

## Appendix E

### Specifications for Design Standards and Construction Methods

#### No. 1. Utility Crossings

- A. Private underground utilities shall be constructed outside the pavement area except for necessary crossings.
- B. Underground utilities to be dedicated to the Village shall be constructed outside the pavement area wherever practicable. All utilities to be located within the pavement area must have Village Engineer's approval during the design process and before final plans are submitted for review.
- C. Whenever possible utilities crossing the roadway will be installed after the subgrade is prepared and before the subbase is placed.
- D. Utilities shall cross at perpendicular to the centerline unless approved by the Village Engineer.
- E. Where crossover trenches are required for utility services, the trenches shall be backfilled with the excavated material, if acceptable and approved by the Village, to 18-inches below the pavement grade. If excavated material does not meet Village approval the material must be removed from site and replaced with bank-run gravel with no stones larger than 4-inches, to 18-inches below the pavement grade. The remainder of the backfill shall be NYSDOT Type 2 or Type 4 (crushed not screened). Material shall be compacted in six (6) inch layers with vibrating tamping equipment.

#### No. 2. Dead-end Turn-around

- A. Turnarounds shall have the dimensions as shown in Figure 1 <sup>[1]</sup>. The side portion shall be to the right as shown unless approved by the Village Engineer.
- B. The turnaround will be constructed with the same materials and dimensions as the remainder of the road as defined in Table 1 or Table 2.

#### No. 3. Culverts

##### 1. A. Driveway Culverts

- (1) When a ditch line separates a proposed lot from the street driveway culverts must be sized by the developer and approved by the Village.
- (2) The minimum diameter is 15-inch.
- (3) The minimum slope is 1.0%.
- (4) Driveway culverts will be either reinforced concrete pipe (RCP) or high-density polyethylene pipe (HDPE), double walled with smooth interior. Aluminized steel corrugated pipe may be used with the approval of the Superintendent of Public Works for driveways crossing ditch lines if there is insufficient cover for HDPE pipe.
- (5) Pipes shall be bedded in a minimum of 4-inches of #1 stone. The remainder of the backfill shall be NYSDOT Type 2 or Type 4 (crushed not screened). Material shall be compacted in six (6) inch layers with vibrating tamping equipment.
- (6) All culverts shall have flared end sections (FES). HDPE pipe requires galvanized or aluminized steel FES. FES 24-inches in diameter or larger shall have NYSDOT type inlet protection installed.

##### 2. B. Road Culverts

- (1) The minimum slope is 1.0%.
- (2) The minimum diameter is 18-inch.
- (3) Acceptable materials are RCP or HDPE pipe with double wall with smooth interior.
- (4) Headwalls of concrete or stone masonry shall be constructed at the inlet and discharge end of the culvert pipe. Culverts shall extend beyond the toe of the embankment, or, if carried in easements through or along lots, to a point of not less than seventy-five (75) feet beyond the rear of proposed residences.
- (5) Guiderail is required whenever the headwall or FES is located in the roadside clear zone.
- (6) Pipes shall be bedded in a minimum of 4-inches of #1 stone.
- (7) Under the pavement, culverts will have a minimum of 12-inches of subbase gravel.

#### No. 4. Road Subgrade

- A. The contractor shall excavate for the base, pavement, and gutters to the designed subgrade elevation and six (6) inches wider on each side than the designed pavement and gutter width as shown on the “Typical Road Cross Section” and as indicated in the following specifications.
- B. The excavation will follow the depth and alignment of the stakes established by the developer’s licensed land surveyor or Engineer for this purpose. These stakes shall be at intervals of not more than fifty (50) feet and at twenty-five (25) feet in areas on grades of less than 0.5%.
- C. After being excavated to the proper depth, the subgrade shall be graded and crowned one quarter (1/4) of an inch to each foot of width on each side of centerline (for roads with concrete gutters, allowing for extra three (3) feet x eight (8) inch wedge excavation as shown in Figure 2 of Appendix D), and rolled thoroughly with a 10-ton 3-wheeled roller or vibratory roller capable of producing a minimum dynamic vibration force of 27,000 lbs.
- D. Any unsuitable material found below subgrade shall be removed and replaced with approved material and compacted in six (6) inch lifts. If the fine grade becomes rutted, it shall be re-graded and rolled before the subbase material is installed.
- E. No subbase material shall be put in over unstable trenches or soft spots. If this condition should arise, the unacceptable material shall be removed and replaced with approved material and compacted in six (6) inch lifts.
- F. Wherever sources of water, such as a spring, are located in the subgrade, perforated underdrain pipe shall be installed bedded with No. 1 or No. 2 stone. The outfall of this pipe will be to an open ditch or roadside closed drainage system.
- G. The subgrade will be proof rolled, inspected, and approved by the Village Engineer or Superintendent of Public Works before subbase is placed.
- H. Use bank-run gravel or on site select embankment fill material as specified in No. 13 Road Material of this Appendix and approved by the Village Engineer for embankment fill compacted 95 percent maximum density. Place material in maximum 8 inch horizontal lifts. Spread wet embankment fill in 8 inch loose lift and disc to expedite air drying. Adjust moisture content of embankment fill material to within 2 percent of optimum by either air-drying or addition of water prior to compaction.

#### **No. 5 Road Subbase**

- A. Subbase material shall be Crushed Gravel or Crushed Stone as specified in No. 13 Road Material of this Appendix. The contractor shall supply to the Village certification from the supplier that the material meets state specifications.
- B. A minimum compaction density of 95% shall be achieved. The contractor will provide the Village with test results from an independent testing company verifying the density.
- C. The subbase shall be placed on graded, crowned and compacted subgrade, free of ruts and disturbed earth.
- D. Before placing subbase, the subgrade will be covered with a layer of Mirafi 140 filter fabric, or approved equal.
- E. The subbase shall be installed in a minimum of two (2) lifts. It shall be placed and graded maintaining the specified slope. Each lift will be individually compacted with a vibratory roller capable of producing a minimum dynamic vibration force of 27,000 lbs.
- F. The subbase will be proof rolled, inspected and approved by the engineer or Superintendent of Public Works before base course is placed.

#### **No. 6 Roadside Grading**

- A. The maximum slope of the ditch side slope or grading away from concrete gutters shall be 1 on 3. Where this is not possible, the Village Engineer will determine if a closed drainage system or guide rails are necessary.
- B. Roadside ditches shall be lined with topsoil and seeded to establish grass or have sod placed.
- C. The distance from the edge of the shoulder to the centerline of the ditch, and the slopes of the side of the ditch shall be constructed so that the grass can easily be maintained, especially in residential areas.
- D. The distance from the edge of the shoulder to the center line of the ditch shall be a minimum of four (4) feet for secondary roads and three and one half (3 ½) feet for the other road types located in Table 1 of Appendix D.
- E. The depth of the ditch shall be at least the minimum necessary to drain the entire subbase (i.e. at or below the subgrade) and to carry the calculated storm water runoff.

## No. 7 Storm Drainage System.

### 3. A. Drainage Inlets

- (1) Precast concrete with interior dimensions of the largest pipe diameter plus 8-inches.
- (2) The minimum size is 2 feet square with a Syracuse Casting 2815 frame and grate.
- (3) All drainage inlets over 5-feet in depth shall be 4 foot diameter.
- (4) Grates shall be the bicycle safe type.
- (5) Drainage inlets shall be spaced at intervals of not over four hundred (400) feet at low points and at intersections.

### 4. B. Pipe

- (1) RCP or HDPE pipe with double wall with smooth interior.
- (2) Strength classification. The pipe shall be designed as to proper strength classification by the developer's licensed professional engineer and shall be stated on the plans. Heights of cover, nature of foundation soil, type of bedding and trench width shall be considered in specifying the pipe. The developer shall be responsible for providing extra strength bedding, cradle or encasement if the design conditions cannot be met in the field. Whenever the storm sewer is under the road, the Village requires that the developer's engineer specify the correct class for H<sub>2</sub>O loading at sewer depth.
- (3) The joint surfaces of all pipes and fittings shall be clean and shall fit together to form a tight joint.

### 5. C. Manholes

- (1) The manhole shall be sized to accommodate the pipes to be installed with a minimum diameter is 4-feet.
- (2) Manholes shall be provided in drain lines not more than four hundred (400) feet apart and wherever branches are connected or sizes are changed and wherever there is a change in alignment or grade.
- (3) Alignment of pipes shall be in a straight line between manholes.
- (4) A manhole can also serve as a drainage inlet with bicycle safe grates.
- (5) Solid covers marked storm shall be provided for all manholes not also serving as inlets.

### 6. D. Storm System Materials and Installation

- (1) Pipe
  - (a) Corrugated Polyethylene Plastic Pipe: ASTM D3350 with strength requirements of AASHTO M254; smooth interior; sizes 12 to 36 inch diameter with coupling bands same material as pipe.
  - (b) Underdrain Pipe and Fittings: ASTM 3350 with strength requirements of AASHTO M252; solid and perforated corrugated polyethylene tubing, with synthetic filter wrap; heavy duty.
  - (c) Reinforced Concrete Pipe grade IV or V as specified in the NYSDOT Specifications
- (2) Structures
  - (a) Reinforced pre-cast concrete drainage inlets in accordance with ASTM C478. AASHTO HS-20-44 design loading. Shape and inside dimensions in accordance with requirements shown on Drawings. Base and riser sections to have a minimum 6 inch thickness and lengths as necessary to meet invert and rim elevations.
  - (b) Reinforced pre-cast concrete manholes in accordance with ASTM C478. Utilize rubber -O- rings for jointing between sections. Copolymer polypropylene encapsulated steel manhole steps, in accordance with ASTM C478, spaced at 12 inches on center and formed integral with manhole section. Align steps with eccentric riser section, clear inside dimension 48 inches.
  - (c) Frame and Grate: Heavy duty cast iron. Grates to seat in any position without rocking.
- (3) Installation
  - (a) All storm pipe and underdrain shall be bedded in NYSDOT No. 1 stone.
  - (b) For storm sewer pipe, place bedding material at trench bottom across entire width of trench in such thickness that a minimum of 6 inches will be under the bottom of the pipe and the bottom quadrant of the pipe will be below the level surface of the bedding material each side of the pipe barrel. Backfill to a minimum of 1-foot above the pipe shall be NYSDOT Item 4.
  - (c) For underdrain tubing, place a minimum of 4 inches of bedding material beneath the invert. Place balance of aggregate encasement for the entire trench width to depth of 6-inches above the pipe.

- (d) A rubber or elastomeric sleeve and stainless steel band assembly fabricated to match outside diameters of pipes to be joined will join all dissimilar pipes.
  - (e) Coordinate work with location and alignment of curbing.
  - (f) All pipe shall be laid true to line and grade with bells upstream and shall have a full, firm and even bearing. Boulders or other natural obstructions shall not be considered cause for varying from true line and grade.
  - (g) The top of any drainage pipe shall not be less than fifteen (15) inches below the finished grade of the pavement. Where soft, spongy or unsuitable soil is encountered, or where rocks, boulders or ledges are present, such shall be removed and replaced with suitable materials and in a manner as directed by the Village Engineer.
  - (h) Drain lines shall be placed between the center line of the road and the gutter line and shall, as far as practical, be parallel the center line of the road.
  - (i) Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities. Accurately record actual locations of pipe runs, fittings, connections, drainage inlets, and invert elevations and provide record documents.
  - (j) Place pre-cast concrete drainage inlets and manholes on leveled bedding stone and at required elevation to maintain pipe invert elevations shown on Drawings.
  - (k) Install pipe flush with the inside face of drainage inlet and manhole wall. Seal voids between pipe and knockout with cement grout inside and outside of drainage inlet.
  - (l) Do not begin backfilling until cement grout seal is completely set.
- (4) Field Quality Control
- (a) Maximum Variation from Intended Elevation of Invert: 1/2 inch.
  - (b) Maximum Offset of Pipe from True Alignment: 3 inches.
  - (c) Inspect interior of pipe to determine whether line displacement or other damage has occurred. Make inspection after pipe has been installed and backfill is in place, and again at completion of work.
  - (d) If inspection indicates poor alignment, displaced or collapsed pipe, or other defect, correct such defect and re-inspect.

## No. 8 Concrete Gutters

- A. The contractor shall furnish and place portland cement concrete gutters as shown on the plans and in accordance with the thickness and cross section as shown on Figure 2<sup>[2]</sup> and as stated in the following specifications.
  - B. Concrete materials and installation are specified in No. 12 Cast-In-Place Concrete of this Appendix.
  - C. The concrete gutters shall be constructed of the shape shown on Figure 2<sup>[3]</sup> and shall conform to the lines and grades shown on the plans and as approved by the Village.
  - D. Standard six-inch steel forms shall be used and set to the grade and alignment by stakes established by the project engineer for this purpose. These stakes shall be set at intervals of not more than fifty (50) feet and twenty-five (25) feet in flat areas on grades of less than eight-tenths percent (0.8%). The base that these forms are set upon shall be graded to obtain a full six- (6) inch of concrete particularly under the invert. This base material between forms shall be compacted by mechanical means.
  - E. Expansion joints with premolded resilient joint filler shall be installed every fifty- (50) feet with fracture (or dummy) joints every ten- (10) feet. An expansion joint shall be installed at the end of a day's work or wherever the pouring of concrete is stopped for any reason.
  - F. To ensure positive flow the gutter shall be screeded longitudinally with a suitable straight edge. The screed shall be worked laterally, i.e., parallel with the centerline of the gutter from the invert to the outer edges. This process shall be done at the appropriate time during the setting of the concrete. When gutters are installed by this hand method special attention should be paid to the spading of the concrete along the sides of the forms.
- G. The gutter may also be installed by use of an approved gutter machine using the proper screed to form the invert shown on Figure 2<sup>[4]</sup> and equipped with a vibrator attachment.
- H. At the appropriate time the concrete shall be broomed lightly with a fine-bristled broom and edged with a proper metal edging tool. This brooming is to fill small voids thus making it unnecessary to do an excessive amount of floating and troweling.

- I. The forms shall not be removed until the concrete is sufficiently set to prevent chipping edges. The gutter shall be backfilled as soon as possible to prevent undermining of the gutter in case of precipitation. The gutters shall be protected from traffic for a sufficient length of time to avoid damage to them.

#### **No. 9 Stone Curb**

- A. Granite, 5 inch wide by 16 inch deep, meeting the requirements specified in N.Y.S.D.O.T. Standard Specifications, Section 714-01 for Type C curb.
- B. Concrete Backing and Bedding: Portland cement concrete mix, 3,000 psi.
- C. Layout curbing in accordance with data shown on Drawings and coordinate with location, alignment and elevation of roadways, sidewalks, curb cuts and drainage inlets.
- D. Place curb on continuous concrete bedding and install concrete backing in accordance with N.Y.S.D.O.T. Specifications
- E. Set curb on true line and grade to provide a 6 inch reveal, unless noted otherwise, above finish pavement and fit sections no closer than ¼ inch at the arris line.
- F. Mortar all joints and clean excess mortar from curb faces.
- G. Backfill, after mortar and concrete backing is set, with specified material and compact to required density.
- H. Maintain materials and surrounding air temperature to a minimum 50 degrees F prior to, during and 48 hours after completion of masonry work.

#### **No. 10 Asphalt**

- A. The material shall conform to the current edition of the State of New York, Department of Transportation Standard Specifications. The contractor shall furnish the Village in writing the source of the material and provide a written description of the material to be used including size and percentage of the aggregate and asphalt. The Village reserves the right to modify the percentages of the aggregates to be used.
- B. 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 gallon per square yard of surface. Allow to dry until at proper condition to receive paving.
- C. The asphalt shall be applied in two (2) courses consisting of Type 3 binder course and Type 6 top course at the compacted thickness indicated in Tables 1 and 2 of Appendix D.
- D. A self-propelled asphalt spreader manned by competent operators shall lay the pavement.
- E. Each course will be compacted by rolling with a minimum of a ten-ton to twelve-ton tandem vibratory roller at the appropriate time by a competent operator.
- F. All raking shall be done by skilled help to maintain a smooth and uniform finish at intersections, curves and around manholes, valve boxes, etc.
- G. Perform work in accordance with New York State Department of Transportation Standard Specification for Construction and Materials, latest edition.
- H. Mixing plant: shall conform to New York State Department of Transportation Standard Specification for Construction and Materials most recent edition.
- I. Saw-cut existing pavements in straight lines and tack coat the edge where connecting to existing pavement.
1. J. Environmental Requirements
  - (1) Do not place hot-mix asphalt concrete when base surface temperature is less than 50 degrees F, or surface is wet or frozen.
  - (2) Do not apply tack coat materials when surface temperatures are 45 degrees F or below. Do not apply to wet base surface.
2. K. Bituminous Materials
  - (1) Hot-mix Asphalt Concrete to meet the requirements specified in N.Y.S.D.O.T. Standard Specification for the material and composition of the following courses.
    - (a) Asphalt Concrete - Type 3 Binder.
    - (b) Asphalt Concrete - Type 6 Top.
  - (2) Tack Coat to meet the requirements specified in N.Y.S.D.O.T. Standard Specifications for asphalt emulsion for tack coat, Material Designation 702-90.
  - (3) Bituminous Joint and Crack Filler to meet the requirements specified in N.Y.S.D.O.T. Standard Specifications for miscellaneous asphalt cements.
3. L. Examination

- (1) Check for unstable or loose areas of base. Do not begin paving work until deficient areas have been corrected. Remove and replace unstable corrugated areas. Areas requiring replacing, patching or shaping in excess of 1 inch thickness to be constructed with base course materials.
  - (2) Verify gradients and elevations of base are correct.
  - (3) Verify that Engineer has observed final proof rolling of base.
4. M. Joint And Crack Filler
- (1) Apply to finished joints between new and previously constructed asphalt pavements.
  - (2) Apply to finished longitudinal joints abutting curbing and at joints with storm sewer drainage inlets.
5. N. Tolerances
- (1) Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
  - (2) Thickness: In-place compacted thickness will not be acceptable if exceeding the following allowable variations.
  - (3) Binder Course - Plus or minus 1/4 inch
  - (4) Top Course - Plus or minus 1/8 inch
  - (5) Elevation: Within 1/2 inch of the established elevation.
6. O. Protection
7. Immediately after placement, protect pavements from mechanical and vehicular traffic damage until final acceptance.

#### **No.11 Concrete Sidewalks**

- A. The contractor shall furnish and place portland cement concrete sidewalks with a minimum width of 5-feet as shown on the plans and as stated in the following specifications.
- B. Sidewalks are to be reinforced 6-inches thick in driveways and streets with the remainder 4-inches thick.
- C. The materials are specified in No. 12 Cast-In-Place Concrete of this Appendix.
- D. Expansion joints shall be installed every fifty- (25) feet and provide transverse tooled control joints, 1-1/2 inch deep every (5) feet of the walk. An expansion joint shall be installed at the end of a day's work or wherever the pouring of concrete is stopped for any reason.
- E. Install premolded resilient joint filler in expansion joints and between walks and structures or curbs.
- F. Provide a light broom finish and tool all exposed edges.
- G. The sidewalks shall conform to the lines and grades shown on the plans and as approved by the Village.
- H. Standard four-inch and 6-inch steel forms shall be used.

#### **No. 12 Cast-In-Place Concrete**

- A. Submittals
 

Concrete Mix Designs: Include cement content and type, aggregate source and gradation, water content, unit weight, admixture content and type, air content, slump and documentation of average strength by field experience or laboratory prepared trial mixture in accordance with ACI 318. Submit at least 7 days before start of placement.
8. B. Materials
- (1) Portland Cement: ASTM C150, Type I or II, Minimum 28-day compressive strength of 4,000 psi.
  - (2) Aggregates: ASTM C33 (normal weight), from same source.
  - (3) Water: Clean and not detrimental to concrete.
  - (4) Air Entraining: ASTM C260.
  - (5) Chemical: ASTM C494, Type A - Water Reducing; Type D - Water Reducing Retarder; Type C or E - Noncorrosive, Nonchloride Accelerator; Type F or G - High Range Water Reducing Admixture.
  - (6) Curing Compound – Non-yellowing
9. C. Accessories
- (1) Non-shrink Grout: In accordance with N.Y.S.D.O.T., 701-05.
  - (2) Premolded Resilient Joint Filler: Meet the requirements specified in N.Y.S.D.O.T. Standard Specifications, Section 705-07.

10. (3) Reinforcing Materials

- (4) Deformed Bars: ASTM A615, Grade 60.
  - (5) Steel Wire: ASTM A82, plain, cold-drawn steel.
  - (6) Welded Wire Fabric: ASTM A185. Flat sheets only.
  - (7) Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Wire-bar type supports complying with CRSI.
11. D. Erection - Formwork
- (1) Erect formwork, shoring and bracing to achieve design requirements.
  - (2) Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to over stressing by construction loads.
  - (3) Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
12. E. Reinforcement Placement
- (1) Clean reinforcement of loose rust, mill scale, earth, ice, and other materials, which reduce or destroy bond with concrete.
  - (2) Accurately position, support, and secure reinforcement against displacement by formwork construction, or concrete placement operations. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, and hangers, as required.
  - (3) Place reinforcement to obtain at least the minimum coverage for concrete protection.
  - (4) Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
  - (5) Use of nails in forms and using clay brick to support reinforcement are prohibited.
  - (6) Do not splice reinforcement at joints of maximum stress.
13. F. Concrete Placement
- (1) Mix, deliver, and place concrete in accordance with ACI 304.
  - (2) Deposit concrete continuously or in layers of such thickness that no concrete shall be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within section. Provide construction joints if section cannot be placed continuously.
  - (3) Deposit concrete as nearly as practicable to its final location to avoid segregation caused by rehandling or flowing.
  - (4) Do not retemper concrete that has already begun to set.
  - (5) Keep excavations free of water. Do not deposit concrete in water, mud, snow, nor on frozen ground.
  - (6) Maintain reinforcing in proper position during concrete placement.
  - (7) Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
  - (8) Maintain records of concrete placement and provide Engineer with a copy of all concrete mix truck tickets.
  - (9) The concrete sidewalks and gutters shall be protected with an approved sprayed on curing compound. The spray shall be applied to the concrete within the time frame and at the coverage rate as specified by the manufacturer or provide 7 days of continuous wetting.
14. G. Field Quality Control
- (1) Provide field sampling and testing, if determined necessary, by the Village during placement of concrete will include the following:
    - (2) Record time concrete batched as shown on truck ticket, and record time truck is emptied.
    - (3) Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
    - (4) Slump: ASTM C143 - one for each concrete truck, measured at point of discharge from truck and at point of discharge from pump line (if pumped).
    - (5) Air Content: ASTM C231, pressure method - one for each truck load of ready-mixed air-entrained concrete.
    - (6) Temperature: One test for each concrete truck load. Test in-place concrete temperature hourly when ambient temperature is 40 degrees F and below, and when 80 degrees F and above.
    - (7) Concrete compressive tests by Contractor will include the following:
      - (8) Compressive Test Specimen: ASTM C31, one set of six standard cylinders for each compressive strength test. Store undisturbed, and in an insulated box during cold weather. Deliver cylinders to lab between 16 and 32 hours after making.
      - (9) Compressive Strength Tests: ASTM C39, one set of six cylinders for each 100 cubic yards or fraction

thereof, of each concrete class placed in any one day; two lab specimens tested at 7 days, two lab specimens tested at 28 days, and two specimens retained in reserve for later testing if required.

- (10) Provide and pay for additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in structure.

15. H. Schedule For Concrete Quality

Location	Required 28-day Compressive Strength	Maximum Water Cement Ratio	Air Content	Slump
Sidewalks & Gutters	4,000	0.46	6.5%	2½ in. - 3½ in.

**No. 13 Road Materials**

- A. Submit name and address of imported aggregate materials suppliers. Provide materials from same source throughout the Work. Change of source requires the approval of the Village Engineer.

B. Materials

- (1) Bank-Run Gravel: Natural bank or screened gravel having durable particles graded from fine to coarse in a reasonably uniform combination, with no boulders or stones larger than 4 inch in size. Free from slag, cinders, ashes,

refuse or other deleterious or objectionable materials. No more than 10 percent finer than No. 200 sieve.

- (2) Crushed Gravel: Naturally or artificially graded crushed bank-run gravel meeting the requirements of NYSDOT Specifications Section 304 Type 4.
- (3) Crushed Stone: Naturally or artificially graded crusher-run stone meeting the requirements of NYSDOT Specifications Section 304 Type 2.
- (4) 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 with 100% passing the ¼- inch sieve and less than 10% passing the No. 100 sieve.:
- (5) Select Embankment Fill: Sand, loam or clay material free from organic material and debris. Unfrozen and containing only small amounts of stones, pebbles and lumps not exceeding four inches in the largest dimension.
- (6) Rip-Rap: Sharp-angled fragments of rock of uniform quality and conforming to NYSDOT Figure 620-1, Stone Filling Gradation Requirements and Table 620-2. Nominal spherical dimensions as shown on the Drawings.
- (7) Soil Stabilization Fabric: Provide a woven polypropylene fabric with the following certifiable property values:

Property	(8)	Value
Puncture Strength (lb.)	(9)	125 (min.)
Mullen Burst Strength (psi)	(10)	430 (min.)
Grab Tensile Strength (lb.)	(11)	220 (min.)
Apparent Opening Size (sieve)	(12)	#40 (max.)

- (8) Filter Fabric: Provide a non-woven polypropylene fabric with the following certifiable property values:

Property	(9)	Value
Puncture Strength (lb.)	(10)	70 (min.)
Mullen Burst Strength (psi)	(11)	240 (min.)
Grab Tensile Strength (lb.)	(12)	120 (min.)
Apparent Opening Size (sieve)	(13)	#70 (max.)

C. QUALITY CONTROL

- (1) Provide and pay for tests and analysis of aggregate material performed in accordance with ASTM C136. If tests indicate materials do not meet specified requirements, change materials and retest.



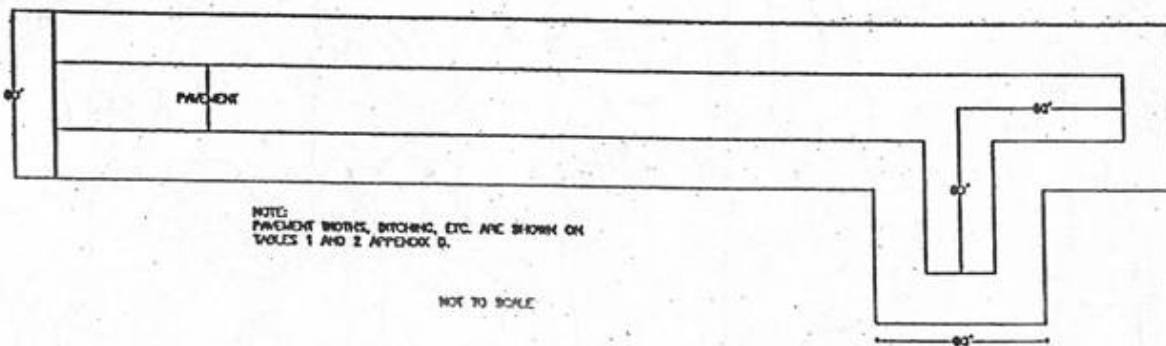
- (2) Compaction testing of embankment fill, aggregate base course and backfill materials will be performed in accordance with ASTM D1157, Modified Proctor at the expense of the developer.
- (3) If tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.
- (4) Slope grade such that surface water will not pond adjacent to original excavation. Provide compacted aggregate courses at or above 95 percent maximum density.
- (5) Use mechanical tamping equipment in areas inaccessible to drum compactor. Test roll aggregate base course with fully-loaded, ten-wheeled dump truck prior to placing asphalt concrete pavements.

16. D. STOCKPILING

- (1) Stockpile materials on site adjacent to areas of work.
- (2) Separate differing materials with dividers or stockpile apart to prevent mixing.
- (3) Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

**SUBDIVISION OF LAND**  
**Appendix E**

**Figure 1**  
**Dead End Turn-around**



[1] Editor's Note: Figure 1 is included at the end of Appendix E.

[2] Editor's Note: Figure 2 is included in Appendix D.

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[4] Editor's Note: Figure 2 is included in Appendix D.