# NEW YORK STATE DEPARTMENT OF TRANSPORTATION
## SPECIFICATIONS FOR PHOTOGRAMMETRIC STEREOCOMPILEMENT
### 2005 Edition

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CHAPTER 1
Introduction

Section 1. Purpose
These Specifications for Photogrammetric Stereocompilation (Specifications) set forth the standards to be met and the general procedures to be followed in the production of digital photogrammetric stereocompilation for the New York State Department of Transportation (NYSDOT). As used in this document, 'stereocompilation' refers to photogrammetrically prepared large scale engineering mapping to be used in NYSDOT’s CADD environment for highway and structures design. These Specifications are intended to comply with NYSDOT’s CADD Standards and Procedure Manual.

These Specifications are not intended to cover the entire photogrammetric process. They only pertain to the stereocompilation phase. Thus they do not include information on obtaining aerial photography, scanning, control surveys, aerotriangulation or final editing and finishing.

Section 2. Changes
Included within this edition of the Specifications is a significant change in stereocompilation strategy and file submission requirements for VENDORS providing stereocompilation to NYSDOT. Anyone affected by NYSDOT photogrammetric mapping standards is urged to carefully and completely review these Specifications.

The primary changes in NYSDOT stereocompilation techniques since the last edition (June 2001) are noted below:

- One 3-dimensional (3D) compilation file will be used for all features and terrain portrayal.
- All files must be edited and submitted in MicroStation Version 8 format.
- All feature types will have their own unique named levels.
- Certain features will be designated for later use in forming the triangulated surface of the digital terrain model (DTM). Other features will be excluded from the triangulated surface.
- Zone mapping will no longer be used.
- No labels or text will be required.
- VENDORS are required to use only Softcopy Photogrammetric Workstation technology. The use of analytical stereoplotters is not allowed.
- Subcontracting is still not permitted.
Section 3. Authority and Responsibilities

NYSDOT's Photogrammetry Section writes, maintains and updates these Specifications to remain consistent with NYSDOT [CADD Standards and Procedure Manual], as well as current NYSDOT stereocompilation standards. These Specifications are intended for use by knowledgeable technical individuals who interact with NYSDOT’s Photogrammetry Section in the preparation of large scale, photogrammetrically prepared engineering mapping.

NYSDOT's Photogrammetry Section is responsible for the update and distribution of these Specifications. Therefore, NYSDOT’s Photogrammetry Section remains the authority for final review and interpretation of these Specifications.

The Recipient of these Specifications is responsible for verifying that the complete content has been received and is legible. The Recipient is also responsible for contacting NYSDOT’s Photogrammetry Section to clarify and resolve any questions.
CHAPTER 2
Vendor Qualification Requirements

Section 1. Purpose
To assure that a prospective VENDOR is capable of delivering photogrammetrically prepared stereocompilation files in the specified formats and in compliance with these Specifications, NYSDOT has adopted a qualification process. All VENDORS seeking to provide stereocompilation to NYSDOT must meet the qualification requirements set forth herein before becoming eligible for the competitive bid process as a NYSDOT Qualified VENDOR.

Section 2. Eligibility Requirements
VENDORS must have at least 2 Softcopy Photogrammetric Workstations available for in-house stereocompilation. In addition, VENDORS must be able to generate, review and submit files in MicroStation Version 8 design file format. Also refer to Chapter 4 - Vendor Responsibilities.

Section 3. Qualification Criteria
A. Site Specific Qualification: NYSDOT’s qualification of a prospective VENDOR is limited to a specific site or office location. Prospective VENDORS wishing to have multiple site locations qualified will be required to have each site location qualify independently.

B. Qualification Cost: The prospective VENDOR will assume all costs necessary for the preparation and submission of all materials required for the NYSDOT Qualification Review Process. NYSDOT will not be held liable for any costs incurred by a prospective VENDOR seeking to demonstrate the ability to deliver and furnish photogrammetric stereocompilation files in accordance with these Specifications.

Section 4. Qualification Process and Procedure
All VENDORS seeking to become a NYSDOT Qualified stereocompilation VENDOR will follow the procedure detailed below.

A. VENDOR Request: Upon request, NYSDOT will send prospective VENDORS a copy of these Specifications and a questionnaire.

B. Review of Specifications: All VENDORS seeking to provide stereocompilation to NYSDOT will thoroughly review these Specifications and any Addendum.

C. Acknowledgment Letter: Upon completion of the Specification review, the prospective VENDOR will send a letter to NYSDOT’s Photogrammetry Section requesting the opportunity to become a Qualified NYSDOT Stereocompilation VENDOR. The letter should indicate the VENDOR has read, understands and has the ability to fully comply with these Specifications. The letter should also indicate that the VENDOR is ready to continue with the NYSDOT Qualification Process.
D. **VENDOR Questionnaire**: The prospective VENDOR will also return a completed VENDOR Questionnaire which will be provided by NYSDOT. The information obtained from the Questionnaire is intended to provide NYSDOT with a general and technical profile of the prospective VENDOR. NYSDOT will review information to ensure that the proposed equipment is suitable. If it is not suitable the qualification process will end immediately.

E. **Qualification/Sample Stereocompilation**: Upon receipt of the Acknowledgment Letter and a completed VENDOR Questionnaire, NYSDOT will provide the prospective VENDOR with the digital files and project specific materials necessary to compile a small sample of a “typical” NYSDOT stereomodel. The prospective VENDOR shall compile and submit the sample stereocompilation file in accordance with these Specifications.

F. **Delivery Schedule**: The prospective VENDOR will be allotted **10 weeks** to compile and submit the sample stereocompilation file to NYSDOT for review and evaluation. If the sample is not submitted within this time period, NYSDOT will deny the prospective VENDOR's request for placement on NYSDOT's List of Qualified VENDORS. A prospective VENDOR who has failed to meet the qualification requirements may attempt to re-qualify as a NYSDOT VENDOR at the end of **one year** from the date of NYSDOT's Review Notification by using this same procedure.

G. **NYSDOT's Review & Evaluation**: NYSDOT will review and evaluate the prospective VENDOR's sample stereocompilation for conformity with the accuracy, content, symbology, and file format detailed in these Specifications.

H. **Review Notification**: A letter detailing the results of NYSDOT's review and evaluation will be mailed to the prospective VENDOR. This letter will outline the prospective VENDOR's options based upon the results of NYSDOT's review as follows:

- **Acceptable Submission**: If the sample stereocompilation meets the minimum requirements prescribed in these Specifications the VENDOR will be added to NYSDOT's List of Qualified VENDORS (Refer to Section 4-L Bid List Inclusion).

- **Correctable Submission**: If the sample stereocompilation initially fails to meet the minimum requirements but is deemed by NYSDOT to be correctable, the VENDOR will be given one opportunity to make the appropriate corrections and resubmit the sample.

- **Unacceptable Submission**: If the first sample stereocompilation submission is deemed by NYSDOT to be a significant departure from these Specifications, or the files are unreadable, uncorrectable or require excessive corrections, the VENDOR's request for placement on NYSDOT’s List of Qualified VENDORS will be denied. A summary of NYSDOT's findings will be sent to the prospective VENDOR in writing. A prospective VENDOR who has failed to meet the qualification requirements may attempt to re-qualify as a NYSDOT VENDOR at the end of **one year** from the date of NYSDOT's Review Notification by using this same procedure.

I. **Sample Stereocompilation Corrections**: NYSDOT will permit the prospective VENDOR one opportunity to correct the sample stereocompilation as prescribed by NYSDOT. NYSDOT will provide a list of items that do not meet these Specifications and the VENDOR must make all
corrections and resubmit the file.

J. **Correction Delivery Schedule:** The corrected sample stereocompilation must be received by NYSDOT within **2 weeks**. If the corrected sample stereocompilation is not received within this time, the prospective VENDOR's request for placement on NYSDOT's List of Qualified VENDORS will be denied. A prospective VENDOR who has failed to meet the qualification requirements may attempt to re-qualify at the end of **one year** from the date of NYSDOT's Review Notification by using this same procedure.

K. **Correction Review & Evaluation:** Upon receipt of the corrected sample stereocompilation file, NYSDOT will again review and evaluate the prospective VENDOR's file for conformity with the specified accuracy, content, symbology, and file format.

- If the corrected sample stereocompilation file meets the minimum requirements prescribed in these *Specifications* and in NYSDOT's review letter, the VENDOR will be notified of acceptance and added to NYSDOT's List of Qualified VENDORS (Refer to Section 4-L **Bid List Inclusion**).

- If the corrected sample stereocompilation file is deemed by NYSDOT to be unacceptable, the results of NYSDOT's findings will be sent to the prospective VENDOR in writing and the VENDOR's request for placement on NYSDOT's List of Qualified VENDORS will be denied. A prospective VENDOR who has failed to meet the qualification requirements may attempt to re-qualify at the end of **one year** from the date of NYSDOT's Review Notification by using this same procedure.

L. **Bid List Inclusion:** Upon meeting the eligibility requirements and satisfactorily demonstrating the ability to provide stereocompilation as specified, the prospective VENDOR will be notified and placed on NYSDOT's List of Qualified VENDORS. At this point the VENDOR added as a “First-Time” VENDOR.

The “First-Time” VENDOR status allows the VENDOR to bid on all lots in the first eligible bid announcement but limits the award to one lot. Upon the successful completion of the first lot awarded, NYSDOT will remove the “First Time” VENDOR award limitation. The VENDOR will then be eligible for multiple bid lot awards.
CHAPTER 3
Competitive Bid Process for Stereocompilation Services

Section 1. Bid Announcement
Pursuant to provisions of the State Finance Law or the State Printing Law, sealed proposals will be solicited for Photogrammetric Stereocompilation in a competitive bidding process from NYSDOT’s Qualified VENDORS only. Only VENDORS that appear on NYSDOT’s List of Qualified VENDORS at the time of the announcement will be sent an Invitation for Bids and all supporting Bid Materials. The public announcement will also be inserted in the New York State Contract Reporter publication which is available by subscription in hard-copy and online at [http://www.nyscr.com](http://www.nyscr.com).

Section 2. Bid Documents
The Bid Documents distributed will consist of an Invitation for Bids, bid materials and project specific information to be used in preparation of the bid response.

A. Project specific information for each lot consists of:

- An Individual Project Description which will include the specific mapping requirements, a written description of the project area, the project size, the estimated project start and the allotted production time.

  The estimated project start is the range of months in which NYSDOT expects to deliver all required materials to the VENDOR. The allotted production time is the amount of time allotted to the VENDOR for completion of each lot. The allotted production time is measured from the time authorization to proceed is given by NYSDOT.

- A project image file (.pdf) with the mapping limit line overlaid on an orthoimage backdrop.

- A flightline diagram showing the layout of the project’s aerial imagery.

B. Technical clarification, questions on project specific information or these Specifications must be directed to and resolved by NYSDOT’s Photogrammetry Section.

C. Within each Bid Lot, NYSDOT reserves the right to add or remove up to 25% of the number of stereomodels specified in the Individual Project Description and in the Bid Documents. The Bidder will adjust the final project cost in accordance with the stereomodel unit rate specified in the Bid Response.

Section 3. Bid Response Submission
All bid responses must be submitted to NYSDOT’s Central Purchasing Office in Albany, NY in accordance with the Bid Documents. Bidders are cautioned to verify their bids before submission to NYSDOT, as bids and amendments to bids or requests for withdrawal of bids after the time specified for the bid opening may not be considered. Modifications to withdrawal of bids before the time specified for the opening, may be considered on a case by case basis when such requests are made in
writing to the Central Purchasing Office. A request shall specify, in detail, the reason for modification or withdrawal and will not be unreasonably denied by NYSDOT.

Facsimile bids sent to the Central Purchasing Office will be permitted and any such bids submitted are at the sole option and risk of the bidder and are fully governed by all conditions outlined in the bid documents. Access to the facsimile machine is on a “first come-first served” basis and NYSDOT bears no responsibility and makes no guarantee whatsoever with respect to any bidder's access to the equipment at any specific time. Bidders are solely responsible for submission and receipt by NYSDOT of the entire facsimile bid prior to the date and time of the Bid Opening. NYSDOT bears no responsibility whatsoever for late, illegible or incomplete facsimile receipts. Such bids must be submitted on the forms provided by NYSDOT and must outline, in sufficient detail, the commodities or services offered, including all other pertinent information needed for a complete and responsive bid. Confirmation of the facsimile bid (i.e., originals) must be received in the Central Purchasing Office no later than 3 calendar days following the scheduled Bid Opening date. Facsimile bids shall be transmitted only to the designated number indicated in the Bid Documents. Other facsimile machine numbers are to be used for correspondence only. Bids received at facsimile numbers other than the designated number may be rejected. Do not submit Bids directly to the Photogrammetry Section.

A. Completed Bid Response: Unless otherwise specified, each bid must be submitted on the forms provided by NYSDOT. All blank spaces in the bid form must be filled in as indicated and no change shall be made in the wording of the specifications, terms or conditions, or in the items mentioned therein. Bids that are illegible or contain any omission, erasure, alteration, addition, or item not called for, or that contain irregularities of any kind may be rejected.

B. Declining to Bid: Bidders are not obligated to prepare bids for all solicitations. If a Bidder chooses not to prepare bids for a solicitation, it is recommended that the Bidder respond to the solicitation by submitting the cover sheet of the Invitation for Bids indicating “No Bid Submission” and the reason for not bidding as outlined in the Bid Announcement. It is important to note that there are completion requirements that must be met to remain on NYSDOT's List of Qualified VENDORS (Refer to next item and Chapter 4, Section 1-B Performance Requirement).

C. No Response: A Bidder's failure to respond to 3 successive solicitations will result in removal from NYSDOT's List of Qualified VENDORS.

Section 4. Method of Award
All bids will be opened and read publicly at the date and time indicated in the Bid Documents. NYSDOT may at any time, for good cause, postpone or cancel a scheduled Bid Opening. Award of contracts will be made on the basis of lowest total bid price on a lot by lot basis. In order for a bid to be considered for award, a bid must:

- Be responsive (i.e., conforms in all material respects to the terms, conditions, Specifications, and other requirements of the Invitation for Bids), and;

- Have been submitted by a responsible bidder (i.e., has the capacity in all respects to perform the contract requirements in full, and the integrity and reliability that will assure good-faith performance), and;
• Have been submitted by a NYSDOT Qualified VENDOR (Bidder)

Bidders selected for award, who will be providing stereocompilation to NYSDOT as “First-Time” VENDORS, or VENDORS who are bidding for the first time after being reinstated to NYSDOT’s List of Qualified VENDORS will be limited to an award of only one lot regardless of the number of lots for which they are the apparent low bidder. Choice of the bid lot awarded under this circumstance will, absent extraordinary circumstances or unique project schedules, be based upon the lot offering the greatest savings to NYSDOT.

Concern about project scheduling requirements should not deter Bidders from submitting bids on multiple projects or lots. All apparent low Bidders will be contacted by NYSDOT prior to award to assure that the required production schedules can be met. In the event that a Bidder is the apparent low Bidder for multiple lots and is unable to meet the required production schedules, NYSDOT may reject apparent low bids on selected bid lots of its choice and proceed with award to the next lowest qualified Bidder. Choice of bid lots to be rejected/awarded will, absent extraordinary circumstances or unique project schedules, be based upon the bid lot offering the greatest savings to NYSDOT.

Section 5. Payment
Final Payment will be made at the stereomodel unit rate specified in the Bid Response for the awarded Bid Lot. No additional payment will be made by NYSDOT for work performed by the VENDOR in making corrections required by NYSDOT. Payment will be processed upon receipt of the following:

• The delivery of all final materials called for in these Specifications and in the Individual Project Description

• The inspection and acceptance of those materials by NYSDOT

• Receipt of the VENDOR's invoice by NYSDOT

Unless otherwise given advance authorization by NYSDOT, VENDORS delivering final project materials more than 7 calendar days late will be subject to late delivery payment penalties. An amount equal to one percent of the total project bid price will be deducted from monies due the VENDOR for each additional business day beyond the seventh calendar day that the project is late.
CHAPTER 4
Vendor Responsibilities

Section 1. General Responsibilities
A. VENDOR Preparedness: It is the VENDOR's responsibility to be familiar with these Specifications and any guidelines provided by NYSDOT and to follow them in preparation of photogrammetric stereocompilation for NYSDOT.

Where these Specifications and the Individual Project Description describe portions of the work in general terms, but not in complete detail, it is understood that only the best technical judgment and practice is to prevail. Satisfactory materials and equipment are to be used as necessary to complete the work in accordance with the accuracy and content requirements specified herein. **It is the VENDOR’s responsibility to consult with NYSDOT to resolve all discrepancies and ambiguities between these Specifications and the Individual Project Description prior to proceeding with work on the project.**

B. Performance Requirement: To remain a NYSDOT Qualified VENDOR, VENDORS must demonstrate their continued ability to provide photogrammetrically prepared stereocompilation files. Within every 3 year period, each Qualified VENDOR shall have satisfactorily completed an awarded project, or shall re-qualify as outlined in Chapter 2, Section 4 Qualification Process and Procedure.

C. Required Resources: It is the VENDOR's responsibility to provide all additional labor, materials, equipment and other incidentals which are not supplied by NYSDOT and are necessary to perform the work specified. Each of these items is to be of uniformly high quality and compatible with the quality and accuracy standards specified for the project.

D. Subcontracting: It is the VENDOR's responsibility to provide all stereocompilation to NYSDOT. No subcontracting is permitted.

Section 2. Softcopy Photogrammetric Workstation Requirements
A. General Requirements: VENDORS must have at least 2 Softcopy Photogrammetric Workstations available for in-house production and be capable of providing digital stereocompilation in the format specified. The Softcopy Photogrammetric Workstations used in production must be the same instruments identified in the VENDOR's bid.

B. Technical Requirements: Each Softcopy Photogrammetric Workstation (computer, monitor and viewing system) must be a high-performance workstation specifically designed for stereocompilation and must be capable of producing high accuracy, large-scale mapping. Each workstation must also have the following capabilities:

- Each workstation must be capable of importing or directly using the Z/I Imaging ISPM (ImageStation Photogrammetric Manager) files (ASCII text file format) created by NYSDOT which contain project specific camera calibration data, densified control, model orientation data, project parameters and photo measurements.
Each workstation must be capable of making stereoscopic measurements using the image files provided by NYSDOT. (Refer to Chapter 5, Section 1 Materials Provided for all Projects) No translation or manipulation of the NYSDOT provided image files is permitted.

Each workstation must be capable of using high resolution imagery and able to handle large image files (110-130 MB per image).

Each workstation’s image separation method for stereoscopic viewing must be equivalent to Z/I Imaging’s Frame Sequential display viewed with synchronized eyewear (i.e., high frequency alternating display of left & right images combined with synchronized alternating viewing eyewear).

Each workstation shall be equipped with at least a 21" high resolution monitor capable of refreshing the screen at a rate of at least 120 Hz. The stereocompilation view resolution ratio (the number of monitor pixels to image pixels) shall be set to 1:1 or better (e.g., 1.25:1). However, the view resolution ratio must not be set to the point at which stereoscopic viewing is lost.

Permitted usage of specific workstations is at the sole discretion of NYSDOT.

Section 3. Software Requirements
The following requirements relate to the use of Bentley MicroStation Version 8 (V8) software:

- All VENDOR stereocompilation must be compiled stereoscopically either directly in or translated to MicroStation V8 Design File format.
- The VENDOR must review all stereocompilation using MicroStation V8 prior to submitting it to NYSDOT.
- The VENDOR is required to produce and deliver 100% clean, edited MicroStation V8 Design Files.
CHAPTER 5
NYSDOT Provided Project Materials

Section 1. Materials Provided for all Projects
The following materials will be provided to the VENDOR when the project is ready to be started:

- Cover letter establishing delivery dates
- Individual Project Description with project specific requirements
- Flightline Diagram
- Mapping File Break Scheme
- MicroStation design file containing the project’s mapping limits and strip tie locations
- USGS Report of Calibration for the aerial mapping camera used for the project imagery
- Ground control file with the original surveyed control used in the aerotriangulation solution
- Project imagery scanned at 14 micron scan resolution. The final file format will be JPEG compressed, tiled (256) Tagged Image File Format - TIFF (*.TIF) image files. Resultant image file size is approximately 110-130 MB per photo image. **No translation or manipulation of the NYSDOT provided image files is permitted.** Software display enhancement to lighten or darken images is allowed.

- Z/I Imaging - ISPM (ImageStation Photogrammetric Manager) files (ASCII text file format) created by NYSDOT which contain project specific camera calibration data, densified control, model orientation data, project parameters and photo measurements.

Section 2. Materials Available Upon Request
The following materials should be on file with NYSDOT's Qualified VENDORS; however, upon request, the VENDOR may receive replacement copies as needed to complete work for NYSDOT.

- NYSDOT's current edition of *Specifications For Photogrammetric Stereocompilation* and any applicable addendums.
- VENDORS using MicroStation V8 software may use NYSDOT's Compilation and Editing Macros (MicroStation Basic and/or MicroStation Visual Basic). The VENDOR is solely responsible for the use and implementation of NYSDOT provided MicroStation macros.
- All VENDORS must use MicroStation V8 software with NYSDOT’s MicroStation resource files for final file review and editing. The VENDOR is solely responsible for the use and implementation of NYSDOT provided MicroStation resource files. The following files will
be provided:

**Seed File:**
photseed.dgn  Photogrammetry seed file

**Symbology Files:**
ny_linestyle_2003.rsc  Linestyle resource file
ny_font_2003.rsc  Font resource file
ny_styles.dgnlib  Library file with standard font styles
ny_2003_survey.dgnlib  Library file with feature, point, attribute and comment levels
ny_2003_photo.dgnlib  Library file with feature and comment levels
ny_color.ctb  Color table

**Configuration Files:**
CSPM2003Photogrammetry.pcf  Photogrammetry project configuration file*
Standards.cfg  Standard configuration file*

*  VENDORS may need to edit the path names to locations on their workstations.

**Cell Libraries:**
ny_plan_bridge.cel  Bridge plan symbols
ny_plan_drainage.cel  Drainage plan symbols
ny_plan_landscape.cel  Landscape plan symbols
ny_plan_roadway.cel  Roadway plan symbols
ny_plan_signs.cel  Signs plan symbols
ny_plan_traffic.cel  Traffic plan symbols
ny_plan_utility.cel  Utility plan symbols

**Menu Bar File:**
ustn.m01  Menu to access Compilation and Editing Macros
CHAPTER 6
Vendor Submission Requirements

Section 1. General Requirements
A. Digital File Requirements

- Submission Conformance: The VENDOR shall ensure that the completed stereocompilation files (MicroStation V8 design file format - .dgn) submitted to NYSDOT conform with these Specifications and the specific project requirements set forth for each project in the Individual Project Description supplied by NYSDOT. The files typically required will include a 3D design file with all features and breaklines for each flightline and 3D design files for overlapping bridge deck surfaces as needed.

- File Submission: All files submitted to NYSDOT should be on a CD. E-mail or 3.5” diskettes may only be used for first stereomodel submissions. No file compression is permitted. The media shall be identified with the VENDOR name and NYSDOT’s Project Identification Number (PIN). As an alternative, a VENDOR may submit files electronically directly to the NYSDOT ProjectWise file management system. NYSDOT will provide details to interested VENDORS.

- File Names: The file names must conform to the file names listed in mapping file break scheme supplied by NYSDOT. The standard compilation files will generally be named with the Project Identification Number (PIN) and a sequential letter (a, b, c, etc.). When bridge decks overlap, the overlying deck is placed in a separate file with a sequential number (See Chapter 13, Bridge Feature Descriptions). Any internal VENDOR version number or directory paths shall be dropped from the final file nomenclature when copied to the submission media. The file names must be in the following form:

  Standard compilation file name: PINa_vbm.dgn
  Overlapping bridge deck file name: PINa1_vbm.dgn (See Chapter 13)

- File Format: All files must be submitted to NYSDOT in a 3D MicroStation V8 Design File format using NYSDOT’s seed file. Files shall be compiled with coordinate values to the nearest thousandth (1/1000) of a meter. Coordinate values for all features must be based on the grid system indicated by the control data.

  The file’s working units shall be: Master Units: Meters Label: m
  Sub Units: Millimeters Label: mm

  The file’s resolution shall be: 1000 per Meter

The global origin for the stereocompilation files shall be in the center of the design cube. This will be accomplished automatically by using NYSDOT's seed file. The coordinates used must be based on the same coordinate system used for the control data.
• Data Retention: It is the VENDOR's responsibility to keep a back-up of all digital files for **90 days** after final project acceptance by NYSDOT.

B. Delivery Requirements

• **Delivery Deadlines:** NYSDOT will establish the required delivery deadlines with the delivery of the Project Materials and/or with the authorization to proceed. The delivery deadlines will be set using the specified allotted production time indicated on the Individual Project Description.

• **Delivery Method:** It is the VENDOR's responsibility to ensure that all project submissions are received by NYSDOT's Photogrammetry Section on or before the established deadline. VENDORS are required to ship project materials via overnight shipping carriers that will deliver directly to the Photogrammetry Section's office (e.g., United Parcel Service or Federal Express).

**Section 2. First Stereomodel Submission**

With the initial delivery of the Project Materials to the VENDOR, NYSDOT requires that the VENDOR provide one stereomodel of the project to assure conformity to these Specifications and the project requirements before authorization to continue on the rest of the project is granted. The First Stereomodel submission is designed as an opportunity to detect any possible compilation problems before the completion of the entire project. The First Stereomodel will be selected by NYSDOT and will rarely be the first stereomodel of a flightline or at the beginning of the project.

A. **Delivery:** The file requirements for the First Stereomodel submission are outlined in Section 1-A Digital File Requirements. It is only necessary to submit the required stereocompilation for the one stereomodel. The First Stereomodel submission must be delivered to NYSDOT within **10 calendar days** after the VENDOR receives the NYSDOT materials.

B. **NYSDOT's Review & Evaluation:** Upon receipt of the First Stereomodel submission, NYSDOT will review the stereocompilation for Specification compliance in terms of accuracy and content. The review will be an evaluation of feature content, portrayal and placement; density and portrayal of terrain surface; and an evaluation of data accuracy. This NYSDOT review does not negate the required VENDOR review of all stereocompilation using MicroStation V8 prior to submitting it to NYSDOT.

C. **Review Notification:** The results of NYSDOT's First Stereomodel review and evaluation will be sent to the VENDOR.

• If there are no problems, or if the problems are minor and can easily be corrected, the VENDOR will be advised to make all the required corrections and proceed with the project. As part of the authorization to proceed, NYSDOT will establish the submission deadline for the completed project.

• If significant problems in compilation or translation are evident, the VENDOR will be notified to make the necessary corrections and submit the revised files within **7 calendar days.** NYSDOT will review the revised submission for the completion of the specified
corrections. If significant problems in compilation are still evident, and/or the submission is late or incomplete, at the discretion of NYSDOT, the VENDOR may be assessed penalties as outlined in Section 4 Performance Penalties.

Section 3. Complete Project Submission
On or before the established project deadline, the VENDOR shall submit the completed project to NYSDOT's Photogrammetry Section.

A. Delivery: The file requirements for the Complete Project submission are outlined in Section 1-A Digital File Requirements. The submission must be delivered to NYSDOT within NYSDOT's established submission deadline for the completed project.

B. NYSDOT's Review & Evaluation: Upon receipt of the complete project, NYSDOT will review the submission for overall Specification compliance. The review will include reviewing the completion of any First Stereomodel corrections and the implementation of those corrections throughout the entire project as applicable. The review will be an evaluation of feature content, portrayal and placement; density and portrayal of terrain surface; and an evaluation of data accuracy. This NYSDOT review does not negate the required VENDOR review of all stereocompilation using MicroStation V8 prior to submitting it to NYSDOT.

C. Review Notification: NYSDOT will notify the VENDOR with the results of the completed project's review and evaluation.

• If there are no problems, or if the problems are few and minor and can easily be corrected, the project will be accepted. The VENDOR will be advised about any minor deficiencies NYSDOT found during its review and encouraged to implement steps to prevent similar deficiencies on future projects as appropriate.

• If significant problems in compilation or translation are evident the VENDOR will be notified to make the necessary corrections and submit the revised files within 10 calendar days. NYSDOT will review the revised submission for the completion of the specified corrections. If significant problems in compilation are still evident, and/or the submission is late or incomplete, at the discretion of NYSDOT, the VENDOR may be assessed penalties as outlined in Section 4 Performance Penalties.

Section 4. Performance Penalties
A. Failure to Meet Submission/Accuracy Requirements: If the stereocompilation submitted by the VENDOR fails to meet the minimum standards prescribed herein and/or requires excessive editing by NYSDOT, the VENDOR will be required to make corrections. No additional payment will be made by NYSDOT for work performed by the VENDOR in making corrections required by NYSDOT.

B. Failure to Make Required Corrections: If the VENDOR is unable to attain the minimum standards prescribed herein with the Correction Submission or within an acceptable time frame, NYSDOT reserves the right to notify the VENDOR and take one of the following actions:

• Termination of Agreement: Failure to make the corrections prescribed during the First Stereomodel process may result in the termination of the agreement. The project will be
withdrawn, the Purchase Order canceled and no payment made by NYSDOT.

- **Payment Penalties**: If the VENDOR is unwilling or unable to attain the minimum standards prescribed herein or make the required corrections on a completed project, NYSDOT reserves the right to deduct from the VENDOR's payment the actual costs incurred by NYSDOT to bring the project into conformity with the minimum standards prescribed herein.

C. **Failure to meet Delivery Schedule/Deadline**: Unless otherwise authorized in advance by NYSDOT, VENDORS delivering final project materials more than 7 calendar days late will be subject to late delivery payment penalties. An amount equal to one percent of the total project bid price will be deducted from monies due the VENDOR for each additional business day beyond the seventh calendar day that the project is late.

D. **Removal from List of Qualified VENDORS**: VENDORS that fail to perform in accordance with the terms and Specifications set forth herein may, at the discretion of NYSDOT, be removed from the List of Qualified VENDORS to be contracted for future stereocompilation. After a period of one year, a VENDOR may re-apply and re-qualify for inclusion on the List of Qualified VENDORS as outlined in [Chapter 2, Vendor Qualification Requirements](#).
CHAPTER 7
Accuracy Requirements

Section 1. Accuracy Testing
Submitted stereocompilation will be tested by NYSDOT to assure compliance with the accuracy requirements specified in Section 2 below.

A. Completeness: Completeness of the stereocompilation content will be checked by comparing the completed mapping against the aerial imagery used for compilation.

B. Horizontal accuracy: The horizontal accuracy of the stereocompilation will be checked by using photogrammetric measurements and/or field survey.

C. Vertical accuracy: Features that are to be included as part of the triangulated surface for subsequent digital terrain model (DTM) generation will be checked. Directly measured stereocompilation points and the triangulated surface will be checked by using photogrammetric measurements and/or field survey.

Section 2. Horizontal Accuracy
Ninety percent of all well-defined point and linear features tested by NYSDOT which are measured from standard design scale photography (nominally 1:3000) shall be compiled so that their positions are accurate to within 60 mm of true ground location. The remaining ten percent of the well-defined features tested by NYSDOT shall be compiled so that their positions are accurate to within 120 mm of true ground location.

Section 3. Vertical Accuracy
A. Point Measurements: Ninety percent of the directly measured points (measured on unobstructed pavement or bare ground) tested by NYSDOT which are measured from standard design scale photography (nominally 1:3000) shall be accurate to within 60 mm of their true ground elevation. The remaining ten percent of the directly measured points shall be accurate to within 120 mm of their true ground elevation.

B. DTM Surface: The accuracy of the overall DTM triangulated surface, subsequently generated from the submitted stereocompilation, will be assessed through a statistical analysis of the differences between NYSDOT measured check points and elevations extracted from the DTM triangulated surface at the same horizontal locations. NYSDOT requires that the differences average between +25 mm and -25 mm and the Square Mean of the Differences (SMD) shall be as follows:

\[
SMD = \sqrt{\frac{\sum (\text{DTM Surface} - \text{NYSDOT Checkpoint})^2}{\text{Number of Checkpoints}}}
\]
60 mm or less  **Transportation Surfaces** - This category includes all Pavement, Roadway and Bridge Features; such as paved and unpaved roadways, shoulders, travelways, parking lots, driveways, curbs, bridge decks and sidewalks.

120 mm or less  **Engineered Surfaces / Drainage** - This category includes features such as roadway embankments, drainage ditches, water body edges, lawns and all areas within 15 m of the outermost edge of transportation alignments.

300 mm or less  **Other Surfaces** - This category includes non-engineered surfaces and all other areas over 15 m from the outermost edge of transportation alignments.

C. **Accuracy Exceptions**: Features that will be excluded from the triangulated surface and not utilized to generate the subsequent DTM will not be subject to NYSDOT's Vertical Accuracy requirements or testing. However, the elevations of these features should be of sufficient accuracy to ensure that the features will meet NYSDOT's Horizontal Accuracy requirements. The elevation (Z) component of these features should be within the nominal range of the elevations.
CHAPTER 8
General Production Techniques

Section 1. Stereocompilation Preparation
A. VENDOR Check: For each project, NYSDOT will supply a MicroStation design file with the horizontal and vertical location of the surveyed control points. The VENDOR will use this file for reference during stereocompilation. The compiler should measure the elevation from the imagery at each of the points to verify that their measurements are within 60 mm of each control point elevation. If the difference between the elevations for any one point is greater than 60 mm, the VENDOR must contact NYSDOT before undertaking further stereocompilation on the project.

B. Stereocompilation Data: All stereocompilation data must be recorded directly as output from a Softcopy Photogrammetric Workstation. Post-compilation digitizing of features is not permitted.

C. Aerotriangulation Data: The Softcopy Photogrammetric Workstations shall be capable of either directly using or importing the Z/I Imaging ISPM (ImageStation Photogrammetric Manager) files provided by NYSDOT.

D. NYSDOT Macros: The NYSDOT Photogrammetric Compilation and Editing Macros are provided to VENDORS for use with MicroStation V8 software. The VENDOR is solely responsible for the use and implementation of NYSDOT provided MicroStation files and macros.

Section 2. Stereocompilation Measurement
A. Measurement Method: All data points must be individually measured points. All element types (e.g., line strings) must be constructed of directly measured points. "Stream" digitizing or software generated measurement points are not allowed.

B. Measurement Points: All point and line data must be compiled using graphic elements listed in Appendix A, Graphic Element Definitions. Curve strings must not be used. Additional points should be measured with line strings in order to maintain the horizontal integrity of curves (See Appendix B, Compilation Diagrams - B2).

C. 3 Dimensional Files and Elements: All terrain and cultural features shown in NYSDOT stereocompilation must be measured and submitted as 3D primary class elements (i.e., not construction class elements) in a 3D MicroStation V8 design file format. All files will contain terrain and cultural feature symbology using the NYSDOT supplied Cell Libraries, Level Libraries, Font and Linestyle Resource Files and Seed File.

D. Mapping Ties: Compilation adjacent to existing compilation files or between stereomodels must be snapped together so all line work matches exactly. Occasionally NYSDOT will provide files of stereocompilation from a previous project that the VENDOR must also edge match exactly. If this cannot be achieved within NYSDOT accuracy specifications, (See Chapter 7, Accuracy...
Requirements notification and consultation with NYSDOT is required.

E. File Limits: Mapping Files will usually contain all the stereomodels to be compiled in a single aerial photography strip. NYSDOT will designate the number of stereomodels and limits of manageable mapping file sizes. NYSDOT will provide the VENDOR with a File Break Scheme indicating where these file breaks should occur.
CHAPTER 9  
General Compilation Techniques

Section 1. Stereocompilation Overview

A. Terrain / Feature Portrayal: One 3-dimensional (3D) compilation file will be used for all features and terrain portrayal. All feature types will have their own unique named levels. Certain features are designated for later use in forming the triangulated surface of the DTM. Other features will be designated as excluded from the triangulated surface. All features and terrain surfaces within the established Mapping Limits must be portrayed as completely as possible. The portrayal of specifically listed features should follow the instructions in Chapters 10 -17 Feature Descriptions. Unless specifically listed as a feature not to be shown, it is expected that all terrain surfaces and features will be compiled in conformity with these Specifications. Also refer to the Appendices which contain detailed Compilation Diagrams with additional explanations and illustrations, and the Feature Symbology Table that serves as a quick reference for feature symbology and usage.

- Stereocompilation shall show all required mapping features that are visible, identifiable and interpretable on the project's aerial imagery. All features shown must be depicted in accordance with NYSDOT Feature Descriptions contained within these Specifications.

- Features not readily identifiable or not included in the Feature Description chapters shall be shown and symbolized with the most equivalent symbology or delineated as an Unidentifiable Feature.

- No labels or text should be included in the stereocompilation design file.

B. NYSDOT's Compilation Data Types

All NYSDOT stereocompilation (features and terrain) is measured in 3 dimensions with vertical/elevation (Z) data for all features and submitted in the same 3D MicroStation V8 design file. Certain features are designated for later use in forming the triangulated surface of the DTM. Other features will be designated as excluded from the triangulated surface. However, both sets of features will be in the same design file.

The following types of data are used to differentiate the stereocompilation features:

- Include in Triangulated Surface: This type of data consists of all features to be compiled for later use in the triangulated surface of the DTM. This includes all features, general terrain breaklines and points that are important to the complete portrayal of the terrain surface. These features, breaklines and points must meet all NYSDOT vertical accuracy standards. The specific features included in this data type are indicated in the Feature Descriptions and listed in Appendix C, Feature Symbology Table.
• **Exclude from Triangulated Surface**: This type of data consists of all features to be compiled that will **not** be used for the triangulated surface of the generated DTM. The elevations for these features may not always be portrayed at ground level. For example, building locations will generally be shown using the roof outline and a number of other features such as guide rail may be measured at the top of the feature. These features will **not** be subject to NYSDOT's vertical accuracy requirements or testing. However, the elevations these features shall be of sufficient accuracy to ensure that the feature will meet NYSDOT's horizontal accuracy standards. The specific features included in this data type are indicated in the Feature Descriptions and listed in Appendix C, Feature Symbology Table.

**Section 2. Terrain Surface Compilation Requirements**

To properly model the terrain surface the stereocompilation must be captured in a manner that will best enable NYSDOT to subsequently generate a DTM surface. The final DTM surface, generated by NYSDOT, will be made from all terrain breaklines and features designated to be included in the triangulated surface. NYSDOT has the following requirements:

• The stereocompilation may utilize 3D graphic elements comprised of directly measured points, line strings, complex chains, complex shapes, arcs, circles, shapes and cells. **However, Curve String, Arc, Circle and Planar Shape element types shall not be used for features to be included in the triangulated surface.** Also refer to Appendix A, Graphic Element Definitions for MicroStation V8 elements used in NYSDOT compilation files and Appendix C, Feature Symbology Table.

• **Stream digitizing or the use of software generated point data is not allowed.** Breaklines will be manually compiled as linear elements with 3D data points to portray the feature or terrain being compiled. All data points must be directly measured. Additional software generated or interpolated points are **not** to be used or included.

• The accuracy of breakline and point feature measurements and the density of those measurements must be appropriate for the type of surface and associated cultural features to achieve NYSDOT accuracy standards. ([Refer to Chapter 7, Accuracy Requirements](#))

• Vertical features, such as curbs or retaining walls, are to be compiled as though the vertical faces were slightly canted (away from the visible base) such that two data points or lines with different elevations (i.e., top & bottom) are not horizontally coincident or improperly crossing. NYSDOT's DTM software cannot process data for perfectly vertical surfaces.

• A coincident terrain breakline is required between specified stereocompilation files (i.e. at strip tie locations) to divide a project into files of manageable size. This breakline must horizontally coincide with the NYSDOT supplied mapping file limits (i.e. strip tie lines) as specified in Chapter 10, Plan Feature Descriptions for Mapping Limit.

• Areas that cannot be compiled (under bridge decks, heavy tree cover, deep shadows, etc.) are designated as obstructed areas. Refer to Chapter 17, Landscape Feature Descriptions - Obstructed Area for more details.

• In areas of overlapping Bridge Decks or sections thereof, the primary Bridge Deck (usually the lowest) shall be portrayed in the primary stereocompilation file. Each additional Bridge Deck
that over passes the lowest bridge deck shall be placed into a separate stereocompilation file. Refer to Chapter 13, Bridge Feature Descriptions - Overlapping Bridges.

Section 3. Terrain Surface Compilation Technique Recommendations
After establishing the file limits in accordance with the project specific information and as described in the Feature Descriptions, it is preferable to begin compilation measurement with the Transportation surfaces. The greatest attention to detail should be given to transportation related features. Areas farther away from these features generally require less detailed terrain surface portrayal as noted below.

A. Transportation surfaces: This category includes such features as pavement edge, edge of travelway, parking lots and driveways, as well as curbs, bridges, retaining walls and sidewalks. These features should be portrayed using breaklines. Individual point elevations should rarely be used to model these surfaces except in the case of parking lots. Along straight segments the breakline data points should be 8 to 10 m apart. Along tightly curved segments, intersections and complex areas additional breakline data points should be compiled to accurately model the surface. Additional software generated or interpolated points are not to be used or included. Additional data points shall be inserted at intersecting symbology (e.g., road and driveway intersections) as well as to show high points and low points.

To provide the stereocompiler a frame of reference for compiling a regular pattern of measurements along the transportation alignments, NYSDOT recommends creating a series of guide alignments along the centerline of every major transportation feature. VENDORS using MicroStation V8 for stereocompilation may use the NYSDOT supplied macro. These guide alignments look identical to a cross section layout with the section lines at 10 m intervals along the alignment. Minor adjustments of data collection along the guide alignment interval is permissible to overcome obscuring factors (e.g., a bridge overpass, shadow or traffic). (See also Appendix B, Compilation Diagrams - B2, B9.)

B. Engineered Surfaces / Drainage: This category includes such features as roadway embankments, drainage ditches, water body edges, lawns and other areas within 15 m of the outermost edge of the transportation alignments. Drainage ditches and water body edges should be compiled using breaklines. Embankments, lawns and other areas within 15 m of the outermost edge of the transportation alignments should be compiled with breaklines at the slope changes with additional breaklines to accurately depict the form of the engineered slopes. Data points along breaklines which parallel transportation alignments should be compiled at the same 8 to 10 m interval used for the transportation alignment. Data points along other breaklines should generally be between 8 to 15 m apart unless additional data points are required to correctly model the surface. Individual elevation spot points should also be between 8 to 15 m apart. Breaklines should be compiled first and then supplemented with a regular pattern of discrete elevation spot points to fill-in the model. The regular pattern need not be an exact grid and stereocompilers should take points in areas where the ground surface is visible. It is generally advisable to place elevation spot points at points of local minimum and maximum elevation (i.e., low and high spots) to accurately depict the surface.

C. Other surfaces: This category represents the general terrain more than 15 m from the outermost edge of the transportation alignments. It includes hillsides, fields, wooded areas and brush areas
where only the general shape of the ground is required. These areas should be compiled with breaklines at significant slope changes and to reflect the general form or shape of the terrain. Individual elevation spot points should be used to fill in between breaklines or to portray areas without distinct surface discontinuity as needed to achieve surface accuracy requirements. Elevation spot points should generally be between 8 to 25 m apart.

NYSDOT experience indicates that 425-600 points per hectare (2.47 acres) is an appropriate range for general point density in rural areas and 650-850 points per hectare is an appropriate range for general point density in highly urbanized areas. This point density is the total of all elevation spot points and all breakline data points. Point densities above or below these ranges may indicate that too many or too few points are being collected than are necessary to accurately model the terrain.

**Section 4. Stereocompilation Workflow**

The following steps are the NYSDOT recommended process for producing the required stereocompilation. Also refer to the VENDOR Stereocompilation Production Workflow Diagram following this section.

A. The stereocompilation process begins with the careful identification of the mapping and file limits. The required mapping limits are specified in the Individual Project Description and NYSDOT supplied MicroStation design file (PINml.dgn) containing the project’s mapping limits and strip tie locations.

B. Create a new stereocompilation file for each flight strip as indicated. Reference the NYSDOT provided mapping limits and recompile the limits in the same horizontal location but to reflect the actual ground elevation. See also Chapter 10, Plan Feature Descriptions - Mapping Limit.

C. Compile all “Include in Triangulated Surface” features required for later use in the triangulated surface of the DTM. This includes all features and general terrain breaklines and points that are important to the complete terrain surface.

D. Compile all “Exclude from Triangulated Surface” features that will not be used for the triangulated surface of the DTM. This includes only those features that are not part of the terrain surface. During this part of the stereocompilation it may be helpful to “turn off” the general terrain breaklines (LELB) and points (LELS).

E. Generate a triangulated DTM surface using all the “Include in Triangulated Surface” features. Review the DTM and edit as necessary. Also check for crossed breaklines and any common points with mismatched elevation data which may have resulted from improper snapping techniques. These compilation errors should be corrected stereoscopically as necessary. This DTM surface is for VENDOR review only and is not to be submitted to NYSDOT.

F. Contours should be generated using a small interval (usually 0.25 m) from the DTM surface and reviewed by compilation personnel to verify the contour pattern and data integrity (i.e., apparent abnormal contour generation, or character resulting from one or more incorrectly measured data points). These contours are for VENDOR review only and are not to be submitted to NYSDOT.

G. Create a separate Bridge Deck file to segregate any over passing bridge surfaces for multi-level bridges. A separate compilation file must be created for any bridge decks that pass over the
lowest elevated bridge. This separate file will contain only the over passing bridge deck data. Generate a triangulated bridge deck DTM surface and edit as necessary.

H. Perform a final review and edit of the mapping content - all features except the general terrain breaklines (LELB) and points (LELS). This review and edit must be completed using MicroStation V8 to ensure that the VENDOR submittal is totally compatible with NYSDOT software and conforms to these Specifications.

I. Submit completed stereocompilation files to NYSDOT for review, processing and acceptance.
Review Project Requirements.

Create Stereocompilation File.
Recompile Mapping Limits at ground elevation.

Compile all "Include in Triangulated Surface" features.
Turn off LELB(breaklines) and LELS(elevation spots).
Compile all "Exclude from Triangulated Surface" features.

Triangulate DTM Surface ("Include in Triangulated Surface" features only).

Review and Edit Mapping Content.

Review and Edit Triangulated Surfaces.
Check for Crossed Breaklines and Mismatched Elevations.
Generate .25 m Contours and review.

Submit to NYSDOT Standard Compilation Files.
(PINa_vbm.dgn)

Submit to NYSDOT Bridge Deck Compilation Files.
(PINa1_vbm.dgn)

Create Additional DTM Bridge Deck Files for multi-level bridges.

Triangulate individual DTM Bridge Deck Surfaces and review.
CHAPTER 10
Plan Feature Descriptions

This chapter contains specific feature descriptions and their NYSDOT stereocompilation portrayal techniques. The Plan Features category includes the Mapping Limit and Stereomodel Limit. As outlined in Chapter 9, General Compilation Techniques, stereocompilation shall portray the entire terrain surface within the Mapping Limits and shall show all required features that are visible, identifiable and interpretable on the project's aerial imagery. Also refer to Appendix C, Feature Symbology Table.

<table>
<thead>
<tr>
<th>Feature Description Notation</th>
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<tbody>
<tr>
<td>Example: Mapping Limit - NLPBM (Include in Triangulated Surface)</td>
</tr>
<tr>
<td>Mapping Limit - Feature Name</td>
</tr>
<tr>
<td>NLPBM - Level and Symbology Name</td>
</tr>
<tr>
<td>(Include in Triangulated Surface) or (Exclude from Triangulated Surface) - All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.</td>
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</tbody>
</table>

Mapping Limit - NLPBM (Include in Triangulated Surface)
The Mapping Limit line indicates the extent of the project’s mapping area. The required mapping limits are specified by the NYSDOT supplied MicroStation design file (PINml.dgn) containing the project’s mapping limits and strip tie locations. The Mapping Limit symbology should also be used at the beginning and end of each individual file at the indicated strip ties. The supplied mapping limit should only be used as a reference. This line is at an average elevation and must be recompiled accurately at ground elevation.

The Mapping Limits should be stereocompiled in the same horizontal location as the supplied limit but reflect the actual ground elevation. Measurement data should be carefully compiled along the perimeter at points of terrain discontinuity and intersecting cultural feature symbology (e.g., sidewalks, driveways). The density of measurement data along the Mapping Limit line will vary according to terrain irregularity and the proximity to the transportation surfaces where greater accuracy is required. The measurement points along the Mapping Limit will later be snapped into by other terrain breaklines and feature symbology so they are exactly coincident (X,Y,Z).

Mapping Limit lines indicate the end of stereocompilation except as follows:

- A feature whose cell origin point falls within the Mapping Limits should be shown in its
entirety. A feature whose cell origin point does not fall within the Mapping File should not be shown even if some portion of the cell would lie within the Mapping Limits.

- Structural features (e.g., bridges, buildings, dams) that fall partially within the Mapping Limits are generally broken at the Mapping Limit but may be compiled in their entirety, if easier. Mapping Limit lines shall pass through these features unbroken.

- Where Transmission Lines continue beyond the mapping limits, Transmission Poles, Towers and Lines should be shown beyond the Mapping Limit lines to the next pole or tower (imagery permitting).

**Stereomodel Limit - NLPS (Exclude from Triangulated Surface)**
The Stereomodel Limit line indicates the extent of the stereomodel used for the photogrammetric stereocompilation. The Stereomodel Limit line should be delineated using NLPS symbology, between the Mapping Limit lines, in line with the mid-side fiducial marks of each photographic image used to form the stereomodel. Horizontally, this line should be a straight line. Vertically, this line should conform roughly to the ground elevation and is used as a guide to show where stereocompilation ends for each stereomodel. Features intersecting the Stereomodel Limit should not be snapped to the line. Do not compile a terrain breakline at the location of the Stereomodel Limit. Linear features between adjoining stereomodels should be snapped to each other. In general all stereomodel compilation shall end at the Stereomodel Limit lines unless instructed otherwise by NYSDOT or in the case of the following exceptions:

- A feature whose cell origin points fall within the Stereomodel Limits should be shown in its entirety. A feature whose cell origin points do not fall within the current Stereomodel Limits should be compiled in the adjoining stereomodel where applicable, even if some portion of the cell lies within the current Stereomodel Limits.

- Structural features (e.g., bridges, buildings, dams) that fall partially within a stereomodel should be shown in their entirety in the stereomodel containing the majority of the structure if feasible. Extremely large structures should be split at the Stereomodel Limit line.

Linear features between adjoining stereomodels should edge match to be exactly coincident (X,Y,Z). If this cannot be achieved within the specified mapping accuracies, NYSDOT's Photogrammetry Section should be notified.
CHAPTER 11
Pavement Feature Descriptions

This chapter contains specific feature descriptions and their NYSDOT stereocompilation portrayal techniques. The Pavement Features category includes features that relate to the roadway pavement. Since these features are the primary focus of NYSDOT's design and construction, particular attention must be given to accurately portray all transportation pavements.

As outlined in Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations, unless otherwise noted, portrayal of linear roadway features will consist of data points carefully measured in a regular 8-10 m interval (the measurement point interval along linear features shall be aligned to form a 'cross-sectional' pattern of data points). Additional points should be measured along curved sections and at points of intersecting symbology in order to correctly form the pavement surface. Also refer to Appendix C, Feature Symbology Table.

<table>
<thead>
<tr>
<th>Feature Description Notation</th>
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<tbody>
<tr>
<td>Example: <strong>Change Of Pavement</strong> - PCH (Include in Triangulated Surface)</td>
</tr>
<tr>
<td><strong>Change Of Pavement</strong> - Feature Name</td>
</tr>
<tr>
<td>PCH - Level and Symbology Name</td>
</tr>
<tr>
<td>(Include in Triangulated Surface) or (Exclude from Triangulated Surface) - All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.</td>
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</table>

**Change Of Pavement** - PCH (Include in Triangulated Surface)
Change of Pavement symbology should be used for a visible change in roadway pavement composition (i.e., concrete to asphalt) and/or a visible change of roadway pavement surface appearance (i.e., new pavement vs. older pavement). Pavement surface condition changes (i.e., new asphalt to old asphalt changes) should be shown only when the change is evident across the entire travel lane or road alignment. Do not show pavement changes at small road repairs and patches, in driveways or in parking lots.

Delineate visible pavement changes on roadways, approaches to bridge decks or exit/entrance ramps using PCH symbology. Snap the PCH symbology into all intersecting pavement features.

**Pavement Edge** - PE (Include in Triangulated Surface)
A paved roadway consists of the entire surface width between the outermost pavement edges. The outermost edge of pavement edge is defined by the following features:
  - The bottom face of roadway curbing when coincident with the pavement surface;
Pavement Edge symbology takes precedence over Driveway, Parking Lot, Paved Gutter, and Sidewalk symbology when the features coincide. The Pavement Edge symbology should be generalized to avoid minor character changes caused by broken or uneven pavement edges. PE symbology is a continuous line that does not break for any features except bridges. Do not break PE symbology for driveways or parking areas.

Delineate the edge of the paved surface using PE symbology. Pavement Edge data should be carefully measured in accordance with Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations. (See also Appendix B, Compilation Diagrams - B2, B3, B5).

Pavement Edge, Unpaved - PEU (Include in Triangulated Surface)
An unpaved roadway is usually a graded dirt or gravel transportation surface maintained as a thoroughfare, commonly found in rural areas. The extent of the unpaved road is defined by the outer edge of graded surface when visible. If not visible, or if the surface is not graded, define by outside edges of travelway as indicated by tire wear. Use the edge of vegetation where the travelway is indistinguishable. (Also refer to similar descriptions for unpaved trails - Chapter 12, Roadway Features - Trail, Unpaved).

Unpaved Pavement Edge symbology takes precedence over Driveway / Parking Lot symbology when features coincide. Delineate the edge of the unpaved road surface using PEU symbology. Unpaved Pavement Edge data should be carefully measured in accordance with Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations.

Pavement Elevation Break - PELB (Include in Triangulated Surface)
To complete the roadway surface portrayal it is necessary to compile Pavement Elevation Breaks between each travel lane on multiple lane roadways. If the road surface dictates, it is permissible to use PELB breaklines within travel lanes and intersections to model the roadway surface. Refer to Pavement Edge, Travelway Edge and Roadway Crown symbology to complete the roadway surface.

Delineate the roadway surface between multiple travel lanes using PELB symbology. Pavement Elevation Breaks should be carefully measured in accordance with Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations. Do not use PELB symbology for Parking Lots or Driveways.

Pavement Joints (Not Compiled)

Pavement Striping (Not Compiled)
Pavement striping is not compiled - refer to Pavement Edge and Travelway Edge for use of pavement striping in portraying these features.

Roadway Crown - PRC (Include in Triangulated Surface)
The Roadway Crown is digitized as a breakline along the center pavement seam or where the
maximum road crown is observed. These Roadway Crowns may not always fall exactly at the painted centerline of the road and in those cases the Roadway Crown should be measured where the actual crown is observed. For multi-lane roadways, **without** a median, a Roadway Crown should be compiled and a PELB breakline should be compiled between each travel lane (See Pavement Elevation Break). For multi-lane roadways, **with** a median, a Roadway Crown should **not** be compiled, instead Pavement Edge should be used with a PELB breakline compiled between each travel lane (See Pavement Elevation Break). Do not use PRC symbology in Driveways.

**Runway, Paved** (See Pavement Edge)
Delineate the edge of paved surfaces at airports used for the takeoff, landing, taxiing or parking of aircraft using Pavement Edge symbology.

**Runway, Unpaved** (See Pavement Edge, Unpaved)
Delineate the apparent edge of the unpaved landing strip or cleared area used for the takeoff or landing of aircraft using Pavement Edge, Unpaved symbology.

**Shoulder, Paved** (See Pavement Edge and Travelway Edge)

**Shoulder, Unpaved** (Not Compiled)

**Travelway Edge - PET** *(Include in Triangulated Surface)*
The Travelway is defined as the center of the unbroken painted white line which defines the outer edge of the travelway. Travelway symbology should be used to define the extent of the traveled surface when the distance between Pavement Edge symbology used to portray the pavement and the painted white line is **greater** than 0.5 m. In other words, when the paved shoulder area is greater than 0.5 m wide the Travelway Edge must be shown in addition to the Pavement Edge symbology. (Also refer to related description for Pavement Edge for portrayal usage).

Pavement Edge symbology takes precedence over Travelway Edge symbology when the distance between the Pavement Edge and the painted white line is less than 0.5 m or the features coincide. Thus when the paved shoulder area is less than 0.5 m wide the Travelway Edge is not compiled. When the painted white line which defines the travelway is being delineated with the Travelway Edge symbology, the symbology is ended (not blended) when the average distance between the Travelway Edge and the Pavement Edge is less than 0.5 m or when the painted white line is ended (broken) at an intersection. (See also Appendix B, Compilation Diagrams - [B2, B3]).

Delineate the center of the painted white line using PET symbology. Travelway Edge data should be carefully measured in accordance with [Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations](#).
CHAPTER 12
Roadway Feature Descriptions

This chapter contains specific feature descriptions and their NYSDOT stereocompilation portrayal techniques. The Roadway Features category consists of features that relate to the transportation system for pedestrian, vehicular and rail traffic including driveways and parking areas. Since these features are the primary focus of NYSDOT’s design and construction, particular attention should be given to accurately portray all transportation and related features along transportation corridors.

As outlined in Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations, unless otherwise noted, portrayal of linear roadway features will consist of data points carefully measured in a regular 8-10 m interval (the measurement point interval along linear features shall be aligned to form a 'cross-sectional' pattern of data points). Additional points should be measured along curved sections and at points of intersecting symbology. Also refer to Appendix C, Feature Symbology Table.

Feature Description Notation

Example: **Buffer Strip - RBS**  (Include in Triangulated Surface)

**Buffer Strip** - Feature Name

**RBS** - Level and Symbology Name

(Include in Triangulated Surface) or (Exclude from Triangulated Surface) - All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.

**Barrel** (See Chapter 14, Sign and Traffic Control - Impact Attenuator)
Temporary construction Barrels are not compiled.

**Barricade** (See Concrete Barrier)

**Bike Path** (See Trail, Paved)

**Buffer Strip - RBS** (Include in Triangulated Surface)
A Buffer Strip is a strip of pavement located outside the top of a roadway Curb. Delineate the edge of the paved surface using RBS symbology. Additional data points must also be measured in curve sections where the regular 10 meter spacing of data points would be insufficient to accurately define the curve. Sidewalk symbology takes precedence over Buffer Strip symbology.
Concrete Barrier - RGCB (Exclude from Triangulated Surface)
A Concrete Barrier is temporary or permanent protective concrete wall approximately 1 m in height usually located in the median between opposing traffic lanes in place of a guide rail. Delineate the top center of the barrier (approximately 0.6 m wide) with RGCB symbology. If the barrier widens less than 1 m at areas to accommodate light poles, bridge piers, landscaping, etc. continue with the single RGCB symbology. If the barrier widens to over 1 m, use 2 RGCB lines each centered on the top of each of the barriers. See Appendix B, Compilation Diagrams - B6.

Curb / Drop Curb - RC / RCD (Include in Triangulated Surface)
Curbs generally define the pavement edge along a paved road, travelway edge along a paved road or outline traffic islands (e.g., raised median). They are also found along driveways and parking areas. Drop Curbs are sections of curbing that have no appreciable height and generally continue as edging through adjoining/intersecting features such as driveways and sidewalks. (See also Chapter 13 for curbs on bridges).

Delineate Curbs using the Curb/Drop Curb (RC/RCD) symbology to portray the top back edge of the curb. The bottom face of the Curb at the elevation of the adjoining road or paved surface should be portrayed with the appropriate pavement symbology (See Chapter 11, Pavement) or Driveway / Parking Lot symbology. Additional data points must also be measured in curve sections where the regular 8 - 10 meter spacing of data points would be insufficient to correctly define the curve. The top back edge of the Curb should be carefully measured and data points must be adjacent to and slightly offset horizontally from the bottom face pavement measurements. The curb (top back edge) and pavement (bottom face of curb) lines must not overlap or cross.

The Curb symbology should reflect any Drop Curbs. To portray a Drop Curb, the Curb breakline symbology should be measured along the top back edge of the Curb leading to the Drop Curb and then Drop Curb symbology should be used for the Curb cut portions and the flat base of the Drop Curb. Landscape Elevation Break (LELB) symbology is used along the ramp from the Drop Curb base up to the top of the ramp. The symbology between the top of the Curb cut and the top of the ramp should reflect the feature being represented usually a Driveway (RDP) or Sidewalk (RSW). The RC, RCD, RDP, RSW and LELB symbology should all be snapped to each other. See also Appendix B, Compilation Diagrams - B4 for illustration of this technique.

Driveway, Parking Lot, Paved - RDP (Include in Triangulated Surface)
Paved Driveways and Parking Lots are portrayed with the same symbology. If this feature intersects a roadway alignment and the roadway pavement markings (painted lines) are broken for the intersecting feature, delineate the feature as a Roadway and portray using Pavement Edge or Travelway Edge. All Curbs should be portrayed using RC / RCD symbology. Paved Driveway and Parking Lot symbology takes precedence over Sidewalk, Unpaved Driveway and Unpaved Parking Lot symbology when these features coincide (Refer to Appendix B, Compilation Diagrams - B5).

Delineate the edges of paved Driveway and Parking Lot surfaces (with or without Curbs) using RDP symbology. Measurement points should be taken as needed to define the feature's position and achieve the surface's vertical accuracy requirements. Additional data points should be measured at points of intersecting symbology where snapping of symbology is required (e.g. intersections of driveways, curbs and sidewalks). Complete the paved surface portrayal with Landscape Elevation
Break (LELB) and Landscape Elevation Spot (LELS) symbology as appropriate to achieve surface accuracy requirements. Do not use Pavement Elevation Break (PELB) symbology for Driveways and Parking Lots.

**Driveway, Parking Lot, Unpaved - RDU (Include in Triangulated Surface)**

Unpaved Driveways and Parking Lots are portrayed with the same symbology. If this feature intersects a roadway alignment and the roadway pavement markings (painted lines) are broken for the intersecting feature, delineate the feature as an Unpaved Roadway. Paved Driveway, Paved Parking Lot, Unpaved Roadway and Sidewalk symbology have precedence over Unpaved Driveway and Unpaved Parking Lot symbology when these features coincide.

Delineate the apparent edges of unpaved driveway and parking lot surfaces using the RDU symbology. Measurement points should be taken as needed to define the feature's position and achieve the surface's vertical accuracy requirements. Additional data points should be measured at points of intersecting symbology where snapping of symbology is required (e.g. intersections of other driveways and sidewalks). Complete the unpaved surface portrayal with Landscape Elevation Break (LELB) and Landscape Elevation Spot (LELS) symbology as appropriate to achieve surface accuracy requirements.

**Field Entrance** (See Trail, Unpaved)

**Flush Median** (See Median, Flush)

**Footpath** (Not Compiled)

**Guide Post - RGP (Exclude from Triangulated Surface)**

A Guide Post is approximately 1 m in height and is used as a protective/warning post or right-of-way marker. They are often triangular in shape, made of concrete and positioned at the road edge near culverts or bridges. Place the RGP cell at the center of the post location. See also the similar feature description for Post in Chapter 14, Sign and Traffic Control Features to confirm feature interpretation.

**GUIDE RAIL FEATURES**

A Guide Rail is a traffic barrier located in the median or near the roadway shoulder. Delineate the Guide Rail (usually along the top of the feature) using the symbology indicated below. See also Concrete Barrier. See also Appendix B, Compilation Diagrams - B6.

- **Guide Rail Anchor Block** (Not Compiled)
- **Guide Rail, Box Beam - RGB (Exclude from Triangulated Surface)**
  This Box Beam Guide Rail (Tubular Steel) has a single rail alongside support posts, and is usually located at road edges or in a wide median between opposing traffic lanes.

- **Guide Rail, Box Beam, Median - RGBM (Exclude from Triangulated Surface)**
  This Box Beam Guide Rail (Tubular Steel) has rails attached to both sides of support posts or one central rail, and is usually located in median between opposing traffic lanes.
• **Guide Rail, Cable - RGC (Exclude from Triangulated Surface)**
  This Cable Guide Rail consists of posts at the road edge that are connected by heavy cable to serve as a barrier.

• **Guide Rail, ‘W’ Beam - RGW (Exclude from Triangulated Surface)**
  This ‘W’ Beam (Corrugated Steel) Guide Rail has a single rail attached to support posts, and is usually located at road edges or in a wide median between opposing traffic lanes.

• **Guide Rail, ‘W’ Beam, Median - RGWM (Exclude from Triangulated Surface)**
  This ‘W’ Beam (Corrugated Steel) Guide Rail has rails attached to both sides of support posts, and is usually in median between opposing traffic lanes.

• **Guide Rail, Miscellaneous - RG (Exclude from Triangulated Surface)**
  This refers to wooden or other guide rail, not described above, that is located at road edges or in the median between opposing traffic lanes.

**Median, Flush - PELB or PRC (Include in Triangulated Surface)**
A Flush Median is a traffic-guiding median separating traffic flow in opposite directions. They are normally comprised of contrasting pavement, with little or no appreciable height or a painted striped surface. Painted striping at exit and entrance ramps should be compiled as Travelway Edge, not flush medians. Flush Medians are delineated using Pavement Elevation Break (PELB) or Pavement Roadway Crown (PRC) symbology as appropriate (See Chapter 11, Pavement).

**Median, Raised** (See Chapter 11, Pavement Edge and Chapter 12, Roadway Curb)
A Raised Median is a raised (with or without curb) surface area outlining traffic islands and separating traffic in opposite directions. Use the appropriate transportation symbology (e.g. Pavement Edge and Curb) to delineate the edge of Raised Median areas regardless of size. Add additional DTM terrain data as required to properly portray the terrain surface of the median area.

**Mile Marker; Reference Marker** (See Chapter 14, Sign and Traffic Control)

**Parking, Roadway** (Not Compiled)
Do not outline area or delineate any of the painted lines designating parallel or other parking along roadways.

**Parking Bumper - RPB (Exclude from Triangulated Surface)**
Delineate the devices used as vehicle wheel stops in parking lots using RPB symbology. Delineate the bumper center line with one data point at each end.

**Parking Lot, Paved** (See Driveway, Paved)

**Parking Lot, Unpaved** (See Driveway, Unpaved)

**RAILROAD FEATURES**

• **Railroad, Track - RRPSS (Exclude from Triangulated Surface)**
Show all active and abandoned rail lines, sidings, multiple tracks and rail yard tracks. Delineate the center of the track (midway between the rails) using RRPSS symbology to accurately depict the location of each rail.

- **Railroad, Ballast - RRB** *(Include in Triangulated Surface)*  
The railroad ballast is the aggregate material used to maintain the position of the track and ties. This feature is commonly elevated terrain.

  Data points along the railroad alignment should be carefully measured at positions of terrain discontinuity (breaks) of the ballast and **not** the ties and rails. Generally four breaklines will be compiled to define the cross-section of the ballast's engineered slopes; two at the top and two at the bottom. The top two will delineate the top outside edges of the ballast using RRB symbology and the bottom two will delineate the ground break along each side of the ballast where it meets the ground using Landscape Elevation Break (LELB) symbology (See Chapter 17, Landscape Features).

- **Railroad Bridge** *(See Chapter 13, Bridge Features)*

- **Railroad Catenary - RRC** *(Exclude from Triangulated Surface)*  
A Catenary is a structure supporting wires for electrically powered trains. Delineate using RRC symbology to connect points at center of pole locations.

- **Railroad, Control Box - TCMC** *(Exclude from Triangulated Surface)*  
A Control Box is used to control railroad crossing signal, railroad signal pole or other railroad control device. Place TCMC cell at the center of feature location.

- **Railroad Crossing Signal - TCSP** *(Exclude from Triangulated Surface)*  
A Crossing Signal is a roadway traffic control device (e.g. gates, flashing signals and/or signs) at railroad crossings. Place TCSP cell at the center of feature's location.

- **Railroad, Electric Rail - RRER** *(Exclude from Triangulated Surface)*  
An Electric Rail is a “third rail” adjacent to tracks used by electrically powered trains. Delineate using RRER symbology. (Refer to Railroad Track above for portrayal of adjacent tracks)

- **Railroad Signal Pole - TCSP** *(Exclude from Triangulated Surface)*  
This Signal Pole is a railroad signal that controls train traffic. Place TCSP cell at the center of the feature's location. Show both sides if feature crosses tracks.

- **Railroad Switch - TCRSW** *(Exclude from Triangulated Surface)*  
A Switch or turnout is a device used to control track merges. Delineate extent of control mechanism or switch box with TCRSW symbology.

- **Runway, Paved** *(See Chapter 11, Pavement Features - Pavement, Edge)*

- **Runway, Unpaved** *(See Chapter 11, Pavement Features - Pavement, Edge, Unpaved)*

- **Sidewalk - RSW** *(Include in Triangulated Surface)*  
Sidewalks consist of concrete, asphalt, stone or brick surfaces used for pedestrian walkways. Show
all Sidewalks, whether public (parallel to the road), or private (leading to or adjacent to a building).

Sidewalk symbology continues through Paved Driveway and Parking Lot entrances only if the Sidewalk surface composition is a different pavement type. Sidewalk symbology takes precedence over Buffer Strip, Unpaved Driveway and Unpaved Parking Lot symbology when these features coincide. Pavement Edge, Driveway, Parking Lot and Curb symbology take precedence over Sidewalk symbology when these features coincide. (Refer to Appendix B, Compilation Diagrams B5).

Delineate the edges of the walkway surface using RSW symbology. Walkways parallel with roads should be measured along the same 8-10 m measurement interval that the roadway symbology is being measured. All other walkway data should be measured at positions of surface discontinuity as needed to correctly define the feature's location and achieve the surface's vertical accuracy requirements. Additional data points should also be measured at points of intersecting symbology where snapping of symbology is required (e.g. intersections of driveways and other sidewalks).

**Trail, Footpath** (Not Compiled)

**Trail, Paved - RTRP (Include in Triangulated Surface)**

Paved trails, often bike paths, are paved surfaces specifically prepared and used for bicycle traffic. Bike lanes that are part of the roadway (e.g. a widened shoulder with bike lane markings) are not compiled as a separate feature. Delineate the apparent edges of surfaces using RTRP symbology. Complete the surface portrayal as appropriate to achieve accuracy requirements.

**Trail, Unpaved - RTR (Include in Triangulated Surface)**

An Unpaved Trail is a major dirt or gravel passageway, permanent in nature, usually in a rural or undeveloped area. Distinguishable from an Unpaved Road by its lack of maintenance. Trail must be either a cross country trail or used as a service trail (e.g., running along railroad tracks, connecting transmission towers, logging trail). Field entrances should also be shown as a double line trail. Do not show random trails (i.e. those created by all-terrain vehicles). (See also Chapter 11, Pavement Features - Pavement, Edge Unpaved to confirm interpretation).

Delineate the apparent edges of the trail using RTR symbology. Data points should be measured at positions of surface discontinuity as needed to define the feature's position and achieve the surface's vertical accuracy requirements. Additional points should be measured at the locations of intersecting symbology where snapping of symbology is required (e.g. intersections of Trail and Roadway symbology).

**Tunnel** (See Chapter 17, Landscape - Tunnel)

**Underpass** (See Chapter 17, Landscape - Underpass)
CHAPTER 13
Bridge Feature Descriptions

Bridge Features, including supports or piers, are erected over a depression or an obstruction such as water, roadway, railway or canals, and normally have a clear span (i.e. the open area between the faces of the abutments) of more than 6 m. Unless otherwise indicated by NYSDOT, if the clear span is less than 6 m, the feature should be depicted as a Tunnel or Underpass. Listed in this Chapter are the specific features that are given special attention because they are part of a highway or railroad bridge. Other features that may be part of the bridge such as utility poles and signs should be delineated using symbology as indicated in the appropriate chapter. Also refer to Appendix C, Feature Symbology Table.

As outlined in Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations, unless otherwise noted, portrayal of linear roadway features (including bridges) should consist of data points carefully taken in a regular 8-10 m interval (the measurement point interval along linear features must be aligned to form a 'cross-sectional' pattern of data points) with additional points measured along curved sections and at points of intersecting symbology.

Under Bridge Area: The area obstructed from view by the bridge deck shall be outlined as an Obstructed Area (See Chapter 17, Landscape - Obstructed Area). To complete the surface portrayal underneath the bridge deck, surface features that continue on both sides of the bridge should be connected (do not add any additional data points in obstructed area) from one side of the Obstructed Area to the opposite side and snapped to the corresponding symbology.

Overlapping Bridges: In areas of overlapping Bridge Decks or sections thereof, only the lowest elevated bridge deck will be included in the primary compilation. Therefore, to segregate any other overlapping bridge surfaces, a separate compilation file must be created for any bridge that passes over the lowest elevated bridge within each file area. This separate file will contain only the overlapping bridge deck data; while the primary compilation file will contain the lowest elevated bridge, as well as all bridge abutment data and the terrain surface underlying the bridges. Separate Bridge Deck Files are only required for bridges that pass over a bridge in the primary compilation file. Each additional Bridge Deck shall be portrayed as completely as possible which may include connecting the symbology through the obscured area of the overlapping bridge.

The overlapping bridge deck files will be named using the same PIN/letter designation as the primary compilation file name with a unique identifier in accordance with NYSDOT Photogrammetry Section's File Naming Convention as follows:

- The first bridge deck that passes over a bridge deck in the primary compilation file should be placed in a unique bridge deck file. The file name should be the same as the main file but with a “1” added (PINa1_vbm.dgn). Any other bridge decks that pass over a different bridge deck in the primary compilation file should be in the same file (i.e. there could be
numerous bridge decks in this file).

- Each subsequent occurrence of another bridge deck passing over the same bridge deck in the primary compilation file should be placed in a separate and unique bridge deck file. The file name should be the same as the main file but with a “2” added (PINa2_vbm.dgn) or “3” if needed.

### Feature Description Notation

**Example:**  
**Bridge Abutment** - BWW  (Include in Triangulated Surface)

- **Bridge Abutment** - Feature Name  
- **BWW** - Level and Symbology Name

*(Include in Triangulated Surface)* or *(Exclude from Triangulated Surface)* -  
*All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.*

**Bridge Abutment** - BWW  *(Include in Triangulated Surface)*

Bridge Abutments are fixed structures, usually concrete or stone, that have vertical or near vertical faces which support a bridge deck and form the clear span area under the bridge. Bridge Abutment symbology takes precedence over Sidewalk symbology when these features coincide.

Delineate the Bridge Abutment with Wing Wall symbology along the top of the feature. Delineate the top front and top back (if visible) of the Bridge Abutment at its true horizontal location using BWW symbology. Then delineate the terrain surface by measuring the bottom (toe) of the Bridge Abutment with Landscape Elevation Break (LELB) symbology which is slightly offset from the top breakline so that the top and bottom breaklines do not cross or overlap. (Refer to Bridge Wing Wall and Appendix B, Compilation Diagrams - B8, B9, B10).

**Bridge Deck Curb** - BDC  *(Include in Triangulated Surface)*

Bridge Deck Curbs are the raised edging generally along the deck surface defining the pavement edge, travelway edge or outlining traffic islands (e.g. raised median) which are located on a bridge deck. Bridge Deck Curb symbology is also used for all curbed sections associated with a bridge structure, whether or not the curbing is adjacent to the pavement edge. (See also similar Transportation feature descriptions for Curb/ Drop Curb, Roadway; Curb/ Drop Curb, Non-Roadway to confirm feature interpretation).

Delineate Bridge Deck Curbs using BDC symbology at the **top back edge** of the Curb. The bottom face of the Curb at the elevation of the adjoining deck surface should be portrayed with Bridge Deck Edge symbology. The top back edge of the Curb should be delineated adjacent to and slightly offset horizontally from the bottom face pavement measurements. **The curb (top back edge) and pavement (bottom face of curb) lines must not overlap or cross.** (See Bridge Deck Edge, Bridge Rail, Bridge Deck Travelway and Appendix B, Compilation Diagrams - B8, B9).
**Bridge Deck Edge - BDE (Include in Triangulated Surface)**
The Bridge Deck Edge symbology is used to portray the sides of bridge deck roadway surface at the edge of the paved surface on the bridge deck. The Bridge Deck Edge is also used to portray both the ends of the bridge deck (perpendicular to the roadway) from one Bridge Fascia to the other.

Delineate the beginning and end of a Bridge Deck at the first and last expansion joint using BDE symbology. This BDE symbology should be snapped to the Bridge Fascia symbology. If a change of pavement type or an expansion joint is not visible, the bridge deck ends are defined by the back edge of the Bridge Abutment. (See Appendix B, Compilation Diagrams - B10 for illustration.) The beginning and ending lines will serve as a "cut line" for the Bridge Deck's surface and should be exactly coincident with the Landscape Elevation Breakline (LELB) used to portray the end of the adjoining pavement. All roadway and other transportation features shall be snapped where the symbology is overlapping or intersecting. These “cut lines” should portray the Bridge Deck's surface cross-section by measuring all points of surface discontinuity (e.g. outside corner of Bridge Deck, top/bottom of Bridge Deck Curb, Bridge Curb, edge of Travelway and Roadway Crown). (Refer to Appendix B, Compilation Diagrams - B8, B9).

Also delineate edge of the paved surface on the bridge deck using BDE symbology with data points along the bridge deck surface in the regular 8-10 m interval used for the adjoining transportation surface. The BDE symbology shall be snapped to any Bridge Deck Joint lines. Bridge Deck Edge data should be carefully measured in accordance with Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations.

**Bridge Deck Joint - BDJ (Include in Triangulated Surface)**
The Bridge Deck Joint symbology is used to delineate internal expansion joints usually found over piers. Delineate the Joint using BDJ symbology. All intersecting symbology should be snapped together. The ends of the bridge deck, usually at the abutments, should be portrayed using Bridge Deck Edge symbology. (See Bridge Deck Edge and Appendix B, Compilation Diagrams - B8, B9).

**Bridge Deck Roadway Crown - BDRC (Include in Triangulated Surface)**
The Bridge Roadway Crown is along the center of the Bridge Deck or where the maximum road crown is observed. These Roadway Crowns may not fall exactly at the painted centerline of the road and in those cases the Roadway Crown should be measured where the actual crown is observed. Delineate the Crown using BDRC symbology. For multi-lane Bridge Decks, a breakline should be compiled between each travel lane using Bridge Elevation Break symbology (See Bridge Elevation Break).

**Bridge Deck Sidewalk - BDSW (Include in Triangulated Surface)**
Sidewalk symbology on most bridges will be not be used because Bridge Curb symbology takes precedence for the top of curb side of the sidewalk and the Bridge Fascia takes precedence for the other side of the sidewalk. When this is not the case use BDSW symbology. (Refer to Bridge Fascia, Bridge Deck Curb and Appendix B, Compilation Diagrams - B8, B9).

**Bridge Deck Travelway - BDET (Include in Triangulated Surface)**
The Bridge Deck Travelway is defined as the center of the unbroken painted white line which
defines the outer edge of the travelway. Travelway symbology should be used to define the extent
of the traveled surface when the distance between Bridge Deck Edge symbology (used to portray the
pavement) and the painted white line is greater than 0.5 m. In other words, when the paved
shoulder area is greater than 0.5 m wide the Bridge Deck Travelway must be shown. (See also
related description for Bridge Deck Edge for portrayal usage).

Bridge Deck Edge symbology takes precedence over Bridge Deck Travelway symbology when the
distance between the pavement edge and the painted white line is less than 0.5 m or the features
coincide. Thus when the paved shoulder area is less than 0.5 m wide, the Bridge Deck Travelway is
not compiled. When the painted white line which defines the travelway is being delineated with the
Travelway symbology, the symbology is ended (not blended) when the average distance between the
Travelway and the Pavement Edge and is less than 0.5 m or when the painted white line is ended
(broken) at an intersection. (See also Appendix B, Compilation Diagrams - B3).

Delineate the center of the painted white line to portray the travelway surface using the BDET
symbology. (See also Bridge Deck Edge, Bridge Rail, Bridge Deck Curb and Appendix B,
Compilation Diagrams - B8, B9). Bridge Deck Travelway data should be carefully measured in
accordance with Chapter 9, Section 3 Terrain Surface Compilation Technique Recommendations.

**Bridge Elevation Break - BELB (Include in Triangulated Surface)**

Bridge Elevation Breaks are breaklines used to portray each travel lane on multiple lane roadways.
Refer to Bridge Deck Edge, Bridge Deck Travelway and Bridge Deck Roadway Crown symbology
to complete the Bridge Deck surface.

Delineate the lanes of the roadway surface using BELB symbology. Bridge Elevation Breaks should
be carefully measured in accordance with Chapter 9, Section 3 Terrain Surface Compilation
Technique Recommendations. Complete the surface portrayal as appropriate to achieve the vertical
accuracy requirements.

**Bridge Fascia - BF (Include in Triangulated Surface)**

Bridge Fascia symbology is used to portray the outside edge of the Bridge Deck parallel to the
roadway. Delineate the lateral extent of the outermost edges (i.e., the edges parallel with the
alignment) of the bridge using BF symbology. The elevation of the Bridge Fascia symbology should
match that of the adjacent Bridge Deck Edge or Bridge Deck Curb (whichever is outermost). The
actual top and bottom of the fascia is not compiled. At each end of the Bridge Fascia line, Bridge
Deck Edge symbology should be used to portray the ends of the Bridge Deck perpendicular to the
roadway. Bridge Fascia symbology for railroad bridges should be compiled along the outer edge of
the structure at an elevation matching the top of the railroad ties. (See also Bridge Deck Edge,
Bridge Rail, Bridge Fence Pedestrian and Appendix B, Compilation Diagrams - B8, B9).

**Bridge Fence, Pedestrian - BFNC (Exclude from Triangulated Surface)**

A Pedestrian Bridge Fence is a protective wire fence barrier on bridge rails or parapets, generally
over 2 m in height. Delineate using BFNC symbology, usually just outside the Bridge Rail and
inside or outside of the Bridge Fascia. Do not compile snow fences. (See Bridge Fascia and Bridge
Rail).

**Bridge Pier - BSUBM (Exclude from Triangulated Surface)**
Bridge Piers are Bridge Deck support structures located between Bridge Abutments. When visible on the aerial photography, delineate the Pier sections that extend beyond the Bridge Fascia using BSUBM symbology. Show all piers if possible (compile in mono if necessary). End symbology at the intersecting Bridge Deck Fascia symbology. (See Bridge Abutment and Appendix B, Compilation Diagrams - B8).

**Bridge Rail - BR (Exclude from Triangulated Surface)**
Bridge Rail refers to the railing along the edge of the Bridge Deck. Delineate using BR symbology, usually just inside the Bridge Fascia line. This symbology should also be used for guide rail or railings on bridge decks that are between a sidewalk and travelway, or in the median between two travel ways. Do not compile snow fences. (See Bridge Fascia, Bridge Rail and Appendix B, Compilation Diagrams - B8).

**Bridge Scupper - BSC (Include in Triangulated Surface)**
A Bridge Scupper is a drainage structure that collects storm water runoff from bridge surfaces. The feature is characterized by a rectangular shaped grate that is generally set at the elevation of the surrounding surface. Place a BSC cell at the center of the grate and rotate to match the correct orientation of the feature. See also the Bridge Curb feature description for related delineation information. (Also see Appendix B, Compilation Diagrams - B8).

**Bridge Wing Wall - BWW (Include in Triangulated Surface)**
Bridge Wing Walls are fixed structures, usually concrete or stone, that have vertical or near vertical faces which support the embankment near a bridge. The Bridge Wing Wall symbology should be used along the top of the feature. Delineate the elevation of the surface (pavement or terrain) at the visible top front and top back, if visible, of the Bridge Wing Wall at its true horizontal location using BWW symbology. Then delineate the terrain surface by measuring the exposed bottom (toe) of the Bridge Wing Wall with a Landscape Elevation Breakline (LELB) which is slightly offset from the top breakline so that the top and bottom breaklines do not cross or overlap. (See Bridge Abutment and Appendix B, Compilation Diagrams - B8, B9).

**Pedestrian Overpass**
A Pedestrian Overpass or footbridge is for public pedestrian use, usually over a highway or railroad. Delineate bridge structure using the appropriate feature symbology from highway bridges. Small foot bridges for private pedestrian use (e.g. over a backyard creek) are not compiled.

**Tunnel** (See Chapter 17, Landscape - Tunnel)

**Underpass** (See Chapter 17, Landscape - Underpass)
CHAPTER 14
Sign and Traffic Control Feature Descriptions

This chapter contains specific feature descriptions and their portrayal techniques for NYSDOT stereocompilation. The Sign and Traffic Control category includes traffic control devices, and both official roadway signs and private or commercial signs. Refer to Roadway, Railroad Features for railroad traffic control features.

As outlined in Chapter 9, General Compilation Techniques, stereocompilation will portray the entire terrain surface within the Mapping Limits and must show all required features that are visible, identifiable and interpretable on the project's aerial imagery. To correctly portray the terrain surface around features that are to be ‘excluded from the triangulated surface’ use Landscape Elevation Breakline (LELB) or Landscape Elevation Spot (LELS) symbology as needed. Also refer to Appendix C, Feature Symbology Table.

Feature Description Notation

Example: **Billboard** - SBLB (Exclude from Triangulated Surface)

**Billboard** - Feature Name

**SBLB** - Level and Symbology Name

*(Include in Triangulated Surface) or (Exclude from Triangulated Surface)* - *All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.*

**Barrel** (See Impact Attenuator)

Only permanent Barrels are shown. Do not portray individual barrels used to temporarily control traffic in construction zones.

**Billboard - SBLB** (Exclude from Triangulated Surface)

Delineate the sign face using SBLB symbology from end to end. Billboards supported by large single post/poles will be portrayed with the SBLB symbology and a sign post cell at the center of supporting post. (See Sign Post)

**Impact Attenuator - TCIA** (Exclude from Triangulated Surface)

Structure designed to reduce vehicle impact at highway hazards or structures. May also be a group of barrels. Delineate extent of the structure or the outline of the barrels with TCIA symbology.
Mile Marker (See Reference Marker)

Parking Meter - SPM (Exclude from Triangulated Surface)
Place SPM symbology at center of Parking Meter.

Reference Marker - SRM (Exclude from Triangulated Surface)
Single post approximately 1 m in height with a small sign face in close proximity to transportation alignments and used as road identification or location markers. These posts include Mile Markers and Reference Markers. Place SRM cell at the center of the post.

Reflector Post (Not Compiled)

SIGN STRUCTURE, OVERHEAD FEATURES
Traffic Sign over a highway supported vertically by one or more posts, poles or mounted on a bridge or overpass structure.

- **Sign, Overhead - SSO** (Exclude from Triangulated Surface)
  Delineate using SSO symbology with a data point at the center of each supporting pole.

- **Sign, Overhead, Cantilevered - SSOC** (Exclude from Triangulated Surface)
  Delineate using SSOC symbology with the first data point at the center of the supporting pole and the second at the end of the support structure away from the pole.

- **Sign, Overhead (No Posts) - SSO** (Exclude from Triangulated Surface)
  If the Overhead Sign is attached to a bridge or other overpass structure, delineate the extent of each Sign face with a linestyle of zero placed on the SSO level.

Sign, Single Post - S (Exclude from Triangulated Surface)
Signs are defined as a permanent board or other display used to identify, advertise, command, warn, or direct. Compile both traffic control and commercial signage. For a Single Post Sign, place S symbology at the center of post.

Sign, Multiple Post - SM (Exclude from Triangulated Surface)
Signs are defined as a permanent board or other display used to identify, advertise, command, warn, or direct. Compile both traffic control and commercial signage. Multiple Post Signs are portrayed with the correct sign face orientation. Delineate using SM symbology with data points at each post compiled from right to left when facing the sign.

Traffic Control Cabinet - TCMC (Exclude from Triangulated Surface)
Metal box containing traffic signal control switches and microcomputer. Cabinets are often freestanding, mounted on a pole (TCSP) or post, or flush with the ground (pull box). Place TCMC symbology at the center of the feature's location. (See Utility Pull Box to confirm interpretation.)

Traffic Control Pedestrian Pole - TCPP (Exclude from Triangulated Surface)
Pole supporting pedestrian cross walk signal. Place TCPP symbology at the center of the pole location. (See Traffic Control Signal Pole)
**Traffic Control Signal Pole - TCSP (Exclude from Triangulated Surface)**
Pole supporting vehicular traffic signals or cables from which signals hang. Traffic Control Signal Pole symbology has precedence over Light Pole symbology. Place TCSP symbology at the center of the pole location. (See Traffic Control Span Wire and Traffic Control Pedestrian Pole)

**Traffic Control Span Wire - TCSW (Exclude from Triangulated Surface)**
Wire between Traffic Control Signal Poles supporting traffic Signals. Delineate wire using TCSW symbology with the first data point at the top of the pole, intermediate points at the top of each signal head and the last point at the top of the opposite pole. Do not show hanging signs. Although this feature is excluded from the triangulated surface these data points should be accurately measured horizontally and vertically. Rigid cantilevered signals are portrayed with only Traffic Control Signal Pole symbology. (See Traffic Control Signal Pole)
CHAPTER 15
Utility Feature Descriptions

This chapter contains specific feature descriptions and their portrayal techniques for NYSDOT stereocompilation. The Utility category includes utility company and municipal utility features and fuel station features.

As outlined in Chapter 9, General Compilation Techniques, stereocompilation will portray the entire terrain surface within the Mapping Limits and must show all required features that are visible, identifiable and interpretable on the project's aerial imagery. To correctly portray the terrain surface around features that are to be ‘excluded from the triangulated surface’ use Landscape Elevation Breakline (LELB) or Landscape Elevation Spot (LELS) symbology as needed. Also refer to Appendix C, Feature Symbology Table.

<table>
<thead>
<tr>
<th>Feature Description Notation</th>
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<tbody>
<tr>
<td>Example: <strong>Brace Pole - UPBP (Exclude from Triangulated Surface)</strong></td>
</tr>
<tr>
<td><strong>Brace Pole</strong> - Feature Name</td>
</tr>
<tr>
<td><strong>UPBP</strong> - Level and Symbology Name</td>
</tr>
<tr>
<td>(Include in Triangulated Surface) or (Exclude from Triangulated Surface) - All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.</td>
</tr>
</tbody>
</table>

**Brace Pole - UPBP (Exclude from Triangulated Surface)**
A Brace Pole supports a utility pole or tower. Delineate using UPBP symbology with the first data point at the ground end of the angled pole and the second snapping to the supported Utility Pole or Tower.

**Filler Cap - UMFC (Exclude from Triangulated Surface)**
Filler Caps are small metal lids, flush with the ground, covering the access pipes to underground fuel storage tanks, usually in a gas station lot. Place UMFC symbology at center of each Filler Cap. Delineate concrete pads around caps, if larger than the Filler Cap symbology (See Chapter 17, Concrete Slab).

**Fire Hydrant - UWFH (Exclude from Triangulated Surface)**
Place UWFH symbology at center of Fire Hydrant location.

**Fuel Pump - UGP (Exclude from Triangulated Surface)**
Place UGP symbology at center of gasoline or diesel fuel pump location. (See also Fuel Pump Canopy).

**Fuel Pump Canopy - LBRO** *(Exclude from Triangulated Surface)*
Delineate top edge of the roof-like feature using LBRO symbology.

**Gas Line Vent - UUVT** *(Exclude from Triangulated Surface)*
A Gas Line Vent is a “Gooseneck” shaped vent pipe found along route of an underground gas line. Place UUVT symbology at center of the feature's location.

**Guy Wire - UPGW** *(Exclude from Triangulated Surface)*
A Guy Wire is a ground anchored cable which supports a utility pole or tower. Delineate using UPGW symbology with the first data point at the ground end of the Guy Wire and the second snapping to the supported Utility Pole or Tower.

**Lamp Post** *(See Light Pole, Pedestrian)*

**Light Pole - ULP** *(Exclude from Triangulated Surface)*
A Light Pole supports only a street light (without utility lines) or parking lot light. Place ULP symbology at center of pole location. Orient symbol to correspond with direction of light arm extension if present. Show 1-arm Light Poles and no arm Light Poles with ULP single light arm symbology. (See Light Pole, Median; Light Pole, Pedestrian; and Utility Pole with Light).

**Light Pole, Median - ULPM** *(Exclude from Triangulated Surface)*
A Light Pole supports only street lights (without utility lines) or parking lot lights along the median. Place ULPM symbology at center of pole location. Orient symbol to correspond with direction of light arms if present. Show all Light Poles located in a median and all other 2-arm Light Poles with ULPM symbology. (See Light Pole and Utility Pole with Light).

**Light Pole, Pedestrian - ULPP** *(Exclude from Triangulated Surface)*
Pedestrian Light Poles are poles supporting a light along a sidewalk or small yard light, distinguished by their lower height. Place ULPP symbology at center of pole location. (See Light Pole and Utility Pole with Light).

**Manhole - UUMH** *(Exclude from Triangulated Surface)*
Manholes allow access to utilities under the transportation surface or sidewalk through round metal plates approximately 0.8 m in diameter. Manholes may be associated with water, sewer, electrical or telephone systems. No symbology distinction is made between these types. Place UUMH symbology at the center of the Manhole.

**Pipes - UUO** *(Exclude from Triangulated Surface)*
Above ground Piping conveys liquids, gases or finely divided solids and is usually associated with storage areas, industrial areas, public utilities, etc. Delineate using UUO symbology.

**Substation, Electric - UESS** *(Exclude from Triangulated Surface)*
An Electric Substation is a group of electric utility structures (e.g., transformers) in a fenced
enclosure. Delineate enclosure using UESS symbology. Structures within the fences are not compiled. (See Substation, Utility.)

**Substation, Utility - LFNC (Exclude from Triangulated Surface)**
A Utility Substation is a group of water, gas line or other utility structures in a fenced enclosure. Delineate enclosure using LFNC symbology. Structures within the fences are not compiled. (See Substation, Electric.)

**Telephone Booth - UTB (Exclude from Triangulated Surface)**
Place UTB symbology at the center of phone booth or drive-up open telephone box.

**Transmission Line - UEO (Exclude from Triangulated Surface)**
A Transmission Line is a major overhead utility suspended from Transmission Poles or Towers. Delineate major power lines using UEO symbology connecting the center of the supporting poles or towers. Where power lines cross through the Mapping Limits, extend the UEO symbology to the first pole or tower beyond the Mapping Limits. (See Transmission Pole and Transmission Tower)

**Transmission Pole - UEPT (Exclude from Triangulated Surface)**
Transmission Poles are widely spaced, tall wood or steel poles suspending cross country power lines. Place UEPT symbology at center of pole locations. If symbolizing a multiple pole structure add a cross arm with a linestyle of zero placed on the UEPT level. Transmission Poles are usually distinguishable from local service Utility Poles by their greater height and diameter. Where power lines cross through the Mapping Limits, show the first pole or tower beyond the Mapping Limits. (See Utility Pole, Transmission Line and Transmission Tower)

**Transmission Tower - UETO (Exclude from Triangulated Surface)**
Transmission Towers are widely spaced, tall steel frame towers suspending cross country power lines. Delineate tower bases to scale using UETO symbology. Where power lines cross through the Mapping Limits, show the first pole or tower beyond the Mapping Limits. (See Transmission Pole and Transmission Line)

**Utility Box - UUB (Exclude from Triangulated Surface)**
A Utility Box is a metal or concrete structure containing utility controls. Place UUB symbology at the center of the feature's location.

**Utility Line Marker - LPST (Exclude from Triangulated Surface)**
A Utility Line Marker identifies the location of an underground utility line. This could include a gas line or other unknown utility line. Place LPST symbology at the center of the feature's location.

**Utility Pole - UP (Exclude from Triangulated Surface)**
A Utility Pole is a pole from which local power, telephone or cable television lines are suspended. This symbology is also used for utility poles (usually telephone lines) crossing the countryside. Place UP symbology at pole locations and orient symbology to connecting lines, but do not show connecting lines. Distinguishable from transmission poles by their shorter height and smaller diameter. (See Transmission Pole and Utility Pole with Light to confirm interpretation.)
Utility Pole, No Utility - UPD (Exclude from Triangulated Surface)
This is a Utility Pole with no apparent local power, telephone or cable television lines connected. Place UPD symbology at center of pole.

Utility Pole With Light - UPL (Exclude from Triangulated Surface)
This is a Utility Pole with an overhead street light attached. Place UPL symbology at center of pole and orient light arm symbol to correspond with direction of light arm extension (See, Light Pole and Light Pole, Median to confirm interpretation).

Utility Pull Box - UUPB (Exclude from Triangulated Surface)
This is a covered metal or concrete in-ground structure containing utility controls. Generally found flush with the ground in close proximity to utilities. Place UUPB symbology at the center of the feature's location. (See Chapter 14, Traffic Control Cabinet to confirm interpretation.)

Well - UUW (Exclude from Triangulated Surface)
A Well is a water supply usually indicated by a steel casing emerging out of the ground. Place UUW symbology at the center of the feature's location with indicated symbology.
CHAPTER 16
Drainage Feature Descriptions

The Drainage Features category includes features that relate to the collection, diversion, treatment and discharge of storm water runoff from land and pavement surfaces. Since these features are important to NYSDOT particular attention should be given to accurately portraying all Drainage Features.

As outlined in Chapter 9, General Compilation Techniques, stereocompilation will portray the entire terrain surface within the Mapping Limits and must show all required features that are visible, identifiable and interpretable on the project's aerial imagery. Also refer to Appendix C, Feature Symbology Table.

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<td>Example: <strong>Culvert, End Section</strong> - DES (Include in Triangulated Surface)</td>
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<tr>
<td><strong>Culvert, End Section</strong> - Feature Name</td>
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<tr>
<td>DES - Level and Symbology Name</td>
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**Catch Basin** (See Curb Inlet, Drainage Structure, Drainage Grate or Scupper)

**Culvert** (See Drainage Invert)
If a culvert opening is characterized by an absence of any Culvert End Section or Headwall (the actual pipe may or may not be visible) use Drainage Invert symbology. (See Culvert End Section or Headwall if present.)

**Culvert, End Section** - DES (Include in Triangulated Surface)
A Culvert End Section is a fitting attached to the end of a pipe culvert or conduit. The Culvert End Section is a visible pipe extension that has a sloping exposure in the top of the pipe such that the sidewall height tapers down to the elevation of the bottom of the pipe (the taper commonly mirrors the adjacent terrain slope). These End Sections may be found at the ends of culvert pipes under roadways, railroads and parking lots. If the End Section is not clearly visible only use Drainage Invert symbology to show the culvert end.

Delineate the End Section using DES symbology to form a “V” shaped line from the bottom left to
the top center and ending at the bottom right of the end section. Each End Section will also have an associated Drainage Invert (See Drainage Invert). Portray the terrain around the End Section with Ditch and Landscape Elevation Breaklines measured around the extent of the culvert opening (See Ditch and Chapter 17, Landscape Elevation Break). (See Appendix B, Compilation Diagrams - B11.)

**Culvert, Headwall - DHW (Include in Triangulated Surface)**
A Culvert Headwall is a fixed structure, usually constructed of concrete or stone, which retains earth at a culvert opening. This feature is characterized by an abrupt change in elevation around the culvert opening. These Headwalls may be found at the ends of culvert pipes under roadways, railroads and parking lots.

Portray the Culvert Headwall with breaklines in a similar technique as other vertical features. Delineate the top front and back of the headwall at its true horizontal location using DHW symbology. The exposed bottom (toe) of the headwall should be delineated with a Landscape Elevation Breakline (LELB) slightly offset from the top breaklines so that the top and the bottom breaklines do not cross or overlap. The terrain around the Headwall shall be portrayed with Ditch and Landscape Elevation Breaklines measured around the extent of the culvert opening (See Ditch and Landscape Elevation Break). Data points shall be measured at positions of terrain discontinuity and be of sufficient frequency and accuracy to achieve the vertical accuracy requirement. Drainage Inverts are not compiled at Headwalls. (See Appendix B, Compilation Diagram - B12.)

**Culvert, Pipe - DCP (Exclude from Triangulated Surface)**
A Culvert Pipe is the pipe or conduit used to allow the movement of water from one open channel to another passing beneath a roadway, railroad, parking lot or driveway. This feature is portrayed by a straight line connecting (snapped to) the Drainage Invert at each Culvert End Section or the end of a culvert pipe. If it can not be determined which Drainage Inverts should be connected, do not show a Culvert Pipe. Delineate using DCP symbology. (See Drainage Invert, Culvert End Section, Culvert Headwall and Appendix B, Compilation Diagrams - B11.)

**Curb Inlet - DS (Include in Triangulated Surface)**
A Curb Inlet is a drainage structure typically characterized by a 1-2 m rectangular concrete surface pad adjacent to the top face of curbing. If visible in the photography, the curb face would appear to be open or have a grate present. This opening provides an inlet to a subsurface drainage system for storm water runoff from the surrounding surface. A Manhole may also be associated with the feature.

Portray a Curb Inlet with Drainage Structure (DS) symbology in the roadway adjacent to the feature. Delineate the extent of any associated concrete surface using Landscape Concrete Slab (LS) symbology. The symbology should be snapped to the bottom of curb Pavement Edge symbology. Any associated manhole should be portrayed using Utility, Manhole (UUMH) symbology. (See Drainage Structure, Chapter 17, Concrete Slab and Chapter 15, Manhole)

**Ditch - DD (Include in Triangulated Surface)**
A Ditch is a man-made trench created to channel water flow and characterized by distinct channel
edges. Ditch symbology is only used to portray the bottom of the ditch. Delineate using DD symbology measured at locations of terrain discontinuity as well as angle points along the center and/or bottom edges of the channel. Ditches with a “U” shape cross-section typically will have 2 or 3 bottom (DD) breaklines to properly model its shape, while ditches with a “V” shape cross-section will typically have one bottom (DD) breakline. If the Ditch parallels a Roadway, data points should be generally measured along the same 8-10 m interval used for the Roadway measurements. If water is present ditch symbology (DD) is still used, usually at the water edge. The top of the ditch is portrayed using Landscape, Elevation Breaks (LELB).

**Drainage Basin** - LELB (Include in Triangulated Surface)
A Drainage Basin is an engineered depression that provides storage or retention of storm water runoff. This feature includes Recharge Basins and retention ponds often found on Long Island. Delineate bottom and top with Landscape Elevation Breaklines. If significant (obscuring the bottom of the basin) water is present delineate using Water Edge (LAWE) symbology.

**Drainage Grate** - DSSD (Include in Triangulated Surface)
A Drainage Grate is an elongated slotted grate in a pavement surface for collection and removal of storm water runoff, often at driveway or parking lot entrances. Delineate the centerline of the grate using DSSD symbology measured at the elevation of the grate surface. (See Drainage Structure, Rectangular and Drainage Structure, Round to confirm feature interpretation.)

**Drainage Invert** - DINV (Exclude from Triangulated Surface)
A Drainage Invert represents the bottom of a culvert outlet. Place Drainage Invert (DINV) symbology at the bottom elevation of the pipe's outlet if visible or the elevation of the associated water or Ditch symbology of the adjoining open channel. If a Culvert End Section or the end of a Culvert Pipe is present a Drainage Invert is shown. If a culvert has no Culvert End Section, only show the Drainage Invert.

Each Drainage Invert should be connected by a straight line Culvert Pipe (DCP) snapped to the Drainage Invert. If it can not be determined which Drainage Inverts should be connected, do not show a Culvert Pipe. (See Culvert Pipe, Culvert End Section, Culvert Headwall and Appendix B, Compilation Diagrams - B11.)

**Drainage Manhole** (See Utility, Manhole)

**Drainage Structure** - DS / DSR (Include in Triangulated Surface)
A Drainage Structure is subsurface structure that collects storm water runoff from paved and unpaved surfaces. The feature is characterized by a rectangular or round shaped grate that is generally situated over the top of the collection structure and set at an elevation close to the elevation of the surrounding surface. Also refer to similar feature descriptions for Curb Inlet, Drainage Grate and Scupper to confirm feature identification.

Place the Drainage Structure (DS or DSR) symbology at the center of the grate. For rectangular Drainage Structures use the DS symbology and for round Drainage Structures use the DSR symbology. Rotate the cell so that it is parallel to any coincident Pavement Edges or Curbs. As outlined in the portrayal techniques for curb features, while delineating the bottom-of-curb Pavement
Edge, additional points must be measured at each adjacent corner of a coincident Drainage Structure grate. (See Appendix B, Compilation Diagrams - B4).

**End Section** (See Culvert, End Section)

**Field Inlet** (See Drainage Structure)

**Paved Gutter - DGTR / DELB (Include in Triangulated Surface)**
A Paved Gutter is an asphalt or concrete channel used to direct storm runoff. This feature is commonly located along engineered slopes or the edge of pavement.

Delineate the Paved Gutter edges along engineered slopes using DGTR symbology. Measure data points to define the feature's location and elevation. The trough (bottom) of the gutter should be portrayed using Drainage Elevation Break (DELB) symbology as required to accurately model the feature's surface.

Paved Gutters that involve a concrete apron, concrete curb or concrete without curb that are parallel to the Pavement Edge, should be delineated using DGTR, Pavement Edge (PE), Curb (RC) and Drainage Elevation Break (DELB) symbology. Pavement Edge (PE) symbology takes precedence over DGTR symbology. DGTR symbology takes precedence over Sidewalk (RSW) symbology. If the Paved Gutter is parallel to a Roadway, points should be generally measured at the same 8-10 m interval as the Roadway. Additional points should be measured along tightly curved sections and at intersections. (See Appendix B, Compilation Diagrams - B13).

**Recharge Basin** (See Drainage Basin)
CHAPTER 17
Landscape Feature Descriptions

This chapter contains specific feature descriptions and their portrayal techniques for NYSDOT stereocompilation. The Landscape category includes structural, cultural, natural and general terrain features.

As outlined in Chapter 9, General Compilation Techniques, stereocompilation must portray the entire terrain surface within the Mapping Limits and show all required features that are visible, identifiable and interpretable on the project’s aerial imagery. Features not described or listed herein should be delineated using the symbology for Unknown Feature. To correctly portray the terrain surface around features that are to be ‘excluded from the triangulated surface’ use Landscape Elevation Breakline (LELB) or Landscape Elevation Spot (LELS) symbology as needed. Also refer to Appendix C, Feature Symbology Table.

Feature Description Notation
Example: **Antenna** - **LANT** (Exclude from Triangulated Surface)

**Antenna** - Feature Name

**LANT** - Level and Symbology Name

(Include in Triangulated Surface) or (Exclude from Triangulated Surface) - All features will be designated as either included in or excluded from the triangulated surface. See Chapter 9, Section 1 - Stereocompilation Overview for more information.

**Antenna** - **LANT** (Exclude from Triangulated Surface)
An Antenna is a shortwave or FM transmitter usually under 30 meters, or a Satellite Dish. Show only if a free standing structure (i.e., not attached to the roof or side of a building). Refer also to similar features descriptions for Tower to confirm feature interpretation. Delineate the perimeter of the Antenna structure or base with LANT symbology.

**Apron, Concrete** (See Concrete Slab)

**Aqueduct** - **LDS** (Include in Triangulated Surface)
An Aqueduct is Concrete or masonry channel or large above ground pipe for transporting water. Delineate outer edges of channel or pipe using LDS symbology.

**Athletic Field / Court or Playground** - **LAFL** (Exclude from Triangulated Surface)
Delineate area or surface only where not bounded by a fence or other linear feature using LAFL symbology. Show associated buildings, light poles, tennis net posts and poles supporting basketball backboards within area using feature specific symbology.

**Beaver Dam - LELB (Include in Triangulated Surface)**
A Beaver Dam is a barrier constructed by beavers in a water body. Delineate the top and bottom of the Beaver Dam using LELB symbology at positions of water discontinuity.

**Bench - LBNC (Exclude from Triangulated Surface)**
Delineate the outer edge of permanently located benches in public areas using LBNC symbology. Do not show benches in yards or movable benches.

**Berm - LELB (Include in Triangulated Surface)**
A Berm is an engineered earthen embankment which is generally built along a transportation corridor in the vicinity of residential areas, as a noise and/or visual barrier. (See also similar feature descriptions for Levee). Delineate using LELB symbology to portray the shape and form of the Berm. Data points should be measured at positions of terrain discontinuity and should be of sufficient density to achieve vertical surface accuracy requirements.

**Birdbath / Birdhouse (Not Compiled)**

**Boulder - LRB (Exclude from Triangulated Surface)**
Place LRB cell at the center of landmark decorative human-placed rocks. To be considered landmark the boulders should be along roadways or in front of buildings. Do not use for naturally occurring boulders.

**Breakwater (See Jetty)**

**Brush Area - LABL (Exclude from Triangulated Surface)**
A Brush Area is an area heavily vegetated with brush and small trees (under 3 m in height) which cover most of the ground surface. Delineate area outline using LABL symbology. Brush Area symbology must not overlap any roads, double line trails, railroads, or buildings. Close all Brush Areas that are completely within the Mapping Limits. Isolated trees over 3 m in height should be plotted within Brush Area. Wooded Area symbology takes precedence over Brush Area symbology when these features coincide. See also similar feature descriptions for Hedge, Planting Bed, and Wooded Area to confirm feature interpretation.

**Building - LBRO (Exclude from Triangulated Surface)**
Buildings include all private dwellings and outbuildings (e.g., greenhouses, houses, mobile homes, garages, and barns) as well as all commercial buildings. Buildings also include all other roofed structures/outbuildings associated with private dwellings and commercial buildings (e.g., playhouse, shed, gazebo or bus stop enclosures). Carports, porches and overhangs (awnings are not compiled) should be compiled as part of the building. Do not use Building symbology to delineate decks, patios, ramps, stairs or cellar doors (Refer to Landscape Building Features and to Landscape Stairs). A Building partially within a stereomodel should be included in its entirety in the model containing the majority of the building. Buildings are generally clipped at the Mapping Limit line but may be
compiled in their entirety, if easier. Building symbology takes precedence over all other symbology when features coincide.

Also use Building symbology for buildings under construction. These are any building structures and/or foundations which are under construction at the time of photography. See also similar feature descriptions for Building Ruin, to confirm feature interpretation.

Delineate the perimeter of the building's roof line using LBRO symbology. All building roof line corners that are nearly orthogonal corners should be shown at right angles “squared” within the horizontal accuracy tolerances. Do not show interior roof lines (e.g., dormers) or portray the interior surface of the roof.

Landscape Elevation Breaks or other indicated symbology (Sidewalk, Driveway and Retaining Wall) should be used as needed to accurately portray the elevation of the ground surface at the base of the building, or as close to the building as the stereoscopic imagery permits. Terrain data points should be measured at locations of terrain discontinuity and be of sufficient frequency to achieve surface accuracy requirements. This ground surface symbology may extend into the Building symbology. Do not compile an Obstructed Area around Buildings unless it is apparent that significant features cannot be compiled.

**Building Features - LBF (Exclude from Triangulated Surface)**

Building Features include all patios, decks, cellar doors, loading docks or ramps. Delineate the extent of the building feature outline using LBF symbology. Building symbology takes precedence over Building Feature symbology when they coincide. Building Features should be trimmed at the Building symbology. Also see Landscape Stairs.

**Building, Ruin - LBR (Exclude from Triangulated Surface)**

Building Ruins are the remains of a structure that has collapsed, been abandoned or destroyed. Delineate the general extent of the Ruin using LBR symbology. Landscape Elevation Breaks (LELB) or other indicated symbology should be used as needed to portray the elevation of the ground surface around the Ruin, or as close to the structure as the stereoscopic imagery permits. Terrain data points should be measured at locations of terrain discontinuity and should be of sufficient frequency to achieve surface accuracy requirements.

**Building, Under Construction** (See Building)

**Bush** (See Shrub)

**Canal - LAWE (Include in Triangulated Surface)**

A Canal is an artificially created or modified water course/channel intended for inland water movement and navigation. See also feature descriptions for Dam (Spillway) and Lock to confirm feature interpretation.

Delineate the extent of water in the Canal with Waters Edge (LAWE) symbology measured along the edge of the water level. Complete the portrayal of the Canal's terrain shape and form above or outside the water level using Landscape Elevation Breakline (LELB) symbology measured at positions of terrain discontinuity.
**Carport**  (See Building)

**Cellar Door**  (See Building Features)
A Cellar Door is the cover of exterior stairs to cellar or basement indicated by sloping bulkhead doors attached to buildings.

**Cemetery**  - LCEM  (Exclude from Triangulated Surface)
Cemeteries are commonly bounded by a Fence. Delineate the apparent extent of a Cemetery (maintained grass area with or without monuments or markers) not bounded by a fence using LCEM symbology. For the fences use Fence (LFNC) symbology.

**Clothesline Pole**  (Not Compiled)

**Concrete Slab**  - LS  (Include in Triangulated Surface)
A Concrete Slab or pad often acts as a support base or surface for another feature. Also use for concrete slabs in parking lots, around Filler Caps and Fuel Pumps, or at loading docks. Delineate the top edge of the slab using LS symbology. When the Slab top is above the terrain, the base of the feature should be delineated with LELB breaklines symbology.

**Construction Area**  - NLPDOP  (Include in Triangulated Surface)
A Construction Area is any surface area or terrain being modified by construction activities. The area is characterized by active (on-going) earth excavation or grading activities, or earthen piles. Include construction debris, dirt piles or storage piles as part of Construction Area symbology. Delineate the extent of the Construction Area using Obstructed Area (NLPDOP) symbology snapped together to form a closed non-planar polygon measured at the elevation of the ground surface around the area. Data points should be measured at points of terrain discontinuity and shall be of sufficient frequency to achieve surface accuracy requirements. For Construction Areas which extend beyond the Mapping Limit, the symbology should be closed along the Mapping Limit Line (i.e., not extended around the entire perimeter of the Construction Area).

The completeness of the terrain portrayal within the Construction Area will be determined by the status of the construction activities. Areas that appear to be under-going significant change need only show major terrain breaks (rough shape) using Landscape Elevation Breakline and Elevation Spot symbology. Delineate any mapping features which appear to be permanently in place using the appropriate symbology. If the Construction Area appears to have been final graded, the surface portrayal should be more complete. (Also see Obstructed Areas).

**Creek**  (See Waters Edge)

**Dam / Spillway**  - LDS  (Include in Triangulated Surface)
A Dam or Spillway is a fixed structure or barrier built of concrete, stone, or earthen materials to restrict or regulate the flow of water. Dam or Spillway symbology takes precedence over Waters Edge symbology when coincident. (See also similar feature descriptions for Berm, Beaver Dam, Jetty, Levee and Lock to confirm feature interpretation).
Delineate the top of the Dam or Spillway structure using LDS symbology in a similar technique to other vertical features such as retaining walls. The top of the feature should be delineated with LDS symbology at its true horizontal position. Delineate the visible bottom (toe) of the structure either at the water level or along the terrain surface using either Waters Edge or Landscape Elevation Breakline symbology as applicable. The symbology at the bottom (toe) of the structure should be slightly offset from the top breakline symbology so that the top and bottom symbology do not cross or overlap. Earthen Dams should be measured with LDS symbology for the 'top' of the embankment’s engineered slope. Waters Edge or Landscape Elevation Breakline symbology as applicable should be used for the 'toe' of the embankment’s engineered slope.

**Debris - LAFL (Exclude from Triangulated Surface)**
Debris is accumulated or discarded material covering large areas of ground. Small areas of Debris should not be shown. (See also similar feature descriptions for Construction Area, Storage Area as well as Building, Under Construction to confirm feature interpretation). Delineate the extent of Debris areas using LAFL symbology. Fence symbology takes precedence over Debris.

**Deck** (See Building Features)

**Dock / Pier - LPJ (Exclude from Triangulated Surface)**
A Dock or Pier is a structure that usually serves water craft, built of steel, wood or concrete extending into a water body. The structure is supported by posts or pilings rising from open water. Delineate the extent of the Dock or Pier using LPJ symbology.

Large Docks or Piers filled with earthen material whose edges are characterized by vertical walls should be shown using Retaining Wall symbology (See Retaining Wall). See also similar feature description for Jetty to confirm feature interpretation. Dock or Pier symbology takes precedence over Waters Edge symbology when the features coincide. Docks which have been removed from the water for storage are not compiled.

**Dog House** (Not Compiled)

**Fence - LFNC (Exclude from Triangulated Surface)**
A Fence may be post and rail, wire, chain link, picket or stockade style. Delineate all fences using the LFNC symbology. Do not show temporary snow fences. Delineate gates in the same position as they appear on the aerial photos. (See also Bridge Rail Screening, for wire fences on bridge rails.)

**Field Line - LAFL (Exclude from Triangulated Surface)**
Delineate the perimeter of any open areas which exhibit indication of agricultural land use (e.g., furrowed field, standing corn or wheat crop, short grass/hay field, open pasture) using LAFL symbology. Fence, Wooded Area, Brush Area, Tree Row and Water Edge symbology take precedence over Field Line symbology when features coincide. See also similar feature descriptions for Orchard, Vineyard and Nursery to confirm feature interpretation.

**Fire Escape** (See Stairs)

**Fireplace - LBF (Exclude from Triangulated Surface)**
A Fireplace is a significant permanent outdoor structure used for containing an open fire or for barbecuing. Delineate using LBF symbology.

**Flagpole - LFP (Exclude from Triangulated Surface)**
Place LFP symbology at the center of pole's location.

**Freestanding Wall - LBF (Exclude from Triangulated Surface)**
A Freestanding Wall is a fixed structure of concrete or brick not used for retention of earth. Delineate as a double line using LBF symbology. (See also similar feature descriptions for Fence, Noise Wall, Retaining Wall and Stone Wall to confirm interpretation.)

**Foundation** (See Building Under Construction or Ruin)

**Garden**
Residential flower and vegetable gardens are not compiled. See also similar feature description for Planting Bed to confirm feature interpretation.

**Gas Pump** (See Chapter 15, Utility - Fuel Pump)

**Gas Pump Canopy** (See Chapter 15, Utility - Fuel Pump Canopy)

**Gazebo** (See Building)
A Gazebo is a small open structure with screened or unscreened walls which is not attached to a house or other building. Show only if structure appears permanent.

**Golf Course - LAFL (Exclude from Triangulated Surface)**
Delineate the outer extent of each hole (include tee areas, fairway, green and sand traps) as one generalized polygon using LAFL symbology. Show associated features (e.g., buildings, light poles, trees, trails and wooded areas) using the appropriate symbology.

**Grate, Non-Drainage - LBF (Exclude from Triangulated Surface)**
A Non-Drainage Grate is a Grate found in urban sidewalks used for access or ventilation. Delineate perimeter of grate to scale with LBF symbology. (See also Chapter 16 for Drainage Grate.)

**Greenhouse** (See Building)

**Hedge - LAHR (Exclude from Triangulated Surface)**
A Hedge is a row of maintained bushes less than 3 m high. Delineate along the center of the Hedge row using LAHR symbology. Use Tree Row symbology if the feature is over 3 m tall and use Bush symbology when individual bushes can be clearly identified.

**Jetty - LAWE (Include in Triangulated Surface)**
A Jetty is a structure or barrier usually constructed of concrete or stone in a body of water to protect a shoreline from erosion and to retard or inhibit the movement of sand along a beach. The extent of the Jetty is delineated using Waters Edge (LAWE) symbology along the water level at the base of the Jetty. Complete the portrayal of the Jetty's surface above the waterline using Landscape...
Elevation Breakline (LELB) symbology. See also Dock/Pier to confirm interpretation.

**Lake** (See Waters Edge)

**Lamp Post** (See Chapter 15, Utility - Light Pole, Pedestrian)

**Landscape Elevation Breakline - LELB (Include in Triangulated Surface)**
Landscape Elevation Breaklines may be isolated segments, or polygons used to delineate any visual change in slope, form or aspect of a feature or general terrain. They may also be used as form lines where a change in slope is not present but terrain data is needed to model the ground surface. Landscape Elevation Breaklines are generally needed at the bottoms of vertical features. They are also needed to portray the terrain in areas where the feature symbology is excluded from the triangulated surface. (Refer to Appendix B, Compilation Diagrams for examples.)

The vertices at all joining points or crossing points of breaklines must be snapped together so as to be exactly coincident in position and elevation \((x, y, z)\). Breaklines may change direction as often as needed. “Stream” digitizing is not allowed. Breaklines should be measured with sufficient data points to meet surface accuracy standards. Generally, data points along breaklines should not be spaced more than 15 m apart. Tight curves will require extra data points. Avoid compiling excessive data points along breaklines in other areas.

**Landscape Elevation Spot - LELS (Include in Triangulated Surface)**
Landscape Elevation Spots are discrete points \((x, y, z)\) used to complete (fill in) the terrain surface between breaklines. Use LELS points to portray areas without distinct surface discontinuity as needed to achieve surface accuracy requirements. Elevation Spots are generally used only to portray relatively flat or gently rolling terrain, or high and low spot locations. For most areas breaklines and form lines are the preferred terrain portrayal method.

**Levee - LELB (Include in Triangulated Surface)**
A Levee is an embankment built to control flood water or retain any overflow liquids. A levee is generally constructed of earthen materials and is usually found along a river or canal, as well as around liquid storage tanks. (See also similar feature descriptions for Berm and Dam to confirm feature interpretation). Delineate the shape and form of the Levee using LELB breakline symbology.

**Loading Dock** (See Building Features)

**Lock - LDS (Include in Triangulated Surface)**
A Lock is a structure that artificially controls water levels to raise and lower water craft and is located along waterways at points of significant elevation change (e.g., dams, waterfalls). Delineate the top of the Lock structure (walls and gates) with LDS symbology consisting of line strings in a similar technique to other vertical features such as retaining walls. The top of the feature should be delineated with LDS symbology at its true horizontal position. Delineate the visible bottom (toe) of the structure either at the water level or along the terrain surface using either Waters Edge or Landscape Elevation Breakline symbology as applicable. The symbology at the bottom (toe) of the structure should be slightly offset from the top breakline symbology so that the top and bottom symbology do not cross or overlap. See also Dock/Pier and Retaining Wall to confirm
**Mailbox - LMB (Exclude from Triangulated Surface)**
No distinction is made between collection and delivery boxes. Place LMB symbology at center of Mailbox. When several Mailboxes are grouped together or assembled on a rack, place Mailbox symbology at beginning and end of group and fill area in between with additional symbols as space permits without overlapping cells.

**Marsh, Swamp or Wetland - LAM (Include in Triangulated Surface)**
A Marsh, Swamp or Wetland is an area of wet, spongy ground characterized by patchy vegetation which may be interspersed with small pools of standing water. Waters Edge symbology takes precedence over Swamp symbology when features coincide. Waters Edge, Wooded Area and Brush Area symbology may continue through a marsh.

Delineate the extent of the Marsh using LAM symbology. Open water areas in excess of 50 square meters within the Marsh shall be delineated using Waters Edge symbology. Complete the portrayal of any surface within the Marsh by using discrete spot elevations.

**Noise Wall - LWN (Exclude from Triangulated Surface)**
A Noise Wall is a freestanding wall, generally four or more meters in height, made of wood, concrete or composite materials erected generally parallel to the roadway for noise abatement purposes. These walls are typically located along divided highways in urban and suburban areas. Delineate the center of the top of the wall with a single line of LWN symbology. Delineate the base of the wall with a Landscape Elevation breakline (LELB). See also similar feature descriptions for Berm and Freestanding Wall to confirm feature interpretation.

**Nursery (See Orchard)**

**Obstructed Area - NLPDOP (Include in Triangulated Surface)**
An Obstructed Area is an irregularly shaped closed polygon inside of which precise and accurate vertical data cannot be measured consistently within NYSDOT specifications. The Obstructed Area is delineated with a NLPDOP symbology breakline accurately representing the ground surface at the edge of the visible unobstructed area. If the Obstructed Area is outlined with a single line string it must be made a closed non-planar polygon. If the Obstructed Area is outlined with multiple line strings it **must be a Complex Shape** (2 or more line strings joined together that form a closed polygon). See also Appendix A, GRAPHIC ELEMENT DEFINITIONS for clarification. For Obstructed Areas not contained completely within a single stereomodel, create a closed figure by snapping the ends of the boundary along the Stereomodel Limit Line.

In some cases the Obstructed Area may be void of any clearly visible ground, where no reliable data can be compiled to meet accuracy specifications (e.g., dense coniferous tree stands). In other cases the ground cannot be consistently measured throughout with reasonable confidence, but small locations exist within the boundary where reliable data can be measured to meet accuracy specifications. In these cases delineate as many features and as much of the terrain surface as possible. Do not compile an Obstructed Area around Buildings unless it is apparent that significant features can not be compiled.
The area under Bridge Decks is outlined using Obstructed Area symbology. While no additional data points are collected, features that continue on both sides of the bridge should be connected from one side of the Obstructed Area to the opposite side and snapped to the corresponding symbology. See Chapter 13, Bridge Deck for additional information and Appendix B, Compilation Diagrams - B8, B9.

**Ocean** (See Waters Edge)

**Orchard - LAON (Exclude from Triangulated Surface)**
An Orchard, Nursery or Vineyard is a cultivated area of trees or vines, usually in evenly spaced rows. Delineate the perimeter of the area using LAON symbology. Fence symbology takes precedence over Orchard symbology when features coincide. Do not show individual plants, trees, shrubs or symbolize as Wooded Area.

**Overhang** (See Building)
A permanent roof-like structure which is open on more than one side extending from a Building. An Overhang is usually at a lower height than the structure's main roof (e.g., a carport, bank drive-through or structure covering the sidewalk).

**Patio** (See Building Features)

**Pier** (See Dock)

**Pit or Quarry - LAQP (Exclude from Triangulated Surface)**
A Pit or Quarry is an area of excavation or mining that serves as a supply source of earthen materials (e.g., sand, stone, or rock). The area is shown whether it is in active use or appears inactive or abandoned.

Delineate the extent of the Pit or Quarry area using LAQP symbology. Do not delineate debris or storage piles in an active Pit or Quarry area. It is not necessary to delineate rock outcrops and separate boulders within the area. Portray the terrain surface of the area with Landscape Elevation breakline symbology measured along positions of significant terrain discontinuities. Show only major terrain breaks inside Pit and Quarry areas. Delineate any water features using Waters Edge (LAWE) symbology.

**Planter - LBF (Exclude from Triangulated Surface)**
A Planter is a structure designed to hold plants and/or private signs. Delineate the perimeter of the top outside edge of the Planter with single line LBF symbology. Also portray any features (i.e. Signs) within the Planter with appropriate symbology.

**Planting Bed - LAPB (Exclude from Triangulated Surface)**
A Planting Bed is an area of landscape shrubbery less than 3 m in height commonly found near buildings, in parking lot islands or lawn areas. Delineate perimeter of Planting Bed with LAPB symbology. Building symbology takes precedence over Planting Bed symbology when features coincide. Show trees if present using the appropriate Tree symbology. Residential flower and vegetable gardens are not compiled.
**Pole - UPD** (Exclude from Triangulated Surface)
Non-utility pole greater than 2 m in height. Place UPD cell at center of Pole location. Birdhouse and clothesline poles are not compiled. See also Flagpole and Chapter 15 Utility Pole to confirm feature interpretation.

**Pond** (See Waters Edge)

**Porch** (See Building)

**Post - LPST** (Exclude from Triangulated Surface)
This Post refers to a non-transportation related Post less than 2 m in height. Place LPST symbology at the center of Post location. See also Chapter 12, Guide Post and Chapter 14, Reference Marker to confirm feature interpretation.

**Quarry** (See Pit)

**Ramp - LBF** (Exclude from Triangulated Surface)
A Ramp is a sloped walkway for pedestrian traffic, leading to building entrance or loading dock. Delineate the ramp perimeter using LBF symbology. For ramps connected to a pedestrian overpass or footbridge, use the appropriate pedestrian overpass symbology.

**Reforestation Area** (See Wooded Area)

**Reservoir** (See Waters Edge)

**Retaining Wall - LWR** (Include in Triangulated Surface)
A Retaining Wall is a fixed structure, usually constructed of concrete, stone, or wood, which retains earth. Retaining Walls are commonly used in landscaping and engineered slope applications around buildings, yards, shorelines and transportation features. Do not use LWR symbology for Bridge Abutments or Wing Walls. Refer to similar feature descriptions for Planter, Freestanding Wall, Stone Wall and Chapter 13, Bridge Abutment and Wing Wall to confirm feature interpretation. Retaining Wall symbology takes precedence over Pavement Edge, Driveway and Sidewalk symbology when these features coincide at the top of the Retaining Wall. Large Docks or Piers filled with earthen material whose edges are characterized by vertical walls should be shown using Retaining Wall symbology.

Delineate the top of the Retaining Wall with LWR symbology using a similar technique to other vertical features. The top of the feature should be delineated using LWR symbology at its true horizontal position. Delineate the visible bottom (toe) of the structure along the terrain surface using Landscape Elevation Breakline (LELB) symbology or other symbology as applicable. The symbology at the bottom (toe) of the structure should be slightly offset from the top breakline symbology so that the top and bottom symbology do not cross or overlap. If present show fence or railing on top of retaining wall using Fence symbology. Retaining Walls along transportation surfaces should be measured in the same regular 8-10 m interval used for Roadway measurements. (Refer to Appendix B, Compilation Diagrams - B12).
**Riprap - LARR (Exclude from Triangulated Surface)**
Riprap is loose broken rocks placed along a stream, shoreline or road to reduce erosion. Delineate the perimeter of Riprap using LARR symbology. Waters Edge symbology takes precedence over Riprap outline.

**River or Kill** (See Waters Edge)

**Rock Outcrop - LARO (Exclude from Triangulated Surface)**
A Rock Outcrop is an area of exposed rock or rock cut created by either natural occurrence or excavation/construction activities. Delineate the perimeter of the Rock Outcrop using LARO symbology. Delineate all rock faces with Landscape Elevation breakline symbology. Compile vertical (sheer) faces and overhanging faces using a similar technique to other vertical features so that the top, intermediate and bottom breaklines do not cross or overlap. See also Pit or Quarry to confirm feature interpretation.

**Satellite Dish** (See Antenna)

**Screen House** (See Building)
A Screen House is a small open structure with screened or unscreened walls which is not attached to a house or other building. Show only if structure appears permanent.

**Shoreline** (See Waters Edge)

**Shrub - LSHC / LSHD (Exclude from Triangulated Surface)**
A Shrub is an individual bush less than 3 m in height. Place appropriate shrub symbology (LSHC or LSHD) at the center of the Shrub. Distinguish between coniferous (LSHC) and deciduous (LSHD) shrubs by shape, texture, leaf presence and character of shadow that is cast. Use Tree symbology if Shrub is greater than 3 m tall or an apparent tree sapling less than 3 m tall. See also similar feature descriptions for Hedge, Planting Bed, Tree and Wooded Area to confirm feature interpretation.

**Silo - LSILO (Exclude from Triangulated Surface)**
Large cylindrical structure for farm and industrial product storage. Delineate the extent of the Silo's roof line using LSILO symbology.

**Smokestack - LBRO (Exclude from Triangulated Surface)**
Large industrial chimney. Delineate perimeter using LBRO symbology.

**Spillway** (See Dam / Spillway)

**Stairs - LST (Exclude from Triangulated Surface)**
Delineate the outer extent of the stairs and stoops using LST symbology. Stairs may be attached to buildings or stand alone as part of walkways. Stairs symbology should be trimmed at the Building symbology. Do not symbolize railings or individual steps.

**Stone Wall - LWS (Include in Triangulated Surface)**
A Stone Wall is a freestanding wall (i.e., not retaining earth) constructed of loose rock or stones. This feature is commonly located along existing or former farm fields. See also similar feature descriptions for Retaining Wall and Freestanding Wall to confirm feature interpretation.

Delineate loose Stone Walls with 3 breaklines, one line using LWS symbology to define the top centerline and two Landscape Elevation Breaklines (LELB) to define the bottom front and back. Delineate the general form of the wall in a regular pattern.

Storage Area - LAFL (Exclude from Triangulated Surface)
A Storage Area is an area of organized items or raw material at industrial or commercial sites (e.g., construction equipment, lumber, pipe, stone, sand, dirt, gravel, or salt). Small Storage Areas (under 500 square feet) should not be shown. See also similar feature descriptions for Construction Area and Debris to confirm interpretation.

If the terrain surface is visible between piles and stacks of material, delineate the extent of Storage Area using the LAFL symbology. The terrain surface within a storage area should be portrayed using Landscape Elevation Breaklines (LELB). If the terrain surface is not visible between piles and stacks of material, delineate the extent of Storage Area using Obstructed Area Boundary symbology (NLPDOP) joined together to form a “closed” polygon measured at the elevation of the ground surface around the area. Data points should be measured with sufficient density and vertical accuracy to achieve surface accuracy. The surface of any piles of raw material is not compiled.

Stream (See Waters Edge)

Stump - LTS (Exclude from Triangulated Surface)
Place LTS symbology at center of stump. Stumps inside Brush and Wooded Areas are not compiled.

Swamp (See Marsh)

Swimming Pool - LPOOL (Exclude from Triangulated Surface)
Swimming Pools include above ground or in-ground pools and should be shown whether they are filled with water or have been drained. Delineate the perimeter of the pool using LPOOL symbology. Any deck or paved area surrounding the pool should be shown using Building Feature (LBF) symbology. The terrain surface around the pool should be portrayed using Landscape Elevation Breaklines (LELB). It is not necessary to show the depth of the pool.

Tank - LBF (Exclude from Triangulated Surface)
Tanks can be small storage Tanks that contain residential materials or large storage Tanks for commercial materials (e.g., tank farms). Tanks may contain gas, oil, propane, water or other material. Delineate the outer edge of the tank with LBF symbology.

Telephone Booth (See Utility, Telephone Booth)

Tower (For radio tower see Antenna. For water tower, see Tank. For transmission tower see Chapter 15, Transmission Tower)

Tree - LTC / LTD (Exclude from Triangulated Surface)
Use Tree symbology if feature is greater than 3 m tall or if it is an apparent tree sapling less than 3 m tall. Place LTC or LTD symbology at the center of individual Trees. Distinguish between coniferous (LTC) and deciduous (LTD) by crown shape, texture, leaf presence and character of shadow that is cast. See also similar feature description for Shrub, Tree Row and Wooded Area to confirm feature interpretation.

**Tree Row - LTRC / LTRD (Exclude from Triangulated Surface)**
A Tree Row is a group of densely situated trees forming a row that is greater than 15 m in length. Delineate the center of row using coniferous (LTRC) and deciduous (LTRD) symbology based on the dominant tree type present. Compile individual Trees when individual trunks are visible. This is especially important close to the road's edge. See also similar feature descriptions for Hedge and Tree to confirm feature interpretation.

**Tunnel - LTUN (Include in Triangulated Surface)**
A Tunnel is a fixed structure, usually concrete or stone, to facilitate underground automobile or railroad traffic. (Refer to similar feature descriptions for Underpass and Bridge Features to confirm feature interpretation).

The visible concrete or stone structure and/or headwall should be compiled with breaklines in a similar technique to other vertical features. Delineate the top edge (top front and/or back) of the structure using LTUN symbology at its true horizontal location. Then delineate the exposed bottom (toe) with a Landscape Elevation Break (LELB) slightly offset from the top breakline so that the top and bottom breaklines do not cross or overlap. If the headwall of the entrance/exit part of the structure extends above the ground, it should be delineated and reflected in the DTM surface.

**Underpass - LTUN (Include in Triangulated Surface)**
An Underpass is a fixed structure usually constructed of concrete (e.g. box culvert) under a road or railroad that is used as a passageway (e.g. for livestock and/or wildlife, tractor pass, bikeway, and pedestrian walk). (See also similar feature descriptions for Tunnel, Bridge Features and Drainage Features, Headwall to confirm feature interpretation.)

The visible structure and/or headwall and wing walls should be compiled with breaklines in a similar technique to other vertical features. Delineate the top plane (top front and/or back) of the structure using LTUN symbology at its true horizontal location. Then delineate the exposed bottom (toe) with a Landscape Elevation Break (LELB) slightly offset from the top breakline so that the top and bottom breaklines do not cross or overlap. If the headwall or any wing walls of the entrance/exit part of the structure extends above the ground, it should be portrayed in the DTM surface.

**Unidentifiable Feature - LUKL / LUKP (Exclude from Triangulated Surface)**
Show unidentifiable features or features not described or listed herein. Compile the feature using LUKL symbology to delineate the extent of a linear or area feature or place LUKP symbology centered on an unknown point feature.

**Vineyard** (See Orchard)

**Waters Edge - LAWE (Include in Triangulated Surface)**
Waters Edge is the edge of a body of water (e.g., canal, brook, creek, stream, kill, lake, ocean, pond, reservoir or river). Delineate the extent of the water using LAWE symbology. Data points should be measured along the shoreline with sufficient accuracy to show areas of standing water as nearly constant elevation, and opposite stream edge shorelines should have corresponding measurements which are nearly identical in elevation. A natural channel of water (e.g., brook, creek or stream) with an average width less than 1 meter may be portrayed with a single Waters Edge line.

**Waterfalls - LAWE (Include in Triangulated Surface)**
The outer edges of the falling water course should be delineated using Waters Edge (LAWE) symbology. Additional Landscape elevation breaklines should be used as needed to portray the terrain surface.

**Wetland** (See Marsh)

**Wooded Area - LAWA (Exclude from Triangulated Surface)**
A Wooded Area is an area of densely situated deciduous and/or coniferous trees too numerous to plot as individual Trees. Wooded Area symbology is commonly used in more rural areas wherein the area being delineated is a natural forest. In an urban setting where the underlying ground is maintained or improved, the trees would more likely be depicted with individual Tree cells. Portraying individual Trees whenever possible is especially important close to the road's edge. Wooded Area symbology takes precedence over Brush Area symbology when the features coincide. See also similar feature descriptions for Brush Area, Tree and Tree Row to confirm feature interpretation.

Delineate the extent of the Wooded Area using LAWA symbology. Data points should be measured along the outside edge of the tree trunks to generalize the limit of the Wooded Area. Do not use the edge of the branch canopy. Wooded Area symbology should not overlap any Building, Vehicle Trail, Water Edge, Pavement or Railroad symbology. Do not show individual Trees within the Wooded Area. All Wooded Area lines that are entirely within the Mapping Limits shall be closed by snapping the ends together. Wooded Areas that extend beyond the Mapping Limits should be ended at the Mapping Limit line.
### APPENDIX A

### Graphic Element Definitions

<table>
<thead>
<tr>
<th>Element Name</th>
<th>Graphic Appearance</th>
<th>Element Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell</td>
<td><img src="image" alt="Cells" /></td>
<td>A complex element composed of a group of primitive or other complex elements that is stored in a cell library for repeated placement.</td>
</tr>
<tr>
<td>Line</td>
<td><img src="image" alt="Lines" /></td>
<td>A singular linear graphic element (MicroStation Type 3) which contains two vertices.</td>
</tr>
<tr>
<td>Line String</td>
<td><img src="image" alt="Line String" /></td>
<td>A singular graphic element (MicroStation Type 4) containing between 2 and 5000 vertices.</td>
</tr>
<tr>
<td>Polygon</td>
<td><img src="image" alt="Polygon" /></td>
<td>As used by NYSDOT in this document, a line string which closes upon itself (i.e., the last vertex is identical to the first vertex) and forms an irregular shape.</td>
</tr>
<tr>
<td>Complex Chain</td>
<td>See Definition</td>
<td>An open singular graphic element comprised of 2 or more lines, and/or line strings which are joined together.</td>
</tr>
<tr>
<td>Complex Shape</td>
<td>See Definition</td>
<td>A closed singular graphic element comprised of 2 or more complex chains, lines, or line strings which are joined together.</td>
</tr>
<tr>
<td>Shape</td>
<td><img src="image" alt="Shape" /></td>
<td>As used by NYSDOT in this document, shall be defined as a singular graphic element (MicroStation Type 6) containing between 4 and 5000 vertices which is a closed polygonal shape consisting of either orthogonal, rectangular or regularly shaped segments.</td>
</tr>
<tr>
<td>Circle (Ellipse)</td>
<td><img src="image" alt="Circle" /></td>
<td>As used by NYSDOT in this document, shall be defined as a singular graphic element constructed by an ellipse (MicroStation Type 15) which has equal major &amp; minor axes. The circle is constructed with 2 to 3 data points which form the basis of the closed circular shape.</td>
</tr>
<tr>
<td>Arc</td>
<td><img src="image" alt="Arc" /></td>
<td>As used by NYSDOT in this document, shall be defined as a singular graphic element constructed with an Arc element (MicroStation Type 16). The Arc is constructed with 2 to 3 data points which forms the basis of the open circular shape.</td>
</tr>
</tbody>
</table>
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR PHOTOGRAMMETRIC STEREOCOMPILATION

2005 Edition

APPENDIX B
Compilation Diagrams

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ROADWAY BREAKLINES (PELB) ADDED TO PROPERLY PORTRAY INTERSECTION

EXTRA POINTS PLACED AROUND CURVES (TYPICAL)

8-10 m

GUIDE ALIGNMENTS

TOP OF DITCH (LELB)
BOTTOM OF DITCH (DD)

EXTRA POINTS ON TERRAIN BREAKLINE AROUND CURVES
Visible seam between old and new asphalt or concrete and asphalt; small pavement patches for minor road repair or utility work are not compiled

(RSW) SymboLOGY takes precedence over (RBS)

(PET) SYMBOLOGY ENDS WHEN PAINTED LINE IS LESS THAN 0.5 m FROM (PE)

(PET) SYMBOL ENDS WHEN PAINTED LINE VISIBLY TERMINATES

CENTER OF PAINTED LINE SHOWN AS AS (PET) WHEN DISTANCE TO CURB FACE IS GREATER THAN 0.5 m

NARROW CONCRETE STRIP PARALLEL TO CURB FACE SERVING AS PAVED GUTTER
COMPILATION DIAGRAM
CURB / DROP CURB

TOP VIEW (NOT TO SCALE)

ISOMETRIC VIEW (NOT TO SCALE)

CROSS SECTION VIEW

TOP OF CURB BREAKLINE
OFFSET INWARD
HORIZONTALLY TO BACK OF CURB

EDGE OF DTM TRIANGLE
FORMED BETWEEN TOP
AND BOTTOM OF CURB

(RD) CENTER LOCATION

GUIDE ALIGNMENT
LOCATION

SIDEWALK SYMBOL
BREAKLINE DATA POINT
(TYPICAL)

(RD) BREAKLINE

(ELB) BREAKLINE

(RCD) BREAKLINE

(RC) BREAKLINE

(PE) BREAKLINE AT BOTTOM OF CURB

END OF CURB

(PE) BREAKLINE AT BOTTOM OF CURB

(RCD) BREAKLINE

(TYPICAL POINT SPACING)

GUIDE ALIGNMENT
LOCATION

(top of curb breakline
offset inward
horizontally to back of curb

edge of dtm triangle
formed between top
and bottom of curb

(pe) breakline at bottom of curb

(pe) as bottom of curb

(8-10 m)

(0) CENTER LOCATION

GUIDE ALIGNMENT
LOCATION

SIDEWALK SYMBOL
BREAKLINE DATA POINT
(TYPICAL)
SEE COMPILATION DIAGRAM B4 FOR ENHANCED DETAIL OF PAVEMENT EDGE, CURB & SIDEWALK AREAS
**COMPILATION DIAGRAM**

**GUIDE RAIL AND CONCRETE BARRIER**

---

**IN ALL CASES - GUIDE RAIL ANCHOR BLOCKS ARE NOT SHOWN**

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<td><strong>GUIDE RAIL WOODEN BEAM</strong></td>
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**Notes:**

- (RGBM) Data points along top center of supporting posts or rail above posts in example on right.
- (RGW) Data points along top center of supporting posts.
- (RG) Data points along top center of supporting posts.
- (RGC) Data points along top center of posts.
- (RGCB) Data points near edges of 1 m or wider barrier.
ENGINEERED SLOPES

ISOMETRIC VIEW

BREAKLINES COMPILED ALONG SLOPE
(NOT NECESSARILY AT CONSTANT ELEVATION)

TOE OF SLOPE

SECTION A

(C)CROSS SECTION VIEW

TOP AND TOE OF SLOPE MAY REQUIRE MORE THAN ONE (LELB) BREAKLINE TO PROPERLY MODEL TERRAIN

(LELB) BREAKLINES COMPILED ALONG SLOPE TO PORTRAY LAND FORM
(NOT NECESSARILY AT CONSTANT ELEVATION)
BRIDGE AND MAPPING FEATURES NOT DISPLAYED

(NLDPDOP) BOUNDARY FOR AREA UNDER BRIDGE (BREAKLINES EXTENDED THROUGH AREA WITH NO ADDITIONAL DATA POINTS)

(LELB) BREAKLINES PORTRAYING ENGINEERED SLOPE

(NLDPDOP) ACTS AS BOTTOM OF WALL HERE

(BDE) AND (LELB) ARE EXACT COPIES FOR THE EXPANSION JOINT

(LELB) AS TOP OF WALL (LELB) AS BOTTOM OF WALL
GUIDE ALIGNMENTS
SPACED 8-10 m
ON ROADWAY AND
ACROSS DECK

(BDE) AND (LELB)
ARE EXACT COPIES

(LELB) BREAKLINES
PORTRAYING
ENGINEERED SLOPE

(NLPDOP) BOUNDARY FOR AREA UNDER BRIDGE
(BREAKLINES EXTENDED THROUGH AREA
WITH NO ADDITIONAL DATA POINTS)
BEGINNING OF SLOPE DROP-OFF DETERMINES
BRIDGE DECK LENGTH WHEN EXPANSION JOINTS ARE NOT VISIBLE
COMPILATION DIAGRAM
PAVED GUTTER PROFILES

- ASPHALT WING GUTTER
- CONCRETE WITHOUT CURB
- CONCRETE CURB
- OFF-ROAD

ROAD (PRC) (PE) (DGTR) (RC) (RSW)

ASPHALT ← CONCRETE

ASPHALT (PE) (PET) (LELB) (DGTR) (DGTR) (DGTR) (ELB)
NEW YORK STATE DEPARTMENT OF TRANSPORTATION
SPECIFICATIONS FOR PHOTOGRAMMETRIC STEREOCOMPILATION

2005 Edition

APPENDIX C
Feature Symbology Table

<table>
<thead>
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<tr>
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<td>Pavement Features</td>
<td>86</td>
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<td>Roadway Features</td>
<td>87</td>
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<td>Bridge Features</td>
<td>89</td>
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<td>Sign and Traffic Control Features</td>
<td>90</td>
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<td>Utility Features</td>
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### Feature Description

Feature Name (Features presented in same order as Chapters 10 – 17)

### Level Name

Level Name of Feature

### Graphic Symbology

Illustration of Feature (relative scale of images may vary for clarity)

### Color *

Color Number 0, 1, 2, 3, 4, 5, 6 or 7 (NYSDOT Standard Color Table)

### Style *

Line Style Number 0, 1, 2, 5, 6 or Name of Feature’s Custom Line Style

### Wt. (Weight) *

Weight Number 0, 1 or 2

### Cell

Name of Feature’s Cell or ‘na’ if not applicable

### Scale Factor

Scale Factor of 1.0 or 2.5 applied to Feature’s Style or Cell or ‘na’ if not applicable

### △

Feature to be Included in Triangulated Surface, Yes or No

### Page

Location of Feature’s Narrative Description in Chapters 10 – 17

* Note: VENDORS must set the element attributes (Color, Style and Weight) for each level name to “ByLevel” in MicroStation V8. This will ensure that the file contents will conform to the required symbology when used in conjunction with the NYSDOT standard level libraries.
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