

# **BETHLEHEM TOWNSHIP**

NORTHAMPTON COUNTY, PENNSYLVANIA

## **STANDARD CONSTRUCTION DOCUMENTS**

JANUARY 2023  
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THE PIDCOCK COMPANY  
CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE  
LAND SURVEYING

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## **PREFACE**

These Standard Construction Documents are comprised of the General Provisions, Technical Specifications, and Standard Construction Details. The utilization of any portion of these Documents shall consider the content of the full Documents in their entirety.

These Standard Construction Documents are the minimum standard and are to be used only for construction and installation of improvements and common amenities (as those items are defined in the Township Subdivision and Land Development Ordinance) which are intended to be offered for dedication or otherwise conveyed or transferred to the Township, and to common amenities for which the Subdivision and Land Development Ordinance requires construction to Township Standards, all pursuant to an approved subdivision/land development plan. These Standard Construction Documents are not a substitute for comprehensive project construction specifications as prepared by the Design Engineer for a Developer and may not include references to additional, applicable requirements of PENNDOT, Building Codes, private utilities, authorities, etc. These Standard Construction Documents do not address all issues typically addressed in the Developer's complete set of plans and specifications including but not limited to, safety, measurement of quantities for payment, insurance, etc. Additionally, these Standard Construction Documents represent the minimum standards and requirements for construction and installation of improvements and common amenities. In cases where these minimum standards and requirements are not adequate for the specific design, it is incumbent upon and solely the responsibility of the Developer and Design Engineer to identify such inadequacies and provide for the necessary modifications in the design.

These Standard Construction Documents are intended to be used in conjunction with the current edition of the Commonwealth of Pennsylvania, Department of Transportation (PENNDOT) Specifications, Publication 408 (latest edition), and PENNDOT Bureau of Design and Delivery, Standards for Roadway Construction (latest edition). The Provisions of the PENNDOT, Specifications Publication 408 (latest edition), and the PENNDOT Publication No. 72M, Standards for Roadway Construction, Series RC-1M-100M (latest editions) shall govern where applicable, except as specifically modified by the requirements of the Standard Construction Documents.

All work and installations as outlined in these Documents shall be required to comply with all applicable federal, state, and local standards and regulations, including but not limited to, Occupational Safety and Health Administration (OSHA) regulations, Department of Labor & Industry regulations, state and local blasting permit requirements, regulations governing earth disturbance, stormwater management, environmental protection, etc.

The Standard Construction Documents prepared by The Pidcock Company are copyrighted. It shall be understood by all parties or persons that this notice of copyright is equivalent to affixing the notice of copyright on every component of the Standard Construction Documents prepared by The Pidcock Company. No other person, party, or organization of whatsoever kind other than The Pidcock Company shall have the legal right to reproduce, publish, or sell any component of the Standard Construction Documents prepared by The Pidcock Company. The Standard Construction Documents are not published, any dissemination or circulation of the Standard Construction Documents notwithstanding, and The Pidcock Company reserves all rights related to the Standard Construction Documents prepared by The Pidcock Company.

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**Section A** GENERAL PROVISIONS

## GENERAL PROVISIONS

The following GENERAL PROVISIONS are to be used for work within Bethlehem Township.

### **Art. 1 DEFINITIONS:**

**COMMON AMENITIES** – Certain additions, alterations, or modifications constructed or made to, upon, or in connection with realty as required by an approved subdivision or approved land development plan and which are not intended to be offered for dedication to the Township. Common Amenities do not include buildings, building pads, private parking lots, etc., and any earthwork related thereto.

**CONTRACTOR** – The term “Contractor” shall in every case be held to mean the individual, co-partnership, or corporation performing the Work of the project for the Developer. The term Contractor shall be understood to include all Subcontractors also performing work for the Developer.

**DESIGN ENGINEER** – The Engineer responsible for the preparation of the plans for the Developer.

**DEVELOPER** – The Developer, where referred to in these Specifications, shall be the individual, partnership, corporation, or entity, undertaking the improvement of property within the Township pursuant to the Subdivision and Land Development Ordinance and/or Zoning Ordinance.

**DOCUMENTS** – These General Provisions, Technical Specifications, and Standard Construction Details for the Township.

**ENGINEER** – The term “Engineer” shall be held to mean the Township Engineer duly appointed by the Bethlehem Township Board of Commissioners, acting directly or through authorized representatives, such representatives acting within the scope of the particular duties and authority assigned to them by the Township.

The term “Engineer” may also be held to mean such other person, persons, or authority as may hereafter be appointed by Bethlehem Township to succeed to the functions, duties, and employment herein specified to be performed by the Engineer.

**ENVIRONMENTAL CONSULTANT** – The Environmental Consultant shall be the person or entity advising the Township on environmental issues.

**GEOTECHNICAL ENGINEER** – The Geotechnical Engineer shall be the person or entity advising the Township on geotechnical issues.

HAZARDOUS ENVIRONMENTAL CONDITION – The presence at the site of asbestos, PCBs, petroleum, hazardous waste, radioactive material, or other, which are routinely recognized by the state or federal governments as being hazardous.

IMPROVEMENTS – All additions, alterations, or modifications constructed or made to, upon, or in connection with realty as required by an approved application including all related plans, details, permits, and outside agency approvals, and which may or may not be intended to be offered for dedication to the Township.

LIGHTING ENGINEER – The Lighting Engineer shall be the person or entity advising the Township on all lighting matters.

OBSERVER – An authorized representative of the Engineer assigned to make observations of the Work performed or being performed.

PLANS – The plans or drawings of a subdivision or land development as approved by the Township for substantial compliance with the applicable Ordinances, Regulations, etc., and plans or drawings renewed and approved by other third-party review agencies as part of related permit and approval processes.

SHOP DRAWINGS – All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the Contractor, a Subcontractor, manufacturer, supplier, or distributor, and which illustrate the equipment, material, or some portion of the Work.

STRUCTURAL ENGINEER – The Structural Engineer shall be the person or entity advising the Township on all structural matters.

TOWNSHIP – Bethlehem Township.

WORK – Any and all obligations, duties, and responsibilities necessary for the successful completion of the project undertaken by a Contractor which shall include such obligations, duties, and responsibilities not only of the Contractor but also of each and every Subcontractor.

## **Art. 2 SUPERINTENDENCE OF THE WORK:**

The Developer and the Contractor shall provide a superintendent or other person responsible for overseeing the Work on a day-to-day basis. In cases where such superintendence is not provided, the Developer or his authorized representative shall meet with the Engineer's representative on a pre-arranged basis to discuss any concerns and the general condition of the project.

## **Art. 3 PRECONSTRUCTION REQUIREMENTS:**

Before any work at the site can commence, the following must be completed:

- A. The Contractor shall provide, and update as necessary, a progress schedule indicating the starting and completion dates of the various stages of the Work and a schedule of shop drawing submissions. The Contractor shall provide a minimum of 48-hours advanced notice to the Engineer for observation of work;
- B. Unless it is determined to be unwarranted by the Township, a Preconstruction Conference will be held to review the schedule, establish procedures for review of shop drawings and other submissions, process improvements security release requests, and establish a working understanding between the parties as to the project. The conference is to be attended by an authorized representative of the Developer, Contractor, its superintendent, and by the Engineer, Geotechnical Engineer, Township, and others as deemed necessary by the Township. Additionally, as work continues, if in the opinion of the Township, job progress meetings are determined to be necessary, these meetings are to be attended by the Contractor and Developer; and
- C. The Developer shall provide evidence of adequate insurance to the Township and its Solicitor for review. Such insurance shall name the Township and all Township Engineers as additional Insureds.

**Art. 4 SCOPE OF OBSERVATION BY THE ENGINEER:**

General observation of construction of the Work, including but not limited to proposed storm sewerage systems, streets, including utility trench backfill, traffic signals, etc. shall be performed to the extent deemed necessary by the Engineer given the scope of the Work. Accessory to this observation is the review of all grade sheets, catalog, and shop drawing submittals, processing of improvements security release requests, required surveys, etc.

The Engineer shall not have the authority to stop the Work; that authority is reserved for the Township and Developer/Contractor.

Any work done or materials installed without proper notification of the Engineer for observation, adequate survey control, or Engineer-reviewed grade sheets and submittals, may be ordered removed or replaced by the Township. Any removal/replacement so ordered shall be accomplished at the sole expense of the Developer. Additionally, improvements security for this work will not be recommended by the Engineer for release by the Township.

Observation of the construction of, and recommendations for the release of security for the site lighting, pavement markings, traffic signage, planting of shade trees, buffer strip landscaping, etc., will be performed by Township Staff.

**Art. 5 APPROVALS AND STANDARDS:**

- A. Should revisions be proposed to the approved Plans, revised plans shall be submitted promptly to the Township and the Engineer. Although the Plans have been approved by the Township for substantial compliance with the Subdivision and Land Development Ordinance, changes may be required due to field conditions that were

unknown, or incorrectly or insufficiently described on the drawings. In such instances, it will be the responsibility of the Developer, through its engineer, to propose any changes to the Plans for review by the Township prior to proceeding with the Work. Observers do not have the authority to approve any changes from the approved Plans. Any and all requests for deviation from the approved Plans shall be proposed/approved by the Design Engineer and submitted in writing by the Developer to the Township for review and must be accompanied by supporting engineering data. Oral agreements may not be substituted for this process.

- B. Although relevant technical portions of these Documents may be relied upon in the specifications prepared by the Developer's engineer for his client, the Professional Engineer's Seal to be put on the construction plans and specifications shall be that of the Developer's Design Engineer who has the professional responsibility for the complete set of plans and specifications. Incorporation, including by reference, of portions or all of these Documents into the project construction documents by the Developer and/or the Developer's engineer constitutes an acceptance of these Documents by the Developer and the Developer's engineer for use on this project.

**Art. 6 DIFFERING SUBSURFACE AND PHYSICAL CONDITIONS:**

If the Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Plans, then the Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any work in connection therewith (except in an emergency) notify the Township and the Geotechnical Engineer in writing about such condition. The Contractor shall not further disturb such condition or perform any work in connection therewith (except as aforesaid) until receipt of approval to do so from the Geotechnical Engineer.

**Art. 7 HAZARDOUS SUBSURFACE AND PHYSICAL CONDITIONS:**

If the Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition, or if the Contractor creates a Hazardous Environmental Condition, then the Contractor shall immediately:

- A. Secure or otherwise isolate such condition;
- B. Stop all Work in connection with such condition and in any area affected thereby (except in an emergency); and
- C. Promptly notify the appropriate regulatory agency and advise the Township in writing about such condition.

The Contractor shall not further disturb such condition or perform any work in connection therewith (except as aforesaid) until the Contractor provides the Township and the Environmental Consultant written notification that the appropriate regulatory agency has rendered the area safe



for the resumption of work or has specified any special conditions under which the Work may resume safely.

**Art. 8 REQUIRED SUBMITTALS:**

- A. The Contractor shall review, stamp with its approval on each sheet, and submit material lists, catalog submissions, shop drawings, pipe certifications, concrete and asphalt mix designs, and samples for improvements as proposed by the Plans. All submittals should be properly identified. At the time of submission, the Contractor shall inform the Engineer in writing of any deviation in the submittals from the requirements of the Plans.
1. Hard Copy Submittals – Five copies of each submittal should be provided for review in accordance with the Standard Construction Documents. Two reviewed copies will be returned to the Contractor; or
  2. Electronic Submittals – For convenience, the Contractor may submit “Approved” signed PDF copies by e-mail for review in accordance with the Standard Construction Documents. Reviewed copies will be returned by e-mail.

Mix design information for all materials used in constructing streets, curbs, sidewalks, and recreation paths, which are to be dedicated to the Township, shall have PENNDOT approval and shall be submitted to the Engineer a minimum of one week in advance of the delivery of the materials on the project.

By approving and submitting shop drawings and samples, the Contractor thereby represents that it has determined and verified all field measurements, field construction criteria, materials, catalog numbers, and similar data and that it has checked and coordinated each shop drawing and sample with the requirements of the Work and the approved Plans.

No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed by the appropriate Township consultant. All such portions of the Work shall be in accordance with reviewed shop drawings and samples, and no release of security for any improvement will be made until all required documentation has been supplied.

The Engineer’s review is only for general conformance with the Township Standards and general compliance with the information given in the Plans. The Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to the means, methods, sequences, techniques, and procedures of construction; and for coordination of the Work of all trades. Review of catalog submissions or shop drawings by the Engineer in no way relieves the Developer or Contractor from their responsibility to complete all work in accordance with these Documents. Any risk

of error or omission or liability resulting thereby is assumed entirely by the Developer and/or Contractor.

- B. For improvements included in the Work where delegation of professional design services is required by the Plans (e.g., retaining walls, box culverts, etc.) or where the Contractor is proposing an alternative to the Work shown on the Plans, the Calculations and Shop Drawings or plan revisions submitted must be signed and sealed by the engineer responsible for their preparation. In addition, the calculations and shop drawings or plan revisions submitted must be annotated by the Design Engineer to indicate that they have reviewed the calculations and shop drawings or plan revisions and found them to be in conformance with the design intent as shown on the Township-approved Plans. No portion of the work shall commence until the submission has been reviewed by the appropriate Township consultants.

**Art. 9 SAFETY AND PROTECTION:**

- A. The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. The Engineers and Observers are not authorized, and the Developer and Contractor shall not rely upon them to assume any responsibility for the Contractor's means, methods, sequences, techniques, and safety of construction.
- B. The following notice shall be posted at the project site at a location visible and accessible to all workers.

## **NOTICE TO WORKERS**

**The Pidcock Company (TPC), acting on behalf of Bethlehem Township, and Bethlehem Township assume no responsibility for or control over the Contractor's safety programs, nor any responsibility for the Contractor's work procedures, means, methods, sequences, techniques of construction, equipment, etc. Representatives of TPC are at the site only on behalf of Bethlehem Township to determine general compliance with applicable Township documents and to determine the acceptability of the final product. Should any worker feel that the Work is proceeding in an unsafe manner, it is recommended that the foreman, the project superintendent, the Pennsylvania Department of Labor and Industry, the Occupational Safety and Health Administration, and/or any other regulatory agency having jurisdiction be notified by the worker.**

**Art. 10 SURVEY:**

- A. Prior to the Contractor proceeding with the Work, the Developer shall provide engineering surveys to establish reference points as necessary to enable the Engineer to confirm installation of the Work in accordance with the Plans. The Developer through its engineer and/or Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without adequate prior notice to the Engineer.
- B. All survey and grade control are the responsibility of the Developer through its engineer and/or Contractor.
- C. Easements for storm drainage facilities and utilities, and property lines adjacent to proposed improvements, or other locations as may be required by the Township or Engineer, shall be visibly staked prior to construction.
- D. Grade sheets for curbs, storm sewers, swales, etc. shall be submitted for review a minimum of three days before construction. The Developer is responsible for the accuracy thereof. Should the Contractor choose to construct these improvements by Global Positioning System (GPS) survey, the Contractor remains responsible for providing grade stakes and grade sheets to afford the Observer the opportunity to determine if the line and grade of the improvement is in accordance with the approved Plan at the time of installation. As-built survey data is not an acceptable substitute for grade stakes and grade sheets at the time of construction.
- E. The Observer will “spot-check” the accuracy of project survey points and elevation datum during construction, as may be necessary. If necessary, the Engineer may verify locations by independent survey. Municipality costs of independent surveying checks by the Engineer will be treated as observation charges to the Developer.
- F. The Developer shall have the basin construction baseline and the controlling site features staked and shall set grade stakes for the bottom of the basin berm. Should the Contractor choose to construct basins by GPS methods, the Contractor remains responsible for providing grade stakes and grade sheets as needed at the time of basin grading to afford the Observer the opportunity to determine if the basin is being graded in accordance with the approved Plans. As-built survey data is not an acceptable substitute for grade stakes and grade sheets.
- G. Following the Contractor’s grading operations for the detention basin and prior to placement of the basin liner (if applicable) and topsoil, the Developer’s engineer will complete a preliminary basin as-built survey and stage storage volume calculations for review by the Engineer to verify that the basin volume generally conforms to the approved Plans. If applicable, prior to the placement of basin topsoil and seeding, permeability/density/infiltration testing shall be coordinated with the Geotechnical Engineer, and the test results shall be furnished by the Developer to the Geotechnical

Engineer (copies to both the Township and Engineer), to confirm the limiting permeability/infiltration has been achieved. For synthetic basin liners, a certification as to the acceptable installation of the geotextile basin liner shall be provided by the liner manufacturer for the Geotechnical Engineer's review and approval.

Upon completion of topsoiling and seeding, a final basin survey and stage storage volume calculations shall be completed by the Developer's engineer and submitted to the Engineer verifying that the as-built basin volume generally conforms to that shown on the approved Plans.

#### **Art. 11 RECORD AS-BUILT PLANS:**

Record as-built plans shall be prepared by the Developer's engineer or surveyor from information recorded during construction. Information obtained by an Observer is not available for and is not to be used for the preparation of the record as-built plans. Such Plans shall be submitted to the Township and Engineer upon the completion of construction. Following are the record as-built plans submission and drawing requirements:

- A. Submission Requirements: The Developer shall have its engineer or surveyor prepare, sign and seal, and provide three prints and three copies in electronic format (i.e., PDF format) of the final record as-built plans, drawn in a neat and legible manner, and identified as "Record As-Built Plans". The plan preparer and date should be identified. Prior to submitting these plans, one print of the Plan(s) shall be submitted to the Township and Engineer for review.
- B. Drawing Requirements: All construction changes shall be noted by drawing a line through the design data and adding the record data adjacent thereto, or in cases where the Plan would be unclear, redrawing the Plan to reflect the actual installation. The following specific information shall also be noted:
  1. Roads: "Record" curb and/or pavement grades for intersections. Any significant deviations in the centerline profile shall be noted on the Plan;
  2. Storm Sewerage Systems:
    - a. Pipe Systems (Including underground detention facilities): Invert and top elevations at all manholes, basin outlet control structures, inlets, water quality outlet snouts, endwalls, and storm pipe lengths, slopes, diameters, types of material, and spray-irrigation systems;
    - b. Detention/Retention Basins: Outlet control structure orifices, weirs, and top grates (size and elevation), riprap aprons, or other energy dissipation structures (widths, lengths, type/size of material), low flow channels, emergency spillways (width, elevation, etc.), top of berm elevations, underdrains; and

- c. All BMPs shall be shown on the Plans and their locations be referenced with latitude and longitude.
3. Traffic Improvements: Signal equipment, pull boxes, conduits, loops, signs, striping and other pavement markings, depressed curbs, streetlight poles, etc. shall be noted on the Plan. PENNDOT approval of changes is required. A copy of the as-built drawing shall be provided for storage in the controller cabinet;
4. Other Underground Utilities: Location and depth of water and sanitary sewerage systems owned and operated by others, electric, telephone, cable TV, and gas lines, including wiring between streetlight poles and transformers where power is supplied within the rights-of-way. Any encasement of the above utilities should be identified, and the utility location and depth should be shown;
5. Abandoned utilities should be identified by a note and by drawing a line through the original location data;
6. Landscaping: Locations, species, sizes, and numbers of trees and shrubs;
7. Site Lighting: Locations and types of light fixtures and heights of light standards and building-mounted lights; and
8. Site Signage: Locations, types, and dimensions of signs.

#### **Art. 12 CERTIFICATIONS AND PERMIT CLOSEOUTS:**

Signed and sealed certifications shall be provided by the Developer's engineer or surveyor, or other appropriate professional representing the Developer, for monumentation and property pins; site lighting types, numbers, and locations; landscape planting numbers, locations, sizes, and species; site traffic sign sizes, types, and locations; and post-construction stormwater management (PCSM) critical stage BMPs which document that each item has been installed in accordance with the approved Plan. As an alternative to the PCSM critical stage BMP certification, the Developer may provide a copy of the Northampton County Conservation District-approved NPDES Permit Notice of Termination (NOT) form. The Developer shall provide additional copies of these documents to the Township Public Works Department as well. In addition, for all improvements to be dedicated and which required state or federal permitting, all permits shall be transferred to the Township upon successful completion of the improvement and closeout of the permits.

#### **Art. 13 WAIVERS:**

The Developer may submit a request for a waiver of the requirements of these documents. Such request shall be in writing and shall include evidence that the requirement is unnecessary given the nature of the Work or the operation thereof or that the proposed alternative meets or exceeds

the requirements of these documents. The waiver shall be subject to the review and approval of the Board of Commissioners.

**Art. 14 FINAL AND MAINTENANCE INSPECTIONS:**

After completion of the improvements, representatives of the Township, Developer, Contractor, Engineer, Geotechnical Engineer, and others as deemed appropriate by the Township, will perform a Final Inspection of project-installed improvements and the Engineer will issue a “punchlist” (if applicable) of work to be corrected or completed.

**Art. 15 REFERENCE DOCUMENTS:**

Whenever these Standard Construction Documents reference a source document from an outside agency, (e.g., PENNDOT Specifications, Form 408), it shall be understood as the latest edition of that document, unless otherwise specifically noted in the Standard Construction Documents.

**Section B** TECHNICAL SPECIFICATIONS



BETHLEHEM TOWNSHIP

TECHNICAL SPECIFICATIONS

STREETS, CURBS, SIDEWALKS, AND RECREATION PATHS

Materials and Construction

All materials and construction methods used in the construction of streets, curbs, sidewalks, and recreation paths shall meet the requirements as set forth in Pennsylvania Department of Transportation (PENNDOT) Specifications, Publication 408 (latest edition) except as specifically modified by the requirements herein and except that the use of any type of slag, lightweight aggregate, or crushed concrete material is prohibited.

EXCAVATION AND EMBANKMENT: It is required that the Contractor maintain all areas in a well-drained condition during the construction period so as to avoid pooling or ponding of water. If a sinkhole should develop during construction, the Developer shall have the sinkhole immediately repaired at its expense alone and in accordance with the following:

Upon detection of a sinkhole, the Developer or its Contractor shall notify the Township, contact its own geotechnical engineer who shall propose a repair solution, and have that procedure reviewed by the Geotechnical Engineer. The Developer's geotechnical engineer and the Geotechnical Engineer shall monitor the repair in accordance with the reviewed procedure and upon completion of the repair and before any construction activity resumes in the area, the Developer's geotechnical engineer shall send a written report to the Township and the Geotechnical Engineer that the sinkhole has been repaired in accordance with the reviewed procedure and that construction activities may continue.

All excavation and embankment construction shall be accomplished in conformance with the applicable sections of the PENNDOT Specifications, Publication 408 (latest edition).

Compaction requirements shall be as required by PENNDOT Specifications, Publication 408 (latest edition), or as otherwise required by the Geotechnical Engineer. In areas not intended to be dedicated to the Township (building footprints, private parking lots, etc.), compaction requirements shall be as directed by the Developer's engineer.

CLEAN FILL CERTIFICATION: For all material used to fill areas to be dedicated to the Township such as street rights-of-way, basin berms, easements, etc., the Developer shall provide a completed DEP Form FP-001 Certification of Origin of Clean Fill to the Township, along with a copy of the associated environmental study due diligence documentation.

FINISHING AND PROTECTION OF SUBGRADE: After the subgrade has been substantially completed, the full width shall be conditioned by removing any soft or other unstable material which will not compact properly. The resulting areas and all other low areas, holes, or depressions shall be brought to grade with suitable select materials. Scarifying, blading, rolling

and other operations shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the Plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. Hauling over the finished subgrade is prohibited. All ruts or rough places that develop in a completed subgrade shall be regraded and recompact.

No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been satisfactorily proof rolled with a fully loaded tri-axel dump truck (provided by its Contractor and paid for by the Developer) in the presence of the Engineer and/or the Geotechnical Engineer, as applicable, and the line and grade checked by the Engineer.

TRENCH BACKFILLING: Backfilling of utility trenches (such as for storm sewers, water mains, gas mains, electrical facilities, etc.) shall be accomplished in accordance with these specifications unless otherwise specified by the owner of the utility and reviewed by the Township. All trenches and excavations shall be backfilled promptly after the utilities are installed. Method of backfilling shall be as follows:

- A. Within State Highway Right-of-Way: Backfilling shall be done in accordance with requirements of the State Highway Occupancy Permit;
- B. Within existing Township streets, the backfill shall consist of:
  - 1. Bedding of PENNDOT No. 2A stone or material of the type required by the pipe manufacturer and facility owner, properly formed to fully support the entire length of pipe;
  - 2. PENNDOT No. 2A stone for initial backfill of sides and top of the pipe to subgrade elevation;
  - 3. Replace the top 8 inches of PENNDOT No. 2A stone with clean clay placed and compacted to seal the trench at the subgrade elevation;
  - 4. In lieu of 2. and 3. above and with written approval from the Township, “flowable fill”; i.e., “Controlled Low Strength Material” (CLSM), with late-age strength of 80 to 100 psi may be placed to existing subgrade elevation;
  - 5. New subbase, and asphalt base and surface courses to the depths on the Standard Construction Details or depths equivalent to those of the material of the existing roadway (whichever is greater), as determined by the Engineer; and
  - 6. When excavation of an existing Township street is necessary, the Developer is responsible for obtaining any required Township permits required prior to street opening.

- C. Within proposed streets the backfill shall consist of:
1. Bedding of PENNDOT No. 2A stone or material of the type required by the pipe manufacturer and facility owner, formed to fully support the entire length of pipe;
  2. Clean clay-like material or PENNDOT No. 2A stone for initial backfill of the sides and a minimum of 12 inches above the pipe. For HDPE and PVC pipe, PENNDOT No. 2A stone or material of the type required by the pipe manufacturer and facility owner shall be used to a minimum of 12 inches above the pipe, which envelope shall be maintained throughout the construction period and shall not extend into subbase materials for roadways; and
  3. Approved material free from organic matter, large or frozen lumps, or rocks over 10 inches in their largest dimensions. Rocks used in backfilling shall be so distributed through the mass that all interstices are filled with fine material.

The material shall be moistened or dried, as necessary, to obtain the required compaction. The stability of the backfill material shall be reviewed by the Geotechnical Engineer. The use of slag, lightweight aggregate, or crushed concrete in any form for bedding or backfill is prohibited. Special care shall be taken in placing the backfill. Particular care shall be used to obtain thorough compaction under the haunches and along the sides to the top of the pipe.

If imported earthen material is used to backfill trenches in areas to be dedicated to the Township such as street rights-of-way, easements, etc., the Developer shall first provide a completed DEP Form FP-001 Certification of Origin of Clean Fill to the Township, along with copies of the associated environmental study due diligence documentation.

All backfill shall be placed in loose layers not exceeding 6 inches in depth under and around the pipe, and not exceeding 8-inch lifts over the pipe. Successive layers shall be added and thoroughly compacted by mechanical and pneumatic tampers until the trench is completely filled to the elevation as directed. Backfilling shall be done in such a manner as to prevent damage to the pipe.

Underground warning tape shall be installed at approximately 2 feet above any pipe, cable, or conduit in the backfill of any mainline or lateral trench. Tape shall be alkali resistant, 4 mils polyethylene, 4 inches minimum width, continuously printed with name or symbol of utility buried below, color-coded as follows:

Red: Electric.

Yellow: Gas, oil, and dangerous materials.

Orange: Telephone, cable TV, and other communications.

Blue: Waterlines and services.

Green: Sanitary sewer lines and laterals.

Where plastic water or sewer pipe is used, the tape shall be appropriately colored and able to conduct a signal generated by a locating device. For force mains and where otherwise directed by the Township, a 12-gauge copper tracer wire coated with polyethylene insulation shall be installed along the pipe with all junction boxes required for the tracer system. In addition, the Township may direct the Developer to install vertical pipeline markers of the type and size (with marking signs) deemed appropriate for the particular pipeline size and location proposed for the project.

Backfill shall be adequately compacted. If required by the Township, the Contractor shall provide documentation that the backfill material is compacted to a density of not less than 95% of the maximum density for cohesive soils or not less than 100% of the maximum density for non-cohesive soils, or as otherwise required by the Geotechnical Engineer. The maximum density is the maximum dry weight density as determined by the Standard Proctor Density (AASHTO T 99 – Method C). The acceptable moisture content and the number and frequency of the density tests shall be determined by the Geotechnical Engineer.

All backfilled trenches shall be permitted to settle for at least 120 days before the permanent subbase for the pavement may be constructed. Where less than 120 days of settlement time is anticipated, and as permitted by the Engineer/Township, all trench backfill shall be PENNDOT No. 2A stone, thoroughly compacted, and when required by the Geotechnical Engineer/Township, capped with 8 inches of clean clay-like material at proposed subgrade elevation, wherever permanent subbase and pavement are to be constructed. In such cases, the delay time until subbase material placement will be as determined by the Engineer/Township.

The following requirements will govern the placement of asphalt concrete pavement on streets and/or roads within the Township:

A. Weather Limitations.

1. Asphalt Base Course – Superpave Mixture Design. Asphalt base course shall not be placed on surfaces that are wet or at a temperature of 35 degrees F or lower, or when the air temperature is 35 degrees F or lower;
2. Asphalt Wearing and Binder Course – Superpave Mixture Design. Placement shall be permitted during the period 1 April to 15 October annually, provided temperature conditions as listed in No. 3 below are met and provided further that paving will not be permitted during inclement weather.

Prior to the placement of the wearing or binder course, if the base course is dirty or has been in place longer than two weeks, the Engineer/Township will determine whether the base course shall be satisfactorily cleaned, and a tack coat applied.

When the asphalt-wearing course is placed adjacent to concrete curbs and structures, it shall be sealed with a rubberized asphalt material such as Deary 103 (PENNDOT 408-705.4(C)) or as otherwise approved by the Township Public Works Department. Excess sealant material shall be removed to the satisfaction of the Engineer/Township; and

3. Asphalt Wearing and Binder Course – Superpave Mixture Design. Placement may be permitted during the period from 16 October to 15 November with the permission of the Township and under the following conditions:
  - a. Asphalt wearing and binder course shall be hauled in properly covered and insulated trucks;
  - b. Asphalt wearing and binder course shall not be placed on damp or wet surfaces;
  - c. Asphalt wearing and binder course shall not be placed when the air temperature is 40 degrees F or lower, nor when the temperature of the base or binder on which it is to be placed is 40 degrees F or lower;
  - d. Extra precautions shall be taken in controlling the temperature of the delivered material and compacting the mixture;
  - e. Asphalt wearing and binder course shall not be placed if, on the date preceding placement, it rained or snowed, and the temperature fell below freezing during the previous evening; and
  - f. Asphalt wearing and binder course shall not be placed from 16 November to 31 March without a written request from the Developer and the subsequent express written consent of the Township Manager and Engineer.

CONCRETE CURB, SIDEWALK, DRIVEWAY APRONS, AND CURB RAMPS:  
Construction of plain cement concrete curb shall meet the requirements of Section 630 – Plain Cement Concrete Curb, PENNDOT Specifications, Publication 408 (latest edition). This shall include the placement of concrete curb with an acceptable, self-propelled machine (slip-form machine).

Construction of cement concrete sidewalks, driveway aprons, and curb ramps shall meet the requirements of Section 676 – Cement Concrete Sidewalks, PENNDOT Specifications, Publication 408 (latest edition). Refer to Standard Construction Details – RESIDENTIAL SIDEWALK AND DRIVEWAY APRON – BTWP-R-3; NON-RESIDENTIAL SIDEWALK AND DRIVEWAY APRON – BTWP-R-4; CONCRETE CURB – BTWP-R-5. Curb ramp construction shall be in accordance with PENNDOT Publication No. 72M RC-67M (latest edition). The detectable warning surface material shall be reviewed by the Township. The color shall be dark gray or as otherwise approved by the Township.

Concrete curb shall be cast to a regular vertical and horizontal alignment. Transition in the vertical and horizontal alignment shall be smooth and continuous. The finish on the visible portion of the curb shall be dense and consistent in appearance. Visible differences in the finish alone shall be grounds for rejection of the curb construction.

Contractor shall adhere to the weather restrictions of PENNDOT Specifications, Publication 408, Section 501.3(b) when placing concrete curb, sidewalk, driveway aprons, and curb ramps. Concrete curb, sidewalk, driveway aprons, and curb ramps shall not be placed on frozen base, subbase, or subgrade. Concrete to be used shall be PENNDOT Class AA minimum (minimum mix design 28-day compressive strength of 3,750 psi).

The Contractor shall be particularly diligent in its craftsmanship at radii, expansion and contraction joints, and stormwater inlets or any other structure that interrupts the continuity of the concrete curb. Failure to integrate joints and inlets into a consistent and continuous vertical and horizontal alignment and smooth finish shall be grounds for rejection of the curb construction.

RECREATION PATH: Construction of Recreation Paths shall be as specified in the Standard Construction Details – RECREATION PATH – BTWP-REC-1.

LINE AND GRADE: The location (line) and/or grade of all curb and curb ramps to be constructed shall be established by means of offset stakes, pins, or other survey marks. The grade stakes shall be furnished at a maximum 25-foot interval along radii and a maximum 100-foot interval along tangent sections. Each PC, PT, PVC, PVT, high point, and low point should be staked. Grade cut sheets shall be prepared by the Developer's engineer/surveyor and submitted to the Engineer for review a minimum of three working days prior to construction. The Contractor is not permitted to install curb, curb ramps, sidewalk, or driveway aprons with line and grade determined only by GPS methods as the Township must be able to verify the line and grade of these improvements during installation. For contractors using GPS survey control methods, grade stakes shall be furnished at a minimum 100-foot interval with each PC, PT, PVC, PVT, high point, and low point staked. Grade cut sheets shall be prepared by the Developer's engineer/surveyor and submitted to the Engineer for review as indicated above.

BELGIAN BLOCK GRANITE CURB: When permitted by the Township, Belgian Block granite curb shall be installed in accordance with the Standard Construction Details – BELGIAN BLOCK GRANITE CURB – BTWP-R-6.

SHOULDERS: Unless otherwise specifically approved by the Township, the shoulder shall consist of the same pavement structure as the cartway.

PIPE UNDERDRAIN AND PAVEMENT BASE DRAIN: Pipe underdrain and pavement base drain shall meet the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 610 and be reviewed by the Engineer. Inside diameter of pipe shall be 6 inches unless otherwise shown on the approved Plans. The use of combination storm sewer and underdrain is prohibited without specific approval from the Township.

NOTIFICATION: No connections shall be made to existing Township streets without prior approval and without three working days advance notice to the Township to allow for scheduling of Township observation personnel.

BETHLEHEM TOWNSHIP

TECHNICAL SPECIFICATIONS

TRAFFIC SIGNALS, SIGNS, AND PAVEMENT MARKINGS

TRAFFIC SIGNAL EQUIPMENT: The Developer and its Contractor shall follow all applicable signalization system design and installation standards and codes including but not limited to standards and codes of IEE, ASTM, ANSI, International Municipal Signal Association (IMSA), Institute of Transportation Engineers (ITE), and PENNDOT. All equipment installed shall bear the label of approval of the National Board of Fire Underwriters and Laboratory where applicable. New, first quality, PENNDOT-approved materials (Bulletin 15 listed), made by a manufacturer of established recognized reputation, shall be furnished and used unless otherwise specified. The Contractor shall follow PENNDOT Specifications, Publication 408 (latest edition), notably Sections 901, 930-945, 948, 950-958, 970-976, 1101, and 1103, as well as Title 67 Chapter 212, Publication 46, Publication 148 (TC-8800), Publication 149, Publication 191, and Publication 236.

A signal corridor analysis shall be provided for any proposed traffic signal within the limits of an existing coordinated corridor or if timing changes are proposed to a traffic signal within the limits of an existing coordinated corridor.

Unless otherwise directed by the Township, all existing equipment to be removed (signs, signal heads, mastarms, controller cabinets, and all hardware within the cabinet) shall remain the property of the Township and shall be inventoried and stored at the location designated by the Township. The Township reserves the right to require the Contractor to legally dispose of any equipment not desired by the Township.

Prior to final acceptance, as-built drawings shall be provided to the Township for review. A copy of the as-built drawing shall be provided for storage in the controller cabinet.

The Contractor shall be responsible for providing all required information for any and all equipment that has been revised or added to any signalized intersection as well as associated equipment remaining in place. The required information shall be consistent with that required in PENNDOT's Traffic Signal Access Management System (TSAMS) website and shall be provided to Township personnel. The Township will update PENNDOT's TSAMS website, based on the information provided by the Contractor.

Signal Support. All Traffic Signals shall be supported with Traffic Signal Mastarms and each mastarm shall have a luminaire arm. Certification by a Pennsylvania Registered Professional Engineer shall be provided by the Developer indicating that all components of the vertical poles and mastarms have been designed by the manufacturer to adequately support the signal and sign loads as shown on the Plans, or the maximum load requirements established by AASHTO specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, latest edition, whichever is greater. Copies of the PENNDOT Certifications for the signal supports shall be supplied to the Engineer. Design



calculations signed and sealed by a Pennsylvania-registered Professional Engineer shall be provided to the Engineer for review before fabrication of all non-PENNDOT standard poles. Wire mesh shall be provided between the top of the foundation and the bottom of the base plate to prevent rodent access but permit adequate drainage. For foundations in fill, the required foundation depth shall be measured from the point of minimum grade at the foundation. For foundations in cut, slope protection walls, connected to the top of the foundation, shall be provided. Slope protection wall designs prepared by a Pennsylvania Registered Professional Engineer shall be submitted to the Geotechnical Engineer for review prior to construction. Abandoned Signal Foundations shall be removed to a depth of a minimum of 1 foot below final grade, and the existing ground shall be restored in the area of the foundation to provide a uniform level surface. The area disturbed by removal shall be restored to match the adjoining undisturbed area. All mastarms, poles, foundations, and any other materials included as part of the signal supports shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 951.

Controllers. All Traffic Signal Controllers shall be NEMA ATC, as manufactured by Naztec, Inc., and shall be capable of integration into a Central System and communication via Ethernet communications or the latest product by this same manufacturer which replaces this model, in accordance with PENNDOT's Publication 408 (latest edition) Section 952. The Controller shall include a hand-held cord in the police compartment, sufficient shelving for the necessary equipment, pedestrian isolation circuiting, and surge protection on all controller inputs. Cabinets will include an adapter base (riser) to facilitate fiber optic cable storage, battery storage, and to raise the door height and not be impeded by occasional snow. Each cabinet shall accommodate local and system detection.

Intersections, if required to be in a system, will be integrated into the central system server located at PENNDOT's headquarters. Additional servers and licenses will be purchased by the Contractor as needed.

Interconnect, if required, will be Fiber Optic cable, 12 fiber 9/125 micron single mode, terminated in patch panels. In situations where attachment to utility poles is not available or where conduit and trenching is not feasible, interconnect can be accomplished with radio, provided a site survey has been performed and the testing substantiates reliability. The radio interconnect option shall be at the sole discretion of the Township.

The controller shall be equipped with a double conversion battery back-up unit that will automatically switch to battery power unit when the incoming power is interrupted and shall be capable of operating for a minimum of 4 hours under battery power. Calculations shall be provided for each intersection to verify that each intersection will operate under battery back-up for the minimum 4-hour requirement. These calculations should include the power requirements for all equipment installed at each intersection and continue operating as if power was not lost and in accordance with the approved Condition Diagram. These calculations should also be compared to the battery run times based on the number of batteries proposed for the intersection to verify the intersection will operate under battery back-up for a minimum of 4 hours. The controller cabinet must have a 1" red LED external indicator which must illuminate when utility power is lost.

The controller cabinet shall be equipped with a generator hook-up connection in a separate cabinet.

Electrical Distribution. The Contractor shall coordinate with the local power company to obtain metered power for each traffic signal controller cabinet. All metering equipment shall be housed in the Small Single Door Enclosure. The electrical distribution shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 954.

Conduit runs shall be sized for future use. All conduit crossing streets shall be a minimum of 3 inches in diameter. Controllers should be located at the intersection of conduit runs, and not at the end of a conduit loop. Each controller foundation or pole foundation (if the controller is pole-mounted), shall have the equivalent of two 3” conduits entering it from an adjacent junction box. The conduits shall be installed prior to construction of final grade (i.e., sidewalk, driveways, road widening, etc.) unless otherwise approved by the Township. All loops shall terminate in junction boxes, and there shall be at least one junction box on each corner. A separate 2-inch conduit shall be provided for luminaire wiring if proposed during construction or for future installations. The conduits and installation shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 954.

Signal Heads. All Vehicular and Pedestrian Signal Head indications shall be LED modules. Pedestrian Signals will utilize the countdown feature. All signal heads shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 955.

All vehicular and pedestrian signal indications shall be contained in a polycarbonate housing. The number of signal heads, types of signal heads, back plates, visors, and louvers shall be provided as indicated on the PENNDOT-approved Traffic Signal Permit Plans and shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 955. Signal heads shall be securely mounted, using signal mounting brackets, and in accordance with the regulations outlined in PENNDOT Specifications, Publication 408 (latest edition), Section 955.

Preemption. All intersections will be equipped with Optical Preemption for all approaches to the intersection. Detectors will be positioned to achieve the proper distance for activation and control of the intersection. Optical preemption equipment will be Strobecom II as manufactured by Tomar. The Contractor shall coordinate with the Township Fire Marshal to ensure adequate advance detection of approaching emergency vehicles and shall adjust the system as necessary, including advance detection, to achieve desirable operation.

Detection. Intersection detection will be video, thermal or radar based. Mid block detection will be a thermal detector providing accurate detection in all weather conditions. The thermal detector must also have a built in HD video camera for CCTV use if desired. When adding to or extending the Freemansburg Avenue system, a true presence radar

based system utilizing the X3 RTMS detector or the latest product by this same manufacturer replacing this model, mounted on a 30' straight pole shall be used.

### STREETSCAPE ENHANCEMENT CORRIDORS

At the discretion of the Township, any intersection that is proposed to be signalized, the signal design is revised, or existing equipment is replaced along the Freemansburg Avenue, William Penn Highway, or Route 191 corridors will require special provisions regarding the signal equipment. The following requirements are in addition to all other requirements identified in the Standard Construction Documents:

- A. All traffic signal equipment with exception to vehicular traffic signal heads, pedestrian signal heads, push buttons, junction boxes, video detectors, and signs shall be painted black, including bandings, signal head mounts, pedestrian signal mounts, video detection extension arms, sign mounts (mounted on mastarms or vertical shaft of mastarm only), and pre-emption detector and beacon mounts. The mastarms, vertical luminaire extensions, luminaire arms, pedestal poles, and controller cabinets shall be finished with a black powder coat.
- B. The intersections along these corridors will be coordinated and interconnected via fiber optic cable. Future intersection improvements will include additional intersections to be integrated into the system by use of fiber optic cable. The interconnect wiring for these systems will be comprised of fiber optic cable, 54 Fiber Singlemode, Low Water Peak ITU-T G.652.D wiring.
- C. Radar detection units for volume-density detection zones, traffic count loops, and ramp detection (if applicable) shall be a thermal detector providing accurate detection in all weather conditions. The thermal detector must also have a built in HD video camera for CCTV use if desired. When adding to or extending the Freemansburg Avenue system, RTMS G4 Radar detectors as manufactured by Image Sensing Systems Incorporated or the latest product by this same manufacturer replacing this model shall be used.
- D. A separate 2" conduit shall be provided for all new signal designs for power to the luminaires. This 2" conduit should be utilized for power to the luminaires only.
- E. All luminaire heads shall be equipped with LED lighting.
- F. All junction boxes that include fiber optic cables or anticipated to include fiber optic cables shall be JB-27, not JB-26.
- G. Additional junction boxes and conduits may be required as part of a signal design to extend the fiber optic cable to adjacent intersections that are anticipated to be signalized in the near future and added to the existing interconnect system.

SIGNS: All signalized intersections shall be signed with street name signs of the size and designation as required by and in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 936. All overhead street name signs (Series D3-4 and D3-5) shall include stiffeners. All stand-alone traffic signs shall be mounted on PENNDOT Breakaway Type 'B' posts and be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Sections 930, 945, 948, 970-976, 1103 and Publication 111 (TC-8600 and 8700).

Street signs to be installed at unsignalized intersections for Township roadways shall conform to PENNDOT Specifications, Publication 236 (latest edition), Detail D3-1 with white reflectorized Type III or Type VII sheeting letters on blue reflectorized Type III or Type VII sheeting background. All street signs shall be installed prior to installation of roadway paving and be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Sections 930-936, 940-945, 948, and Publication 111 (TC-8600 and 8700).

Where identified on the Plans, signs shall be removed from their current locations according to PENNDOT Specifications, Publication 408 (latest edition), Sections 970-976. All existing aluminum and steel removed shall be inventoried and stored at a location as designated by the Township. The Contractor shall exercise care during removal, storage, bundling, and delivery to prevent additional damage or deterioration of the sign materials, particularly aluminum sign blanks.

For sign relocations, signs shall be removed as noted above and according to PENNDOT Specifications, Publication 408 (latest edition), Sections 940-946. The sign shall be installed in the new location, as identified on the Plans, or as directed by the Engineer.

PAVEMENT MARKINGS: Long lane line pavement markings are to be painted and shall conform to PENNDOT Specifications, Publication 408 (latest edition), Section 962, and Publication 111 (TC-8600 and 8700). Gore transverse markings are to be Epoxy and shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Section 964. All other pavement markings are to be cold inlaid plastic or hot surface applied thermoplastic and shall be in accordance with PENNDOT Specifications, Publication 408 (latest edition), Sections 960, 961, and 965. Painted pavement markings shall be reapplied at the close of the 18-month maintenance period. Manufacturers of all pavement marking materials shall be included in PENNDOT's Bulletin 15 as an approved manufacturer for the specific materials supplied. Pavement markings to be removed shall be in accordance with PENNDOT's Publication 408 (latest edition), Section 963.

BETHLEHEM TOWNSHIP

TECHNICAL SPECIFICATIONS

STORM SEWERS AND APPURTENANCES

GENERAL: All materials and construction methods used in the construction of storm sewers and appurtenances shall meet the requirements as set forth in Pennsylvania Department of Transportation (PENNDOT) Specifications, Publication 408 (latest edition) and the PENNDOT Publication No. 72M, Standards for Roadway Construction, Series RC-1M-100M (latest editions) except as specifically modified by the requirements herein, and except that the use of any type of slag, lightweight aggregate, or crushed concrete material is prohibited.

Materials

PIPE AND STRUCTURES: Reinforced concrete pipe (RCP) shall be used for all storm sewers to be dedicated to the Township, regardless of whether they are located within streets or drainage easements. The use of High-Density Polyethylene (HDPE) pipe within streets or proposed drainage easements requires the advance specific written approval of the Township Director of Public Works. The minimum pipe diameter shall be 15 inches.

Manholes shall be constructed of precast concrete sections. Inlets, flared end sections, and endwalls shall be precast reinforced concrete structures. Manholes and inlets shall not be constructed of precast concrete blocks or brick. Sewer brick shall be used only at the top of the concrete structure to allow for adjustment of the casting to grade. See Construction, LEVELING COURSE.

MATERIAL SUPPLIERS: All materials shall be fabricated by a manufacturer listed in PENNDOT Publication 35, Bulletin 15 (Approved Construction Materials) for the specific material supplied.

CONCRETE STORM SEWER PIPE, REINFORCED: Concrete culverts and storm sewer pipe, reinforced, circular, and elliptical, shall conform to the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 601.2(a)3 and have watertight joints.

HIGH-DENSITY POLYETHYLENE (HDPE) PIPE: HDPE pipe shall meet the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 601.2(a)6, and have watertight joints. HDPE flared end sections are not permitted for use.

MORTAR: Mortar for brick masonry and connections to other structures shall conform to the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 705.6

RUBBER GASKET JOINTS: Joints using rubber gaskets shall conform to the requirements of AASHTO M198. Rubber gaskets shall be continuous rubber rings that fit snugly in the annular spaces between the overlapping surfaces of the ends of the pipes to form a flexible watertight seal under all conditions of service. The gasket shall have smooth surfaces free from all imperfections.

STEPS: All manholes and inlets shall be provided with drop steps consisting of aluminum alloy with plastic inserts or deformed reinforcement bars coated with copolymer polypropylene plastic. Drop steps shall conform to PENNDOT Specifications, Publication 408 (latest edition), Section 605.2(c), and Publication No. 72M, RC-39 and RC-46M.

CONCRETE: Plain and reinforced cement concrete used in structures, pipe cradles, connections of pipes with structures, low flow channels, support of structures or frames, etc. shall conform to the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 704, Class A concrete (minimum).

BRICK: Brick shall conform to the requirements of AASHTO M91, Grade MM.

PRECAST CONCRETE INLET BOXES, MANHOLES, TOP SLABS, TRANSITION SLABS, AND INLET BOX TOP UNITS: Precast reinforced structures shall conform to the requirements of PENNDOT Specifications, Publication 408 (latest edition), Sections 605 and 714, and the PENNDOT Publication No. 72M, Standards for Roadway Construction, Series RC-1M-100M (latest editions), and the Standard Construction Details, as applicable. Unless otherwise accepted by the Engineer, the sections shall have a minimum inside diameter of 48 inches and inlet boxes shall have minimum inside dimensions of 2 feet by 4 feet. All inlet tops shall contain the trout logo plate shown on the Standard Construction Details.

FRAMES, COVERS, AND GRATE CASTINGS: Standard manhole castings shall be as identified on the Standard Construction Details – STANDARD PRECAST CONCRETE PIPE MANHOLE – BTWP-D-1 and inlet grates shall be as identified on the Standard Construction Details – PRECAST CONCRETE INLETS – BTWP-D-3. The castings shall be gray iron and meet the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 1105.02(h)1.

All castings shall be true to form and dimensions and shall be free from inclusions of foreign material, casting faults, injurious blow holes, cracks, sponginess, and other defects rendering them unsuitable. The finished frame and cover or grate shall have the bearing surfaces machined or ground so that there will be no variations that will permit rocking or rattling, and the diameter of the cover or grate shall be such as to fit the frame without wedging. All castings shall be thoroughly cleaned by the manufacturer. All manhole covers shall contain the waste dumping warning indicated on the Standard Construction Details.

Grates for inlets shall be bicycle safe as detailed in the PENNDOT Publication No. 72M, Standards for Roadway Construction, Steel Grate – Bicycle Safe. Inlets shall not be installed within ADA-accessible routes.

## Construction

EQUIPMENT: The Contractor shall provide equipment to adequately unload, handle, and place the pipe and structures in their final positions without damage.

The Contractor shall provide mechanical and pneumatic tampers sufficient to obtain the compaction of the pipe bedding and backfill as specified.

LINE AND GRADE: The location (line) and/or grade of all sewers and pipelines to be constructed shall be established by means of offset stakes, pins, or other survey marks. When the Contractor uses a laser to obtain line and grade for laying the pipe, periodic checks shall be made by the Contractor from grade stakes. The first grade stake shall be furnished at the structure and the second at 25 feet from the beginning of the pipe run and thereafter at intervals not greater than 100 feet. When the Observer requests the Contractor to check the line and grade of the pipe between structures the Contractor shall comply, and when the Observer checks for line and grade, the Contractor shall assist him. Grade cut sheets shall be prepared by the Developer's engineer and submitted to the Engineer for review a minimum of three working days prior to construction. The Contractor is not permitted to install pipe or structures with line and grade determined only by GPS methods as the Township must be able to verify the line and grade of the pipe and structures during installation by use of grade stakes and grade cut sheets.

A minimum horizontal separation of 10 feet and a minimum vertical separation of 18 inches shall be maintained between waterlines and sanitary or storm sewers in accordance with the Pennsylvania Department of Environmental Protection (DEP) Public Water Supply Manual, Part II, Community System Design Standards, Chapter 8, Section 8.7 inclusive, or latest version of the governing regulations. When conflicts occur with existing facilities and the separations are less than noted above, corrective methods shall be proposed by the third-party utility and/or the Design Engineer and reviewed by the third-party utility and/or the Engineer/Township prior to installation.

### EXCAVATION:

- A. The Contractor shall perform all common excavation to the depth necessary for pipe installation as shown on the grade cut sheets reviewed by the Engineer;
- B. The Contractor shall perform all rock excavation to the depth required for common excavation plus at least 8 inches below the bottom of the pipe bedding.

When rock or non-cushioning material is encountered in trench excavation, a cushion at least 8 inches thick shall be placed between the rock or non-cushioned material and the bottom of the pipe bedding. The cushion shall consist of PENNDOT No. 2A stone. The bottom of the trench shall be excavated to a horizontal section as far as practicable;

- C. Should unstable soil be encountered, or should the Engineer or Geotechnical Engineer deem it necessary to excavate to a depth below the grade shown on the

Plans to secure a good foundation, the Contractor shall remove the unstable soil for the full width of the trench and replace it with PENNDOT No. 2A stone or larger, as reviewed by the Geotechnical Engineer or Engineer. The pipe bedding shall be constructed on top of the PENNDOT No. 2A stone. The Engineer or Geotechnical Engineer shall determine the depth of removal of unstable soil and the amount of backfill necessary. The PENNDOT No. 2A stone backfill shall be thoroughly compacted;

- D. Excavated material not required or acceptable for backfill shall be legally disposed of by the Contractor. Common excavation shall not be carried below the required depth. If this occurs, the trench shall be backfilled with material reviewed by the Engineer and thoroughly compacted. If required by the Township, the Contractor shall provide documentation that the backfill material is compacted to a density of not less than 95% of the maximum density for cohesive soils or not less than 100% of the maximum density for non-cohesive soils, or as otherwise required by the Geotechnical Engineer. The maximum density is the maximum dry weight density as determined by the Standard Proctor Density (AASHTO T 99 – Method C). The acceptable moisture content and the number and frequency of the density tests shall be determined by the Geotechnical Engineer;
- E. Where the bottom of the trench is found to be an inadequate foundation for the pipe and cannot be stabilized by the above methods or wherever otherwise deemed necessary, a concrete pad or cradle of sufficient size shall be constructed as determined by the Geotechnical Engineer;
- F. The minimum width of the trench at the top of the pipe when placed shall be at least equal to the outside diameter of the pipe plus 12 inches on each side of the pipe. The trench shall be excavated accurately to the established line so that at least a 12-inch space will exist between the side of the trench and the side of the pipe. The maximum allowable width of trench shall not exceed 24 inches on each side of the pipe when placed;
- G. The sides of trenches shall be vertical for a minimum distance of 4 feet above the top of the pipe to maintain the stability of the pipe within the trench. The Contractor shall perform such veeing, trench bracing, sheathing, or shoring necessary to perform the excavation. Unless otherwise required, bracing, sheathing, or shoring shall be removed by the Contractor as backfill progresses; and
- H. In the absence of more stringent limitations specifically defined herein or imposed by the Engineer, Township, or others, the length of open trench shall be limited to 50 feet in advance of where pipe has been laid and 100 feet in total at any single location. Any open trenches shall be completely backfilled at the end of each workday. Open trenches may be covered with steel plates only as approved a minimum of 24 hours in advance by the Township on a case-by-case basis. All construction equipment shall be removed from within rights-of-way of existing



public roadways at the end of each workday and immediately upon the discontinuation of work.

BEDDING: Unless otherwise directed by the Engineer/Township, all pipe to be installed, including that which is laid on an 8-inch cushion in areas of rock excavation, shall bear the full length on firm, compacted PENNDOT No. 2A stone bedding which is shaped to receive the pipe configuration at the joints. The bedding and initial backfill around the pipe shall be placed as follows:

- A. For reinforced concrete pipe – minimum compacted thickness of 4 inches beneath the pipe; and
- B. For HDPE pipe – minimum compacted thickness of 4 inches beneath the pipe to a minimum compacted thickness of 12 inches over top of the pipe.

LAYING AND INSTALLING PIPE: Pipe shall be laid to true alignment and regular grade. Before pipe is laid, all dirt shall be removed from inside the pipe and all lumps, blisters, dirt, oil, grease, and moisture shall be removed from inside and outside the ends. After pipe is laid, care shall be taken to prevent the entrance of dirt or water from the trench. Every open end of a pipe or fitting shall be plugged before leaving the Work for the day or before backfilling the trench. Plugs shall be on the site before the Contractor commences construction of the pipeline. Cutting of pipe shall be done in a neat and workmanlike manner by a method that will provide smooth edges and surfaces without damaging the pipe. All such cutting of pipe shall be done in conformance with the manufacturer's recommendations.

The Engineer/Township may inspect all pipe before it is laid and reject any section that is damaged by handling or is found to be defective to a degree that will materially affect the function and service of the pipe.

Pipe shall be installed upgrade unless otherwise approved by the Engineer/Township.

Pipe shall not be laid on frozen ground. Pipe which is not true in alignment, or which shows any settlement after laying, shall be removed and re-laid.

The Contractor shall provide, as may be necessary, for the temporary diversion of streamflow in order to permit the installation of the pipe under dry conditions. The Developer shall obtain all necessary permits for stream diversion prior to commencing work.

Where RCP is used in paved areas, the minimum cover over the pipe shall be 4 inches to the subgrade elevation of the pavement structure unless additional cover is required by the pipe manufacturer. Where RCP is used in non-paved areas, the minimum cover over the pipe shall be 1 foot unless additional cover is required by the pipe manufacturer.

DEWATERING: Any water which collects in an excavation shall be removed by the Contractor before proceeding with the construction of the pipeline or structures.

HIGH-DENSITY POLYETHYLENE (HDPE) PIPE: HDPE shall be installed in accordance with the requirements of the PENNDOT Specifications, Publication 408 (latest edition), Section 601. However, in all installations, during construction, the minimum depth from surface grade to the top of the pipe shall be 3 feet unless greater depths are recommended by the pipe manufacturer. Where HDPE pipe is used in paved areas, the minimum cover over the pipe shall be a minimum of 1 foot to the subgrade elevation and a minimum of 2 feet to the paved surface of the pavement structure unless additional cover is required by the pipe manufacturer. Where HDPE pipe is used in non-paved areas, the minimum cover over the pipe shall be 2 feet unless additional cover is required by the pipe manufacturer. All pipe joints shall be watertight.

TRENCH BACKFILLING: See STREETS, CURBS, AND SIDEWALKS, TRENCH BACKFILLING.

BACKFILLING OF STRUCTURES:

- A. After a structure has been bedded and set in accordance with the Standard Construction Details, the area around it shall be filled with the material approved for pipe backfill, in horizontal layers not to exceed 8 inches in loose depth and compacted to the density specified under TRENCH BACKFILLING. The fill shall be made to the elevation shown on the Plans, or as directed by the Engineer/Township;
- B. Backfill shall not be placed against any structure until concrete is given the necessary time to cure; and
- C. Fill shall be deposited uniformly around the structure while backfilling to prevent unequal lateral pressure. Special care shall be taken to prevent any wedging action against the structure.

TRENCH PAVEMENT RESTORATION: The paving of trenches in Township streets shall be completed in accordance with the Standard Construction Details – NON-STATE HIGHWAY PAVEMENT RESTORATION – BTWP-R-2, street paving section. When there are multiple trenches to be restored within an existing roadway, the Township will require the existing wearing course pavement to be milled and overlaid above the trenched areas for the entire width of the travel lane or lanes and the length of the trenched area as applicable.

LEVELING COURSE: A leveling course of precast concrete adjustment units shall be provided at all manholes and inlets to set each casting at final grade. Brick is to be used for slope adjustments only, and the inside and outside surfaces of the masonry leveling course shall be neatly plastered with mortar to a minimum thickness of one-half inch.

PLACEMENT AND TREATMENT OF CASTINGS, FRAMES, AND FITTINGS: All castings, frames, and fittings shall be placed in the positions indicated on the Plans or as directed by the Engineer and shall be set true to line and correct elevation. In roadways, frames and castings and structure tops shall be set to the road grade and cross slope. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and positioned before

the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

There shall be three to four weepholes placed in each inlet at subgrade elevation as shown on the Standard Construction Details, as directed by the Engineer/Township. The minimum size of each weephole shall be 2 inches by 4 inches. The weepholes shall be placed in the top of the base unit (called "Inlet Box" by the PENNDOT Publication No. 72M, Standards for Roadway Construction) or in the leveling course between the "Inlet Box" and the Concrete Top Units. The weepholes shall be spaced evenly unless otherwise directed by the Engineer.

INSTALLATION OF STEPS: Plastic or aluminum alloy drop steps shall be installed, and typical step configuration shall be in accordance with the PENNDOT Publication No. 72M, Standards for Roadway Construction (latest editions), detail for STORMWATER MANHOLES, RC-39M.

UNDERDRAIN: Pipe underdrain shall meet the requirements of PENNDOT Specifications, Publication 408 (latest edition), Section 610 and be reviewed by the Engineer. Inside diameter of pipe shall be 6 inches unless otherwise shown on the approved Plans.

SECURITY GRATES: Security grates shall be installed on all headwalls, endwalls, end sections, and culverts with openings 15 inches or greater. It shall be the responsibility of the Developer or its Contractor to submit to the Engineer for review a detailed drawing of the proposed security grate prior to fabrication. The number of bars shall be determined by the culvert size with bar spacing not to exceed 6 inches each way. Structural steel shall conform to ASTM A36 and bars shall conform to ASTM A615, Grade 60, epoxy coated or hot-dipped galvanized after fabrication. Grates shall be attached to the structures in a manner permitting ready removal for future cleaning of debris.

DETENTION AND INFILTRATION BASINS: The construction of detention and infiltration basins shall meet the requirements of PENNDOT Specifications, Publication 408 (latest edition), Sections 200 and 800 and be reviewed by the Engineer/Geotechnical Engineer.

In cut or embankment areas, the upper 6 inches of the subgrade material beneath the clay blanket within detention basin construction limits shall be adequately compacted. If required by the Township, the Contractor shall provide documentation that the area is compacted to a density of not less than 95% of maximum density. Maximum density is the maximum dry weight density as determined by the Standard Proctor Density (AASHTO T 99 – Method C). The acceptable moisture content and the number and frequency of the density tests shall be determined by the Geotechnical Engineer.

Any required impervious liner shall be reviewed by the Geotechnical Engineer.

Detention and infiltration basins must be located as shown on the approved Plans. Any proposed changes shall be subject to review and approval by the Township and Geotechnical Engineer. Percolation tests and test pits or borings must be performed in the location of proposed

infiltration basins as determined necessary by the Geotechnical Engineer. The Geotechnical Engineer may require post-construction infiltration testing to verify as-built infiltration rates.

The fence around detention basins shall meet the requirements of the Standard Construction Details – DETENTION BASIN FENCE – CHAIN LINK – BTWP-D-4. Alternative fence materials may be permitted by the Township as reviewed on a case-by-case basis, meeting the requirements of the Standard Construction Details – DETENTION BASIN FENCE – WOOD SPLIT RAIL – BTWP-D-5 or DETENTION BASIN FENCE – ALUMINUM – BTWP-D-6. The Developer shall install either the permanent fence or a temporary fence around a detention basin prior to it detaining water. If a temporary fence is used, it shall meet the size requirements of the approved permanent fence and shall be continuously maintained by the Developer until the permanent fence is installed.

UNDERGROUND DETENTION AND INFILTRATION FACILITIES: Underground detention and infiltration facilities are not to be dedicated to the Township. They may be constructed of either: reinforced concrete vaults or tanks, large diameter plastic or concrete pipe, or commercially available proprietary systems intended for underground installation. The underground detention facilities shall be designed by the Design Engineer and/or geotechnical engineer and reviewed by the Engineer/Geotechnical Engineer. All materials used in the construction of underground detention facilities shall be watertight, and any required impervious liner shall be by the Geotechnical Engineer.

Underground detention and infiltration facilities must be located as shown on the approved Plans. Any proposed changes shall be subject to review and approval by the Township and Geotechnical Engineer. Percolation tests and test pits or borings must be performed in the location of the proposed underground infiltration facility as determined necessary by the Geotechnical Engineer. The Geotechnical Engineer may require infiltration testing after the basin subgrade has been established and prior to construction of the remaining portion of the facility to verify as-built infiltration rates.

All vaults or tanks and pipes, bedding and backfill shall be designed to withstand HS-25 loading. All vaults, tanks, and pipes shall be continuously sloped as required by the approved design. The minimum pipe diameter shall be 36 inches, and pipes may not be closer (edge to edge) to one another than  $\frac{1}{2}$  the inside pipe diameter or 3 feet, whichever is greater. A minimum of 6 inches of pipe bedding shall be provided, and the minimum backfill, and cover must be per the manufacturer's specifications, based on the design load and considering flotation, where required. An emergency spillway shall be provided to safely pass the 100-year storm event.

A water quality treatment BMP shall be provided upstream of the underground detention facility. A minimum of one 30-inch diameter access port shall be provided for each vault or tank. A minimum of one 48-inch diameter manhole shall be provided for every 150 feet of pipe with a minimum of two 48-inch diameter manholes for each underground piping facility. Access shall also be provided at the outflow structure. All access port/manhole covers shall be bolted.

VIDEO INSPECTION: All storm sewer pipe shall be video inspected at the Developer's expense. In streets, the video inspection shall be accomplished prior to roadway construction. Additionally, should defects be found during the inspection which require pipe replacement, the damaged pipe shall be replaced and all connecting pipe to the closest structure shall be removed and reinstalled. Use of bands, collars, etc. will not be permitted for repairing the damaged pipe to be dedicated to the Township.

TESTING: If required by the Township, infiltration/exfiltration testing of the concrete storm sewers shall be in accordance with ASTM C969-02 as may be updated or modified. The testing would be conducted by, and at the expense of, the Developer.

NOTIFICATION: No connections shall be made to existing Municipal storm sewer systems without prior approval and without three working days advance notice to the Township to allow for scheduling of Township observation personnel.

SINKHOLES: It is required that the Developer maintain all areas in a well-drained condition during the construction period so as to avoid pooling or ponding of water. If a sinkhole should develop during construction, the Developer shall immediately repair the sinkhole at its expense alone and in accordance with the following:

Upon detection of a sinkhole, the Developer or its Contractor shall notify the Township, contact its own geotechnical engineer who shall propose a repair solution, and have that procedure reviewed by the Geotechnical Engineer. The Developer's geotechnical engineer and the Geotechnical Engineer shall monitor the repair in accordance with the reviewed procedure and upon completion of the repair and before any construction activity resumes in the area, the Developer's geotechnical engineer shall send a written report to the Township and the Geotechnical Engineer that the sinkhole has been repaired in accordance with the reviewed procedure and that construction activities may continue.

**Section C** STANDARD CONSTRUCTION DETAILS

# BETHLEHEM TOWNSHIP

NORTHAMPTON COUNTY, PENNSYLVANIA

# STANDARD CONSTRUCTION DETAILS

JANUARY 2023

PREPARED BY

THE PIDCOCK COMPANY

CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING

OXFORD DRIVE AT FISH HATCHERY ROAD  
ALLENTOWN, PENNSYLVANIA

# BETHLEHEM TOWNSHIP

## NORTHAMPTON COUNTY, PENNSYLVANIA

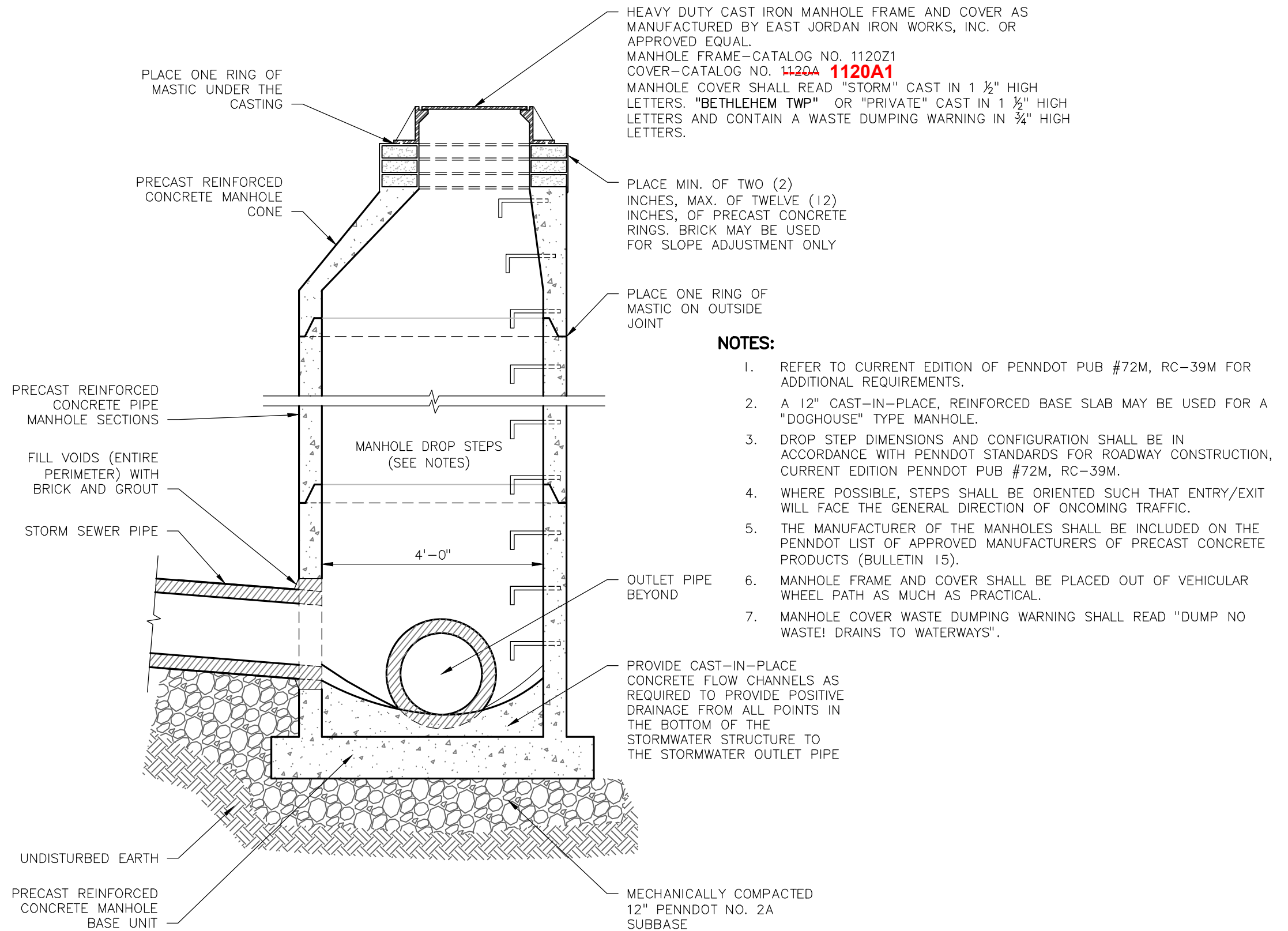
INDEX OF DETAILS		
NO.	TITLE	PLAN DATE OR LAST REVISION
<b>STORM DRAINAGE</b>		
BTWP-D-1	STANDARD PRECAST CONCRETE PIPE MANHOLE	JANUARY 2023
BTWP-D-2	SHALLOW PRECAST CONCRETE PIPE MANHOLE	JANUARY 2023
BTWP-D-3	PRECAST CONCRETE INLETS	JANUARY 2023
BTWP-D-4	DETENTION BASIN FENCE – CHAIN LINK	JANUARY 2023
BTWP-D-5	DETENTION BASIN FENCE – WOOD SPLIT RAIL	JANUARY 2023
BTWP-D-6	DETENTION BASIN FENCE – ALUMINUM	JANUARY 2023
<b>GENERAL CONSTRUCTION</b>		
BTWP-G-1	STANDARD TRENCH	JANUARY 2023
<b>ROADWAY CONSTRUCTION</b>		
BTWP-R-1	TYPICAL ROADWAY CROSS SECTIONS	JANUARY 2023
BTWP-R-2	NON-STATE HIGHWAY PAVEMENT RESTORATION	JANUARY 2023
BTWP-R-3	RESIDENTIAL SIDEWALK AND DRIVEWAY APRON	JANUARY 2023
BTWP-R-4	NON-RESIDENTIAL SIDEWALK AND DRIVEWAY APRON	JANUARY 2023
BTWP-R-5	CONCRETE CURB	JANUARY 2023
BTWP-R-6	BELGIAN BLOCK GRANITE CURB	JANUARY 2023
<b>RECREATION FACILITIES</b>		
BTWP-REC-1	RECREATION PATH	JANUARY 2023

**NOTE:**

THESE STANDARD CONSTRUCTION DETAILS TOGETHER WITH THE GENERAL PROVISIONS AND TECHNICAL SPECIFICATIONS CONSTITUTE THE STANDARD CONSTRUCTION DOCUMENTS FOR PUBLIC INTEREST IMPROVEMENTS INSTALLED AS PART OF SUBDIVISIONS/LAND DEVELOPMENTS WITHIN BETHLEHEM TOWNSHIP.



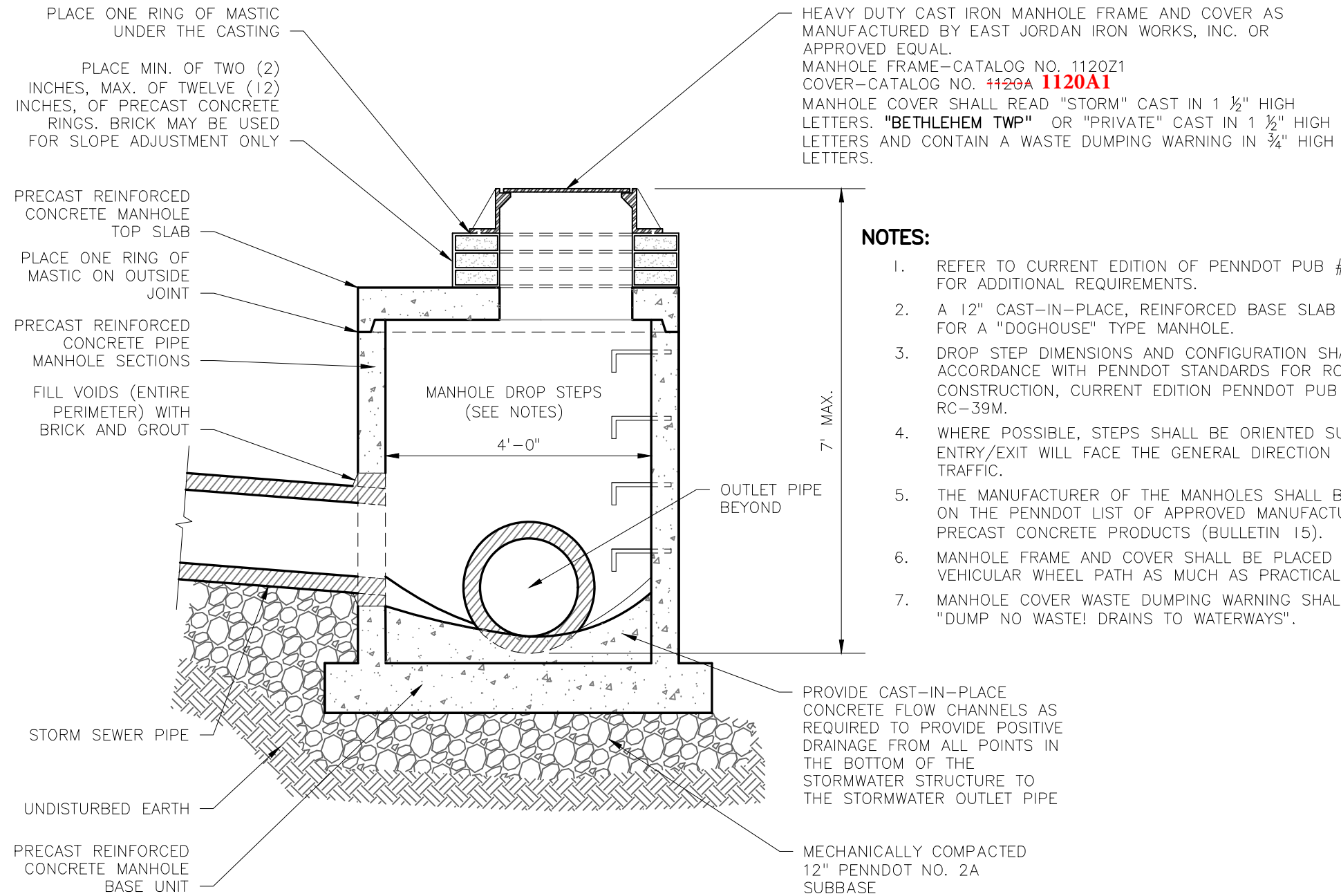
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**MANHOLE SECTION**  
**STANDARD PRECAST CONCRETE PIPE MANHOLE**  
 (SHOWN WITH PRECAST BASE UNIT)  
 NO SCALE

REVISIONS 1 APRIL 2014 2 MARCH 2015 3 APRIL 2021 4 AUGUST 2022 5 JANUARY 2023		BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA STORM DRAINAGE <b>STANDARD PRECAST CONCRETE PIPE MANHOLE</b>
THE PIDCOCK COMPANY <small>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</small> <small>OXFORD DRIVE AT TISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA</small>		DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE
		<b>BTWP-D-1</b>

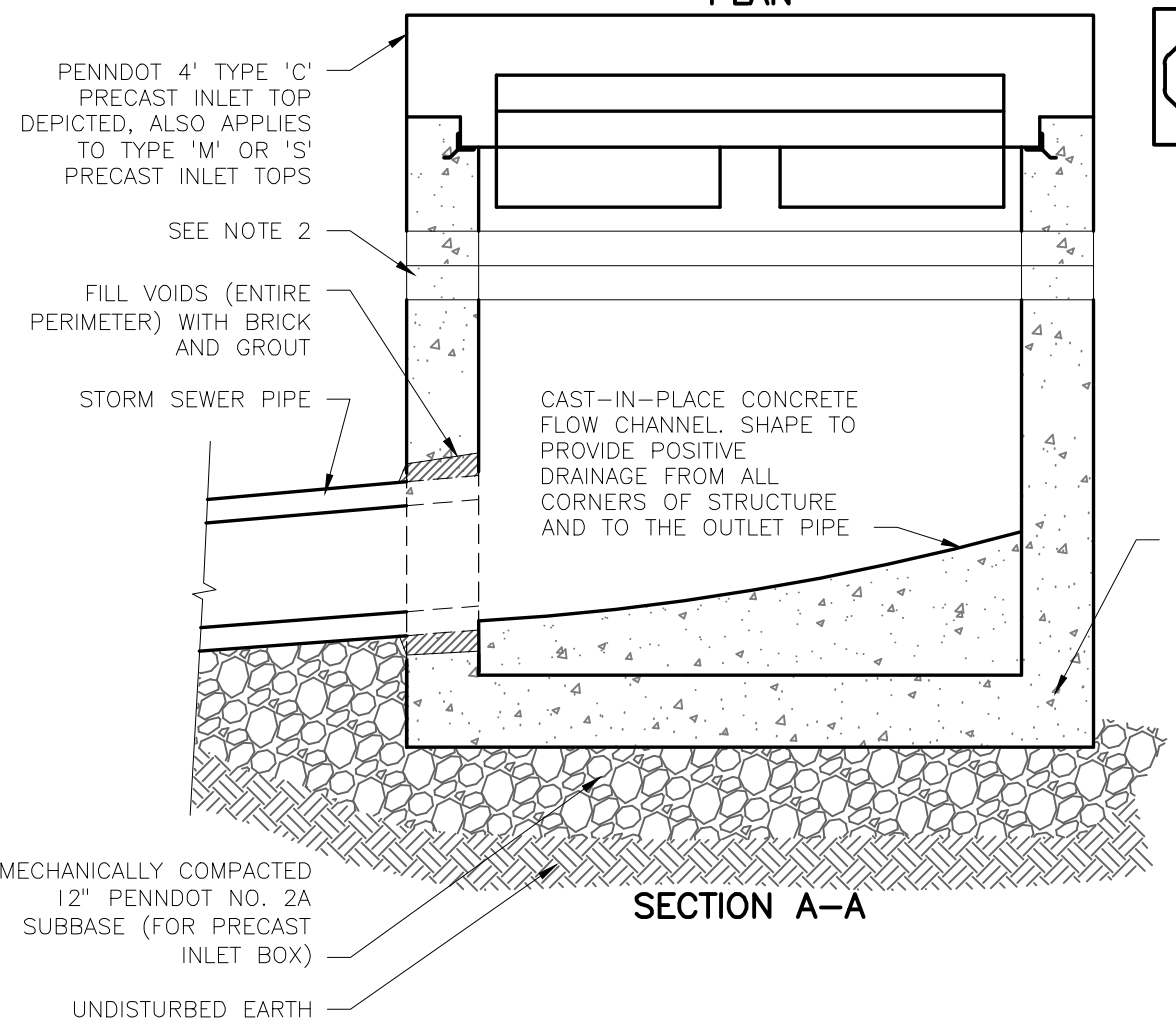
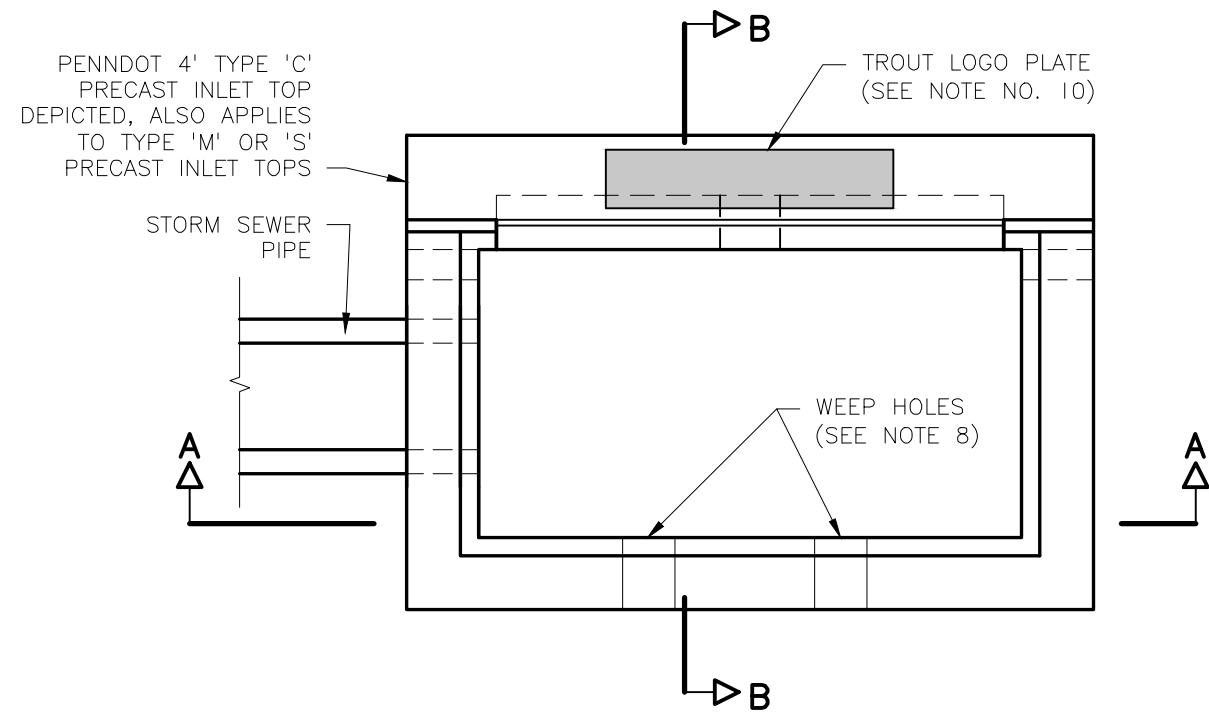
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**MANHOLE SECTION**  
**SHALLOW PRECAST CONCRETE PIPE MANHOLE**  
 (SHOWN WITH PRECAST BASE UNIT)  
 NO SCALE

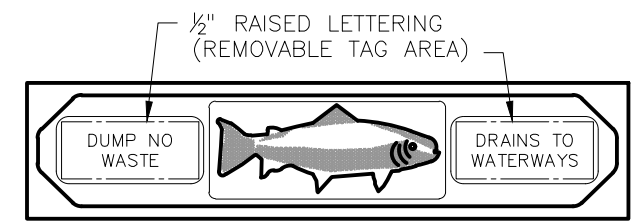
BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
STORM DRAINAGE <b>SHALLOW PRECAST CONCRETE PIPE MANHOLE</b>	
REVISIONS 1 APRIL 2014 2 MARCH 2015 3 APRIL 2021 4 AUGUST 2022 5 JANUARY 2023	DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE <b>THE PIDCOCK COMPANY</b> <small>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</small> <small>OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA</small> <b>BTWP-D-2</b>

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\Bethlehem Township\Working Documents - Details\BTWP-D-03.dwg Last Modified: Jan 12, 2023 - 11:47am



**NOTES:**

1. CONCRETE INLET AND TOP UNITS SHALL BE AS DETAILED IN PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION, CURRENT EDITION (PENNDOT PUB #72M) RC-45 AND RC-46M "INLET TOPS, GRATES, AND FRAMES", AND "INLET BOXES".
2. PROVIDE A MINIMUM OF 4 INCHES AND MAXIMUM OF 8 INCHES VERTICALLY OF PRECAST CONCRETE COLLARS WITH THROUGH-WALL OPENINGS ADJACENT TO SUBGRADE TO SERVE AS WEEP HOLES.
3. ALL EXPOSED EDGES SHALL BE CHAMFERED 1"x1".
4. DROP STEPS SHALL BE PROVIDED WHENEVER STRUCTURE EXCEEDS 4 FEET IN DEPTH.
5. DROP STEP DIMENSIONS AND CONFIGURATION SHALL BE IN ACCORDANCE WITH PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION, CURRENT EDITION (PENNDOT PUB #72M), RC-39M.
6. THE CENTERLINE OF AN INLET SHALL BE NO CLOSER THAN 8 FEET TO THE EDGE OF A DRIVEWAY FOR TYPE C INLET.
7. PROVIDE STRUCTURAL STEEL GRATE - BICYCLE SAFE, AS DETAILED IN PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION, CURRENT EDITION (PENNDOT PUB #72M), RC-45M "INLET TOPS, GRATES, AND FRAMES", WHERE APPROPRIATE USE HANDICAPPED ACCESSIBLE GRATE.
8. THE BACKFILL AROUND THE WEEPHOLES SHALL NOT CONTAIN SCREENINGS; i.e., PLACE PENNDOT NO. 3 OR LARGER STONES AS REQUIRED BY ENGINEER, WITHOUT SCREENINGS TO ALLOW WATER TO ENTER WEEPHOLES. PLACE GEOTEXTILE FABRIC AROUND BACKFILL TO PREVENT MIGRATION OF SURROUNDING MATERIAL INTO VOIDS OF BACKFILL.
9. THE MANUFACTURER OF THE INLETS SHALL BE INCLUDED ON THE PENNDOT LIST OF APPROVED MANUFACTURERS OF PRECAST CONCRETE PRODUCTS (BULLETIN 15).
10. TOP UNITS MUST CONTAIN THE 24-INCH BY 5-INCH TROUT LOGO PLATE AND TAGS DISPLAYING A DUMPING WARNING AS MANUFACTURED BY EAST JORDAN IRON WORKS INC. (CATALOG NO. 7001PL1).



**TROUT LOGO PLATE**  
NO SCALE

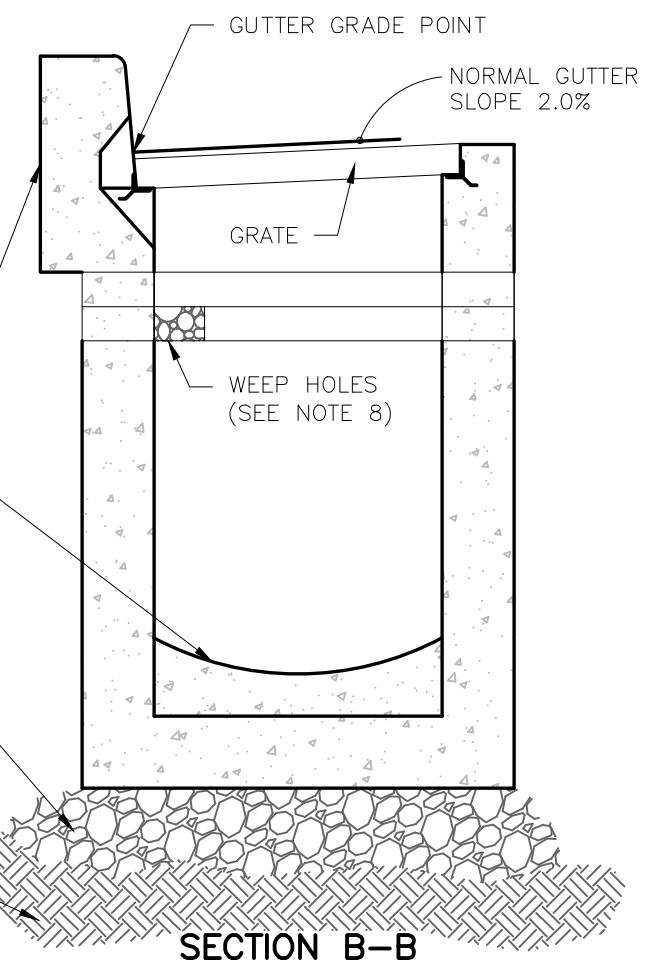
PENNDOT 4' TYPE 'C' PRECAST INLET TOP DEPICTED, ALSO APPLIES TO TYPE 'M' OR 'S' PRECAST INLET TOPS

CAST-IN-PLACE CONCRETE FLOW CHANNEL. SHAPE TO PROVIDE POSITIVE DRAINAGE FROM ALL CORNERS OF STRUCTURE AND TO THE OUTLET PIPE

MECHANICALLY COMPACTED 12" PENNDOT NO. 2A SUBBASE (FOR PRECAST INLET BOX)

UNDISTURBED EARTH

**INLETS**  
NO SCALE

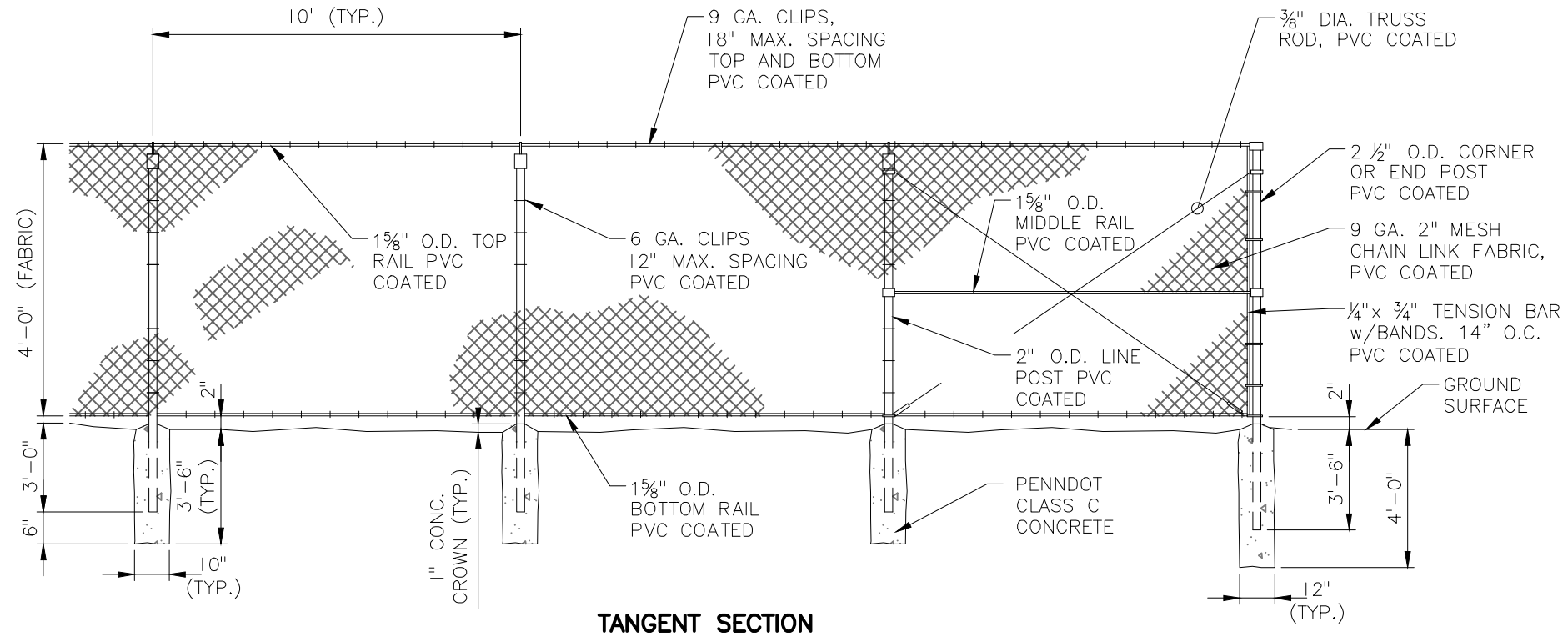


**SECTION B-B**

REVISIONS	
1	APRIL 2014
2	MARCH 2015
3	APRIL 2021
4	AUGUST 2022
5	JANUARY 2023

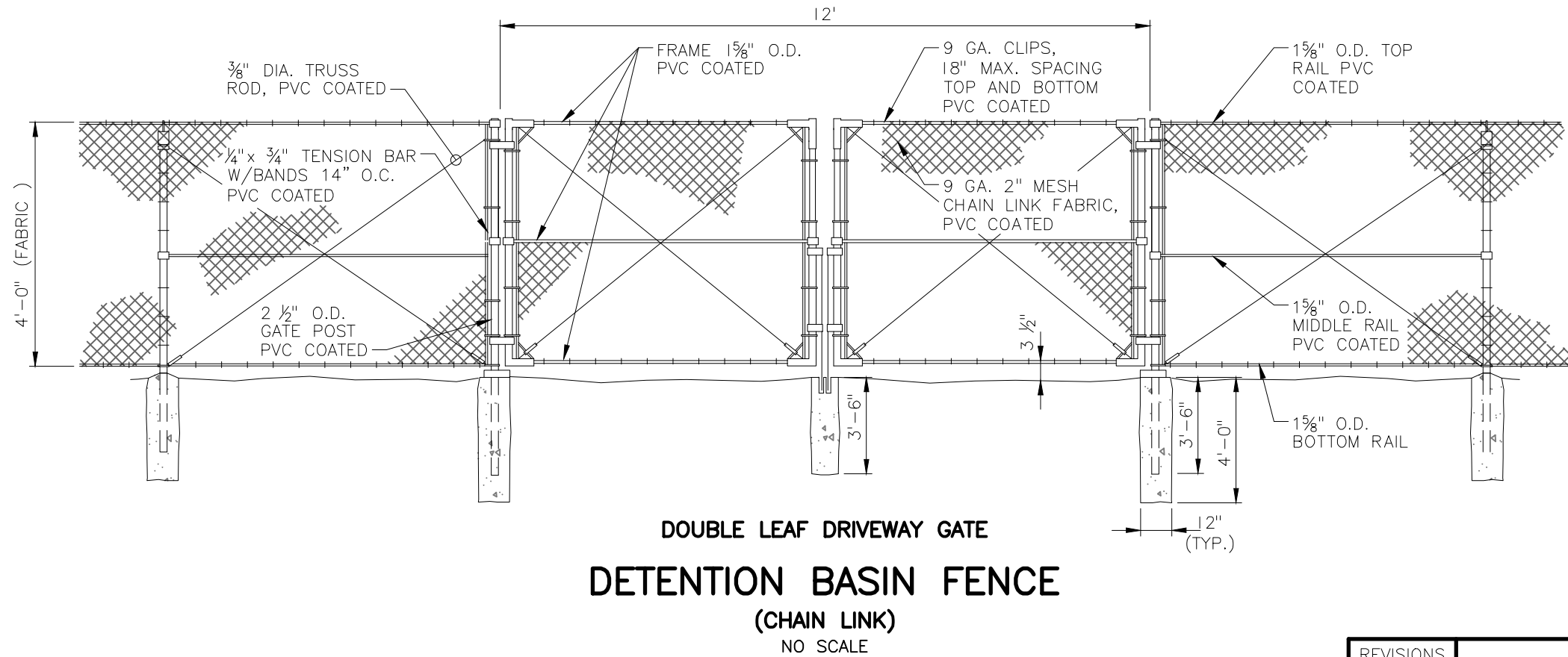
BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
STORM DRAINAGE <b>PRECAST CONCRETE INLETS</b>	
<b>THE PIDCOCK COMPANY</b> CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING	
DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	BTWP-D-3

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\Bethlehem Township\Working Documents - Details\BTWP-D-04.dwg Last Modified: Jan 12, 2023 - 11:46am



**NOTES:**

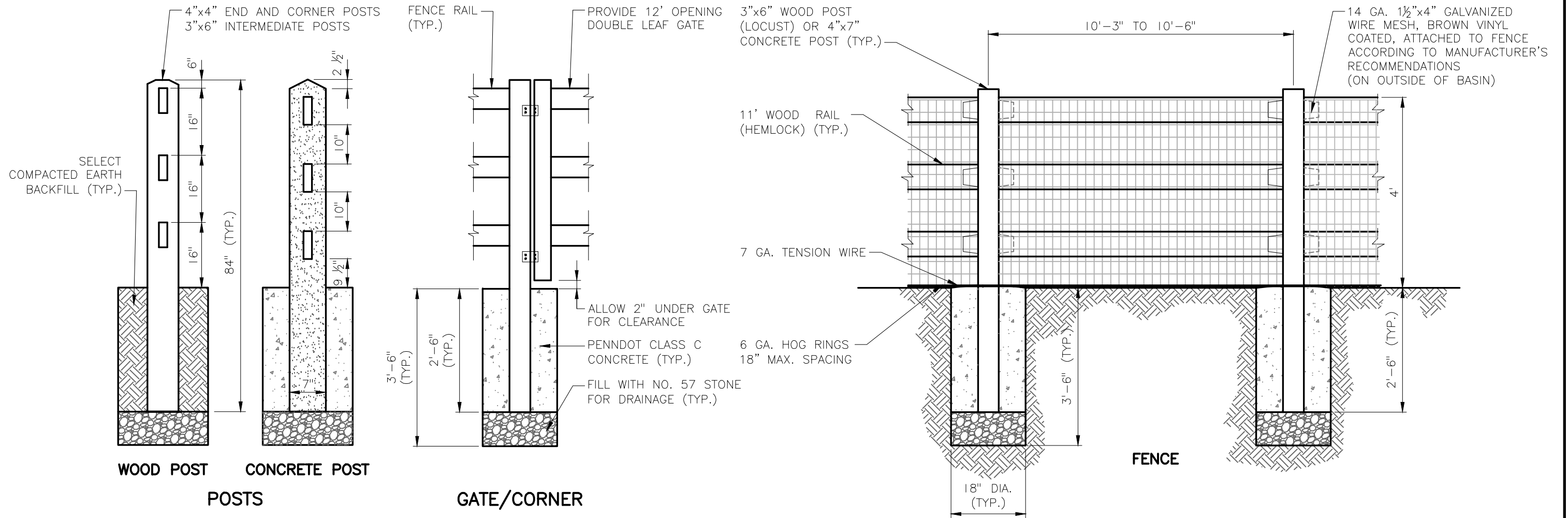
1. THE FENCE FABRIC FOR TANGENT SECTION AND GATES SHALL BE 6-GAUGE THICKNESS (9 GAUGE CORE) PVC COATED WIRE, 2-INCH MESH IN BROWN COLOR AS REVIEWED BY THE TOWNSHIP. ALTERNATE FABRIC SHALL BE 2-INCH MESH, #9 GAUGE WIRE WITH A MINIMUM OF 1.2 OUNCES OF ZINC PER SQUARE FOOT (REQUIRES PRIOR REVIEW AND APPROVAL BY TOWNSHIP).
2. 1 5/8" O.D. MIDDLE RAIL AND 3/8" DIA. TRUSS ROD ADJACENT TO BOTH SIDES OF CORNER AND END POSTS ONLY ON FENCE LINE.
3. TOP AND BOTTOM SELVAGES AT TANGENT SECTION AND GATES SHALL BE KNUCKLED.
4. PROVIDE A LOCKABLE (PADLOCK THROUGH A LATCH) ASSEMBLY (NO CHAINING) ON ALL GATES. ALL LOCKS TO BE KEYED ALIKE IN ACCORDANCE WITH TOWNSHIP REQUIREMENTS.
5. ALL MATERIALS NOT IDENTIFIED TO BE PVC COATED SHALL BE HOT DIPPED GALVANIZED.



**DOUBLE LEAF DRIVEWAY GATE  
DETENTION BASIN FENCE  
(CHAIN LINK)  
NO SCALE**

<b>REVISIONS</b> 1 APRIL 2014 2 APRIL 2021 3 AUGUST 2022 4 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
	STORM DRAINAGE <b>DETENTION BASIN FENCE - CHAIN LINK</b>	
	THE PIDCOCK COMPANY CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING	
	DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-D-4</b>

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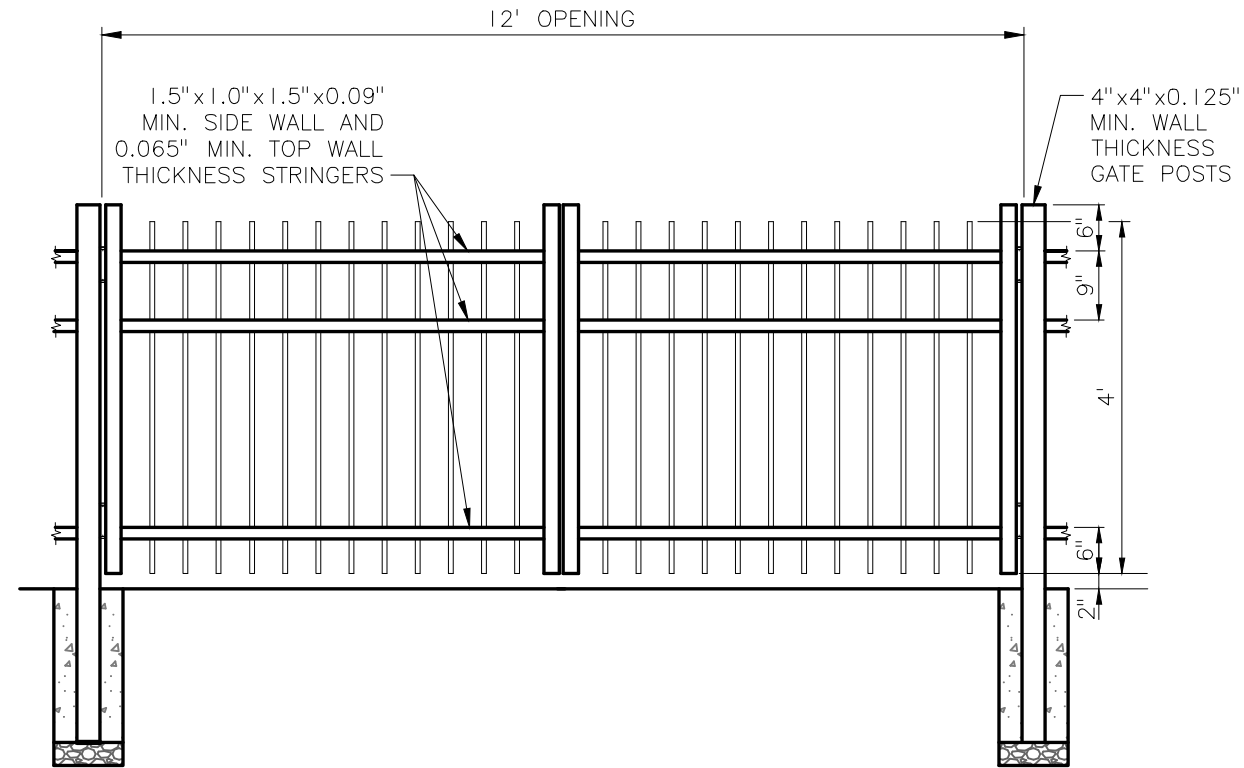
**NOTES:**

1. FOLLOW MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION.
2. ALL POSTS SHALL BE EITHER WOOD OR CONCRETE.
3. WIRE MESH ON GATE DETAIL NOT SHOWN FOR CLARITY.
4. ALL HARDWARE SHALL BE PER MANUFACTURER'S SPECIFICATIONS AND BE HOT DIPPED GALVANIZED
5. PROVIDE A LOCKABLE (PADLOCK THROUGH A LATCH) ASSEMBLY (NO CHAINING) ON ALL GATES. ALL LOCKS TO BE KEYED ALIKE IN ACCORDANCE WITH TOWNSHIP REQUIREMENTS.
6. CONCRETE BACKFILL SHALL ONLY BE USED WITH CONCRETE POSTS AND AT ALL GATE POSTS.

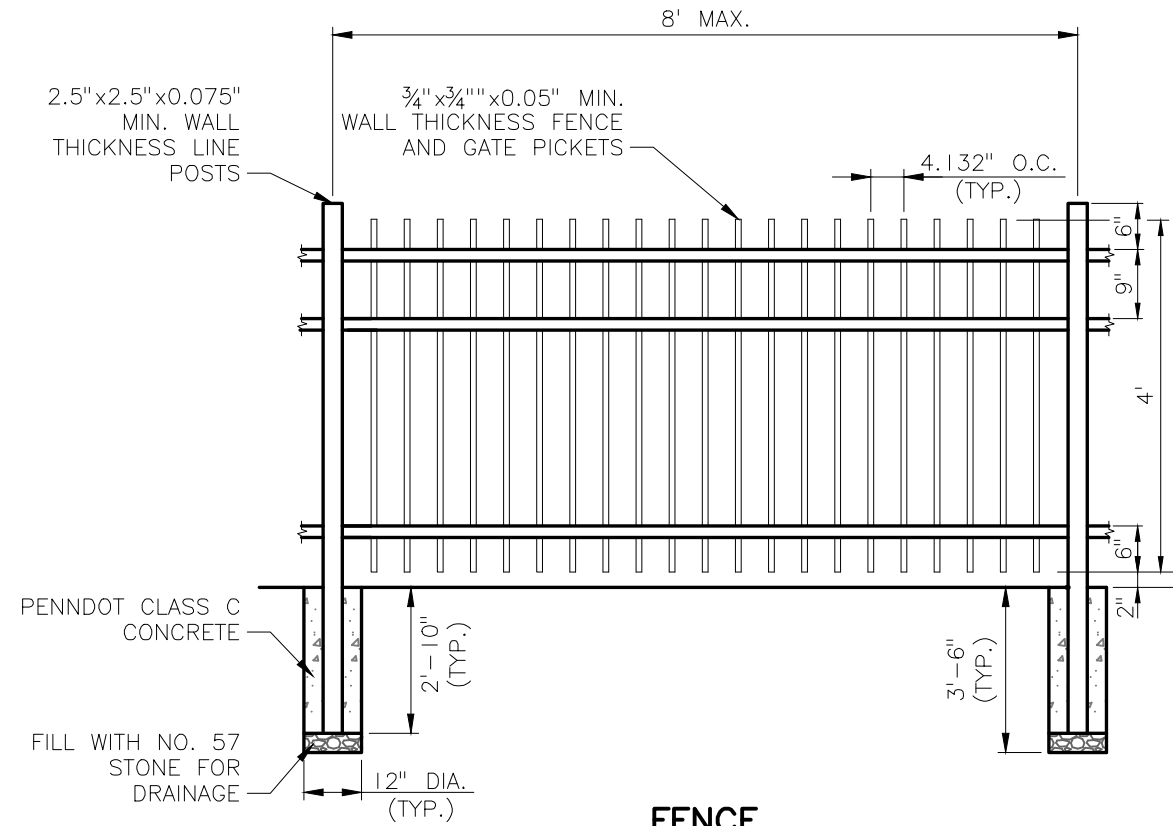
**DETENTION BASIN FENCE**  
**(WOOD SPLIT RAIL FENCE WITH WIRE MESH)**  
NO SCALE

<p>REVISIONS</p> <p>1 APRIL 2014</p> <p>2 APRIL 2021</p> <p>3 AUGUST 2022</p> <p>4 JANUARY 2023</p>	<p>BETHLEHEM TOWNSHIP</p> <p><b>STANDARD CONSTRUCTION DETAILS</b></p> <p>NORTHAMPTON COUNTY, PENNSYLVANIA</p> <p>STORM DRAINAGE</p> <p><b>DETENTION BASIN FENCE - WOOD SPLIT RAIL</b></p>
<p>THE PIDCOCK COMPANY</p> <p>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</p> <p>OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA</p>	
<p>DATE: MARCH 2008</p> <p>CHKD BY: RJG</p> <p>SCALE: NO SCALE</p> <p><b>BTWP-D-5</b></p>	

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\BETHLEHEM TOWNSHIP\BTWP-WORKING DOCUMENTS - Details\BTWP CONSTRUCTION DETAILS\BTWP-D-06.dwg Last Modified: Jan 12, 2023 - 11:50am



**DOUBLE GATE**



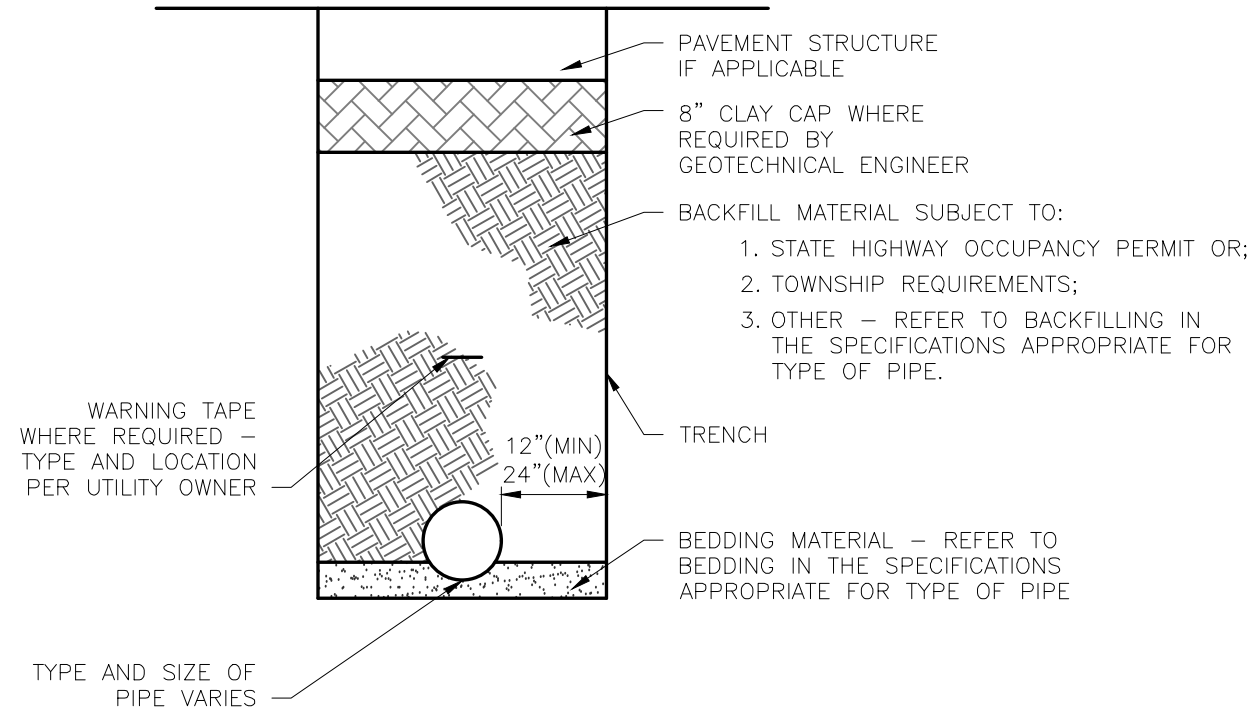
**FENCE**

**DETENTION BASIN FENCE  
(ALUMINUM FENCE)  
NO SCALE**

**NOTES:**

1. ALUMINUM FENCE MATERIAL TO BE ALUMINUM ALLOY 6105-T5 WITH HIGH -SOLIDS ACRYLIC FINISH (BLACK) MEETING REQUIREMENTS OF AAMA 603.8 SPECIFICATIONS.
2. FOLLOW MANUFACTURER'S SPECIFICATIONS FOR INSTALLATION.
3. ALL HARDWARE SHALL BE PER MANUFACTURER'S SPECIFICATIONS AND SHALL BE HOT DIPPED GALVANIZED.
4. PROVIDE A LOCKABLE (PADLOCK THROUGH A LATCH) ASSEMBLY (NO CHAINING) ON ALL GATES. ALL LOCKS TO BE KEYED ALIKE IN ACCORDANCE WITH TOWNSHIP REQUIREMENTS.

REVISIONS 1 APRIL 2021 2 AUGUST 2022 3 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA
	STORM DRAINAGE <b>DETENTION BASIN FENCE - ALUMINUM</b>
	THE PIDCOCK COMPANY CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA
DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-D-06</b>

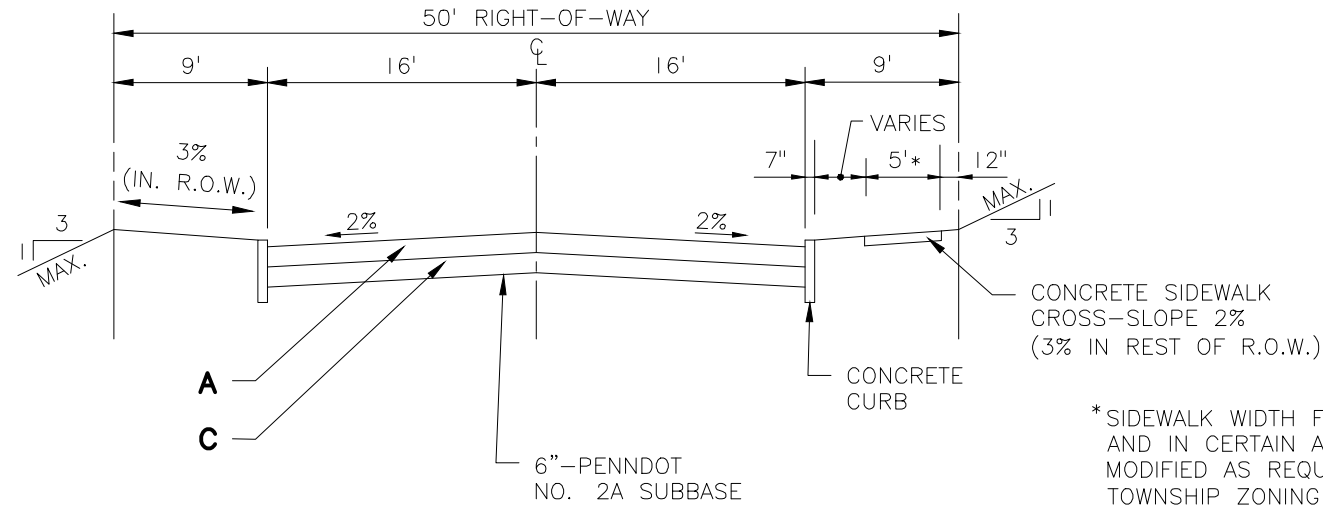


## STANDARD TRENCH

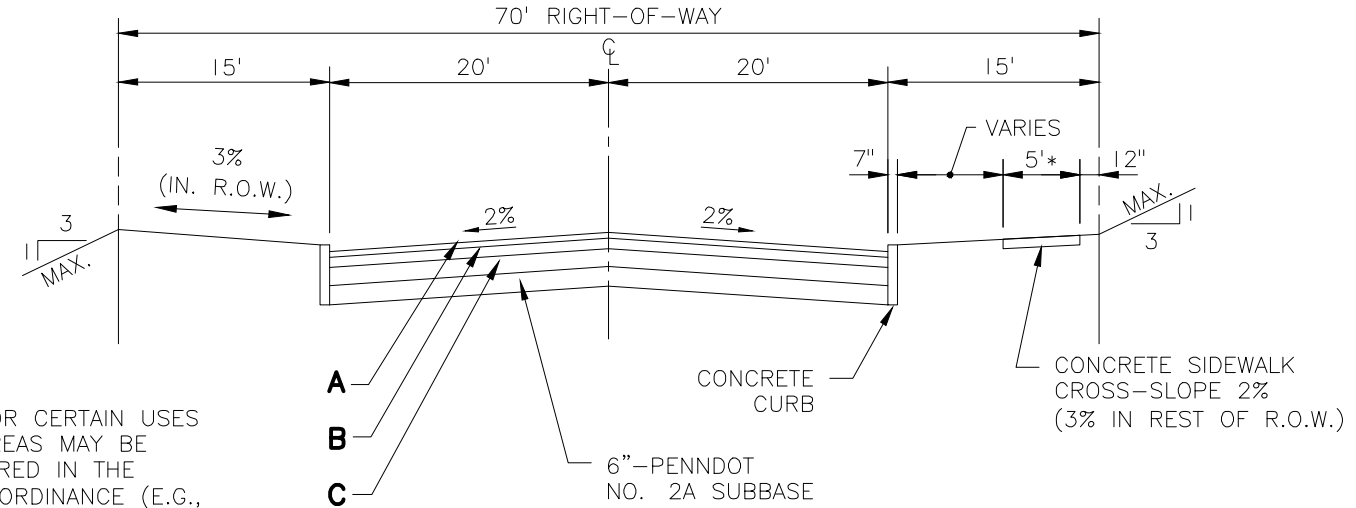
NO SCALE

<p>REVISIONS</p> <p>1 AUGUST 2022</p> <p>2 JANUARY 2023</p>	<p>BETHLEHEM TOWNSHIP</p> <p><b>STANDARD CONSTRUCTION DETAILS</b></p> <p>NORTHAMPTON COUNTY, PENNSYLVANIA</p>
<p>GENERAL CONSTRUCTION</p> <p><b>STANDARD TRENCH</b></p>	
<p><b>THE PIDCOCK COMPANY</b></p> <p>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</p> <p>OXFORD DRIVE AT FISH HATCHERY ROAD ALLEN TOWNSHIP, PENNSYLVANIA</p>	
<p>DATE: MARCH 2008</p> <p>CHKD BY: RJG</p> <p>SCALE: NO SCALE</p>	
<p><b>BTWP-G-1</b></p>	

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\BETHLEHEM TOWNSHIP\BTWP-WORKING DOCUMENTS - Details\BTWP-CONSTRUCTION DETAILS\BTWP-R-01.dwg Last Modified: Jan 12, 2023 - 11:52am

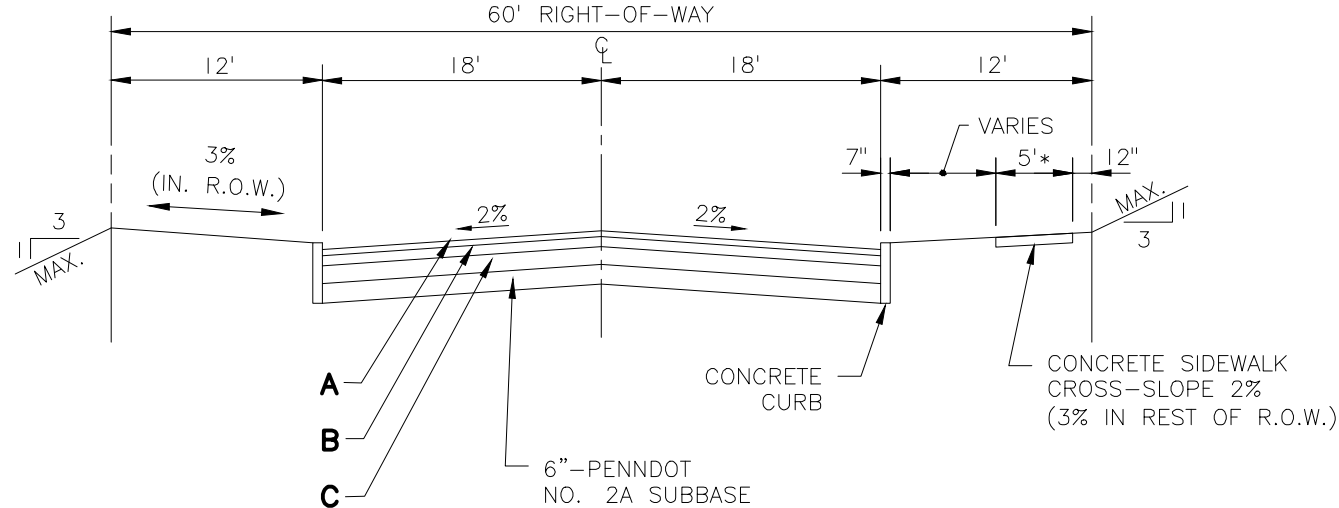


**TYPICAL CROSS SECTION  
(LOCAL STREETS)**  
NO SCALE

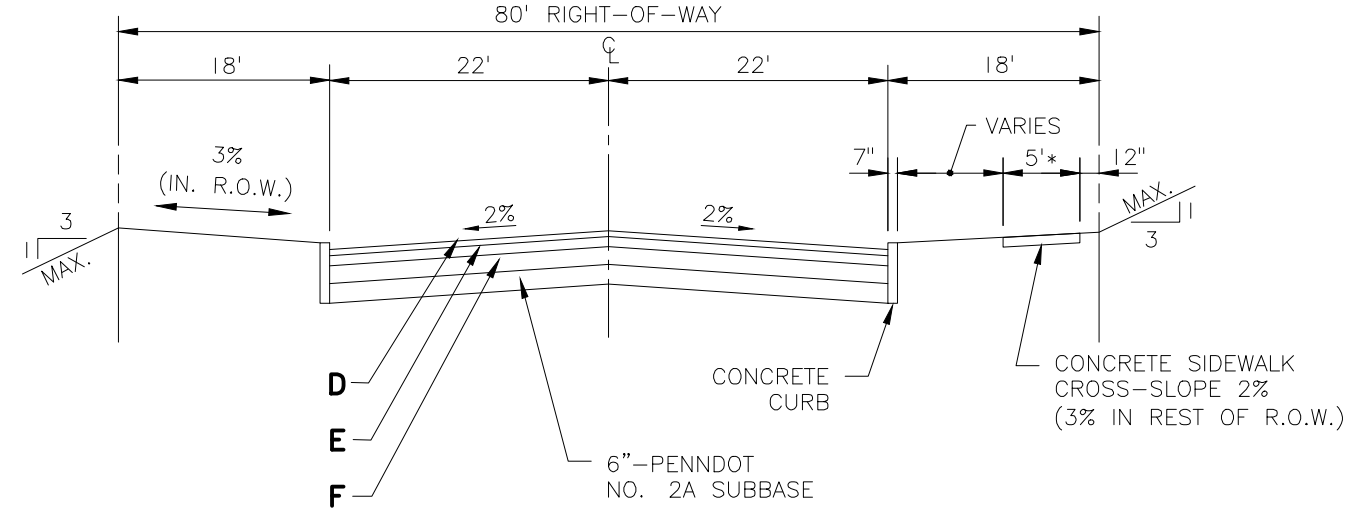


**TYPICAL CROSS SECTION  
(CONNECTOR STREETS)**  
NO SCALE

\*SIDEWALK WIDTH FOR CERTAIN USES AND IN CERTAIN AREAS MAY BE MODIFIED AS REQUIRED IN THE TOWNSHIP ZONING ORDINANCE (E.G., STREETScape ENHANCEMENT OVERLAY DISTRICT, TOWN CENTER DISTRICT, HOSPITAL HEALTH CARE VILLAGE)



**TYPICAL CROSS SECTION  
(COLLECTOR STREETS)**  
NO SCALE



**TYPICAL CROSS SECTION  
(ARTERIAL STREETS)**  
NO SCALE

**PRIMARY PAVEMENT:**

- A**- 1 ½" SUPERPAVE ASPHALT 9.5mm, PG 64S-22, 0.0 TO 0.3 MILLION ESAL, SRL-L, WEARING COURSE.
- B**- 2 ½" SUPERPAVE ASPHALT, 19.0mm, PG 64S-22, 0.0 TO 0.3 MILLION ESAL, BINDER COURSE.
- C**- 5" SUPERPAVE ASPHALT, 25.00mm, PG 64S-22, 0.0 TO 0.3 MILLION ESAL, BASE COURSE.
- D**- 1 ½" SUPERPAVE ASPHALT 9.5mm, PG 64S-22, 0.3 TO 3.0 MILLION ESAL, SRL-M, WEARING COURSE
- E**- 2 ½" SUPERPAVE ASPHALT, 19mm, PG 64S-22, 0.3 TO 3.0 MILLION ESAL, BINDER COURSE.
- F**- 5" SUPERPAVE ASPHALT, 25.00mm, PG 64S-22, 0.3 TO 3.0 MILLION ESAL, BASE COURSE.

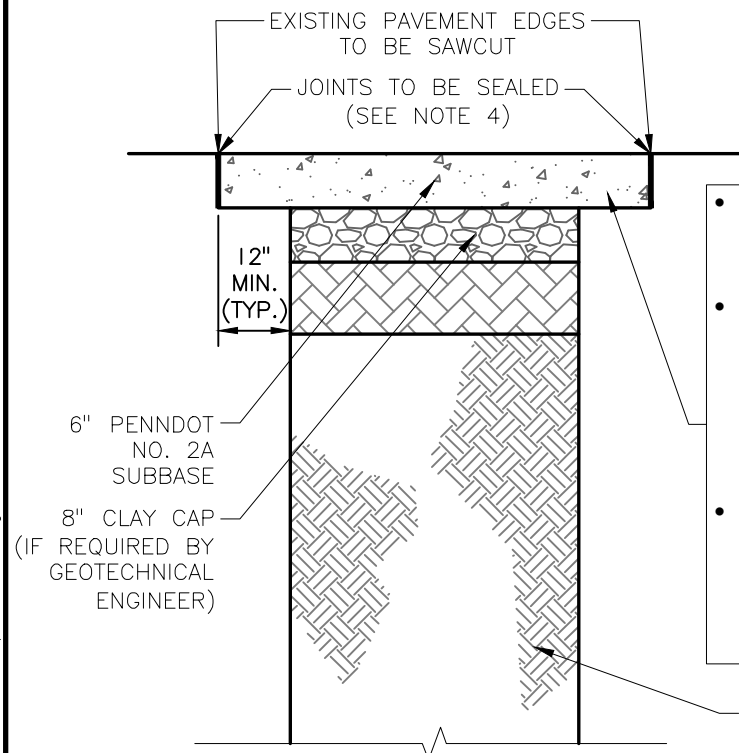
**NOTES:**

1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENT FOR PENNDOT SPECIFICATIONS, PUBLICATION 408.
2. SEAL CURB IN ACCORDANCE WITH CONCRETE CURB DETAILS BTWP-R-5
3. THE FOLLOWING ABBREVIATIONS APPEAR ON THIS SHEET:
  - a. ESAL - EQUIVALENT SINGLE AXLE LOAD
  - b. SRL - SKID RESISTANCE LEVEL
  - c. PG - PERFORMANCE GRADE
4. SIDEWALK SHALL BE INSTALLED AT A STANDARD 5' WIDTH. IF SIDEWALK IS INSTALLED AT A WIDTH LESS THAN 5' THEN 5' WIDE PASSING ZONES MUST BE PROVIDED PER ADA REQUIREMENTS.

REVISIONS 1 APRIL 2014 2 APRIL 2021 3 AUGUST 2022 4 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
	ROAD CONSTRUCTION <b>TYPICAL ROADWAY CROSS SECTIONS</b>	
	THE PIDCOCK COMPANY CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING	
	DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-R-1</b>

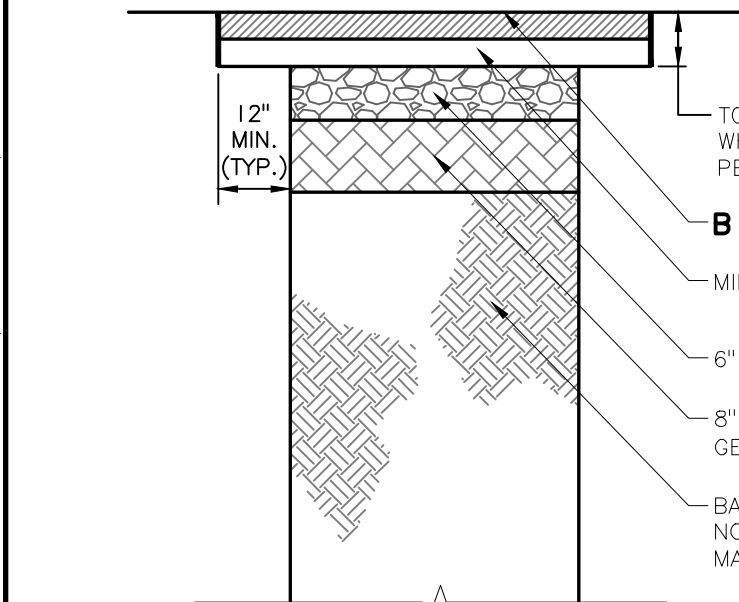


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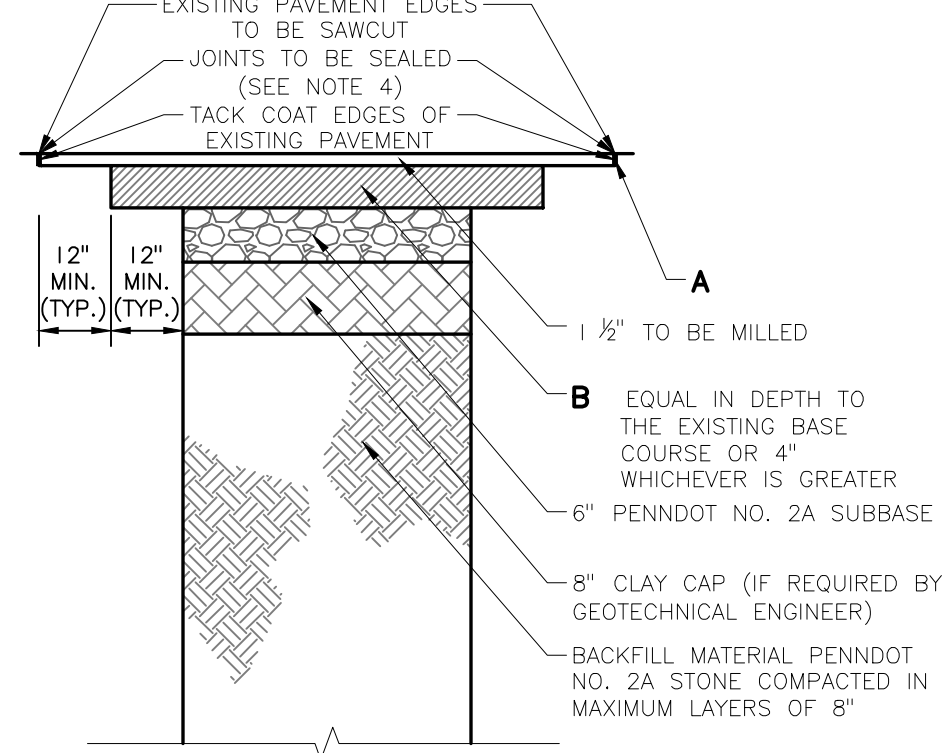


- HIGH EARLY STRENGTH CONCRETE EQUAL IN DEPTH TO THE EXISTING CONCRETE OR 9" WHICHEVER IS GREATER.
- REINFORCEMENT AT LEAST EQUAL IN SIZE AND SPACING TO THE EXISTING REINFORCEMENT SHALL BE USED. IF NO REINFORCING EXISTS THE DESIGN ENGINEER SHALL PROVIDE REQUIRED REINFORCING DESIGN TO THE TOWNSHIP FOR REVIEW PRIOR TO INSTALLATION.
- REINFORCING STEEL, TIE BOLTS, AND LOAD TRANSFER DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH PENNDOT STANDARDS FOR ROADWAY CONSTRUCTION, CURRENT EDITION (PENNDOT PUB #72M) RC26M.

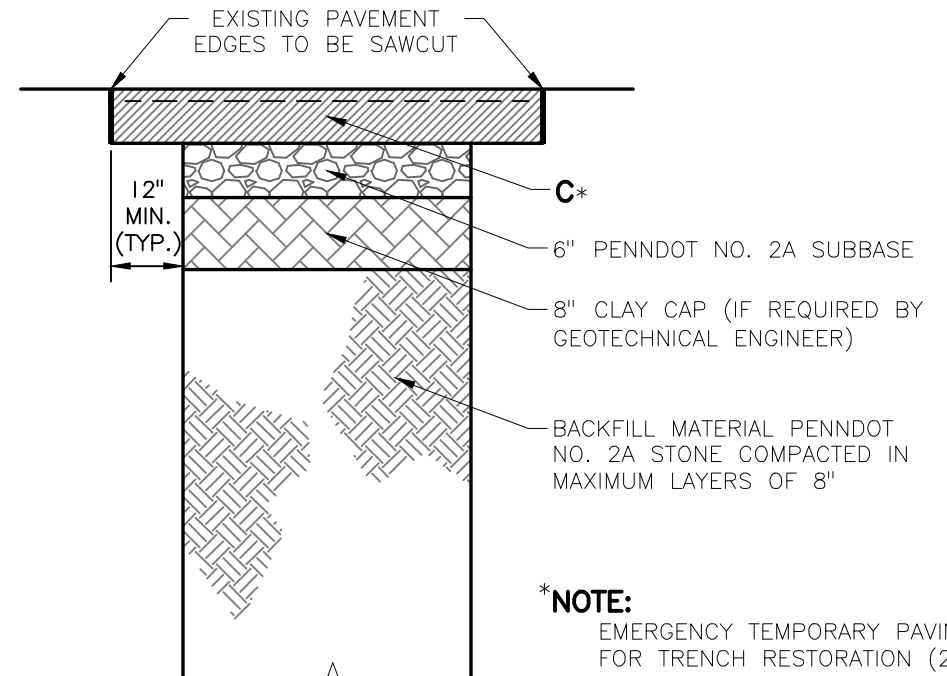
SEE TP-G-1  
FOR PIPE/BEDDING DETAIL  
**PERMANENT TYPE "C"  
REINFORCED CEMENT  
CONCRETE PAVEMENT**



SEE TP-G-1  
FOR PIPE/BEDDING DETAIL  
**TEMPORARY FOR TYPE "C"  
REINFORCED CEMENT  
CONCRETE PAVEMENT**



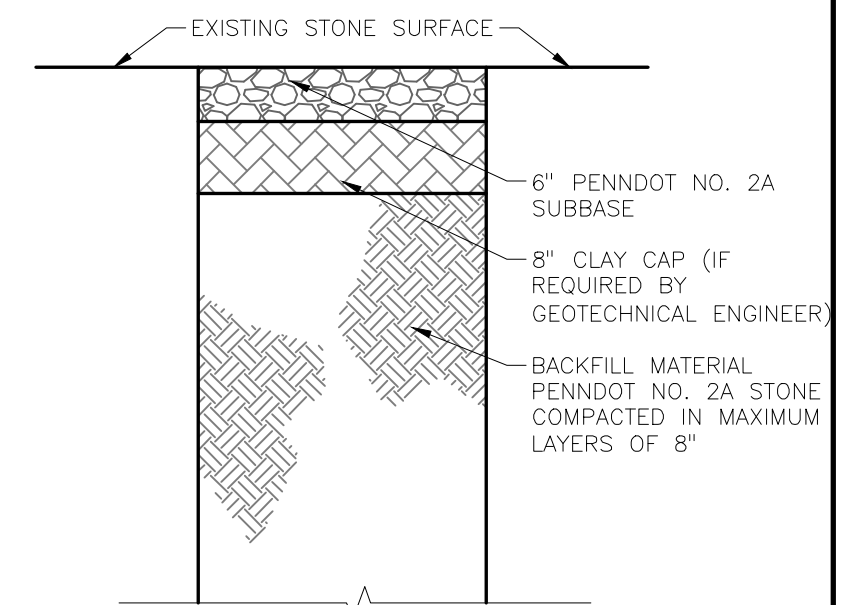
SEE TP-G-1  
FOR PIPE/BEDDING DETAIL  
**PERMANENT TYPE "D"  
ASPHALT PAVEMENT**



SEE TP-G-1  
FOR PIPE/BEDDING DETAIL  
**TEMPORARY FOR TYPE "D"  
ASPHALT PAVEMENT**

**\*NOTE:**  
EMERGENCY TEMPORARY PAVING FOR TRENCH RESTORATION (2" COLD ASPHALT MATERIAL WITH 3 1/2" PENNDOT NO. 2A STONE) MAY BE UTILIZED SUBJECT TO TOWNSHIP REVIEW, ONLY UNTIL MATERIAL AS REFERENCED IN **C** BECOMES AVAILABLE FOR INSTALLATION.

**NON-STATE HIGHWAY  
PAVEMENT RESTORATION**  
NO SCALE



SEE TP-G-1  
FOR PIPE/BEDDING DETAIL  
**TYPE "E"  
STONE SURFACE**

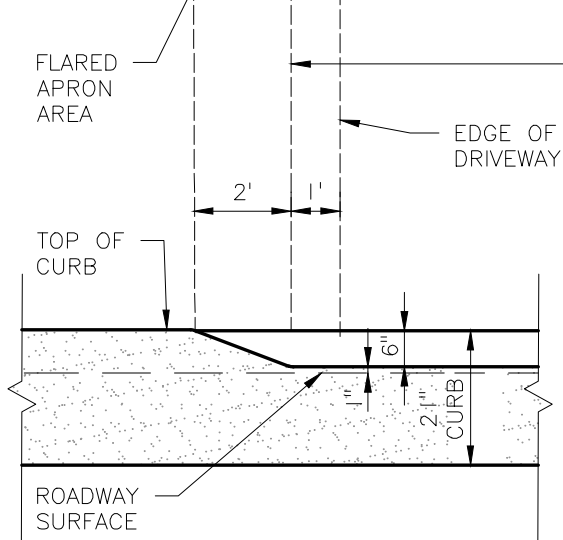
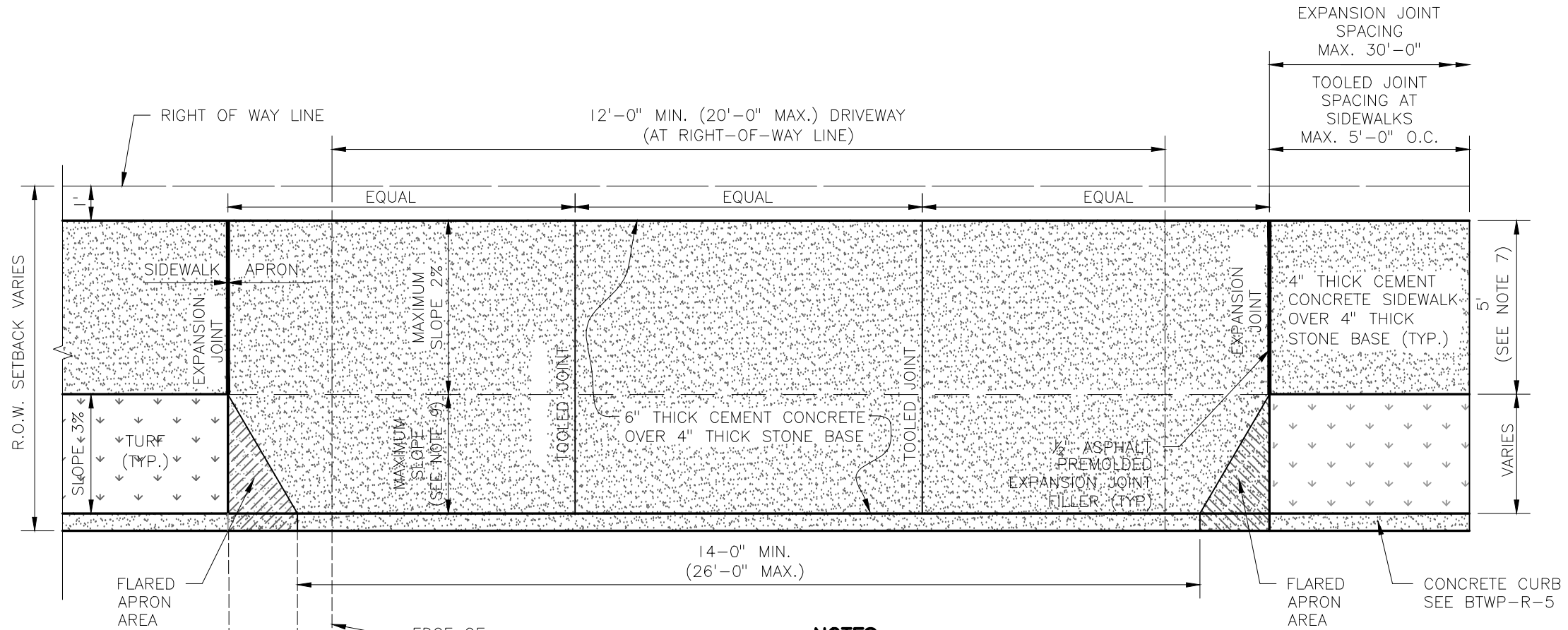
**NOTES:**

1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PENNDOT SPECIFICATIONS, PUBLICATION 408, CURRENT EDITION.
2. PERMANENT ASPHALT PAVING THICKNESSES SHALL MATCH THE DETAILS OR EXISTING PAVEMENT, WHICHEVER IS GREATER.
3. WARNING TAPE SHALL BE PLACED AT A MINIMUM OF 2' ABOVE ANY MAINLINE PIPE OR LATERAL OR AS OTHERWISE REQUIRED BY THE UTILITY OWNER.
4. JOINT SEALANT SHALL BE COMPLETED IN A NEAT AND UNIFORM MANNER WITH CRAFCO BRAND POLYFLEX TYPE 2 RUBBERIZED SEALANT.
5. THE FOLLOWING ABBREVIATIONS APPEAR ON THIS SHEET:
  - a. ESAL - EQUIVALENT SINGLE AXLE LOAD
  - b. SRL - SKID RESISTANCE LEVEL
  - c. PG - PERFORMANCE GRADE

- A**- 1 1/2" SUPERPAVE ASPHALT 9.5mm, AS DEFINED IN DETAIL TP-R-1 FOR THE APPLICABLE STREET CLASSIFICATION.
- B**- 4" SUPERPAVE ASPHALT, 25.0mm, AS DEFINED IN DETAIL TP-R-1 FOR THE APPLICABLE STREET CLASSIFICATION.
- C**- 5 1/2" SUPERPAVE ASPHALT, 25.0mm, AS DEFINED IN DETAIL TP-R-1 FOR THE APPLICABLE STREET CLASSIFICATION.

REVISIONS 1 JANUARY 2018 2 APRIL 2021 3 JUNE 2022 4 AUGUST 2022 5 JANUARY 2023		BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA ROADWAY CONSTRUCTION <b>NON-STATE HIGHWAY PAVEMENT RESTORATION</b>	
THE PIDCOCK COMPANY CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA		DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-R-2</b>

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\Bethlehem Township\BTWP-Working Documents - Details\BTWP Construction Details\BTWP-R-03.dwg Last Modified: Jan 12, 2023 - 11:55am



**ELEVATION  
(AT CURB DEPRESSION)**

**NOTES:**

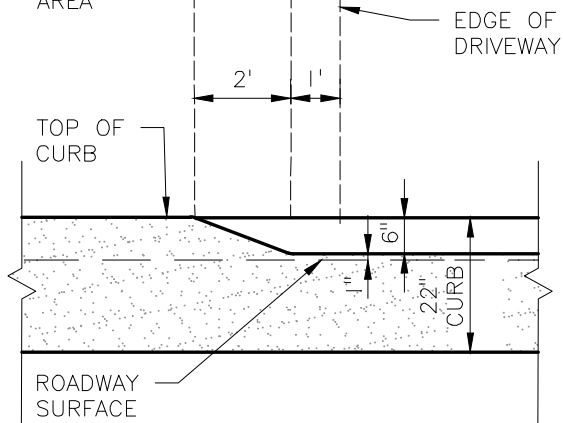
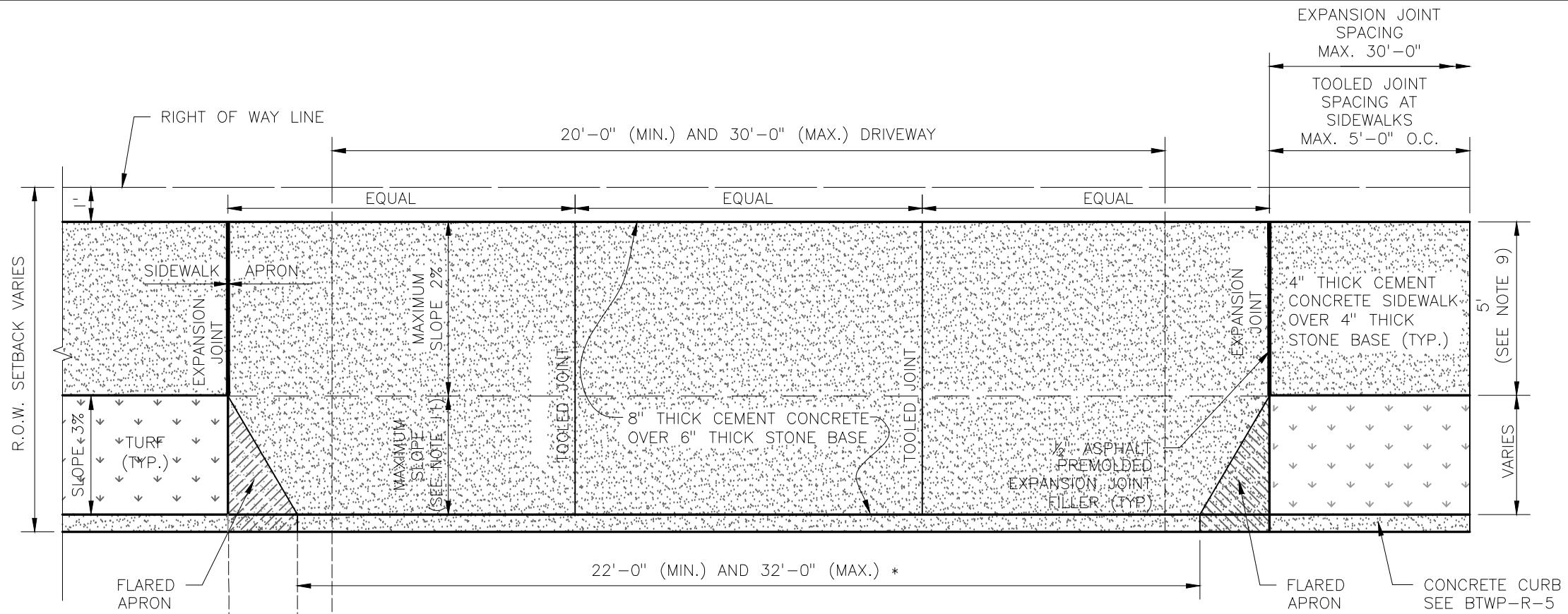
1. REFER TO CURRENT EDITION OF PENNDOT PUB #72M AND RC-67M FOR ADDITIONAL REQUIREMENTS.
2. SUBBASE SHALL BE PENNDOT NO. 2A STONE MECHANICALLY COMPACTED ON A PREPARED SUBGRADE.
3. CONCRETE DRIVEWAY APRONS SHALL BE INSTALLED WHERE CONCRETE CURB DEPRESSIONS HAVE BEEN INSTALLED.
4. THE EDGE OF A DRIVEWAY SHALL BE NO CLOSER THAN 8 FEET FROM THE CENTERLINE OF AN INLET.
5. THE BACK OF DRIVEWAY APRON ELEVATION SHALL BE CONSISTENT WITH THE BACK ELEVATION OF EACH ABUTTING SIDEWALK. LOWERING THE BACK OF APRON ELEVATION BELOW THE ABUTTING SIDEWALK ELEVATIONS REQUIRES A REVISED PLAN SUBMISSION FROM THE DESIGN ENGINEER TO THE TOWNSHIP FOR APPROVAL.
6. PROVIDE DRIVEWAY APRONS AT ACCESS POINTS TO ALL TOWNSHIP UTILITY EASEMENTS UNLESS DIRECTED OTHERWISE BY THE TOWNSHIP.
7. CONCRETE SHALL BE PENNDOT CLASS AA.
8. SIDEWALK SHALL BE INSTALLED AT A STANDARD 5' WIDTH. IF SIDEWALK IS INSTALLED AT A WIDTH LESS THAN 5' THEN 5' WIDE PASSING ZONES MUST BE PROVIDED PER ADA REQUIREMENTS.
9. 8% MAX. CHANGE IN GRADE BETWEEN ROAD SURFACE AND DRIVEWAY.

**RESIDENTIAL SIDEWALK AND  
DRIVEWAY APRON PLAN**

NO SCALE

<b>REVISIONS</b> 1 APRIL 2014 2 APRIL 2021 3 AUGUST 2022 4 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
	ROADWAY CONSTRUCTION <b>RESIDENTIAL SIDEWALK AND DRIVEWAY APRON</b>	
	<b>THE PIDCOCK COMPANY</b> CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING	
	DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-R-3</b>

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\Bethlehem Township\Working Documents - Details\BTWP Construction Details\BTWP-R-04.dwg Last Modified: Jan 12, 2023 - 11:55am



**ELEVATION  
(AT CURB DEPRESSION)**

\* 24'-0" MAX. IN STREETSCAPE ENHANCEMENT OVERLAY DISTRICT

**NOTES:**

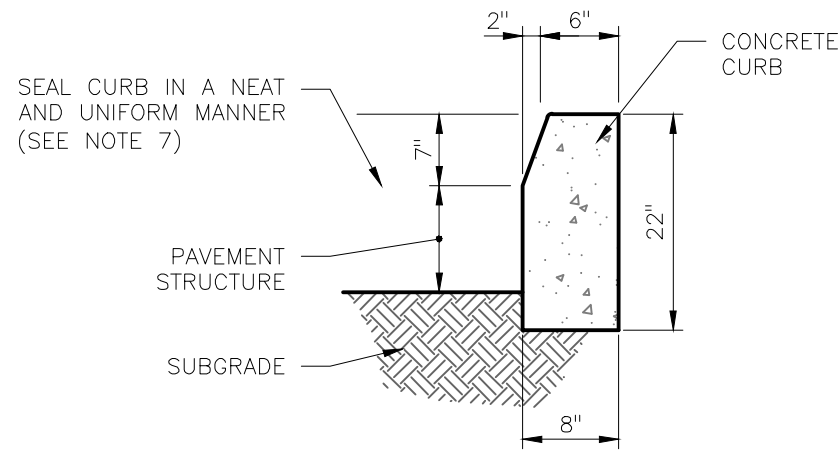
1. REFER TO CURRENT EDITION OF PENNDOT PUB #72M AND RC-67M FOR ADDITIONAL REQUIREMENTS.
2. SUBBASE SHALL BE PENNDOT NO. 2A STONE MECHANICALLY COMPACTED ON A PREPARED SUBGRADE.
3. CONCRETE DRIVEWAY APRONS SHALL BE INSTALLED WHERE CONCRETE CURB DEPRESSIONS HAVE BEEN INSTALLED.
4. NON-RESIDENTIAL DRIVEWAY APRON SHALL BE REINFORCED WITH A MINIMUM 6x6-W4.0xW4.0 WELDED WIRE REINFORCING. TERMINATE REINFORCING AT EXPANSION JOINTS.
5. PROVIDE DRIVEWAY APRONS AT ACCESS POINTS TO ALL TOWNSHIP UTILITY EASEMENTS UNLESS DIRECTED OTHERWISE BY THE TOWNSHIP.
6. THE EDGE OF A DRIVEWAY SHALL BE NO CLOSER THAN 8 FEET FROM THE CENTERLINE OF AN INLET.
7. THE BACK OF DRIVEWAY APRON ELEVATION SHALL BE CONSISTENT WITH THE BACK ELEVATION OF EACH ABUTTING SIDEWALK. LOWERING THE BACK OF APRON ELEVATION BELOW THE ABUTTING SIDEWALK ELEVATIONS REQUIRE A REVISED PLAN SUBMISSION FROM THE DESIGN ENGINEER TO THE TOWNSHIP FOR APPROVAL.
8. CONCRETE SHALL BE PENNDOT CLASS AA.
9. THE REINFORCING STEEL AND SUBBASE AND CONCRETE THICKNESSES PROVIDED ARE MINIMUM REQUIREMENTS. THE DESIGN ENGINEER SHALL SPECIFY REVISIONS AS NEEDED BASED ON LOADING/USE REQUIREMENTS.
10. SIDEWALK SHALL BE INSTALLED AT A STANDARD 5' WIDTH. IF SIDEWALK IS INSTALLED AT A WIDTH LESS THAN 5' THEN 5' WIDE PASSING ZONES MUST BE PROVIDED PER ADA REQUIREMENTS.
11. 8% MAX. CHANGE IN GRADE BETWEEN ROAD SURFACE AND DRIVEWAY.

**NON-RESIDENTIAL SIDEWALK AND DRIVEWAY APRON PLAN**

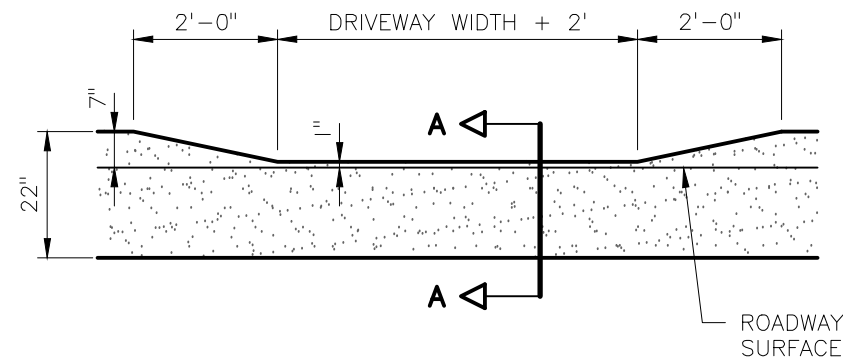
NO SCALE

<b>REVISIONS</b> 1 APRIL 2014 2 APRIL 2021 3 AUGUST 2022 4 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
	ROADWAY CONSTRUCTION <b>NON-RESIDENTIAL SIDEWALK AND DRIVEWAY APRON</b>	
	<b>THE PIDCOCK COMPANY</b> CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING	
	DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE	<b>BTWP-R-4</b>

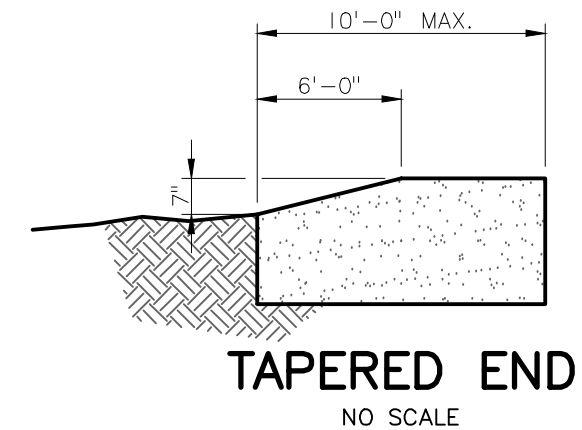
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**TYPICAL CURB**  
NO SCALE



**SECTION A-A  
DEPRESSED CURB**  
NO SCALE



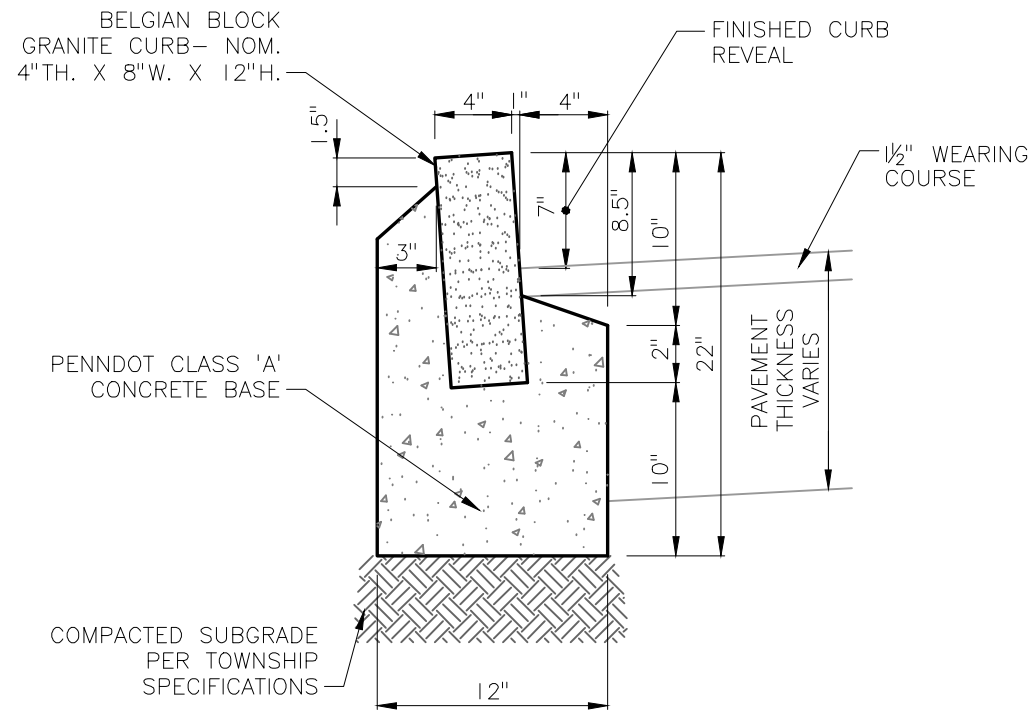
**TAPERED END**  
NO SCALE

**NOTES:**

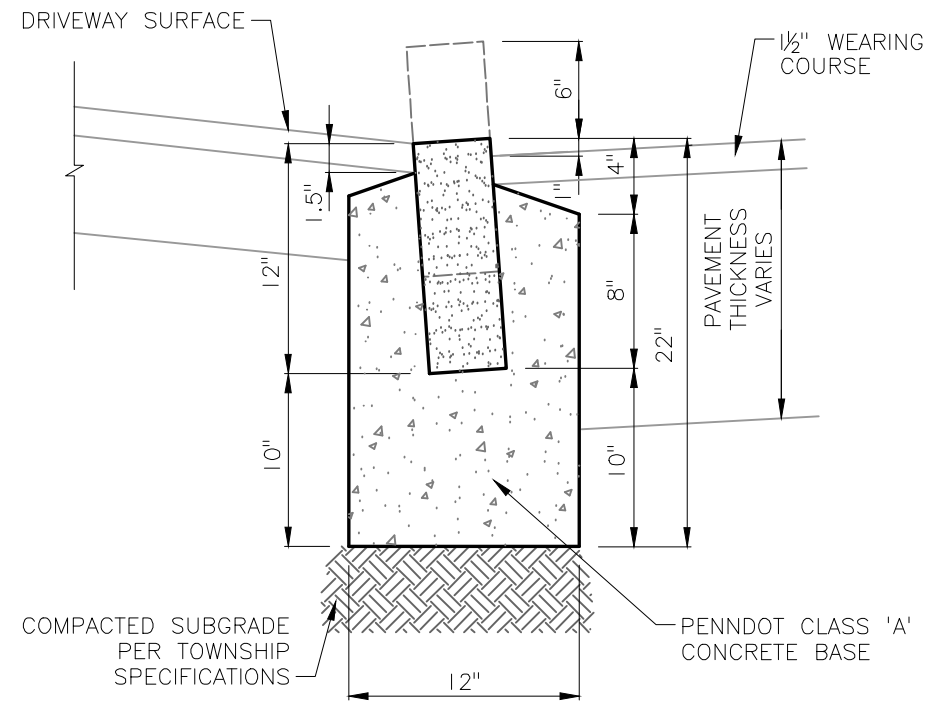
1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PENNDOT SPECIFICATIONS, PUBLICATION 408, CURRENT EDITION, SECTION 630.
2. EXISTING CURB REMOVAL SHALL BE IN COMPLETE SECTIONS (JOINT TO JOINT), NOT PARTIAL SECTIONS.
3. SPACE CONTRACTION JOINTS IN UNIFORM LENGTHS OR SECTIONS, 10'-0" MAX. TO 4'-0" MIN.
4. PLACE 1/2 INCH ASPHALT PREMOLDED EXPANSION JOINT FILLER MATERIAL AT STRUCTURES AND AT THE END OF THE WORK DAY. CUT MATERIAL TO CONFORM TO AREA ADJACENT TO CURB OR TO CONFORM TO CROSS SECTIONAL AREA OF CURB.
5. EXPANSION JOINTS SHALL BE SPACED AS REQUIRED BY THE TOWNSHIP - TYPICALLY 30' O.C.
6. EXISTING FULL HEIGHT CURB CANNOT BE MODIFIED INTO DEPRESSED CURB.
7. USE CRAFCO BRAND POLYFLEX TYPE 2 RUBBERIZED SEALANT.

REVISIONS 1 APRIL 2021 2 AUGUST 2022 3 JANUARY 2023	BETHLEHEM TOWNSHIP <b>STANDARD CONSTRUCTION DETAILS</b> NORTHAMPTON COUNTY, PENNSYLVANIA	
	ROADWAY CONSTRUCTION <b>CONCRETE CURB</b>	
	THE PIDCOCK COMPANY CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA	
		DATE: MARCH 2008 CHKD BY: RJG SCALE: NO SCALE
		<b>BTWP-R-5</b>

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\BETHLEHEM TOWNSHIP\BTWP-WORKING DOCUMENTS - Details\BTWP CONSTRUCTION DETAILS\BTWP-R-06.dwg Last Modified: Jan 12, 2023 - 11:57am



**TYPICAL BELGIAN BLOCK GRANITE CURB**



**TYPICAL BELGIAN BLOCK GRANITE CURB AT DRIVEWAY APRON**

**NOTES:**

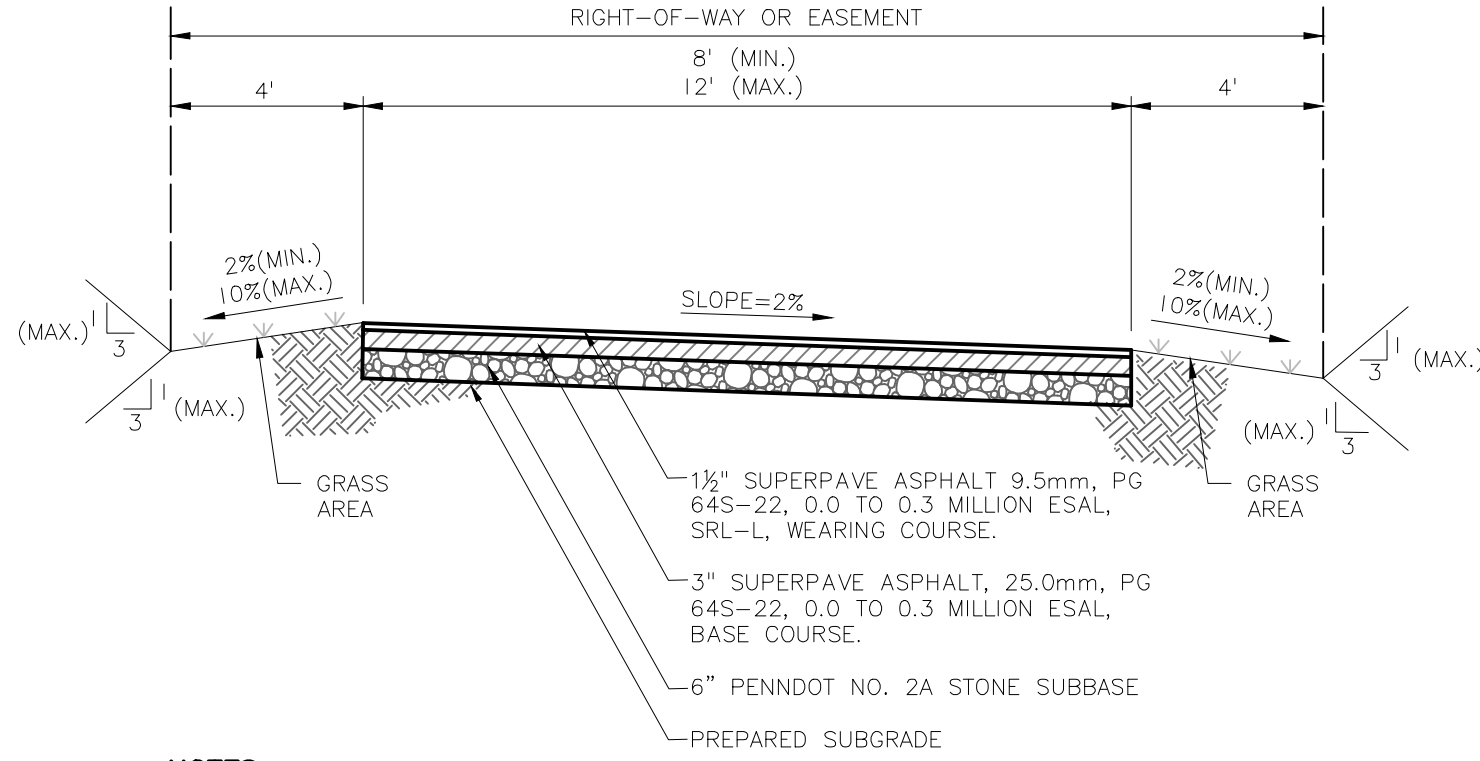
1. 1:1 CEMENT-SAND MORTAR JOINTS SHALL NOT BE MORE THAN  $\frac{3}{8}$ " WIDE.
2. TRANSVERSE JOINTS  $\frac{1}{2}$ " WIDE SHALL BE INSTALLED IN THE CURB A MAXIMUM OF 60' APART, AND ON BOTH SIDES AT ALL INLETS, AND SHALL BE FILLED WITH PREFORMED ASPHALT-IMPREGNATED FIBER JOINT FILLER RECESSED  $\frac{1}{4}$ " IN FROM FRONT FACE AND TOP OF CURB.

**BELGIAN BLOCK GRANITE CURB**

NO SCALE

<p>REVISIONS</p> <p>1 APRIL 2021</p> <p>2 AUGUST 2022</p> <p>3 JANUARY 2023</p>		<p>BETHLEHEM TOWNSHIP</p> <p><b>STANDARD CONSTRUCTION DETAILS</b></p> <p>NORTHAMPTON COUNTY, PENNSYLVANIA</p> <p>ROADWAY CONSTRUCTION</p> <p><b>BELGIAN BLOCK GRANITE CURB</b></p>	
<p>THE PIDCOCK COMPANY</p> <p>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</p> <p>OXFORD DRIVE AT FISH HATCHERY ROAD ALLEN TOWN, PENNSYLVANIA</p>		<p>DATE: MARCH 2008</p> <p>CHKD BY: RJG</p> <p>SCALE: NO SCALE</p> <p><b>BTWP-R-6</b></p>	

Drawing name: S:\Municipalities\Municipal Standard Construction Documents\BETHLEHEM TOWNSHIP\WORKING DOCUMENTS - Details\BTWP-RECREATION DETAILS\BTWP-REC-01.dwg Last Modified: Jan 12, 2023 - 11:52am

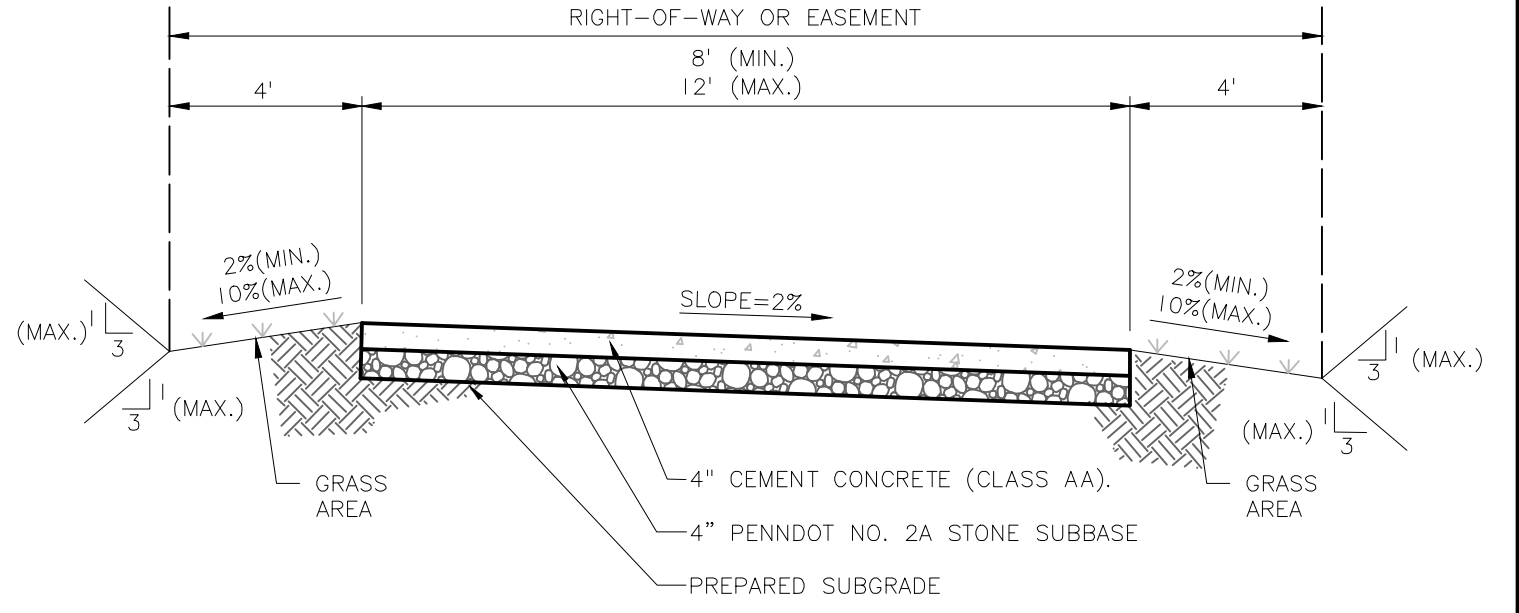


**NOTES:**

1. THE TOWNSHIP SHALL DETERMINE WHETHER AN ASPHALT OR CONCRETE PATH IS TO BE CONSTRUCTED.
2. REFER TO CURRENT EDITION OF AASHTO GUIDE FOR THE PLANNING, DESIGN, AND OPERATION OF BICYCLE FACILITIES FOR ADDITIONAL REQUIREMENTS.
3. RECREATION PATH MAY BE REQUIRED TO BE ILLUMINATED TO TOWNSHIP STANDARDS.
4. RECREATION PATH SHALL HAVE A CROSS SLOPE OF TWO (2) PERCENT AND A MAXIMUM LONGITUDINAL SLOPE OF FIVE (5) PERCENT.
5. A TURFED AREA SHALL BE MAINTAINED 4 FEET ON EACH SIDE OF THE PAVED RECREATION PATH.
6. GUIDE RAIL OR OTHER SUITABLE PROTECTIVE BARRIER SHALL BE INSTALLED AT THE EDGE OF RIGHT-OF-WAY OR EASEMENT AS DETERMINED BY THE TOWNSHIP.

## ASPHALT RECREATION PATH CROSS SECTION

NO SCALE



**NOTES:**

1. CONCRETE SHALL BE PENNDOT CLASS AA.
2. PROVIDE LIGHT BROOM FINISH PERPENDICULAR TO THE DIRECTION OF TRAVEL.
3. PROVIDE JOINTS AT SPACING EQUAL TO RECREATION PATH WIDTH.
4. PROVIDE AN EXPANSION JOINT AT EVERY THIRD JOINT.
5. ALL JOINTS SHALL BE MADE IN A FLUSH MANNER USING REMOVABLE "ZIP STRIPS".

## ALTERNATE CONCRETE RECREATION PATH CROSS SECTION

NO SCALE

<p><b>REVISIONS</b></p> <p>1 APRIL 2014</p> <p>2 APRIL 2021</p> <p>3 AUGUST 2022</p> <p>4 JANUARY 2023</p>	<p>BETHLEHEM TOWNSHIP</p> <p><b>STANDARD CONSTRUCTION DETAILS</b></p> <p>NORTHAMPTON COUNTY, PENNSYLVANIA</p> <hr/> <p>RECREATIONAL FACILITIES</p> <p><b>RECREATION PATH</b></p> <hr/> <p>THE PIDCOCK COMPANY</p> <p>CIVIL ENGINEERING AND LAND PLANNING ARCHITECTURE LAND SURVEYING</p> <p style="font-size: small;">OXFORD DRIVE AT FISH HATCHERY ROAD ALLENTOWN, PENNSYLVANIA</p>
	<p>DATE: MARCH 2008</p> <p>CHKD BY: RJG</p> <p>SCALE: NO SCALE</p>
	<p>BTWP-REC-1</p>