

PROJECT ENGINEERING NARRATIVE

BRITTON WOODS SUBDIVISION

Prepared by:

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Prepared for:

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December, 2020

#1847

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I. INTRODUCTION AND BACKGROUND

The proposed project involves the subdivision of 9.7 acres of vacant farm land into single family residential building lots. Ten single family parcels are proposed ranging in size for 27,000 sf to over 40,000 sf acres each. The project also includes over .8 acres of conservation reserve, meaning no buildings or development. The project will be developed in just a single phase, which includes the construction of a new Township roadway into the development, and extension of water mains from the existing main on North Triphammer Road. This water main extension will expand the present Water District of the Town of Lansing. All roads and utilities will become the property of the Town of Lansing. This report will serve as the engineering project description for the proposed water, septic and stormwater management design for development as shown on the plans.

The basic development data is as follows:

Owner:	Scotty & Wayne Britton 18 Murfield Drive Ithaca, NY 14850
Total Acreage:	9.7 Ac
Lot size:	Max: 40,268 sf Min: 25,015 sf Avg: 33,336 sf
Frontage:	109.9' (Cluster/Conservation Subdivision) 150 ft. min (standard lots)
Zoning Requirements:	
District:	Residential-1 Low Density
Yards:	
Side:	15 ft. total -provided
Front:	60 ft. to Center of Road - provided
Rear:	25 ft. - provided
Open Space:	75% - provided
Density:	40,000 sf/dwelling - provided

II. DEVELOPMENT CONCEPT

The subdivision is designed as a cluster/conservation subdivision, in which the individual lot sizes and frontages vary from the standard lot requirements, but the overall base density (40,000 sf/dwelling) is kept. The layout is designed to be separated from the main traffic thoroughfares. No lots will have driveway access to any existing road. All will be off an internal dead-end roads built by the developer, so that the atmosphere of a closed neighborhood community is created.

III. ROAD DESIGN AND DRAINAGE

The development requires the construction of 1,000' +/- of new town road. All grading and roadway sections were designed to Town specifications. As shown on the drawings and listed in the appendices, the maximum grade found is 1.89 %. Drawings show profiles and typical cross sections. Construction of the development will call for complete construction of the new Town Road, with a possible future extension to the north. The proposed road construction will be a dead end until such time as the adjacent properties to the north are developed.

All roads will be constructed to Town specifications as to geometry and materials. Rip-rap protection of ditches is provided on slopes over 5%. Roads are designed for a speed for 30 mph with stopping site distances of 200 ft. per AASHTO.

Drainage for the site is handled by drainage ditches along the edge of the proposed roads, back yard swales, retention basins, and several new culverts. This system will feed into the existing drainage patterns along the southwest corner of the site. Two new retention basins will be constructed just upstream of this area, which will hold post-development runoff to pre-development levels. A complete Stormwater Management Report and a Stormwater Pollution Prevention Plan have been prepared for this project, and are included by reference in Appendix B. (See separate bound document and drawings.)

IV. WATER SUPPLY

The proposed project is supplied water from the Southern Cayuga Intermunicipal Water Supply system and Town of Lansing Water District. A new 8" ductile iron water main will tie into an existing 10" main located opposite the new road intersection with Triphammer Road. A road bore (or directional drilling) will be used to extend the main connection under Triphammer Road, where a "live tap" or insertion "T" will be made for the connection. The new main diameter will insure that development will have adequate domestic and fire flows volumes and pressures, and will also for future neighboring areas should additional extensions be made. (In checking with Bolton Point representatives, the working pressure of the main is approximately 110 psi.) Fire hydrants with shut off valves are located throughout as shown on the plans. Valves are proposed dead ends will be left for future connections to adjacent properties should such become necessary.

With only 40' of elevation rise from the existing water main to the highest point in the project, and with using an 8" diameter pipe, static and friction losses in the new service area will not be significant (less than 20 psi, even with a 500 gpm fire demand. In short, there should be no apparent problem with water main pressures or flows in the new development. The proposed district expansion and new construction will be at no cost to the Town of Lansing, as all costs will be paid by the developer. As such, it is a "No Cost" district extension for the Town.

V. SANITARY WASTE DISPOSAL DESIGN

The lots will be served by individual septic system of sand filters with raised downstream mounds/fills. Soil Percolation test holes have been taken on each lot in the development near the intended location of the systems. Some deep holes were also taken on previous occasions, A minimum of 12" of percable soil was found at each site. Soil conditions vary somewhat with both Illion and Ovid silt loams being encountered. Deep hole tests indicated that all lots are shown to be able to accommodate a sand filter/downstream mound type of system, because of the impermeable soils found below the 12" depth.

All plans are for 3 and 4 bedroom homes using standard water-saver fixtures (110 GPD/BR). Specifications for sand filters and fill materials follow Tompkins County Health Department Guidelines. For system details and plans, see Drawing ST-54 on the accompanying drawing set.

VI. STORMWATER MANAGEMENT & EROSION CONTROL

In order to comply with NYS Department of Environmental Conservation and EPA Phase II Storm Water Discharge regulations as defined in 40 CFR 122.26(b)(14)(x), a complete Stormwater Management Plan and Stormwater Pollution Prevention Plan (SPPP), including the required Notice of Intent (NOI), have been prepared and are referenced in Appendix F. The NOI will be filed under the NYSDEC General Permit for Storm Water Discharges for Construction Activities (GP-0-20-001) prior to the start of any construction work as required. An erosion Control Plan is included in the SWPPP document and in the project drawings. All erosion control work will be carried out in conformance with the current NYSDEC Erosion Control Guidelines and the accompanying plans. It is planned to form a separate StormWater drainage Maintenance District to maintain and operate the onsite facilities once constructed.

Respectfully submitted,

TIMOTHY C. BUHL, P.E.



Timothy C. Buhl, PE

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APPENDIX A

CONSTRUCTION SPECIFICATIONS & TESTING

SITE SPECIFICATIONS

FOR

**BRITTON WOODS SUBDIVISION
LANSING, NEW YORK**

Prepared for:

**SCOTTY AND WAYNE BRITTON
18 MURFIELD DRIVE
ITHACA, NEW YORK 14850**



Prepared by:

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35 Fire Lane 24
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DECEMBER, 2020

#1847

**SITE SPECIFICATIONS
FOR
BRITTON WOODS SUBDIVISION
LANSING, NEW YORK**

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SECTION 01000 - PROJECT SUMMARY

A. PROJECT DESCRIPTION

1. Project Name and Location:

Britton Woods Subdivision
Lansing, NY

2. Project Summary: The work consists of construction of roads, drainage ditches, swales, culvert pipe, retention basins, water mains, hydrants, and services in a wooded area east N. Triphammer Road in the Town of Lansing, New York. Items of work include:

- site clearing, soil stockpiling, erosion control plan and implementation, reseeded
- road grading, geotechnical fabric placement, subbase, base, and surface courses per Town of Lansing Specifications for the entire roadway as shown on the plans.
- also included will be the 8" water mains along proposed roads including the hydrant assembly and connections to the Town water system.
- stormwater management facilities including retention ponds, filter strips, forbays, slope protection, outlet piping, spreaders, etc.
- Ditch and culvert installation with rip-rap protection along portions of roads and backyard swale construction along south and east sides of the property.
- 8" ductile iron water main installation with a roadway bore under N. Triphammer Road, hydrants, valves, services and connection to existing mains in conformance with Health Department, Bolton Point Water system, and Town of Lansing standards

3. Projected Start Date: May 1, 2021
Projected Date of Occupancy: October 30, 2021

4. Special Requirements:

- a. Prior or Concurrent Work by Owner or Others: The owner will be working in areas of the site concurrent with contractors work including home and septic system construction. The contractor will be required to interface with the installing contractor and coordinate locations of water services and curb boxes.
- b. Existing Site Conditions and Restrictions: Portions of the site have buried utilities the location of which are unknown. NYSEG will be installing gas and electric buried utilities. Work must be coordinated with utility installation.

5. Alternates:

- a. None planned at this time

B. CONTRACT FORMS

1. Owner Contractor Agreement: AIA A101-1997, Stipulated Sum.
2. Material and Payment Bond: AIA A311-1970, Performance Bond and Labor and Material Payment Bond. (unless waived by owner - list cost on bid forms)
3. General Conditions: AIA A201-1997, for Construction.

C. TESTING

1. Testing Agency: Independent testing agency engaged and paid for by Contractor.

D. COORDINATION

1. Coordination: Coordination of site work, utilities, and building construction.
2. Schedule: Bar-chart type project schedule.

E. FIELD ENGINEERING

1. Underground Utilities: Verification and location of underground utilities, facilities, and equipment.
2. Layout: Layout for site improvements, utilities, and structures.

F. PROJECT MEETINGS

1. Pre-Construction Conference: Attendance by Owner, Engineers, Contractor, major subcontractors, and suppliers.

G. SUBMITTALS

1. Project Submittals: Three copies of shop drawings, three copies for product data and warranties, two representative units for samples.
2. Record Documents: Record drawings, record specifications, maintenance manuals. Clean sets of drawings and specifications to be kept by contractor and marked with all changes in the work and all final locations of concealed items including buried piping, etc. Turn over marked as-builts prior to submittal of final pay request.

H. TEMPORARY FACILITIES

1. Temporary Facilities: Temporary construction, support facilities, and security measures.

I. INSURANCE

1. Meet \$2,000,000 dollar limits for general and auto liability, and additional coverage as required by owner.

END OF SECTION 01000

SECTION 02100 - GENERAL SITE WORK CONSTRUCTION SPECIFICATIONS

PART 1 - GENERAL

1.1 OWNER

- A. Throughout this specification document the word "Owner" appears in various contexts. Relative to all issues associated with the actual construction and acceptance of work items, the word "Owner" refers to Scotty and Wayne Britton, 18 Murfiled Drive, Ithaca, New York 14850 and/or their representative.
- B.

1.2 SITE CONDITIONS AND WORKMANSHIP

- A. Contractor is responsible for all existing structures and features both within and surrounding the project site and is fully responsible for any damage that may occur due to this construction.
- B. All existing features, dimensions, and inverts depicted on these Drawings shall be verified by the Contractor prior to beginning the work. Contractor shall immediately notify the Owner of any discrepancies or inaccuracies. Specific dimensions shall not be scaled from the Drawings. Contractor to provide all stakeout work based on available survey data. Discrepancies and/or clarifications shall be brought immediately to the attention of the Owner.
- C. Contractor shall be fully responsible to contact the appropriate agency/business/individuals (including the Town of Lansing and Bolton Point) and secure all required permits, prior to any construction to be performed within an easement and/or ROW.
- D. Contractor shall full comply with all applicable local, utility, State and Federal regulations and requirements. Full compliance with all OSHA requirements is essential. If additional permits and approvals are required for the completion of the work, the Contractor shall obtain them prior to beginning the work.
- E. The project construction shall be undertaken in a neat, clean, safe and orderly fashion. The site shall be maintained in such a manner so as to protect all persons, structures and equipment from injury and/or damage. In the event of any damage to any property, the Contractor shall be fully responsible and shall replace/repair the property to it's original condition at the Contractor's expense. At the completion of the project, the Contractor shall remove all remaining debris, materials, equipment, rubbish, excess material, etc.

1.3 UTILITIES

- A. Contractor shall contact and fully coordinate all activities with the appropriate utility companies and/or agencies. Access to all existing and proposed utilities shall be fully maintained to the satisfaction of the applicable utility itself.
- B. All of the existing utilities have been shown based on the best available information and physical evidence. These locations have been shown for informational purposes only and are not viewed as being exact. Prior to beginning any work, Contractor shall have all existing utilities located so as to prevent damage and possible interruption. Contractor shall be fully responsible for any damage.
- C. The responsibilities of the Contractor relative to each utility has been described within the Drawings. Any deficiencies in these descriptions does not relieve the Contractor of his responsibility to fully complete all of the work required by said utility.

1.4 MAINTENANCE OF TRAFFIC

- A. Contractor shall maintain roadways, sidewalks and crosswalks to such an extent as will give safe, unimpeded, practical use.
- B. Contractor shall provide and maintain all necessary flag persons, barricades, warning lights and signs, and take necessary precautions for the protection and safety of the public, the workers and the Work. Suitable warning signs shall be placed on both sides of the work area. All barricades and signs left in place at night shall be illuminated with flares or blinking lights maintained in operating condition. Contractor required to obtain a Town Highway Permit, if required.
- C. Contractor shall control all mud and/or dust caused due to the construction by sweeping, flushing and wetting as often as is necessary to prevent a nuisance. In dry-weather, this shall be a minimum of once per day.

1.5 ENVIRONMENTAL PROTECTION

- A. Contractor shall take all the necessary precautions and utilize standard preventative measures to prevent any discharges or other releases of harmful materials into the environment. Strict compliance with all applicable regulations and requirements is required.
- B. If, in the judgement of the Owner or other authorized regulatory representatives, the Contractor is not adequately protecting the environment, the Owner will so inform the Contractor who in turn will improve their practices so as to comply and satisfy all those concerned.
- C. Contractor shall implement all of the necessary practices such that site erosion is minimized and that which does occur will be fully contained on-site. The Contractor shall fully comply with all NYSDEC Guidelines for Erosion and Sediment Control, and shall follow the specific Erosion & Sediment Control and SWPPP work plans prepared by to the Engineer prior to the start of site construction activities. The Engineer may propose modifications to said plan.
 - 1. All erosion control measures shall be maintained in effective working order throughout the duration of the project. The effectiveness of all such measures shall be monitored subsequent to each rainfall event and if modifications are necessary the Contractor shall so implement at no additional cost to the Owner. Once all disturbed areas have been stabilized, said measures shall be removed and/or eliminated.
 - 2. The sequence of construction activities shall be such that erosion will be minimized and limited in it's duration.

1.5 QUALITY CONTROL AND SUBMITTALS

- A. At various junctures of this project, the Owner requires that the Contractor perform specified testing as an assurance that the work completed fully complies with the specifications. Particular test requirements and submittals are noted below and in the applicable specification sections. The cost for all such testing shall be borne by the Contractor and shall be performed by suitably certified and qualified laboratories/agencies. Work shall be retested if unsatisfactory. Cost of all retesting shall be borne by the Contractor. Said laboratories shall be hired by the Contractor who will be fully responsible to coordinate their activities in conjunction with the construction. All test results shall be provided to the Contractor who in turn will provide them to the Owner.
- B. The Contractor shall periodically submit to the Owner various documentation of the work as required by the specifications. Said submittals shall include proposed materials, permits obtained, test results, etc. Contractor shall submit four (4) copies of all such documentation.
- C. Contractor shall maintain a set of working Record Drawings. The record set shall show all changes to the work and shall be updated on a weekly basis. The record set shall accurately show the final installed

locations and elevations of:

1. Sanitary and storm sewer mains, casing pipe, laterals, manholes, cleanouts, drywells, catch basins, subdrains, and all rims and inverts.
 2. All retaining walls, concrete pads, etc. if within Contract.
 3. Water mains, valves, services connections, encasements, etc.
 4. Curbs, walks, signs, trees, fences, guiderail, and any other surface objects.
 5. Correct location and measurements to any underground utilities installed during the course of the work.
- The final set of Record Drawings must be complete and submitted as one reproducible set of drawings and three sets of prints.

- D. Contractor to provide submittals for each of the following. Earthwork - Information verifying compliance for each soil material, stone or product to be used. Proctor curve data for each material to be compacted. Asphalt Pavement - Marshall Mix Design properties. Concrete Pavement - Design Mix. Water, Storm and Sanitary Utilities - Product data for valves, manholes, drywells, frames, grates, steel casing, pipe, and all other associated items.

PART 2.0 PRODUCTS - NOT USED

PART 3.0 EXECUTION - NOT USED

SITE CLEARING AND GRUBBING

GENERAL

- A. Utility Services: Maintain existing utilities indicated to stay in service and protect against damage during clearing operations. Do not interrupt existing utilities serving occupied or used facilities.
- B. Environmental Protection: Use suitable control measures to minimize all erosion, dust, noise or any other environmental concern. Implement Erosion Control Plan as provided and as approved by the Engineer. Comply with all applicable Local, State and Federal regulations. Clean adjacent structures and improvements of dust, dirt, and debris caused by clearing operations. Return adjacent areas to condition existing prior to start of work.
- C. Offsite Disposal: Unless otherwise noted, all items to be demolished shall be legally disposed of on a daily basis at an offsite location/facility.
- D. Permits and Records: Obtain all required permits for work to be completed. Keep accurate location records of all disconnects, plugging, etc. of buried utilities as well as any unusual or previously unidentified items that are revealed during the course of the work.

EXECUTION

- A. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.
- B. Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
 1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
 2. Stockpile topsoil in storage piles. Construct storage piles to provide free drainage of surface water. Cover

storage piles, if required, to prevent wind erosion.

3. Dispose of unsuitable or excess topsoil as specified for disposal of waste material.

- C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing. Completely remove stumps, roots, and other debris protruding through ground surface. Use only hand methods for grubbing inside drip line of trees indicated to remain. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.
- D. Removal of Improvements: Remove existing above-grade and below-grade improvements as necessary to facilitate new construction. Abandonment or removal of certain underground pipe or conduits may be indicated on drawings and is included under work of related Division Sections. Removing abandoned underground piping or conduits interfering with construction is included under this Section. Completely remove and dispose of indicated abandoned water piping, valves, and fittings in cut areas and proposed roadways.
- E. Excess soil materials not suitable or required for general fill or backfill material may be placed and graded in areas as directed by Owner. Final grades of additional soil placement and compaction shall be conducted in a manner in which positive drainage to intended drainage swales shall be achieved. Contractor shall coordinate this work with Owner prior to commencement.

EARTHWORK (REFER TO APPENDIX A FOR TOWN OF LANSING ROAD SPECIFICATIONS)

GENERAL

- A. This Section includes excavating and backfilling for underground mechanical utilities, buried mechanical appurtenances, pavement, curbing, subgrade preparation, guiderails, etc.
- B. Excavation consists of removal of material encountered to subgrade elevations indicated and subsequent relocation disposal or removal of materials removed.
- C. Subgrade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage stone, pipe bedding or topsoil materials.

MATERIALS

- A. Roadway Granular Subbase Course: A well graded sand and gravel mixture meeting the requirements of NYSDOT Material Specification 304.14M, or an evenly graded bank run gravel which is sound, durable, and free of other deleterious materials and free of boulders in excess of 3 inches along the longest dimension, with no more than 8% by weight finer than the No. 200 sieve.
- B. Roadway Base Course Material: Provide a naturally or artificially graded crusher-run stone, which is sound, durable, and free of other deleterious material. Material shall have a plasticity index of 5 or less for material passing the 40 sieve, shall have less than 20% loss based on the NYSDOT Magnesium Sulfate Soundness Test (STM II) and have a gradation conforming to the following limits:

<u>Percent Passing by Weight</u>	<u>Sieve Size</u>
100	2"
30-65	1/4"
5-40	No. 40
0-8	No. 200

- C. Drainage Stone: NYSDOT No. 2 Size Designation, evenly graded mixture of clean, angular, sharp washed crushed stone, or washed crushed gravel meeting NYSDOT Material Designation 703-0201.
- C. Native Backfill: Satisfactory soil materials free of clay, rock or gravel larger than 8 inches, (4" maximum in top 3' of controlled fill) in any dimension, with no debris, waste, frozen materials, vegetation and other deleterious matter. Plasticity index less than 10. Maximum 15% larger than 3", maximum 30% larger than 3/4" and maximum 25% smaller than No. 200 sieve.
- D. Imported Granular Fill or Gravel: A well graded run-of-bank gravel free from organics, ash, refuse or other deleterious matter, with 100% by weight passing a 3" sieve but no more than 8 % passing the No. 200 sieve.
- E. Pipe Bedding Stone: Stone of No. 1 or No. 1A Size Designation consisting of sound, sharp crushed stone or other granular material approved by the Engineer. Material shall be clean and durable and shall be graded within the limits outlined in NYSDOT Material Spec. 703-0201
- F. Select Fill: Fill material meeting the requirements of NYSDOT Material Specification 203-2.02 B, Select Fill.
- G. Medium Duty Rip-Rap or Stone Fill: Hard angular stone that meets the gradation requirements of NYSDOT Material Specification found in Table 620-1, Medium Item. At least 50% of the material shall be at least 12" to 15" in size.
- H. Geotextile Fabric: Mirafi 500X for pavement areas. Mirafi 100X for silt barrier fences. Mirafi 180N for drywell stone wraps and beneath rip-rap. Pavement Fabric must have puncture strength of 125 lb. Min., Mullen Burst Strength of 430 PSI Min., Grab tensile strength of 220 lb. Min., and an Apparent Opening Sive Size of 40-80 Max.
- I. Light Duty Rip-Rap or Stone Fill: Stone that meets the gradation requirements of NYSDOT Material Specification found in Table 620-1, Light Item.
- J. Cushion Sand: Clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances conforming to the following limits of gradation when dry:

<u>Percent Passing by Weight</u>	<u>Sieve Size</u>
100	1/4"
0-35	No. 50
0-10	No. 100

STABILITY OF EXCAVATION

- A. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- B. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in compliance with OSHA regulations. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

DEWATERING

- A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.
- B. Do not allow water to accumulate in excavations.

STORAGE/REMOVAL OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill where directed. Place, grade, and shape stockpiles for proper drainage.
- B. Locate and retain soil materials away from edge of excavations.
- C. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill as directed by the on-site geotechnical engineer.

EXCAVATION FOR STRUCTURES AND IMPROVEMENTS:

- A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection.
- B. Excavations for footings and foundations: do not disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.
- C. Excavation for Underground Manholes, Basins, Drywells, and Mechanical or Electrical Structures: Conform to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection. Do not disturb bottom of excavations, intended for bearing surface.
- D. Cut surface under pavements to comply with cross-sections, elevations and grades as indicated.

TRENCH EXCAVATION FOR PIPES AND CONDUIT

- A. Excavate trenches to uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both sides of pipe or conduit.
- B. Excavate trenches and conduit to depth indicated or required to establish subgrade elevations for indicated pipe bedding material thickness prior to pipe installation.
- C. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90 degrees (bottom 1/4 of the circumference). Fill depressions specified with pipe bedding material.
- D. For utility trenches, comply with all applicable utility company requirements.

COLD WEATHER PROTECTION

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

BACKFILL AND FILL

- A. General: Place soil material in layers to required elevations, for each area classification listed below, using materials as specified in this Section.
 - 1. Under grassed areas, use satisfactory Native Backfill excavated or Imported Granular Fill material.
 - 2. Under walks, use Granular Subbase material, as specified, and Native Backfill or Imported Fill material to bring to subgrade elevation.
 - 3. Under pavements, use Granular Subbase material, as specified, and Native Backfill or Imported Fill material to bring to subgrade elevation. When a compacted subbase course is indicated to be 6 inches thick or less, place material in a single layer. When indicated to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.
 - 4. Under and above piping and conduit and equipment, use specified thickness of Pipe Bedding material and for correction of unauthorized excavation.
 - 5. Do not backfill trenches until tests and inspections have been made and backfilling is authorized by Owner. Use care in backfilling to avoid damage or displacement of pipe systems.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
3. Removal of concrete formwork.
4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
5. Removal of trash and debris from excavation.
6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

PLACEMENT AND COMPACTION

- A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.
- B. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- C. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment (minimum 8 ton smooth drum vibratory roller), and not more than 6 inches in loose depth for material compacted by hand-operated tampers.
- D. Before compaction, moisten or aerate uniformly each layer as necessary to provide optimum moisture content. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- E. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with ASTM D 1557:
 1. Under structures, building slabs and steps, compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent maximum density.
 2. Under pavements and walkways, compact top 6 inches of subgrade and each layer of backfill or fill material at 95 percent maximum density.
 3. Under lawn or unpaved areas, compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent maximum density.

GRADING

- A. General: Smooth finish surface within specified tolerances, with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes shall be as follows:
 1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 2. Walks: Shape surface of areas under walks to line, grade, and cross-section, with finish surface not more than 1/2 inch above or below required subgrade elevation.
 3. Pavements: Shape surface of areas under pavement to line, grade, and cross-section, with finish surface not more than 1/2 inch above or below required subgrade elevation.
- C. Grading Above Cut Slopes: In areas of all cut slopes of 2:1 and steeper, an upgradient cut-off ditch shall be cut into the top of slope to minimize runoff down the face of the slope.

RIP-RAP

- A. Place stone on roughened surface in one placement operation. Avoid segregation of materials so that all

voids are filled between larger stone pieces. Secure geotextile fabric prior to placing stone.

MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion.
- B. Repair and reestablish grades in settled, eroded, and disturbed areas to specified tolerances and condition.

FIELD QUALITY CONTROL

- A. The Contractor will have an independent testing laboratory perform field density tests to verify the satisfactory completion of the work. Field density tests will be performed by the nuclear method in accordance with ASTM D 2922, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with ASTM D 3017. If field tests are performed using nuclear methods, calibration checks will be made of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Engineer.
- B. Paved Areas and Slab Subgrade: Perform at least one field density test of subgrade and each compacted fill layer for every 2,500 sq. ft. of developed area.
- C. If in opinion of the Owner, based on testing service reports and inspection, subgrade and/or fills have been placed below specified density, additional compaction and testing will be conducted until the specified density is obtained. The cost for additional testing will be fully borne by the Contractor.

ASPHALT CONCRETE PAVING, SIGNAGE, GUIDERAIL AND PAVEMENT MARKING **(REFER TO APPENDIX A FOR TOWN OF LANSING ROAD SPECIFICATIONS)**

GENERAL

- A. This Section includes provisions for oil & stone and/or asphalt concrete paving over prepared subbase as shown on drawings.
- B. Proof rolling of prepared subbase and saw-cutting existing pavements is included in this Section.
- C. Raising existing utility covers to finished grade, pavement markings, signage, and guiderail included in this Section.
- D. See "Earthwork" section for excavation and backfill requirements.

SITE CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 deg F (10 deg C) and when temperature has not been below 35 deg F (1 deg C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct asphalt concrete surface course when atmospheric temperature is above 40 deg F (4 deg C) and when base is dry. Base course may be placed when air temperature is above 30 deg F (minus 1 deg C) and rising.
- C. Grade Control: Establish and maintain required lines and elevations to allow positive drainage of surfaces as shown.

MATERIALS

- A. Asphalt Concrete: Meet NYS DOT Standard Specification for Asphalt Concrete, Section 400, for each asphalt type. Top Course-403198202, Type 7F. Binder Course-403.138902, Type 3.
- B. Tack Coat: The bituminous tack coat shall meet NYS DOT Standard Specification for Asphalt Emulsion for Tack Coat, Table 702-9, Grade HFMS-2L.

- C. Prime Coat: Provide slow setting asphalt emulsion meeting the requirements for NYSDOT Material Designation 702-3501 or 702-3601.
- D. Oil & Stone: Meet NYSDOT standard Specifications, Section 410, latest edition. Emulsions to meet any of the following:
- | | |
|-------------------|---|
| 702-3101 - RS - | Rapid Setting Asphalt Emulsion |
| 702-3102 - HFRS-2 | High Float Rapid Setting Asphalt Emulsion |
| 702-4101 - CRS-2 | Cathionic Rapid Setting Asphalt Emulsion |

Submit to Town Highway Superintendent certifications from supplier for all asphalt emulsions.

Provide coarse aggregate sizes specified. Aggregate shall be crushed limestone or dolomite that have an acid insoluble content of not less than 10%. Coarse aggregate shall not contain more than 5% chert and no more than 1.0 % dust.

- E. Lane Marking Paint: Alcohol based conforming to Fed. spec. TT-P-11s, Type III. Color: Yellow for all striping except as noted.
- F. Signs: "Stop" signs to be EMED Co. Model #121264, 24" x 24". All signs to be reflective steel. Posts to be galvanized steel EMED Co. model #SCSP10G.

SAW CUT EXISTING PAVEMENTS

- A. All existing asphalt surfaces to remain at limits of work, shall be saw cut prior to excavation of designated asphalt removal areas. Saw cutting shall be performed in a manner to provide a continuous straight line and be smooth without jagged edges.

SURFACE PREPARATION

- A. General: Remove loose material from compacted subbase surface immediately before applying prime coat.
- B. Proof roll prepared subbase surface and correct if needed to check for unstable areas and areas requiring additional compaction.
- C. Tack Coat: Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.05 to 0.15 gal. per sq. yd. of surface. Allow tack coat to dry until at proper condition.
- D. Examine all utility covers for proper finished grade elevations and alignment prior to asphalt placement. Install acceptable cover extensions to existing utility covers to match finished grade prior to asphalt placement.

PLACING MIX

- A. General: Place asphalt concrete mixture on prepared surface, in accordance with NYS DOT Standard Specifications Sections 403 and 401-3. Place areas inaccessible to equipment by hand. Place each course to required grade, cross-section, and compacted thickness.
- B. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
- C. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.

ROLLING

- A. Asphalt Concrete Pavement
1. General: Begin rolling when mixture will bear roller weight without excessive displacement.

2. Equipment: Shall be in accordance with NYS DOT Standard Specification Section 401-3.12.
3. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
4. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
5. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been evenly compacted.
6. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained 95 percent laboratory density.

TRAFFIC LANE MARKINGS, SIGNS AND GUIDERAILING

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust. Do not apply traffic and lane marking paint until layout and placement have been verified with Owner and/or Owner's Representative.
- B. Apply paving markings and install signs in conformance with NYS DOT Standard Specification Section 640-3.02 and NYS Uniform Traffic Control Devices Manual. Lines to be 4" wide.

FIELD QUALITY CONTROL

- A. General: Repair or remove and replace unacceptable paving as directed by Owner.
- B. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variations:
 1. Binder and Top Course: Plus or minus 1/4 inch.
- C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10-foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
 1. Binder Course Surface: 1/4 inch
 2. Wearing Course Surface: 1/8 inch
- D. Compaction: Test each course for adequate compaction to a minimum of 95% density of Marshall Test results at a frequency of 1 test for every 4,000 Sq. Ft. of paved area.

PORTLAND CEMENT CONCRETE

GENERAL

- A. This section includes portland cement concrete paving including curbs, utility pads and walkways over prepared subbase as shown on the drawings.
- B. Excavation and prepared subbase is specified in "Earthwork" section.

MATERIALS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects.
 1. Use flexible spring steel forms or laminated boards to form radius bends as required.
- B. Coat forms with a non-staining form release agent that will not discolor or deface surface of concrete.
- C. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185, in flat sheets only.
- D. Concrete Materials: Comply with requirements of NYS DOT Standard Specifications Section 501 for concrete materials, admixtures, bonding materials, curing materials, and others as required. Concrete to be Class A as defined in above document Table 501-3.
- E. Expansion Joint Materials: Comply with requirements of NYS DOT Standard Specifications Section 705-070 for pre-moulded joint fillers and sealers.

- F. Liquid-Membrane Forming and Sealing Curing Compound: Comply with ASTM C 309, Type I, Class A unless other type acceptable to Owner or Owner's Representative. Moisture loss no more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

CONCRETE MIX, DESIGN, AND TESTING

- A. Compressive Strength: 3500 psi, minimum at 28 days, unless otherwise indicated.
1. Slump Limits: Maximum 3 inches.
2. Air Content: 5 to 8 percent.

SURFACE PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.
B. Proof-roll prepared subbase surface and correct if needed for unstable areas and need for additional compaction.

FORM CONSTRUCTION

- A. Set forms to required grades and lines, braced and secured. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
B. Check completed formwork for grade and alignment to following tolerances:
1. Top of forms not more than 1/8 inch in 10 feet.
2. Vertical face on longitudinal axis, not more than 1/4 inch in 10 feet.
C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

REINFORCEMENT AND INSTALLATION

- A. Locate, place and support reinforcement as shown on drawings and as specified in NYS DOT Standard Specifications Section 608-3.01. Minimum 6 X 6 - 1.4/1.4 WWF.
B. Do not place concrete until subbase and forms have been checked for line and grade. Moisten subbase if required to provide a uniform dampened condition.
C. Place concrete by methods that prevent segregation of mix and dislocation of reinforcing, dowels, and joint devices.
D. Use bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
E. Deposit and spread concrete in a continuous operation between transverse joints as far as possible. If interrupted for more than 1/2 hour, place an expansion joint.

JOINTS

- A. General: Construct expansion, weakened-plane (contraction), and construction joints true to line with face perpendicular to surface of concrete. Construct transverse joints at right angles to the centerline, unless otherwise indicated.
B. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.
C. Weakened-Plane (Contraction) Joints: Provide weakened-plane (contraction) joints as indicated sectioning concrete into uniform areas.
D. Expansion Joints: Provide premoulded joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks, and other fixed objects, unless otherwise indicated.

1. Locate expansion joints for pavement, sidewalks and at end of placements as indicated.

2. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.
3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material.

CONCRETE FINISHING AND CURING

- A. After striking-off and consolidating concrete, smooth surface by screeding and floating. After floating, test surface for trueness with a straightedge. Curbing and top and exposed face of retaining wall to be rub finished.
- B. Work edges of sidewalks, slabs, and formed joints with an edging tool, and round to 1/2-inch radius, unless otherwise indicated.
- C. After completion of floating, broom finish by drawing a fine-hair broom across concrete surface.
- D. Protect and cure finished concrete paving using membrane-forming curing and sealing compound or approved moist-curing methods.

REPAIRS AND PROTECTIONS

- A. Repair or replace broken or defective concrete and protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- B. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just before final inspection.

FIELD QUALITY CONTROL

- A. The Contractor will hire a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement.
- B. Testing: Compressive-Strength Tests (ASTM C 39), Slump (ASTM C 143), and Air Content (ASTM C 231) - One set (four standard cylinders) for each day's pour or each concrete class exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. Test one specimen at 7 days, test two specimens at 28 days, and retain one specimen in reserve for later testing if required. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- C. Test results will be reported in writing to Owner, concrete manufacturer, and Contractor within 24 hours of testing.

WATER SERVICE, VALVES, & ACCESSORIES

(SEE "SPECIFICATIONS FOR WATER MAIN EXTENSIONS" AS PER SCLIWC - BOLTON POINT WATER SYSTEM AND TOWN OF LANSING STANDARD DETAILS)

GENERAL

- A. This Section includes water service piping, valves, and appurtenances as shown on drawings.
- B. See the "Earthwork" section for excavation and backfill specifications for water mains and service piping.

MATERIALS

- A. Gate valves (Buried) shall be KENNEDY Ken Seal #8571 or equal with non-rising stem, resilient seated, double sealing disc, 125-pound end flange drilling, 200-pound working pressure, and open to the left.
- B. Valve Boxes shall be BUFFALO style, two-piece cast iron, screw type, 5 1/4" shaft, in accordance with

ASTM Spec. A-48. Lids shall be marked "WATER".

- C. Pipe shall be ductile iron pipe, AWWA C151, Class 350 - or- PVC DR18 C900 Pipe.
- D. Hydrant: Kennedy K-81D, 5 1/4" barrel; 2 - 2 1/2"Hose Nozzles, 1 - 4 1/4 pump nozzle, both NST
- E. Metallic lined plastic warning tape - 6", Blue. (For PVC pipe only).
- F. Casing pipes (if required): ASTM A252 "Welded and Seamless Steel Pipe", Grade 2.
- G. Corporation Stop Valves shall be Mueller B-25008 with compression connections.
- H. Curb Stop Valves shall be Mueller B-25209 with compression connections.
- I. Curb Boxes shall be telescoping type.
- J. Tapping Sleeve and Valve shall be a FORD stainless; Fast -1350 SERIES with carbon steel flanges.
- K. Corps and Saddles for PVC mains shall be Ford FB1100 Series and Ford FS303 Series.
- L. Retainer Glands for Ductile Iron Pipe shall be Ford UFR 1400 Series. For C-900 Pipe shall be Ford UFR 1300 and 1350 Series.
- M. Pipe Materials

1. Ductile Iron Pipe

Ductile iron pipe shall be manufactured in accordance with ANSI A21.51 and AWWA C151. Working pressure shall be 350 psi and thickness class shall be 52 unless otherwise specified on the Drawings.

Double cement mortar lining shall be in accordance with ANSI A21.4 and AWWA C104.

Push-on joints and mechanical joints shall be in accordance with ANSI A21.11 and AWWA C111.

Fittings shall be ductile iron in accordance with ANSI A21.53 and AWWA C153. Fittings shall be cement lined and seal coated with an asphaltic material in accordance with ANSI A21.4 and AWWA C104. Working pressure rating on fittings shall be 350 psi.

All pipe and fittings shall have an asphaltic outside coating.

2. Copper Pipe

Copper piping shall be Type K in accordance with ASTM B-88. All fittings shall be compression type fittings.

3. PVC Pipe

PVC water main pipe shall be in accordance with AWWA C-900 specs. DR18 and NSF Standard No. 14 with a pressure rating of 200 psi.

4. Polyethylene Pipe

Water Main - Shall be SDR 11, AWWA C906 , HDPE 3408. Stainless steel insert stiffeners shall be used at all mechanical joint couplings.

Water Service - Shall be SDR 9, AWWA C901 , CTS HDPE 3408. Stainless steel insert stiffeners shall be used at all joint couplings

PREPARATION OF BURIED PIPE FOUNDATION

- A. Grade trench bottom with specified pipe bedding prior to installation, to provide a smooth, firm, stable, and rock-free foundation throughout the length of the piping.
- B. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

INSTALLATION OF PIPE AND PIPE FITTINGS

- A. Depth of Cover: Provide minimum cover over piping of 4.5 feet below finished grade.
- B. Install pipe in accordance with AWWA C600. At main, expose and connect as indicated with adaptations as required.

INSTALLATION OF VALVES, ANCHORAGES, THRUST BLOCKS AND TAPE

- A. General Application: Use bronze corporation stops and valves, with ends compatible to piping, for 2-inch and smaller installation. Use mechanical joint end valves for 4" and larger. Comply with AWWA C600.
- B. Provide anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches.
- C. Concrete thrust blocks shall be installed behind all tees, bends of 1/16 or greater, and all hydrants. Concrete shall be poured against undisturbed soil only, and shall provide at least four (4) square feet of bearing area against the side of the trench. Concrete shall be placed in such a manner that all fitting joints are accessible.
- D. Install continuous plastic underground warning tape during back-filling of trench. Locate 6 to 8 inches below subgrade, directly over piping.

DISINFECTION, CLEANING AND TESTING

- A. Clean and disinfect all new water distribution piping. Purge all new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired, prior to use. Use the purging and disinfecting procedure prescribed by the authority having jurisdiction or, in case a method is not prescribed by that authority, use the procedure described in the latest revision of AWWA Standard Specification C-651. After flushing, collect and test sample for bacteriological analysis.
- B. Piping Tests: conduct piping tests before joints are covered and after thrust blocks have sufficiently hardened. Fill pipeline 24 hours prior to testing and apply test pressure to stabilize system. Use only potable water. Test pressure shall:
 - 1. Not be less than 1.25 times the working pressure at the highest point along the test section or at least 150 psi,
 - 2. Not exceed pipe or thrust-restraint design pressure,
 - 3. Be of at least 2 hour duration,
 - 4. Not vary by more than + or - 5 psi (0.35 Bar) for the duration of the test,
 - 5. Not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants, and
 - 6. Not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.
- C. The complete test shall be conducted in full compliance with AWWA specifications C600, Section 4 - Hydrostatic Testing (See Appendix C), or as required by the Town of Lansing/Bolton Point Water System.

STORM SEWERAGE**GENERAL**

- A. This Section includes storm sewerage system piping and appurtenances as shown on the drawings.
- B. See "Earthwork" section for excavation and backfill specifications for storm sewerage system piping and structures.

MATERIALS

- A. Corrugated Polyethylene Pipe (CPEP): The pipe shall be high density polyethylene pipe with corrugated exterior and smooth interior (Mannings n factor of 0.012). Pipe, coupling bands, fittings, cleanouts and appurtenances shall meet the requirements of AASHTO M294 and M190 and material shall conform to ASTM D3350. End sections shall be polyethylene made to fit pipe. Hancor or ADS.
- B. Precast Concrete Drywells: ASTM C 478 or ASTM C 858, precast reinforced concrete. Sections shall have provision for sealed joints. Base section slab shall have minimum thickness of 6 inches, riser sections shall have minimum thickness of 4 inches and top section shall match riser and have surface to accept frame and grate specified, unless otherwise indicated. Suitable for H-20 loading. Fort Miller or approved equivalent.
- C. Drywell Frames and Grates: ASTM A 536 Grade 60-40-18, heavy-duty, ductile iron, size and style as indicated. Manholes with Grates: Syracuse Castings #1157C or approved equivalent. Manholes with Covers: Syracuse Castings #1023A or approved equivalent with "Storm Sewer" lettering on cover.
- E. Sidewalk Grates: Solid or perforated to allow walking. ADA compliant. Corrosion-resistant. McNichols Co. or equivalent.

PREPARATION OF FOUNDATION FOR BURIED STORM SEWERAGE SYSTEMS

- A. Grade trench bottom with specified Pipe Bedding Material to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped Pipe Bedding Material. Ensure continuous bearing of the pipe barrel on the foundation.

INSTALLATION, GENERAL

- A. Installation shall be in accordance with ASTM D2321 and as recommended by the pipe manufacturer. Join and install pipe and fittings with couplings in accordance with manufacturer's recommendations. Coupling bands shall cover at least one full corrugation on each section of pipe.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Insure pipe has a minimum 1 foot of cover in all areas.
- C. Drywells:
 - 1. Construct drywells to sizes and shapes indicated.
 - 2. Set frames, covers, and grates to elevations indicated.
- D. Extend storm sewerage system piping to connect to building storm drains (roof), of sizes and in locations indicated. Provide all necessary adaptors, etc. that are required to satisfactorily complete the connections. Install 1-inch thick extruded polystyrene directly over underground building drain piping not under building if the pipe depth is less than three (3) feet. Width of insulation shall extend minimum of 12 inches beyond each side of pipe.

FIELD QUALITY CONTROL

- A. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. In large, accessible piping, brushes and brooms may be used for cleaning. Place plugs in ends of uncompleted pipe at end of day or whenever work stops. Flush piping between manholes, if required by local authority.

- B. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred. Make inspections after pipe between manholes and catch basins have been installed and approximately 2 feet of backfill is in place, and again at completion of project. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and reinspect.

SANITARY SEWERAGE (THIS SECTION INSERTED FOR STORMWATER PIPE AND MANHOLE DATA ONLY)

GENERAL

- A. This Section includes sanitary sewerage system piping and appurtenances.
B. See "Earthwork" section for excavation and backfill specifications for sanitary sewerage system piping and structures.

MATERIALS

- A. PVC (Polyvinyl Chloride) Sewer Pipe and Fittings: Gravity-ASTM D 3034, SDR 35, with elastomeric gasket joints. Gaskets: ASTM F 477, elastomeric seal.
B. Clean-outs: Provide PVC SDR 35 pipe and fittings for cleanout, with round cast-iron access frame and heavy-duty, secured, scoriated cast-iron cover.
D. Cleanout Frames and Covers: Syracuse Castings #4181 0130 with "Sewer" lettering on cover as is appropriate.
E. Manholes
Contractors shall furnish and install precast manholes as shown on the Contract Drawings. Work shall include precast concrete base, precast concrete walls, concrete benches and channels frames and covers, steps, and concrete collars as required to produce manhole.

Adequate foundation for all manhole structures shall be obtained by removal and replacement of unsuitable material with NYSDOT #3 crushed gravel material approved by the Engineer, as outlined in the specification for "Excavation Below Subgrade." Precast base section shall be placed on a 12" lift of #2 stone pipe bedding material.

Precast manholes shall be constructed in accordance to ANSI/ASTM C478-78a, Standard Specification for Precast Reinforced Concrete Manhole Sections. Cones and sections shall be free from fractures or deep cracks, and surface roughness. Engineer may reject sections of unsound quality, or sections with improperly aligned pipe connections.

Precast sections shall be placed and aligned to provide vertical sides and plumb alignment of ladder rungs. Complete manhole shall be rigid, true to dimensions, and watertight.

Lift holes and joints shall be filled with non-shrink grout. Joints between precast sections shall be sealed using butyl rubber. Joints on the inside of the manhole shall be mortared to provide a smooth and continuous surface.

Pipes shall enter manhole wall through a flexible connector system in accordance with ASTM Spec. C-923. The resilient connector shall be a "Z-Lok" product.

Benches shall be constructed of concrete flow channels shaped carefully to match inverts and pipe sizes. Flow channels for straight-through main line pipes shall be lined with PVC pipe cut at one-half diameter.

Tops of benches shall pitch toward flow channels.

Manhole frames and covers shall be gray iron casting ASTM A-48, Class 30B, heavy-duty, cast iron, 24-inch inside diameter by 7- to 9-inch riser with 4-inch minimum width flange, indented top design, with lettering "SANITARY SEWER" cast into cover, in accordance with the detailed Drawings. Frames shall be placed on a bed of cement mortar. Use Syracuse Castings No. 1041B or approved equal. Watertight Manhole Frame and Cover shall be Syracuse Casting No. 6545 or approved equal.

A drop manhole shall be constructed as shown on the Drawings consisting of removable polyvinyl chloride tee, drop pipe, and 90 degree elbow.

All four-inch and six-inch service laterals that enter a manhole shall be provided with a piped drop connection into a respectively sized flow channel.

Manhole steps shall be spaced 1' - 0" on center with a space between the top of the bench wall and the first step not to exceed 12". Manhole steps shall be located so as not to interfere with any drop piping. Manhole steps shall be constructed of steel reinforced copolymer polypropylene

PREPARATION OF FOUNDATION FOR BURIED SANITARY SEWERAGE SYSTEMS

- A. Grade trench bottom with specified Pipe Bedding Material to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped Pipe Bedding Material. Ensure continuous bearing of the pipe barrel on the foundation.
- C. Grade and place bedding material for all tanks, structures and traps as shown.

INSTALLATION, GENERAL

- A. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed. Use fittings for branch connections.
- B. Install piping pitched down in direction of flow, at no less than minimum slope for pipe size installed. C. Extend sanitary sewerage system piping to connect to building sanitary drains, of sizes and in locations indicated. Provide all necessary adapters, etc. required to satisfactorily complete the connections. Install 1-inch thick extruded polystyrene directly underground building drain piping not under building where the pipe depth is less than three (3) feet. Width of insulation shall extend minimum of 12 inches beyond each side of pipe.
- D. Join and install PVC pipe as follows: Pipe and gasketed fittings, joining with elastomeric seals in accordance with ASTM D 3212. Installation in accordance with ASTM D 2321. Join different types of pipe with standard manufactured couplings and fittings intended for that purpose.
- E. Install cleanouts and extension from sewer pipe to cleanout at grade as indicated. Set top of cleanout cover 1 inch above surrounding earth grade or flush with grade when installed in paving.

FIELD QUALITY CONTROL

- A. Testing: Perform testing of completed system in accordance with Town of Lansing requirements.
- B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of

uncompleted pipe at end of day or whenever work stops. Flush piping if required by local authority, to remove collected debris.

LANDSCAPING

GENERAL

- A. This Section includes provisions for the following items: trees, shrubs, plants, ground cover, lawns, soil amendments and initial maintenance of landscape materials.
- B. Excavation, filling, and rough grading required is specified in "Earthwork" Section.

QUALITY ASSURANCE, SUBMITTALS AND WARRANTY

A. Source Quality Control:

1. Do not make substitutions. If specified landscape material is not obtainable, provide written proposal for use of equivalent material. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized Laboratory.
2. Soil Amendments, Fertilizer, and Grass Seed - Submit manufacturers or vendor's certified analysis for compliance. For seed, state botanical and common name, and percentages of weight, purity, germination and weed seed for each species.
3. Trees, Shrubs and Plants - Provide trees, shrubs, and plants of quantity, size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock". Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement. Submit label data substantiating that plants, trees, shrubs and planting materials comply with specified requirements. Label at least one tree and one shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.
4. Inspection - The Owner may inspect trees and shrubs for compliance with requirements for genus, species, variety, size, quality, and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.
5. Maintenance Instructions: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year.

B. Delivery, Storage and Handling:

1. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

- C. Project Warranty: Warranty trees, shrubs and lawns for a period of one year after date of substantial completion, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner or abuse and damage by others. Remove and replace trees, shrubs, or other plants found to be dead or in unhealthy condition, and/or reseed lawns in unhealthy condition during warranty period. Make replacements during growth season following end of warranty period.

MATERIALS

- A. Topsoil: Stockpiled from the existing green areas for re-use in landscape work. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required. On-site or imported material shall be a fertile, friable, natural loam reasonably free of subsoil, clay lumps, brush, weeds, roots, stones larger than 2" and any other harmful matter.

B. Soil Amendments:

1. Peat Humus: Granular form, free of hard lumps and with suitable pH range.
 2. Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs, or plants and consisting of shredded hardwood, shredded bark or wood chips.
 3. Commercial Fertilizer: For trees, shrubs and planting beds - minimum 5 % total nitrogen, 10 % phosphoric acid and 10 % soluble potash. For lawns - percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4 percent phosphoric acid and 2 percent potassium. Provide nitrogen in a form that will be available to lawn during initial period of growth; at least 50 percent of nitrogen to be organic form.
- C. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as follows:
1. Seed Mix A: Kentucky Bluegrass (*Poa Pratensis L.*) - 25%, Creeping Red Fescue - 50%, Perennial Ryegrass (*Lolium Perenne L.*) -25%. PLS = 80% minimum. Weed seed/Inert matter = .15% maximum.
 2. Seed Mix B: Tall Fescue (*Festuca Arundinacea schreb.*) - 60%, Perennial Ryegrass (*Lolium Perenne L.*) - 15%, Birdsfoot trefoil (*Lotus corniculatus L.*) - 25%. PLS = 80% minimum. Weed seed/Inert matter = .15% maximum.
- D. Miscellaneous Landscape Materials:
1. Anti-Erosion Mulch: Provide clean, seed-free threshed straw of wheat, rye, oats, or barley.
 2. Anchoring Mulch: Wood cellulose fiber.
 3. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants.
 4. Lime: Ground dolomitic limestone with 95% passing an ASTM #100 mesh screen.
 5. Plastic Sheet: Black, weather-resistant polyethylene sheeting, 0.008 inch (8-mils) thick.
 6. Filtration/Separation Fabric: Water permeable filtration fabric of fiberglass or polypropylene fabric.

PREPARATION

- A. Lawns and Slopes: Loosen subgrade of areas. Remove stones measuring over 1-1/2 inches and sticks, roots and all rubbish, etc. Spread top soil to a depth of 6", add specified soil amendments (Lime to achieve Ph 6.0-6.5) and mix thoroughly. Fine grade lawn areas to smooth even surface and then roll, rake, and drag water thoroughly and allow surface moisture to dry before planting.
- B. Planting Beds:
1. Loosen subgrade of planting bed areas to a minimum depth of 6 inches using a culti-mulcher or similar equipment. Remove stones measuring over 1 1/2 inches in any dimension, sticks, stones, rubbish, and other extraneous matter. Spread planting soil mixture to minimum depth required to meet lines, grades, and elevations shown, after light rolling and natural settlement. Place approximately 1/2 of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer, then place remainder of the planting soil.

INSTALLATION, MAINTENANCE AND ACCEPTANCE

- A. Planting Trees and Shrubs:
1. Set B&B stock on layer of compacted soil, plumb and in center of pit. Remove burlap from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly. Water again after placing final layer of backfill.
 2. Dish top of backfill to allow for mulching. Mulch pits, trenches, and planted areas and work into top of backfill and finish level with adjacent finish grades. Provide 4 inches thickness of mulch.

3. Apply anti-desiccant, using power spray, to provide an adequate film over trunks, branches, stems, twigs and foliage. If deciduous trees or shrubs are moved when in full-leaf, spray with anti-desiccant at nursery before moving and spray again 2 weeks after planting.
 4. Prune, thin out, and shape trees and shrubs to retain natural character in accordance with standard horticultural practice.
 5. Wrap tree trunks of 2 inches caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunks for injury, improper pruning and insect infestation and take corrective measures before wrapping.
- B. Seeding New Lawns and Slopes: All lawns and slopes shall be hydroseeded. Apply at following rates: Seed Mix A - Kentucky Bluegrass (1 lb/1000 S.F.), Creeping Red Fescue (2 lbs/1000 S.F.), Perennial Ryegrass (1 lb/1000 S.F.). Seed Mix B - Tall Fescue (20 lbs/Ac.), Perennial Ryegrass (5 lbs/Ac.) Birdsfoot Trefoil (8 lbs/Ac.). Mix specified seed, fertilizer, (700 lbs/Ac.) and pulverized mulch (2 Tons/Ac.) in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into a homogenous slurry suitable for hydraulic application. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate. The Contractor, at his option, may delete the mulch from the hydroseed slurry (for the lawn areas only) and apply a 1 1/2" blanket of Anti-Erosion Mulch immediately after hydroseeding is applied. All side slope areas (2:1) must receive the anchoring mulch immediately following initial seeding and mulching at a rate of 750 lbs/Ac.
- C. Planting Ground Cover: Dig holes large enough to allow for spreading of roots. Leave a slight saucer indentation around plants to hold water and water thoroughly after planting. Mulch areas between ground cover plants with mulch not less than 2 inches thick.
- D. Maintenance and Acceptance:
1. All lawn areas shall be watered and maintained until a healthy, dense, mowable stand of grass is established. Turn over to Owner after mowing.
 2. All plant materials (except grass) shall be maintained in such a manner as to ensure their survival for at least one year after substantial completion of the project or installation of the plant materials, whichever is later. The Contractor shall bear all costs to replace any unhealthy plants and repair surrounding grass or mulch areas during the first full year.

LANDSCAPE SCHEDULE

1. Topsoil and seed all unpaved areas; follow all directives, procedures, and sequencing outlined in the SWPPP documents prepared and approved for this project.

Uncultivated Areas And/Or Non-Lawn Areas

These areas shall be identified by the absence of lawn turf, the predominance of weed (non-grass) plant growth and the presence of a ground texture too uneven and rough to be mowed with a finishing type mower.

The surface of uncultivated areas shall be graded evenly to original elevation and surface texture. All large stones, boulders, and debris shall be removed. A 2" lift of Type B topsoil shall be placed. This topsoil shall be screened to the following special gradation;

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
2-inch	100

1-inch	85 - 100
¼-inch	65 - 100
No. 200 mesh	20 - 80

Otherwise the Type B topsoil shall meet all the requirements specified for the Type A topsoil as outlined in the Technical Specification "Landscape Development Materials". Finished surface shall be seeded at a rate of Two (2) pounds per 1000 SF of pure live perennial grass seed of the following composition:

- 50% Pennlawn Red Fescue
- 25% Kentucky Blue Grass
- 25% Perennial Rye Grass

Topsoil shall be mulched with a continuous cover of hay, .

APPENDIX A

TOWN OF LANSING ROAD SPECIFICATIONS

TOWN OF LANSING
SPECIFICATIONS FOR TOWN HIGHWAYS

August 10, 2015

DESIGN SPECIFICATIONS

General: Any variation of, or deviation from, these minimum Specifications must be approved by the Town Board and Town Highway Superintendent in writing prior to taking any action.

1. Road right-of-way shall be a minimum of 60 feet in level terrain. The radius for intersecting right-of-ways shall be 25 feet. Additional right-of-way may be required where deep cuts and fills exist or adjacent to drainage structures.
2. Total roadway width shall be a minimum of 32 feet. Total driving lane width shall be 20 feet centered within the R.O.W. and shoulder width shall be 6 feet. Refer to Typical and Alternative Roadway Cross-Sections attached. (Detail 1 and 2)
3. Geometric design features should be consistent with a minimum design speed of 30 mph.
4. Stopping sight distance shall be at least 300 feet (back from the intersection).
5. The minimum radius for horizontal and vertical curves shall be 150 feet and 100 feet, respectively. The minimum radius for intersecting edges of shoulder and driving lane shall be 40 feet.
6. All design plans submitted for review shall be at a minimum scale of 1" = 50'.
7. Town Highway Superintendent or Town Engineer may request a roadside clear zone analysis to determine if guide rail is necessary where one on three slopes along roadways is not practical or obstructions within the right-of-way are of a safety concern. Box Beam Guide rail shall be used where required in accordance with the NYSDOT Guiderail Standards.
8. The design storm frequencies for different drainageways have been outlined below in Table 1. The objective of the design storm is to design a culvert crossing, storm sewer or roadside drainage ditch to adequately to pass most rainfall events, yet allow flooding to occur during heavy rainfall events. All design storms are based on a 24-hour duration storm event.

Table 1.

DRAINAGEWAY	RECURRENCE INTERVAL (YEARS)
Perennial Streams (Existing Watercourse Channels)	50 ^{a,f}
Road Cross Culvert	25 ^b
Roadside Ditch	25 ^{c,f}
Driveway Cross Culvert	25 ^d
Storm Sewer with Drain Inlets	5 ^e

- a. Relocated natural channel should have the same flow characteristics (geometrics and slope) as the existing channel and should be provided with a lining having roughness characteristics similar to the existing channel.
 - b. Detail analysis must be provided to safely show the overflow conveyance of the 100 year design storm.
 - c. Unless hydraulic calculations indicate otherwise, all ditches shall be designed to the minimum dimension shown on Detail 1 and have a minimum grade of 0.5%.
 - d. Unless hydraulic calculations indicate otherwise, the minimum culvert diameter is 15 inches.
 - e. Unless hydraulic calculations indicate otherwise, the storm sewer systems shall have a minimum size of 15” and a minimum slope of 0.5%. Use a 25-year design storm at the following locations where no overflow relief is available:
 1. Sag vertical curves connection negative and positive grades.
 2. Other locations such as depressed roadways, etc.
 - f. Based upon hydraulic and hydrologic calculations, dry rip rap, of the weight and diameter required, shall be designed in all drainageways with grades exceeding 5 percent and shall extend up the slopes of the drainageway to the height of the 10 year rainfall event.
9. Perforated underdrain pipe, wrapped in geotextile fabric, may be required by the Highway Superintendent for low wet areas, where side hill seepage is encountered or in any other area where groundwater will impair the integrity of the roadway.
10. Dead-end road designs will terminate with tee turn-around designed in accordance with Detail 3.
11. In rock cut sections, the backslope beyond the right-of-way shall be a minimum of 1:1.

MATERIAL SPECIFICATIONS

CULVERT MATERIAL –Provide either reinforced concrete pipe (RCP) or high-density polyethylene (HDPE) double walled with smooth interior. Aluminized steel corrugated pipe may be used with the approval of the Highway Superintendent for driveway crossing ditch lines if there is insufficient cover for HDPE pipe or limited availability of manufactured sizes (e.g. arch pipes or box culverts).

GEOTEXTILE FABRIC – Provide a woven or nonwoven fabric consisting of continuous chain polymeric filaments or yarns of polyester; similar to Mirafi 500X and subject to the acceptance of the Highway Superintendent with the following certifiable property values:

Property	Minimum Value	Test Method
Puncture Strength	90 lbs.	ASTM D 6241
Mullen Burst Strength	400 psi	ASTM D 3786
Grab Tensile Strength	200 lbs.	ASTM D 4632
Equivalent Opening Size (sieve)	40	US Std. Sieve

SUBBASE COURSE MATERIAL – Provide an evenly graded bank-run gravel which is sound, durable, free of other deleterious materials and free of boulders in excess of 3 inches along the longest dimension with no more than 8 percent by weight finer than the No. 200 sieve.

BASE COURSE MATERIAL – Provide a naturally or artificially graded crusher-run stone, which is sound, durable and free of organic and other deleterious material. Material shall have a Plasticity Index of 5 or less for material passing No. 40 sieve, shall have less than 20 percent loss based on the NYSDOT Magnesium Sulfate Soundness Test (STM II) and gradation conforming to the following limits:

<u>Percent Passing by Weight</u>	<u>Sieve Size</u>
100	2”
30-65	1/4”
5-40	No. 40
0-8	No. 200

PRIME COAT – Provide a slow setting asphalt emulsion meeting the requirements specified for NYSDOT Material Designation 702-3501 or 702-3601.

BITUMINOUS MATERIALS – Provide the following bituminous materials, subject to the acceptance of the Highway Superintendent, for pavement and conforming to the latest edition of NYSDOT Standard Specifications, Section 402:

- 702-90 -Tack Coat
- 702-0700 Miscellaneous Asphalt Cements- Bituminous Joint and Crack Filler
- Type 3 Binder Course
- Type 7 Top Course

Submit to Highway Superintendent certifications from supplier for all bituminous materials.

Provide Superpave mix design system with performance grade binder PG 64-22.

Provide coarse aggregate sizes as specified. Aggregate shall be crushed limestone or dolomite that have an acid insoluble content of not less than 10%. Coarse aggregate shall not contain more than 5% chert and no more than 1.0% dust.

CONSTRUCTION SPECIFICATIONS

ROADWAY EXCAVATION

1. Excavate subsoil to the depth required to provide a uniform surface of solid and undisturbed ground for the placement of aggregate subbase course.
2. Excavate ditches, if applicable, to the minimum depth shown below the centerline finish grade elevation.

3. Where the bottom of the roadway excavation is found to be unstable or to include deleterious material, which in the judgment of the Highway Superintendent should be removed, excavate and remove and backfill the over-excavation with compacted bank-run gravel.
4. Compact the subgrade to or above 95 percent 'Modified Proctor' density with a smooth drum roller, or other sufficient compaction equipment, weighing at least 7 tons. Operate compactor in the static mode for compaction of silty soils and in the vibratory mode for soils containing larger fractions of sand and gravel.
5. Slope the subgrade as shown on Detail 1. Proof roll the final subgrade to provide drainage of groundwater and surface water to ditches.
6. Install underdrains wherever groundwater seepage is encountered or in low, wet areas.

ROADWAY EMBANKMENT

1. Obtain subgrade elevation by compacting on-site soils in maximum 8 inch horizontal lifts. Use on-site soils as embankment fill that do not contain organic or deleterious materials, excessively wet or frozen, or cobbles in excess of 6 inches along the longest dimension.
2. If on-site soils are unsuitable or not available, a well-graded bank-run gravel shall be imported. Bank-run gravel shall be approved by the Highway Superintendent subject to a sieve analysis from the source of supply. Bank-run gravel shall be sound, durable, free of organic or other deleterious material with no more than 10 percent by weight finer than the No. 200 sieve.
3. Adjust the moisture content of embankment fill to within 2 percent of optimum by either air drying or addition of water prior to compaction. Spread wet fill in an 8 inch loose lift and disc to expedite air drying.
4. Compact the subgrade to or above 95 percent 'Modified Proctor' density with a smooth drum roller, or other sufficient compaction equipment, weighing at least 7 tons. Operate compactor in the static mode for compaction of silty soils and in the vibratory mode for soils containing larger fractions of sand and gravel.
5. Slope the subgrade as shown on Detail 1. Proof roll the final subgrade to avoid ponding of surface water.

ROADWAY SUBBASE COURSE

1. Prior to placing the geotextile fabric and aggregate subbase course, verify that the Highway Superintendent has observed proof rolling of the subgrade. Proof rolling shall be accomplished with a smooth drum roller weighing at least 7 tons and operating in the vibratory mode. Alternatively a loaded 10-wheel dump truck can be used as directed by

the Highway Superintendent. Any settlement or movement of the subgrade ahead of or under the roller/dump truck that indicates a potential soft area will require removal and replacement with suitable compacted well-graded bank-run gravel as outlined previously.

2. Place the geotextile fabric across the width of the roadway and lap in accordance with manufacturer's instructions. Remove any rocks or debris from subgrade surface that could puncture the fabric.
3. Lap underdrain fabric with subgrade fabric where subdrains are indicated to be installed.
4. Place subbase course material in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compaction. When a compacted subbase course is indicated to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.
5. Compact subbase course to 95 percent 'Modified Proctor' maximum density.
6. Slope the subbase as shown on Detail 1 and 2. Proof roll the final subbase to provide drainage of surface water to ditches.

ROADWAY BASE COURSE

1. Prior to placing the aggregate base course, verify that the Highway Superintendent has observed proof rolling of the subbase course. Proof rolling shall be conducted in the same manner as for the subgrade.
2. Place base course material in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compaction. When a compacted subbase course is indicated to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches thickness when compacted.
3. Provide a compacted base course at 95 percent maximum dry density.
4. Slope the base as shown on Detail 1 and 2. Proof rolling the final base to provide drainage of surface water to ditches or drainage system.

ROADWAY PAVEMENT

1. Prior to applying hot-mix asphalt concrete, verify that the Highway Superintendent has observed proof rolling of the base course. Proof rolling shall be conducted in the same manner as for the subgrade. The surface shall be free from voids, settlement, or irregularities to provide a reasonably smooth and uniform surface to receive the hot mix asphalt. Unstable corrugated areas shall be removed and replaced. Areas requiring replacing, patching or shaping in excess of one inch in thickness shall be constructed with

- base materials. Manhole covers, valve boxes and any other structures with the roadway shall be adjusted to the proper grade to meet the crown and slope for the finished pavement.
2. Apply tack coat to contact surfaces of previously constructed asphalt and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.03 to 0.07 gallons per square yard of surface. Allow to dry until at proper conditions to receive paving. Manhole covers, drop inlets, catch basins, curb and any other structure within the roadway area shall be protected against the application of bituminous material.
 3. The asphalt shall be applied in two (2) courses consisting of Type 3 binder course and type 7 top course at the compacted thickness as indicated on Detail 1 and 2. Top course shall be applied immediately after the base course during one paving operation. Base course should not be left exposed for any extended period of time.
 4. Bituminous material shall not be applied on a wet surface, when the ambient temperature is below 50 degrees F in the shade or greater than 95 degrees F or when weather conditions would prevent the proper construction of the surface treatment.
 5. The following equipment shall be required: a self-propelled asphalt spreader, a tandem vibratory roller weighing at least 8 tons and shall be capable of maintaining set frequency and amplitude, all of which shall conform to NYSDOT specifications.
 6. Pavement density shall be monitored with either a nuclear gauge or measured by the number of roller passes in conformance to NYSDOT specifications.
 7. Saw-cut existing pavements in straight lines and tack coat the edge where connecting to existing pavements. Provide minimum of a 2 feet wide mill and "T" patch at joint. Mill existing asphalt to a minimum depth of 2 inches.
 8. Hot-mix asphalt material shall be applied by means of a self-propelled asphalt spreader to the compacted thickness shown on the plan and on the typical details.

DRAINAGE

1. Culverts shall be placed in natural waterways and low points in the roadway grade. Where culverts cross the roadway, the top of culvert should not extend above the elevation of the roadway subgrade.
2. Install culverts beginning at the low point of the drainage system, true to grades and alignment with unbroken continuity of the invert. Join and install pipe and couplings in accordance with manufacturer's instructions.
3. All culverts, including driveway culverts, shall be installed with galvanized flared end sections (FES) at the inlet and outlet. Where FES are not practical, other materials or techniques may be submitted for approval by the Highway Superintendent.

4. Driveways shall be graded so that runoff from the driveways will not sheet across the road surface. See Detail 4 for typical driveway culvert installation.
5. Provide temporary soil erosion control devices in accordance with standards of the New York "Guidelines for Urban Erosion and Sediment Control." Remove any silt or debris periodically from drainageways to avoid a backup of storm water. Maintain devices until drainageways are firmly established with vegetation or lined.

TOPSOILING AND SEEDING

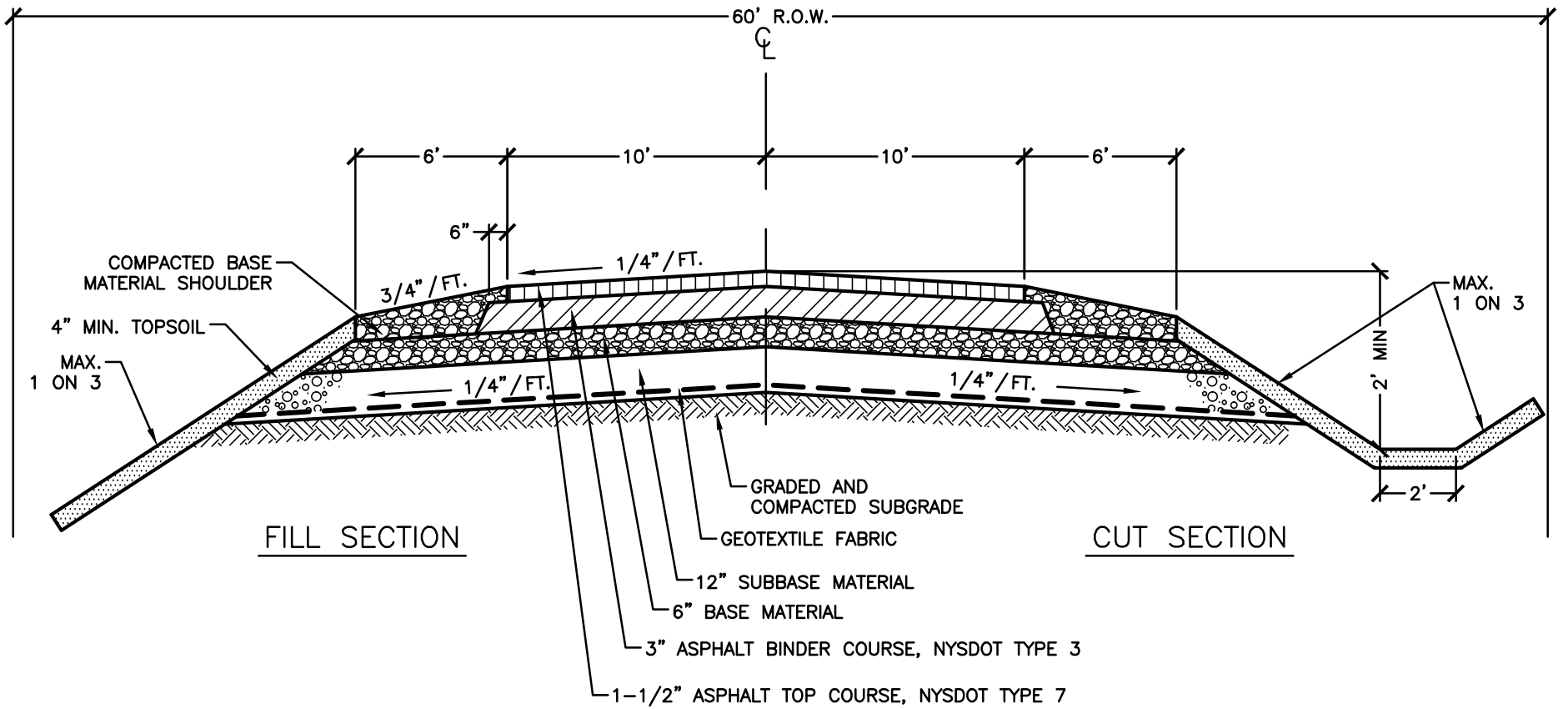
1. All disturbed natural areas within the road right-of-way or proposed drainage easements shall be restored with a minimum 4 inches of topsoil and reseeded with a grass mixture compatible with the surrounding environment.
2. For late fall construction and prior to winter, seed rough graded areas with a temporary conservation mix of winter rye, winter wheat and annual ryegrass.

QUALITY ASSURANCE

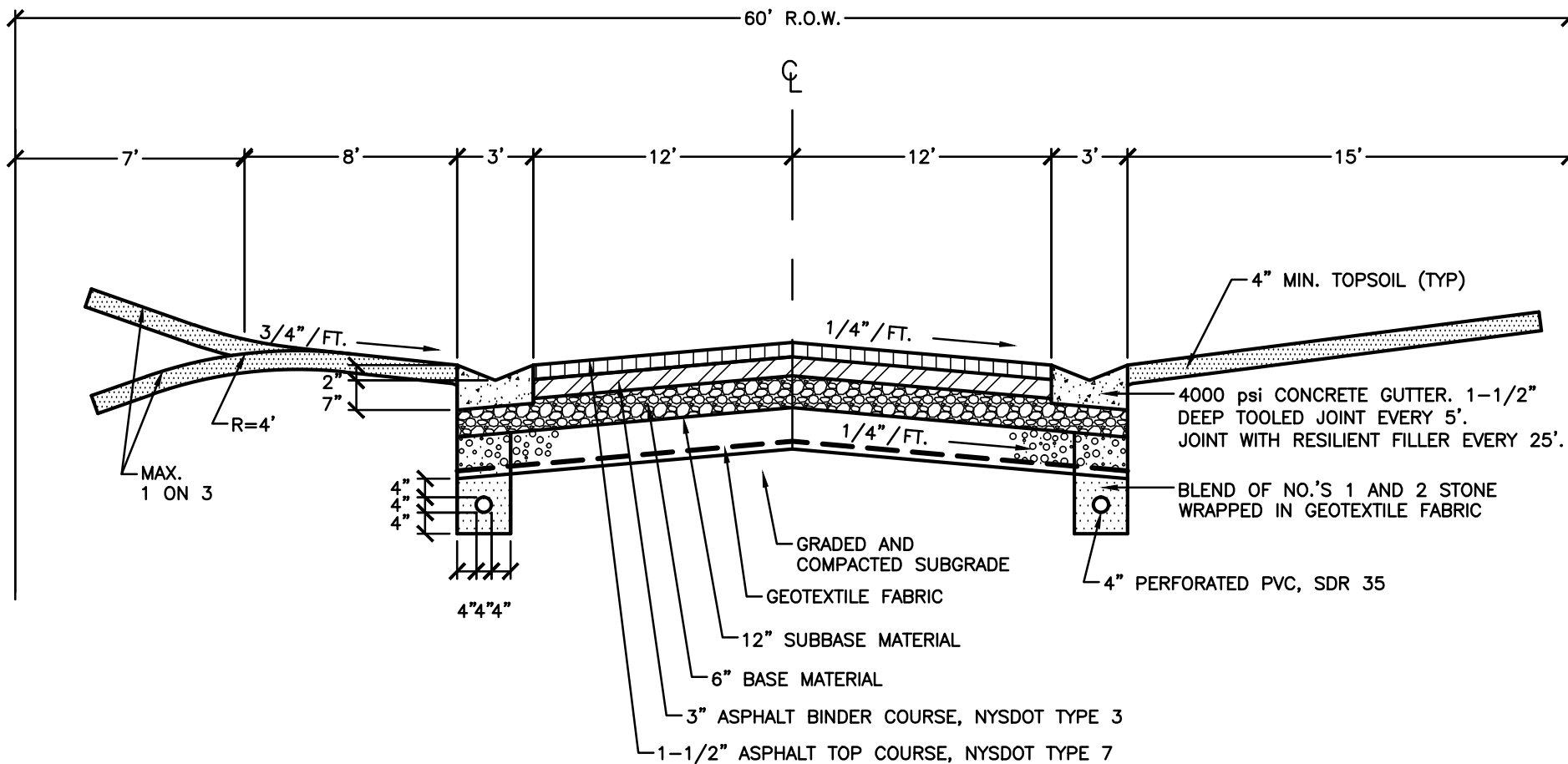
1. Materials Source for Roadway Subbase Course: Submit name and address of imported aggregate materials suppliers. Provide materials from the same source throughout the construction. Change of source requires approval by the Highway Superintendent. Submit test reports directly to the Highway Superintendent. Analysis of aggregate materials performed in accordance with ASTM C136 and within past three months along with a Standard Proctor compaction test.
2. Schedule inspections of the road construction in accordance with Exhibit A. Notify the Highway Superintendent a minimum of 24 hours in advance of each inspection. Such inspection by the Town Highway Superintendent, or designated representative, does not obligate the Town to accept the road upon offering for dedication nor relieves the builder and/or Developer from complying with the requirements of these specifications.
3. All road right-of-ways, easements, and above and below grade improvements therein shall be guaranteed against defects and poor workmanship for a period of two years from the time of acceptance by the Town.
4. Prior to acceptance by the Town, the Developer shall deliver to the Town a complete release of all liens arising out of the construction of the dedicated improvements, or receipts in full in lieu thereof, and if required in either case, an affidavit that so far as the Developer has personal knowledge or information, the releases and receipts include all labor and materials for which a lien could be filed.

TOP COURSE: Inspection by: _____ Date _____
 Location: _____
 Section: _____
 Weather (conditions): _____
 Notes: _____

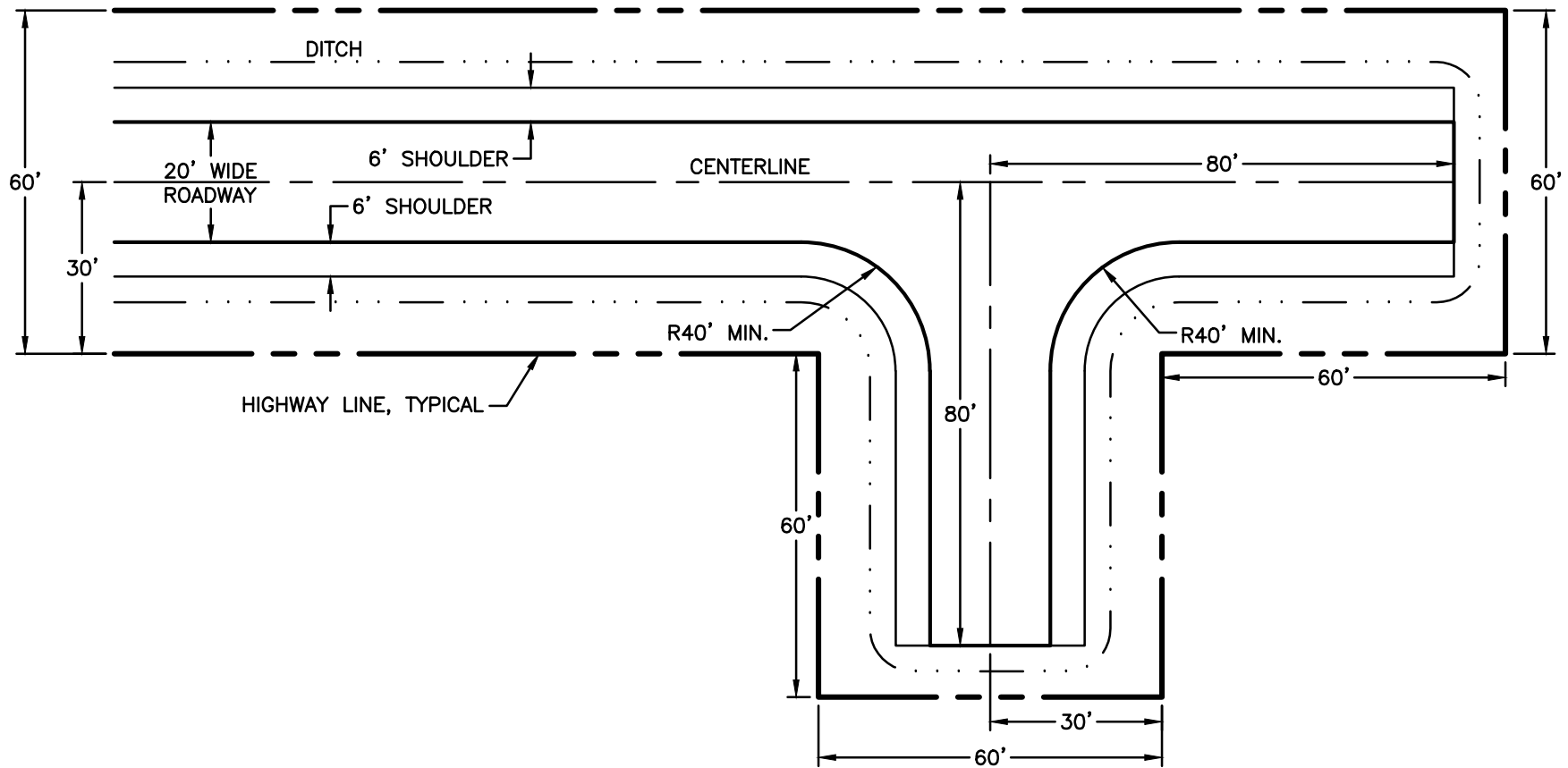
RECOMMENDED APPROVAL: _____ Date _____
 HIGHWAY SUPERINTENDENT



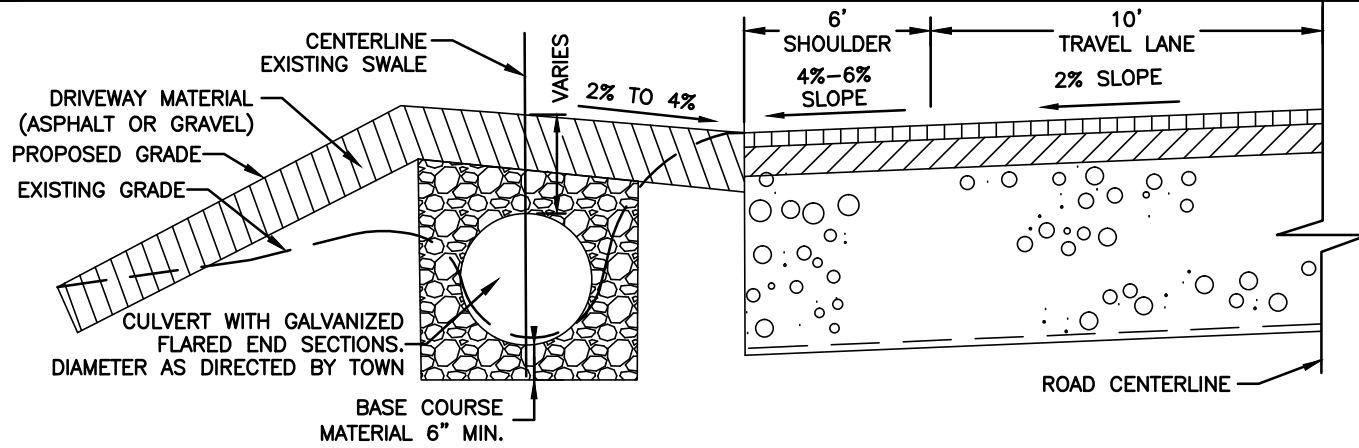
① TYPICAL ROADWAY CROSS-SECTION
NOT TO SCALE



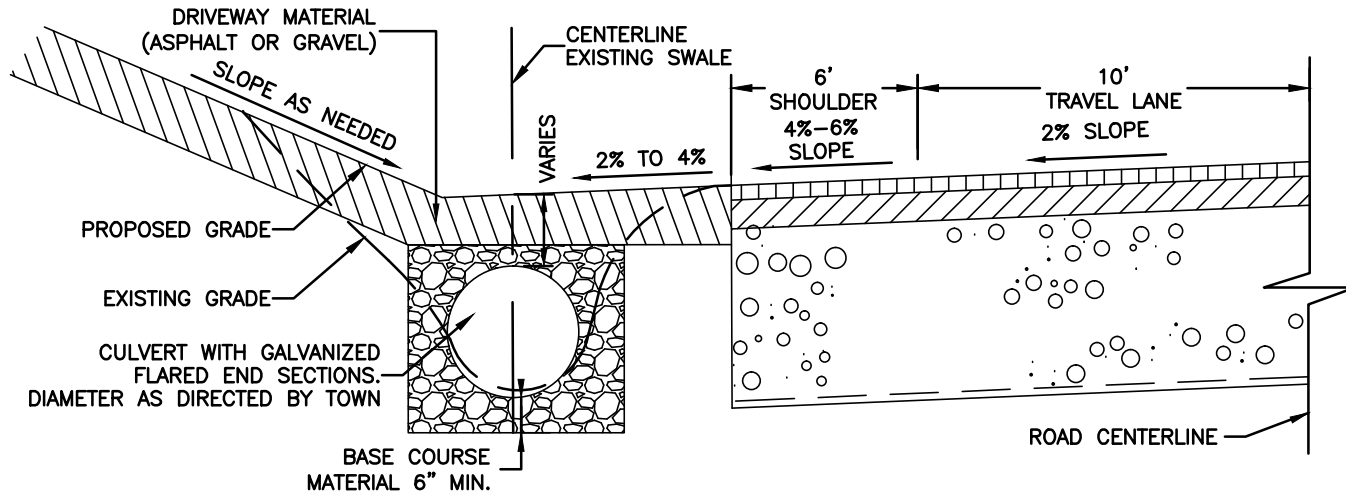
② ALTERNATIVE ROADWAY CROSS-SECTION
NOT TO SCALE



③ TYPICAL TURN-AROUND
NOT TO SCALE



DRIVEWAY SLOPING AWAY FROM HIGHWAY



DRIVEWAY SLOPING TOWARDS HIGHWAY

4

TYPICAL DRIVEWAY CULVERT
NOT TO SCALE

APPENDIX B

**SCLIWC - BOLTON POINT WATER SYSTEM FIELD WORK
GUIDE (PARTIAL LISTING); WATER SYSTEM DETAILS
AS-BUILT MAPPING REQUIREMENTS**

The Southern Cayuga Lake Intermunicipal Water Commission

Bolton Point Water System



*TOWNS OF DRYDEN, ITHACA, LANSING
VILLAGE OF CAYUGA HEIGHTS
VILLAGE OF LANSING*

*1402 East Shore Drive
Ithaca, NY 14850*

FIELD WORK GUIDE

March 27, 2005

FIELD WORK GUIDE**March 27, 2003****TABLE OF CONTENTS**

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SOUTHERN CAYUGA LAKE INTERMUNICIPAL WATER COMMISSION (SCLIWC)

1402 East Shore Drive
Ithaca, New York 14850
Phone: (607) 277-0660

Serving the
Bolton Point Municipal Water System

FIELD WORK GUIDE**GENERAL INFORMATION**

This information is intended to assist contractors and property owners in meeting state and local codes. This summary is not all-inclusive nor does it replace existing codes. This summary addresses areas where deficiencies are frequently noted or about which questions are frequently asked. It is recommended that you contact our office with any proposed changes or questions that you have. This document does not necessarily reflect recent changes in these codes. The owner of a property is the permit holder and is responsible for meeting the minimum requirements of all applicable codes and regulations.

You must have the following information to obtain a plumbing, water connection, or sewer connection permit:

- 1) Property address (not lot number)
- 2) Owner's name
- 3) Owner's mailing address
- 4) Owner's daytime phone number
- 5) Plumber's name
- 6) Plumber's daytime phone number

You must have plans of the work you intend to perform. Plumbing proposed according to the New York State Building Code shall be shown in isometric form on 8 ½ x 11-inch paper(s). A site plan on 8 ½ x 11-inch paper must show street, building, driveway and intended route of water and/or sewer laterals, and anticipated lengths of those lines. These plans may be hand-drawn.

Taps and inspections require a minimum of one working day's notice and may require two working days' notice. Taps on Town of Ithaca water and sewer mains must have prior approval from the Town Engineering Department.

No piping of any kind may be covered until it has been inspected and approved.

OFFICE HOURS ARE 8:00 A.M. TO 4:00 P.M., MONDAY THROUGH FRIDAY (except holidays) for issuing permits and scheduling inspections. Please arrive before 3:00 p.m. for permit applications.

GENERAL INFORMATION (continued)

Piping tests should be established before the inspector arrives. Acceptable tests for piping are:

- 1) All Water Piping: existing main pressure or 100 psi air pressure with a gauge.
- 2) Building Drain, Waste, and Vent (DWV) Systems: 10-foot head of water or 5 psi air pressure with a gauge (provide Bolton Point personnel advance notice of an air test).
- 3) Sewer Laterals: 4-foot head of water.

The required minimum depths of water and sewer laterals shall be observable at the time of inspections. Future plans to increase inadequate cover will not be considered for approval at the time of inspection.

Any unsatisfactory inspection may result in the water service being discontinued. Only Bolton Point personnel may restore service after a satisfactory re-inspection has been made.

Review Boards that deal with differences in code interpretations and requests for code variances exist at the State level only. The Commission and the municipal building departments can help with these procedures.

References and Related Documents:

Residential Code of New York State (denoted with prefix RC-)¹
Plumbing Code of New York State (denoted with PC-)²
*SCLIWC Rules & Regulations (R+R)
*Local Law for Cross Connection Control
*NYS Cross Connection Control Guide
AWWA Standards
NYS Sanitary Code, Part 5 (Drinking Water Supplies)
Village of Cayuga Heights Sewer Ordinance
Town of Ithaca Sewer Ordinance

1. Applies to one-and two-family dwellings and multiple dwellings not exceeding three stories in height.
2. Applies to all other occupancies.

*Copies of these documents are available on request from our Customer Service office. Other reference documents are available for review only.

WATER SERVICE CONNECTIONS AND WATER SERVICE LINES

INSTALLATION

The service line must be laid with bedding and backfill materials no greater than 2 inches in diameter for 6 inches in all directions from the tubing. All points of the service line must be no less than 54 inches below existing grade at the time of inspection. This means the initial trench may have to be deeper to accommodate the minimum of 6 inches of bedding. Trench depth may also need to be increased when there is a vertical separation requirement between water and sewer lines.

The water service line must be a minimum of 5 feet horizontally apart from any sewer line, and a minimum of 3 feet from any other parallel utility.

When crossing any metal piping closer than 3 feet, the water line must be covered with a protective sleeve or sheet.

The curb stop and box must be placed as close to the front property line as practical and out of the driveway and ditch line. The water service should take the shortest possible route.

Where copper tubing passes through concrete or masonry structures, it must be covered with a protective sleeve. The sleeve should extend a minimum of 12 inches into surrounding soil. The sleeve diameter must be at least two standard pipe sizes larger than the copper tubing.

An acceptable and accessible meter setting must be provided. The first inside valve shall be a meter stop immediately before the meter. Another valve must be provided immediately after the meter or pressure regulator. A household pressure regulator is required. The meter must be approachable by a standing person. Meters shall not be concealed behind wall panels, etc. unless accessible through a hinged, sliding, or easily removable panel. NOTE: Under stair locations are usually not acceptable. Stairs or ladders used to access the meter must be sturdy and safe. Meters must be installed horizontally 2 to 4 feet above the floor. All pit installations shall be free of standing water, accessible from ground level by Commission personnel, frost-proof, and vandal-proof. (See SCLIWC RESIDENTIAL WATER METER PIT GUIDELINES AND REQUIREMENTS, pages 8-10.)

In most cases, type K copper tubing and bronze fittings are required on outside water services. In some instances, non-standard materials, such as polyethylene (PE), may be permitted. These non-standard materials will always be downstream of a meter.

WATER SERVICE CONNECTIONS AND WATER SERVICE LINES (continued)

SCLIWC advises strongly against the use of PE or other non-standard materials and fittings in the water service line because of failures observed in the past. If the owner decides to use PE or other non-standard materials or fittings, extra care must be taken in bedding, compacting, and backfilling to achieve good performance. Non-metallic lines should be provided with tracer wires for locating purposes. All underground fittings must be bronze compression unless otherwise approved.

MATERIALS

- 1) Piping: Must be soft temper, type “K” copper of a size to be determined by Bolton Point for each installation. In the Town of Ithaca, minimum size is 1 inch. A minimum size of ¾-inch applies in other municipalities, but the Commission recommends a minimum of 1 inch.
- 2) Fittings: Compression or iron pipe thread joints are to be installed before the meter and in any underground locations. “Stop and waste” curb valves are prohibited. No solder joints are permitted ahead of the meter or in any part of the service line or service connection.
- 3) Curb Box: Must be “Buffalo” style, cast iron, 2 ½ inch, size 94-F. It must be equipped with a rod and centering ring for the rod. The rod must be attached to the curb valve with a brass or copper pin only. The top and bottom sections and any extensions must engage each other by a minimum of 2 full threads when top is at grade (see illustration below).



WATER SERVICE CONNECTIONS AND WATER SERVICE LINES (continued)

OUTSIDE WATER INSPECTION CHECKLIST

1) TESTS:

- a. _____ Existing water pressure or 100 psi air (R+R III 4.h.)
- b. _____ All piping must be visible.
- c. _____ Must be flushed for 2 minutes for each 100 feet of pipe or portion thereof.

2) MATERIALS:

- a. _____ Piping must be of type K, soft temper copper (see Permit Application for size).
- b. _____ Joints must be compression or iron pipe thread; no solder (R+R III 4.g.).
- c. _____ Curb Valve: Stop and waste is **NOT PERMITTED** (RC-P2903.9.1; R+R III 4.a. and 4.h.; PC-608.7).
- d. _____ Meter valve must be non-flow restricting.
- e. _____ Curb box must be Buffalo style, marked "water", with rod and centering ring.

3) DEPTH:

- a. _____ Depth of top of pipe must be 4 feet, 6 inches from existing ground level to top of pipe, observable at the time of inspection
- b. _____ Curb box lid must be at or above grade.

4) PROTECTION:

- a. _____ See bedding and masonry diagram on page 22, TYPICAL RESIDENTIAL WATER SERVICE.

5) DEGREE OF COMPLETION:

- a. _____ Must be complete from water main to meter valve.

SCLIWC RESIDENTIAL WATER METER PIT GUIDELINES AND REQUIREMENTS

Residential meters should be installed within the building whenever possible. Interior locations usually provide better accessibility, security, and protection against freezing and flooding than do exterior locations. Occasionally, a property owner may want to install the meter in a meter pit outside of the building. The Commission will consider such requests on a case-by-case basis. Common reasons for installing the meter in an outside pit include lack of a suitable space within the building, desire to use a non-standard piping material between the meter and the building, and the need to meter water serving multiple buildings on one property.

If a property owner installs a meter pit, it is the owner's responsibility to assure that all requirements of such installations are met and that the installation will provide adequate accessibility, security, and protection against freezing and flooding for the meter. The Commission generally performs one or two inspections during this phase of construction of water service lines. The Commission's inspection is not continuous, so it cannot guarantee that the installation will provide trouble-free service. The Commission's primary inspection objective is to assure that the installation will not impose a deleterious effect on the municipal water distribution system. The property owner has primary responsibility for ensuring that the construction or installation of a meter pit provides adequate accessibility, security, and protection from the elements. The Commission will require the property owner (or installer) to correct any deficiencies noted during inspections. The owner can and should point out any suspected deficiencies to the installer and ask that they correct them. In all cases, the property owner owns the meter pit and bears responsibility for required pit maintenance and repairs. The owner pays for meter repair or replacement due to an inadequate pit environment. The owner is responsible for all water registered on the meter, including consumption caused by leakage between the meter and the building.

Factors that must be considered during meter pit construction or installation include:

ACCESSIBILITY

The pit must be easily approachable without the need to stoop, crawl, or climb over obstacles. Plants or other landscaping features must not diminish pit accessibility. The pit opening must be large enough to allow easy removal and maintenance of the meter and associated equipment. The meter must be serviceable and removable without the need to enter the pit. The Commission will provide a remote reader on a steel post as part of the water connection permit cost. The property owner is responsible for providing quarterly meter readings to the Commission for billing purposes. The owner can use the remote reader for most of these readings; however, the owner should compare the readings of the meter and the remote reader at least once per year and notify the Commission of

SCLIWC RESIDENTIAL WATER METER PIT GUIDELINES AND REQUIREMENTS (continued)

any discrepancy. In cases when the readings on the meter and the remote reader differ, the meter reading is used. Longstanding discrepancies between the reading on the meter and the remote reader can lead to large water bills when the meter is finally read.

SECURITY

The meter pit must have an access port that is removable using pentagonal keys or other specialized tools that are not in the possession of the general public.

FREEZE PROTECTION

The meter pit must be installed in a location where water in the meter and piping will not freeze. Insulation may be used. Insulating materials must be effective even when they are wet or damp. Insulation must be readily removable and re-installable without losing insulating ability or damaging the meter. The pit must be installed at a depth where its lid is flush with grade, and where the pit bottom is a minimum of five feet below grade.

FLOOD PROTECTION

The meter pit must provide an environment where water will not collect. Even standing water that does not cover the meter may produce a damp environment that causes failure of the meter and/or the remote reader. This requirement may be met by using a waterproof enclosure or by installing a gravity drain from an enclosure that is not waterproof. Earth should be graded downward away from the pit lid in all directions such that rain and runoff water will not collect around or course over the pit lid.

OTHER CONSIDERATIONS

Meter pits may not be installed in roadways, road shoulders, or driveways. Pits must be capable of supporting the weight of pedestrians and lawn care equipment.

Pit lids should be made of iron to facilitate finding them with a metal detector if they are accidentally buried.

If non-metallic water lines are used downstream of the meter pit, a jacketed cable or wire should be laid with the water line so that water lines can later be found using electronic locating equipment.

SCLIWC RESIDENTIAL WATER METER PIT GUIDELINES AND REQUIREMENTS (continued)

As a service to the customer, the Commission makes available commercially manufactured meter pits that help assure the foregoing guidelines and requirements are met. When such pits are used, proper installation techniques are still essential to assure that the pit's capability of meeting these requirements is not compromised. Although these pits are available at the Commission's office, they are sold by the manufacturers' distributors. The Commission assumes no liability for defective pits. Customers are not required to use these pits and may purchase or construct any pit that meets the foregoing criteria.

Please call the Commission at 277-0660 with any questions concerning meter pits.

TOWN OF ITHACA INTERMUNICIPAL SEWER SYSTEM

SEWER LATERAL INSTALLATION SPECIFICATIONS

- 1) Lateral Pipe Materials: Lateral pipe shall be of one of the following materials:
 - a. Tar-coated, service grade, cast iron soil pipe conforming to ASTM specification A-74, "Cast Iron Pipe and Fitting." All dimensions, weight and markings of the pipe shall conform to the requirements of ANSI, Designation A112.51, except spigot ends shall be "plain end" if gasket joints are used, OR
 - b. Polyvinyl chloride (PVC) pipe and fittings conforming to ASTM specification D-3034, "SDR-35 Polyvinyl Chloride (PVC) Sewer Pipe Fittings." Pipe shall have integral bell ends. Joints shall be of the bell and spigot type with rubber gaskets.
- 2) Joints: All joints and connections shall be made water-tight as determined by water ex-filtration test, minimum four feet head, upstream of property line clean-out. Joints for either cast iron or PVC pipe shall be of the push-on type using neoprene rubber gaskets and gasket lubricant furnished by the pipe manufacturer. Assembly shall be made by inserting the spigot end of the pipe to the full depth of the bell following the manufacturer's recommended procedures. Bell and spigot ends of pipe shall be kept completely clean and free from debris when assembling joint.
- 3) Pipe Bedding: See TYPICAL SEWER LATERAL TRENCH SECTION, on page 25, for pipe bedding procedures.
- 4) Clean-Outs: Clean-outs shall be installed at the end of the existing lateral in the area of the property line and every 75 feet thereafter. Clean-outs shall also be installed at every break in the grade and horizontal alignment of the lateral, and at the outside of the trap as close to the basement wall as possible. Refer to drawing on Page 23, for placement and construction of clean-outs.
- 5) Sweeps (Long Radius Bends): With prior approval of the Town of Ithaca Engineering Department, sweeps not less than 3 feet in length or greater than 45 degrees in angle may be allowed.

TOWN OF ITHACA INTERMUNICIPAL SEWER SYSTEM (continued)

- 6) Traps: A trap shall be installed as close to the dwelling as possible, away from any windows. As shown in the drawing, a standpipe or clean-out on the street side and a standpipe with vent cap on the house side of the trap are required. The use of off-set vents requires prior approval of the Town of Ithaca Engineering Department. The purpose of house traps is to prevent sewer gas from entering the drain, waste, and vent system of a property.
- a. Traps are to be made of SDR 35 push-on joint or cast iron in accordance with the Town of Ithaca Engineering Department requirements.
 - b. Schedule 40 glued fittings can be used to fabricate house traps and clean outs; then use SDR-35 for all other piping.
 - c. If clean out risers are of PVC, use cast iron plugs. If risers are of cast iron, use bronze plugs.
- 7) Cover: The sewer lateral shall have a minimum of 4 feet, 6 inches of cover over the top of the pipe at all points unless otherwise approved by the Town of Ithaca Engineering Department.
- 8) Fittings: Fully jacketed (e.g., “clamp-all” style) stainless steel fittings must be used in any underground sewer laterals when connecting to existing piping. Unjacketed fittings (e.g., Fernco) will not be permitted.
- 9) Taps: “Y” type fittings must be used for taps on sewer mains. “T” type fittings are not permitted. Taps into Town of Ithaca sewer mains must have prior approval from the Town of Ithaca Engineering Department.

TOWN OF ITHACA INTERMUNICIPAL SEWER SYSTEM (continued)

OUTSIDE SEWER INSPECTION CHECKLIST1) TESTS:

- a. _____ Minimum 4 feet of water at all points

2) MATERIALS:

- a. _____ PVC pipe or cast iron pipe may be used for residential or commercial properties (see page 11, #1 Lateral Pipe Materials).
- b. _____ Push-on joints must be used (see page 11, #2 Joints).
- c. _____ Fittings must be fully jacketed (see page 12, #8 Fittings).

3) DESIGN (see pages 23-30):

- a. _____ Bedding (see page 26, TYPICAL SEWER LATERAL TRENCH SECTION).
- b. _____ Clean-Outs (see pages 23-25)
- c. _____ "Y" type fittings must be used for taps on sewer mains. "T" type fittings are not permitted.
- d. _____ Traps (see page 12, #6 Traps; page 23).

UNDER SLAB INSPECTION CHECKLIST

1) TESTS:

a. Drain, Waste, and Vent Systems:

1. _____ Minimum of a 10-foot head of water or 5 psi air with a gauge (RC-P2503.5.1; PC-312.2-3)

b. Distribution Piping:

1. _____ Existing water pressure or 50 psi air with a gauge, except that air tests shall not be applied to plastic systems (RC-P2503.6; PC-312.5)

c. Piping:

1. _____ All piping must be visible (RC-P2503.2; PC-312.1.2)

2) MATERIALS:

a. Drain, Waste, and Vent Systems:

1. _____ Must conform with RC-P3002.1; PC702.2.

b. Distribution Piping:

1. _____ Must conform with RC-P2904.5; PC-605.5. Protective sleeve or sheet must be used where piping passes through concrete slabs.

3) DESIGN:

a. Drain, Waste, and Vent Systems:

1. _____ Sizes must conform with RC-P3005.4 and RC-P3113; PC-710 and PC-916. Minimum is 2 inches in diameter.

b. Distribution Piping:

1. _____ Must be sized in accordance with RC-P2903.7 or PC-Chapter 6.

c. Vents:

1. _____ Provisions must be available to vent each trap in accordance with RC-P 3106-P3112 or PC-907-913 (individual, common, wet, stack, circuit or loop venting).
2. _____ Distance from trap to vent connection must be in accordance with RC-P 3105.1 or PC-906.1.

Continued

UNDER SLAB INSPECTION CHECKLIST (continued)

d. Fittings:

1. _____ No single or double sanitary tees are permitted in horizontal drain plumbing (except as connections for dry vents) (RC-Table P3005.1; PC Table 706.3).

4) DEGREE OF COMPLETION:

1. _____ The degree of completion must be to the exit point.

ROUGH INSPECTION CHECKLIST

1) TESTS :

a. Drain, Waste, and Vent Systems:

1. _____ Must be filled to overflow with water or tested with 5 psi air with gauge (RC-P2503.5.1; PC-312.2 or 312.3).
2. _____ Must include water closet flanges and glued traps that may be concealed (tubs, showers, etc.)
3. _____ Slip connection traps must be provided with access panel per (RC-P3003.3.7; PC405.8).

b. Distribution Piping:

1. _____ Water supply must be tested with existing water pressure or 50 psi air with gauge. Air tests shall not be applied to plastic systems including PEX (RC-P2503.6; PC312.5).

c. Piping:

1. _____ All piping must be visible (RC-P2503.2; PC-312.1.2).

2) MATERIALS:

a. Drain, Waste, and Vent Systems:

1. _____ Must conform with RC-P3002 or PC-702.1. Permissibility of materials varies with occupancy.

b. Distribution Piping:

1. _____ Must conform with RC-P2904.5; PC-605.5.

3) DESIGN:

a. Sizing:

1. _____ Drain, waste, and vent systems must conform to RCP3005.4 and P3113; or PC710 and 916.
2. _____ All vents through the roof must be at least 3 inches in diameter in accordance with RC-P3103.2 or PC904.2.
3. _____ Water supply lines should be sized in accordance with RC-P2903.7 or PC-Chapter 6.

Continued

ROUGH INSPECTION CHECKLIST (continued)

b. Vents:

1. _____ Each trap should be individually vented or vented in accordance with RC-P3106-P3112 or PC-907-913.:
 - a) Individual vent (RC-P3106; PC-907).
 - b) Common vent (RC-P3107; PC-908).
 - c) Wet vent (RC-P3108; PC-909).
 - d) Waste stack vent (RC-3109; PC-910).
 - e) Circuit venting (RC-P3110; PC-911).
 - f) Combination waste and vent system (RC-P3111) or Combination drain and vent system (PC-912).
 - g) Island fixture venting (RC-P3112 or PC-913).

c. Distance:

1. _____ The distance between vent connection and fixture trap must be in accordance with (RC-P3102.1) or [PC-906.1].
 - a) 1¼ inch trap = (5 feet) (3 ½ feet)
 - b) 1½ inch trap = (6 feet) (5 feet)
 - c) 2 inch trap = (8 feet) (6 feet)
 - d) 3 inch trap = (12 feet) (10 feet)
 - e) 4 inch trap = (16 feet) (12 feet)

d. Fittings:

1. _____ No single or double sanitary tees are permitted in horizontal drain piping (except as connections for dry vents) (RC-Table 3005.1; PC-Table 706.3).

4) DEGREE OF COMPLETION:

1. _____ All stacks must be through the roof. Building drains must be installed to the building exit point.

FINAL INSPECTION CHECKLIST

1) TESTS:

a. Drain, Waste, Vent, and Water Supply:

1. _____ Shall have no leaks (RC-P2503.5.2; PC-312.4)
2. _____ Hot and cold water must be available.

2) MATERIALS:

a. Distribution piping:

1. _____ Fixture supply risers must comply with RC-P2904.5 or PC-605.5.

(For EXISTING DWELLINGS connecting to public water, the following items are often found to need corrective action.)

3) FIXTURES AND APPLIANCES:

1. _____ All counter, floor or wall-mounted fixtures must be caulked where they meet counters, floors or walls in accordance with RC-P2705.1 or PC-405.5.
2. _____ Water heaters must be equipped with adequate temperature and pressure (T&P) relief valves. T&P discharge must be piped full size and terminated in a safe, trouble-free location in accordance with RC-P2903 or PC-504.

4) BACKFLOW CONTROL:

1. _____ Hose bibbs shall be equipped with vacuum breakers (RC-P2904.3.3; PC-608.15.4.2).
2. _____ Boiler systems plumbed directly to the potable water system must be isolated with at least a dual check valve with intermediate vent to atmosphere (Watts 9D or equivalent). Vent must be piped full size and terminated in a safe, trouble-free location (RC-P2902.4.1; PC608.16.2).
3. _____ Residential auxiliary supplies (e.g., well, cistern) require a physical separation from the public system or an appropriate back flow preventer, and require prior approval. Other occupancies having auxiliary supplies shall be equipped with a backflow preventer in accordance with NYS Sanitary Code Part 5.

Continued

FINAL INSPECTION CHECKLIST (CONTINUED)

5) APPURTENANCES:

1. _____ Curb box and clean-outs must be to grade, intact and visible.
2. _____ Curb valve must be easily accessible and operable.
3. _____ Meter pit covers must be to grade.
4. _____ Pressure regulator must be in place (downstream of meter) (see page 22, TYPICAL DOMESTIC WATER SERVICE diagram).
5. _____ Meter must be in place and accessible (see page 5, INSTALLATION, and page 22, TYPICAL DOMESTIC WATER SERVICE diagram). Meter Reading.
6. _____ If a pressure tank is used, a check valve must be installed between the pressure regulator and the tee to the storage tank.
7. _____ Required Backflow preventers must be in place and test documentation provided.

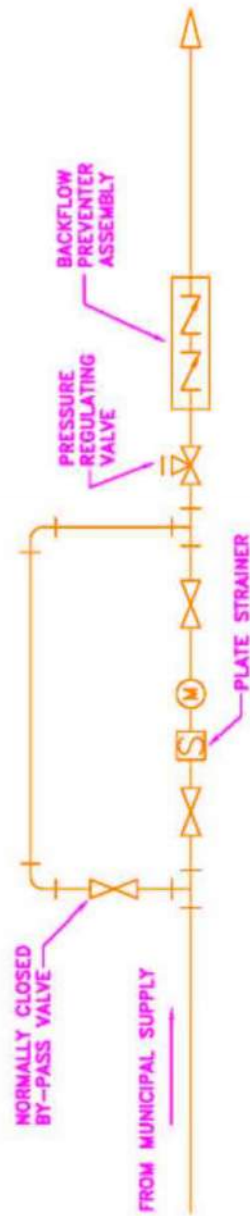
6) DEGREE OF COMPLETION:

1. _____ All plumbing proposed on the permit must be completed.
2. _____ All plumbing must be in compliance with the Residential Code of New York State or the Plumbing Code of New York State.

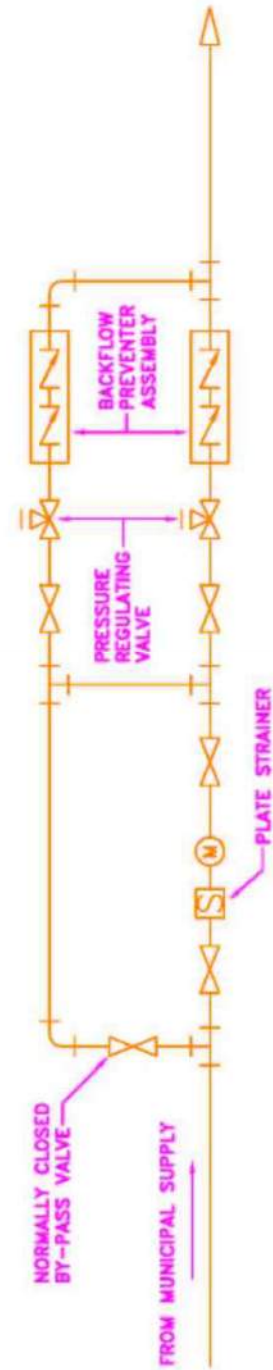
METERS LARGE METER SETTINGS (FOR METERS LARGER THAN 1 INCH)

REQUIREMENTS

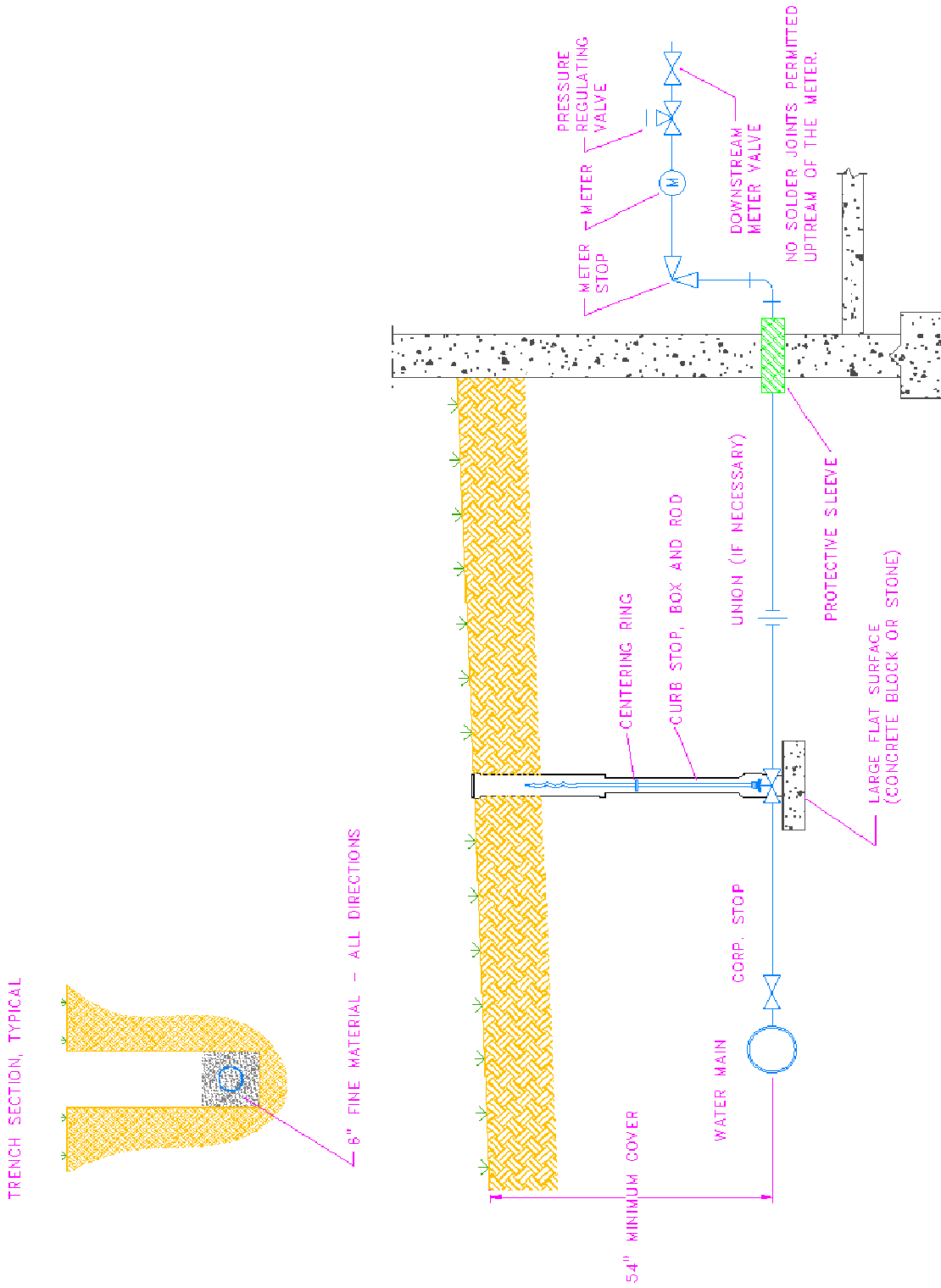
- 1.) NO SOLDER JOINTS BEFORE METER OR BY-PASS VALVE.
- 2.) FOR INSTALLATION REQUIRING BACKFLOW PREVENTION, THE SUPPLY MUST BE PROTECTED UNDER ALL CIRCUMSTANCES OF FLOW.
- 3.) INSTALLATION OF BACKFLOW PREVENTION DEVICES MUST BE IN ACCORDANCE WITH N.Y.S. HEALTH DEPT. SPECIFICATIONS.



THIS SETTING ASSURES CONTINUED WATER SERVICE DURING REPAIR OF METER ONLY AND NOT DURING REPAIR OF REGULATOR OR BACK FLOW PREVENTOR.

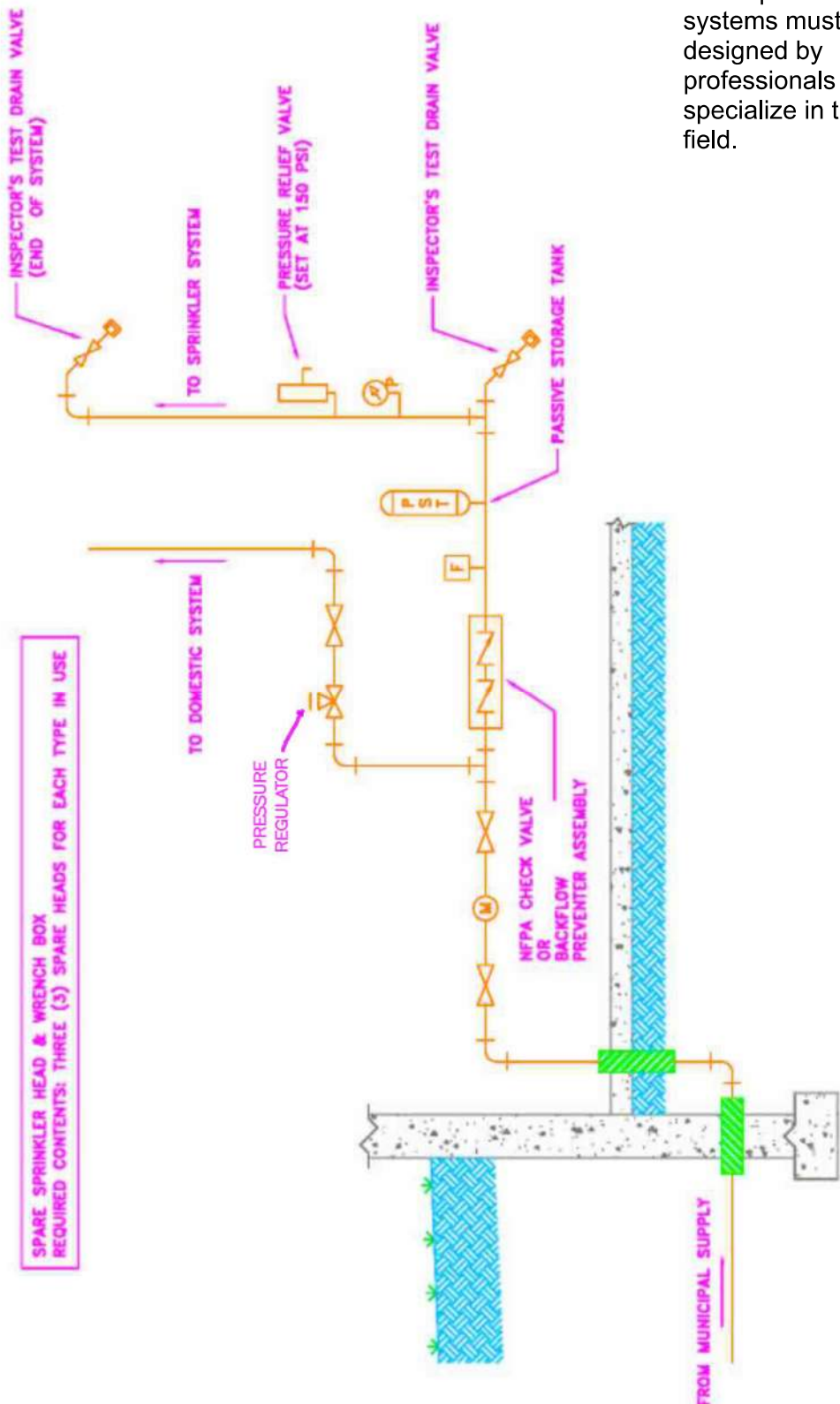


METERS TYPICAL DOMESTIC WATER SERVICE



METERS

TYPICAL RESIDENTIAL WATER METER AND FIRE SPRINKLER DETAILS



Note: Fire suppression systems must be designed by professionals who specialize in the field.

As-Built Drawing Requirements for Public Water Mains in the Bolton Point/Municipal Water System

In accordance with local law, new public water mains shall not be put into service until Southern Cayuga Lake Intermunicipal water Commission (SCLIWC) accepts as-built drawings for such mains. This document describes the minimum requirements for as-built drawings. Information to be included in as-builts, for example, GPS coordinates and offsets, must be collected as the project progresses rather than after the components have been backfilled.

The Commission and municipality reserve the right to require the contractor to expose selected water main components after backfill and before acceptance, using only the as-built drawings, to demonstrate the effectiveness of the as-builts.

The Commission will require as-built drawings to be submitted in printed and electronic format.

Printed As-Built Drawings

- As-builts must be certified “as-built” or “as-constructed” by the engineer of record.
- North arrow
- Scale
- Dates of installation
- All lot lines
- Addresses or lot numbers
- Street names
- Right of ways and easements
- Crossings of other underground utilities
- Depth of cover
- Pipe information, including material, class, diameter, and joint type
- Valves—type, manufacturer, and date of manufacture
- Hydrants—type, manufacturer, date of manufacture
- Measurements—all valves; all fittings, including service taps and curb valves, caps, plugs, blowoffs, and vaults must be measured 90 degrees from the road centerline and along the main from the nearest hydrant. Measurements must be reproducible in the field.

Electronic As-Built Drawings

- DWG file format
- Use New York State Plane Coordinate System (New York Central)

APPENDIX C

HYDROSTATIC & BACTERIOLOGICAL TESTING OF WATER MAINS

HYDROSTATIC & BACTERIOLOGICAL TESTING OF WATER MAINS

1. HYDROSTATIC TESTING

1. Piping Tests: Conduct piping tests after thrust blocks have hardened sufficiently. Fill pipeline 24 hours prior to testing and apply test pressure to stabilize system. Use only potable water.
2. Conduct hydrostatic testing at isolated sections of main a maximum of 2500 lineal feet. Use gate valves to isolate testing sections.
3. Hydrostatic Tests: Follow procedures as depicted in revised AWWA Standard C600-93 Section 4, except that test pressure shall be at 150 psig.

1. The hydrostatic test shall be for at least a 2 hour duration. Maximum allowable leakage shall be determined by the following formula:

$$L = \frac{SDP^{0.5}}{133,200}$$

Where:

- L = allowable leakage, in gallons per hour
- S = length of pipe tested, in feet
- D = nominal diameter of pipe, in inches
- P = average test pressure during the leakage test, in pounds per square inch (gauge)

2. If any test reveals leakage greater than allowable, repairs and/or replacements shall be accomplished with new materials and methods (as approved by the Engineer prior to repair being done), test shall be repeated until leakage is within above limits.
3. If leakage is found at pipe to pipe joints, one repair utilizing a bell clamp will be permitted. If additional joints leak, then faulty pipe must be fully re-installed and no “after the fact” repairs will be permitted.

2. DISINFECTION AND FLUSHING

1. Clean and disinfect water distribution piping as follows:
 1. Purge new water distribution piping systems and parts of existing systems that have been altered, extended, or repaired prior to use.

2. Use purging and disinfecting procedure described in AWWA C651-92, using continuous feed method for chlorination and the following.
 - (a) Comply with NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.
 - (b) Fill system or part of system with water/chlorine solution containing at least 25 ppm of free chlorine. Isolate (valve off) system or part thereof and allow to stand for 24 hours. Maintain a minimum of 10 ppm of free chlorine residual after the 24 hour period. Repeat procedure if residual is less than 10 ppm of free chlorine.
 - (c) Following allowed standing time with maintained residual, flush system with clean, potable water until chlorine does not remain in water coming from system.
 - (d) Collect a set of water samples for bacterial testing at the following locations: Pheasant Way terminus and "C" road intersection.
 - (e) Submit water samples in sterile bottles to NYS certified water testing laboratory. The Contractor shall employ certified laboratory to conduct bacterial testing. Repeat procedure if biological examination made by laboratory shows evidence of contamination.

2. Prepare reports for purging and disinfecting activities. Submit all reports and water sample analysis to the Engineer, Town of Cortlandville, Cortland County Health Department, and the Owners representative for approval that main meets use for potable water.

APPENDIX B

NOI FORM (NYSDEC - Notice of Intent)

**STORMWATER MANAGEMENT
AND STORMWATER POLLUTION PREVENTION PLANS
(SEPARATE DOCUMENT DATED DECEMBER 2020)**

