



INSTRUCTIONS FOR
FILING PLANS &
GUIDELINES FOR THE DESIGN OF
SIDEWALKS, CURBS,
ROADWAYS AND OTHER
INFRASTRUCTURE COMPONENTS

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TABLE OF CONTENTS

SECTION	TITLE	PAGE
I	Introduction	1
II	Professional Certification	1
III	Coordination with Capital Projects	1
IV	Instructions & Submissions	1
V	Waivers	3
VI	DOT Approval/Review of Design Elements	3
VII	Final Acceptance of Work by DOT	4
VIII	Sidewalks	4
	General requirements	4
	Ribbon sidewalks	4
	Sidewalk widths	5
	Material	5
	Access to buildings for people with disabilities	5
	Drainage and slopes	5
	Vault covers	6
	Grates	6
	Retaining walls	7
	Cellar doors	7
	Elevator doors	7
IX	Curbs	7
	General requirements	7
	Curb types	8
	Horizontal alignment	8
	Vertical alignment	9
	Curb Cuts	9
	Corner and mid-block sites	11
	Sites at T intersections	11
X	Roadways	11
	General requirements	11
	Extent of Pavement responsibility	11
	Quality of pavement required	12
	Required material	12
	Roadway geometric design	12
	Gutter slope	13
	Crown/Cross slope	13
	Transition to adjacent road areas	14
	Curb reveal	14
XI	Utilities	15
	General requirements	15
	Location of above-ground utility structures	15
	Allowable tolerances for flush structures	15
	Provision of utilities on virgin streets	15
XII	Drainage	16
	General requirements	16

	Location of street drainage inlets	16
	Hydraulic calculations and adequacy	16
	Existing non-standard storm drainage structures	16
	Damage to existing drainage structures	16
XIII	Encroachments	16
	General requirement	16
	Bollards	16
XIV	Trees	17
	General requirements	17
APPENDICES		18
Appendix A	Sidewalk, Curb & Roadway Application (SCARA)	
Appendix B	Cover Sheet Format for All Plan Types	
Appendix C	Requirements for Preparing a Topographical Survey	
Appendix D	Instructions for Preparing Plan Views	
Appendix E	Instructions for Preparing Profile Views	
Appendix F	DOT Design Directive No. 83-S2	
	Standard Highway Symbols	
Appendix G	Glossary of Highway Engineering Terms	
Appendix H	How to Set Your Top of Curb Elevations	
Appendix I	Common Errors and Problems in Design Plans	
Appendix J	Distinctive Sidewalk	
Appendix K	Administrative Code 19-112 (Ramps on Curbs)	
Appendix L	Dot Design Directive No. 30	

I INTRODUCTION

- A) Every owner developing property is required to have a sidewalk, curb and paved roadway along the public right-of-way abutting the property.
- B) The **Sidewalk, Curb & Roadway Application** (SCARA), except as provided in IV.B., and all other appropriate forms, plans and certifications must be submitted to the satisfaction of the New York City Department of Transportation (DOT).
- C) All public infrastructure work shall be designed and installed in compliance with current highway engineering practice, the latest version of this publication (refer to Sections VIII to XIV below), and the latest versions of these other DOT publications: *Standard Details of Construction*, *Standard Specifications*, and *Highway Rules*.

II PROFESSIONAL CERTIFICATION

- A) A property owner may install the required street infrastructure without prior review of the plan(s) by DOT under a process of professional self-certification. DOT plan review will not be required when a Professional Engineer, Registered Architect or Registered Landscape Architect self-certifies that the proposed infrastructure work complies strictly with the requirements of the DOT publications listed above in Section I.C. and meets or exceeds DOT's standards and specifications. Self-certification consists of filling out and signing page three (3) of SCARA ("*Statement of Professional Certification*") and signing the correct Certification Type block and attaching it on the plan.
- B) If the application (SCARA) is not professionally self-certified, then the Certification Type block need not be included on the plan. However, full DOT review and approval must be obtained before work can begin.

III COORDINATION WITH CAPITAL PROJECTS- ALL AGENCIES: CITY, STATE, FEDERAL & PUBLIC AUTHORITIES

- A) In some cases, the required infrastructure work may be proposed for installation by an agency or authority under a capital improvement project. It shall be the sole responsibility of every applicant to examine all capital plans to see whether any such work is planned. If so, the applicant shall coordinate the improvements with the appropriate agency or authority.

IV INSTRUCTIONS & SUBMISSIONS

- A) For each project, every applicant shall submit 3 original (original signature and professional seal, page 3 of the application) **Sidewalk, Curb & Roadway**

Applications (SCARA). Applicant shall check every box that applies to his/her project. (For example, if the applicant/property owner wants to install a special paver and bollards on the sidewalk, he/she will check the box “Sidewalk” and the boxes “Special Paver” and “Bollards” under the “Sidewalk” category). **SCARA is a three-page form.** See Appendix A.

- B) SCARA IS NOT REQUIRED IF ONLY PLAN TYPE A IS CHECKED.
- C) Every applicant shall submit the following:
- 1) The correct Plan Type as required by SCARA:
 - a) If more than one box is checked, the most detailed Plan Type shall be submitted. (Plan Type F is the most detailed; Plan Type B the least detailed.) For a description of the different Plan Types see page 4 of Appendix A.
 - b) Plan cover sheet- formatted as per Appendix B-1.
 - c) Include the following, if required by SCARA:
 - (i) Topographical Survey– see Appendix C.
 - (ii) Plan View– see Appendix D.
 - (iii) Profile View– see Appendix E.
 - (iv) Standard Highway Symbols– see Appendix F.
 - (v) Glossary of Highway Engineering Terms– see Appendix G.
 - 2) The correct Certification Block as required by SCARA, for self-certified plans. The Certification Type is to be put into DOT Block format, and the Block is to go on the plan cover sheet as per Appendix B-1. Submit the correct Certification Type based on the box(es) checked on SCARA. If more than one box is checked, applicant shall combine the information into one certification block. See Appendix B-4 that shows Certification Types 1 through 11, and a sample of a combined certification of 4 & 7.
 - 3) Written approval from the Landmarks Preservation Commission or the Public Design Commission of the City of New York, if applicable (applicant must check to see if the project is in a landmarked area or district).
 - 4) Material Testing, if required by SCARA.
 - 5) Maintenance Agreement, if required by SCARA.
 - 6) Statement of Professional Certification to accompany SCARA (which is page 3 of the Application), for self-certified plans. See Appendix A.

V WAIVERS

- A) A property owner may request a waiver of any requirement of the New York City Department of Transportation (DOT).
- B) The request shall be prepared in writing by a professional architect, engineer or landscape architect and shall have an original seal and signature affixed.
- C) It shall be submitted to DOT's Bureau of Permit Management & Construction Control (address noted in Section VI.A. below).
- D) Supplementary materials must be submitted to support the waiver request, such as maps, drawings, traffic reports, calculations, affidavits, etc. No consideration will be given without complete and adequate documentation.
- E) A waiver may be granted at the discretion of the DOT Commissioner (Commissioner), except where prohibited by law.

VI DOT APPROVAL / REVIEW OF DESIGN ELEMENTS

- A) All elements of a proposed design that require approval and/or review by DOT as specified in this publication shall be submitted to:

New York City Department of Transportation
Bureau of Permit Management & Construction Control
55 Water Street, Concourse Level
New York, NY 10041
Attn: Permit Management/Plan Examination

- B) Each submittal shall include:
 - 1) Completed 3 original *Sidewalk, Curb & Roadway Applications* (SCARA), as per Section IV.A. See Appendix A.
 - 2) All SCARA requirements as determined by the scope of the project as per Section IV.C. above.
 - 3) All supplementary materials as specified in Sections VIII through XIV below.
 - 4) Any additional material required by DOT.

VII FINAL ACCEPTANCE OF WORK BY DOT

- A) All work in the public right-of-way abutting the property may be reviewed by DOT for compliance with the plan and with all applicable rules of the New York City Department of Transportation. DOT acceptance will be based upon any or all of the following:
- 1) Visual inspection of field installations.
 - 2) Verification of as-built grades and alignment using surveying instruments or slope-meters on an audit basis.

VIII SIDEWALKS

A) GENERAL REQUIREMENTS

- 1) Every property being developed shall have a sidewalk along its entire development frontage, including the corner quadrant, and pedestrian ramps where applicable.
- 2) The sidewalk shall generally extend from the mapped right-of-way line to the curb, except for ribbon sidewalks (see Section B. below) and other site-specific applications.
- 3) An existing concrete sidewalk may be left in place, provided it is at the correct alignment and pitch, if it was built and maintained to meet the latest version of the NYC DOT *Standard Details of Construction, NYC DOT Standard Highway Specifications, Highway Rules, and the Americans with Disabilities Act (ADA)*.
- 4) For a discussion on “How to Set Your Top of Curb Elevations” see Appendix H. Also refer to Appendix I: “Common Errors and Problems in Design Plans.”

B) RIBBON SIDEWALKS

- 1) Permitted usage: Areas zoned R-1 through R-6 only.
- 2) Permitted width: 5’ or as required to match the existing ribbon width in the immediate neighborhood.
- 3) Corner lots and at crosswalks: Full-width sidewalk required for the corner quadrant and in the area where a pedestrian ramps is required.
- 4) Dirt areas adjacent to the ribbon.
 - a) Grass required everywhere for erosion control.
 - b) Fire hydrants in dirt areas: 5’ x 5’ concrete slab of 6” thick concrete

on 6” crushed stone base extending from the curb to the sidewalk required. When a sidewalk is waived, the hydrant pads shall still be provided.

C) SIDEWALK WIDTHS

- 1) Fully developed areas
 - a) Replacement sidewalks shall be built to the existing width when:
 - i) The block meets the criteria defined in Section IX.C.1.a. (under CURBS).
 - ii) The existing width is consistent with the general sidewalk width in the immediate neighborhood.
- 2) All other cases
 - a) The sidewalk width shall be determined by DOT. The applicant shall submit the following:
 - i) City Section Map.
 - ii) Survey prepared as per DOT requirements.
 - iii) Sketch showing the sidewalk widths on the block in question, the block opposite, and preceding and following blocks.

D) MATERIAL

- 1) Required: Standard specification concrete only.
- 2) Permitted alternative: As per DOT’s Special Street Pavement requirements. See Appendix J: Distinctive Sidewalk
- 3) Landmark Districts (designated and pending)
 - a) Existing non-concrete sidewalks: DOT approval of replacement sidewalk required.
- 4) Test method: As required under DOT’s Special Street Pavement requirements.

E) ACCESS TO BUILDINGS FOR PEOPLE WITH DISABILITIES

- 1) New and existing buildings must be accessible to people with disabilities in accordance with the Americans with Disabilities Act (ADA).

F) DRAINAGE AND SLOPES

- 1) General Requirement
 - a) All sidewalks shall slope from the property line down to the curb and longitudinally in the direction of the topography. Arbitrary breaks in grade are not allowed.

- 2) Transverse slope
 - a) Recommended minimum: 0.50% (0.3" of drop per 5' of width).
 - b) Recommended maximum: 2.1% (1.25" of drop per 5' of width) for a minimum width of 5' of sidewalk and 5% (3" of drop per 5' of width) for the remainder sidewalk width.
 - c) Any deviation from the slopes included above, must be submitted

- 3) Longitudinal slope
 - a) Access for people with disabilities: The smooth slope may be interrupted at the entrance of a building to provide for a flush entryway, subject to DOT approval.

- 4) Drainage from private property
 - a) Drainage across the public right-of-way: Not allowed.
 - b) Drainage under the sidewalk: In compliance with all applicable New York City Department of Environmental Protection (DEP) regulations.

- 5) Meeting existing adjacent conditions
 - a) Existing adjacent sidewalks: All new work shall meet the existing sidewalk flush across the full width.
 - i) Non-standard cross-slope at the point of transition: The applicant shall submit a copy of the survey and a plan (scale 1" = 4') with contours at 1" intervals showing the proposed design for DOT approval.
 - b) Adjacent dirt area: An asphalt transition ramp at a maximum grade of 8% shall be provided from the new work to the dirt across the full width of the sidewalk.

G) VAULT COVERS

- 1) Required load capacity rating: New York City Department of Buildings (DOB) maximum.
- 2) Construction method: Top course (minimum 4" concrete) on a separate structural slab.
- 3) Metal or decorative covers: As directed by the Landmarks Preservation Commission only. DOT approval required.

H) GRATES

- 1) Mounting: Flush
- 2) Surface texture: Slip-resistant
- 3) Bar spacing: Safe for people with disabilities and bicycles
- 4) TA Grates: Approval from Transit Authority required

I) RETAINING WALLS

- 1) Not permitted within the right-of-way except with DOT approval.

J) CELLAR DOORS

- 1) Mounting: Flush
- 2) Surface texture: Slip-resistant
- 3) Placement: Against the building line (outside of the pedestrian access route)
- 4) Maximum size: 3' x 7'

K) ELEVATOR DOORS

- 1) Mounting and surface texture: Same as above
- 2) Pedestrian protection: Required on all four sides
- 3) Maximum size: As required by DOB

IX CURBS

A) GENERAL REQUIREMENTS

- 1) Every property being developed shall have a curb of the type specified below along its entire development frontage, including the corner radius for corner lots.
- 2) The curb being installed shall generally be of the same type that exists on the rest of the block except as required by Sections IX.B.1.a and IX.B.3.a. below. When two or more curb types already exist on the block within a single zoning area, the new curb shall be of the higher type material. The accepted curb types from highest to lowest shall be as follows: Granite, steel faced, concrete, granite block.
- 3) A curb existing at the site may be left in place, provided it is at the proper alignment, if it was built to DOT standards and is not chipped, cracked, spalled, misaligned, gouged, broken or otherwise damaged.
- 4) For any curb that cannot be installed in strict conformance with NYCDOT publications *Standard Details of Construction* and *Standard Specifications*, a detail showing the method of construction shall be submitted to DOT for approval.

- 5) For a discussion on “How to Set Your Top of Curb Elevations” see Appendix H. Also refer to Appendix I: “Common Errors and Problems in Design Plans.”

B) CURB TYPES

- 1) Poured-in-place concrete
 - a) Permitted usage: Zoning areas R-1 to R-6 only, except that steel facing must be added to all corner curbs.
 - b) Permitted colors: Standard specification concrete only.
- 2) Steel-faced concrete
 - a) Required usage: Areas zoned M, C, and R-7 and above, and for all corners, except as permitted in Section IX.B.4. below.
 - b) Permitted color: Natural (unpigmented) concrete only.
- 3) Granite
 - a) Required usage:
 - i) Existing granite curbs shall be replaced in kind, except as approved by the Commissioner.
 - ii) All new curbs in designated or pending Landmark Districts shall be granite.
 - b) Permitted usage: All zoning areas.
- 4) Belgian block (Unit Pavers)
 - a) Permitted usage
 - i) New: As approved by DOT only.
 - b) Required usage: Existing block curbs shall be maintained or restored in kind.
- 5) Asphalt
 - a) Not permitted except when used to channel run-off along temporary pavement.
- 6) Timber
 - a) Not permitted except as a temporary curb authorized by DOT.

C) HORIZONTAL ALIGNMENT

- 1) Existing fully developed areas
 - a) The existing horizontal alignment shall be maintained when all of the following conditions apply for each frontage of the property:
 - i) The block in question, the blocks before and after it and the block opposite it all have existing permanent curbs and sidewalks for the full length.
 - ii) The road is paved from curb to curb for the block in question and the blocks before and after it.

- iii) The width of the roadway does not vary by more than 1 foot within each of the three blocks in question, and there are no abrupt neckdowns or wells in the existing alignment abutting the property in question.
- iv) The new work is limited to one city block or less in length in any direction.

2) All other cases

- a) The new curb horizontal alignment shall be determined by DOT. The applicant shall submit the following:
 - i) City sectional map
 - ii) Tax map
 - iii) Survey prepared as per Appendix C.
 - iv) Sketch showing the sidewalk and roadway widths of the block in question, the previous block and the block after, including all points where the roadway width varies.

D) VERTICAL ALIGNMENT

1) Existing fully developed areas

- a) The existing vertical alignment of the top of the curb shall be maintained when all the conditions outlined in Section IX.C.1.a. (as above) apply.
- b) In all such cases, the top of curb elevations shall form a common line with the other top of curb elevations on the block or on the preceding and following blocks, as applicable. Sunken curbs maybe reset with DOT approval.
- c) The top of curb elevations shall follow as consistent a slope as is possible across the site. Grade breaks shall be made only as the underlying topography dictates. Arbitrary changes in grade are not allowed.

2) All other cases

- a) The new curb vertical alignment shall be determined by DOT. The applicant shall submit the following:
 - i) City sectional map
 - ii) Survey prepared as per DOT published requirements
 - iii) Sketch showing areas of existing curb along the block in question, across the street, and in the preceding and following blocks, and listing the various curb reveals (measured within 1/4 inch accuracy).

E) CURB CUTS

1) Definition

- a) A curb cut is an inclined cut in the edge of a sidewalk to permit vehicular access to a driveway, garage, parking lot, loading dock or drive-through facility.

- 2) General requirements
 - a) Curb cuts must conform to the DOT specifications herein and are subject to approval from DOB, BSA and/or City Planning.
 - b) Curb cuts that will impact sidewalk trees must be approved by the NYC Department of Parks and Recreation.
 - c) Curb cuts located in historic districts or for a designated landmark must be approved by the Landmarks Preservation Commission.
 - d) Only curb cuts that provide access to authorized driveways, garages, parking lots, loading docks or drive-through facilities shall be permitted.
 - e) Unauthorized curb cuts may subject the adjacent property owner to encroachment violations.

- 3) Width
 - a) Minimum: As required in the administrative code and/or zoning resolution.
 - b) Maximum: 30 feet, including splays.

- 4) Clearances
 - a) The following minimum distances are required between the edge of a curb cut splay and the items listed below:

Item	Clearance (ft)
Tree	7
Light Pole	7
Utility Pole	7
Fire Hydrant	7
Telephone	10
NYC Right-of-Way Lines (Residential zones)	5
NYC Right-of-Way Lines (All other zones)	25
Adjacent Driveways within a Lot*	5

*Specified Zoning Districts may have additional minimum clearance restrictions.

- b) Curb cuts shall not be permitted:
 - (i) within a crosswalk;
 - (ii) within a bus stop; or
 - (iii) where there exists within, partially or fully, a utility access cover or other access point to a utility

- 5) Alignment
 - a) All curb cuts and areas of 7-inch sidewalk shall be aligned perpendicular to the curb line and property line.

F) CORNER AND MID-BLOCK SITES

- 1) Alignment
 - a) Curved sections of curb at corners shall generally have a 12-foot radius, but in all cases the radius shall be selected to accommodate the existing traffic conditions. When a radius other than 12 feet is selected, sketches showing the geometry of the corner and the traffic movements shall be submitted to DOT for approval.
- 2) Pedestrian ramps
 - a) All corner curbs shall be installed or upgraded with pedestrian ramps to meet the latest version of NYC DOT Standard Details of Construction, NYC DOT Standard Highway Specifications, Highway Rules, and the Americans with Disabilities Act (ADA).
 - b) Every site being developed shall provide pedestrian ramp installations and upgrades at corner and mid-block locations and any receiving ramp for all crossings unless otherwise specified by DOT.

G) SITES AT T (TEE) INTERSECTIONS

- 1) The location of the pedestrian ramps shall be determined by DOT.

X ROADWAYS

A) GENERAL REQUIREMENT

- 1) Every property being developed shall have a paved roadway along its entire development frontage.
- 2) Work on protected streets shall be performed in accordance with Section 2-11(f) of DOT's *Highway Rules*.
- 3) For a discussion on "How to Set Your Top of Curb Elevations" see Appendix H. Also refer to Appendix I: "Common Errors and Problems in Design Plans."

B) EXTENT OF PAVEMENT RESPONSIBILITY

- 1) Minimum width: One-half the mapped street width plus five feet. (Pavement shall be installed or repaired within this area only as required by these guidelines and as directed by DOT.)
- 2) If required, continuous access from the owner's frontage to the nearest paved road shall be provided with a 20' wide, 2" to 4" thick asphalt temporary road on an acceptable subgrade.

C) QUALITY OF PAVEMENT REQUIRED FOR DOT ACCEPTANCE

- 1) Surface texture: Smooth, free of scars, ruts, cracks, depressions, ridges, humps and similar defects.
- 2) Concrete base: Free of fractures, erosion, crumbling, differential settlements and other structural defects.

D) REQUIRED MATERIAL

- 1) New Roads:

Course	Material	Minimum Thickness
Top	asphaltic concrete wearing course	3"
Base	concrete	6" - 9"*
Subbase	compacted selected material	N/A

*Match existing thickness or as required by traffic and soil conditions

Staten Island only:

Course	Material	Minimum Thickness
Top	asphaltic concrete wearing course	3"
Base	dense graded stone	8"*

*If adjacent base is greater than 8" stone, or if adjacent base is concrete, match existing thickness.

- a) Alternative pavements: DOT approval required.
- 2) Patching and Restoration of Existing Pavements
 - a) Asphaltic pavement: Repair/restore as per DOT's *Standard Details of Construction*.
 - b) Existing concrete or granite block pavement: Repair in kind.
 - c) Existing substandard pavement: DOT approval of restoration required.

E) ROADWAY GEOMETRIC DESIGN

- 1) New or reconstructed roads shall be built with a New York City parabolic cross section as per DOT Design Directive No. 30– see Appendix L.
 - a) Non standard designs: Plan Type F (of SCARA) approval required.
- 2) Redesigning an existing road:
 - a) DOT approval required to:
 - i) Widen existing pavement
 - ii) Change an existing centerline elevation
 - iii) Change an edge of pavement grade

- iv) Change a top of curb
 - a) Transverse cross sections showing the existing topographic data and the proposed conditions on standard cross section paper shall be submitted for review
 - Extent: Building line to building line
 - Intervals: 25 foot maximum, at grade breaks, and at street ends midway into intersecting street
 - Scale: 1'=10' horizontal, 1"=1' vertical

F) GUTTER SLOPE

- 1) General requirement
 - a) The gutter (paved area next to the curb) shall follow a straight uniform slope downhill between points of grade change to an approved point of drainage collection.
 - i) Micro-engineering methods of design that incorporate deliberate breaks in grade to mitigate tree damage, property damage or other substantial problems may be allowed. DOT approval required.
- 2) Drainage
 - a) All methods of drainage collection, including but not limited to the following, shall be approved by DOT and DEP:
 - i) At any point within or at the lot lines where the gutter slope changes from downhill to uphill.
 - ii) Where the gutter flow creates a pond off-site.
 - iii) As per DEP requirements for catch basin spacing.
- 3) Longitudinal slope
 - a) Minimum: 0.50%

G) CROWN/CROSS SLOPE

- 1) Horizontal crown alignment:
 - a) Virgin Streets: As per DOT Design Directive No. 30– see Appendix L.
 - b) Existing crowned streets: Maintain existing crown alignment.
 - c) Existing paved streets with no crown: DOT approval of crown configuration required.
- 2) Required crown height
 - a) Virgin streets: DOT Design Directive No. 30– see Appendix L.
 - b) Existing paved streets: Crown height shall be based on an approximation of the roadway cross slope, calculated as follows:

$$\frac{(\text{Elev. of crown}) - (\text{Elev. of gutter})}{(\text{Distance} - \text{curb to center line})}$$

- c) Fully developed areas:
 - i) Midblock lots: Maintain existing crown/cross slope
 - ii) Corner lots: Comply with the minimum–maximum cross slope requirements listed below

- d) All other areas:

<u>Required cross slope</u>	
Minimum	1.5%
Maximum	4.2%

- 3) Maintenance of cross section shape
 - a) The lane adjacent to the gutter shall be adjusted for a width of two feet laterally for each one–inch change in gutter elevation to maintain or create a smooth parabolic cross section.

H) TRANSITION TO ADJACENT ROAD AREAS

- 1) General requirement
 - a) The new road shall meet any adjacent road area or portion of a road area flush in all directions. The transition shall be smooth, without any cusps, breaks in grade, humps or other irregularities.
- 2) Drainage
 - a) General requirement: The new road shall include adequate drainage, so as not to cause ponding or flooding of adjacent areas. Existing ponding shall be corrected as required by DOT.
- 3) Grading
 - a) Existing adjacent dirt areas shall be graded to a safe condition, defined as follows:

Usage of	Maximum Gradient
<u>Abutting Property</u>	<u>within Roadway Area</u>
Vacant	1:2
In Use; Access Required	1:3
 - b) Mitigation of erosion shall be provided as required by DOT.
- 4) Protective /Dead End barriers
 - a) As required by DOT.

I) CURB REVEAL

- 1)

<u>Street Type</u>	<u>Required Curb Reveal</u>
Virgin	7"
Fully developed*	Match adjacent curbs (Less than 4": DOT approval required. Submit photos of adjacent curbs)
<u>All others</u>	<u>DOT approval required</u>

*Streets meeting the criteria of Section IX.C.1.a. (under CURBS).

- 2) Controlling design principles
 - a) When the existing tops of curb are at the same elevation on both sides of the street, this symmetric alignment shall be retained.
 - b) When the underlying topography is symmetric across the roadbed and the City Map indicates symmetric top of curb elevations are required:
 - i) No top of curb elevation shall be set that increases the existing imbalance with the curb across the.
 - ii) The new design shall seek to minimize the imbalance whenever possible.

XI UTILITIES

A) GENERAL REQUIREMENTS

- 1) No utility structure shall be installed, removed or relocated within the public right-of-way without written permission from the owner of the utility.

B) LOCATION OF ABOVE-GROUND UTILITY STRUCTURES

- 1) Raised structures (poles, hydrants, etc.) on sidewalks shall not be installed within 2' of the face of the curb or in the roadway.
- 2) Flush structures (grates, utility access covers, etc.) shall be installed as approved by DOT.

C) ALLOWABLE TOLERANCES FOR FLUSH STRUCTURES

<u>Area</u>	<u>Maximum distance in inches from the paved surface grade</u>	
	<u>Above</u>	<u>Below</u>
On sidewalk	0"	1/8"
<u>In roadway</u>	<u>1/4"*</u>	<u>1/4"</u>
* Catch basin grates	0"	

D) PROVISION OF UTILITIES ON VIRGIN STREETS

- 1) Street lights: As per DOT's Division of Traffic Engineering/Street Lighting requirements.
- 2) Fire hydrants: As per NYC Fire Department requirements.
- 3) Drainage structures: As per DOT and DEP requirements and the requirements of Section XII below.

XII DRAINAGE

A) GENERAL REQUIREMENTS

- 1) DEP approval, where necessary, shall be submitted.
- 2) The design, materials, construction, and workmanship of all new storm drainage structures shall comply with DEP requirements.
- 3) All new storm drainage structures must pass an inspection and be given a Certificate of Inspection by DEP before DOB will give a Certificate of Occupancy.

B) LOCATION OF STREET DRAINAGE INLETS

- 1) Street storm drainage inlets shall be placed as directed by DOT.

C) HYDRAULIC CALCULATIONS AND HYDRAULIC ADEQUACY

- 1) It shall be the sole responsibility of the licensed architect/engineer representing the property owner to verify the hydraulic adequacy and capacity of all proposed street drainage structures and connections.

D) EXISTING NON-STANDARD STORM DRAINAGE STRUCTURES

- 1) All existing storm drainage structures abutting the property that were not built to current or previous DEP standards shall be reconstructed or modified to comply with current DEP requirements.

E) DAMAGE TO EXISTING DRAINAGE STRUCTURES

- 1) Any existing drainage facilities that are damaged shall be repaired to the satisfaction of DEP.

XIII ENCROACHMENTS

A) GENERAL REQUIREMENT

- 1) No permanent installation that is designed primarily for the personal use of the abutting property owner is allowed within New York City's right-of-way except as authorized through DOT's Revocable Consent program.

B) BOLLARDS

- 1) Pipe bollards shall be installed at all fire hydrants as per the requirements of the Bureau of Water Supply of the DEP.

XIV TREES

A) GENERAL REQUIREMENTS

- 1) No tree shall be planted in or removed from the public right-of-way without a written permit from the Department of Parks and Recreation (DPR).
- 2) All tree plantings and work at existing trees shall comply with the current DPR rules and specifications.
 - a) Trees over 24” in diameter: Details of proposed new sidewalk or curb installations shall be submitted to DOT for approval. Submit photos showing the existing sidewalk and curb at the tree, and survey data as per published DOT requirements.

APPENDICES



NEW YORK CITY
DEPARTMENT OF TRANSPORTATION

APPENDIX A (FORM 1 of 3)
SIDEWALK, CURB AND ROADWAY
APPLICATION (SCARA)

Date received: _____

Tell us about this proposed construction project.

Which of the following are involved? Check ALL that apply:

LOG # _____

	Required approvals by others		Submit the following:					DOT Review
	Landmarks ⁱ	Design Commission ⁱⁱ	Plan Type ⁱⁱⁱ (3 Originals)	Certification Type ^{iv}	Material Testing	Maintenance Agreement	As Built	Type ^v
<input type="checkbox"/> Sidewalk								
<input type="checkbox"/> Standard concrete Flags	YES	NO	A	NONE	NO	NO	NO	PMCC
<input type="checkbox"/> Standard concrete with special tint (coloring)	YES	YES	B	1	NO	YES	NO	PMCC
<input type="checkbox"/> Standard concrete with special scoring pattern	YES	YES	B	2	NO	YES	NO	PMCC
<input type="checkbox"/> Standard granite cobble stone paver	YES	YES	D	2	YES	YES	NO	SSP
<input type="checkbox"/> Special paver, Distinctive Sidewalk	YES	YES	D	2	YES	YES	YES	SSP
<input type="checkbox"/> Relocating Utility Lines	YES	NO	C	3	NO	NO	YES	SSP
<input type="checkbox"/> New grade for sidewalk	YES	NO	F	4	NO	NO	YES	SSP
<input type="checkbox"/> Fire Hydrant	YES	NO	C	6	NO	NO	NO	PMCC
<input type="checkbox"/> Tree pits	YES	NO	A	7	NO	NO	NO	PMCC
<input type="checkbox"/> Vaults	YES	NO	B	5	NO	NO	YES	PMCC
<input type="checkbox"/> Bollards	YES	YES	C	8	NO	NO	NO	PMCC
<input type="checkbox"/> Other: _____								
<input type="checkbox"/> Curb								
<input type="checkbox"/> Replace/Resetting (at established grade)	YES	NO	A	2	NO	NO	NO	PMCC
<input type="checkbox"/> New grade (elevation)	YES	NO	F	10	NO	NO	YES	SSP
<input type="checkbox"/> New curb Alignment	YES	NO	E	10	NO	NO	YES	SSP
<input type="checkbox"/> Standard concrete	YES	NO	A	2	NO	NO	NO	PMCC
<input type="checkbox"/> Standard steel face	YES	NO	A	2	NO	NO	NO	PMCC
<input type="checkbox"/> Distinctive	YES	YES	D	2	NO	YES	NO	SSP
<input type="checkbox"/> Other: _____								

i If in a Landmark Preservation Commission (LPC) District

ii Public Design Commission approval is not required if the project is in a Landmarked District (in this case approval shall come from LPC)

iii Submit 3 originals of the most detailed Plan Type checked: B=least detailed, F=most detailed. If only Plan Type A applies, this application (SCARA) is not required.

iv Submit the Certification Type(s) for each box checked

v PMCC=Permit Management & Construction Control SSP=Special Street Pavement 55 Water Street, 7th Floor, New York, NY 10041 – Phone: (212) 839-9653

APPENDIX A FORM 2 OF 3 (SCARA)

Tell us about this proposed construction project.
Which of the following are involved? Check ALL that apply:

LOG # _____

	Required approvals by others		Submit the following:					DOT Review
	Landmarks ⁱ	Design Commission ⁱⁱ	Plan Type ⁱⁱⁱ (3 Originals)	Certification Type ^{iv}	Material Testing	Maintenance Agreement	As Built	Type ^v
<input type="checkbox"/> Roadway								
<input type="checkbox"/> Replace (standard, wearing surface only)	NO	NO	A	2	NO	NO	NO	PMCC
<input type="checkbox"/> Replace (distinctive wearing surface only)	YES	YES	D	1	YES	YES	NO	PMCC
<input type="checkbox"/> Reconstruction (standard, includes base)	NO	NO	F	11	NO	NO	YES	SSP
<input type="checkbox"/> Reconstruction (distinctive, includes base)	YES	YES	F	11	YES	YES	YES	SSP
<input type="checkbox"/> New or relocating catch basin	NO	NO	A	6	NO	NO	NO	PMCC
<input type="checkbox"/> Hydrant offset (fenders)	NO	NO	A	6	NO	NO	NO	PMCC
<input type="checkbox"/> Bicycle lane (Class I – separate facility)	YES	NO	F	11	YES	YES	YES	SSP
<input type="checkbox"/> Other _____								

For property located at:

Street Address: _____ Borough/Zip Code: _____
 Block: _____ Lot: _____ Landmark District Name (or, N/A): _____

I have verified with the Landmarks Preservation Commission that this **is/ is not** a Landmarked District (circle one)

Property Owner:

Private Government

Name: _____ Phone #: _____ Fax #: _____
 Street Address: _____ City/State/Zip: _____
 Project Manager/Contact Person: _____ Phone #: _____

I am submitting this application with the Plan Type: _____, Certification Type(s): _____ as required by my project.

Owner or Authorized Representative's Signature: _____

Print Name and Title: _____

ALL SIGNATURES MUST BE ORIGINAL.

Calculation of Fee based on NYCDOT Fee Schedule ^{vi}
 _____ X _____ = \$ _____

Total linear feet of property fronting public street (round to nearest foot) **Current fee per linear foot for Plan Type C, D, E, or F** **Total Fee or Filing Fee (Payable to NYCDOT)**

^{vi} Plan Type Fee Schedule

Plan Type Fee Schedule

A	B	C	D	E	F
No Fee	\$35 Filing Fee	\$2 Per Linear Feet	\$4 Per Linear Feet	\$4 Per Linear Feet	\$8 Per Linear Feet

STATEMENT OF PROFESSIONAL CERTIFICATION

I am _____, a licensed _____ in the State of New York, License No. _____.
(name) (PE, RA, RLA)

I am submitting this application under professional certification. My business address is: _____
My business phone # is: _____

I understand the Department of Transportation may audit this application at its sole discretion.

I certify that:

1. All work shown on Plan No. _____ complies fully with the document "INSTRUCTIONS AND GUIDELINES FOR FILING PLANS AND FOR THE DESIGN OF SIDEWALKS, CURBS, ROADWAYS AND OTHER INFRASTRUCTURE COMPONENTS" (Instruction and Guidelines).
2. I will remove any work constructed under this plan that in the judgement of the DOT, violates any of the provisions of of the Instructions and Guidelines because of a design error.
3. I will revise or repair any as-built work as necessary to the satisfaction of the Department when its design is not full compliance with the Instructions and Guidelines.
4. I will amend or revise the plan or provide additional survey data when, in judgement of the DOT the material I have presented does not meet the DOT's published requirements.

I understand that if I fail to carry out any of the above provisions when required, the DOT may cancel the work permits and/or deny acceptance of the work.

Signature

Seal

Date:

DO NOT ALTER THE CERTIFICATE ITEMS.

**APPENDIX A (SCARA)
PLAN TYPES**

LOG # _____

- A Plan does not have to be to scale. Plan must show property lines, curb lines, sidewalk width and length, encroachments, street furniture.
- B Plan must be to scale: drawing 1" = 30' on 2'x3' (24"x 36") and drawings to DOT standard, including DOT drawing symbols- see Appendix F. Plan must show: block #, lot #, property lines, curb line, sidewalk width and length, encroachments, street furniture.
- C Plan must be to scale: drawing 1" = 30' on 2'x3' (24"x 36") and drawings to DOT standard, including DOT drawings symbols- see Appendix F. Plan must show block #, lot #, property lines, curb line, sidewalk width and length, encroachments, street furniture, driveways and existing and relocated layout of utility lines.
- D Plan must be to scale: drawing 1" = 30' on 2'x3' (24"x 36") and drawings to DOT standard, including DOT drawings symbols- see Appendix F. Plan must show block #, lot #, property lines, curb line, sidewalk width and length, encroachments, street furniture, driveways, drainage details and cross section showing details of the placement and composition of pavers, mortar bed, base, sub-base and method of installation and construction. In addition, photographs that show existing conditions and are clearly labeled, identifying the location from which the photos were taken and the view (north, south, east, west), must be included.
- E Plan must be to scale: drawing 1" = 30' on 2'x3' (24"x 36") and drawings to DOT standard, including DOT drawings symbols- see Appendix F. Plan must show block #, lot #, property lines, curb line, sidewalk width and length, encroachments, street furniture and elevations from curb to first floor/sidewalk, any slope breaks, grades 25' of abutting sidewalk. A topographical survey shall be required and shall include all information required by Appendix C in the manner specified there. A preliminary Design & Investigation report (PDI) shall be submitted if previously required (i.e. by DOT or, other agency).
- F Scale drawing 1" = 30' on 2'x3' (24"x 36") drawings to DOT standard, including DOT drawing symbols- see Appendix F. Plan must show or include the following:
 - 1) PLAN VIEW & PROFILE VIEW- Existing and proposed infrastructure conditions in all streets abutting the property line, existing and proposed sewers, basins and manholes, extent of proposed pavement, sidewalk and curb, existing portions of pavements, sidewalks and curbs, profiles along all sides of the proposed improvement of existing grade, legal grade at the property line, curb line and gutter reveal, widths of sidewalks and roadways, both mapped and existing, property frontage/lot lines for which the builder(s) are making an application, adjoining street elevations and location plan area, including elevations at 25 feet and 50 feet past the project limit lines, street address of project, lot and block numbers, names of streets, avenues, lanes, etc. and with whom title is vested, including all information on non-mapped areas, i.e. Tax maps, rights-of-way, prescriptive streets, easements and in-rem properties, all information required by Appendix D (plan view) and Appendix E (profile view) in the manner specified there.
 - 2) LOCATION MAP- A small-scale map showing the location of the property in relation to the block and the surrounding streets shall be shown. The map shall show the full extent of the block and the alignment of all streets that abut it. The street names shall be shown. The following maps are acceptable for use as a location map: Sanborn map, Tax map, Final Section map, Zoning map (enlarged)
 - 3) TOPOGRAPHICAL SURVEY- A topographical survey shall be required and shall include all information required by Appendix C in the manner specified there.
 - 4) PRELIMINARY DESIGN & INVESTIGATION REPORT- A preliminary design & investigation report (PDI) shall be submitted if previously required (i.e., by DOT or, other agency)

***Note: Some elements of the plan descriptions stated above must be referenced to various DOT and other governmental publications which provide more detailed technical information.**

Plan Type:	A	B	C	D	E	F
Fee Schedule:	No Fee	\$35 Filling Fee	\$2 per Linear Feet	\$4 per Linear Feet	\$4 per Linear Feet	\$8 per Linear Feet

APPENDIX A

CERTIFICATION TYPES

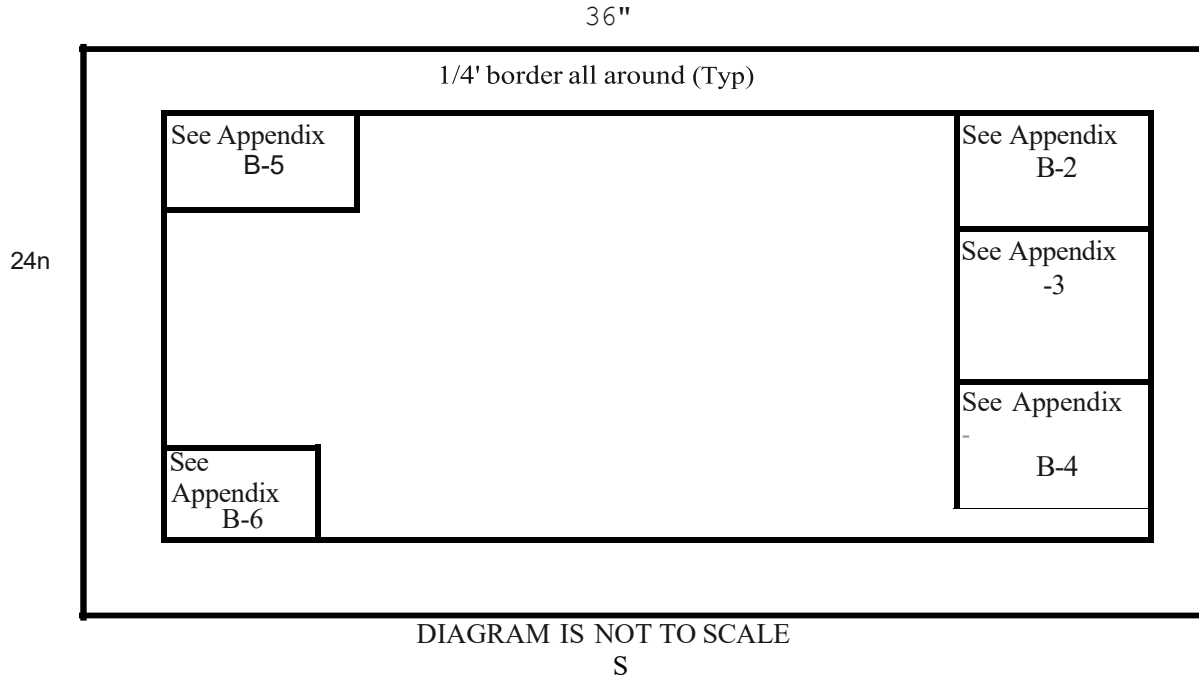
The following is information for specific **Certifications Types** (1 through 11) which are to be put into DOT block format (“boiler plate”) as per appendix B-4 in the DOT publication “*Instructions for Filing Plans and Guidelines for the Design of Sidewalks, Curbs, Roadways and other Infrastructure Components.*” The Certification block shall be included on the plan cover sheet as per appendix B-1. If more than one Certification Type is required by the plan, then all information shall be combined into one certification block (see sample of multiple Certification Type block in Appendix B-4).

These Certification Types are not to be confused with the “**Statement of Professional Certification**” which is page 3 of the “*Sidewalk, Curb and Roadway Application*” (SCARA).

- 1** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade.
- 2** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; Specification of the materials used for the sidewalk assembly and the details of construction shall be according to DOT requirements. For special pavers, a sample of the material, size 8” x10” x 2”, with test results on the appropriate DOT form, may be submitted.
- 3** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; Written approval from utility company received.
- 4** Self certify that: Plan meets or exceeds DOT standards and specifications; ADA standards met.
- 5** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; DOB approval received.
- 6** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; DEP approval received.
- 7** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; DPR approval received.
- 8** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; revocable consent received.
- 9** Self certify that: Plan meets or exceeds DOT standards and specifications; No change in grade; revocable consent received; integrity of existing vault, if any.
- 10** Self certify that: Plan meets or exceeds DOT standards and specifications; ADA standards met; Highway Design approval received; if applicable, DEP approval received.
- 11** Self certify that: Plan meets or exceeds DOT standards and specifications; ADA standards met; Highway Design approval received; approval received from any other Agency and/or utility company, etc., affected.

APPENDIX B-1

Required cover sheet format for all Plan Types
The applicant shall create the cover sheet by pasting down the material that follows in Appendix B1-B5 in exactly the manner shown here:



APPENDIX B-2

Borough:	Sheet _____ of _____
DOB Ref. No.:	DOT Ref. No.:
<p>NEW YORK CITY DEPARTMENT OF TRANSPORTATION PLAN TYPE _____ PROJECT DATA</p>	
Block Zoning Street Address	Lot(s) Zoning Map No.
Owner: Name Address Phone No.	
Plan prepared by: Name Street Address City/State/Zip Phone No.	Seal Signature
DOT requirement waived WAIVERS As per/Date	
1) 2) 3) 4)	

APPENDIX B-3

NOTES

GENERAL REQUIREMENTS

1. ALL DESIGNS, MATERIALS, CONSTRUCTION METHODS AND WORKMANSHIP SHALL COMPLY WITH THE FOLLOWING PUBLICATIONS OF THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT): STANDARD SPECIFICATIONS; STANDARD DETAILS OF CONSTRUCTION; RULES OF THE HIGHWAY OPERATIONS; GUIDELINES FOR THE DESIGN OF INFRASTRUCTURE COMPONENTS.
2. ALL NON STANDARD MATERIALS AND CONSTRUCTION PROCEDURES SHALL BE SPECIFICALLY APPROVED IN WRITING BY DOT.
3. ANY WORK NOT COMPLYING WITH THE REQUIREMENTS OF THE DOT SHALL BE REMOVED AND REPLACED.
4. THIS PLAN SHALL BE VALID FOR THE ISSUANCE OF CONSTRUCTION PERMITS FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL OR SELF-CERTIFICATION, AS APPLICABLE.
5. ALL SIDEWALK AND STREET AREAS CONSTRUCTED UNDER THIS PLAN SHALL REMAIN OPEN TO THE PUBLIC AT ALL TIMES

ISSUANCE OF PERMITS

6. NO SIDEWALK, CURB OR ROADWAY WORK SHALL BE DONE WITHOUT A PERMIT FROM THE DOT. THE CONTRACTOR SHALL HAVE ALL REQUIRED INSURANCE COVERAGE ON FILE.
7. NO WORK ON DRAINAGE STRUCTURES SHALL BE DONE WITHOUT A PERMIT FROM THE BOROUGHS OFFICE OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION
8. ANY VAULT WORK AT THE SITE SHALL BE DONE AS PER THE APPLICABLE RULES OF THE DOT AND THE DEPT. OF BUILDINGS.

CONSTRUCTION ACTIVITY

9. A CONSTRUCTION PLAN SHOWING MAINTENANCE AND PROTECTION OF TRAFFIC, INCLUDING PLACEMENT OF SIDEWALK BRIDGES, BARRIERS AND SIGNAGE SHALL BE SUBMITTED TO THE DOT PERMIT OFFICE BEFORE CONSTRUCTION BEGINS.
10. NO SIDEWALK SHALL BE CLOSED WITHOUT A PERMIT. PEDESTRIAN TRAFFIC SAFETY SHALL BE PROTECTED AT ALL TIMES. ROADWAY CLOSINGS SHALL BE AS DIRECTED.
11. THE SITE SHALL BE MAINTAINED IN A CLEAN AND SAFE CONDITION.

FINAL SIGN-OFF

12. PERMITS SHALL BE PRESENTED FROM ALL PUBLIC AGENCIES AND UTILITIES HAVING OWNERSHIP OF STRUCTURES RELOCATED OR REMOVED DURING CONSTRUCTION
13. ALL PAVEMENT MARKINGS INCLUDING THERMOPLASTIC LANE DIVIDERS REMOVED DURING CONSTRUCTION SHALL BE REPLACED IN KIND TO THE DOT STANDARDS.
14. ALL EXISTING CATCH BASINS ON SITE SHALL BE CLEANED AND MADE OPERABLE
15. ALL DAMAGE CAUSED BY CONSTRUCTION ON THE PROJECT OUTSIDE THE PROJECT LIMITS SHALL BE REPAIRED AS DIRECTED.
16. THE ROADWAY SHALL BE PAVED TO THE REQUIREMENTS OF THE DOT AND AS DIRECTED.

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 1

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE
REQUIREMENTS OF THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT)
AND THAT THIS PLAN MEETS OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS
THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT THERE WILL BE NO CHANGE IN GRADE.

Signature

_____/_____/_____
Date

.....
NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

PROFESSIONAL CERTIFICATION TYPE 2

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE
REQUIREMENTS OF THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT)
AND THAT THIS PLAN MEETS OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS
THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE AND THAT THE
SPECIFICATIONS OF THE MATERIALS USED FOR THE SIDEWALK ASSEMBLY AND THE
DETAILS OF CONSTRUCTION SHALL BE ACCORDING TO NYC DOT REQUIREMENTS.
(FOR SPECIAL PAVERS, A SAMPLE OF THE MATERIAL, SIZE 8'X10'X2, WITH TEST
RESULTS ON THE APPROPRIATE DOT FORM, MAY BE SUBMITTED.)

Signature

_____/_____/_____
Date

.....
NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 3

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE
NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS OR
EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE, AND I HAVE SECURED
WRITTEN APPROVAL TO DO WORK FROM THE APPROPRIATE UTILITY COMPANY (COPY OF
APPROVAL DOCUMENT ATTACHED).

Signature Date / /

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature Date / /

PROFESSIONAL CERTIFICATION TYPE 4

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE
NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS OR
EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT ALL AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS WILL BE
MET.

Signature Date / /

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature Date / /

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 5

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE
NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS OR
EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE AND, I HAVE SECURED WRITTEN
APPROVAL FROM THE NEW YORK CITY DEPARTMENT OF BUILDING (DOB) TO PROCEED WITH THE
PROJECT (COPY OF DOB APPROVAL ATTACHED).

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

PROFESSIONAL CERTIFICATION TYPE 6

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE
NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS OR
EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE AND, I HAVE SECURED WRITTEN
APPROVAL FROM THE NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) TO
PROCEED WITH THE PROJECT (COPY OF DEP APPROVAL ATTACHED).

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 7

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE AND, I HAVE SECURED
WRITTEN APPROVAL FROM THE NEW YORK CITY DEPARTMENT OF PARKS & RECREATION
(DPR) TO PROCEED WITH THE PROJECT (COPY OF DPR APPROVAL ATTACHED).

Signature Date / /

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature Date / /

PROFESSIONAL CERTIFICATION TYPE 8

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE AND, I HAVE SECURED
WRITTEN APPROVAL FROM DOT'S REVOCABLE CONSENT UNIT TO PROCEED WITH THE
PROJECT (COPY OF REVOCABLE CONSENT APPROVAL ATTACHED).

Signature Date / /

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature Date / /

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 9

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE, AND I HAVE SECURED
WRITTEN APPROVAL FROM DOT'S REVOCABLE CONSENT UNIT TO PROCEED WITH THE
PROJECT (COPY OF REVOCABLE CONSENT APPROVAL ATTACHED). IN ADDITION, I CERTIFY
THAT IF A VAULT EXISTS AT THE LOCATION, THE PROPOSED STRUCTURE WILL NOT IN ANY
WAY, DO STRUCTURAL DAMAGE TO THE VAULT.

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

PROFESSIONAL CERTIFICATION TYPE 10

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: I HAVE SECURED WRITTEN APPROVAL FROM THE NEW YORK CITY
DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) AND IF APPLICABLE, DOT'S HIGHWAY
DESIGN TO PROCEED WITH THE PROJECT (COPY OF DEP AND HIGHWAY DESIGN APPROVAL
ATTACHED); AND, ALL AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS WILL BE MET.

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

APPENDIX B-4

**SAMPLE CERTIFICATION BLOCKS (TYPES 1-11, INCLUDING SAMPLE
BLOCK COMBINING CERTIFICATION TYPES 4 & 7)**

PROFESSIONAL CERTIFICATION TYPE 11

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: I HAVE SECURED WRITTEN APPROVAL FROM DOT'S HIGHWAY
DESIGN TO PROCEED WITH THE PROJECT AND ANY AFFECTED NEW YORK CITY AGENCY
AND/OR UTILITY COMPANY (COPY OF ALL APPROPRIATE APPROVALS ATTACHED); AND, ALL
AMERICANS WITH DISABILITIES ACT (ADA) STANDARDS WILL BE MET.

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

PROFESSIONAL CERTIFICATION TYPE 4 & 7

I HEREBY CERTIFY THAT I, A LICENSED _____ AM SUBMITTING THIS PLAN UNDER
(PE,RA,RLA)
PROFESSIONAL CERTIFICATION IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF
THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION (DOT) AND THAT THIS PLAN MEETS
OR EXCEEDS DOT STANDARDS AND SPECIFICATIONS AS THEY RELATE TO THIS PROJECT.

I FURTHER CERTIFY THAT: THERE WILL BE NO CHANGE IN GRADE, ALL AMERICANS WITH
DISABILITIES ACT (ADA) STANDARDS WILL BE MET, AND I HAVE SECURED WRITTEN
APPROVAL FROM THE NEW YORK CITY DEPARTMENT OF PARKS & RECREATION (DPR) TO
PROCEED WITH THE PROJECT (COPY OF DPR APPROVAL ATTACHED).

Signature

_____/_____/_____
Date

NYC DOT APPROVAL NOT REQUIRED
THIS PLAN IS BEING ACCEPTED FOR FILING PURPOSES ONLY

DOT Signature

_____/_____/_____
Date

APPENDIX B-5 & B-6

APPENDIX B-5

DOT APPROVAL OF DESIGN ELEMENTS For self-certified projects only		
<u>Item requiring DOT approval</u>	<u>Approved by</u>	<u>Date</u>

APPENDIX B-6

LIST OF ESTIMATED QUANTITIES	
New Curb _____	Lin. ft.
New Sidewalk _____	Sq. ft.
New Roadway _____	Sq. yds.
New Trees _____	Each
New CBs _____	Each
New DIP _____	Lin. ft.
New Manholes _____	Each

APPENDIX C

REQUIREMENTS FOR PREPARING A TOPOGRAPHICAL SURVEY

- A) The Topographic Survey shall cover the area abutting the site within the public right-of-way from property line to property line, and the area extending 50 feet beyond any mid-block lot lines of the property.
- B) The Topographic Survey shall be referenced by station and offset to a Center Line Baseline of the Mapped Street which has been established/coordinated/tied into existing Borough Monument Lines, in accordance with current Departmental Standards. All elevations shall be referenced to established Borough Bench Marks, or to bench marks set from said Borough Bench Marks, through the use of independent Bench Runs. The reference points including bench marks and turning points for the independent bench runs and all tie-ins to the Center Line baseline shall be clearly documented so that any other surveyor may reestablish them in the future.

The Topographic Survey shall locate all physical features within the project limits needed to produce a comprehensive design, including, but not limited to, the following information:

- a) Established building line lengths, including interior angles.
- b) Established legal grades of all streets.
- c) Legal widths from property line to property line.
- d) Identification of “possession” lines where different from property lines.
- e) Actual widths of all pavements, sidewalks and sidewalk areas.
- f) Identification of all streets, including “paper” streets, by name.
- g) Identification of all plazas, malls and public areas.
- h) Location by station and offset of all roadways, edges of pavements, headers, curbs, curb cuts, pedestrian ramps, sidewalks, driveways, distinctive/special sidewalk areas, bus stops, traffic islands and traffic channelization (permanent and temporary), trees (including caliper and edge distance to existing curb), wooded areas and survey monuments. Existing curbs, sidewalks and pavements shall be identified by condition and type of material.
- i) Location by station and offset, and identification of all street hardware including, but not limited to, valve box cover castings, manhole cover castings, catch basins, inlets, utility chamber covers, gratings and headwalls.
- j) Location, by station and offset, and identification of all sidewalk hardware including but not limited to, coal chutes, oil fills, cellar doors, undersidewalk drains, sidewalk elevators, building sidewalk ventilation gratings, subway ventilation gratings, hydrants (high pressure, low pressure), street lights, traffic signal poles, parking signs, parking meters, traffic control boxes, traffic

APPENDIX C

REQUIREMENTS FOR PREPARING A TOPOGRAPHICAL SURVEY

controllers, traffic detectors, fire call boxes, police call boxes, subway entrances and emergency exits, traffic stanchions, structural columns, monuments, newsstand kiosks, sidewalk retail areas, areaways, decorative fences and railings, steps, walls, stoops, planting areas, railroad gates, trackage and cellar windows at grade.

- k) The probable existence, extent and impact of undersidewalk vaults shall be ascertained through the use of a record search and visual surface inspection. All data shall be incorporated into the Topographic Survey.
 - l) Location, by station and offset, of all columns and abutments for all grade separation structures, pedestrian overpasses, and vehicular/railroad structures.
 - m) Location, by station and offset, of all street encroachments including, but not limited to, hedges, fences, grass areas, retaining walls, rock outcrops, steps and stoops.
 - n) Location, by station and offset, of all surface drainage elements including, but not limited to, swales/ditches, brooks/creeks, streams/channels, water courses, retention areas, headwalls, swamp areas and other drainage structures or appurtenances.
 - o) Location and identification of all abutting tax lots by Lot and Block Numbers (including those encroaching into the mapped right-of-way), as well as existing frontage lengths.
 - p) Location, by station and offset, of all abutting buildings, including identification by house numbers, story height, entranceways, building type and use.
 - q) Direction of traffic, and the location and type of all lane and crosswalk markings, including school crossing markings.
- C) Horizontal locations shall be taken to the nearest tenth (1/10) of a foot.
- D) Vertical locations (elevations) shall be taken to the nearest hundredth (1/100) of a foot longitudinally at 25 foot stations (50' stations of virgin streets and complete reconstructions), as measured along the Center Line Baseline, and at all street intersections (P.T.'s, property lines and centerline of intersecting streets), breaks in grade, building lines at intersections, and other locations required to fully define the existing topography; transversely, elevations shall be taken at the building lines, top and bottom of curbs, center line of street, front and back edges of ribbon sidewalks, and widening line(s), where applicable
- E) Spot elevations shall be taken at all street surface hardware locations, steps/platforms, building entrances, first floors, garage floors, back of sidewalk at all entranceways, ground elevations at building entrances, traffic islands, driveways, parking aprons, intersections (as required), corner (with crosswalk) sidewalk quadrants, storm/combined sewer inverts, at points giving the clearance from the roadway to the underside of overhead structures, Transit Authority ventilator structures and as otherwise required for design.

APPENDIX C

REQUIREMENTS FOR PREPARING A TOPOGRAPHICAL SURVEY

- F) Spot elevations shall be taken at the centerline of all existing trees, as follows: top of curb in front of tree, average root zone elevations nearest curb, top of sidewalk at front edge and at back edge.
- G) Datum Plane and Coordinate System shall be “as in use” by the respective Borough Presidents Office. Where no City coordinate system exists, the surveyor, upon written authorization from DOT, may utilize an independent coordinate system.
- H) All measurements shall be in the United States Standard of Measurements.
- I) Flat or reverse sidewalk pitch at a lot line. When the elevation at the property line is equal to or below that of the top of curb, the survey shall include elevations of the top of curb and property line at 5’ and 10’ beyond the lot line.
- J) Legal Grade for the site shall be based on the grades shown on the final section map on file in the topographic section in the Borough President’s Office.

The Surveyor shall calculate the Legal Grade for the project using the Legal Grades shown on the map and the gradients based on the distances between the grades shown.

The Legal Grades for the site shall be referenced as follows:

<u>Borough</u>	<u>Legal Grade refers to</u>
Manhattan	Top of Curb
Bronx	Top of Curb
Brooklyn	Top of Curb
Staten Island	Top of Curb
Queens	Centerline of street

APPENDIX D

INSTRUCTIONS FOR PREPARING PLAN VIEWS

- A) Each plan view shall depict, to scale, the area within the right-of-way lines plus an area within the owner's property at least 40' deep. The view shall also depict the area adjacent to the owner's property for a distance of 50', or across the intersection, as applicable.
- B) Scale: 1"=20' or larger
 - i) Virgin streets: 1"=30' permitted
- C) The plan view shall present the information about the property frontage and its immediate vicinity collected by the surveyor as per Appendix B of this booklet. This includes the R.O.W. lines, property, possession and lot lines, edges of pavement, sidewalks, planted areas, areas of distinctive pavement, unpaved areas, curb cuts, handicap ramps, steps, stoops, structures, encroachments, street and sidewalk hardware, sewers, trees and other physical features required to accurately depict the site.
- D) The plan view shall also show all proposed installations, including the lines of new sidewalks and curbs and the extent of new pavement. Areas of cut and fill adjacent to the new work shall be shown and the slopes called out.
- E) Within the minimum 40' deep area of the owner's property, the following shall be shown: Building footprints, retaining walls, driveways, parking lots, walkways, stairs, significant slopes, large trees and other items at the R.O.W. line that may impact the installations within the roadway.
- F) Dimensions. All dimensions required to construct the new work and to define the exact location of existing conditions shall be shown, including property line lengths, widths of sidewalk, widths of driveways, widths of streets and paved areas, etc. Dimensions shall be shown correct to two decimal places.
- G) Stationing. Each plan view shall be stationing as follows: A baseline shall be established, generally along the centerline, and key features of the site shall be defined by perpendicular offsets from the centerline to the property line. The stationing of the following points shall be called out on the plan: property/lot lines, PC/PT at corners, and other features of special significance to the design such as points of Legal Grade change, etc. The baselines shall show stations at 50' intervals. All stations shall be accurate to two decimal places.
- H) Vertical elevations.
 - i) Option 1: The plan views shall show the construction grades for all new installations as follows:
 - a) The following grades shall be shown: Property line or back of sidewalk, as applicable/top of curb/bottom of curb/roadway centerline.

APPENDIX D

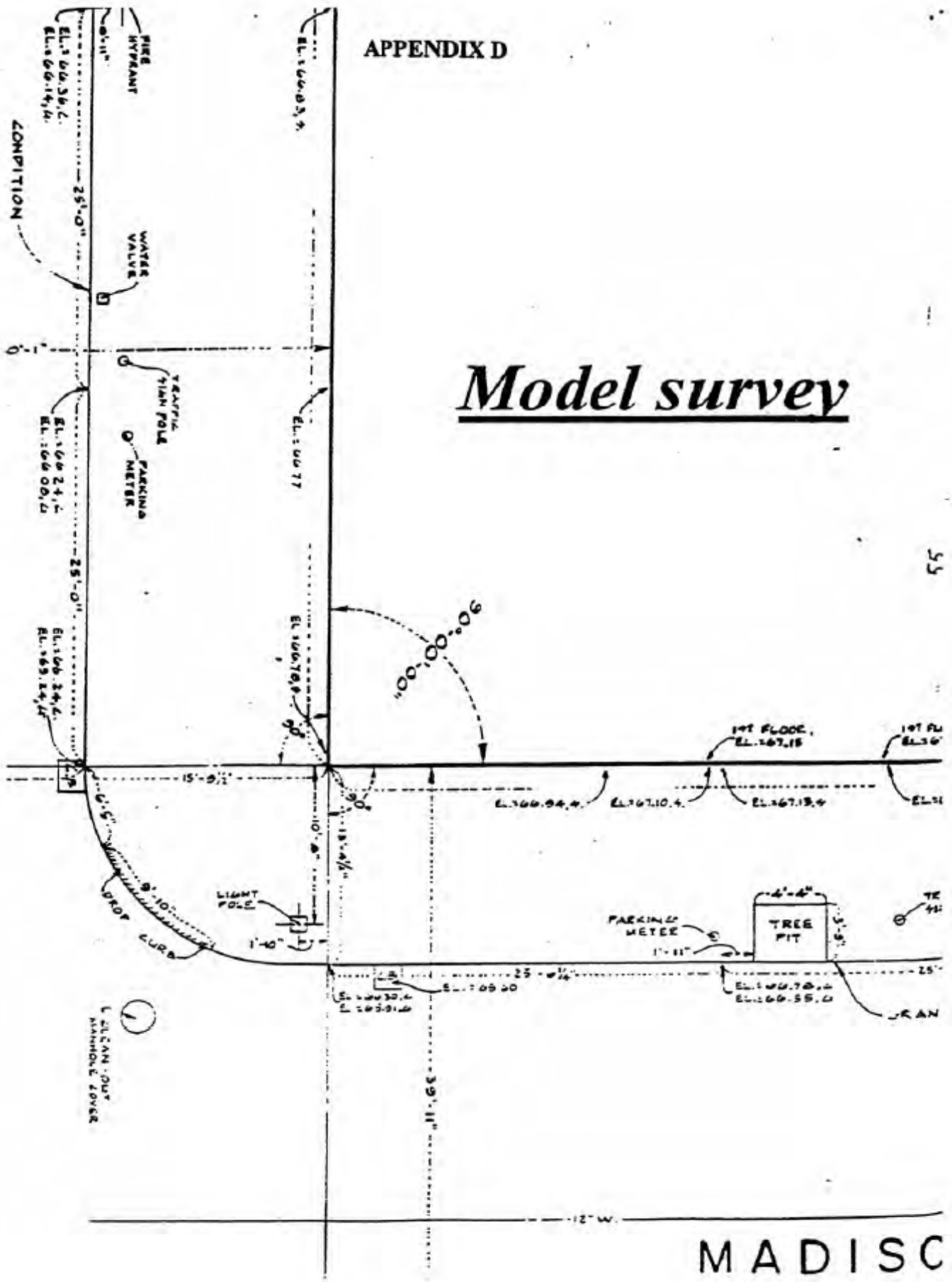
INSTRUCTIONS FOR PREPARING PLAN VIEWS

- b) The design elevations shall be shown correct to two decimal places immediately adjacent to a tick mark indicating the location of the grade.
 - c) The design grades shall be shown only at the following points: Midblock lot lines/breaks in grade/PC-PT. The station of all grade breaks shall be given.
 - d) The station and offset of each elevation shown on the plan shall be apparent from the plan.
- ii) Option 2: To save time and labor, the designer of the plan may elect to omit showing any design elevations on the plan view. Under this option the design grades shall appear only in the profile views. In this case, the profiles shall be prepared in strict accordance with the requirements of Appendix F.
 - iii) Rim/grate and invert elevations of all sewer structures shall be shown on all plan views.
- I) Descriptions and labels of proposed and existing installations
- i) For items depicted using the standard DOT Division of Roadway Engineering symbols, no other written descriptions or labels shall be used.
 - ii) Curbs and sidewalks shall be identified with concise labels only, using abbreviations where applicable (e.g. New conc. Walk, New steel curb, Exist. conc. curb, etc.)
- J) Street status. The legal status of all streets abutting the site shall be described on the plan, based upon information available from the topographic bureau of the Borough President's Office.

APPENDIX D

Model survey

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MADISC

APPENDIX E

INSTRUCTIONS FOR PREPARING PROFILE VIEWS

- A) The profile lines shown below shall be plotted to scale for the cases shown below using the legend shown, for the property frontage and 50' beyond:

i) Roadway paved to full width; existing curb

<u>Existing Elev.</u>	<u>Proposed, if different</u>
-- -- <i>FBC</i> -- -- Bottom of curb	BC ——— <i>PBC</i> ———
-- -- <i>ETC</i> -- -- Top of curb	TC ——— <i>PTC</i> ———
-- -- <i>EPL</i> -- -- Property line	PL ——— <i>PPL</i> ———
••••• <i>EQ</i> ••••• Centerline	

ii) Road not fully paved; no existing curb

<u>Existing Elev.</u>	<u>Proposed, if different</u>
-- -- <i>EP</i> -- -- Edge of pavt.	
-- -- <i>FBC</i> -- -- Elev. at curbline	BC ——— <i>PBC</i> ———
	TC ——— <i>PTC</i> ———
	PL ——— <i>PPL</i> ———
••••• <i>EQ</i> ••••• Centerline	CL ——— <i>PQ</i> ———

iii) Virgin Street

<u>Existing Elev.</u>	<u>Proposed Elev.</u>
••••• <i>EQ</i> ••••• CL	TC (Sl, Bk, Bx) ——— <i>PTC</i> ———
*** ROW *** R.O.W. elevs. of property owned by others abutting new road	CL (Qns) ——— <i>PQ</i> ———

- B) Legal Grade shall be plotted on all profiles as required below.
- C) Format: Quadrille-ruled (graph) paper with light reproducible lines, 10 squares to the inch. Stampat onto Builders Pavement Plan.
- D) Scales
- i) Vertical: 1"=1' or 1"=6", as required for clarity

APPENDIX E

- ii) Horizontal: 1"=20' or larger, as required for clarity
 - a) The horizontal scale for the profile shall preferably be the same as for the plan, but may differ if necessary for clarity
- iii) Virgin streets: Vertical scale 1"=3' permitted

E) Dimensions

- i) The profiles shall be stationing to correspond with the stationing on the plan views.

F) Plotting instructions

- i) Existing elevations shall be plotted to scale at the stations where taken by the surveyor. The stationing shall be shown on the profile view. The numerical values of the elevations, correct to two decimal places, shall be written in the profile as close as possible to the plotted points.
 - a) Existing drop curbs shall be plotted to scale, showing the abrupt transitions of the splays and the extent of dropped curb.
- ii) Proposed elevations. When the new work will be constructed to grades other than those existing, the grades of the new work shall be plotted at the following locations for each profile line:
 - a) Start of new work
 - b) All points of grade change
 - c) End of new work or PC/PT, as applicable

The numerical values of the elevations, correct to two decimal places, shall be written in the profile as close as possible to the plotted points.

- d) Proposed drop curbs shall not be shown in the profile view.

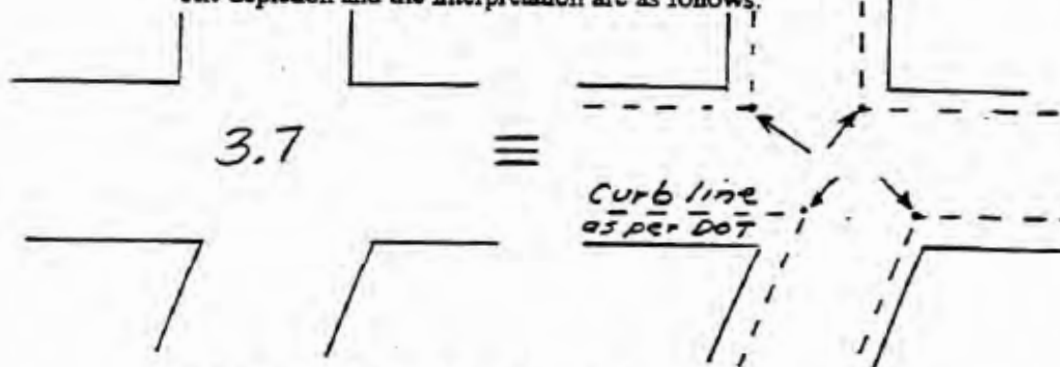
G) Construction grades

- i) The key construction grades on the profiles, whether existing or proposed, shall be identified by underlining and boldfacing the numbers
- ii) The gradient lines between the key construction grades shall be marked with the numerical value of the gradient, correct to four decimal places, to facilitate the setting of intermediate construction grades.

APPENDIX E

H) Plotting Legal Grade

- i) Legal Grade for any project is based on elevations recorded on the City Map, copies of which are on file in the Borough President's Office, Topographical Bureau.
- ii) It shall be the responsibility of the designer preparing the plan to interpret the Legal Grades properly and to depict them on the profile views. The designer shall independently verify any calculations of Legal Grade made by a surveyor.
- iii) In all boroughs, Legal Grades are recorded at the intersections of all streets and, in many cases, at intermediate points along a given block frontage. However, the method of depiction and the interpretation of Legal Grade differ from borough to borough.
- iv) In Manhattan and Staten Island, the interpretation is clear from the City Map, and LG refers to top of curb elevation.
- v) In Brooklyn and the Bronx, the intersection LG is typically shown with a single number in the center of the intersection. The depiction and the interpretation are as follows:



It is the responsibility of the designer to interpolate the LG elevations for the PC and the PT from the PI elevations given by the City Map, using, in most cases, a radius of 12' for the corner. LG refers to top of curb.

APPENDIX E

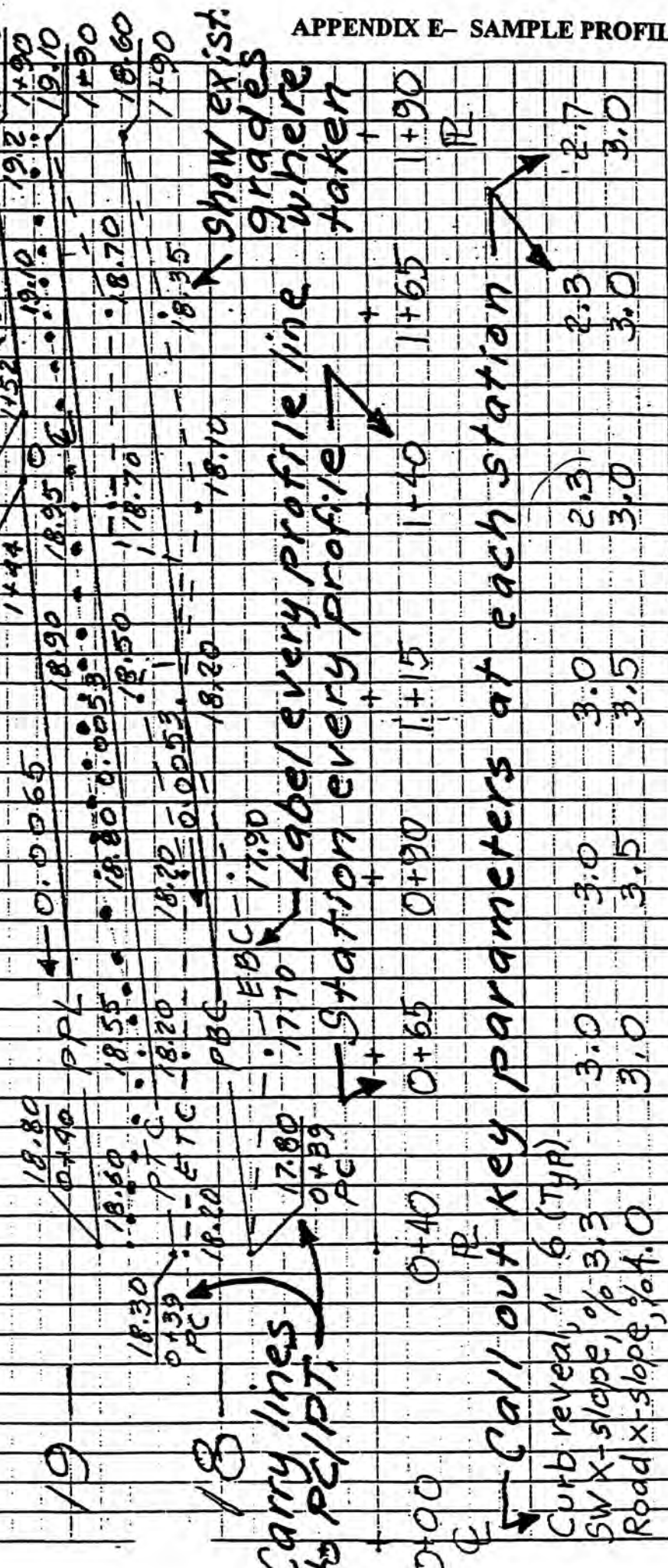
- vi) In Queens, the intersection LG is also typically shown with a single number in the center of the intersection. In this case, however, the LG refers to the point where the centerlines of the two streets intersect, and LG is always referenced to the street centerline unless stated otherwise on the City Map. For Queens projects, the plan designer shall plot the true centerline Legal Grade on the profile. No projections of Legal Grade onto a top of curb shall be shown, and no existing elevations that may have been noted on the City Map shall be plotted. The projection of the centerline LG onto the top of curb will be done by the DOT based on the slope, width and cross-section of the street.

D) Key geometric design parameters











































- i) The following design parameters shall be calculated and shown in table format for each 25' station:
- a) Curb reveal, inches
 - b) Sidewalk cross slope, %
 - c) Roadway cross slope, %
 - 1) Virgin streets: Show key parameters using one typical cross-section only

Use grid paper - 10 squares per inch
 Call out slopes of all proposed grades
 Show prop. grade elevs. only at start & end of run & at each point of grade break
 Show design grades w/underline



































5 of 5




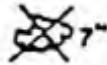
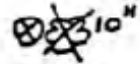















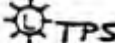
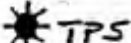







**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>EXISTING</u>	<u>NEW</u>
<u>UTILITY ACCESS COVERS (UAC) (AKA. MANHOLES)</u>		
ELECTRIC	 	 E
TELEPHONE		 T
GAS		 G
WATER (D.W.R.)		 W
FIRE DEPARTMENT		 F
SUBWAY		 R
COMBINED		 C 
UNKNOWN UAC (NO RECORD AVAILABLE)		
STORM SEWER	 ST	 ST
COMBINED SEWER		
SANITARY SEWER	 SAN	 SAN
INTERCEPTOR SEWER	 INT	 INT
<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;">RIM & INVERT REQUIRED (SHOW ON UTILITY PLAN)</div> </div>		
BASINS		
CATCH BASIN WITH HOOD - TYPE 1		
CATCH BASIN WITHOUT HOOD - TYPE 1		
CATCH BASIN WITH HOOD (NO CURB PIECE) - TYPE 2	 ²	 ²
CATCH BASIN WITHOUT HOOD (NO CURB PIECE) - TYPE 2	 ²	
CATCH BASIN WITH HOOD AND WITH CURB PIECE - TYPE 3	 ³	 ³
EXISTING CATCH BASIN TO BE REMOVED		
TO BE ABANDONED	 A	 A
TO BE MODIFIED	 M	 M
TO BE ADJUSTED	 A	 A
NON-STANDARD CATCH BASIN	 N	

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>EXISTING</u>	<u>NEW</u>
NEW CATCH BASIN TO BE CONSTRUCTED IN SAME LOCATION AS OLD BASIN (OLD BASIN TO BE COMPLETELY REMOVED)		
NEW CATCH BASIN USING OLD HARDWARE		
INLET		
SEEPAGE BASIN		
<u>HYDRANTS</u>		
LOW PRESSURE HYDRANT		
HIGH PRESSURE HYDRANT		
LOW PRESSURE HYDRANT TO BE RELOCATED		
HIGH PRESSURE HYDRANT TO BE RELOCATED		
LOW PRESSURE HYDRANT TO BE ADJUSTED (VERTICALLY)		
HIGH PRESSURE HYDRANT TO BE ADJUSTED (VERTICALLY)		
HYDRANT SHUTOFF VALVE BOX		
SIAMESE CONNECTION		
<u>UTILITY VALVES</u>		
GAS VALVE		
WATER VALVE		
STEAM VALVE		
		} DO NO USI
<u>VALVE BOX (INCLUDES VALVE)</u>		
GAS		
WATER		
STEAM		

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>EXISTING</u>	<u>NEW</u>
<u>TREES</u>		
EXISTING TREE TO REMAIN (SIZE AS LABELLED)		
EXISTING TREE TO BE REMOVED		
EXISTING TREE TO BE REMOVED AND REPLACED (SAME LOCATION)		
NEW TREE TO BE PLANTED (SIZE TO BE DETERMINED BY HIGHWAYS, TYPE TO BE DETERMINED BY THE DEPT. OF PARKS AND RECREATION)		
ROCK OUTCROP		
HEDGE (HEIGHT AS LABELLED)		
<u>WOOD UTILITY POLES</u>		
WOOD UTILITY POLE		
WOOD UTILITY POLE WITH STREET LIGHT		
WOOD UTILITY POLE WITH TRAFFIC SIGNAL		
WOOD UTILITY POLE WITH STREET LIGHT AND FIRE ALARM BOX		
<u>STREET METAL LIGHT POLES</u>		
STREET METAL LIGHT POLES		
STREET METAL LIGHT POLE AND TRAFFIC SIGNAL		
STREET METAL LIGHT POLE AND TRAFFIC SIGNAL WITH PEDESTRIAN SIGNAL		
TRAFFIC SIGNAL POST		
TRAFFIC SIGNAL CONTROL BOX		
STANCHION WITH TRAFFIC SIGNAL		
STANCHION WITH PEDESTRIAN SIGNAL		

SYMBOLS TO
CONFORM WITH
BUREAU OF TRAFFIC
LEGEND

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>EXISTING</u>	<u>NEW</u>
MISCELLANEOUS		
VAULT / ELECTRICAL SIDEWALK VAULT		
CELLAR WINDOW GRATING		
SUBWAY GRATING		
ACCESS TO BASEMENT (OPEN AREA)		
CELLAR DOOR		
PIPES-VITRIFIED CLAY PIPE CONNECTION (SIZE & TYPE AS LABELLED)		
SURFACE WATER FLOW		
TRAFFIC DIRECTION		
SURVEY MONUMENT (CITY) - IDENTIFY BY TOPO. NUMBER		
BENCH MARK (LABEL)		
PARKING METER		
FIRE ALARM BOX		
POLICE CALL BOX		
MAIL BOX / TELEPHONE BOOTH		
COLUMN - FOUNDATION (OF ELEVATED STRUCTURES)		
HEADER		
BUS STOP LOCATION		
BUS PAD		
SIGN (GROUND MOUNTED)		
SIGN (OVERHEAD)		
SHAFT TO BUILDING BASEMENT		
PEDESTRIAN RAMP (PLOT TO SCALE)		
NOT IN CONTRACT		

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>DESIGN DRAWING</u>
POSSESSION LINE (SHOW WHEN DIFFERENT FROM PROPERTY LINE)	
PROPERTY LINE (RIGHT-OF-WAY LINE) REPUTED OWNERSHIP OF PRIVATE PROPERTY TO POSSESSION LINE)	
EXISTING CURB (CONCRETE UNLESS OTHERWISE SPECIFIED)	
LOT LINE	
EDGE OF PAVEMENT WITHOUT CURB	
PROPOSED/NEW CURB (LABEL TYPE)	
EXISTING CONCRETE CURB WITH DROP CURB (DRIVEWAY)	<p align="center">SEE PAGES 52 & 53</p>
NEW STEEL FACED CONCRETE CORNER CURB	
LOT NUMBER BLOCK NUMBER	
ESTABLISHED / LEGAL / GRADE -----> MANHATTAN----- + EG-13.7	
PROPOSED CONSTRUCTION (TOP OF CURB) GRADE	
WATER MAIN (SHOW SIZE)	
GAS LINE (SHOW SIZE)	
STEAM (SHOW SIZE)	
ELECTRIC, TELEPHONE, FIRE DEPARTMENT TRAFFIC OR TRANSIT DUCTS (LABEL)	<p>AF - AERIAL FIRE T = UNDERGROUND TELEPHONE</p>
EXISTING 36" STORM WATER SEWER	
EXISTING 36" SANITARY SEWER	
EXISTING 36" COMBINED SEWER	
EXISTING 36" INTERCEPTOR SEWER	
EXISTING CATCH BASIN CONNECTION	
NEW CATCH BASIN CONNECTION (SIZE & TYPE OF MATERIAL)	

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>DESCRIPTION</u>	<u>DESIGN DRAWING</u>
AREA OF ADJUSTMENT (INDICATE LENGTH REQUIRED)	
LIMIT OF NEW PAVEMENT	
BASE LINE AND STATION	
<u>BARRIERS</u>	
BEAM TYPE MALL BARRIER	
PORTABLE PRECAST CONCRETE BARRIER	
CAST IN PLACE CONCRETE BARRIER	
<u>WALLS</u>	
RETAINING WALL	
BRICK BALL	
RAILROAD / TROLLEY TRACKS	
<u>FENCE (SHOW HEIGHT AND TYPE)</u>	
CHAIN LINK FENCE	
IRON PICKET FENCE	
WIRE FENCE	
IRON ON CONCRETE COPING	
WOOD PICKET FENCE	
WOOD	
<u>HOUSE INFORMATION</u>	

SUBSURFACE EXPLORATIONS PROGRAM

- ⊕ APPROXIMATE LOCATION OF 5 FT. DEEP BORINGS
 - ⊙ APPROXIMATE LOCATION OF * FT. DEEP BORINGS FOR DRAINAGE STUDY
- * DEPTH TO BE DETERMINED BY DESIGN ENGINEER
 LOCATIONS OF PROPSD BORINGS ARE SCALED TO CLEAR EXISTING PLOTTED UTILITY LINES
 AND MAY BE ALTERED IN THE FIELD BY THE ENGINEER

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

DESCRIPTION

DESIGN DRAWING

STRUCTURES CROSSING STREETS

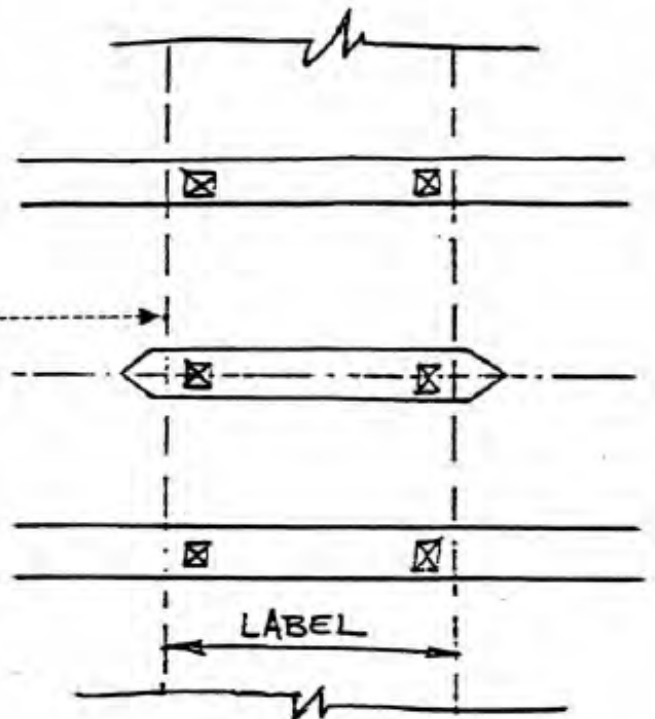
Station beginning & end ----->

Locate & show expansion joints

Identify:

1. Overhead or depressed
2. RR / Highway / etc.
3. Classify structure
4. Columns / foundations, etc.

On Topo. Sheet - Clear distances under structure, typical cross-section, others as necessary. Discuss with project engineer.



HOUSE INFORMATION

GARAGE
ENTR. ELEV.

BUILDINGS WITH
MULTIPLE ENTRANCES/
STORE ENTRANCES

FRAME
GAR.
GE 17.5

FF 17.5

FF 18.2


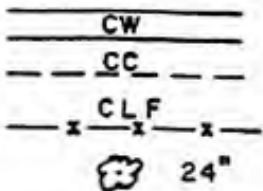
#82-02
3 STY. BRK.
WAREHOUSE

FF 16.3


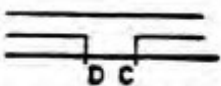
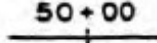

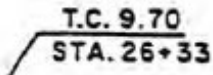
**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

TEMPLATE AND PEN SIZE

The following guidelines are provided in order to attain uniformity of presentation of Preliminary Design & Investigation Report (P.D.I.) and "In-House" drawings.

<u>ITEM DESCRIPTION</u>		<u>TEMPLATE / PEN SIZE</u>
STREET NAME	EMMONS AVENUE	#175 / #2 PE
PROPOSED CURB/EDGE OF PAVEMENT	—————	#2 PE
PROPERTY LINE	—————	#1 PE
FINAL GRADE LINE (PROFILE) (CONSTRUCTION / TOP OF CURB)	—————	#2 PE
LEGAL GRADE LINE	—————	#0 PE
ALL OTHER LINE ON PROFILE	- - - - - - - - - - - - - - -	#00 PE
ALL INFORMATION ON PROFILE (STATIONS, ELEVATIONS...)	22+00 7.54 7.38 7.21	#100 / #00 PE
TITLE BLOCK INFORMATION:		
HIGHWAY CONSTRUCTION PLAN TYPICAL SECTION PROFILE MAINTENANCE OF TRAFFIC (COMBINED) UTILITY PLAN GENERAL NOTES SURVEY CONTROL LIST OF STANDARD DRAWINGS	} HIGHWAY CONSTRUCTION PLAN	} #175 / #2 PE
CATCH BASIN TO MANHOLE CONNECTION		
NOTES: NOTES CONTENTS	<u>NOTES</u> 1. THE LATEST REVISIONS OF	#140 / #1 PE #120 / #0 PE
ITEM NO. (TYP.)		#120 / #1 PE
C.W. (CONCRETE WALK) C.C. (CONCRETE CURB) C.L.F. (CHAIN LINK FENCE) D.C. (DEPRESSED CURB) OAK/24" (TREE/SIZE)		#100 / #00 PE

**APPENDIX F
DOT DESIGN DIRECTIVE 83-S2
STANDARD HIGHWAY SYMBOLS**

<u>ITEM DESCRIPTION</u>		<u>TEMPLATE / PEN SIZE</u>
CORNER ANGLE (86° - 30' 48")	86°-30'-48"	#140 / #1 PEN
HOUSE ADDRESS	95-02 2-STY. FR EF. 25.3	#100 / #00 PEN
ALL UTILITY LEGENDS	(S) (W) (E)	#100 / #00 PEN
ROADWAY / SIDEWALK AREA WIDTH		#100 / #00 PEN
DRIVEWAY (DEPRESSED CURB)		#100 / #00 PEN
MATCH LINE STA. 53+50	MATCH LINE STA. 53+50	#140 / #1 PEN
167.01' (50.90m) (BLOCK LENGTH)	167.01' (50.90m)	#120 / #0 PEN
(BASE LINE / CENTER LINE) STA. 50+00	50+00 	#100 / #00 PEN
ADJUSTMENT AREA		#100 / #00 PEN
BLOCK 8780	BLOCK 8780	#140 / #1 PEN
29 (LOT NO)	<u>29</u>	#140 / #1 PEN
L.G. (LEGAL GRADE)	<u>L.G. 8.01</u>	#120 / #0 PEN
<u>T.C. 9.70</u> STA. 26+33	 <u>T.C. 9.70</u> <u>STA. 26+33</u>	#100 / #00 PEN

GLOSSARY OF HIGHWAY ENGINEERING TERMS

Stationing. This is a method of keeping accurate track of the distance of any point from a reference point, or of the point from any other point. Such information is crucial because, in highway design, distances and grades cannot be approximate or unclear. For instance, a vertical difference of one inch in 30 feet may seem insignificant, but in fact this represents the difference between an acceptable roadway drainage slope and a flat one, where water will not drain, and which is obviously not allowed. The method of stationing is used to assure precise horizontal measurement. It works as follows:

A starting point is arbitrarily chosen (generally, one that makes sense). A straight line (the baseline) is projected from this point in a given direction. Distances are marked off in 100-foot lengths (“stations”), starting from point 0 + 00. The 100-foot mark becomes 1 + 00, the 200-foot mark is 2 + 00, etc. Intermediate points are referenced as, say, 0 + 38.9 (at the 38.9 foot mark), 1 + 79.23 (at the 170.23 foot mark), etc.

When the location of any given point on a project is wanted, it is determined as follows: A line is shot, perpendicular to the baseline, from the baseline to the point. The station at which the perpendicular crosses the baseline, and the length of the offset from the baseline to the point, become the coordinates of the point in question. (When the distance between two points not on the same baseline is wanted, more elaborate calculations may be needed, depending on the geometry of the road alignment.)

One major benefit of using the station system is that it eliminates the need to use architectural dimension line, greatly uncluttering the plan view.

For stationing to be used correctly, it’s essential that the location of every vertical elevation on the plan be specified correctly. This requires that the exact place where the surveyor took every elevation shown on the survey be known. A survey on which the distance between individual surveying shots is not clearly specified, or obvious, cannot be used to prepare a Plan Type F.

Profiles. A profile is a line that represents the elevation of the ground surface in a defined direction. The profiles used in a Plan Type F depict the elevation of the surfaces at the back of the sidewalk (PL), top of curb (TC), bottom of curb (BC), and street centerline (CL). These lines, when plotted on grid paper at a greatly exaggerated scale, permit the Plan Type F examiner to be sure the geometric design of the curb, sidewalk and roadway meets standards. The profiles are a graphic device and are interpreted visually by the examiner, who studies the relationships among the lines to check the various slopes at the site.

For this reason, we require that the various elevations be plotted completely accurately, and that the accuracy be easy to verify. This is the reason we insist on grid paper, which is designed for easy plotting and checking. Careless plotting distorts the shape of the profile, leading the examiner to make erroneous decisions about the acceptability or safety of a design. Since these decisions affect the liability of the City in case of an accident, properly drawn profiles are crucially important to us.

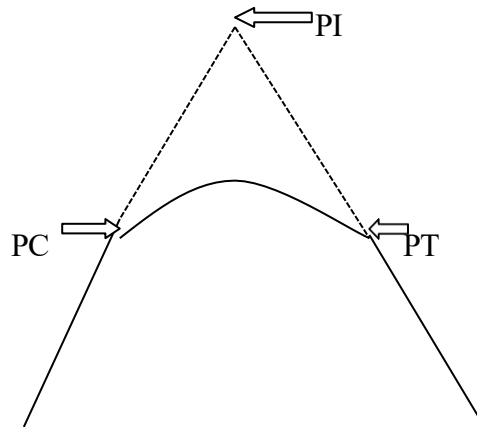
Plotting the profiles is not difficult once the concept is understood. To facilitate the construction of profiles, grid paper is commonly used. This has horizontal and vertical lines in pale green, blue or orange, so spaced as to represent certain distances in the horizontal and vertical scales. Paper divided into one-inch squares by fairly heavy.

GLOSSARY OF HIGHWAY ENGINEERING TERMS

lines is common. The spaces between two such horizontal and vertical lines are divided into 10 equal parts by lighter lines. To accentuate the differences of elevation, the space between two horizontal lines is considered as equivalent to 0.1 feet or 0.05 feet, and the space between two heavy vertical lines is considered as equivalent to 8, 10, 16 or 20 feet, according to the total difference of elevation, the amount of vertical exaggeration desired, the length of the line, and the requirements of the work.

The elevation of some convenient horizontal line is assumed, and one of the vertical lines is taken as station 0 + 00. As the elevation or station of each printed line is known, the points on the ground surface can be plotted easily. When these points are connected with a smooth line, an accurate representation of the ground surface should result.

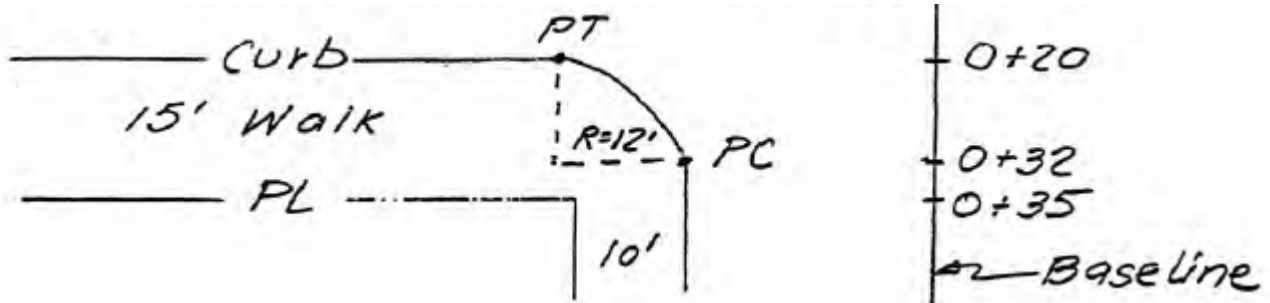
PC, PT, and PI. These are concepts from surveying used to lay out a line that includes a curve. PC means “point of curvature” and is used to mark the station at which the straight line changes to a curve. PT means “point of tangency” and refers to the station at which the curve changes back to a straight (tangent) line. PI means “point of intersection” and refers to the imaginary point where the straight line entering the curve and the straight line leaving the curve would intersect if they were projected, i.e.:



In general, working with curved lines requires use of analytical coordinate geometry, and sometimes even calculus, to calculate the correct station of the various points of interest. In SCARA plans, however, the PC-PT concept is used almost exclusively with reference to corners, and requires little calculation.

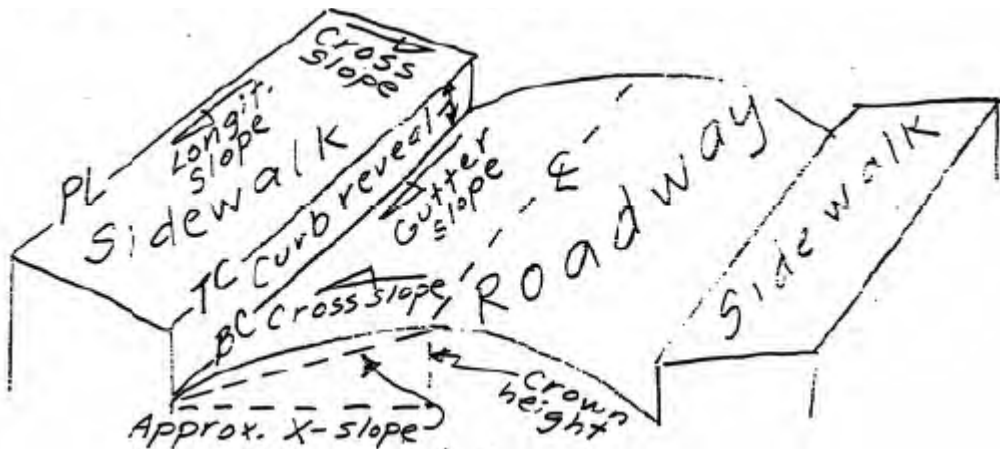
APPENDIX G

For most corners, a 12' radius (corner curved piece) is used. In such cases, the station of the PC will therefore be 12' from the station that marks the intersection of the intervening curb line, i.e.:



If a smaller curb radius is being used, the station of the PC will be closer to the station of the intersecting curb line.

Roadway cross section, roadway cross slope. These terms refer to the method of constructing a roadway, so the water drains quickly away from the riding portion to the gutters. This is one of a number of safety parameters the SCARA Plan is designed to illuminate through the profiles. It's instructive to look at the three-dimensional projection of the profiles to understand the safety issues the SCA.RA Plan addresses. The profile lines define the intersection of a number of planes spaces, as follows:



Our procedures require you to check the parameters shown above along the full frontage of your property. The roadway cross slope is probably the least familiar. City streets are built to a parabolic shape, and it's quite complicated to calculate the cross slope exactly. The Permit Management Office uses the simple approximation shown above. Whenever a roadway is depicted in a cross section, however, it should be shown with a parabolic shape.

APPENDIX H

HOW TO SET YOUR TOP OF CURB ELEVATIONS: A DISCUSSION

Row deep should I make my curb?

Where should I set my top of curb elevation?

These two related questions can be one of the hardest issues a plan designer has to wrestle with. The short, simple answer is that your curb should be between four and seven inches deep. From a pedestrian and traffic safety point of view, the closer to 7" the better. And when you're building a brand new street, or doing a major curb-to-curb reconstruction project from the ground up, you can and should make the curb 7" everywhere.

But the reality of designing smaller projects in New York City can be much more complex. In some cases, you won't be able to achieve even a 4" curb. In some cases your curb may end up being just 1" deep. Before you start your design, look at all the following:

- 1) How high is the existing curb?
- 2) How does your existing top of curb elevation relate to the TC across the street?
- 3) What's the extent of your project?
- 4) Was the existing curb installed by the City under a reconstruction project?
- 5) What's the general infrastructure like in your immediate neighborhood? Is it fully developed? Or is it an area that's just now being built up?
- 6) How high is the curb reveal in the immediate neighborhood? Is it consistent?
- 7) What's the underlying topography of the land like? Is your Street built on the side of a slope such that the buildings directly across the street are all at a generally higher or lower elevation than on your side?
- 8) What's the existing roadway geometry like across the full width of the street?
- 9) What is the Legal Grade?

One thing you should not do. Don't think you can set your top of curb elevation to accommodate the first-floor elevation of your building. It works the other way around. Your top of curb elevation must be set based on the infrastructure. Your building first floor elevation should be determined after you have set the right top of curb,

Let's look at each issue one by one. In all cases, keep in mind that good design usually calls for a straight top of curb profile across your site, with breaks in grade only where the ground topography changes.

- 1) How high is the existing curb?

This information comes from your survey, and it's the place to start your design. Is the reveal consistent across your site? Be sure you're not misled by any existing curb cuts along your frontage. If the surveyor happens to take a surveying shot at an existing curb cut, you may be deceived into thinking your curb reveal is much shallower than it really is. When a surveying shot occurs at a drop curb, you should go to the site and measure the curb reveal on either side of the drop curb.

- 2) How does your TC relate to the TC directly across the street?

If the existing top of curb elevation directly across the street from you is within an inch or so of your existing top of curb, and the existing infrastructure is in decent shape, you have a

APPENDIX H

very desirable roadway symmetry that should be retained. A symmetrical roadway cross section is always easier to work with from a roadway design point of view, especially when the DOT rehabilitates roads using the method known as "engineered resurfacing." In general, you should not set a TC elevation so that it damages any existing symmetry.

3) What's the extent of your project?

If it's 40' or less, things become fairly simple. In general, with a project of limited frontage, especially in a built-up area, the curb reveal will be dictated by the curb height at either end of your lot. One complication may occur if you have a dropped curb at the lot line. In such a case, of course, you must meet the existing driveway without any trip hazard. But the curb reveal immediately before the driveway should match the full-height reveal immediately beyond the driveway on the neighbor's property.

As a general rule, except in undeveloped or deteriorated areas, you should not raise or lower your top of curb immediately adjacent to your lot lines simply to achieve what you believe is some "correct" curb height. Whenever you raise a curb top, you're simultaneously raising the entire sidewalk slab, and that can have a significant effect on pedestrians.

4) Was the existing curb built by the City under a major reconstruction project? If it was, you should probably retain the existing top of curb elevations.

5) What's the infrastructure like in your neighborhood?

In many parts of New York, the existing streets and sidewalks were designed with great skill and intelligence by the city's municipal engineers. In other parts of the city, the infrastructure has deteriorated, or was installed piecemeal by private developers without much engineering oversight... 'When you have a project in a neighborhood that was properly designed and maintained, you should generally put the new curb in to the existing elevations.

(If the curb is very shallow, it's almost always because of repeated resurfacings. There can be a surprising thickness of extra asphalt on some streets.) The trick is to recognize whether the infrastructure has been designed and kept up properly. Walk the adjacent blocks and look at the curbs and sidewalks. Look at the roadway crown and curb reveals. Is the work consistent? Does it seem to fit effortlessly? Does it provide you with a smooth, safe passage?

6) How high is the curb reveal in your immediate neighborhood? Is it consistent?

In fully built-up neighborhoods, if the curb reveal is consistent, your new curb should probably be set to that height - even if it's very shallow. (First, however, investigate lowering the pavement to increase the reveal - see below.) On many streets on the Upper East Side of Manhattan, for instance, the existing curbs are all 2" high. This is not desirable from a safety point of view, but it would be a serious error to try and design a 6" curb in such a neighborhood. In fact, -on some streets on the East Side the existing curbs are all 1" deep. Again, that's often what a new curb in such a neighborhood should be. (One exception: If there's a significant ponding problem.) But in a neighborhood that is currently being redeveloped, as in parts of the Bronx, for instance, where the infrastructure has deteriorated, matching an existing 1" reveal probably would not be appropriate.

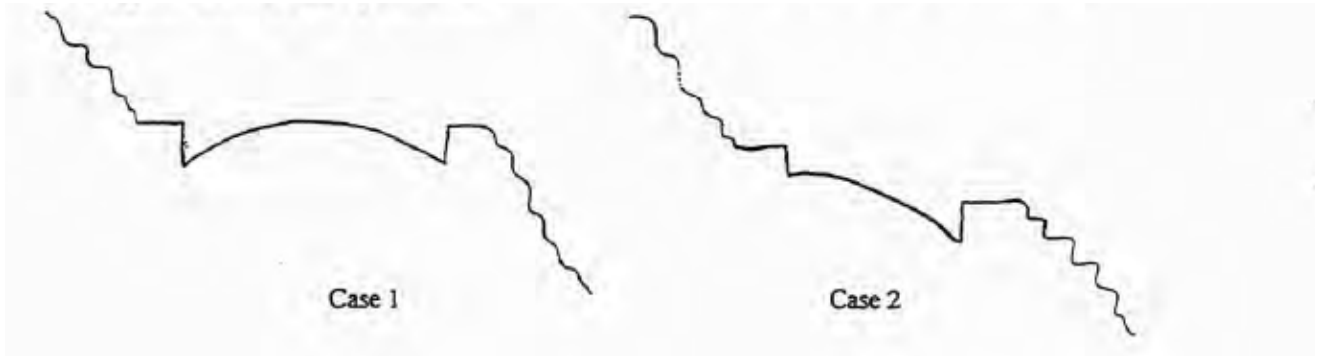
Before being forced to accept a substandard reveal, however, see whether you can drop the pavement. This is a process involving very precise design calculations. But it can only be done if the roadway has more than a 1% longitudinal slope, and if the cross-slope is not too steep.

7) What's the existing topography of the land like?

If the underlying street bed is flat in the transverse direction (looking across the street), the top of curb elevations should ideally be the same on each side of the street.

APPENDIX H

If the land is sloping in the transverse direction, you must look at how the street was designed. There are two possibilities:

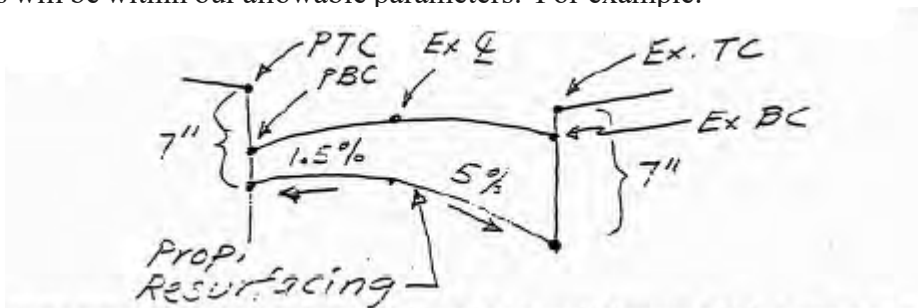


In Case 1, a symmetrical street bed has been carved out of the sloping hillside. In this case, the top of curb elevations should ideally be the same on both sides of the street.

In case 2, a non-symmetric street bed has been designed, with one top of curb at a significantly different elevation from the opposite top of curb. This type of case complicates the roadway design. In general, no top of curb elevation should be set that increases the imbalance between the two sides.

8) What is the existing geometry of the street?

No curb should be designed without looking at the curb reveal across the street and the roadway cross slope on each side of the street. If the cross slope on your side is inadequate, you may be required to deal with that, and it may affect your curb reveal. In general, you don't want to design a sizeable curb reveal on your side if the one across the street is very substandard. The point is to avoid designing a curb that will cause problems when the DOT removes the old asphalt and resurfaces the roadway. One very good way to check a proposed design is as follows: In section, draw in your proposed top and bottom of curb, the existing centerline elevation, and the existing top and bottom of curb directly across the street. Now, imagine that each curb will be 7" deep, and draw in a roadway surface to accommodate these curbs. Check that the resulting cross slopes will be within our allowable parameters. For example:



In this example, the proposed design would not be acceptable because, with it, a proper cross section could not be achieved if the DOT resurfaced the street.

9) What is the Legal Grade?

If the Legal Grade at the site is within inches of the existing top of curb elevations, you must discuss the matter with your plan examiner. If LG is further away, and you're in a built-up area, LG will usually not be a factor in your design.

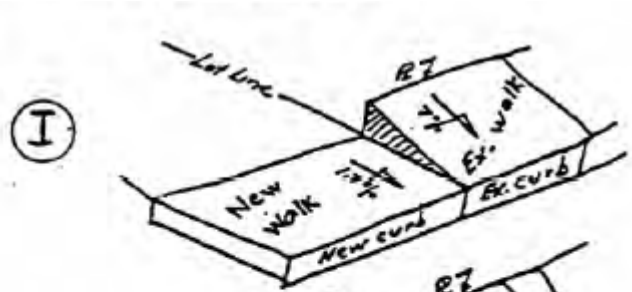
APPENDIX I

COMMON ERRORS AND PROBLEMS IN DESIGN PLANS

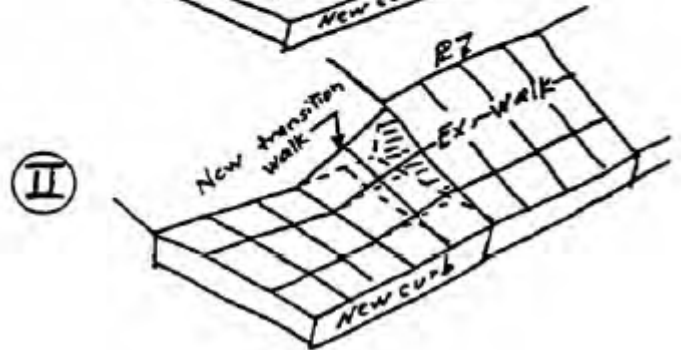
Matching existing elevations at the lot line

General rule: All new work shall meet the existing adjacent conditions at a midblock lot line in a flush, smooth and safe manner. Common difficult situations are illustrated below:

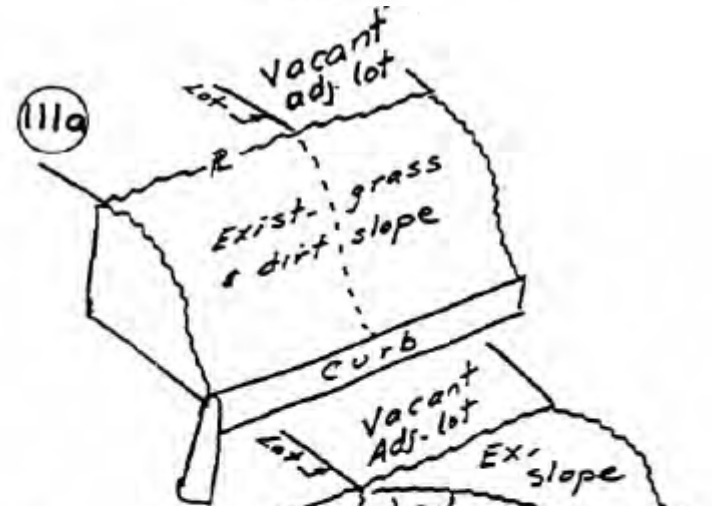
- I Failure to mitigate an existing substandard slope; applicant creates an unacceptable transition



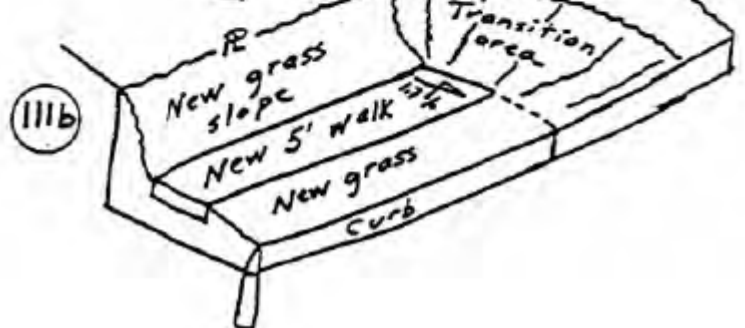
- II Transition slope is provided but slope of new work is too steep



- IIIa Problem:
Existing very high lot line in a residential area; no existing walk cross slope from PL to TC will seemingly be too steep.

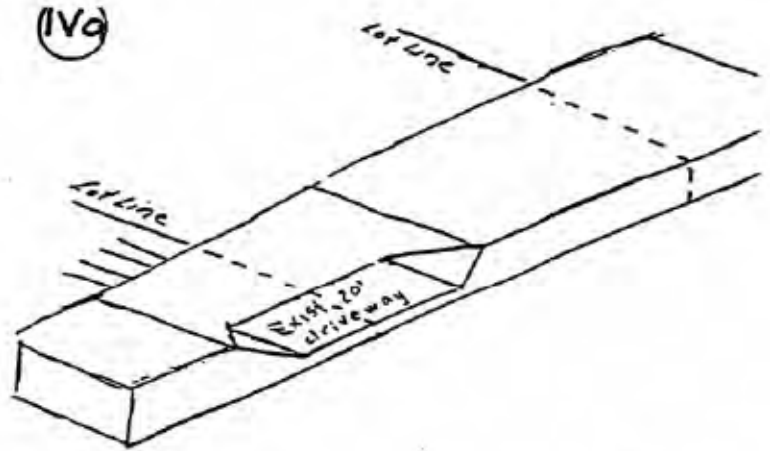


- IIIb Correction solution:
New ribbon walk is laid with a mild slope; the steep transition to the high PL is achieved in the grass area.

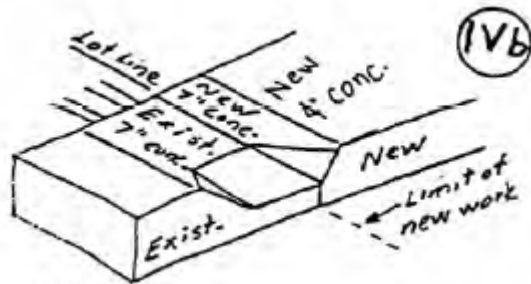


APPENDIX I

- IVa Problem
There is an existing shared driveway at the lot line; applicant plans to eliminate drop curb on his side.

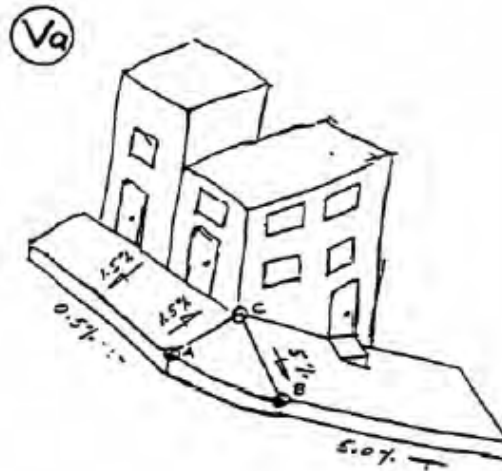


- IVb Correct solution:
Applicant provides a new splay at his lot line and an area of 7" concrete immediately adjacent, to create a proper edge for the neighbor's driveway. Dropped curb on applicant's property is eliminated.

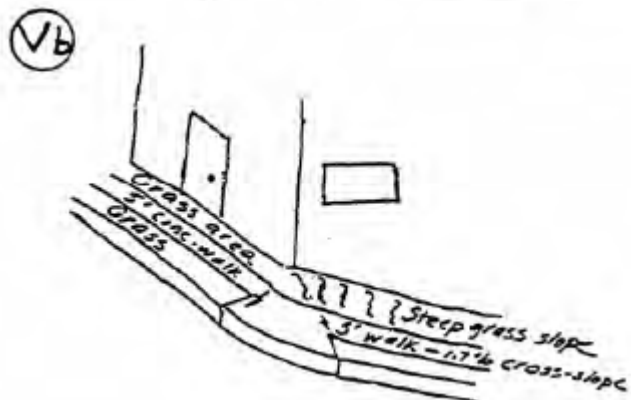


Dealing with a steep drop around a corner

- Va A corner site with a full width sidewalk sits on a hillside such that points A and B on the sketch are at significantly different levels. In such a case, point C may be set such that there is minimal back-pitch along line A-C, provided that the slope of B-C is at a maximum.



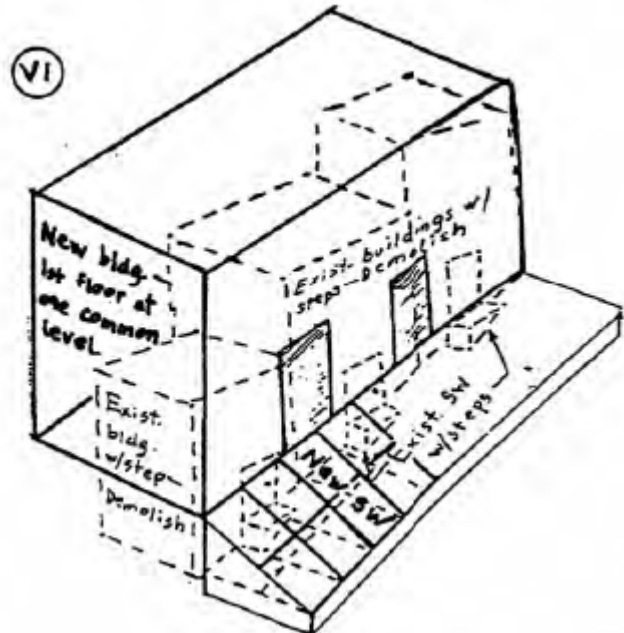
- Vb Same corner, but in a residential zone with a ribbon sidewalk. Here, the grass area along the building line can be used to take up the steepness of the drop, as in IIIb above. All sidewalks can be set with a mild positive cross-slope.



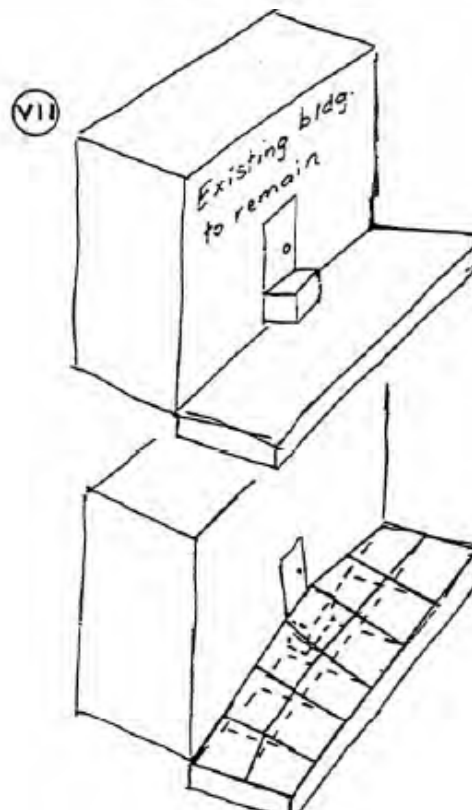
Providing flush access to a building APPENDIX I

General rule: The applicant must balance the requirement to make his building handicapped accessible with the constraints imposed by the underlying topography. In areas with steep slopes, buildings must always be designed and altered so their floors and entrances are compatible with the existing infrastructure.

- VI Design Error:
Applicant proposes to demolish three existing buildings with steps and replace them with one long building with a single floor at one convenient level: he proposes raising the sidewalk for full flush access.



- VII Design Error:
Applicant altering existing building proposes to eliminate existing 6" step by raising the back of sidewalk to provide flush access.

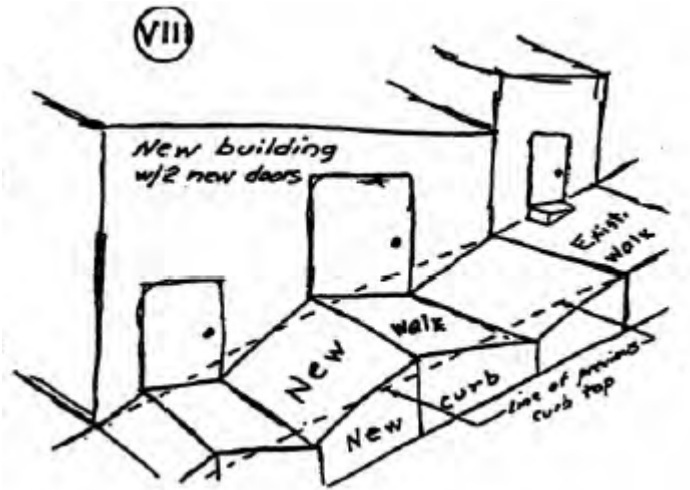


In all such cases where an applicant proposes altering the existing sidewalk grades, a detailed study of the impact on pedestrians must be made. In general, only slight changes in existing grades are permitted.

APPENDIX I

- (VIII) Design Error:
Applicant seeks to provide flattened access at two new doors, without creating a steep sidewalk cross-slope, by using breaks in the curb grade to produce a ramp-platform effect.

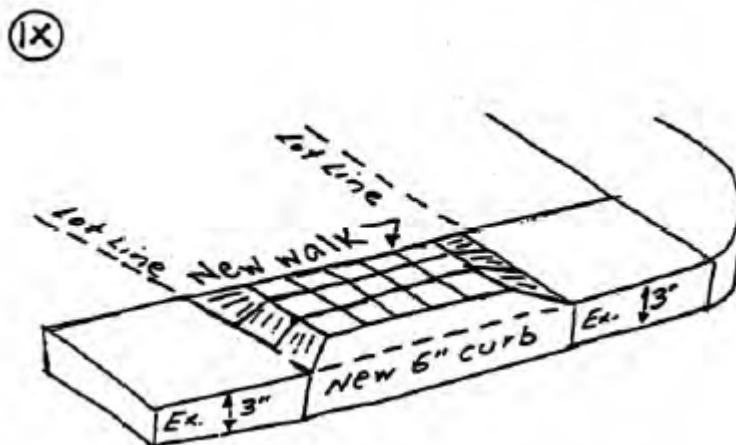
General rule: Arbitrary breaks in curb or sidewalk grade are not permitted. Abrupt transitions from flattened sidewalk areas to sloping areas are not permitted.



Matching the top of curb with the existing infrastructure

General Rule: The proposed top of curb should always be consistent with the existing adjacent infrastructure. This topic is fully discussed in Appendix K.

- (IX) A common design mistake, caused by a belief that a new curb should always have some specific reveal.



**NEW YORK CITY
DEPARTMENT OF TRANSPORTATION
BUREAU OF PERMIT MANAGEMENT AND
CONSTRUCTION CONTROL**

DISTINCTIVE SIDEWALK

GENERAL INFORMATION: The New York City Department of Transportation (DOT) will permit a property owner (owner) to install a distinctive sidewalk fronting their property provided that the following criteria are met:

- The owner (or designated representative) submits the required DOT filings and applicable fee to DOT as specified below
- The Public Design Commission approves the design
- The owner complies with the insurance requirements as per the *Distinctive Sidewalk Improvement Maintenance Agreement* (Agreement)
- The proposed material meets certain physical requirements as specified below

DEFINITION: A distinctive sidewalk is any sidewalk that is not:

- Standard concrete/standard color
- Scored in panels of 5' x 5'
- Built with joints perpendicular and parallel to the curb

REQUIRED FILINGS & FEES: The property owner must engage an architect, engineer, surveyor or landscape architect licensed by New York State to process the request. The licensed professional must file the following applications and plans following the guidelines and procedures established by, and available from, the New York City Department of Transportation:

- *The Sidewalk, Curb & Roadway Application* (SCARA)
- The correct Plan Type based on SCARA
- The *Distinctive Sidewalk Paving Material & Test Report Form*- see Attachment 1

Additionally, the owner (or designated representative) must file with DOT:

- The *Distinctive Sidewalk Improvement Maintenance Agreement* (Agreement)
- The current filing fee based on the linear feet of the proposed distinctive sidewalk
- All filings & fees shall be submitted to:

New York City Department of Transportation
Bureau of Permit Management & Construction Control
55 Water St, Concourse Level
New York, NY 10041
Attn: Distinctive Sidewalk/Plan Examination

TECHNICAL REQUIREMENTS:

- For Paving Stones, Bricks, etc.:
 - * Minimum thickness 2"
 - * Substrate 4"/7" concrete on 6" cinder/gravel base
 - * Setting bed and joint treatment: DOT approval required
 - * Finish: Slip-resistant- see below and Attachment 2
 - * Physical characteristics- see Attachment 3

- For Distinctive Scored or Colored Concrete:
 - * Color or other additives: DOT approval required
 - * Finish: Wood float or light broom
 - * Panel separators: DOT approval required

PUBLIC DESIGN COMMISSION APPROVAL: DOT will submit plans to the Public Design Commission for approval. No plans will receive final DOT approval without the approval of the Public Design Commission.

A. DOT Design Review and Pre-Application

1. Prospective applicants will be instructed to contact DOT's Director of Design Review (DDR), who is the liaison to the PDC. The DDR will advise the applicant to review DOT's Street Design Manual that includes the current materials palette and is available on DOT's website. The DDR will also review with the applicant the on-line PDC guidelines, which generally discourage the installation of distinctive sidewalks and endorse the use of consistent materials on most streets. Designs for distinctive sidewalks that are part of new building construction projects will be referred to and coordinated with the staff of the New York City Department of Buildings.

2. In order to be considered for a distinctive sidewalk, an application must meet one of these criteria:
 - (a) encompass an entire block; pertain to a streetscape project;
 - (b) relate to a landmark designated by the New York City Landmarks Preservation Commission (LPC); or
 - (c) feature a design integral to a building or open space that significantly enhances the public realm.

Applications that do not meet these criteria will not advance to the PDC for conceptual review and the DDR will notify the applicants of this determination in writing.

3. Upon review of an application that satisfies one of the above referenced criteria, the DDR will arrange a pre-application meeting with the applicant to review the design for context and site appropriateness, consistency with neighboring street materials and treatments, and overall design suitability. If the proposal is not consistent with DOT's Street Design Manual, does not meet the PDC guidelines, or does not exhibit satisfactory design integrity as outlined above, the DDR may request revisions and design alternatives.
4. If the application meets the aforementioned guidelines, the applicant will be notified in writing by the DDR that DOT has accepted the distinctive sidewalk application for PDC conceptual review.

B. PDC Conceptual Review

1. Upon notification that DOT has accepted the application for PDC conceptual review, the applicant will coordinate with the DDR to prepare a formal proposal to the PDC for conceptual review in accordance with the PDC guidelines.
2. Applicants who are granted conceptual approval may have to address and/or incorporate comments made by the PDC into their proposed design. Accordingly, the applicant will work with the DDR to execute any necessary changes to the proposed design.
3. If the PDC denies conceptual approval, the project will not move forward to Sidewalk, Curb and Roadway Application (SCARA) review.

C. Sidewalk, Curb and Roadway Application (SCARA) Review

1. If conceptual approval is granted by the PDC, the DDR will notify DOT's Office of Construction Mitigation and Coordination, Street Pavement Section (OCMC) in writing of such approval and will instruct the applicant to prepare and submit a SCARA to OCMC.
2. OCMC will review the application and notify the DDR in writing of its determination.
3. The DDR will notify the applicant in writing of OCMC's approval of the SCARA. The applicant must execute and comply with the current version of DOT's Distinctive Sidewalk Improvement Maintenance Agreement (DSIM Agreement) before DOT grants its final approval.

4. Upon receipt of the SCARA approval, the applicant will be instructed by the DDR to resubmit the application to the PDC for preliminary and final review.

D. PDC Preliminary and Final Review

5. The applicant will submit a copy of the SCARA approval along with the requisite PDC submission materials.
6. The applicant will coordinate with the DDR to execute any necessary changes to the proposed design resulting from PDC staff-level and committee reviews and as requested by the PDC at its public meeting/hearing.
7. If the application receives final PDC approval and certification, the DDR will notify OCMC in writing and instruct the applicant to obtain all necessary permits and approvals, including but not limited to DOT construction permits.

E. Applications Involving Revocable Consents

1. If the applicant proposes to install an aboveground or underground structure in addition to the distinctive sidewalk, the DDR will refer the application to the DOT Division of Franchises, Concessions and Consents (FCC) before it is accepted for PDC conceptual review. The applicant may be instructed to submit a petition for a revocable consent as set forth in Title 34, Chapter 7 of the Rules of the City of New York.
2. Distinctive sidewalks and revocable consents are subject to different requirements and separate review procedures. However, all presentations to the PDC (conceptual, preliminary, and final) must include both types of proposed streetscape element. The DDR and FCC will coordinate to ensure that both sets of requirements are met before submission to PDC.
3. The revocable consent will not be granted by FCC until the applicant's SCARA is approved and the application receives final PDC approval and certification.

LEGAL AGREEMENT: The property owner (or designated representative) must sign four copies of the current version of DOT's *Distinctive Sidewalk Improvement Maintenance Agreement* (Agreement) before DOT will accept the plan. The Agreement shall not be altered or retyped.

PROCESSING THE AGREEMENT: After all the copies of the Agreement are co-signed by DOT, one copy will be returned to the owner. This copy must be filed and indexed with the City Register or County Clerk for the borough where the property is

located. Upon presentation of proof of filing, the finished sidewalk will be inspected by DOT for compliance with the accepted plan. After the new sidewalk passes DOT inspection, a copy of the Agreement containing DOT's approval will be given to the property owner.

If the new sidewalk fails to comply with the DOT accepted plan, the owner must have the non-complying work repaired or removed and replaced correctly before DOT will acknowledge final acceptance.

INSURANCE: The property owner must comply with the requirements of Section 12 of the legal Agreement before the plan will be accepted. A sample certificate of insurance is attached for reference- see Attachment 4.

SLIP RESISTANCE: All materials used for distinctive sidewalks shall comply with the recommendations for slip resistance of the United States Architectural & Transportation Barriers Compliance Board, issued in conjunction with the passage of the Americans with Disabilities Act (ADA). These recommendations call for a coefficient of static friction of 0.6 for level areas and 0.8 for ramps.

To demonstrate compliance, the applicant shall submit test results from a licensed testing laboratory. The laboratory may use the NBS-Brungraber Tester or the Horizontal Pull Slipmeter, as described in the Compliance Board publication "Slip Resistant Surfaces Advisory Guidelines"- see Attachment 2. Or the laboratory may use the American Society for Testing and Materials (ASTM) Test C1028. In all cases, the proposed paving material must be tested under both wet and dry conditions using both Neolite and leather (ASTM standard) soles.

If the material fails the required test, the surface may be altered to increase slip resistance. The altered material must be re-tested and the new test results must be submitted.

SAMPLE: In some cases, the applicant may be required to submit an original sample size or a minimum sample size of about 8" X 10" with 2" thickness. This determination shall be made by DOT on a case by case basis.

BOILERPLATE: The following note should be completed and put on the plan:

Repairs and Maintenance of the sidewalks to be constructed with the following distinctive materials (), bounding the property with street address () shall be in accordance with the Distinctive Sidewalk Improvement Maintenance Agreement signed on date () and filed with the Department of Transportation, Bureau of Permit Management and Construction Control and all other Applicable Agreements between the City of New York and the owners.

**New York City
Department of Transportation**

**Distinctive Sidewalk Paving Material
& Test Report Form**

Applicant's Name: _____

Job Location: _____

Plan #: _____ Block #: _____ Lot #: _____

Sample Type: _____

Sample Finish: _____

Sample Size: _____

Source: _____

Date Sample Submitted: _____ Date Tested: _____

TEST REPORT

Slip Resistance or Coefficient of Static Friction		Crushing Strength (psi) ASTM	Breaking Strength (psi) ASTM	Abrasion Resistance ASTM
Dry Condition	Wet Condition			

The above test results comply fully with the Special Street Pavement requirements of the New York City
Department of Transportation¹

Date

Signature (P.E., R.A., L.S., or R.L.A.)

Seal



¹ Note: A Manufacturer's Certificate or Test Report from a Licensed Testing Laboratory shall be submitted to demonstrate compliance.

HOW IS SLIP RESISTANCE MEASURED? From “*Slip Resistant Advisory Guidelines*”

A variety of devices are available for measuring slip resistance. In a recent study conducted at The Pennsylvania State University three slip resistance testers– the NBS- Brungraber Tester, the Horizontal Pull Slipmeter, and the PTI (Pennsylvania Transportation Institute) Drag Sled Tester -- were evaluated. All three devices are portable and easy to use. The following major criteria were applied in the evaluation study:

Relevance- The measuring results should correlate in a known and constant manner with human perception of the surface slipperiness.

Versatility- Accurate measurements of slip resistance must be possible on various types of surfaces (smooth, rough, level, inclined) and under diverse conditions (wetness, contaminated).

Sensitivity to measuring technique- the difference between measurements performed on the same surface and under the same conditions by different persons should be minimal.

In addition, reliability, repeatability, and precision of the testers were determined. Reliability was evaluated on the basis of hardware failures recorded during the testing program. Repeatability was determined by the scatter of measuring results from experiments conducted several times on the same surface and under the same test conditions but distributed over a significant period of time. Precision is measured by the scatter of a series of successive reading obtained on a given surface over a short period of time.

Based on the results of this study, the NBS- Brungraber Tester was recommended as the best device currently available for measuring slip resistance. The NBS- Brungraber Tester is portable and very easy to use. The measuring procedure described in the tester manual can be mastered in 30 minutes. The tester measures the static coefficient of friction between a representative sample of shoe sole material and a flooring surface. The result from the recording shaft is converted into an equivalent value of static coefficient of friction by means of the calibration chart or formula supplied with the tester.

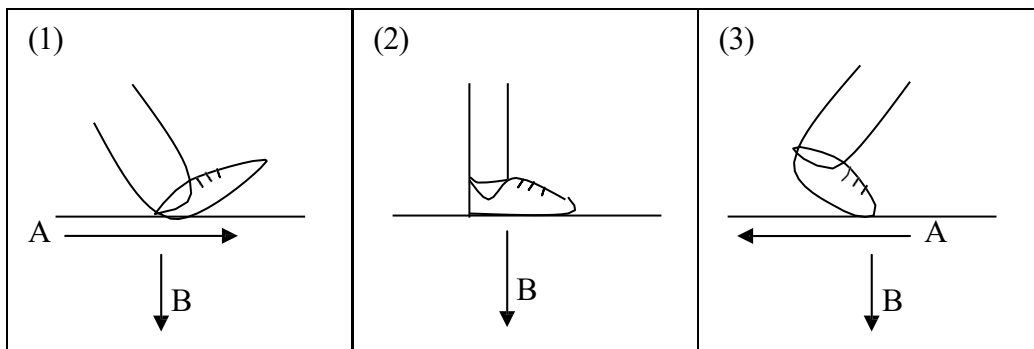


Figure 2. Critical stages of gait.

From “*Slip Resistant Advisory Guidelines*”

The PTI Drag Sled Tester also performed well in the tests; however it is not commercially available at this time. The Horizontal Pull Slipmeter, which proved to be an excellent device for laboratory measurements of slip resistance, did not produce satisfactory

results in field measurements. Detailed information about the three testers, including cost and availability, can be obtained by contacting the following persons:

NBS- Brungraber Tester:
Dr. Robert J. Brungraber
409 South 21 Street
Lewisburg, PA 17837
(717) 524-0852

PTI Drag Sled Tester:
Dr. Bohdan T. Kulakowski
The Pennsylvania State University
Research Bldg. B
University Park, PA 16802
(814) 863-1893

Horizontal Pull Slipmeter:
Mr. Robert Yarrison
Creativity Inc.
P.O. Box 384
Beverly, MA 01915
(617) 927-3174

ROLL RESISTANCE FOR WHEELCHAIRS

In addition to slip resistance requirements, wheelchair users are also affected by the roll-resistance of the surface of the floor. If the roll of the floor is prohibitively high, wheelchair users will be faced with the choice of avoiding those areas or expending extra energy maneuvering the surface. In a limited study of wheelchair roll-resistance, the force needed to traverse four different surfaces was measured. The following surfaces were tested: concrete, linoleum, low- pile carpet (loop 0.1-inch pile height, 10 stitches/inch, 16-ounce face weight excluding backing and glue, on jute), and high-pile carpet (cut, 0.5-inch pile height, 10 stitches/inch, 40-ounce face weight excluding backing and glue, on ActionBac).

Though the study was not intended to be comprehensive, the following trend was observed. With the force needed to traverse concrete as a baseline, the increase in force needed to cross each surface was: linoleum, +3%; low-pile carpet, +20%; high-pile carpet, +62%. From these results it appears that linoleum and concrete equally require minor effort; low-pile carpet requires a noticeable, though moderate, increase in effort; and high-pile carpet requires an important increase in effort.

From “*Slip Resistant Advisory Guidelines*”

APPENDIX J

With attachments 1, 2 & 3

ARE OTHER CHARACTERISTICS IMPORTANT?

Many other characteristics of both the surface of the floor and the device making the contact are important. When considering the floor, the regulations require that the surface be “firm” and “stable.” In order to clarify these terms, the following definitions have been incorporated into the regulations:

Stable Surface: a surface that remains unchanged by contaminants or applied force, so that when the contaminant or force is removed, the surface returns to its original condition.

Firm Surface: a surface that resists deforming by either indentations or particles moving on the surface.

A factor over which the building designer/operator has no control is that of personal footwear and assisting equipment such as crutches or walkers. The surfaces of these items play an important role in determining the effectiveness of a slip resistance floor. In environments where the operator may have some control, such as nursing homes, care should be taken to encourage residents to use appropriate footwear. It becomes the responsibility of the mobility- impaired individual to do his or her part in matters where he or she has control in the choice of footwear.

From “Slip Resistant Advisory Guidelines”

ATTACHMENT 3

NEW YORK CITY

DEPARTMENT OF TRANSPORTATION

Distinctive Sidewalk Paving Materials¹

Physical Characteristics

MATERIAL	GRANITE	BRICK	SLATE	MARBLE	LIMESTONE	BLUESTONE	CERAMIC TILE	CONCRETE PAVEMENT
GOVERNING STANDARD	ASTM C615	ASTM C902	ASTM C629	ASTM C503	ASTM C568	ASTM C616	ANSI A137.1	ASTM C936
CRUSHING STRENGTH (PSI) As per ASTM	19000 C170	8000 C67		7500 C170	8000 C179	2000 C170		8000 C140
BREAKING STRENGTH (PSI) As per ASTM	1500 C99		7.2/9KSI C120	1000 C99/880	1000 C99	300 C99	375 LBS. C648	
ABRASION RESISTANCE As per ASTM		.11 C418	8 C241	12 C241	10 C241	8 C241	100/50/35 C501	0.915/7.75 C418
ABSORPTION (%) As per ASTM	0.4 C97	8 C67	0.25 C121	0.75 C97	3 C97	20 C97	0.5/3/5 C373	5 C140
DENSITY (PCF) As per ASTM	160 C97			144 C97	160 C97	135 C97		
FROST RESIST. As per ASTM							RESISTANCE C1026	RESISTANCE C67

¹ A paving material proposed for use as a sidewalk in New York City shall comply with the requirements listed above. A manufacturer's certification or test report from a licensed testing lab shall be submitted to demonstrate compliance. ASTM = American Society for Testing and Materials. ANSI = American National Standards Institute, Inc.

ACORD CERTIFICATE OF INSURANCE

ISSUE DATE (MM/YY)

PRODUCER

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY A

COMPANY B

INSURED

COMPANY C

COMPANY D

COMPANY E

COMPANY F

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN ARE SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO. LTR.	TYPE OF INSURANCE	POLICY NUMBER	EFFECTIVE DATE	EXPIRATION DATE	LIMITS	
	GENERAL LIABILITY				GENERAL AGGREGATE	\$
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OP AGG.	\$
	<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR.				PERSONAL & ADV. INJURY	\$
	<input type="checkbox"/> OWNER'S & CONTRACTORS PROT.				EACH OCCURRENCE	\$
					FIRE DAMAGE (Any One Fire)	\$
					MEDICAL EXP. (Any One Person)	\$
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	\$
	<input type="checkbox"/> ANY AUTOMOBILE				BODILY INJURY (Per Person)	\$
	<input type="checkbox"/> ALL OWNED AUTOMOBILES				BODILY INJURY (Per Accident)	\$
	<input type="checkbox"/> SCHEDULED AUTOMOBILES				PROPERTY DAMAGE	\$
	<input type="checkbox"/> HIRED AUTOMOBILES				EACH OCCURRENCE	\$
	<input type="checkbox"/> NON-OWNED AUTOMOBILES				AGGREGATE	\$
	<input type="checkbox"/> GARAGE LIABILITY					
	EXCESS LIABILITY				<input checked="" type="checkbox"/> STATUTORY LIMITS	
	<input type="checkbox"/> UMBRELLA FORM				EACH ACCIDENT	\$
	<input type="checkbox"/> OTHER THAN UMBRELLA FORM				DISEASE - POLICY LIMIT	\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				DISEASE - EACH EMPLOYEE	\$
	OTHER					

SAMPLE

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS:

The policy of insurance names the City of New York as additional insured and provides completed operations coverage.

CERTIFICATE HOLDER

The City of New York and
 The Department of Transportation
 c/o DOT Office of Permit Management
 55 Water Street, Concourse Level
 New York, NY 10041

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE:

APPENDIX K

ADMINISTRATIVE CODE OF THE CITY OF NEW YORK

§ 19-112 RAMPS ON CURBS

In the construction and installation of all new and reconstructed curbs at corner located street intersections and pedestrian crosswalks not located at street intersections, provision shall be made for the installation of the following: two ramps at corners located at street intersections and one ramp at pedestrian crosswalks not located at street intersections. Such ramps shall be no less than four feet wide and shall blend to a common level with the roadway. If a common level is unobtainable, then the lip of such ramps shall not exceed a maximum of five-eighths of an inch and shall have a rounded edge. The slope of such ramp shall not exceed eight percent. This section shall apply to all construction of new curbs and to all replacement of existing curbs. The commissioner shall have discretion to waive one of the two mandatory ramps at corners located at street intersections where any of the following obstacles exists preventing construction of such ramps within an intersection: fire hydrants, light poles, traffic signals, fire alarms, or free-standing police alarms, underground vaults, tunnels, utility maintenance holes (manholes), chambers or where the gradient of the street on which the ramp is to be located or an intersecting street exceeds a gradient of 1:8. The commissioner may waive the construction of both such ramps where the existence of underground vaults, tunnels, utility maintenance holes (manholes) and chambers would either prevent the safe construction of such ramps or render impossible the construction of such ramps to proper specifications without removal of said underground installations. A certification to such effect shall be made part of the engineering design documents for such construction, and a copy thereof shall be filed with the city clerk. Curbs for non-pedestrian routes, such as, but not limited to, service paths for highways and pedestrian restricted traffic islands shall not be subject to the provisions of this section.

APPENDIX L

DOT DESIGN DIRECTIVE #30 OF 1978
STANDARDIZATION OF PAVEMENT CROWN AND CROSS SECTION

Recommended Conclusions

1. Use a standard 7" curb height with the above modification.
2. Obtain roadway crown and x-section from the following formula:

a) $c = \Delta + (w - a) \frac{(24 - \%)}{750}$

b) $a = \frac{w^2 \left(\frac{24 - \%}{750} \right)}{2w \left(\frac{24 - \%}{750} \right) - \Delta}$

c) $y' = c \left(\frac{x'}{a} \right)^{1.5}$

d) $y'' = (c - \Delta) \left(\frac{x''}{(w - a)} \right)^{1.5}$

“c” is the total crown in feet.

“Δ” is the difference in elevation between the two curb lines in feet.

“w” is the width of roadway in feet.

“a” is the distance from the lower curb line to the crown line in feet (at Δ = 0, a = w/2; at a ≥ w use a = w).

“%” is the percent grade of the street in the longitudinal direction as a pure number. (Example – a 3' fall in 100 feet is a 3% grade use 3 for % in the formula; above the limit of 8% (8) use 16 in the formula.)

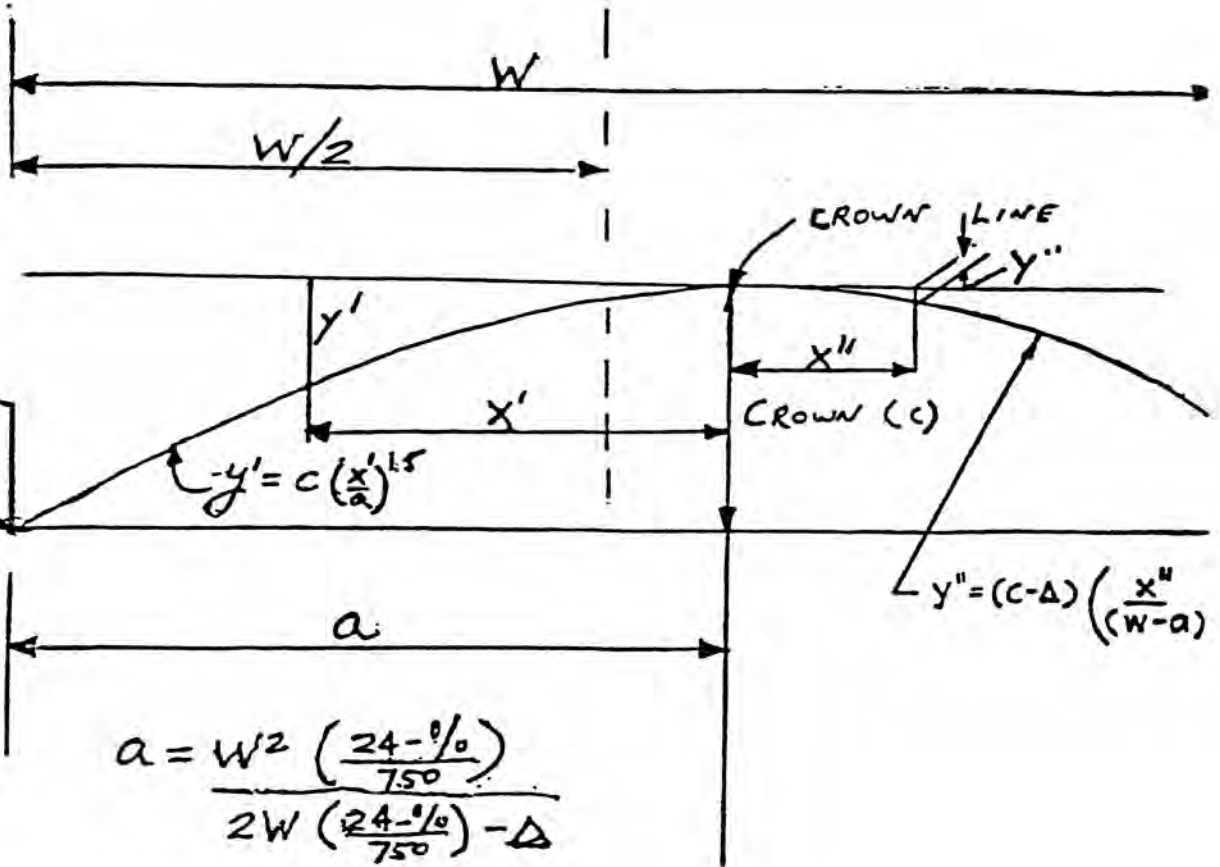
“y” is the vertical crown offset along any point x from the crown point (in feet).

“x” is the horizontal distance from the crown point to any point along the curve (in feet).

CROWN:

$$C = \Delta + (W - a) \left(\frac{24 - 0/0}{750} \right)$$

⊥ ROADWAY

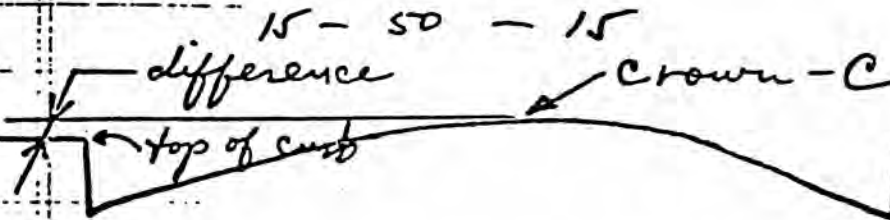


THHQ460A

EXAMPLE

80' R.O.W.

Appendix L



$$C = \Delta + (w - a) \left(\frac{24 - \%}{750} \right)$$

Assume

$w = 50'$

$a = 25'$

$\% = 4\%$ grade

$$C = 0 + (50 - 25) \left(\frac{24 - 4}{750} \right)$$

$$C = \frac{500}{750} = 0.67' \sim 8''$$

Std. curb = 7''

⊥ should be 1'' above T.C.

$\Delta = 0$ assumed
no
difference
between curb

$$a = \frac{w}{2}$$

if $\% = 1\%$ grade

$$C = 0 + 25 \left(\frac{23}{750} \right) = \frac{57.5}{750} = 0.77' \sim 9''$$

$- 7''$

2'' difference

NOTE

1" to 2" represents 0.1 of a foot. For all practical purposes, use ⊥ legal grades for top of curbs computations.

WJ 2/4/82