

**STANDARD SPECIFICATIONS
FOR
SIDEWALK CONSTRUCTION**

**NASHUA, NEW HAMPSHIRE
BOARD OF PUBLIC WORKS**

APPROVED AND ADOPTED

AUGUST 28, 1995

INDEX

<u>SECTION 100 - GENERAL PROVISIONS</u>		<u>Page No.</u>
100.1	Applicability and authority	3
100.2	Definitions	3-4
100.3	Quality Control	4
100.4	Special Controls	4-6
100.5	Suitability of materials	6
100.6	Sampling and testing of materials	6-7
100.7	Materials for which no specification has been adopted by the B.P.W.	7
 <u>SECTION 200 - EARTH WORK</u>		
200.1	Clearing and grubbing	7
200.2	Excavation for Sidewalks	8
200.3	Winter Construction Methods	8
200.4	Density Requirements and Tests	8
 <u>SECTION 300 - CONCRETE SIDEWALK</u>		
300.1	Description of Work	8-9
300.2	Materials	9
300.2.2	Portland Cement	9
300.2.3	Aggregate	9-10
300.2.4	Protective Coating	10
300.2.5	Steel Mesh	11
300.2.6	Expansion Joints	11
300.3	Construction Requirements	11-12
 <u>SECTION 400 - HOT BITUMINOUS SIDEWALK</u>		
400.1	Description of Work	13
400.2	Materials	13
400.3	Construction Requirements	13-15

SECTION 500 - GRANITE CURBING

Page No.

500.1	Description of Work	15
500.2	Slope Granite Curbing	15
500.2.1	Materials	15
500.2.2	Construction Requirements	16
500.3	Vertical Granite Curbing	16
500.3.1	Materials	16-17
500.3.2	Construction Requirements	17

SECTION 600 - LOAMING & SEEDING

600.1	Materials	17-18
600.2	Application	18
600.3	Installation	18-19

SECTION 700 - SIDEWALK RAMPS

700.1	Description	19
700.2	Location	19
700.3	Construction Requirements	19

APPENDIX

Fig 1-	Typical X-section	20-22
Fig 2-	Typical Driveway Detail	23
Fig 3-	Wheelchair ramp detail with grass strip	24

SECTION 100 GENERAL PROVISIONS

100.1 APPLICABILITY & AUTHORITY

1. These specifications govern all public sidewalk construction associated with new Site-Plans as well as on-site and off-site sidewalks associated with Subdivision Plans as approved by the Nashua City Planning Board; and are issued under the authority given to the City Engineer and the Board of Public Works by Section 60 of the City charter and section 16-117 of the Nashua Revised Ordinances of 1987.

If any conflict should arise between these specifications and chapter 19, Article III, the more stringent shall govern.

2. These specifications also apply to sidewalk work which is constructed by Public Works Department employees, by virtue of its adoption as a standard by the Board of Public Works.
3. When so stated in the contract, these specifications shall govern the work of private contractors doing work under contract to the City of Nashua, Board of Public Works.
4. These specifications shall govern the work of all private contractors doing work for developers, contractors, etc. in streets and easements which shall later be dedicated for acceptance by the City of Nashua.
5. This specification supplements the Standard Specifications for Road Construction adopted June 11, 1986 and the Standard Specifications for Sewers and Drains as revised, approved and adopted on June 15, 1992, and shall not supersede these here to for adopted specifications.
6. Drainlayers, contractors and utilities desiring to work within the R.O.W. of City Streets must first obtain a Street Opening Permit from the City of Nashua Street Department on Riverside Street.

100.2 DEFINITIONS

"Contract Drawings" shall be the construction drawings which have been approved by the City Engineer, signed "approved" and on file in his office.

"Contractor" shall be the party doing the construction: either a private contractor or the Department of Public Works crews, as the case may be.

"Engineer" shall be understood to be the City Engineer, or his appointed representatives.

"Inspector" shall be understood to be an inspector of the City Engineer or his appointed representative.

"Roadway" shall mean the entire R.O.W., and any cut or fill slopes which extend beyond the R.O.W.

"Sidewalk" - That portion of the roadway primarily constructed for the use of pedestrians.

"Standard Specifications for Road and Bridge Construction, Department of Transportation" shall be the most recent available, including all revisions and addendum's.

"Subgrade" shall mean the top surface of the roadbed upon which select materials are placed.

100.3 QUALITY CONTROL

AUTHORITY AND DUTIES OF INSPECTORS

Inspectors shall be authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the work, and to the preparation or manufacture of the materials to be used. In case of any dispute arising between the Contractor and the Inspector as to materials furnished or the manner of performing the work, the Inspector shall have the authority to reject material or suspend the work until the question be referred to and decided by the Engineer. The Inspector shall not be authorized to revoke, alter, enlarge, relax or release any requirements of these specifications nor to approve or accept any portion of the work, nor to issue instructions contrary to the plans and specifications.

The Inspector shall in no case act as a foreman or perform other duties for the Contractor or interfere with the management of the work by the Contractor. Any advice which the Inspector may give the Contractor shall in no circumstances be construed as binding to the Engineer in any way.

INSPECTION OF THE WORK

The Contractor shall not start any sidewalk, curb or road construction or lay or bury any pipes or casings or other appurtenances except in the presence of the Engineer or the Inspector. To this end, 48 hours notice shall be given the Engineer by the Contractor of the time and place he intends to do the work. Any work which is done without having given notice or is done contrary to the direction of the Engineer is considered unauthorized and will not be accepted. The Contractor shall remove and replace any unsatisfactory work.

100.4 SPECIAL CONTROLS

Erosion Control The Contractor shall take due precautions to minimize the run-off of pollution substances such as silt, clay, fuels, oils, bitumens, calcium chloride and any

other polluting materials harmful to humans, fish or other life into the waters of the State. Methods and materials conforming to section 645-Erosion Control, of the Standard Specifications for Road and Bridge Construction, State of New Hampshire Department of Transportation shall be used.

Dust Control

Dust control shall be provided when deemed necessary by the Engineer so as to prevent damage and nuisance to adjacent property owners and public streets. The means of dust control may include the use of water, calcium chloride or other approved methods.

Traffic Control The contractor shall erect and maintain traffic control devices and employ flagmen or City of Nashua Police officers to direct traffic when directed to do so by the City of Nashua Traffic Engineer. The Manual on Uniform Traffic Control devices for Streets and Highways Part IV is a part of these specifications.

Detours will only be allowed after obtaining a "Permit to Encumber" from the City Traffic Engineer.

A request for the "Permit to Encumber" shall be accompanied with a detailed plan containing the following:

1. Street to be closed
2. Location of construction signs
3. Location of flagmen
4. Dates and hours of the proposed detour
5. Method for notifying the public agencies affected
6. Method for notifying the general public
7. Method for notifying the effected abutters
8. Telephone Numbers of Responsible Persons available in emergency-24 hours/day 7 days/week.

When, in the opinion of the City Traffic Engineer, public safety or convenience requires the services of the police, the City Traffic Engineer may direct the Contractor to request the Nashua Police Department to assign officers to direct traffic within the location of work.

Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property.

Police are to be paid by the Contractor.

Use of Explosives

The storage, handling, transportation and use of explosives shall conform with all Federal, State, and local laws and regulations, including the rules and regulations of the Director of State Police, The City of Nashua Fire Rescue, and the provisions below.

The Contractor's attention is called to RSA I 58:9-a (SUPP.), which in part provides that licenses must be obtained from the Director of State Police in order (1) to use, purchase, or transport explosives, or (2) to store explosives.

When the use of explosives is necessary for the prosecution of the work, the Contractor shall exercise the utmost care not to endanger life or property, including new work. The Contractor will be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner. All storage places shall be clearly marked. Explosives shall be stored in a magazine which shall be located in respect to buildings, railways, and highways in a manner as required by the Director of State Police and the Chief of Nashua Fire Rescue.

The Contractor shall notify each public utility company having structures in proximity to the site of the work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the companies to take such steps as they may deem necessary to protect their property from injury.

Explosives shall be used only during daylight hours, shall be handled only by competent workmen, and particular care shall be taken to insure that no unexploded charges remain in the work

All persons within the danger zone of blasting operations shall be warned and no blasting shall be done until the zone has been cleared. Sufficient flagmen shall be stationed outside the danger zone to stop all approaching traffic during blasting operations.

100.5 SUITABILITY OF MATERTALS

All materials to be used shall be subject to inspection and approval or rejection by the Engineer. Any material rejected shall be immediately removed from the work site.

100.6 SAMPLING AND TESTTNG OF MATERIALS

The cost of sampling and testing will be the responsibility of the contractor doing the work. In the case of a Licensed Drainlayer, the cost of sampling and testing will be billed through the "Inspectors Fees Procedure". The contractor may elect to have materials sampled and tested by an independent testing laboratory of his choice, provided the laboratory meets with the approval of the Engineer; in which case, sampling shall be done

in the presence of an Inspector and test results furnished to the Engineer. Sampling and testing frequency will be determined by the Engineer. Previously approved material, later found to be unacceptable shall be considered as having never been approved, and shall be removed from the work site.

100.7 MATERIALS FOR WHICH NO SPECIFICATION HAS BEEN ADOPTED BY THE BOARD OF PUBLIC WORKS

In the event a material to be used is not specifically mentioned in these specifications, the acceptance and use of such material shall be subject to prior approval by the Engineer. The contractor or developer shall submit his request with documentation, test results, and samples to the Engineer.

SECTION 200 - EARTHWORK

200.1 CLEARING AND GRUBBING

SCOPE OF WORK

Clearing and grubbing shall be carried out where necessary. The Contractor will be allowed to remove only the trees and brush that are absolutely necessary for his construction operations. The Contractor shall be expected to save as many trees as is possible. The removal of all brush and trees, including their stumps necessary for construction purposes, shall be done in such a manner to present a neat appearance at the end of the work. No stumps, roots, brush or timber shall be buried within the limits of the roadway, or within the limits of any lot to be dedicated for public purposes, or within the limits of any public easement.

CLEARING

Clearing shall consist of felling, cutting and the satisfactory disposal of trees, brush and other vegetation, down timber, and rubbish.

If land owners desire the timber or small trees, the Contractor shall cut and neatly pile it in 4-ft. lengths for removal by the land owner; otherwise the Contractor shall dispose of it by hauling away. No burning will be permitted unless the Contractor obtains the permission of the City of Nashua Fire Chief beforehand.

GRUBBING

Grubbing shall be carried out where trees have been felled, and shall consist of the removal and disposal of stumps, including all roots larger than 3-in. in diameter to a depth of 18-in. below ground surface and within a 3 ft. radius of the trunk. Stumps within the limits of the sidewalk shall be completely removed.

200.2 EXCAVATION FOR SIDEWALKS

Earth excavation shall be considered all excavation not included as rock excavation. The removal of bituminous pavements shall be considered as earth excavation.

Rock Excavation shall consist of all solid rock which requires for its removal drilling and blasting. It shall also consist of boulders and parts of masonry structures when found to measure 2 cubic yards or more. The removal of concrete pavements shall be considered as rock excavation.

Where excavation to designed elevations results in a subgrade or slope of unsuitable material, the contractor will be required to remove the unsuitable material as directed by Engineer. the backfilling will be done with approved materials and compacted to the design subgrade or slope.

Over-excavated subgrade in rock shall be backfilled to design subgrade with porous material, such as sand, gravel, or broken rock. Non-porous materials will not be acceptable.

200.3 WINTER CONSTRUCTION METHODS

No sidewalk shall be constructed on frozen earth materials. Each layer of material placed shall be compacted to the required density before it freezes. All frozen material shall be removed from the sidewalk prior to placing additional material.

200.4 DENSITY REQUIREMENTS AND TESTS

Earth materials used to construct sidewalks shall be compacted to at least 95 percent of maximum density. The maximum density determination will be made as specified in AASHTO T99 (Standard Proctor Test). The in place density determination will be made by AASHTO T191 (Sand cone method), AASHTO T204 (Drive Cylinder Method), or by AASHTO T238 and T239 (Nuclear Method). The contractor shall obtain whatever equipment is necessary to achieve the specified density.

SECTION 300 - CONCRETE SIDEWALKS

300.1 DESCRIPTION OF WORKS

This section consists of furnishing, placing, finishing, curing, stripping, coating and clean up work in the installation of Portland cement concrete sidewalks. The sidewalks shall be 4" thick and shall have a maximum cross-slope of 2% (1/4" per foot), reinforced as specified in Section 300.3 and installed on a properly graded, compacted 6" gravel subgrade having a minimum width of 5 ft. or as shown on the construction plans or as directed by the engineer.

Where appropriate, item numbers correspond to New Hampshire Department of Transportation standard specifications for road and bridge construction. All the requirements of Section 608 sidewalks, of the New Hampshire Department of Transportation standard for road and bridge construction staff apply, unless more stringent requirements are stated herein.

300.2 MATERIALS

Portland Cement Concrete shall be Class AA and shall conform to section 520-Portland Cement Concrete of the NH DOT Standard Specifications for Road & Bridge Construction.

Portland cement concrete sidewalks shall be Class AA having a minimum compressive strength of 4000 lbs. after 28 days and shall conform to the following mix formula:

Class	Minimum 28 day compliance strength	Min. Amount of cement per C Y. of concrete		Max. Gallons of Water per bag of cement	Max. Water/ Cement Ratio	% Estimated Air
Concrete	P.S.I.	Lbs.	Bags	Gallons		
AA	4000	658	7.0	5.00	0.444	5-8

300.2.2 PORTLAND CEMENT

Portland cement shall be Type II or Type IP conforming to AASHTO M 85 or M 240, and shall be the same type and color throughout the entire continuous sidewalks work being done. In repairing or replacing individual sections of sidewalks every effort shall be made to match the color of the adjacent concrete sidewalks.

300.2.3 AGGREGATE

Coarse aggregate shall consist of crushed stone, gravel, or other approved inert materials with similar characteristics or combinations thereof having hard, strong, durable particles, free from surface coating and injurious amounts of soft, friable, or laminated pieces, and free of alkaline, organic, or other harmful matter. Material passing the No. 200 sieve as determined by AASHTO T 11 shall not exceed 1.0 percent by weight. Thin or elongated particles shall not exceed 1.0 percent by weight. Thin or elongated particles shall not exceed 10 percent by number as determined by Corps of Engineers specifications CRD-C119, on a 3 to 1 ratio and a minimum of 100 particles The percent of wear shall not

exceed 40 as determined by AASHTO T 96 and the material shall conform to the following gradation.

Required grading: Coarse Aggregate

<u>Class of Concrete</u>	<u>AA</u>
Standard stone-size	67
Nominal Size	3/4" to No 4
<u>Sieve Size</u>	<u>Percentage by Weight Passing</u>
2 inch	
1-1/2 inch	
<u>1 inch</u>	<u>100</u>
<u>3/4 inch</u>	<u>90 -100</u>
1/2 inch	
<u>3/8 inch</u>	<u>20- 55</u>
<u>No.4</u>	<u>0-10</u>
<u>No.8</u>	<u>0-5</u>

Fine aggregate shall consist of sand, stone screenings, or other materials with similar characteristics, or a combination thereof Tests for organic impurities shall be in accordance thereof Tests for organic impurities shall be in accordance with AASHTO T 21 and T 71. Fine aggregate showing a variation in fineness modulus greater than 0.2 above or below that upon which mix was designed may be rejected.

The gradation of fine aggregate from any source shall be reasonably uniform and the fineness modulus as determined by AASHTO M 6 shall lie between 2.5 and 3.1, and shall conform to the following gradation.

Required grading: Fine Aggregate

<u>Sieve Size</u>	<u>Percentage by Weight Passing</u>
3/8 inch	100
No. 4	95-100
No. 16	45 - 80
No. 50	10 - 30
No. 100	2-100
No.200	0-3

300.2.4 PROTECTIVE COATING

Sidewalk protective coating consists of a boiled linseed oil mixture conforming to AASHTOM 230 and shall be composed of 50 percent double boiled linseed oil and 50 percent petroleum spirits by volume or approved equal.

300.2.5 STEEL MESH

Steel mesh shall be in accordance with the Concrete Reinforcing Steel Institute with a minimum spacing of 6 x 6 - W 2.9 x W 2.9.

300.2.6 EXPANSION JOINTS

Expansion joint filler shall conform to AASHTO M 153, Type III or AASHTO M 213.

300.3 CONSTRUCTION REQUIREMENTS

When the average daily temperature falls below 35 degrees Fahrenheit for more than one day, concrete sidewalks shall not be poured without protective measures to prevent damage to the concrete by freezing. The contractor shall submit his proposed protective methods to the City Engineer's Office for approval. Concrete shall be protected from freezing for a minimum of 5 days.

Excavation shall be made to the required depth and to a width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm, even surface conforming to the section shown on the plans, all soft and yielding material shall be removed and replaced with acceptable material.

Granular backfill of the specified or ordered gradation shall be placed in layers at the locations shown or as ordered. Backfill shall be placed in the manner detailed in the section in connection with which the backfill is specified. The backfill layers shall not exceed 6 inches of computed depth unless otherwise directed.

Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp, and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

The foundation shall be thoroughly moistened immediately prior to the placing of the concrete. The proportioning, mixing, and placing of the concrete shall be in accordance with section 520.3. Portland Cement Concrete-Construction Requirements of the NH DOT Standard Specification for Road and Bridge Construction.

Steel Mesh reinforcement shall be used across the full width of commercial and industrial use driveways and shall be placed at mid-depth or as shown on the plans. The sidewalk shall be divided into 5-foot sections by dummy joints formed by a jointing tool or other acceptable means as directed. These dummy joints shall extend into the concrete for at least 1/3 of the depth and shall be approximately 1/8 inch wide.

Expansion joints shall be formed around all appurtenances such as manholes and utility poles for the full depth of the sidewalk. Expansion joint filler 1/2 inch in thickness shall

be installed between concrete sidewalks and any fixed structure such as building or bridge. This expansion joint material shall extend for the full width and depth of the walk.

Finishing

Concrete shall be finished by use of wood, or magnesium floats, by skilled concrete finishers.

Joints

All outside edges and joints shall be edged with an edging tool having a radius of 1/4 inch. No plastering of the surface will be permitted. After floating, edging and jointing, the surface shall be brushed by drawing fine-grained broom over the surface to produce a non-slip surface.

Curing

Concrete shall be cured for a minimum of 7 days. Curing compounds will not be permitted. Plastic sheets or other approved materials shall be placed in close contact with the finished concrete as soon as the concrete has set sufficiently to avoid damage from the placement of coverings. The protective covering shall be maintained vapor-proof in close contact with the concrete for the entire 7-day period. All traffic shall be excluded during the curing period. During curing, all traffic, both pedestrian and vehicular shall be excluded.

Water repellent with linseed oil may be applied on horizontal surfaces by any approved means. If a sprayer is used, the nozzle shall be held within 18 inches of the concrete or as directed.

Two coats of linseed oil mixture shall be applied. The first shall be at a rate sufficient to obtain maximum penetration, taking care to prevent the material from discoloring curbs or other parts of the work. The second coat shall be applied as a seal coat, with attention given to the lighter appearing areas. The rate of application shall be approximately 0.025 gallons per square yard for the first coat, or an average of approximately 25 square yards per gallon. The second application shall not be made until the concrete has regained its dry appearance and in any event not until at least 24 hours have passed.

The edges of the sidewalk shall be backfilled as necessary with suitable material compacted and finished flush with the top of the sidewalk.

Handicap ramps shall be constructed at street intersections as per section 700 which are part of these specifications.

SECTION 400 - HOT BITUMINOUS SIDEWALK

400.1 Description of Work

This work shall consist of constructed hot bituminous pavement sidewalks on a properly graded and compacted sub-grade. The sidewalk shall be constructed in (2) - 1" courses having a minimum width of 5 feet or as shown on the construction plans or as directed by the engineer.

Where appropriate, item numbers correspond to NH DOT Standard Specification for Road and Bridge Construction. All the requirements of Section 608 Sidewalks of the NH DOT Standard Specification for Road and Bridge Construction shall apply, unless more stringent requirements are stated herein.

400.2 MATERIALS

Hot Bituminous Pavement

Hot Bituminous Pavement shall meet the material requirements of section 401- Plant Mix Pavements of the NH DOT Standard Specification for Road and Bridge Construction, except that the composition of mixtures shall conform to the following mix formula:

Course Sieve Size	Binder Percentage by Weight Passing	Wearing
1/2 inch	95-100	
3/8 inch	90-100	98-100
No.4	45-75	80-100
No. 10	30-50	40-65
No. 20	17-37	25-45
No. 40	10-30	18-33
No. 80	5-20	8-20
No. 200	2-6	2-6
Asphalt Cement Percent of Mixture	5.5-7.5	6-9

400.3 CONSTRUCTION REQUIREMENTS

The plant, mixing methods and hauling shall conform to the provisions of section 401 Plant Mix pavements - Cereal of the NH DOT Standard Specification for Road and Bridge Construction.

The sidewalks shall be constructed having a compacted binder coarse (1) inch in thickness and a compacted wearing coarse (1) inch in thickness.

Handicap ramps shall be constructed at street intersections section 700 as per appendix "A" which are part of these specifications.

Any Bituminous Pavement delivered to the project having a temperature lower than 250 degrees Fahrenheit shall not be used. The pavement shall be thoroughly compacted in accordance with 400.13 before the mix cools to 180 degrees Fahrenheit.

The Engineer shall have the authority to prevent the starting of a paving operation or to suspend a paving operation that has begun, when in his opinion a satisfactory final product cannot be produced.

Mixtures shall be placed only when the underlying surface is dry, frost-free and the surface temperature and air temperature is above 40 degrees Fahrenheit. No load shall be sent out so late in the day that spreading and compacting cannot be completed during daylight. Wearing course shall not be placed after October 30th, unless specifically permitted in writing by the Engineer. Base course pavement shall not be placed until the Engineer has been given the opportunity to inspect the crushed gravel for conformance to the plans and specifications. Wearing course pavement shall not be placed until the Engineer has been given the opportunity to inspect the base course pavement for conformance to the plans and specifications.

Any base course pavement which has been exposed for a considerable length of time, such as over the winter, or has a dusty surface, shall be uniformly covered by a tack coat of emulsified asphalt immediately prior to paving the next course.

Emulsified asphalt for tack coat shall be SS-1, SS-1h, CSS-1, or CSS-1h diluted one part water to one part emulsified asphalt. The tack coat shall be applied on only as much pavement as can be covered with asphalt-aggregate mixture in the same day. The rate of application shall be 0.05 to 0.15 gals/s.y., as directed by the Engineer.

A tack coat of emulsified asphalt shall be applied to the contact edge of all utility castings, the contact edge of existing pavement, and to the contact edge of any previously placed mat that, in the opinion of the Engineer, will result in a cold joint. A longitudinal or transverse joint left open overnight shall be considered a cold joint, and will require a tack coat prior to continuing with the paving operation.

The bituminous pavement shall be spread uniformly in two courses as specified above. Each course shall be rolled with a roller weighing between 500 pounds and 2000 pounds. The finished surface shall be uniform in appearance, free from irregularities, and shall present a smooth surface. The edges shall be trimmed as directed.

The edges of the sidewalk shall immediately be backfilled as necessary with suitable material compacted and finished flush with the top of the sidewalk.

All loads of hot bituminous pavement shall be accompanied with a delivery slip, one copy to be retained by the engineer for his records. The slip shall have the following information:

- a) Source of material
- b) Type of material
- c) Tons of material
- d) Date
- e) Plant inspectors initials (when appropriate)

SECTION 500 - GRANITE CURBING

500.1 DESCRIPTION OF WORK

This item consists of furnishing and installing slope, vertical, and radius granite curbing, which shall be used for highways, residential streets, parking areas, driveways and traffic islands.

500.2 SLOPE GRANITE CURBING

500.2.1 MATERIALS

Curbing shall be of hard and durable granite, light gray in color, and free from seams which impair its structural integrity. Variations characteristic of the formation are permitted.

Dimensions shall conform to the following:

Top - wire sawed to approximate true plane and shall be three (3) to nine (9) inches wide.

Front or exposed face - shall be smooth quarry split to an approximate true plane. Dimension of face shall be twelve (12) inches plus or minus one (1) inch. Face shall have no projections or depressions greater than one (1) inch, under a two-foot straight edge.

Back or Concealed Face - shall be approximately parallel to the front or exposed face.

Length of Stone - minimum length shall be two (2) feet.

Ends of Stone - shall be square with the plane of the face and so finished that, when the stones are flat, no space more than one inch shall show in the joint for the full width of the face. Slope granite curb, when used on a radius of twenty (20) feet or less, shall be cut with radial joints.

500.2.2 CONSTRUCTION REQUIREMENTS

Curb shall be set at line and grade required by the City Engineer on an approved foundation on a one to one (1:1) slope, and shall project seven (7) inches above the shoulder grade or pavement, unless otherwise directed.

Slope granite curb, when used on a radius of twenty (20) feet or less, shall be cut with radial joints.

Joints between curbstones shall be carefully filled with mortar for a depth of three (3) inches from the face. They shall be neatly joined on the face, and all excess mortar shall be satisfactorily cleaned from the curbstone face

Cement mortar shall be composed of equal parts of cement and sand with sufficient water to form workable moisture.

Curbing shall be placed in a minimum of six (6) inches of compacted gravel. Curbing shall be set as specified and all spaces under curbstones carefully and thoroughly rammed so that the curbstone shall be completely supported throughout their entire length.

500.3 VERTICAL GRANITE CURBING

500.3.1 MATERIALS

Curbing shall be of hard and durable granite, light gray in color, and free from seams which impair its structural integrity. Variations characteristic of the formation are permitted.

Dimensions shall conform to the following:

Granite curb both straight and radius, shall conform to the following:

Top - wire sawed to an approximate true plane and shall be five (5) inches plus or minus one-eighth (1/8) inch wide.

Front or exposed face - shall be at right angles to the plane of the top and shall be smooth quarry - split. Depth of curbing shall be eighteen (18) inches plus or minus (1) inch. Front face shall have no depressions or projections greater than one half (1/2) inch measured from the vertical plane of the face from a distance down from the top of ten (10) inches.

Back or Concealed Face - shall be parallel with the front or exposed face and shall have no projections for a distance of (3) inches down from the top.

Bottom - shall be approximately parallel to the top and shall have a minimum width of (4) inches.

Length of Stone - minimum length shall be 3-0 feet.

Ends of Stone - shall be square with the planes of the top and front face and so finished that, when curbing is set' no space more than three - quarters (3/4) inch shall show in the joint for the full width of the top or down on the face for eight (8) inches. Remainder of end may break back not over four (4) inches from the plane of the joint.

500.3.2 CONSTRUCTION REQUIREMENTS

Curb shall be set at line and grade required by the City Engineer and shall project seven (7) inches above the shoulder grade or pavement, unless otherwise directed.

Joints between curbstones shall be carefully filled with cement mortar and shall be neatly pointed on top and exposed front portions.

Cement mortar shall be composed of equal parts of cement and sand with sufficient water to form a workable mixture.

Curbing shall be placed in a minimum of six (6) inches of compacted gravel. Curbing shall be set as specified and all spaces under curbstones carefully and thoroughly rrammed so that the curbstone shall be completely supported throughout their entire length.

SECTION 600 – LOAMING AND SEEDING

600.1 MATERIALS

Loam shall be fertile, natural soil, typical of the locality, free from large stones, roots, sticks, clay, peat, weeds and sod and obtained from naturally well drained area. It shall not be excessively acid or alkaline nor contain toxic material harmful to plant growth.

Fertilizer shall be a complete commercial fertilizer, 10-10-10 grade. It shall be delivered to the site in the original; unopened containers each showing the manufacturer's guaranteed analysis. Store fertilizer so that when used it shall be dry and free flowing.

Lime shall be ground limestone containing not less than 85 percent calcium and magnesium carbonates.

Seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than 90, a percentage of purity of not less than 85, and shall have not more than one percent weed content. The mixture shall consist of seed proportioned by weight as follows:

For grassplots and lawns: -

Canadian Creeping Red Rescue	50%
Kentucky Bluegrass	20%
Red Top	15%
Domestic Rye Grass	15%

Seed shall be delivered in sealed containers bearing the dealer's guaranteed analysis.

600.2 APPLICATION

Loam shall be placed to a minimum depth of 4 inches.

Lime shall be applied at the rate of 25 pounds per 1,000 per square feet.

Fertilizer shall be applied at the rate of 30 pounds per 1,000 square feet.

Seed shall be applied at the rate of 5 pounds per 1,000 square feet.

600.3 INSTALLATION

The subgrade of all areas to be loamed and seeded shall be raked and all rubbish, sticks, roots and stones larger than 2-in. shall be removed. Loam shall be spread and lightly compacted to finished grade. Compact loam shall *not* be less than the depth specified. No loam shall be spread in water or while frozen or muddy.

After the loam is placed and before it is raked to true lines and rolled, limestone shall be spread evenly over loam surface and thoroughly incorporated with loam by heavy raking to at least one half the depth of loam.

Fertilizer shall be uniformly spread and immediately mixed with the upper 2-in. of topsoil.

Immediately following this preparation the seed shall be uniformly applied and lightly raked into the surface. Lightly roll the surface and water with a fine spray. Seed shall be sown in a favorable season, as approved the Engineer.

Keep all seeded area watered and in good condition, reseeding if and when necessary until a good, healthy, uniform growth is established over the entire area seeded, and maintain these areas in an approved condition until final acceptance.

On slopes, the Contractor shall provide against washouts by an approved method. Any washout which occurs shall be regraded and reseeded at the Contractor's expense until a good sod is established. Methods and materials conforming to Section-645 Erosion

Control, of the Standard Specification for Road and Bridge Construction, NH DOT shall be used.

SECTION 700 - SIDEWALK RAMPS

700.1 DESCRIPTION

Sidewalk ramps are required wherever sidewalks on streets and ways or curbing are being constructed, reconstructed or other repair improvements are being made thereon.

700.2 LOCATION

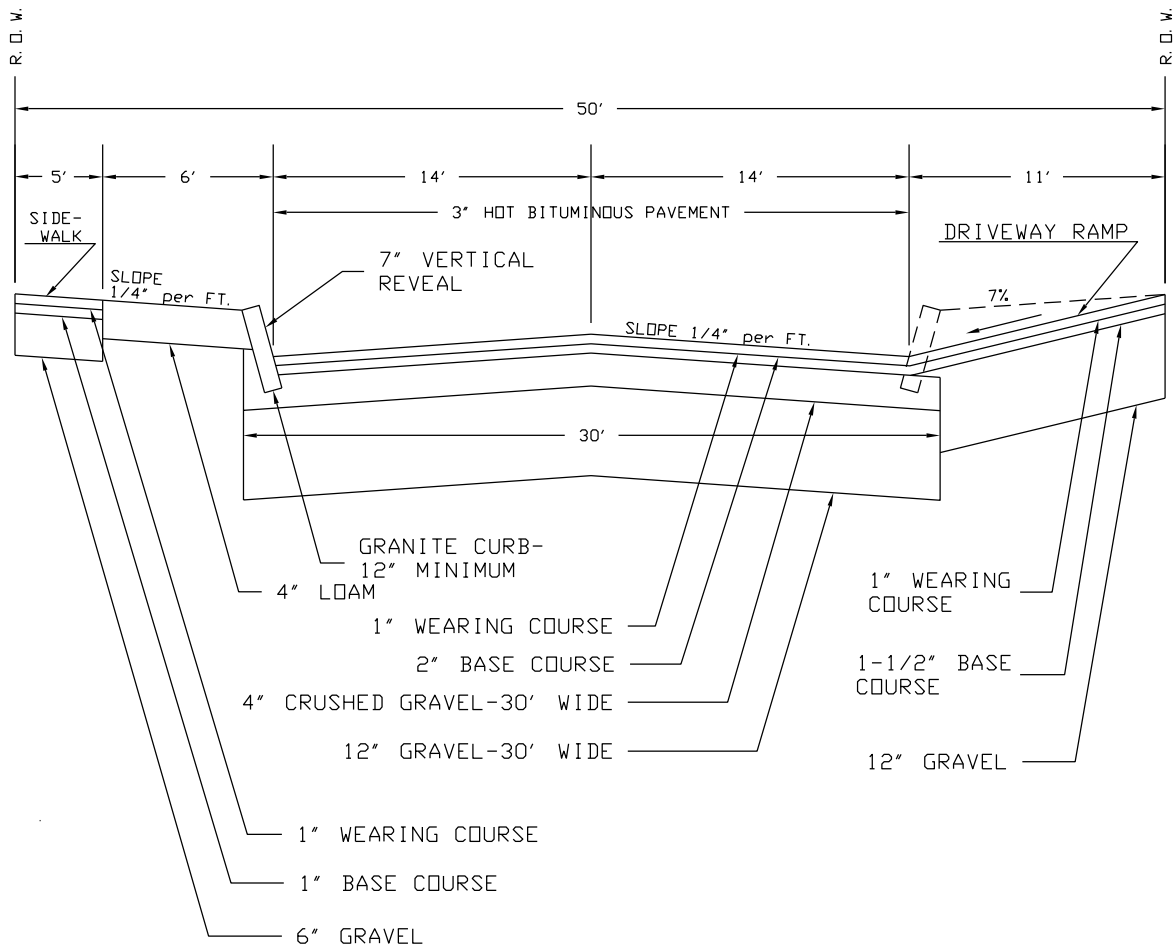
Sidewalk ramps shall be located at each corner of each intersection and also at each street crossing which is not an intersection. Sidewalk ramps at corners shall be as close as possible to the apex or the center of the radius of curb intersection with consideration for the intersection geometry and safety hazards.

700.3 CONSTRUCTION REQUIREMENTS

Width of the sidewalks shall not be less than 60", and shall have a continuous common surface, not interrupted by steps or abrupt changes in level greater than 1/2". Concrete sidewalks shall have a non-slip or broom finish.

See figures 2 and 3 which are a part of these specifications.

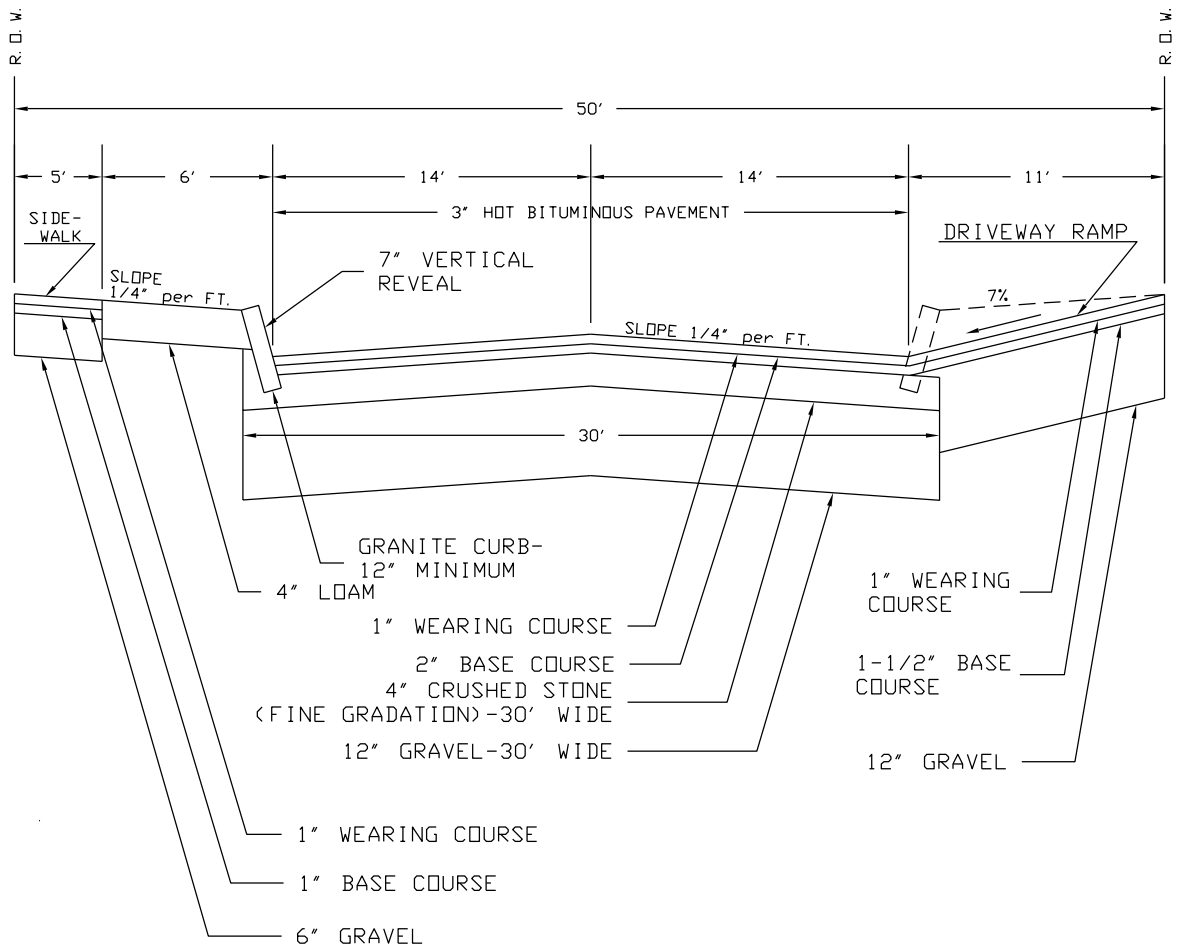
Figure 1A



-TYPICAL X-SECTION-
 ALT. "A"
 SUBDIVISION STREET

< NOT TO SCALE >

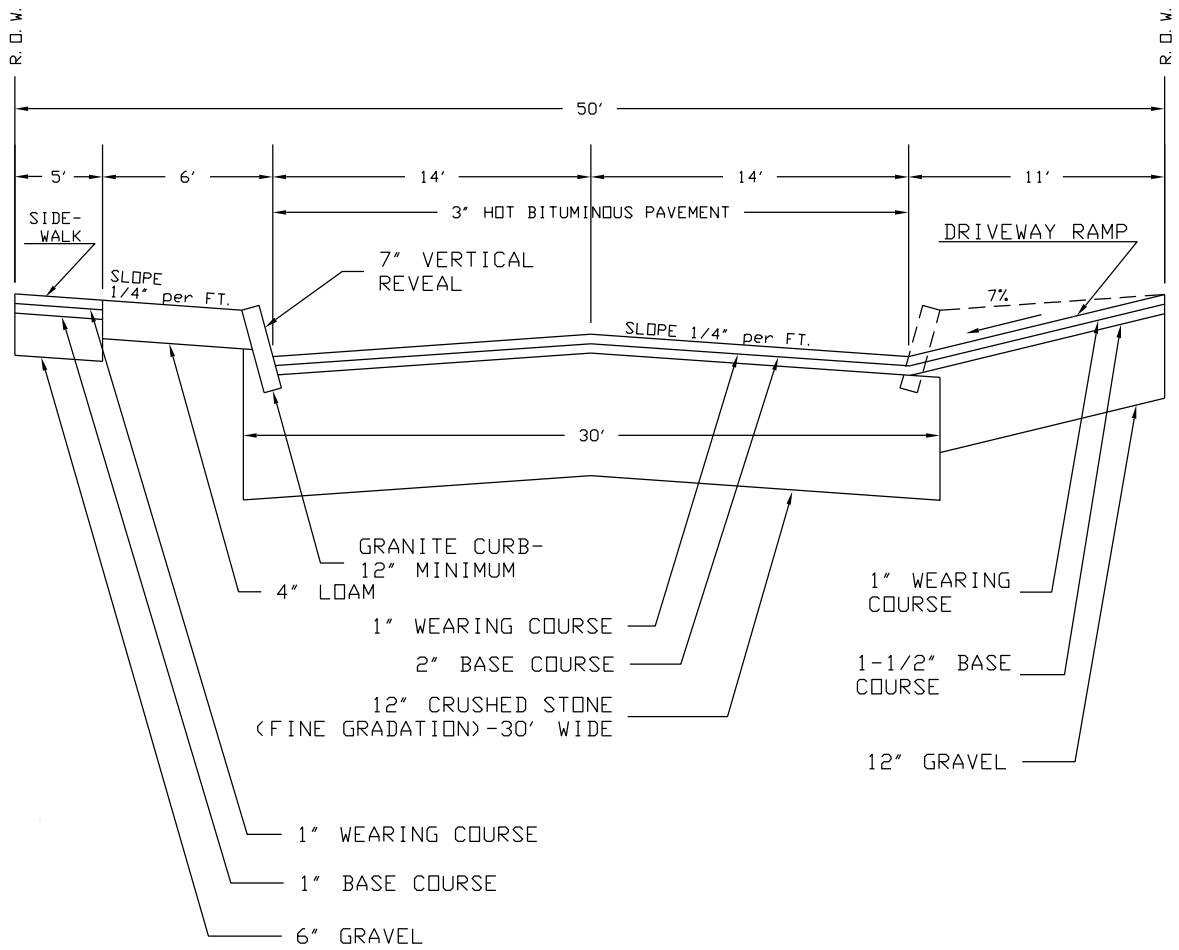
Figure 1B



-TYPICAL X-SECTION-
 ALT. "B"
 SUBDIVISION STREET

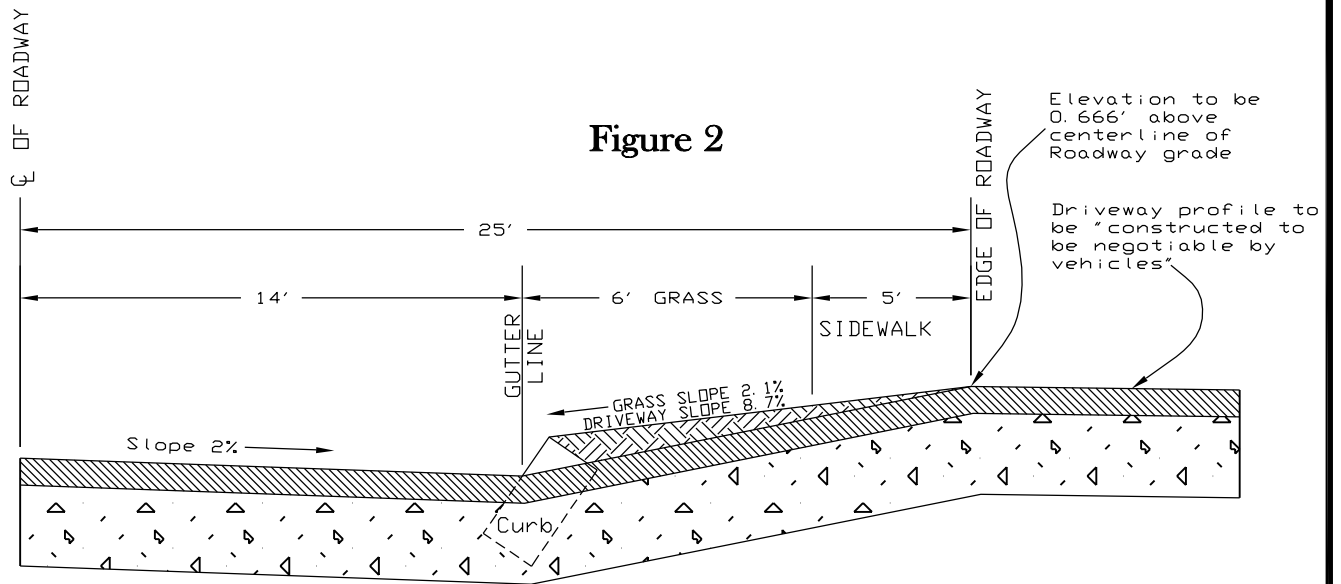
(NOT TO SCALE)

Figure 1C



-TYPICAL X-SECTION-
 ALT. "C"
 SUBDIVISION STREET

(NOT TO SCALE)

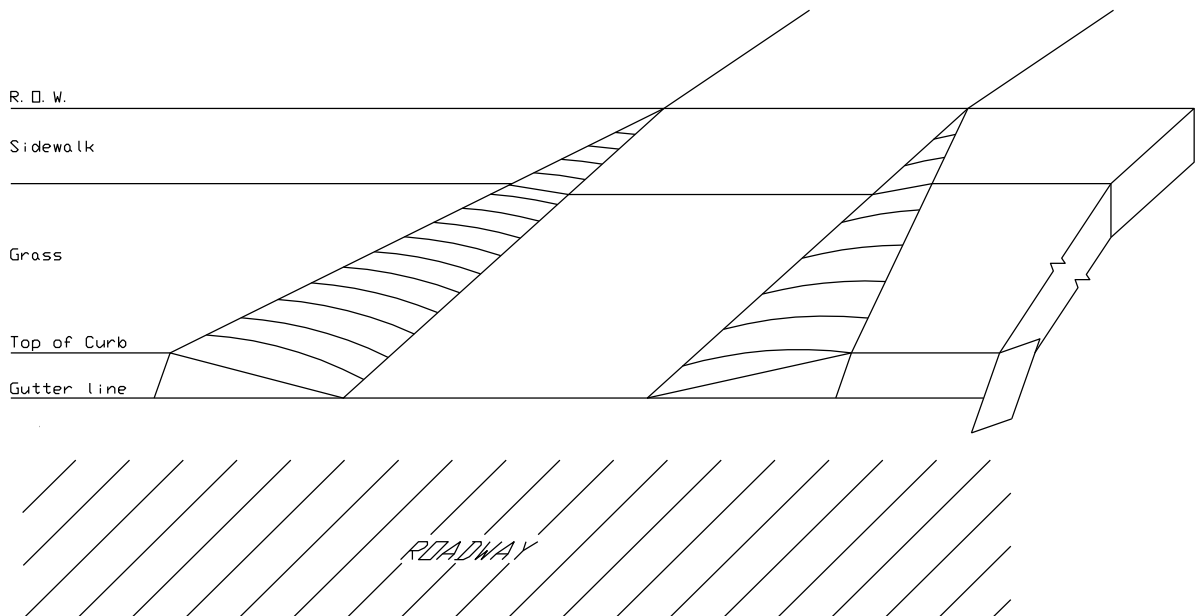


-Roadway & Driveway Cross Section-

TYPICAL DRIVEWAY DETAIL

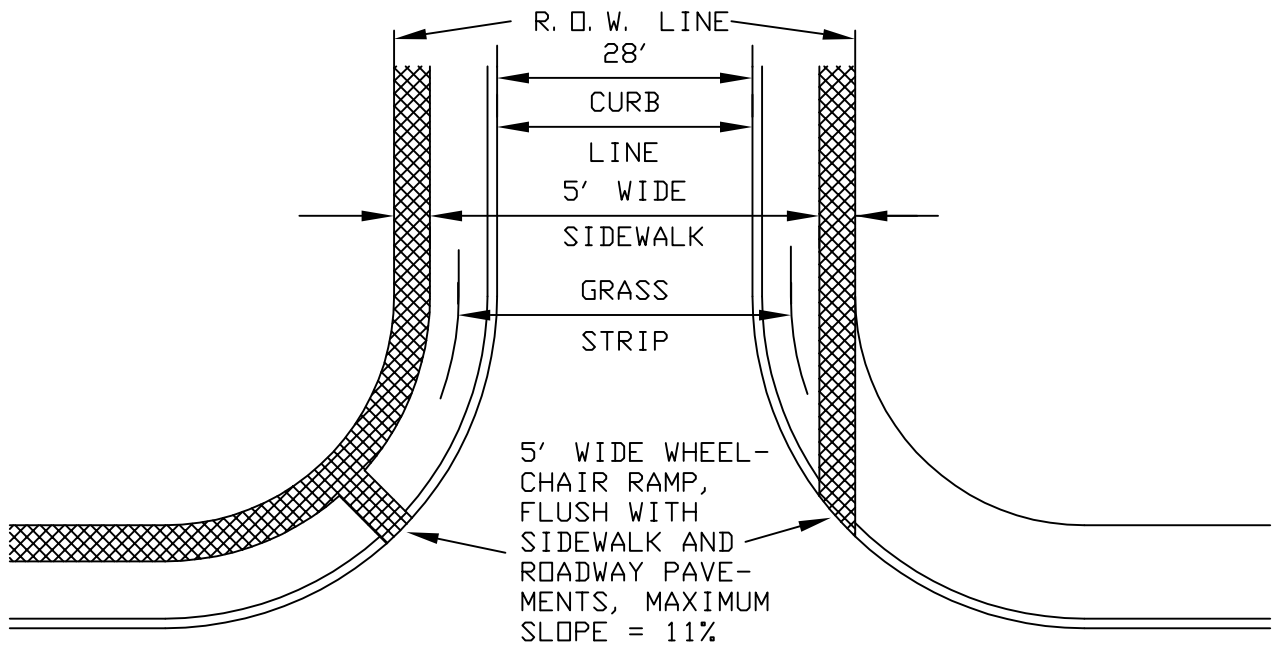
(NOT TO SCALE)

CONSTRUCT DRIVEWAY TO MEET GRADING AS SHOWN ON PERSPECTIVE.
 DRIVEWAY SLOPE TO RISE 8.7% FROM E. P. TO BACK OF WALK/R. D. W.

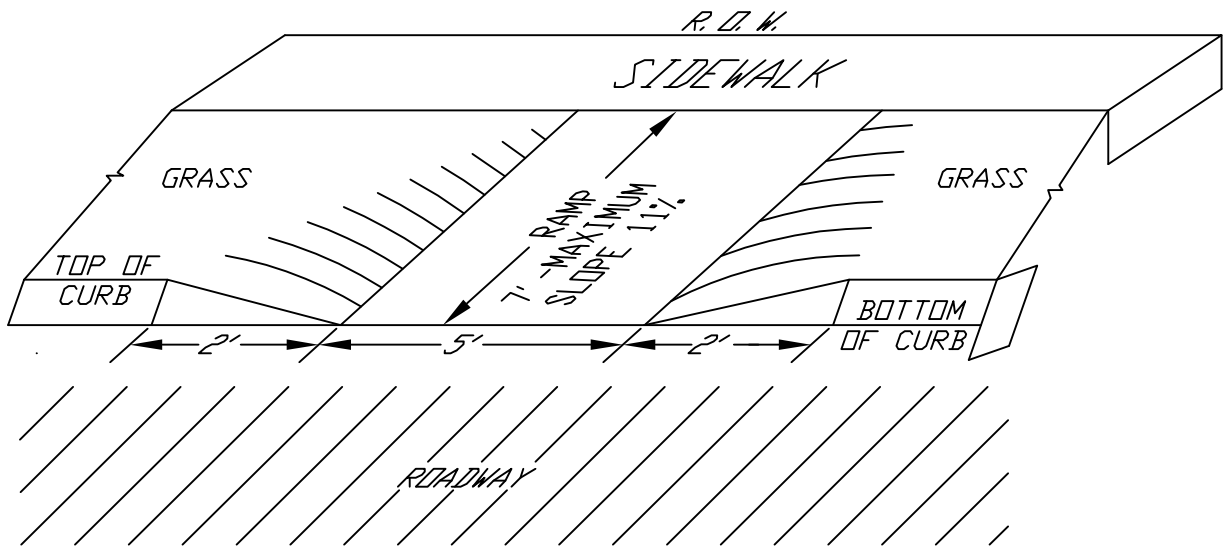


-PERSPECTIVE-

Figure 3



-PLAN-



-PERSPECTIVE-

WHEELCHAIR RAMP DETAIL
WITH GRASS STRIP
(NOT TO SCALE)