TOWN OF CHESHIRE

GUIDELINES AND SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

DEPARTMENT OF PUBLIC WORKS & ENGINEERING

84 SOUTH MAIN STREET

CHESHIRE, CONNECTICUT 06410

TOWN OF CHESHIRE

GUIDELINES AND SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

PREPARED BY THE TOWN ENGINEER

JULY 7, 2023

ADOPTED BY PLANNING & ZONING

OCTOBER 23, 2023

APPROVED BY TOWN COUNCIL

DECEMBER 12, 2023

REPRINTS & AMENDMENTS

DATE	DESCRIPTION
August 7, 1973	Original Release
April 18, 2000	Update and Reprint
April 15, 2002	Specification Change for Concrete Walks, Aprons and Ramps
July 7, 2023	Format Change and Update

PREFACE

The Town of Cheshire's Department of Public Works and Engineering is dedicated to helping ensure that all construction within the Town is performed to high engineering standards and provides safe and practical solutions for the public.

The Standards contained herein were developed to help achieve these objectives, and also to provide consistency for construction performed within the Town of Cheshire. The requirements of these standards shall be adhered to on all public construction projects.

All prior specifications for construction in the Town of Cheshire are hereby superseded.

Copies of this document are available in the Department of Public Works and Engineering Office and may be downloaded from the Town's website. https://www.cheshirect.org/

It shall be the sole responsibility of any Engineer, Developer, Contractor, Applicant, or Property Owner involved in designing or building any public improvements within the Town of Cheshire to obtain a copy of these specifications and to familiarize themselves with its entire contents, and adhere to these Specifications.

The standard drawings attached are only a part of the entire specifications and are included solely as a convenience to interested parties.

Any conflicts between these standards and any other statute, ordinance, regulation, standard, or policy shall be brought to the immediate attention of the Director of Engineering ("Town Engineer") for resolution.

Persons using this document are urged to contact the Engineering Division of the Public Works Department regarding any questions they may have on its application or interpretation. It is highly recommended that such communications be made early in the planning and design stages.

Marek L. Kement, P.E.,L.S.
Town of Cheshire
Director of Engineering

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AUTHORITY AND INTENT

A. AUTHORITY

In accordance with the provisions of Chapter 99 of the Connecticut General Statutes, as amended, the Town of Cheshire hereby adopts and enacts these General Requirements and Specifications as the Design Standard Construction Specifications for the Town of Cheshire.

B. INTENT

It is the intent of these Design Requirements and Specifications to prescribe minimum requirements consistent with nationally accepted good practice necessary to control the quality of public improvements in order to insure that they perform satisfactorily and serve the needs of the Town of Cheshire. Conformance to the General Requirements and Specifications will assure quality construction, which will be uniform, durable, safe, aesthetic and which will minimize maintenance costs. This will provide public facilities which have a long service life and which will insure the comfort, convenience, safety, health and general welfare of the citizens of Cheshire.

It is recognized that no single standard specification will cover satisfactorily all variations in local conditions. Therefore, for special conditions, the provisions of these General Requirements and Specifications shall govern so far as they are applicable. The Town Engineer shall be the sole interpreter of the requirements of these General Requirements and Specifications and shall be the one to determine the amount, quality, type, acceptability and fitness of all work, procedures, materials and equipment required to meet the intent of the General Requirements and Specifications. The Town Engineer's interpretation thereof shall be final, conclusive and binding.

All requirements indicated on the plans or within this document or other contractual provisions shall be equally binding on the Contractor, unless there is a conflict between or among any of those requirements. In the case of such a conflict, the order of governance among those requirements, in order of descending authority, shall be as follows:

1) Applicable laws, codes, and governmental regulations.
2) Environmental permits.
3) Additional instructions and/or supplemental drawings, issued or approved (in writing) by the Town Engineer after the start of a project.
4) Project specific Technical Specifications and Special Provisions as issued or approved (in writing) by the Town Engineer.
5) Project specific Contract Drawings issued or approved (in writing) by the Town Engineer.
6) These *Guidelines and Specifications for Public Improvements.*

ARTICLE II

DEFINITIONS AND ABBREVIATIONS

A. DEFINITIONS

Whenever in these Specifications or other Contract Documents, the following terms, phrases, words or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

Aggregate: Inert material such as sand, stone sand, gravel, broken stone, crushed stone, slag, or combination thereof.

Bank Run Gravel: Gravel found in natural deposits usually more or less intermixed with fine material such as sand or clay or combinations thereof.

Calendar Day: Every day shown on the calendar, including Sundays and holidays.

Channel: A channel shall be interpreted to mean a natural or artificial water course having an average width at the bottom after excavation of three feet (3') or more.

Consulting Engineer: A professional engineer registered and licensed in the State of Connecticut to provide engineering services and qualified in the appropriate discipline that is hired by the Developer to provide design and construction services.

Contractor: The terms "Contractor" shall be interpreted to mean the site developer of record or his authorized agent or agents.

Crushed Gravel: A manufactured product resulting from the deliberate mechanical crushing of gravel with at least fifty percent (50%) of the gravel retained on the No. 4 sieve having at least one (1) fractured face.

Department: Cheshire Department of Public Works and Engineering.

Developer: Any person, firm or corporation who shall apply to the Cheshire Planning and Zoning Commission for approval of a subdivision, as hereinafter defined, either for himself or as an agent for others.

Director: Cheshire Director of Public Works and Engineering, acting directly or through his duly authorized representative.

Drainage Ditch: A drainage ditch shall be interpreted to mean an unpaved, artificially constructed open depression having an average width of less than three feet (3') at the bottom, after excavation, constructed for the purpose of carrying off surface water.

Driveway: The vehicle path from the streetline to the garage door or designated parking area.

Engineer: Cheshire Town Engineer, acting directly or through a representative duly authorized.

Entity: Including one or more individual, corporation, firm, partnership, association, proprietorship, organization, trust, or other body recognized by law, and including any agent representing the same.

Form 818: The State of Connecticut Department of Transportation "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction Form 818, 2020" together with all supplements thereto issued by CTDOT.

Gravel: The coarse granular material larger than sand resulting from the natural erosion of rock.

Gutter: A gutter shall be interpreted to mean a paved, artificially constructed open depression contiguous to the roadbed, constructed for the purpose of carrying off surface water.

Inspector: An authorized representative of the Engineer, assigned to make any and all necessary inspections of the work performed and materials furnished by the Contractor.

Laboratory: A certified testing laboratory approved by the Engineer.

Lane: A strip of traveled way intended to accommodate the forward movement of a single line of vehicles.

Paved Ditch Leak-off: A paved ditch or paved leak-off shall be interpreted to mean a paved, open depression not contiguous to the roadbed, constructed for the purpose of carrying off surface water.

Pavement Structure: The combination of subbase, base course and surface course placed on subgrade to support the traffic load and distribute it to the roadbed.

Permit: A street excavation permit issued in accordance with the applicable Ordinance(s) of the Town of Cheshire.

Permittee: The entity to whom a subject Permit has been duly issued, including any officers, employees, subcontractors, representatives, or agents who act, fail to act, omit, or make representations on behalf of said legal entity in any manner with respect to any subject Permit.

Performance Bond: The approved form of security furnished by the Developer and his surety as guarantee of good faith on the part of the Developer to execute the work in accordance with the terms of the Contract.

Plans: All drawings, or reproductions of drawings, pertaining to the construction or details of the work contemplated and its appurtenances.

Regulated Activities: Excavation or other construction activities or work, and including activities incidental or appurtenant to the same, within the public right-of-way(s) of the Town of Cheshire.

Roadbed: The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

Sand: The fine granular material, usually smaller than gravel but coarser than silt, resulting from the natural erosion of rock or from the mechanical reduction of stone.

Screened Gravel: Bank or crushed gravel which has been mechanically screened.

Shoulder: The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles for emergency use, and for lateral support of base and surface courses.

State: State of Connecticut

Street: The whole right-of-way which is reserved for or secured by the Town of Cheshire for use in constructing the roadway and its appurtenances.

Street Line: The property line which defines the limit of the Town right-of- way.

Structures: Bridges, culverts, catch basins, drop inlets retaining walls, manholes, headwall, buildings, sewers, service pipes, underdrains, foundation drains and other features which may be encountered in the work and not otherwise classified herein.

Subbase: Specified or selected materials placed upon the bottom of cuts or upon embankments, the top surface of which supports components of pavements, shoulder and related appurtenances.

Subcontractor: Any individual, firm, partnership or corporation to whom the Developer sublets or assigns any part or parts of the project with the approval of the Director or his duly authorized representative.

Subdivision: The division of a tract or parcel of land into three (3) or more parts or lots for the purpose, whether immediate or future, of sale or building development, including resubdivision as approved by the Cheshire Planning & Zoning Commission.

Subgrade: The top surface of a roadbed upon which the pavement structure and shoulders are constructed.

Supplemental Specifications: Additions and revisions to the Standard Specifications.

Surety: The corporate body which is bound with and for the Developer, which is primarily liable to the Town of Cheshire, and which engages to be responsible for the Developer for his payment of all debts covering all materials and labor used or employed in the execution of work, and for his acceptable performance of the work.

Ton: Two thousand pounds (2,000 lbs).

Town: Town of Cheshire.

Town Engineer: Cheshire Town Engineer, acting directly or through a representative duly authorized.

Town Standards: "Town of Cheshire Guidelines and Specifications for Public Improvements" as amended to date.

Traffic: Pedestrian, vehicles & other conveyances, and domestic animals, ridden or herded, using the highway for purposes of travel.

Traveled Way: That portion of the roadbed especially prepared for the use of vehicular traffic, excluding surfaced shoulders, gutters and medians.

Trench: An excavation, later refilled, necessary to the installation or removal of pipes, drains, tanks, catch basins, manholes, etc.

B. ABBREVIATIONS

Whenever the following abbreviations are used, the intent and meaning shall be interpreted as follows:

AASHO, ASTM, AWS -	Whenever reference is made to AASHO, ASTM, or AWS in the Contract, it refers by number, letter or both, to the latest standard or Tentative standard of the American Association of State Highway Officials, American Society of Testing Materials, or American Welding Society respectively as to material specification or methods of testing, whichever may be the case.
AASHTO -	American Association of State Highway and Transportation Officials (New Designation of AASHO).
ACI -	American Concrete Institute.
AISC -	American Institute of Steel Construction.
AISI -	American Iron and Steel Institute.
ANSI -	American National Standards Institute.
AWWA-	American Water Works Association.
CRSI -	Concrete Reinforcement Steel Institute.
CTDOT -	State of Connecticut Department of Transportation
DEEP -	Department of Energy and Environmental Protection
EPA -	Environmental Protection Agency.
FHWA -	Federal Highway Administration.
MUTCD -	Manual on Uniform Traffic Control Devices.
NEMA -	National Electrical Manufacturers Association.
OSHA-	Occupations Safety and Health Administration.
PCA -	Portland Cement Association.
PCI -	Pre-stressed Concrete Institute.
UL -	Underwriters' Laboratories, Inc.

ARTICLE III

CONTACT INFORMATION AND REFERENCES

A. CONTACT INFORMATION:

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
84 SOUTH MAIN STREET
CHESHIRE, CT 06410
(203) 271-6650

PLANNING AND DEVELOPMENT
84 SOUTH MAIN STREET
CHESHIRE, CT 06410
(203) 271-6670

BUILDING OFFICIAL
84 SOUTH MAIN STREET
CHESHIRE, CT 06410
(203) 271-6640

WATER POLLUTION CONTROL AUTHORITY
1325 CHESHIRE STREET
CHESHIRE, CT 06410
(203) 272-9105

CHESHIRE FIRE DEPARTMENT
250 MAPLE AVENUE
CHESHIRE, CT 06410
(203) 272-1828

CHESHIRE POLICE DEPARTMENT
500 HIGHLAND AVENUE
CHESHIRE, CT 06410
(203) 271-5500

REGIONAL WATER DEPARTMENT
90 SARGENT DRIVE
NEW HAVEN, CT 06511
(203) 562-4020

CHESPROCOTT HEALTH DEPARTMENT
1247 HIGHLAND AVENUE
CHESHIRE, CT 06410
(203) 272-2761
http://www.chesprocott.org

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION (DISTRICT I)
BUREAU OF HIGHWAY OPERATIONS AND MAINTENANCE
1107 CROMWELL AVENUE
ROCKY HILL, CT 06067
(860) 258-4544

STATE OF CONNECTICUT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106
(860) 424-3000

EVERSOURCE ENERGY (ELECTRIC)
107 SELDEN STREET
BERLIN, CT 06037
(203) 352-5412
(800) 286-2000 (EMERGENCY)

EVERSOURCE ENERGY (GAS)
107 SELDEN STREET
BERLIN, CT 06037
(203) 596-3071
(877) 944-5325 (EMERGENCY)

CALL BEFORE YOU DIG (CBYD)
(800) 922-4455 or 811
https://www.cbyd.com

B. REFERENCE PUBLICATIONS

The following listed publications are hereby included in these "Guidelines and Specifications for Public Improvements" as reference specifications and standards:

- **Geometric Design:** Current edition of *"A Policy on Geometric Design of Highways and Streets*" (a.k.a. AASHTO Green Book) together with all supplements, addenda, and corrections issued thereto;

- **Geometric Design:** Current edition of "*Highway Design Manual*", as issued by The State of Connecticut Department of Transportation (CTDOT), as amended, including any and all supplements, addenda, and corrections issued thereto;

- **CTDOT Standard Specifications:** The State of Connecticut Department of Transportation (CTDOT) current version of *"The Standard Specifications for Roads, Bridges, Facilities and Incidental Construction", Form 818, 2020 as amended,* together with all supplements thereto;

- **E&S Control:** "*2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control*", as issued by the Connecticut Council on Soil and Water Conservation in cooperation with the Connecticut Department of Environmental Protection, DEP Bulletin 34, as amended, including any and all supplements, addenda, and corrections issued thereto;

- **Traffic:** Current edition of the "*Manual on Uniform Traffic Control Devices for Streets and Highways"*, as published by the U.S. Department of Transportation Federal Highway Administration, including any and all supplements, addenda, and corrections issued thereto;

- **Drainage:** "*2004 Connecticut Stormwater Quality Manual*", as issued by the Connecticut Department of Environmental Protection, as amended, including any and all supplements, addenda, and corrections issued thereto;

- **Town of Cheshire Zoning Regulations;**

- **Town of Cheshire Subdivision and Other Land Use Regulations;**

- **Town of Cheshire Inland Wetlands and Watercourses Regulations;**

- **Town of Cheshire Sanitary Sewer Regulations;** and

- **Town of Cheshire "Code of Ordinances".**

ARTICLE IV

PERMIT APPLICATION POLICIES

In order to do any work within the Town of Cheshire right-of-way (i.e. connecting a driveway to the street, crossing a town sidewalk with a driveway, or any excavation in the right-of-way) one must first obtain a *Street Excavation Permit* with the Town of Cheshire Engineering Department.

A. PERMIT APPLICATION

Obtaining a Street Excavation Permit requires: (1) Completion of an application; (2) Payment of an application fee; (3) Obtaining a Call-Before-You-Dig (CBYD) number; (4) Meeting the performance bond requirements; and (5) Providing proper insurance coverage. See Appendix for reference. Current permit application and related information can be obtained from the Public Works Department or are available at the Town's website. https://www.cheshirect.org/

Incomplete permit applications will not be accepted. Permit application fees shall be submitted with the permit application and are non-refundable regardless of issuance. A permit application along with fee does not guarantee that a permit will be issued. Permit applications will not be accepted from any entity in default as a result of non-payment of permit fees or failure to address issues from previous permits.

B. PERFORMANCE BOND

Each Permittee, as a license requirement, shall obtain and deliver to the Town, and for the benefit of the Town, a surety bond, of not less than three thousand dollars ($3,000.00), or as amended, guaranteeing the performance of the Permittee with respect to Regulated Activities.

Per C.G.S. 8-3, to satisfy any financial guarantee requirement of the PZC, the commission may accept surety bonds and shall accept cash bonds, passbook or statement savings accounts and other financial guarantees other than surety bonds including, but not limited to, letters of credit, provided such other financial guarantee is in a form acceptable to the commission and the financial institution or other entity issuing any letter of credit is acceptable to the commission. Bonds shall be kept in force for the duration of any subject license.

In the event that the Town determines that the outstanding amount of any such Performance Bond is insufficient to fund the completion of any outstanding items of work, the Town may require the permittee to provide additional security sufficient to fund completion of the work.

If the Town at any time determines that any security which has been provided is insufficient, or if the Permittee fails to provide additional sufficient security, or if the Permittee fails to complete to the Town's satisfaction any necessary items of work not adequately covered by such security, the Town may withhold the issuance of any certificates of occupancy or of ay permits or may seek any other legal remedies to enforce the completion of such work.

Bonds shall be released to the Permittee upon final acceptance of the work and shall be warranted for a period of not less than two (2) years from the date of permanent restoration.

C. INSURANCE COVERAGE

Each Permittee shall provide, pay for, and maintain in full force and effect acceptable evidence of insurance coverage, at not less than the prescribed minimum limits of liability herein. All insurance will be provided through companies authorized to do business in the State of Connecticut and considered acceptable by the Town.

Such coverage is to remain in force during the life of the permit and for such additional time as may be required, and will cover the permittee's activities, those of any and all subcontractors, sub-consultants or anyone directly or indirectly employed by any of them.

The Permittee shall give the Town a certificate of insurance completed by a duly authorized representative of their insurer certifying that at least the minimum coverages required here are in effect and specifying that the liability coverages are written on an occurrence form and that the coverages will not be canceled, non-renewed, or materially changed by endorsement or through issuance of other policies of insurance without sixty (60) days advance written notice to the Public Works Department.

The Permittee will cause each subcontractor employed by the Permittee to purchase and maintain insurance of the types specified below. When requested by the Town, the Permittee shall furnish copies of certificate of insurances evidencing coverage for each subcontractor.

Failure of the Town to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the Town to identify a deficiency from evidence provided will not be construed as a waiver of the Permittee's obligation to maintain such insurance. The original certificate of insurance form shall be on file in the Public Works Department.

The Permittee shall indemnify and hold harmless the Town, its officers and employees from any and all liability, claims, damages, losses and expenses, arising out of or resulting from the performance of the work and/or the supplying of materials.

Public liability insurance coverage shall be not less than five hundred thousand dollars ($500,000.00) liability for one (1) person, five hundred thousand dollars ($500,000.00) liability for one (1) accident and five hundred thousand dollars ($500,000.00) for property damage.

D. PERMIT FEES

The permit fee for a *Street Excavation Permit* shall be:

1. For minor work (lateral connections & driveway aprons) within the Town right-of-way, a fee of seventy-five dollars ($75.00) for each excavation site shall be required.

2. For work associated with sidewalk installations and trench excavations up to 100 square feet in size within the Town right-of-way, a fee of seventy-five dollars ($75.00) for each excavation site shall be required.

3. For all other work in excess of 100 square feet, a base fee of seventy-five dollars ($75.00) plus seventy-five dollars ($75.00) for each additional 400 square feet of disturbance shall be required.

This fee shall reimburse the Town of Cheshire for the direct cost of inspection services and administration of these regulations.

A surcharge fee of fifty dollars ($50.00) per day shall be required in addition to all applicable permit fees noted above for any person or company found to be performing work within the public right-of-way without having first obtained the required permit(s). Each day of such violation shall be deemed a separate offense.

The permit fee shall be in the form of Cash or Check made payable to the Town of Cheshire.

The Director of Public Works or the Director of Engineering may waive all permit fees to Permittees performing work under contract with the Town of Cheshire.

E. PERMIT DISPLAY

A copy of the valid issued permit must be available when and where work is being conducted, and the same produced for inspection upon the request of representatives of law enforcement, the Town of Cheshire, other regulating agencies, or other interested persons.

F. EMERGENCY WORK

Where an emergency situation exists, and as dictated thereby, work may be performed by a licensed entity prior to obtaining a permit provided that the entity undertaking the regulated activities, within five (5) days of the commencement of the subject emergency work, file an application with the Town.

When traffic conditions, the safety or convenience of the traveling public or the public interest require that the excavation work be performed as “emergency work”, the Director of Public Works or the Director of Engineering shall have the full power to order that a working crew and adequate facilities be employed by the Permittee up to twenty-four (24) hours a day so that work may be completed as soon as possible.

The entity engaged in performing the emergency action shall notify the Town Engineer at the start of the work. The Police Department should be notified for construction activities performed after normal working hours, weekends, or holidays.

G. REVOKING A PERMIT

Permits issued by the Town of Cheshire may be revoked at any time when work does not comply with regulations, laws, ordinances, or creates a public nuisance. The permit is revocable upon written notification to the Permittee.

Failure of the permittee to comply with the above regulations will make the applicant subject to the suspension of any further permits in the Town of Cheshire. If the completed work is unsatisfactory to the Town Engineer, the contractor shall be notified allowing five (5) days to correct such work. If the work is not repaired, the Town of Cheshire will make the necessary repairs and will bill the contractor for the cost of the same.

H. FAILURE TO OBTAIN A PERMIT

Any person or company found to be conducting any excavation activity within the public right-of-way without having first obtained the required permit(s) shall immediately cease all activity and be required to obtain a permit before work may be restarted.

A surcharge fee of fifty dollars ($50.00) per day shall be required in addition to all applicable permit fees noted above for any person or company found to be performing work within the public right-of-way without having first obtained the required permit(s). Each day of such violation shall be deemed a separate offense.

I. VIOLATIONS

Any person violating the terms of any of the ordinances or statutes or regulations covering the issuance of permits and the work to be performed thereunder may be subject to fines in addition to all costs due to damages by each violation.

Any Permittee or entity who continues to violate any section of these regulations and fails to correct any violations in a timely manner shall receive no further permits until such time as the Town of Cheshire is satisfied that all violations have been corrected in compliance with the terms of this document. The Town of Cheshire reserves the right to notify a permittee's insurance and/or bond carrier of any violations of the permittee.

ARTICLE V

PLAN REVIEW PROCEDURES

Site Development or Construction plans are required to be submitted to the Town for approval for all industrial, commercial, and residential developments, including work within the public right-of-way. Plan approvals must be granted by the Town of Cheshire prior to any construction activities taking place on that site.

A. CONSULTATION WITH TOWN STAFF

Consultation with Town Staff is recommended before any detailed plans are developed to avoid costly design changes. Town Staff may be aware of other public or private development projects that could have an effect on the proposed project, and may also be able to suggest alternative methods or designs that have proven successful within the Town in the past and are more likely to be accepted.

In addition, submission of plans to the Town for review is likely to proceed more efficiently when Town Staff has already had the opportunity to discuss the project with the Developer and consider the project implications.

B. TOWN REGULATORY AGENCIES

The majority of site development plans are reviewed by the Engineering Department and the Office of Planning and Development as part of the submission of an application to the Planning & Zoning Commission or the Inland Wetlands and Watercourses Commission.

The specific requirements for site development plans and construction plans can be found in the Town of Cheshire's Zoning Regulations, Subdivision Regulations, and within this document. Questions on these plan requirements should be directed to the Engineering Department or the Office of Planning and Development.

C. SITE DEVELOPMENT & CONSTRUCTION PLANS

Construction plans shall be prepared in accordance with this document and shall receive the approval of the Town Engineer, before beginning any construction. Plans that do not contain the minimum required information may not be considered for review.

Information shall be presented to a level of scope, detail, accuracy, and completeness as is appropriate and/or necessary to meet all applicable regulations, standards, specifications, and requirements and sound professional and industry standard practices.

Materials such as topography, GIS data, and any other information made available by the Town of Cheshire for public use shall be used in a proper and appropriate manner. The Town does not warrant the suitability of any resources in its possession for any use, and it is up the licensed professional to determine if the resources available are appropriate for the proposed use.

While this information may be utilized for general grading purposes at the designer's own risk, critical areas such as road intersections, drainage outfalls, where proposed grades are to meet adjoining properties, flat or low-lying other areas, or where the ground cover areas where the source data for contours are likely to have been obscured by evergreen vegetation will require the provision of field topography by a licensed land surveyor to ensure that proper grading is achieved.

In no case shall the limitations or inherent inaccuracies of the data result in any liability upon the Town of Cheshire, should the design be faulty. The Town of Cheshire disclaims any responsibility for the use of this general information.

These policies represent a minimum standard, and, as such, the Town may require additional information as deemed appropriate. Plan sets submitted shall, at a minimum, include:

- ***Title Sheet*** (cover page) which includes the project name, address, location map, applicant and owners information, etc.
- ***Existing Conditions Plan*** showing existing topography, structures, drainage, utilities, tree lines, demolition, wetlands & watercourses, flood limits, buffer limits, easements, lot area, property corner monumentation, etc.
- ***Site Layout Plan*** showing design components with dimensions, proposed parking and drives, curbing, curb radii, sidewalks and ramps, driveway aprons, dumpsters, signage, line striping, zoning data table, zoning classification, setback requirements, etc.
- ***Grading Plan*** showing proposed site grades, surface and subsurface drainage, footing drains, building elevations, benchmark, limits of clearing, test pits, lighting, sight lines, snow storage areas, etc.
- ***Utility Plan*** showing all existing and proposed on-site sewage disposal systems, sanitary sewers, laterals, water lines, hydrants, gas lines, and any other underground utilities.
- ***Landscaping Plan*** showing proposed trees and shrubs, landscaping areas, seed mix design, planting schedule and dates, fences, retaining walls, etc.
- ***Erosion & Sediment Control Plan*** showing location of stockpile areas and all erosion & sediment (E&S) control measures needed.
- ***Centerline Plan & Profile*** of proposed roads, sanitary sewers and storm sewers with grades, stationing, structures, and utilities. Plan to also include typical cross-section(s) of each proposed street showing the width and composition of pavement and the location, width and composition of sidewalks and ramps;
- ***Construction Details &*** **Notes Sheet** showing relative details, construction sequence, project narrative, etc.

D. PLAN REQUIREMENTS

The following requirements are considered minimum. The applicant has the responsibility for furnishing sufficient information in appropriate clarity and detail to allow determination of conformance with the

Town's Ordinances, policies, specifications, and other standards and requirements. In general, plan submittals shall address the following requirements:

SURVEY INFORMATION

All survey information shall be compiled and presented pursuant to the Regulations of Connecticut State Agencies Sections 20-300b-1 through 20-300b-20 and the "Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. on September 26, 1996, as amended.

Site Development Plans, Plot Plans, Construction Plans, or As-Built Plans shall be presented through the use of an "*Improvement Location Survey"*.

The boundary survey shall be prepared to a Horizontal Accuracy Class of A-2; and shall reference the basis of bearings used. Unless otherwise approved, the reference datum shall be Connecticut State Plane NAD83. All plan sheets shall contain a north arrow and graphical scale indicator.

The topographic survey shall be prepared to a Topographical Accuracy Class of T-1, T-2, or T-3, as is appropriate, and shall include the basis of elevations used. Unless otherwise approved, the reference datum shall be NAVD88. Plans using "assumed datum" will not be accepted. A convenient usable benchmark shall be identified on the plans and be made visible in the field.

If referenced plans or "plans by others" are used as part of the design or survey, then said plans shall be certified and be made part of the plan set submittal.

SHEET SIZE & SCALE

All plans submitted shall be neat and easy to read. Small type shall be avoided and notes shall be neat and concise. Notes shall be located near items they refer to and tie lines for notes shall be short and not cross each other wherever possible. Full size plans shall be submitted in bound sets of plain white paper measuring 24 inches by 36 inches (24" x 36").

The drawing scale(s) shall be appropriate to comply with general requirements on the Town's Zoning Regulations and shall be to an industry standard scale factor. The horizontal scale of drawings presenting information relating to any aspect of the construction of or modifications to improvements should not be less than a forty scale (1" = 40'). This requirement is not intended to cover references or detailed sheets to assist in plan interpretation or clarifications.

PERMANENT OR TEMPORARY EASEMENTS

The limits and purpose of any permanent or temporary easements (existing or proposed) affecting the property and public right-of-ways shall be clearly identified. Existing easements shall reference the relevant land record volume and page number(s).

Proposed easements shall be located such that they can be accessed by vehicles from a public or private street and shall be filed on the land records of the Town upon final approval of the regulating body.

Where required, sanitary sewer easements shall be a minimum of 20 feet wide and drainage easements shall be a minimum of 25 feet wide, with the main line pipes centered within the appropriate easement.

STORMWATER MANAGEMENT

Protection of water quality and reducing the discharge of pollutants from the Town's storm sewer system to the maximum extent practical shall be adhered to per the Town of Cheshire's Stormwater Management Plan (SMP). Proposed storm water drainage design, details, and reports shall be prepared in accordance with the CTDEEP 2004 Connecticut Stormwater Quality Manual and to Town Standards.

The Town of Cheshire uses zero net increase in post development runoff for all development projects. It shall be demonstrated in a drainage report that the project can meet the net zero increase requirements for the 10, 25, 50, and 100 year storm events. If there is more than one sub-catchment area exiting the site, this net zero increase requirements shall apply to all individual sub-catchment areas as well as the overall site.

This department encourages the use of Low Impact Development (LID) strategies, environmental structures, and environmentally sensitive designs. Sedimentation chambers are required prior to run-off from private properties entering a Town of Cheshire storm drainage system.

Infiltration designs (i.e. rain gardens, subsurface chambers, etc.) shall include all data and calculations to demonstrate that the system will perform as proposed. Location, logs, and other pertinent information associated with any subsurface geotechnical investigation (i.e. borings, test pit, percolation tests) performed shall be included.

All drainage reports shall include a narrative summary. This summary shall include statements regarding the existing conditions of the site and post development conditions. A chart or table summarizing the pre and post development flows for the 10, 25, 50, and 100 year storm events shall be included.

The report shall be written in a clear and concise manor; shall include information about the method used to evaluate the site drainage; and shall be certified by a Professional Engineer licensed in the State of Connecticut.

This office is interested in seeing the background calculations for the run-off coefficient, times of concentration, etc. and how they were chosen. Initially, pages of computer calculations (print outs) are not required. If these calculations are required by this Department to complete a review, then they will be requested. Reports should include the Design Engineer's conclusions and recommendations where appropriate.

EXISTING CONDITIONS

Existing conditions shall be shown on the plans (i.e. site topography, tree lines, specimen trees, wetlands & watercourses, upland review areas, floodway, storm drainage, above and below ground utilities, structures, impervious areas, fences, retaining walls, signage, etc.).

Existing trees, vegetated buffer, and other existing landscaping features, to remain, including methods, measures, and details for protecting the same during construction, shall be shown.

Existing elevation contour lines at an interval appropriate to the nature of the existing topography shall be provided. Two-foot (2') contours are preferred, but smaller or larger contour intervals may be used if necessary. Spot elevations may also be necessary to accurately depict the existing elevation characteristics of the site.

SITE DEVELOPMENT

Site layout information shall be dimensioned, coordinated, annotated, detailed, and otherwise presented in such a manner that the proposed improvements can be accurately staked or otherwise laid out for construction. Proposed improvements, and their limits, shall be readily distinguishable from existing conditions.

All proposed buildings shall have their footprints adequately dimensioned, and shall show applicable finish floor, foundation wall, garage slab, and basement floor elevations. Footing drains and roof leader drains shall be identified with discharge points shown. Invert elevations of these drains shall also be shown.

All proposed retaining walls shall be identified on the plans and grades shall be shown at the base and top of all walls at both ends, all angle points, and all changes in slope. Submissions shall include a design for the walls and shall demonstrate that the type of wall system proposed is appropriate for the intended use and site conditions.

Proposed drainage facilities, drainage swales, and channels shall be shown and annotated to an extent required to determine the complete drainage path for any location on the site. Drainage shall not be directed onto adjacent property, nor shall the location or manner of drainage onto adjacent property change, without written evidence of proper permission.

Limits of cut slopes, fill slopes, land disturbances, and construction activities, including the total area of vegetation to be cleared shall be shown. List the total earthwork volumes calculated for the site based on the design.

Proposed elevation contour lines at an interval appropriate to the scope and nature of the proposed improvements shall be provided. Sufficient elevations information shall be provided around all foundations and to demonstrate the control of surface water on and off site. Spot elevations may also be necessary to accurately depict the proposed elevation characteristics of the design.

Location, logs, and other pertinent information associated with any subsurface geotechnical investigation (i.e. borings, test pit, percolation tests) performed shall be included.

Proposed site-related gas, water, electric, communications, and exterior lighting improvements shall be designed, detailed, and shown in accordance with all applicable regulations and standards, and in accordance with standard industry practice. A photometric plan may be required upon request.

Plans shall show every sanitary and drainage pipe run, with length, type, and slope for every pipe.

Sanitary pipe invert elevations shall be given at the penetration into the building and at the connection point to the main collection pipe for all building sewer laterals. If sanitary pumping is proposed, then provide pump information (i.e. pump type, rated flow rates, performance curves, pump dosing cycle, chamber capacity, etc.).

Every drainage structure (i.e. catch basin, manhole, sediment chamber, culvert, flared end, etc.) shall include all pipe inverts (both inlet and outlet), sump depths, and top of grade elevations. Structures shall be labeled and details shall be provided for all.

Proposed improvements shall be shown and detailed to an extent necessary to properly present vehicular and pedestrian traffic flow circulation, ingress and egress, parking, emergency access lanes, and loading/unloading areas.

A parking table shall be provided outlining parking requirements and calculations thereof. Vehicle turning radius analysis shall be applied to design emergency and other non-passenger vehicle movements. Intersection Sight Distance (ISD) analysis shall also be performed for all site ingress and egress drives.

Accessible parking spaces, access ramps, routes, and other facilities shall be in accordance with all applicable state and federal codes and regulations. Accessible access ramps shall have details showing, at a minimum, inset spot elevations and running slope of ramps.

Refuse & recyclable collection and storage area(s) shall be identified on the plans for commercial, industrial, and multi-family developments, along with proposed screening. Provide applicable notes and details.

The location with name, size, and quantity of proposed site plantings shall be shown.

Location of property corners and concrete monuments along the public right-of-way shall be shown and labeled appropriately (i.e. found, set, or to be set).

A sequence of work shall be provided outlining the process and major milestones of construction for the site development proposed.

EROSION AND STABILIZATION

The transportation of eroded materials onto Town roads or into drainage systems is prohibited. The applicant shall demonstrate that appropriate permanent measures are utilized to ensure the stability of earthen materials. All proposed solutions, such as plantings, permanent fabrics and other measures shall be selected based on site conditions of soil type, topography (grade), location, etc.

An Erosion & Sediment Control Plan shall be prepared in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control, showing location of all erosion & sediment (E&S) control measures needed. On-site storage areas for topsoil or other excavated material shall be shown.

The E&S Control Plan shall include a narrative and maintenance schedule, as outlined in the Town's Zoning Regulations. The narrative shall also designate the method and location proposed for disposal of clearing debris and materials removed from the site. Said plan shall also contain details and notes detailing any E&S measures required. The use of industry standard Best Management Practices (BMP's) is encouraged.

PROFESSIONAL CERTIFICATION

The preparer of the plans, and any supporting calculations, studies, or other such information, on the Applicant's behalf, is expected and required to be aware of and to have competent knowledge of applicable federal, state, and local standards, regulations and requirements, and appropriately comply with and apply the same. Said preparer is also expected to have an intimate knowledge of and control over every aspect and detail of the information presented on the plan.

Plans shall have the original (live) signature and seal (embossed) of the professional (i.e. engineer, land surveyor, landscape architect, soil scientist) responsible for the plans, reports, and supporting documentation (or portion thereof), as applicable. The signing professional(s) shall be appropriately licensed in the State of Connecticut.

Plans that do not have a live signature and embossed seal, or are not certified by a licensed professional will not be accepted. In addition, digital submission shall also be provided.

PLAN REVISIONS & TRACKING

All revisions after the initial submittal shall be clearly identified on the drawings. The Applicant should provide written responses addressing all Town review comments. It is strongly suggested that this office be contacted to clarify any of its review comments that are not clearly understood.

It should be noted, however, that it is not the duty of this office to design projects for applicants and questions of this nature will not be answered.

AS-BUILT PLAN SPECIFICATIONS

The purpose, expectation, and requirement for an As-Built Plan (Record Drawing) is to accurately present the as-built record information in order to locate, interpret, and evaluate the improvements and work completed. In addition, the As-Built Plan is to identify and quantify deviations of the as-built product from the intended design.

All as-built plans submitted shall be class A-2 & T-2 and shall meet the standards established in the "Standards for Surveys and Maps in the State of Connecticut" as adopted by the Connecticut Association of Land Surveyors, Inc. on September 26, 1996, as amended.

As-Built Plans shall be presented through the use of an "*Improvement Location Survey".*

Plans shall be appropriately certified, signed, and sealed by a registered land surveyor licensed in the State of Connecticut. Plans that do not contain the minimum required information will not be considered for review. As-Built Plans shall include:

- All improvements (Structures, fences, walls, driveways, parking, walks, etc.);
- Exterior wall dimensions for all buildings and distances from the foundation to all property lines (nearest tenth of a foot);
- Elevations of the finish floor, foundation wall, garage slab, and basement floor;
- All underground utilities (gas, electric, communications, propane tank, etc.), as applicable;
- Water service or domestic water well, as applicable;
- Sanitary sewer lateral or subsurface sewage disposal system location, as applicable;
- Drainage improvements (rain gardens, subsurface chambers, footing drains, yard drains, etc.) with invert elevations;

- Elevations in the form of “spot elevations”, taken as part of the final actual field survey shall be provided. Sufficient elevations information shall be provided around all foundations and to demonstrate the control of surface water on and off site. If elevations are insufficient, two-foot (2’) contours may be required;

- Adequate spot elevations shall be provided for the entire driveway, driveway apron, and parking areas. Percentage of driveway slope shall also be shown;

- At the request of the Town Engineer, sufficient elevations shall be provided on the sidewalk and curbs to demonstrate conformance with Town Standards.

- Benchmark shall be provided;

- Zoning table providing bulk & area requirements and existing as-built conditions;

- Building and impervious coverage calculations shall be provided;

- Any easements and/or right-of-ways shall be shown;

- Wetlands & watercourse boundaries and flood plain shall be shown;

- Plan shall show zoning setbacks, lot dimensions, bearings, and lot area;

- Abutting property owners as determined from the most recent Assessor’s records; and

- All lot corners and street monumentation shall be shown and labeled.

Interim As-Built Surveys prepared for pavement placement or *Final As-Built Surveys* prepared for road acceptance shall include, in addition to items listed above, a “Plan & Profile” (P&P) of the roadway centerline showing design grades and actual finish grades. The P&P shall also show design and finish grades of all structures and length and slopes of piping within the right-of-way.

For all utility laterals (i.e. sewer connections), a record drawing shall be provided showing “swing tie” locations from fixed points and provide depth of lateral (or lateral connection) measured from the existing grade.

As-built plans shall be submitted in a timely manner to provide adequate time for review and revisions.

ARTICLE VI

DESIGN STANDARDS

All public improvements shall be designed by the Developer's Consulting Engineer in accordance with good engineering practice. All plans provided shall show all information necessary to determine compliance with State and Local Regulations.

The following standards developed are intended to serve as a guideline for public improvements, including roadway and drainage design.

The Developer, Contractor and Consulting Engineer shall adhere to all applicable regulations or ordinances required for any public works or dedicated public works activity within the Town of Cheshire.

A. ROADWAY GEOMETRY

Road geometry should generally conform to the latest edition of the CTDOT Highway Design Manual and the AASHTO Green Book, "A Policy on Geometric Design of Highways and Streets"; and are subject to the approval of the Town Engineer.

The "Typical Roadway Section" detail included in this document is a minimum standard for roadway construction. Any supplemental to this standard shall be subject to the approval of the Town Engineer and local Traffic Authority.

HORIZONTAL ALIGNMENT

Streets should be designed to provide horizontal alignment that discourages high speeds and cut-through traffic situations. Compound curves and spirals shall not be used for the layout of new streets.

All horizontal curves shall provide stopping sight distances of at least two hundred fifty feet (250') on residential streets and three hundred fifty feet (350') on all other streets. If necessary, the area along the inside of the curve shall be cleared or regraded to provide such sightline. A sightline easement across any affected lots shall be provided to the Town of Cheshire prior to commencing construction.

The minimum centerline radius of any horizontal curve shall be two hundred feet (200').

No street shall have a right-of-way width of less than fifty feet (50'). The traveled way width shall be at least thirty feet (30') in all residential, commercial, and industrial areas.

VERTICAL ALIGNMENT

Vertical alignment shall be designed to fit, as closely as practical, to the existing topography.

Minimum street grade shall be two percent (2%). Site development plans shall possess proposed spot elevations at cul-de-sacs and intersections to ensure that this criterion can be achieved.

For residential streets, the maximum grade for major streets shall be seven percent (7%) and minor streets shall be ten percent (10%). No minor street shall have a grade of more than four percent (4%) within seventy-five feet (75') of its intersection with the centerline of another street.

For commercial and/or industrial streets, the maximum grade for major streets shall be six percent (6%) and minor streets shall be eight percent (8%). No minor street shall have a grade of more than three percent (3%) within one hundred feet (100') of its intersection with the centerline of another street.

Vertical curves shall provide a minimum stopping sight distance (SSD) of two hundred fifty feet (250') on residential streets and three hundred fifty feet (350') on all other streets.

INTERSECTIONS

In the layout of new streets, no more than four (4) streets shall intersect at any one point to form an intersection. The centerline of all streets entering the intersection shall pass through a single point. Offset intersections shall be avoided.

Intersecting streets shall be laid out at such intervals that minimum block lengths between streets provide adequate sight distance.

Intersections shall connect at or near a ninety degree (90°) angle as determined by the intersecting centerline. Skew angles shall be permitted only with approval from the Town Engineer and local Traffic Authority. No street shall intersect at less than sixty degrees (60°).

Adequate turning radii shall be provided to avoid unnecessary lane encroachment, traffic conflict, and related accidental potential. For local streets, the minimum streetline radius shall be fifteen feet (15') and the minimum curb radius shall be twenty-five feet (25'). With approval from the Town Engineer, greater turning radii may be permitted for commercial or industrial applications.

CUL-DE-SACS

Cul-de-sacs shall be designed as described within the Zoning and Subdivision Regulations and the standard details. Temporary cul-de-sacs shall be used if there remains developable land adjacent to the property or when phasing subdivisions. All cul-de-sac circles shall be tangent to the adjacent section of roadway. Alternate layouts shall only be allowed subject to the approval of the Fire Marshal and Town Engineer.

The measurement of the length of a permanent cul-de-sac shall commence at the street line of the intersected through street then taken to the center of the turnaround. This measurement shall be along the center line of the street.

Street grades in cul-de-sacs shall be measured along the curb line.

ROAD SECTION PROFILE

Streets shall be crowned having a three eights of an inch per foot (3/8" per FT) cross slope. Super-elevation shall not be used without approval of the Town Engineer.

Bituminous concrete pavement shall consist of two inch (2") minimum leveling binder course (Class I or Superpave HMA S0.50) and a 1-1/2" minimum surface course (Class II or Superpave HMA S0.375); both measured after compaction. The entire bituminous concrete pavement shall be of 3-1/2 inch (3½") thick minimum.

Refer to the Technical Standards of this document for additional specifications and requirements regarding pavement placement and pavement for Arterial, Collector and Industrial use applications.

All roadways shall have a minimum of six inch (6") processed aggregate base over eight inch (8") well graded and compacted bank run gravel.

An additional twelve inch (12") depth of bank run gravel, geotextile fabric, underdrains, or other stabilizing methods may be required by the Town Engineer if the subgrade materials possess high frost susceptibility, low CBR (California Bearing Ration) strength or other indications of low stability.

The base course (binder course) shall not be applied to the subgrade until all water mains, storm and sanitary sewer mains and laterals have been installed and properly backfilled; and shall not be constructed during freezing weather or on a wet or frozen subgrade.

If the top course is applied more than three (3) days or at the discretion of the Town Engineer after placement of the binder or second course, a tack coat shall be added prior to placement of the top course.

STOPPING SIGHT DISTANCE (SSD)

Stopping sight distance is the length of roadway ahead that is visible to the driver. Minimum SSD provided shall be sufficient to enable a vehicle traveling at the design speed to stop before reaching a stationary object in its path.

The SSD is measured from a height of eye of 3.5 feet to an object height of two feet (2').

Adjustments to the minimum SSD for grades over three percent (3%) may be required. SSD shall be performed in accordance to AASHTO and the CTDOT Highway Design Manual.

INTERSECTION SIGHT DISTANCE (ISD)

Intersection sight distance generally refers to the available distance that allows a driver corner sight distance available, at intersections, that allows a driver approaching an intersection to observe the actions of vehicles on the crossing leg(s).

Minimum ISD shall be provided using gap acceptance methodology and is obtained by providing clear sight triangles both to the left and to the right. A passenger car design vehicle shall be used for determining required ISD for new local residential roads and driveways.

The ISD is measured with the driver's eye located fifteen feet (15') from the curb line of the crossing street at a height of 3.5 feet viewing the height of object of also 3.5 feet. ISD shall be performed in accordance to AASHTO and the CTDOT Highway Design Manual.

B. CURBING

Curbing details included in this document are the minimum standards for curb construction and any supplemental to these standards shall be subject to the approval of the Town Engineer.

Curbs shall be required on all new streets and may be required on existing streets and shall conform to the design standards of this document. Curbs shall be provided for drainage and reduction of maintenance operations, unless otherwise directed by the Town Engineer.

Curbs shall generally be portland cement concrete in residential areas; and can be constructed either cast-in-place (Full-Depth) type or machine laid (Extruded) type. Granite curbing may also be used in place of concrete curbing.

Bituminous lip curbing may also be used in roadways, parking lots and non-residential areas with the approval of the Town Engineer and Planning & Zoning Commission. Class-3 bituminous concrete shall be used for this type of curbing.

A six inch (6”) curb reveal shall be provided. Any replacement curbing shall be replaced in-kind, unless approved by the Town Engineer. Topsoil shall be placed to the top of the curb elevation.

Curbs shall be installed on the pavement binder course except for Full-Depth and granite curbing.

Cul-de-sacs shall use cape cod curbing as shown in the Standard Details for improved snow removal operations.

C. APRONS & CURB CUTS

Driveway apron details included in this document are the minimum standards for driveway apron construction and any supplemental to these standards shall be subject to the approval of the Town Engineer.

Curb cuts and driveways at the gutter (curb line) shall be a minimum of sixteen feet (16’) wide and in no case shall exceed twenty-four feet (24’) wide for residential driveways or no greater than thirty-five feet (35’) wide for non-residential driveways unless greater width is required by the State of Connecticut or as determined by the Town Engineer.

Aprons shall be bituminous concrete when curbing is bituminous concrete or portland cement concrete when curbing is portland cement concrete unless otherwise approved by the Town Engineer. Any replacement apron shall be replaced in-kind, unless otherwise approved by the Town Engineer.

Whenever development result in the abandonment or discontinued use of a curb cut and/or driveway apron, the curb cut and/or driveway apron shall be removed and replaced with standard walk and curb to match existing conditions.

D. SIDEWALKS & RAMPS

Sidewalks shall be provided as described within the Town’s Zoning and Subdivision Regulations and shall be constructed of concrete and in accordance with the specifications and construction details included within this document. All sidewalk ramps shall be constructed following the CTDOT sidewalk details.

Sidewalks, ramps, and driveway aprons shall be Class "F" Concrete having a minimum 28-day compressive strength of 4,000 psi. New and replacement curb cuts require that existing curbs be removed to full depth and re-poured.

Concrete sidewalks shall be four feet (4') wide and shall be five inches (5") thick over a six inch (6") thickness of compacted well-graded processed aggregate. Sidewalks shall be laid out in a curvilinear manner unless otherwise approved by the Town Engineer.

Sidewalks shall be continuous through all residential driveway. For sidewalks that cross driveways, the concrete shall be seven inches (7") thick, with 6" x 6" welded wire mesh over an eight inch (8") thickness of compacted well-graded processed aggregate.

Sidewalks shall be placed such that the back of walk is located one foot (1') in front of the street line and five feet (5') behind the face of curb, unless otherwise directed by the Town Engineer.

The cross slope for a sidewalk shall be one-quarter inch per foot (¼"/FT) and the slope between the sidewalk and curb shall be one-half inch per foot (½"/FT).

Special attention is to be paid to the line and grade of work. All driveway aprons must pitch toward the public road for the entire portion located within the Town's right-of-way. Attention is made to the locations and placement of expansion joint material.

Ramps shall be constructed at all pedestrian crosswalks in all new designs and at pedestrian crosswalk locations where an existing curb or walk is to be disturbed by construction.

Sidewalk ramps shall conform to the latest Americans with Disabilities Act (ADA).

Detectable Warning Pads shall be provided at all ramp ends. The detectable warning pad shall be constructed using ADA solutions (or approved equal) 24" X 48" cast-in-place tactile panels in brick red color. Alternate colors and designs shall require approval of the Town Engineer.

The circumference of the turnaround circle of a cul-de-sac shall not require sidewalks.

Interior site walkways shall be preferably of portland cement concrete. Bituminous concrete interior walks are permitted, but are not recommended.

Work done that does not adhere to these specifications will be rejected and must be re-done by the contractor at his expense within a time frame specified by the Department of Public Works and Engineering.

E. DRIVEWAYS

Driveways shall be constructed in accordance with the specifications and construction details included within this document. Refer to the Town of Cheshire's Zoning and Subdivision Regulations for additional design criteria.

Each driveway shall be located so as to ensure adequate sight lines for vehicles to exit the drive with minimum hazard and disruption of traffic. The minimum Intersection Sight Distance (ISD) shall be

determined by CTDOT and AASHTO standards based on the prevailing speed of traffic and the classification of the intersected roadway.

The Director of Public Works may require the removal of sight obstructions including, but not limited to, structures, trees, brush, shrubs, boulders, walls, fences, or adjustments to cut slopes, adjacent to intersections of a driveway with a Town road in order to assure an adequate sight distance and to ensure a safe and efficient means of access for emergency service vehicles.

The Town Engineer may require a sight line plan be prepared and signed by a licensed land surveyor and professional engineer to demonstrate adequate ISD is provided.

No more than three (3) driveways shall access the circle portion of any cul-de-sac. The Engineer shall make determinations as to where the driveway may be situated so as to facilitate snow plowing operations.

No driveway, approach or improvement constructed within the Town right-of-way shall be relocated or its dimensions altered without approval from the Town Engineer.

Driveways shall be located so as not to interfere with public improvements such as, but not limited to, catch basins, accessible ramps, fire hydrants, utilities, and street line monuments.

Points of entrance and exit (ingress & egress) for driveways onto the street shall be located so as to minimize hazards to pedestrians and vehicular traffic.

Driveways shall be setback a minimum of five feet (5’) from the property line, except where it crosses a property line at its entrance. Driveways shall not be constructed within four feet (4’) of a crosswalk and shall be located no closer than seventy-five feet (75’) from any intersection.

No more than one (1) driveway or access shall be constructed on the same premises unless the distance between them is greater than fifty feet (50’) and approval has been granted by the Town Engineer and the Planning and Zoning Commission.

All driveways shall be constructed at a minimum grade of plus three percent (+3%) and maximum grade of plus six percent (+6%) from the curb line to the street line. Driveway grades between the street line and the building setback line shall not exceed ten percent (10%) at any point.

The maximum grade for a driveway within public property or right-of-way shall not exceed ten percent (10%) and shall be constructed so that the slope of the driveway commences at the street line, not the curb line. Steeper grades may be permitted on a case-by-case basis and shall require approval from both the Town Engineer.

Ascending driveways shall be graded so as to establish sheet flow drainage and avoid the discharge of concentrated runoff into Town roads. For driveways which descend into private property, driveway aprons shall rise in elevation from the Town gutter line to the street line a minimum of six inches (6”) before descending into the property.

Driveways are required to be paved within the public roadway right-of-way line and no driveway radius shall extend beyond the side property line in front of an adjacent property.

Whenever practical, a driveway shall intersect a road at ninety degrees (90°). In no case shall a driveway intersect a street at an angle of less than sixty degrees (60°). A sufficient curb radius or angle shall be provided on each side of the residential driveway to allow vehicles to enter and exit the drive without encroaching over the roadway centerline or shoulder areas.

The minimum center turning radius on the driveway curve shall not be less than forty feet (40'). Based on driveway configuration, the Town Engineer may determine that a larger turning radius be required for proper accessibility and safety.

All gravel driveways shall have a minimum of six inch (6") processed aggregate base.

Paved driveways shall have a minimum of two inches (2"), after compaction, of Class II bituminous concrete (or "Driveway Mix") over the six inch (6") processed aggregate base. Alternate surface material may be permitted subject to approval by the Town Engineer. The use of "millings" shall not be permitted within the Town right-of-way.

The maximum cross-slope on driveways shall not exceed three and one-half percent (3.5%).

The driveway lip height at the edge of road must be between one to two inches (1"- 2") above the finished road pavement.

Driveways shall be a minimum of ten feet (10') wide and in no case shall exceed twenty feet (20') wide for residential driveways or no greater than thirty-five feet (35') wide for non-residential driveways unless greater width is required by the State of Connecticut or as determined by the Town Engineer.

Driveways shall be constructed in such a manner that they minimize erosion and migration of sediment onto the street; and that they do not permit the runoff of storm water from the street to enter private property or adjacent properties.

Where necessary, or as directed by the Town Engineer, stormwater conveyance measures (i.e. curbing, catch basins, piping, swales, etc.) may be required to prevent stormwater impacts to town roads or to adjacent properties.

Any culvert or bridge on a driveway shall be designed and constructed to carry the weight of emergency vehicles and construction equipment; and must be capable of supporting an H-20 wheel loading.

Driveway culverts shall be a minimum of fifteen inches (15") in diameter, unless otherwise approved by the Town Engineer, and be sized to adequately convey all surface runoff.

Driveways shall be constructed to provide year-round access for emergency and service vehicles and shall have an all-weather passable surface.

In order to provide adequate room for emergency vehicles to turn into driveways and access all buildings and parcels within the Town of Cheshire, all new driveways shall provide minimum vertical clearance of fourteen feet (14') and horizontal clearance free of tree branches, walls, fences and other impediments.

Entrance gate posts, pillars or arches must be located, with a minimum fifteen foot (15') setback, and constructed so as not to impede the entrance of any of the Town's emergency service vehicles. Where

there are gates at driveways, an emergency means of opening the gates shall be provided to the Fire Department.

Side slopes shall not exceed a slope of three feet horizontal to one foot vertical (3:1) unless retaining walls or suitable stabilizing provisions are utilized, or as directed by the Town Engineer.

Guardrails, guide posts, headwalls, flared ends, or wider driveway widths shall be used when steep side slopes or culvert crossings present a safety hazard, future maintenance problem, or as directed by the Town Engineer.

Any driveway installation which requires the removal of a portion of an existing guide rail shall be secured with concrete end anchorages on each side of the driveway. All such work shall be the responsibility and expense of the developer, owner, and/or applicant.

Driveways longer than three hundred and fifty feet (350') shall include a pull-off area to accommodate emergency service vehicles. Pull-off areas shall be a minimum of six feet (6') wide and twenty-five feet (25') long or as directed by the Fire Marshal and/or Town Engineer.

Pull-off areas shall be provided every two hundred feet (200') subject to approval of the Fire Marshal and Town Engineer. The maximum distance between pull-off areas shall be three hundred fifty ft. (350').

For all driveways longer than three hundred and fifty feet (350'), a "hammerhead" or equivalent turnaround area is recommended at the termination of the driveway, suitable in design to accommodate safe turning movements for large service vehicles and fire apparatus. The turnaround location shall not interfere with the parking area for vehicles. Said turnaround shall be subject to the approval of the Fire Marshal and Town Engineer.

Structures accessed by driveways longer than six hundred feet (600') within public property or right-of-way shall have a fire suppressant sprinkler system, unless otherwise approved by the Fire Marshal and Building Official.

F. REAR LOT ACCESSWAYS

Rear lot accessways shall be constructed in accordance with the specifications and construction details included within this document. Refer to the Town of Cheshire's Zoning and Subdivision Regulations for additional design criteria.

No rear lot accessway shall exceed seventeen hundred feet (1,700') in length or have a grade in excess of ten percent (10%) at any point.

The accessway shall be a minimum of fifteen feet (15') wide and paved with a clear zone of six feet (6') wide on each side. The clear zone shall be at road grade and readily available for emergency vehicle parking.

The clear zones may alternatively be constructed of a reinforced turf driving surface subject to the approval of the Fire Marshal and Town Engineer.

The roadway may be super-elevated with approval from the Town Engineer. Drainage structures may be required by the Town Engineer to eliminate drainage impact onto the Town road and/or adjacent properties.

At the end of the accessway, a paved turnaround shall be constructed with a minimum radius of twenty-five feet (25'). Sidewalks on rear lot accessways shall not be necessary unless required by the Planning & Zoning Commission and Town Engineer.

Entrance gate posts, pillars or arches must be located, with a minimum fifteen foot (15') setback, and constructed so as not to impede the entrance of any of the Town's emergency service vehicles. Where there are gates, an emergency means of opening the gates shall be provided to the Fire Department.

Where the rear lot accessway connects to a roadway having public water and/or public sewer, connection(s) to such facilities shall be required. Such connection(s) and cost shall be borne by the developer and/or owner.

The Town Engineer may require a sight line plan be prepared and signed by a licensed land surveyor and professional engineer to demonstrate adequate ISD is provided.

The Town's responsibility to provide services to lots serviced by the rear lot accessway ceases at the street line of the public street.

G. OFF-STREET PARKING (PUBLIC PARKING)

Public parking lots shall be designed to provide safe and efficient flow for vehicles and pedestrians.

All public off-street parking and loading areas shall be suitably improved, graded, stabilized and maintained so as to cause no nuisance or danger from dust or from surface water flow. No such area shall have a slope of less than a half percent (0.50%) or greater than three percent (3%).

All public parking and loading areas shall be either bituminous concrete or portland cement concrete; and shall be defined by curbing unless approved by the Town Engineer.

Each parking space for public use shall be provided with adequate area for approach, turning and exit of an automobile having an overall length of up to twenty feet (20') without the need to use any part of a public street right-of-way.

Minimum public parking stall and aisle widths shall be designed as follows, unless otherwise approved:

Parking Pattern	Stall Length	Aisle Width
90 degrees	18 Feet	24 Feet
60 degrees	18 Feet	18 Feet
45 degrees	20 Feet	14 Feet
30 degrees	20 Feet	14 Feet
Parallel Parking (0°)	22 Feet	12 Feet

Only one-way traffic patterns are allowed when angled parking spaces are proposed. When parking spaces are angled, forty-five degrees (45°) is preferred.

Aisle widths for two-way traffic configurations may be reduced subject to the approval of the Fire Marshal and Town Engineer.

Each public parking space shall constitute a minimum width of nine feet (9'), unless approved by the Town Engineer. Stalls shall be measured from the center of the stripe.

Wheel stops (curb stops) or bumper guards shall be installed adjacent to pedestrian pathways to limit vehicle overhang. Such stops or guards shall be properly anchored or secured.

Accessible (Handicapped) parking spaces shall be designed and built to meet current applicable ADA and Building Code standards.

H. GRADING

Grades of all streets shall conform in general to the terrain. Street grades in cul-de-sacs shall be measured along the curb line not along the centerline.

Streets shall be graded to the full width of the right-of-way, except that in the case of difficult topography, the Town Engineer may waive the requirement where it is determined to be in the best interest of the Town.

The maximum side slope shall not exceed three feet horizontal to one foot vertical (3:1) for earth material; and two feet horizontal to one foot vertical (2:1) for rock.

Fill slopes flatter than four feet horizontal to one foot vertical (4:1) are recommended whenever possible to reduce or eliminate the need for guiderail.

Graded areas shall have a minimum aggregate grade of a half percent (0.50%) for paved or impervious areas; and a minimum of one percent (1.0%) for unpaved or pervious areas.

Graded areas shall not alter drainage patterns and shall not result in increased flooding on adjacent properties. Areas adjacent to buildings or structures shall slope away for a minimum of fifteen feet (15').

Grassed and paved areas adjacent to sidewalks and ramps should be sloped back from the streetline to prevent minor storm flows from flowing across said sidewalks and ramps.

Graded areas shall not extend into wetlands, watercourses, or the upland review area (URA) without Inland Wetlands & Watercourses Commission (IWWC) approval.

I. SUBSURFACE DRAINAGE (UNDERDRAINS)

Underdrains shall be constructed wherever in the opinion of the Town Engineer drainage conditions require it. They may be required even though not shown on the approved plans.

Underdrains shall consist of a trench cut below the elevation of the bottom of the subbase, containing a suitable perforated or slotted conduit backfilled with a pervious material and wrapped in geotextile fabric according to the Standard Detail.

The conduits for underdrains shall be not less than six inches (6") in diameter.

Underdrains shall be connected to catch basins or manholes. If no drainage structure is available, the outlet conduit shall discharge down gradient or into an existing watercourse or wetland area. IWWC approval may be required.

Clean outs shall be provided at intervals not to exceed one hundred fifty feet (150') and utility marking tape shall be provided.

J. STORM DRAINAGE

Protection of water quality and reducing the discharge of pollutants from the Town's storm sewer system to the maximum extent practical shall be adhered to per the Town of Cheshire's Stormwater Management Plan (SMP). Proposed storm water drainage design, details, and reports shall be prepared in accordance with the CTDEEP 2004 Connecticut Stormwater Quality Manual and to Town Standards.

The Town of Cheshire uses zero net increase in post development runoff for all development projects. It shall be demonstrated in a drainage report that the project can meet the net zero increase requirements for the 10, 25, 50, and 100 year storm events. If there is more than one sub-catchment area exiting the site, this net zero increase requirements shall apply to all individual sub-catchment areas as well as the overall site.

All pipe sizes should be determined by actual design with due consideration of the drainage area, whether on-site or off-site. Actual drainage computations, in accordance with standard engineering practice, should be submitted.

The design of culverts, bridges and through watercourses or ditches shall be based on not less than a 50-year storm for large watersheds greater than one square mile and watersheds with less than one square mile, the design shall be based on a 25-year storm event.

The drainage system for roads, including catch basins, inlets, pipelines, underdrains and gutters shall be designed for a 10-year storm event. This may be increased in special situations or as required by the Town Engineer.

All stormwater facilities within the Town of Cheshire's right-of-way shall be designed to carry an HS-20 wheel loading.

The minimum cover over all storm drainage within town roadways is three feet (3').

Storm water pipe shall be installed in a continuous line for the entire length of all streets and should have capacity to transport all future runoff within the vicinity of the improvement.

All pipes shall be of such diameter, not less than fifteen inches (15"), as will be sufficient to properly carry storm water expected to enter the pipe from the surrounding area.

The minimum slope for all stormwater pipe shall be a one half percent (0.50%).

Catch basins or manholes shall be located at changes of grade or alignment of the storm water system. The maximum distance between manholes and/or catch basins shall be three hundred feet (300'). There shall be a minimum of two (2) catch basins in a cul-de-sac unless approved by the Town Engineer.

In general, catch basins shall be set with the face of curb fifteen feet (15’) off the centerline of the pavement, for a thirty foot (30’) pavement width.

Connections of yard drains, catch basins, roof drains, or foundation drains shall be made to a catch basin or manhole. When connecting to an existing Town drainage structure, the invert pipe of the connecting pipe shall enter at an elevation no higher than two feet (2’) above the existing structures invert.

An Indemnification and Hold Harmless Agreement (See Appendix) shall be required when connecting private yard drains to Town maintained storm drainage systems. The agreement shall relieve the Town of Cheshire of any responsibility in the event of any failure of the storm drainage system caused or impacted by private connections to the Town’s storm drainage system.

In curved sections of roadway, storm drains shall be designed to "follow” the curve with short chords and shall not transect the curve by crossing the road centerline.

Watercourses that cross building lots shall be enclosed in pipes or culverts to a point beyond the extended rear line of the house.

Culverts shall extend from the toe of slope of the roadway embankment to the toe of the slope on the opposite side of the embankment, and shall not be constructed of multiple pipes unless approved by the Town Engineer.

Care shall be given during design and construction of sidewalks and ramps so as not to direct water off the walks into the roadway gutter and to avoid erosion and undermining of the walks.

In "sag" areas of streets the installation of double-inlet catch basins to reduce the potential for clogging and frequency of maintenance shall be required unless approved by the Town Engineer. Special care shall be given not to create a low spot in the sidewalk which traps water. The "standard section" shall be modified and approved by the Town Engineer to avoid the above.

Special care should be given to "off-road" and "rear yard" drainage. Catch basins or other inlets and storm drainage pipes shall be provided wherever water might tend to concentrate or collect. These drains, which shall be considered to be private, and are not a Town responsibility to maintain, repair or replace unless they are designed to receive water from public property and a drainage easement has been required for the protection of public improvements.

Spring or seepage water encountered shall be reported to the Town Engineer. Underdrains shall be installed in all locations where springs or seepage occurs as directed by the Town Engineer. The Contractor shall keep the excavation free from water at all times by pumping or by any other means that may be necessary.

Where surface streams enter into conduits or storm pipes discharge into streams, properly designed inlet and outlet structures shall be required.

Isolated storm sewer systems servicing parking areas and discharging towards wetlands or watercourses shall be equipped with oil/water separators.

Drainage easements shall be a minimum of twenty-five feet (25’) wide with the main line pipe centered within the easement.

K. STORMWATER TREATMENT

This department encourages the use of Low Impact Development (LID) strategies, environmental structures, and environmentally sensitive designs. Sedimentation chambers are required prior to run-off from private properties entering a Town of Cheshire storm drainage system.

All proposed site development shall include provisions for the treatment of surface runoff in order to minimize the transport of pollutants into downstream waterbodies, watercourses, wetlands and stormwater conveyance systems after construction is complete.

Stormwater treatment facilities shall treat either the water quality volume (WQV) or the water quality flow (WQF) and shall be designed in accordance with the 2004 Connecticut Stormwater Quality Manual as published by the DEP.

Design and construction of Low Impact Development (LID) is encouraged for private site developments to replicate pre-development hydrology. LID features can aid in reducing runoff volume and pollutant loads through infiltration, evapotranspiration and reuse of stormwater runoff. Some examples include vegetated swales, bio-retention/rain gardens, drywells/leaching trenches, and rainwater harvesting.

L. FOUNDATION & ROOF DRAINS / PRIVATE DRAINS

It is preferred that private drains (i.e. roof leaders and foundation drains) be tied into the Town's storm drainage system whenever feasible.

Roof leaders which are splashed on the ground shall be kept separate so as not to concentrate water at any discharge point; and where there is no impact on lot to lot drainage.

Roof leader drains and foundation drains shall not be connected unless approved by the Town Engineer. In no case shall the connection of these drains will be permitted within five feet (5') of a building foundation wall.

If a foundation drain outlet is to be connected to the Town storm drainage system and the invert of the pipe at the building is below the top of frame elevation of the connecting structure (i.e. catch basin and manhole), a backwater valve (backflow preventer) may be required. All foundation drain outlets shall be located above the crown of the existing drainage pipe of the connecting structure.

An Indemnification and Hold Harmless Agreement shall be required when connecting roof leaders and/or footing drains to the Town maintained storm drainage system. The agreement shall relieve the Town of Cheshire of any responsibility in the event of any failure of the storm drainage system caused or impacted by private connections to the Town's storm drainage system.

M. PRECAST CONCRETE BOX CULVERT

Precast concrete box culverts shall be design and installed in conformity with the lines, grades, dimensions, sizes, types, length and details shown on the construction drawings or as ordered, and in accordance with the requirements of these specifications.

Box culverts shall be designed under the supervision of a Professional Engineer (PE) licensed in the State of Connecticut who specializes in stormwater management and culvert design.

Two (2) sets of shop drawings and two (2) sets of complete design calculations sealed by the PE shall be submitted for approval prior to fabrication of the units. The shop drawings shall include complete details of the methods, materials and equipment the manufacturer proposes to use.

Design of the structures shall be in accordance with the latest ASTM, ACI and AASHTO specifications. Design live load shall be HS20-44 with impact applied in accordance with the latest AASHTO bridge specifications. Load factor shall be in accordance with AASHTO. The materials to be used in the construction shall be those indicated on the plans or ordered by the Town Engineer and shall conform to CTDOT Standard Specifications.

Box culvert sections shall be four-sided monolithically cast of reinforced concrete with open ends. Inside surfaces shall be smooth so as not to restrict flow through the completed installation. Chamfered fillets shall be monolithically cast in all four corners. Floors of box culverts shall generally be designed level in cross section unless a fish-way is required, or if granular material is required to line the bottom foot of the pipe, requiring the formation of low-flow critter troughs or plateaus.

No patching of the completed units will be allowed unless permitted by the Town Engineer. The manufacturer's proposal for methods and materials to be used in the patching operation shall be submitted to the Town Engineer for approval.

The quality of materials, the process of manufacture, and the finished units shall be subject to inspection by the Town Engineer. Precast units shall be subject to rejection on account of failure to conform to any of the specification requirements and individual units may be rejected because of (1) Fractures or cracks passing through the wall, except for a single end crack that does not exceed the depth of the joint; (2) Defects that indicate imperfect proportioning, mixing and molding; (3) Honeycombed or open texture; or (4) Damaged ends, where such damage would prevent making a satisfactory joint.

Each section of box culvert shall be positioned in the trench only in such manner and by such means as recommended by the manufacturer. The Contractor will be required to furnish slings and all devices necessary to permit satisfactory support of the structure when lifted.

Any unit which is not in true alignment, or which shows any settlement, displacement, misfit or distortion after installation, shall be taken up and reinstalled or corrected, to the satisfaction of the Town Engineer without additional compensation.

N. DAMS

The Connecticut Department of Energy and Environmental Protection (CTDEEP) imposes regulations on dam owners for the inspection, maintenance, repair and reporting depending on the dam classification. Developers that propose the addition or modification of a dam or earthen embankments used to detain water must review these requirements and present said review at the time of application.

Please contact the State of Connecticut Department of Energy and Environmental Protection for permitting information.

O. SANITARY SEWERS

The standard Sewer Regulations for the Town of Cheshire adopted by the Water Pollution Control Authority, as amended, shall be the official regulations for sanitary sewer construction in the Town of

Cheshire, and all materials and construction methods shall conform to these regulations. All Federal, State, and Local regulations shall also be satisfied.

In all matters pertaining to sanitary sewer design and construction, the Town Engineer, acting on behalf of the Water Pollution Control Authority, shall be the final judge as to the proper practice.

Privately owned community sewer systems are regulated by the Connecticut Department of Environmental Protection (CTDEEP), and require that an agreement be put in place between the WPCA and the association that will own, operate, and maintain the private community sewer system to ensure that proper funding is set aside for future maintenance, repair, and replacement of said sewer system.

All sanitary sewer facilities within the Town of Cheshire's right-of-way shall be designed to carry an HS-20 wheel loading.

Sanitary sewer easements shall be provided for all sewers which are not installed within roadways or lands to be dedicated to the Town. Easements shall be a minimum of twenty feet (20') wide with the main line pipe centered within the easement.

P. IRRIGATION SYSTEMS

All components of a private irrigation system shall not be permitted in the Town right-of-way without written consent of the Town Engineer. Any portion of the irrigation system in the right-of-way will be the responsibility of the property owner to maintain, repair, and relocate as a result of any future construction or maintenance.

The irrigation system shall not cause any icing to the sidewalk or street and at no time shall the spray/flow cross the sidewalk interfering with pedestrian, cyclist, or motor vehicle traffic.

An Indemnification and Hold Harmless Agreement shall be required when a subsurface lawn irrigation system is proposed within the Town right-of-way. The agreement shall relieve the Town of Cheshire of any responsibility in the event of any damage of said lawn irrigation system caused by any Town activity.

Q. CANINE INVISIBLE FENCING

All components of canine invisible fencing (dog fencing) shall not be permitted in the right-of-way without written consent of the Town Engineer. Any portion of the underground dog fencing in the right-of-way will be the responsibility of the property owner to maintain, repair, and relocate as a result of any future construction or maintenance.

An Indemnification and Hold Harmless Agreement shall be required when a subsurface canine invisible fence is proposed within the Town right-of-way. The agreement shall relieve the Town of any responsibility in the event of any damage of said dog fencing caused by any Town activity.

R. GUIDE RAILS / GUARD RAILS

Guiderails (a.k.a. Guard Rails) shall be installed as required to protect against roadside hazards within the designated right-of-way or clear zone. Guiderails shall be installed for fill slopes adjacent to the roadway where side slopes are steeper than four feet horizontal to one foot vertical (4:1); and where as directed by the Town Engineer.

Guiderail installations shall be Metal Beam Rail Type RB-350 with galvanized steel and shall be designed and installed in accordance with the latest CTDOT standards and specifications. Weathering steel, timber rail, or other guide rail types may be permitted with approval of the Town Engineer.

When a sidewalk is present, the guiderail should typically be placed with the rail element flush with the back of the sidewalk.

Guiderail anchoring systems shall be installed outside of the designated clear zone. Terminal end wraps may only be used upon approval by the Town Engineer. Easements may be required for the placement of the guiderail or its anchoring system.

S. PROTECTIVE FENCING

Protective Fencing shall be required at the top of slopes, stream embankments, retaining walls and wing walls of culverts with drops in excess of forty-eight inches (48”) or near pedestrian of vehicular traffic.

Protective fencing shall consist of galvanized or PVC coated chain link fence with a minimum height of sixty inches (60”), split rail fence, or other suitable fence type or barrier as deemed appropriate by the Town Engineer for the area of concern.

T. RETAINING WALLS

Retaining walls shall not be installed within the Town of Cheshire’s right-of-way unless approved by the Town Engineer. Permitting and inspection by the Town’s Building Official may be required.

Retaining walls with any portion over forty-eight inches (48”) in height, or those of lesser height (as determined by the Town Engineer) to be critical to life and safety, shall be designed by a professional engineer licensed in the State of Connecticut.

For wall embankments, a minimum eight feet (8’) wide bench shall be provided in front of the wall for access and maintenance purposes. An easement may be required to be conveyed to the Town for the purpose of accessing the wall for inspection and repair.

U. MAILBOXES

Individual mailboxes which conform to United States Postal Service (USPS) Regulations may be installed without a permit. Mailboxes should be installed in accordance with USPS Regulations and American Association of State Highway Transportation Officials guidelines. Mailboxes not conforming to these standards will not be permitted.

Generally, these regulations and guidelines require mailboxes be installed on a sturdy post able to withstand the forces of plowed snow, the bottom of the mailbox should be between thirty-nine (39”) and forty-eight (48”) inches above the ground surface and the face of the mailbox be between eight (8”) inches and twelve (12”) inches from the edge of the street travel way.

Curbside mailboxes and curbside newspaper boxes or both a combination of the two may be mounted on a wood post provided that the wood post does not exceed twenty-five inches (25”) in cross section if located upon a state highway or thirty-six inches (36”) in cross section upon all other roads. If a metal post is used, it shall be aluminum or of sufficient weakness to break upon impact of any motor vehicle.

No masonry posts or enclosures will be allowed without approval of the Town Engineer. See Town's Code of Ordinances (Chapter 14) for additional information.

Any development or group of person desiring to combine several mailboxes in a single structure within the Town right-of-way shall be required to apply for a permit.

V. STREET LIGHTING

For all new roads in all zoning districts, street lights shall be required at: (1) all intersections; (2) at curves; and (3) at other locations as necessitated by safety considerations, unusual topography, or other special conditions. A Photometric Plan shall be provided if deemed necessary by the Town Engineer.

Street lighting shall be required in all subdivisions with the cost of lighting fixtures, poles, and installations being the responsibility of the developer. In developments where sidewalks do not parallel the road system, additional lighting of such sidewalks in addition to street lighting may be required. Contact the Planning Department for additional information.

Street utility poles installed on dead end roads shall be numbered consecutively (1, 2, 3, etc….) starting from the intersection. Please contact the Engineering Department for assistance on all other roadway configurations or questionable conditions.

No Certificate of Occupancy (C.O.) for a dwelling on any non-accepted street shall be issued nor shall any dwelling be occupied on such street until all street lighting has been installed and be in operation.

Prior to road acceptance, all required street lighting shall be completely installed and be in operation.

Refer to the Technical Standards of this document for additional specifications and requirements regarding to street lighting.

W. STREET SIGNS / TRAFFIC SIGNS / TRAFFIC CONTROL DEVICES

All street and traffic signs shall be in accordance with the Town of Cheshire – Traffic Authority requirements and it shall be the responsibility of the Developer to coordinate with the Town of Cheshire's Department of Public Works and local Traffic Authority for approval.

STREET SIGNS

All street names must be approved by the Planning & Zoning Commission. Proposed street names shall be substantially different from any present names to avoid confusion in sound or spelling. Streets that become extensions of existing streets shall generally bear the same name. All cul-de-sacs streets shall bear a street name and be designated as a "Court" or "Place". See Zoning and Subdivision Regulations for additional information.

Street name signs shall be fabricated and installed by the Department of Public Work; and the developer shall be responsible for the cost. The Developer shall provide a written request to the Town Engineer for the fabrication and installation of the street sign, including no outlet designations.

Such signs shall be placed at all intersections with existing streets as well as at all intersections within the development. Street name signs shall be of the same size, color and construction as the latest Town of Cheshire street signs and shall be subject to approval by the Town of Cheshire Traffic Authority.

Signs shall conform to Section 2D-40 Street Name Sign (D-3) as may be amended (MUTCD) approved by the Federal Highway Administrator as the Nation's Standard for all highways open to public travel in accordance with Title 23, U.S. Code, Sections 109(b), 109(d), and 402(a) as may be amended.

After completion, The Department of Public Works will prepare an invoice for the Developer which shall be paid in a timely manner. The developer shall bond such required street name signs with all other public improvements.

TRAFFIC SIGNS & TRAFFIC CONTROL DEVICES

All traffic signs shall conform to the latest revision of the MUTCD and the CTDOT Catalog of Signs.

Signs shall be constructed of sheet aluminum (0.80 inches thick) with reflective sheeting, high intensity grade, ASTM D4956 Type III. Posts for traffic signs shall meet the requirements of the CTDOT for three pounds per foot (3 PPF) galvanized steel u-channel posts with a Type II breakaway base.

New traffic signals and/or modifications to existing traffic signals shall be designed and installed by the Developer in accordance with MUTCD and CTDOT standards. Approval from the Office of the State Traffic Administration (OSTA) of new traffic signals shall be required.

The Developer shall be responsible for the cost and installation of any traffic sign or traffic control devices deemed necessary by OSTA and the Town of Cheshire Traffic Authority. A bond shall be posted for any required traffic signs and/or traffic control devices.

X. TRAFFIC IMPACT STUDY

A Traffic Impact Study (TIS) will be required for all developments or additions to existing developments generating 100 or more trips during the peak hour of the generator; or over 750 trips in an average day; or as required by the Town Engineer and/or the local Traffic Authority and/or the Planning & Zoning Commission.

A TIS may also be required for commercial and industrial developments generating lower peak hour volumes where; current traffic problems or concerns exist; the public may perceive an adverse impact on the adjacent neighborhoods or other areas; the proximity of site drives to other drives or intersections could create traffic concerns; or based on other specific problems or concerns that may be aggravated by the proposed development. Should such conditions arise, the Town Engineer shall evaluate the need for the TIS based on technical merit.

Traffic Impact Studies shall be prepared under the supervision of a Professional Traffic Operations Engineer (PTOE) or a Professional Engineer (PE) licensed in the State of Connecticut who specializes in traffic engineering.

Traffic counts shall be adjusted according to CTDOT procedures to account for the time of year the count was completed. Adjustments shall also be made to include other approved developments within the study area that are not fully developed at the time of the study.

Site generated traffic for a proposed development shall be determined using the ITE Trip Generation Manual latest edition, or actual traffic counts from similar facilities.

Y. PAVEMENT MARKINGS

All proposed pavement markings shall be epoxy coated resin unless otherwise directed by the Town Engineer and shall be designed in accordance with CTDOT and MUTCD standards.

Stop bars, centerline, and cross walks shall be installed on all streets.

Stop bars shall be twelve inches (12”) wide minimum unless otherwise noted. Stop bars shall be marked a minimum of four feet (4’) in advance of nearest edge of crosswalk. In absence of a marked crosswalk, the stop bar shall be placed at the desired stopping point. The stop bar shall ordinarily be placed in line with the stop sign.

Z. MONUMENTATION

Monuments shall be set at right angles to and opposite all points of curvature and points of tangency of all curves, street intersections, right-of-way angle points, and other points as directed by the Town.

Monuments shall be a minimum of thirty inches (30”) in length and shall be set so that the elevation of the top of the monument is flush with the final grade. In no case shall the monument exceed six inches (6”) below final finished grade. Plantings, fences, or other improvements shall not be installed directly over the monument.

Iron rods shall be set at all property corners, easement corners and other points as directed by the Town.

If proposed monumentation falls within a paved, concrete or rock surfaced area, then alternate markers such as a MAG or PK nail, RR Spike, drill hole, or bronze disk may be used with approval from the Town Engineer.

All monumentation shall be furnished and installed by a Licensed Professional Land Surveyor and indicated as such on the As-Built Record Drawings.

Upon completion, a Land Surveyor licensed in the State of Connecticut, shall submit a sworn affidavit stating that all pins and monuments have been set in accordance with the approved plans and Town requirements.

ARTICLE VII

CONSTRUCTION PROCEDURES

A. GENERAL CONSTRUCTION PROCEDURES

The Contractor shall take measures to control the noise intensity caused by their construction operations and equipment, including but not limited to, equipment used for drilling, pile driving, blasting, excavation or hauling.

All work performed by or on behalf of the Contractor shall be performed in compliance with all applicable federal, state and local laws, codes, regulations and published requirements.

Unless otherwise approved, construction season shall be between April and October based upon temperatures and climatic conditions. No bituminous surfacing work or concrete flat work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

In matters pertaining to highway construction, if there is a conflict between this document, as amended, and the Subdivision and/or other Land Use Regulations, then the most restrictive specification or requirement shall prevail.

The Contractor shall notify the Town Engineer of any potential conflicts and/or discrepancies with the approved plans and actual field conditions. Source of materials with current certification documentation and sieve analysis shall be provided and approved by the Town Engineer.

Before any roadways can be accepted by the Town of Cheshire, all storm sewers, catch basins, manholes, particle separator sumps, and forebays shall be flushed clean; street pavement will be swept clean; and all other disturbed lands within the right of way will be graded, loamed and seeded.

B. PRE-CONSTRUCTION MEETING

Prior to the commencement of any work on an approved application, a pre-construction conference between the developer and the contractor, who is to perform construction work on any public improvement within the Town of Cheshire, the Town Engineer or his representative, and any affected public service personnel and/or utility company shall be held.

At this meeting, emergency contact information shall be provided and an agreement shall be made on time schedules for the improvements required and the Town construction standards governing this construction. In addition, a tentative completion and inspection schedule shall be agreed upon.

Prior to the start of construction, the Contractor shall digitally photograph and/or video the project to document existing conditions, special care items and critical areas. Special attention should also be paid to areas where construction is anticipated on private property. This data shall be delivered to the Town Engineer prior to commencing any construction activities.

C. STATE ENCROACHMENT PERMIT

When work performed in the Town of Cheshire is within the State of Connecticut right-of-way, a *State Encroachment Permit* will be required prior to commencing any construction activities. A copy of the executed State Encroachment Permit shall be submitted to the Town Engineer prior to starting construction activities.

Please contact the State of Connecticut Department of Transportation (District I) Bureau of Highway Operations and Maintenance for permitting information.

D. MAINTENANCE & PROTECTION OF TRAFFIC

Refer to the Technical Standards of this document for additional specifications and requirements regarding to maintenance and protection of traffic.

The Contractor shall maintain and protect pedestrian and vehicular traffic in accordance with the requirements and regulations of the applicable State and Local Regulatory Agencies and these Guidelines. Construction activities shall not interfere with the normal flow of traffic.

Unless otherwise approved, Contractor must permit continued access to businesses, residences, and intersecting streets. Unless otherwise coordinated, no residential or non-residential driveway access shall be closed for more than a 3-hour period.

All construction equipment and materials shall be placed or stored in such a way and in such locations as will not create a hazard to the general public. Paved roadways or sidewalk areas shall not be used for staging of equipment or materials without the express consent of the Director of Public Works or the Director of Engineering.

E. TRAFFIC CONTROL PLAN / ROAD CLOSURE

Where deemed appropriate thereby, the Town Engineer, the Director of Public Works, or the Chief of Police may require, at any time, the permittee to submit thereto, for review and written acceptance thereby, and implement, a traffic control plan detailing the means and methods to be employed by the Permittee in meeting the maintenance and protection of traffic obligations set forth herein.

The specific requirements of any particular traffic control plan for any particular situation shall be determined by the Chief of Police on a case-by-case basis, as deemed appropriate thereby.

No public way may be entirely closed to any mode of traffic intended or allowed prior to the commencement of the work except by express direction of the Chief of Police, except in the case of an emergency. In case of any such emergency, the Permittee shall notify the Police Department immediately.

F. EROSION & SEDIMENTATION CONTROL MEASURES

Refer to the Technical Standards of this document for additional specifications and requirements regarding to erosion and sedimentation (E&S) control measures.

The transportation of eroded materials onto Town roads or into drainage systems is prohibited. The applicant shall demonstrate that appropriate permanent measures are utilized to ensure the stability of earthen materials. All proposed solutions, such as plantings, permanent fabrics and other measures shall be selected based on site conditions of soil type, topography (grade), location, etc.

An Erosion & Sediment Control Plan shall be prepared in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control, showing location of all E&S control measures needed.

Erosion & Sediment Control BMP's shall be installed prior to construction. E&S control will require daily diligence by the Contractor to avoid erosion and sedimentation problems and illicit discharges to the environment and the public right-of-way.

A proper construction entrance shall be provided and maintained. Any trash, debris, or sediment tracked onto a public road shall be removed and swept daily. The Contractor shall also provide for prevention and control of dust resulting from all construction activities.

Additional E&S shall be installed by the Contractor at the direction of the Town Engineer or Town's designated representative as warranted by changing site conditions. The cost thereof shall be borne by the Contractor.

G. DUST CONTROL

The Contractor shall provide water and/or calcium chloride and all equipment, labor, materials and related work necessary for the prevention and control of dust resulting from operations in the performance of the work.

Water used shall be non-polluted. Calcium chloride shall conform to the requirements of AASHTO M 144 (ASTM D-98) except that the pellet and flake forms shall be equally acceptable.

The Contractor shall exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods.

Pavements adjoining the pipe trenches shall be kept broomed off and washed clean of excess trench material wherever and whenever directed. Water and/or calcium chloride shall be applied to surface of all disturbed areas at such rates and at such times as may be directed by the Town Engineer to allay dust conditions.

Should the Contractor or their employees neglect to provide proper dust control, as required in these Specifications, the Town immediately, and without notice may furnish such dust control measures as are deemed necessary. The cost thereof shall be borne by the Contractor.

H. CONSTRUCTION INSPECTION

The Contractor shall notify the Public Works Department at the beginning and end of each step of the construction procedure, and shall <u>not</u> proceed with the next step until the Town Engineer or authorized agent for the Town has caused the work to be inspected. See *Inspection Checklist* sheet in the Appendix for reference.

Failure to comply with construction inspection requirements may result in delay of any bond release(s) and any work that is performed and covered without Town inspection may require the work to be tested, uncovered and replaced; all at the Contractor's expense.

All materials and each part or detail of the work shall be subject at all times to inspection by the Town Engineer or designated representative.

The Town Engineer or designated representative shall be allowed access to all parts of the work to monitor compliance with approved plans and applicable ordinances, laws, regulations, and policies; and shall be furnished with such information and assistance as deemed necessary to make a complete, detailed, and timely inspection.

Timely advanced notice of **at least 24-hours** for inspections of all phases of construction is required, and requested to be made to the Department of Engineering. Please call (203-271-6650) or email DPWengineering@cheshirect.org to schedule all necessary inspections. See *Inspection Checklist* sheet in the Appendix for required inspection phases.

Town inspections shall be performed during Town of Cheshire normal working hour, which are from 8:30 a.m. to 4:00 p.m. daily, Monday thru Friday, excluding holidays.

If any work is performed and covered without Town inspection, the Town Engineer may require the work to be uncovered and replaced at the Contractor's expense.

For private construction projects or work being performed outside of the town's right-of-way, it is recommended that inspection be performed by an independent company to verify compliance with design and town standards.

The Town of Cheshire will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto; and will not be responsible for the Contractor's failure to perform the work.

The Town of Cheshire will not be responsible for the acts or omissions of the Contractor or any subcontractor, or any of their agents, servants or employees, or any other persons at the site or otherwise performing any of the work.

The Engineering Dept. is not authorized to revoke, alter, enlarge, relax or release any requirements of approved plans or specifications, nor issue instructions contrary to any approved plans or specifications.

Any advice which the Town Engineer or designated representative gives the Contractor shall in no circumstance be construed as binding the Town of Cheshire in any way nor releasing the Contractor from fulfilment of the terms of these Public Improvement Standards.

I. CONSTRUCTION BONDS & INSPECTION FEES

Public Improvement bonds that have received final approval from the Planning & Zoning Commission shall be posted as described by the Town of Cheshire's Zoning regulations.

As part of this process, the Developer shall submit a quantity estimate for the proposed public improvements and common facilities for certain private improvements to the Engineering Department

for review. Following review, a recommendation for a construction and maintenance bond amount shall be provided based on unit costs assigned by the Town Engineer.

Requests for a partial bond release for accepted public improvements may be made by the Developer to the Town Engineer or to the Office of Planning & Development. After receiving the request, the Town Engineer will review the work completed for acceptability and will determine an appropriate amount for the bond release based on the value of work completed and remaining work to be done. A recommended bond amount available for release will then be made by the Town Engineer to the Office of Planning & Development.

The amount and frequency of bond releases will be at the sole discretion of the Town. In the event that unit prices increase significantly over the duration of construction, The Town reserves the right to withhold bond funds based on the current cost of the remaining public improvements as determined by the Town.

An Inspection Fee shall be provided to the Department of Public Works prior to commencement of work. Said fee is based on two percent (2%) of the construction bond estimate approved by the Town Engineer.

J. CONSTRUCTION DESIGN CHANGES

The Contractor shall notify the Town immediately of any potential changes to the approved plans. Any changes from the approved plans require review and approval by the Town prior to construction. If deemed necessary by the Town, the Contractor must submit a plan prepared and certified by the Design Engineer of record, documenting the changes to the approved plan.

The proposed changes shall be submitted to the Town Engineer or Town Planner as required. Depending upon the nature of the change and/or impacts, the modification(s) may require additional approvals, and an application may have to be submitted to the Town Planning & Zoning Commission, Town Inland Wetlands Commission, Town Water Pollution Control Authority, or other regulatory agencies. Any changes to the approved plans shall be submitted to the Town Engineer for a determination.

K. SHOP DRAWINGS / MATERIAL CERTIFICATIONS

The Contractor shall obtain the Town Engineer's approval of the source of supply of each of the materials to be used with the Town's right-of-way prior to delivery and use of such materials.

Any deviations that shop drawings or material certification has from the requirement of the specifications shall be called to the attention of the Town Engineer. Approval shall be only for conformance with the design concept and compliance with the specifications. No work requiring an approved shop drawing shall commence until the submission has been approved.

L. MATERIALS TESTING / MATERIAL VERIFICATION

The Developer is responsible for hiring a geotechnical engineer or testing Laboratory to provide any required testing, or as requested by the Town Engineer. Material testing reports for concrete, asphalt, base course, etc. shall be submitted to the Town Engineer for review. Densities must comply with Town Standards.

Prior to binder course placement, all compaction test results must be received as well as an interim as-built survey (plan & profile) signed by a Connecticut licensed Land Surveyor, which will be reviewed for conformance by the Town Engineering Department.

The Developer is also responsible for providing the Engineering Department with concrete and asphalt delivery tickets to ensure materials used are in conformance with these Public Improvement Standards.

M. COMPLIANCE TESTING

The Town Engineer may order a materials test on any public improvement in order to determine if the work has been or is being completed in accordance with the approved plans, specifications, and these Public Improvement Standards. If the Contractor fails to notify the Town during each step of the construction procedure then the materials testing shall be borne by the Contractor.

If any of these tests reveal any material or workmanship to be in violation of the approved plans, specifications, or these Public Improvement Standards, then the Contractor and/or Developer shall pay the cost of the testing and all required subsequent testing necessary to verify the proper standards have been met.

If any work is defective, or the Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, the Town Engineer may order the Contractor and/or Developer to stop work, or any portion thereof, until the cause for such order has been eliminated.

N. CORRECTION OF UNSATISFACTORY WORK

Where the Town Engineer or any other authorized representative of the Town determines at any time, including during any warranty period, that any work or activity are not in compliance with the provisions of this document or any condition of the subject permit, or any applicable directive of the Town Engineer or other authorized representative of the Town, and the Permittee has been notified of the same, or otherwise observes or becomes aware of such non-compliance, then the Permittee shall correct the same, at their expense, in a timely manner.

Where the Permittee is actively working covered by the subject permit, then the Permittee shall commence such corrective measures within twenty-four (24) hours of the issuance of such notice, unless otherwise allowed by the notifying authority.

Where the Permittee has demobilized from the subject site (including during the warranty period), then the Permittee shall commence such corrective measures within five (5) days of the issuance of such notice, unless otherwise allowed by the notifying authority.

Failure to correct any unsatisfactory work or abide by these regulations may result in the Town contracting the work to be done by others; the Permittee may be billed at cost plus 10% administrative fee; and/or may result in bond forfeiture and/or suspension of permit privileges.

O. UTILITY COORDINATION

The Contractor is responsible to call CBYD (Call Before You Dig) at 1-800-922-4455 to allow notification of utilities before commencing excavation. The Contractor shall coordinate their own work and that of

any subcontractors with all utilities in the work area. The developer shall insure that no conflicts exist between the utilities and any other buried structures or pipes.

The Contractor shall schedule their operations in such a manner as to minimize interference with the operation of the utility companies or the Town for the installation of new facilities as shown on the plans or relocation of their existing facilities.

Whenever pole lines, guys, braces or anchors are to be placed or relocated, then these locations shall be staked for approval by the Town Engineer or designated representative.

The Developer shall make arrangements to have the electric and any other public service facility (i.e. phone, cable, fiber optic, etc.) be installed underground in accordance with the specifications of the Town of Cheshire ads the public service organization(s) serving the area. All service connections from underground distribution lines shall be underground.

Underground utility vault boxes shall not be placed on property corners. Locations shall be subject to approval by the Town Engineer.

Where utilities are underground, the Developer shall acquire easements where necessary and may be required to submit drawings to the Town Engineer for approval. In addition, underground utilities placed shall be shown on the final as-built or record drawings.

P. EXCAVATION & BACKFILL

Refer to the Technical Standards of this document for additional specifications and requirements regarding to excavation and backfilling.

The limits of excavations shall be kept as small as practical to carry out the subject work. In any case where the limits of an excavation are expanded beyond what was anticipated at the time of permit issuance or the original pavement removal limits due to instability of one or more sides of the excavation, the Permittee shall notify the Town Engineer of the situation immediately once the excavation has been stabilized.

The Contractor shall use support systems such as trench boxes, sheeting, bracing, shoring, etc., as required by OSHA to support the sides of the excavation. Such support systems shall be installed as required for protection of the work and for the safety of all personnel.

Fills shall not be started until the area has been inspected and approved by the Town Engineer or his representative.

Backfill material shall be deposited in layers not to exceed six inches (6”) thick and each layer shall be thoroughly compacted before the addition of other layers. Appropriate utility marking tape shall be provided for all public utilities installed or uncovered prior to backfill.

Only material from excavation or borrow pits approved by the Town Engineer shall be used as fill. The Town Engineer may require certification by a Professional Engineer of any questionable material to insure its conformity with the specifications.

All soft yielding or unsuitable Subgrade material shall be excavated and replaced with granular material acceptable to the Town Engineer. The Town Engineer may require installation of geotextile fabric to stabilize subgrade as determined necessary.

When ledge rock is encountered, this material shall be excavated to a depth of not less than 2 feet below subgrade unless otherwise directed.

Material removed below grade shall be replaced with approved material thoroughly compacted or as otherwise directed by the Town Engineer.

All fill that is placed to an elevation of less than three feet (3') above the water table at the time of filling shall consist of rock or free-draining soil meeting specifications. The subgrade shall be rolled with minimum of ten-ton roller before placing the base course.

Appropriate compaction equipment shall be on site prior to commencing excavation operations. Failure to comply with this provision to any extent may be considered failure to comply.

Compaction of backfill shall be performed with mechanical equipment specifically designed and marketed for such purposes (i.e. "jumping jack compactor"). The use of a single plate (one direction) vibratory compactor shall not be used in trench repair work. The use of the outside of an excavation bucket or driving over an area to attempt to achieve proper compaction is also not acceptable.

Detention basins and berms shall not be constructed during freezing weather or on a wet or frozen Subgrade.

Q. SHEETING / STEEL PLATES

No trench excavation shall be left open and uncovered at any time when the permittee is not present at the subject work site.

Use of steel plates to protect open excavations is generally discouraged. Approval by the Town Engineer is required for this method. Steel plates will not be allowed between November 15th and April 1st .

Where appropriate, steel plates of sufficient strength, size, and anchoring may be used to temporarily cover open trench areas during such times. When steel plates are used for temporary bridging of the roadway or sidewalk, design, construction methods, and installation shall be performed in accordance with the *State of Connecticut Department of Transportation Office of Maintenance Operation Temporary Steel Plate Use Within Highway Right Of Way* policies.

Where travel of any kind is allowed or anticipated over such a steel plate cover, then asphalt pavement (for transition to paved areas) or compacted gravel (for transition to non-paved areas) shall be used to provide an appropriate transition for travel from the adjacent areas onto and off the subject steel plate.

R. BLASTING & EXPLOSIVES

When the use of explosives is required, the Contractor shall secure all necessary permits and shall observe all State, Federal and Municipal laws, ordinances and regulations relating to the transportation, storage, and handling and use of said explosives. All necessary permits and licenses shall be obtained by the Contractor at his expense.

Refer to the Technical Standards of this document for additional specifications and requirements regarding to blasting and explosives.

S. HORIZONTAL DIRECTIONAL BORING

Pipes and conduits shall generally be placed by the open cut method (Trench Excavation). In individual cases where there is a deep installation and heavy traffic or other special circumstances, The Town Engineer may allow or even require that the installation be made by pipe jacking, ramming, or horizontal directional boring when such method is of definite benefit to the traveling public.

No jetting or other use of water shall be allowed in connection with horizontal directional boring or pipe jacking. The Permittee shall be responsible for careful investigation of the work area to determine the location of all existing (public and private) structures, pipes, and utilities lines.

When required by the Town Engineer, detailed plan and profiles showing all existing features and proposed installation shall be submitted for review prior to construction. Said plan shall also show method of operation, including the jacking and receiving pits, cradles, and thrust blocks.

T. COLD WEATHER CONSTRUCTION

No person, company or utility shall be granted a Street Excavation Permit or excavate any street, sidewalk, or driveway apron from the time of October 15th of each year to April 15th of the following year unless an emergency or special condition exists and permission is obtained in writing from the Public Works Department. These dates may be modified only with written consent of the Town Engineer.

All construction activities should occur during warm and dry weather conditions; generally when air temperatures or subbase temperatures are above forty degrees Fahrenheit (40°F) and rising. The placing of bituminous concrete or portland cement concrete requires special consideration or protective measures during cold or freezing weather conditions.

Construction activities occurring during winter months on any permanent improvements intended for public use will not be permitted unless approved by the Town Engineer or designated agent. The Town Engineer shall make decisions on special condition permit approvals based on winter weather conditions, forecasts, and the availability of materials. Additional bonding provisions may be required.

U. TREE REMOVAL

The cutting, pruning or removal of any tree or shrub within the limits of any public road or grounds, except those along the State right-of-way, shall require at least a fourteen (14) day notice to the Town Tree Warden for required posting per the Connecticut General Statutes.

The limits of any Town easement or property line adjacent to the removal shall be clearly marked by stake and flagging before posting of any trees or shrubs can be made.

No cutting, pruning or removal of any tree or shrub can proceed until notification has been made by the Town Tree Warden that the posting period has ended. Disposal of trees, shrubs, and/or stumps are prohibited from being buried or disposed of on site.

V. RECORD DRAWINGS / AS-BUILT SURVEYS

Record drawings (As-Built Surveys) shall be provided and prepared in accordance with this document and shall receive the approval of the Town Engineer prior to acceptance. See As-Built Plan Specifications for plan requirements.

Plans shall be submitted digitally along with two (2) hard copy paper sets. One (1) mylar print shall be filed on the land records. Additional mylar prints shall be provided upon request of the Town Engineer.

The Developer shall submit these plans with all necessary signatures, and have their attorney submit warrantee deed(s) for streets and drainage easements (if any) together with the maintenance bond, if applicable.

W. PUBLIC IMPROVEMENT CERTIFICATIONS / ROAD ACCEPTANCE

The Developer shall submit a construction certification letter, from the Design Engineer licensed in the State of Connecticut, that all improvements (i.e. sidewalks, ramps, roads, storm drainage, etc.) have been built in accordance with the approved plans and Town requirements.

The Developer shall also submit a submit a sworn affidavit, from a Land Surveyor licensed in the State of Connecticut, that all pins and monuments have been set in accordance with the approved plans and Town requirements.

The Design Engineer shall submit a sworn affidavit stating that the sidewalks and ramps installed are compliant with ADA Standards for Accessible Design.

No street or public facility shall be accepted until all public improvements and public service facilities have been installed and are in operation. The developer shall be required to maintain all improvements and shall provide for snow removal on streets and sidewalks until acceptance of all public improvements by the Town.

X. EASEMENTS AND WARRANTY DEEDS

The Developer shall submit to the Town for review, draft documentation for all easements as identified on the approved plans. Said conveyances are to be in the approved format as described in this document (for storm and sanitary easements), or as provided by the Planning & Zoning Department.

Upon approval by the Town, the Developer shall deliver executed conveyances for all easements to either the Town Engineer or the Town Planner. Once accepted, the Developer will then file the final easement documents along with the appropriate approved mylars in the Town Clerk's office.

All warranty deeds for land to be acquired by the Town of Cheshire within approved subdivision or site development plans, shall be submitted to the Town for review and approval. Upon approval by the Town, the Town will hold the warrantee deed in escrow until there is final acceptance of the Public Improvements by the Town.

ARTICLE VIII

TECHNICAL SPECIFICATIONS

INTRODUCTION

All work within this document shall conform to the requirements of the CTDOT Standard Specifications, as amended; and any applicable Safety Code.

CTDOT Standard Specifications shall mean the latest edition of the State of Connecticut, Department of Transportation, Bureau of Highways, "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, as amended to date.

Regarding items for which a specification is provided herein, only those portions that are referred to in the "Materials" section of the Standard Specifications shall apply. For any item for which a specification is not provided herein, the Standard Specification shall apply and it is understood the Town of Cheshire is the Owner.

Applicable Safety Code shall mean the latest edition including any and all amendments, revisions and additions thereto of the Federal Department of Labor, Occupational Safety and Health Administrations' "Occupational Safety and Health Standards" and "Safety and Health Regulations for Construction," the State of Connecticut, Labor Department, "Construction Safety Code," or State of Connecticut "Building Code," whichever is more stringent for the applicable requirement.

SITE PREPARATION

(CLEARING & GRUBBING)

A. DESCRIPTION

The Contractor shall do all work necessary for the movement of personnel, materials and equipment to and from the project site, and for the establishment and removal of all Contractor's facilities necessary to the performance of the work and shall do clearing and grubbing as required for the work, as shown on the Contract Drawings, as specified in the Special Provisions, or as directed by the Town Engineer.

This Work shall include all types of work usually included in the clearing and grubbing item except that restoration will be done under "Right-Of-Way Restoration." It is the intent of-these specifications that work done shall minimize the disturbing effect of construction. Therefore, only such clearing and grubbing (cutting and removing shrubbery, bushes, trees, roots, stumps, organic matter, fences, other surface structures and objectionable materials) as is absolutely necessary to perform the work shall be done.

B. RELATED SPECIFICATIONS

- MAINTENANCE AND PROTECTION OF TRAFFIC
- EROSION & SEDIMENTATION CONTROL (E&S)
- RIGHT-OF WAY RESTORATION

C. MATERIALS AND CONSTRUCTION METHODS

Prior to commencing this work, the Contractor shall install all erosion & sedimentation control measures deemed necessary and as shown on the approved plan, or as directed by the Town Engineer.

The Contractor shall remove trees, stumps, brush, rubbish and all objectionable material only as required to perform the work. The Contractor shall control operations so as to minimize the disturbance to all areas, minimizing cutting and damage to trees, etc. which are to be preserved.

Excavating machinery shall be handled with care to prevent damage to trees, particularly to overhanging branches and limbs and to other property. Protection may include fences and/or boards lashed to trees to prevent damage. Any damage caused by the Contractor's operations shall be repaired as directed by the Town Engineer.

The Contractor shall carefully cut off all branches of trees to be saved that interfere with construction operations or which have been broken or injured during construction. Prior to commencing clearing and grubbing operations, the Contractor shall walk the job with the Town Engineer in order to determine and mark the extent of clearing and grubbing.

Where the root structure of existing trees interferes with the work, the Contractor will be required to cut and trim the roots in an acceptable manner. Where soil over the roots of trees to be preserved has become compacted, it shall be restored by proper cultivation to a condition which will permit adequate aeration of the soil.

All branches and root surfaces which become exposed by cutting shall be painted with approved asphalt base tree paint. All tree repairs and painting of tree wounds with asphaltic paint shall be as approved by the Town Engineer.

All new and existing ditches, waterways, drainage structures and culverts shall be cleaned of obstructions resulting from construction operations including any existing downstream channels, culverts, etc. that have sediment or are obstructed.

All wood, timber, trees, stumps, and brush shall be disposed of off-site within 15 days after cutting or felling unless otherwise ordered.

Due to the air pollution potential, open burning is discouraged and will only be permitted after receiving the approval in writing from the Local Regulatory Agencies. The Contractor shall obtain all permits required. The Contractor is further warned that any such permits obtained may be revoked at any time for reasons including Air Pollution Alerts issued by the Commissioner of Health or Local Regulatory Agencies. The revocation of such permits shall in no way relieve the Contractor of his responsibility to dispose of the materials as herein specified. No claims for extra compensation for such other means of disposal as may be required shall be considered.

It shall be the responsibility of the Contractor to locate suitable places for the lawful disposal of brush, logs, chips, and stumps. Such sites shall be approved by the State & Local Regulatory Agencies in writing and acquired by the Contractor at his own expense unless otherwise stated elsewhere in the Contract Documents. Disposal of trees and stumps are prohibited from being buried or disposed of on site.

The Contractor shall prevent all damage to installations such as pipes, conduits, wires, cables or structures above or below ground; and shall ascertain from the owner of said utilities or installations any special construction methods or precautions which should be employed while working in proximity to same.

No land monuments, property markers, or official datum points shall be damaged or removed until an authorized agent approved by the Town Engineer has witnessed or otherwise referenced their location and approved their removal.

All fences, railings, road signs, mailboxes, utilities, stone wall fences and ornamental and utilitarian domestic accessories, such as but not limited to garden pools, arbors, fireplaces, and sheds interfering with the Work shall be removed and reset as directed. Items required to be temporarily reset during construction such as road signs, mailboxes, etc. shall be completed under this item without additional compensation.

MAINTENANCE AND PROTECTION OF TRAFFIC

A. DESCRIPTION

The Contractor shall maintain and protect pedestrian and vehicular traffic in the project area in accordance with the requirements and regulations of the applicable State and Local Regulatory Agencies and these Specifications. Unless otherwise specified, the Contractor must maintain pedestrian and vehicular traffic to permit access to businesses, factories, residences, and intersecting streets.

It shall be the responsibility of the Contractor to pre-warn the State and Local Regulatory Agencies (including but not limited to the Police and Fire Departments) at least 72 hours in advance of changes in traffic patterns due to reduction of pavement widths or closing of streets.

The Contractor shall furnish, install, maintain, adjust, and store all signs, barricades and traffic cones, as necessary to carry out traffic routing plan and maintain vehicular and pedestrian traffic.

B. RELATED SPECIFICATIONS

- SITE PREPARATION (CLEARING & GRUBBING)
- EROSION & SEDIMENTATION CONTROL (E&S)

C. MATERIALS AND CONSTRUCTION METHODS

ACCESS:

The Contractor shall arrange operations to provide access to properties along the street including temporary bridges to driveways, and provide access to fire hydrants, manholes, gate boxes, or other utilities. Whenever any work obstructs traffic in or to any public way, private driveway, or property entrance, the Contractor shall take such steps as required to maintain necessary traffic and access including temporary bridging if required. The Contractor shall confine the occupancy of public or traveled ways to the smallest space compatible with the efficient and safe performance of the work.

The Contractor shall observe and obey all local and state laws, ordinances, regulations and permits in relation to the obstruction of streets and highways, keeping passageways open and protecting traffic where there may be danger from blasting or other construction activities.

If the Contractor's operations shall interfere with the removal or sanding of snow or ice by the public authorities or adjoining land owners, in an ordinary manner with regular highway equipment, the Contractor shall be required to perform such services for the public authorities or adjoining owners without charge.

If the Contractor fails to do so, then they shall reimburse the said authorities or adjoining owners or the Owner for any additional cost to them for doing such work occasioned by conditions arising from the Contractor's operations, occupancy, or trench surfaces, together with any damage to the equipment of said parties by those conditions, or claims of any parties for damage or injury or loss by reason of failure to remove snow or ice or to sand icy spots under these conditions.

TRAFFIC PERSON:

The Contractor shall provide the services of uniformed traffic men at such locations and for such periods as the Town Engineer may order for the control and direction of vehicular traffic and pedestrians. Traffic men shall consist of uniformed police officers from the Town of Cheshire Police Department. The Contractor shall be solely responsible for all arrangements in advance to schedule such officers, and to obtain a determination as to where and when the use of uniformed officers is required rather than certified flaggers. Reference is made to the Traffic Control Ordinance adopted by the Town Council on April 10, 2018.

SIGNS:

Properly lighted, adequately sized, dear, concise, legible signs shall be furnished as necessary for the safe regulation of traffic.

BARRICADES:

Suitable barriers or barricades shall be furnished by the Contractor and put up and maintained at all times during the night or daytime, around all open ditches, trenches, excavations, or other work potentially dangerous to pedestrians and traffic. Barricades shall be placed on all sides and throughout the entire length of all open ditches, trenches, excavations, or other work which must be barred to the general public Barricades shall be properly painted in order to retain a high degree of visibility to vehicular and pedestrian traffic.

FLASHERS:

The Contractor shall furnish and securely fasten flashing units to signs, barricades, and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic. The flasher shall be in operation during all hours between sunset and sunrise, and during periods of low visibility. The Contractor shall maintain, relocate and operate barricades and flashers throughout the life of the contractual work. No special payment will be made for lights or flashers.

TRAFFIC DRUMS:

The Contractor shall have, available on the project, a sufficient number of traffic drums to fulfill all the requirements, as specified in the contract, to provide adequate traffic control on roadways during periods of unforeseen circumstances or emergencies.

Traffic drums shall be designed and installed to adequately and safely control traffic and in accordance with the "Manual on Uniform Traffic Control Devices", latest edition, and as directed by the Town Engineer.

Traffic drums shall be lit by flashers in accordance with this paragraph or other lighting methods approved by the Town Engineer in lieu thereof. Flashers shall be power operated, lens directed, enclosed light unit which shall provide intermittent light from 70 to 120 flashes per minute, with the period of light militancy occurring not less than 25 percent (25%) of each on-off cycle, regardless of temperature. The emitted light shall be yellow in color and the area of light on at least one face of the unit shall be not less than 12 square inches. The discernible light shall be bright enough to be conspicuously visible during the hours of darkness at a minimum of 800 feet from the unit under normal atmospheric conditions. For

units which beam light in one or more directions, the foregoing specifications shall apply 10 degrees (10°) or more to the side and 5 degrees (5°) or more above and below the photometric axis.

Suitable lighted traffic drums shall be furnished by the Contractor and put up and maintained at all times during the night or daytime, around all open ditches, trenches, excavations, or other work potentially dangerous to pedestrians and traffic. Traffic drums shall be placed throughout the entire length of all open ditches, trenches, excavations, or other work.

The Contractor shall furnish and securely fasten flashing units to traffic drums and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic. The flasher shall be in operation during all hours between sunset and sunrise, and during periods of low visibility. The Contractor shall maintain, relocate and operate traffic drums and flashers throughout the life of the contract.

Traffic drums shall be 55-gallon weighted plastic containers or approved equal and shall be suitably weighted with rubber ballast rings so as to minimize accidental movement of the drum.

Reflective sheeting shall conform to CTDOT Standard Specifications. For this material, a Certificate of Compliance shall be required.

Traffic drums, which have become damaged, defaced or are missing, shall be promptly replaced by the Contractor. When the traffic drums are no longer required on the project, they shall be removed from the highway property and shall remain the property of the Contractor.

DETOURS:

If a detour is deemed necessary, a proposed detour plan will be submitted to the Town Engineer and the applicable Regulatory Agencies in sufficient time for proper review and approval.

NONPERFORMANCE:

Should the Contractor or their employees neglect to set out and maintain barricades or signs, as required in these Specifications, the Town of Cheshire immediately, and without notice may furnish, install and maintain barricades or signs. The cost thereof shall be borne by the Contractor.

The Contractor will be held responsible for any damages that the Town may have to pay as a consequence of the Contractor's failure to protect the public from injury.

BLASTING AND EXPLOSIVES

A. DESCRIPTION

When the use of explosives is required, the Contractor shall secure all necessary permits and shall observe all State, Federal and Municipal laws, ordinances and regulations relating to the transportation, storage, and handling and use of said explosives. The Contractor shall particularly comply with "Administrative Regulations, Connecticut State Police Department, Storage Transportation and Use of Explosives and Blasting Agents", dated April 18, 1972, as amended.

The Contractor is required to be thoroughly familiarized with the regulations. Copies of these regulations may be obtained at State Police Headquarters or at the State Fire Marshal's Office.

B. RELATED SPECIFICATIONS

- SITE PREPARATION (CLEARING & GRUBBING)
- EROSION & SEDIMENTATION CONTROL (E&S)

C. MATERIALS AND CONSTRUCTION METHODS

All necessary permits and licenses shall be obtained by the Contractor at his expense. In the event that any of the above mentioned laws, ordinances or regulations require a licensed blaster to perform or supervise the blasting, said blaster shall, at all times, have their license on the site and shall permit examination thereof by any official having jurisdiction.

Explosives must be carefully transported, stored, handled, and used. The Contractor will keep on the job only such quantities of explosives as may be needed for the work and only during such times as they are being used. Explosives shall be stored in a secure manner in locked containers and separate from all tools. Caps and detonators shall be stored separately from other explosives.

An accurate blasting log must be maintained continuously for the duration of the work. The log shall record, for each shot the location, number of holes, depth, spacing, amount of explosive per hole, number of caps used and the exact date and time of blast.

Explosives shall be such power and placed and used in such quantities and positions as will not make the excavation unduly large, nor shatter unnecessarily the rock upon or against which the work is to be built, nor injure adjacent persons or property, those portions of the new work or structure as may already be in place or other adjacent pipes, ducts or other structures. The quantity of explosives fired at one blast must be small enough and the time for blasting selected to avoid undue annoyance to persons owning or occupying premises near the work.

The rock must be completely matted when blasts are fired to prevent damage or injury to persons or property or the scattering of broken fragments on the adjacent ground. Adequate warning shall be given all persons in the vicinity before any blast is discharged.

When blasting is required, the operation shall be conducted with such care as not to cause damage to any of the existing underground utilities. Should such occur, the cost of repairs shall be the sole responsibility of the Contractor.

When blasting for trench excavation, each shot sequence shall begin sufficiently ahead of completed work to prevent damage to the completed work which must be properly protected prior to each shot.

In areas where the proposed construction is built against the face of the rock excavation, all loosened or shattered portions of the rock must be completely removed by barring, wedging or other approved means so the masonry can be built firmly in contact with solid rock.

The Contractor shall notify each public utility or others having structures in proximity to the site, and others who may be affected, of his intention to use explosives. Said notice shall be given in accordance with the applicable regulations therefore and sufficiently in advance to enable the involved agencies/ companies/persons and the Contractor to take such steps as may be necessary to protect life and property. Such notice shall not in any way relive the Contractor of responsibility for any damage resulting from his blasting operations.

When, in sufficiently close proximity to existing gas, water, sanitary, storm, subway or other utilities and structures and all services connected thereto, the Contractor shall remove the rock by methods other than blasting, if necessary, in order to protect said utilities and their services from damage. Approved methods other than blasting are barring and wedging, jack hammer, drilling or other such hand or machinery methods which will not damage the adjacent utility.

No explosives shall be brought into, stored or used on the site of any job by the Contractor unless and until he shall furnish the Engineer with a satisfactory certificate of insurance showing that the risks arising from the presence and use of explosives and from blasting are included within the insurance provided by the Contractor to secure his obligations to the Town. Insurance should also cover damage to any underground utilities or other underground facilities.

Indemnity Clause: "The Contractor shall, at all times, indemnity and save harmless the Town, and the Engineer and their agents and employees and employees from and against all loss and expense (including attorney's fees) by reason of liability imposed by law upon the Town, or Engineer for damages because of bodily injury, including death at any time resulting therefrom, sustained by any person or persons or on account of damage to property, including loss of use thereof, arising out of or in consequence of the performance of this work, whether such injuries to persons or damage to property is due or claimed to be due to the negligence of the Contractor, his subcontractors, the Town or the Engineer, their agents or employees, except only such injury or damage as shall be determined by a court of law to have been caused by the sole negligence of the Town or Engineer."

The Engineer may require the Contractor to schedule and hold a pre-blast conference attended by representatives of all affected utilities, the Fire Marshal, a representative of his insurance carrier and other appropriate parties.

EROSION & SEDIMENTATION CONTROL (E&S)

A. DESCRIPTION

The work under this section shall consist of any and all temporary and/or permanent measures to control water pollution and soil erosion as may be required, specified herein, or directed by the Town Engineer, during the construction of the work and for such a length of time after the completion of work as determined by the Town Engineer.

This work also applies to any construction work in or near any watercourse or water body resulting in water pollution or soil erosion.

The work shall consist of measures to control water pollution and soil erosion through the use of berms, dikes, dams, sediment basins, netting, fences, hay bales, gravel, mulches, grasses, slope drains, ditches, channels, riprap, anti-tracking pads, grading to control surface runoff and other erosion control devices or methods.

B. RELATED SPECIFICATIONS

- SITE PREPARATION (CLEARING & GRUBBING)

C. MATERIALS

The materials for E&S shall conform to CTDOT Standard Specifications and shall be satisfactory to the Town Engineer and may consist of the following:

1. Mulches may be hay, straw, wood cellulose, wood chips, stone, netting, burlap, plastic sheets or other suitable mulch material acceptable to the Town Engineer. Mulches shall be reasonably clean and free of noxious weeds and deleterious materials.

2. Slope drains or ditches may be constructed of pipe, rubble, riprap, sod, burlap, jute and excelsior matting, plastic sheets, portland cement concrete, bituminous concrete or other material satisfactory to the Town Engineer.

3. Grass shall conform to the specifications for "Turf Establishment" except that the seeding may be altered by the Town Engineer if requested by the Contractor to suit special areas or conditions.

D. CONSTRUCTION METHODS

Construction methods shall, in general, be in accordance with the provisions set forth in the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control" published by the Connecticut Council on Soil & Water Conservation and CT DEP (Bulletin 34), available for download on-line at the CT Department of Energy and Environmental Protection’s website.

Prior to the commencement of any work, the Contractor shall submit to the Engineer the proposed methods of water pollution and soil erosion control to be incorporated in the work.

In general, all construction activities shall proceed in such a manner so as not to pollute, insofar as possible, any watercourse, water body, conduit carrying water, etc., all in accordance with this specification and to the satisfaction of the Town Engineer.

The Contractor shall be responsible to limit, insofar as possible, the surface area of earth materials exposed by construction methods, immediately provide permanent and temporary pollution control measures to prevent contamination of adjacent watercourses and water bodies, and prevent, insofar as possible, erosion on the site and abutting property.

All slopes of stockpiled and excavated materials, all borrow stored on the site, al1 embankments and/ or filling operations sloping into or near watercourses, water bodies, wetlands, etc., and all other disturbed areas shall be protected with mulching, seeding or plastic sheets. A temporary system of anchored bales of hay or straw or silt fence shall be placed at or near the toe of all exposed earth surfaces as ordered by the Town Engineer and at other locations may be directed, until such areas are reduced in grade or permanently stabilized.

When working in open areas such as fields, the Contractor shall limit his construction activities to as small an area as possible so as to have the least disturbing effect on the land. All damaged areas shall be repaired as soon as possible.

Temporary channels, ditches and outfalls shall be protected prior to directing water into them to prevent erosion. Netting, asphalt sprays, or other anchoring devices shall be used to secure mulches other than stone when placed within the channels, ditches and watercourses.

The Engineer has the authority to direct the Contractor to divert surface water runoff away from exposed earth surfaces through the use of temporary berms, dikes, dams and diversion channels.

The Contractor shall, at all times, have on hand the necessary materials and equipment to provide for early slope treatment and corrective measures to damaged slopes.

The erosion control features shall be installed and maintained by the Contractor, and shall be checked periodically and after each severe rain storm for damage, until such features are no longer needed.

Ditches, sediment traps etc. which are or become filled or partly inoperative shall be cleaned and made operative before the Contractor stops work for any day and shall be maintained in a condition satisfactory to the Town Engineer throughout the duration of the project.

The Contractor shall be responsible for the preservation of all stream banks within and adjacent to the limits of work. No excavation, stockpiling, or construction equipment will be permitted within ten feet (10’) of the top of any stream bank or water body, unless required for the work shown on the Contract Drawings. Any stream bank disturbed by the Contractor's operations will be riprapped or otherwise repaired as ordered by the Town Engineer.

In all cases involving work in a water body, every effort should be made to return the water body to the highest possible standard for aesthetic value, water quality and fish habitat.

At stream crossings, the Contractor's work shall meet the following minimum standards:

a. Sufficient flow of water shall be maintained at all times to sustain aquatic life.

b. Any divergence of the stream shall provide a “V” or “disc-shaped” channel, to concentrate flow during periods of low water.

c. Disturbance of the streamed shall be kept at an absolute minimum, and the streamed shall be returned as nearly as possible to its original condition or better. (Where possible, in modifying a streamed, the centerline shall be 8 to 12 inches lower than the toe of the channel bank to concentrate the flow of the water).

d. Disturbed banks shall be returned to original slope, and riprapped and/ or planted with suitable grasses, trees and shrubs so as to prevent erosion.

e. Any dike, cofferdam, or turbidity curtain required to facilitate construction shall be erected in such a manner that stream flow will not be sufficiently reduced to endanger aquatic life downstream and such shall be erected of materials that will not contribute substantially to the turbidity or siltation of the stream.

f. When it is necessary to use construction pads, haul roads or temporary roads in or across a river or stream, they shall be constructed with gravel or stone consisting of durable particles of rock and contain only negligible quantities of fines.

This or other methods of entering a river or stream for construction purposes may be used but must meet with the written approval of the Town Engineer.

Care shall be taken to prevent or reduce to a minimum any damage to any water body from pollution by debris, sediment or other materials in or near such water bodies. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters will be diverted through a settling basin or filter before being directed into the water body.

If it becomes necessary, the Town Engineer will inform the Contractor of unsatisfactory construction procedures and operations insofar as erosion control and water pollution are concerned. If same are not corrected promptly, the Town may suspend the performance of any or all other construction until the unsatisfactory conditions have been rectified. In case of repeated failures on the part of the Contractor to properly control erosion, pollution and/or siltation, the Town Engineer reserves the right to use Town forces or to employ outside assistance to provide the necessary corrective measures. Any direct costs thus incurred, plus associated engineering costs, will be charged to the Contractor.

REINFORCED CONCRETE PIPE (RCP)

A. DESCRIPTION

The Contractor shall provide all labor, materials, tools, and equipment necessary for furnishing and installing reinforced concrete pipe; and connecting to storm drainage structures. Trench excavation and backfill, including all sheeting, bracing, and dewatering shall be included.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- CRUSHED STONE BEDDING
- COMPACTED GRAVEL FILL
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

Reinforced concrete pipe shall conform to CTDOT Standard Specifications.

Where the pipe is to be laid below the existing ground line, the trench shall be excavated to the required depth. Unless otherwise ordered by the Engineer, the pipe shall bear continuously on a 6-inch layer of crushed stone, which has been thoroughly compacted and shaped to conform to the lower part of the pipe exterior to afford it a uniformly firm bed throughout its entire length.

A recess of sufficient depth shall be excavated at each bell to relieve it of any load and to allow ample space for making the joint. When the pipe has been bedded satisfactorily and the joint made, the recess under the bell shall be refilled with gravel or crushed stone and a 4-inch layer of gravel or crushed stone placed and tamped on each side of the pipe to hold it securely in place, care being taken not to disturb the pipe in the process.

Where rock is encountered, the trench, unless otherwise ordered by the Town Engineer, shall be excavated a minimum of eight inches (8”) below the bottom of the pipe. This area shall be refilled with suitable material, thoroughly compacted and shaped as hereinbefore specified.

Where a pipe is to be placed in a fill section, the fill shall first be constructed to an elevation three feet (3’) higher than the flow line of the pipe or one foot (1’) over the top of the pipe, whichever is greater. Then the trench shall be excavated as in a cut section and the pipe laid and backfilled.

If indicated in the plans or directed by the Town Engineer, poor foundation material below the normal grade of the pipe bed shall be removed and replaced to the required elevation with gravel.

All pipes shall be carefully laid true to the line and grade as shown on the Contract Drawings or as furnished by the Town Engineer, with hubs upgrade and with the spigot ends fully entered into the adjacent hubs. Pipe shall not be placed in any length less than four feet (4’). When the distance between the end of the pipe and the structure would require that a short piece of pipe will be used, the last two pieces of pipe shall be cut to approximately equal length to insure no pipe section is shorter than four feet (4’) in length.

All pipes which are not in true alignment or, which show any settlement or distortion after laying, shall be taken up and re-laid or corrected to the satisfaction of the Town Engineer without additional compensation.

Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Proper and suitable tools and equipment shall be used for safe and convenient handling of the pipe.

Joints in concrete pipe shall be sealed ·with either cold-applied bituminous sealer, preformed plastic gaskets, flexible watertight rubber-type gaskets or carefully caulked and filled with mortar.

Backfill shall be placed in twelve inch (12”0 layers with approved material free from large stone, sod or other material which would prevent the backfill from being thoroughly compacted and each layer shall then be tamped thoroughly around and over the pipe with special attention being given to thoroughly tamping the material around the pipe. Tamping shall be done through the use of mechanical tampers. No heavy equipment shall be moved over the pipe until a fully compacted backfill of at least three feet (3’) has been placed. No pavement or surfacing materials shall be laid over any pipe until the backfill has been thoroughly compacted and settled and is satisfactory to the Town Engineer.

The interior of the pipe shall, as the work progresses, be cleaned of all dirt, cement and superfluous material of every description. The exposed ends of all pipes shall be provided with approved temporary covers fitted to the pipe so as to exclude earth and other materials.

The completed drainage line shall be substantially watertight and any visible leakage shall be corrected. No additional payment will be made for this work.

Reinforced concrete culvert ends shall be placed on a prepared bed of the existing ground, or if so directed by the Town Engineer, on gravel fill and accurately aligned as shown on the plans. The joints shall be sealed as noted above.

HIGH DENSITY POLYETHYLENE PIPE (HDPE)

A. DESCRIPTION

High Density Polyethylene Pipe (HDPE) is an acceptable alternative to reinforced concrete pipe under certain circumstances and in compliance with the proper bedding specifications, with advance written approval by the Town Engineer. Under this Item, the Contractor shall provide all labor, materials, tools, and equipment necessary for furnishing and installing high density polyethylene pipe; and connecting to storm drainage structures. Trench excavation and backfill, including all sheeting, bracing, and dewatering shall be included.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- CRUSHED STONE BEDDING
- COMPACTED GRAVEL FILL
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

HDPE is available in 300mm (12 in), 375mm (15 in), 450mm (18 in), 600mm (24 in), 750mm (30 in), 900mm (36 in), 1050mm (42 in), 1200mm (48 in) diameters.

HDPE is lightweight; easy to handle; hydraulically efficient; easy to cut; unaffected by brackish water, chemicals, and corrosive elements found in soils; produced in 6m (20 FT) lengths; and is somewhat flexible, thus permitting smooth curvilinear installation.

Only HDPE smooth interior (Type S or Type D) shall be utilized. This type is hydraulically efficient and reportedly easier to install, since it is more rigid than the corrugated interior version.

Designers must recognize that a buried plastic pipe is a composite structure made up of a plastic ring and the soil envelope, and that both materials play a vital part in the structural integrity of plastic pipe. Conversely, buried reinforced concrete pipe is less influenced by the soil envelope.

The successful performance of HDPE depends upon proper bedding, backfill and care in installation.

The initial cost should not be the only basis for culvert material selection. The most economical culvert is one which has the lowest total annual cost over the design life of the structure.

HDPE can easily be damaged during excavation activities for items such as underground utilities. Although field repairs can be accomplished using repair couplers available from the manufacturer, the designer needs to assess the overall risk of damage associated with other excavation activities before HDPE is selected.

Minimum cover shall be established by the engineer based on an evaluation of specific site conditions. In the absence of pipe strength calculations, the minimum cover above the pipe shall be at least 0.9m (3 FT) or one pipe diameter (whichever is larger). The minimum cover should be maintained before vehicles or heavy construction equipment to traverse the pipe trench.

Maximum cover should be limited to 2.5m (8 FT) (measured to top of pipe).

Pipe strength calculations in accordance with AASHTO Standard Specification for Highways and Bridges, Section 18 (ASD) or AASHTO LRFD Bridge Design Specifications Section 12 are required for the following installations:

1. Installations subject to vehicle loads
2. Fills greater than 2.5m (8 FT) (measured to top of pipe)
3. Fills less than 0.9m (3 FT) (measured to top of pipe)
4. Adverse soil conditions
5. High water table

Because HDPE pipe is relatively lightweight, buoyancy forces, especially at the culvert inlet, may be a concern. Anchorage in the form of a headwall, slope paving or other stabilization methods may be necessary. HDPE may not be used for as cross culvert in a flowing stream environment, but may be used for intermittent watercourses if anchored by head and end walls, and test hole data does not indicate the seasonal high groundwater is higher than the proposed pipe invert.

HDPE is susceptible to fire damage, especially at outfall locations. Fire damage may result due to an adjacent grass fire. Overall, the likelihood of damage is considered low.

Since proper bedding and backfill are vital to a successful installation, diligent construction and inspection is needed.

Installation shall conform to manufacturers requirements and to CTDOT Standard Specifications.

The design or construction engineer may elect to specify a Type II bedding installation when native backfill material is judged to be inadequate for use.

Vibratory compaction of backfill can cause HDPE to shift and therefore appropriate measures and monitoring during installation are necessary. Normally, visual inspections are adequate to confirm the installation is acceptable. However, a mandrel test may be requested by the engineer when it is necessary to confirm the acceptability of an installation. The Town also reserves the right to require that the plastic pipe be visually inspected by camera prior to acceptance for payment or as a Town street should suspicion of damage be raised.

When specifying HDPE pipe, designers must consider loads from construction vehicles as well as those experienced during construction staging operations.

The use of HDPE can be considered in the following applications: (1) Temporary installations; (2) Areas remote from the traveled portions of pavements; (3) Medians; (4) Parking lots, (where vehicular traffic is light to moderate and truck traffic is light); (5) Longitudinal installations on local and collector routes within the shoulder areas; (6) Slope drains; (7) Areas with little or no underground utility involvement; and (8) Where parallel underground utility work is not likely in the foreseeable future.

Where parallel underground utility work is likely, the designer must be aware that it is possible to disrupt the supporting soil envelope adjacent to the pipe, which in turn can compromise the structural integrity of the pipe/soil system.

When coverage depth exceeds eight feet (8') concrete pipe is required/or the use of higher strength HP model (stronger) pipe may be allowed on a case-by-case basis.

Ho-pack compactors may not be utilized for trench compaction until after the first 4-feet of backfill has been places and compacted by alternative means.

Blind connections (including the use of HDPE chimneys) into the HDPE pipe are not allowed, and all roof, footing, yard, or underdrains shall be made into the concrete structures or discharge to suitable, stable swales or watercourses where approved. The use of HDPE manholes is not permitted.

Whereas concrete pipe is less influenced by the soil envelope, HDPE pipe relies vitally upon, more expensive carefully installed select fill placement for its strength and crush resistance.

The design engineer shall specify whether "water-tight" pipe shall be required or if "soil-tight" pipe is satisfactory for the application and soil conditions, subject to the approval of the Engineer.

The use of non-shrink grout or manufacturer's watertight seals as specified by the design engineer are required at all concrete structure connections.

The use of elbows, Tees and Wyes are not allowed at bends for new drainage system construction, unless approved by the Town Engineer.

The use of HDPE pipe material is NOT allowed at wetland crossings or in other wet areas where the seasonal water table is less than three feet (3') below finished grade.

Where rock is encountered, the trench, unless otherwise ordered by the Engineer, shall be excavated a minimum of eight inches (8") below the bottom of the pipe. This area shall be refilled with suitable material, thoroughly compacted and shaped as hereinbefore specified.

Where a pipe is to be placed in a fill section, the fill shall first be constructed to an elevation three feet (3') higher than the flow line of the pipe or one foot (1') over the top of the pipe, whichever is greater. Then the trench shall be excavated as in a cut section and the pipe laid and backfilled.

If indicated in the plans or as directed by the Town Engineer, poor foundation material below the normal grade of pipe shall be removed and replaced to the required elevation with gravel.

All pipes shall be carefully laid true to the line and grade as shown on the Contract Drawings or as furnished by the Engineer, with hubs upgrade and with the spigot ends fully entered into the adjacent hubs. Pipe shall not be placed in any length less than four feet (4'). When the distance between the end of the pipe and the structure would require that a short piece of pipe will be used, the last two pieces of pipe shall be cut to approximately equal length to insure no pipe section is shorter than four feet (4') in length.

All pipes which are not in true alignment or, which show any settlement or distortion after laying, shall be taken up and re-laid or corrected to the satisfaction of the Town Engineer without additional compensation.

Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Proper and suitable tools and equipment shall be used for safe and convenient handling of the pipe.

HDPE culvert ends shall be placed on a prepared bed of the existing ground, or if so directed by the Town Engineer, on gravel fill and accurately aligned as shown on the plans. The joints shall be sealed as noted above.

Backfill shall be placed in eight inch (8”) layers maximum with approved material free from large stone, sod or other material which would prevent the backfill from being thoroughly compacted and each layer shall then be tamped thoroughly around and over the pipe with special attention being given to thoroughly tamping the material around the pipe. Tamping shall be done through the use of mechanical tampers.

No heavy equipment shall be moved over the pipe until a fully compacted backfill of at least three (3’) feet has been placed. No pavement or surfacing materials shall be laid over any pipe until the backfill has been thoroughly compacted and settled and is satisfactory to the Town Engineer.

The interior of the pipe shall, as the work progresses, be cleaned of all dirt, cement and superfluous material of every description. The exposed ends of all pipes shall be provided with approved temporary covers fitted to the pipe so as to exclude earth and other materials.

UNDERDRAIN AND OUTLETS

A. DESCRIPTION

Underdrains shall consist of pipe pervious to water, laid in a trench refilled with pervious material. They shall be made of rigid perforated material six inches (6”) in diameter unless directed otherwise by the Town Engineer.

Outlets for underdrains shall consist of pipe laid in a trench and refilled with earth. The size and type of outlet pipe shall be the same as that of the underdrain to which it is connected, except that it shall not be pervious to water.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- EARTH FILL
- COMPACTED GRAVEL FILL

C. MATERIALS

PIPE:

The pipe of underdrains and outlets shall conform to the requirements of ASTM. Couplings and elbows shall conform to the requirements of ASTM D 2466 or D 2467, or rigid perforated HDPE with rubber gasket joints if approved by the Town Engineer.

AGGREGATE:

The aggregates specified for filling the trench shall meet the requirements of Article M.08.03.

FABRIC:

The filter fabric shall be non-rotting acid and alkali resistant and have sufficient strength and permeability for the purpose intended, including handling and backfilling operations. Fibers shall be low water absorbent. The fiber network must be dimensionally stable and resistant to domination. The fabric shall be free of any chemical treatment or coating that will reduce its permeability. The fabric shall also be free of any flaws or defects which will alter its physical properties. Torn or punctured fabrics shall not be used. For each specific use, only commercially available fabric which is certified in writing by the manufacturer for the purpose intended shall be used. The Engineer reserves the right to reject any fabric which he deems unsatisfactory for a specific use. The brand name shall be labeled on the fabric or the fabric container. Fabrics which are susceptible to damage from sunlight or heat shall be so identified by suitable warning information on the packaging material.

Fabrics susceptible to sunlight damage shall not be used in any installations where exposure to light will exceed 30 days, unless specifically authorized in writing by the Town Engineer.

D. CONSTRUCTION METHODS

The trench for the underdrain shall be excavated in conformity with the requirements for pipe culverts. The dimensions of the trench shall be as indicated on the plans or as ordered. Where the bottom of the

trench is unstable or in rock, the trench shall be excavated six inches (6”) deeper and an additional six inch (6”) layer of gravel fill or Aggregate similar to that used to fill the trench shall be placed and compacted in the trench.

Where the perforations are to be at the bottom of the pipe, the aggregate for filling the trench shall then be placed to a depth of three inches (3”) and tamped true to grade. The pipe shall be placed and firmly bedded on the aggregate. This aggregate shall be placed whether the pipe is encased with Filter Fabric or not.

When the pipe used has a bell, the pipe shall be installed with the bell end upgrade with the spigot end entered fully into the adjacent bell. The pipe shall be carefully butted together and held by approved means so as to prevent any displacement of the joint.

After the pipe has been installed as described above, the aggregate shall be placed carefully around and over the pipe to a height of twelve inches (12”) above the top of the pipe. The remainder of the trench shall be filled with aggregate and tamped in layers. When the underdrain pipe is used with the holes in an upward position, and in all cases where sand is used instead of the aggregate described hereinbefore, a protective three-inch minimum layer of three-eighths inch (3/8”) aggregate shall be placed over the pipe and around all of the holes. Filter fabric may be substituted for the three inch (3”) layer of aggregate. When filter fabric is used, the entire length of each drainpipe shall be wrapped with the fabric and the seams lapped and welded or bonded. Where the seams of the filter fabric are not welded or bonded, they shall be lapped to a minimum width equal to the diameter of the pipe for six inch (6”) pipe and larger and a minimum of six inch (6”) for smaller pipe.

In all cases where underdrain material or gravel is to be placed over the underdrain, a layer of at least six inches (6”) of underdrain material or gravel shall be placed over the underdrain immediately after its completion.

Where shown on the plans or directed by the Town Engineer, the Contractor shall connect underdrain or outlets to existing or proposed drainage systems or structures.

This work shall be performed in a workmanlike manner satisfactory to the Town Engineer by installation of tees or wyes branches or by providing an acceptable hole in the main line underdrain.

Where the upgrade end of the underdrain does not enter a structure, it shall be capped or plugged as directed.

TRENCH EXCAVATION

A. DESCRIPTION

Trench excavation shall consist of the removal of all materials which are necessary for the proper construction of storm sewers, drains, pipe culverts, catch basins, manholes, utilities and related work; the removal of underground storm sewers, drains, pipe culverts, catch basins, manholes, utilities and appurtenances; proper disposal of all surplus or unsuitable material, all dewatering, all sheeting and shoring, and backfilling and compaction necessary for the construction of the work in the location and to the dimensions as shown on the plans or as directed by the Town Engineer, all in accordance with these specifications.

The classification of trench excavation will only be in accordance with the following classes:

a. Trench Excavation - Normal

Trench Excavation Normal shall include the removal as indicated on the plans or directed by the Engineer of all earth, muck, mud, hardpan and loose disintegrated or decomposed ledge rock, topsoil, sod and similar materials which are sufficiently soft to permit removal by normal earth excavation machinery and methods.

b. Trench Excavation - Below Normal Grade

Trench Excavation Below Normal Grade shall include the removal and proper disposal of the natural foundation material at or below the normal grade for the bottom of the trench which the Engineer has determined is insufficient to safely support the pipe.

c. Trench Excavation - Rock

Trench Excavation Rock shall include the removal of rock in definite ledge formation and severed or fragmented rock that cannot be removed by means of a suitable shovel or backhoe, suitably powered, in good condition and properly operated, without continuous drilling, blasting, barring and/ or wedging. A suitable shovel or backhoe is defined as equipment of the proper type, size, and power to perform the excavation required. It shall also include boulders, portions thereof, concrete structures (not specified to be removed under other items of work), of 1/2 cubic yard or more in volume which fall within the limits of the trench or which are removed as directed by the Engineer. Material which can be removed by normal earth excavation methods will not be paid for as trench excavation rock. Trench excavation rock shall not include excavation or removal of catch basins, manholes, drop inlets, pavement/bases and pipes of whatever dimension or type.

B. RELATED SPECIFICATIONS

- COMPACTED GRAVEL FILL
- EARTH FILL
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

Trench excavation shall be completed in conformity with the requirements of the plans or as directed by the Town Engineer. The Contractor shall furnish and employ all bracing, sheeting, shoring, trench boxes, pumps, etc. as may be necessary for the proper completion of the work, the protection of property and the safety of the public, employees of the Contractor, the Town and the Engineer all in accordance with the applicable sections of the Occupational Safety and Health Act of 1970 (William-Steiger Act) as amended to date and all laws, rules, regulations, codes and published guidelines of any or all regulatory agencies having jurisdiction over such work. All bracing, sheeting, etc. shall be removed when no longer required for the construction or safety of the work.

After the excavation is completed, the Contractor shall notify the Town Engineer and no masonry pipe or other material shall be placed in the excavated trench until the Engineer has approved the depth of excavation and the character of the foundation material.

Whenever the natural foundation material is insufficient to safely support the pipe, poor foundation material below the normal grade of the culvert bed shall be removed and replaced to the required elevation with gravel meeting the material requirements of "Compacted Gravel Fill".

If rock is encountered, the Contractor shall strip it of sufficient overlying material to allow for proper measurement and shall then notify the Engineer that the rock surface is ready for measurement. Rock shall not be excavated until measurements have been made by the Engineer unless, in the opinion of the Engineer, satisfactory measurements can be made in some other manner. If the Contractor excavates rock prior to measurement by the Engineer, the Engineer shall estimate the quantity of rock excavated and it shall be presumed that the Engineer's estimate will give the true quantity of excavation. If rock is excavated beyond the limits of payments specified or authorized in writing by the Engineer, the excess excavation, whether resulting from over breakage or other causes, shall be by and at the expense of the Contractor.

In pipe trenches, excess excavation below the elevation of the bottom of the bedding shall be filled with material of the same type, placed and compacted in the same manner as specified for the bedding.

Excess excavation above said elevation shall be filled with the same material as specified for trench backfill. If rock below normal depth is shattered due to drilling or blasting operations of the Contractor, and the Engineer considers such shattered rock to be an unfit foundation, the shattered rock shall be removed and the excavation shall be backfilled with the same material as specified as bedding, all such removal and backfilling shall be done by and at the expenses of the Contractor.

Excavated rock shall not be used in backfilling trenches unless authorized by the Engineer and then subject to the following limitations:

1. Pieces of rock larger than those permitted as trench backfill under the Item "Earth Fill" shall not be used for this purpose.

2. Rock shall be mixed with earth fill in a sufficient quantity to measure a uniform well compacted backfill free of voids.

3. Rock backfill shall not be placed within twelve inches (12”) of the pipe or twelve inches (12”) of the finished subgrade.

Surplus excavated rock shall be disposed of as specified or as surplus excavated material under "Earth Fill". All blasting shall be completed within a minimum distance of twenty-five feet (25') before any portion of a masonry structure is placed or any pipe is laid.

The Contractor shall, at all times, keep the excavation free from water. Water shall be disposed of by the Contractor to the satisfaction of the Engineer and in accordance with all applicable laws and regulations. The Contractor shall provide all necessary pumps, drains, sumps, pipes, ditches and other means for excluding and removing water from trenches and other parts of the work and for preventing the sides of the trench from sliding or caving. He shall satisfactorily remove all water which interferes with the work.

The Contractor shall sufficiently dewater all trenches to dry and solidify the foundation below the bottom of the pipe or structure and to provide a firm, solid foundation on which to lay the pipe or construct the structure.

It shall be the responsibility of the Contractor to maintain and protect the pipe at all times during construction. Any displacement of the pipe or appurtenant structures as a result of inadequate drainage protection during construction shall be the sole responsibility of the Contractor and he will be required to restore any pipe or appurtenant structure so displaced without additional compensation therefore.

No direct payment shall be made for the work of dewatering as specified above, but compensation for such work and all expenses incidental thereto shall be considered as having been included for the various pipe items. Discharge of groundwater into the Town Storm Drainage system is prohibited.

Excess excavation below the elevation of the bottom of the bedding shall be filled with material of the same type as specified for the bedding. Backfill shall be clean fill, free from large stone, rock and frost. Unless approved by the Town Engineer, excavated material within the Town right-of-way shall be deemed unsuitable for backfill and shall be removed off site.

Backfill material shall be deposited in layers not to exceed six inches (6") thick and each layer shall be thoroughly compacted before the addition of other layers. The use of a single plate (one direction) vibratory compactor shall not be used in trench repair work.

STRUCTURAL EXCAVATION

A. DESCRIPTION

This Item shall consist of the excavation and satisfactory disposal of all materials of whatever nature necessary for the construction of foundations for bridges, culverts, retaining walls, and similar structures. It shall also include the removal of all material encountered, whether earth or ledge, the necessary backfilling, compacting, the satisfactory disposal of all surplus material and all work incidental to the removal and disposal of said material.

Work shall be done in accordance with lines, grades, and cross-sections as indicated on the plans, or as ordered by the Town Engineer. It shall also include all necessary materials and equipment for, and in the construction of, cribs, coffer dams, and similar items together with their unwatering, all in accordance with these specifications and the plans, or as the Town Engineer may otherwise direct. The item shall also include the subsequent removal of coffer dams, cribs or similar temporary structures.

Structure excavation shall be classified for the purpose of pavement as "Structural Excavation-Earth" and "Structural Excavation-Rock", in accordance with the following definitions:

1. Structure Excavation-Earth shall include all materials other than water or structure excavation rock.

2. Structure Excavation-Rock shall include rock and definite ledge formations, boulders, or portions of boulders of (1) cubic yard or more in volume and concrete structures of one (1) cubic yard or more in volume.

B. RELATED SPECIFICATIONS

- CONCRETE WORK
- COMPACTED GRAVEL FILL
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

Unless otherwise indicated in the plans or directed by the Town Engineer, the Contractor shall confine his excavating operations to within the bounds of the site of the proposed structure and within the limits of coffer dams if such are used. The natural stream bed shall not be disturbed without permission of the Engineer. Material from foundation or other excavation shall not be deposited within the stream area and the stream area shall be kept free from obstructions.

Elevations of the bottom of the footings as indicated on the plans shall be considered as only approximate. The Town Engineer may issue written orders changing the dimensions or elevations of footings necessary to provide a satisfactory foundation. All foundation excavation shall be completed so that the footings will be of the full lengths and widths indicated on the plans. The footings shall be constructed with full horizontal beds and rounded or undercut corners and edges will not be permitted.

When required by the Town Engineer, the foundation shall be either horizontally benched or level stepped vertically as he/she shall direct. All loose materials shall be removed and all seams cleaned out and filled with concrete mortar or grout. Any over-breakage in rock more than 6 inches below the plan

grade for the bottom of the footing, not authorized by the Engineer, shall be replaced by the Contractor with Class B concrete at the Contractor's expense.

When the structure is to be constructed on an excavated surface other than rock, particular care shall be taken not to disturb the bottom of the excavation. The final removal of the foundation material to grade shall not be done until just prior to the placement of concrete. Any foundation material disturbed below plan grade or revised plan grade shall be dressed and compacted or, if necessary, it shall be removed and replaced with suitable material as directed by the Engineer at the Contractor's expense. Construction of footings shall not be started until the Engineer has approved the depth of the foundation and the character of the foundation materials.

Cofferdams for foundation construction shall be carried to adequate depths and height shall be safely designed and well braced and as watertight as necessary for the proper performance of the work.

Cofferdams shall have interior dimensions sufficient to provide ample clearance for the construction of forms and to permit the inspection of their interiors, and to permit pumping outside of the forms.

Cofferdams which become tilted or move laterally during the process of building the substructure shall be righted, reset, or enlarged as maybe required to provide the necessary clearance and this work shall be at the sole expense of the Contractor.

Cofferdams shall be constructed so that the fresh concrete will be protected against damage from a sudden rise of the water and to prevent damage to the foundation by erosion. No part of the cofferdam shall be left in such a way as to extend into the substructure masonry without the written permission of the Engineer.

For substructure work the Contractor shall, upon request, submit for approval drawings indicating his proposed method of cofferdam construction and other details left open to his choice. The type and clearance of cofferdams insofar as the details effect the character of the finish work, shall be subject to the approval of the Engineer but other details of their design and construction will be left to the Contractor who shall be responsible for successful construction.

The furnishing of such plans and methods shall not serve to relieve the Contractor of any of his responsibility for the safety of the work or responsibility for successful completion of the project.

Unless otherwise directed by the Town Engineer, cofferdams with all sheeting and bracing shall be removed by the Contractor following the completion of the structure. The removal shall be done in such a manner that the finished masonry is neither disturbed nor otherwise injured. The Engineer may require the Contractor to remove only a portion or portions of the cofferdams or to leave them entirely in place. When upon written order the engineered cofferdams are left in place, the Contractor shall be paid for the actual cost of the material left in place but no allowance will be made for labor, tools, equipment, incidentals etc. which are to be included in the price bid for structural excavation.

The Contractor shall supply sufficient pumping capacity to unwater all cofferdams and to place all masonry in the dry except as specified below.

When conditions are encountered which, when in the opinion of the Engineer, render it impractical to unwater the cofferdams when every reasonable effort has been made to reduce the inflow of water or

other conditions are such that a foundation seal is necessary, the Engineer may then require the construction of a concrete foundation seal of such dimensions as he determines are necessary.

If the Contractor requests permission to install a foundation seal to facilitate his operations, and such approval is granted in writing, the seal shall be to the dimensions designated by the Engineer and shall be constructed at no additional cost to the Town.

When concrete foundation seals are required, or permission granted for their use, they shall be constructed as provided in the specifications for "Concrete Work". Seals shall be of Class B concrete placed continuously from start to finish. To insure thorough bonding, each successive layer shall be placed before the preceding layer has taken initial set. The cofferdam shall have been vented or ported at low water level. The surface of the concrete shall be kept as nearly horizontal at all times as practicable.

Unless otherwise directed, the bottom of the seal shall be at the elevation of the bottom of the footing as shown on the plan or as revised by the Engineer and the seal shall be of the thickness ordered. When the seal has hardened sufficiently to withstand hydrostatic pressure, and not until then, the cofferdam shall be dewatered and the remainder of the concrete poured in the dry.

Pumping from the interior of any foundation enclosure shall be performed in such a manner as to preclude the possibility of the migration or erosion of any fresh concrete. During the placement of concrete and for a period of twenty-four (24) hours thereafter, no pumping will be permitted unless from a suitable pump separated from the concrete by a watertight wall or other effective means.

All spaces within the excavation not occupied by the structure shall be backfilled to the level of the original ground surface with approved excavated material or borrow. No backfill material shall be placed against a newly completed structure until the masonry has cured a minimum seven (7) days and permission has been given by the Engineer. Such backfill shall be thoroughly compacted and neatly graded. Adequate provision shall be made for the drainage of all fill in accordance with the provision of the plans or as ordered.

COMMON EXCAVATION

A. DESCRIPTION

Common excavation shall consist of the removal and satisfactory disposal of all materials of any type taken from within the limits of the work and not specifically included in other items of work.

Common excavation shall include the removal of all material necessary for the construction of the subgrade, preparation of roadway shoulders and slopes, grading and preparation for sidewalk construction, construction of driveways, steps, channels and other miscellaneous construction as shown on the plans or as directed by the Engineer. It shall also include the placement of excavated material in embankments, depressions or as otherwise directed by the Engineer, the disposal of surplus or unsuitable materials, and the shaping and cleaning of slopes and shoulders. It shall not include excavation classified as "Trench Excavations" or "Structural Excavation".

Common excavation shall be classified as "Common Excavation-Earth", "Common Excavation Rock', and "Channel Excavation".

"Common Excavation-Earth" shall include the removal as indicated on the plans or as directed by the Engineer of all earth, muck, hard-pan, loose disintegrated or decomposed ledge rock, topsoil, sod, pavement, or similar materials which are sufficiently soft to permit removal by normal earth excavation machinery and methods or which can be loosened by the use of a suitable ripper.

"Common Excavation-Rock" shall include rock in definite ledge formations, severed or fragmented rock and boulders or portions thereof, one cubic yard (1 CY) or more in volume that cannot be removed by means of a ripper in good condition and properly operated without continuous drilling, blasting, barring and/or wedging.

"Channel/Pond Excavation" shall include the excavation of all materials necessary for the restoration or enlargement of an active watercourse channel, (bottom width over four feet) or pond including diverting or otherwise handling all water and proper disposal of all muck or wet material. Where no item for "Channel/Pond Excavation" appears in the bid proposal, said work will be included in "Common Excavation-Earth".

B. RELATED SPECIFICATIONS

- CONCRETE WORK
- COMPACTED GRAVEL FILL
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

All excavation shall be made strictly to the required alignment, grade and cross-section indicated on the plans or directed by the Town Engineer. All suitable materials removed during excavating operations shall be used as far as practicable in the formation of embankments to the level of the subgrade and at other locations as directed by the Town Engineer.

Contractors shall take all reasonable care to insure that the highest quality excavated material is utilized to maximum advantage within the work. Generally, all inorganic soils excavated from within the limits

of excavation except soft clays and loam shall be considered suitable for the formation of embankments. However, if at the time of excavation, these soils are wet or saturated, they shall be dried to moisture content within three percent (3%) of the optimum moisture content as determined by AASHTO- T-99 Method C prior to placement and compaction. The Contractor shall take all necessary steps to dry the excavated soil to the required moisture content and no additional compensation will be allowed for this work. The Contractor may elect to supply and haul in approved material rather than dry out excavated soil. No payment will be made for such material or for the disposal of the excavated soils.

The Contractor shall, when necessary in excavation areas, provide and maintain ditches which are adequate to prevent free water from becoming incorporated in material to be used to form embankments, such ditching to be at the sole expense of the Contractor.

All topsoil, unless otherwise specified, shall be excavated from within the limits of the pavement, shoulders, or embankment area and if suitable for use as topsoil as specified elsewhere herein shall be stockpiled. The Contractor shall exercise all reasonable care to insure that suitable topsoil is not intermixed with subsoil or otherwise spoiled to prevent its use as topsoil. Topsoil shall remain the property of the Owner and shall be used elsewhere within the work or shall remain stockpiled for the Owner's use. If unsuitable for use as topsoil, it may be used to flatten embankment slopes or otherwise disposed of as unsuitable material.

Unsuitable excavated material shall be disposed of by removing such material from within the limits of the work and disposing of such material at sites determined by the Contractor and approved by the Engineer or by disposing of such material within the limits of the work as approved by the Engineer. Prior to disposing of any unsuitable material within the project limits, the Contractor shall submit to the Engineer for his approval a proposal outlining the locations and extent of the areas in which he intends to dispose of such material.

The proposal shall describe the nature of the material and the methods to be employed in placing and covering the material. The proposal shall be amended as required by the Engineer. No such materials shall be disposed of within the project limits until the proposal has been approved by the Engineer. Unsuitable material placed within the project shall be placed in accordance with the construction methods required for said placement or as otherwise directed by the Engineer.

Suitable material excavated for the disposal of the unsuitable excavated material shall be utilized elsewhere in the work or shall be used to cover the unsuitable excavated material. No additional compensation will be paid for any excavation necessary for the disposal of unsuitable material. The Engineer shall not be obligated to approve any sites within the project area for disposal of unsuitable excavated material and the Contractor shall dispose of all unsuitable excavated material in excess of that which can be placed within approved areas at off-site disposal areas. Such off-site disposal areas shall be secured by the Contractor at no additional cost to the Owner shall be approved by all regulatory authorities and shall be approved by the Town Engineer.

The Contractor shall provide for cleaning and leaving the disposal areas in a well- drained and smoothly graded condition and blending into the existing topography. Unless otherwise specified, the entire disturbed shall be scarified, limed, fertilized, seeded and mulched.

All surplus excavated material shall be used where directed by the Engineer to uniformly widen embankments, to flatten slopes, to fill low areas, or for such other purposes as the Engineer may direct.

Any surplus material not required nor permitted to be used for such purposes, shall be disposed of in accordance with the requirements for unsuitable material.

The Contractor shall neither excavate, remove or otherwise disturb any material outside the limits of the excavation slope and grade lines indicated on the plans unless directed authorize.

If during excavation, bedrock is encountered, the Contractor shall notify the Engineer after which time the Engineer shall be allowed ample opportunity to make such investigations and measurements as are necessary to ascertain the nature and volume of the materials

Rock excavation shall conform with or closely approximate the lines and grades shown on the plans unless modified by the Engineer. It shall be, at all times, the responsibility of the Contractor to perform all phases of this work to produce the required rock slope faces to the satisfaction of the Engineer. If necessary, the Contractor shall adjust his methods including presplitting the rock, so as to result in a uniform plane of rupture in the bedrock in the rock face which will be stable and will not be affected by subsequent blasting and excavation operations. All loose and unstable material shall be removed as the work progresses.

Channel excavation shall be made in conformity with the requirements of the plans or as directed by the Engineer. The ground in the vicinity where the channel is to be excavated or re-excavated shall be cleared and grubbed in accordance with the appropriate requirements said forth in "Site Preparation". The work pertaining to clearing and grubbing shall be considered as subsidiary work described under "Channel Excavation" and is included in the payment of said item.

All excavated material shall then be removed from the area adjoining the excavation and the suitable excavated material shall be dried and used in the embankments or for other construction or purposes indicated in the plans or directed by the Engineer. Unsuitable materials shall be disposed of as directed.

The tops of the banks of the channel shall be graded and left in a neat and acceptable condition. The Contractor shall be responsible for determining the methods and materials required to dewater the site and shall perform such work at his expense.

The Contractor shall operate all equipment and perform all construction operation so as to minimize pollution of the watercourse and shall implement all appropriate pollution control measures specified in "Erosion and Sedimentation Control".

CRUSHED STONE BEDDING

A. DESCRIPTION

This Item shall consist of furnishing, placing, shaping and compacting crushed stone or screened gravel as a foundation for structures, culverts and storm drains and elsewhere as indicated on the plans, required by the specifications or as ordered by the Town Engineer.

B. RELATED SPECIFICATIONS

- REINFORCED CONCRETE PIPE (RCP)
- HIGH DENDITY POLYETHYLENE PIPE (HDPE)
- UNDERDRAINS AND OUTLETS
- TRENCH EXCAVATION
- CONCRETE CATCH BASINS
- CONCRETE MANHOLES

C. MATERIALS AND CONSTRUCTION METHODS

Crushed Stone Bedding shall conform to CTDOT Standard Specifications, except that it shall conform to the graduation requirements of Article M.01.01 for 3/4-inch aggregate.

Foundation surfaces and trenches shall be clean and free of organic matter, loose soil, foreign substance, and standing water when the bedding is placed. Earth surfaces upon or against which bedding will be placed shall not be scarified.

Bedding shall not be placed until the subgrade has been inspected and approved by the Town Engineer. Bedding shall not be placed over or around pipe or drain tile until the installation of the pipe or tile has been inspected and approved.

Bedding shall be placed uniformly in layers not more than twelve inches(12”) deep before compaction. When compaction is accomplished by manually controlled equipment, the layers shall not be more than eight inches (8”) deep. Materials shall be placed in a manner to insure that no foreign matter is allowed to become intermixed with or otherwise contaminate the bedding placed.

Bedding over or around pipe or culvert shall be placed in a manner to avoid any displacement in line on grade of the pipe or tile.

CONCRETE CATCH BASINS

A. DESCRIPTION

This Item shall consist of the construction of catch basins using solid concrete blocks or precast units, including precast concrete base, precast tops with metal frame and grate, and be in conformance to the specifications as indicated on the plans or as ordered by the Town Engineer.

B. RELATED SPECIFICATIONS

- REINFORCED CONCRETE PIPE (RCP)
- HIGH DENDITY POLYETHYLENE PIPE (HDPE)
- TRENCH EXCAVATION
- CRUSHED STONE BEDDING

C. MATERIALS

The materials to be used in the construction shall be those indicated on the plans or ordered by the Engineer and shall conform to CTDOT Standard Specifications. Catch basins shall be constructed of solid concrete block or precast concrete. Bases shall be precast concrete.

Catch basin tops shall be Type "C" or Type "CL" precast concrete tops with galvanized steel frame and grate. Grates shall meet Federal Bicycle Safety Standard (CTDOT Drawing 507-K Type “A”).

Tops shall have a cross slope equal to the cross slope of the finished roadway surface and shall be specifically intended for use with the type of curbing used.

Catch basins shall have a two foot (2’) minimum sump unless deep sump catch basins are required. Sumps shall be measured from the outlet pipe flow line. Four foot (4’) sumps shall be used at terminus structures prior to discharge unless approved by the Town Engineer.

All mortar used in the work shall be composed of one volume of cement to two volumes of sand. The use of lime in the mortar shall not be permitted.

D. CONSTRUCTION METHODS

Excavation shall be to the established bottom of the foundation and the finished surface shall be firm and smooth. If soft or yielding spots are encountered at this elevation, they shall be removed, backfilled with suitable material and thoroughly tamped into place. Should rock be encountered at the bottom elevation, the excavation shall be carried down six inches (6”) further and backfilled with approved material, thoroughly tamped to the required elevation.

Mortar shall be mixed in a suitable box or on a tight platform. The cement and sand shall be thoroughly mixed dry until the mixture has a uniform color. Water shall then be added and the mass worked until the mortar is uniform and of the required consistency. Mortar shall be mixed in no greater capacity than is required for the work in progress and any that sets sufficiently to require re-tempering shall not be used.

Brick or block masonry units shall be laid in horizontal courses with full and close joints of mortar and finished properly as the work progresses. Masonry units shall be satisfactorily wet when laid and each

unit shall be laid in mortar so as to form full bed and side joints in one operation. The joint shall be not wider than 3/8" except when the units are laid radially, in which case the narrowest part of the joint shall not exceed 1/4".

Bricks and blocks shall be laid in workmanlike manner, true to line and the joints shall be carefully struck and pointed on the inside. The outside of the masonry shall be neatly plastered with 1/2" cement mortar as the work progresses. Vertical joints shall be broken and as nearly as practical, adjoining courses shall be offset 1/2 unit.

Catch basins over ten feet (10') deep shall be constructed with precast units designed for the proposed depth or shall be constructed of a double thickness of concrete blocks placed in an interlocking pattern to provide additional strength.

Standard double catch basins shall be constructed with a precast concrete top with steel frame and grate designed, constructed and intended for use in building double grate catch basins. Top shall be cast as a single integral unit. Catch basin shall be constructed to proper dimensions to coincide with the top.

Inlet and outlet pipes shall extend thorough the walls a sufficient distance to allow for satisfactory connections and the concrete or masonry shall be constructed around it neatly to prevent leakage along their outer surface. Unless otherwise shown, the inside ends shall be saw cut flush with the inside walls and all reinforcing steel shall be neatly trimmed flush with the pipe end. The pipe shall be of the same size and type as that with which it connects on the outside. Partial lengths of pipe connected to structures shall not be less than four feet (4') in length and the Contractor shall measure and plan his work to insure that short lengths of pipe are not required.

All fresh masonry shall be carefully protected from freezing and from the drying effects of the sun and wind and if required, it shall be sprinkled with water at such intervals and/ or such a time as may be directed. Masonry shall be protected from injuries of all sorts and all portions, which may become damaged, shall be removed and rebuilt. Masonry shall not be constructed in freezing weather unless all blocks have been heated sufficiently to remove all ice and frost.

All basins shall have at least two courses of concrete brick or precast grade rings immediately below the precast top to facilitate future grade changes and basins constructed of precast units shall also have at least one course of concrete block in addition to the two courses of brick.

Precast tops shall be set accurately to the finish pavement elevation so that subsequent adjustments will not be necessary. Where precast tops are adjacent to, or surrounded by, cement concrete construction, each top unit shall be entirely separated from the concrete by a preformed bituminous expansion joint not less than 3/8" thick. The cost of each joint, including the materials, shall be included in the price for the structure.

If the completed structure is in the immediate vicinity of pavement, sidewalks, curbs, gutters or similar miscellaneous structures, they shall be backfilled with granular material. Backfill shall be thoroughly and completely compacted in six-inch layers. Care shall be taken to avoid any damage or displacement of the masonry units during backfill.

Upon final completion, all catch basins shall be cleaned and all structures shall be freed from any accumulation of silt, debris and other foreign matter of any kind.

CONCRETE MANHOLES

A. DESCRIPTION

This item shall consist of the construction of manholes using solid concrete blocks or precast units, including precast concrete base, cast iron frame and cover, steps if required, and in full conformance to the specifications at locations indicated on the plans or as ordered by the Engineer.

B. RELATED SPECIFICATIONS

- REINFORCED CONCRETE PIPE (RCP)
- HIGH DENDITY POLYETHYLENE PIPE (HDPE)
- TRENCH EXCAVATION
- CRUSHED STONE BEDDING

C. MATERIALS

The materials to be used in the construction shall be those indicated on the plans or ordered by the Engineer and shall conform to CTDOT Standard Specifications.

Manholes shall be constructed of solid curved concrete block or precast concrete. Precast concrete manholes shall be used unless manholes constructed of concrete block are specifically authorized by the Engineer. Bases shall be precast concrete.

Manhole sections shall contain manhole steps accurately positioned and embedded in the concrete when the section is cast.

Frames and covers shall be Campbell Foundry Company #1032 or approved equal. Manhole sections shall be manufactured with properly sized opening at the necessary locations and elevations to accommodate pipe connection. Holes shall not be broken through manhole walls to allow such connections.

All mortar used in the work shall be composed of one volume of cement to two volumes of sand. The use of lime in the mortar shall not be permitted.

D. CONSTRUCTION METHODS

Excavation shall be to the established bottom of the foundation and the finished surface shall be firm and smooth. If soft or yielding spots are encountered at this elevation, they shall be removed, backfilled with suitable material and thoroughly tamped into place. Should rock be encountered at the bottom elevation, the excavation shall be carried down six inches (6”) further and backfilled with approved material, thoroughly tamped to the required elevation.

Mortar shall be mixed in a suitable box or on a tight platform. The cement and sand shall be thoroughly mixed dry until mixture has a uniform color. Water shall then be added and the mass worked until the mortar is uniform and of the required consistency. Mortar shall be mixed in no greater capacity than is required for the work in progress and any that sets sufficiently to require re-tempering shall not be used.

Brick or block masonry units shall be laid in horizontal courses with full and close joints of mortar and finished properly as the work progresses. Masonry units shall be satisfactorily wet and each unit shall be

laid in mortar so as to form full bed and side joints in one operation. The joint shall not be wider than 3/8" except when the units are laid radially, in which case the narrowest part of the joint shall not exceed 1/ 4".

Bricks and blocks shall be laid in a workmanlike manner, true to line and the joints shall be carefully struck and pointed on the inside. The outside of the masonry shall be neatly plastered with 1/2" cement mortar as the work progresses. Vertical joints shall be broken and as nearly as practical, adjoining courses shall be offset 1/2 unit.

Precast-reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment.

All holes in sections used for their handling shall be thoroughly plugged with rubber plugs made specifically for this purpose or with mortar. The mortar shall be one-part cement to 1-1/2 parts sand, mixed slightly damp to the touch just short of “balling”), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

Inlet and outlet pipes shall extend thorough the walls a sufficient distance to allow for satisfactory connections and the concrete or masonry shall be constructed around it neatly to prevent leakage along their outer surface. Unless otherwise shown, the inside ends shall be saw cut flush with the inside walls and all reinforcing steel shall be neatly trimmed flush with the pipe end. The pipe shall be of the same size and type as that with which it connects on the outside. Partial lengths of pipe connected to structures shall not be less than four feet (4’) in length and the Contractor shall measure and plan his work to insure that short lengths of pipe are not required.

All fresh masonry shall be carefully protected from freezing and from the drying effects of the sun and wind and if required, it shall be sprinkled with water at such intervals and/ or such time as may be directed. Masonry shall be protected from injuries of all sorts and all portions which may become damaged shall be removed and rebuilt.

Masonry shall not be constructed in freezing weather unless all blocks have been heated sufficiently to remove all ice and frost.

All manholes shall be at least two courses of concrete brick or precast grade rings immediately below the cast iron frame to facilitate future grade changes and manholes constructed of precast units shall also have at least one course of concrete block.

Castings shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

All castings shall be thoroughly cleaned and subject to a careful hammer inspection. Castings shall be at least Class 25 conforming to the ASTM Standard Specifications for Gray Iron Castings, Designation A-48-76.

Before being shipped from the foundry, castings shall be given one coat of coal-tar-pitch varnish, applied in a satisfactory manner so as to make a smooth coating, tough, tenacious, and not brittle or with any tendency to scale off.

Manhole covers shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings or directed. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be complete fil1ed and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

Manhole covers shall be left in place in the frames on completion of other work at the manholes.

Unless otherwise indicated, manhole steps shall be of aluminum. Aluminum manhole steps shall be similar in shape to Stock No. 12653B made by Aluminum Company of America, Pittsburgh, Pa., and Allegheny Foundry Co., Pittsburgh, Pa., or Stock No. F- 14-2-B made by New Jersey Aluminum Co., New Brunswick, N.J., or an acceptable equivalent product. Before the steps are built into the masonry and after thorough cleaning, those parts of aluminum steps which will be embedded shall be given a protective coating of an acceptable, heavy-bodied, bituminous material The cleaning shall be done by suitable means and with suitable cleaning agents to ensure that the surfaces to be coated are free from all foreign matter such as dirt, oil, and grease. The steps shall be thoroughly rinsed and dried before the coating is applied and the coating shall have become thoroughly dry before the steps are built into the masonry.

The steps shall be embedded in the walls of precast sections during manufacture or shall be securely embedded in masonry block walls during construction and shall be capable of supporting any person using them. Steps shall be set in a continuous vertical alignment to form a ladder with rungs uniformly spaced 12 to 16 inches apart vertically. Invert channels shall be formed in the concrete base or shall be constructed of brickwork upon the base unless deleted by the Engineer.

The inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent, within the manhole, to the centerlines of adjoining pipelines. All surfaces of the manhole invert and table shall be finished to provide gradual transitions and a smooth even surface free from offsets, ridges, dislocations or other defects or irregularities which could impede flow or snag debris.

If the completed structure is in the immediate vicinity of pavement, sidewalks, curbs, gutters or similar miscellaneous structures, they shall be backfilled with granular material. Backfill shall be thoroughly and completely compacted in six inch layers. Care shall be taken to avoid any damage or displacement of the masonry units during backfill.

Upon final completion, all manholes shall be cleaned and all structures shall be freed from any accumulation of silt, debris and other foreign matter of any kind.

RIP RAP

A. DESCRIPTION

Under this Item the Contractor shall supply all labor, tools, materials, and equipment required to furnish and place riprap at the various locations shown on the Plans or as directed by the Town Engineer.

The riprap shall be placed to the thickness as shown, or as ordered by the Engineer and shall be of well-graded stone which may be dumped in place.

The surface shall be brought up evenly to the required grade with surface voids filled by hand placing.

This Item is subdivided into the following Items: (1) Standard Riprap; (2) Intermediate Riprap; and (3) Modified Riprap.

B. RELATED SPECIFICATIONS

- REINFORCED CONCRETE PIPE (RCP)
- HIGH DENDITY POLYETHYLENE PIPE (HDPE)
- PRECAST CONCRETE BOX CULVERT
- UNDERDRAINS & OUTLETS

C. MATERIAL

The stone used for riprap shall be hard, durable, angular in shape; resistant to weathering and to water action; free from overburden, spoil, shale and organic material; and shall meet the gradation requirements for the class specified.

Neither breadth nor width of a single stone should be less than one-third its length. Broken concrete or rounded stones (such as those occurring naturally in stream beds or outwash deposits) will not be acceptable.

Riprap shall form a compact, solid blanket to protect the slope and prevent erosion, placed in accordance with the 2002 CT Guidelines for Soil Erosion and Sediment Control, as amended.

Standard Riprap shall meet the following requirements:

- Not more than 15% of riprap shall be scattered spalls and stones less than 6" in size.
- No stone shall be larger than 30" in size and at least 75% of the mass shall be stones at least 15" in size.

Intermediate Riprap shall meet the following gradation:

Stone Size	Mass Percentage
18” or greater	0
10” to 18”	30 - 50
6” to 10”	30 - 50
4” to 6”	20 - 30
2” to 4”	10 - 20
Less than 2”	0 - 10

Modified Riprap shall meet the following gradation:

Stone Size	Mass Percentage
10” or greater	0
6” to 10”	20 - 50
4” to 6”	30 - 60
2” to 4”	30 - 40
1” to 2”	0 - 10
Less than 1”	0

Filter Fabric: (when specified or shown on the Contract Drawings):

(a) The fabric shall be non-rotting, acid and alkali resistant and have sufficient strength and permeability for the purpose intended, including handling and backfilling operations. Fibers shall be low water absorbent. The fiber network must be dimensionally stable and resistant to germination.

(b) The fabric shall be free of any chemical treatment or coating that will reduce its permeability. The fabric shall also be free of any flaws or defects which will alter its physical properties. Torn or punctured fabrics shall not be used. For each specific use, only commercially available fabric which is certified in writing by the manufacturer for the purpose intended shall be used.

(c) The Contractor shall submit a two-foot square sample of each type of fabric to be used along with technical data sheet, certified test reports, materials' certificates, and certificates of compliance. The Town Engineer reserves the right to reject any fabric which he deems unsatisfactory for a specific use. The brand name shall be labeled on the fabric or the fabric container. Fabrics which are susceptible to damage from sunlight or heat shall be so identified by suitable warning information on the packaging material.

(d) Fabrics susceptible to sunlight damage shall not be used in any installations where exposure to light will exceed 30 days.

Bedding Material: (when specified or shown on the Contract Drawings):

Bedding material shall conform to CTDOT Standard Specifications unless noted otherwise in the contract documents or directed by the Town Engineer.

D. METHOD OF CONSTRUCTION

The area shall be accurately shaped prior to placing of any filter fabric, bedding material, or riprap. Bedding material shall be placed on the prepared area and compacted to the depth, lines and grades indicated on the plans.

The filter fabric shall be installed at the locations and to the dimensions shown on the plans or as directed by the Engineer. Filter fabric shall be installed as recommended by the manufacturer for the specific use or purpose intended, or as otherwise approved by the Town Engineer.

The riprap shall be placed to its full course thickness in one operation in such a manner as to produce a reasonably well-graded mass of rock without causing displacement of the underlying material. The finished surface shall be free from pockets of small stones and clusters of larger stones.

Placing this material by methods likely to cause segregation of the various sizes of stone will not be permitted. Rearranging of individual stones by mechanical or hand methods will be required to the extent necessary to obtain a reasonably well-graded distribution of the specified stone sizes. The completed course shall be of the specified thickness and to the lines and grades as shown on the plans or as ordered by the Town Engineer.

Excavation shall consist of the removal and satisfactory disposal of all material, which is necessary for the proper completion of any riprap channel, outlet, and/or slope protection.

CONCRETE WORK

A. DESCRIPTION

Under this Item, the Contractor shall furnish all labor, materials, tools, and equipment necessary to do all concrete work, including all expansion joint material, water stops, and sealants.

Concrete work shall conform to CTDOT Standard Specifications unless noted otherwise in the contract documents or directed by the Town Engineer.

Concrete Classification	
Type of Use	**Class of Concrete**
All reinforced concrete and that requiring considerable form work.	A
Concrete for reinforced headwalls, wing walls, retaining walls, steps, etc.	A
All concrete not expressly shown or specified as Class A.	B
Fill concrete, concrete encasement, and other concrete which requires little or no form work.	B
Concrete used for granite curb joints.	C
Concrete used in public sidewalks and driveway aprons.	F
Cast-in-place concrete curbing installation.	F
Concrete used in extruded curbing installations.	F

B. RELATED SPECIFICATIONS

- FULL-DEPTH CONCRETE CURBING
- EXTRUDED CONCRETE CURBING
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS

C. MATERIALS

CEMENT:

Portland cement shall conform to the Standard Specifications of ASTM Designation C150, latest revision, Type I or Type II cement. It shall be made by a well- known, acceptable manufacturer and the product of not more than one plant shall be used in the work.

Cement shall be stored and handled in such a manner as to prevent deterioration or the intrusion of foreign matter. Any material which has deteriorated or which has been damaged shall not be used in the work.

AGGREGATES:

Aggregates shall conform to ASTM Designation C33, latest revision. Coarse aggregate shall be size No. 67, nominal 3/ 4" to No. 4, unless permitted otherwise by the Town Engineer.

The Contractor shall obtain the services of an approved commercial testing laboratory to sample and test the aggregates to insure compliance with the above specification and shall submit the test results to the Town Engineer before beginning work.

Acceptance of sample shall not be considered as a guarantee of acceptance of all materials from the source and it shall be understood that any aggregates which do not meet with requirements of these specifications may be rejected at any time.

ADMIXTURES:

All concrete mixes shall include air entraining and water reducing admixtures and, as needed, a retarder or accelerator. Admixtures other than an air entraining admixture shall not be used without the written approval from the Town Engineer. All admixtures must be on the CTDOT approved list.

In the event that concrete properties are specified that require the use of additional admixtures, or the Contractor proposes the use of additional admixtures to facilitate placement, the admixtures shall meet the requirements of AASHTO M194M/M, including the one (1) year performance data.

Air entraining admixtures shall be used and shall be Sika AER, or approved equal, conforming to ASTM Designation C260. Air content of the concrete with 3/4" maximum size aggregate shall be 6%, plus or minus 1 % by volume.

The Contractor shall provide equipment and all necessary assistance for calculating air content in conformity with the requirements of "Test for Air Content of Freshly Mixed Concrete by the Pressure Method", ASTM Designation C231.

WATER:

Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalize, organic materials, salts, or other substances that may be deleterious to concrete or steel.

D. CONSTRUCTION METHODS

STORING OR HANDLING AGGREGATES:

All materials used for concrete must be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard, clean surfaces shall be provided for storage.

Suitable means shall be taken during hauling, piling, and handling to prevent segregation of the coarse and fine particles of the aggregate to such a degree as to disturb the grading.

MEASURING MATERIALS:

The proportions of cement and aggregates for each batch of concrete shall be determined by weight. Equipment for measurement of the amount of water used in each mix shall be readily adjustable and capable of measuring water in variable amounts within a tolerance of 1%.

All equipment for measuring and accurately controlling the quantities of materials shall be of approved design and shall be tested before they are used.

Tests shall be made of moisture content of aggregates and allowance shall be made for variation in moisture content as required.

PROPORTIONS:

Proportions of materials in the concrete and strength of concrete shall be approved by the Town Engineer and shall be subject to the following limitations:

Class	Min. 28-day Compressive Strength (psi)	Max. Net Water Content (Gals. Per Sacks – Cement by Weight)	Min. Cement Contents (lbs. per CY)	Slump (inches)
A	3,500	.53	615	2 - 4
B	3,000	.53	658	2 - 4
F	4,000	.44	658	4

Prior to the beginning of the concrete work, the Contractor shall submit a statement of the proportions of the cement, fine aggregate, coarse aggregate, and water, and the gradations of the fine and coarse aggregates he proposes to use for approval. He shall have standard test cylinders made and tested by an approved testing laboratory. Laboratory test reports shall show sources of materials, proportions of each material, including water, used in the test mix, consistency, and the results of 7-day and 28-day compressive strength tests. Tests shall be made as described hereafter.

The exact proportions of materials used in the work shall be subject to the approval of the Engineer and shall not be changed without his approval. Slump tests shall be made from time to time during the progress of the work as specified.

SLUMP TEST AND TEST CYLINDERS:

The Contractor shall be responsible for and shall provide all labor, materials, tools and equipment necessary for making slump tests and standard compression test cylinders as the work progresses, all at the direction of the Engineer, who shall be the sole judge of the number of tests and cylinders required.

The Contractor shall furnish all necessary materials for the tests, including standard slump cones and molds for concrete test cylinders in conformance with ASTM Standard C470, latest revision. The Contractor shall provide proper storage for the cylinders.

Standard test cylinders shall be made, stored, and cured in accordance with "Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field", ASTM Designation C31, latest revision.

A standard sample shall consist of 6 test cylinders, 3 of which normally shall be broken at 7 days and 3 of which shall be broken at 28 days. Not less than 1 standard sample shall be made for each 50 cubic yards, or fraction thereof, of concrete placed in any 1 day.

The Contractor shall provide the services on an approved testing laboratory to test the cylinders. Tests shall be made as described hereafter. Slump tests shall be made by the Contractor in accordance with ASTM Designation C143, latest revision.

If tests do not show satisfactory results, the mix shall be adjusted as directed. Concrete which does not meet the strength requirements is subject to rejection and removal from the work or to such other corrective measures as are directed by Engineer to make the work acceptable, all at the expense of the Contractor.

TESTS BY APPROVED LABORATORY:

Compression strength tests of cylinders shall conform to "Test for Compressive Strength of Molded Concrete Cylinders", ASTM Designation C39, latest revision.

The cost of all testing work shall be borne by the Contractor. The testing laboratory shall submit certified copies of the test results in duplicate directly to the Town Engineer and the Contractor within 24 hours after tests are made.

MIXING:

Concrete shall be mixed by an approved rotating type batch machine, except where hand mixing of very small quantities may be permitted. The arrangements shall provide for the correct weight of each ingredient before placing in the mixer and the introduction of a measured quantity of water at any stage in the process. The quantity of ingredients to be used in each batch shall be governed by the size of the concrete mixer and shall not exceed the rated capacity specified for the mixer by the manufacturer. Unless otherwise permitted, the quantities shall be such as to require a whole number of bags of cement.

Mixing shall be thorough and all materials for each batch shall be mixed together at least 2 minutes while the drum revolves at the proper speed.

TRANSPORTING CONCRETE:

The concrete shall be transported and placed in the work not more than one hour after the water is added to the dry ingredients. Care shall be taken to avoid spilling and separation of the mixture.

No concrete in which ingredients have become separated shall be placed in the work. Re-tempering of partially set concrete will not be permitted. Suitable and approved equipment for transporting of concrete from mixer to forms shall be used.

TRANSIT MIXED CONCRETE:

If the Contractor desires to use transit mixed concrete, he shall submit full information as to the physical capability of the mixing plant and trucking facilities which are available and the estimated average amount which can be produced and delivered to the job site during a normal 8 hour day, excluding the output to other customers, for approval.

The number of yards of concrete placed daily will depend on the ability of the plant to deliver concrete to the site and is subject to the approval of the Engineer. The concrete shall be in accordance with the "Specifications for Ready Mix Concrete", ASTM Designation C94, as amended and all applicable requirements of this Item.

The Engineer shall have access to the mixing plant at all times. The concrete shall be mixed in revolving drum-type mixers, which are in good condition and which produce thoroughly mixed concrete of the specified consistency and strength. Loads shall not exceed the proper capacity of the mixer.

Concrete shall be mixed for a minimum of 1-1/2 minutes after it arrives at the job site, or as recommended by the mixer manufacturer. The drum shall not mix while in transit. Mixing shall be continuous at proper speed until the concrete is discharged. Concrete shall be discharged from the mixer within 1 hour after water is added to the mix and shall have a maximum slump from 2" to 4".

Adequate facilities shall be available for continuous delivery of concrete at the required rates. Concrete which does not meet the requirements of this specification will be rejected.

FORMS:

Forms shall be in accordance with the "Recommended Practice for Concrete Form Work", ACI 347, latest revision.

Forms shall be of plywood, plywood faced, or metal; shall conform to the shape, lines, and dimensions of the concrete as shown on the Contract Drawings; and shall be substantial and sufficiently tight to prevent leakage of mortar. Contractor shall be responsible for the design and engineering of the form work, as well as its construction. The inside of forms shall be coated with non-staining mineral oil or other approved material to prevent adhesion of concrete to the forms.

All edges and corners in the finished work shall be straight and true. External comers shall have a 3/ 4" chamfer unless otherwise shown.

For all faces, which are exposed in the finished work, forms shall be smooth and so built and treated that when removed; the concrete will be left with smooth, presentable surfaces, free from offsets, ridges, discoloration, or other unsightly defects. Deformed or otherwise defective forms shall be removed from the work. The methods and materials used for tying forms in place shall be subject to approval and no wires shall be used for tying the forms on faces exposed in the finished work. Form ties shall be bolts and rods of such design that the end of the internal member will be recessed by a removable cone at least 1" from the face of the finished concrete. Holes shall be closed in a workmanlike manner as specified hereafter. Patches on exposed surfaces shall match the color of the surrounding concrete.

Concrete shall not be placed until all forms, bracing, and reinforcement are in final secure position. Form work shall be completed and inspected prior to the placing of concrete. All pipes, sleeves, and other embedded items as shown on the Plans shall be in place before the concrete placing commences. Temporary openings shall be provided at the base of wall forms and at other points where necessary to facilitate cleaning and inspection.

PIPES AND FIXTURES IN CONCRETE:

Pipes, sleeves, or other inserts shall be placed in the work as shown on the Contract Drawings. Special care shall be taken to place them on the proper lines and grades. The placing of concrete around pipes, sleeves, and inserts shall be as specified. Weep holes will be 3-inch diameter PVC piping meeting with ASTM D-2241.

PLACING CONCRETE:

No concrete flat work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

Immediately before placing concrete, the forms shall be thoroughly cleaned and wet and the space to be occupied by concrete shall be free from all dirt, chips, and foreign material. The concrete shall be carried up level along the whole length of the section under construction and shall be so placed so as to avoid re-handling within the forms. Concrete shall be compacted by means of approved internal vibrators to produce dense, homogenous concrete without pockets or voids. Vibrators shall not be used to move the concrete along the form. Where space under pipes or other spaces are to be filled, concrete shall be forced under from one side until visible from the other side to prevent voids.

Chutes may be used for distributing concrete only when approved in writing by the Engineer. Requests for such approval shall be accompanied by sketches showing methods by which chutes will be employed. Chutes, if permitted, shall be designed with proper slopes and supports to permit efficient handling of the concrete without increasing the water-cement ratio.

Concrete shall not be permitted to free-fall within the form a distance exceeding four feet (4'). "Elephant trunks" shall be used to prevent free fall and excessive splashing on forms and reinforcement.

When fresh and previously placed concrete masonry are jointed, immediately before placing fresh concrete, the contact surface of the old concrete shall be thoroughly cleaned using a stiff brush or other tools and a stream of water under pressure. The surface shall be clean and wet but free from pools of water at the moment the fresh concrete is placed. Any laitance, waste mortar, or other substance, which will prevent complete adhesion, will be removed. A 1" thick coat of mortar of similar proportions to the mortar in the concrete shall be placed over the contact surface of the old concrete and the fresh concrete shall be placed before the mortar has attained its initial set. No concrete shall be placed when the Engineer is not present.

WEATHER CONDITIONS AND AT NIGHT:

Concrete placement during cold & hot weather and at night shall conform to the following:

Cold Weather: All methods and materials used for winter concreting shall be in accordance with the requirements of "Recommended Practice for Winter Concreting", ACI 306, latest revision, and shall be subject to the approval of the Engineer. Plans to protect fresh concrete from freezing and to maintain temperatures not less than the permissible minimum during the first 7 days after placing shall be made before the first frosts are to occur. The temperature of the concrete placed shall not be less than 55 degrees, nor greater than 85 degrees and a temperature of between 50 degrees F and 70 degrees F shall be maintained for at least 7 days after placing. Means shall be provided, if necessary, to insure that the ambient temperature shall not fall more than 30 degrees F in the 24 hours following the 7 day period. Admixtures, except those approved by the Town Engineer, shall not be used.

The cost of all materials furnished or required to protect against freezing shall be at the sole expense of the Contractor without extra charge therefore.

Hot Weather: All methods and materials used for hot weather concreting shall be in accordance with the requirements of "Recommended Practice for Hot Weather Concreting", ACI 305, latest revision, and shall be subject to the approval of the Engineer. Concrete deposited in hot weather shall have a placing temperature, which will not cause difficulty from loss of slump, flash set, or cold joints.

At Night: No concrete shall be placed at night without permission of the Town Engineer. A minimum of twelve hours' notice shall be given to place concrete at night.

QUALITY OF CONCRETE WORK:

Concrete shall be placed solidly against the forms and elsewhere so as to leave no voids. Every precaution shall be taken to make all masonry solid, compact, watertight, and smooth and to prevent the formation of ligancy and to avoid cold joints. If for any reasons the surfaces have voids or are unduly rough, or are in any way defective, such masonry shall be cut out to the extent ordered or permitted and shall be repaired to the satisfaction of the Engineer. The cost of all repairs shall be borne by the Contractor. No thin patches or plastering will be accepted.

Any concrete that is defective which, in the opinion of the Engineer, cannot be properly repaired as described above, shall be removed and replaced at the expense of the Contractor.

CARE AND CURING OF THE CONCRETE:

All exposed surfaces of finished and unfinished concrete shall be kept constantly moist by sprinkling with water at short intervals, by covering with moist burlap, or by such other means as may be approved, for a period of not less than 7 days.

No exposed work shall be laid during rainstorms and freshly laid concrete shall be protected during storms to prevent erosion. Sufficient covering shall be provided and kept ready at hand for this purpose. All fresh work shall be carefully protected from injury.

REMOVAL OF FORMS:

Forms shall be removed in such manner as to insure the complete safety of the structure. Re-shoring will not be permitted. In no case shall the supporting forms or shoring be removed until the members have acquired sufficient strength to support safely their weight and the load thereon. The results of suitable control tests may be used as evidence that the concrete has attained such sufficient strength. The minimum time for removal of forms will be subject to the Town Engineer's approval.

FINISH:

Immediately after the concrete forms are removed, all extrusions shall be chipped off and all tie rod holes patched with 1:2 cement mortar. All exposed vertical surfaces shall have a rubbed finish and shall be rubbed with carborundum stones. During rubbing, water shall be constantly applied to the concrete. Rubbing shall continue until the surface is brought to a smooth, even texture.

All horizontal surfaces shall be struck to the proper grade by moving a straight edged template back and forth across the placed surface in a saw motion until the required grade is reached. Shortly after the striking operation, while the surface is still plastic, it shall be floated with wood. The process shall bring

the surface to the true required grade. After the surface has reached the partial hardness stage, it may have to be refloated to secure a proper finish.

PROTECTION FROM INJURY:

Finished concrete surfaces shall be protected from injury and defacement until the work under the Contract is accepted.

CONSTRUCTION AND EXPANSION JOINTS:

Joints in concrete shall only be made where shown on the Drawings or permitted by the Town Engineer. In either case they shall be made in accordance with the details shown on the Drawings.

Where shown on the Contract Drawings, expansion joint material shall be pre-molded concrete gray, open cell sponge rubber as manufactured by Williams Products, Inc., Troy, Michigan, or approved equal.

PROTECTIVE COMPOUND / SEALANT:

Protective compound sealant shall be used such as *DensiCrete*, penetrating concrete sealer, or approved equal. Sealant shall be placed in accordance with the manufacturer's instructions.

The brand and type of material must be on the Department's Qualified Products List and approved by the Town Engineer for the specified use.

STEEL REINFORCEMENT:

Bars or rods shall be deformed bars of an approved type and shall be free from defects and kinks and from bends, which cannot be readily and fully straightened in the field. They shall conform to ASTM Designation A615, Gage 40, latest revision. Deformations shall conform to ASTM Designation A305. The Contractor shall furnish satisfactory test certificates. All bars shall be stored in clean, dry places until incorporated in the work.

DETAILING, FABRICATION, AND PLACING REINFORCEMENT:

All reinforcement at the time concrete is placed shall be free from loose rust, scale, or other coatings that will destroy or reduce the bond. All detailing and fabrication of reinforcement, unless otherwise noted, shall follow the ACI "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Metal supports, touching formed or exposed concrete, shall not be used. Reinforcement shall not be secured to forms by means of wire, nails, or other ferrous material.

ACI CODE:

Except as otherwise shown on the Contract Drawings or as specified herein, "Building Code Requirements for Reinforced Concrete", ACI 318, latest revision, shall apply.

EARTH FILL

A. DESCRIPTION

The work under this Item shall consist of the placement, shaping and compaction of earth fill used to backfill trenches and structures, to construct or widen embankments, to fill and grade depressions or low areas, to flatten slopes or for such other purposes as the Engineer may direct. It shall also include all grading of the sight and dressing all fill to a smooth uniform surface which conforms to the lines, grades and cross-sections shown on the plans or as may be otherwise directed by the Town Engineer.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- STRUCTURAL EXCAVATION
- COMMON EXCAVATION
- COMPACT GRAVEL FILL

C. MATERIALS AND CONSTRUCTION METHODS

Unless otherwise indicated on the plans, or otherwise directed by the Engineer, all trees, stumps, and roots and other debris shall be removed and all topsoil shall be stripped prior to placement of fill for embankments. Trees, stumps, roots and brush outside embankment areas shall be cut flush with the ground and removed along with other debris.

All earth fill shall be placed and compacted to provide a stable embankment, slope or subgrade which shall not be subject to undue settlement, subsidence, or other failures.

Embankments (including detention basin berms) shall be constructed of earth or a mixture of earth and rock, placed in successive layers of not more than twelve (12) inches in depth (prior to compaction) for the full width of the cross-section. Soft clay shall not be used in embankments. Stumps, trees, rubbish, sod and other types of unsuitable materials shall not be placed in the embankments. Successive layers shall kept graded by means of a blade grader, scraper or bulldozer and thoroughly and uniformly compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors or a combination thereof. Earth moving and other equipment not specifically manufactured for compaction purposes will not be considered as compaction equipment. The dry density after compaction shall be not less than 95% of the dry density for that soil when tested in accordance with AASHTO-T99 Method C. Material excavated from trenches shall, if suitable, be utilized in backfilling trenches after the pipe is laid. When trenches which are located under pavement or within five (5) feet or less of pavement, sidewalks, curbs, gutters, or similar structures, the Contractor shall backfill entire trench thereof, with material complying with the specification for "Compacted Gravel Fill" unless directed otherwise by the Town Engineer.

Detention basin berms shall be designed and constructed a minimum of eight (8) feet wide at their top to allow for backhoe and mason dump truck access to both the outlet control structure and emergency overflow, and graded such that a loader or excavator can easily enter the impoundment area for maintenance and sediment purposes.

Per 2004 Stormwater Quality Manual a reverse slope bench is required for any slope steeper than 3:1 that exceeds 15 feet vertically, unless engineered slope stabilization structures or measures are included.

All approved trench backfill shall be placed in layers of not more than twelve (12) inches in depth prior to compaction and shall be thoroughly compacted by means of vibrators or by pneumatic or mechanical tampers. Hand tampers shall be used only with permission of the Town Engineer.

No stones or course materials shall be placed adjacent to the pipe and special care shall be taken not to injure or disturb the pipe during all backfilling operations. The backfill shall be brought to the surface of the subgrade or surrounding ground and neatly graded except that where excavation is required in existing lawn or grass areas, the backfill shall be brought to within four (4) inches of the top of the trench and the remainder shall be filled with topsoil to three-quarters (3/ 4) of an inch above adjacent areas as directed by the Town Engineer.

Structure backfill shall be "Compacted Gravel Fill" placed adjacent to abutments, retaining walls, outlet control structures, box culverts, and elsewhere as shown on the plans or directed by the Engineer. It shall be placed above a plain extending on a 1 to 1 slope from the upper edge of the footing to the top of the embankment unless modified by the Engineer or shown otherwise on the plans. When filling behind abutments, retaining walls, box culverts or other structures, the fill shall be built up in horizontal layers so that at all times the fill is placed against undisturbed material or against a completed and compacted embankment. The slope of the embankment on which the structure backfill is to be placed shall be plowed deeply or cut into steps before and during the placing of the backfill so that both types of material will be thoroughly bonded and compacted. Each layer of structure backfill shall be spread to a thickness not exceeding twelve (12) inches in depth prior to compaction and shall be thoroughly compacted as directed by the Engineer by the use of power rollers or other motorized compaction equipment, by tamping with mechanical rammers or vibrators, or by pneumatic tampers. Any equipment not principally manufactured for compaction purposes and equipment which is not in proper working order in all respects, shall not be used within the area adjacent to structures.

Special attention shall be given to compaction in places close to walls where motorized compaction equipment cannot reach within three (3) feet of the back face of walls and within a greater distance at angle points of walls, each layer of backfill shall be compacted by mechanical rammers, vibrators or pneumatic tampers. The dry density of each layer of structure backfill after compaction shall not be less than 100% of the dry density for that material when tested in accordance with AASHTO-T99 Method C. Each layer of the backfill should be sprayed with just enough water to obtain optimum moisture content for proper compaction. Where weep holes are installed, bagged stone shall be placed around the inlet of each weep hole to prevent movement of the backfill material into the weep hole.

Where backfill must be placed on both sides of a structure, the layers on both sides shall be brought up simultaneously and at approximately the same level to avoid unbalanced pressure. Special precautions shall be taken to prevent wedging action against the structure. Adequate drainage shall be provided at all times.

Stone, which is too large to be placed in twelve (12) inch layers, may be placed within the embankment at the downstream toe as directed by the Engineer. Large stones may not be placed in nests, but shall be distributed over the area and interstices shall be filled with spall, fine fragments or earth to form a solid compacted mass.

When embankments are to be made on a hillside, the slope of the original ground on which the embankments are to be constructed shall be plowed deeply or cut into steps before the placement of the fill is commenced.

Frozen material shall not be used in the construction of embankments nor shall embankment layers be deposited on surfaces of snow or ice, nor shall it be placed on frozen or unstable surfaces. The Contractor shall be required to remove, at no cost to the Town, any frozen or unsuitable material incorporated into the embankment.

Where filling in twelve (12) inch layers is impractical, as determined by the Engineer, the embankment may be constructed in one layer to the minimum elevation at which equipment can be operated and above this elevation; the embankment shall be constructed as specified herein.

Embankments to an elevation three (3) feet above the water table at the time of filling shall be constructed of free draining material.

In fills where the top of the proposed pavement will be less than four (4) feet above an existing bituminous pavement and the existing pavement is not required to be removed, it shall be scarified as directed by the Town Engineer.

No stone over twelve (12) inches in its greatest dimension shall be placed within three feet of the top of the prepared subgrade and no stone over five (5) inches in its greatest dimension shall be placed within twelve (12) inches of the elevation of the top of the prepared subgrade unless otherwise specifically authorized by the Engineer. The Contractor shall be responsible for the stability of all constructed embankments and shall replace at his own expense any portions which in the opinion of the Engineer have become displaced due to careless and negligent work on the part of the Contractor or to damage resulting from natural causes such as storms, cloud bursts, etc. and not attributable to the unavoidable movement of the natural ground upon which the embankment is made.

When embankments are constructed of material from roadway excavation and the Engineer determines that the material cannot be sufficiently stabilized to construct a proper embankment, he may order the material disposed of as unsuitable and the embankment constructed of borrow. When embankments are constructed of borrow, they shall be stable and the methods and materials used to obtain such stability shall be determined by the Contractor and performed at his expense.

Embankments shall be so constructed that adequate surface drainage will be provided at all times. The center shall be kept higher than the sides and the surface kept uniformly graded. Embankments shall be constructed to the elevations, lines, grades, and cross-sections as shown on the drawings. The upper surface of the embankment shall be maintained in a manner satisfactory to the Engineer, and its surface shall be compacted and left in a satisfactory condition approximately true to line and grade. All slopes, both original and newly constructed in either cut sections or on embankments, shall be left in a neat, trim and workmanlike condition free from all rubbish, boulders or ledge and in conformity with the lines, grades, and requirements indicated in the plans.

Earth fill placed in areas outside the embankment and earth fill used to flatten slopes, shall be spread by bulldozer in lifts no to exceed six (6) inches and each lift shall be thoroughly compacted by successive trips back and forth with the bulldozer tread areas overlapping enough on each trip so that all portions

will be compacted uniformly. The Contractor may, at his option, use vibratory compaction equipment or rollers in lieu of the above.

Where topsoil is to be placed on slopes, the Engineer may direct that the slopes be tracked prior to the installation of the topsoil. Tracking shall consist of traversing the slopes with cleated tracks so that the cleat indentations are horizontal. Its sole purpose is to provide indentations in the slope to help reduce soil erosion.

BORROW

A. DESCRIPTION

Under this Item the Contractor shall furnish additional material in excess of the volume of suitable material excavated elsewhere within the project limits from approved borrow pits located beyond the limits of the project.

This Item shall also include the excavation, transport, satisfactory placement and compaction of the additional material necessary to complete any embankments, backfill any trenches or excavations, fill any low areas or complete any other features of the work.

This Item shall be subdivided into two categories of work: (1) Borrow and (2) Select Borrow.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- STRUCTURAL EXCAVATION
- COMMON EXCAVATION
- COMPACT GRAVEL FILL

C. MATERIALS

Borrow shall consist of inorganic granular soils and/ or rock having not more than 20 percent by weight passing the No. 200 sieve. The maximum stone size shall be 1-1/2 inches for use as trench backfill or 5 inches for construction of embankments and the material shall be well-graded throughout the entire size range.

Borrow shall be free from roots, leaves and other organic materials. Rubbish, garbage or trash in any quantity shall not constitute a part of the borrow. Borrow shall also be free of ice or frost and no aggregations of soil particles shall be frozen. The moisture content of the borrow shall be within +/-3 percent of its optimum moisture content at the borrow source.

Select Borrow shall be free-draining material consisting of sound, hard durable stone, run of the bank gravel, sand or other acceptable granular material, the particles of which shall have a maximum size of 6 inches unless otherwise specified and shall be of such size that, of the portion passing the 4 inch sieve, not more than 20 percent by weight shall pass the No. 200 mesh sieve as determined by washing through the sieve in accordance with ASTM Test Designation D422.

Select Borrow shall include sufficient well graded material to fill any voids in the embankment/backfill area in its upper strata prior to placing any courses thereon.

D. CONSTRUCTION METHODS

Borrow/Select Borrow will be permitted only to the extent necessary to complete the embankments, backfill trenches and similar details and only after all usable material from the excavation has been placed.

However, with the prior written approval of the Engineer, the Contractor may be permitted to place Borrow/Select Borrow before all excavation is completed. Prior to receiving permission to place borrow before completing all excavation; the Contractor shall furnish the Engineer with a statement waiving payment for any borrow placed in lieu of suitable excavated material. This permission may be revoked by the Engineer at any time if, in his opinion, satisfactory progress is not maintained on other operations.

Borrow/Select Borrow shall be placed where directed and in accordance with the applicable sections of these Specifications.

COMPACTED GRAVEL FILL

A. DESCRIPTION

The work under this Item shall be the furnishing, placing and compacting of gravel fill to be used as a foundation for structures, to replace unstable material in slopes, replace unsuitable material, as a foundation for sidewalks and pipes, as trench backfill where directed, in shoulders and elsewhere as indicated on the Contract Drawings, required by the specifications or ordered by the Engineer. It shall consist of gravel conforming to the requirements of these specifications.

B. RELATED SPECIFICATIONS

- TRENCH EXCAVATION
- STRUCTURAL EXCAVATION
- REINFORCED CONCRETE PIPE (RCP)
- HIGH DENSITY POLYETHYLENE PIPE (HDPE)
- CONCRETE CATCH BASINS
- CONCRETE MANHOLES
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS

C. MATERIALS

Gravel fill shall conform to the requirements of Article M.02.01 of the Standard Specifications. Samples of the material (along with sieve analysis results) to be used shall be furnished to the Engineer at least 5 days prior to its intended use Largest stone size shall be 3 inches.

D. CONSTRUCTION METHODS

Where gravel is used for foundations (including drainage structures) or to replace unsuitable or unstable material, it shall be deposited in layers not over 6 inches thick and each layer shall be thoroughly compacted before the addition of other layers.

The surface shall be carefully brought to grade. The gravel fill shall be compacted to 98% of the maximum dry density as determined by ASSHTO T-99 Method C. The moisture content of the gravel shall not vary by more than 3% +/-from its optimum moisture content.

PREPARATION OF SUBGRADE

A. DESCRIPTION

This item shall consist of the preparation necessary to bring the subgrade to the required grade, alignment and cross-section in preparation for the construction of the subbase course. The bottom of the excavation and the top of the fill between the outer limits of the subbase course shall be known as the subgrade.

B. RELATED SPECIFICATIONS

- COMPACTED GRAVEL FILL
- GRAVEL SUBBASE
- BITUMINOUS CONCRETE PAVEMENT
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS
- PAVEMENT REPAIR
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

After all rough grading for the road bed has been substantially completed; the subgrade shall be brought to the lines, grades and cross-sections shown on the plans. The subgrade shall not be prepared until all sewers, storm drains, culverts, conduits, utilities, etc. have been installed in the roadway. All soft and yielding material and other portions of the subgrade which will not compact readily shall be removed and replaced with suitable material. The surface shall be compacted uniformly by rolling with an approved power roller having a minimum ground pressure of not less than 300 pounds per inch of contact width on the rear wheel and weighing not less than 10 tons or with an equivalent vibratory roller or compactor.

The amount of compaction effort shall be as directed by the Town Engineer, but in no case shall be less than four (4) complete passes of the compacting equipment being used. The dry density after compaction shall be not less than ninety-five percent (95%) of the dry density for that soil when tested in accordance with AASHTO-T-99 Method C.

When more than one compacting unit is to be used, the unit which exerts the largest compaction effort will make the initial passes. Any portion of the subgrade not accessible to larger compacting units shall be compacted as directed by the Engineer to a degree equal to that obtained on the other portions of the subgrade with equipment and by-methods appropriate to the size of the inaccessible area.

After initial compaction, the top surface of the subgrade shall be fine graded and re-compacted. A tolerance of one-half (1/2) inch above or below the finish subgrade will be allowed provided that this one-half (1/2) inch deviation is not maintained for a distance longer than fifty (50) feet and that the required crown is maintained in the subgrade.

The subgrade shall not be wet, muddy, or otherwise unsatisfactory when the subbase is placed upon it. If the fine grade of the subgrade becomes rutted or displaced due to any cause whatsoever, the Contractor shall regrade same at this own expense.

The Contractor shall protect the subgrade from damage by exercising such precautions as the Engineer may deem necessary. At all times, the subgrade surface shall be kept in such a condition that it will drain properly.

The subgrade shall be checked and approved by the Engineer prior to placing subbase material thereon. The dry density after compaction shall be not less than ninety-five percent (95%) of the dry density for the subbase material when tested in accordance with AASHTO-T-99 Method C with the contractor being responsible for furnishing compaction test results at a minimum of every 100 feet by an independent geotechnical laboratory prior to any gravel placement, or as approved by the Town Engineer.

GRAVEL SUBBASE

A. DESCRIPTION

The work under this item shall consist of the construction of subbase for streets driveways and sidewalks. consisting of gravel placed on the prepared subgrade in accordance with these specifications and in conformity with the lines, grades, compacted thickness, and typical cross-section as shown on the plans.

B. RELATED SPECIFICATIONS

- PREPARATION OF SUBGRADE
- PROCESSED AGGREGATE BASE (PAB)
- BITUMINOUS CONCRETE PAVEMENT
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS
- COMPACTION TESTING

C. MATERIALS AND CONSTRUCTION METHODS

All materials for this work shall conform to the CTDOT Standards Specifications for Roads, Bridges and Incidental Construction. Maximum aggregate size shall not exceed five inches (5”).

The subgrade shall be shaped true to the lines, grades and cross-sections given on the plans. Any unsuitable material in the subgrade shall be removed and replaced with satisfactory material.

The subgrade shall be thoroughly compacted with equipment approved by the Engineer before any subbase of gravel is placed. All utilities, sanitary sewers, storm sewers and cross-culverts shall be completed before any gravel subbase is placed.

Gravel subbase shall be spread uniformly upon the subgrade with a road grader in a single eight inch (8”) course. After the gravel has been placed as specified above, it shall be compacted with equipment specifically manufactured for that purpose.

The sole use of hauling and spreading equipment shall not be considered as a substitute for compaction equipment. Compaction shall be continued until the entire course is uniformly compacted to the required minimum density.

The dry density after compaction shall be not less than ninety-five percent (95%) of the dry density for the subbase material when tested in accordance with AASHTO-T-99 Method C.

If the material in the subgrade becomes intermixed with the subbase material at any time, the Contractor shall, without additional compensation, remove the mixture and replace it with new subbase material to the required thickness shown on the plans or as previously required by the Engineer. Such replaced subbase material shall be compacted to the required minimum density.

Should the moisture content of the subbase, either because of the weather, source or nature of the material be such that it cannot be properly compacted, the Contractor will be required to wet or dry the subbase without additional compensation. The Contractor shall take all necessary steps to insure that the subbase is properly drained and does not become saturated prior to placement of the base course.

PROCESSED AGGREGATE BASE (PAB)

A. DESCRIPTION

The work under this item shall consist of the construction of a processed aggregate base for highways, roads, streets, etc. consisting of a two course foundation placed on the prepared subbase in accordance with these specifications and in conformity with the lines, grades, compacted thickness and typical cross-section as shown on the plans. Total base thickness will be not less than six inches (6”). Single lift thickness shall not be less than two inches (2”).

B. RELATED SPECIFICATIONS

- GRAVEL SUBBASE
- BITUMINOUS CONCRETE PAVEMENT
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS
- PAVEMENT REPAIR
- COMPACTION TESTING

C. MATERIALS

All materials for this work shall conform to Section M.05 of the CTDOT Standard Specifications for Roads, Bridges and Incidental Construction.

GRADATION: Coarse and fine aggregates shall be combined and mixed by approved methods so that the resulting material shall conform to requirements of Section M.05.01 as follows:

Square Mesh Sieves	Percent Passing by Weight
Pass 2-1/2”	100
Pass 2”	95 – 100
Pass ¾”	50 – 75
Pass ¼”	25 – 45
Pass #40	5 – 20
Pass #100	2 - 12

COARSE AGGREGATE: Coarse aggregate shall be broken angular stone and shall be the product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from the crushing operation. It shall be free of soft disintegrating pieces, mud, dirt, organic or other injurious material. No recycled material content permitted.

FINE AGGREGATE: Fine aggregate shall be natural sand, stone sand, screenings or any combination thereof. The fine aggregate shall be limited to material 95 percent of which passes a No. 4 sieve having square openings and not more than 8 percent of which passes a No. 200 sieve. The material shall be free from clay, loam and deleterious materials.

D. CONSTRUCTION METHODS

The processed aggregate base course shall be spread on the previously prepared subbase course. The Contractor will not be permitted to spread processed aggregate base course on a subbase course which

has not been suitably compacted and which does not conform to the crown line and grade as shown on the plans or as directed by the Town Engineer.

The Contractor will not be permitted to spread the processed aggregate base course on a wet subbase nor to spread any base material more than five hundred feet (500') ahead of the compaction operation. Contractor shall maintain the subbase to true line and grade for a minimum distance of two hundred feet (200') in advance of the spreading operation.

The thickness of the bottom course shall not be more than four inches (4") after compaction unless otherwise directed. After aggregate is spread, it shall be thoroughly compacted and bound by use of equipment specifically manufactured for that purpose. Roller shall deliver a ground pressure of not less than three hundred pounds per lineal inch of contact width and shall weigh not less than ten (10) tons. Vibratory units shall have a static weight of not less than four (4) tons.

Water may be used during the compaction and binding operation as directed by the Town Engineer. The compacting and binding operation shall begin at the outside edge and progress towards the center, parallel with the centerline of the pavement.

The work shall cover the entire surface of the course, with uniform overlapping of each preceding track or pass. On banked or super elevated curve, the rolling operation shall commence on the low side and be carried toward the high side.

The compaction operation shall be continued until the voids in the aggregate have been reduced to provide a firm and uniform surface satisfactory to the Engineer. The amount of compaction effort shall be as directed by the Engineer but in no case shall be less than four (4) complete passes of the compacting equipment being used.

If the material of the subbase becomes mixed with base course material, the mixture shall be removed and replaced with new processed aggregate base course material without additional compensation to the Contractor.

Any surface irregularities which develop during or after work on either course shall be corrected by loosening material already in place, removing or adding aggregate as required, after which the entire area including the surrounding base course shall be re-compacted and rebound until it is brought to a firm and uniform surface satisfactory to the Town Engineer.

Where the base course thickness exceeds that indicated on the plans and the Town Engineer determines that such additional thickness will interfere with the Contractor's ability to place pavement of the required thickness, the Contractor shall, without additional compensation, remove the excess base material and regrade and re-compact the base surface.

BITUMINOUS CONCRETE PAVEMENT

A. DESCRIPTION

Work under this item shall consist of bituminous concrete placed upon a completed base course or upon the surface of an existing pavement as either a full or partial leveling course or a surface course.

This work shall also include resetting to proposed grade all existing or newly constructed grates, frames, valve boxes and utility access covers which must normally be set to match finished grade. This work shall be performed in accordance with these specifications and in conformity with the line, grade, and compacted thickness and typical cross-section shown on the plans or as directed by the Town Engineer.

Note: Prior to the paving of new public roads the developer shall submit an "Interim As-Built showing line and grade of the road, curbs, and drainage structures, which must be approved by the Town Engineer.

B. RELATED SPECIFICATIONS

- PROCESSED AGGREGATE BASE (PAB)
- BITUMINOUS CONCRETE LIP CURBING
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS
- PAVEMENT REPAIR
- COMPACTION TESTING

C. MATERIALS

The materials for the bituminous concrete mixture, sources of supply, formula for mix, tolerances, approval of mix formula and the control of the mixture shall conform to the CTDOT Standard Specifications for Roads, Bridges and Incidental Construction.

Tack coat, prime coat, and material for joint sealer for pavement shall conform to CTDOT Standard Specifications.

D. CONSTRUCTION METHODS

No Bituminous surfacing work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

The methods employed in performing the work and all equipment, tools, machinery and plant used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started, and whenever found unsatisfactory, it shall be changed and improved as required by the Engineer. All equipment, tools, machinery and plant used must be maintained in a satisfactory working condition.

Samples of the actual mixture may be taken by the Engineer as many times as he determines are necessary at his sole discretion.

The mixture shall be transported from the mixing plant in trucks having tight bodies which have previously been cleaned of all foreign material. The use of kerosene, gasoline, fuel oil or similar products for the coating of the inside of the truck bodies is strictly prohibited.

Such coatings may consist of soapy water or commercial oil emulsions (also known as soluble oils) in the proportions recommended by the manufacturer. If such coatings are applied, all excess coating material shall be removed prior to loading. Loaded trucks shall be tightly covered with waterproof canvas or other suitable covers.

The mixture shall be delivered at a temperature within 25°F of the approved job mix formula.

Paving equipment shall be of the self-powered type with an adapter to provide guidance of the screeding action. The screed or strike-off member shall be adjustable to the shape of the cross-section of the finished pavement. Some method shall be provided for the tilting of the screed while in operation to secure the proper drag and to provide the compressive action necessary to prevent "pulling" and to result in the uniformly screeded surface required. The machine shall have a sufficient number of driving wheels so that there will be no undue amount of slippage. Whenever the design of the equipment and plan of operation are such that the driving wheels travel on the finished surface of a completed pavement, said wheels shall be equipped with rubber tires or other means to protect the finished surface. Screeding members shall be preheated, and means shall be provided for heating the screeding members by some method that will prevent accumulation of bituminous material.

Prior to the placement of the bituminous concrete, the underlying base course shall be brought to the plan grade and cross-section within the allowable tolerance. If material is to be place upon an existing concrete surface, the area to be surfaced shall be cleaned immediately before placing the mixture by brooming or by other means acceptable to the Town Engineer.

The mixture shall not be placed when weather conditions of fog or rain prevail or when the pavement surfaces shows signs of any moisture. Unless specifically authorized by the Engineer, the mixture shall be laid only when the air and base temperatures are above forty degrees Fahrenheit (40°F) and the depth of pavement to be placed at a minimum of 1-1/2 inches. For a 1- inch depth of pavement to be placed, the base temperature shall be above 50°F.

The Engineer may, at his sole discretion, permit work to continue when overtaken by sudden storms up to the amount which may be in transit from the plant at the time provided the mixture is within temperature limits specified and there is no standing water on the existing surface. At the time of placement, the mixture shall be within 25°F +/- of the temperature specified in the approved mix formula unless in the opinion of the Engineer job conditions warrant varying these limits. Upon arrival, the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck off to the full width required and to such appropriate loose depth for each successive course that when the work is completed, the designed depth will be obtained. Each course shall be struck off by the mechanical equipment. For use in striking off the bottom course, the machine shall be equipped with easily adjustable strike-off plates.

The hopper and tunnel shall be properly loaded at all times during the paving operation.

In order to obtain tight and well-compacted longitudinal joints, the sequence of the bituminous concrete placing operations for all courses laid shall be subject to the control of the Engineer.

Before any rolling is started, the finished surface struck by the machine shall be checked, any inequalities adjusted, and all fat spots from any source, shall be removed and replaced by satisfactory material.

In areas where, on account of physical limitations it is impracticable to operate the paving equipment, the Engineer may permit the use of other type spreaders or the mixture may be spread and screeded by hand.

When hand-spreading is permitted by special provisions or when, because of any project conditions, it becomes necessary to spread by hand, the mixture, upon arrival, shall be dumped on approved steel dump sheets outside of the area on which it is to be spread and shall then be immediately distributed into place by means of suitable shovels and other tools and spread with metal lutes in a uniformly loose layer of such depth as will result in a completed pavement having the designed depth. Any deviation from standard crown or section shall be immediately remedied by placing additional material or removing surplus as directed. The Engineer may direct that other means of placing the material in addition to the metal lutes be used to insure a better control of the depths of material and the surface finish.

Contact surfaces of curbing, gutters, manholes, etc. shall be painted with a thin, uniform tack coat just before the material is placed against them. Such tack coat shall not be paid for separately. Where the bituminous material is spread on a concrete or an old bituminous base, a uniform coat of asphalt, or approved equal, shall be spread about one foot-wide along each edge of the pavement to prevent water entering between the new pavement and the base. The Engineer may order a very light web-like coating of emulsion applied to the old pavement. Care must be taken not to apply too heavy a coating; application rate shall be 0.03 to 0.10 gallons per square yard.

Refueling of equipment in such a position that fuel might be spilled on bituminous concrete mixtures already placed or to be placed is prohibited. Solvents and cleaners for use in cleaning mechanical equipment or hand tools shall be stored well clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off the paved or to be paved area; and they shall not be returned for use until after they have been allowed to dry.

In the case of bridge decks, immediately before placing the bituminous concrete upon a waterproofing membrane, the waterproofing shall be cleaned by a method, which shall not damage the membrane.

If damage does occur, it shall be repaired by patching as directed by the Town Engineer at no cost to the Town. No traffic shall be allowed on the bituminous concrete course directly over the membrane.

After spreading and when sufficient set has developed to permit proper compaction, each course shall be compacted by rolling consisting of initial or breakdown rolling, intermediate rolling and final or finish rolling. Initial rolling shall be performed with power-driven steel wheel, tandem or 3-wheel rollers weighing not less than 10 tons. Final rolling shall be done by a power-driven steel wheel tandem roller weighing not less than 10 tons.

The in-place density of each layer or course of the compacted mixture shall be compacted to a density of between 92-97 percent of the target value as determined by a laboratory designated by the Town Engineer.

The density of the completed S 0.375 or S0.5 Superpave Premixed Bituminous Base shall be not less than 92 percent not more than 97 percent of the theoretical void-free density. Density may be tested from samples taken from the completed base or by other acceptable methods.

When nuclear density tests taken on surface courses indicate that 92 percent compaction has not been achieved, the Engineer may request pavement cores and/or additional testing.

Cessation temperature for continued compaction shall be 175°F.

The Contractor may include a vibratory roller in the compaction train providing the vibratory roller meets the requirements stated herein. The vibratory roller shall be a self-propelled type specifically designed for the compaction of bituminous concrete and meeting the following criteria:

FREQUENCY OF VIBRATION:

1500 vpm minimum; 2500 vpm maximum. (A Reed Tachometer shall be supplied by the Contractor to determine the frequency of vibration).

DRUM WIDTH:

66 inches minimum (dual vibratory drums 84 inches minimum (pneumatic drive wheels).

In addition, all vibratory rollers shall be equipped with a speedometer that accurately indicates roller speed in either 1/2-mph or 50-fpm increments (maximum) throughout the normal operating range. Vibratory rollers shall be equipped with a speed control device, which shall be set by the Contractor to prevent the roller from traveling in excess of 2-1/2 mph or 220 fpm when the roller is operating in a vibratory mode. All vibratory rollers shall be equipped with an automatic vibrator shut-off and automatic reversing eccentrics (weights).

The Contractor may substitute one vibratory roller for a breakdown roller and a pneumatic roller in the conventional procedure, the course shall be finish-rolled with a steel-wheel tandem roller having a minimum weight of 10 tons.

Dual vibrating drum rollers meeting the requirements of a steel-wheel tandem roller and operating in the static mode may be used as the finish roller; however, this single vibratory roller shall not be used as both the breakdown roller and the finish roller. One vibratory roller and one steel-wheel tandem roller shall be provided for each single-lane paver.

The use of a vibratory roller in the dynamic or vibratory mode is strictly prohibited on bridge decks or concrete structures.

The Contractor assumes full responsibility for the cost of repairing all damages which may occur to highway components and adjacent property. If the Engineer determines that the compaction-obtained is less than that specified, or damage to highway components and/ or adjacent property occurs with the use of the vibratory compaction equipment, the Contractor, at no additional expense, shall immediately cease using the equipment and shall proceed with the work in accordance with the conventional procedure outlined in the specifications.

For the purpose of testing the finished surface, a standard 10-foot straightedge shall, at all times, be available at the work site. The Contractor shall provide or designate an employee whose duty it is to use the straightedge in checking all surfaces.

The finished pavement shall be such that it will not vary more than 1/ 4 inch from a 10- foot straightedge applied parallel to the centerline of the pavement. Any irregularity of the surface exceeding the above limits shall be corrected. Depressions which may develop after the initial rolling shall be remedied. Such portions of the completed pavement as are defective in surface, compression or composition, or that do not comply with the requirements of the specifications shall be taken up, removed and replaced with suitable mixture, properly laid in accordance with these specifications at the expense of the Contractor.

The surface of the finished base course shall not vary by more than 3/8 inch from a 10-foot straightedge applied parallel to the centerline of the base.

Placement of the bituminous material shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the Engineer. Transverse joints shall be formed by cutting back on the previous run, existing bituminous concrete pavement, or bituminous concrete driveways to expose the full depth of the course. On any cold joint, a brush coat of asphaltic material or approved equal shall be used on contact surfaces of transverse and longitudinal joints just before additional mixture is placed against the previously rolled material.

The longitudinal joint in one layer shall offset the previous joint in the layer immediately below by approximately six inches; however, the joint in the top layer shall be at the centerline of the pavement if the roadway comprises two-lane width, or at lane lines if the roadway is more than two lanes in width. In compacting the joint, the steel-wheel roller shall be shifted onto the previously placed lane so that only 1 or 2 inches of the drive wheel extends over the uncompacted material.

The steel wheel roller shall continue to roll along this line and its position shifted gradually across the joint until the joint has been rolled with the entire width of the drive wheel. Rolling with steel wheel and pneumatic-tired rollers shall be continued until a thoroughly compacted, neat joint is obtained. When the vibratory roller is used for breakdown rolling, compacting the joint shall be accomplished with the roller on the uncompacted material shifted 1 to 2 inches across the joint onto the previously placed lane. Sections of the newly finished bituminous work shall be protected from traffic to prevent damage to the finished mat.

Compositions and Compacted Depths of Asphalt by Road Classification for New Construction:

LOCAL STREETS		
1-1/2”	Bituminous Concrete Surface Course	Superpave HMA S0.375
2”	Bituminous Concrete Binder Course	Superpave HMA S0.5
6”	Processed Aggregate Base Course	

ARTERIAL AND COLLECTOR STREETS (INCLUDING INDUSTRIAL ROADS)		
2”	Bituminous Concrete Surface Course	Superpave HMA S0.50
2”	Bituminous Concrete Binder Course	Superpave HMA S0.50
4”	Bituminous Concrete Base Course	Superpave HMA S1.0
10”	Processed Aggregate Base Course	

FULL-DEPTH CONCRETE CURBING

A. DESCRIPTION

This Item shall consist of the construction of concrete curbing, placed on a prepared base in accordance with these specifications at the location and to the lines, grades, dimensions and details shown on the Contract Drawings or as ordered by the Town Engineer.

B. RELATED SPECIFICATIONS

- CONCRETE WORK

C. MATERIALS AND CONSTRUCTION METHODS

The concrete for cast-in-place curbing shall be Class A concrete conforming to the requirements of "Concrete Work" and shall have a minimum compressive strength of 3,500 PSI at 28 days.

Joint filler shall conform to the requirements of the CTDOT Standard Specifications for Roads, Bridges and Incidental Construction.

Construction methods for concrete curbing shall conform to the requirements of the specification for the item entitled "Concrete Work" as supplemented by the following requirements:

EXCAVATION:

Excavation shall be made to the required depths below the finish grade as shown on the Contract Drawings or as directed. All soft and yielding materials shall be removed and replaced with suitable material and the base upon which the curbing is to be set shall be compacted to a firm, even surface.

FORMS:

Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist spring from the pressure of the concrete. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of concrete.

All forms shall be cleaned and oiled or wetted before concrete is placed against them. If concrete curbing is to be constructed against existing bituminous pavement, the front form shall be securely fastened to the pavement. Building paper shall then be inserted behind the forms to insure that no concrete seeps under the form.

Concrete curbing at driveways shall be continuous and full depth and shall be depressed to provide a 1-1/2-inch lip above the pavement surface.

PLACING CONCRETE:

No concrete work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

The elevation of the forms shall be checked just before the concrete is placed. Any irregularities indicated shall be corrected.

The concrete shall contain neither less than 5 nor more than 7 percent entrained air at the time the concrete is deposited within the forms. Concrete shall be placed only on a moist base. If the base if dry, it shall be thoroughly wetted a sufficient time in advance of the placing of the concrete. Concrete shall not be placed in puddles of water, nor shall it shall be placed on a soft, muddy or frozen base.

CURING AND PROTECTION:

Concrete curbing shall be cured and protected in conformity with the requirements of the specification of the item entitled “Concrete Work".

BACKFILLING:

After the concrete has set sufficiently, the grading shall be completed to the lines shown on the plans, or as ordered, by backfilling to the required elevation with approved material which shall be placed in layers of not over six inches in depth and compacted until firm and solid.

After the curbing has sufficiently set, it shall be backfilled with no undue delay in order to insure that it is not undermined or otherwise damaged. Curbing that has been damaged shall be removed and replaced as ordered by the Town Engineer at no additional cost to the Town.

EXTRUDED CONCRETE CURBING

A. DESCRIPTION

The item shall consist of the construction of extruded concrete curbing consisting of machine laid concrete, constructed on the pavement surface in conformance with these specifications, at the locations and to the lines and grades, dimensions and details as shown on the Town Standard Detail drawing, as an acceptable alternative to the installation of full-depth curbing. This alternative necessitates the widening of the entire pavement structure to accommodate and support the curbing.

B. RELATED SPECIFICATIONS

- CONCRETE WORK

C. MATERIALS

Materials for this work shall conform to the requirements of the CTDOT Standard Specifications for Roads, Bridges, and Incidental Construction.

The concrete shall be designed to include approximately 75% state approved concrete sand and 25% 3/8" rock. The concrete shall contain a minimum of 620 pounds of cement (6.5 sacks) per cubic yard, yielding a concrete that will exceed 4,000 psi in 28 days. The concrete shall be produced according to ASTM C94 Ready Mixed Concrete or ASTM C 685 Concrete Produced by Volumetric Continuous Mixing.

The grading limits shall be further modified, if necessary, to produce concrete that, after extrusion, has well defined web marks of water on the surface and is free of surface pits larger than 3/16" diameter. The concrete shall be of such consistency that, after extrusion, it will maintain the shape of the curb section without support or slumping. It shall contain the maximum amount of water that will permit this result.

The concrete shall contain a minimum of one pound of fiber reinforcement per cubic yard.

The adhesive or bonding agent that is required to anchor the extruded concrete curb to the existing pavement or curbing shall be Sika Latex, Laticrete 40, or Concresive Paste LPL.

D. CONSTRUCTION METHODS

No concrete work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

The methods employed in performing the work and all equipment, tools and machinery used in the handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started, and whenever found unsatisfactory, it shall be changed and improved as required by the Town Engineer. All equipment, tools and machinery used must be maintained in a satisfactory working condition.

If the design of the curbing machine is such that the outside wheels operate outside the limits of the paved surface, the Contractor will be required to obtain a smooth surface by grading and consolidating the area on which the outside wheel of the machine rides, and this work shall be done at his expense.

All surfaces where the curbing is to be installed must be thoroughly cleaned, and if necessary, by abrading and/or high pressure water washing, so as to assure all removal of all dust, loose material, and/or oil.

The extruded concrete curbing shall be installed when outside temperature is above forty-five degrees Fahrenheit (45°F), and rising when it can be expected that the placing and finishing can be accomplished at that temperature and above, and during non-precipitating weather conditions.

The extruded concrete curbing shall be bonded to the existing pavement by utilizing an adhesive as referenced in the materials specifications.

The top of the finished curb must be true to line. The curb will follow the contour of the adjacent pavement. The curb must be free of humps or sags. Control joints shall be cut immediately through one third of the cross section of the fresh extruded concrete curb. The joint shall be tooled and finished to a neat and uniform appearance. The control joint shall be installed at nine foot intervals and more often on radii, so as to minimize shrinkage cracking.

The top surface of the curbing shall not deviate more than ¼ inch from the contour of the pavement. Any variation from the contour horizontally or vertically exceeding ¼ inch shall be satisfactorily corrected. The only compaction required shall be that obtained by the approved mechanical curbing machine.

The finished curb shall be coated with a curing compound which has been designed to seal the surface and form a waterproof membrane to retard the loss of water from then fresh concrete following the manufacturer's instructions. The curing compound shall be applied immediately or up to 2 hours after the extruded concrete curbing is installed. Weather conditions must be non-precipitating between the time of the extruded concrete curb installation and four (4) hours later.

Protection from traffic shall be provided to guard against vehicles hitting the extruded concrete curbing for a minimum period of 36 hours after the extruded concrete curbing is installed. This protection shall be in the form of cones or drums, or as directed by the Town Engineer.

BITUMINOUS CONCRETE LIP CURBING

A. DESCRIPTION

The work under this item shall consist of the construction of bituminous concrete lip curbing consisting of machine laid bituminous concrete, constructed on the pavement in conformance with these specifications, at the locations and to the lines and grades, dimensions and details as shown on the plans or as directed by the Town Engineer.

B. RELATED SPECIFICATIONS

- BITUMINOUS CONCRETE PAVEMENT

C. MATERIALS AND CONSTRUCTION METHODS

No bituminous curbing shall be placed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

Materials for this work shall conform to the CTDOT Standard Specifications for Roads, Bridges, and Incidental Construction.

The methods employed in performing the work and all equipment, tools and machinery used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started, and whenever found unsatisfactory, it shall be changed and improved as required by the Engineer. All equipment, tools and machinery used must be maintained in a satisfactory working condition.

The bituminous concrete mixture shall be transported from the mixing plant in trucks having tight bodies which have previously been cleaned of all foreign material. The use of kerosene, gasoline, fuel oil or similar products for the coating of the inside of truck bodies is strictly prohibited. Loaded trucks shall be tightly covered with waterproof canvas or other suitable covers. The mixtures shall be delivered at a temperature within 25F of the approved job mix formula.

Curbing equipment shall be of the self-powered type which shall force the hot bituminous mixture through a die or form properly shaping and compacting it to the required cross section of the curb.

If the design of the curbing machine is such that the outside wheels operate outside the limits of the paved surface, the Contractor will be required to obtain a smooth surface by grading and consolidating the area on which the outside wheel of the machine rides, and this work shall be done at his expense.

Prior to the arrival of the mixture on the work, the surface of the pavement where the curbing is to be constructed shall be cleaned of all loose and foreign material. The surface, which shall be perfectly dry and clean at the time the mix is placed, shall be coated with an RC-2 or other approved tack coat just prior to placing the mixture. On arrival at the site, the mixture shall be transferred from the truck to the hopper of the curbing machine; and the mixture shall be kept clean and free from dirt or foreign materials at all times.

The mixtures shall not be placed when weather conditions of fog or rain prevail nor when the pavement surface shows signs of any moisture. Unless specifically authorized by the Town Engineer, the mixture shall be laid only when the air and base temperatures are above forty degrees Fahrenheit (40°F).

The surface of the curbing shall be tested with a 10- foot straightedge, and any variation from a true line horizontally or vertically exceeding 1/ 4 inch shall be satisfactorily corrected. The only compaction required shall be that obtained by the approved mechanical curbing machine.

Where machine work is impractical, the Town Engineer may permit hand-laid curbing to be constructed.

After the completion of curbing, traffic shall be kept at a safe distance for a period of not less than 24 hours and until the curbing has set sufficiently to prevent injury to the work. The Contractor shall be responsible for the repair of any damaged curbing.

CONCRETE SIDEWALKS, DRIVEWAY APRONS, AND RAMPS

A. DESCRIPTION

The work under this item shall consist of the construction of new concrete sidewalks, driveway aprons and ramps or the replacement of existing damaged sidewalks, driveway aprons and ramps. They shall be constructed on a gravel base course at the locations and to the dimensions and details shown on the Contract Drawings or as ordered by the Town Engineer and in accordance with these Specifications. Sidewalks shall be protected with an anti-spalling treatment prior to acceptance.

B. RELATED SPECIFICATIONS

- CONCRETE WORK
- COMPACTED GRAVEL FILL
- PREPARATION OF SUBGRADE
- GRAVEL SUBBASE
- PROCESSED AGGREGATE BASE (PAB)
- BITUMINOUS CONCRETE PAVEMENT

C. MATERIALS

Materials for this work shall conform to the requirements of the specification "Concrete Work".

Sidewalks, ramps and replacement driveway aprons shall be Class "F" 4,000 p.si. concrete. However, this agency recommends that replacement driveway aprons be bituminous concrete per current Town standard whenever possible due to corrosive effects of road salt. Replacement of deteriorated sidewalks crossing of driveways with asphalt when it's possible to attain the A.D.A. cross slope pitch

Anti-spalling compound shall be Consolideck Saltguard as manufactured by ProSoCo Inc., Kansas City, KS. or an approval equal.

Preformed Expansion Joint cement and air-entraining admixtures shall conform to CTDOT Standard Specifications.

Air-entraining Portland cement and air-entraining admixtures shall conform to the requirements of the applicable section of the Standard Specification "Concrete Work".

Gravel for the base course shall conform to the Specification for "Compacted Gravel Fill".

Reinforcement where required by this specification or where indicated by the Contract Drawings shall conform to the requirements of CTDOT Standard Specifications.

D. CONSTRUCTION METHODS

No bituminous surfacing or concrete flat work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

EXCAVATION:

Excavation, including removal of any existing sidewalk, driveway apron or ramp, shall be made to a minimum depth of inches below the finished grade, to accommodate a sidewalk, apron or ramp of the thickness specified together with the specified compacted gravel base, (six (6) inch minimum) or as shown on the Contract Drawings or as directed. All soft and yielding material shall be removed and replaced with suitable material.

GRAVEL BASE:

The gravel base shall be placed to the dimensions six (6) inch minimum, eight (8) inch minimum at driveways, shown on the Contract Drawings and properly compacted. The base shall be wetted and rolled or tamped after the spreading of each layer.

FORMS:

Forms shall be full dimension and shall be of metal or wood, straight, free from warp and of sufficient strength to resist spring from the pressure of the concrete. If of wood, they shall be of 2"x6", (2"x8" at driveways) surfaced plank, except that at sharp curves thinner material may be used. 2”x4” forms may be used only if forms are elevated on shims and backed up by gravel fill to attain proper thickness to be confirmed by the Engineer. If of metal, they shall be of approved section and shall have a flat surface on the top.

Forms shall be securely staked, braced, and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of concrete or mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them. Pre-molded bituminous expansion joints 1/2 inch in thickness, of full depth and width of the walk, driveway, or ramp shall be placed at intervals of 16 feet. The contractor is encouraged to call for a form inspection prior to pouring concrete to reduce the possibility or removal and rework if proper grades, landings, and wings are not attained.

PLACING CONCRETE:

The correct cross section of the base shall be checked just before the concrete is placed by testing with a template of wood or metal, the bottom surface of which conforms to the desired cross section. Any irregularities thus indicated shall be corrected. The base shall be kept in a satisfactory condition by rolling with an approved roller, as often as may be necessary to maintain the required contour and compaction. Concrete shall be placed on a moist base. If the base is dry, it shall be thoroughly wetted a sufficient time in advance of the placing concrete. The base shall not be allowed to dry out before the concrete is placed, but concrete shall not be placed in puddles of water. No concrete shall be placed unless the inspector is present.

CONCRETE:

The concrete shall be proportioned, mixed, placed, etc., in accordance with the provisions of the Specifications for "Concrete Work", except as modified herein.

The concrete shall contain neither less than 5 nor more than 7 percent entrained air at the time the concrete is deposited in the forms. Air-entrainment shall be obtained and the concrete cured m accordance with the provisions of the Specifications for "Concrete Work".

FINISHING:

The surface of the concrete shall be finished with a wood float or by other approved means. A wood float type surface will be achieved unless otherwise noted on the Contract Drawings. The outside edges of the slab and all joints shall be edged with a 1/4-inch radius edging tool. Dummy joints will be provided as shown on the Contract drawings.

Anti-spalling compound shall be spray applied in full conformance with the manufacturer's recommendations at a rate of one gallon per 100 square feet.

Concrete monuments, gas gates, water gates and manhole frames and covers, sidewalks vault doors, frames, etc. shall be carefully adjusted to the proposed finished grade.

BACKFILLING AND REMOVAL OF SURPLUS MATERIAL:

The sides of the sidewalk, driveways and ramps shall be backfilled with suitable material, thoroughly compacted and finished flush with the top of the sidewalk, driveway or ramp, as indicated on the Contract Drawings or as ordered by the Town Engineer. In order to protect the completed sidewalk from undermining, the backfill shall be placed immediately upon removal of the forms. All surplus material shall be removed and the site left in a neat and presentable condition to the satisfaction of the Town Engineer.

REINFORCEMENT:

Welded wire mesh (6”x6”x6”) shall be used as reinforcement in all sidewalks at driveways and in all driveway aprons. Reinforcement where used shall be placed as shown on the Contract Drawings in accordance with the applicable methods of the Specification "Concrete Work" or as directed by the Engineer.

E. AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE

All ramps shall comply with the United States Department of Justice 2010 ADA Standards for Accessible Design, as Amended. Reference is made to State of Connecticut Engineering Office sidewalk Ramp Details sheets 2, 3, & 4, which are available for download at the CTDOT website.

Ramps that do not fully comply will be rejected and have to be replaced at the contractors expense.

TOPSOIL

A. DESCRIPTION

The work under this Item shall consist of furnishing, placing, spreading and shaping topsoil; or placing, spreading, and shaping topsoil from stockpiles or stripped areas; on the areas shown on the Contract Drawings or where directed by the Town Engineer. The topsoil will be placed to a depth equivalent to the existing depth or four inches (4”) whichever is greater.

B. RELATED SPECIFICATIONS

- SITE PREPARATION (CLEARING & GRUBBING)
- EROSION AND SEDIMENTATION CONTROL (E&S)
- TURF ESTABLISHMENT
- RIGHT-OF-WAY RESTORATION

C. MATERIALS

Topsoil shall consist of friable loam reasonably free of subsoil, clay lumps, brush, roots, weeds or other objectionable vegetation, stones or similar objects larger than 2 inches. Brush and other vegetation, which will not be incorporated with the soil during handling operations, shall be cut and removed prior to stripping. Ordinary sods and herbaceous growth such as grass and weeds need not be removed but shall be thoroughly broken up and intermixed with the soil during handling operations.

The topsoil, unless otherwise specified or approved, shall have an acidity range of approximately 5.5 PH to 6.5 PH. The organic content shall be not Jess than 3% nor more than 20% as determined by the wet combustion method. There shall not be less than 20% nor more than 80% passing the 200-mesh sieve.

All topsoil from offsite sources will be tested unless otherwise directed. A report on representative samples from the proposed source of the topsoil by an approved Soil Testing Laboratory shall show a PH rating between 5.5 and 6.5 and agronomical acceptable levels of nitrogen, phosphorus, potash and trace elements magnesium, manganese, iron and sodium with recommendations for additions of lime and fertilizer. Soil supplements that may be necessary, based on the test results, will not be part of the work, under this Item, but will be included under the Item “Turf Establishment".

All material delivered to the project which does not meet these specifications, or which has become mixed with undue amounts of subsoil during any operation at the source or during placing or spreading, will be rejected and shall be replaced by the Contractor with acceptable material at his expense.

Topsoil shall not have been treated with a residual insecticide or herbicide within one year of delivery for use on the project.

D. CONSTRUCTION METHODS

The areas on which the topsoil is to be placed shall be excavated and/or brought to grade as necessary such that on placement of the specified topsoil depths, the surface will be within reasonably dose conformity to the lines, grades, and cross sections specified or required.

Unless otherwise specified or shown on the Contract Drawings, all existing mere stones, gas gates, water gates, manhole frames, and covers, drainage or other existing structures in the proposed topsoil areas shall be adjusted to the proposed finished grade and protected from damage during topsoil operations.

The Contractor shall use sufficient stakes or other approved methods to insure reasonably close conformity to the elevations or grades shown on the Contract Documents.

Areas to be topsoiled shall be cleared of all stones, roots, debris, sod, weeds and foreign materials one (1) inch or larger in any dimension and shall be loosened to a depth of two (2) inches by raking, dicing or other approved methods. On sloped areas, the raking or dicing shall be done parallel to the contours to minimize erosion.

The topsoil shall then be spread over the prepared areas in such quantities as necessary to obtain the required depth after natural settlement and compaction, and shall be raked free of all material unsuitable for, or harmful to plant growth. It shall then be compacted as directed by means of a light roller weighing not over 120 pounds per foot- width of roller. The Contractor shall perform such work as required to provide a smooth, uniform, friable surface for seed germination and plant growth prior to seeding or planting.

After shaping and grading, all trucks and equipment shall be excluded from the topsoiled area to prevent excessive compaction. During hauling and spreading operations, Contractor shall immediately remove any material dumped or spilled beyond the limits of the topsoiled area.

It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition. Plant cover or erosion preventing materials shall be established as soon as possible on all bare earth areas to minimize air and stream pollution.

All available onsite stockpiled topsoil shall be placed and spread prior to the use of topsoil from offsite sources. Unless stockpile areas are available or are provided, the topsoil used from offsite sources will be delivered to the project site as necessary for immediate use.

The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor's operations shall be graded if required and put into a condition acceptable for seeding. Unless specified elsewhere herein, surplus stockpiled topsoil shall be the property of the Town of Cheshire and may be removed by the Town at its discretion. If not removed by the Town, it shall be used to flatten embankment slopes or placed in other locations approved by the Town Engineer.

TURF ESTABLISHMENT

A. DESCRIPTION

The Work under this section consists of furnishing and placing agricultural ground dolomitic limestone, fertilizer, seed and/ or mulch at the rates and by the method specified herein.

B. RELATED SPECIFICATIONS

- EROSION AND SEDIMENTATION CONTROL (E&S)
- TOPSOIL
- RIGHT-OF-WAY RESTORATION

C. MATERIALS

Materials shall conform to the following requirements:

1. Lime shall be standard commercial ground dolomitic limestone.

2. Fertilizer used for non-maintained areas shall be a standard 10-6--4 mixture; in maintained areas organic fertilizer shall be used and have a quality and mixture equal to Spurzon, Milorganite, or Turf Builder. All fertilizer shall be delivered to the job in its original sealed containers.

3. Grass Seed shall be from a new crop, fresh and clean. The seed is to be delivered to the site in its original containers, which shall bear the dealer's guaranteed analysis, indicating the proportions of each seed, the purity, and the germination. The following indicates the type of seed required and the minimum percentages of each.

Grass Type	Proportion By Weight	Purity	Germination
Chewing Fescue	30%	97%	90%
Kentucky 31 Fescue	30%	98%	90%
Kentucky Bluegrass	20%	85%	80%
Domestic Ryegrass	20%	98%	90%

Note: Weeds and inert material shall not exceed 2%.

D. CONSTRUCTION METHODS

Construction methods shall be agronomical acceptable and feasible. The rate and recommendations for liming and fertilizing shall be established by an approved Agricultural Experiment Station in Connecticut the results of which must be approved by the Engineer. In order to assist in obtaining this information 'the Contractor will be required to submit to this experiment station a sample of the topsoil to be used at the rate of at least one sample per acre.

Seed shall be spread at least four days after fertilization of the soil by an approved mechanical method and at the rate of 5 pounds per thousand square feet. Seed shall be lightly raked into the soil to a depth of approximately 1/8 inch (and not more than 1/4 inch) and the entire seeded area shall be rolled with a light weight roller. Planting seasons shall be between March 1st and May 1st, or between September 1st and October 15th.

Areas seeded shall be mulched unless otherwise ordered by the Engineer. Woodchopper mulch shall not be used on seeded areas; unless otherwise shown on the Contract Drawings or called for elsewhere in the Contract Documents, hay mulch or wood fiber mulch (only when hydraulic seeding methods are utilized) will be used.

Hay (where used) shall be uniformly applied by an approved method to a placed depth of two (2) inches (at a rate of two tons per acre). Hay shall be held in place by one uniform application of asphalt emulsion Type SS-1, applied at the rate of 0.08 gallons per square yard. The emulsion shall have a temperature range within 50-120 degrees F. at the time of the application. The emulsion may be applied during or immediately after the application of the mulch.

The Contractor shall be required to replant, at no additional cost to the Owner, using full amounts of all specified materials, those areas damaged by wind, washout, fire, equipment, pedestrian traffic, or other natural or man-made occurrences, to the satisfaction of the Town Engineer.

The Work shall not be complete until all stones over one (1) inch in diameter, glass, cables, bale wire, and other debris have been removed from the seeded areas. Cleanup shall include the removal of all debris resulting from the seeding or planting operations on shoulders, pavement or adjacent property, public and private.

The Contractor shall be required to shape, grade and establish vegetative cover in accordance with the specifications and Contract Drawings on all areas disturbed outside the normal limits of construction. The Contractor shall be required to maintain and water as required the grass through the fourth cutting. Periods of cutting shall be as ordered or approved by the Town Engineer or when the grass reaches four inches in height.

PAVEMENT REPAIR

A. DESCRIPTION

The work under this Item shall consist of the permanent repair to pavement which have been damaged or removed during the course of construction. This work shall also include the cutting and removal of existing pavement, removal of such temporary pavements, subbase, backfill and any other materials as may be required for installation of the permanent repairs in accordance with the plans and specifications or as directed by the Town Engineer.

B. RELATED SPECIFICATIONS

- EROSION AND SEDIMENTATION CONTROL (E&S)
- TRENCH EXCAVATION
- PREPARATION OF SUBGRADE
- GRAVEL SUBBASE
- PROCESSED AGGREGATE BASE (PAB)
- BITUMINOUS CONCRETE PAVEMENT
- RIGHT-OF-WAY RESTORATION
- COMPACTION TESTING

C. MATERIALS

The base of the roadway shall consist of six inches (6”) of processed stone, meeting the material requirements specified in "Processed Aggregate Base" and the remainder of the backfill material to be replaced within the excavation shall consist of compacted gravel meeting the material requirements specified in "Gravel Subbase" and “Processed Aggregate Base” in accordance with the standard pavement structure cross section.

The use of native material for backfill material is not allowed unless suitable granular material is confirmed to be present and is determined to be acceptable in advance by the Town Engineer or his designated agent. Trenches backfilled without providing the Public Works Dept. adequate notice for inspection shall be re-excavated and backfilled under observation of a Town inspector.

Bituminous concrete shall meet the material requirements specified in "Bituminous Concrete Pavement". Base course shall be either Superpave 0.5 or S0.375 and surface course shall be S0.375 for local roads. The pavement shall consist of a two inch (2”) base course and a 1-1/2" surface course both measured after compaction.

Bituminous concrete shall not be placed until the base is in proper condition and has been approved by the Engineer. The two course bituminous concrete pavement shall be spread and compacted in accordance with the specifications. In no case shall the asphalt patch thickness be less than the surrounding asphalt in the area cut. Additional lifts of no more than 2.5-inches are required to be placed and compacted to restore the original depth not to exceed a maximum depth of nine (9) inches.

D. CONSTRUCTION METHODS

No bituminous surfacing work shall be performed between October 15th and April 15th. These dates may be modified only with written consent of the Town Engineer.

Prior to making any permanent repairs, all temporary repairs existing pavement base and other materials as required shall be removed to required depths and widths as shown on the Contract Drawings or as directed by the Engineer. Edges of existing pavement shall be compressor cut to a straight square edge surface and shall be coated with liquid asphalt emulsion immediately prior to placing the permanent pavement repair.

Construction methods shall be as specified in the respective items for "Gravel Subbase", "Processed Aggregate Base", and "Bituminous Concrete Pavement" except that if the Town Engineer determines that the size of the pavement repair area justifies alternate methods for placing or compacting the subbase, base or pavement, he shall so direct the Contractor who shall employ such alternate methods at no additional cost to the Town. In general, for smaller excavations such as for service connections a jumping jack compactor is preferable over the use of a plate compactor, and for utility main extension trench work a remote-controlled sheep foot trench roller is highly recommended. Both of these methods are recommended to achieve proper compaction in the least amount of time. For reasonably sized plate compactors, the maximum pre-compaction lift height is 6", for jumping jack 8", and sheep foot trench roller in one-foot lifts.

Cold patch is not allowed for temporary patchwork unless applied in emergency situations. Hot mix asphalt is required for all cold patches within 24 hours. Any recycled asphalt laid down during the winter months after the plants have closed in a temporary patch will have to be removed prior to permanent paving.

Excavations larger than 200 square-feet may require that the contractor hire an independent geotechnical lab to furnish nuclear density testing of the trench backfill. This condition shall be noted on the street excavation permit. Pavement marking replacement is required on all roads where they are lost to patching.

On all roads one-foot cutbacks beyond temporary patch limits and temporary patch removal is required, along with tack coat and crack sealing of joints after a minimum ninety-day settlement period of the temporary patch.

For permanent patches within roads rated below 70 PCI, a mill and pave permanent restoration is not required beyond the trench limits. If the road's rating falls within 70-79, then ½ width mill & pave restoration will apply. Service trenches that cross the centerline shall be cut back the minimum of 1-foot unless apparent settlement warrants a greater distance, and their spacing is not a factor. A public utility company may offer to contribute the cost of the permanent restoration to the Town rather than perform the work if the road is already candidate for repaving, and at the discretion of the Town Council.

For utility main or drainage installations on roads with a PCI rating between 80-90 per last independent evaluation up to full-width 1.5" deep mill and pave restoration is required depending upon the pipeline and service connection location, crossing the centerline from the main side of road, and any ancillary pavement damage such as from movement of heavy tracked equipment. In the event that private services cross the centerline of the road from the main (that is to receive ½ width mill & pave restoration) within 200 LF of each other, then both lanes shall be milled and paved between the service crossings and to a distance of five (5) feet beyond each trench. If the temporary patch crosses the centerline then the mill & pave restoration shall at least extend to the center of the wheel path of the opposing lane, if not all the way to the gutter.

For utility main or drainage installations on roads rated 90 and above per last independent evaluation, permanent restoration will require up to full-width 1.5" mill and pave restoration depending upon the pipeline location, number of services crossing the centerline from the main side of road, and any ancillary damage that occurs. In the event that private service trenches cross the opposite side of the road from the main (that is required to receive ½ width mill & pave restoration at minimum) within 300 LF, the opposite frequently than both lanes shall be milled and paved between crossings. If greater than 300 lineal feet the trenches shall be cut back, plus receive milling and pave treatments to a distance of 10-feet beyond the midpoint of each trench.

For lower rated roads public utility companies may elect to contribute a payment in lieu of permanent patching (subject to the approval of the Town Council), which the Town would use to pave the entire road sometime after the utility main and service work is completed.

Service trench patches will have to be milled and paved ½ width (to the centerline), for a distance extending 5' from either edge of temporary trench on roads rated between 80-90 PCI. Should the service disturbance cross the centerline, this restoration treatment will extend the full-width of the road.

Except for emergency repairs a winter moratorium between November 15th and April 1st will be enforced for non-essential service connections or for subdivision improvements.

Non-emergency weekend work within Town roads is not allowed. Non-emergency work in Town streets after 5:00 PM not permitted without prior arrangements made for the presence of a Town inspector.

RIGHT-OF-WAY RESTORATION

A. DESCRIPTION

Under this item, the Contractor shall, upon completion of the construction within any section of this Contract repair or replace to a condition equal to or better than original, all pavement, curbing, topsoil, lawns, bushes, shrubs, trees, fences, fields, incidental works' or any and all other property removed or harmed in any way by reason of work done under this Contract.

This work shall include all excavation, grading, placement of topsoil, fertilizing and seeding necessary to insure that all areas adjacent to new work are brought into conformance with Town Standards.

B. RELATED SPECIFICATIONS

- EROSION & SEDIMENTATION CONTROL (E&S)
- CONCRETE SIDEWALK, DRIVEWAY APRONS & RAMPS
- TOPSOIL
- TURF ESTABLISHMENT
- PAVEMENT REPAIR

C. MATERIALS AND CONSTRUCTION METHODS

Clearing and Grubbing within these areas shall be as defined under Site Preparation". In restoring all areas the Contractors shall:

1. Replace to an equivalent depth any topsoil that has been removed during the excavation.

2. Remove from the property and dispose of it in a fashion approved by the Engineer, all trees, brush and other items that the Contractor has cut in order to prosecute his work.

3. Remove from the property upon completion of the work thereon all excess materials of construction such as stone, pipe, concrete block, gravel, etc., that the Contractor may have stockpiled for use during the course of the work.

4. Leave the land in a smooth, even condition. All ruts, holes or other undesirable grading conditions which resulted from work under this Contract shall be filled and the area so graded to eliminate ponding. All drainage courses shall be restored to their pre-existing condition or better.

5. Fertilize and seed those areas where the original ground cover was removed or disturbed by operations under this Contract.

6. Replace all curbing damaged or removed during construction.

7. Replace all bituminous concrete damaged or removed during construction including cutting pavement, emulsion seal, preparation of subgrade, processed stone base and 3" bituminous concrete pavement.

8. Reset all public or private monuments, iron pipes or other types of property line and geodetic markers damaged or disturbed by operations under this Contract. This work will be done by a licensed land surveyor or authorized agent approved by the Engineer - all at no additional cost to the Owner.

9. The Contractor shall also repair, reset or replace as directed by the Town Engineer, all pipes, walls, utilities, fences, railings, stone walls, etc., and ornamental or other surfaces, structures or property which may have been damaged, either directly or indirectly by his operations under this Contract.

STREET LIGHTING

A. DESCRIPTION

For installation of new street lights on existing roads and for new subdivisions, reference is made to the "Street Light Policy" adopted by the Town Council on September 13, 1982 as amended. All proposed street light locations will be reviewed by the Town Engineering Department as part of the Planning & Zoning approval process.

B. RELATED SPECIFICATIONS

- SITE PREPARATION (CLEARING & GRUBBING)
- TRENCH EXCAVATION
- RIGHT-OF-WAY RESTORATION

C. MATERIALS AND CONSTRUCTION METHODS

Town of Cheshire standard light fixture is the LED "Cobra Head" style luminaire. Post top fixtures, or alternative fixtures may be permitted for new subdivisions or other developments on a case-by-case basis with approval by the Town Engineer and the Planning & Zoning Commission.

All fixtures are to be fit at time of installation with photo cells.

FIXTURES:

1. *COBRA HEAD*: Cree LED cobra head (XSP Series LED Street Light – Horizontal Tenon Mount – Type II) - Model: BXSPRA02 or approved equal.

2. *POST TOP*: American Electric Lighting Post Top (American Revolution LED Series 247L) or approved equal.

POLE REQUIREMENTS:

1. Thirty feet (30') Pressure Treated Yellow Pine (For use with Cobra Head Fixtures)

2. Thirty feet (30') 5" x 5" Fiberglass Pole (For use with Post Top Fixtures)

LED "COBRA HEAD" STYLE LUMINAIRE MINIMUM SPECIFICATION:

1. Luminaire shall mount to a 1¼" to 2" (1 5/8" to 2 3/8" O.D.) diameter horizontal mast arm (tenon); Tenon shall be adjustable to allow for fixture leveling.

2. Luminaires shall be suitable for wet location applications.

3. Manufacturer shall provide a minimum ten year (10 YR) limited warranty on luminaire and on the finish.

LED “POST TOP” STYLE LUMINAIRE MINIMUM SPECIFICATION:

1. Die-cast aluminum housing and hood for long-life performance.
2. CSA listed and suitable for up to 30°C ambient.
3. Rated L70, LED life greater than 100,000 hours at 25°C.
4. Manufacturer shall provide a minimum five year (5 YR) limited warranty on product.

ELECTRICAL CONNECTION:

For street lights being installed as part of a new subdivision, the Developer is responsible for establishing an electrical connection and private account with EVERSOURCE until such time as the road is accepted by the town.

The Developer is responsible for contracting a licensed electrical professional, approved by EVERSOURCE to install town approved street light fixtures.

Electrical connections shall be underground. Fiberglass hand hole shall be provided and shall be located on the field side of pole flush with ground.

Upon road acceptance the Developer shall coordinate with the Engineering Department to transfer ownership of the affiliated fixtures.

LIGHT POLE INTERVALS:

For all new roads in all zoning districts, street lights shall be required at: (1) all intersections; and (2) at curves and other locations as necessitated by safety considerations, unusual topographical features, or other special conditions.

In addition, light poles shall be spaced at intervals specified in the table below and as deemed necessary and appropriate. Locations shall be approved by the Town Engineer.

Pedestrian traffic and residential density shall be taken into consideration in connection with such lighting placement.

Street Classification	Pole Spacing Interval
Arterial Streets	250 Feet
Collector Streets	500 Feet
Residential (Local) Streets	750 Feet*

*In no event shall street lighting be less than 400 feet intervals except for placement at curves and intersections.

COMPACTION TESTING

A. DESCRIPTION

Compaction testing shall normally be required for the construction of new Town Roads and for the repair of utility trenches in roads with a Pavement Condition Index (PCI) rating of 80% and higher. Compaction testing may also be required for other work as determined by the Director of Public Works and/or the Town Engineer.

B. RELATED SPECIFICATIONS

- COMPACTED GRAVEL FILL
- PREPARATION OF SUBGRADE
- GRAVEL SUBBASE
- PROCESSED AGGREGATE BASE (PAB)
- BITUMINOUS CONCRETE PAVEMENT

C. MATERIALS AND CONSTRUCTION METHODS

Where required, the Developer/Contractor will make arrangements for and pay for compaction testing. Compaction testing will be paid for by a qualified testing company as approved by the Town Engineer. The testing company shall prepare a test location layout plan based upon a random selection of test sites within the project area upon arrival on-site. Said test location plan shall be presented to the authorized Town representative on-site for Town approval.

No testing shall take place until the location plan has been approved. Test locations shall be no farther than 100 feet apart. At the end of the data collection, the testing company shall prepare a report of its findings and present said report to the Town. All fees associated with the compaction testing will be borne by the Developer/Contractor.

During performance of the tests, any area identified to be below the minimal acceptable values as established shall be re-compacted and re-tested as required.

Minimum Compaction Requirements	
Trench backfill	98% of maximum dry density
Road sub-base	95% of maximum dry density
Road gravel base	95% of maximum dry density
Processed Aggregate Base	95% of maximum dry density
Bituminous Concrete Pavement	92% - 98% of maximum dry density

Pavements with a density of less than 90% shall be rejected. Pavements with a density greater than 90% but less than 92% will be considered on a case-by-case basis, said remedy may be payment in lieu, bond extension or other remedy acceptable to the Town Engineer.

ARTICLE IX.

STANDARD DETAIL DRAWINGS

INTRODUCTION

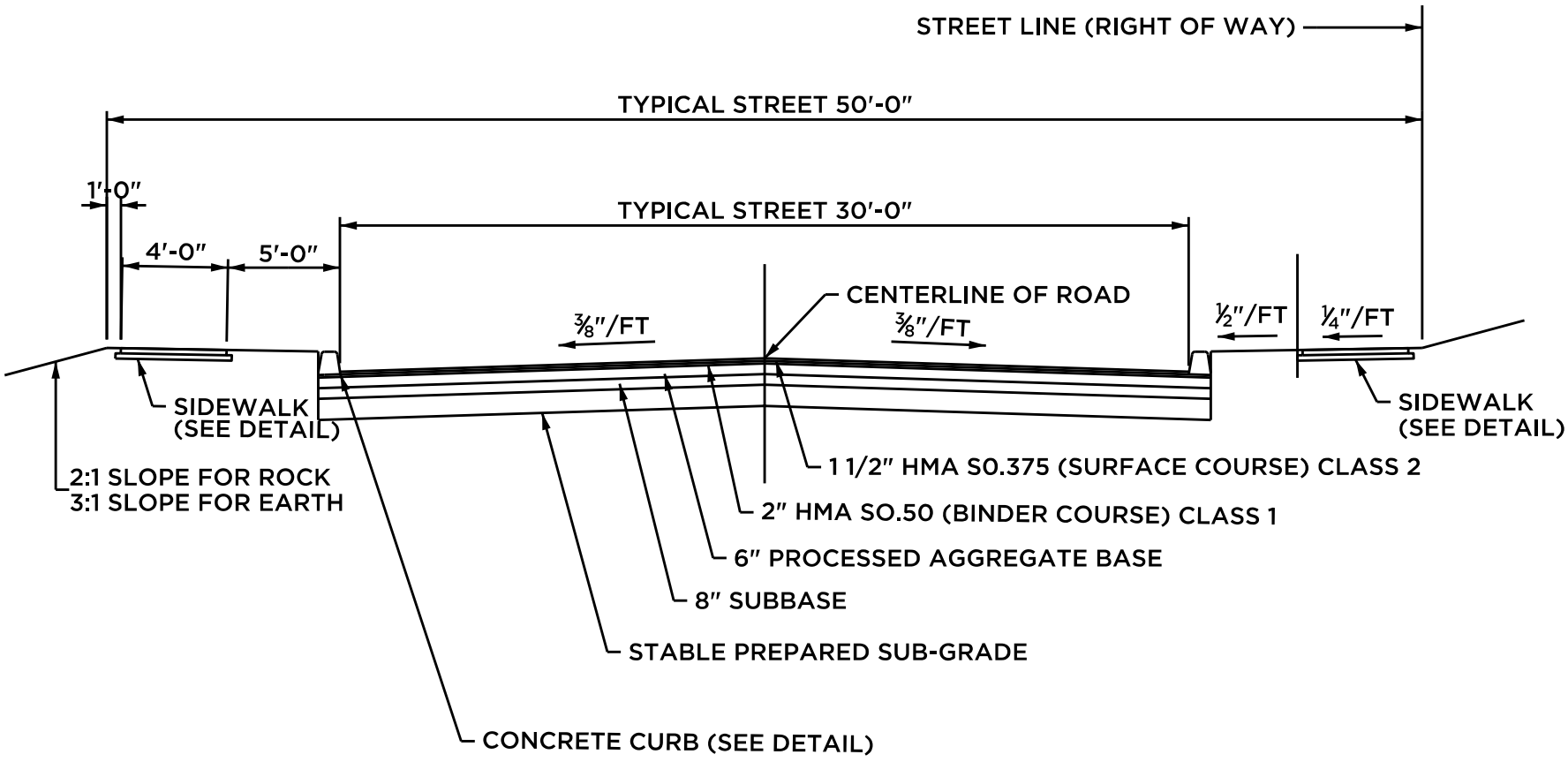
All improvements that impact public infrastructure and facilities within the Town of Cheshire's right-of-way shall conform to the following standard construction details, unless otherwise approved by the Town Engineer. The Town Engineer reserves the right to modify these standard construction details at any time as deemed necessary to meet the needs of existing and proposed public infrastructure and facilities and to protect private property.

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

TYPICAL ROADWAY SECTION

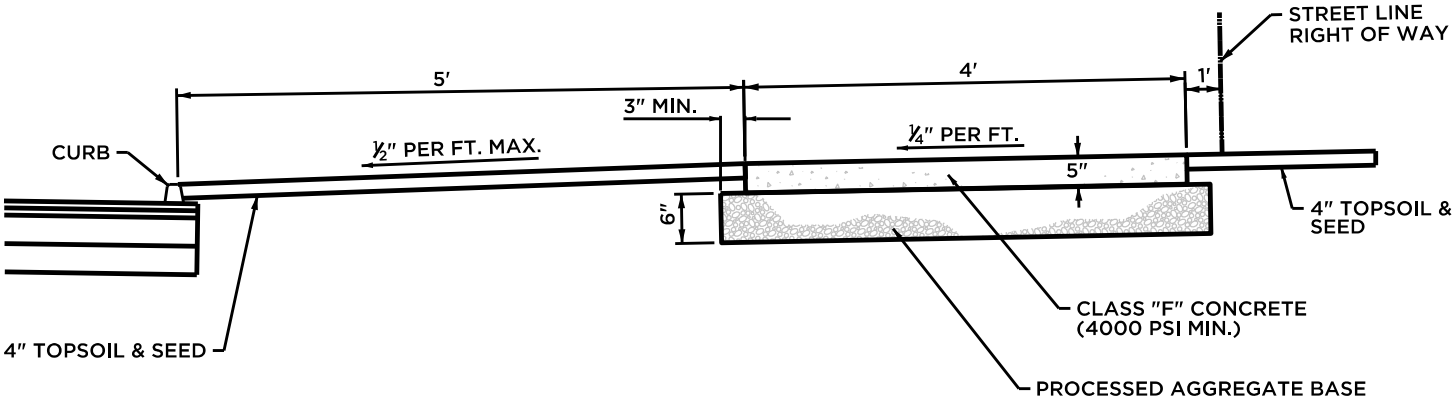
PLATE
IX-01

NOT TO SCALE

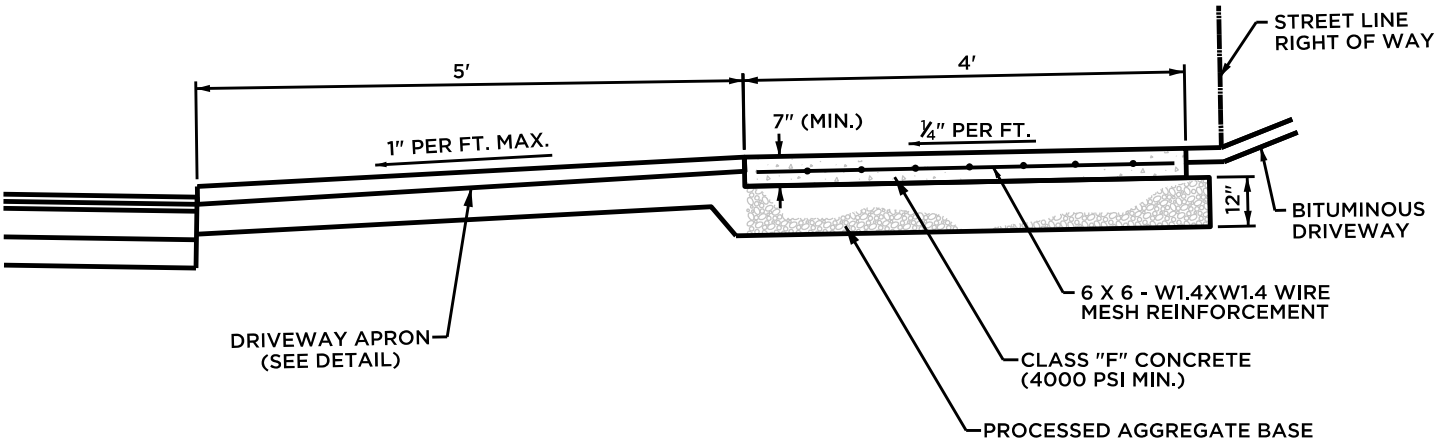


NOTES:

1. AN ADDITIONAL 12" DEPTH OF BANK RUN GRAVEL, GEOTEXTILE FABRIC, UNDERDRAINS, OR OTHER STABILIZING METHODS MAY BE REQUIRED BY THE TOWN ENGINEER IF THE SUBGRADE MATERIAL POSSESS HIGH FROST SUSCEPTIBILITY, LOW CBR STRENGTH (CALIFORNIA BEARING RATIO) OR OTHER INDICATIONS OF LOW STABILITY.
2. ALL MATERIALS ARE TO MEET CONN. D.O.T. SPECIFICATIONS AS AMENDED
3. ALL UNDERGROUND UTILITIES INCLUDING SERVICE LATERALS, SHALL BE INSTALLED PRIOR TO PLACEMENT OF BINDER COURSE.



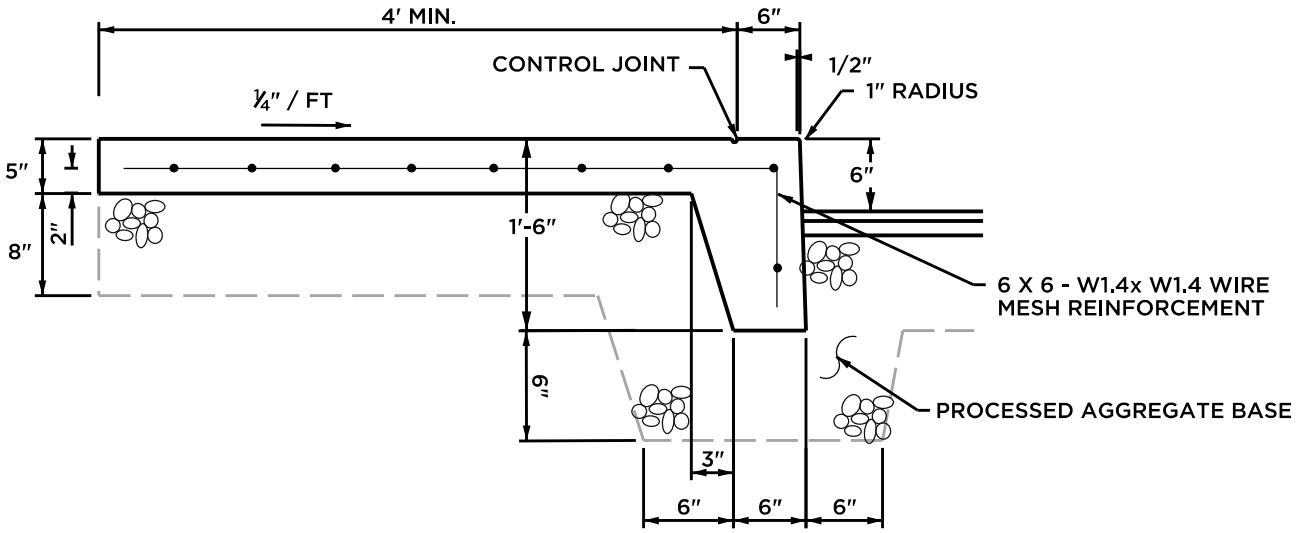
TYPICAL SECTION (NO DRIVEWAY CROSSING)



DRIVEWAY CROSSING

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**CONCRETE SIDEWALK**	PLATE IX-02

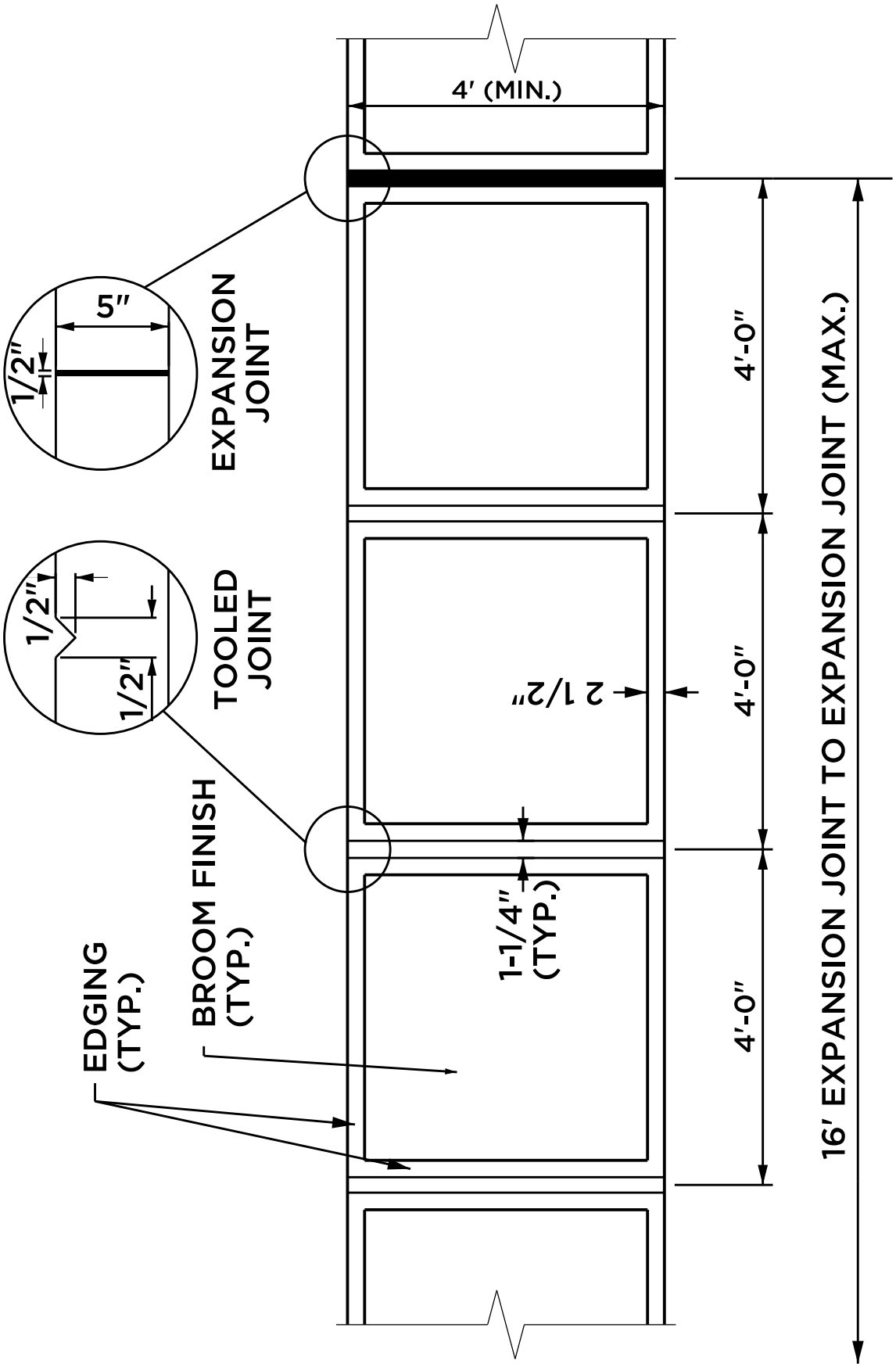


NOTES:

1. CONCRETE TO BE CLASS F (4,000 PSI).
2. 6" CURB REVEAL REQUIRED UNLESS OTHERWISE DIRECTED.
3. ONE HALF INCH (1/2") EXPANSION JOINTS SHALL BE PROVIDED NOT TO EXCEED 16'. EXPANSION JOINTS TO RUN TO THE FACE OF CURB.
4. PROCESSED AGGREGATE BASE THICKNESS SHALL BE 8"MINIMUM.
5. MONOLITHIC CURBING TO BE USED IN ALL LOCATIONS WHERE PROPOSED CONCRETE WALKS ABUT PROPOSED CONCRETE CURBING.

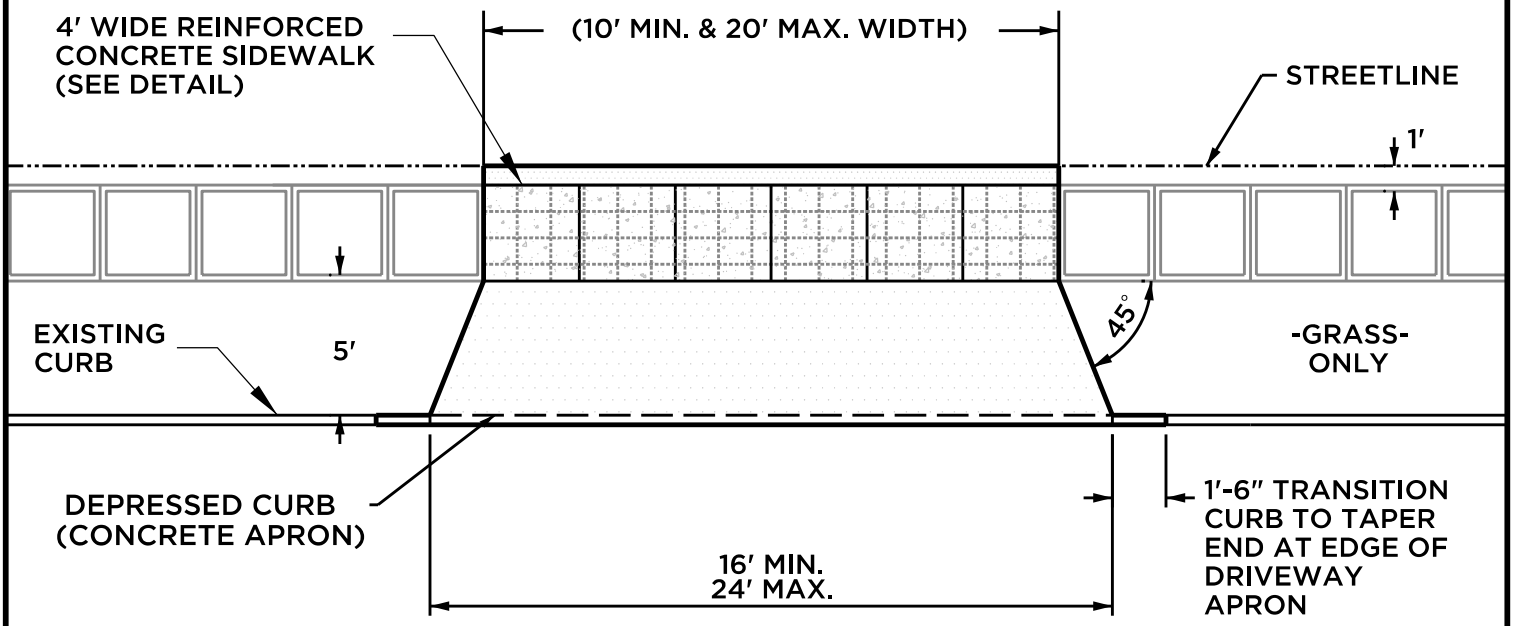
NOT TO SCALE

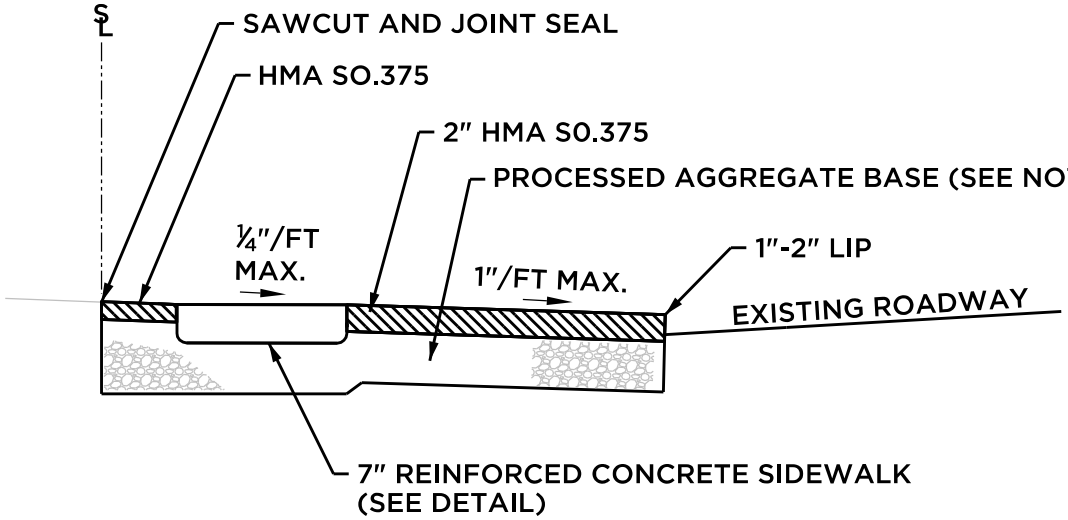
TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	CONCRETE SIDEWALK AND CURB (MONOLITHIC)	PLATE IX-03

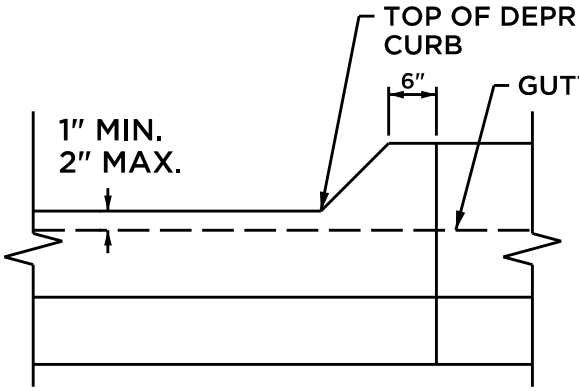


NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**CONCRETE SIDEWALK JOINTING AND EDGING**	PLATE IX-04





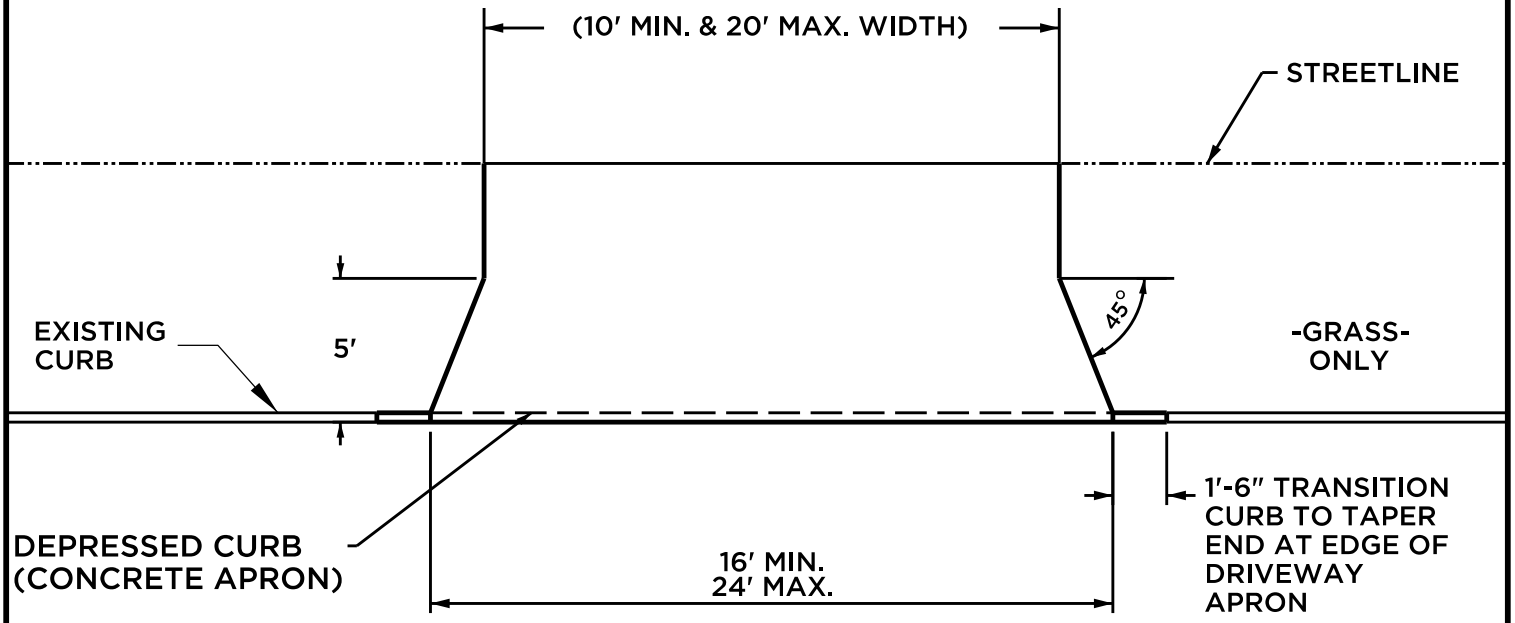


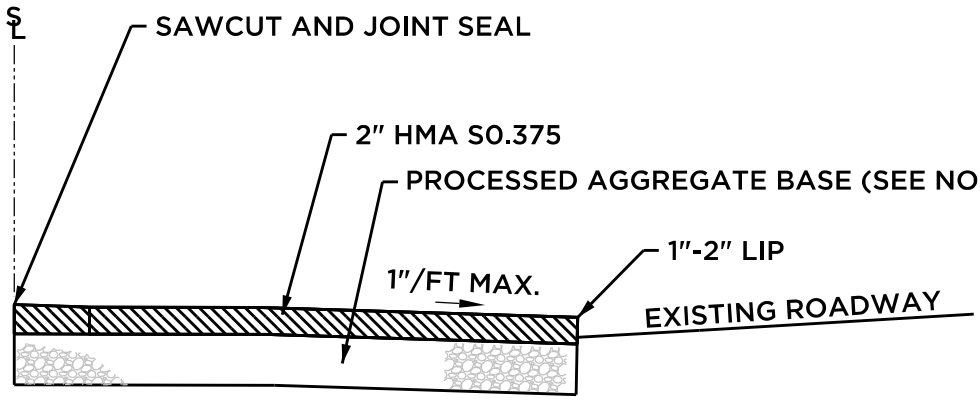
NOTES:

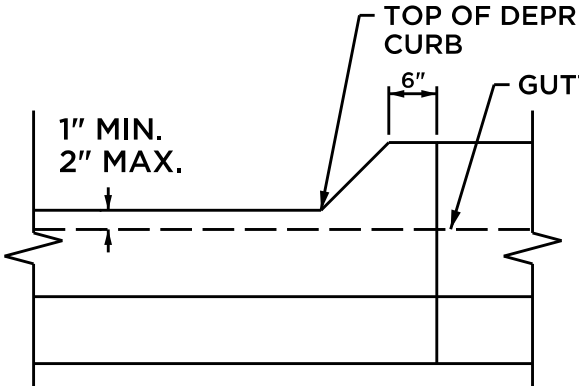
1. PROCESSED AGGREGATE BASE SHALL BE MINIMUM 6″ UNDER APRON AND MINIMUM 12″ UNDER SIDEWALK.
2. ALL MEASUREMENTS AFTER COMPACTION.
3. APRONS SHALL BE BITUMINOUS CONCRETE OR PORTLAND CEMENT CONCRETE. NO MILLINGS PERMITTED.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**DRIVEWAY APRON (WITH SIDEWALK)**	PLATE IX-05







NOTES:

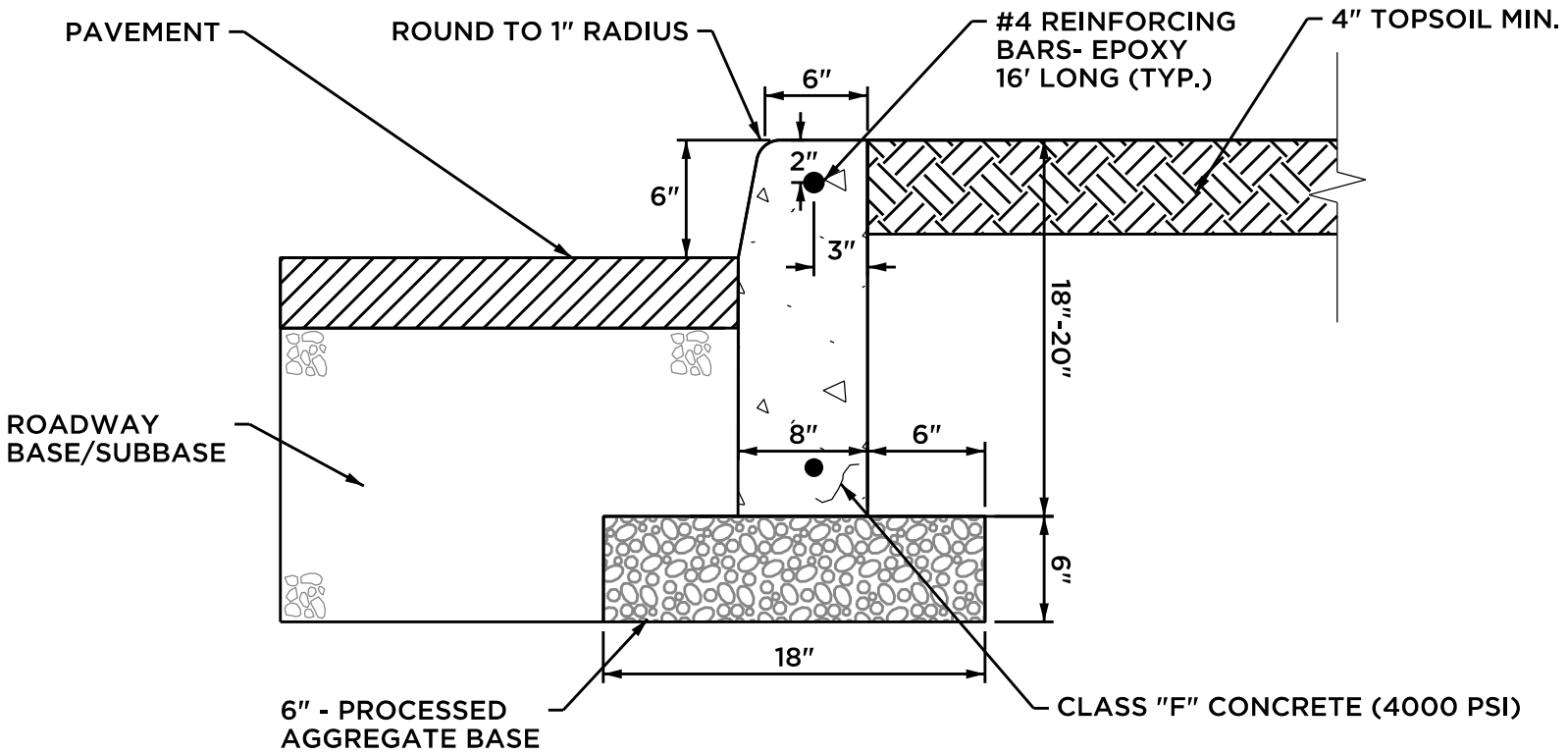
1. PROCESSED AGGREGATE BASE SHALL BE MINIMUM 6″ UNDER APRON.
2. ALL MEASUREMENTS AFTER COMPACTION.
3. APRONS SHALL BE BITUMINOUS CONCRETE OR PORTLAND CEMENT CONCRETE. NO MILLINGS PERMITTED.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**DRIVEWAY APRON (WITHOUT SIDEWALK)**	PLATE IX-06

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

CONCRETE CURB (FULL DEPTH)

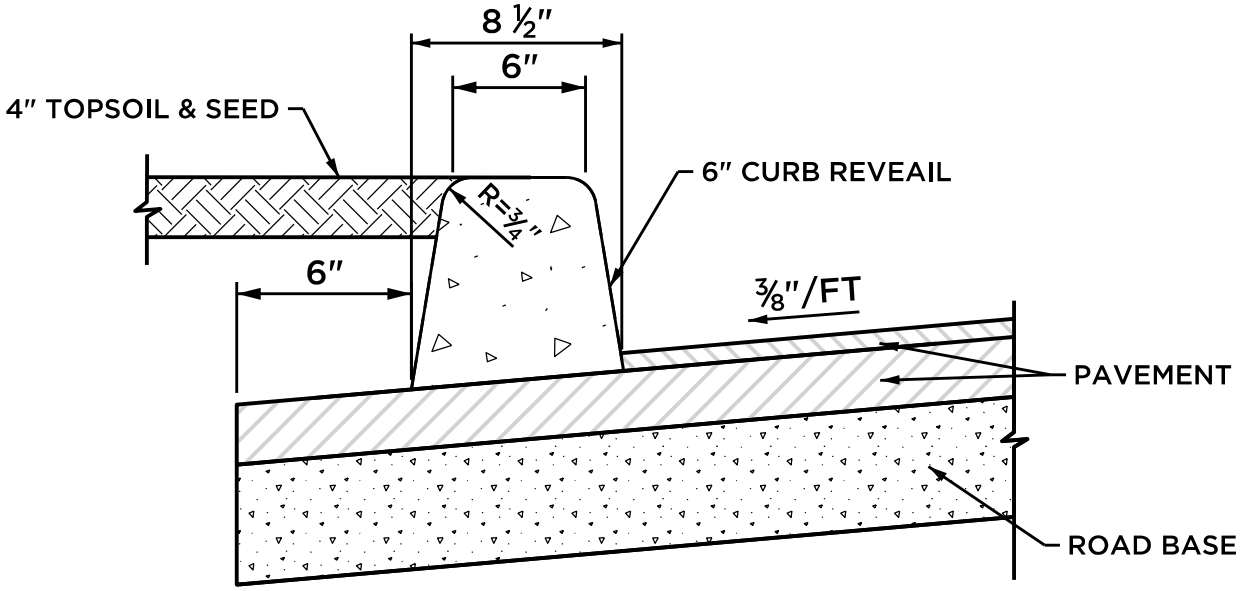


NOTES:

1. 6" CURB REVEAL REQUIRED UNLESS OTHERWISE DIRECTED.
2. ONE HALF INCH (1/2") JOINTS TO BE PROVIDED AT INTERVAL NOT TO EXCEED 10'. EXPANSION JOINTS TO RUN TO THE FACE OF CURB.

NOT TO SCALE

PLATE IX-07



NOTES:

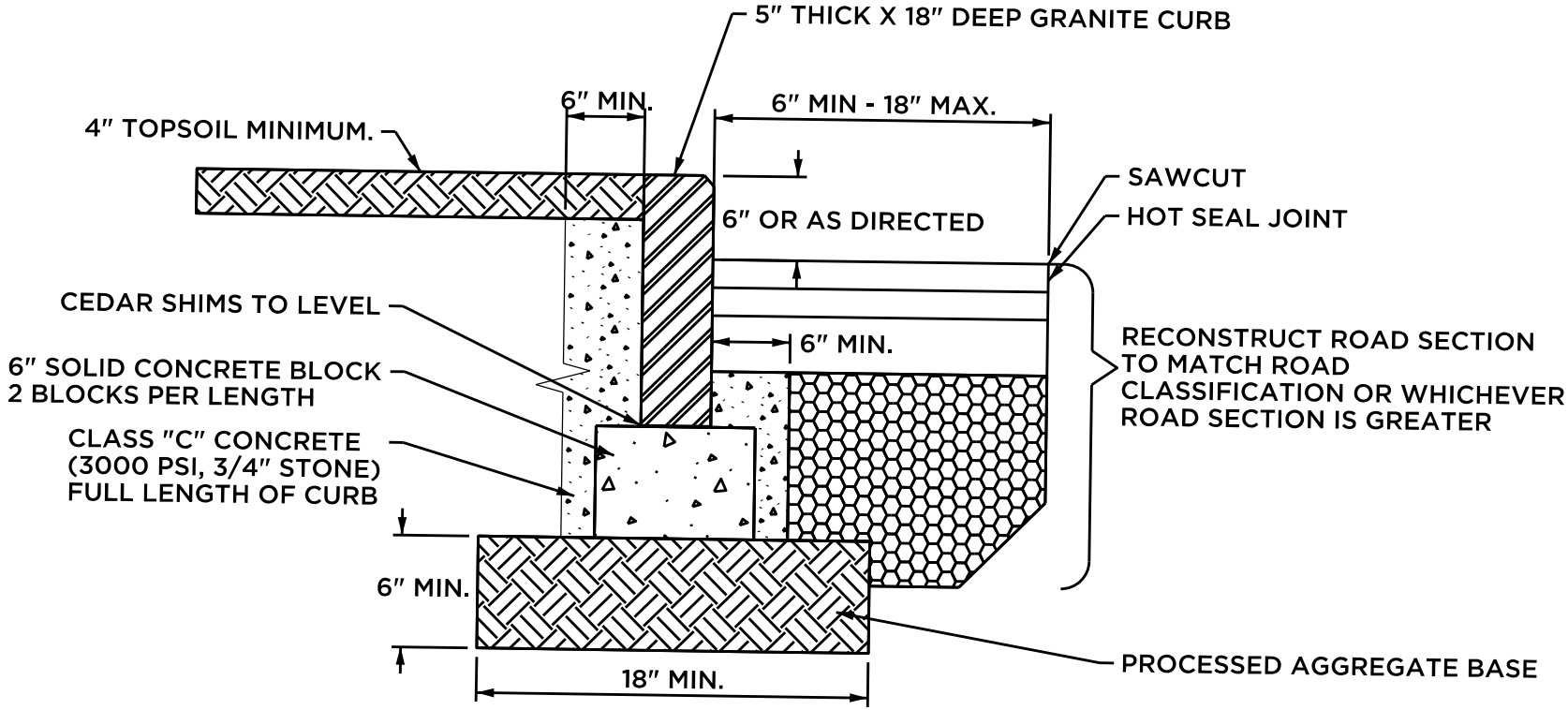
1. CONCRETE TO BE CLASS F (4000 PSI)
2. ONE HALF INCH (½") EXPANSION JOINT AT INTERVALS NOT TO EXCEED 20'. EXPANSION JOINT TO RUN TO THE FACE OF CURB.
3. CURBING SHALL BE MACHINE EXTRUDED.
4. SURFACE ON WHICH CURBING IS PLACED SHALL BE CLEAN.
5. CURBING TO BE LAID ON TOP OF BINDER COURSE.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	CONCRETE CURB (EXTRUDED)	PLATE IX-08

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

GRANITE CURB

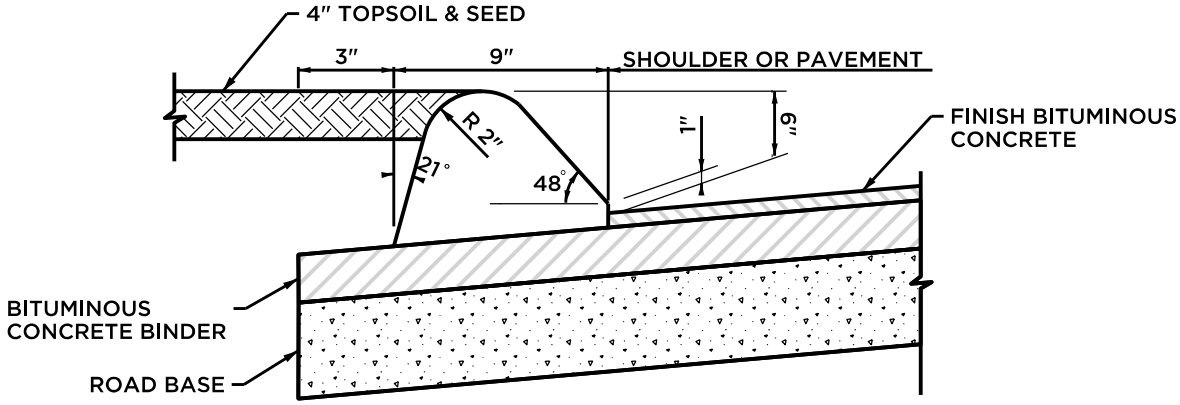


NOT TO SCALE

NOTES:

1. GRANITE CURB SHALL BE FINISH-SAWN TOP AND SPLIT FACE JOINTED.
2. 6"CURB REVEAL REQUIRED UNLESS OTHERWISE DIRECTED.
3. MINIMUM LENGTH OF STRAIGHT CURB SHALL BE 4'-0"AND RADIUS CURB SHALL BE 2'-6".
4. GRANITE CURB WITH A RADIUS OF 100' OR LESS SHALL BE BUILT OF RADIUS GRANITE CURB AND SET IN 6"OF CONCRETE ALONG THE ENTIRE LENGTH.
5. ALL GRANITE CURB JOINTS SHALL BE SET IN 6"OF CLASS "C"CONCRETE AND MORTAR SHALL BE APPLIED ALONG THE HEIGHT AND WIDTH OF ALL ABUTTING CURB FACES.

PLATE
IX-09

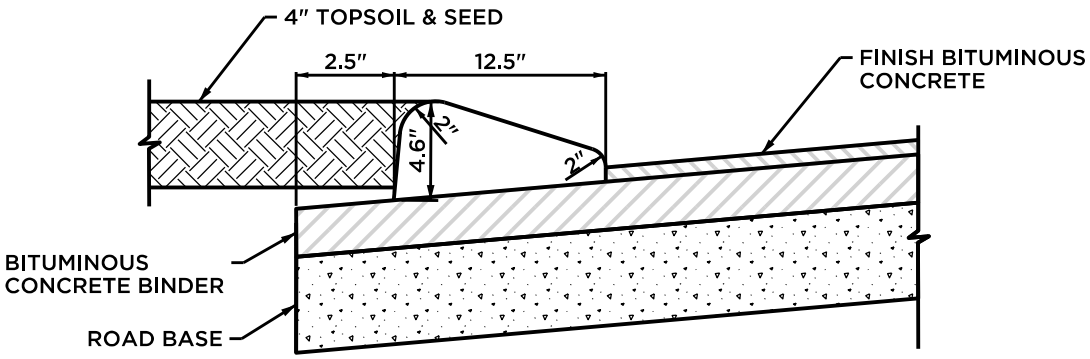


NOTES:

1. SURFACE ON WHICH CURBING IS PLACED SHALL BE CLEAN AND AN APPROVED TACK COAT SHALL BE APPLIED JUST PRIOR TO PLACING CURB.
2. CURBING SHALL BE MACHINE EXTRUDED.
3. CURBING TO BE LAID ON TOP OF BINDER COURSE.
4. CURBING MATERIAL TO BE CLASS 3 BITUMINOUS CONCRETE.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	BITUMINOUS CONCRETE CURB	PLATE IX-10

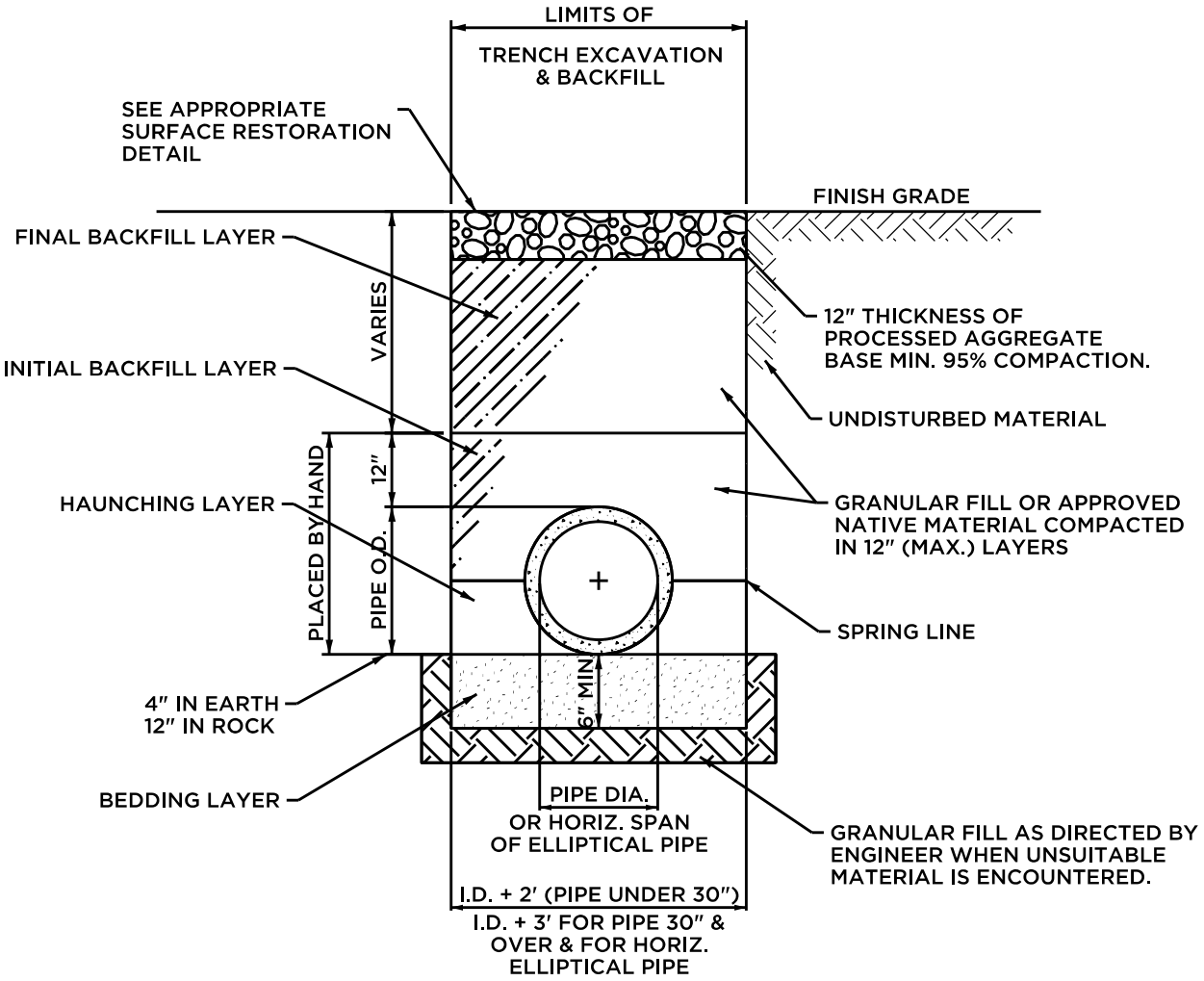


NOTES:

1. SURFACE ON WHICH CURBING IS PLACED SHALL BE CLEAN AND AN APPROVED TACK COAT SHALL BE APPLIED JUST PRIOR TO PLACING CURB.
2. CURBING SHALL BE MACHINE EXTRUDED.
3. CURBING TO BE LAID ON TOP OF BINDER COURSE.
4. CURBING MATERIAL TO BE CLASS 3 BITUMINOUS CONCRETE.
5. CAPE COD STYLE CURBING ONLY PERMITTED ON CUL-DE-SAC PORTION OF ROADWAY.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	CAPE COD CURB	PLATE IX-11

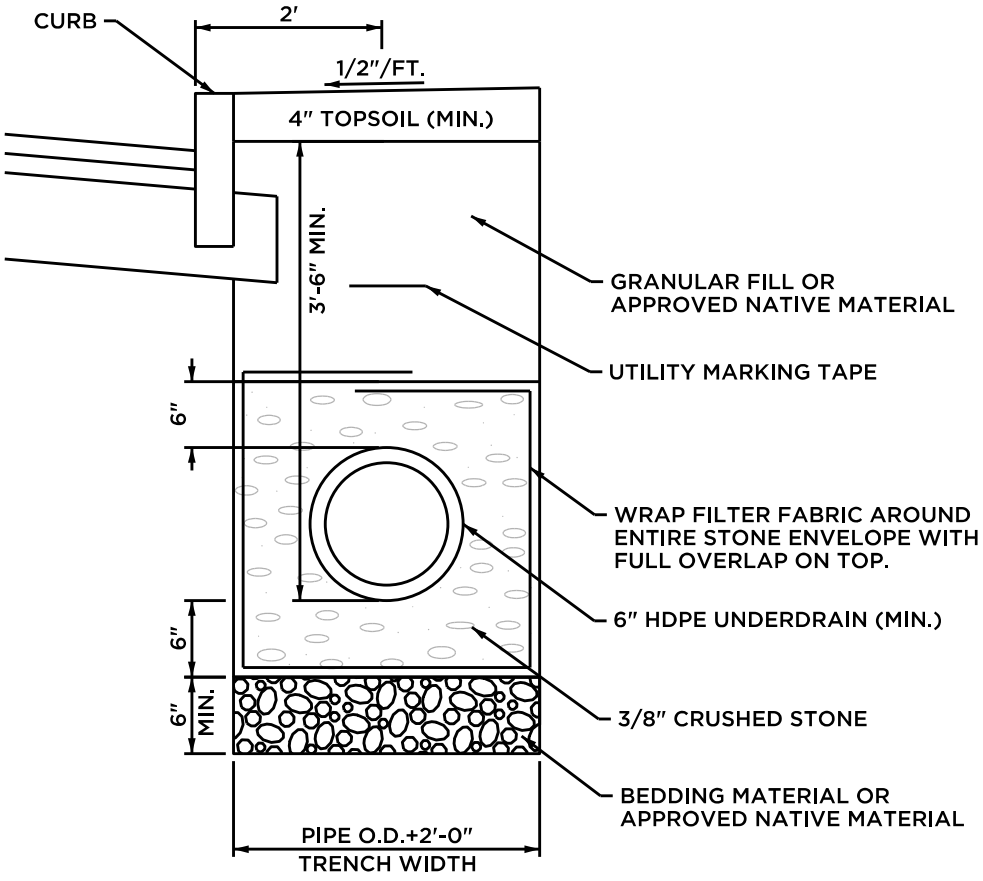


NOTES:

1. ALL CONCRETE PIPE TO BE MINIMUM CLASS IV UNLESS OTHERWISE APPROVED BY THE TOWN.
2. USE WATERTIGHT RUBBER GASKETS IN ALL PIPE JOINTS. ALL CONCRETE PIPE JOINTS SHALL BE MORTARED.
3. BEDDING MATERIAL SHALL BE INSTALLED A MINIMUM OF 12"FOR ALL PIPES 48"IN DIAMETER OR GREATER.
4. MINIMUM GRADE OF PIPE SHALL BE 0.50% SLOPE.
5. THERE SHALL BE A MINIMUM 3 FT OF COVER OVER THE PIPE.
6. EXCAVATED MATERIAL SUCH AS DEBRIS AND REMOVED PAVEMENT IS NOT SUITABLE FOR TRENCH BACKFILL. BACKFILL MATERIAL SHALL CONFORM TO TOWN SPECIFICATIONS.
7. WHERE DEWATERING IS NECESSARY, WATER SHOULD BE REMOVED UNTIL THE PIPE HAS BEEN INSTALLED AND THE BACKFILL HAS BEEN PLACED TO SUFFICIENT HEIGHT TO PREVENT FLOTATION OF THE PIPELINE.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**STORM SEWER TRENCH**	PLATE IX-12

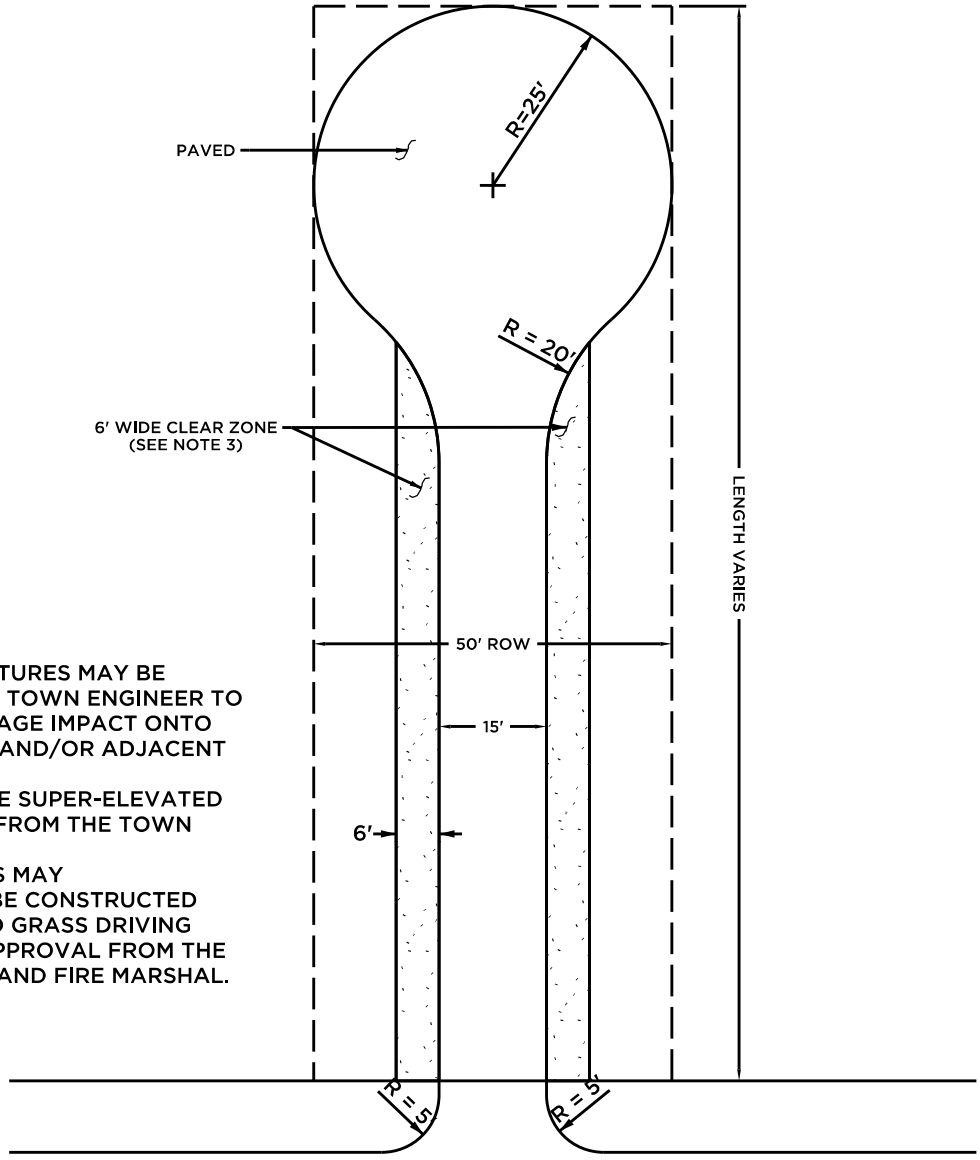


NOTES:

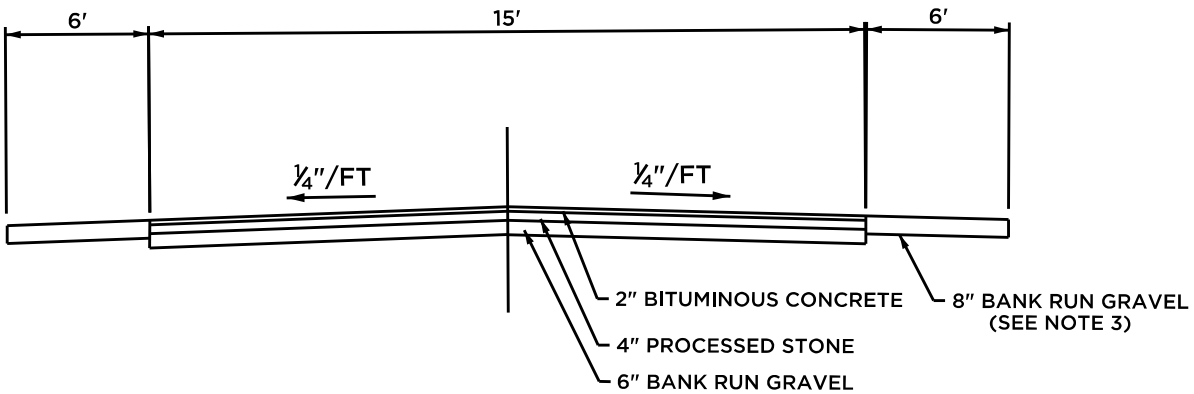
1. DEPTH & LOCATION MAY VARY WITH LOCAL CONDITIONS.
2. ALL UNDERDRAINS ARE TO OUTLET DIRECTLY INTO A CATCH BASIN UNLESS OTHERWISE APPROVED BY THE TOWN ENGINEER.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	ROAD UNDERDRAIN	PLATE IX-13



PLAN VIEW



PROFILE

NOT TO SCALE

NOTES:

1. DRAINAGE STRUCTURES MAY BE REQUIRED BY THE TOWN ENGINEER TO ELIMINATE DRAINAGE IMPACT ONTO THE TOWN ROAD AND/OR ADJACENT PROPERTIES.
2. ROADWAY MAY BE SUPER-ELEVATED WITH APPROVAL FROM THE TOWN ENGINEER.
3. THE CLEAR ZONES MAY ALTERNATIVELY BE CONSTRUCTED OF A REINFORCED GRASS DRIVING SURFACE WITH APPROVAL FROM THE TOWN ENGINEER AND FIRE MARSHAL.

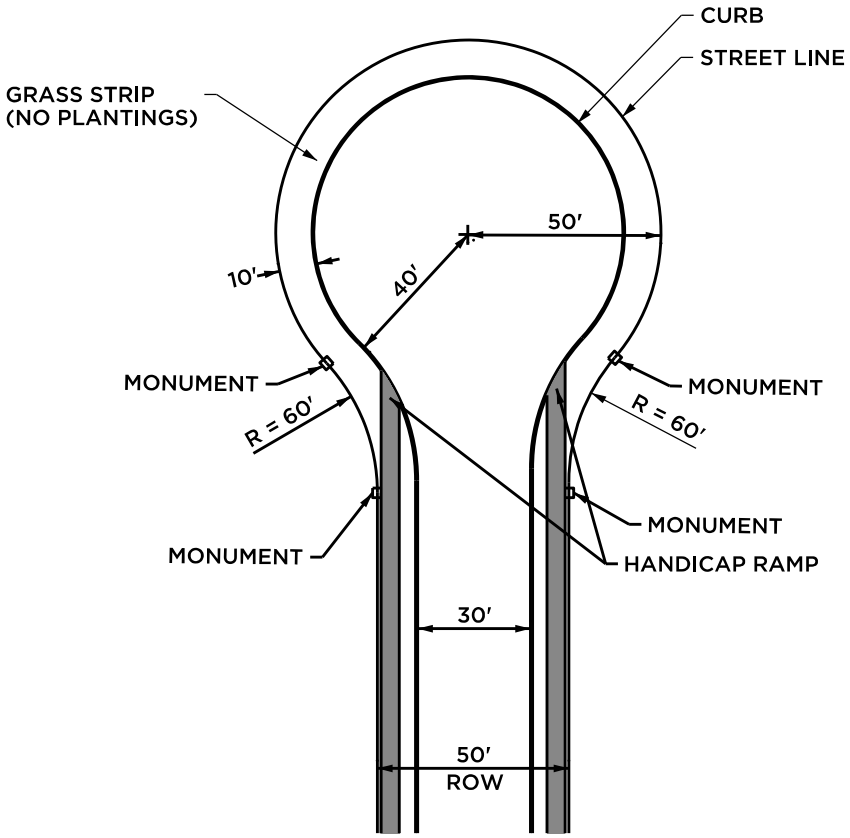
TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	REAR LOT ACCESSWAY	PLATE IX-14

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

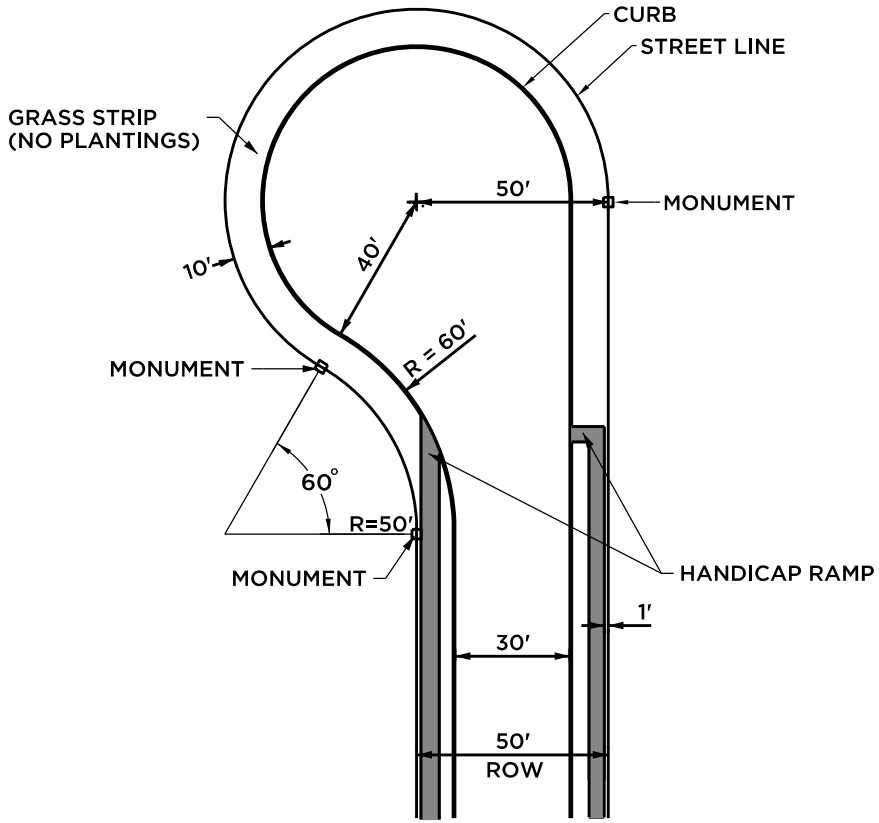
CUL-DE-SAC

PLATE
IX-15

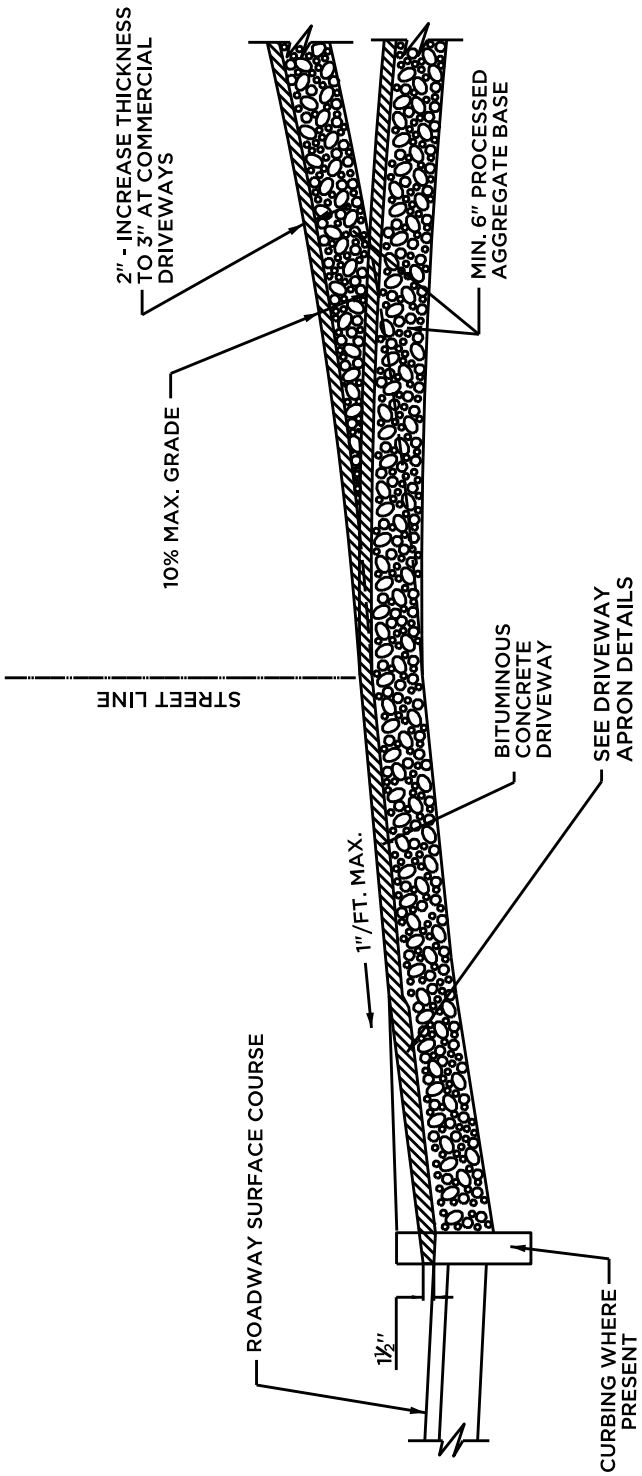
NOT TO SCALE



ALTERNATE LAYOUT WITH TOWN ENGINEER APPROVAL



PREFERRED LAYOUT

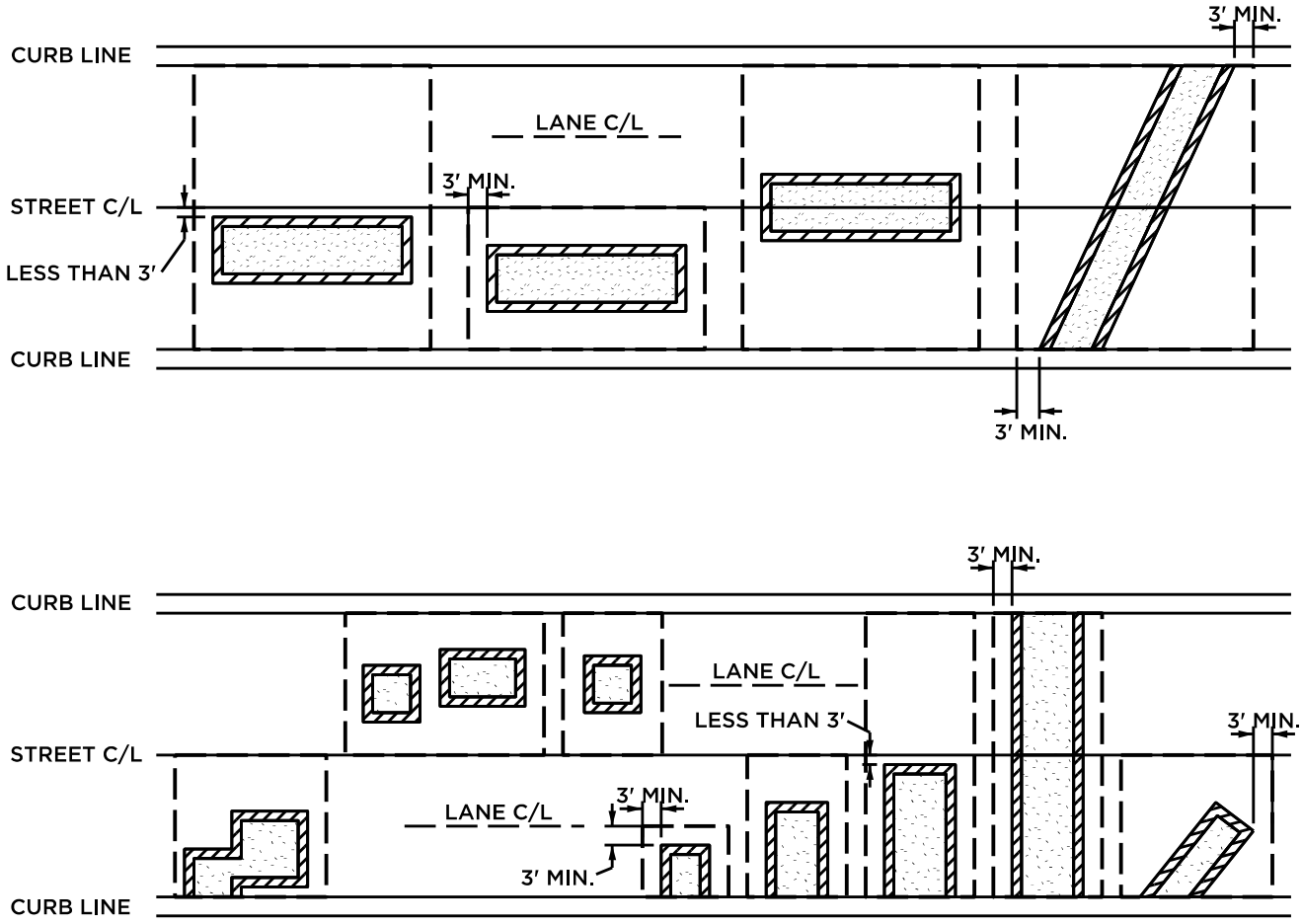


NOTES:

1. NO MILLINGS PERMITTED WITHIN TOWN RIGHT-OF-WAY.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**DRIVEWAY**	**PLATE IX-16**



NOTES:

1. FULL DEPTH PAVEMENT REPLACEMENT IS REQUIRED TO ONE FOOT (1') BEYOND TRENCH LIMITS.
2. FULL DEPTH REPLACEMENT IS REQUIRED TO CURB LINE WHEN REMAINING DISTANCE BETWEEN CURB AND TRENCH IS LESS THAN THREE FEET (3').
3. WHEN DISTANCE BETWEEN TRENCH AND CENTERLINE OF ROAD IS LESS THAN THREE FEET (3'), PAVEMENT IS TO BE MILLED THE FULL WIDTH OF THE ROAD.
4. WHEN TWO TRENCHES ARE WITHIN TWENTY FEET (20') OF EACH OTHER, THE TRENCHES SHALL BE TREATED AS ONE AREA AND MILLED TOGETHER FOR ONE PATCH.
5. THE EXTENT OF THE CUTBACK LINE FOR THE 1-1/2"MILL AND PAVE RESTORATION REQUIRED WILL BE DETERMINED BY THE ROAD RATING. (SEE DETAIL PLATE IX-19)
6. FOR EACH CASE, THE RESTORATION SHALL ONLY OCCUR AFTER THE APPROPRIATE SETTLEMENT PERIOD OF NINETY (90) DAYS HAS PASSED. THE TOWN WILL HOLD THE BOND FOR A PERIOD OF TWO (2) YEARS AFTER FINAL RESTORATION.

LEGEND:

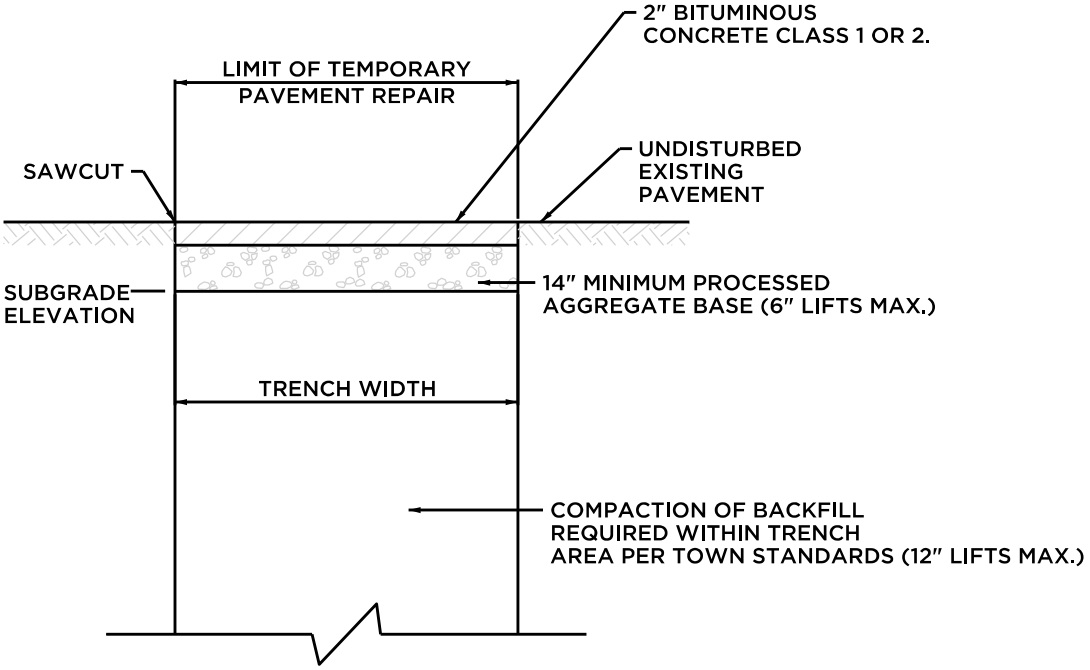
TRENCH LIMITS AT TOP OF PAVEMENT

AREA OF FULL DEPTH PAVEMENT REPLACEMENT

EDGE OF MILLING AREA

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**TRENCH IN PAVEMENT LIMITS**	**PLATE IX-17**

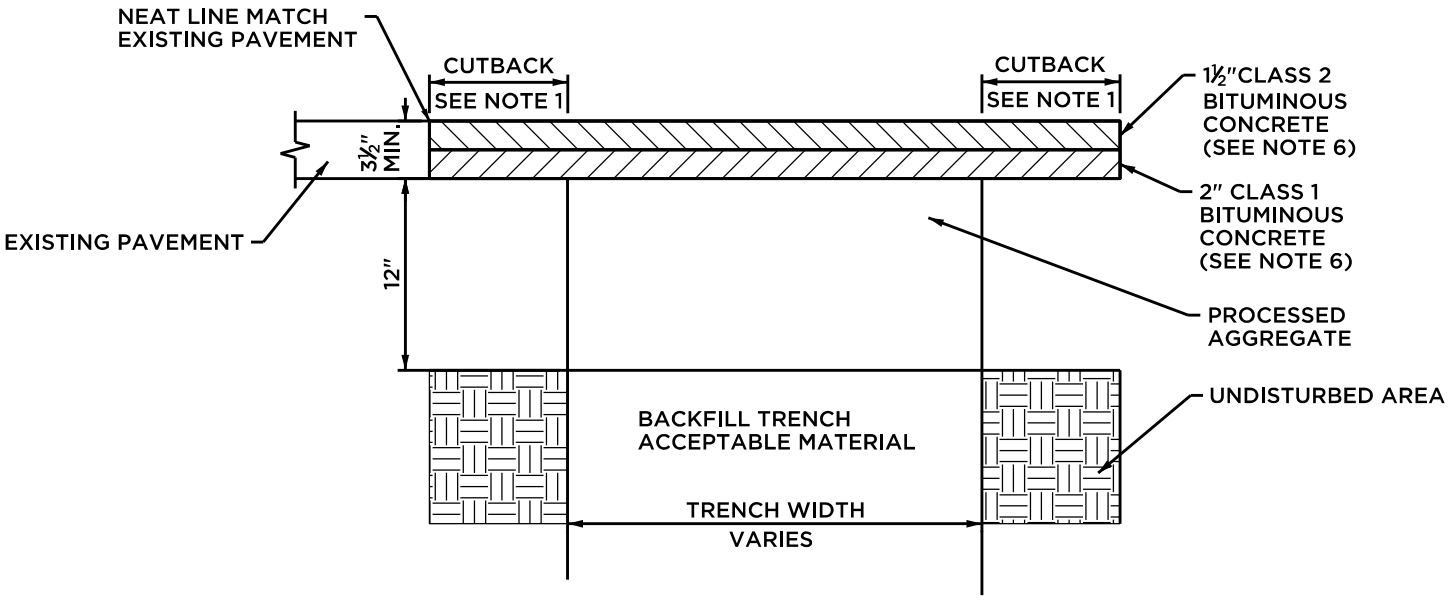


NOTES:

1. UNLESS APPROVED BY THE TOWN ENGINEER, EXCAVATED MATERIAL SHALL BE DEEMED UNSUITABLE FOR BACKFILL AND SHALL BE REMOVED OFF SITE.
2. AT THE REQUEST OF THE TOWN ENGINEER, THE CONTRACTOR SHALL VERIFY AND SUBMIT TESTING RESULTS THAT THE COMPACTION OF THE TOTAL TRENCH AREA MEETS WITH TOWN STANDARDS FOR A 95% COMPACTION DENSITY.
3. DISTURBED PAVEMENT MARKINGS SHALL BE REPLACED WITH NEW PAVEMENT MARKINGS PER THE MUTCD.
4. NO COLD PATCH SHALL BE PERMITTED FOR TEMPORARY OR PERMANENT TRENCH REPAIRS.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**PAVEMENT REPAIR (TEMPORARY)**	PLATE IX-18



NOTES:

1. CUTBACK LENGTH VARIES BASED ON ROAD RATING UNLESS OTHERWISE DIRECTED. SAW CUT REQUIRED.

    a. ROADS RATED 90-100: CUTBACK LENGTH SHALL BE TWENTY-FOUR INCHES (24").
    b. ROADS RATED 80-89: CUTBACK LENGTH SHALL BE TWELVE INCHES (12").
    c. ROADS RATED 70-79: CUTBACK LENGTH SHALL BE SIX INCHES (6") AND SHALL BE CENTERED OVER THE TRENCH AS LONG AS SEAMS DO NOT FALL WITHIN WHEEL PATHS.
    d. ROADS RATED BELOW 70: CONTACT DEPARTMENT OF PUBLIC WORKS FOR OPTIONS.

2. UNLESS APPROVED BY THE TOWN ENGINEER, EXCAVATED MATERIAL SHALL BE DEEMED UNSUITABLE FOR BACKFILL AND SHALL BE REMOVED OFF SITE.
3. AT THE REQUEST OF THE TOWN ENGINEER, THE CONTRACTOR SHALL VERIFY AND SUBMIT TESTING RESULTS THAT THE COMPACTION OF THE TOTAL TRENCH AREA MEETS WITH TOWNS STANDARDS FOR A 95% COMPACTION DENSITY.
4. TACK COAT SHALL BE APPLIED PRIOR TO THE PLACING OF THE FIRST COURSE OF BITUMINOUS CONCRETE; AFTER THE FIRST COURSE OF PAVEMENT HAS BEEN PLACED; AND TO THE JOINTS BETWEEN THE PATCH AND EXISTING PAVEMENT SURFACE.
5. DISTURBED PAVEMENT MARKINGS SHALL BE REPLACED WITH NEW PAVEMENT MARKINGS PER THE MUTCD.
6. THE ENTIRE BITUMINOUS CONCRETE PAVEMENT SHALL BE A MINIMUM OF 3-1/2 INCH THICK OR TO THE DEPTH OF THE EXISTING PAVEMENT, WHICHEVER IS GREATER.
7. NO COLD PATCH SHALL BE PERMITTED FOR TEMPORARY OR PERMANENT TRENCH REPAIRS.
8. SEE DETAIL PLATE IX-17 FOR ADDITIONAL TRENCH IN PAVEMENT LIMITS.

NOT TO SCALE

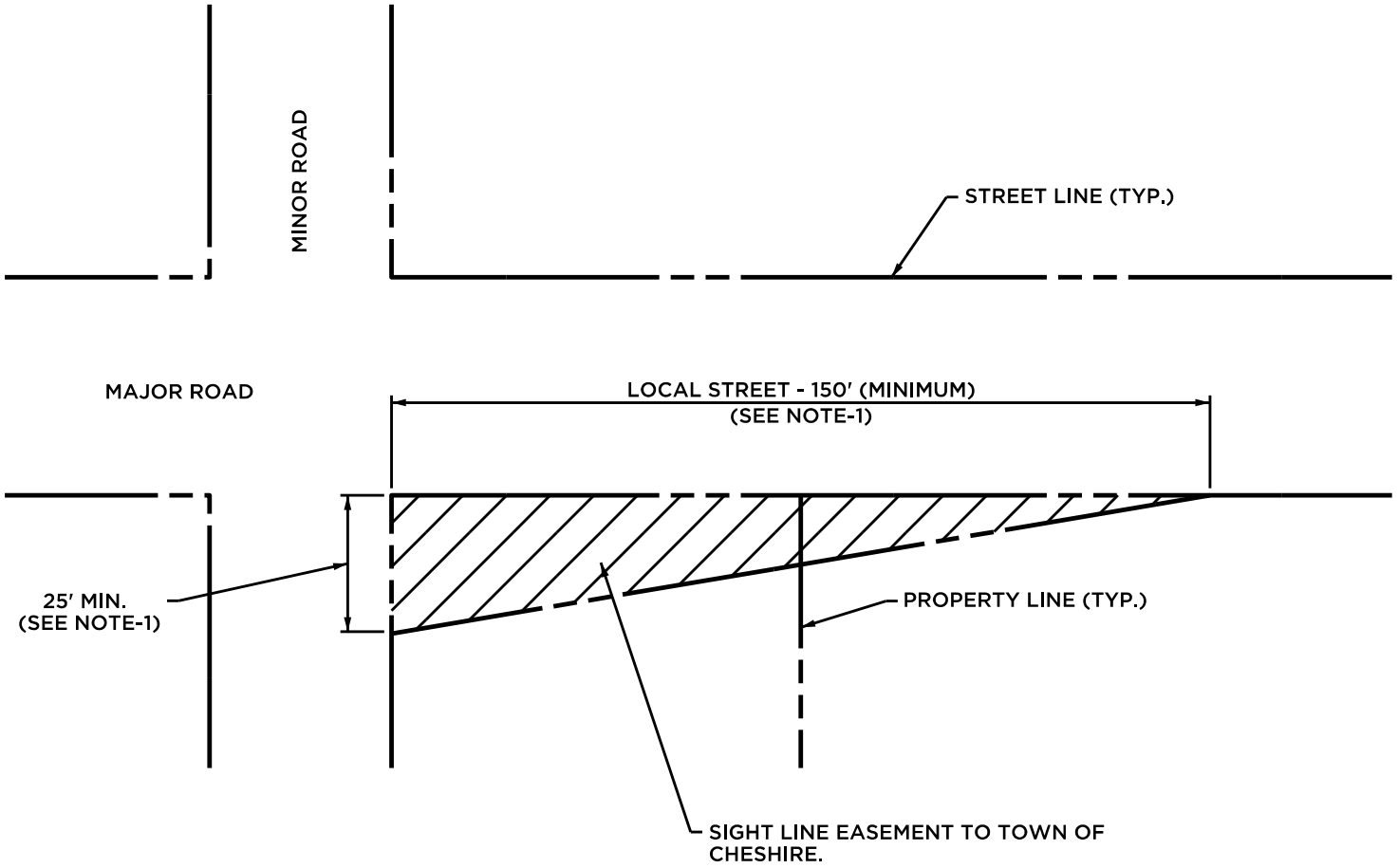
TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**PAVEMENT REPAIR (PERMANENT)**	PLATE IX-19

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

SIGHT LINE EASEMENT

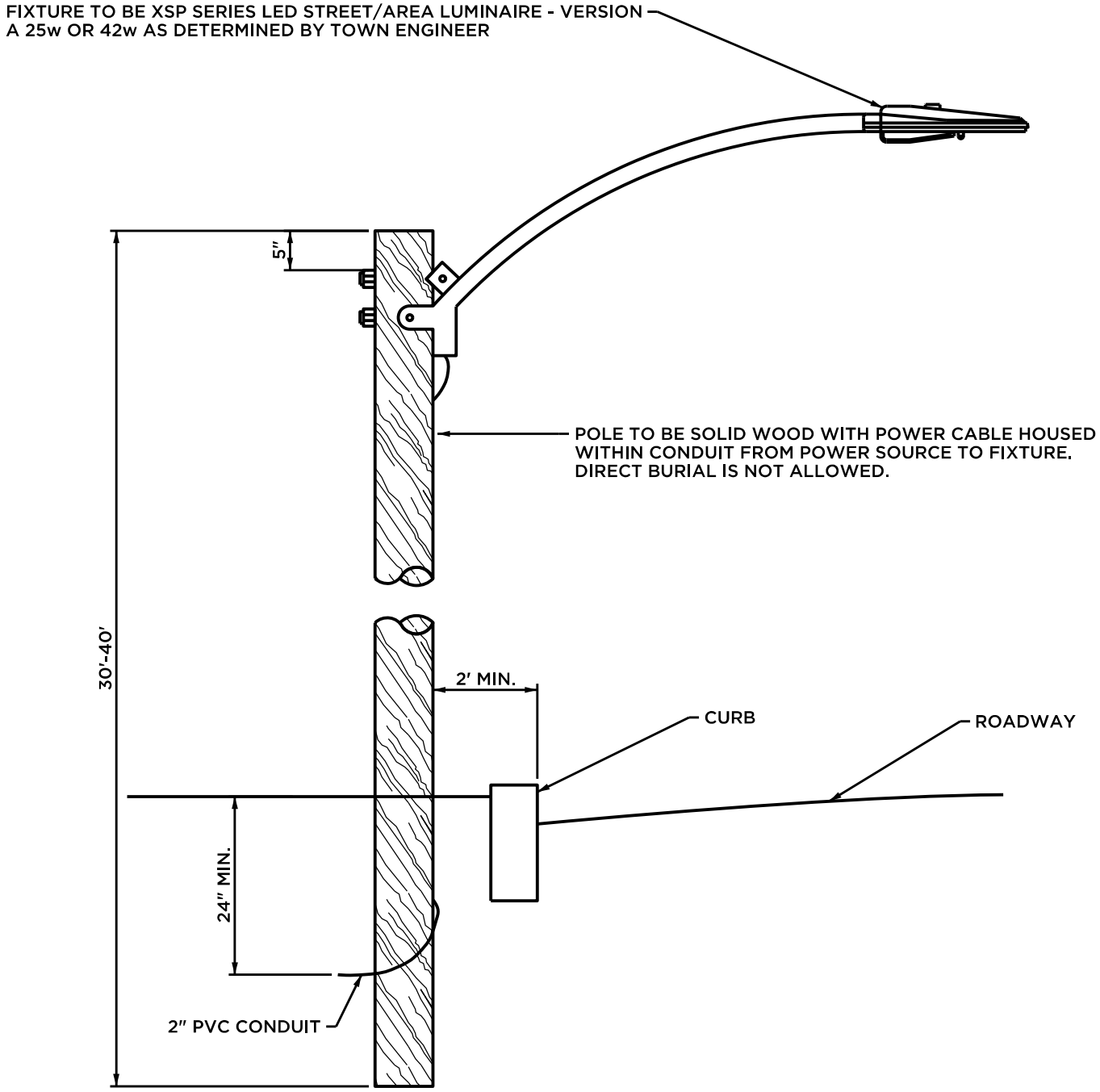
PLATE
IX-20

NOT TO SCALE



NOTES:

1. EASEMENT AREA MAY VARY AS DETERMINED BY ACTUAL SIGHT LINE ANALYSIS PERFORMED. FINAL CONFIGURATION TO BE APPROVED BY THE TOWN ENGINEER.
2. NO PLANTINGS PERMITTED IN EASEMENT AREA UNLESS APPROVED BY THE TOWN ENGINEER.

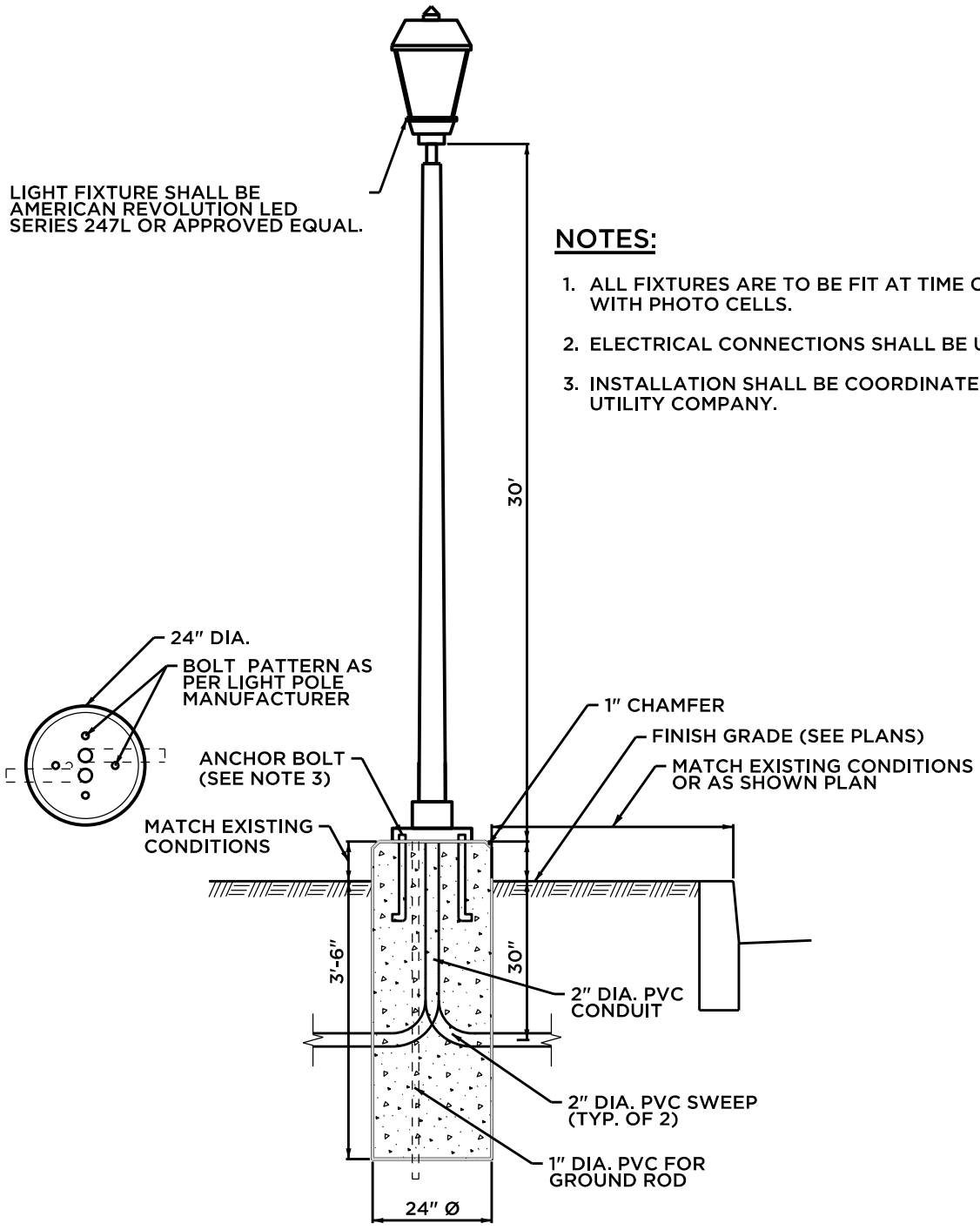


NOTES:

1. ALL FIXTURES ARE TO BE FIT AT TIME OF INSTALLATION WITH PHOTO CELLS.
2. LUMINAIRE SHALL BE MOUNTED TO A HORIZONTAL MAST ARM AND BE ADJUSTABLE TO ALLOW FOR FIXTURE LEVELING.
3. ELECTRICAL CONNECTIONS SHALL BE UNDERGROUND.
4. INSTALLATION SHALL BE COORDINATED WITH THE UTILITY COMPANY.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	STREET LIGHT (COBRA HEAD)	PLATE IX-21

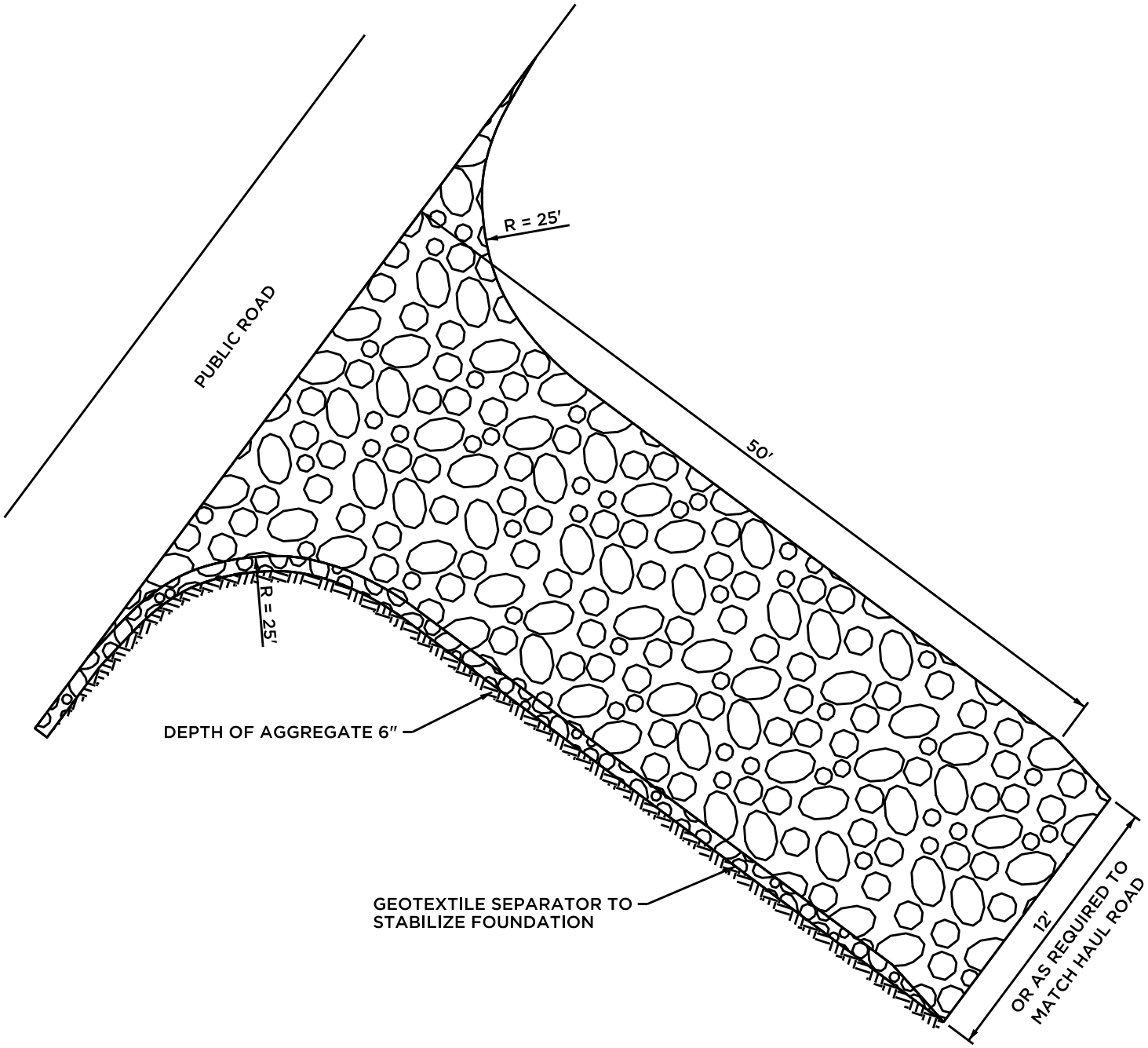


NOTES:

1. ALL FIXTURES ARE TO BE FIT AT TIME OF INSTALLATION WITH PHOTO CELLS.
2. ELECTRICAL CONNECTIONS SHALL BE UNDERGROUND.
3. INSTALLATION SHALL BE COORDINATED WITH THE UTILITY COMPANY.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**STREET LIGHT (POST TOP)**	PLATE IX-22



NOTES:

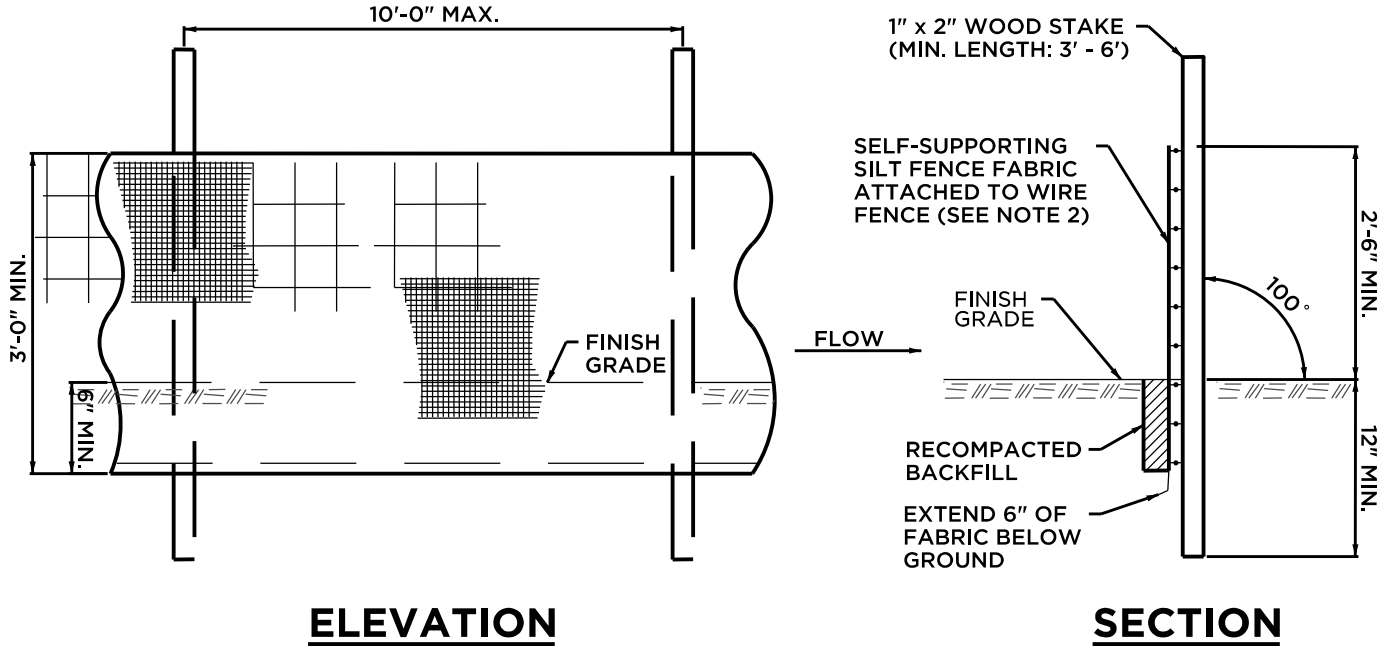
1. MAINTAIN ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING AND WASHING OF SEDIMENT ONTO THE ROADWAY. PROVIDE ADDITIONAL STONE OR ADDITIONAL WIDTH AND/OR LENGTH AS CONDITIONS WARRANT.
2. ROADWAY SHALL BE SWEPT DAILY TO REMOVE ANY MATERIAL THAT MAY BE TRACKED ONTO THE PAVEMENT.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**CONSTRUCTION ENTRANCE**	**PLATE IX-23**

TOWN OF CHESHIRE
STANDARD DETAIL
AUGUST 2022

GEOTEXTILE SILT FENCE



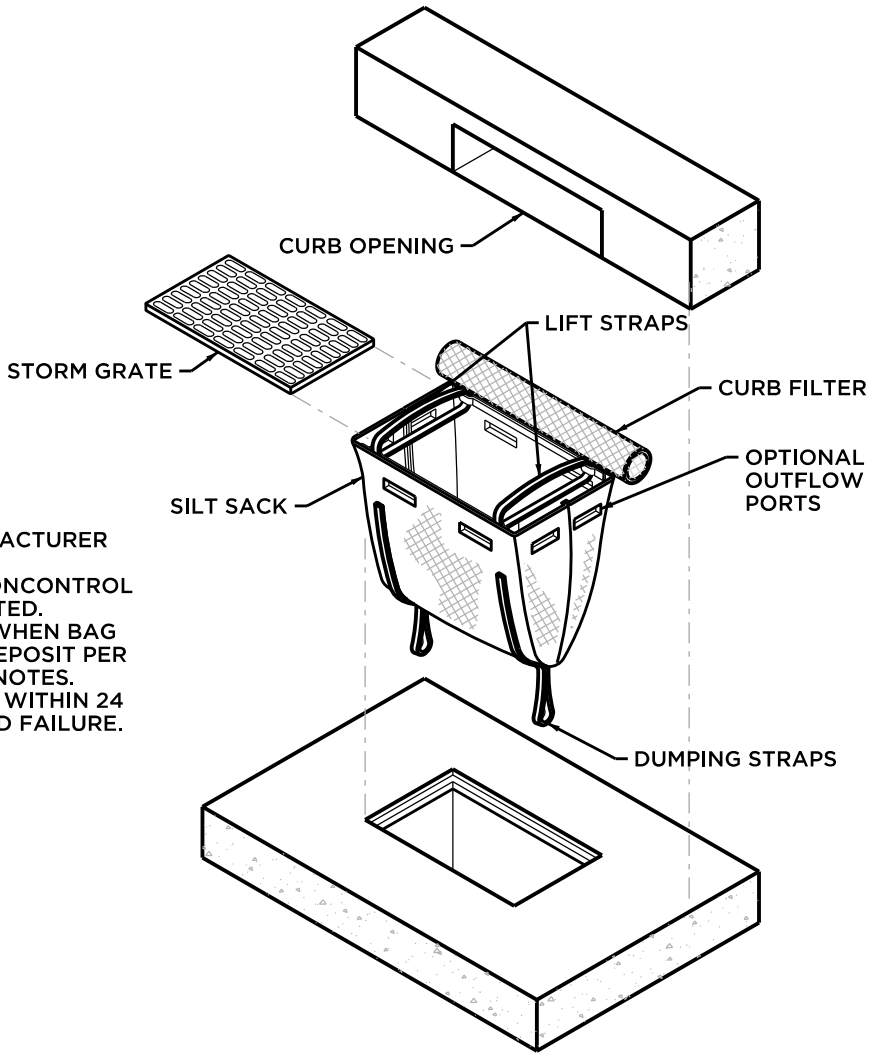
ELEVATION **SECTION**

NOTES:

1. INSTALL SILT FENCE & WOOD STAKES AS RECOMMENDED BY MANUFACTURER.
2. SILT FENCE SUBJECT TO HEAVY LOADS SHALL BE REINFORCED WITH FARM FENCING & STEEL POSTS (0.5 # STEEL/L.F.). THE MINIMUM POST LENGTH SHALL BE 5'-0".
3. SILT FENCE FABRIC SHALL BE A PERVIOUS SHEET OF WOVEN PROPYLENE, NYLON, POLYESTER OR POLYETHYLENE FILAMENTS AND SHALL BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.

NOT TO SCALE

PLATE IX-24

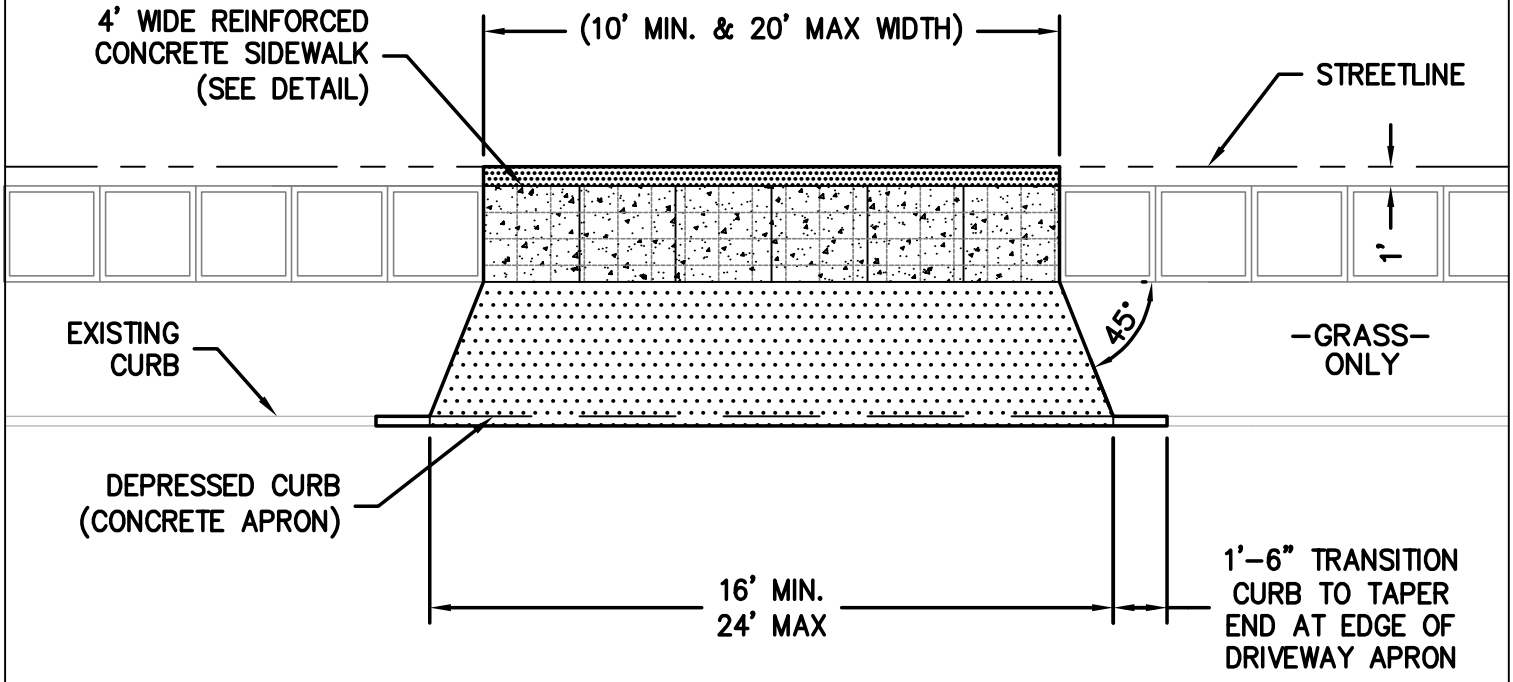


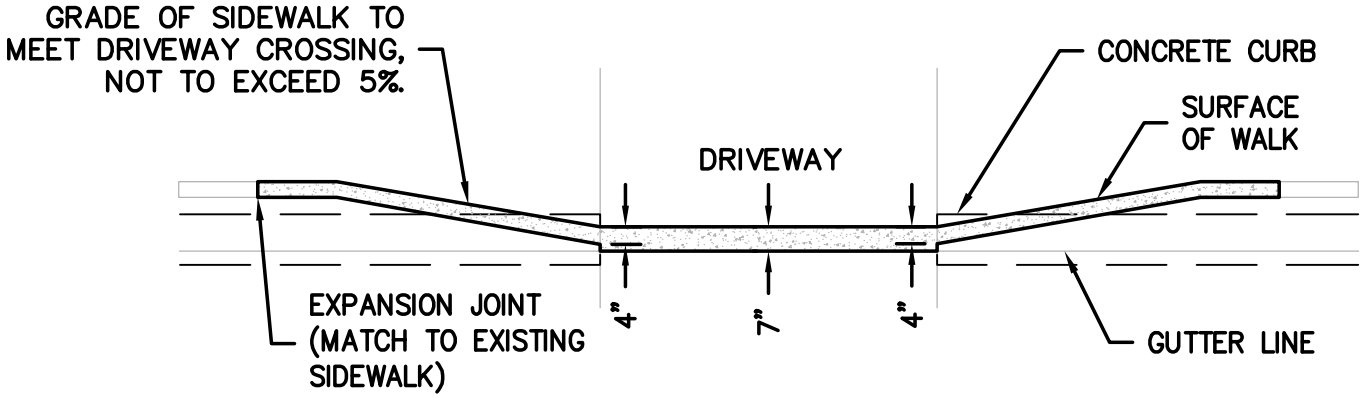
NOTES:

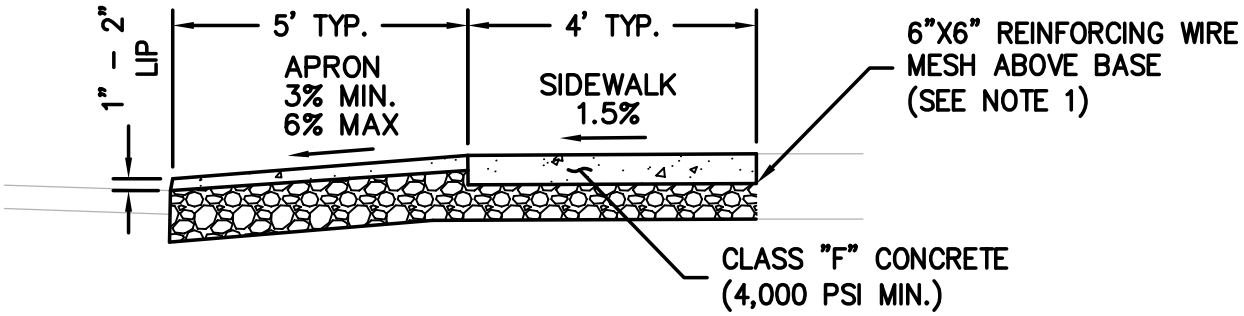
1. INSTALL PER MANUFACTURER SPECIFICATIONS.
2. INSPECT PER EROSIONCONTROL NOTES OR AS DIRECTED.
3. REMOVE SEDIMENT WHEN BAG IS HALF FULL AND DEPOSIT PER EROSION CONTROL NOTES.
4. REPAIR OR REPLACE WITHIN 24 HOURS OF OBSERVED FAILURE.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	**INLET SEDIMENT CONTROL DEVICE (SILT SACK)**	PLATE IX-25







NOTES:

1. WHERE WALKS CROSS DRIVEWAYS THEY SHALL BE 7" THICK AND HAVE 6"X6" W/W REINFORCEMENT WIRE MESH 2" ABOVE BASE.
3. APRONS SHALL BE BITUMINOUS CONCRETE OR PORTLAND CEMENT CONCRETE. NO MILLINGS PERMITTED.
4. ALL WORK AND MATERIALS SHALL CONFORM TO TOWN OF CHESHIRE GUIDELINES AND SPECIFICATIONS FOR PUBLIC IMPROVEMENT.

NOT TO SCALE

TOWN OF CHESHIRE STANDARD DETAIL AUGUST 2022	DRIVEWAY APRON & SIDEWALK REHABILITATION	PLATE IX-26

APPENDIX A

(STREET EXCAVATION PERMIT PROCEDURES & CHECKLIST)

STREET EXCAVATION PERMIT PROCEDURES & CHECKLIST

Street Excavation Permits are issues at the Department of Public Works and Engineering which is located at the Town Hall (84 South Main Street). To ensure that all applicants have the necessary information and to minimize any inconvenience when making the application for a permit, the Town of Cheshire has developed this document for guidance.

Please contact the Public Works Department (203-271-6650) with any questions regarding these procedures.

STEP NUMBER	PROCEDURE INFORMATION	COMMENTS	COMPLETED (√)
1	Call Before You Dig (CBYD) 1-800-922-4455	Whenever excavation is planned to be done utilizing power or mechanized equipment, CBYD must be contacted at least two (2) full working days prior to the proposed excavation. A CBYD number will be issued, which needs to be provided at the time of the Street Excavation Permit application.	
2	State of Connecticut Encroachment Permit	If work is being performed in the State of Connecticut right-of-way, then a State Encroachment Permit is required. A Street Excavation Permit will not be necessary if a State Encroachment permit has been obtained. A copy of the Encroachment Permit shall be submitted to the Town Engineer prior to commencing construction activities.	
3	Street Excavation Permit Application	If work is being performed within the Town of Cheshire's right-of-way, then a Street Excavation Permit is required. A complete permit application shall be filled out and signed; along with **all** items below.	
4	Performance Bond	A performance (surety) bond of not less than three thousand dollars ($3,000.00) guaranteeing work performance shall be provided to the Department of Public Works and placed on file. The Town may require the permittee to provide additional security sufficient to fund completion of the work. Bonds shall be kept in force for the duration of any subject license.	
5	Certificate of Insurance	An insurance certificate is required to be on file prior to issuance of a Street Excavation Permit. Public liability insurance coverage shall be not less than five hundred thousand dollars ($500,000.00) liability for one (1) person, five hundred thousand dollars ($500,000.00) liability for one (1) accident and five hundred thousand dollars ($500,000.00) for property damage.	
6	Plan / Sketch	A plan showing the work proposed shall be submitted with the application. A sketch is acceptable for driveway replacements.	
7	Application Fee	(1) For minor work (lateral connections & driveway aprons) within the Town right-of-way, a fee of seventy-five dollars ($75.00) for each excavation site shall be required. (2) For work associated with sidewalk installations and trench excavations up to 100 square feet in size within the Town right-of-way, a fee of seventy-five dollars ($75.00) for each excavation site shall be required. (3) For all other work in excess of 100 square feet, a base fee of seventy-five dollars ($75.00) plus seventy-five dollars ($75.00) for each additional 400 square feet of disturbance shall be required.	

APPENDIX B

(CONSTRUCTION INSPECTION CHECKLIST)

CONSTRUCTION INSPECTION CHECKLIST

The Contractor shall notify the Public Works Department at the beginning and end of each step of the construction procedure, and shall not proceed with the next step until the Town Engineer or authorized agent for the Town has caused the work to be inspected.

Timely advanced notice of **at least 24-hours** for inspections of all phases of construction is required, and requested to be made to the Department of Public Works. Please call (203-271-6650) or email DPWengineering@cheshirect.org to schedule all necessary inspections.

Failure to comply with construction inspection requirements may result in delay of any bond release(s) and any work that is performed and covered without Town inspection may require the work to be tested, uncovered and replaced; all at the Contractor's expense.

PROJECT: _____

CONTRACTOR/DEVELOPER: _____

Construction Bond Posted	Date:	$
Inspection Fee Provided	Date:	$

INSPECTION STAGE	INSPECTION REQUESTED	DATE INSPECTED	COMPLETED (√)
Installation of E&S Control Measures			
Subgrade Preparation			
Installation of Storm Drainage			
Installation of Water Service (Contact Regional Water Co.)			
Installation of Sanitary Sewer			
Road Subbase Preparation			
Processed Aggregate Base (Material Certification Required)			
Road Base Preparation (Density Testing Required)			
Interim As-Built Provided prior to asphalt placement			
Asphalt Binder Placement (Density Testing Required)			
Curbing Installation			
Asphalt Surface Course (Density Testing Required)			
Driveway Apron Installation			
Sidewalk Installation (Mix Verification Required)			
Turf Establishment			
Pavement Markings & Signs			
Final As-Built Provided			

APPENDIX C

(SITE PLAN APPLICATION REVIEW CHECKLIST)

SITE PLAN APPLICATION REVIEW CHECKLIST

REV. 11/14/22

		YES	NO	N/A	COMMENTS
GENERAL PLAN REQUIREMENTS:					
1	Appropriate sheet size (i.e. 24”x36”)				
2	Graphic scale (i.e. 1” = 40’)				
3	North arrow				
4	Date of plan preparation and revisions				
5	Cover sheet / Sheet numbers				
6	Location or vicinity map				
7	Legend & Index or List of drawings				
8	Name of person/firm preparing plans w/contact info.				
9	Name and address of the Applicant				
10	Street address of site				
11	Professional’s Seal & Signatures (PE/LS/Soil Scientist)				
12	Boundary Survey Certification (A-2) with Datum				
13	Topographic Survey Certification (T-2) with Datum				
EXISTING INFORMATION:					
14	Wetlands & Watercourses delineation with URA				
15	FEMA Flood lines delineation				
16	Property Lines with Bearings & Distances				
17	Property Corners (Found / Set / To Be Set)				
18	Existing Topography (Contours & Spot Grades)				
19	Benchmark (Elevation & Datum)				
20	Location of all existing structures				
21	Abutting roads, sidewalks, curbs, drives & parking				
22	Tree lines, landscaping, fencing & retaining walls				
23	Type & size of on-site/off-site drainage systems				
24	Name & type of on-site/off-site utilities				
25	Easements & Right-of-Ways				
26	Demolition Plan				
PLANNING DEPARTMENT INFORMATION:					
27	Abutter names & street addresses				
28	Zoning District Data Table				
29	Dimensional requirements for zoning district				
30	Property setback lines shown				
31	Parking calculations				
SITE LAYOUT:					
32	Limits of Clearing / Construction				
33	Proposed Buildings w/offsets to property lines				
34	Building Dimensions / Architectural Plans				
35	Building Elevations (FF / TW / GAR / BASE)				
36	Ingress/Egress (Dimensions / Apron / Grades / Etc.)				
37	Parking layout (Aisles / Stalls / Pavement)				
38	ADA Spaces (Handicapped)				
39	Sidewalks / Ramps / Crosswalks				
40	Trash & Recycle Policy / Dumpster Pad				
41	Snow Storage Areas				
42	Proposed Easements				

SITE: _____ DATE: _____

SITE PLAN APPLICATION REVIEW CHECKLIST

REV. 11/14/22

		YES	NO	N/A	COMMENTS
SITE DESIGN:					
43	Proposed grading (Contours & Spot Grades)				
44	Plan & Profile				
45	Footing drains (Location / Invert Elevations)				
46	Roof drains				
47	Surface Runoff (Grade to Drain)				
48	Stormwater Drainage Report (Pre & Post)				
49	Test Pit & Percolation Data				
50	Drainage (Size, type, length, slope & elevations)				
51	Detention / Rain gardens / Subsurface drainage areas				
52	Landscaping plan with planting schedule				
53	Fences / Retaining walls / Signage				
54	Outdoor lighting / Photometric Plan				
UTLITIES:					
55	Domestic water wells / Public water service				
56	Fire hydrants / Fire suppression				
57	Sewers / sewer laterals				
58	Subsurface sewage disposal system				
59	Underground Utilities (Power / Gas / Etc.)				
EROSION & SEDIMENTATION CONTROL:					
60	Topsoil / Stockpile Areas				
61	Construction entrance (Anti-tracking pad)				
62	Silt fencing / hay bales				
63	Inlet control devices (Silt sacks)				
64	E&S Control narrative / O&M Plan				
MISCELLANEOUS:					
65	Sight Lines (ISD) / Sight Line Easement				
66	Vehicular Turning Movement Analysis				
67	State Highway Encroachment Permit				
68	Traffic impact study				
69	Construction sequence				
70	Construction details & notes for all applicable items				
NOTE to be added on all plans:					
71	*"All site work to be completed in accordance with all permits and approvals issued by local, state, and/or federal reviewing agencies. All work shall be performed in accordance with the standards of the Town of Cheshire and applicable State codes."*				
72	*"All Dimensions and elevations shall be field verified prior to construction. Any discrepancies shall be brought to the attention of the Design Engineer."*				
73	*"Erosion and sedimentation control measures as depicted on these plans and described within the erosion and sedimentation control narrative shall be implemented and maintained until permanent cover and stabilization is established."*				

SITE: _____ DATE: _____

APPENDIX D

(NOTICE TO CONTRACTOR)

NOTICE TO CONTRACTOR

PROFESSIONAL ENGINEERS AND LAND SURVEYORS

Connecticut General Statutes, Chapter 391, Section 20-300-10b. Engineering and land surveying practices in property development work

(a) The phase of property development work requiring evaluation, planning and design of drainage systems, proposed major changes in ground contours affecting surface water runoff, sanitary sewer systems, sewage disposal systems, water supply and distribution and proposed buildings, structures or other improvements constitute professional engineering and, as such, any documents relating thereto shall be sealed by a licensed professional engineer.

(b) The phase of property development work requiring measuring, evaluating and mapping of topographic conditions, boundary lines, interior lot and street lines, including their monumentation, the horizontal and vertical location of all existing and proposed buildings, structures or other improvements to determine their compliance with any specified location requirements set forth in architectural and/or engineering plans or building and zoning regulations, constitutes land surveying and, as such, any documents relating thereto shall be sealed by a licensed land surveyor.

(c) The evaluation, planning and design of roads in general constitutes engineering and, as such, shall be sealed by a licensed professional engineer. The alignment and grades of a road incidental to planning the layout and mapping of a subdivision may also be performed by a land surveyor.

Effective – February 23, 1990