478. Joints between riser sections shall be fitted with an "O" ring rubber gasket, meeting the requirements of ASTM Designation C-443. Installation of risers shall be in accordance with manufacturer's recommendations.

D. Precast reinforced concrete base riser sections shall be as manufactured by Atlantic Concrete Products or equal.

E. Interior and exterior joint spaces of all manhole and inlet risers shall be filled with mortar

prior to application of the exterior waterproofing.

F. Lifting holes in the walls of precast reinforced concrete risers will be allowed, but shall be plugged with rubber stoppers and grouted flush with face of manhole and inlets riser sections. Not more than two (2) holes shall be cast in the walls of each riser section for the purpose of handling.

G. The exterior surface of all precast manholes and inlets shall receive a minimum two (2) coat application of sixty-eight (68%) percent solid coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the manufacturer's instructions and coatings applied in the field in an acceptable manner.

H. Concrete utilized in poured in place structures shall have compressive strength of 3000 psi while precast concrete shall have a compressive strength of 5000 psi in 28 days.

I. Storm water man holes shall not have flow channels.

J. All transitions between pipe materials shall occur at a manhole, inlet or junction box.

2.02.06 CASTINGS

A. Manhole frames and covers shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.

B. Material for frames and covers shall be in accordance with the standard specifications for gray iron castings ASTM Designation A-48 for Class No. 35.

C. All frames and covers shall be of the sizes and types detailed on the plans.

D. Manhole frames and covers shall be installed on grade to match the slope of the paved surface. Use concrete leveling rings or pre-manufactured devices as approved by the Town Engineer, to build up from cone to grade as required to match the slope of the frame and cover to the slope of the paved surface.

E. Inlet gratings shall conform with the detail shown on the plans and/or for the Maryland State Highway Administration Standard Specifications and Standard Details as appropriate.

2.02.07 BRICK AND MORTAR FOR INLET FLOW CHANNELS

A. All brick shall conform to the "Standard Specifications for Sewer Brick", ASTM C-32, Grade SS.

B. Cement shall be in accordance with the "Standard Specifications for Portland Cement", ASTM C-150 for Type II.

C. Mortar shall be type S, in accordance with ASTM C-207.

2.02.08 MANHOLE AND INLET STEPS

A. Manhole and inlet steps shall be made of steel bars, ASTM Designation A-615, grade 60, encased in polypropylene plastic. Manhole steps shall have tread ridge with retainer lug on each side.

B. Manhole and inlet steps shall be cast-in-place during manufacture of precast reinforced concrete risers and eccentric tip section or embedded during construction of cast-in-place manholes. Embedment length shall be suitable for minimum five (5") inch thick, precast reinforced concrete riser walls or eight (8") inch thick brick manhole walls.

C. Manhole and inlet steps shall be OSHA approved and as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas or equal.

D. Manhole steps shall be spaced twelve (12") inches apart. The maximum spacing from top of manhole to the first step shall not exceed sixteen (16") inches.

2.02.09 DETECTION TAPE

A. Pipeline detectable tape shall be installed continuously along all storm drain. The tape shall be installed directly above the pipe, twelve (12) inches below the ground surface.

B. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard, Inc. of Wheaton, Illinois or equal. The tape shall be a minimum of six (6") inches wide, white in color, imprinted with the words "CAUTION – STORM DRAIN BELOW".

END OF SECTION

SECTION 2.3 - SURFACE RESTORATION

2.03.01 GENERAL

A. The Contractor shall restore all surfaces damaged by his operations to the widths and extent detailed in the Appendix or specified herein.

B. Surface restoration in streets and roads maintained by the Maryland State Highway Administration shall be accomplished in accordance with applicable utility construction permits.

C. Materials and construction methods shall be in accordance with these specifications and the Maryland Department of Transportation Standard Specifications for Construction & Materials dated 2001 and all subsequent amendments.

D. Existing pavement to be trimmed to secure a straight clean edge for repaving. Saw cut bituminous pavement as shown on the drawings and as directed to obtain a clean pavement edge.

E. Surface course and concrete sections shall be saw cut and removed, not broken out.

F. No staggered or irregular longitudinal trench repair widths shall be allowed in each block of work. Repairs shall be of a uniform width and in a straight line.

G. Minimum pavement restoration width shall be fifteen feet (15') on either side of pavement disturbance. Pavement restoration width shall be as shown in the details unless otherwise approved in writing by the Engineer. Should the Contractor damage or disturb larger areas without being authorized to do so by the Engineer, he shall replace the additional area.

H. Undermined areas shall be grout filled or cut back.

I. All necessary adjustments to existing utilities shall be made prior to paving operations and shall be repeated if there is any damage due to rolling and compacting operations.

J. Manhole or catch basin adjustments can be made with manhole adjustment rings, brick courses or mortar layers. Valve boxes shall be screw adjusted.

K. Catch basins, inlets, curbs and all other appurtenances shall be adequately covered and protected prior to application of bituminous materials. No earth or bituminous materials shall be allowed to enter any storm drainage system, and suitable containment provisions shall be employed to prevent surface runoff of bituminous materials.

L. All trenches within paved areas shall be cut back by one (1') foot on either side as shown in the standard details.

M. Skewed patches will not be permitted; the patches shall be boxed square or rectangular.

N. The final surface shall match grades existing prior to construction and shall be such that a smooth transition free of abrupt changes in grade is made with adjacent pavements and/pr sidewalks. No depressions or other misalignment shall obstruct, trap or otherwise misdirect the flow of surface water drainage.

O. Where longitudinal trenches are installed within the roadway, the entire lane disturbed shall be milled 1½" for the effected area and overlay with 9.5mm Superpave surface course 1 ½" thick after compaction. The lane restorations shall be milled and an overlay placed from the Limit of Disturbance to the Limit of Disturbance.

P. Where horizontal trenches or multiple cross trenches are installed in a roadway, the entire road width shall be milled 1½" for the effected area , fifteen feet (15') on either side of the disturbance, and an overlay placed with 9.5mm Superpave surface course 1 ½" thick after compaction. If multiple trenches are made within fifty feet (50') of one another the area between the trenches shall also be milled 1 ½" and a 9.5 mm Superpave overlay placed to a 1 ½" compacted thickness.

Q. Paving operations can be performed with the following minimum temperatures:

1. 32 degrees for Super-Pave base courses.
2. 40 degrees for Super-Pave surface course.

Lift thickness shall be limited to:

1. 2" for 9.5mm Super-Pave surface course.
2. 3" for 19mm Super-Pave base courses.
3. 4" for Graded Aggregate.
4. 8" for backfill.

2.03.02 TEMPORARY REPAVING IN PUBLIC STREETS

A. Where weather conditions preclude trench pavement repair, the Contractor shall furnish, place and compact 2 inches of cold patch as temporary pavement surface over all backfill areas created for pipeline and structure installation located in roadways. This surface shall be maintained by the contractor until permanent surface restoration has been performed.

B. Should the contractor remove existing pavement beyond the width specified or detailed on the plans, or should pavement be disturbed from settlement, slides or other construction activities, he shall saw cut back the pavement and provide temporary paving in these areas.

C. On State highways and all other areas over which the Maryland Department of Transportation exercises jurisdiction, all pavement restoration shall be done in accordance with the permit requirements of the State Highway Administration.

D. A six (6) inch layer of crusher run shall be placed at the end of every workday on all utility trenched in areas not subject to complete street repavement such as gravel parking lots, drives, crusher run alleys and walkways.

E. Metal laying may be used at the end point of the utility laying operation and must be used to protect the integrity of concrete patches.

2.03.03 MAINTENANCE OF REFILLED EXCAVATIONS

A. The Contractor shall maintain, at his own expense, all refilled excavations and surfacing in proper condition as specified herein. All depressions appearing in the refilled excavation, stabilized base and temporary paving shall be properly refilled. If the Contractor fails to make repairs within 48 hours after receipt of written notice from the Engineer, the Town may refill said depressions and the cost thereof shall be billed to the Contractor. In case of emergency, the Town may refill any depression or protect with barricades without giving previous notice to the Contractor, and the cost of so doing shall be billed to the Contractor.

B. The Contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time.

2.03.04 BASE COURSES

A. Graded Aggregate

A. Graded aggregate base course shall be spread on prepared and compacted refilled excavation to the compacted depth shown on the drawing details.

B. Materials and methods on construction shall meet the provisions of Section 501 of referenced standard specifications.

B. Bituminous Concrete Base Course (Deep lift)

1. Bituminous concrete base course shall be spread on prepared and compacted refilled excavations to the compacted depth shown on the details.

2. Materials and methods of construction shall meet the provisions of MD-SHA Standards.

2.03.05 BITUMINOUS SURFACE TREATMENT

A. Bituminous surface treatment shall consist of a number of courses of bituminous material and aggregate as shown on the driveway detail.

B. Materials and methods of construction shall meet the provisions of MD-SHA Standards.

2.03.06 BITUMINOUS CONCRETE PAVEMENT

A. Hot mix, hot laid bituminous concrete, Super-pave, shall consist of placing bituminous concrete base and or wearing courses on a prepared sub-base to the minimum compacted thickness shown on the standard details.

B. Materials and methods of construction shall meet the provisions of Section 504 of the referenced standard specification. All thicknesses detailed shall be compacted thicknesses.

C. Bituminous Concrete Driveways

a. Saw cut existing driveways if sections are acceptable for re-use. Prior to replacement of driveways, the Contractor, Engineer and Town shall review field conditions. The Town will designate the extent of additional removal and replacement. Upon completion of utility construction, the Contractor shall reconstruct private driveways as specified.
b. Bituminous driveways and parking areas disturbed through the Contractor's construction operations shall be restored by a minimum of 3-inches of hot mix bituminous concrete pavement placed in a single lift onto a base course consisting of 4-inches of properly prepared and compacted crushed stone or quarry waste. Commercial and residential entrances on State maintained streets shall be in accordance with the plan details. Match existing thickness where condition exceeds minimum restoration.
c. The hot-mix bituminous concrete surface shall conform to the Maryland SHA requirements and shall be constructed in accordance with the applicable Articles of the specifications.
d. The subgrade shall be properly prepared, graded and compacted in accordance with Section 2A of these Standards.

2.03.07 CONCRETE PAVEMENT

A. Concrete used in the restoration of street and roads shall be placed to the minimum thickness as approved by the Town Engineer. Concrete may be a base course with a bituminous concrete overlay or a finished surface course if the layers are separated by a layer of aggregate.

B. All concrete shall be according to Maryland Standard Specifications Section 902.

2.03.08 TOPSOIL AND SEEDING

A. Topsoil shall be placed in areas where grass has been disturbed by the Contractor's operations. Depth of topsoil shall be four inches (4") minimum. Topsoil salvages and stockpiled during trench and structure excavation may be used for this purpose. When topsoiling, all materials and methods of construction shall meet the provisions of MD-SHA Standards. If directed, the Contractor shall have the topsoil tested by a State certified

laboratory and shall submit certification that topsoil meets the specified standard. Topsoil shall be clean, free of roots, stones, and other debris.

B. Seeding shall consist of furnishing and placing seed and soil supplements on topsoiled areas and at any other location, as directed by the Engineer. When seeding, all materials and methods of construction shall meet the provisions of MD-SHA Standards.

C. Fertilizer shall be a recognized commercial fertilizer containing a minimum of five percent (5%) nitrogen, ten percent (10%) available phosphoric acid and ten percent (10%) soluble potash by weight. It shall be applied in sufficient amounts to provide sixty (60) pounds of nitrogen per acre.

D. Fertilizing and seeding application dates shall be in conformance with the Talbot County Soil Conservation District. Seed shall be applied at a rate of four (4) to five (5) pounds per 1,000 square feet.

E. No mulch shall be required unless the area to be seeded rests upon a slope greater than 3 to 1. Mulch for these areas shall consist of straw mulch as specified in MD-SHA Standards, Section.

2.03.09 BRICK SIDEWALK PAVERS

A. Brick sidewalk products and laying patterns vary throughout the Town. Plans presented for review shall define the designer's intentions utilizing a pre-approved product and pattern appropriate to the work area. The final decision on the material and pattern will be at the discretion of the Town Engineer to match the existing site characteristics. To accommodate the Department of Justice's Americans with Disabilities Act requirements all new walks shall utilize 4"x8"x2 1/4" "Paving Brick" sizes to match existing elevations.

B. Downtown areas shall utilize Glenn Gary Molded Model 26HB or Pine Hall wire cut "Pathway Full Range" brick. Glenn Gary 26HB brick may be laid in running bond only. More decorative areas and area subject to significant vehicular loadings shall utilize the Pine Hall Product or equal with compressive strength of 12,000 psf or greater. All areas subject to vehicular loading, including but not limited to handicap ramps, driveway entrances, median ramps, etc... shall have a reinforced concrete subbase as specified in the cast in place concrete section and as detailed in PW – 3.01.

C. Handicap ramps shall utilize truncated dome brick products as required by the Department of Justice's Americans with Disabilities Act requirements. Truncated domes shall be as manufactured by Pine Hall, color "Buff"

END OF SECTION

SECTION 2.4 - CAST-IN-PLACE CONCRETE

2.04.01 GENERAL

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, pozzolans, and ground granulated blast-furnace slag. Materials shall be in accordance with ACI 232.2 R-96 and ACI 233 R-95.

B. Contractor shall provide all labor, materials, and appurtenances for construction of concrete sidewalk, curb, and gutter where indicated in these standards and details.

2.04.02 SUBMITTALS

All submittals shall be approved by the Town prior to ordering concrete.

A. **Design Mixes:**
1. **Sidewalk shall utilize MD-SHA Mix 3, air entrained, 3500 psi 28-day compressive strength.** Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
2. **Curb and gutter shall utilize MD-SHA Mix 7, air entrained, 4200 psi 28-day compressive strength.** Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

B. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315.

C. **Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following, with requirements indicated, based on comprehensive testing of current materials: Slump, temperature, air entrainment, and 7 and 28-day compressive strength. Three (3) cylinder break tests shall be performed for each truckload of concrete delivered. Slump, air entrainment and temperature shall be tested prior to placement.**

D. **Material Certificates: Each truckload delivered to the site shall provide a computer printed delivery ticket. Material Certificates shall be signed by manufacturers certifying that each of the following items complies with requirements:**

1. **Cementitious materials, aggregates, and water.**
2. Form materials and form-release agents.
3. Steel reinforcement and reinforcement accessories.
4. Admixtures.
5. Curing materials.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.

9. Vapor retarders.
10. Joint-filler strips.
11. **Additives (no unapproved additives without prior approval).**
12. Time of mix (Maximum delivery time between adding water at the batch plant to placement shall not be greater than 1 ½ hours.)

2.04.03 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. **Qualifications for testing agency shall be submitted for review and approval.**

B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

2.04.04 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Epoxy-Coated Reinforcing Bars: ASTM A775/A775M (where indicated).

C. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

D. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

E. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

F. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

G. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

H. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing.

Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

2.04.05 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

B. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A615M, Grade 60, (where indicated).

C. Epoxy Repair Coating: Liquid, two part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A775M.

2.04.06 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I/II.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
1. Nominal Maximum Aggregate Size: 1-1/2 inches (38 mm).

Combined Aggregate Gradation: Well graded from coarsest to finest with not more than eighteen (18) percent and not less than 8 percent retained on an individual sieve, except that less than eight (8) percent may be retained on coarsest sieve and on No. 50 (0.3 mm) sieve, and less than 8 percent may be retained on sieves finer than No. 50 (0.3 mm).

C. Water: Potable and complying with ASTM C 94.

D. All materials and construction methods shall be in accordance with the Maryland Department of Transportation Standard Specifications newest edition with all subsequent amendments. Concrete curb shall be constructed per Section 602, paragraphs 602.01 through 602.04.02. Concrete sidewalks shall be constructed per Section 603, paragraphs 603.01 through 603.04.02.

2.04.07 ADMIXTURES

A. Air Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures. Provide one of the following:

"AEA-92" or "Air Mix 200"	The Euclid Chemical Co.
"Pozzolith Normal"	Master Builders
"WRDA"	W.R. Grace Co.
"Plastocrete 160"	Sika Chemical Corp.

2.04.08 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy-Bonding Adhesive: ASTM C 881, two (2)-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type: Class I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Anti-Corrosion Epoxy Adhesive: Water-based epoxy resin for adhesion and corrosion protection of reinforcing members (Twenty-four (24)-hour maximum open time). Products: Subject to compliance with requirements, providing one of the following:

1. Corr-Bond; Euclid Chemical Co.
2. Armatec 110; Sika Corp.

2.04.09 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. **Sidewalks: Proportion normal-weight concrete mix as follows:**

1. Compressive Strength (Twenty-eight (28) days): 3500 psi.
2. Minimum Cementitious Materials Content: 580 lb/cu. yd. for concretes with 57 stone.
3. Maximum Slump: Four (4") inches. (For Slip Form curb Machines, slump shall be 1 ½ -2 inches)

D. Curb & Gutter Proportion normal-weight concrete mix as follows:

1. Compressive Strength (Twenty-eight (28) days): 4200 psi.

2. **Minimum Cementitious Materials Content: 611 lb/cu. yd. for concretes with 57 stone.**
3. **Maximum Slump: Four (4") inches. (For Slip Form curb Machines, slump shall be 1 ½ -2 inches)**

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials (in accordance with ACI 232.2R-96, and ACI 233R-95) other than Portland cement in concrete to Twenty-five (25) percent Combined Fly Ash and Pozzolan or Ground Granulated Blast-Furnace Slag.

F. Maximum Water-Cementitious Materials Ratio:

1. All concrete unless otherwise noted 0.45
2. Building slabs, footings, and sidewalks 0.50

G. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6% with a tolerance of plus or minus 1 percent, unless otherwise indicated.

2.04.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between eighty-five (85) and ninety (90) deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to seventy-five (75) minutes; when air temperature is above ninety (90) deg F (32 deg C), reduce mixing and delivery time to sixty (60) minutes.

B. Time Limit: When either Type I or Type II Portland cements are in use, the elapse time between the initial contact of the cement with water and the discharge of the batch on the job shall not be more than 1 ½ hours or 300 revolutions.

2.04.11 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength, watertightness and appearance of concrete are not impaired, at locations indicated or as approved by Engineer. Maximum distance between construction joints shall be forty (40) feet.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.
2. Locate joints for beams, slabs, and walls in the middle third of spans.
3. Space vertical joints in walls as indicated.

4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Grooved Joints: For sidewalks and as indicated, form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-(3-mm-) wide joints into concrete as soon as cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint, unless noted otherwise.

F. Curb and Sidewalks shall have proper control joints installed at ten (10) foot intervals for curb and five (5) foot intervals for sidewalk. Expansion joints shall be placed at one hundred (100) foot intervals for curb and at the point of tangent or curve. Expansion joints for sidewalk shall be at twenty (20) foot intervals and at changes in direction.

2.04.12 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. The subgrade of all slabs shall be thoroughly wetted with water prior to placement of concrete, especially during hot, dry or windy conditions.

B. Do not add water to concrete during delivery, at Project site, or during placement, unless approved by the Town Engineer.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

D. Dropping of concrete over four (4) feet or through a cage of reinforcing steel will not be permitted.

E. Concrete shall not be deposited during rain. Concrete shall not be deposited into areas of standing or running water.

F. Maximum Pours: Maximum length of all pours shall be forty (40) feet (12.1 m), unless otherwise noted or approved by Engineer. All joints shall be as approved by the Engineer or as detailed on the drawings. All reinforcement, forms and ground with which concrete is to come in contact, shall be free of frost.

G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below forty (40) deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than fifty (50) deg F (10 deg C) and not more than eighty (80) deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
4. Protection After Placement: Suitable means as defined in ACI 306 shall be provided for maintaining a temperature in the concrete of at least fifty (50) degrees F for not less than three (3) days after the concrete is placed. For a period of seven (7) days, the concrete shall not be exposed to a temperature below forty (40) degrees F.
5. Concrete placement shall be made when air temperature is at least thirty-two (32) degrees F and rising, unless special precautions acceptable to the Engineer,

H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below ninety (90) deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

2.04.13 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm) in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.

A. Rubbed Finish: Apply the following to smooth-formed finished concrete:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process and mortar used for concrete repair.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

2.04.14 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

2.04.15 CONCRETE PROTECTION AND CURING

A. General: Take curing measures immediately after casting and extend period according to the Engineer's/Architect's recommendation based upon prevailing temperature, wind, and relative humidity.

1. Keep concrete continuously moist for minimum fourteen (14) days after casting.
2. Maintain concrete temperature at minimum fifty (50) degrees Fahrenheit for seven (7) days after casting.

3. Avoid alternate wetting and drying and fluctuations of concrete temperature.
4. Protect fresh concrete from direct rays of sun, rain, drying winds, soiling, and damage.
5. Do not permit curing method to affect adversely finished or treatments applied to finished concrete.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions will cause excessive moisture loss before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Curing/Sealing Methods for Slabs: Cure all concrete surfaces with one or a combination of the following methods. Where a specific curing procedure is not specified, at the Contractor's selection, one or more of the following methods shall be used.

1. Water curing: Keep concrete surfaces continuously wet with clean water during the curing period by immersion, maintaining a continuous flow of water over the surface, continuous spraying, continuous sprinkling or a combination of these. For all curing methods, the difference in temperature between the water used for curing and the concrete shall not exceed twenty (20) degrees Fahrenheit.
2. Wet Coverings: Cover the concrete surfaces with burlap, cotton mats, sand, earth, or other suitable moisture retaining materials and keep these materials saturated during the curing period. Lap all fabrics at least eight (8") inches at all joints. On exposed concrete, do not use any type covering which will discolor the concrete surface.
3. Waterproof coverings: As soon as possible after finishing, thoroughly wet the concrete surfaces and cover the concrete surfaces with waterproof paper or plastic film immediately after wetting. For a period or at least eight (8) hours after the concrete has taken its initial set, maintain a continuous flow of clean water over the concrete surface under the covering. Lap all joints in the covering at least eight (8") inches and provide weights and other means and methods to keep the waterproof covering in direct contact with the concrete during the curing period.

4. Membrane forming curing compounds: All exposed interior slabs, not receiving a liquid densifier, and troweled slabs receiving mastic applied adhesives or "shake-on" hardeners shall be cured with the specified curing and sealing compound. Exterior slabs, sidewalks, curbs, and architectural concrete, not receiving a penetrating sealer, shall be cured with the specified clear, non-yellowing curing and sealing compound. Maximum coverage shall be 200 ft^2/gallon on steel troweled surfaces and 150 ft^2/gallon on floated or broomed surfaces for the curing/sealing compound.

D. Curing methods for Walls: Cure all concrete walls as follows: Keep forms wet during period forms are required to remain in place. Immediately after formed concrete has taken its initial set, start a gently uniform flow of clean water over concrete to thoroughly wet all concrete surfaces and formwork and maintain this flow of water until forms are

removed. Immediately after form removal cure concrete surfaces with one of the curing methods specified above.

E. Other Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods listed in paragraph F below.

F. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven (7) days with the following materials:

   a. Water.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least twelve (12") inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
   c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process twenty-four (24) hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

G. Do not apply loads to elevated slabs, walls, and beams for twenty-eight (28) days or until approved concrete tests document concrete has reached 100% of specified minimum compressive strength.

2.04.16 FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least two (2") inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

2.04.17 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall, at his discretion, engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Agency shall be approved by the Town Engineer.

B. The Town shall have the right to hire an outside agency to perform independent testing as the Town sees fit. The Contractor shall coordinate and schedule all sampling in advance.

C. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

2. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding five (5) cu. yd. (4 cu. m), but less than twenty-five (25) cu. yd. (19 cu. m), plus one (1) set for each additional fifty (50) cu. yd. (38 cu. m) or fraction thereof.
3. Slump: ASTM C 143; one (1) test at point of placement (prior to pumping) for each truck delivered. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one (1) test for each truck delivered (prior to pumping).
5. Concrete Temperature: ASTM C 1064; one (1) test hourly when air temperature is forty (40) deg F (4.4 deg C) and below and when eighty (80) deg F (27 deg C) and above, and one (1) test for each truck delivered (prior to pumping).
6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mix.
7. Compression Test Specimens: ASTM C 31/C 31M;

    a. Cast and laboratory cure one (1) set of four (4) standard cylinder specimens for each truck delivered.
    b. Cast and field cure one (1) set of four (4) standard cylinder specimens for each day's pour.

c. Cast extra two (2) cylinders for each day's pour (fourteen (14) day compressive strength)
d. Cast two (2) extra cylinders per pour.

8. Compressive-Strength Tests: ASTM C 39;

a. Test two (2) laboratory-cured specimens at seven (7) days, two (2) at fourteen (14) days, and two (2) at twenty-eight (28) days.
b. Test two (2) field-cured specimens at seven (7) days, two (2) at fourteen (14) days, and two (2) at twenty-eight (28) days.
c. A compressive-strength test shall be the average compressive strength from two (2) specimens obtained from same composite sample and tested at age indicated.

D. When strength of field-cured cylinders is less than eighty-five (85) percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

E. Strength of each concrete mix will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 250 psi (3.4 MPa).

F. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within forty-eight (48) hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work per plan stationing, design compressive strength at Seven (7) and twenty-eight (28) days, concrete mix proportions and materials, compressive breaking strength, and type of break for all tests.

G. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

H. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Engineer. Contractor shall pay for cored cylinder collections and testing if standard cylinder specimens fail to confirm conformance with the specifications.

I. Testing agency shall verify that the subgrade is properly compacted prior to placing concrete.

J. The Engineer or his representative shall verify that the area of concrete work is properly prepared, free of water, free of unstable materials and that the reinforcement at driveways, ramps, valley gutters, etc. is in place and properly supported.

2.04.18 Sidewalks, Curbs and Driveways

A. Methods and Materials:

1. Minimum ultimate compressive strength of concrete shall be 3500 pounds per square inch (psi) at the end of 28 days per Maryland State Highway Administration Standard for sidewalk, Mix No. 3, and 4200 psi for curb and gutter, Mix No. 7. Submit mix design for approval. All concrete shall be air entrained.

2. Curbs shall be depressed at all existing driveway and handicapped ramp locations in accordance with both the Maryland Department of Transportation and Americans with Disabilities Act Standards, including proper preparation of sub-grade and proper placing and spacing of joint and joint materials.

3. The Contractor shall permanently repair or relay all curbs, sidewalks and driveways that have been removed, broken, or otherwise injured in excavating any of the work under the contract or injured by settlement of any backfilled excavation at any time prior to termination of the contract and guarantee period.

4. New curb and sidewalk or replacement of areas damaged during construction shall be installed in accordance with the Standard Details. Install wheelchair curb ramps at all street corners constructed.

2.04.19 SUBBASE

A. Base for concrete curbing shall be select borrow as detailed on the plans. Compact subgrade to at least 95% (percent) of maximum density as determined by ASTM D1557 at or near optimum moisture.

B. Where subgrade is unsuitable, the Contractor shall excavate below subgrade and install crusher run as required to stabilize prior to placing curb.

2.04.20 RECONSTRUCTION OF PRIVATE DRIVEWAYS

Saw cut existing driveways if sections are acceptable for re-use. Prior to replacement of driveways, the Contractor, Engineer and Town shall review field conditions. The Town will designate the extent of additional removal and replacement. Upon completion of utility construction, the Contractor shall reconstruct private driveways in kind except as follows:

A. Concrete Driveways

1. Concrete driveways shall be replaced and reconstructed upon a properly prepared, graded and compacted subgrade and in compliance with MD-SHA requirements.
2. Driveways shall be constructed to a minimum thickness of 6-inches and shall be reinforced with 6-inch by 6-inch wire mesh of 10-10 gauge if materials removes were reinforced before.
3. Restoration shall provide for a smooth transition from back of sidewalk or driveway construction to undisturbed areas and shall be free of all localized depressions or abrupt changes in grade that may trap or otherwise misdirect surface drainage or represent possible damage to vehicular travel.

2.04.21 SIDEWALK CONSTRUCTION

A. Concrete sidewalks shall be replaced as required, or as directed, in accordance with the Standard Details. Handicapped ramps shall be installed where shown on the plans, in accordance with current ADA requirements.

B. Sidewalks in areas not subject to vehicular loading shall have a minimum thickness of 4-inches of concrete placed upon a properly prepared, graded and compacted subgrade.

C. Sidewalks in vehicular loading areas and Handicapped ramps shall be a minimum thickness of 6-inches reinforced with 6-inch by 6-inch W1.4 by W1.4 wire mesh. Subgrade shall be prepared as stated for non-load areas.

D. Brick sidewalks shall have 4" graded aggregate, compacted to 95% of ASTM 1557, with 1/2" sand between the aggregate and brick.

E. In driveway and handicapped ramp locations, 4" of graded aggregate, compacted to 95% of ASTM 1557, shall be placed beneath a 6" reinforced concrete slab with a 1/2" sand bedding beneath the brick sidewalk.

F. Replacements of partial sections of concrete sidewalk, where so directed, shall be extended to the nearest existing joint in each direction.

G. Sidewalks shall be replaced to a width equal to that existing prior to start of construction and such width shall be maintained throughout the entire length of the block.

H. A broom finish shall be applied perpendicular to the direction of traffic. Trowel picture frame finish at each control or expansion joint.

I. Cold weather construction shall conform to the Maryland SHA standards.

END OF SECTION

SECTION 2.5 – SOIL CEMENT BASE COURSE

2.05.01 GENERAL

A. Construct soil-cement base course using a combination of soil and portland cement, uniformly mixed, moistened, compacted, shaped, and sealed. Unless otherwise specified, the soil, cement, and water may be either plant mixed or mixed in place.

B. Certificates: Provide 6 copies of materials certificates signed by the material producer and the Contractor, certifying that each material item complies with, or exceed specified requirements.

C. Materials and methods of construction shall meet the provisions of Section 502 and Section 902 of the MD SHA Standards and Details.

2.05.02 REQUIREMENTS

A. Place soil-cement base course when the ambient air and surface temperatures are at least 40 F and rising. Do not place material on a frozen subgrade.

B. Protect the completed base from freezing during the seven-day curing period.

D. Do not place material during precipitation. When precipitation has occurred during the previous 24 hours, the Geotechnical Engineer will determine if the subgrade is sufficiently dry. If precipitation occurs during placement, placement of material en route from the plant to the job site shall be at the Contractor's risk.

E. Three trial test shall be completed on every 300' section of road being treated to determine the correct ratios of soil to cement prior to beginning the soil cement regiment.

F. A bond breaking layer, 2 inches of graded aggregate, shall be placed between the cement treated base course and the pavement course.

2.05.03 SUBGRADE PREPARATION

A. Complete the subgrade to final line and grade at least 500 ft head before beginning base course construction. Construct the foundation as specified in the MD SHA Standards, Sections 204 and 208. If traffic, including construction equipment, is allowed to use the subgrade foundation or preceding layer, distribute the loading over the entire width of the course to aid in obtaining uniform and thorough compaction. Remove rutting by reshaping and compacting the affected area as specified in the MD SHA Standards, Section 204.

2.05.04 TRANSPORTATION

Handle and transport mixed materials in a manner that minimizes segregation and loss of moisture. Cover all loads in accordance with State laws, unless hauling is off road and approved. Unless approved, do not dump material into piles, haul over the completed base course, or stockpile the material on the job site.

2.05.05 MIXED IN PLACE CONSTRUCTION

Pulverize the soil base material to ensure that, at the completion of moist mixing, 100 percent passes a 1 in. sieve and at least 80 percent passes a No. 4 sieve. Limit any variation in the moisture content of the soil at the time of cement application to 2 percent from optimum. Then spread portland cement on the soil at the approved spread rate so as to achieve a weight proportion of concrete-to-soil of 5 to 5.5%. With a depth of 8 inches, the application rate will be 41 pounds per square yard. In the presence of the Engineer, use an accurate scale to verify the spread rate. Then thoroughly mix the pulverized soil and cement. Immediately after completing the mixing operation, use a pressurized distributor to spray water on the mixture at the approved rate. Mix the soil/cement/water combination until it is uniform.

2.05.06 GRADE OR FINISHED SURFACE CONTROL.

Shape the surface of the subbase material to the specified line, grade, and cross section. Set grades longitudinally and transversely with fixed controls spaced no more than 25 ft. Compact and smooth the surface over its full width using a smooth faced steel-wheeled roller, or if rolling is not feasible, by mechanical tampers and vibratory compactors, as approved. Maintain the finished grade within 1/2 in. from the established grade. Shape the surface of the base material to the specified line, grade, and cross section.

2.05.07 COMPACTION

Immediately after placement, compact the soil cement base to a density of at least 100 percent of the maximum density as determined by T 134. Measure the in place density per MSMT 350. Furnish a compaction block as specified in 204.03.04 At the start of compaction, maintain the moisture in the mixture to within 2 percent of the specified optimum moisture. Begin compaction operations, except on superelevated curves, at the sides of the course. Overlap the shoulder or berm at least 1 ft and progress toward the center parallel to the center line of the roadway. On superelevated curves, begin compaction at the low side and progress toward the high side. Continue compaction operations until all compaction marks are removed.

2.05.08 CONSTRUCTION JOINTS

At the end of each day's construction, create a straight transverse construction joint by cutting back into the completed work to form a vertical face. Build the base for large, wide areas as a series of parallel lanes of convenient length and width, complete with longitudinal joints, as approved.

2.05.09 PROTECTION AND CURING

Complete all spreading, compacting, and shaping within three hours after the mixing water, cement, and soil come in contact. Reconstruct any section not meeting these requirements. Allow the soil cement base course to cure for a period of seven days. During this period, close the base course to all traffic. Repair damaged areas.

2.05.10 MAINTENANCE

During construction and after completion of the subbase, maintain the subbase course until the base and surface courses are placed. When unacceptable work cannot be repaired, replace it for the full depth of the base.

END OF SECTION

SECTION 2.6 - WATER MAINS AND APPURTENANCES

2.06.01 GENERAL

The Contractor shall furnish and install all water mains, valves, hydrants, fittings, corporation stops, house service piping and appurtenances as specified herein and as defined in the standard details or as directed by the Town Engineer or Easton Utilities. Provide all necessary adaptors for connection to existing mains.

2.06.02 DUCTILE IRON PIPE AND FITTINGS

A. Ductile iron pipe shall be manufactured in accordance with ANSI/AWWA C-151/A21.51, latest edition, and shall be thickness Class 50 in streets and inside highway sleeves and Class 56 under railroads unless otherwise noted. The Contractor shall furnish mechanical or push-on joints conforming to latest edition of ANSI/AWWA C-111/A21.11.

B. Pipe and fittings shall have an external standard coating of approximately 1 mil thick.

C. Pipe and fittings shall have an internal cement lining in accordance with latest revision of ANSI/AWWA C-104/A21.4. No bituminous coating shall be used on the inside of pipe and fittings unless prior written approval is obtained from the Delaware Division of Public Health.

D. All fittings and specials shall be ductile iron with mechanical joint having a 350 psi pressure rating. They shall be marked and manufactured in conformance with ANSI/AWWA C-110/A21.10-87, latest edition. Compact ductile iron fittings will be an acceptable alternate. They shall be mechanical joint with a 350 psi pressure rating conforming to ANSI/AWWA C-153/A21.53 and C-111/A21.11.

2.06.03 POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS

A. Polyvinyl chloride pipe shall meet the requirements of AWWA C-900 and C-909. It shall be manufactured in standard length not exceeding 20 feet and have an outside diameter equal to cast iron pipe. The pipe shall C-900 DR-18 PVC or C-909, DR-21 PVC.

B. PVC pipe shall be manufactured with an elastomeric-gasket joint conforming to ASTM-D 3139. Pipe ends shall be beveled.

C. Fittings for PVC water mains shall be ductile iron as specified above.

D. The Contractor shall provide all necessary adapters for connecting PVC pipe to ductile iron fittings and valves or other pipelines. Adapters shall be as recommended by the pipe manufacturer.

E. PVC pipe shall be delivered and stockpiled in unit pallets. Store pipe on flat surface. No

stacking of pallets of random lengths above five (5') feet in height will be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective materials to protect the pipe from ultraviolet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

F. Bowed section of pipe will not be acceptable and will not be allowed to be installed on this project.

2.06.04 BORING AND JACKING OF WATER MAINS

A. Where possible, an approach trench shall be excavated far enough to provide a jacking face of at least three (3') feet from a pavement surface. This open face shall be stored securely to prevent slipping or raveling of the face.

B. Boring pits shall be large enough to contain all necessary equipment and tools. Adequate provision shall be made for the removal of excavated material.

C. A substantial backstop of heavy timber or steel beams shall be provided to take the thrust of the jack or boring equipment.

D. As material is excavated or bored ahead of the pipe, the pipe shall be jacked in to follow this excavation. The distance dug ahead of the pipe shall not exceed six (6") inches.

E. The installation of casing pipe and the boring or excavation shall be done simultaneously.

F. Voids between the sleeve and excavation shall be filled by pressure grouting.

G. Cement grout shall be used to seal the pipe ends between the carrier pipe and sleeve.

H. A one (1") inch PVC pipe shall be installed in the downgrade seal to permit drainage.

I. Steel pipe sleeve shall be furnished in random lengths of the diameter shown on the plans and noted in the proposal and shall conform to the requirements of AWWA C-200; Grade B pipe shall be used. Pipe thickness for 18-inch dia. sleeve shall be 0.313 inches. 12-inch dia. sleeves shall be 0.250 inches thick. All joints for casing pipe shall be made by continuous weld completely around the perimeter of the pipe in accordance with AWWA C-206.

J. Carrier pipe shall be Class 50 ductile iron at each location as required by the plans except at railroad crossing use Class 56.

2.06.05 DIRECTIONAL BORE AND SLEEVE

A. PE carrier/casing pipe roadway crossings are allowed with the concurrence of the permitting agency having road jurisdiction. The design engineer shall submit connection details for approval.

B. PE pipe shall be plain end for fusion welding conforming to ASTM F 714 and ASTM D 3035. Minimum pressure rating shall be 160 psi. Minimum SDR shall be 11.0 for carrier pipe and SDR 17.0 for casing pipe.

C. Molded fittings will conform to ASTM F 714. End sections of PE piping in direction bore shall have a mechanical joint adaptor with end butt fusion welded to PE main.

2.06.06 GATE VALVES AND BOXES

A. Gate valves shall be resilient seat type, in accordance with AWWA C-509 or C-515. Valve bodies and bonnets shall be cast iron epoxy coated on the inside per AWWA C-550.

B. Stem and wedge nuts shall be bronze. Stems shall be sealed by at least two O-rings. Seals shall be replaceable with the valve fully open and while subject to the rated pressure. Valves shall open clockwise (open right).

C. Wedge shall be constructed of ductile iron fully encapsulated in synthetic rubber except for guide and wedge nut areas or it shall have a replaceable internally reinforced, contoured molded rubber disc seat ring attached to the face of the wedge with self-locking stainless steel screws. Wedge rubber shall be molded in place and bonded to the ductile iron portion. Wedge shall seat against accurately formed seating surfaces in the valve body.

D. Waterway shall be smooth and shall be no depressions or cavities in seat area where foreign material can lodge and prevent closure or seating.

E. Gate valves shall be manufactured by Kennedy or American Flow Control.

F. Provide each gate valve with a 5-1/4 inch diameter valve box with "Water" cast in the lids. All boxes for 4, 6, and 8 inch valves shall be equipped with #6 round bases. 10 inch valves shall be used with #8 valve box base. Valve boxes shall be adjustable between 2'-4" and 3'-4" except when deeper settings are required. Lids shall be extra deep and have tow holes for removal of lid. Valve boxes shall be as manufactured by Bingham and Taylor. Each valve box shall incorporate a rubber compound valve box adaptor to be placed between the valve and the valve box base. Adaptor shall be Valve Box Adaptor II by Adaptor, Inc. or approved equal.

G. Provide heavy duty socket valve operating wrenches as indicated by Easton Utilities.

2.06.07 TAPPING SLEEVE AND VALVE

A. Tapping sleeves shall be of all stainless steel construction including sleeve, bolts and nuts. Sleeves shall wrap 360° around the pipe with gridded full circumference gasket. Units shall be by Ford Meter Box Co. or Powerseal.

B. Tapping valves shall be cast iron Fig. 950X, by Kennedy or American Flow Control.

C. Install tapping sleeve and valve per manufacturer's recommendations.

2.06.08 FIRE HYDRANTS

A. Fire hydrants shall be provided per the Easton Utilities standards. Hydrants shall be compression type with a 5-1/4 inch main valve opening, two 2-1/2 inch hose nozzles, one 4 inch steamer nozzle and a 6 inch mechanical joint hub base. Hydrant seats shall be provided with bronze to bronze threaded connections.

B. Steamer nozzle threads shall be 6 threads per inch style 60V. 2 ½ inch hose nozzle threads shall be hose thread 3-1/32 inch diameter, 8 threads per inch. Hydrants shall be of proper length for a 4 foot trench depth or as required by field conditions and be American Darling B-62-B or Kennedy K-81D Guardian with Stainless Steel hardware. They shall meet the requirements of AWWA C-502.

C. A sworn certificate of inspection and testing shall be furnished by the manufacturer. Install hydrants with restraint system as detailed on the drawings.

D. All hydrants to be furnished with non-kinking chains on the 2-1/2 inch nozzles.

E. Hydrants shall open by turning the operating nut counter-clockwise. Nozzle caps shall open counter-clockwise

F. Fire hydrants to receive one (1) coat of primer and two (2) coats of green paint in accordance with Federal and Easton Utilities Standards. The final coat shall be applied after the hydrant has been installed.

G. Provide hydrant operating wrenched and repair kits as required by Easton Utilities.

2.06.09 FIRE MAINS

A. Fire mains requested for building insurance purposes shall be of ductile iron or PVC construction. Each fire main shall be equipped with a backflow preventer with detector check valve.

B. Backflow preventers shall be Febco or approved equal. Provide one OS&Y gate valve on each side of the backflow preventer.

C. Backflow preventer shall be in a below ground vault or within a mechanical room accessible from the exterior door to said room. Internal systems shall be accessible to the Town of Easton and Easton Utilities.

2.06.10 LAYING WATER MAINS, FITTINGS AND APPURTENANCES

A. Water main pipe, fittings and valves shall be installed per manufacturer's printed instructions. Care shall be taken to insure that no joints are made with unevenness or rough edges. Pipeline deflection must be kept below the manufacturer's limitations.

B. All pipes shall be bedded on a solid foundation prior to backfilling. Defects due to settlement shall be corrected by the Contractor at his own expense. Bell holes shall be dug sufficiently large to receive same.

C. Pipe and fittings shall be kept clean until final acceptance of the work. All open pipe ends shall be provided with plugs to keep dirt, water and other materials from entering. This plug shall be kept in place when actual pipe laying is not in progress.

D. Excavation and backfill for water mains and appurtenances shall be per Section 2A of these standards.

E. PVC pipe shall be beveled before making pipe joint.

F. Install no pipe on frozen or frost penetrated subgrade. When directed, the Contractor shall install pipe on artificial foundations. Such foundation may consist of gravel or concrete and shall be to the dimensions and in the manner directed by the Engineer.

G. Pipeline detectable tape shall be installed continuously along all water mains. The tape shall be installed 12 inches directly above the water main and 12 inches from the ground surface. The tape shall be Lineguard Type II Detectable Tape as manufactured by Lineguard, Inc. of Wheaton, Illinois or equal. The tape shall be a minimum of 6 inches wide, blue in color, imprinted with the words "CAUTION – WATER LINE BELOW" and be capable of being detected with inductive methods.

H. Pipeline tracer wire shall be installed as shown in the details. Wire shall be a reinforced coated 8 gauge tracer wire as manufactured by Copperhead Industries or approved equal.

I. All concrete required to construct buttresses behind plugs, tees, bends and other fittings and anchorages beneath vertical bends shall be placed as directed and/or as shown on the details.

2.06.11 INSTALLING FITTINGS, HYDRANTS, GATE VALVES AND VALVE BOXES

A. Fittings, hydrants, gate valves and valve boxes shall be placed along the water mains at the locations indicated on the drawings or where otherwise designated by the Engineer.

B. A valve box shall be carefully placed over the bonnet of each gate valve with the top at the finished surface of the street, sidewalk or at such other elevations as the Engineer shall direct. If shall be set exactly plumb. In tamping the backfill around the box special care shall be

taken to keep the box plumb and to have it firmly supported on valve box adaptor. Any box which is found out of plumb or which is not firmly supported, shall be excavated and made to rest in a satisfactory manner, at the Contractor's expense. Place gravel in and around valve box bases to provide for drainage.

C. Ductile iron pipe with cast iron or ductile iron Mega-lug fittings shall be used exclusively throughout the hydrant assembly. Sakrete is not permitted for hydrant tee buttress construction.

2.06.12 INSTALLATION OF WATER MAINS BY THE DIRECTIONAL BORING METHOD

A. General: Installation of the PE water main shall be by the directional boring method to the limits indicated on the drawings and as specified herein.

B. Operating Expertise:

1. The Contractor must demonstrate expertise in trenchless methods by providing a list of ten utility references for whom similar work has been performed in the last two years. The references shall include a name and telephone number where contact can be made to verify the Contractor's capability. The Contractor must provide documentation showing successful completion of water main projects used for reference. Conventional trenching experience will not be considered applicable.

2. The directional boring equipment shall be the GuideDril system manufactured by UTILX Corporation's Flow Mole service or approved equal.

C. Drilling Equipment

1. The system must be remotely steerable and permit electronic monitoring of tunnel depth and location. The system must be able to control the depth and directional of the pipe and must be accurate to a window of ±2 inches.

2. The system must be capable of turning 90 degrees in a 35 foot radius.

3. The system shall utilize a fluid-cutting process, using a liquid clay such as bentonite. This clay must be totally inert and pose no risk to the environment or water main.

4. Liquid clay shall remain in the tunnel to increase stability of the tunnel and provide a lubricant to reduce frictional drag when the pipe is installed.

5. Spoils shall be recovered by use of a vacuum system mounted on a vehicle for removal of the spoil to an approved spoils site. Spoils shall not be discharged into sewers or storm drains.

6. The equipment must be capable of completing the boring in a single bore.

7. Equipment must be fitted with a permanent alarm system capable of detecting an electrical current. The system will have an audible alarm to warn the operator when the drill head nears electrified cables.

D. Safety:

1. All crews are to be provided with grounded safety mats, heavy gauge ground cables with connectors, hot boots and gloves to minimize the risk of electrocution.

2. Upon completion of boring and pipe installation, the Contractor will remove all spoils from the starting and termination pits. The pits are to be restored to the original condition.

2.06.13 DISINFECTION OF WATER MAINS

A. Upon completion of water main construction, disinfect main and appurtenances. Disinfection shall be done in accordance with ANSI/AWWA C-651, latest edition. Contractor shall submit a plan of disinfection for approval by the Engineer.

B. After the applicable retention period, the heavily chlorinated water shall be flushed from the main. This water shall be discharged to the sanitary sewer system or in accordance with the Maryland Department of the Environment regulations. Prior to discharge, heavily chlorinated water shall be dechlorinated using sodium metabisulfite or other acceptable methods to prevent excess strain on the wastewater treatment facility. Only after water leaving the main is no higher in chlorine concentration than normal drinking water, will a discharge to storm drains be allowed. Convey flushed water discharge point in a closed system.

C. Affidavits of compliance, certifying the water sampled from the water mains to be free of coliform bacteria shall be submitted to the Engineer. The Contractor is responsible for coordinating and paying for testing by a private lab which is certified and approved in the State having jurisdiction. The Contractor shall provide written documentation when a section of mains can be placed in service.

D. The Contractor shall place in each length of pipe, hydrants, hydrant branches and other appurtenances, a sufficient amount of chlorine tablets to insure adequate disinfection treatment of the main after its completion. Use only NSF approved chlorine tablets. Tablets shall be fastened to the inside top of every length of pipe as laid, using gasket cement known as "Permatex No. 2".

E. The Contractor shall be held entirely responsible for securing a minimum residual chlorine content of 5 ppm at the extremities of the mains after twenty-four (24) hours or more contact with the full water pressure on the main.

F. Water for filling the mains shall be introduced at a velocity of less than one (1') foot per second in order to permit the chlorine tablets to completely dissolve and have a reasonable uniform distribution throughout the mains. It is the intent of this Specification to require a sufficient amount of chemical to be equivalent to a dosage of 50 ppm of chlorine.

G. After the chlorine has been in contact with the mains or storage units for twenty-four (24) hours or longer, samples collected from the extremities of the mains shall indicate a residual chlorine content of 5 ppm or more.

H. If less than 5 ppm residual chlorine is indicated, the system shall be drained and the disinfection treatment repeated.

I. If samples collected at the extremities indicate chlorine of 5 ppm or more, the system shall be flushed until there is only a normal chlorine residual (1.0 ppm or less) present, as determined by the DPD Method Test. Samples of water shall be collected from various points along the lines by an independent laboratory for bacteriological analysis as previously stated in paragraph C, in this section. If satisfactory bacteriological results are obtained, the lines may then be allowed to be placed in service. A copy of all test results shall be submitted to the Engineer.

J. Dechlorinate and safely dispose of all testing water. Disposal rate and location shall be approved by Easton Utilities. Submit for approval a description of dechlorination method and equipment to be utilized.

2.06.14 WATER MAIN TESTING

A. The Contractor shall furnish all equipment, labor and materials, including water, pumps, compressors, stopwatch, gauges and meters as approved by the Engineer for testing. The Engineer shall determine the amount of main to be tested at any one time and reserves the right to separate the installation into several test sections. All tests must be witnessed by Easton Utilities.

B. PRESSURE TEST

After the pipe has been laid, all newly laid pipe or any valved section thereof, shall be subjected to a hydrostatic pressure of 120 psi.

1. Test Pressure shall:

   a. Be of at least two hour duration.
   b. Not vary by more than ± 5 psi.

2. Pressurization. Each valved section of pipe shall be filled with water slowly and to the specified test pressure, based on the elevation of the lowest point of the line or section under the test; corrected to the elevation of the test gage and shall be applied

by means of a pump connected to the pipe in a manner satisfactory to Easton Utilities.

3. Air Removal. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points, so that the air can be expelled as the line is filled with water. After all the air is expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, all corporation cocks shall be removed and plugged or left in place at the discretion of Easton Utilities.

4. Examination. All exposed pipe, fittings, valves, hydrants and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves or hydrants that are discovered following the pressure test shall be repaired or replaced with same material and the test shall be repeated until it is satisfactory to Easton Utilities.

C. LEAKAGE TEST

A leakage test shall be conducted concurrently with the pressure test.

1. Leakage Defined. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or at any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

2. Allowable Leakage. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{266{,}400}$$

in which L is the allowable leakage, in gallons per hour; S is the length of pipeline tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch gage.

D. Should the test show the main to be defective, the Contractor shall remedy such defects and retest the main as specified above. This procedure shall be repeated until the test requirements are met.

E. HYDRANT FLOW TESTING

The contractor shall have a certified fire hydrant flow test performed and report flow data to the Town and Easton Utilities. The fire flow test is required for all hydrants on all new developments, adjacent hydrants on water main replacements and street reconstructions or

upgrades.

Coordinate all fire flow tests with Easton Utilities

2.06.15 SERVICE PIPE AND APPURTENANCES

A. GENERAL

1. For all new residential or commercial developments currently not served by the Easton Utilities, the Contractor is responsible for furnishing and installing all corporation stops, house service pipe, meter setters or prefabrication meter setters, covers, valves and appurtenances as indicated on the drawings and specified herein.

2. The Easton Utilities will provide at the contractor's expense, a main tap complete with corp stop for all new residential or commercial developments in areas already served by Easton Utilities. The service will be stubbed out to the right-of-way line from where it becomes the Contractor's responsibility.

3. The meter setters installed by the Contractor shall accommodate Easton Utilities standard meters.

4. The Contractor shall provide all tools, equipment and accessories required for tapping ductile iron and polyvinyl chloride water mains and installing water services. All underground service lines, valves and fittings shall conform to ANSI/AWWA C800-84.

5. Trench tape approved by the Engineer shall be placed directly over all water services during backfilling operation. Tracer wire shall be installed as shown in the Standard details.

B. HOUSE SERVICES

1. Standard water service lines shall be as shown on the standard details. Service lines shall conform to ASTM D-2239, 200 PSI rating.
2. Corporation stops shall be 1 inch, Ford Model FB1000-4. Install stainless steel liners at connection to service lines. The Contractor shall furnish and install liners wherever a compression connection is used on plastic service lines.

3. Cutting tools shall be of the hollow, shell bit type for removal of pipe plug. On closely spaced taps for townhouse developments, place corporation stops as recommended by pipe manufacturer. Furnish saddles with standard AWWA corporation stop inlet thread, double strapped for tapping all mains. Saddles shall be Ford stainless steel double strapped type F202 for ductile or cast iron mains and FS 202 for PVC mains.

4. Meter box shall be as shown in the standard details. Cover frames shall incorporate anchor spikes where installed in concrete sidewalks. Lids shall have the word "WATER" cast into the cover and include lifter worm locks.

5. Meter setter with ball valve inlet and dual check valve outlet for 3/4" meters shall be installed in the meter pit. Ball valves, couplings and check valves shall be as required by Easton Utilities. Meter support shall be by a lateral PVC brace.

C. COMMERCIAL SERVICE

1. For tapping ductile iron pipe use Ford FS202, double strap, iron service clamp with 2 inch AWWA threads and FB1001-7-IDR 7 corporation stop. For tapping PVC pipe use Ford FS202, stainless steel tapping saddle with 2 inch AWWA threads and FB1001-7-IDR 7 corporation stop. Use Teflon tape for threaded service connections. Do not torque saddles or sleeves without water pressure in main.

2. Curb valves shall be 2 inch Ford B66-777-IDR7 ball valve. Curb valve boxes shall be B&T 92D screw extension type with arch base.

3. Meter pits shall be Sono-Loc box. Meter pit covers shall be No. 30 by Ford. Provide double extra heavy covers for traffic areas. Setters shall be Ford VH77-15B-11-77 with 2 inch flange angle check valve, 2 inch flange angle ball valve plus a bypass ball valve with padlock wings.

D. LAYING SERVICE PIPE AND APPURTENANCES

1. All service pipe shall be carefully inspected for damaged areas. All damaged pipe shall be cut out and recoupled. Pipe installed during hot weather shall be allowed to contract to normal length before backfilling. Pipes and fittings shall be bedded on a solid foundation.

2. Fittings and valves shall be kept clean, handled carefully and installed according to the manufacturer's recommendations.

3. All new service lines shall be installed in the center of vacant lots with meter in the sidewalk and not driveways, unless otherwise directed by the Engineer.

4. Service lines in streets shall be installed by open cutting or with an underground piercing tool such as an ACCU-punch or equal. Maximum diameter of piercing tool to be 2-1/2 inches.

5. Installation of services by piercing tool shall be performed with all necessary devices to assure alignment accuracy. Such devices shall include a magnetic level, launcher and aiming frame. The Contractor shall demonstrate installation procedures to the Engineer for approval prior to use.

6. Service connections and meter boxes shall be installed immediately after the construction of the adjacent main. Postponement of construction of service lines will not be allowed.

7. Requirements for sterilization and pressure testing of service connections shall be the same as specified for mains in this specification.

8. The Contractor is responsible for locating existing services, cutting and reconnecting with all necessary adaptors or sleeves. The Contractor shall obtain the services of a licensed plumber if required by code.

END OF SECTION

SECTION 2.7 - SEWER PIPE, FORCE MAINS AND APPURTENANCES

2.07.01 GENERAL

A. The Contractor shall furnish all material and shall construct the pipe lines and all required appurtenances at the locations and to the lines, slopes and elevations shown on the drawings or designated by the Engineer.

B. Sewer pipe shall be polyvinyl chloride (PVC) or Ductile iron pipe.

C. The Contractor shall submit certifications to the Engineer and Easton Utilities that all pipe, fittings and joints are as specified herein.

2.07.02 POLYVINYL CHLORIDE SEWER PIPE AND FITTINGS

A. Polyvinyl chloride (PVC) pipe, used for sewer main construction, shall equal or exceed the requirements of ASTM D-3034 and shall have a minimum standard dimension ratio (SDR) of 35 and the minimum pipe stiffness, as tested in accordance with ASTM D-2412, shall be 45 when measured under five (5%) percent deflection at 73 degrees Fahrenheit. Pipe shall be manufactured with integral wall bell and spigot joints in standard lengths not exceeding twenty (20') feet. Service lateral pipe of less than 6 inches shall be schedule 40 PVC, ASTM D-2665 & D-1785.

B. All PVC pipe and fittings shall utilize an elastomeric O-ring gasketed joint assembled in accordance with the manufacturer's recommendations. Service lateral pipes may use glued joints.

C. PVC wye branches, pipe stoppers and other fittings shall be manufactured in accordance with the same specifications and shall have the same thickness, depth of socket and annular space as the pipe. Tee fittings will not be permitted for use. Wye branches shall be complete pipe sections. Saddles will not be permitted for use, except when installed by Easton Utilities on existing mains.

D. PVC pipe shall be delivered and stockpiled in unit pallets. Stacking of pallets above five (5') feet in height will not be allowed. If pipe is stockpiled for more than 30 days prior to installation in the trench, it must be suitably covered with reflective material to protect the pipe from ultraviolet rays emanating from sunlight. Do not use plastic sheets. Allow for air circulation under covering.

E. Bowed sections of pipe will be unacceptable and installation of pipe which has bowed, whether or not the bow has been corrected, will not be allowed.

2.07.03 POLYVINYL CHLORIDE FORCE MAIN PIPE AND FITTINGS

A. Pipe shall be manufactured to meet the requirements AWWA C-900. Pipe shall be

manufactured in lengths not exceeding twenty (20') feet. Pipe shall be integral bell by spigot end design. No HDPE force main shall be allowed unless specifically approved by Easton Utilities.

B. All pipes to be connected using elastomeric gasketed joint and lubricant and shall be installed by experienced pipe layers, to the satisfaction of the Easton Utilities. Installation shall be done in the manner recommended by the manufacturers.

C. Pour concrete thrust blocks according to the details on all horizontal or vertical pipe bends.

D. Force Mains shall be hydrostatically pressure tested per section 2.06.14-C.

E. Fittings shall be mechanical joint ductile iron fittings meeting AWWA C153 as manufactured.

2.07.04 PIPE INSTALLATION

A. Pipe and fittings shall be carefully handled and lowered into the trench. Special care shall be taken to insure that each length shall abut against the next in such a manner that there shall be no shoulder or unevenness of any kind along the inside of the pipe.

B. Sanitary Sewer Mains shall be constructed in accordance with Standard Detail SS-7.00. Any defects due to settlement shall be made good by the Contractor.

C. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipe shall be used.

D. Whenever a pipe requires cutting to fit into the line or to bring it to the required location, the work shall be done in a satisfactory manner so as to leave a smooth end.

E. The pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. The open ends of all pipe lines shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering. This stopper shall be kept in the end of the pipe line at all times when laying is not in actual progress.

F. All concrete required to support and reinforce wye branches, bends and other fittings shall be placed as directed, and the cost thereof shall be included and covered.

G. Backfill materials shall be hand placed and mechanically tamped in six (6") inch layers, placed uniformly on both sides of the pipe to a point at least one (1') foot above the pipe crown. Each layer shall be thoroughly compacted for the full trench width and under, around and over the pipe.

H. Pipeline detectable tape shall be installed continuously along all sewer mains. The tape shall be installed 24" directly above the pipe and twelve (12") inches from the ground surface. The tape shall be Lineguard Type II Detectable tape as manufactured by Lineguard, Inc. of Wheaton, Illinois or equal. The tape shall be six (6") inches wide, imprinted with the word

"CAUTION - SEWER LINE BELOW" and be capable of being detected with inductive methods.

I. Pipeline tracer wire shall be installed as shown in the details. Wire shall be a reinforced coated 8 gauge tracer wire as manufactured by Copperhead Industries or approved equal.

J. For refill of the remaining trench depth, refer to "Excavation and Backfill", Section 2.1 of these specifications.

2.07.05 LAYING PIPE IN FREEZING WEATHER

No pipe shall be laid upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is danger of the formation of ice or the penetration of frost at the bottom of the excavation unless all required precautions as to the minimum length of open trench and promptness of backfilling are observed.

2.07.06 ARTIFICIAL FOUNDATION

Whenever directed, the Contractor shall lay pipe upon an artificial foundation which he shall construct. Such foundation may consist of gravels or of concrete; all to be of the form and dimensions and placed according to the detail or in the manner required by Easton Utilities.

2.07.08 TESTING

A. Gravity sewer to be tested in accordance with the following:

1. Contractor shall furnish all labor, tools, materials and equipment including water, pumps, compressors, stopwatch, gauges and meters, subject to the approval of the Owner, for testing in accordance with these specifications.

2. Easton Utilities shall be notified in advance of all tests, and all tests shall be witnessed and conducted to his entire satisfaction.

3. The gravity sewer shall be mirror and air tested as follows:

a. MIRROR TEST
Upon completion of pipe laying and backfilling to a point at least two (2') feet above the crown of the pipe, the Engineer will conduct a mirror test to check for defects, excess deflection, leakage and for horizontal or vertical misalignment. Mirror testing shall consist of reflecting sunlight or artificial light via mirrors through the completed section of pipeline, which, in order to be accepted, shall be true and straight in horizontal and vertical alignment to allow for the full passage of the reflected light. The right is reserved by the Town or Town Engineer to require mandrel testing per Uni-Bell PVC Pipe Association requirements.

b. LEAK TESTING USING AIR:

1. Sewers shall be tested in sections of not more than four hundred (400') foot lengths unless otherwise approved by the Engineer. Each section shall be tested immediately upon completion thereof. Each section shall meet the air pressure drop limitation specified herein.

2. All material and labor required for leakage tests shall be furnished by the Contractor.

3. Sewers shall be tested using the low-pressure air method in accordance with the requirements of the Uni-Bell PVC Pipe Associations's recommendations, UNI-B-6 based upon the Ramseier test time criteria. Procedural and equipment details shall be submitted to the Engineer prior to acceptance of its use for testing.

4. If the time for the designated size and length elapses before the test pressure drops 0.5 psig, the section undergoing the test shall have passed.

5. If the pressure drops 0.5 psig before the appropriate test time has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test. Contractor shall determine at his own expense the source or sources of leakage and he shall repair or replace all defective materials and/or workmanship to the satisfaction of the Engineer. The completed pipe installation shall then be retested and required to meet the requirements of this test.

c. Mandrel Testing

1. Deflection testing of the sewer shall be performed by the Contractor. No section of sewer shall be tested before at least 30 days have elapsed from the date of completed backfill over the section. The pipe will be observed for evidence of deflected or offset joints and other pipe defects.

2. The deflection, or deformation of the pipe due to external loading, shall not exceed approximately 5 percent. All labor, materials and equipment necessary for cleaning the sewers and performing the deflection testing shall be furnished by the Contractor.

3. Deflection shall be determined by passing an approved go/no go mandrel through the gravity sewer main.

4. The deflection shall be based on the average inside diameter as presented in ASTM D3034, Table XI.I, for PSM SDR35 PVC sewer pipe.

5. If any pipe fails the deflection test, unstable conditions and/or improper bedding will be assumed. The overly deflected pipe shall be removed and replaced by the Contractor.

2.07.09 BORING AND JACKING OF SANITARY SEWER

A. Where possible, an approach trench shall be excavated far enough to provide a jacking face of at least three (3') feet from a pavement surface. This open face shall be shored securely to prevent slipping or raveling of the face.

B. Boring pits shall be large enough to contain all necessary equipment and tools. Adequate provision shall be made for the removal of excavated material.

C. A substantial backstop of heavy timber or steel beams shall be provided to take the thrust of the jack or boring equipment.

D. As material is excavated or bored ahead of the pipe, the pipe shall be jacked in to follow this excavation. The distance dug ahead of the pipe shall not exceed six inches (6").

E. The installation of casing pipe and the boring or excavation shall be done simultaneously.

F. Voids between the sleeve and excavation shall be filled by pressure grouting.

G. Cement shall be used to seal the pipe ends between the carrier pipe and sleeve.

H. A one (1") inch PVC pipe shall be installed in the downgrade seal to permit drainage.

I. Steel pipe sleeve shall be furnished in the diameter shown on the plans and shall conform to the requirements of AWWA C-200; Grade B pipe shall be used. The pipe, including field connections, shall be coated with bitumastic compound, inside and outside. Pipe wall thickness for sleeves shall be standard thickness. All joints for casing pipe shall be made by continuous weld completely around the perimeter of the pipe in accordance with AWWA C-206.

J. Carrier pipe shall be as required by the plans.

K. Use runners or cradles to support the pipe in the casing. A minimum of two supports is needed per joint of pipe providing a maximum span of 6.25 feet for PVC pipe lengths of 12.5 feet or less. The maximum span between supports for pipe lengths of 19 to 20 feet must not exceed 7.5 feet.

2.07.10 SEWER MANHOLES

A. GENERAL

1. The Contractor shall have the option of constructing shallow (4' or less) manholes of precast reinforced concrete or "SS" sewer brick as indicated in the details. Manholes deeper than four feet (4') will be precast reinforced concrete.

2. Manholes shall be built at such points on the pipe lines and of such form and dimensions as are shown on the drawings or as may be directed. Manholes shall be built as pipe laying progresses and the Town or Easton Utilities may stop work entirely on the laying pipe if manhole construction is delayed to such an extent as to be hazardous to construction or the public.

3. Manhole frames and covers shall be installed on grade to match the slope of the paved surface. Use pre-manufactured devices, approved by Easton Utilities, to build up from cone to grade as required to match the slope of the frame and cover to the slope of the paved surface.

B. PRECAST REINFORCED CONCRETE MANHOLES

1. Precast reinforced concrete risers, eccentric cones and bases shall be in conformance with ASTM Designation C-478. Joints between riser sections shall be fitted with an "O" ring rubber gasket, meeting the requirements of ASTM Designation C-443. Installation of risers shall be in accordance with manufacturer's recommendations under the supervision of the Easton Utilities.

2. Precast reinforced concrete base and riser sections shall be 5000 PSI concrete as manufactured by Atlantic Concrete Products Company, Virginia Precast Corporation or equal.

3. Interior and exterior joint spaces of all manhole risers shall be filled prior to application of the exterior waterproofing. The interior joint shall be mortared. The exterior joint may be mortared or filled with a joint filler compound. Said compound shall be Pioneer 301 as manufactured by Daubert Chemical Co., Oakbrook, Illinois or equal.

4. Lifting holes in the walls of precast reinforced concrete risers will be allowed but shall be plugged with rubber stoppers and grouted flush with face or manhole wall after installation of manhole riser sections. Not more than two holes shall be cast in the walls of each riser section for the purpose of handling.

5. The exterior surface of all precast manholes shall receive a minimum two (2) coat application of a sixty eight percent (68%) solids coal tar type protective coating. The total average dry film thickness shall measure 24 mils with no single measurement to be less than 20 mils. Surfaces shall be prepared in accordance with the

manufacturer's instructions and coatings applied in the field in a manner acceptable to the Engineer. The coating material shall be Bitumastic Super Service Black manufactured by Koppers Co., Inc., Pittsburgh, Pennsylvania, Tar-Jet Super Black XX-32-B-22 manufactured by Pennsbury Coatings Corp., New Britain, Pennsylvania or equal.

6. All pipe-to-manhole connections in the precast manhole shall be made by means of an integrally cast flexible connector which shall be Lockjoint flexible manhole sleeve as manufactured by Interpace Corp., Parsippany, New Jersey or A-Lok flexible manhole gasket as manufactured by A-Lok Corp., Trenton, New Jersey or equal.

C. FLOW CHANNELS

1. All manhole flow channels and benches shall be constructed of "SS" sewer brick or concrete, four-inch minimum thickness. Care shall be taken to secure smooth and even surfaces with full special mortar joints. Channel sections shall be built up to true line and radius, and curved sections shall provide a uniform transition in the flow direction.

2. Materials and construction of flow channels shall be in accordance with appropriate sections for materials so used, as hereinafter specified.

D. CONCRETE

All concrete for manhole base slabs and cradles, encasements, blocking, etc. shall have a minimum compressive strength of 3,000 psi at 28 days, and conform to MD-SHA standards.

E. BRICK

All brick shall conform to the "Standard Specifications for Sewer Brick", ASTM Designation C-32, Grade SS, except that the maximum absorption for the average of five (5) bricks shall not exceed ten (10%) percent and the individual brick maximum shall not exceed fourteen (14%) percent.

F. MORTAR

1. Mortar shall be Type S, in accordance with ASTM C-270.

2. Sand shall be composed of sharp, angular, silicious grains, coarse or graded from fine to coarse with the coarsest grains predominating, and sensibly free from clay, loam, dirt, mica, organic matter or other impurities. Sand containing more than five (5%) percent by weight of foreign material shall not be used. This limit may be changed for special classes of work if hereinafter specified. Sand exhibiting more than an acceptable amount of fine matter or impurities may be required to be washed after delivery on the work or shall be rejected altogether. Sand for mortar shall be

screened to reject all particles of a greater diameter than 1/4-inch and shall not contain more than five (5%) percent by weight of a very fine material.

3. Unless hereinafter specified otherwise, all mortar shall be composed of cement and sand of the character above specified. The proportion of volume shall be one part of cement to two of sand. One volume of cement shall be 94 pounds net. One volume of sand shall be 0.9 cubic feet, the sand not being packed more closely than by throwing it into a box the usual way. Mortar shall be fresh mixed in small batches for the work in hand. Tight boxes or platforms made for the purposes shall be used. The sand and cement shall be thoroughly mixed dry, in the proper proportions, until a uniform color has been produced, whereupon a moderate dose of water shall be added, so as to produce a stiff paste of the proper consistency.

4. Sand obtained from the excavation shall not be used.

G. LAYING BRICK

1. All brick work shall be laid by competent professionals.

2. All brick shall be laid in a full bed of mortar with all vertical and horizontal joints filled with solid mortar.

3. Joints shall be not less than 3/8-inch or more than 1/2-inch wide except as otherwise specified in paragraph 5 below.

4. No brickwork shall be laid when the temperature is below 40 degrees or when the indications are for lower temperatures within 24 hours. The Contractor shall take such measures as may be approved to prevent brick work from being exposed to freezing temperatures for a period of not less than five days after laying.

5. Special care shall be taken in laying brick in inverts of manholes to insure a uniform flow of water through the sections. In such locations, joints shall not exceed 1/16-inch in thickness and each brick shall be laid in full mortar bed with joints on bottom side and end made in one operation. No grouting or working in of mortar after laying the brick will be permitted.

H. MANHOLE STEPS

1. Manhole steps shall be made of 3/8-inch diameter (No. 3) steel reinforcing bars, ASTM Designation A-615, grade 60, encased in polypropylene plastic. Manhole steps shall have notched tread ridge with retainer lug on each side.

2. Manhole steps shall be cast-in-place during manufacture of precast reinforced concrete manholes or placed in brick manholes during construction. Embedment length shall be suitable for minimum five (5") inch thick, precast reinforced concrete

riser walls.

3. Manhole steps shall be OSHA approved and as manufactured by M.A. Industries, Inc., Peachtree City, Georgia, ICM, Inc., Jacksonville, Arkansas, or equal.

4. Manhole steps shall be spaced twelve inches (12") apart. The maximum spacing from top of manhole frame to the first step shall not exceed sixteen inches (16").

I. MANHOLE FRAMES AND COVERS

1. Frames and covers for manholes shall be set by the Contractor as the work progresses. The frame shall be well bedded in mortar.

2. Frames and covers shall be as shown in the details and manufactured by by E.A. Quirin Foundry, solid lid with two (2) pick holes and internal ribbing. Material for frames and covers shall be in accordance with standard specifications for gray iron castings ASTM A-48-64 for Class 35B.

3. Furnish Parson manhole inserts with Nylon handles and factory installed gasket in all manholes.

4. Manhole stubs shall be extended four feet (4') outside of the manhole wall unless otherwise detailed. The stub end shall be plugged.

J. TESTS

1. All Manholes will be required to pass a vacuum test. Manholes will be sealed and a vacuum applied to a level of ten (10) inches of mercury. The time will be measured for the vacuum to drop from ten (10) inches to nine (9) inches of mercury.
2. All Sanitary Sewer Manhole/Structure Vacuum Tests shall be performed by the contractor. The contractor shall provide all equipment and personnel to perform the required testing. All Sanitary Sewer Manhole/Structure Vacuum testing equipment shall be approved by Easton Utilities prior to its use. Vacuum testing is recommended to be performed prior to backfilling around the manhole/structure.
3. Vacuum testing times for sanitary sewer structures other than manholes shall be based on the times nearest to the equivalent manhole volume or as directed by Easton Utilities.
4. The following are the minimum allowable test times for manhole/structure acceptance at the specified pressure drop:

Depth of Manhole (feet)	Time Lapse (Seconds) per Manhole Diameter (inches)		
	48 "	60"	72"
8	60	60	60
10	60	60	60
12	60	60	60
14	60	60	60
16	60	60	60
18	60	60	60
20	60	60	60
22	60	60	62
24	60	60	68
26	60	60	74
28	60	64	80
30	60	69	85

If inspection reveals any visible leakage or seepage in any manhole, the Contractor will be required to accomplish such remedial measures as may be directed by the Engineer. Caulking or patching of interior manhole surfaces will not be acceptable.

K. VERTICAL SURVEY

Prior to final acceptance, rim and invert elevations shall be established by a licensed surveyor and provided to the Town of Easton and Easton Utilities.

END SECTION

Section 3
STANDARD DETAILS

FOR PUBLIC WORKS AND
UTILITY CONSTRUCTION
IN THE
TOWN OF EASTON

MAY 1, 1986
REISSUED MAY 1, 1989
REISSUED AUGUST 1, 1994
REISSUED AUGUST 1, 2001
REISSUED MAY 1, 2006
REISSUED APRIL 25, 2009
REISSUED MAY 14, 2009
REISSUED APRIL 12, 2011
REISSUED SEPT 23, 2014

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Terminal Manhole	SS-1.05
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Manhole Steps Aluminum	SS-3.00
Manhole Steps Polypropylene Plastic	SS-3.01
Manhole Frame & Cover	SS-4.00
Watertight Manhole Frame & Cover	SS-4.01
Manhole Insert #1	SS-4.02
Manhole Insert #2	SS-4.03
Driveway Cleanout Cover	SS-4.04
Mainline Cleanout	SS-5.00
Watertight Mainline Cleanout Frame & Cover	SS-6.00
PVC Sewer Main Trench	SS-7.00
Drop Sewer House Connection	SS-8.01
Sanitary Sewer As-Built Drawing	SS-9.00
PVC Forcemain Installation	SS-9.10
Grease Trap	SS-9.20
Thrust Isolator Assembly	SS-9.30
Grease Recovery Device	SS-9.40
PVC Water Main Installation	W-1.00
Water Main Joint Trenching	W-1.01
Standard Strapping Method	W-2.00

TOWN BOUNDARY
PROPERTY LINES
STREET SIDE LINES

FENCES
- WOOD
- CHAIN LINK
- CURB LINES
- WOODS LINE

TREES
- EVERGREEN
- DECIDUOUS

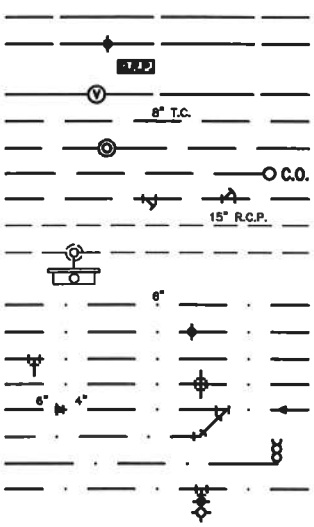
STREAM & DITCHES
- OVER 2'
- UNDER 2'
- MARSH

POLES

UNDERGROUND
- ELECTRIC
- TELEPHONE
- BURIED CABLE
- CABLE TV

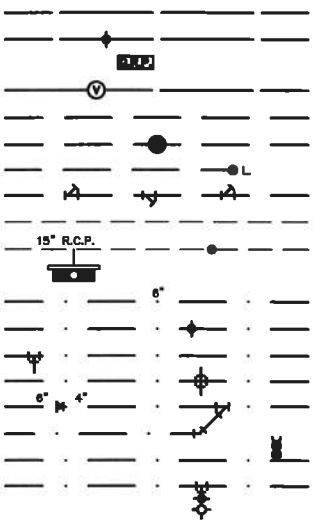
EXISTING WORK

- GAS MAIN
  - VALVE
  - REGULATAOR PIT
  - VENTS
- SEWER MAIN
  - MANHOLE
  - MAINLINE C.O.
  - Y BRANCH
- STORM DRAIN
  - MANHOLE
  - INLETS
- WATER MAIN
  - VALVE
  - TEE
  - CROSS
  - REDUCER
  - BENDS
  - BLOW-OFFS
  - FIRE HYDRANTS



PROPOSED WORK

- GAS MAIN
  - VALVE
  - REGULATAOR PIT
  - VENTS
- SEWER MAIN
  - MANHOLE
  - LAMPHOLE
  - Y BRANCH
- STORM DRAIN
  - MANHOLE
  - INLETS
- WATER MAIN
  - VALVE
  - TEE
  - CROSS
  - REDUCER
  - BENDS
  - BLOW-OFFS
  - FIRE HYDRANTS



APPROVAL	REVISED
TOWN ENGINEER — DATE 4/12/11	AUG. 1, 94
	JULY 1, 98
	AUG 1, 01
	SEP 1, 02
	JAN 1, 11

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

LEGEND

ISSUED: MAY 1, 1986

STANDARD NO. G-1.00

BITUMINOUS CEMENT CONCRETE MIXTURES

SURFACE DESIGNATION SIEVE SIZES	PERCENT PASSING 9.5mm SUPERPAVE	PERCENT PASSING 19.0mm SUPERPAVE
2 IN.	--	--
1½ IN.	--	--
¾ IN.	100	100
½ IN.	100	82–88
⅜ IN.	75–90	60 MAX
NO. 4	30–50	22–30
NO. 8	20–30	14–20
NO. 16	--	--
NO. 200	8–13	9–11
A.C.	--	--

NOTE: UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE CONTRACTORS LABORATORY STUDY SHALL BE SUBMITTED FOR APPROVAL AT LEAST THREE WEEKS PRIOR TO PAVING OPERATIONS. THE FOLLOWING INFORMATION IS REQUIRED.

A. MIX DESIGNATION.

B. SOURCE AND PERCENTAGE OF AGGREGATE, ASPHALT CEMENT, ASPHALT RELEASE AGENT, ANTI–STRIPPING AND ANY OTHER ADDITIVES.

C. COMBINED GRADING, EXTRACTED GRADING, IF USED.

D. PLANT WHERE THE HMA MIX WILL BE PRODUCED.

E. WORKSHEETS AND GRAPHS SHOWING THE MARSHALL PROPERTIES.

F. NUMBER OF COMPACTION BLOWS PER FACE.

G. PERCENT PASSING NO. 200 SIEVE REMOVED BY DUST COLLECTING SYSTEM.

H. RATIO OF DUST TO BINDER MATERIAL.

I. MAXIMUM SPECIFIC GRAVITY AT THE TARGET ASPHALT CONTENT.

J. SURFACE COURSES OF BITUMINOUS CONCRETE MIXES SHALL HAVE LESS THAN 15% OF RECYCLED ASPHALT PAVEMENT (RAP).

K. BASE COURSES SHALL HAVE NO MORE THAN 20% RAP.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS BITUMINOUS CEMENT CONCRETE MIXTURES
TOWN ENGINEER 4/12/11 DATE	AUG. 1, 94 JULY 1, 98 AUG 1, 01 SEP 1, 02 JAN 1, 11	
ISSUED: MAY 1, 1986		STANDARD NO. G–2.00

SHA PORTLAND CEMENT CONCRETE MIXTURES

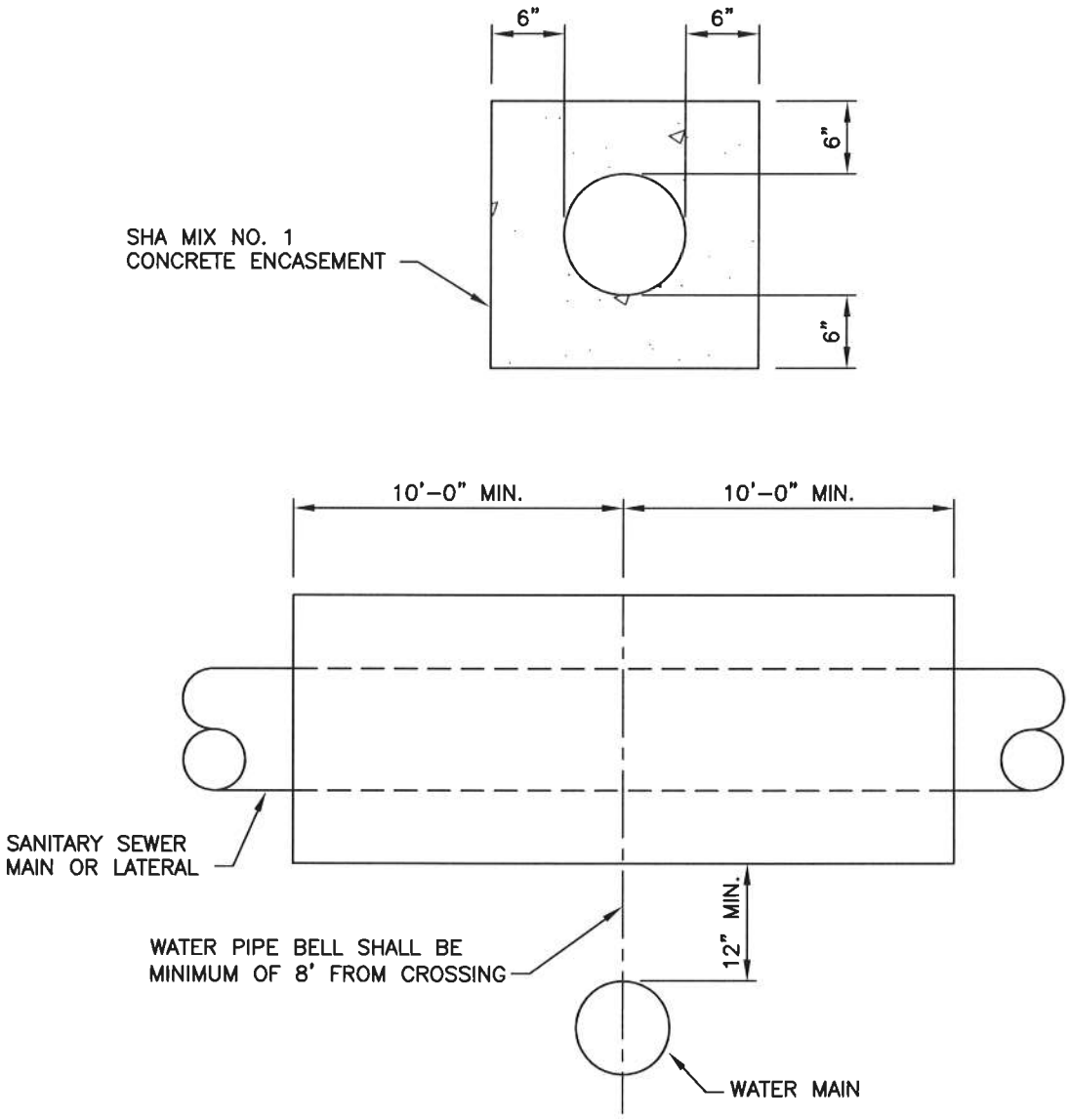
MIX NO.	28 DAY SPECIFIED DESIGN COMPRESSIVE STRENGTH (PSI)	MIN. CEMENT FACTOR	COARGE AGGREGATE AASHTO M43 SIZE	MAX WATER CEMENT RATIO	SLUMP (IN)
1	2500	455	57 OF 67	0.55	2–5
2	3000	530	57 OR 67	0.50	2–5
3	3500	580	57 OR 67	0.45	2–4
7	4200	611	57 OR 67	0.45	2–4

MIX NO.	TOTAL AIR CONTENT (%)	CONCRETE TEMPERATURE (F)
1	5–8	70 ± 20
2	5–8	70 ± 20
3	5–8	70 ± 20
7	5–8	70 ± 20

NOTE:

1. STATE CERTIFIED CONCRETE MANUFACTURER.
2. NO CALCIUM ADMIXTURES SHALL BE UTILIZED IN MIXES.

APPROVAL	REVISED	
TOWN ENGINEER 4/12/11 DATE	AUG. 1, 94 MAR 1, 98 JAN 1, 11	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS SHA PORTLAND CEMENT CONCRETE MIXTURE
ISSUED: MAY 1, 1986		STANDARD NO. G–3.00



NOTES:

1. ANYTIME THE WATER MAIN IS BELOW ANY SEWER MAIN, THE SEWER MAIN SHALL BE ENCASED IN CONCRETE.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4/12/11	MAY 1, 98	CROSSING A WATER MAIN WITH A SEWER MAIN
	AUG 1, 01	
	FEB 1, 02	
	JAN 1, 11	
ISSUED: MAY 1, 1986		STANDARD NO. G-5.00

WATER SYSTEMS

A. Water main pipe:
   1) Ductile iron class 50, ANSI/AWWA C151/A21.41, double cement-lined
   2) AWWA C-900 PVC DR18
B. Fittings: ductile iron, class 350, mechanical joint, ANSI/AWWA C110/A21.10-87
C. Services:
   1) 1" type "K" copper
   2) 1" PE-3408, SDR-9
D. Bedding stone: minimum of 4" graded aggregate or 3/4-inch washed stone, where required.
E. Tracer wire: 8-gauge copper tracer wire.
F. Saddles: stainless steel saddles, equivalent to Ford FS303 on PVC only.
G. Fire hydrants:
   1) Kennedy Guardian 81D
   2) American Darling B 62 B
H. Valves: resilient-seated gates valves (ANSI/AWWA C509), open right.

SANITARY SEWER

A. Gravity sewer main pipe:
   1) 6" and greater: PVC SDR-35
   2) 4" and smaller: PVC schedule 40 - solid core; ASTM D-2665 & D-1785
   3) Cover < 42": class 50 ductile iron only.
B. Forcemain pipe:
   1) Ductile iron class 50
   2) C-900 PVC DR 18
   3) Cover < 42": class 50 ductile iron only

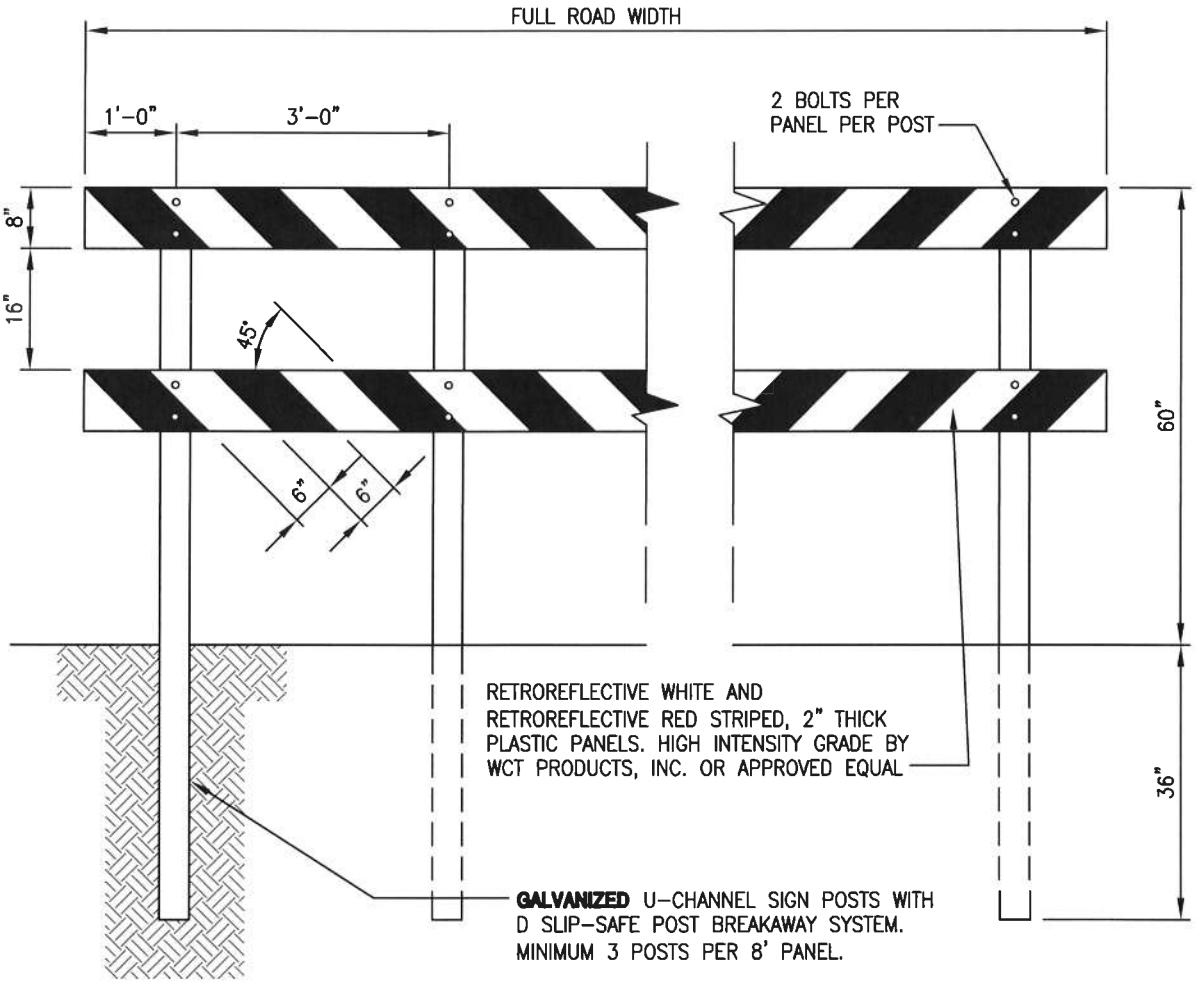
STORM DRAIN

A. Inlets
   1) Precast concrete
   2) Cast in place
B. Storm drain pipe:
   1) Reinforced concrete pipe (RCP)
   2) HDPE (outside of paved surfaces) bedded to the haunches with graded aggregate
   3) Cover < 42" or beneath street improvements (pavement, curb, sidewalk) utilize RCP only

NOTES:

A. All materials subject to shop drawing submittal, review and approval by Easton Utilities and the Town of Easton's Town Engineer prior to commencement of work.
B. Connection of HDPE pipe to inlets and manholes shall be made with a special water-tight fitting as approved by the Town Engineer. Modify concrete wall thickness for fittings to account for pipe entering the joint system on an angle.

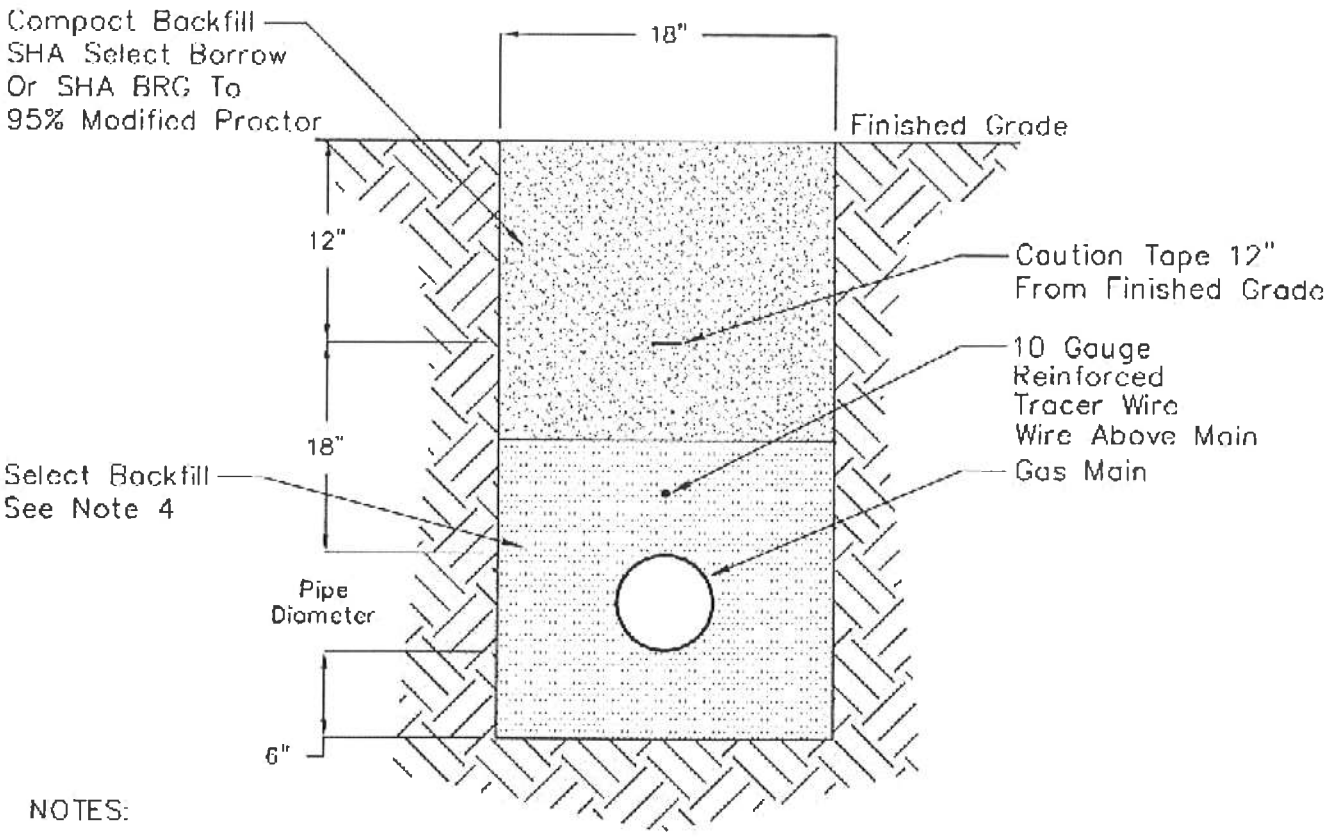
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG 1, 94	
	JAN 1, 11	
		MATERIAL LIST
ISSUED: MAY 1, 1986		STANDARD NO. G-6.00



NOTES:

1. STRIPING SHALL BE INTERCHANGING RETROREFLECTIVE WHITE AND RETROREFLECTIVE RED AND COMPLY WITH THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
2. STRIPING SHALL SLOPE DOWNWARD IN THE DIRECTION THAT TRAFFIC IS DESIRED TO TURN. IF TRAFFIC CANNOT TURN, STRIPING SHALL SLOPE DOWNWARD TOWARD THE CENTER OF BARRICADE.
3. A "NO OUTLET" WARNING SIGN SHALL BE UTILIZED AT THE ENTRANCE TO ALL TERMINATING STREETS.
4. UTILIZE ONE SET OF PANELS PER TRAVEL LANE. PANELS SHALL BE MANUFACTURED BY WTC PRODUCTS, INC. OR APPROVED EQUAL.

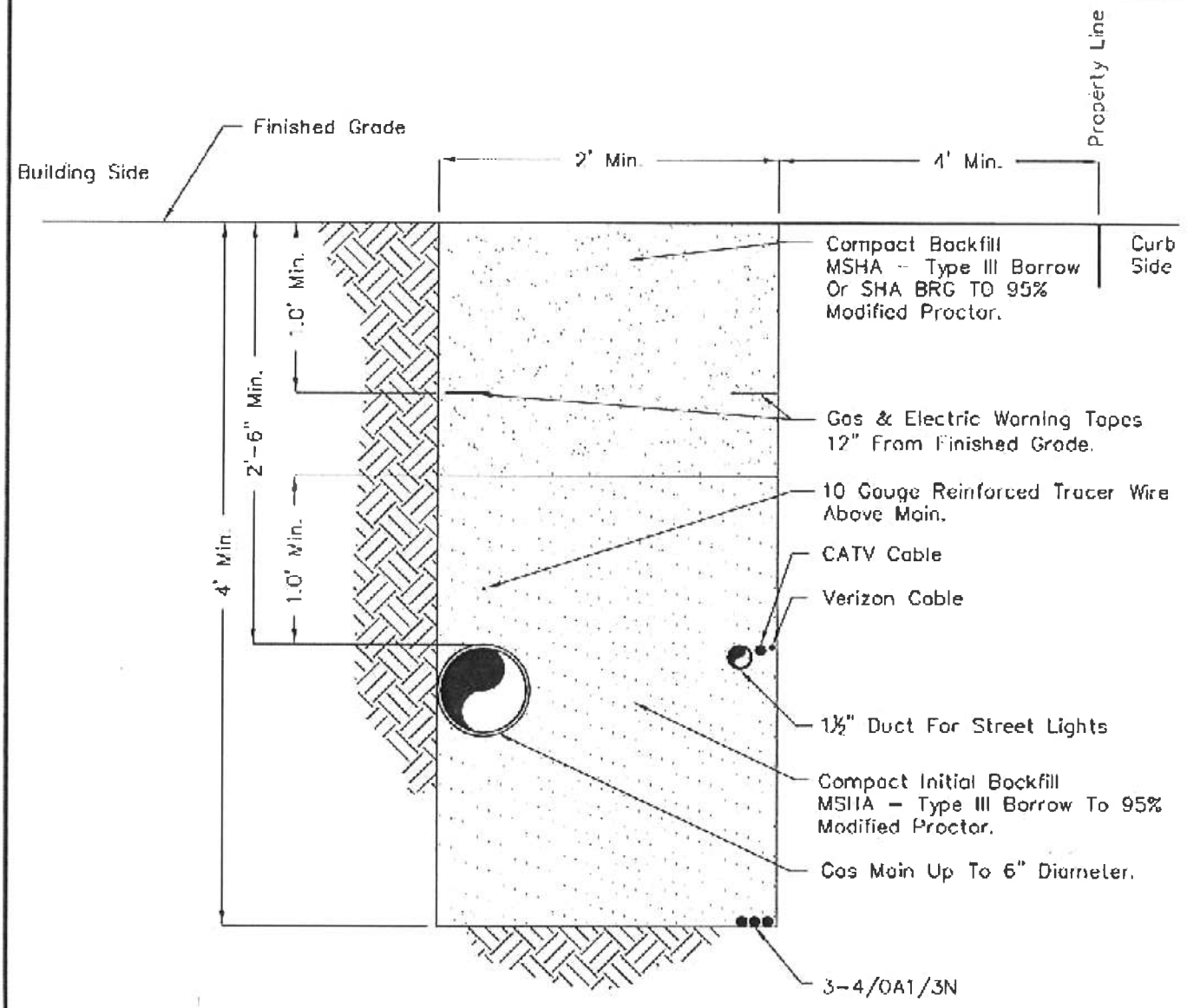
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG 1, 94	
	OCT 11, 10	
	JAN 1, 11	BARRICADE DETAIL
ISSUED: MAY 1, 1986		STANDARD NO. G-7.00



NOTES:

1. Gas Trench Width Varies Depending Upon Pipe Size.
2. Plastic Mains Shall Have A Minimum Of 30" Of Cover Or As Directed By Easton Utilities.
3. Minimum 12" Clearance From Other Underground Utilities.
4. Trench Backfill Shall Be Tamped In 6" Lifts to Ensure Proper Compaction.
5. Street Openings Shall Be Restored in Accordance With G-4.00.
6. Non-Paved Areas Shall Be Restored to Their Original Condition.
7. Trench Material May Be Re-Used As Backfill If It Is Deemed Clean And Reusable By An Easton Utilities Gas Department Representative.
8. Tracer Wire Must Be Surfaced Into Valve Box Or Rhino Internal Terminal Style Test Station Every 400' To 500'.
9. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
10. Thoroughly Tape Mechanical Connections With Electrical Tape.

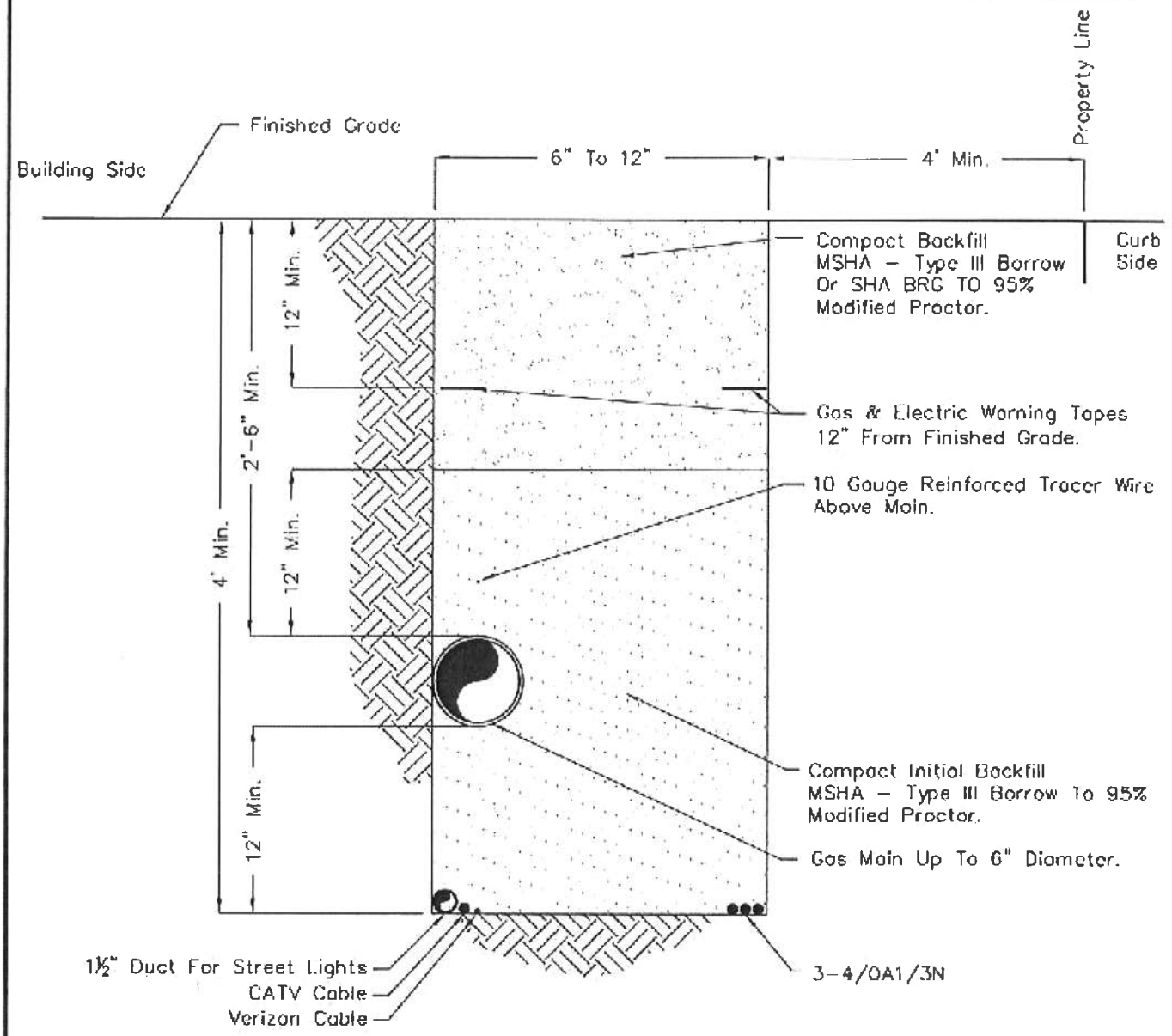
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS GAS MAIN TRENCH
Talbot W Bare 9/1/09 EU MANAGER OF ENGINEERING DATE	Oct. 8, 04 Oct. 25, 05 Aug. 21, 07 SEP. 1, 09	
ISSUED: MAR 1, 2002		STANDARD NO. GS-1.01



Notes:

1. Tracer Wire Must Be Surfaced Into Valve Box Or Rhino Internal Terminal Style Test Station Every 400' To 500'.
2. Street Openings Shall Be Restored In Accordance With G-4.00
3. Non-Paved Areas Shall Be Restored To Their Original Condition.
4. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
5. Thoroughly Tape Mechanical Connections With Electrical Tape.

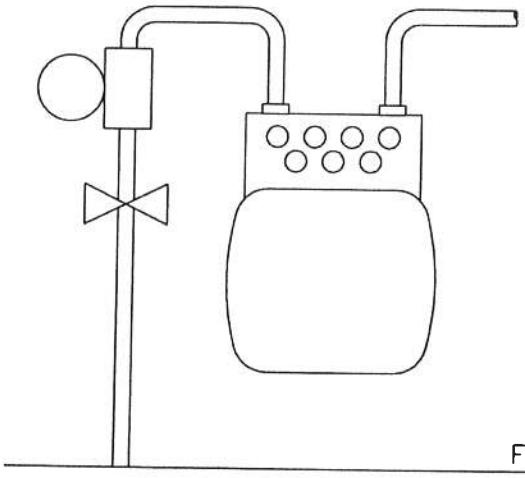
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS GAS JOINT TRENCH
Talbot W Bowe 9/4/09 EU MANAGER OF ENGINEERING DATE	SEP 1, 09	
ISSUED: DEC. 1, 2005		STANDARD NO. GS-1.02



Notes:

1. Tracer Wire Must Be Surfaced Into Valve Box Or Rhino Internal Terminal Style Test Station Every 400' To 500'.
2. Street Openings Shall Be Restored In Accordance With G-4.00.
3. Non-Paved Areas Shall Be Restored To Their Original Condition.
4. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
5. Thoroughly Tape Mechanical Connections With Electrical Tape.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS NARROW GAS JOINT TRENCH
Talbot W Bane 9/1/09 EU MANAGER OF ENGINEERING DATE	SEP 1, 09	
ISSUED: SEP. 1, 2007		STANDARD NO. GS-1.03



Notes:

1. Before Gas Service Is Installed, Service Application Must Be Made At At Easton Utilities Customer Service Center.
2. All Gas Meter Sets Shall Be Installed To NFPA54 ANSI Z 223.1 National Fuel Gas Code And Easton Utilities Gas Department Standard.
3. Gas Service Riser Shall Be Sleeved In PVC Conduit If It Passes Through Concrete, Brick Or Pavement.
4. Easton Utilities Gas Department Shall Be Contacted Regarding Meter Location And Pressure Testing Requirements.
5. Gas Meter Shall Be Located In A Ventilated Space Clear Of Landscaping And Readily Accessible For Examination, Reading, Replacement Or Necessary Maintenance.
6. Gas Meter Shall Be Located At Least 3 Feet From Sources Of Ignition.
7. If Gas Meter Is Equipped With A Regulator, It Shall Be Located At Least 3 Feet From Air Vents And Inlets.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE		GAS METER INSTALLATION
ISSUED: MAR 1, 2002		STANDARD NO. GS-2.00

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APPROVAL

TOWN ENGINEER

DATE 4/12/11

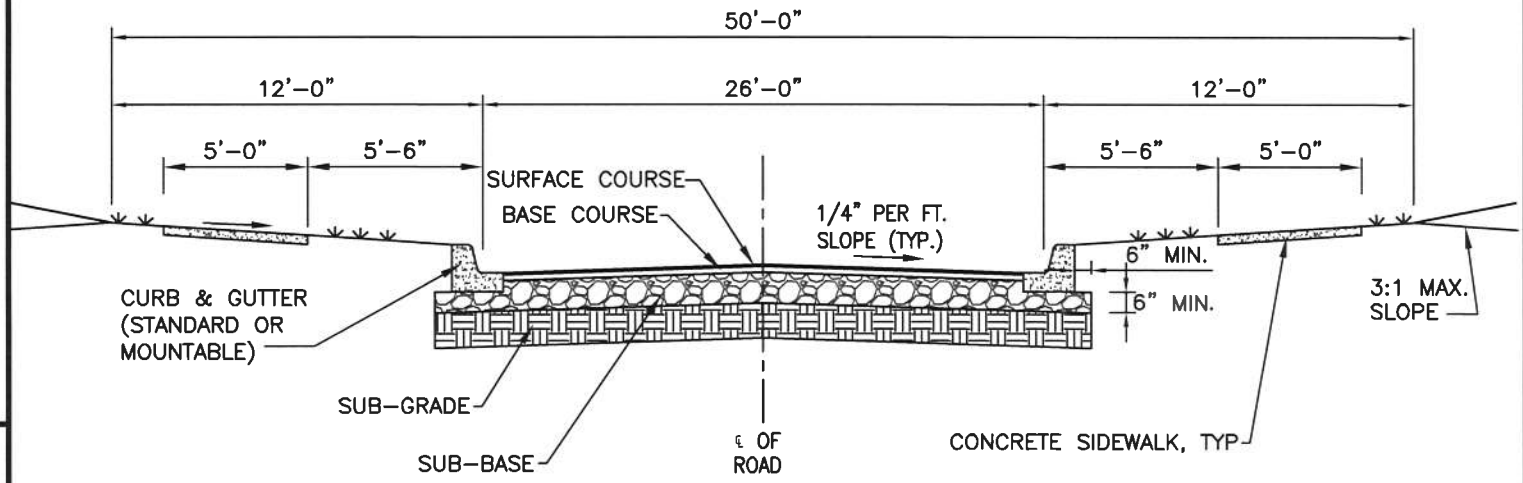
ISSUED: MAY 1, 1986

REVISED	
AUG. 1, 94	
MAR 1, 98	
SEP 1, 02	
FEB 1, 06	
FEB 25, 09	
JAN 1, 11	

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

RESIDENTIAL ACCESS STREET

STANDARD NO. PW-1.00



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 2.5" 'BC' OR SUPERPAVE 19.0MM

3. SUBBASE:
   6" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 50' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. 26' ROAD WIDTH IS MEASURED FROM FLOWLINE FOR STANDARD CURB AND GUTTER OR MOUNTABLE CURB. SEE STANDARD PW 2.03 FOR MOUNTABLE CURB DETAIL.

7. CROSS SLOPE FOR SIDEWALKS SHALL BE A MAXIMUM OF 2%. MINIMUM SLOPE SHALL BE AS REQUIRED FOR PROPER DRAINAGE (SEE PW-3.00 FOR SIDEWALK REQUIREMENTS).

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APPROVAL

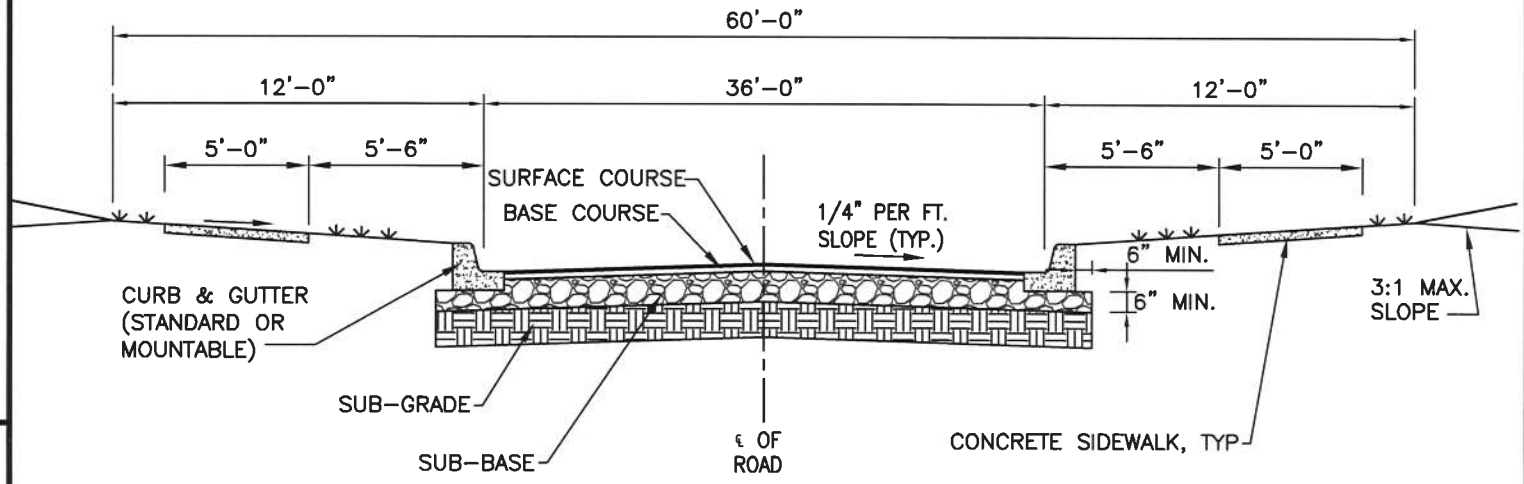
TOWN ENGINEER — DATE 4/12/11

ISSUED: MAY 1, 1986

REVISED	
AUG. 1, 94	
MAR 1, 98	
SEP 1, 02	
FEB 1, 06	
FEB 25, 09	
JAN 1, 11	

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS
RESIDENTIAL SUB-COLLECTOR STREET

STANDARD NO. PW-1.01



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 2.5" 'BC' OR SUPERPAVE 19.0MM

3. SUBBASE:
   6" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 60' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. 36' ROAD WIDTH IS MEASURED FROM FLOWLINE FOR STANDARD CURB AND GUTTER OR MOUNTABLE CURB. SEE STANDARD PW 2.03 FOR MOUNTABLE CURB DETAIL.

7. CROSS SLOPE FOR SIDEWALKS SHALL BE A MAXIMUM OF 2%. MINIMUM SLOPE SHALL BE AS REQUIRED FOR PROPER DRAINAGE (SEE PW-3.00 FOR SIDEWALK REQUIREMENTS).

APPROVAL

TOWN ENGINEER

DATE 4/22/11

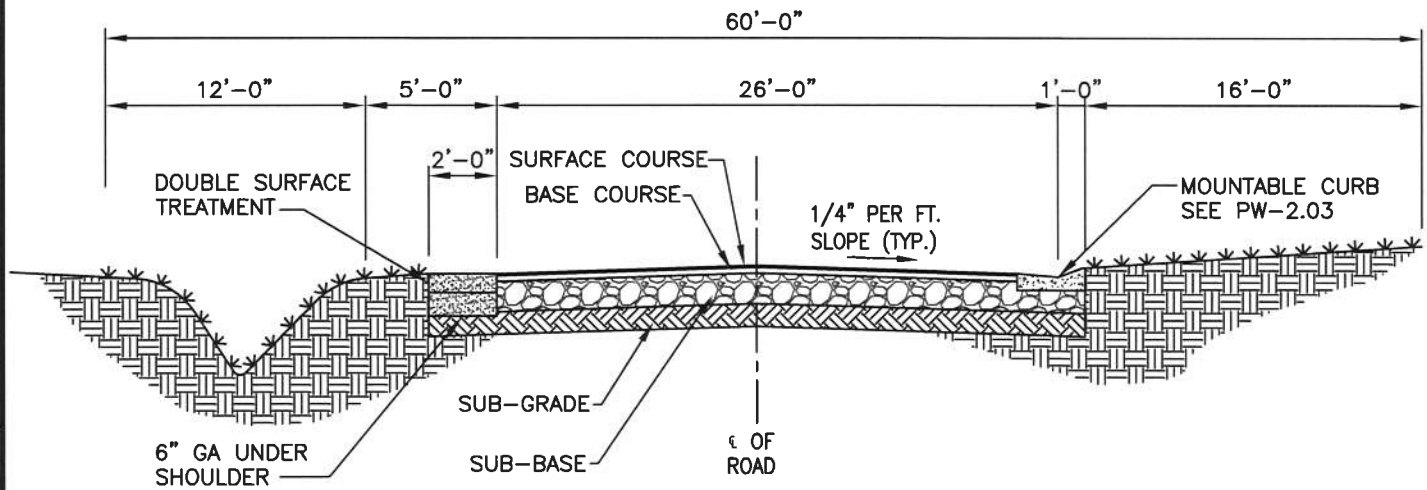
ISSUED: MAY 1, 1986

REVISED	
AUG. 1, 94	
MAR 1, 98	
AUG. 1, 01	
SEP 1, 02	
FEB 25, 09	
JAN 1, 11	

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

RESIDENTIAL COLLECTOR STREET

STANDARD NO. PW-1.02



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

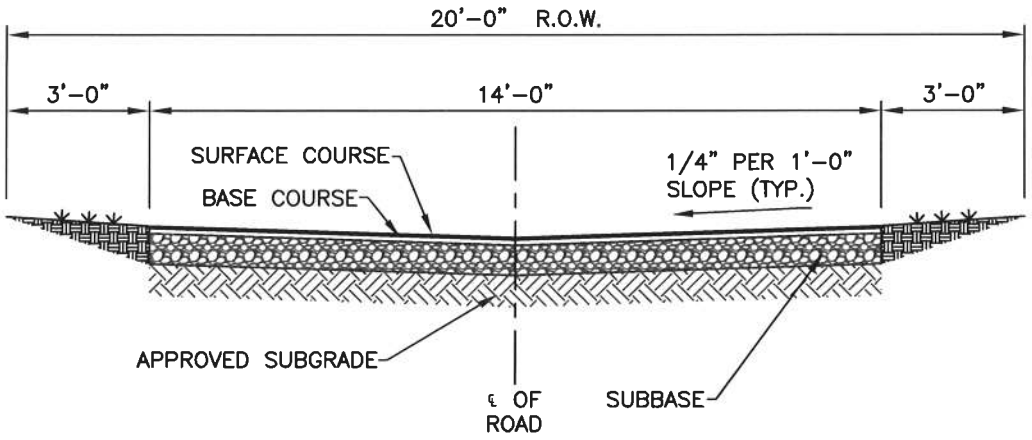
2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 2.5" 'BC' OR SUPERPAVE 19.0MM

3. SUBBASE:
   6" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO THE START OF CONSTRUCTION PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 60' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. MOUNTABLE CURB OR 2' WIDE DOUBLE SURFACE TREATMENT MAY BE REQUIRED AT THE DISCRETION OF THE TOWN ENGINEER.



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 2.5" 'BC' OR SUPERPAVE 19.0MM

3. SUBBASE:
   6" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO THE START OF CONSTRUCTION PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 20' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. MINIMUM RATE OF GRADE FOR ALLEYS SHALL BE 1.00%.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG. 1, 94 JULY 1, 98 SEP 1, 02 JAN 1, 07 FEB 25, 09	RESIDENTIAL ALLEY
ISSUED: MARCH 1, 1994	JAN 1, 11	STANDARD NO. PW-1.03

APPROVAL

TOWN ENGINEER

DATE

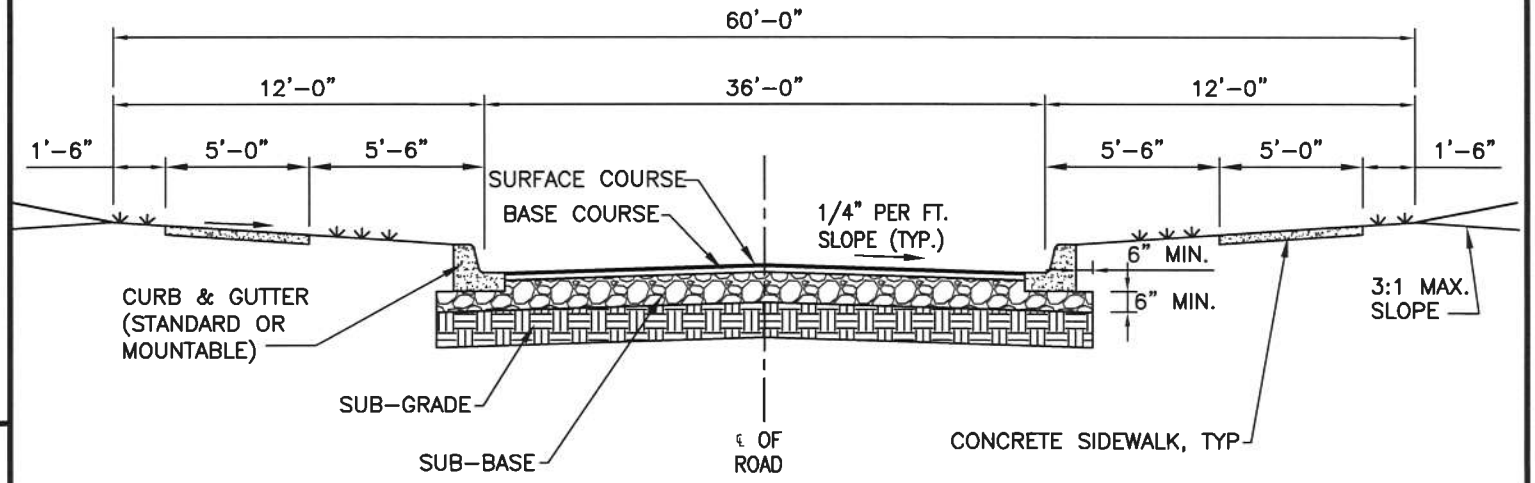
ISSUED: MAY 1, 1986

REVISED	
AUG. 1, 94	
MAR 1, 98	
SEP 1, 02	
FEB 1, 06	
FEB 25, 09	
JAN 1, 11	

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

COMMERCIAL LOCAL STREET

STANDARD NO. PW-1.04



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 4" 'BC' OR SUPERPAVE 19.0MM, PLACED IN TWO (2) 2" COURSES.

3. SUBBASE:
   SHA BRG SUBBASE PLACED AND COMPACTED IN TWO (2) COURSES OR 9" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO THE START OF CONSTRUCTION PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 60' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. 36' ROAD WIDTH IS MEASURED FROM FLOWLINE FOR STANDARD CURB AND GUTTER OR MOUNTABLE CURB. SEE STANDARD PW 2.03 FOR MOUNTABLE CURB DETAIL.

7. CROSS SLOPE FOR SIDEWALKS SHALL BE A MAXIMUM OF 2%. MINIMUM SLOPE SHALL BE AS REQUIRED FOR PROPER DRAINAGE (SEE PW-3.00 FOR SIDEWALK REQUIREMENTS).

APPROVAL

TOWN ENGINEER _____ DATE 4/12/11

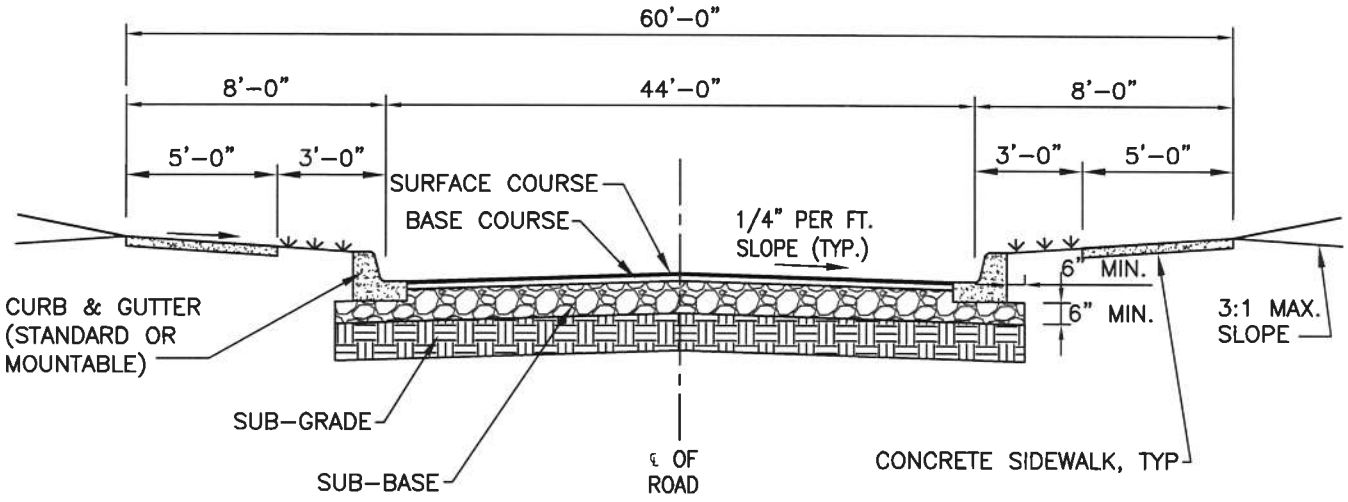
REVISED	
MAY 1, 89	
AUG. 1, 94	
MAR 1, 98	
SEP 1, 02	
FEB 25, 09	
JAN 1, 11	

ISSUED: MAY 1, 1986

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

COMMERCIAL COLLECTOR STREET

STANDARD NO. PW-1.05



NOTES:

1. PROVIDE 4" MIN. TOPSOIL, FERTILIZE, SEED & MULCH ALL DISTURBED AREAS ON BOTH SIDES.

2. PAVING:
   BITUMINOUS CONCRETE (MINIMUM)
   SURFACE COURSE 1.5" 'SF' OR SUPERPAVE 9.5MM
   BASE COURSE 4" 'BC' OR SUPERPAVE 19.0MM, PLACED IN TWO (2) 2" COURSES.

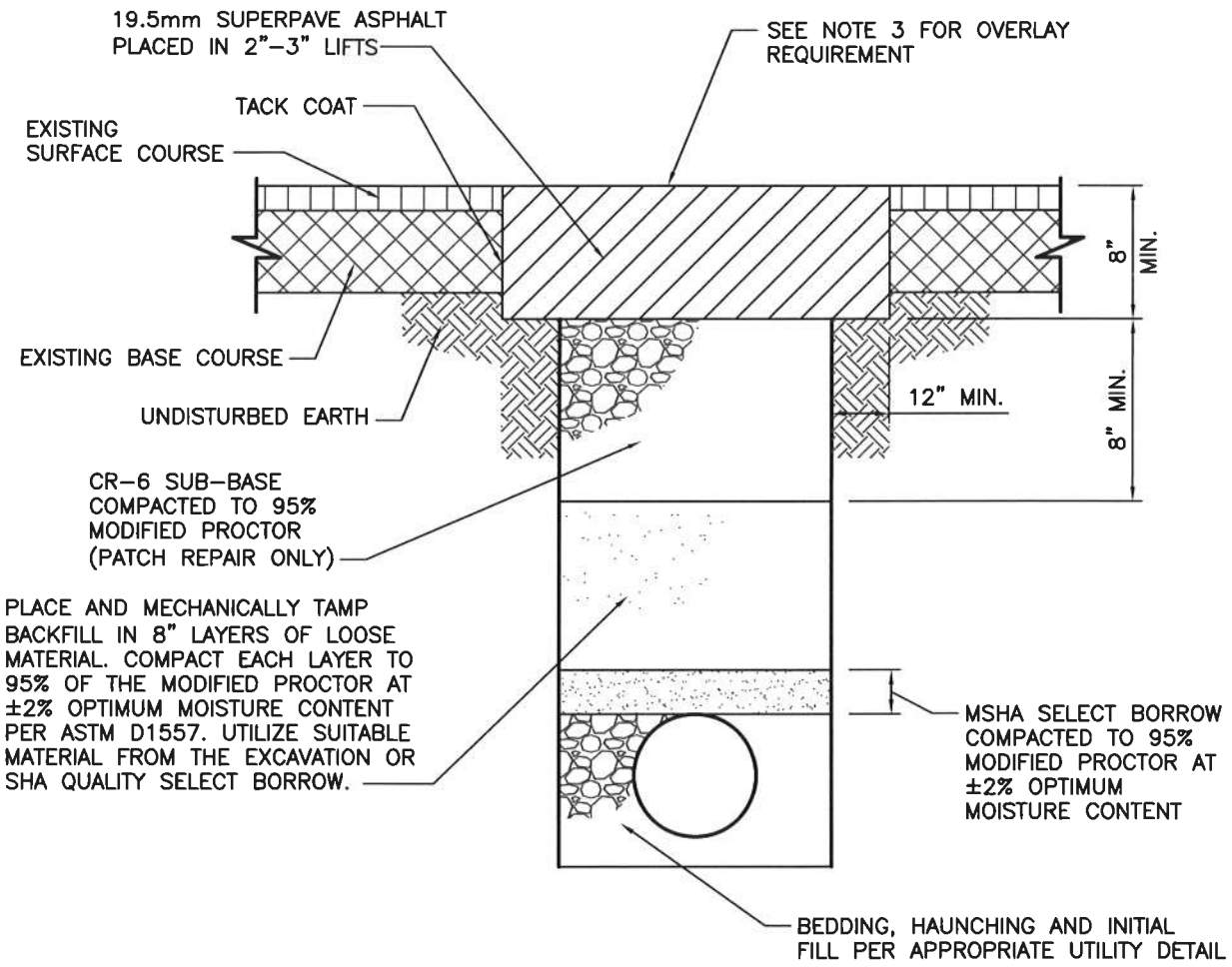
3. SUBBASE:
   SHA BRG SUBBASE PLACED AND COMPACTED IN TWO (2) COURSES OR 9" GRADED AGGREGATE COMPACTED TO 95% OF ASTM D1557, MODIFIED PROCTOR METHOD.

4. SUBGRADE:
   COMPACT APPROVED SUBGRADE TO 95% OF ASTMD1557 – CBR TESTING SHALL BE PERFORMED ON THE SUB-GRADE AND APPROVED BY THE TOWN ENGINEER PRIOR TO THE START OF CONSTRUCTION PRIOR TO CONSTRUCTION DOCUMENT APPROVAL.

5. ENTIRE 60' WIDTH SHALL BE CLEARED AND GRADED AS SHOWN.

6. 44' ROAD WIDTH IS MEASURED FROM FLOWLINE FOR STANDARD CURB AND GUTTER OR MOUNTABLE CURB. SEE STANDARD PW 2.03 FOR MOUNTABLE CURB DETAIL.

7. CROSS SLOPE FOR SIDEWALKS SHALL BE A MAXIMUM OF 2%. MINIMUM SLOPE SHALL BE AS REQUIRED FOR PROPER DRAINAGE (SEE PW-3.00 FOR SIDEWALK REQUIREMENTS).



NOTES:

1. PAVEMENT SHALL BE SAW CUT FULL DEPTH OF THE EXISTING PAVEMENT SECTION. ALL CUTS SHALL BE MADE IN STRAIGHT LINES.
2. WHEN STREET OPENING IS WITHIN MD STATE HIGHWAY ADMINISTRATION OR TALBOT COUNTY RIGHT–OF–WAY, E.U.C. IS REQUIRED TO OBTAIN AN SHA OR TALBOT COUNTY PERMIT AND APPLICABLE STATE OR COUNTY STANDARDS SHALL APPLY.
3. SURFACE RESTORATION ON ROAD CROSSINGS SHALL INCLUDE MILL AND OVERLAY 15' ON EITHER SIDE OF THE TRENCH. LONGITUDINAL TRENCHES SHALL INCLUDE MILL AND OVERLAY FOR 1 FULL LANE WIDTH FOR 15' BEYOND EITHER SIDE OF THE EXCAVATION. SEE PW–1.07 AND PW–1.08 FOR DETAILS. SEE PW–1.09 FOR NOTES.
4. IF PATCH FALLS WITHIN 2' OF EXISTING CURB OR EDGE OF PAVING, CONTINUE RESTORATION TO EDGE OF PAVE.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JUL 1, 98	
	JAN 1, 01	
	AUG 1, 01	
	SEP 1, 02	
	OCT 8, 10	TEMPORARY TRENCH RESTORATION DETAIL
ISSUED: MAY 1, 1986	JAN 1, 11	STANDARD NO. PW–1.06

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APPROVAL

TOWN ENGINEER

DATE

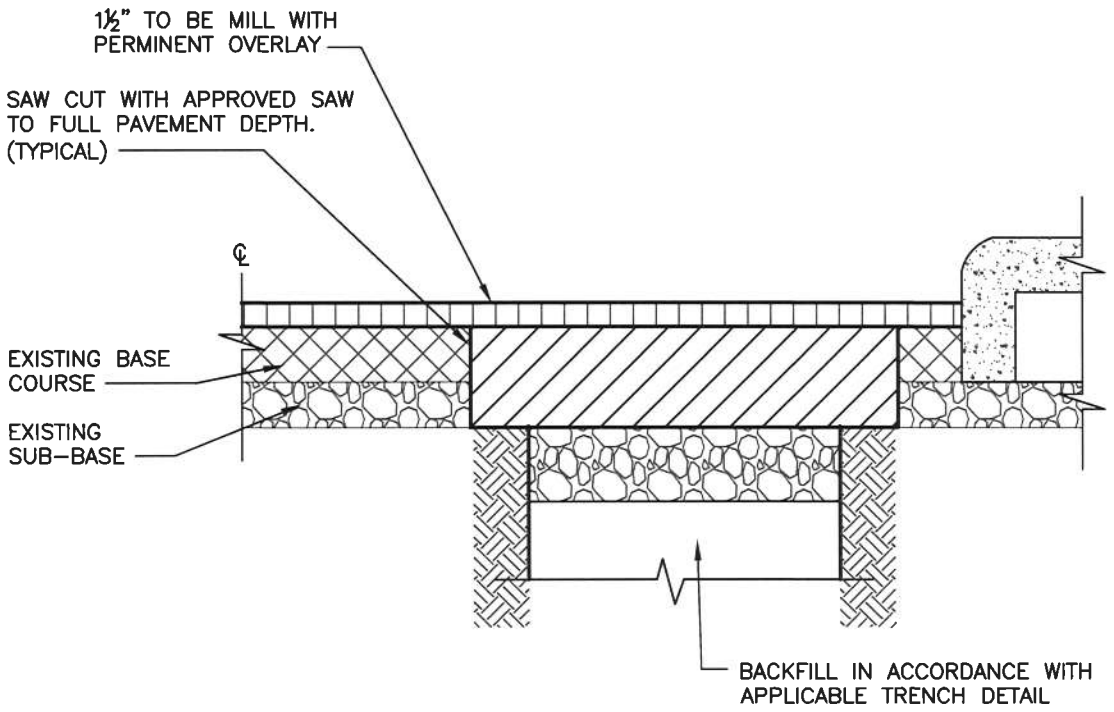
REVISED	
OCT 11, 10	
JAN 1, 11	

ISSUED: FEB 25, 2009

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

PAVEMENT
RESTORATION DETAIL #1

STANDARD NO. PW-1.07



LONGITUDINAL PAVEMENT REPAIR

NOTE:
1. SEE DETAIL PW-1.06 FOR TRENCH RESTORATION.
2. SURFACE RESTORATION ON LONGITUDINAL TRENCHES SHALL INCLUDE MILL AND OVERLAY FOR 1 FULL LANE WIDTH FOR 15' BEYOND EITHER SIDE OF THE EXCAVATION.

APPROVAL

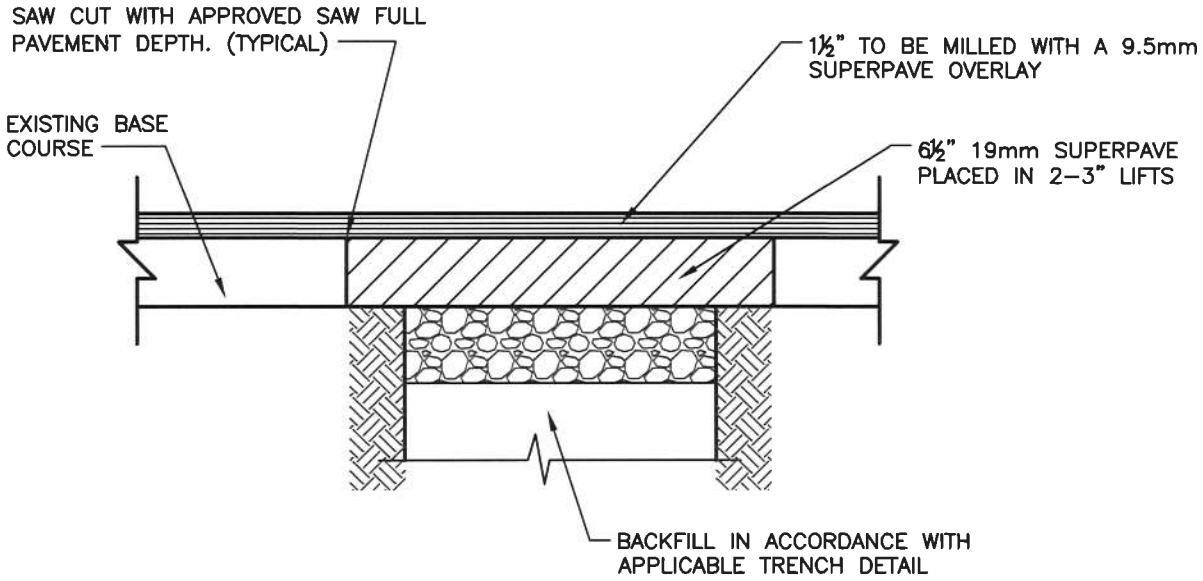
TOWN ENGINEER

DATE

ISSUED: FEB 25, 2009

REVISED

JAN 1, 11



CROSS ROAD PAVEMENT REPAIR

NOTE:

1. SEE DETAIL PW–1.06 FOR TRENCH RESTORATION.
2. SURFACE RESTORATION ON ROAD CROSSINGS SHALL INCLUDE MILL AND OVERLAY 15' ON EITHER SIDE OF THE TRENCH. IF MULTIPLE TENCHES ARE WITHIN 50' OF ONE ANOTHER, MILL AND OVERLAY SHALL INCLUDE THE AREA BETWEEN THE TRENCHES.

TOWN OF EASTON
AND
EASTON UTILITIES
STANDARD DETAILS

PAVEMENT RESTORATION DETAIL #2

STANDARD NO. PW–1.08

SURFACE RESTORATION AND PAVING

A. GENERAL NOTES

1) This specification shall apply to any and all utility work or street modifications such as drainage improvements or other construction deemed appropriate by the Town Engineer. The Contractor shall restore all surfaces damaged by their operations to the widths and extent detailed or specified herein.
2) Surface restoration in Town streets and roads shall be in accordance with the Maryland State Highway Administration Standard Specifications and these Town Standards.
3) Existing pavement shall be trimmed to secure a straight clean edge for repaving. Saw cut pavement as shown on PW-1.06 or as directed to obtain a clean pavement edge. All trenches shall be cut back by one (1') foot on either side of the trench.
4) No staggered or irregular longitudinal trench repair widths shall be allowed. Repairs shall be of a uniform width and in a straight line.
5) Minimum temporary trench restoration width is five (5) feet. Actual width shall vary based on field conditions as determined by the Town Engineer.
6) All street repair areas shall include trench restoration where applicable, plus mill and overlay. Mill and overlay shall include the full lane width of any street disturbed. On horizantal crossings the minimum run of the street to be milled and overlaid shall be thirty (30) feet, centered on the disturbance. Should multiple cross road repairs be created, mill and overlay shall continue the full lane width to include all trenches where cross road repairs are less than fifty (50) feet apart. Longitudinal trenches shall include mill and overlay for 1 full lane width for 15 feet beyond the excavation for each lane disturbed.
7) Undermined areas shall be grout filled or cut back.
8) A temporary two (2") inch layer of cold patch shall be placed on all utility trenches where weather conditions or other delays do not permit final repairs within seven (7) calendar days.
9) Metal plating may be used at the end point of the utility laying operation and must be used to protect the integrity of concrete patches. Contractor shall post warning signs.
10) All adjustments to existing utilities must be made prior to paving operations and repeated if there is any damage due to rolling and compacting operations. Manhole or catch basin adjustments shall be done with adjustment rings, brick courses, or mortar layers, subject to Easton Utilities approval.
11) Paving operations shall be performed if the following minimum temperatures are met:
    a) 32 degrees and rising for any hot mix base course
    b) 40 degrees and rising for any hot mix surface course

    Lift thickness shall be limited to:
    a) 2" for 9.5mm superpave
    b) 3" for 19mm superpave
    c) 4" for aggregate
    d) 8" for backfill
12) Catch basins, inlets, curbs and all other appurtenances shall be adequately covered and protected prior to application of bituminous materials. No earth or bituminous materials shall be allowed to enter any storm drainage system. Suitable containment provisions shall be employed to prevent surface runoff of bituminous materials.
13) The final surface shall provide a smooth transition, free of abrupt changes in grade, is made with adjacent pavements and/or sidewalk. No depressions or other misalignment shall obstruct, trap or otherwise misdirect the flow of surface water drainage.
14) All pavement shall be cut back one foot (1') on either side of the trench

B. MAINTENANCE OF REFILLED EXCAVATIONS

1) All depressions appearing in the refilled excavation, stabilized base and temporary paving shall be properly refilled. If the Contractor fails to make repairs within 48 hours after receipt of written notice from the Town Engineer, the Town may refill said depressions and the cost thereof shall be billed to the Contractor. In case of emergency, the Town may refill any depression or protect with barricades without giving previous notice to the Contractor, and the cost of so doing shall be billed to the Contractor.
2) The Contractor shall be responsible for any injury or damage that may result from lack of maintenance of any refilled excavation at any time.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	SURFACE RESTORATION & PAVING NOTES
ISSUED: FEB 25, 2009		STANDARD NO. PW-1.09

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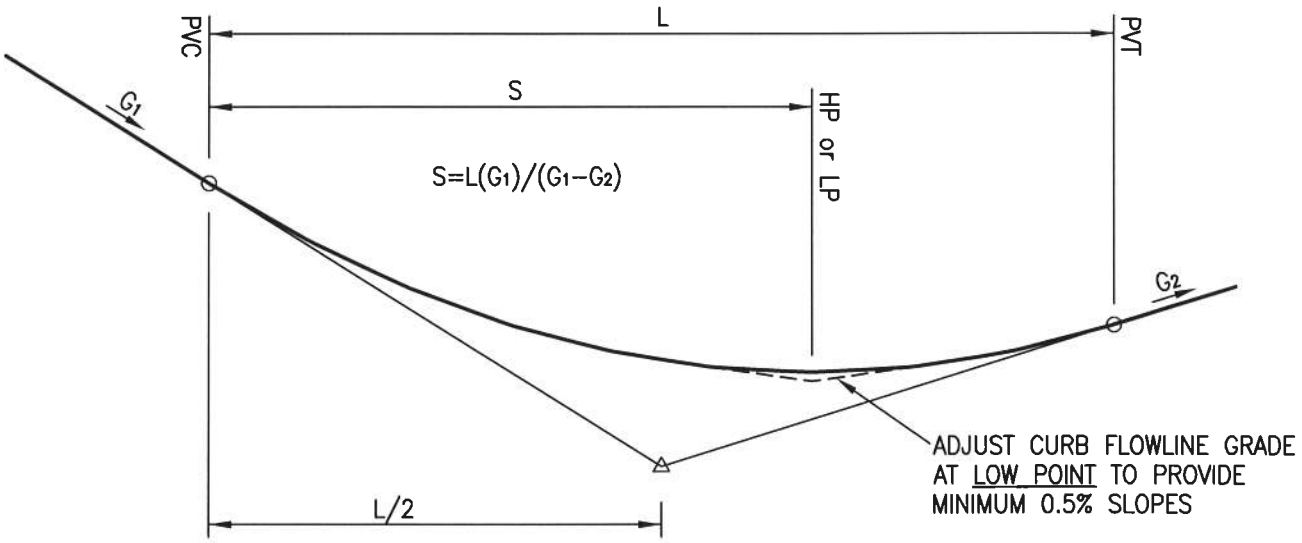
VERTICAL CURVE DESIGN STANDARDS

1) MINIMUM VERTICAL CURVE LENGTH (L) SHALL BE THE ALGEBRAIC GRADE DIFFERENCE (G_1-G_2) MULTIPLIED BY THE K-VALUE SHOWN IN THE TABLE BELOW FOR THE APPROPRIATE DESIGN SPEED. IN NO CASE SHALL A VERTICAL CURVE LENGTH BE LESS THAN 80'.

2) ELEVATION POINTS FOR STAKEOUT SHALL BE COMPUTED AT THE FOLLOWING INTERVALS:
   $K \leq 45$ NO MORE THAN 20'
   $K \leq 35$ NO MORE THAN 10'
   WHERE $K=L/(G_1-G_2)$.

3) VERTICAL CURVES SHALL BE SYMMETRICAL, AS SHOWN IN THE DETAIL BELOW. THIS DETAIL REPRESENTS STREET CENTERLINE PROFILE GRADES. PROFILES OF CURB FLOW LINES SHALL BE ADJUSTED AT LOW POINTS SO AS TO PROVIDE A MINIMUM GRADE OF 0.5% APPROACHING INLETS, DRAINS, GUTTERS, ETC.



K-VALUES (PER AASHTO)

DESIGN SPEED	25	30	35	40	45	50
K-VALUE (CREST VERT. CURVE)	12	19	29	44	61	84
K-VALUE (SAG VERT. CURVE)	26	37	49	64	79	96

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG 1, 01 FEB 1, 02 FEB 1, 06 OCT 5, 10 JAN 1, 11	VERTICAL CURVE
ISSUED: MAY 1, 1989		STANDARD NO. PW-1.10

RESTORATION IN UNPAVED AREAS

A. TOPSOIL AND SEEDING

1. Topsoil shall be placed in areas where grass has been disturbed by the Contractor's operations. Depth of topsoil shall be four inches (4") minimum. Topsoil salvaged and stockpiled during trench and structure excavation may be used for this purpose. When top soiling, all materials and methods of construction shall meet the provisions of MD SHA Standards, Section 701, 702, 703, 704, 705, and 920. If directed, the Contractor shall have the topsoil tested by a State certified laboratory and shall submit certification that topsoil meets the specified standard. Topsoil shall be clean, free of roots, stones, and other debris.
2. Seeding shall consist of furnishing and placing seed and soil supplements on top soiled areas and at any other location, as directed by the Engineer. When seeding, all materials and methods of construction shall meet the provisions of MD SHA Standards, Section 705 and 920.
3. Fertilizer shall be a recognized commercial fertilizer conforming to MD SHA standards, Section 920.
4. Mulch shall be applied on disturbed areas with slopes less than 3 to 1. Mulch for these areas shall consist of straw mulch as specified in MD SHA Standards, Section 705. Mulching of areas where slopes equal or exceed 3:1 shall utilize curlex or equal.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4/12/11	JAN 1, 11	RESTORATION NOTES
ISSUED: FEB 25, 2009		STANDARD NO. PW-1.11

PAVING REQUIREMENTS

A. BASE COURSES

1. Subgrade shall be placed on prepared and compacted refilled excavations to the compacted depth as shown on Detail PW-1.06. Materials and methods of construction shall meet the provisions of MD SHA Standards, Section 208.
2. Graded Aggregate Base Course:

    a) Graded aggregate base course shall be spread on prepared and compacted refilled excavation to the compacted depth shown on the drawing details.
    b) Graded aggregate shall be per MD SHA Standard, section 901.
    c) Recycled crushed concrete is an acceptable alternate provided thickness adjustments are made based on supplemental testing to be submitted by a qualified testing laboratory and approved by the Town Engineer.

B. TACK COAT

1. Coating shall be residual asphalt uniformly spread between .01 and .05 gallons / square yard.
2. Contractor shall take care not to track takc coat on surface courses.

C. HOT MIX ASPHALT PAVEMENT

1. Hot mix asphalt pavement shall consist of a number of courses of HMA Superpave material and aggregate on a prepared sub-base as shown within the Town Standards.
2. Materials and methods of construction shall meet the provisions of Section 504 and Section 904 of the MD SHA Standards and Details.
3. Surface courses of Bituminous Concrete mixes shall have less than 15% of Recycled Asphalt Pavement (RAP).
4. Base Courses shall have no more than 20% RAP.
5. Weather restrictions:

    a) Plant mixed seal – minimum surface temperature 60°F and rising.
    b) Surface course – minimum surface temperature 40°F and rising.
    c) Base course – minimum surface temperature 32°F and rising.

D. CONCRETE PAVEMENT

1. Concrete used in the restoration of street and roads shall be placed to the minimum thickness that shall be approved by the Town. Concrete may be a base course with a bituminous concrete overlay or a finished surface course.
2. Concrete pavement shall meet the provisions of MD SHA Standards, Section 522.
3. Concrete sidewalk and curb and gutter restoration shall be as indicated within the Town Standards.

E. SOIL CEMENT

1. Where the CBR values are found to be low within the paved area, the town will allow the subgrade be reinforced by a cementious material being mixed into the subgrade. Application shall be subject to the geotechnical investigation.
2. A minimum of 2" of graded aggregate shall be installed between the amended soil and bituminous pavement.
3. Minimum mix depth of the soil cement mixture shall be 8" with a 5-5.5% minimum cement content.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	PAVING NOTES
ISSUED: FEB 25, 2009		STANDARD NO. PW-1.12

CAST–IN–PLACE CONCRETE SIDEWALKS AND CURBING

A. Submittals:
   1) Submit mix design for approval prior to placing concrete (MSHA MIX #3 for all concrete sidewalks, air entrained, minimum 3500 psi mix). For curb and gutter, utilize MSHA Mix #7, except maximum water cementitious ratio of 0.45 and 611 pounds minimum cementitious materials, air entrained, minimum 4200 psi mix.
   2) Submit Concrete Testing Agency for approval, which contractor or project owner shall employ for infield and laboratory testing.

B. Concrete Placement:
   1) Notify the Town of intention to pour concrete 24 hours prior to performing work. (Phone: 410–822–2526).
   2) Driver shall present computer generated mix delivery ticket upon arrival to site.
   3) Do not add water to mix at job site unless approved by Engineer. Do not pour concrete during rain events.
   4) Testing agency shall test for slump, temperature and air entrainment at the job site, prior to pouring each truck load delivered to site. The maximum time from adding water to batch at plant to discharge at site shall be 1 ½ hours. Testing agency shall verify that subgrade is properly compacted.
   5) Testing agency shall collect cylinders for compression testing on each truck load of concrete delivered to site per ACI requirements. Test results shall be provided to the Engineer within 48 hours of 7 and 28 day breaks. Report shall include location of pour per plan stationing.
   6) Engineer or his representative shall verify that area of concrete work is properly prepared, free of water, free of unstable materials and that all reinforcement required at driveways, ramps, valley gutters, etc. is in place and properly supported.
   7) Cold weather concrete placement shall be protected from damage and frost, freezing action or low temperatures. No unapproved admixtures are permitted.
   8) Concrete curb and sidewalks shall have proper control joints installed at 10 foot intervals for curb and 5 foot intervals for sidewalk. Expansion joints for curbing shall be at each 100 foot interval plus at each point of tangent or curve. Sidewalks shall have expansion joints at 20 foot intervals or at change of direction.

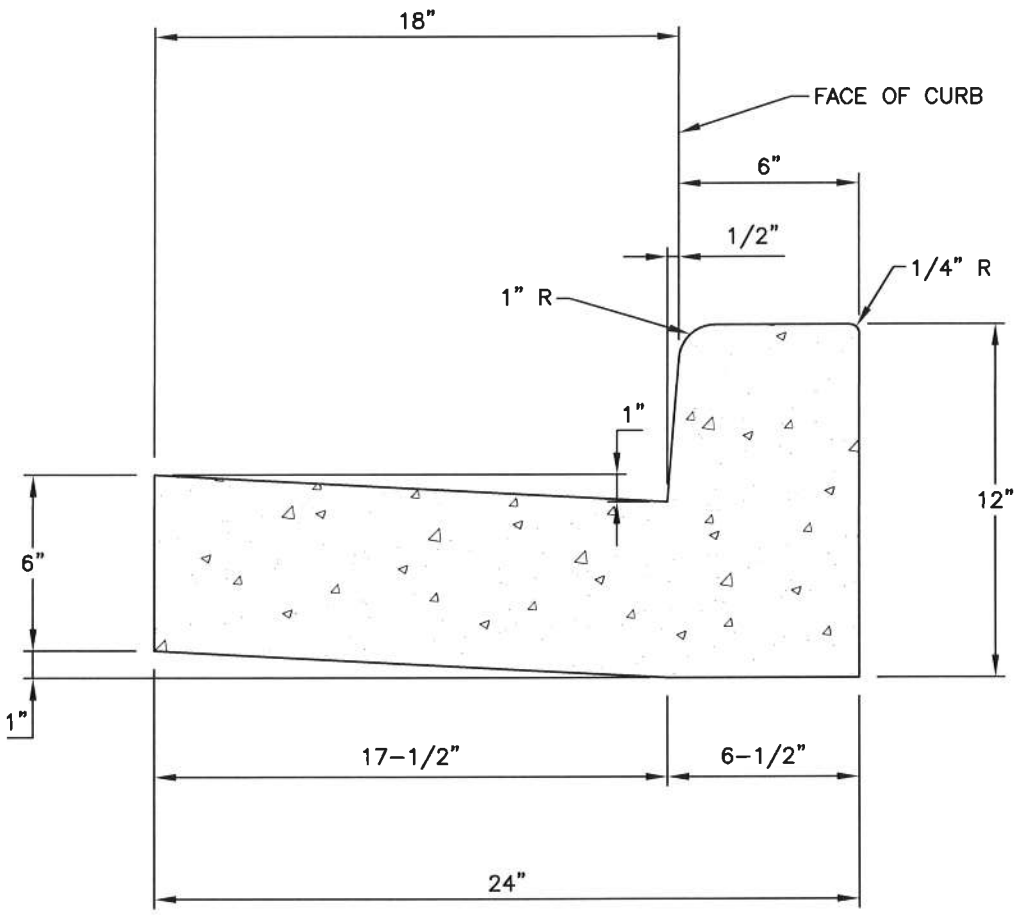
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4-12-11		CONCRETE QUICK REFERENCE LIST
ISSUED: JANUARY 1, 2011		STANDARD NO. PW–1.13

THE FOLLOWING CURB RADII SHALL BE USED. ANY VARIATION MUST BE APPROVED BY THE TOWN ENGINEER.

STREET TYPE	RADIUS (FT.)
RESIDENTAIL ACCESS	12'
RESIDENTAIL SUBCOLLECTOR	15'
RESIDENTAIL COLLECTOR	20'
COMMERCIAL LOCAL	25'
COMMERCIAL COLLECTOR	50'

AT THE INTERSECTION OF 2 DIFFERENT STREET TYPES THE RADIUS OF THE SMALLER STREET TYPE SHALL BE USED.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	OCT 2007	
	JAN 1, 11	
		CURB RETURN RADII
ISSUED: SEP 1, 2002		STANDARD NO. PW-1.20



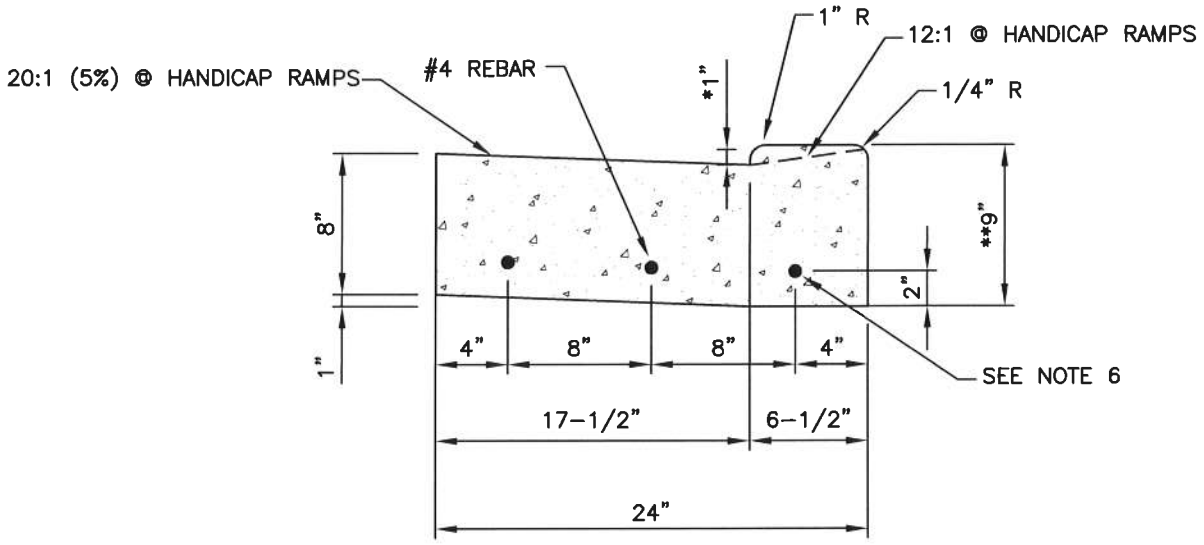
NOTES:
1. ALL CONCRETE USED FOR CURB & GUTTER SHALL BE SHA MIX NO. 7.

2. CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 40'-0". EXTRUDED CONCRETE CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 100'-0" AND AT PT OR PC.

3. DEPRESSED CURB AND GUTTER SHALL BE UTILIZED AT HANDICAPPED RAMPS WHEN TRANSITIONING FROM STANDARD CURB AND GUTTER.

4. MAXIMUM GUTTER SLOPE ON CURB RETURNS SHALL BE 2% WHERE HANDICAPPED RAMPS ARE REQUIRED.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	MAY 1, 89 AUG 1, 94 FEB 25, 09 JAN 1, 11	STANDARD CURB AND GUTTER
ISSUED: MAY 1, 1986		STANDARD NO. PW-2.00



DEPRESSED CURB

NOTES:

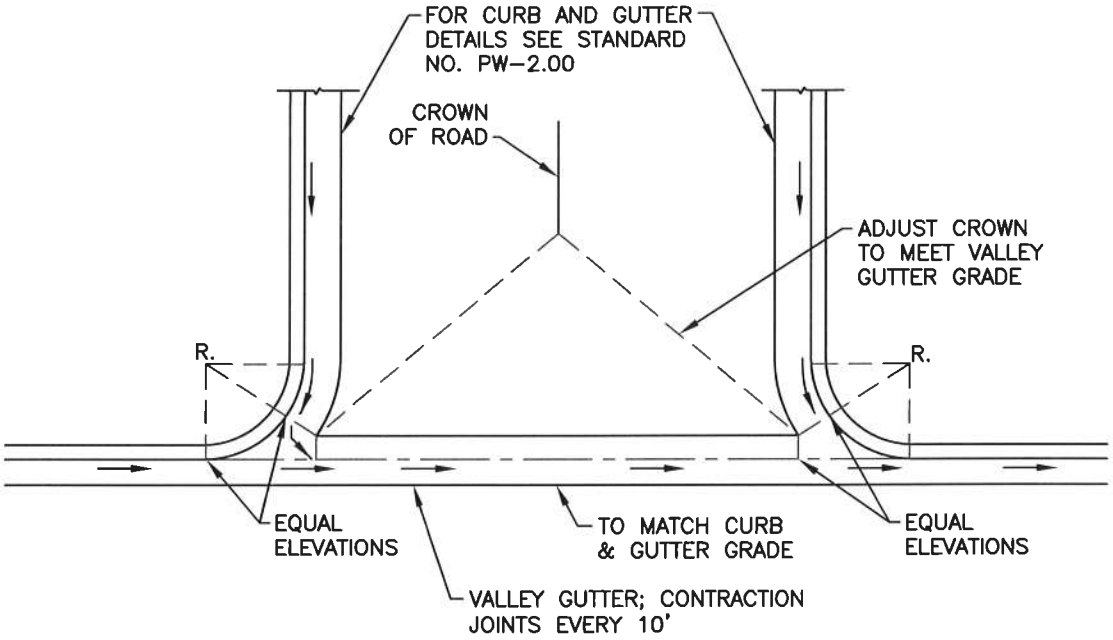
1. ALL CONCRETE USED FOR CURB & GUTTER SHALL BE SHA MIX NO. 7.
2. CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 40'-0". EXTRUDED CONCRETE CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 100'-0".

*3. RISE AT H/C RAMPS SHALL BE 7/8".

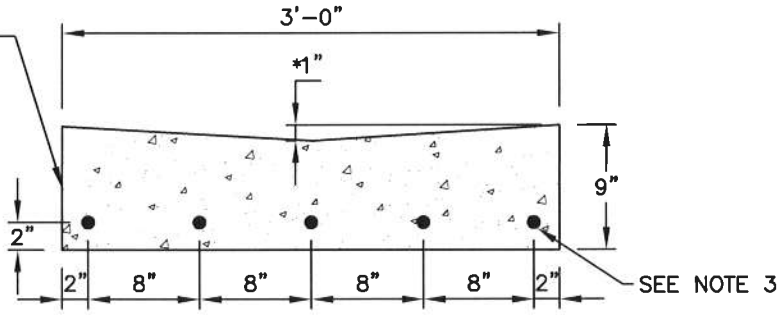
**4. CURB HEIGHT AT H/C RAMPS SHALL BE 8½".

5. MAXIMUM GUTTER SLOPE ON CURB RETURNS SHALL BE 2% WHERE HANDICAPPED RAMPS ARE REQUIRED.
6. ALL DRIVEWAYS AND HANDICAP RAMPS REQUIRE 3 PIECES OF EPOXY COATED #6 REBAR, EQUALLY SPACED THE FULL WIDTH OF THE DEPRESSED CURB.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4/12/11	MAY 1, 89	STANDARD DEPRESSED CURB AND GUTTER
	AUG 1, 94	
	MAR 26, 07	
	FEB 25, 09	
	JAN 1, 11	
ISSUED: MAY 1, 1986		STANDARD NO. PW-2.01



CONCRETE SHALL BE SHA MIX NO. 3 REINFORCED WITH EPOXY COATED NO. 6 DEFORMED REINFORCING BAR AS SHOWN

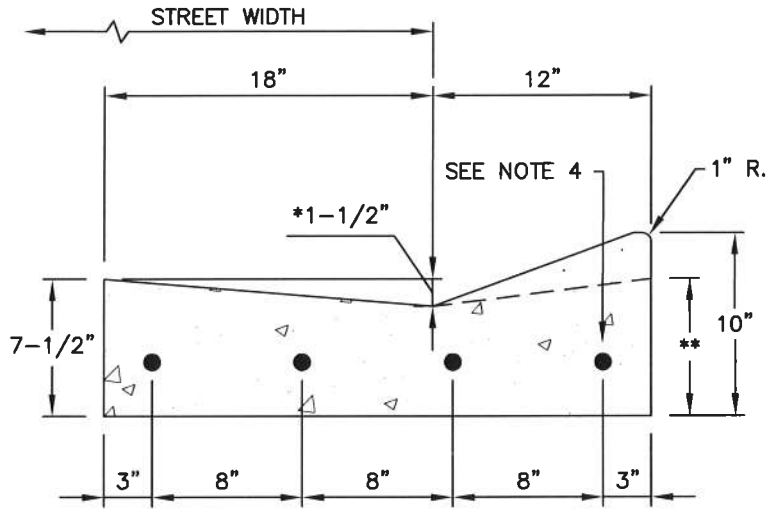


NOTE:
1. DO NOT UTILIZE AT HANDICAP RAMP UNLESS SURFACE SLOPE ≤ 20:1 (5%)

*2. RISE AT H/C RAMPS SHALL BE 7/8"

3. ALL DRIVEWAYS AND HANDICAP RAMPS REQUIRE 5 PIECES OF EPOXY COATED #6 REBAR, EQUALLY SPACED THE FULL WIDTH OF THE DEPRESSED CURB.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	OCT 1, 88	VALLEY GUTTER AND INTERSECTION DETAIL
	AUG 1, 94	
	MAR 1, 98	
	FEB 1, 06	
	FEB 25, 09	
ISSUED: MAY 1, 1986	JAN 1, 11	STANDARD NO. PW-2.02



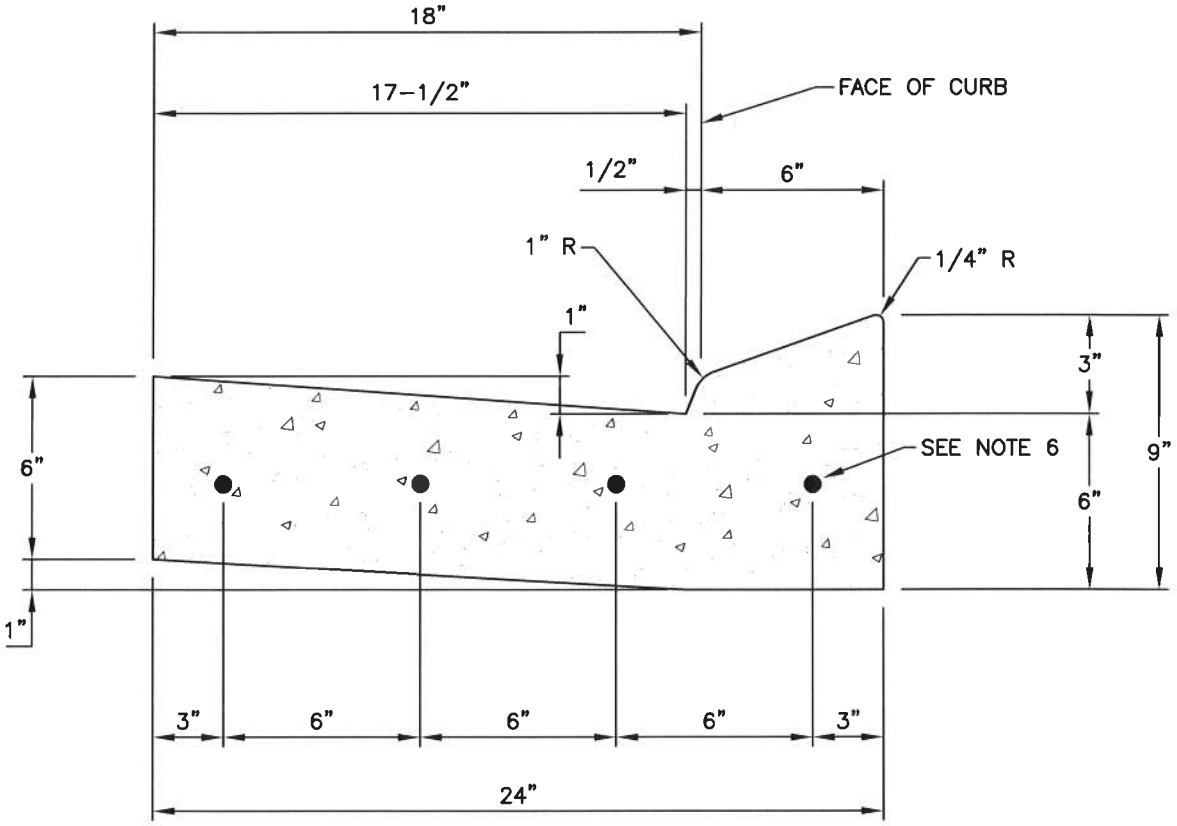
NOTES:

1. ALL CONCRETE USED FOR CURB & GUTTER SHALL BE SHA MIX NO. 7.
2. CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 40'-0". EXTRUDED CONCRETE CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 100'-0".
3. MOUNTABLE CURB MAY BE USED IN SINGLE FAMILY RESIDENTIAL ONLY AND ONLY UPON APPROVAL BY TOWN ENGINEER.
4. ALL DRIVEWAYS AND HANDICAP RAMPS REQUIRE 4 PIECES OF EPOXY COATED #6 REBAR, EQUALLY SPACED THE FULL WIDTH OF THE DEPRESSED CURB.
5. DO NOT UTILIZE AT HANDICAP RAMP UNLESS FRONT SLOPE ≤ 20:1 (5%) AND BACK SLOPE ≤ 12:1.

* 6. RISE AT H/C RAMPS SHALL BE 7/8".

** 7. CURB HEIGHT SHALL BE 7 5/8" AT H/C RAMPS.

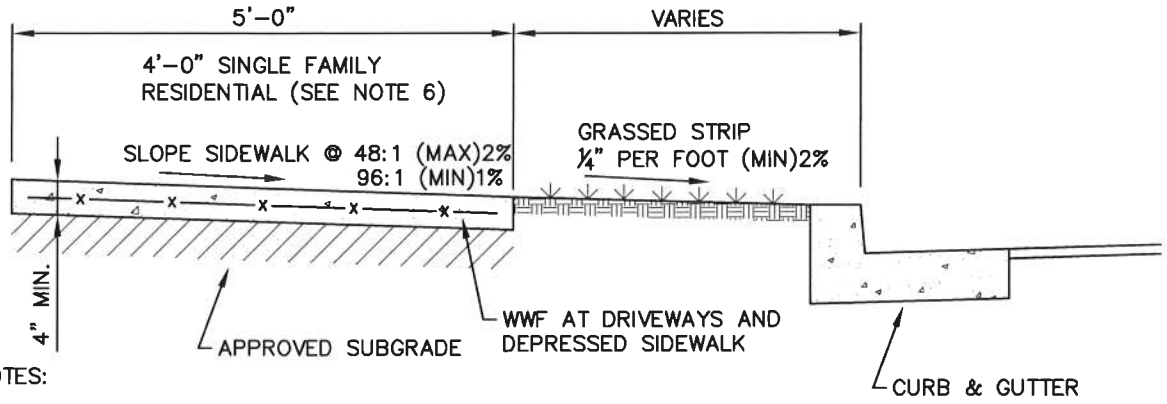
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 94 AUG 1, 94 DEC 12, 94 FEB 1, 02 FEB 25, 09	MOUNTABLE CURB
ISSUED: MAY 1, 1989	JAN 1, 11	STANDARD NO. PW-2.03



NOTES:

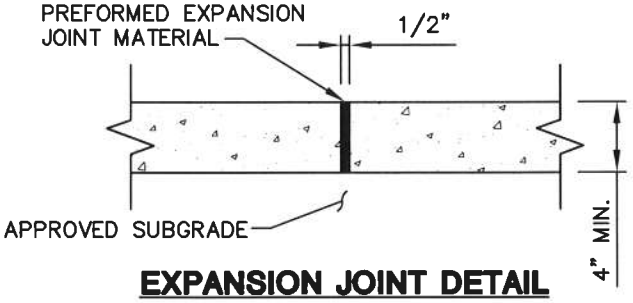
1. ALL CONCRETE USED FOR CURB & GUTTER SHALL BE SHA MIX NO. 7.
2. CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 40'-0". EXTRUDED CONCRETE CURB & GUTTER SHALL HAVE CONTRACTION JOINTS EVERY 10'-0", AND EXPANSION JOINTS EVERY 100'-0" AND AT PT OR PC.
3. DEPRESSED CURB AND GUTTER SHALL BE UTILIZED AT HANDICAPPED RAMPS WHEN TRANSITIONING FROM MEDIAN CURB AND GUTTER.
4. MAXIMUM GUTTER SLOPE ON CURB RETURNS SHALL BE 2% WHERE HANDICAPPED RAMPS ARE REQUIRED.
5. MEDIAN CURB AND GUTTER TO BE USED AT MEDIANS ONLY. SEE PW-4.06 FOR MEDIAN RAMP DETAIL.
6. ALL DRIVEWAYS AND HANDICAP RAMPS REQUIRE 4 PIECES OF EPOXY COATED #6 REBAR, EQUALLY SPACED THE FULL WIDTH OF THE DEPRESSED CURB.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4/12/11		MEDIAN CURB AND GUTTER
ISSUED: JANUARY 1, 2011		STANDARD NO. PW-2.04



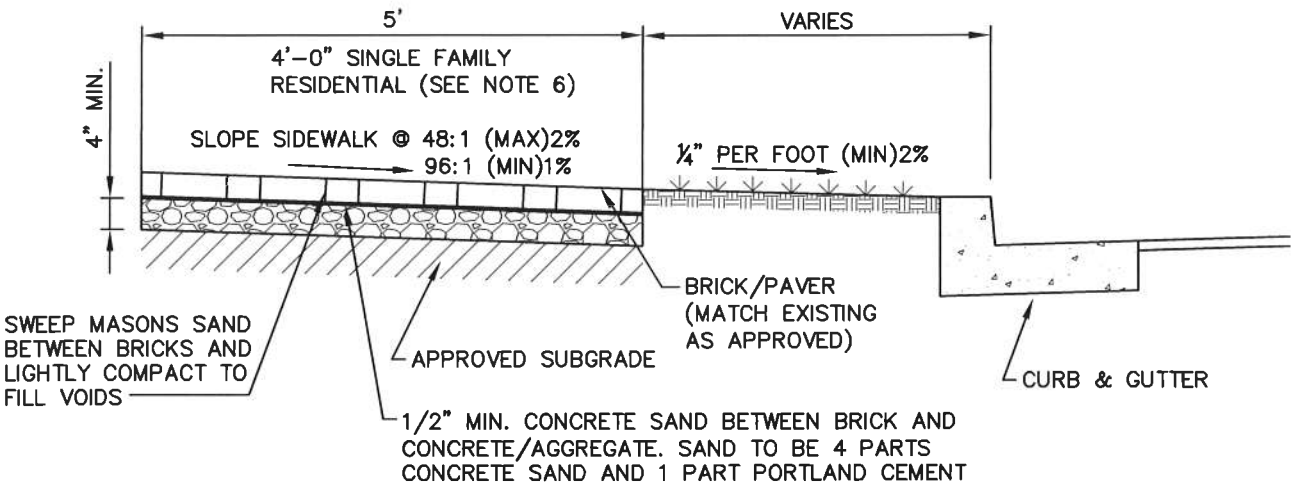
NOTES:

1. CONCRETE SHALL BE SHA MIX NO. 3.
2. CONTRACTION JOINTS SHALL BE TOOLED AT 5'-0" INTERVALS. (4' INTERVALS FOR 4' WIDE SIDEWALK)
3. EXPANSION JOINTS AT INTERVALS NOT GREATER THAN 20'-0".
4. ALL UNPAVED AREAS WITHIN STREET SIDELINES SHALL BE SEEDED OR SODDED PER SPECIFICATIONS.
5. SIDEWALKS AT DRIVEWAY LOCATIONS TO BE 6" THICK WITH 6" x 6" WITH W1.4xW1.4 WOVEN WIRE MESH.
6. WHERE CONTINUOUS WIDTH OF TRAVEL IS LESS THAN 5'-0", PROVIDE SIDEWALK PASSING ZONES AT AN INTERVAL NOT TO EXCEED 200' CENTER TO CENTER. ENTRANCES SHALL BE ACCEPTABLE PASSING ZONES PROVIDED PAVING WIDTH OF 5'-0" IS MAINTAINED AT 48:1 SLOPE.
7. GRASS STRIPS SHALL BE SLOPED AS TO PROVIDE POSITIVE DRAINAGE TOWARD STORMWATER FEATURES.
8. WHERE REVERSE SLOPES OF GRASS STRIPS AND SIDEWALKS ARE REQUIRED TO PROVIDE POSITIVE DRAINAGE TOWARD A STORMWATER FEATURE, SPOT ELEVATIONS SHALL BE PROVIDED ON FRONT AND BACK OF SIDEWALK. (REVERSE SLOPES MUST BE APPROVED BY THE TOWN PRIOR TO CONSTRUCTION)
9. MAXIMUM SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 5% IN LOCATIONS WITHOUT HANDICAPPED RAMPS.
10. SIDEWALKS SHALL COMPLY WITH ADA REQUIREMENTS PER THE MOST UP TO DATE DEPARTMENT OF JUSTICE REGULATION 28CFR PART 36.



EXPANSION JOINT DETAIL

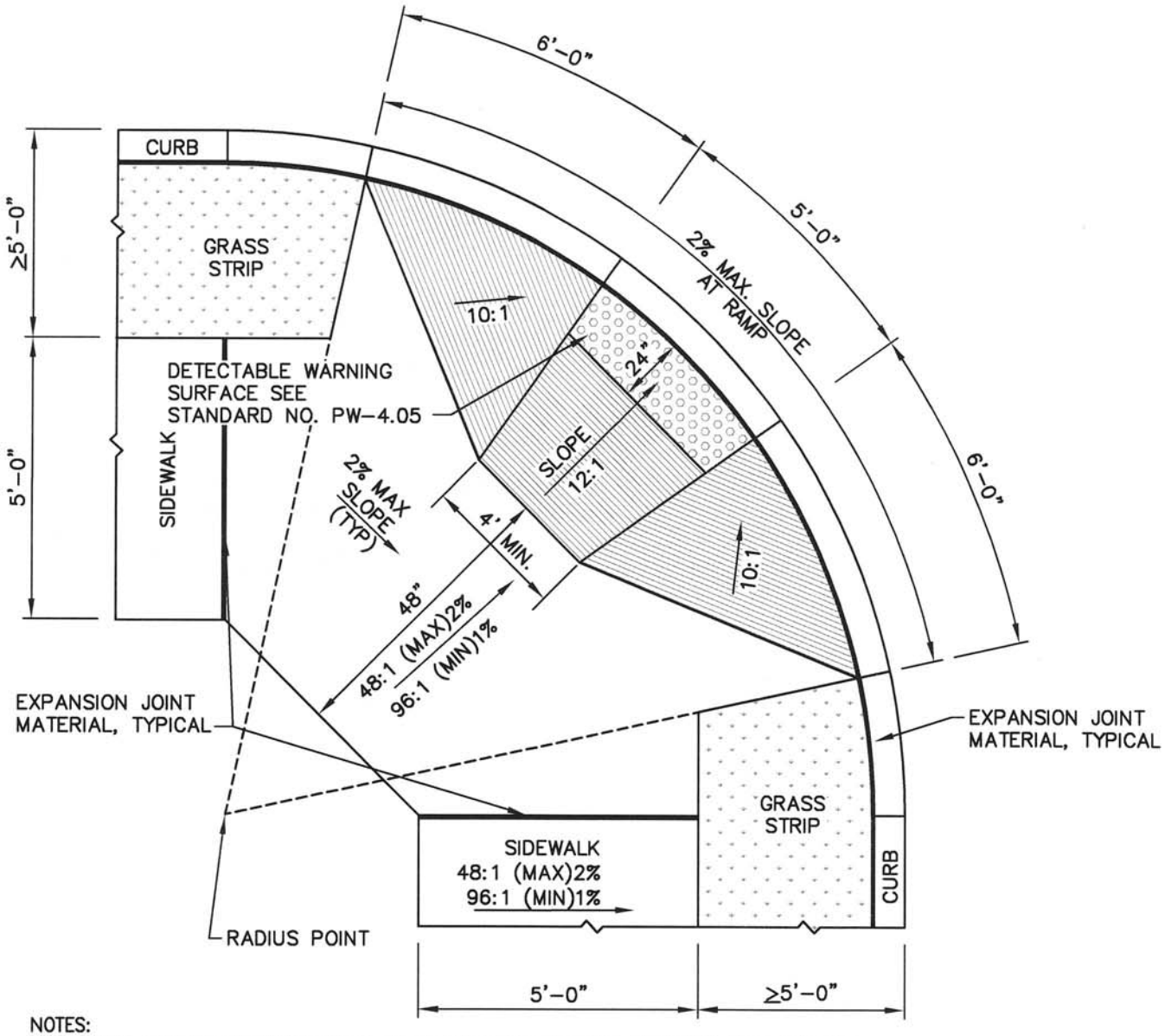
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG 1, 94	
	FEB 1, 02	
	FEB 1, 06	
	MAR 16, 07	SIDEWALK
	OCT 11, 10	
ISSUED: MAY 1, 1986	JAN 1, 11	STANDARD NO. PW-3.00



NOTES:

1. CONCRETE SHALL BE SHA MIX NO. 3.
2. CONTRACTION JOINTS AT 5'–0" INTERVALS.
3. EXPANSION JOINTS AT INTERVALS NOT GREATER THAN 20'–0".
4. ALL UNPAVED AREAS WITHIN STREET SIDELINES SHALL BE SEEDED OR SODDED PER SPECIFICATIONS.
5. PLACE 4" GRADED AGGREGATE COMPACTED TO 95% OF ASTM 1557 BENEATH BRICK SIDEWALKS. PLACE 6" OF CONCRETE UNDER SIDEWALKS AT DRIVEWAY AND HANDICAP RAMP LOCATIONS WITH 6" x 6" WITH W1.4xW1.4 WOVEN WIRE MESH.
6. WHERE CONTINUOUS WIDTH OF TRAVEL IS LESS THAN 5'–0", PROVIDE SIDEWALK PASSING ZONES (SEE PW–4.04) AT AN INTERVAL NOT TO EXCEED 200' CENTER TO CENTER. ENTRANCES SHALL BE ACCEPTABLE PASSING ZONES PROVIDED PAVING WIDTH OF 5'–0" IS MAINTAINED AT 48:1 SLOPE.
7. GRASS STRIPS SHALL BE SLOPED AS TO PROVIDE POSITIVE DRAINAGE TOWARD STORMWATER FEATURES.
8. WHERE REVERSE SLOPES OF GRASS STRIPS AND SIDEWALK ARE REQUIRED TO PROVIDE POSITIVE DRAINAGE TOWARD A STORMWATER FEATURE, SPOT ELEVATIONS SHALL BE PROVIDED ON FRONT AND BACK OF SIDEWALK. (REVERSE SLOPES MUST BE APPROVED BY THE TOWN PRIOR TO CONSTRUCTION)
9. MAXIMUM SLOPE IN THE DIRECTION OF TRAVEL SHALL BE 5% IN LOCATIONS WITHOUT HANDICAPPED RAMPS.
10. SIDEWALKS SHALL COMPLY WITH ADA REQUIREMENTS PER THE MOST UP TO DATE DEPARTMENT OF JUSTICE REGULATION 28CFR PART 36.
11. SEE 2.03 – SURFACE RESTORATION STANDARDS FOR BRICK SPECIFICATIONS.

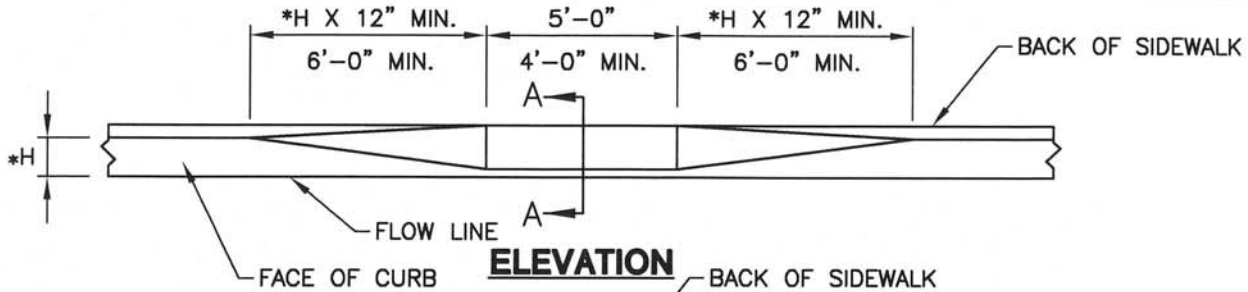
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	FEB 1, 06 MAR 16, 07 JAN 1, 11	BRICK SIDEWALK
ISSUED: JAN 1, 2000		STANDARD NO. PW–3.01



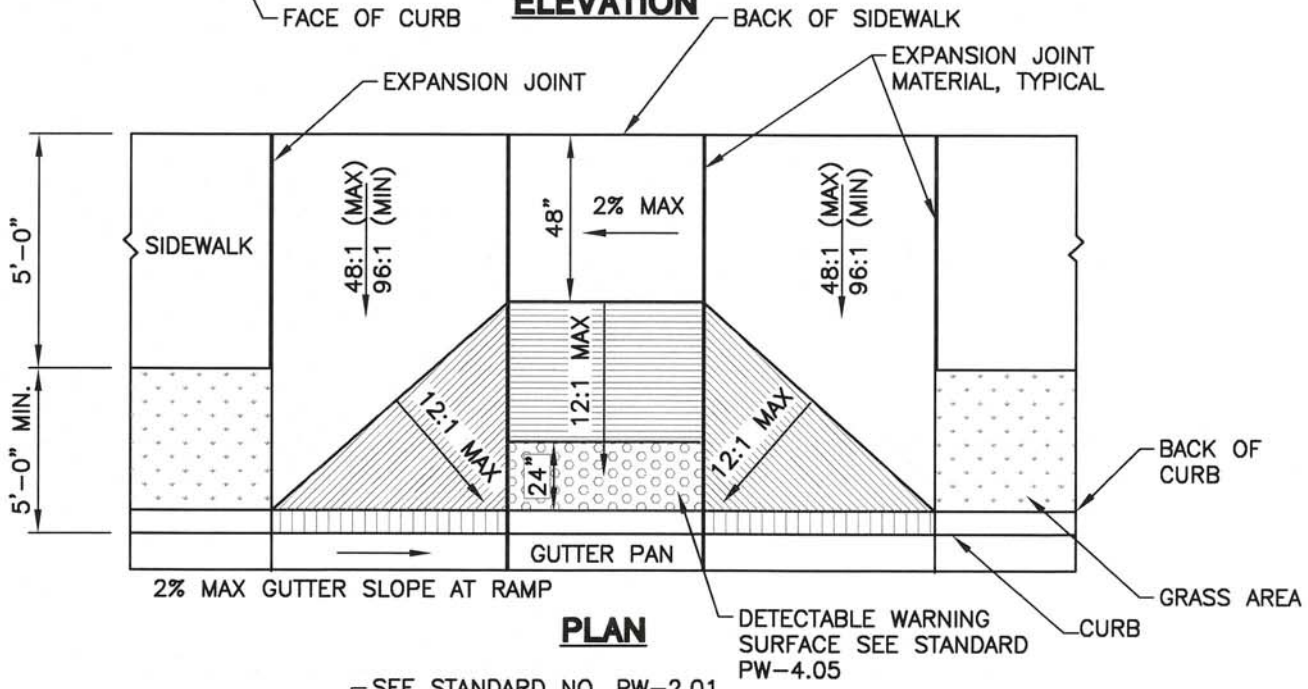
NOTES:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. SEE STANDARD NO. PW-2.01 FOR DEPRESSED CURB.
3. MAX SLOPE FOR RAMP SHALL BE 12:1.
4. HANDICAPPED RAMPS INCLUDING CURB AND GUTTERS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
5. HANDICAPPED RAMPS SHALL CONTAIN A 6" THICK CONCRETE SECTION.
6. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.

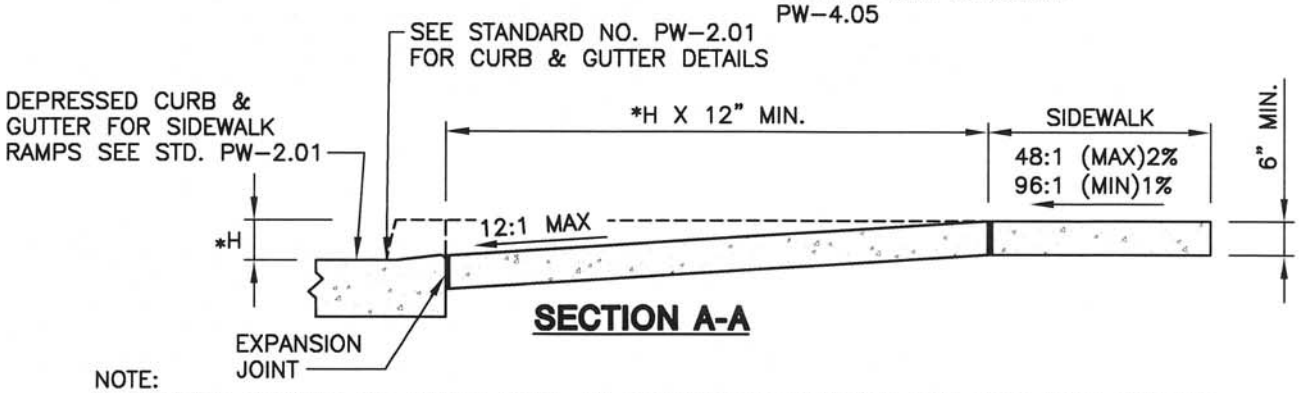
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
1/ Friedel 9/17/14	MAR 1, 98	
TOWN ENGINEER DATE	FEB 1, 02	
	MAR 26, 07	
	FEB 25, 09	TYPE "A" SIDEWALK RAMP
	JAN 1, 11	
ISSUED: MAY 1, 1986	SEP 17, 14	STANDARD NO. PW-4.00



ELEVATION



PLAN



SECTION A-A

NOTE:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.

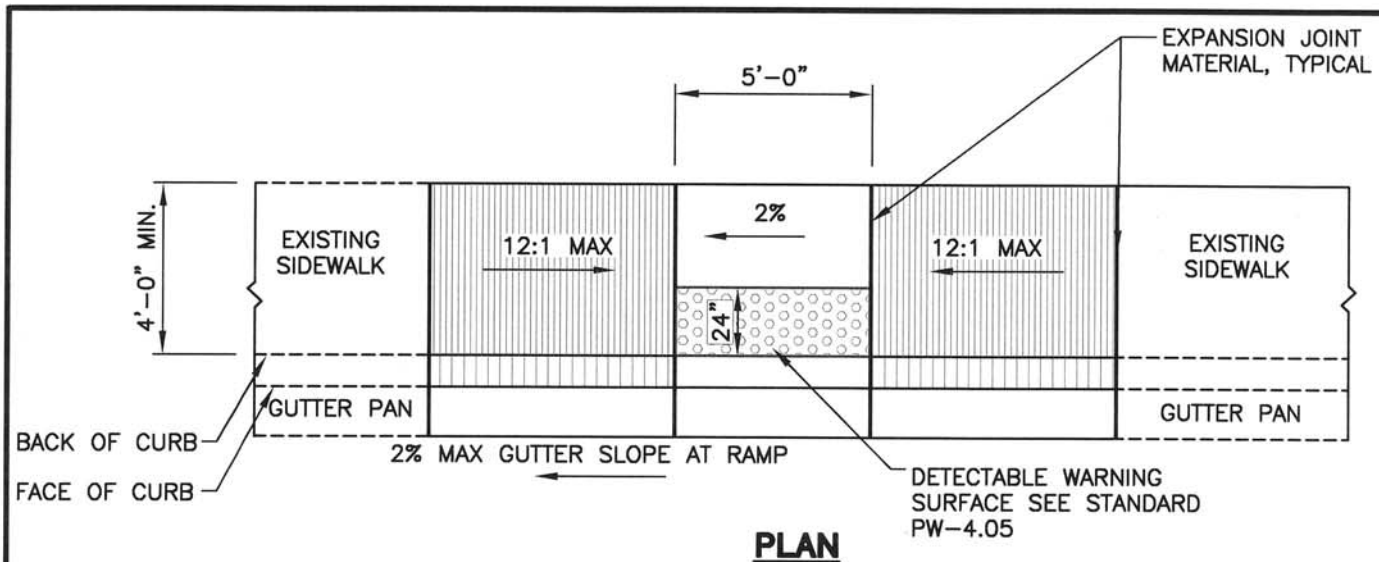
* 2. H = HEIGHT OF CURB (6" IF PW-2.00) ALL MEASUREMENTS IN INCHES.

3. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 (2%) PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.

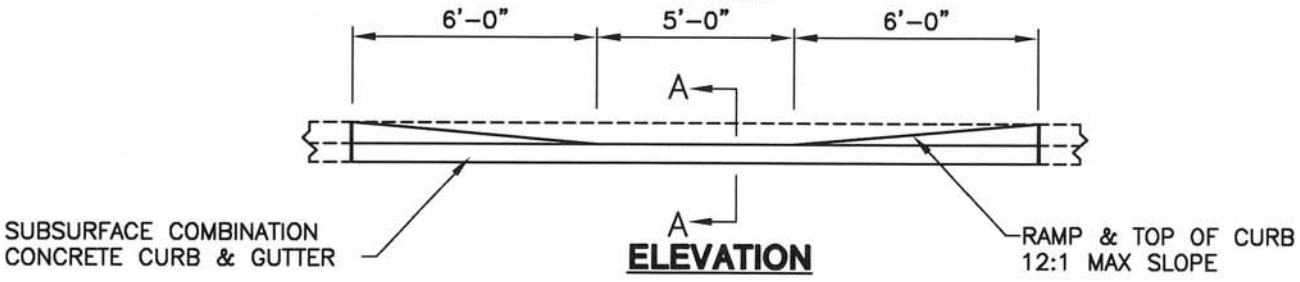
4. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.

5. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.

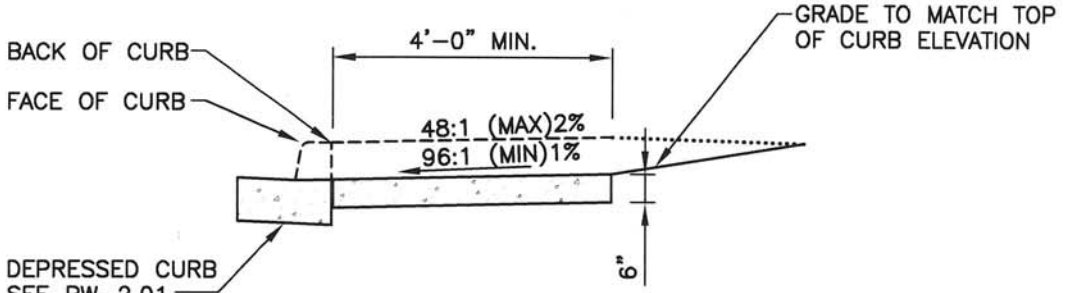
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 9/17/14 DATE	AUG 1, 01	
	FEB 1, 02	
	MAR 26, 07	
	FEB 25, 09	TYPE "B" SIDEWALK RAMP
	JAN 1, 11	
ISSUED: MAY 1, 1986	SEP 17, 14	STANDARD NO. PW-4.01



PLAN



ELEVATION

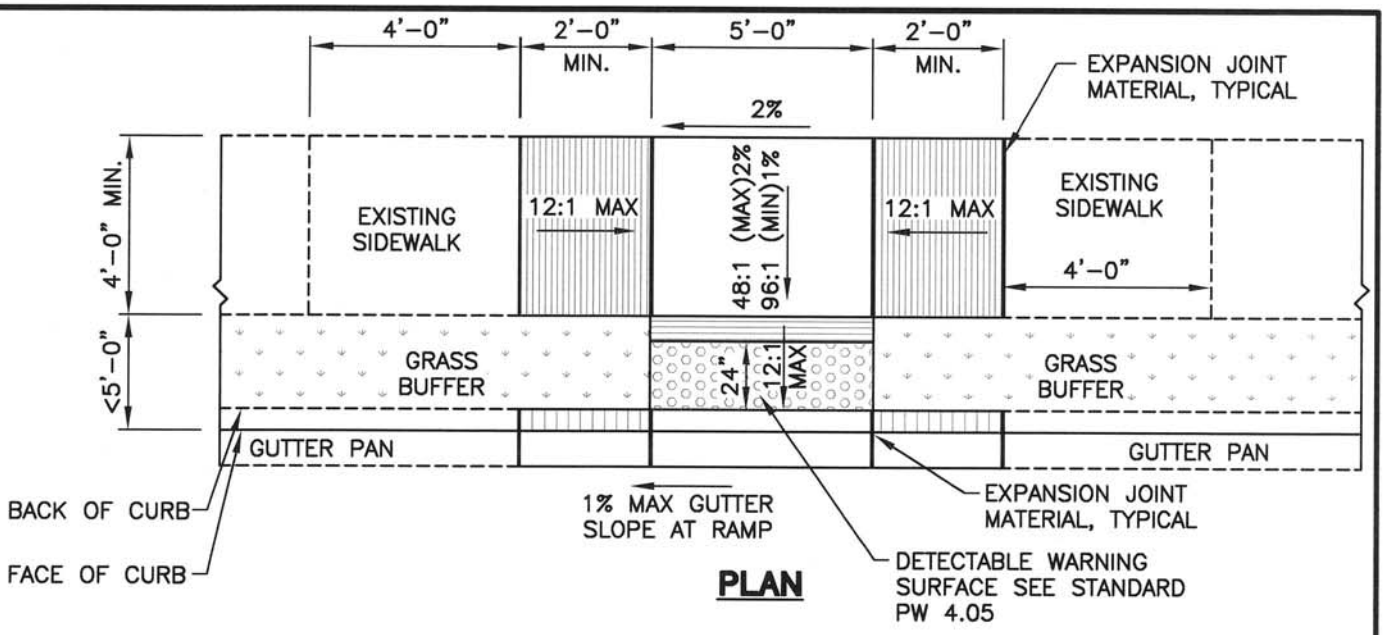


SECTION A-A

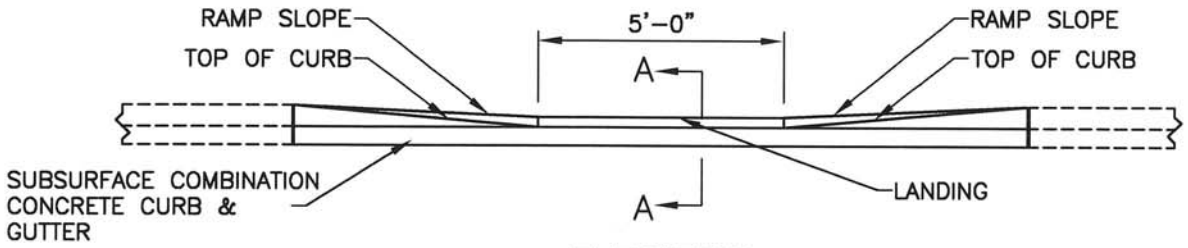
NOTES:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 (2%) PERPENDICULAR TO THE DIRECTION OP PEDESTRIAN TRAVEL.
3. TO BE USED WHERE SIDEWALK IS ADJACENT TO THE CURB.
4. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
5. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.
6. THERE SHALL BE A LANDING PRIOR TO THE RAMPS. THE LANDING SHALL BE 36" IN LENGTH, MINIMUM.

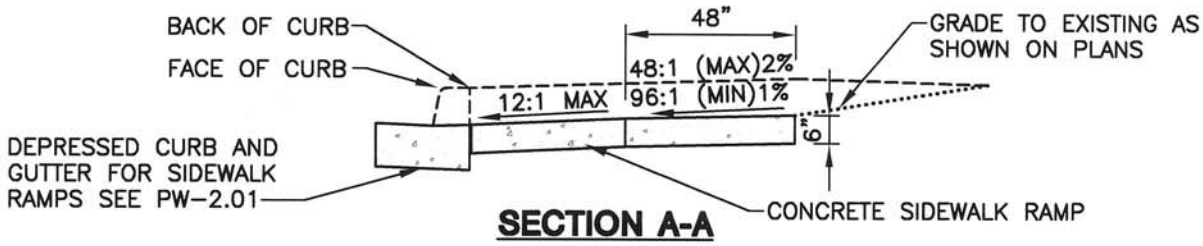
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 9/17/14	FEB 25, 09	SIDEWALK RAMPS TYPE "C" PARALLEL FOR RETROFIT
	JAN 1, 11	
	SEP 17, 14	
ISSUED: MAR 26, 2007		STANDARD NO. PW-4.02



PLAN



ELEVATION

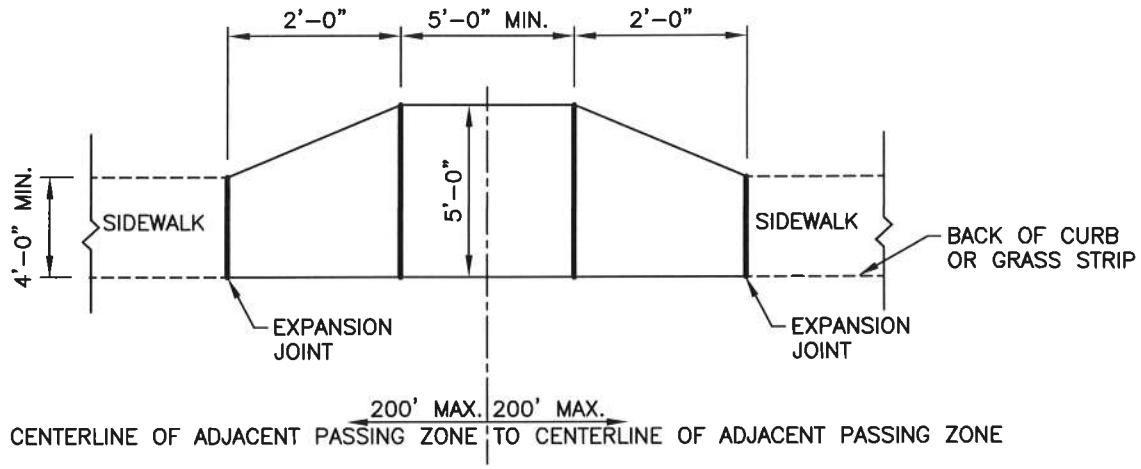


SECTION A-A

NOTES:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON–SKID TYPE SURFACE.
2. NO TRAVERSABLE SLOPE ON THE RAMP OR SIDEWALK SHALL EXCEED 12:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL, OR 48:1 (2%) PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
3. TO BE USED IN SITUATION WHERE LESS THAN 5'–0" EXISTS BETWEEN THE FACE OF CURB AND THE FRONT OF SIDEWALK.
4. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
5. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.
6. THERE SHALL BE A LANDING PRIOR TO THE RAMPS. THE LANDING SHALL BE 36" IN LENGTH, MINIMUM.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
9/17/14	FEB 25, 09	TYPE "D" SIDEWALK RAMP FOR RETROFIT
TOWN ENGINEER DATE	JAN 1, 11	
	SEP 17, 14	
ISSUED: MAR 26, 2007		STANDARD NO. PW–4.03

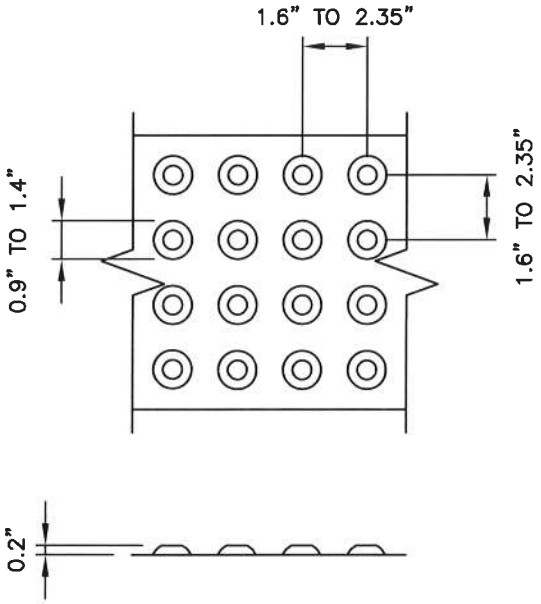


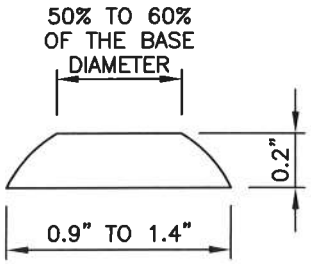
PLAN

NOTES:

1. SIDEWALK TRANSVERSE SLOPE SHALL BE MAINTAINED ACROSS THE ENTIRE WIDTH OF THE PASSING ZONE.
2. SIDEWALK WIDTH SHALL NOT INCLUDE CURB WIDTH.
3. CROSS SLOPE SHALL BE 48:1 MAX AND 96:1 MIN.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	FEB 25, 09 JAN 1, 11	SIDEWALK PASSING ZONES
ISSUED: MAR 26, 2007		STANDARD NO. PW–4.04



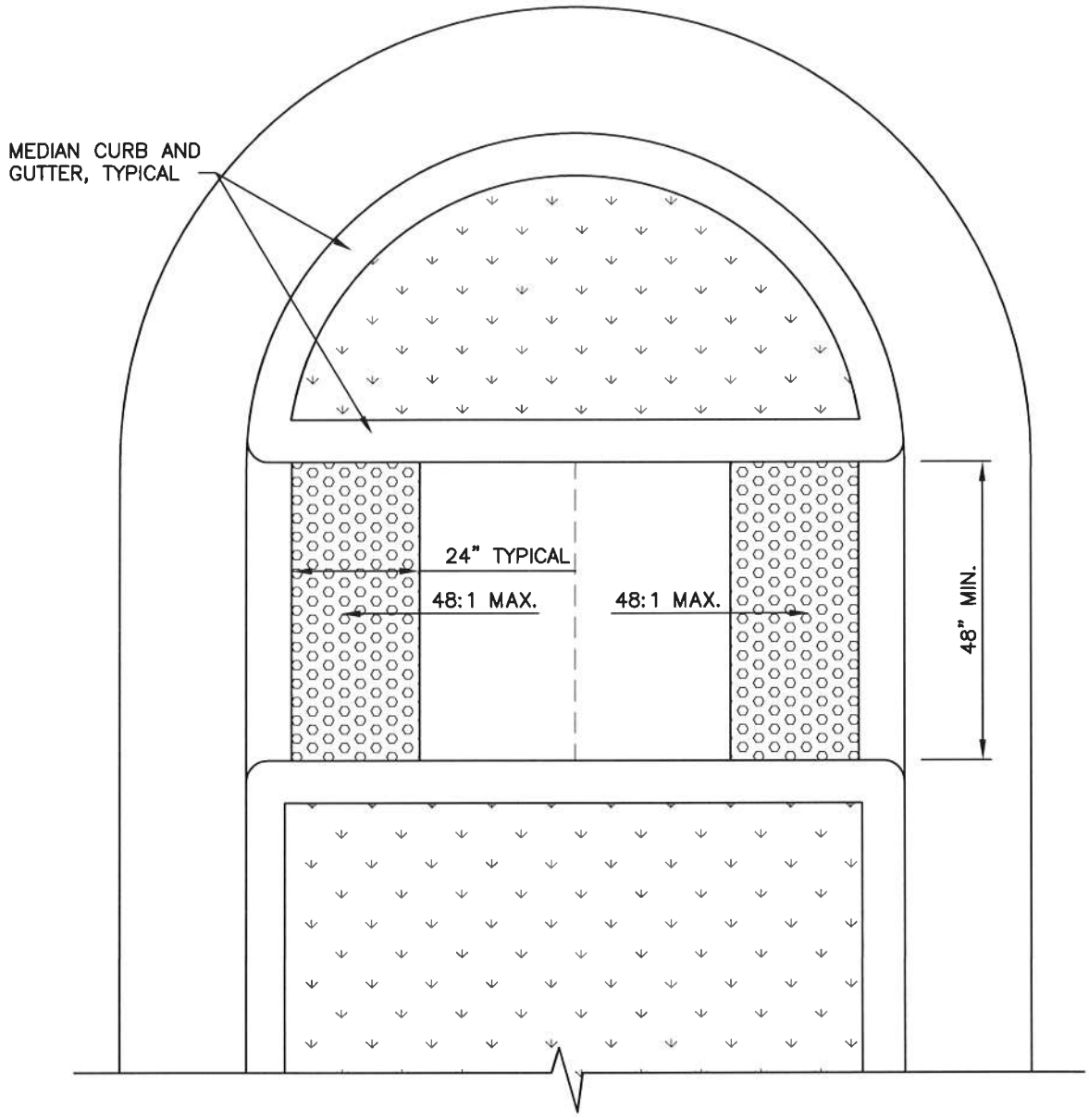


DOME DETAILS

NOTES:

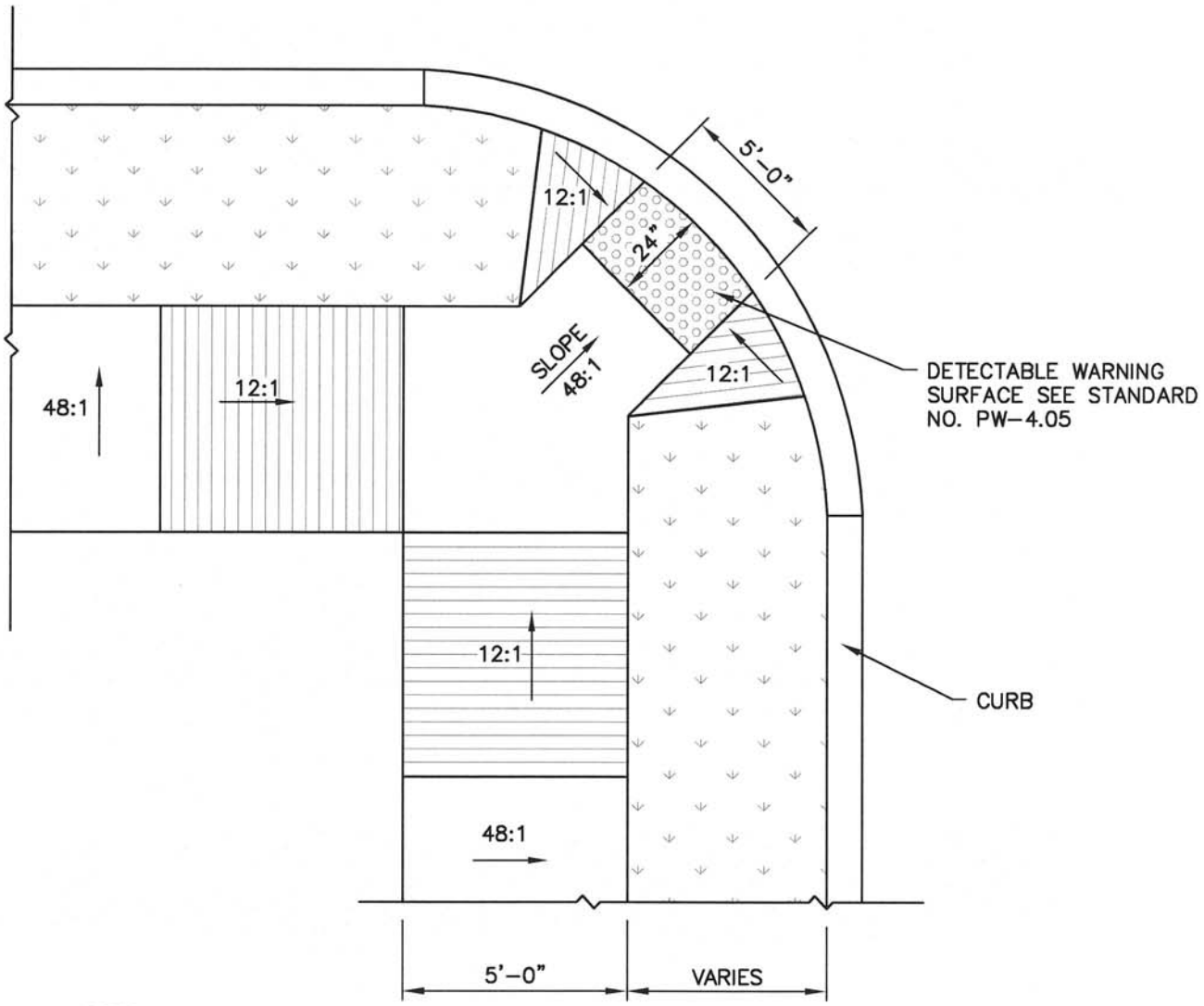
1. THE DETECTABLE WARNING SURFACE SHALL BE LOCATED AT THE BACK OF CURB AND PROTRUDE A MINIMUM OF 24" UP THE RAMP.
2. FOR SKEWED APPLICATIONS DETECTABLE WARNING SHALL BE PLACED SUCH THAT THE DOMES CLOSEST TO THE BACK OF CURB ARE NO LESS THAN 0.5" AND NO MORE THAN 3.0" FROM THE BACK OF CURB. TRUNCATED DOME SURFACES SHALL BE FABRICATED TO PROVIDE FULL DOMES ONLY.
3. DOMES MAY BE CAST IN PLACE OR MAT TYPE – ALL YELLOW OR CONTRASTING COLOR ON BRICK RAMPS.
4. THE DETECTABLE WARNING SURFACE SHALL BE PLACED ACROSS THE ENTIRE WIDTH OF THE RAMP, EXCLUDING FLARED SECTIONS.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	DETECTABLE WARNING SURFACES
ISSUED: MAR 23, 2007		STANDARD NO. PW-4.05



NOTES:
1. SURFACE TEXTURE ON RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. MAX SLOPE SHALL BE 48:1 (2%) IN ANY DIRECTION.
3. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6"x6" W1.4xW1.4 WELDED WIRE MESH.
4. HANDICAPPED RAMPS SHALL CONTAIN A 6" THICK CONCRETE SECTION.

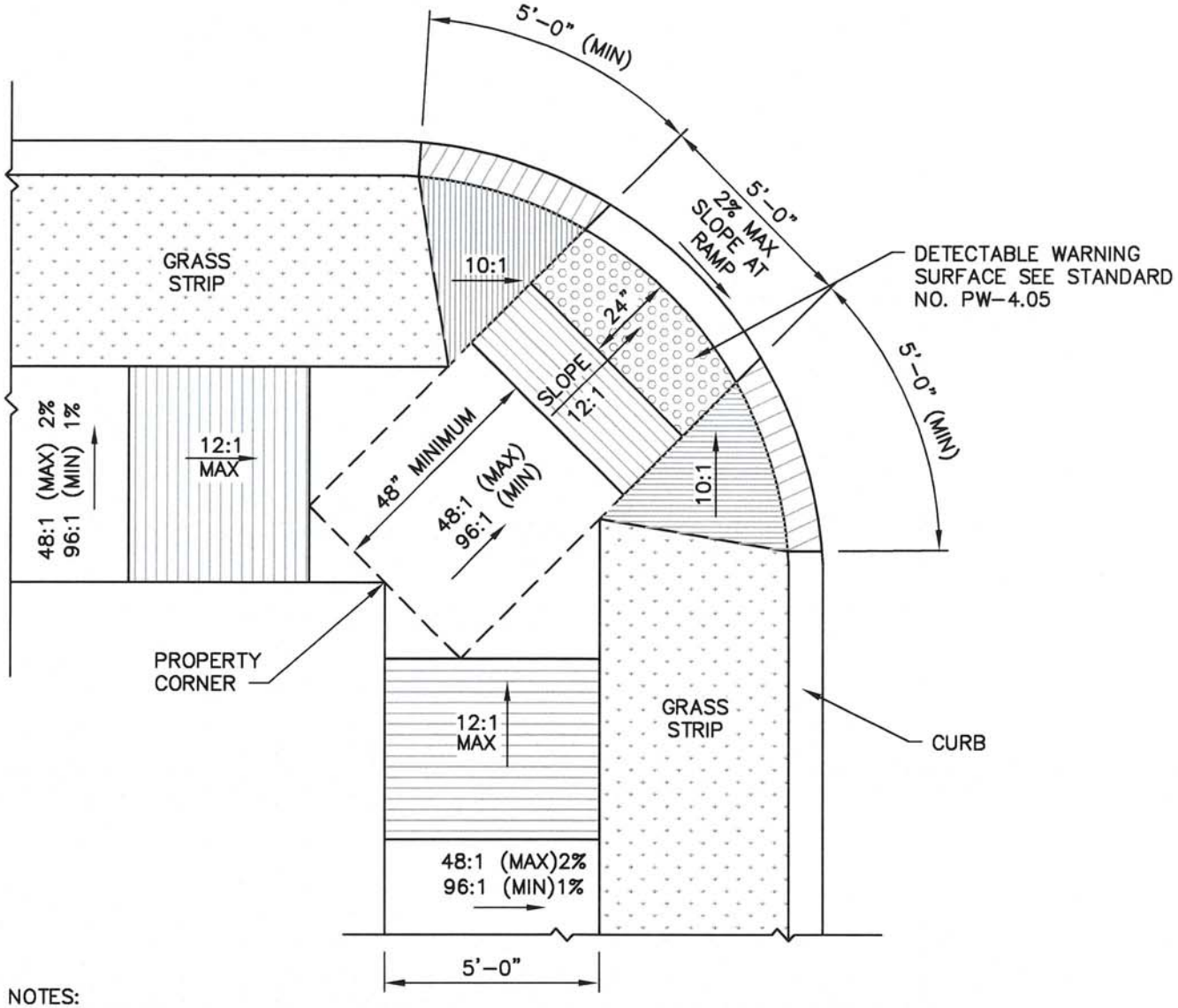
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS MEDIAN RAMP
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	
ISSUED: FEB 25, 2009		STANDARD NO. PW-4.06



NOTES:

1. SURFACE TEXTURE OR RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. SEE STANDARD NO. PW-2.01 FOR DEPRESSED CURB.
3. SEE STANDARD NO. PW-4.03 FOR SECTION.
4. ALL SLOPE FOR RAMP TO BE A MAX OF 12:1.
5. TO BE USED IN RETROFIT SITUATION WHERE LESS THAN 7'-0" EXISTS BETWEEN THE BACK OF CURB AND THE BACK OF SIDEWALK.
6. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6"x6" W1.4xW1.4 WELDED WIRE MESH.

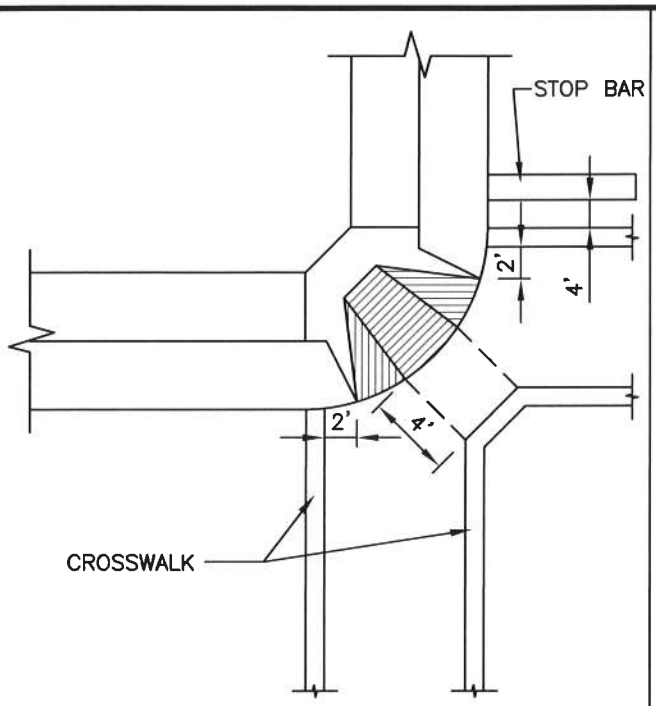
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 9/17/14 DATE	DEC 20, 10	
	JAN 1, 11	
	SEP 17, 14	
		TYPE "F" SIDEWALK RAMP
ISSUED: OCT 29, 2008		STANDARD NO. PW-4.07

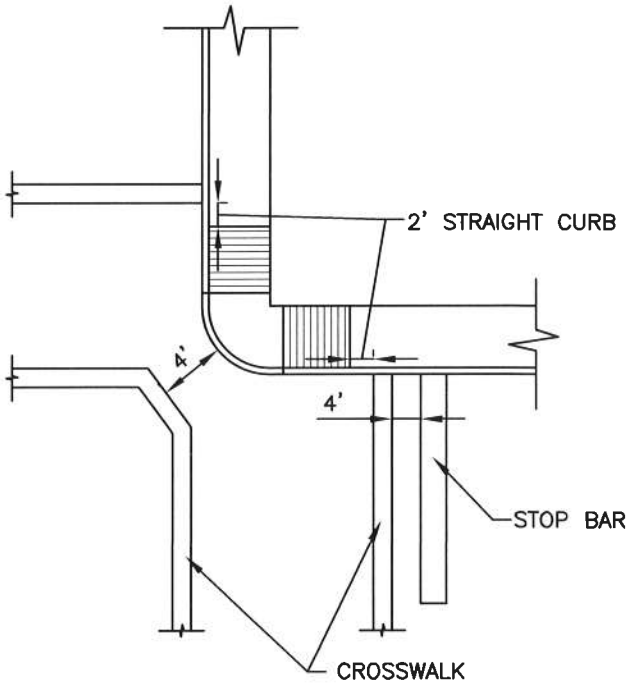


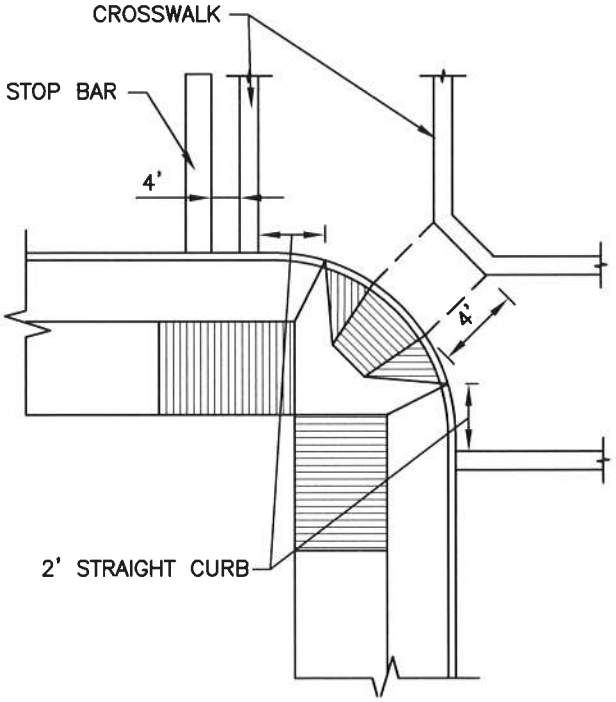
NOTES:

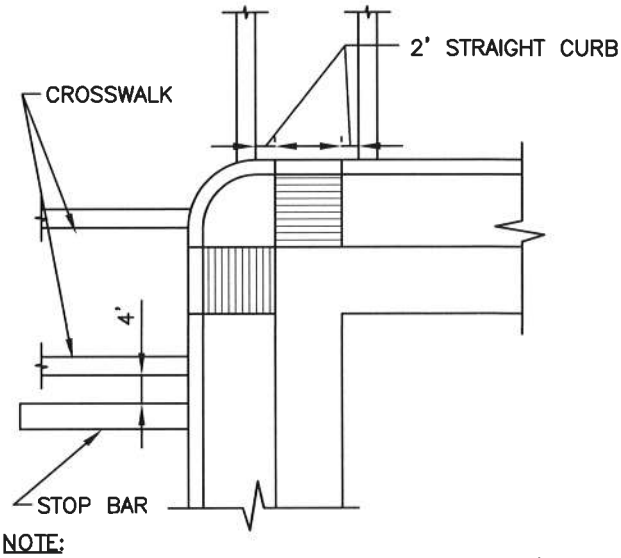
1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. SEE STANDARD NO. PW-2.01 FOR DEPRESSED CURB.
3. SEE STANDARD NO. PW-4.02 FOR ELEVATION.
4. MAX. SLOPE FOR RAMP TAPERS SHALL BE 10:1 (10%).
5. TO BE USED WHERE ≥5' EXIST BETWEEN FACE OF CURB AND FRONT OF SIDEWALK.
6. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
7. HANDICAPPED RAMPS SHALL CONTAIN A 6" THICK CONCRETE SECTION.
8. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.
9. THERE SHALL BE A LANDING PRIOR TO THE RAMPS. THE LANDING SHALL BE 36" IN LENGTH, MINIMUM.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 9/17/14 DATE	JAN 1, 11 SEP 17, 14	TYPE "E" SIDEWALK RAMP
ISSUED: FEB 25, 2009		STANDARD NO. PW-4.08



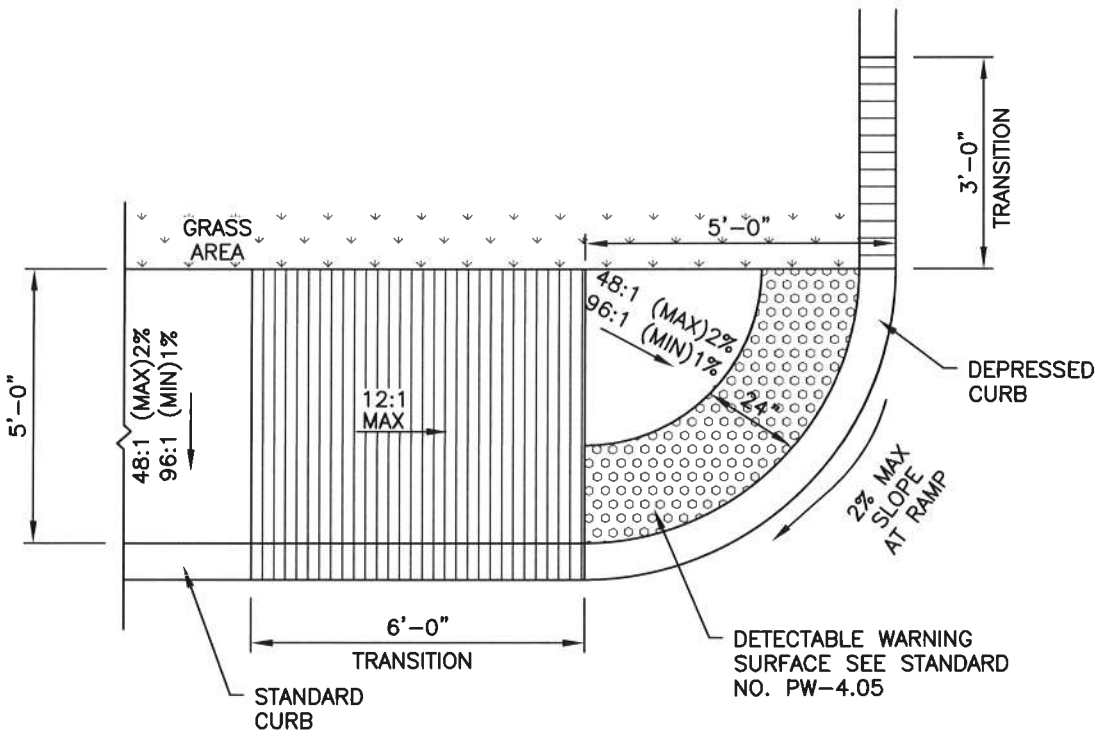






NOTE:
1. CROSSWALK MARKINGS SHALL BE PLACED 2' FROM THE START OF A STRAIGHT SECTION OF CURB.
2. THERE SHALL BE A 48" LANDING AT THE FRONT EDGE OF CORNER RAMPS.
3. STOP BAR SHALL BE PLACED 4' FROM THE CROSSWALK.

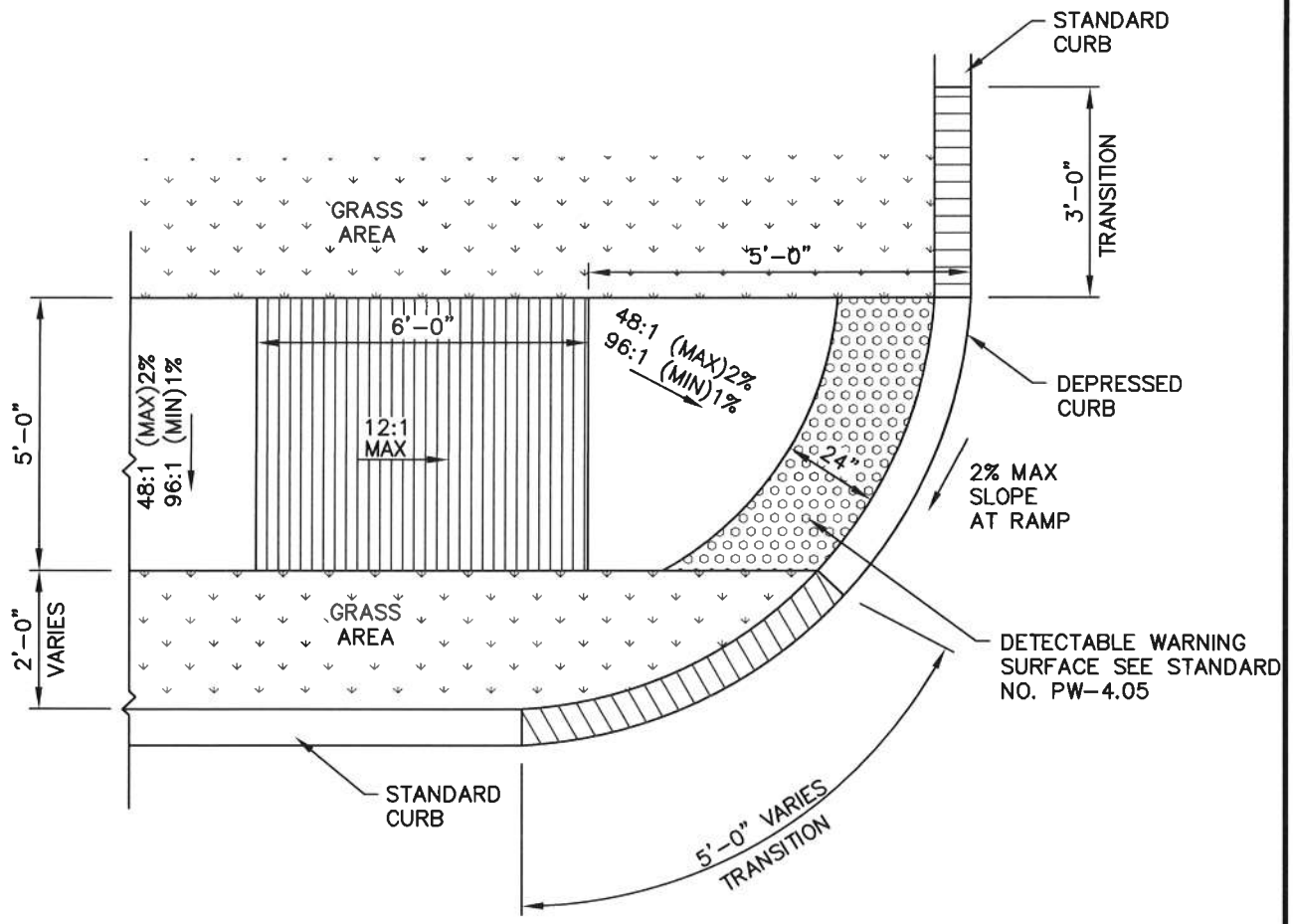
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	CROSSWALK DETAIL
ISSUED: FEB 25, 2009		STANDARD NO. PW-4.09



NOTES:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. SEE STANDARD NO. PW-2.01 FOR DEPRESSED CURB.
3. SEE STANDARD NO. PW-2.00 FOR STANDARD CURB.
4. BRICK SIDEWALK AND HANDICAP RAMPS SHALL BE USED AS DIRECTED BY THE TOWN. SEE STANDARD NO. PW-3.01 FOR BRICK SIDEWALK DETAIL.
5. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
6. HANDICAPPED RAMPS SHALL CONTAIN A 6" THICK CONCRETE SECTION.
6. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.
7. THERE SHALL BE A LANDING PRIOR TO THE RAMPS. THE LANDING SHALL BE 36" IN LENGTH, MINIMUM.

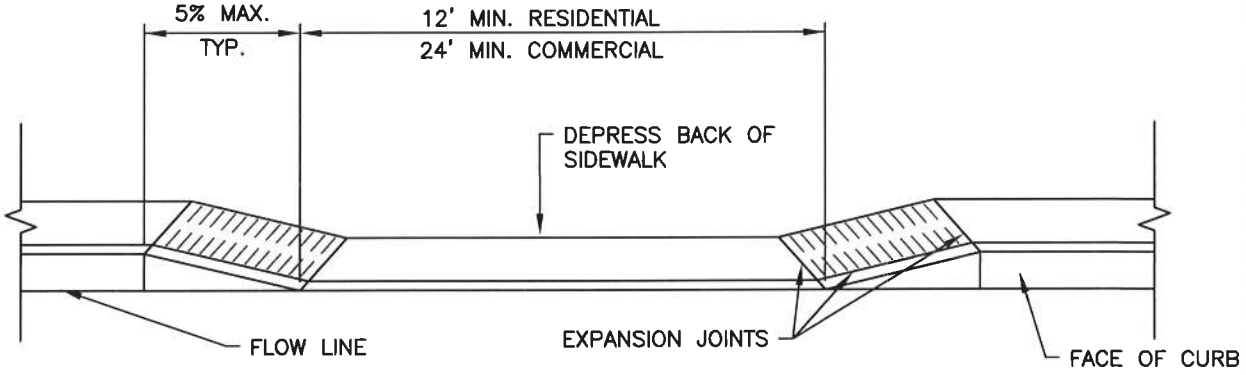
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	TYPE "G" SIDEWALK RAMP
ISSUED: MAY 14, 2009		STANDARD NO. PW-4.10



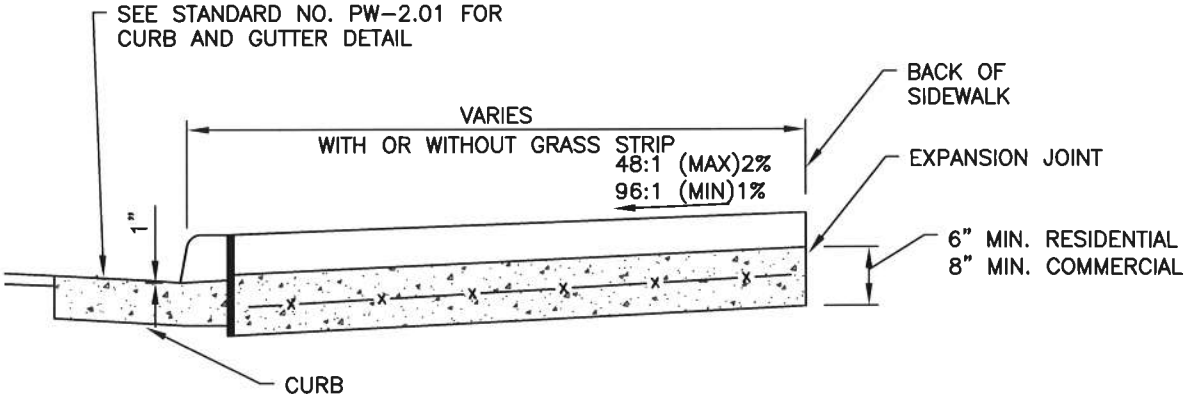
NOTES:

1. SURFACE TEXTURE OF RAMPS SHALL BE COARSE BROOMING OR NON-SKID TYPE SURFACE.
2. SEE STANDARD NO. PW-2.01 FOR DEPRESSED CURB.
3. SEE STANDARD NO. PW-2.00 FOR STANDARD CURB.
4. BRICK SIDEWALK AND HANDICAP RAMPS SHALL BE USED AS DIRECTED BY THE TOWN. SEE STANDARD NO. PW-3.01 FOR BRICK SIDEWALK DETAIL.
5. HANDICAPPED RAMPS SHALL BE REINFORCED WITH 6x6 W1.4xW1.4 WELDED WIRE MESH.
6. HANDICAPPED RAMPS SHALL CONTAIN A 6" THICK CONCRETE SECTION.
7. AT NO POINT SHALL THE SLOPE OF THE LANDING BE GREATER THAN 48:1 (2%), INCLUDING DIAGONAL.
8. THERE SHALL BE A LANDING PRIOR TO THE RAMPS. THE LANDING SHALL BE 36" IN LENGTH, MINIMUM.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	TYPE "H" SIDEWALK RAMP
ISSUED: MAY 14, 2009		STANDARD NO. PW-4.11



ELEVATION



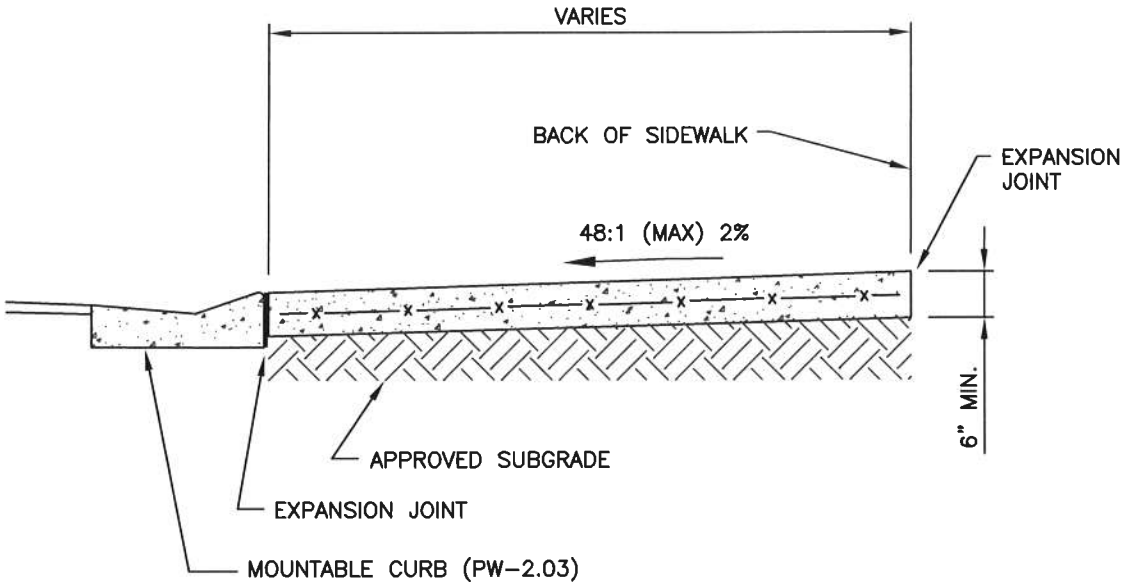
SECTION

NOTES:

1. APRON SHALL BE REINFORCED WITH 6" x 6" – W1.4 X W1.4 WOVEN WIRE MESH.

2. CONCRETE SIDEWALK SHALL BE SHA MIX NO. 3.

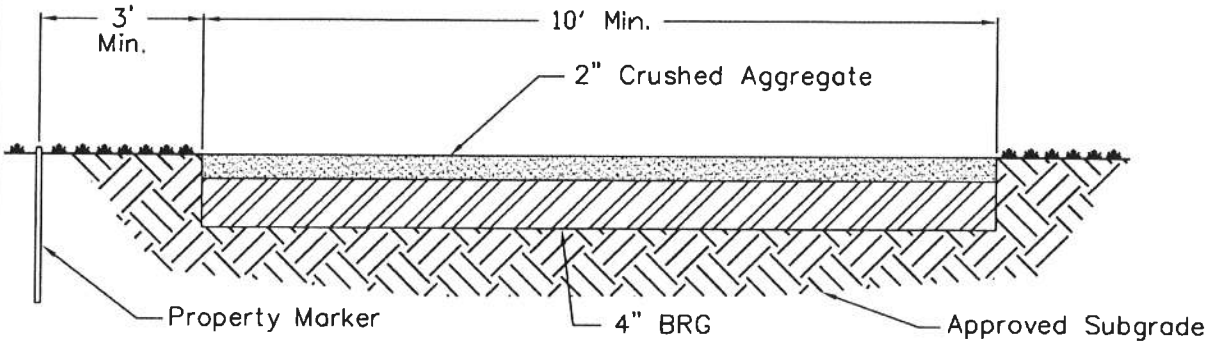
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	AUG 1, 94 JAN 1, 95 MAR 1, 98 AUG 1, 01 FEB 1, 06 APR 1, 10	STANDARD DEPRESSED CURB DRIVEWAY ENTRANCE
ISSUED: MAY 1, 1986	JAN 1, 11	STANDARD NO. PW-5.00



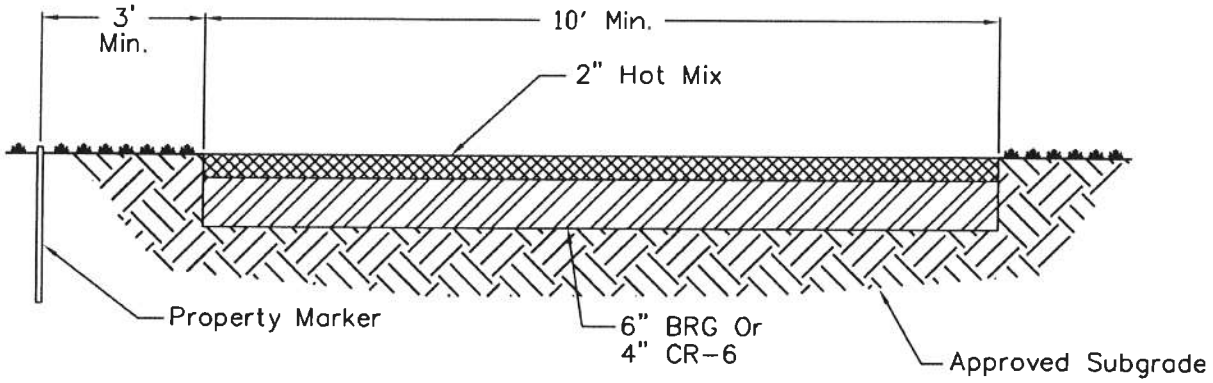
NOTES:

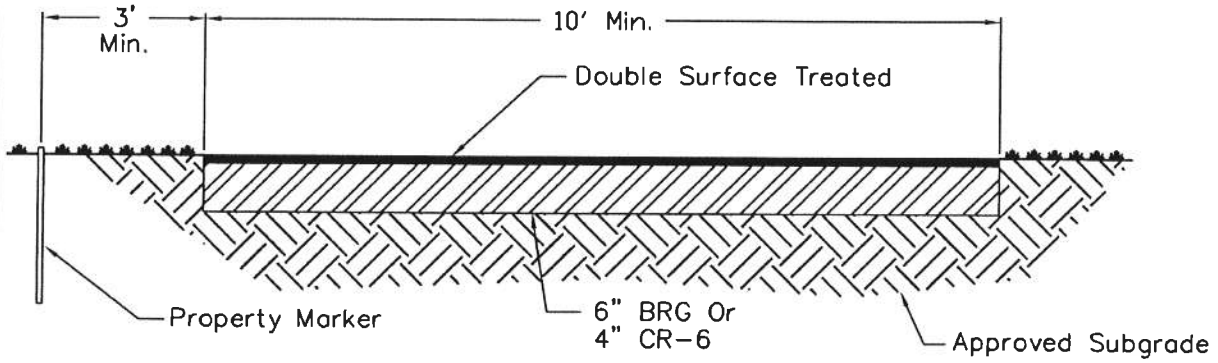
1. APRON SHALL BE REINFORCED WITH 6" x 6" – W1.4 X W1.4 WOVEN WIRE MESH.
2. CONCRETE SIDEWALK SHALL BE SHA MIX NO. 3.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	MAR 1, 94 AUG 1, 94 AUG 1, 01 JAN 1, 11	MOUNTABLE CURB RESIDENTIAL DRIVEWAY ENTRANCE
ISSUED: MAY 1, 1986		STANDARD NO. PW-5.01



Slopes Less Than 10%



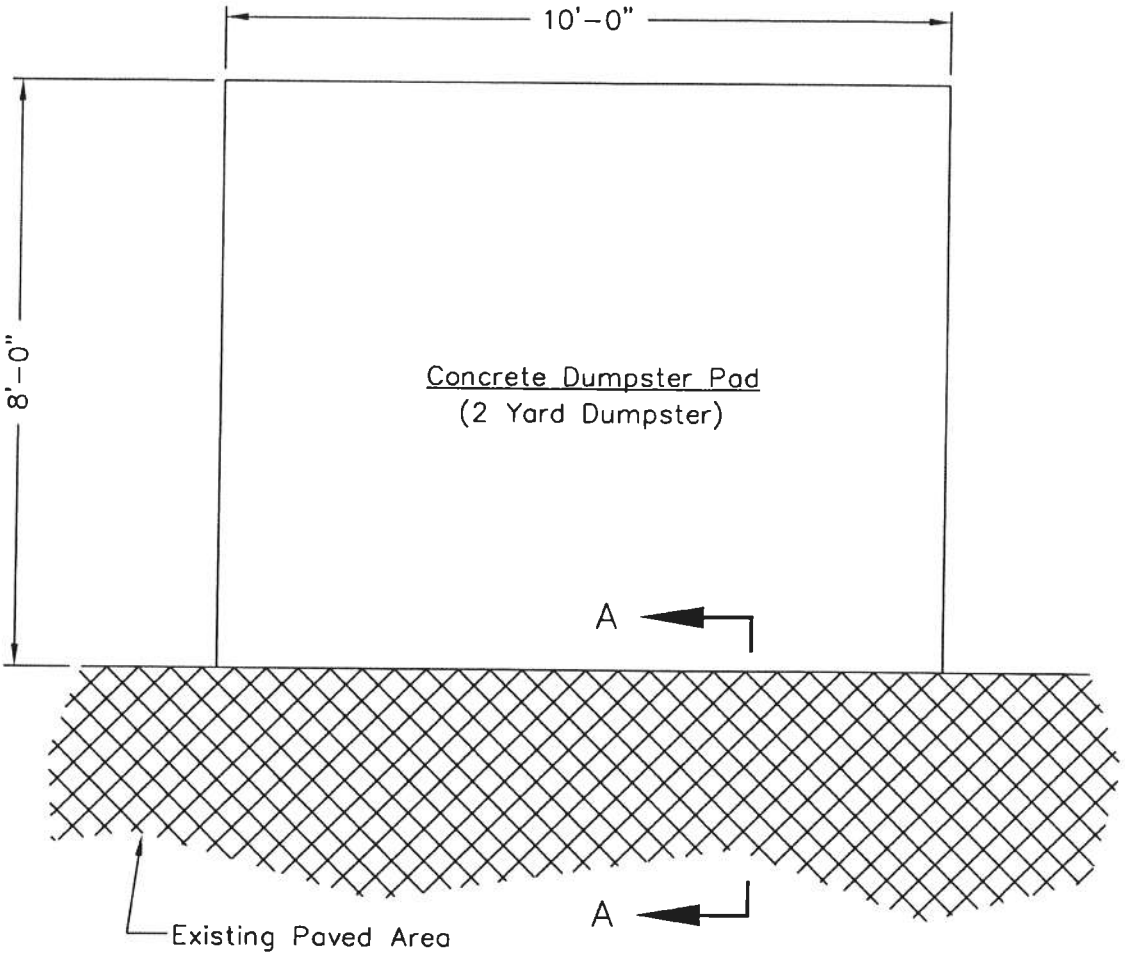


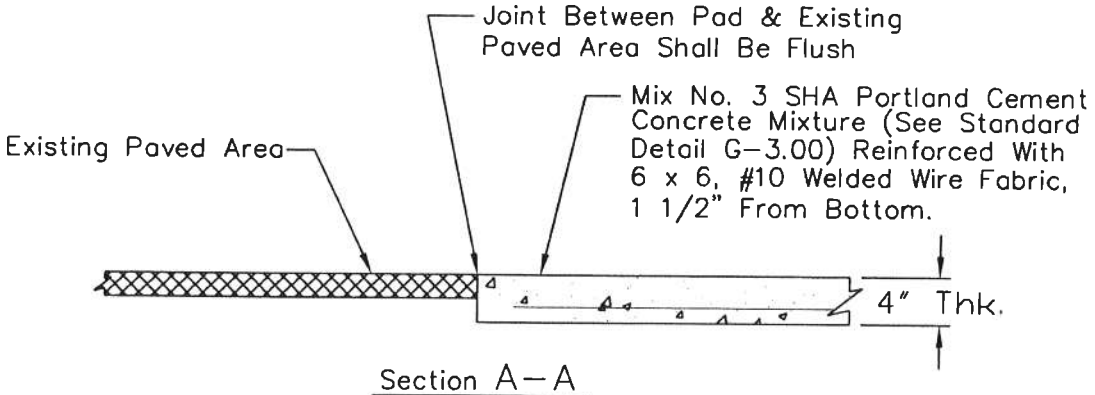
Slopes Greater Than 10%

Note:

1. Driveway Sections To Be As Shown Or As Approved By The Town Engineer's Office.
2. Driveway To Be A Min. Of 35 Ft. Long And A Min. Of 10 Ft. Wide.
3. Driveway To Be A Min. Of 3' From Property Line.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS SINGLE FAMILY RESIDENTIAL DRIVEWAY
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	AUG 1, 94 JAN 1, 95	
ISSUED: OCT. 20, 1992		STANDARD NO. PW-5.10





Section A-A

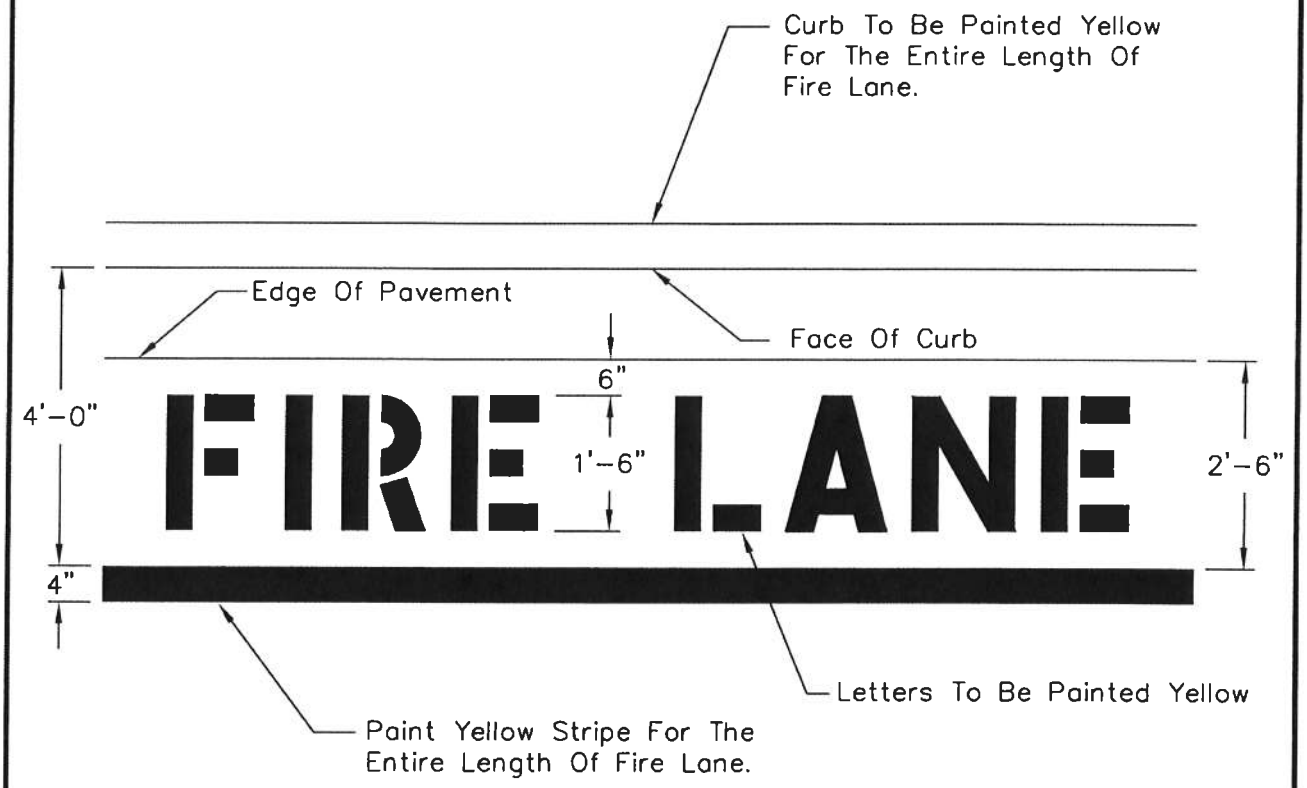
N.T.S.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS CONCRETE DUMPSTER PAD
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	JUL 1, 98 FEB 1, 02	
ISSUED: APR 10, 1995		STANDARD NO. PW-6.00

Notes:

1. All Letters, Arrow & Border Shall Be Painted Red On A White Background.
2. All Letters & Arrow Shall Be Centered Both Vertically & Horizontally.
3. The Distance Between Any 2 Fire Lane Signs Is 40 Ft.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bone 4/25/06 EU MANAGER OF ENGINEERING DATE		SIGN
ISSUED: JUNE 27, 1997		STANDARD NO. PW-7.00



Notes:

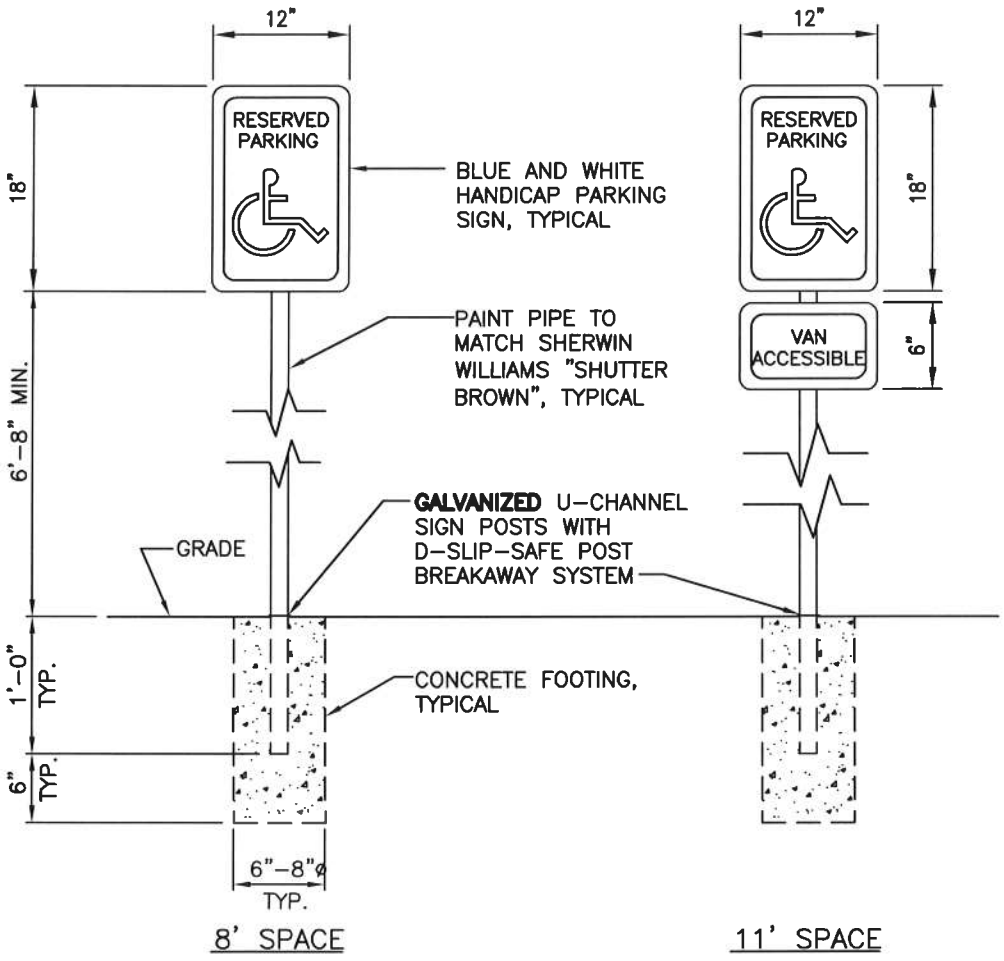
1. Use Stencils Approved By Town Engineer To Paint All Letters.
2. The Contractor Shall Use One Of The Following Paints Or An Approved Equal Approved By The Town Engineer;

   A. Vulcan Signs Traffic Marking Paint
      AY 211 Acryline Water Base
      Paint No. B 05425 Yellow

   B. Coronado
      Alkyd Oil Base
      Paint No. 71-157 Yellow

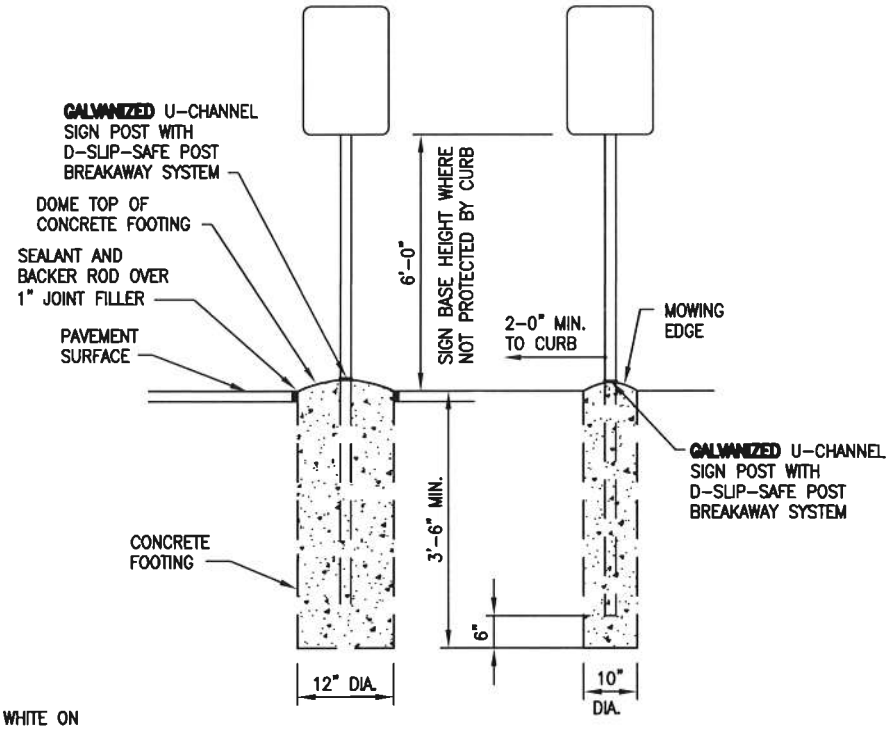
Both Types Of Paint Can Be Purchased From The Annapolis Paint Company.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS PAVEMENT MARKING FIRE LANE
Talbot W Bace 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: JUNE 27, 1997		STANDARD NO. PW-7.01



NOTES:
1. H/C PARKING SIGN (US DOT STANDARD R7-8)

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	SIGNAGE FOR HANDICAP PARKING SPACES
ISSUED: FEB 25, 2009		STANDARD NO. PW-7.02



MOUNTING DETAIL IN PAVING

MOUNTING DETAIL IN UNPAVED AREAS

Karge Lane

36" MAX x 9" WHITE ON REFLECTORIZED GREEN BACKGROUND

STREET SIGN

30"x30" OCTAGONAL REFLECTORIZED WHITE LEGEND ON RED BACKGROUND

R1-1

36"x36"x36" RED & BLACK ON REFLECTORIZED WHITE BACKGROUND

R1-2

STANDARD 24"x30" SIGN PANEL BLACK LEGEND ON REFLECTORIZED WHITE BACKGROUND

R2-1

24"x24" RED & BLACK ON REFLECTORIZED WHITE BACKGROUND

R3-1

24"x24" RED & BLACK ON REFLECTORIZED WHITE BACKGROUND

R3-2

24"x24" RED & BLACK ON REFLECTORIZED WHITE BACKGROUND

NO U TURN SIGN
R3-4

30"x24" RED & BLACK ON REFLECTORIZED WHITE BACKGROUND

R4-7

24"x24" RED WITH REFLECTORIZED WHITE LEGEND & BACKGROUND

R5-1

36"x12" BLACK LEGEND ON BLACK & REFLECTORIZED WHITE BACKGROUND

ONE WAY SIGN
R6-1

NOTES:

1. REFER TO THE MARYLAND STATE HIGHWAY ADMINISTRATION "STANDARD BOOK" FOR DIMENSIONS AND COLORS OF ALL SIGNS NOT SHOWN.
2. ALL PROPOSED SIGNS MUST MEET THE MINIMUM REQUIREMENTS FOR RETROREFLECTIVITY SET FORTH BY THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES, MOST CURRENT EDITION.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	SIGN DETAILS
ISSUED: FEB 25, 2009		STANDARD NO. PW-7.03

LONGITUDINAL PAVEMENT MARKINGS

A. Centerline pavement markings shall be used to delineate the separation of traffic lanes that have opposite directions of travel.

1) The centerline shall be in the geometrical center of the roadway unless otherwise required by field conditions.
2) All two way streets greater than 16' wide shall have a centerline.
3) The centerline marking shall be yellow lines, configuration to be approved by the Town Engineer.

B. Edge line pavement markings shall be used to delineate the shoulder and travel lanes.

1) The edge of the travel lane shall consist of a single solid white line.
2) Except for dotted edge line extensions, edge lines shall not be extended through intersections or major driveways.

C. While separating traffic lanes traveling in the same direction a single broken white line shall be used where crossing lanes is permitted.

D. Longitudinal pavement markings shall be ready–mixed white or yellow paint which may be used as a base for drop–on reflecting glass beads, or for use as a plain non–reflective traffic paint suitable for either bituminous or concrete surfaces.

1) Glass beads shall conform to AASHTO M 247 and shall be Type 2 with a moisture resistant coating.
2) Immediately before applying the pavement marking paint to the pavement, the Contractor shall insure the surface is dry and entirely free from dirt, sand, grease, oil, or other matter which would prevent effective adhesion of the paint to the pavement.
3) The surface temperature of the pavement shall be a minimum of 5 °C (40 °F).
4) Every effort shall be made to apply paint according to the requirements stated in this section. When paint must be applied between the dates of October 15 through April 15 inclusive or on pavement with a surface temperature below 5 °C (40 °F), cold weather paint can be used which does not exceed EPA's Federal Register/Rules and Regulations (40 CFR Part 59 [AD–FRL–6149–7] RIN 2060–AE55), as amended, for VOC content limit and shall meet the AASHTO M248 F and requirements noted below. These products shall be applied according to the manufacturer's requirements.
5) The cold weather paint shall meet the following minimum requirements.

    a) Property Test Method Requirement
    b) Dry Opacity (contrast ratio) ASTM D2244 – with a wet film thickness of 18 ± 1 mils.
    c) VOC ASTM D3960 150 g/l (1.25 lb/gal) Max.
    d) Drying time ASTM D7111 with wet film thickness of 15 mils 15 Minutes max @ 25°C (77°F)

6) Glass beads shall be evenly applied through the entire paint thickness at a rate of 7 to 9 lbs. to each gallon of paint. Glass beads shall be applied simultaneously with paint, by pressurized or mechanical drop methods.
7) Painted lane lines, edge lines, and centerlines shall have a minimum retroreflectivity of 250 millicandelas for white and 150 millicandelas for yellow. The retroreflectivity measurement will be taken by the Town on lines that are clean and dry within 30 days of application, before any winter maintenance takes place.
8) Paint shall be Maryland Fast Dry Waterborne Traffic Paint, Lead Free by Sherman Williams or approved equal. (Federal Standard 595–38907 yellow or 37925 white)
9) Pavement markings shall be warranted for a minimum of 2 years from final acceptance by the Town.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	LONGITUDINAL PAVEMENT MARKINGS
ISSUED: FEB 25, 2009		STANDARD NO. PW–7.04

TRAVERSE PAVEMENT MARKINGS

A. Transverse markings, including stop bars, shoulder markings; speed bump markings, crosswalk lines, yield lines, speed limits, and other marking words or symbols shall be white unless otherwise indicated. For symbols see the Federal "Standard Highway Signs" book (Section 1A.11)

1) Stop bars and Yield lines shall extend across the approach lanes to indicate the point at which to stop.
   a) Stop Bars shall be 12 – 24" in width
   b) Triangles indicating yield lines shall be 12 – 24" at the base with the height being equal to 1.5 times the width of the base.
   c) Stop bars and yield lines shall be a minimum of 4' from a crosswalk at a controlled intersection.

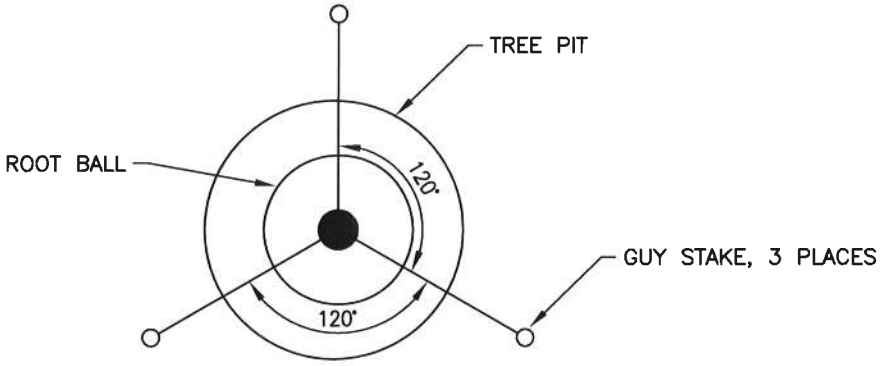
2) Crosswalks markings shall provide guidance to pedestrians by defining paths across traffic.
   a) The minimum width between crosswalk lines shall be 6'.
   b) Crosswalk lines shall extend across the full width of the pavement.
   c) In areas of high traffic volume, crosswalks should be marked with diagonal lines at a 45° angle to the line of the crosswalk to increase visibility.
   d) Diagonal lines, if used shall be 12" wide and spaced 60" apart. Wheel paths shall be considered when placing diagonal lines.

3) Pavement word and symbol markings shall be used to guide or warn traffic.
   a) Symbols should be used in place of words where possible.
   b) Letters and Numerals shall be a minimum of 6 feet in height.
   c) Word and symbol markings shall not exceed three lines of information
   d) Word messages should be read in the direction of travel. The first word in the message should be the closest to the road user.
   e) Pavement markings should not exceed one lane width unless otherwise indicated.
   f) Where traffic lanes approach an intersection and turn into turning lanes, lane–use arrows shall be mandatory.
   g) The word STOP shall not be used as a pavement marking except at the end of aisles in parking lots.

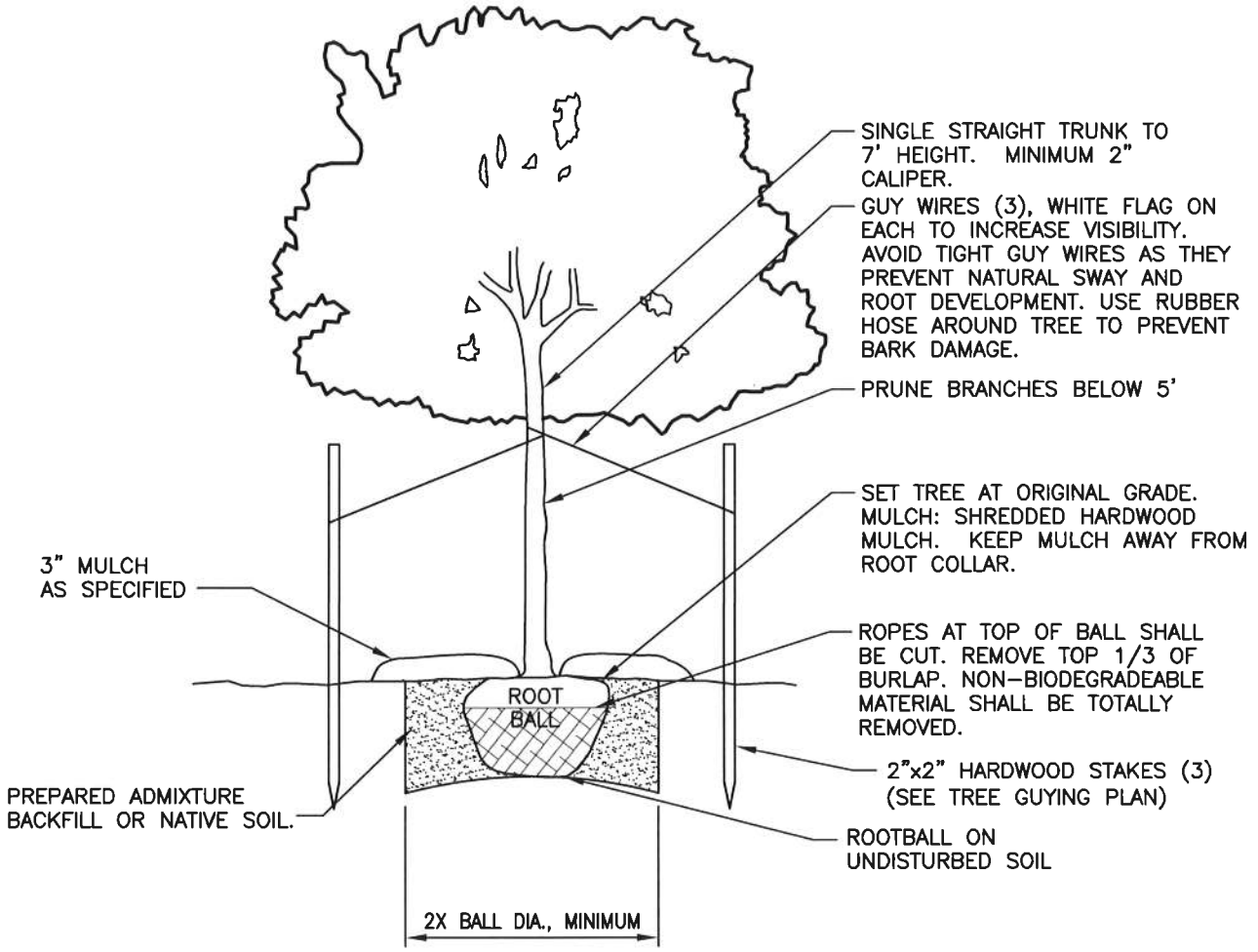
B. Traverse markings shall be constructed utilizing a durable pavement marking tape.

1) Nominal thickness of pavement marking tape shall be 0.065".
2) Pavement marking tape shall be abrasion resistant.
3) The average skid resistance shall be 45BPN when measured in accordance with ASTM E303.
4) Pavement marking tape shall not be applied except between May 15 and September 15. Out of season, when the road surface temperatures and ambient air temperatures are above 40°F, the Town may approve application if additional adhesives are utilized.
5) The pavement surface shall be cleaned with a broom and high pressured blower before applying tape.
6) Pavement marking tape shall not be applied to wet surfaces.
7) Application of marking tape shall be as approved by the manufacturer. Procedure for application shall be submitted to the Town for review.
8) Pavement symbols shall be warranted for a minimum of 2 years.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	TRAVERSE PAVEMENT MARKINGS
ISSUED: FEB 25, 2009		STANDARD NO. PW–7.05

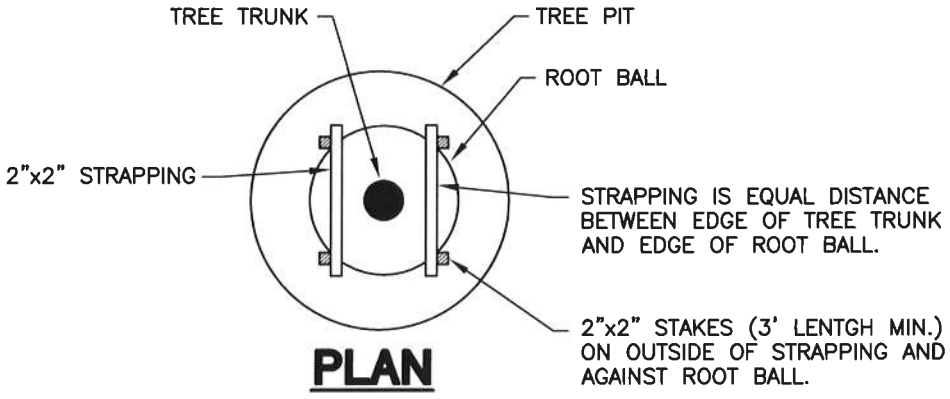


PLAN

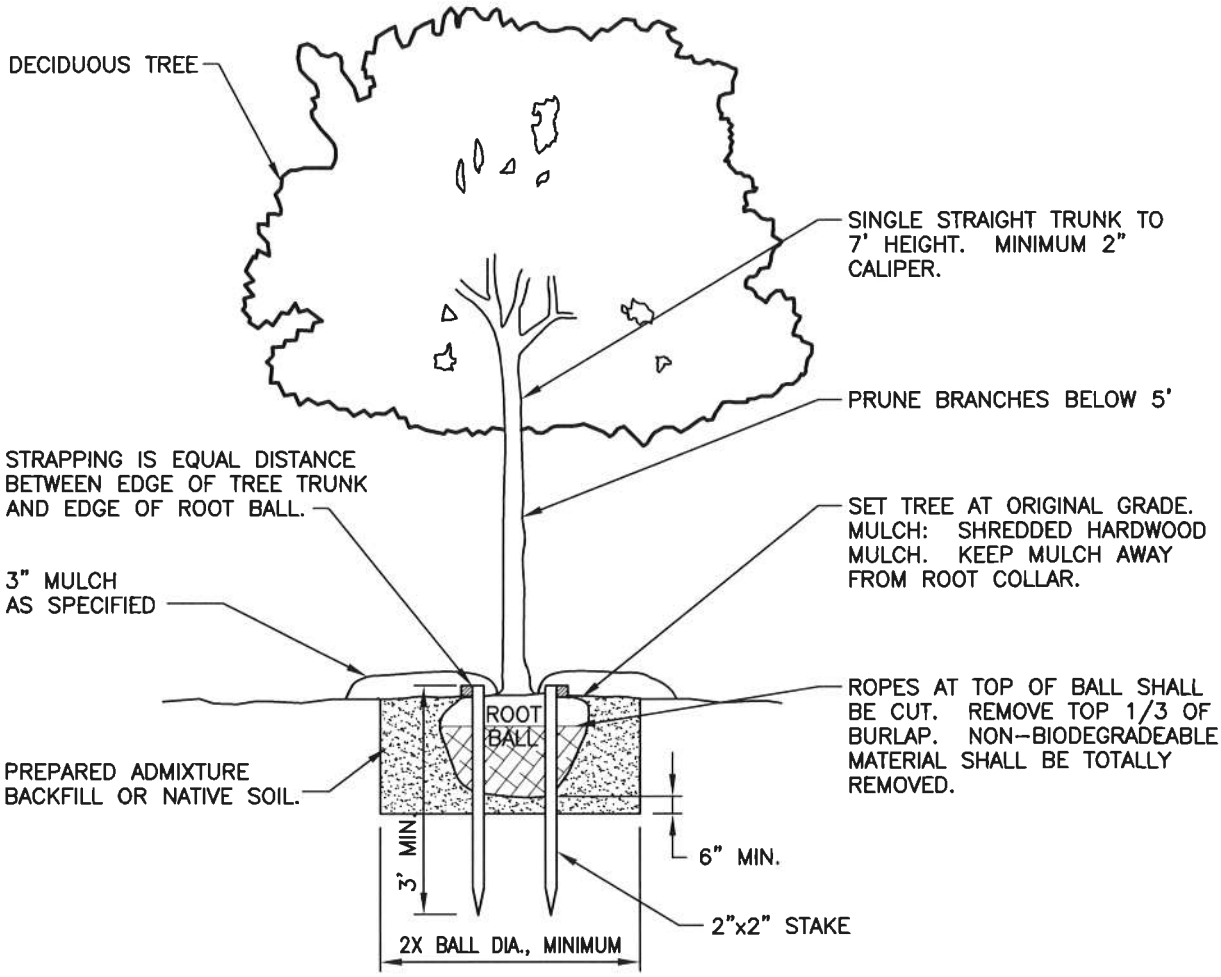


SECTION

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	SEP 1, 02 DEC 1, 04 OCT 13, 10 JAN 1, 11	TREE PLANTING
ISSUED: MAR 1, 1994		STANDARD NO. PW-8.00

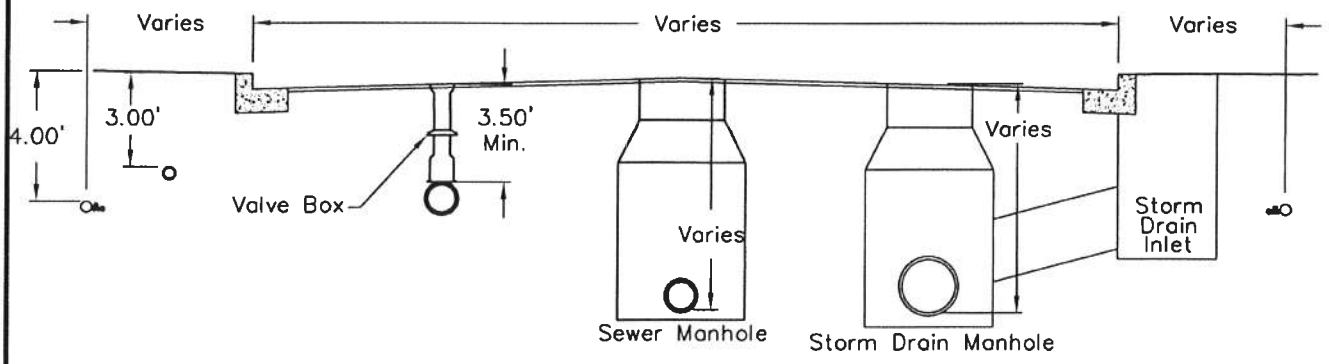


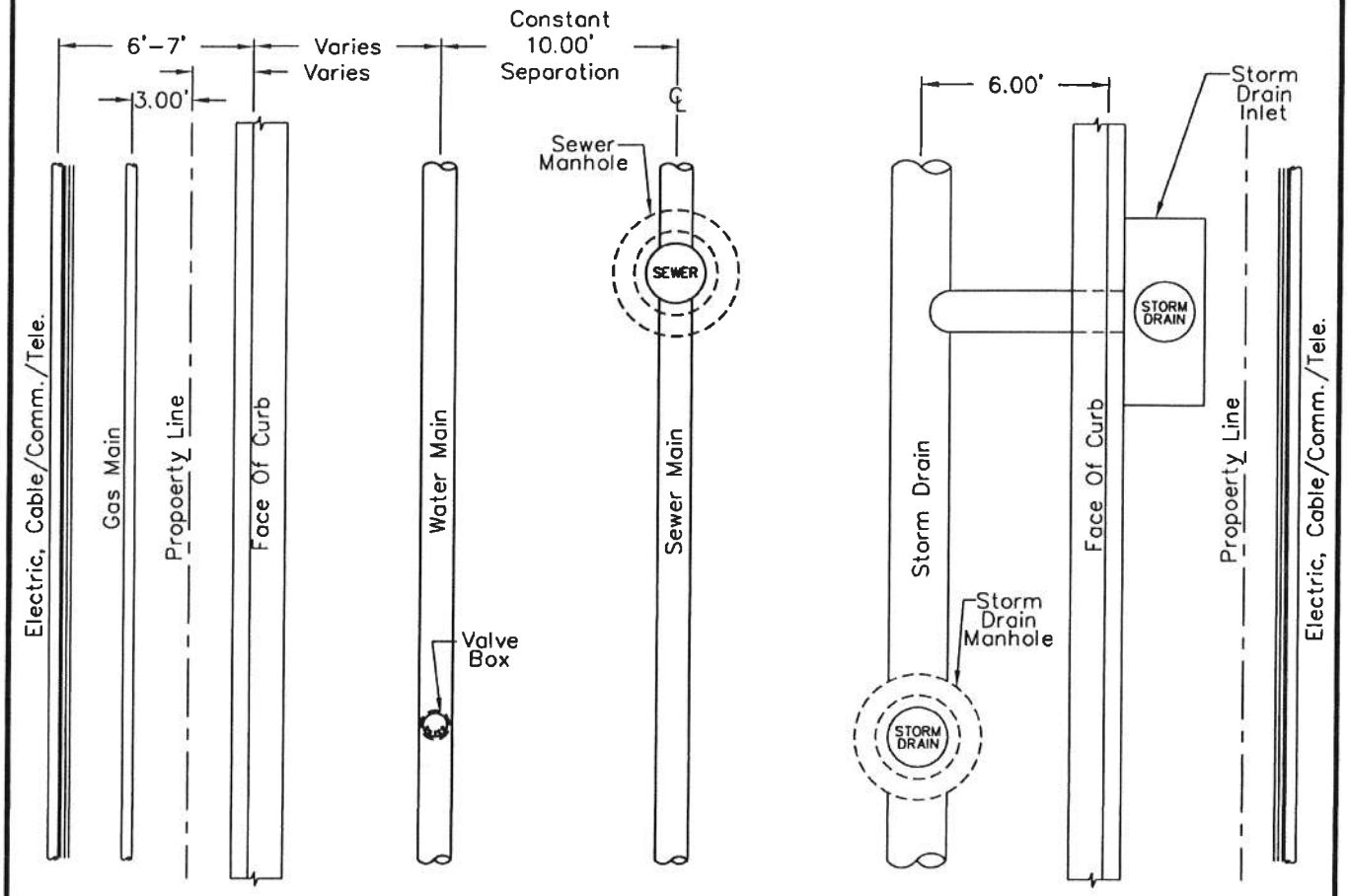
PLAN



SECTION

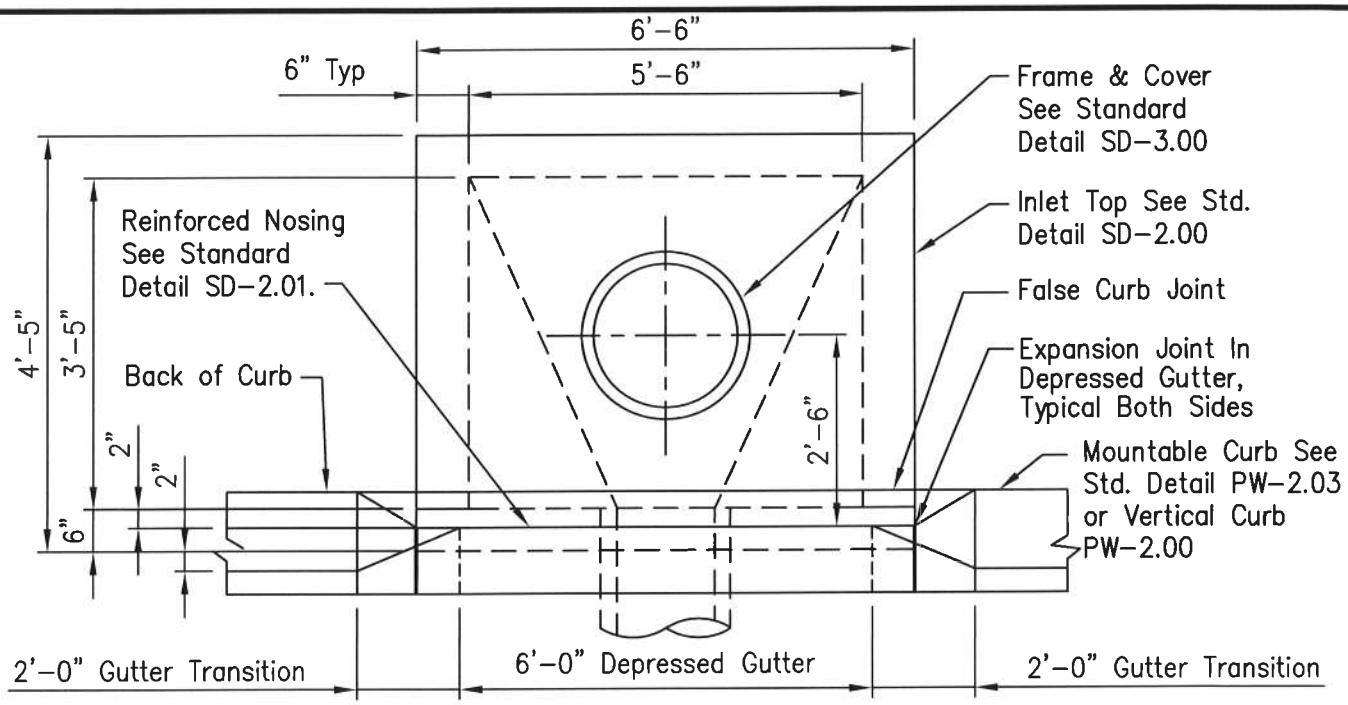
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE		TREE PLANTING ALTERNATE
ISSUED: JANUARY 1, 2011		STANDARD NO. PW-8.01

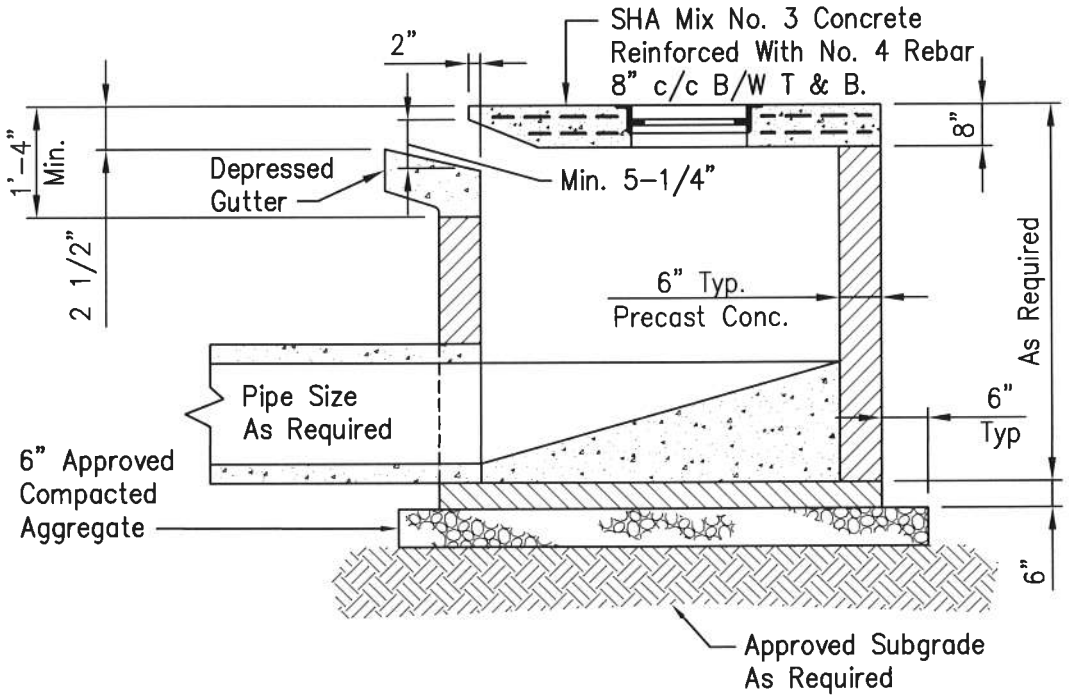




Plan View

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS UTILITY MAINS STREET/R.O.W. LOCATIONS
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: MAR 1, 2006		STANDARD NO. PW-9.00

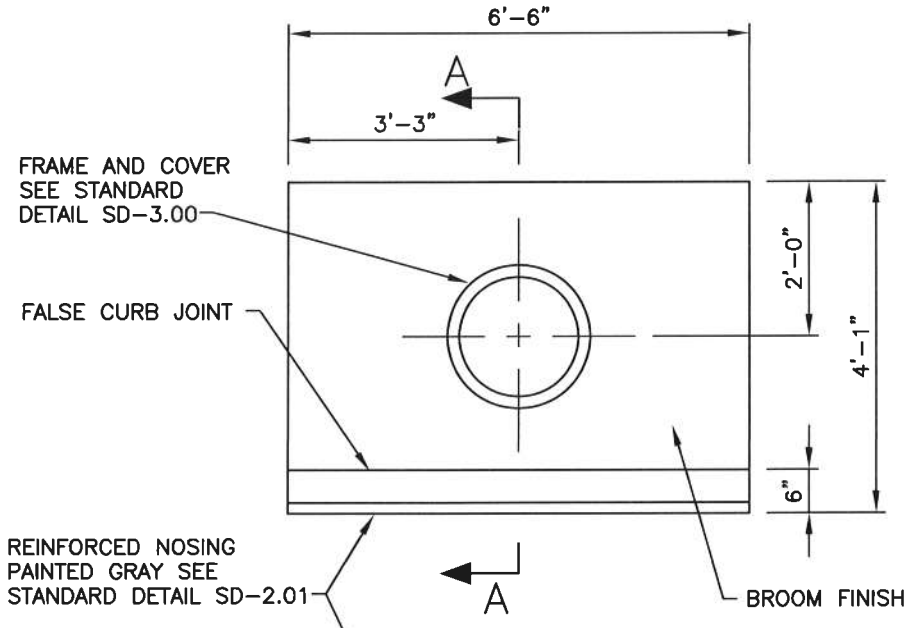




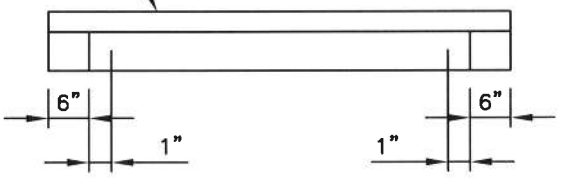
Notes:

1. Provide Lift Hooks In Unexposed Surfaces To Accommodate Field Placement.

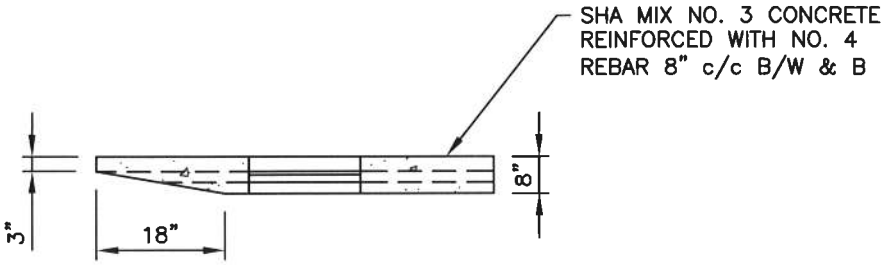
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS CURB INLET
TOWN ENGINEER 4/12/11 DATE	OCT 1, 88	
	APR 1, 98	
	JUN 10, 98	
	FEB 1, 06	
	FEB 25, 09	
ISSUED: MAY 1, 1986	JAN 1, 11	STANDARD NO. SD-1.01



PLAN



FRONT ELEVATION

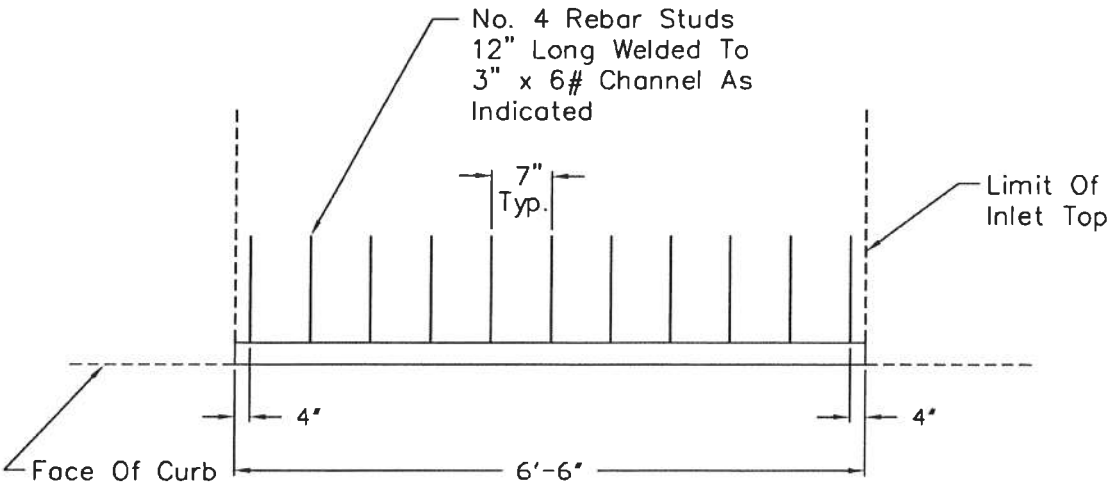


SECTION A-A

NOTES:

1. LIFTING DEVICE SHALL BE DETERMINED BY CONTRACTOR, NO DEVICES SHALL BE PERMITTED IN EXPOSED TOP SURFACES.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	FEB 25, 09 JAN 1, 11	INLET TOP
ISSUED: MAY 1, 1989		STANDARD NO. SD-2.00



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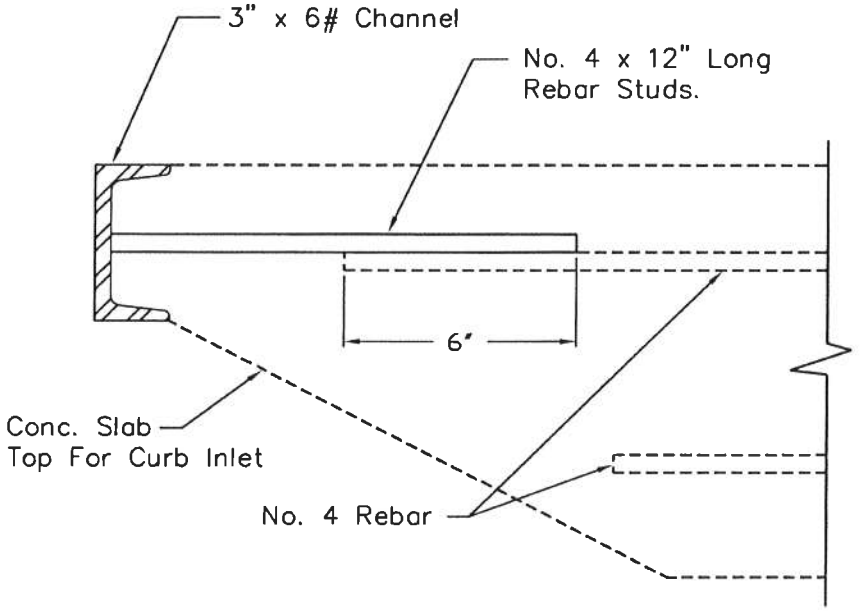
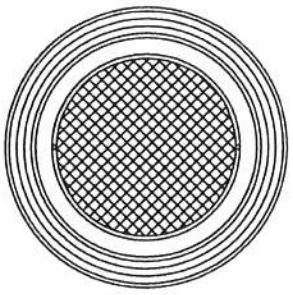
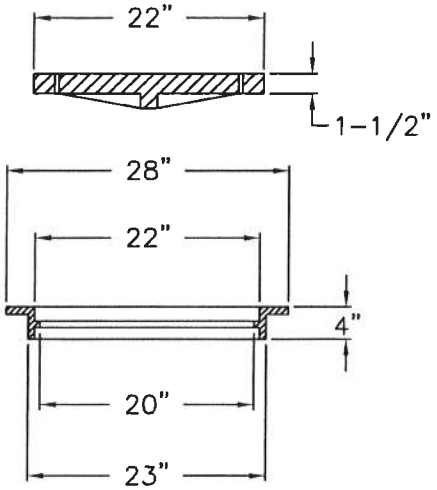


SECTION

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bane 4/25/06	OCT 1, 88	
EU MANAGER OF ENGINEERING DATE	APR 1, 98	
		REINFORCED NOSING
ISSUED: MAY 1, 1986		STANDARD NO. SD-2.01



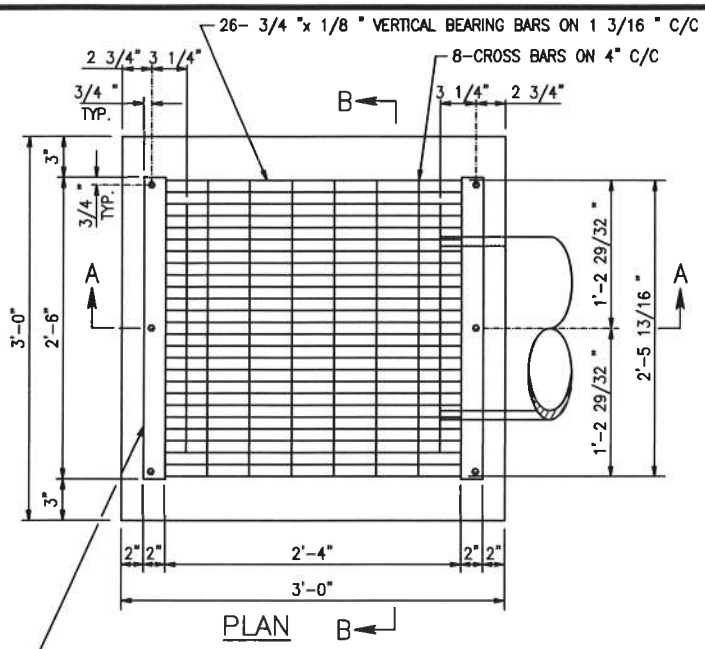
Lid Shall Be Lettered
"Storm Drain"



Notes:

1. Casting Shall Conform To ASTM A-48-64 Class 35B Iron Minimum.
2. Casting Shall Have Ground Or Machined Bearing Surfaces.
3. Casting Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Light Duty Sidewalk Type.
5. "Pick Holes" Are Required In Lid.
6. Frame And Cover Shall Be 1545Z1 & 1544C As Manufactured By East Jordon Iron Works, P.O. Box 439 Spring St. East Jordon, Mich. 49727, Or An Approved Equal.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bane 2/1/06	OCT 1, 88	
EU MANAGER OF ENGINEERING DATE	AUG 1, 94	
	FEB 1, 06	
		INLET FRAME & COVER
ISSUED: MAY 1, 1986		STANDARD NO. SD-3.00

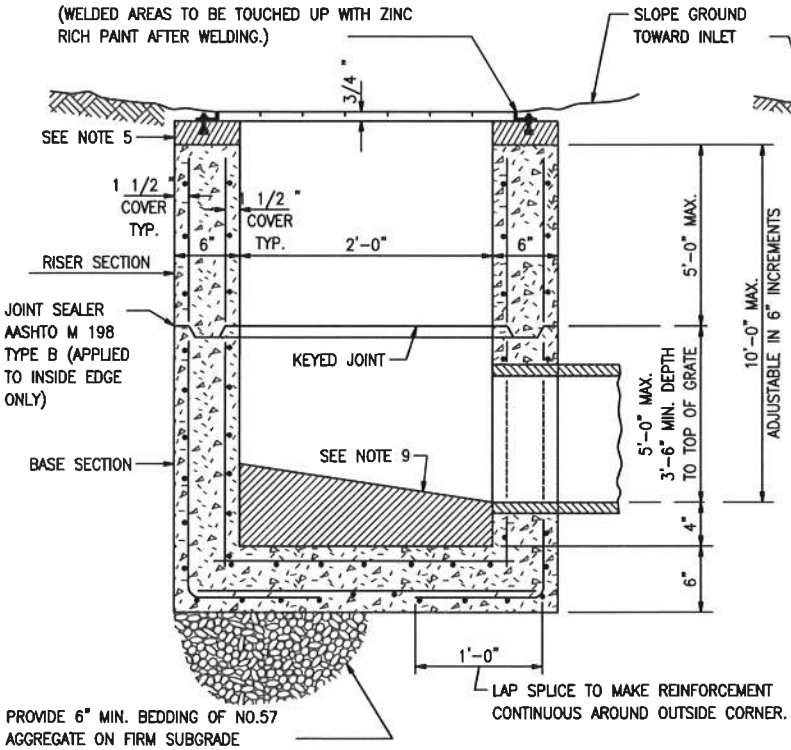


GENERAL NOTES

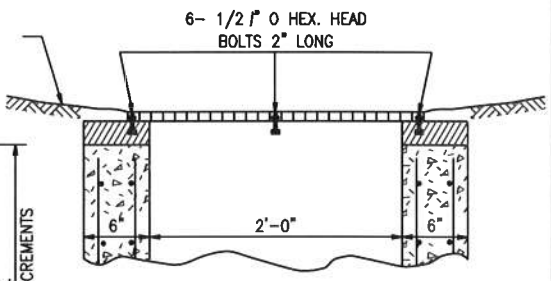
1. CONCRETE TO BE MIX 4500 PSI
2. REINFORCING-2 LAYERS OF 4x4-W4.0x W4.0 WELDED WIRE FABRIC.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. GRATING SHALL BE STEEL "IRVING X-BAR TYPE AA" OR APPROVED EQUIVALENT. ALL MATERIAL TO BE HOT DIPPED GALV.
5. GRADE AND SLOPE ADJUSTMENTS TO BE COMPLETED IN THE FIELD USING CONCRETE OR BRICK AND MORTAR. MIN. ONE LAYER OF BRICK OR 3" OF CONCRETE.
6. PIPE OPENINGS TO BE PROVIDE AS REQUIRED, FOR SIZE, LOCATION AND INVERT ELEVATIONS.
7. MINIMUM DEPTH PAYMENT PER "EACH" INLET INCLUDES DEPTHS UP TO 3'-6" MEASURED FROM THE PIPE INVERT TO THE TOP OF THE GRATE. VERTICAL DEPTH PAYMENT PER LINEAR FOOT FOR DEPTHS IN EXCESS OF 3'-6".
8. INVERT TO BE CONCRETE OR BRICK AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.

NOTE EXPANSION ANCHORS MAY BE USED INSTEAD OF BOLTS.

2- 2"x 1 1/4 "x 3/16 "x2'-6" (CENTERED ON GRATE)
TRIM VERTICAL LEG OF ANGLE TO 3/4 " IN HEIGHT
WELD SECURELY TO GRATING AT EVERY 4TH BAR
(WELDED AREAS TO BE TOUCHED UP WITH ZINC RICH PAINT AFTER WELDING.)



SECTION A-A

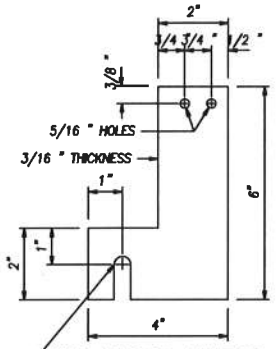


SECTION B-B

NOTE: MDSHA YARD INLET ST. NO. MD 381.02

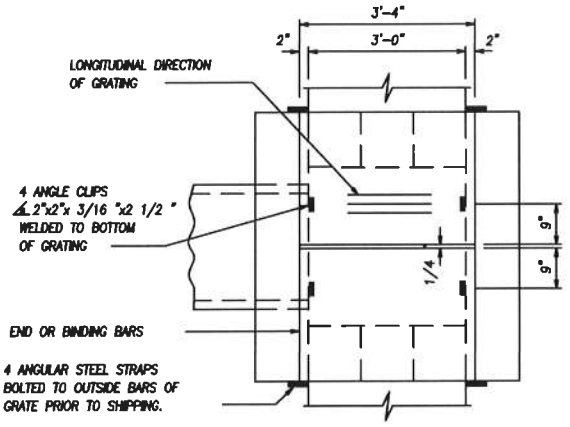
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	NON-TRAFFIC BEARING YARD INLET
ISSUED: OCT 29, 2008		STANDARD NO. SD-3.01

Y:\0000\CADD STANDARDS\DETAILS\City Details\Easton MD\DETAILS\SD-3.01.DWG Apr 12 , 2011 - 1:39pm, (batn)

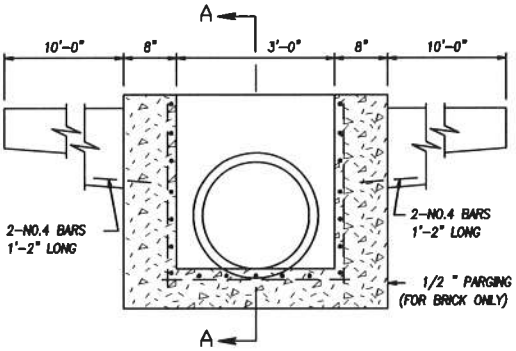


END STRAP DETAIL

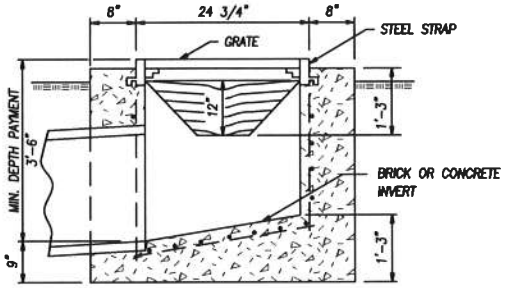
9/16 " SLOTTED HOLE TO RECEIVE 1/2 "x4" MACHINE BOLT (GALV.) IMBEDDED 3" IN CONC. WALL. NUT TO BE PLACED ON END OF BOLT AFTER GRATE IS INSTALLED.



PLAN



ELEVATION

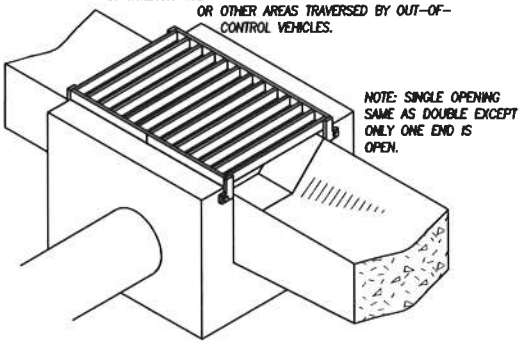


SECTION A-A

NOTES

1. THE CONCRETE VALLEY GUTTER TO BE USED IN CONNECTION WITH THIS INLET, WILL BE WARPED FROM THE STANDARD SECTION TO MEET THE SECTION AT THE END OF THE INLET. THIS TRANSITION WILL TAKE PLACE WITH A DISTANCE OF TEN (10) FEET FROM THE INLET. GUTTER TO BE PAID FOR SEPARATELY.
2. PIPE OUTLETS AND GUTTER APPROACHES CAN BE REVISED TO MEET EXISTING CONDITIONS.
3. INLET MAY BE CONSTRUCTED OF REINFORCED CONCRETE (MIX NO.2) OR BRICK. CHAMFER INSIDE CORNER 3/4 "x 3/4 ". REINFORCEMENT NO.4 BARS @ 6" C/C, 2" COVER.
4. GRATINGS ARE SUBJECT TO APPROVAL FOR EACH JOB. ANY TYPE OF SUBSTANTIAL TRANSVERSE BARS MAY BE USED WHICH WILL SUPPORT A MINIMUM UNIFORM LOAD OF 50 LBS./SQ.FT. THE TRANSVERSE BARS SHALL BE HELD RIGID BY SPACER BARS.
5. AREA TO BE MADE UP OF TWO EQUAL PANELED WIDTHS, ARRANGED FOR BOLTING TOGETHER IN THE FIELD.
6. ALL MATERIAL TO BE HOT DIPPED GALVANIZED.

NOTE THIS TYPE OF INLET MAY BE USED IN CONJUNCTION WITH BERM DITCHES, BENCHES, AND SUMP AREAS OF INNER LOOPS OF INTERCHANGES. IT IS NOT TO BE USED IN MEDIANS OR OTHER AREAS TRAVERSED BY OUT-OF-CONTROL VEHICLES.

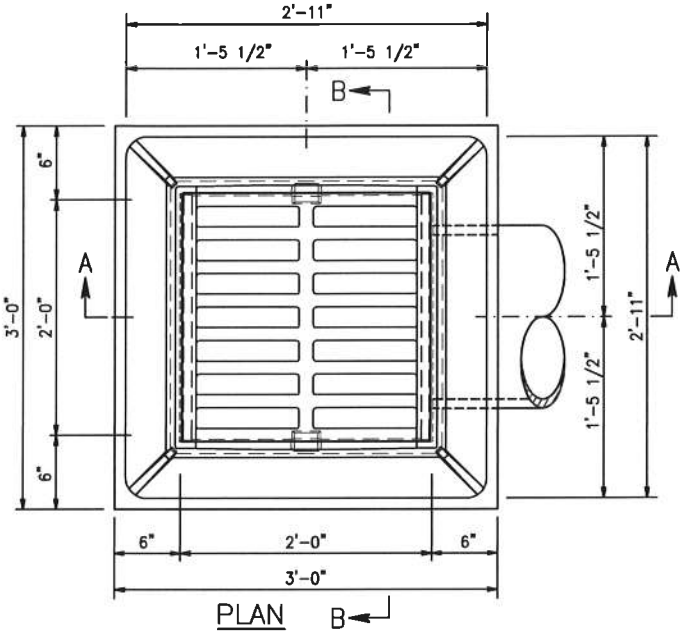


NOTE: SINGLE OPENING SAME AS DOUBLE EXCEPT ONLY ONE END IS OPEN.

ISOMETRIC VIEW
(DOUBLE OPENING SHOWN)

NOTE: MDSHA ST. NO. MD 378.03

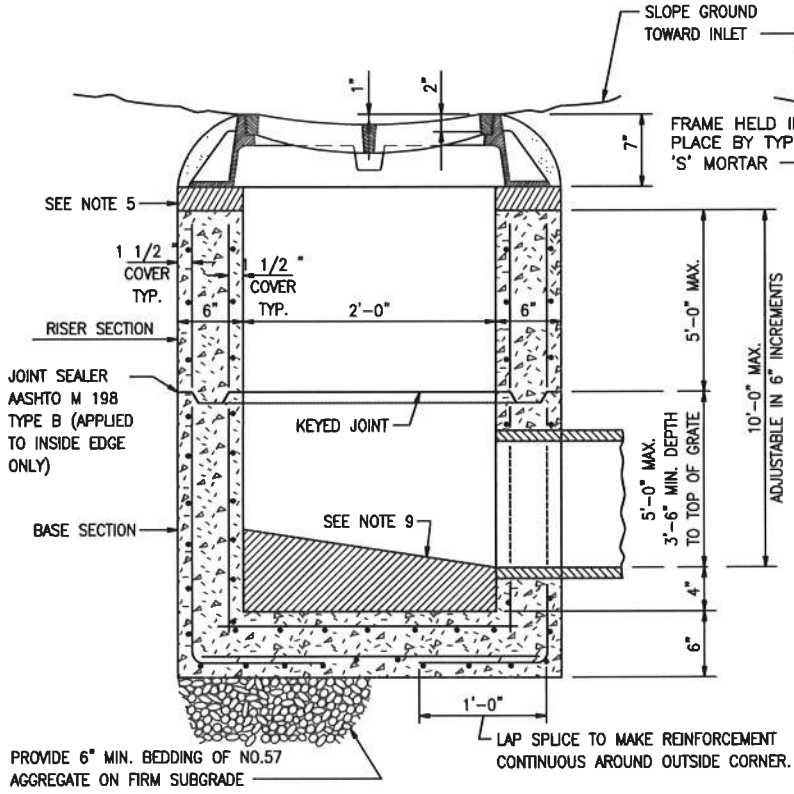
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS STANDARD SINGLE OR DOUBLE OPENING INLET OPEN-END GRATE NON-TRAFFIC AREAS
TOWN ENGINEER 4/12/11 DATE		
ISSUED: MARCH 29, 2011		STANDARD NO. SD-3.03



PLAN B

GENERAL NOTES

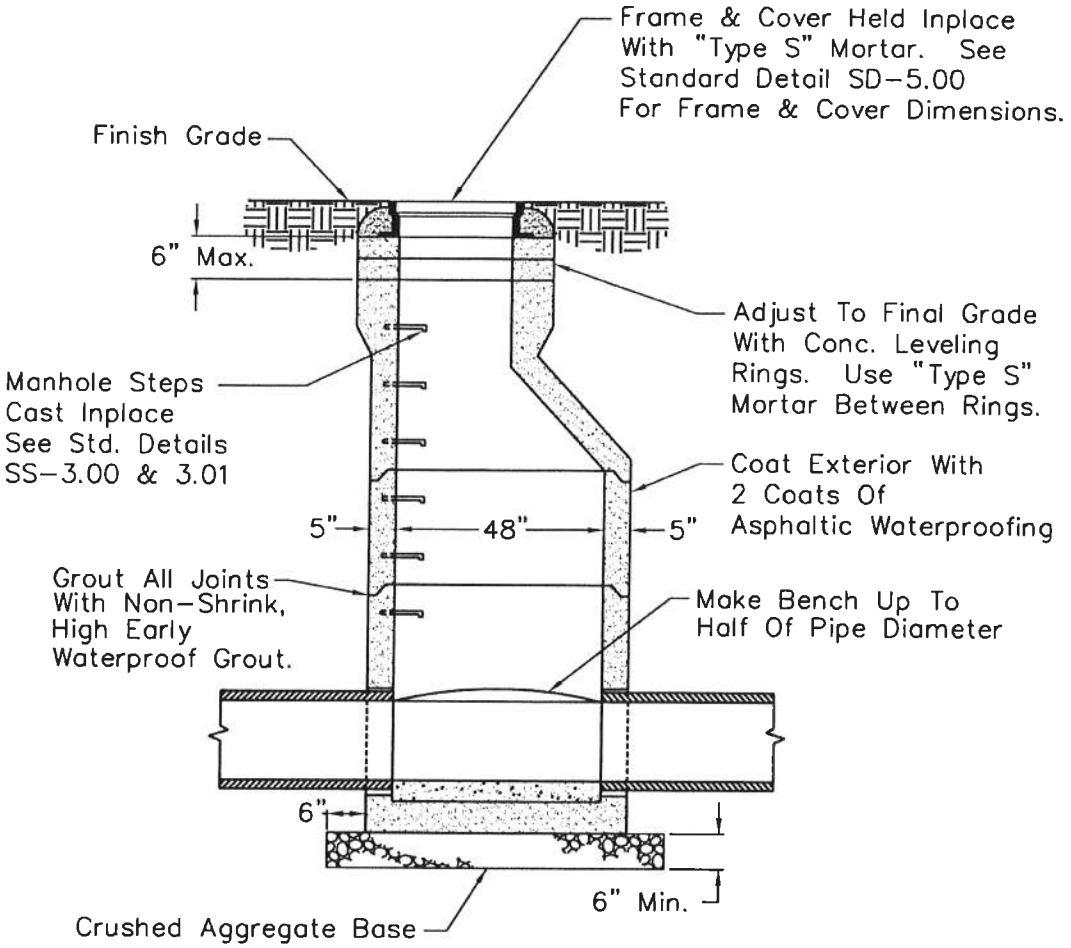
1. CONCRETE TO BE MIX 4500 PSI
2. REINFORCING–2 LAYERS OF 4x4–W4.0x W4.0 WELDED WIRE FABRIC.
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANDLING.
4. FRAME AND GRATE TO BE NEENAH #R–3348 HEAVY DUTY CONCAVE GUTTER INLET FRAME AND GRATE OR APPROVED EQUAL.
5. GRADE AND SLOPE ADJUSTMENTS TO BE COMPLETED IN THE FIELD USING CONCRETE OR BRICK AND MORTAR. MIN. ONE LAYER OF BRICK OR 3" OF CONCRETE.
6. PIPE OPENINGS TO BE PROVIDE AS REQUIRED, FOR SIZE, LOCATION AND INVERT ELEVATIONS.
7. MINIMUM DEPTH PAYMENT PER "EACH" INLET INCLUDES DEPTHS UP TO 3'–6" MEASURED FROM THE PIPE INVERT TO THE TOP OF THE GRATE. VERTICAL DEPTH PAYMENT PER LINEAR FOOT FOR DEPTHS IN EXCESS OF 3'–6".
8. INVERT TO BE CONCRETE OR BRICK AND SHALL SLOPE 2" PER FOOT TOWARD OUTLET OR AS DIRECTED BY THE ENGINEER.



SECTION A–A

SECTION B–B

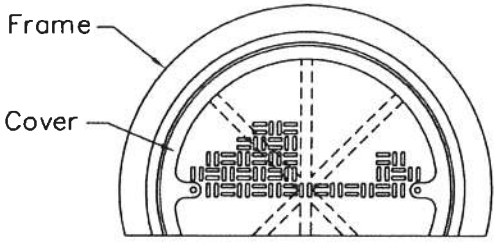
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE		TRAFFIC BEARING YARD INLET
ISSUED: MARCH 30, 2011		STANDARD NO. SD–3.04



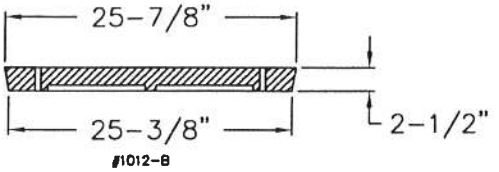
Notes:

1. Precast Manhole Shall Conform To ASTM C-478-78a As Manufactured By: York Concrete Septic Tanks Inc. York Pa. Or An Approved Equal.
2. Bench And Channel Shall Be Brick Or Hand Formed Concrete. Min. Thickness Of 4", Bench Shall Slope To Top Of Pipe 1/2" Fall Per Foot.
3. Mortar Shall Be "Type S".
4. Manhole Steps Required Over The Effluent Side As Shown.

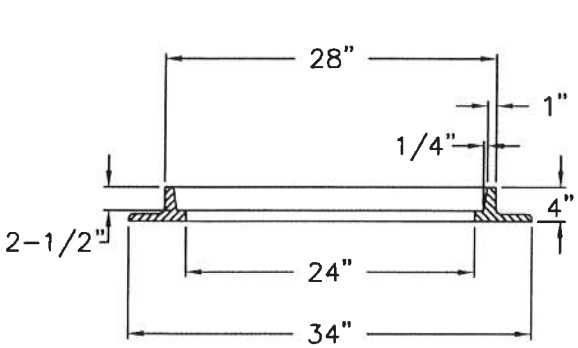
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS PRECAST CONCRETE MANHOLE
Talbot W Bane 4/25/06 EU MANAGER OF ENGINEERING DATE	MAY 1, 89 AUG 1, 94 MAR 1, 98 FEB 1, 02	
ISSUED: MAY 1, 1986		STANDARD NO. SD-4.00



Cover Shall Be Lettered
"STORM DRAIN"



#1012-B



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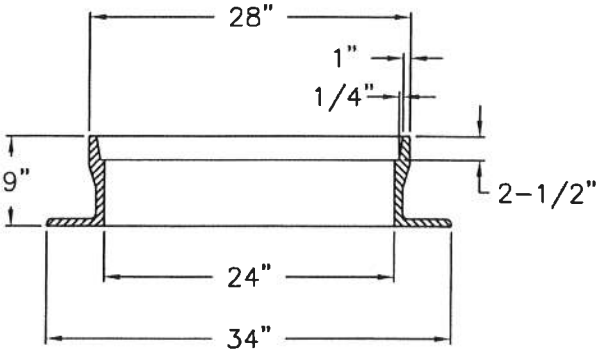
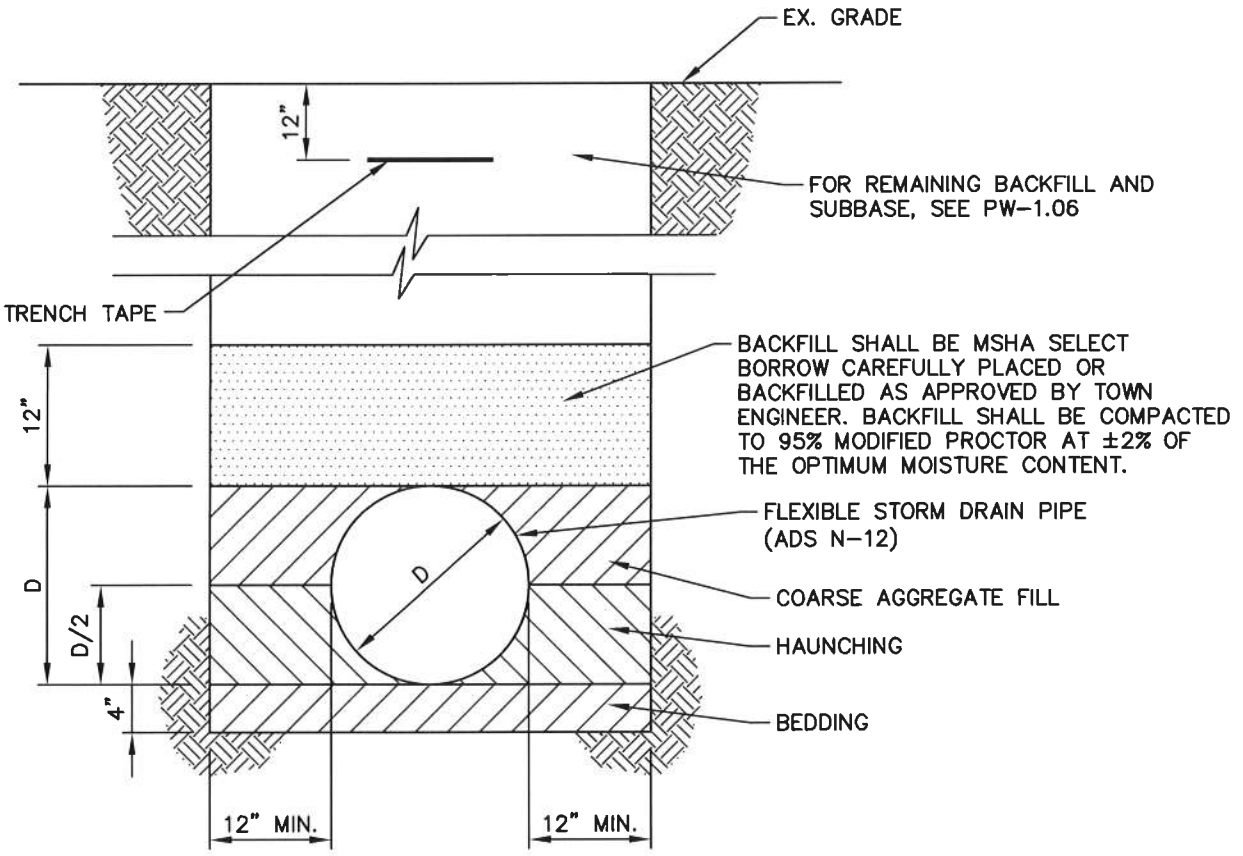


#1940

Notes:

1. Casting Shall Conform To ASTM A-48-64 Class 35B Iron Minimum.
2. Casting Shall Have Ground Or Machined Bearing Surfaces.
3. Casting Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Heavy Duty Roadway Type.
5. "Pick Holes" Are Required In Cover.
6. Frame & Cover Shall Be As Indicated And As Manufactured By E.A. Quirin Foundry, Box 98 St. Clair, PA 17970, Or An Approved Equal.

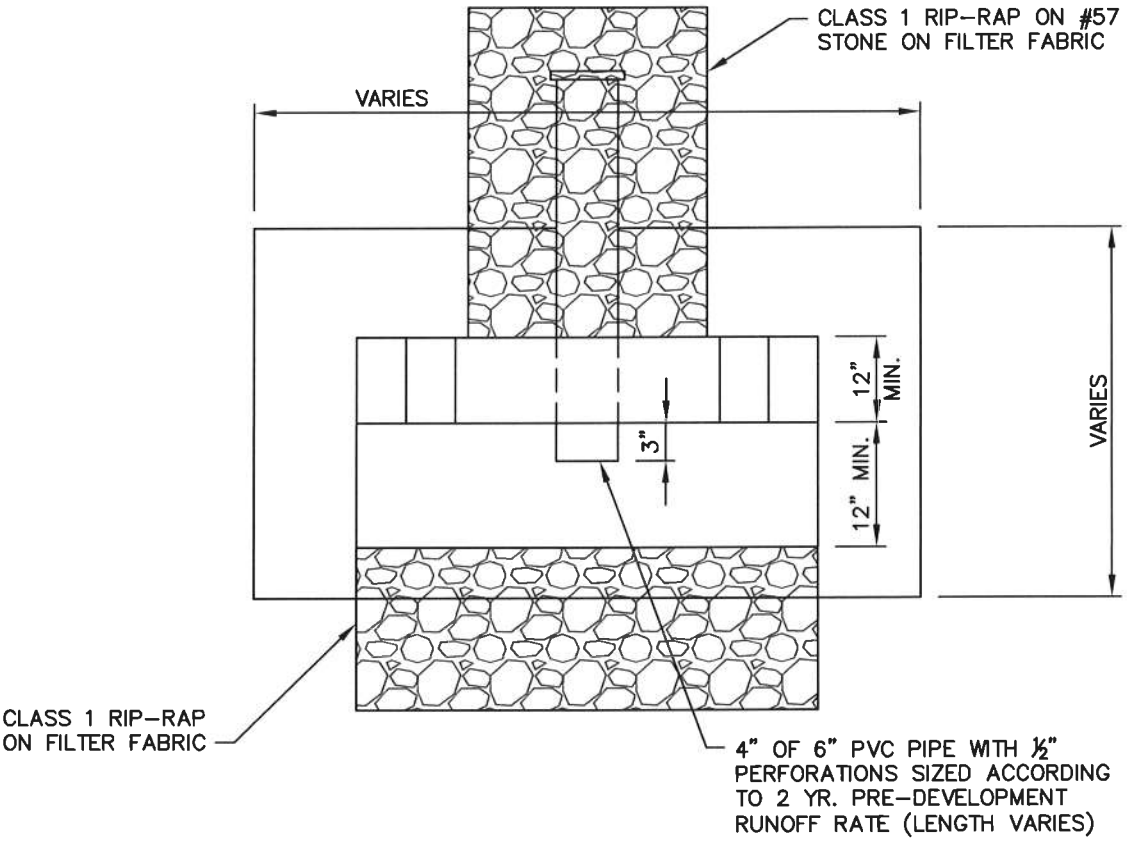
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bruce 2/1/06	AUG 1, 94	MANHOLE FRAME & COVER
EU MANAGER OF ENGINEERING DATE	FEB 1, 06	
ISSUED: MAY 1, 1986		STANDARD NO. SD-5.00

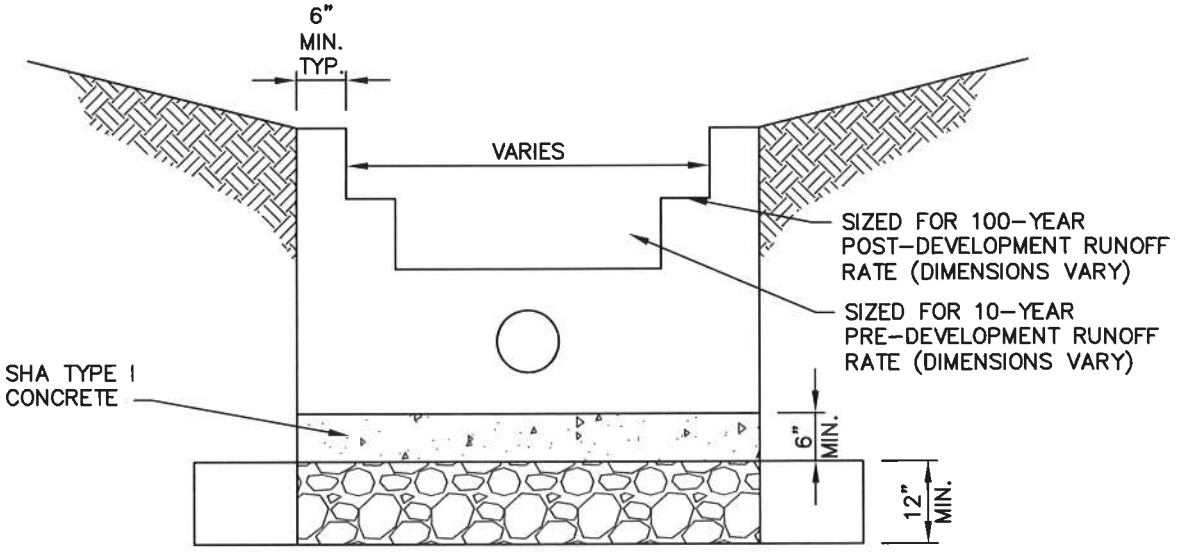


NOTES:

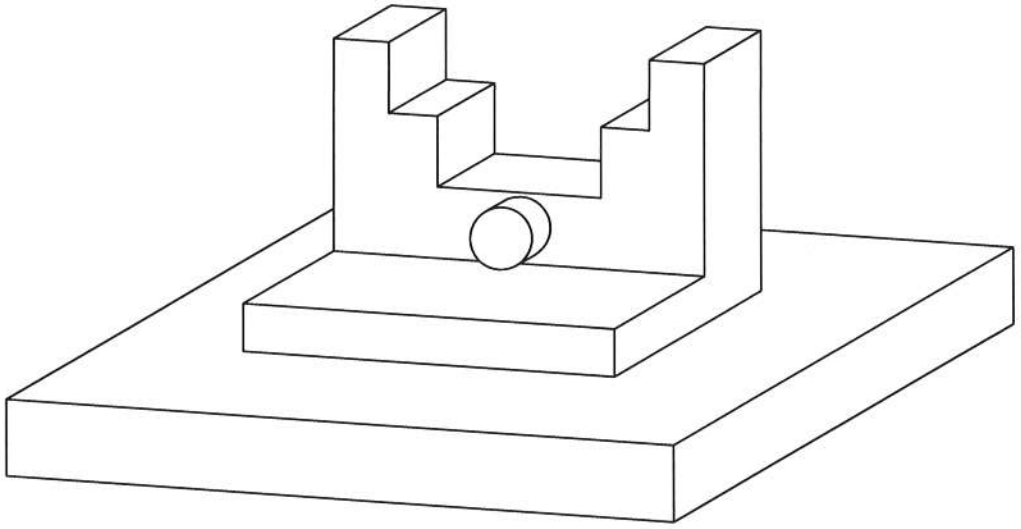
1. BEDDING, HAUNCHING AND FILL MATERIAL TO THE TOP OF THE PIPE SHALL BE COARSE AGGREGATE MEETING THE REQUIREMENTS OF ASSHTO M43-SIZE NUMBER 57.
2. DURING HAUNCHING, CONTRACTOR SHALL CAREFULLY WORK GRAVEL DOWN AROUND THE BOTTOM OF THE PIPE.
3. RCP SHALL BE UTILIZED UNDER ALL PAVED AREAS.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	FLEXIBLE STORM DRAIN PIPE TRENCH
ISSUED: FEB 25, 2009		STANDARD NO. SD-6.00





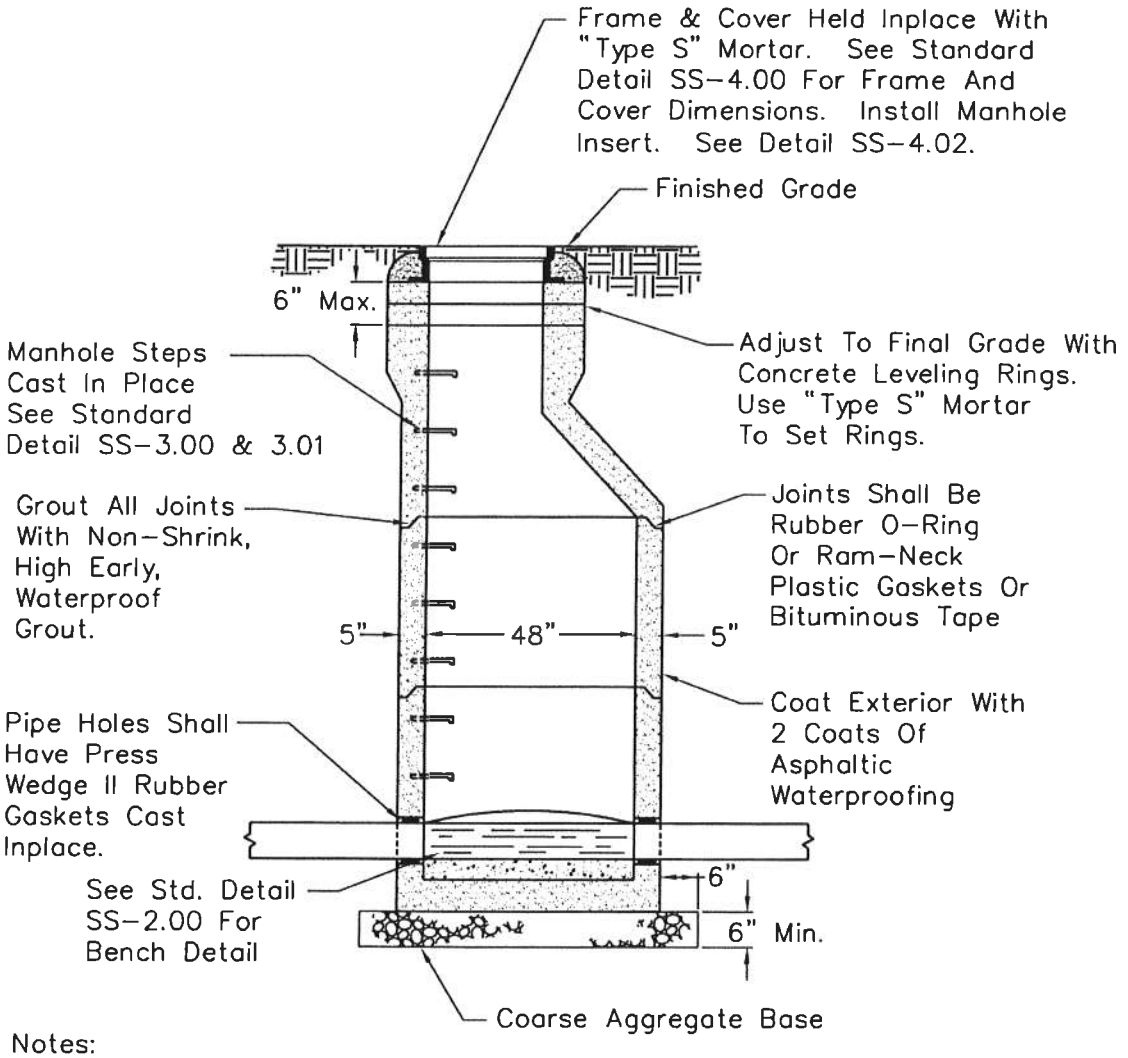
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER — DATE 4/12/11	JAN 1, 11	STORMWATER MANAGEMENT OUTLET WEIR
ISSUED: FEB 25, 2009		STANDARD NO. SD-7.00A



NOTE:

1. ACTUAL DIMENSIONS WILL VARY WITH SPECIFIC APPLICATION.
2. THIS AND OTHER OUT FALL DEVICES/STRUCTURES TO BE APPROVED IN CONJUNCTION WITH A STORM WATER MANAGEMENT PLAN AND CALCULATIONS BY A PROFESSIONAL ENGINEER.

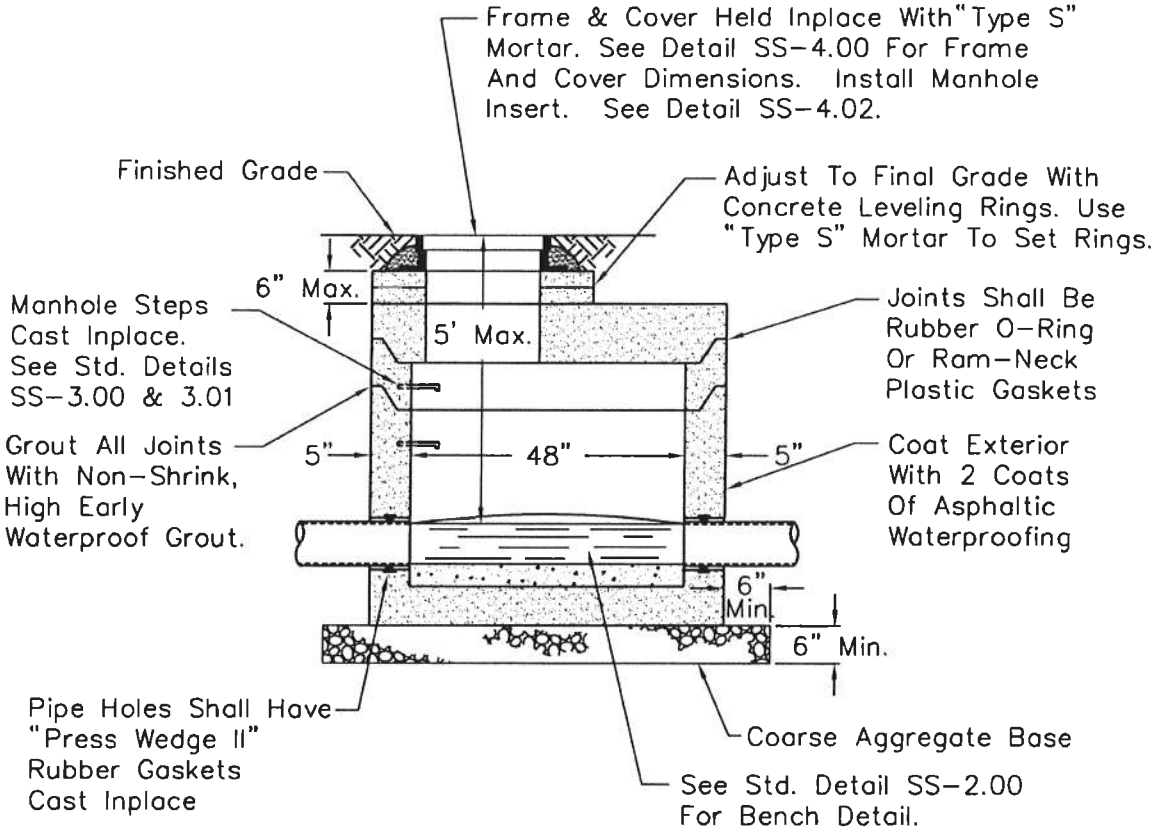
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	STORMWATER MANAGEMENT OUTLET WEIR
ISSUED: FEB 25, 2009		STANDARD NO. SD-7.00B



Notes:

1. Precast Manhole Shall Conform To ASTM C-478(Latest) As Manufactored By: York Concrete Septic Tanks Inc. York Pa. Or An Approved Equal.
2. Mortar Shall Be "Type S".
3. Bench And Channel Shall Be Brick Or Hand Formed Concrete. Min. Thickness Of 4", Bench Shall Slope To Top Of Pipe 1/2" Fall Per Foot.
4. Manhole Steps Required Over Effluent Side As Shown.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS PRECAST CONCRETE MANHOLE
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	MAY 1, 89 AUG 1, 94 MAR 9, 95 FEB 1, 02	
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.00

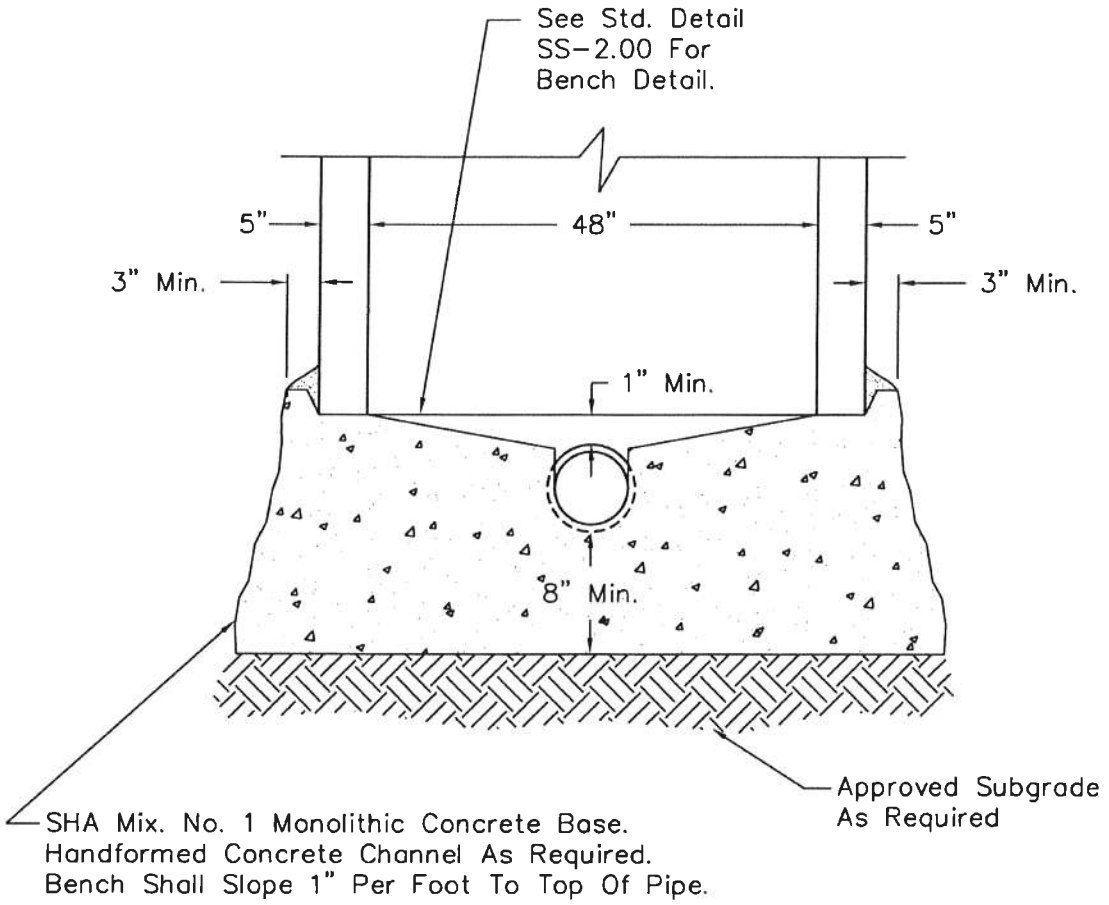


Notes:

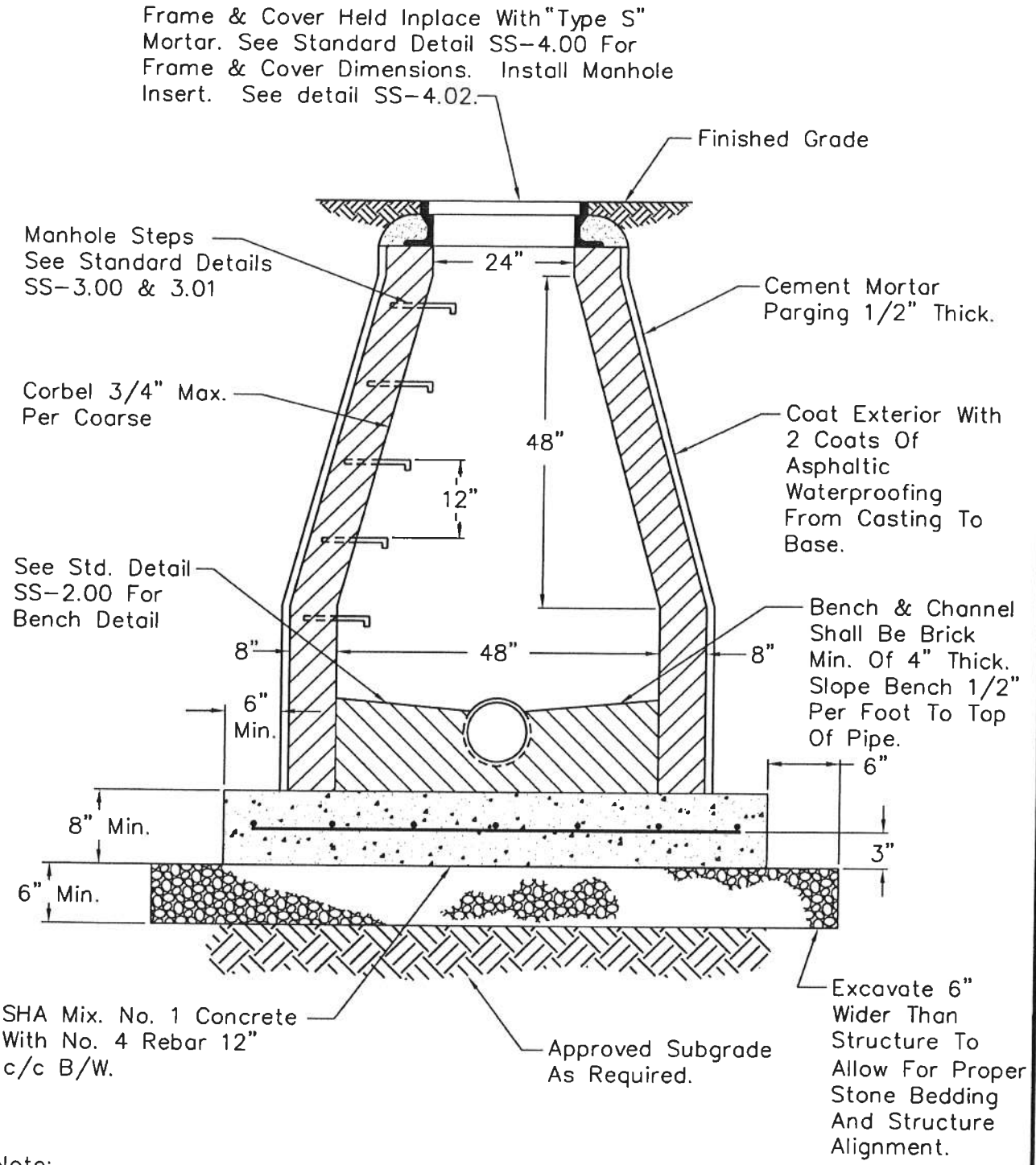
1. Precast Manhole Shall Conform To ASTM C-478-78A As Manufactored By: York Concrete Septic Tanks Inc. York Pa. Or An Approved Equal.
2. Mortar Shall Be "Type S".
3. Bench And Channel Shall Be Brick Or Handformed Concrete. Min. Thickness Of 4", Bench Shall Slope To Top Of Pipe 1/2" Fall Per Foot.
4. Manhole Steps Required Over Effluent Side As Shown.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS SHALLOW PRECAST MANHOLE
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	MAY 1, 89 AUG 1, 94 MAR 9, 95 FEB 1, 02	
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.01

Seal Manhole Riser To The Monolithic Base With A Cement-Based Quick-Set, Hydraulic Compound.



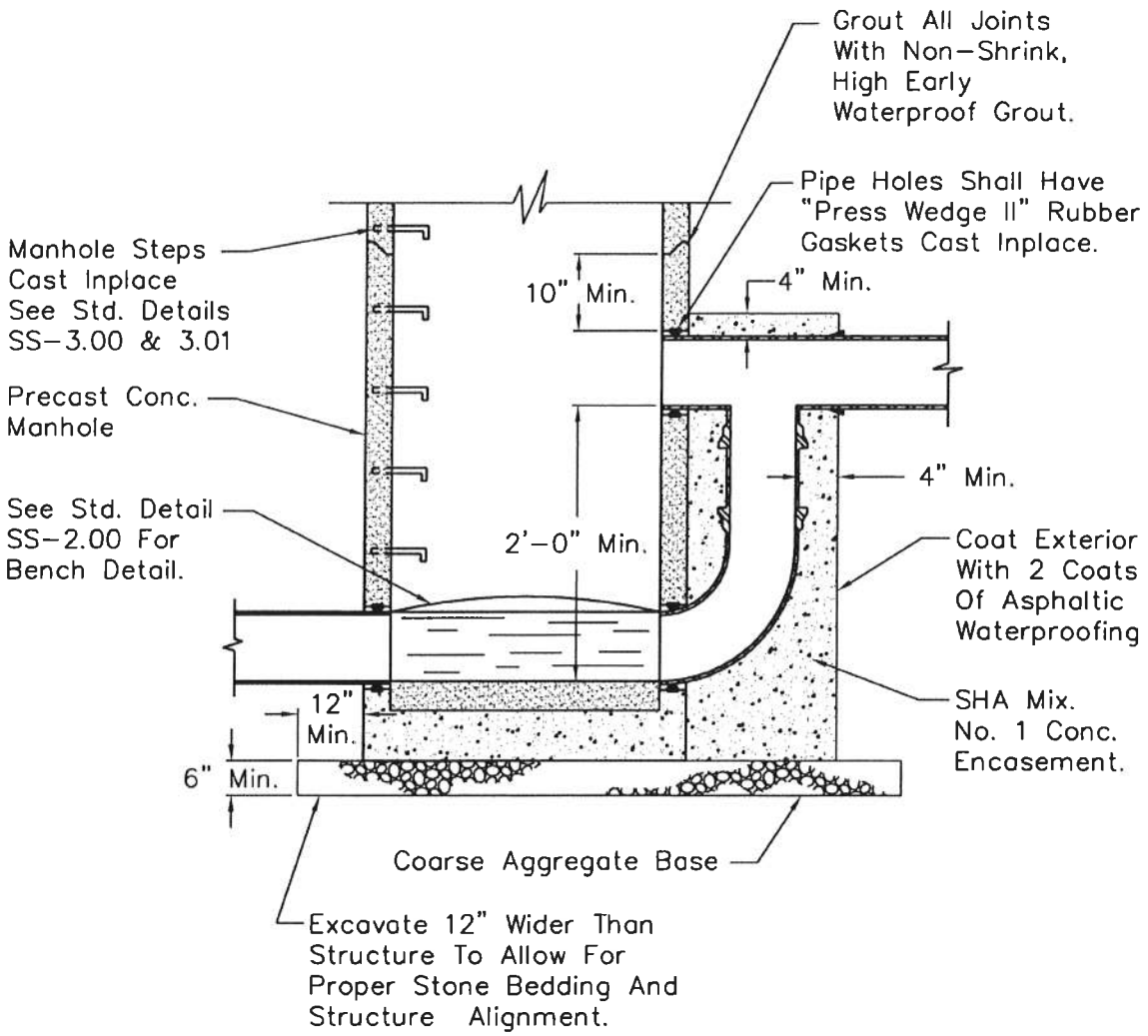
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS ALTERNATE MANHOLE BASE (MONOLITHIC CONCRETE)
Talbott W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.02



Note:

1. Mortar Shall Be "Type S".

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	MAR 1, 94 AUG 1, 94 MAR 1, 98	BRICK MANHOLE
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.03



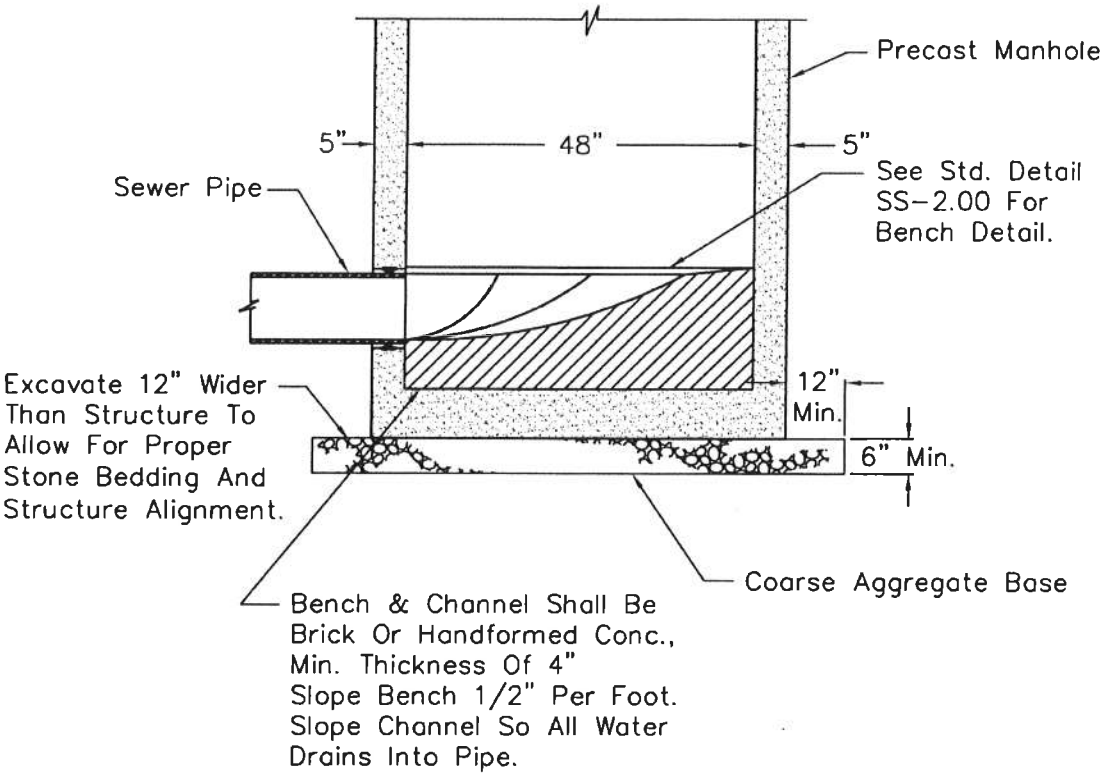
Notes:

1. Precast Manhole Shall Conform To ASTM C-478-78a As Manufactured By: York Concrete Septic Tanks Inc. York Pa. Or An Approved Equal.

2. Bench & Channel Shall Be Brick Or Handformed Concrete Min. Thickness Of 4", Bench Shall Slope To Top Of Pipe 1/2" Fall Per Foot. Mortar Shall Be "Type S".

3. Manhole Steps, Frame & Cover Shall Be Centered Over Effluent Side Of Manhole.

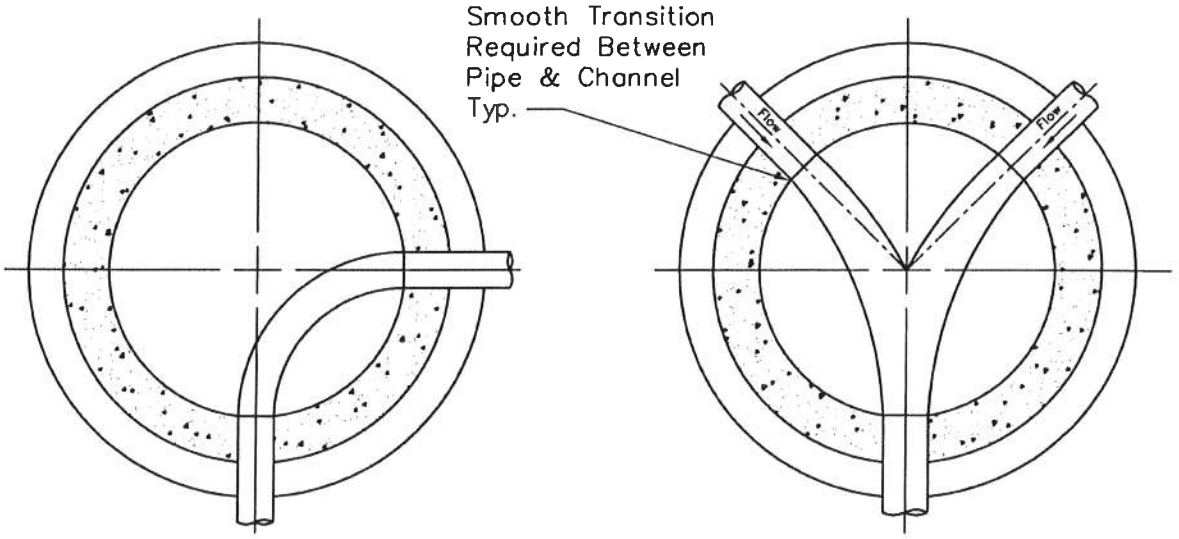
APPROVAL	REVISED	
Talbot W Bruce 4/25/06 EU MANAGER OF ENGINEERING DATE	MAY 1, 89 AUG 1, 94 MAR 9, 95 MAR 1, 98	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS DROP MANHOLE
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.04



Notes:

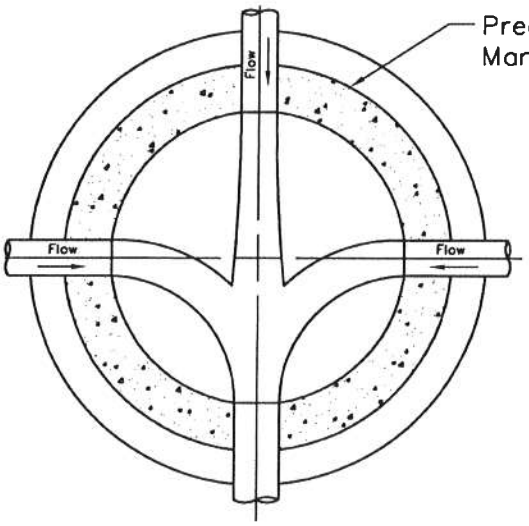
1. Precast Manhole Shall Conform To ASTM C-478-78A As Manufactored By: York Concrete Septic Tanks Inc. York Pa. Or An Approved Equal.
2. Mortar Shall Be "Type S".
3. Concrete Shall Be SHA Mix. No. 1.

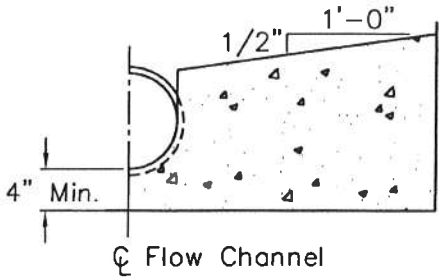
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bare 4/25/06	MAY 1, 89	
EU MANAGER OF ENGINEERING DATE	MAR 1, 98	
		TERMINAL MANHOLE
ISSUED: MAY 1, 1986		STANDARD NO. SS-1.05



Flow Channel Notes:

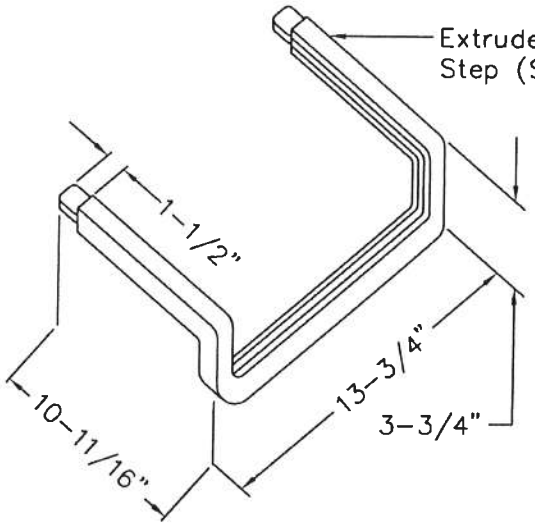
1. Flow Channels Shall Be Either Brick Or Concrete, 4" Min. Thickness. Use "Type S" Mortar For Brick Channels. Concrete Shall Be SHA Mix No. 1.
2. Channel Width Shall Match Inside Diameter Of Incoming And Outgoing Pipes. Blend Channel For Smooth Transition.
3. Bench To Be Installed To Top Of Pipe, See Detail.



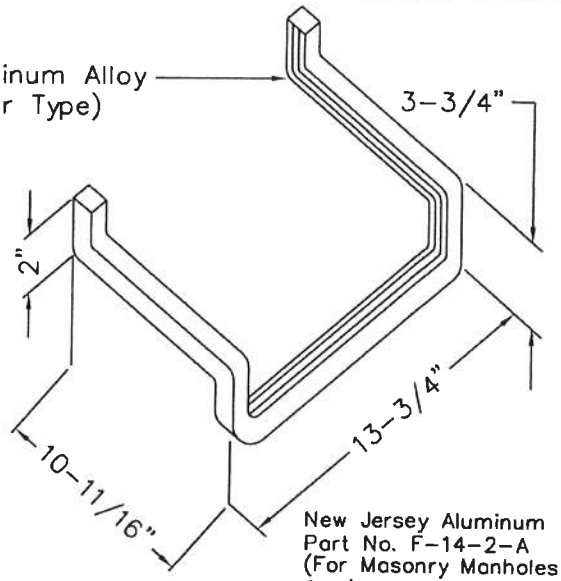


Bench Detail

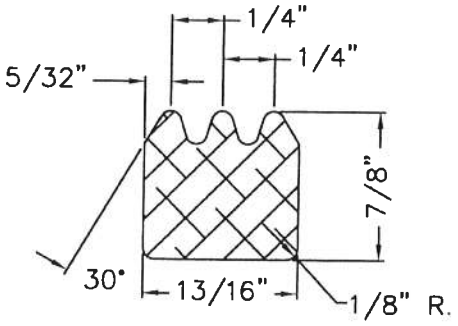
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS MANHOLE FLOW CHANNELS
Talbot W Bale 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: MAY 1, 1986		STANDARD NO. SS-2.00



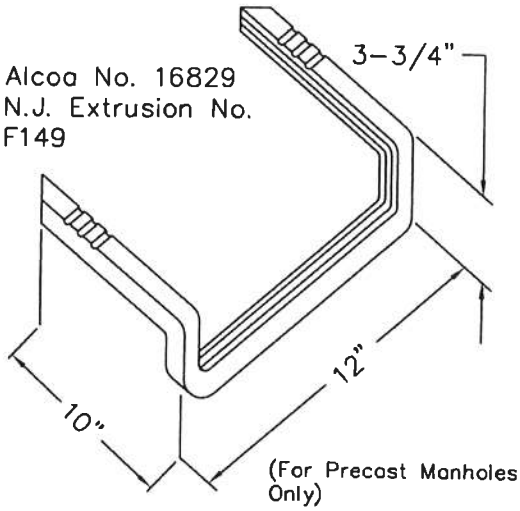
New Jersey Aluminum
Part No. F-14-7-DF-A
(For Precast Manholes
Only)



New Jersey Aluminum
Part No. F-14-2-A
(For Masonry Manholes
Only)



Typical Cross Section
Of Steps



Alcoa No. 16829
N.J. Extrusion No.
F149

(For Precast Manholes
Only)

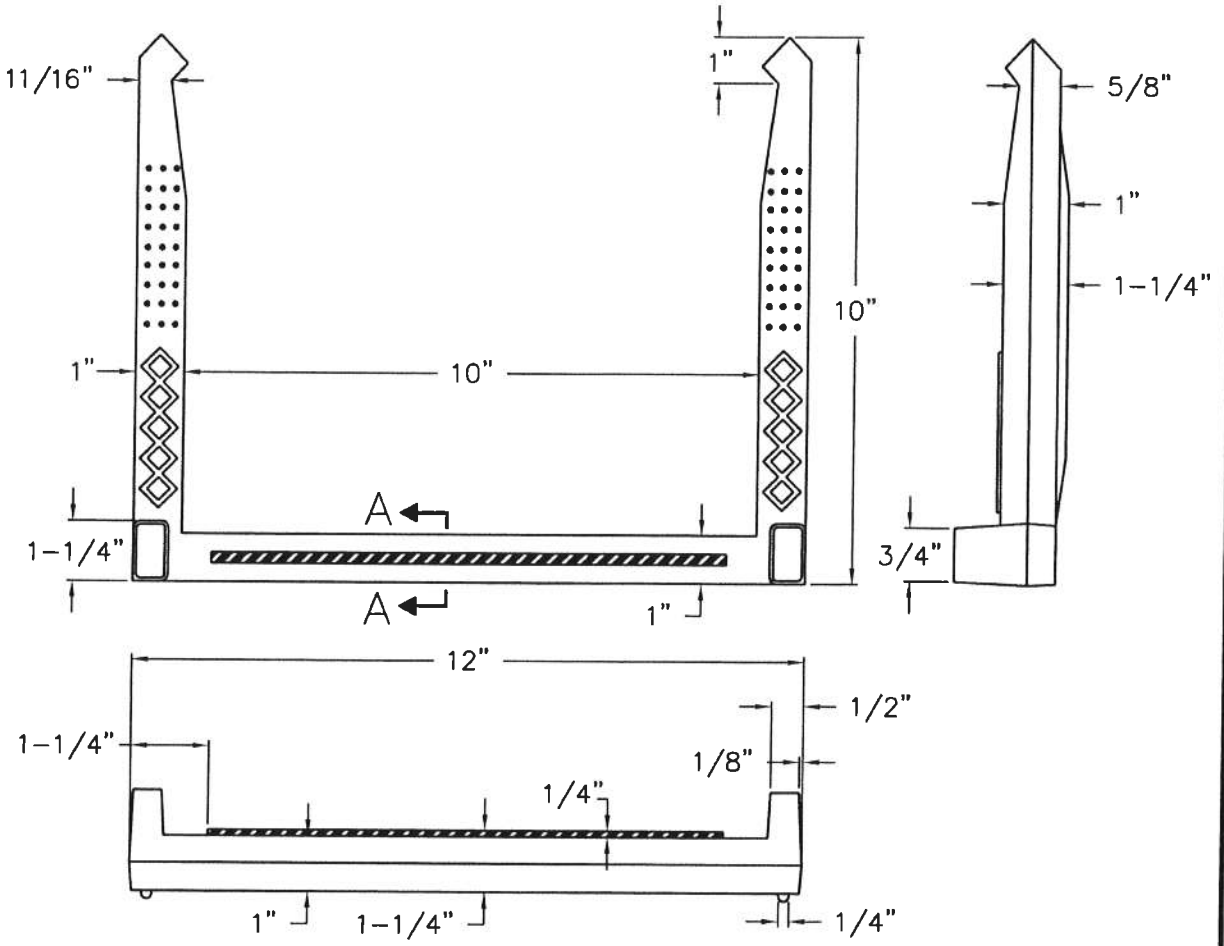
Notes:

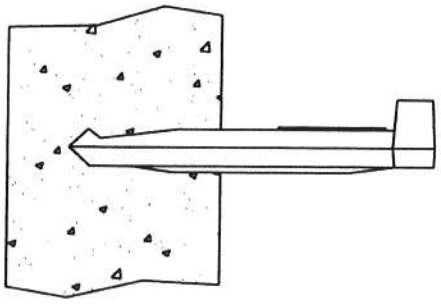
1. Steps Shall Be Extruded Aluminum. Aluminum Shall Be Aluminum Alloy Conforming To ASTM B221 Alloy 6061-T6 As Manufactured By D & D Products, Uhrichsville, Ohio 44683.

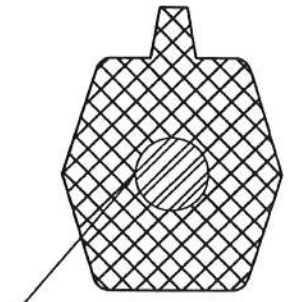
2. Minimum Embedding Depths:
   F-14-2-A 4"
   F-14-7-DF-A Per ASTM-C-478 (Currently 3")

3. Embedded Portion Of Steps Shall Be Coated With Zinc Chromate Or An Approved Equal.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS MANHOLE STEPS ALUMINUM
Talbot W Bauer 4/25/00 EU MANAGER OF ENGINEERING DATE	MAR 1, 94 AUG 1, 94	
ISSUED: MAY 1, 1986		STANDARD NO. SS-3.00





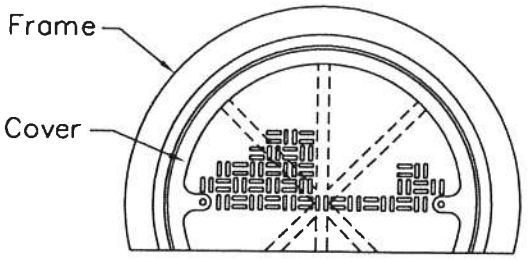


SECTION A~A

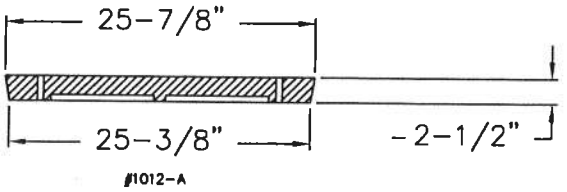
Notes:

1. Steps Shall Be Placed Into Wet Concrete Wall During Manufacture Or Mortared Into Holes After Concrete Has Set.
1. Step Shall Be As Indicated And Manufactured By M.A. Ind., Inc. P.O. Box 1922 Kelly & Dividend Dr. Peachtree, GA. 30269.

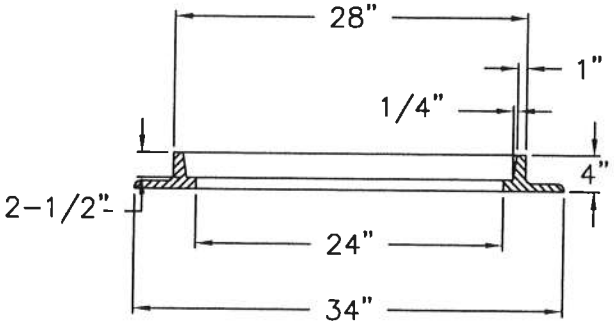
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS MANHOLE STEPS POLYPROPYLENE PLASTIC
Talbot W Lowe 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: AUG 1, 1994		STANDARD NO. SS-3.01



Cover Shall Be Lettered
"SANITARY SEWER"

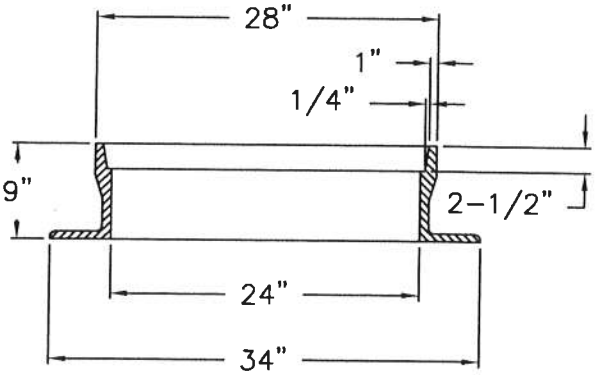


#1012-A



Frame For Slab Top MH.

#A-2570



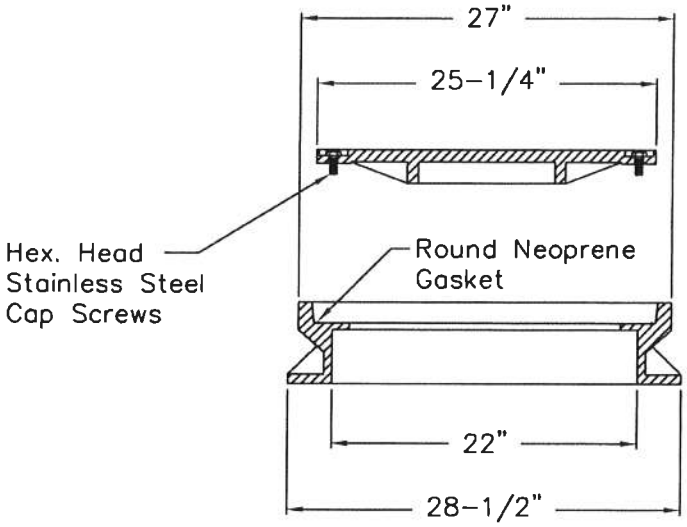
Frame For Standard MH.

#1940

Notes:

1. Casting Shall Conform To ASTM A-48-64 Class 35B Iron Minimum.
2. Casting Shall Have Ground Or Machined Bearing Surfaces.
3. Casting Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Heavy Duty Roadway Type.
5. "Pick Holes" Are Required In Lid.
6. Frame & Cover Shall Be As Indicated And As Manufactured By E.A. Quirin Foundry, Box 98 St. Clair, PA. 17970, Or An Approved Equal.
7. Contractor To Furnish And Install Manhole Insert (SS-4.02) At All Locations.

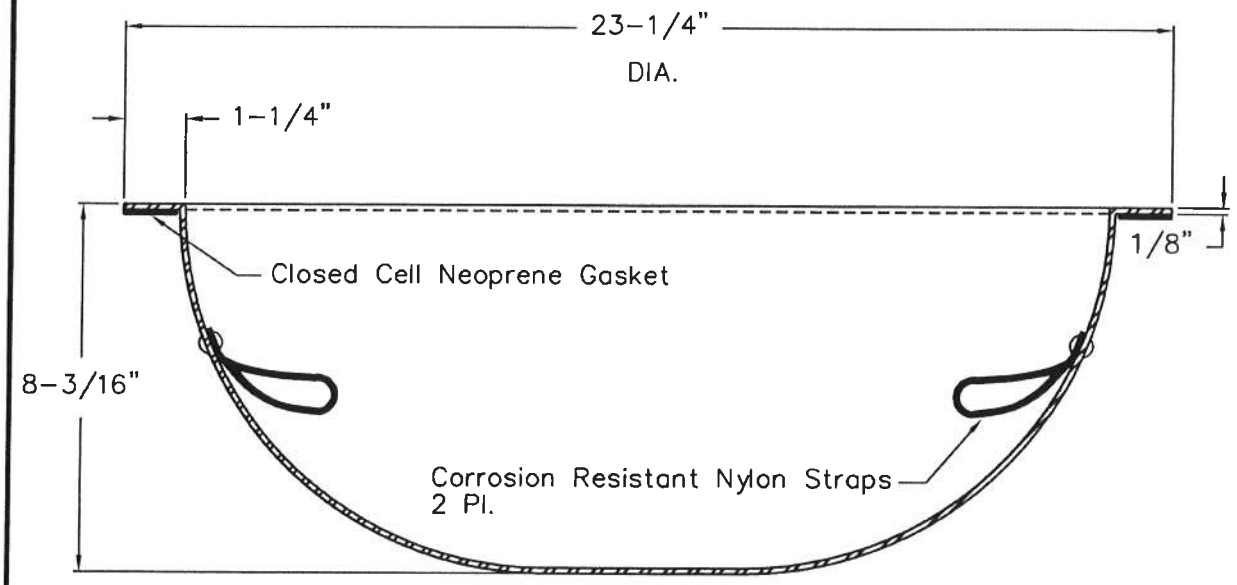
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS MANHOLE FRAME & COVER
Talbot W Bare 2/1/06 EU MANAGER OF ENGINEERING DATE	MAR 1, 94 AUG 1, 94 FEB 1, 06	
ISSUED: MAY 1, 1986		STANDARD NO. SS-4.00



Notes:

1. All Castings Shall Conform To ASTM A48-76 Class 35B Iron Minimum.
2. Casting Shall Have Ground Or Machined Bearing Surfaces.
3. Casting Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Heavy Duty Roadway Type.
5. Casting Shall Be R-1915-E2 As Manufactured By Neenah Foundry Co., Box 729 Neenah Wisconsin, 54956, Or An Approved Equal.
6. Contractor To Furnish And Install Manhole Insert (SS-4.02).

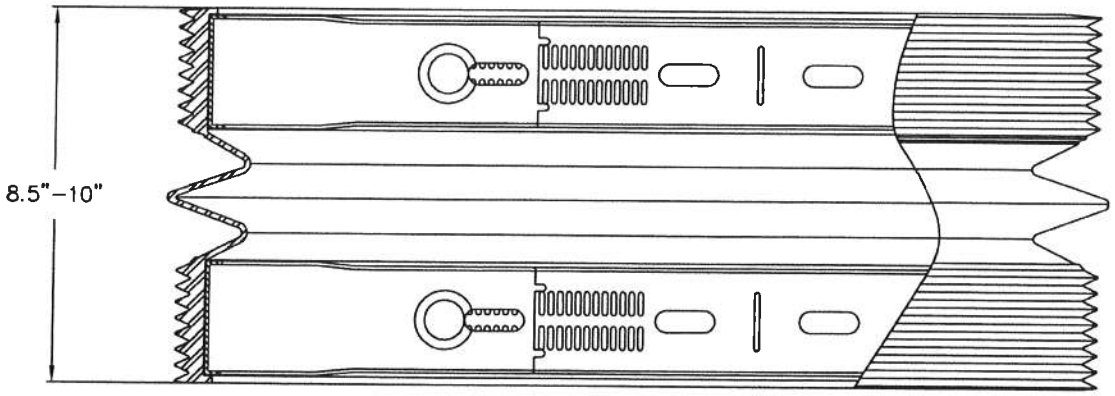
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bare 2/1/06 EU MANAGER OF ENGINEERING DATE	MAR 1, 94 AUG 1, 94 FEB 1, 06	WATERTIGHT MANHOLE FRAME & COVER
ISSUED: MAY 1, 1986		STANDARD NO. SS-4.01



Notes:

1. Manhole Insert Model #1S As Manufactured By Parson Enviromental Products, P.O. Box 4474 Reading, PA. 19606, Or An Approved Equal.
2. Insert Shall Be Placed In All Sanitary Sewer Manholes.

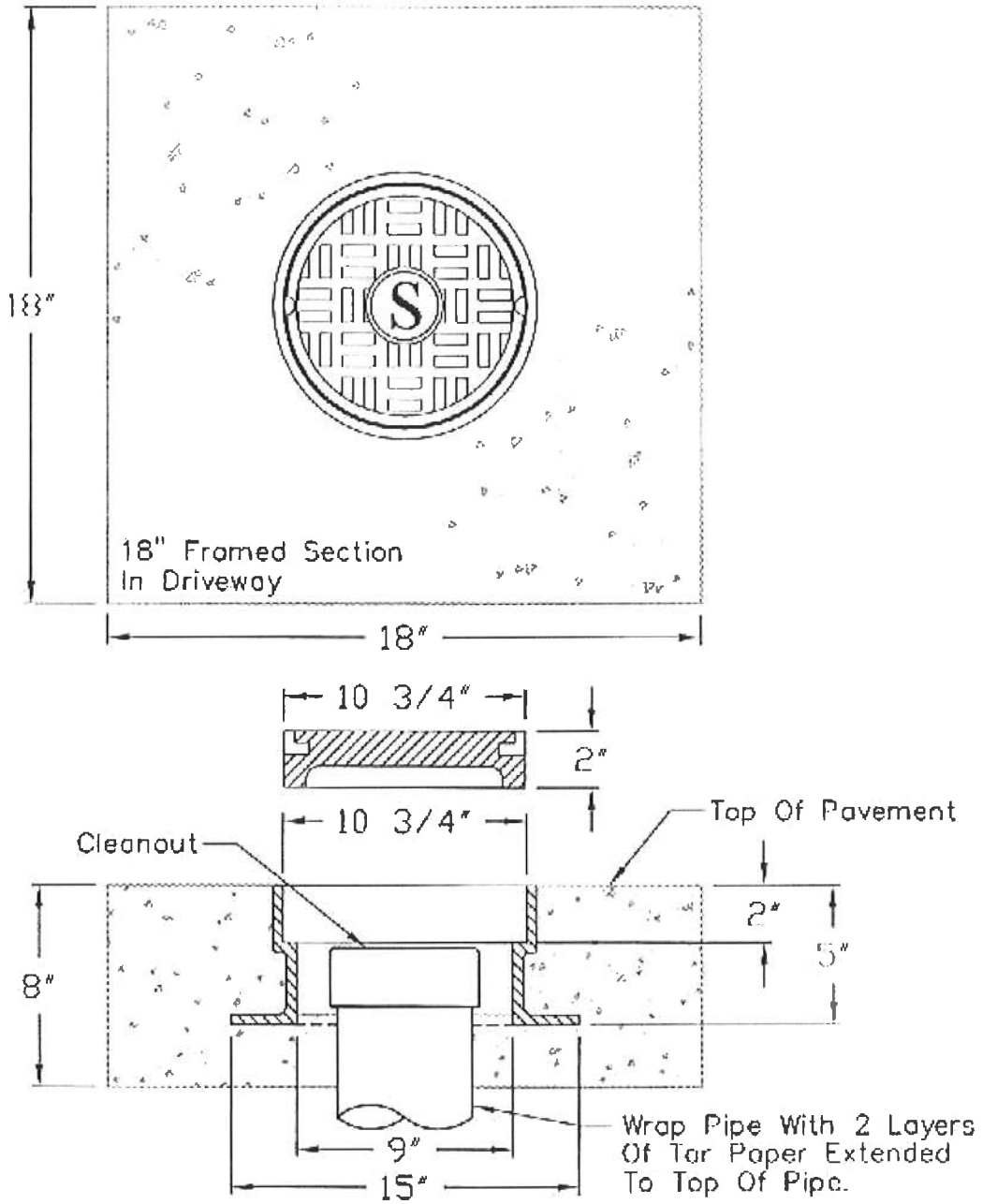
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbott W Bare 4/25/06	MAR 9, 95	
EU MANAGER OF ENGINEERING DATE	AUG 1, 01	
		MANHOLE INSERT #1
ISSUED: AUG 1, 1994		STANDARD NO. SS-4.02



Notes:

1. Manhole Insert Model #1S As Manufactured By Parson Enviromental Products, P.O. Box 4474 Reading, PA. 19606, Or An Approved Equal.
2. Manhole Insert To Be Used When Directed By The Engineer To Eliminate Inflow.

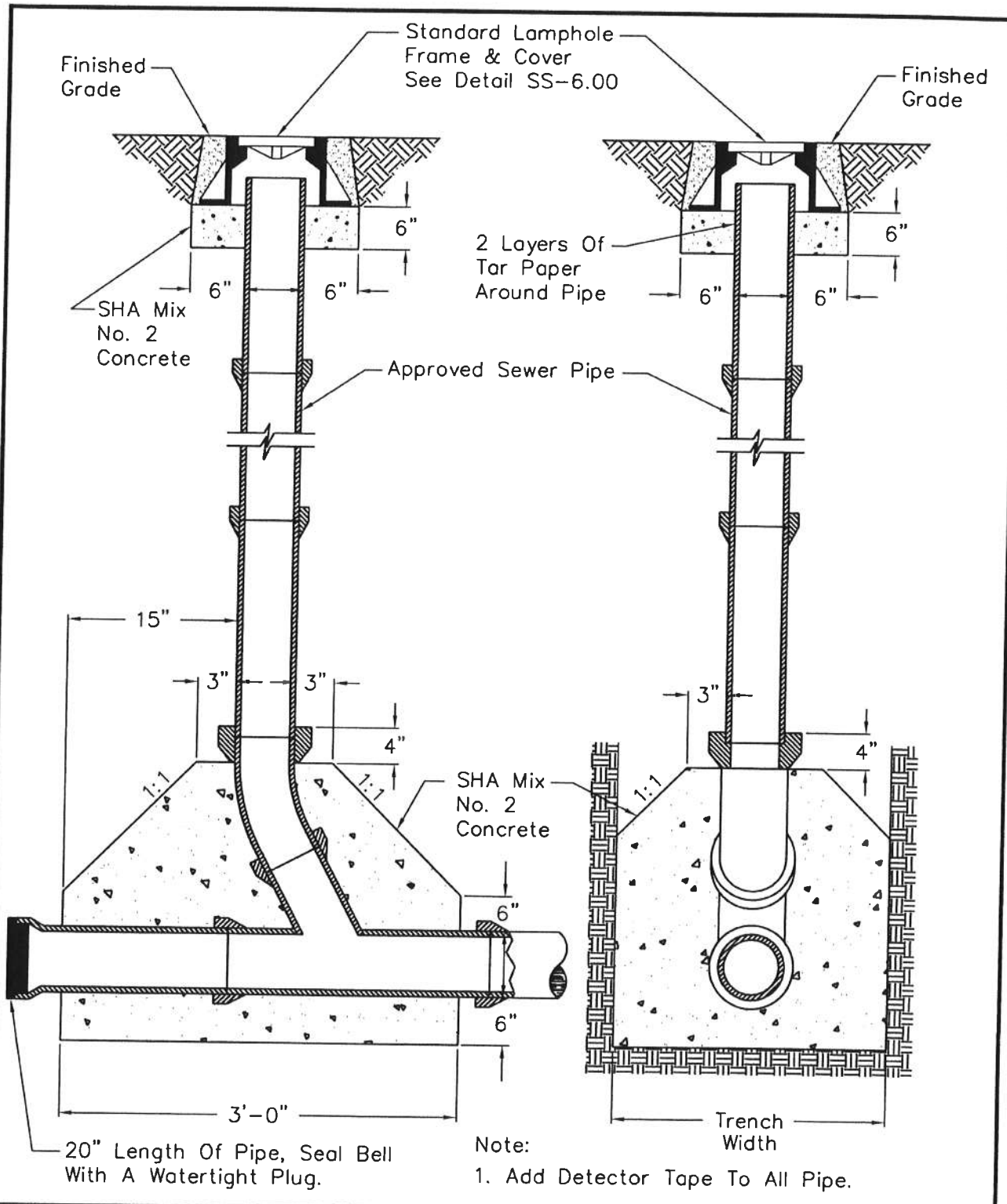
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbott W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	SEP 1, 02	MANHOLE INSERT #2
ISSUED: NOV 1, 1999		STANDARD NO. SS–4.03



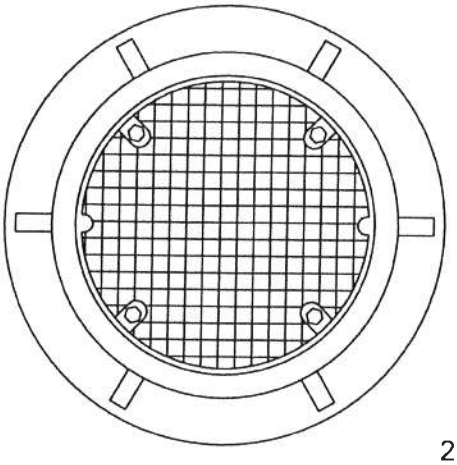
Notes:

1. All Castings Shall Conform To ASTM A48-76 Class 35B Iron Minimum.
2. Casting Shall Have Ground Or Machined Bearing Surfaces.
3. Casting Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Heavy Duty Roadway Type.
5. Casting Shall Be MBX-34B As Manufactured By Sigma Corporation, 700 Goldman Drive, Cream Ridge, NJ 08514, Or An Approved Equal.
6. Assembly To Be Used In Roadways, Sidewalks, Driveways And All Other Paved Areas.

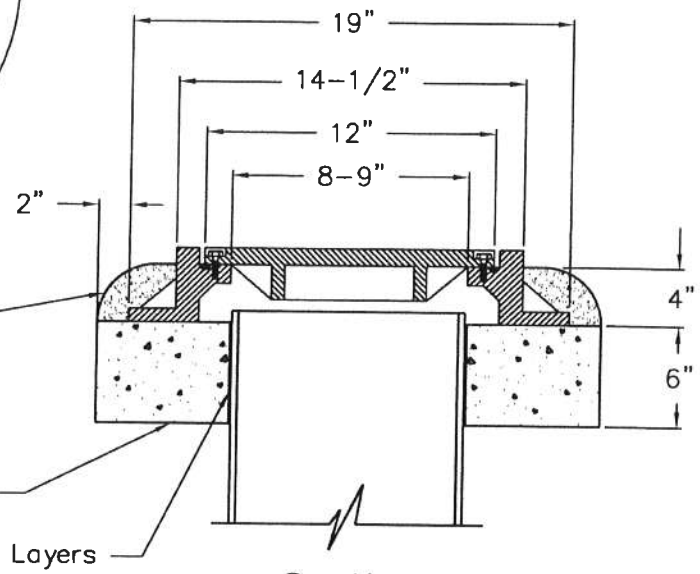
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Bowe 11/1/07 EU MANAGER OF ENGINEERING DATE		DRIVEWAY CLEANOUT COVER
ISSUED: NOV 1, 2007		STANDARD NO. SS-4.04



APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bane 4/25/06	MAR 1, 94	
EU MANAGER OF ENGINEERING DATE	AUG 1, 94	MAINLINE CLEANOUT
ISSUED: MAY 1, 1986		STANDARD NO. SS-5.00



Plan



Grout Inplace With Non-Shrinking, High Early, Waterproof Grout.

SHA Mix No. 2 Conc.

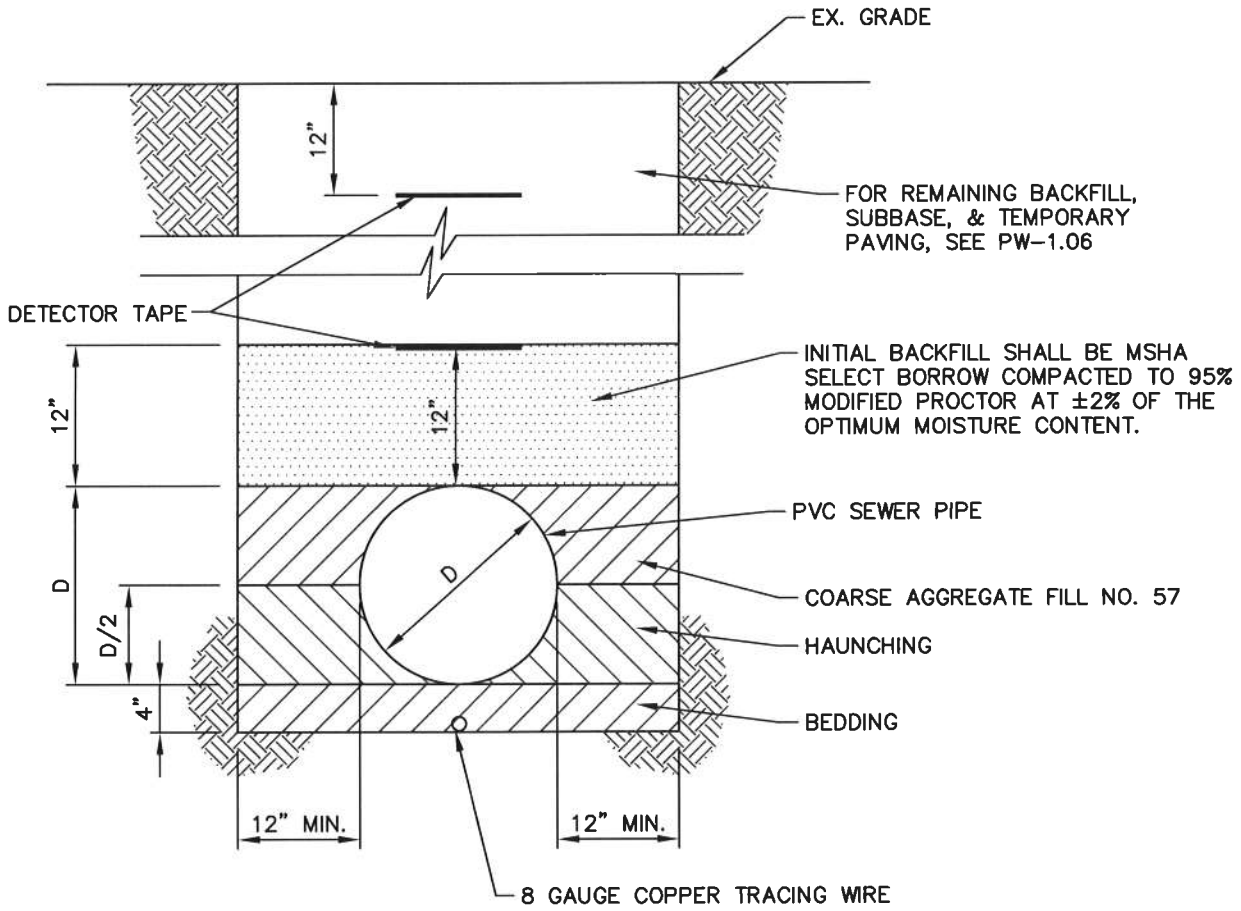
Wrap Pipe With 2 Layers Of Tar Paper Before Placing Conc.

Section

Notes:

1. Castings Shall Conform To ASTM A-48-64 Class 35 Iron Minimum.
2. Castings Shall Have Ground Or Machined Bearing Surfaces.
3. Castings Shall Be Of Uniform Quality, Free From Blow Holes, Porosity, Hard Spots, Shrinkage Defects, Or Other Injurious Defects.
4. Casting Shall Be Heavy Duty Roadway Type.
5. Frame & Cover Shall Be R-1916-A As Manufactured By Neenah Foundry Company, Neenah Wisconsin Or An Approved Equal.

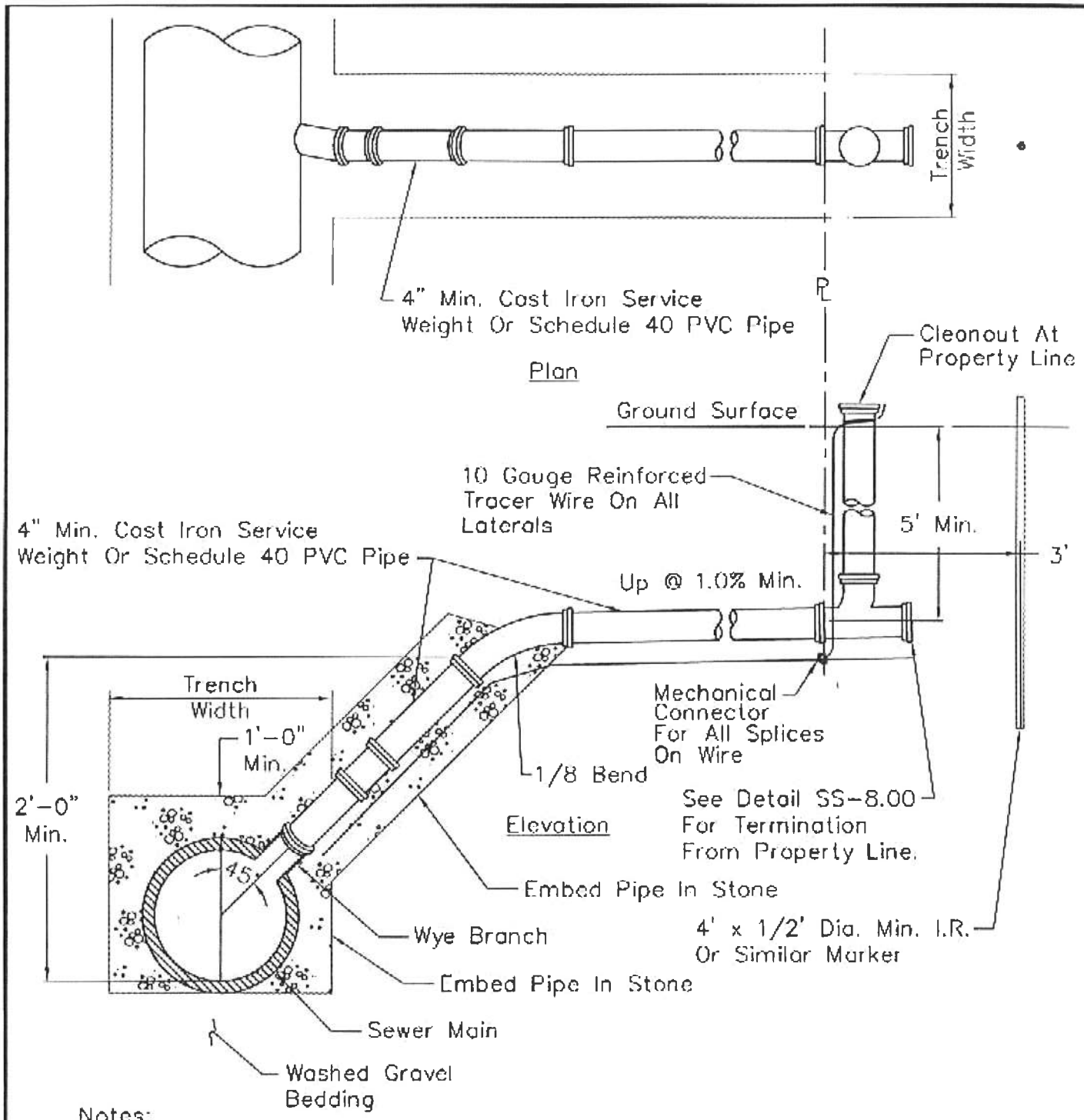
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS WATERTIGHT MAINLINE CLEANOUT FRAME AND COVER
Talbott W Bane 2/1/06	MAR 14, 95	
EU MANAGER OF ENGINEERING DATE	FEB 1, 06	
ISSUED: MAY 1, 1986		STANDARD NO. SS-6.00



NOTES:

1. BEDDING, HAUNCHING AND FILL MATERIAL TO THE TOP OF THE PIPE SHALL BE COARSE AGGREGATE MEETING THE REQUIREMENTS OF ASSHTO M43-SIZE NUMBER 57.
2. DURING HAUNCHING, CONTRACTOR SHALL CAREFULLY WORK GRAVEL DOWN AROUND THE BOTTOM OF THE PIPE.
3. ADD DETECTOR TAPE 12" ABOVE ALL PIPE AND 12" BELOW THE GROUND SURFACE.

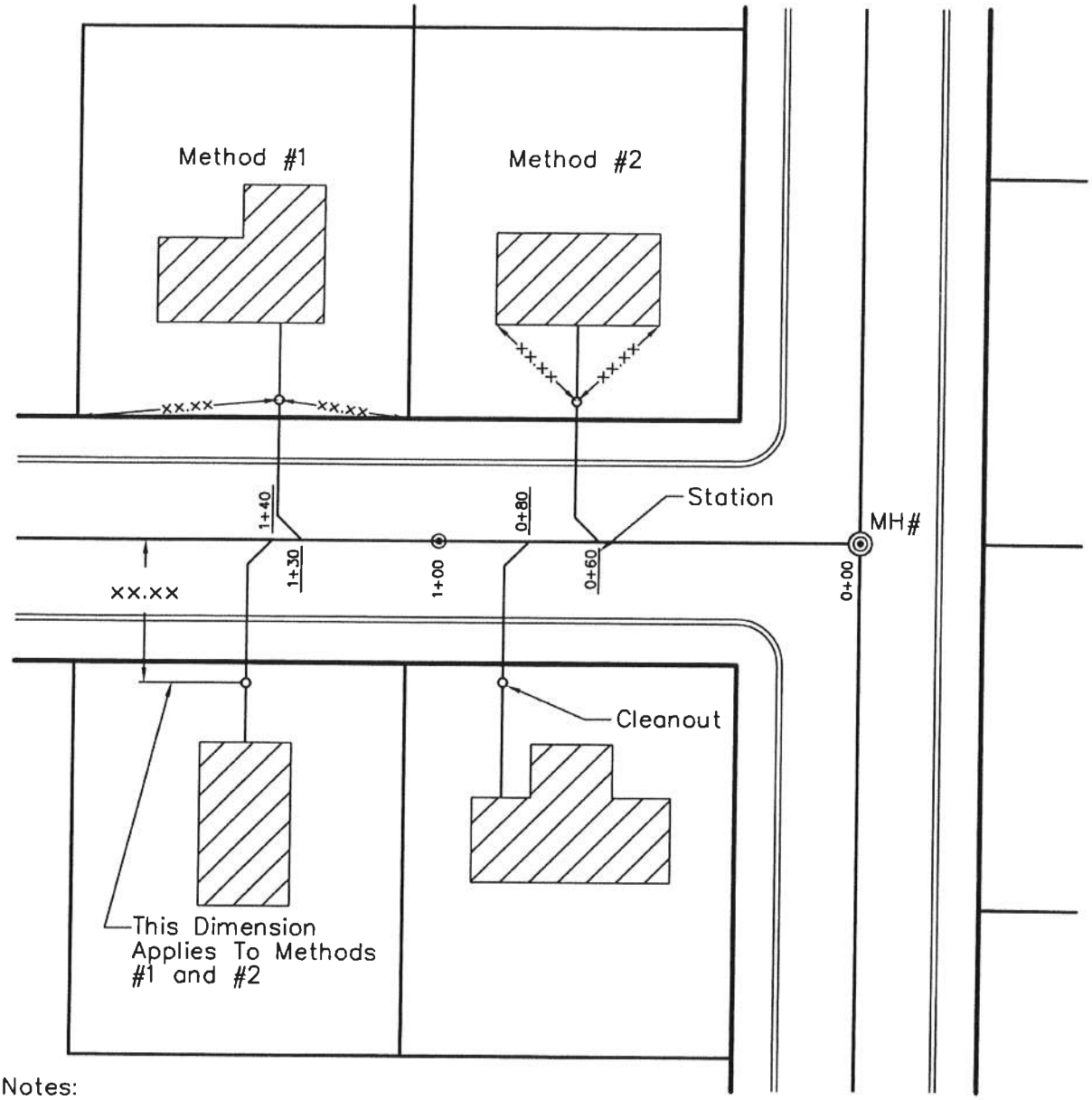
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS PVC SEWER MAIN TRENCH
TOWN ENGINEER — DATE 4/12/11	OCT 11, 10	
	JAN 1, 11	
ISSUED: FEB 25, 2009		STANDARD NO. SS-7.00



Notes:

1. Add Detector Tape To All Pipe.
2. Use Class 50 Ductile Iron For Services With Less Than 3' Of Cover.
3. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
4. Thoroughly Tape Mechanical Connections With Electrical Tape.

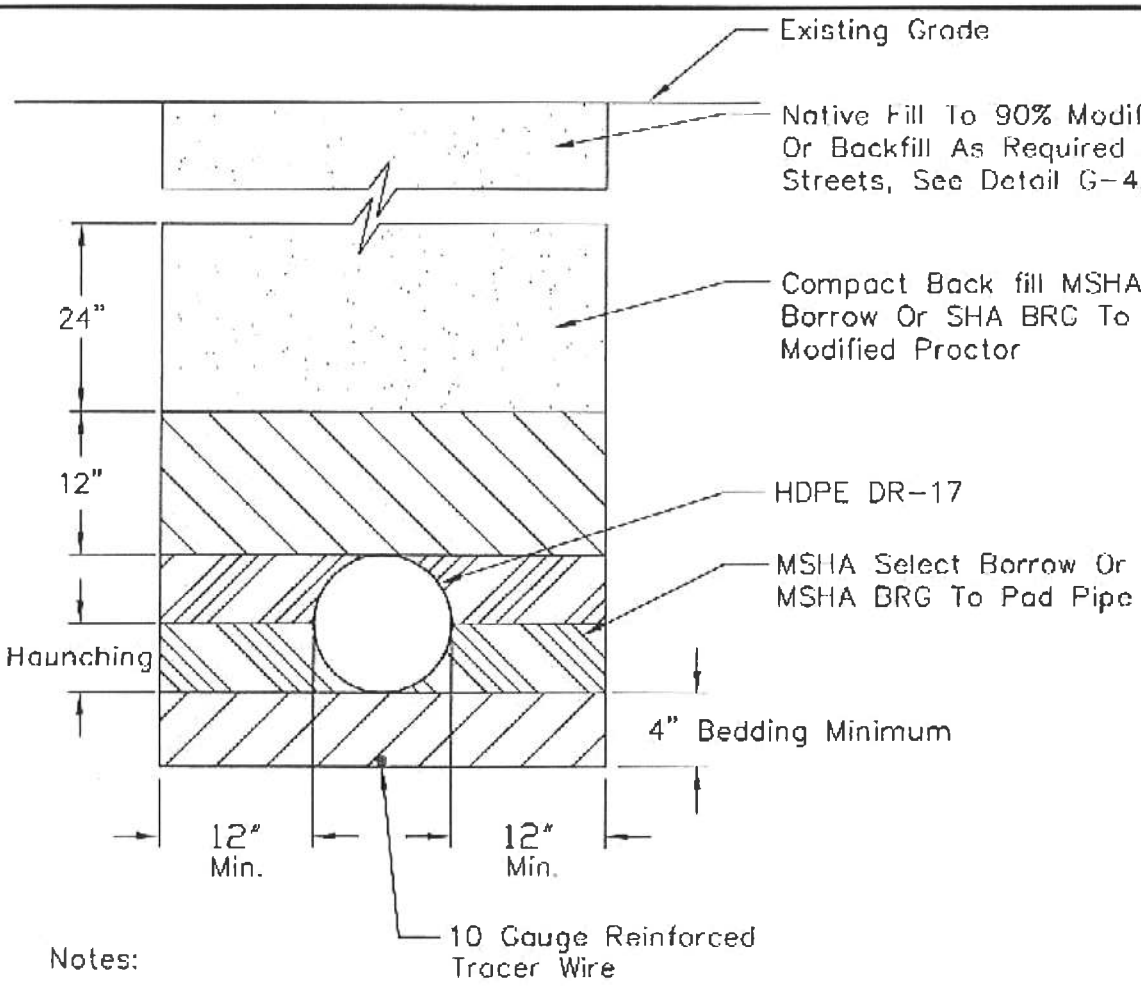
APPROVAL	REVISED	
Talbot W Bare 9/1/09	OCT 1, 88	TOWN OF EASTON
EU MANAGER OF ENGINEERING DATE	MAR 1, 94	AND
	AUG 1, 94	EASTON UTILITIES
	MAR 9, 95	STANDARD DETAILS
	SEP 1, 98	DROP SEWER HOUSE CONNECTION
ISSUED: MAY 1, 1986	SEP 1, 09	STANDARD NO. SS-8.01



Notes:

1. As-Built Of Sewer Lateral To Be Located By Stationing. Cleanout To Be Measured From Sanitary Sewer Main. If Sewer Lateral Is Not Perpendicular To Sanitary Sewer Main Or House Is On A Curve, Use Of Method #1 and/or Method #2 Will Be Required.
2. As-Built Drawings Must Be Compiled By Contractor And Submitted To E.U.C. At Completion Of Project And Prior To Acceptance Of The System.
3. As-Built Drawings Must Be Submitted By A Licensed Engineer Or Surveyor.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS SANITARY SEWER AS-BUILT DRAWING
Talbot W Bare 2/1/06 EU MANAGER OF ENGINEERING DATE	MAR 9, 95 MAR 1, 98 FEB 1, 02 FEB 1, 06	
ISSUED: AUG 1, 1994		STANDARD NO. SS-9.00

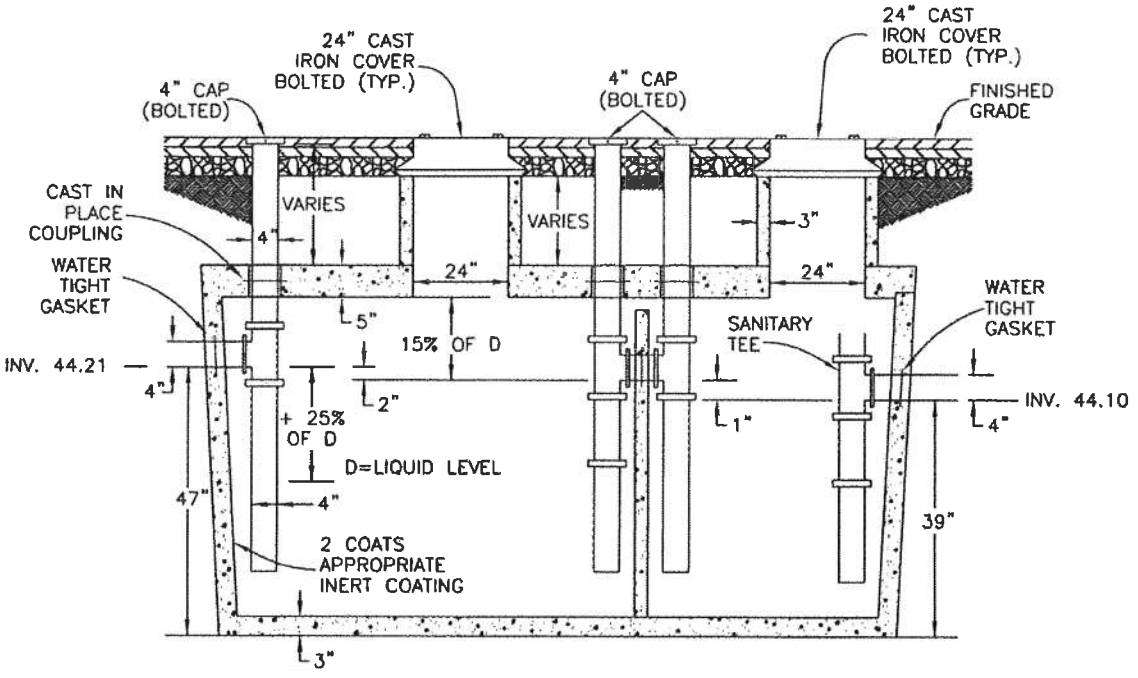


Notes:

1. Warning Tape Shall Be Placed 24" Above All Pipe.
2. The Tracing Wire Shall Be A Continuous Conductor Connected To All Fittings And Services.
3. All Fittings Shall Be As Specified In AWWA C110-93, Mechanical Joint, Ductile Iron, Pressure Rated At 350 PSI.
4. All Fittings Shall Be Restrained By Thrust Blocks According To Standard Detail W-3.00.
5. Firm Bearing Shall Be Provided For Full Length Of Pipe.
6. After Pipe Is Installed On Bedding, Place Backfill In Lifts To Springline, Crown And Cover, Tamping After Each Lift. Lifts Not To Exceed 12".
7. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
8. Thoroughly Tape Mechanical Connections With Electrical Tape.

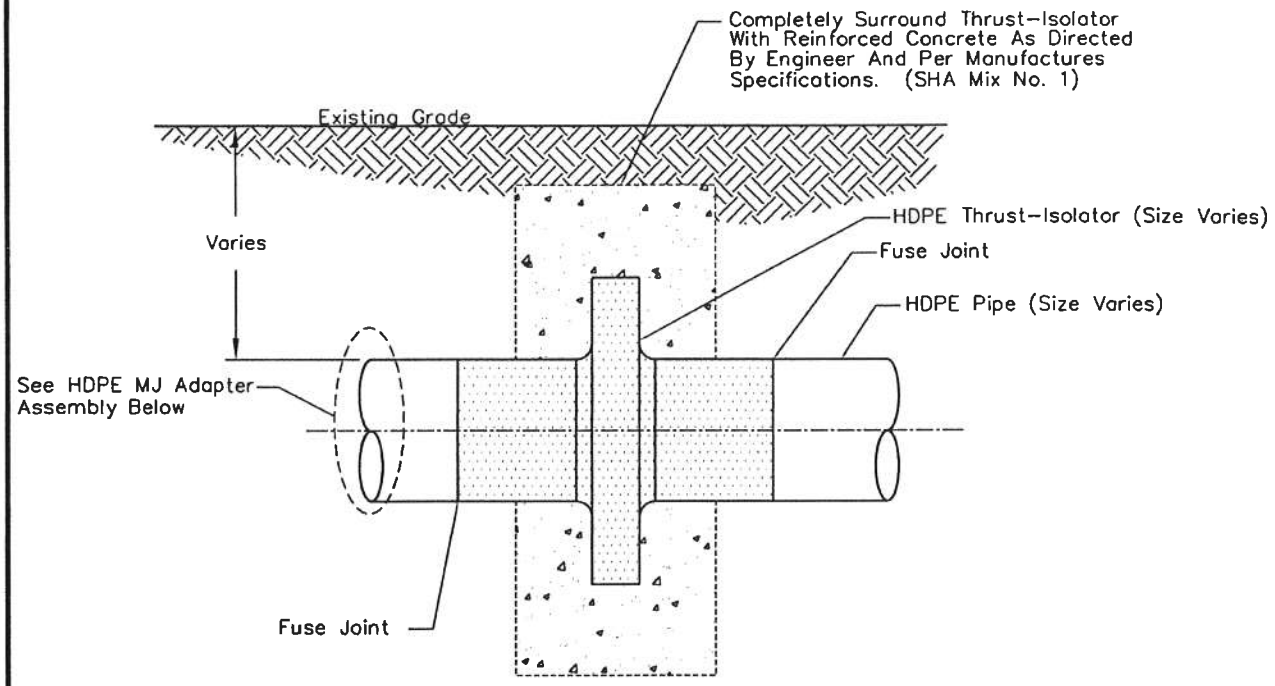
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbott W Bowe 9/1/09 EU MANAGER OF ENGINEERING DATE	JUN 1, 09 SEP 1, 09	PVC FORCE MAIN INSTALLATION
ISSUED: JAN 2, 2001		STANDARD NO. SS-9.10

1500 GALLON (2 COMPARTMENT) TANK



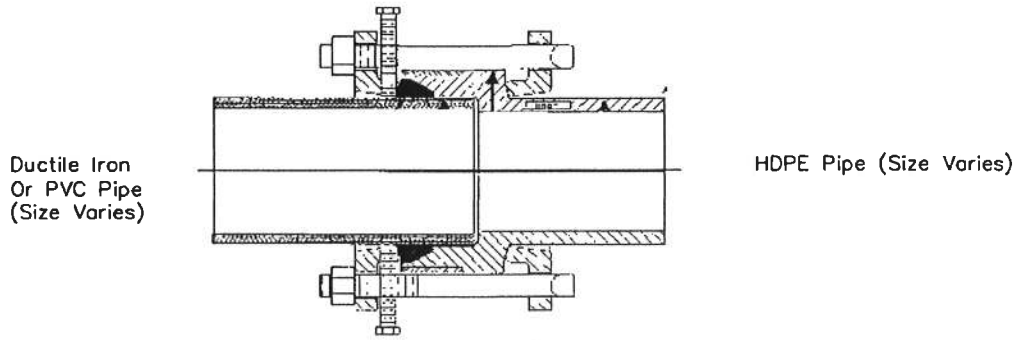
1. ALL INLET AND OUTLET PIPES SHALL BE INSTALLED NO MORE THAN 12" FROM THE BOTTOM OF THE GREASE TRAP.
2. TANK TAPERS TOP TO BOTTOM AND IS TRAPEZOIDAL IN CROSS SECTION.
3. TANK IS 4000 PSI CONCRETE-STEEL REINFORCED CONCRETE CONFORMS CONCRETE CONFORMS TO ACI 318-16-4.5.1 AND 318-16-5.4.2.
4. DIMENSION: 10'11"Lx5'&"Wx52"D (EXTERNAL DIMENSIONS)
5. WHEN LOCATED IN DRIVEWAYS OR PAVED AREAS, GREASE TRAP TO BE DESIGNED FOR APPROPRIATE LOAD BEARING CONDITIONS.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbott W Bare 5/24/07 EU MANAGER OF ENGINEERING DATE		GREASE TRAP
ISSUED: MAR 8, 2007		STANDARD NO. SS-9.20



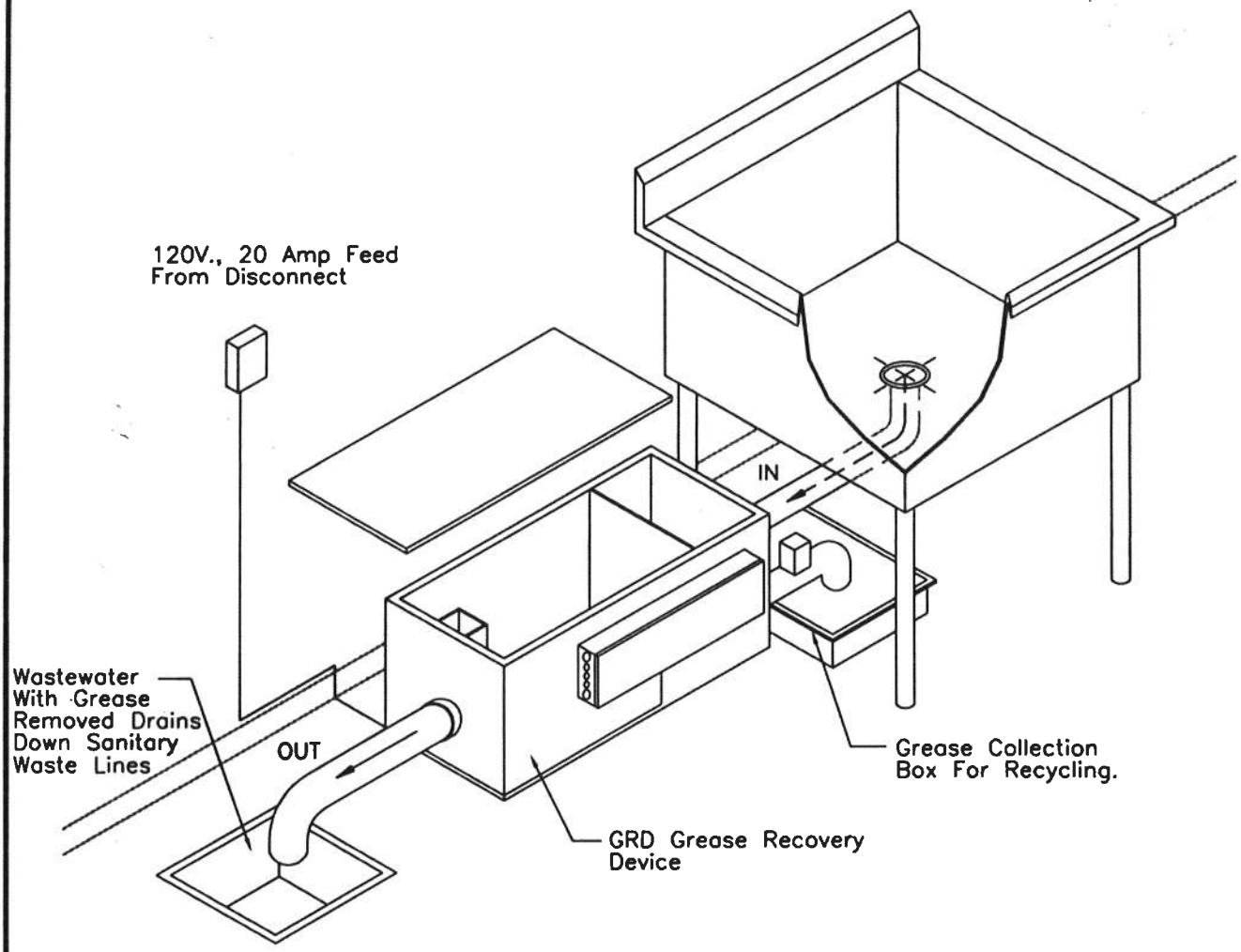
Notes:

1. Configuration Required Where HDPE Pipe Connects To Unrestrained Pipe. Configuration Required On Both Ends Of HDPE Pipe Sections.
2. Thrust-Isolator Assembly Serves To Restrain And Anchor Pipe Mains Against Thermal Expansion And Contraction.
3. Contractor To Make Sure The Soil Bearing Load Area, As Well As The Strength And Thickness Of The Concrete Are Sufficient For The Thrust-Isolator Assembly.
4. See Standard Detail G-3.00 For Concrete Mixture Specifications.



HDPE BELL MECHANICAL JOINT ADAPTER ASSEMBLY

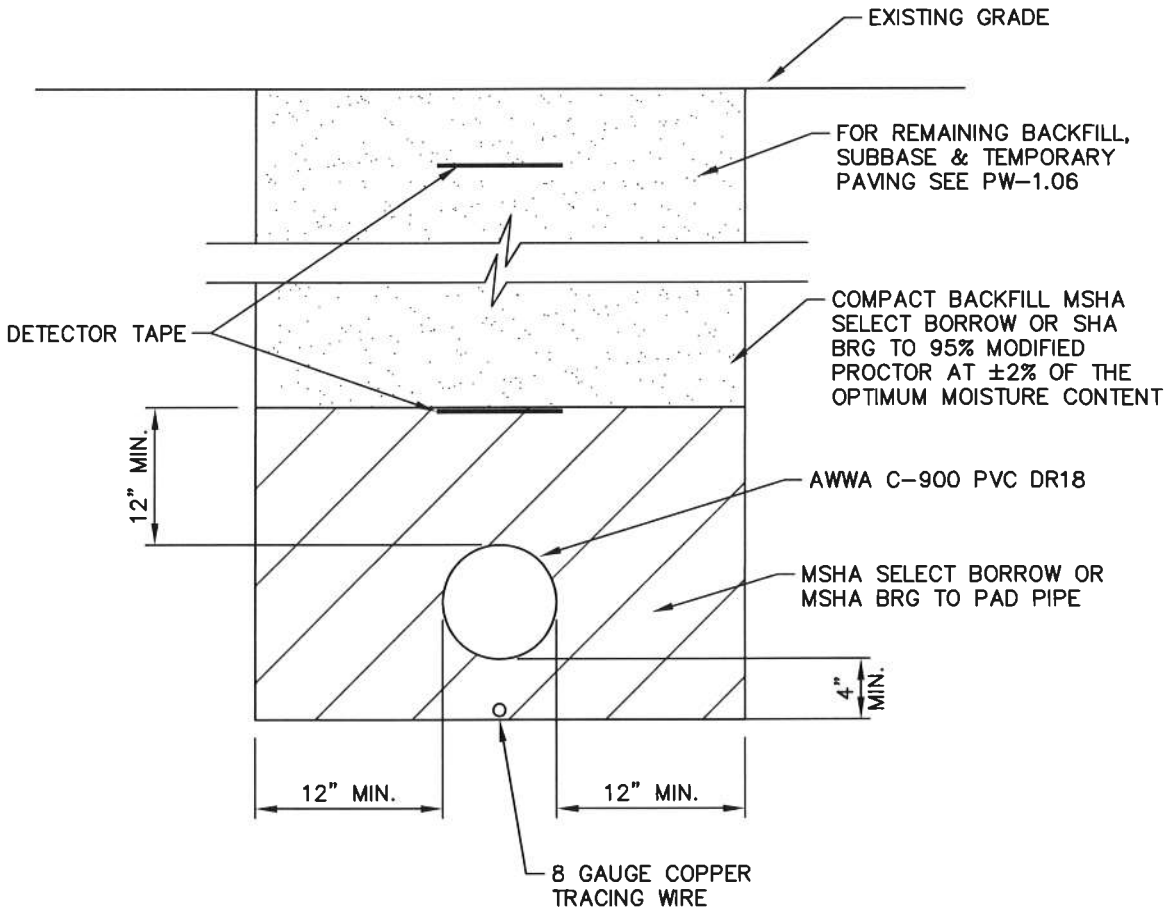
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Bane 6/1/08 EU MANAGER OF ENGINEERING DATE		THRUST ISOLATOR ASSEMBLY
ISSUED: JUN 1, 2008		STANDARD NO. SS-9.30



Notes:

1. The Sink Or Fixture Must Be Installed With Indirect Drain Lines To Meet The Local Codes.
2. For 2 Or More Sinks, Reduce Each Drain To A Maximum Of 1" To Control The flow To The Grease Recovery Device.
3. Acceptable Units Are International GRD Model 25001B, Highland Tank Model AGI 25, Or Equal.
4. Systems To Comply With International Plumbing Code Section 1003.

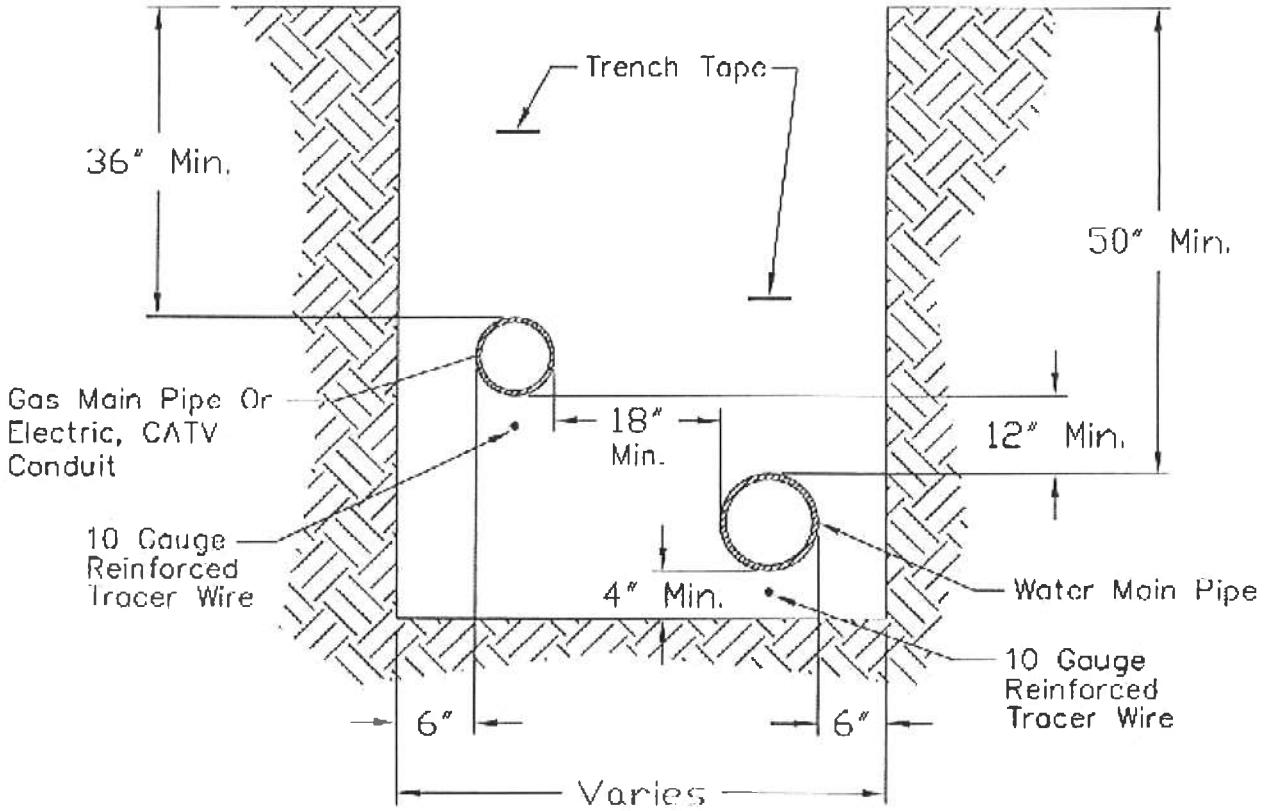
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS GREASE RECOVERY DEVICE
Talbot W Bare 12/1/08 EU MANAGER OF ENGINEERING DATE		
ISSUED: DEC 1, 2008		STANDARD NO. SS-9.40



NOTES:

1. WARNING TAPE SHALL BE PLACED 12" ABOVE ALL PIPE AND 12" BELOW GROUND SURFACE.
2. THE TRACING WIRE SHALL BE A CONTINUOUS CONDUCTOR CONNECTED TO ALL FITTINGS, FIRE HYDRANTS AND SERVICES.
3. ALL FITTINGS SHALL BE AS SPECIFIED IN AWWA C110-93, MECHANICAL JOINT, DUCTILE IRON, PRESSURE RATED AT 350 PSI.
4. ALL FITTINGS SHALL BE RESTRAINED BY THRUST BLOCKS ACCORDING TO STANDARD DETAIL W-3.00.
5. FIRM BEARING SHALL BE PROVIDED FOR FULL LENGTH OF BARREL. EXCAVATE FOR BELL HOLES.

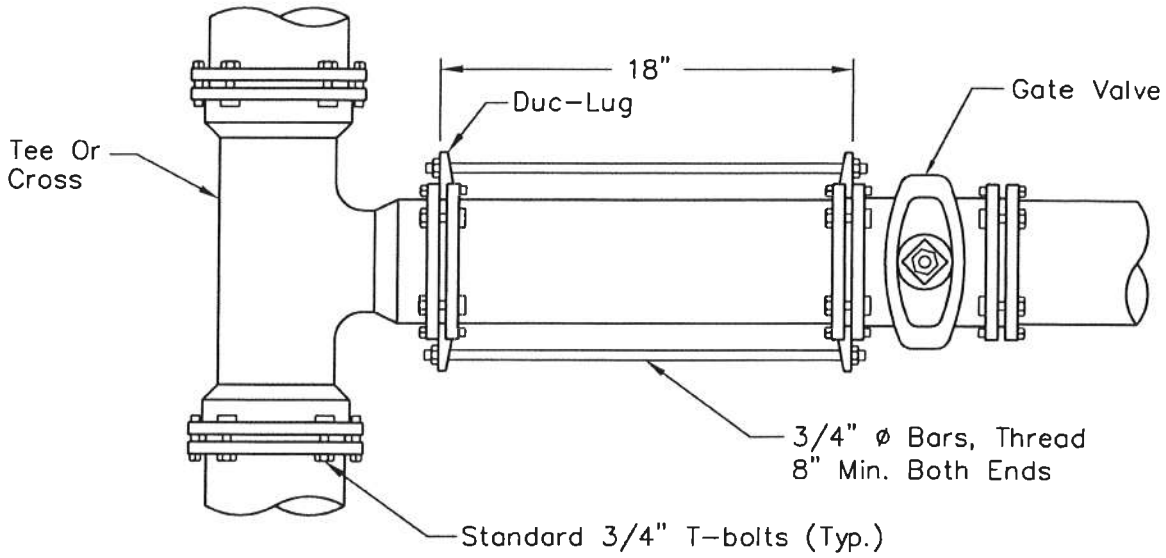
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS PVC WATER MAIN INSTALLATION
TOWN ENGINEER 4/12/11 DATE	JAN 1, 11	
ISSUED: FEB 25, 2009		STANDARD NO. W-1.00



Notes:

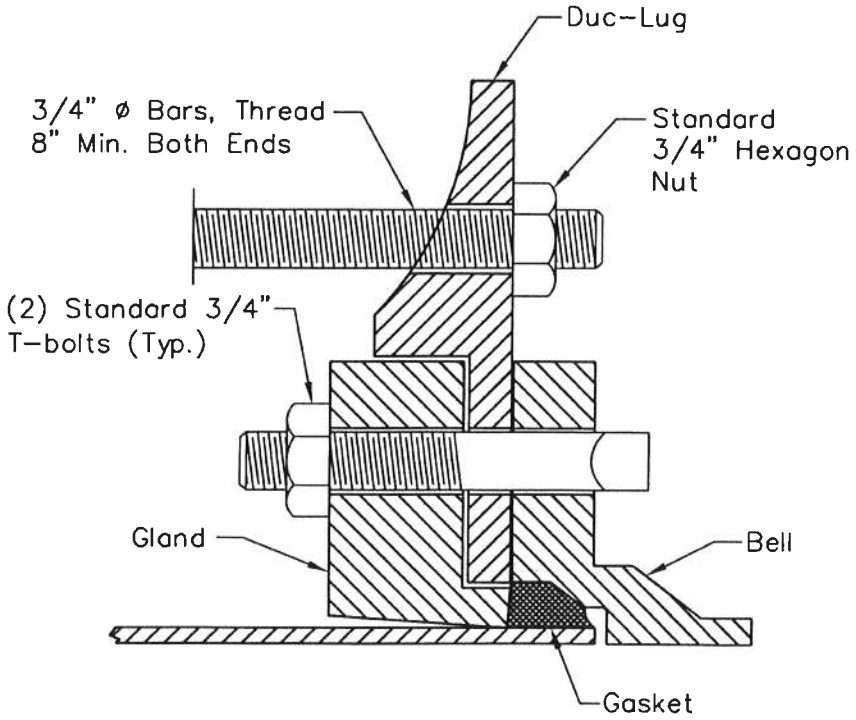
1. Use Select Granular Backfill Only.
2. Provide As Much Separation As Permitted By Trench Width.
3. Trench Tape (Warning Tape) Shall Be Placed 24" Above Water Pipe And At Least 12" Above Gas Pipe.
4. Gas Main Construction By Easton Utilities In Accordance With Easton Utilities Gas Construction Standards.
5. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
6. Thoroughly Tape Mechanical Connections With Electrical Tape.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Bare 9/1/09 EU MANAGER OF ENGINEERING DATE	SEP 1, 09	WATER MAIN JOINT TRENCHING
ISSUED: NOV. 20, 2000		STANDARD NO. W-1.01



Plan

Main Size	No. Of 3/4" Dia. Bars Req'd.
3"	2
4"	2
6"	2
8"	2
10"	4
12"	6
16"	8
20"	12
24"	16

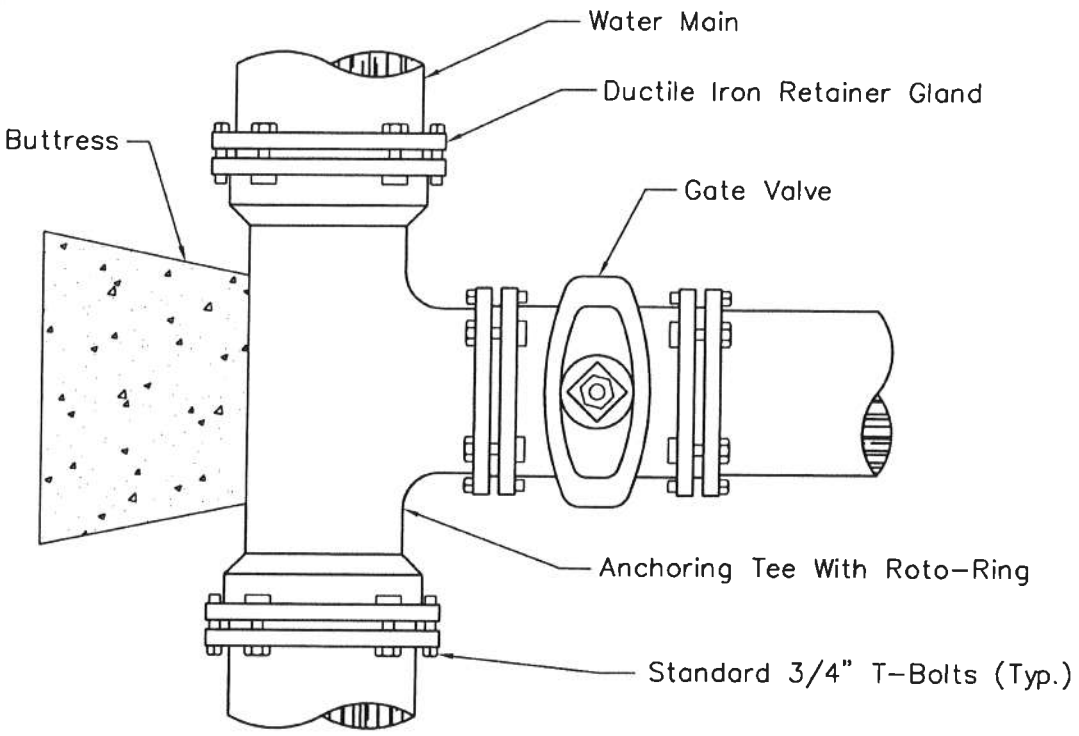


Cross Section
Lug Assembly

Notes:

1. Use Mechanical Joint Fittings Only.
2. Paint All Steel With 2 Coats Of Bituminous Paint.

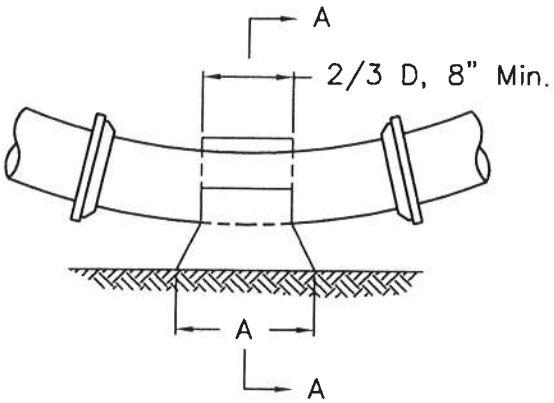
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bane 2/25/06	AUG 1, 94	
EU MANAGER OF ENGINEERING DATE		STANDARD STRAPPING METHOD
ISSUED: MAY 1, 1986		STANDARD NO. W-2.00



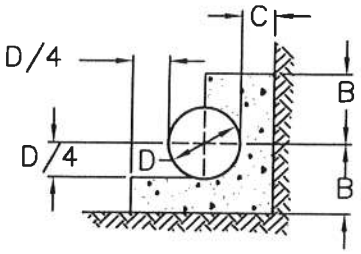
Note:

1. All Fittings Shall Be Mechanical Joint, With Ductile Iron Retainer Glands And Mega-Lug Or Equivalent Restraint.
2. Anchoring Tee Shall Be As Indicated And As Manufactured By Griffin Pipe Products, 1100 West Front St. Florance, N.J. 08518, Or An Approved Equal.
3. Retainer Gland Shall Be As Indicated And As Manufactured By Russell Pipe & Foundry Co. Inc., 910 Washington St., Alexander City, AL. 35010, Or An Approved Equal.

APPROVAL	REVISED	
Talbot W Bass 4/25/06	AUG 1, 94	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
EU MANAGER OF ENGINEERING DATE	MAR 9, 95	
	MAR 1, 98	ANCHORING TEE
ISSUED: MAY 1, 1986		STANDARD NO. W-2.01



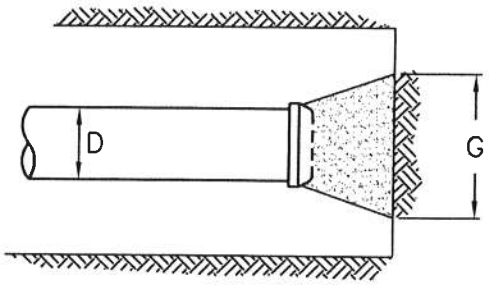
PLAN



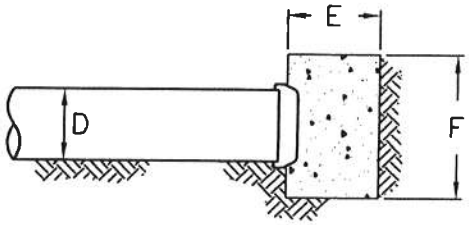
SECTION A–A

BUTTRESS FOR HORIZONTAL BENDS						
BEND		6"	8"	10"	12"	16"
1/32	A	6"	8"	10"	1'-0"	1'-4"
	B	7"	8"	9"	10"	1'-0"
	C	7"	7"	8"	8"	9"
1/16	A	9"	1'-0"	1'-6"	1'-9"	2'-3"
	B	7"	8"	9"	10"	1'-0"
	C	8"	9"	10"	11"	1'-2"
1/8	A	1'-3"	1'-8"	2'-1"	2'-6"	3'-4"
	B	7"	8"	9"	11"	1'-3"
	C	8"	9"	10"	11"	1'-2"
1/4	A	2'-0"	2'-6"	3'-0"	3'-6"	5'-0"
	B	6"	9"	1'-0"	1'-3"	1'-6"
	C	1'-10"	1'-9"	1'-8"	1'-7"	1'-5"

BUTTRESS FOR HORIZONTAL BENDS



PLAN



Carry Concrete To Solid Ground

SECTION

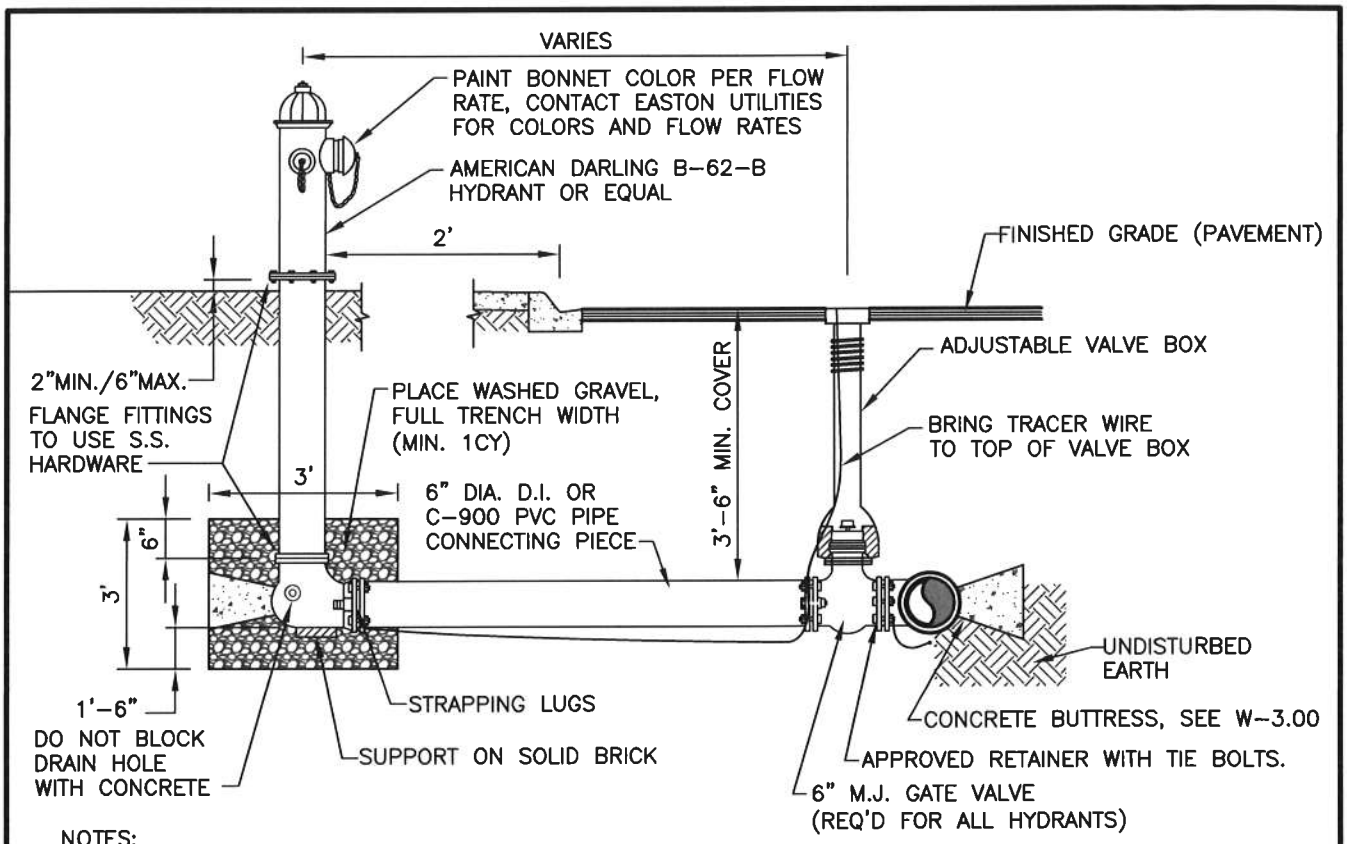
BUTTRESS FOR CAPS AND PLUGS					
D	6"	8"	10"	12"	16"
E	6"	8"	8"	10"	1'-0"
F	1'-0"	1'-4"	1'-6"	2'-0"	2'-8"
G	1'-5"	1'-11"	2"-5"	2'-10"	3'-9"

Notes:

1. All Concrete Shall Be SHA Mix No. 1.
2. Buttress Dimensions Are Minimum. Dimensions Are Based Upon Soil Bearing Pressure Of 3000 P.S.F. And Static Water Pressure Of 150 P.S.I. Where Pressure Exceeds 150 P.S.I. Or Where Soil Bearing Pressure Is Less Than 3000 P.S.F. Special Buttress Design Is Required.

BUTTRESS FOR CAPS AND PLUGS

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS BUTTRESSES FOR CAPS AND HORIZONTAL BENDS
Talbot W Bane 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: MAY 1, 1986		STANDARD NO. W-3.00



NOTES:

1. FIRE HYDRANT SPECIFICATIONS:
   TRAFFIC TYPE, PAINTED GREEN, OPEN LEFT
   OPERATING NUT – HEXAGON 1½" FLAT TO FLAT
   MECHANICAL JOINT BASE – 6"
   BRONZE LINED
   4" STEAMER NOZZLE – 6 THDS./INCH STYLE 60°V
   4.793" PITCH DIA.
   2–2½ – HOSE NOZZLES – HOSE THD. 3 1/32" DIA. 8 THDS/INCH

2. GATE VALVE SPECIFICATIONS:
   SHALL CONFORM TO AWWA STANDARD C-600
   SHALL BE IRON BODY, BRONZE MOUNTED TYPE AND HAVE NON-RISING STEM, OPENING BY TURNING RIGHT (CLOCKWISE)
   RESILIENT SEAT VALVE

3. FIRE HYDRANT SHALL BE INSTALLED AS SHOWN AT THE PROPERTY LINE BETWEEN ADJOINING LOTS.

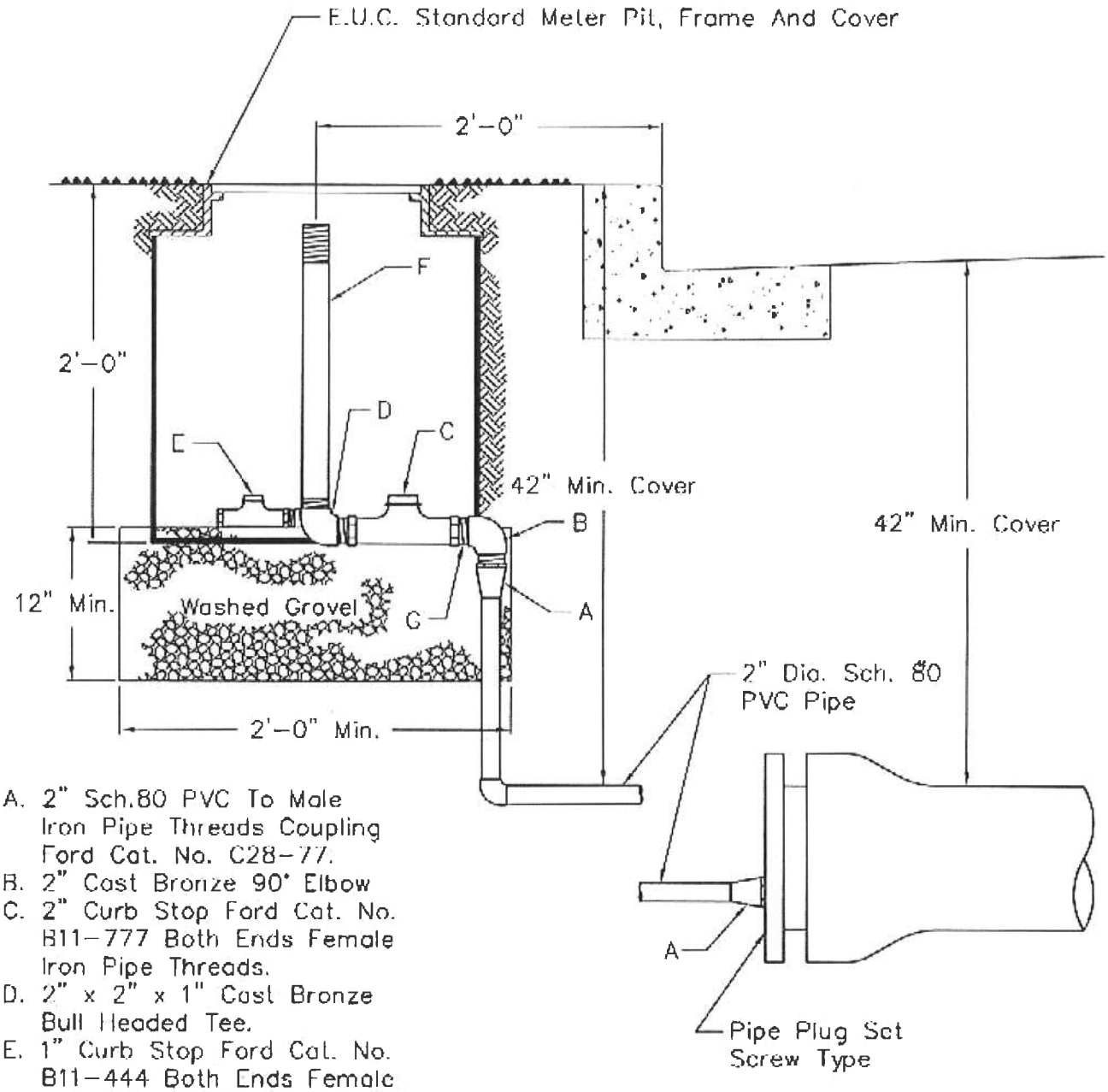
4. HYDRANT SPACING SHALL BE 750' MAX. AS MEASURED ON IMPROVED WAY FOR SINGLE FAMILY RES. 375' MAX FOR MULTI-FAMILY, COMMERCIAL, ETC.

5. WHEN INDICATED BY EUC, DRAIN PORT SHALL BE PLUGGED BY CONTRACTOR.

6. REINFORCED COATED TRACER WIRE AS MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC. P.O. BOX 1081, MONTICELLO, MN, 55362, OR AN APPROVED EQUAL.

7. THOROUGHLY TAPE MECHANICAL CONNECTIONS WITH ELECTRICAL TAPE.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
M Jandel 4/12/11 TOWN ENGINEER DATE	JAN 1, 11	FIRE HYDRANT
ISSUED: FEB 25, 2009		STANDARD NO. W-4.00



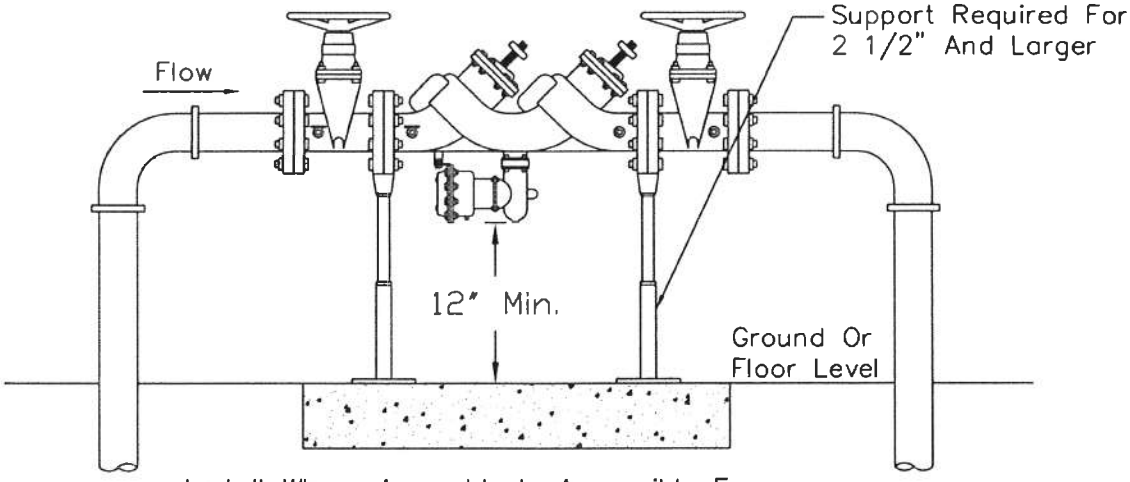
A. 2" Sch.80 PVC To Male Iron Pipe Threads Coupling Ford Cat. No. C28-77.
B. 2" Cast Bronze 90° Elbow
C. 2" Curb Stop Ford Cat. No. B11-777 Both Ends Female Iron Pipe Threads.
D. 2" x 2" x 1" Cast Bronze Bull Headed Tee.
E. 1" Curb Stop Ford Cat. No. B11-444 Both Ends Female Iron Pipe Threads.
F. 2" Galv. Iron Pipe 3" Of Threads Both Ends. Pipe Length Shall Be Sufficient To Place End Of Pipe 3" Below Grade.
G. All Nipples Shall Be Bronze.

Note:

1. Add Detector Tape And Tracer Wire To All Pipe.

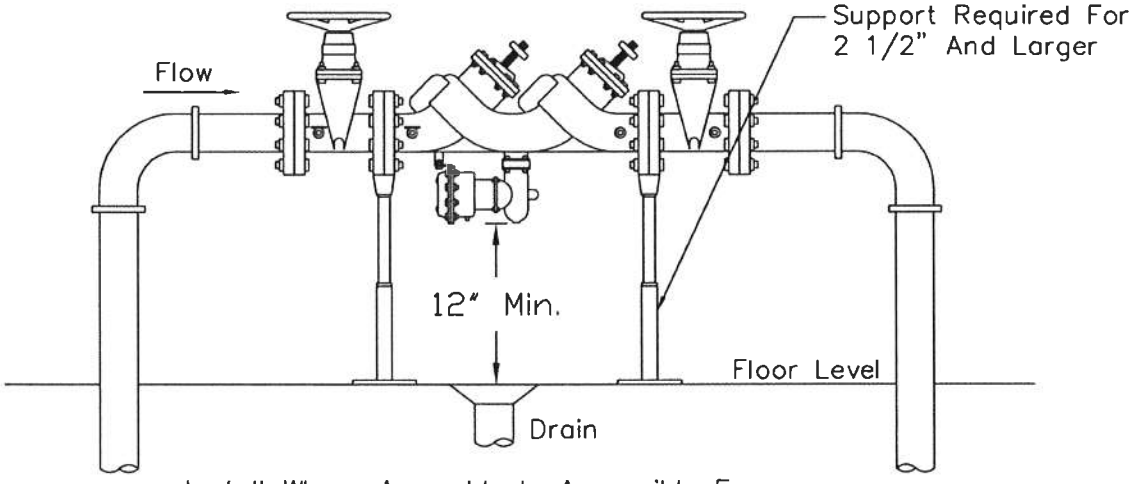
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Rose 10/10/07 EU MANAGER OF ENGINEERING DATE	MAR 1, 94 AUG 1, 94 OCT 10, 07	BLOWOFF
ISSUED: MAY 1, 1986		STANDARD NO. W-5.00

OUTDOOR INSTALLATION



Install Where Assembly Is Accessible For
Periodic Testing And Spillage Is Not Objectionable.

INDOOR INSTALLATION



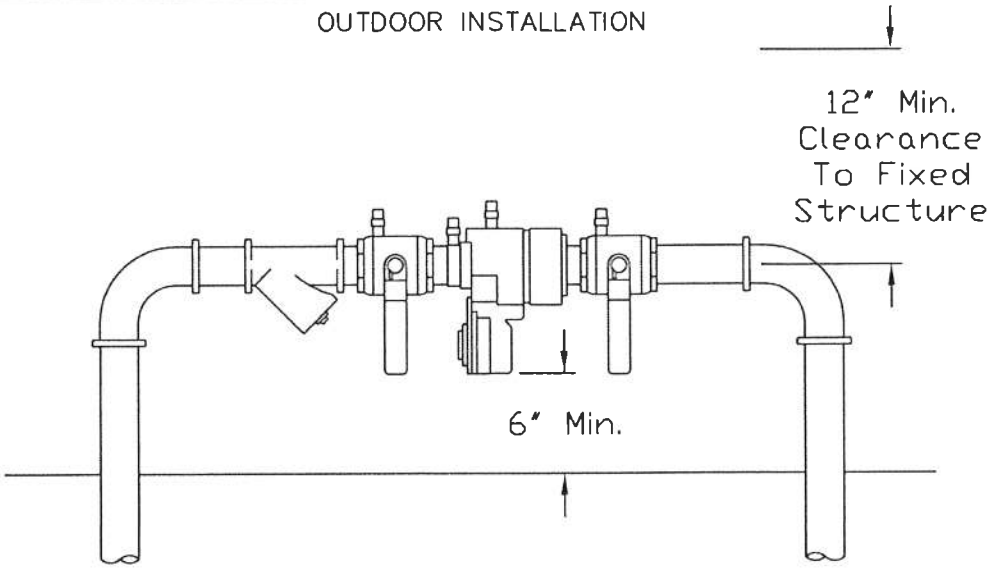
Install Where Assembly Is Accessible For
Periodic Testing And Spillage Is Not Objectionable.

Notes:

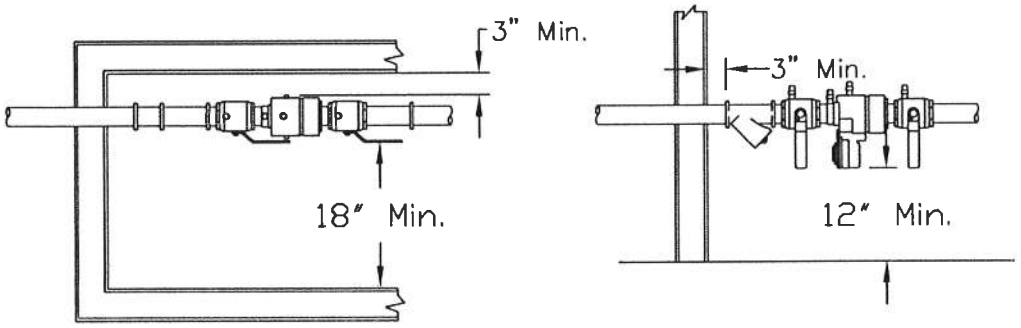
1. Reduced Pressure Backflow Preventer To Be Manufactured By Febco Or An Approved Equal.
2. Assembly To Be Used For Pipe 2 1/2" To 10".

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS REDUCED PRESSURE BACKFLOW PREVENTER
Talbot W Bance 7/1/08 EU MANAGER OF ENGINEERING DATE		
ISSUED: JUNE 1, 2008		STANDARD NO. W-5.10A

OUTDOOR INSTALLATION



INDOOR INSTALLATION

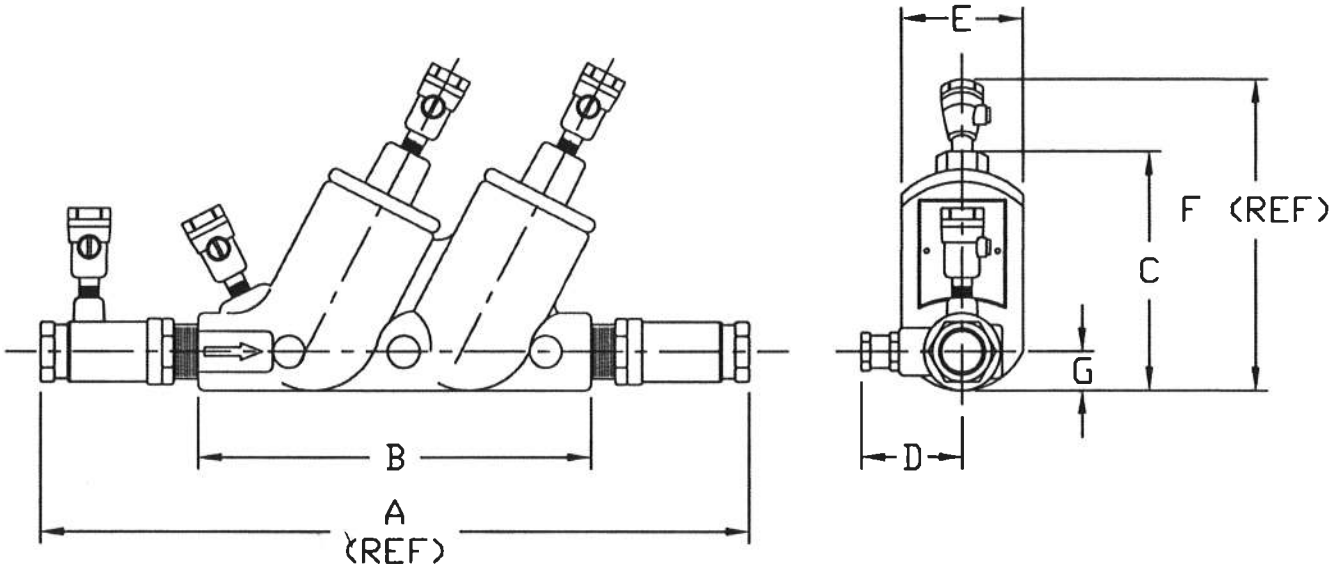


Notes:

1. Reduced Pressure Backflow Preventer To Be Manufactured By Febco Or An Approved Equal.

	FEBCO Part No.
3/4" Assembly –	FE860–075
1" Assembly –	FE860–100
1 1/2" Assembly –	FE860–150
2" Assembly –	FE860–200

APPROVAL	REVISED	
Talbot W Bare 7/1/08 EU MANAGER OF ENGINEERING DATE		TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS REDUCED PRESSURE BACKFLOW PREVENTER
ISSUED: JUNE 1, 2008		STANDARD NO. W–5.11

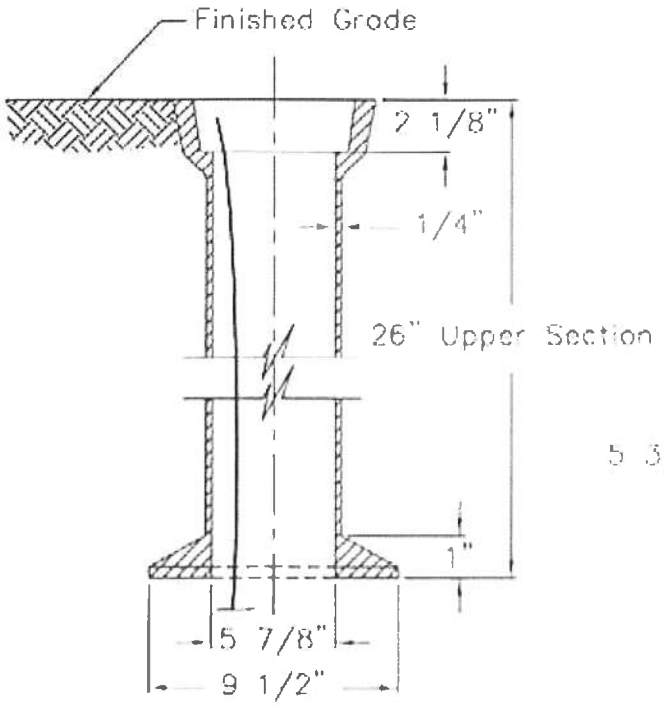


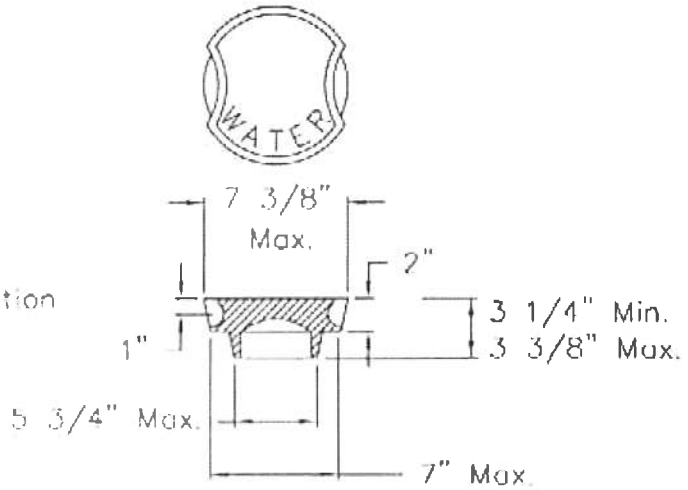
BODY SIZE	3/4"	1"	1-1/4"	1-1/2"	2"
A	14-1/4	14-3/4	20-3/4	21-3/8	23-1/8
B	7-1/4	7-1/4	12-3/8	12-3/8	12-3/8
C	4-5/16	4-5/16	6-1/8	6-1/8	6-1/8
D	1-5/8	1-7/8	2-3/16	2-5/8	3
E	2-7/16	2-7/16	3-13/16	3-13/16	3-13/16
F	5-7/16	5-7/16	6-3/8	6-3/8	6-3/8
G	13/16	13/16	1-3/8	1-3/8	1-3/8
TEST COCKS	1/8x1/4 NPT	1/8x1/4 NPT	1/4x1/4 NPT	1/4x1/4 NPT	1/4x1/4 NPT
NET WT.	8.8	9.5	23.2	25.7	31.5

Notes:

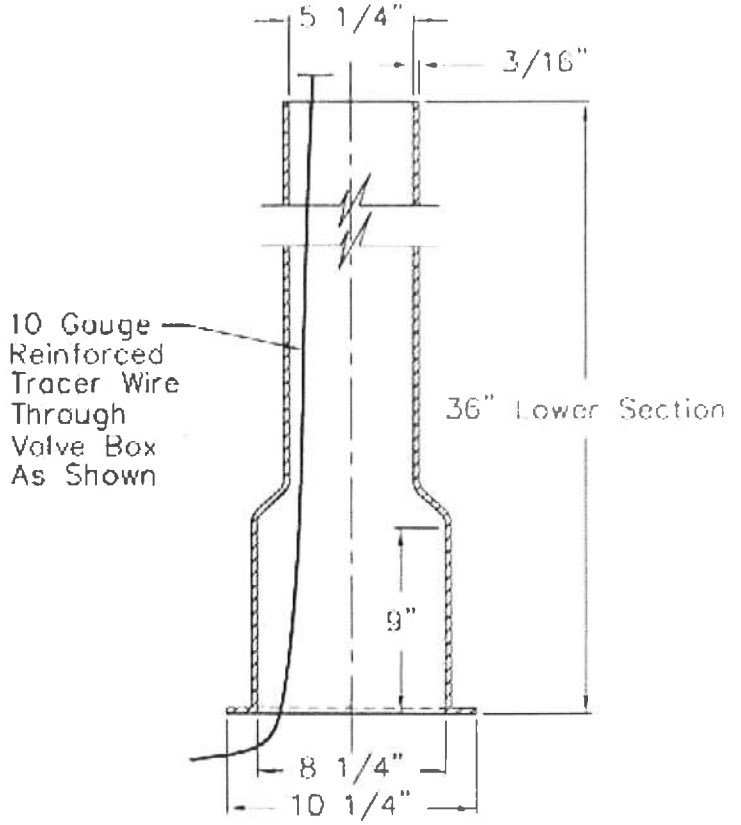
1. Reduced Pressure Backflow Preventer Shall Be Equivalent To Apollo 1015 Or Conbraco, Series 40-100 Or Equal As Approved By Easton Utilities.
2. Assembly To Be Used For Pipe 3/4" To 2".
3. To Be Installed In Horizontal Position With Easy Access For Testing.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS BACKFLOW PREVENTER DOUBLE CHECK VALVE ASSEMBLY
Talbot W Bowe 9/1/2008 EU MANAGER OF ENGINEERING DATE		
ISSUED: SEPT 1, 2008		STANDARD NO. W-5.20





COVER

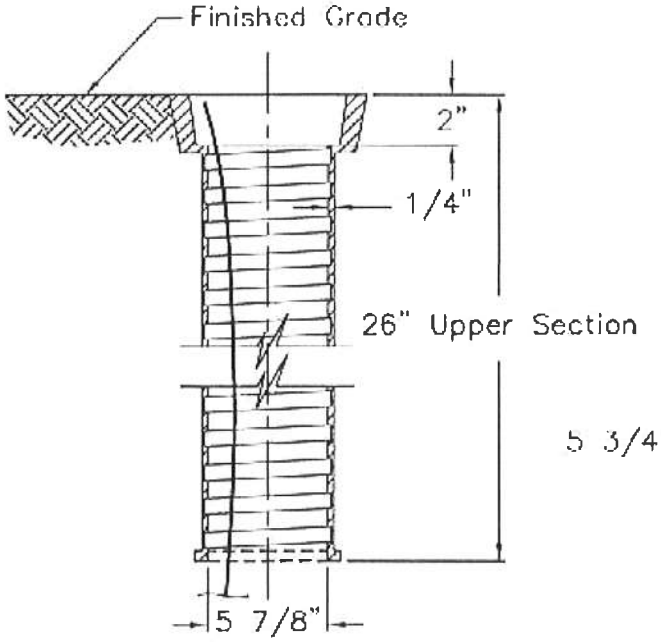


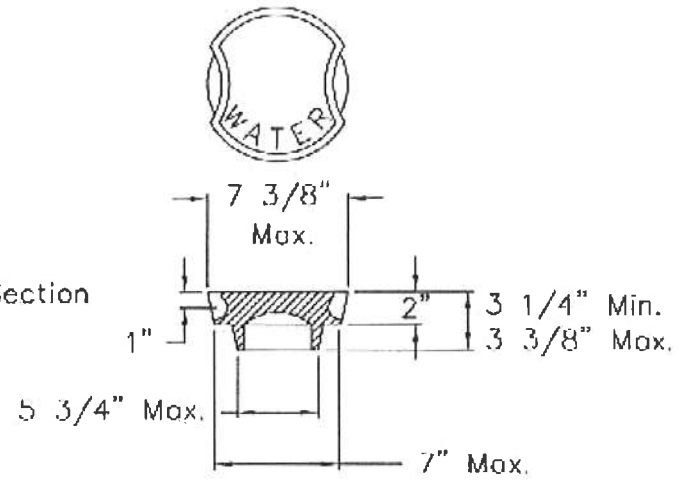
VALVE BOX SECTION

Notes:

1. To Be Plumb And Centered Over Valve.
2. All Sections Shown To Be Gray Iron Castings, Class No. 35 ASTM A-48.
3. Lower Section To Rest On Valve Bonnet.
4. Upper Section To Rest On Select Fill Compacted To 95% Modified Proctor.
5. Valve Box To Be Fig. #4908 And As Manufactured By Bingham & Taylor P.O. Box 552 Culpeper, VA. 22701 Figure #4908
6. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081 Monticello, MN, 55362, Or An Approved Equal.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Bruce 9/1/09	AUG 1, 94	
EU MANAGER OF ENGINEERING DATE	MAR 1, 98	
	SEP 1, 09	
		ADJUSTABLE VALVE BOX
ISSUED: MAY 1, 1986		STANDARD NO. W-6.00





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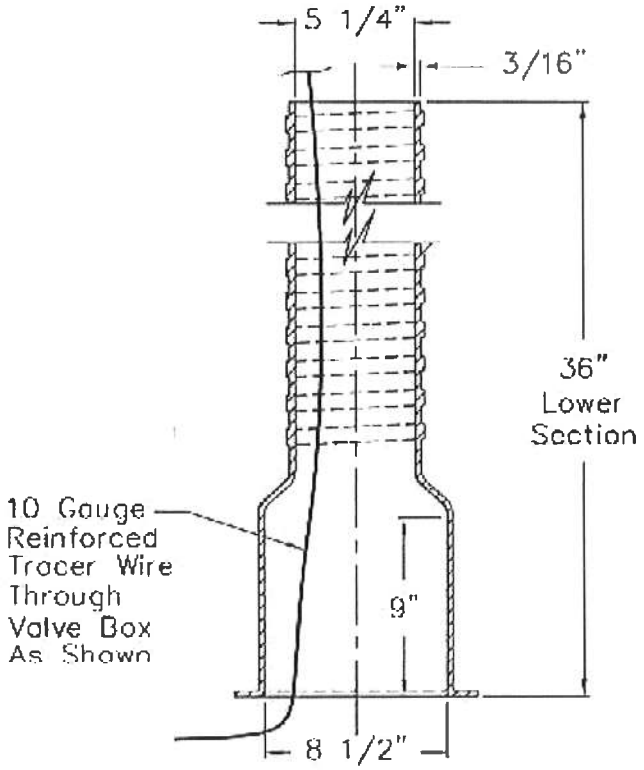
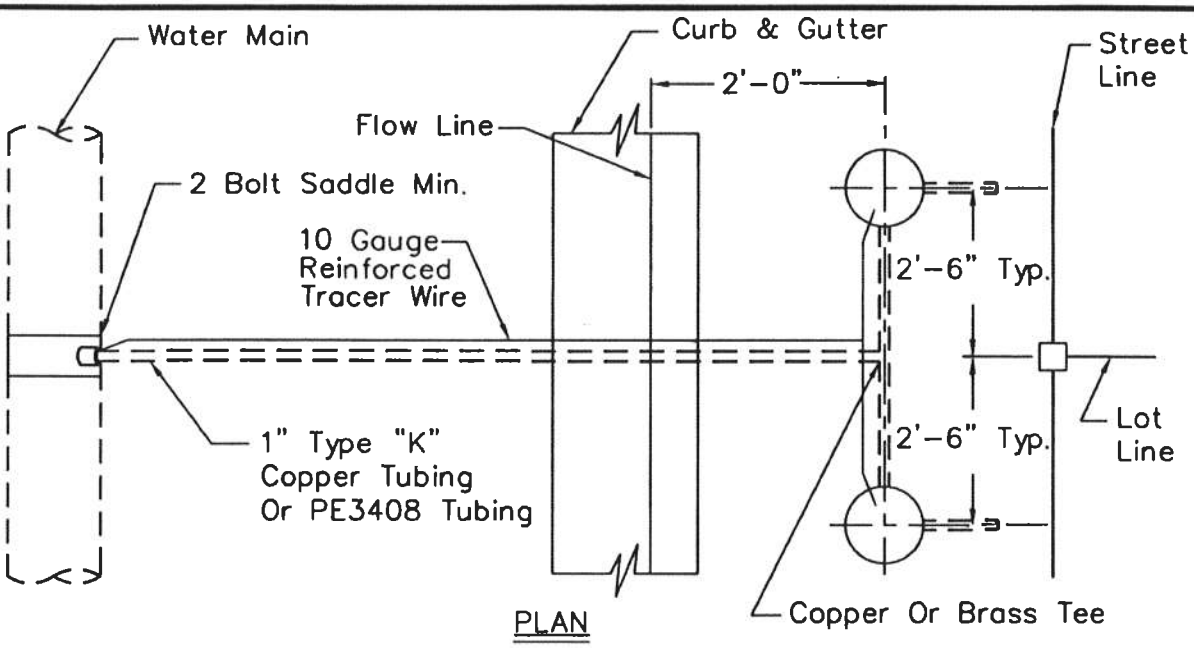


VALVE BOX SECTION

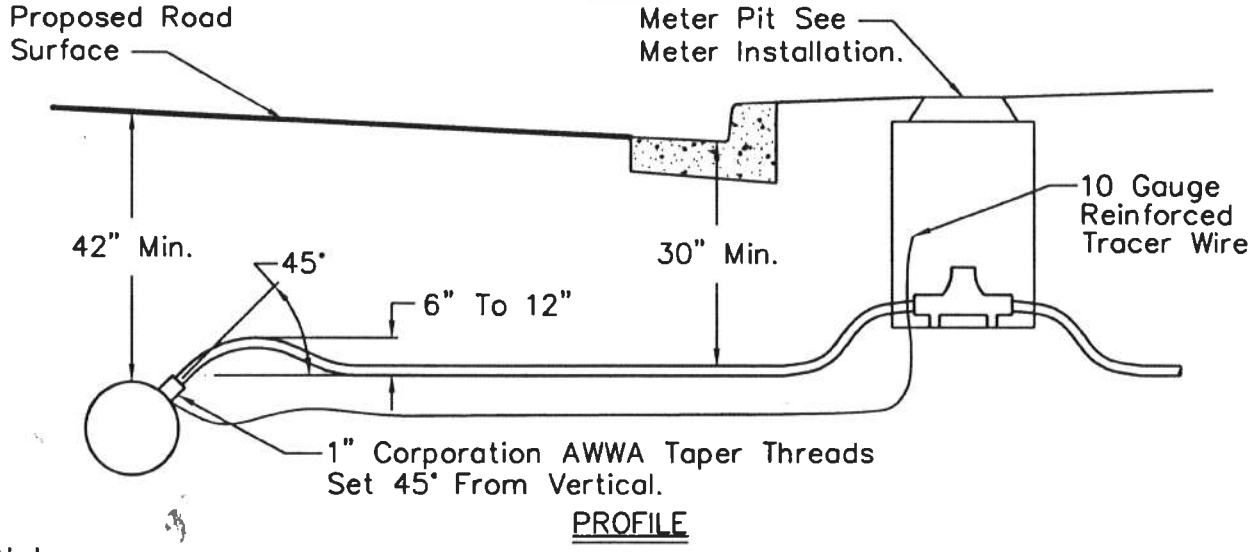
Notes:

1. To Be Plumb And Centered Over Valve.
2. All Sections Shown To Be Gray Iron Castings, Class No. 35 ASTM A-48.
3. Lower Section To Rest On Valve Bonnet.
4. Valve Box To Be Fig. #1905 And As Manufactured By Bingham & Taylor P.O. Box 552 Culpeper, VA. 22701
5. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081 Monticello, MN, 55362, Or An Approved Equal.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS SCREW TYPE VALVE BOX
Talbot W Sowe 9/4/09	MAR 1, 98	
EU MANAGER OF ENGINEERING DATE	SEP 1, 09	
ISSUED: AUG 1, 1994		STANDARD NO. W-6.01



PLAN

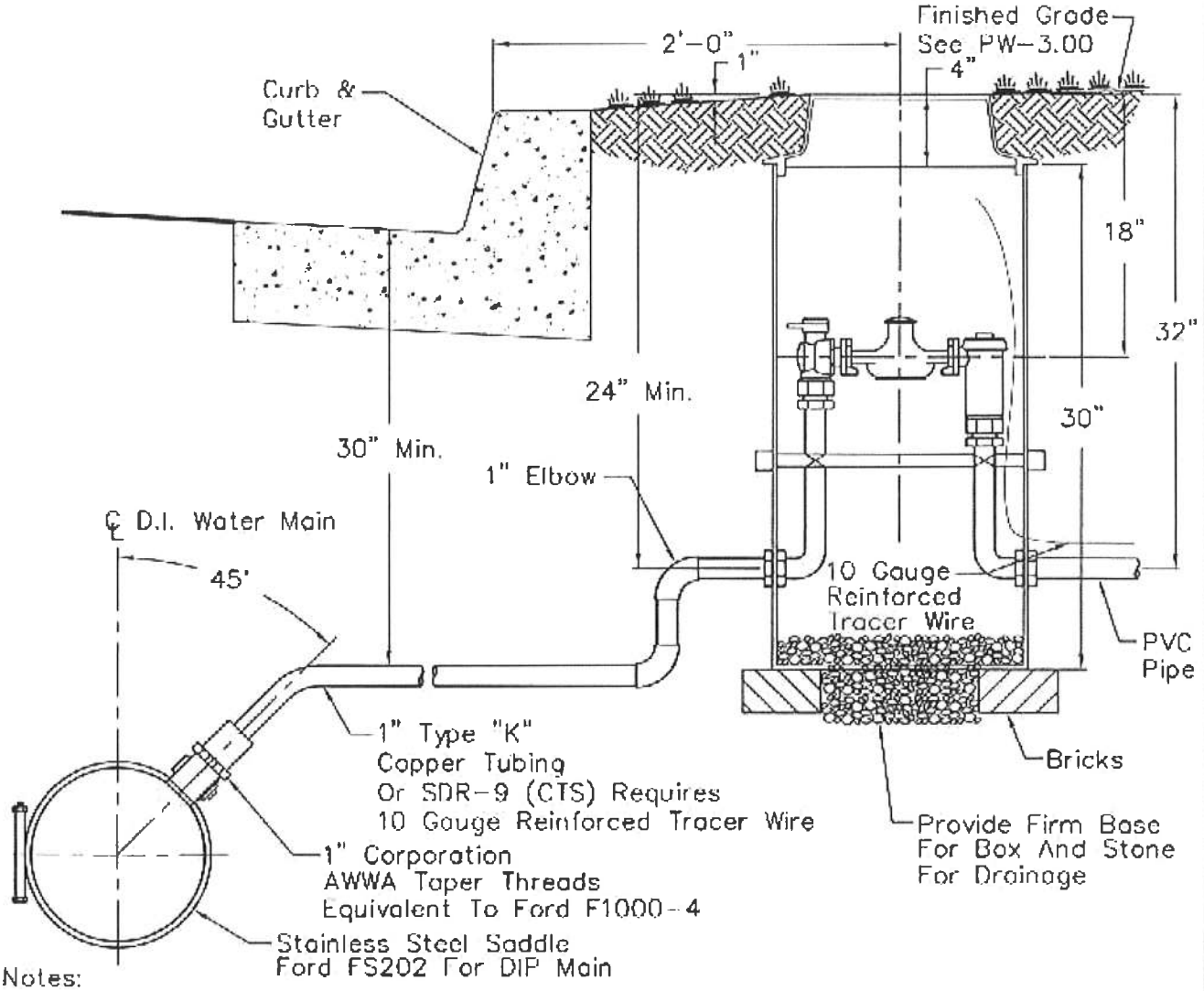


PROFILE

Notes:

1. Copper To Be Laid Level With Top Of Main Unless Otherwise Directed By Engineer.
2. Corporation Cock To Be Left Open, Meter Angle Valve Left Closed.
3. Add Detector Tape And Tracer Wire To All Pipe.
4. PE3408 Tubing Shall Be Manufactured By Orangeburg Inc., 946 Riverside Drive Asheville, NC 28804, Or An Approved Equal.
5. Backfill And Tamp With Select Material To Pad Pipe. See Detail W-1.00.
6. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
7. Thoroughly Tape Mechanical Connections With Electrical Tape.

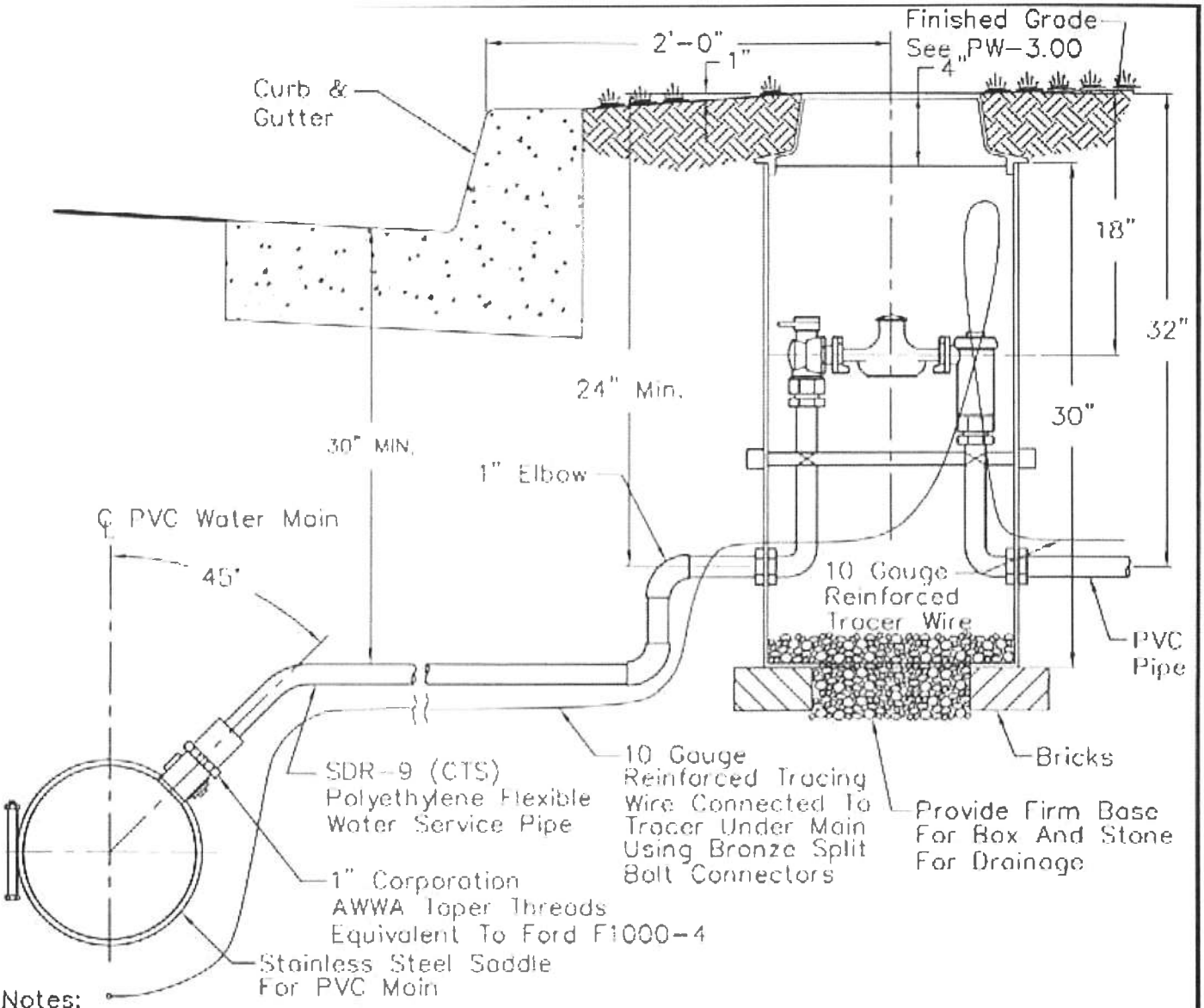
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS DOUBLE SERVICE INSTALLATION
Talbot W Bane 9/1/09 EU MANAGER OF ENGINEERING DATE	AUG 1, 94 MAR 1, 98 FEB 1, 02 FEB 1, 06 SEP 1, 09	
ISSUED: MAY 1, 1986		STANDARD NO. W-7.00



Notes:

1. Tubing To Be Laid Level With Top Of Main Unless Otherwise Directed By Engineer.
2. Corporation Cock To Be Left Open, Meter Angle Valve Left Closed.
3. Meter Box (Ford No. PSBHC-488-20-36-18)Or(Mueller No. 203RCS1830FBBN000237) Or An Approved Equal furnished and Installed By Contractor.
4. PE 3408 Tubing Shall Be Manufactured By Orangeburg Inc., 946 Riverside Drive Ashville, NC 28804, Or An Approved Equal.
5. Add Detector Tape. Add Tracer Wire To PVC Pipe.
6. Backfill And Tamp With Select Material To Pad Pipe. See Detail W-1.00.
7. Pipe Shall Be Tapped With A Hole Cutter That Will Retain The Coupon In Accordance With UNI-BELL Plastic Pipe Association UNI-B-3.
8. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
9. Thoroughly Tape Mechanical Connections With Electrical Tape.

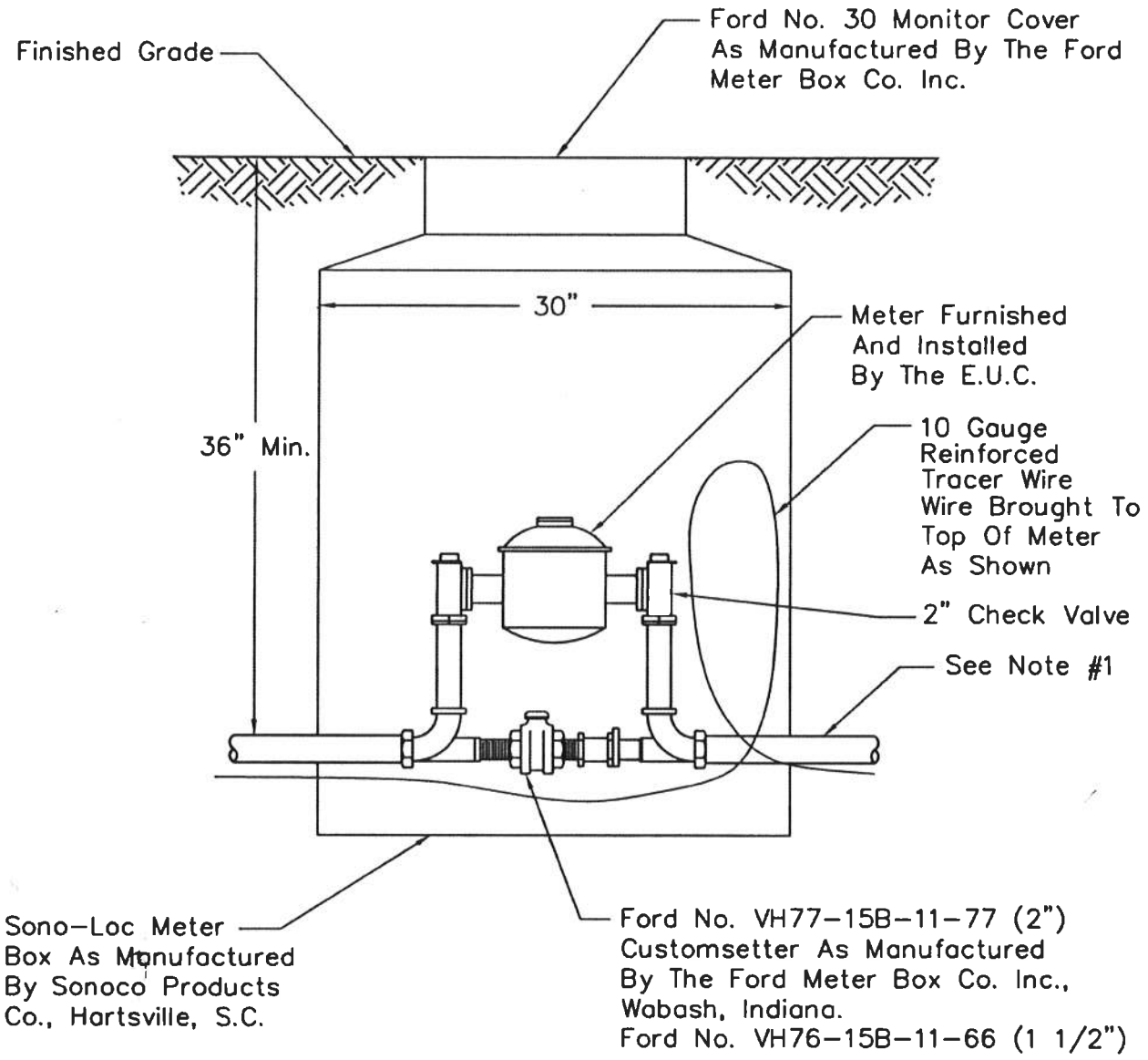
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS 1" WATER SERVICE INSTALLATION – DUCTILE IRON MAIN
Talbot W Bane 9/1/09 EU MANAGER OF ENGINEERING DATE	AUG 1, 94 MAR 9, 95 MAR 1, 98 SEP 1, 09	
ISSUED: MAY 1, 1986		STANDARD NO. W-7.01



Notes:

1. Stainless Steel Saddle Shall Be Equivalent To Ford FS303 Or PowerSeal 3412AST.
2. Pipe Shall Be Tapped With A Shell Type Cutter (Hole Cutter) That Will Retain The Coupon In Accordance With UNI-BELL Plastic Pipe Association UNI-B-3.
3. Pipe Shall Conform And Be Installed According To AWWA C901 For PE-3408 High Molecular Weight Polyethylene, Equivalent To Orangeburg Poly-XTRA, Class 200 (SDR-9, CTS-OD).
4. The Polyethylene Pipe Shall Be Cut With Approved Cutters Only.
5. Stainless Steel Inserts Shall Be Used At All PE Connections To Fittings.
6. Meter Box (Ford No. PSBHC-488-20-36-18) Or An Approved Equal furnished and Installed By Contractor.
7. Backfill And Tamp With Select Material To Pad Pipe. See Detail W-1.00.
8. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
9. Thoroughly Tape Mechanical Connections With Electrical Tape.

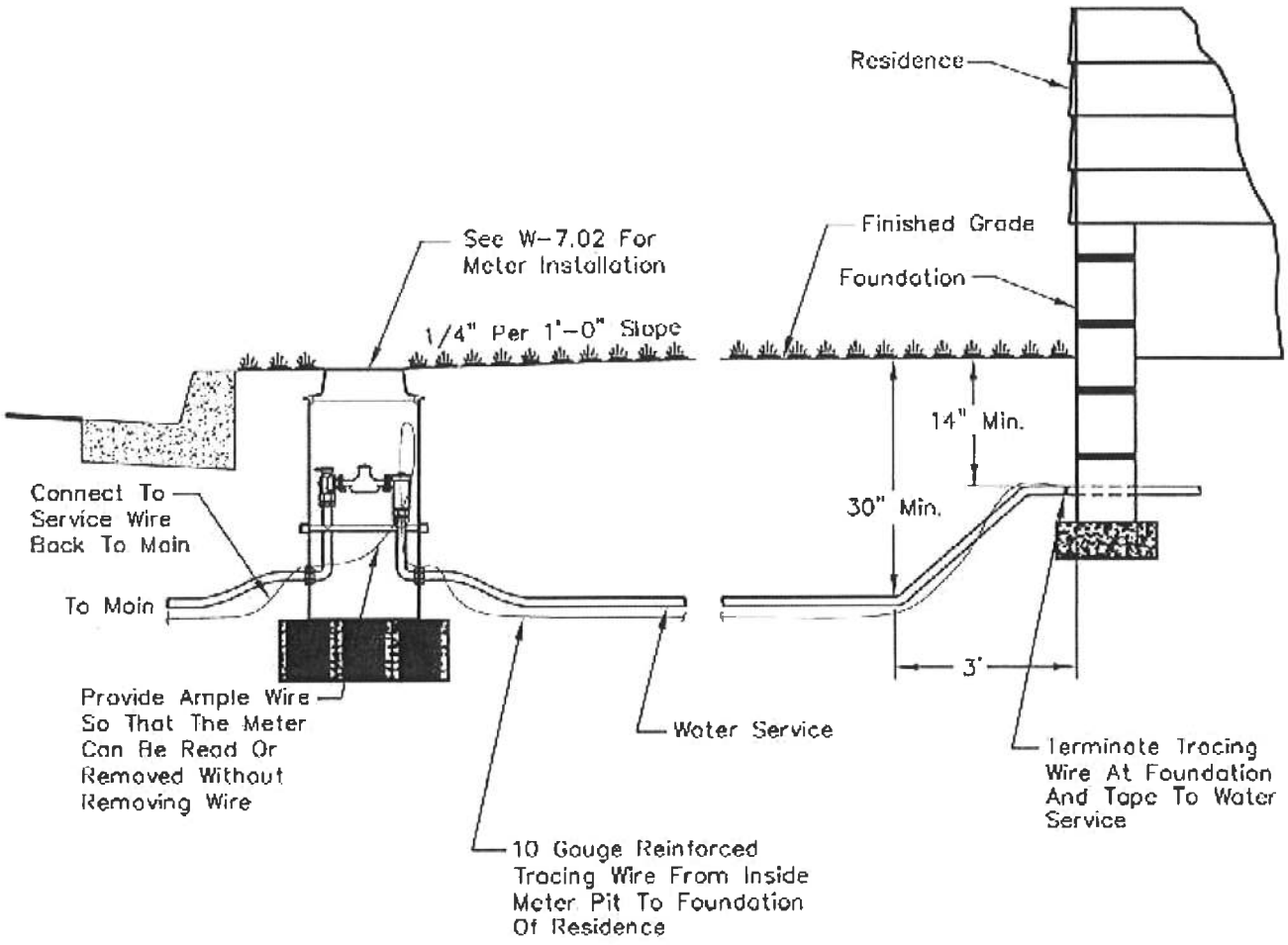
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS 1" WATER SERVICE INSTALLATION – PVC WATER MAIN
Talbot LU Bare 9/1/09 LU MANAGER OF ENGINEERING DATE	DEC 12, 94 MAR 9, 95 MAR 1, 98 SEP 1, 09	
ISSUED: AUG 1, 1994		STANDARD NO. W-7.02



Notes:

1. Meter Pit, Frame And Cover, And Customsetter Shall Be Furnished And Installed By The Contractor.
2. 2" Corporation AWWA Taper Threads Shall Be Installed As Detailed On Standard No. W-7.01.
3. Mueller Part Numbers For 1 1/2" And 2": B-2423--2-01.
4. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
5. Thoroughly Tape Mechanical Connections With Electrical Tape.

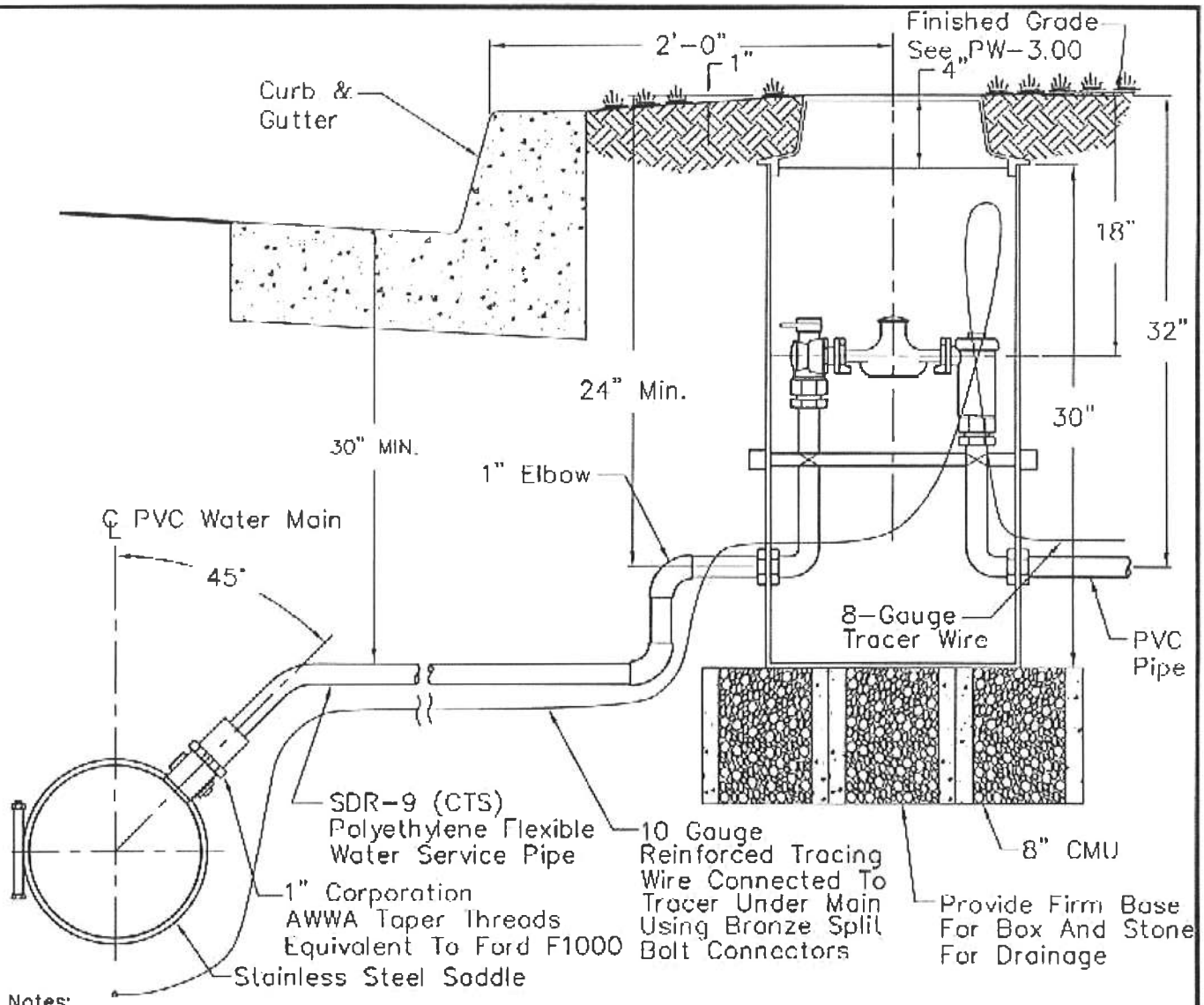
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS 1 1/2" AND 2" METER INSTALLATION
Talbot W Bane 9/1/09 EU MANAGER OF ENGINEERING DATE	AUG 1, 94 MAY 3, 95 MAR 1, 98 FEB 1, 06 MAR 1, 07	
ISSUED: MAY 1, 1986	SEP 1, 09	STANDARD NO. W-7.03



Notes:

1. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
2. Thoroughly Tape Mechanical Connections With Electrical Tape.

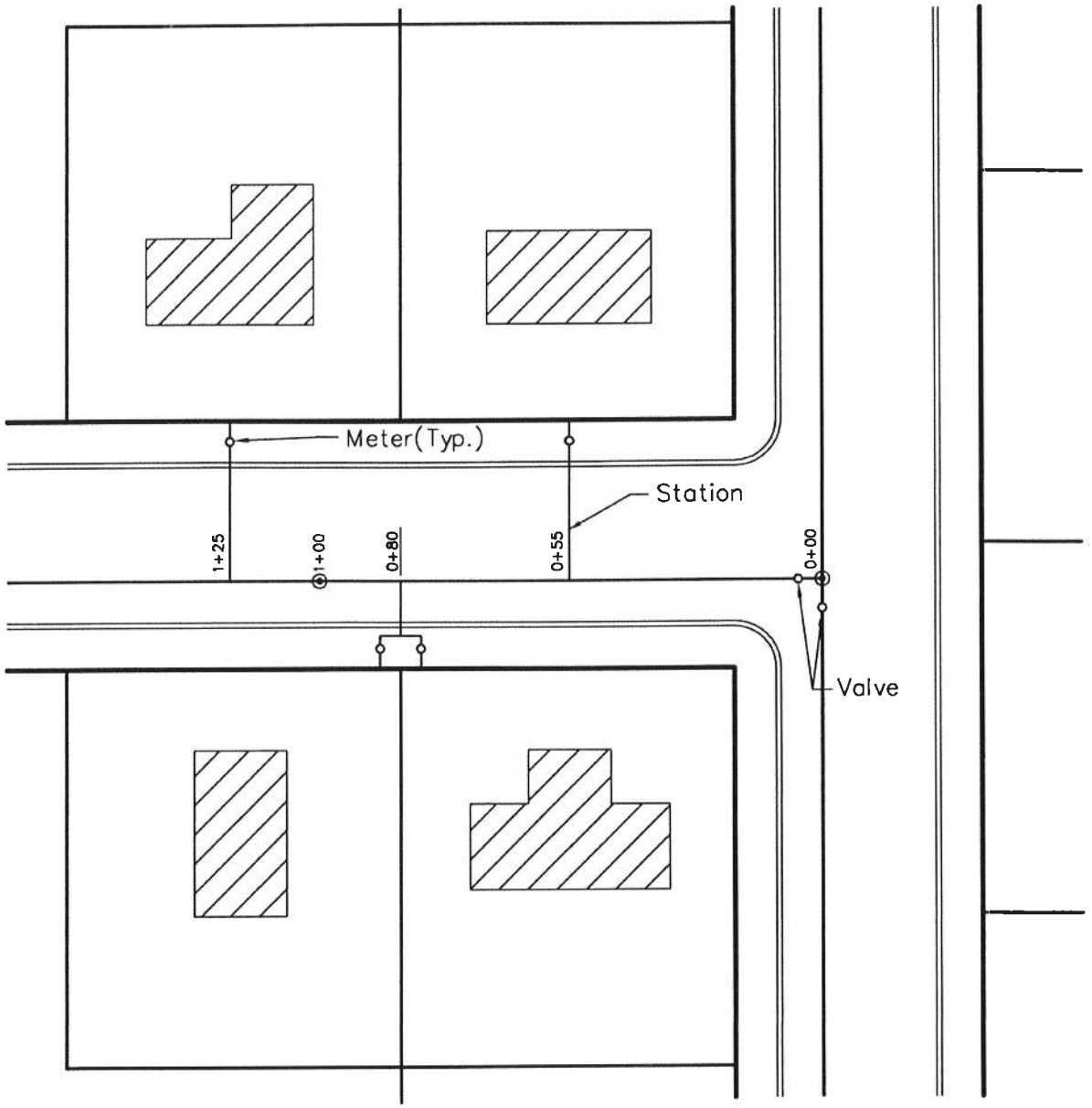
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS
Talbot W Baer 9/1/09	JUN 23, 97	
EU MANAGER OF ENGINEERING DATE	MAR 1, 98	
	MAR 1, 07	
	SEP 1, 09	WATER SERVICE CONNECTION
ISSUED: JUNE 5, 1997		STANDARD NO. W-7.04



Notes:

1. Stainless Steel Saddle Shall Be Equivalent To Ford FS303 Or PowerSeal 3412AST.
2. Pipe Shall Be Tapped With A Shell Type Cutter (Hole Cutter) That Will Retain The Coupon In Accordance With UNI-BELL Plastic Pipe Association UNI-B-3.
3. Pipe Shall Conform And Be Installed According To AWWA C901 For PE-3408 High Molecular Weight Polyethylene, Equivalent To Orangeburg Poly-XTRA, Class 200 (SDR-9, CTS-OD).
4. The Polyethylene Pipe Shall Be Cut With Approved Cutters Only.
5. Stainless Steel Inserts Shall Be Used At All PE Connections To Fittings.
6. Meter Box Ford No. PSVHH-288-18-30 Or An Approved Equal Furnished And Installed By Contractor.
7. Meter Furnished And Installed By E.U.C.
8. Backfill And Tamp With Select Material To Pad Pipe. See Detail W-1.00.
9. Reinforced Coated Tracer Wire As Manufactured By Copperhead Industries, LLC, P.O. Box 1081, Monticello, MN, 55362, Or An Approved Equal.
10. Thoroughly Tape Mechanical Connections With Electrical Tape.

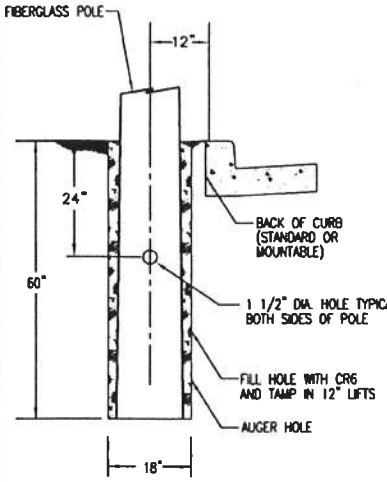
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS 5/8" x 3/4" WATER SERVICE INSTALLATION – PVC WATER MAIN
Talbot W Bane 9/1/09	SEP 1, 09	
EU MANAGER OF ENGINEERING DATE		
ISSUED: APRIL 1, 2007		STANDARD NO. W-7.05



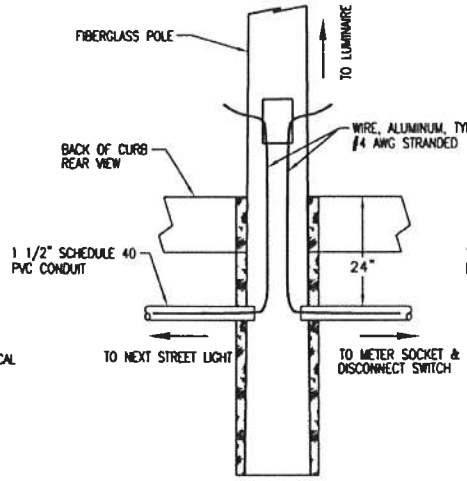
Notes:

1. As-Built Drawings Must Be Compiled By Contractor And Submitted To E.U.C. At Completion Of Project And Prior To Acceptance Of System.
2. As-Built Drawings To Be Submitted By A Licensed Engineer Or Surveyor.

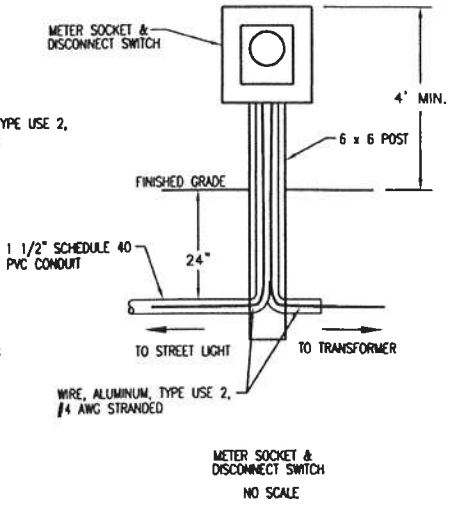
APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES STANDARD DETAILS WATER SERVICE LATERAL AS-BUILT DRAWING
Talbott W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE	MAR 10, 95 MAR 1, 98	
ISSUED: AUG 1, 1994		STANDARD NO. W-8.00



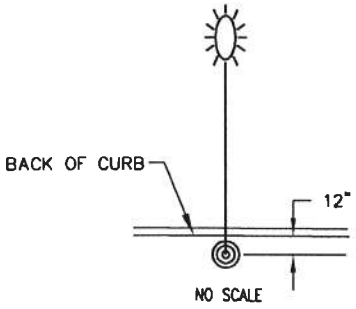
STREETLIGHT FOOTING DETAIL
NO SCALE



FIBERGLASS POLE, CONDUIT & WIRE
NO SCALE



METER SOCKET & DISCONNECT SWITCH
NO SCALE



NO SCALE

NOTES:

1. METER SOCKET AND DISCONNECT SWITCH SHALL BE SUPPLIED AND INSTALLED BY THE DEVELOPERS LICENSED ELECTRICIAN.
2. 100 OR 200 AMP METER SOCKET TO BE APPROVED BY ELECTRIC SERVICE PROVIDER.
3. TWO POLE, 60 AMP, FUSIBLE DISCONNECT SWITCH RATED NEMA 3R. TWO 60 AMP, CLASS K5 FUSES SHALL BE INSTALLED IN DISCONNECT SWITCH.
4. 1 1/2" SCHEDULE 40 PVC CONDUIT REQUIRED FROM METER SOCKET TO DISCONNECT SWITCH AND FROM DISCONNECT SWITCH TO STREET LIGHT POLE.
5. METER SOCKET AND DISCONNECT SWITCH TO BE INSTALLED ON PRESSURE TREATED 6 x 6 POST 3' DEEP AND 4' ABOVE FINISHED GRADE.
6. STREET LIGHT LOCATION, POLE SPACING, LUMINARIE HEIGHT AND TYPE TO BE DETERMINED BY EASTON UTILITIES.
7. EASTON UTILITIES TO SUPPLY AND INSTALL FIBERGLASS POLE, LUMINAIRE AND LAMP, AND CONDUCTORS FROM LUMINAIRE TO BASE OF POLE. EASTON UTILITIES SHALL SUPPLY AND INSTALL THE FINAL CONNECTORS, FUSING AND TERMINATIONS AT BASE OF POLE AFTER DEVELOPERS ELECTRICIAN HAS INSTALLED THE UNDERGROUND DUCT BETWEEN POLES AND PULLED THE WIRE TO EACH POLE. IN ACCORDANCE WITH THE FOLLOWING:
   DISCONNECT SWITCH TO EACH POLE AND IN THE LOCATIONS SPECIFIED BY EASTON UTILITIES. DEVELOPER SHALL PULL WIRE THROUGH THE UNDERGROUND DUCT AND INTO FIBERGLASS POLE IN ACCORDANCE WITH THE FOLLOWING:

   UNDERGROUND DUCT

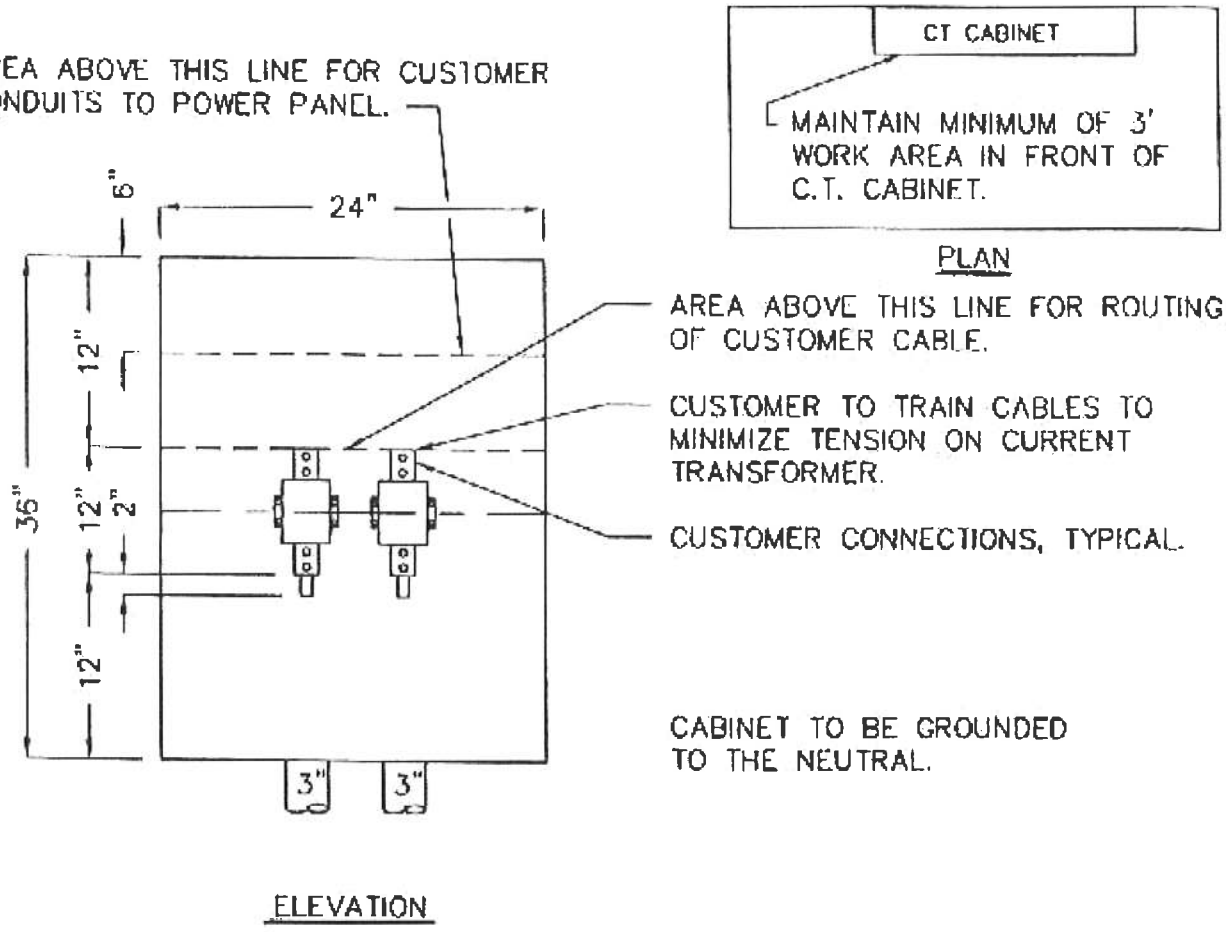
   A. UNDERGROUND DUCT TO BE 1 1/2" SCHEDULE 40, PVC CONDUIT INSTALL PARALLEL TO THE ROAD AND ROUTED THE SHORTEST DISTANCE BETWEEN POLES AS SPECIFIED BY EASTON UTILITIES ELECTRIC DESIGN.
   B. DUCT TO HAVE A MINIMUM OF 24" OF COVER.
   C. ALL DUCT TO BE INSPECTED BY EASTON UTILITIES BEFORE BACKFILLING.
   D. CLEARANCE HOLES FOR 1 1/2" CONDUIT SHALL BE DRILLED IN FIBERGLASS POLE 24" BELOW FINISHED GRADE.
   E. UNDERGROUND DUCT SHALL BE STUBBED INSIDE FIBERGLASS POLE APPROXIMATELY 1" AND REAMED SMOOTH TO ELIMINATE SHARP EDGES.
   F. THE CLEARANCE HOLES SHALL BE SEALED AROUND CONDUIT TO ELIMINATE FOREIGN MATERIAL FROM ENTERING POLE.

   WIRING

   G. CONDUCTORS INSTALLED BETWEEN EACH POLE SHALL BE ALUMINUM, TYPE USE 2, #4 AWG STRANDED.
   H. THERE SHALL BE NO WIRE SPLICES LOCATED INSIDE THE UNDERGROUND DUCT.
   I. AN EQUIPMENT GROUND WIRE OF THE SAME SIZE AS THE SUPPLY CONDUCTORS SHALL BE INSTALLED WITH THE SUPPLY CONDUCTORS TO EACH POLE AND GROUNDED. THE GROUNDING CONDUCTOR SHALL BE PERMANENTLY MARKED (STRIPE OR AN EASTON UTILITIES APPROVED METHOD) BY THE MANUFACTURER. GREEN TAPE SHALL BE APPLIED AT EACH END TO IDENTIFY THE CONDUCTOR AS A GROUNDING CONDUCTOR. WIRE SHALL BE EXTENDED INSIDE EACH POLE A MINIMUM OF 12" ABOVE HAND HOLES LOCATED AT THE BASE OF THE POLE.

8. REFER TO SUPPLEMENTAL SUBDIVISION STREETLIGHT POLICY FOR AREAS OUTSIDE OF EASTON UTILITIES SERVICE TERRITORY.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS
Talbot W Rose 4/25/06 EU MANAGER OF ENGINEER DATE		FIBERGLASS POLE STREETLIGHT INSTALLATION
ISSUED: JUNE 1, 2003		STANDARD NO. E-1.00



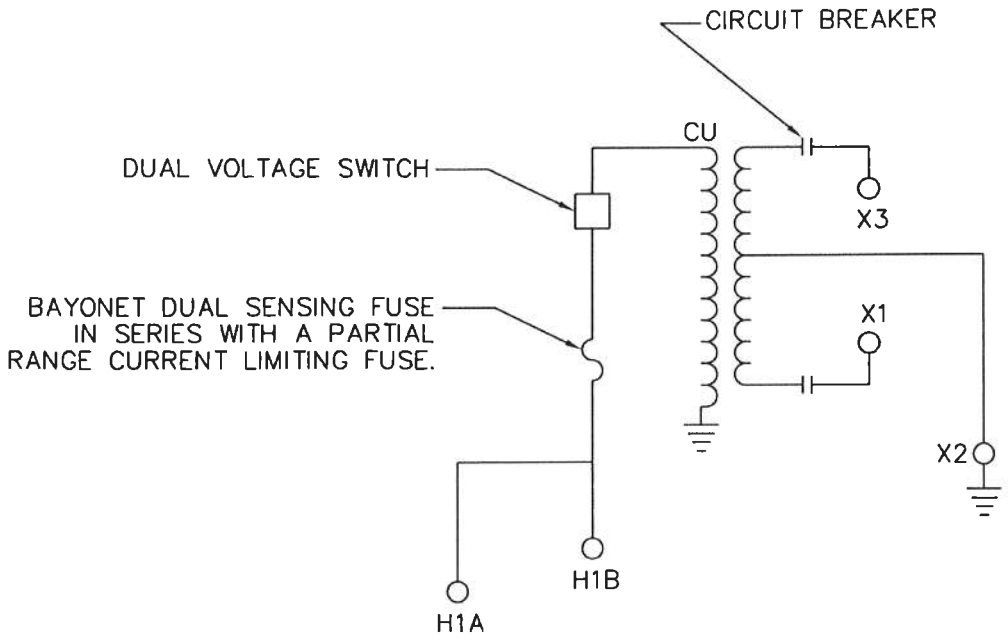
ELEVATION

PLAN

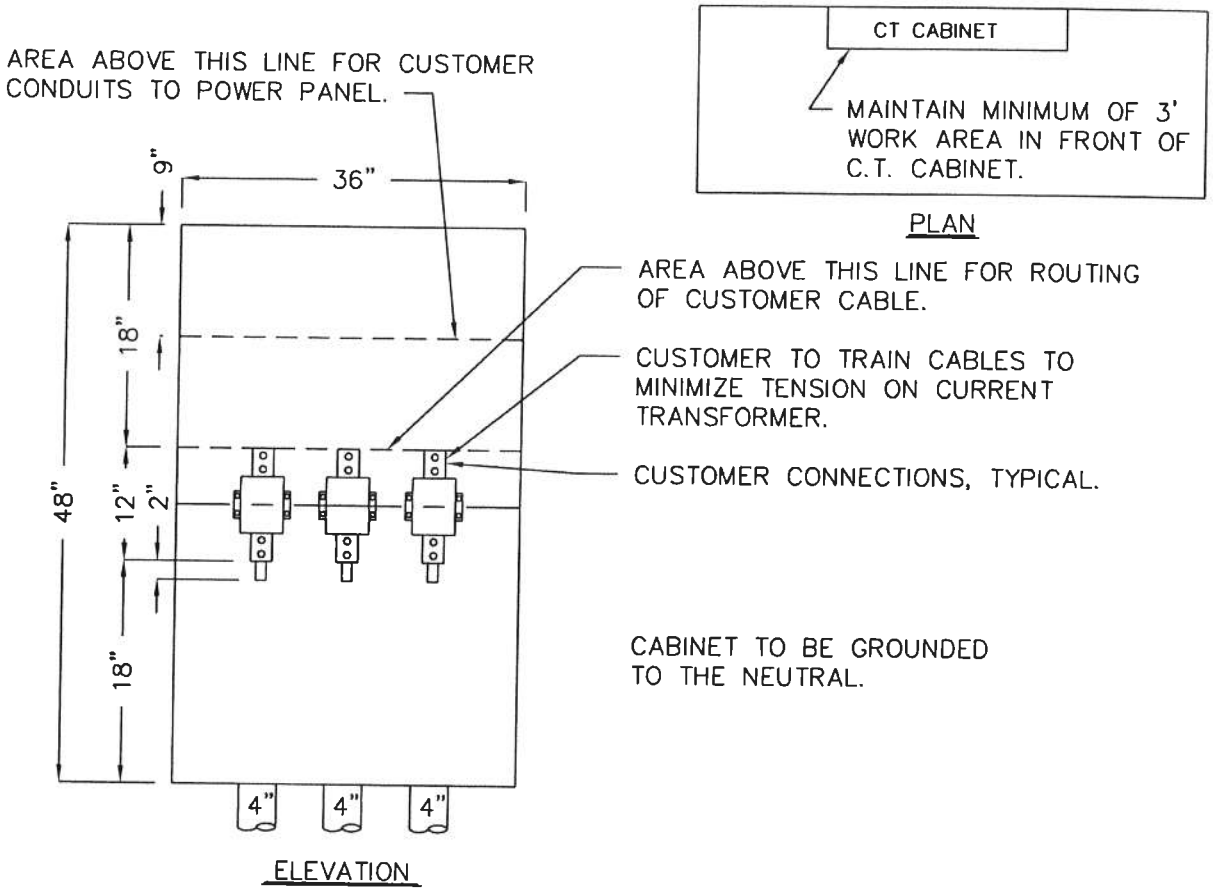
600 AMP SERVICE 2–3" SERVICE CONDUITS, CONDUITS FOR INCOMING LINE MUST ENTER THROUGH THE BOTTOM AS SHOWN UNLESS WRITTEN PERMISSION IS OBTAINED FROM EASTON UTILITIES COMMISSION.

ALL BOXES TO BE MINIMUM OF 16–GAUGE STEEL, NEMA 1 FOR INDOOR OR NEMA 3R FOR OUTDOOR, 10" MINIMUM DEPTH, HINGED DOOR, POSITIVE LATCH WITH PADLOCK EYE. GROUNDED MOUNTING – ADJUSTABLE ASSEMBLY OF VERTICAL AND HORIZONTAL BARS.
CURRENT TRANSFORMER CABINET :
INDOOR – CABINET FURNISHED BY EUC AND INSTALLED BY OWNER.
OUTDOOR – CABINET FURNISHED AND INSTALLED BY OWNER.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS 1ø CURRENT TRANSFORMER CABINET
Talbot W Bare 4/25/08 EU MANAGER OF ENGINEERING DATE		
ISSUED		STANDARD No. E–2.00



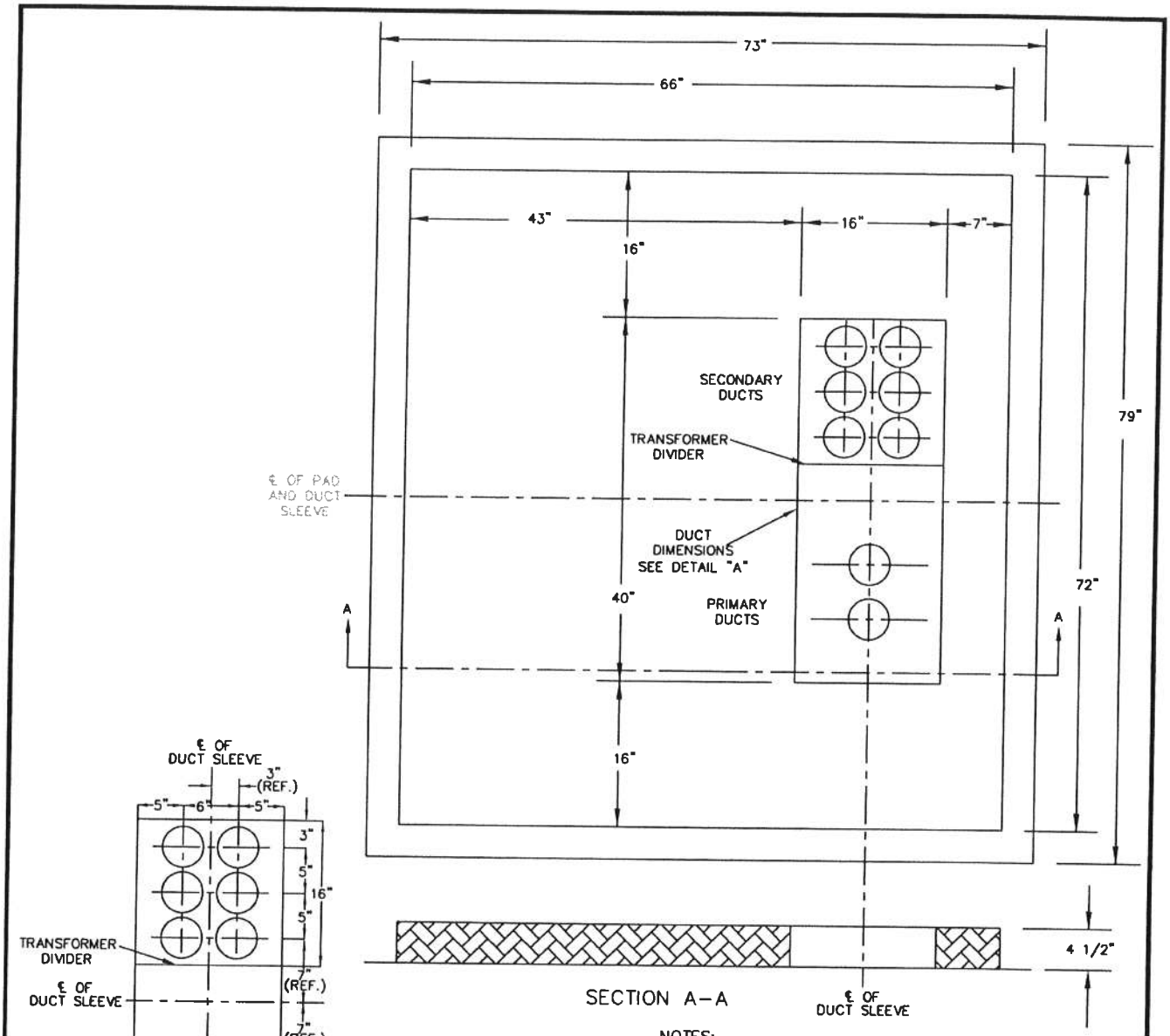
APPROVAL	REVISED	EASTON UTILITIES COMMISSION ELECTRIC DEPARTMENT STANDARD DETAILS SINGLE PHASE/DUAL VOLTAGE TRANSFORMER PRIMARY CONFIGURATION
Talbot W Bone 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED 11/2/01		STANDARD No. E-2.01



600 AMP SERVICE 2–4" SERVICE CONDUITS
800 AMP SERVICE 3–4" SERVICE CONDUITS
} CONDUITS FOR INCOMING LINE MUST ENTER THROUGH THE BOTTOM UNLESS WRITTEN PERMISSION IS OBTAINED FROM THE EASTON UTILITIES COMMISSION.

ALL BOXES TO BE MINIMUM OF 16–GAUGE STEEL, NEMA 1 FOR INDOOR OR NEMA 3R FOR OUTDOOR, 12" MINIMUM DEPTH, BOLT ON DOOR, POSITIVE LATCH WITH PADLOCK EYE. GROUNDED MOUNTING – ADJUSTABLE ASSEMBLY OF VERTICAL AND HORIZONTAL BARS.
CURRENT TRANSFORMER CABINET :
INDOOR – CABINET FURNISHED BY EUC AND INSTALLED BY OWNER.
OUTDOOR – CABINET FURNISHED AND INSTALLED BY OWNER.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS 3ø CURRENT TRANSFORMER CABINET
Talbot W Bare 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED		STANDARD No. E–3.00

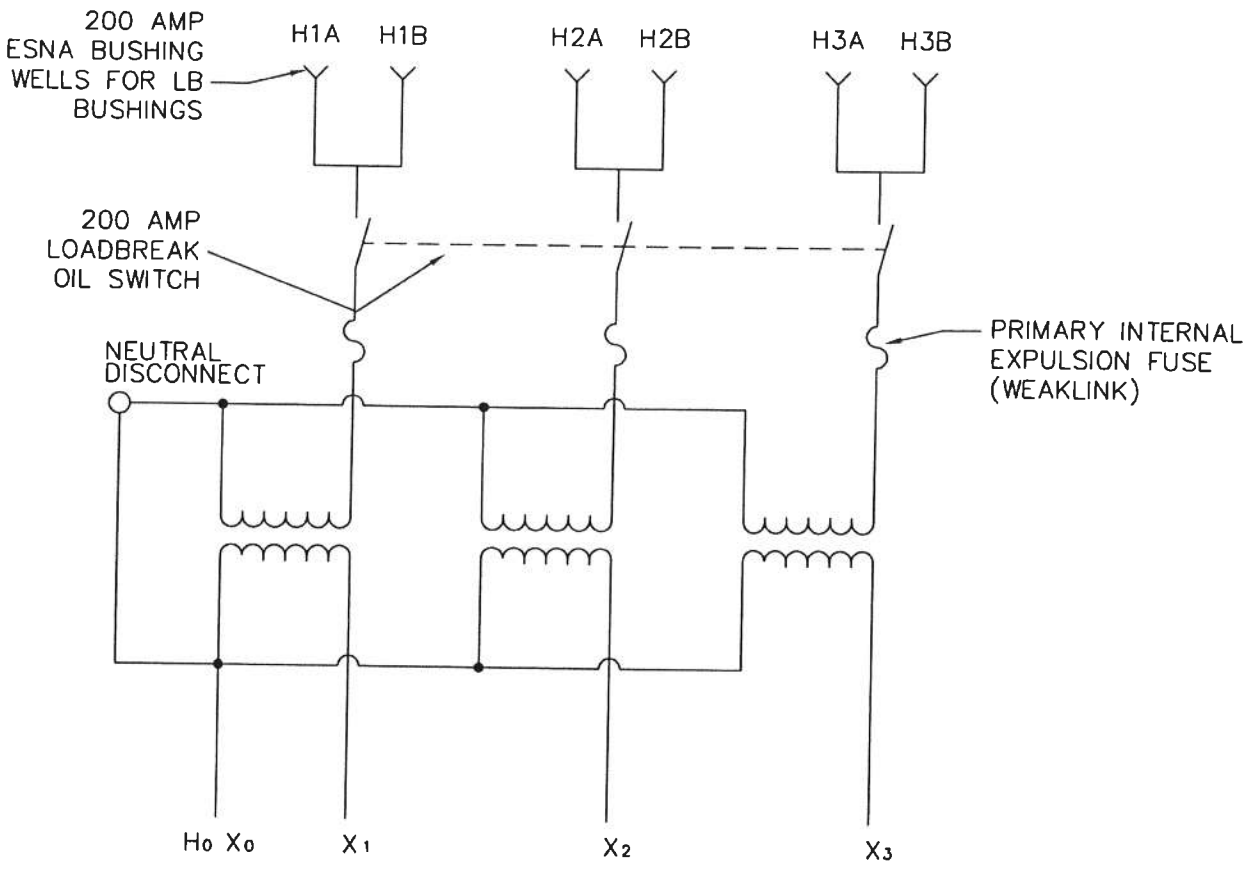


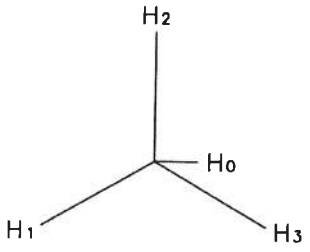
DETAIL "A"

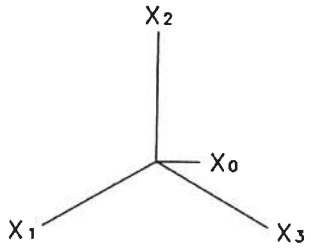
NOTES:

1. ALL PRIMARY AND SECONDARY DUCTS SHALL BE 4" PVC UNLESS SPECIFIED OTHERWISE.
2. INSTALL DUCTS WITH 36" MIN. COVERAGE AND TRENCH MUST BE INSPECTED BY E.U. PRIOR TO BACKFILLING.
3. FULL SIZE TEMPLATE AVAILABLE UPON REQUEST FROM E.U. ELECTRICAL DEPT.
4. 6-4" SECONDARY DUCTS MAXIMUM.

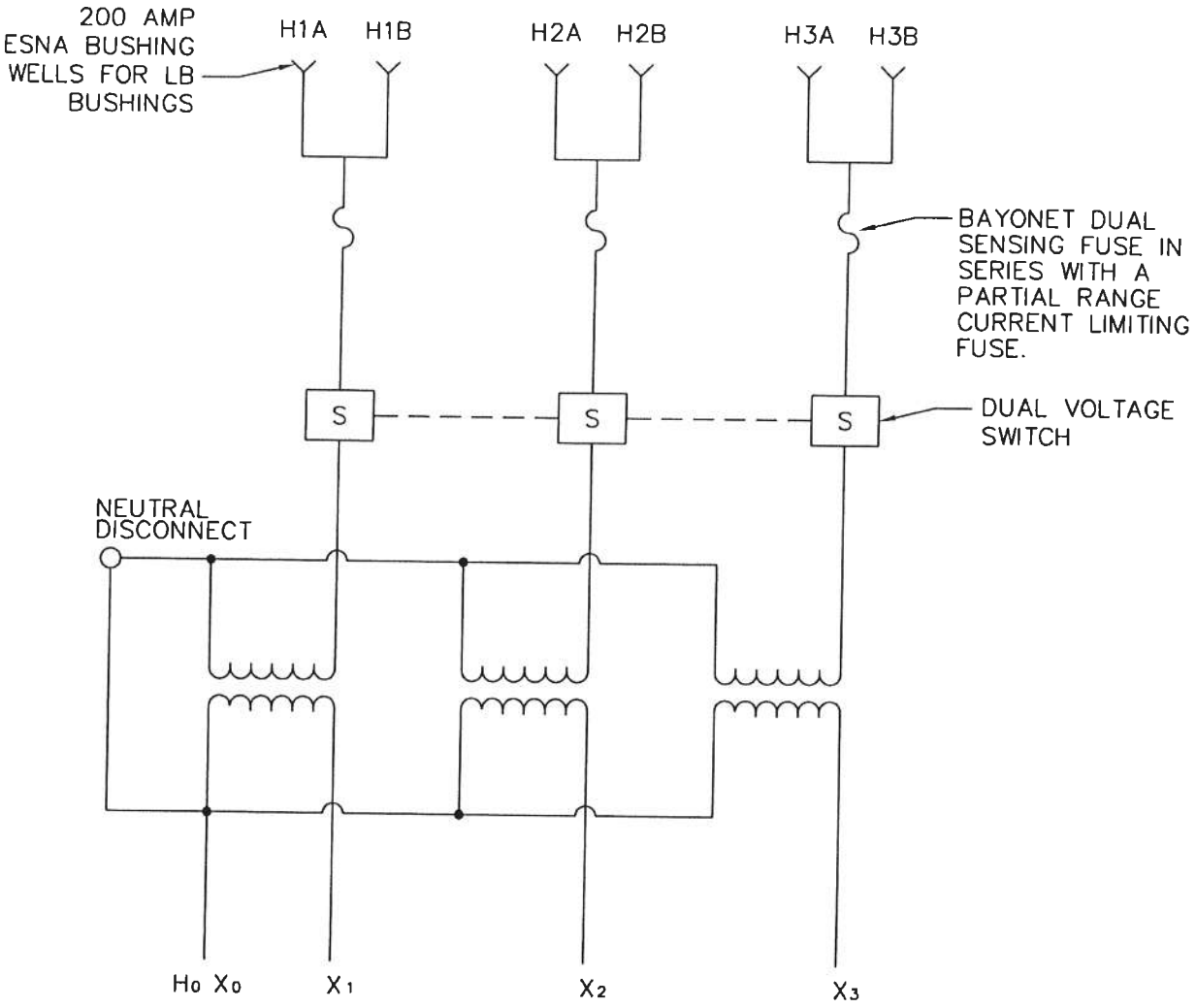
APPROVAL	REVISED	3 Ø TRANSFORMER PAD 75 - 1000 KVA (SUPPLIED BY EU)
Talbott W Base 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED 12/14/04		STANDARD No. E-3.01

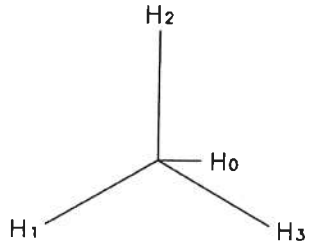


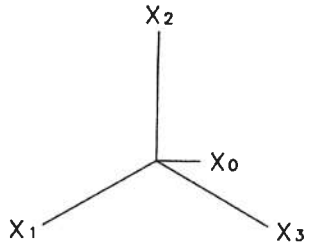




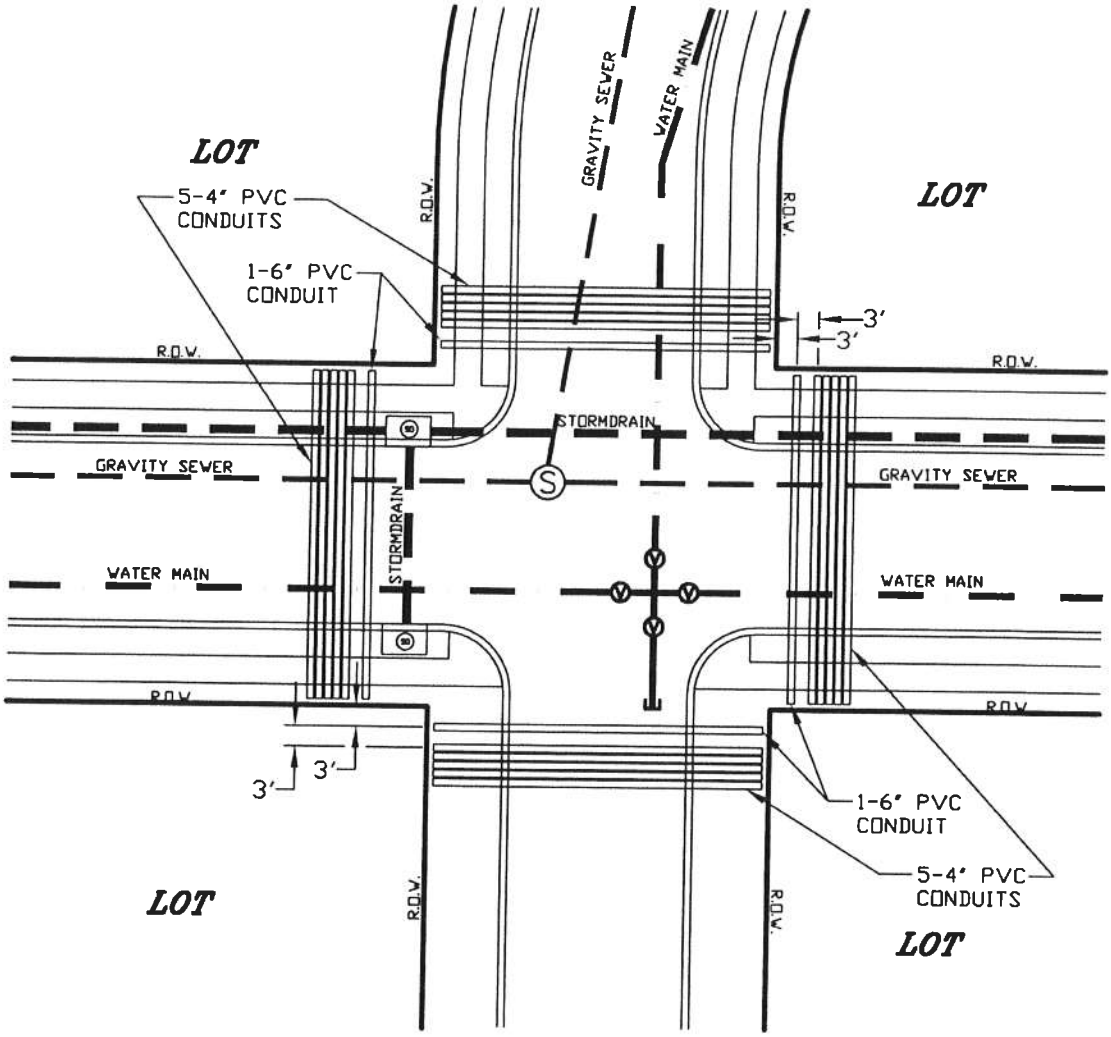
APPROVAL	REVISED	EASTON UTILITIES COMMISSION ELECTRIC DEPARTMENT STANDARD DETAILS THREE PHASE TRANSFORMER PRIMARY CONFIGURATION
Talbott W Base 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED		STANDARD No. E-3.02







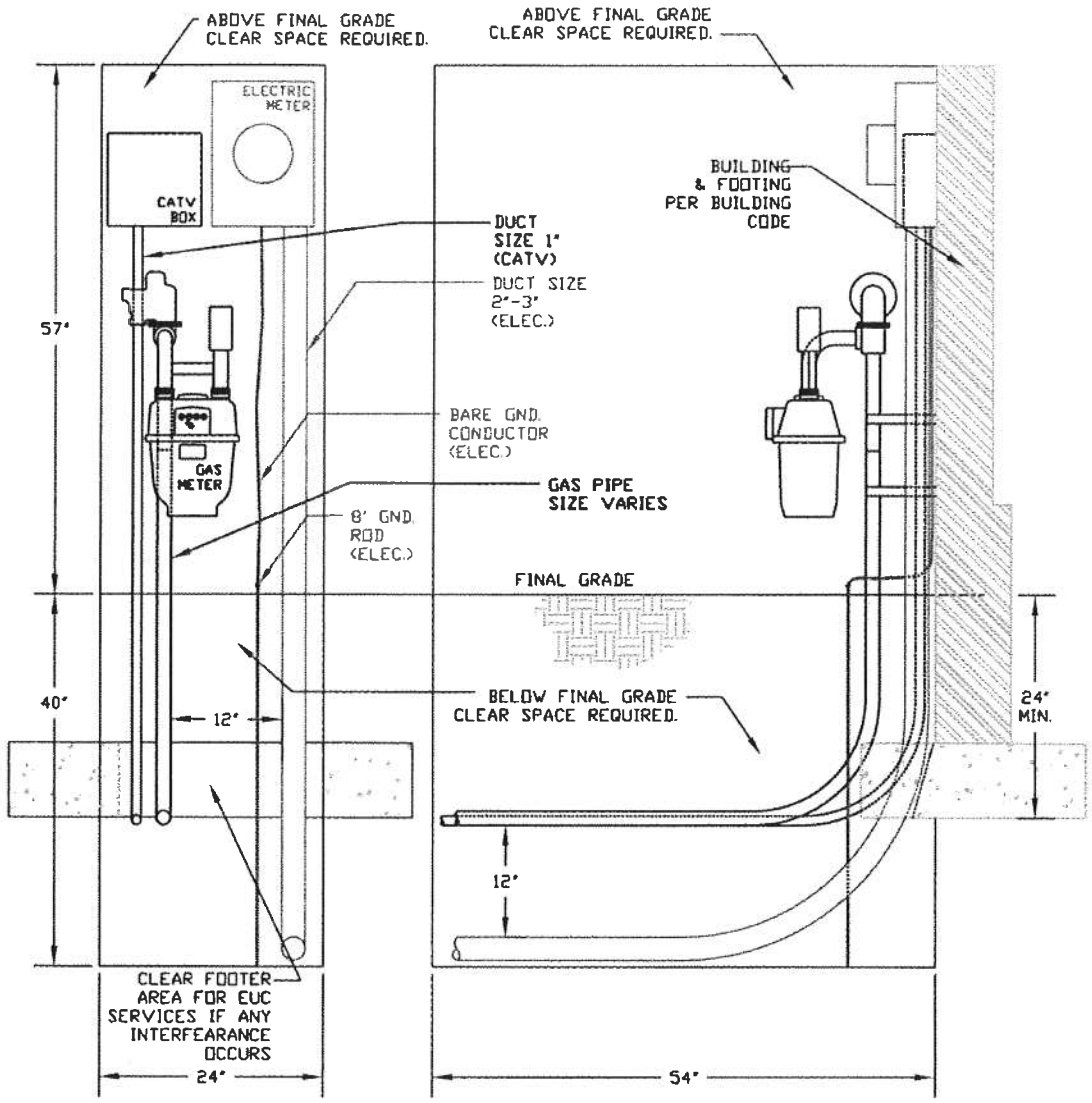
APPROVAL	REVISED	EASTON UTILITIES COMMISSION ELECTRIC DEPARTMENT STANDARD DETAILS THREE PHASE/DUAL VOLTAGE TRANSFORMER PRIMARY CONFIGURATION
Talbot W Bane 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED 10/22/01		STANDARD No. E-3.03



Notes:

1. Proposed Conduits Are To Extend 2' Beyond Back Of Sidewalk.
2. Adjust Location Of Proposed Conduits As Necessary To Avoid Conflicts With Proposed And Existing Utilities.
3. Road Crossings To Be Marked With A 2x4 At Each End. Gas Duct To Be Marked Separate From Duct Bank.
4. Ducts To Have A Minimum Depth Of 36". If Ducts Conflict With Other Utilities And Have A Depth Greater Than 48", Provisions Have To Be Made So Ends Of Ducts Are No Greater Than 48" Deep.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS TYPICAL/INTERSECTION DUCT BANK INSTALLATION
Talbot W Bane 4/25/06 EU MANAGER OF ENGINEERING DATE		
ISSUED: MAR 24, 2006		STANDARD NO. E-4.00



ELECTRIC NOTES

1. 200A electric meter (Typical).

GAS NOTES

1. Gas meter locations shall be agreed upon by the customer and Easton Utilities in advance of construction and are subject to final approval by Easton Utilities.
2. Gas metering assemblies will not be installed in places where it may be subject to damage.
3. Should Easton Utilities determine bollards are required to protect its meter assemblies, the customer shall be required to provide such protection at thier cost.
4. Outside gas meter assemblies are recommended to be at least three (3) feet from any equipment with an open flame or subject to electrical arcing.
5. Refer to National Fuel Gas Code 2002, Easton Utilities Gas Service Tariff and Customer Handbook for additional requirements.

APPROVAL	REVISED	TOWN OF EASTON AND EASTON UTILITIES COMMISSION STANDARD DETAILS ELECTRIC METER, GAS METER & CATV BOX LOCATIONS FOR TOWNHOUSES
Talbot W Lane 4/10/07 EU MANAGER OF ENGINEERING DATE		
ISSUED: NOV 1, 2006		STANDARD NO. E-5.00

APPENDIX A

DESIGN MANUAL QUICK REFERENCE

APPENDIX A
EASTON UTILITIES
DESIGN MANUAL
QUICK REFERENCE
April 12, 2011

General

1. This reference is a supplement to the Standard Details for Public Works and Utility Construction in the Town of Easton. If there are contradictions between this document and the Standard Details, the later shall govern. This document is not intended to cover all aspects of construction. It only documents the most commonly used specifications and requirements of the Town of Easton/Easton Utilities. The Town Engineer or his/her representative may make interpretations or modifications as required.
2. All PVC pipe, mains and laterals, shall have a minimum cover of 42".
3. All approvals of utility systems shall be granted by the Town Engineer or his/her representative.
4. The Contractor shall provide a complete set of redlined as-built drawings to Easton Utilities certified by a licensed professional engineer or surveyor. Any changes from the approved drawings regarding the water system, sanitary sewer, storm sewer, and roadways shall be documented in the required CAD format. All service lateral locations, water, sewer, and gas, if applicable, shall be marked on drawings according to Standard Detail SS-9.00 and W-8.00. Approval of all systems shall not be granted until as-builts have been received by Town of Easton and Easton Utilities.
5. There shall not be any pipe or duct to be backfilled until approved by The Easton Utilities and/or the Town Engineer or by his/her representative.
6. All electric, CATV and/or telephone conduit shall have 36" minimum cover.
7. Additional testing of any utility or infrastructure improvement may be ordered when deemed necessary by Easton Utilities or Town Engineer.
8. All compaction in right-of-way to be 95% modified proctor.
9. Provide lift hooks in unexposed surfaces to accommodate field placement of vaults and manholes.
10. The Town of Easton and/or Easton Utilities shall pre-approve the contractor and all sub-contractors to perform work or infrastructure within the Town of Easton.
11. Inspections to be performed by a representative of Easton Utilities, The Town of Easton or by a contractor that has been pre-approved by the Town Engineer
12. No unauthorized permanent improvements are permitted in any utility easement.

Water Systems

1. All 4" and larger water main shall be Ductile Iron Class 50, ANSI/AWWA C151/A21.51 double cement-lined, or AWWA C-900 PVC DR18. All fittings shall be ductile iron class 350, mechanical joint, in accordance with ANSI/AWWA C110/A21.10-87.
2. All 1" or 2" services shall be Type "K" copper or PE-3408, SDR-9 constructed according to Standard Details W-7.01 or W-7.02.
3. All water main pipes, PVC or Ductile Iron, shall have a minimum of 4" No. 57 or washed stone bedding when high ground water is encountered. Stone is not required at other times unless deemed necessary by the Town Engineer or his/her representative.

All PVC and PE pipe shall have a continuous 10-gauge reinforced tracer wire located beneath the pipe. The wire shall be stubbed into all meter pits and valve boxes and connected across private property with service line to structure.

4. All lateral connections to the PVC main shall be made by stainless steel saddles, equivalent to Ford FS303.
5. Fire Hydrants shall be either Kennedy Guardian 81D or American Darling B 62 B. The maximum distance between hydrants, as measured along an approved roadway, shall be 750' for residential and 375" for commercial and multi-family.
6. The separation between the water and sanitary sewer systems shall be a minimum of 10' laterally and 1' vertically. Concrete encasement per Standard Detail G-5.00 shall be required if this separation is not met.
7. All valves shall be resilient-seated gate valves (ANSI/AWWA C509), open right.
8. Main line valves shall be spaced no greater than 1000'.
9. Gate valves shall be installed on each leg of tees and/or crosses.
10. All mains shall be filled with potable water only, and only by an Easton Utilities representative. At no time shall the Contractor operate any valves or fire hydrants without an Easton Utilities representative being present.
11. The proposed water main shall not be physically connected to the existing water system until all tests; hydrostatic, chlorine residual, bacteria and others deemed appropriate, have been approved by Easton Utilities.

Sanitary Sewer

1. All gravity sewer mains shall be PVC SDR-35, sizes 6" and greater. All 4" gravity sewer laterals shall be Schedule 40 solid core PVC, ASTM 1785 and 2665. If cover is less than 42", all pipe, mains and laterals, shall be Class 50 Ductile Iron.
2. Force main shall be either Ductile Iron Class 50 or C900 PVC. If cover is less than 42", all force mains shall be Class 50 Ductile Iron.
3. All laterals shall be laid at a minimum of 2% slope unless otherwise approved.
4. Manhole spacing shall be no greater than 400'.
5. Approval of main shall not be granted until: a) the main has passed the Uni-bell low-pressure air test; b) a 5% mandrel has successfully been pulled through all mains; c) vacuum test has been successfully completed on all manholes; and d) gravity system is otherwise completed.
6. Sewer clean outs are required at property line and within 5' of foundation. If lateral is greater than 75' or there is a change in direction, additional clean outs are required.
7. Sewer force mains shall not be accepted until a hydrostatic test has been performed by the contractor and approved by Easton Utilities.

Storm Drain

1. Inlets shall be either precast concrete or cast-in-place. The maximum distance between inlets shall be 400 feet or a distance where the spread is a maximum of ½ of a lane width for a 10-year storm.
2. Pipe shall be either RCP or smooth-lined Polyethylene. Construction of Polyethylene pipe shall be in accordance with Standard Detail SD-6.00 and approved manufacture installation procedures, whichever is more stringent, as judged by the Town Engineer. Polyethylene pipe shall not be used below the structural infrastructure improvements including curb and gutter, street section, etc. Use of polyethylene pipe less than 24" in diameter requires specific approval for use and installation by the Town Engineer.

Streets

1. All streets, curbs and gutters, shall have a minimum slope of 0.50%. For curved streets, this standard shall be applied to the long radius of any curb and gutter.
2. All pavement cross-sections shall be according to Standard Details PW-1.01 to PW-1.05.
3. All depressed curb and gutter shall be in accordance with Standard Detail PW-2.01; in particular the thickness shall be 8" with three (3) epoxy coated No. 6 reinforcement bars.
4. In areas where mountable (rolled) curb is used, all measurements referenced to the face of curb shall be taken from the flow line.
5. Top of curb elevations shall be shown at the PC and PT of all curb returns.

APPENDIX B

COST ESTIMATES FOR BONDING SUBMITTALS

Town of Easton

Robert Karge
Town Manager
Mike Dickerson
Superintendant of Public Works

14 SOUTH HARRISON STREET
EASTON, MD 21601
Tel : (410) 822-2525
Fax: (410) 820-8016

DEPARTMENT OF PUBLIC WORKS

COST ESTIMATE FOR BONDING SUBMITTALS
Effective January 1, 2011

PROJECT NAME: _____

DEVELOPER: _____

ADDRESS: _____

PREPARED BY: _____

PHONE: _____

	UNIT COST	QUANITY	TOTAL
STORMWATER COLLECTION			
15 in. HDPE	$40.00 per LF		$0.00
18 in. HDPE	$42.00 per LF		$0.00
21 in. HDPE	$50.00 per LF		$0.00
24 in. HDPE	$55.00 per LF		$0.00
27 in. HDPE	$65.00 per LF		$0.00
30 in. HDPE	$75.00 per LF		$0.00
36 in. HDPE	$90.00 per LF		$0.00
48 in. HDPE	$100.00 per LF		$0.00
15 in. RCP	$45.00 per LF		$0.00
18 in. RCP	$50.00 per LF		$0.00
21 in. RCP	$55.00 per LF		$0.00
24 in. RCP	$67.50 per LF		$0.00
27 in. RCP	$75.00 per LF		$0.00
30 in. RCP	$88.00 per LF		$0.00
36 in. RCP	$119.00 per LF		$0.00
48 in. RCP	$161.00 per LF		$0.00
60 in. RCP	$228.00 per LF		$0.00
Standard Inlet (Typical to 6' Depth)	$3500.00 Each		$0.00
Yard Inlet	$1500.00 Each		$0.00
Throated Inlet	$3500.00 Each		$0.00
Manhole (Typical to 6' Depth)	$3500.00 Each		$0.00
End Section (Concrete < 36" in Diameter)	350.00 Each		$0.00
SUB-TOTAL - PAGE 1			$0.00

TOWN OF EASTON
COST ESTIMATE FOR BONDING SUBMITTALS
2

STORMWATER	**UNIT COST**	**QUANITY**	**TOTAL**
Outfall Structure	$5,000.00 Each		$0.00
Stabilization – Top soil and seeding	$1.00 per SY		$0.00
Excavation of Stormwater Ponds	$10.00 per CY		$0.00
SEDIMATE CONTROL			
Super Silt Fence	$9.00 per LF		$0.00
Silt Fence	$5.00 per LF		$0.00
Inlet Protection	$250.00 Each		$0.00
Rip-Rap	$90.00 per CY		$0.00
Stabilized Construction Entrance	$1500.00 Each		$0.00
Sediment Trap	$8.00 per CY		$0.00
Clearing and Grubbing	$4000 per AC		$0.00
SANITARY SEWER			
8" **(per foot)**	$68.00		$0.00
10" **(per foot)**	$85.00		$0.00
4" Service Lateral	$575 Each		$0.00
6" Service Lateral	$600 Each		$0.00
4" Cleanout Assembly	$250 Each		$0.00
6" Cleanout Assembly	$300 Each		$0.00
Manhole (typical to 8' Deep)	$3,500 Each		$0.00
WATER			
8" Main **(per foot)**	$52.00		$0.00
10" Main **(per foot)**	$65.00		$0.00
¾" Service Lateral (includes pitsetter)	$800 Each		$0.00
1" Service Lateral (includes pitsetter)	$900 Each		$0.00
1 ½ " Service Lateral (includes pitsetter)	$1,800 Each		$0.00
2" Service Lateral (includes pitsetter)	$2,000 Each		$0.00
Fire Service - 2"	$1,000 Each		$0.00
Fire Service - 4"	$1,600 Each		$0.00
Fire Service - 6"	$1,900 Each		$0.00
Fire Service - 8"	$2,200 Each		$0.00
Relocate existing hydrant	$2,500.00 Each		$0.00
Fire hydrant assembly, new	$5,500.00 Each		$0.00
In Line Valve 6" to 10'	$750.00 Each		
SUB-TOTAL – PAGE 2			$0.00
SUB-TOTAL – PAGES 1 AND 2			$0.00

COST ESTIMATE FOR BONDING SUBMITTALS

3

CASING PIPE, JACK AND BORE			
24-in Casing Pipe, Jack and Bore	$475.00 per LF		$0.00
30-in Casing Pipe, Jack and Bore	$625.00 per LF		$0.00
36-in Casing Pipe, Jack and Bore	$725.00 per LF		$0.00
24-in Casing Pipe, Laser Guided Boring	$525.00 per LF		$0.00
30-in Casing Pipe, Laser Guided Boring	$675.00 per LF		$0.00
36-in Casing Pipe, Laser Guided Boring	$775.00 per LF		$0.00
ROADWAY PRICING			
Excavation & Embankment	$10.00 per CY		$0.00
Select Fill	$22.00 per CY		$0.00
Graded Aggregate	$65.00 per CY		$0.00
Bituminous Concrete Base	$4.50 per SY-in		$0.00
Bituminous Concrete Surface	$5.75 per SY-in		$0.00
Milling	$12.50 per SY		$0.00
Milling & Repaving 1.5"	$18.00 per SY		$0.00
Top Soil & Seed - 3' wide/side	$10.00 per SY		$0.00
CURB, GUTTER, SIDEWALK PLACEMENT	**UNIT COST**	**QUANITY TOTAL**	
Curb and Gutter	$25.00 per LF		$0.00
V Gutter, Mountable Curb	$35.00 per LF		$0.00
Sidewalk 4"	$6.00per SF		$0.00
Sidewalk 6"	$8.00 per SF		$0.00
Brick Sidewalk	$12.00 per SF		$0.00
CURB, GUTTER, SIDEWALK REMOVAL			
Gutter Only	$5.00 per LF		$0.00
Sidewalk 4"-6"	$7.50 per SF		$0.00
Curb & Gutter, V Gutter, Mountable Curb	$12.00 per LF		$0.00
STREET LIGHTING			
Street lighting, Standard	$2000.00 each pole, installed		$0.00
Street lighting,Decorative	$4000.00 each pole, installed		$0.00
Other Signage and Pavement Markings	Engineer's Estimate		
Traffic Signals	Engineer's Estimate		
Amenities			
Landscaping			
Forest Conservation			
Street Trees	$300.00 each		$0.00
SUB-TOTAL – PAGE 3			$0.00
TOTAL ESTIMATE			$0.00