STANDARDS AND REGULATIONS

FOR

SUBDIVISION STREETS AND STATE HIGHWAY ACCESS

Delaware
Department of
Transportation

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CHAPTER 1 INTRODUCTION

1.1 PURPOSE

The purpose of DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* is to set forth the requirements of the State of Delaware, Department of Transportation for access to State-maintained roadways and for the planning, design, construction, and acceptance for maintenance of subdivision streets.

Land development and subdivisions have a direct impact on the transportation system. These impacts have to be assessed to ensure that the system is safe and efficient.

The efficiency and safety of a roadway depends to a large extent upon the amount and character of interruption in the movement of traffic. Vehicles entering, leaving, or crossing the roadway, or standing nearby, cause most interruptions in traffic.

Property owners fronting State-maintained roadways have certain rights of access consistent with the zoning and use of their property (except along controlled or limited access highways). In addition, the traveling public who use those State-maintained roadways have certain rights to freedom of movement and safety.

The standards and regulations presented herein are intended to regulate and control the location, design, and operation of access points and transportation facilities maintained by DelDOT. All commercial entrances, residential entrances and subdivision streets are to be designed and constructed in accordance with these requirements. These requirements apply to the following:

- New subdivisions and land developments,
- Changed or expanded subdivisions and land developments,
- Any new access onto a State-maintained roadway,
- Modifications to an existing access,
- Assessment of the impacts of traffic, and
- Offsite improvements

1.2 LEGAL AUTHORITY

The authority for DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* is set forth in the Delaware Code. Applicable sections include:

- Title 17 – Highways, Chapter 1, Section 131.
- Title 17 – Highways, Chapter 1, Section 141.
- Title 17 – Highways, Chapter 1, Section 146.
- Title 17 – Highways, Chapter 5, Section 508.
- Title 21 – Motor Vehicles, Chapter 41.
- Title 29 – State Government, Chapter 61, Section 6103.
- Title 9 – Counties.

Pursuant to Title 17 of the Delaware Code, the State of Delaware Department of Transportation (DelDOT) is charged with the responsibility of

controlling all access points to State-maintained roadways. Relevant portions of this section are as follows:

Title 17 – Highways, Chapter 1, Section 131 – General Jurisdiction

(b) All roads and streets situate in unincorporated suburban communities throughout the State which were built or created between July 1, 1935, and July 1, 1951, whether paved or unpaved, shall henceforth be under the absolute care, management and control of the Department and shall be maintained, repaired and reconstructed by the said Department.

(e) All roads and streets not dedicated to the public use and intended to be private, as indicated on the filing plan, situated in an unincorporated suburban community within the State, shall be constructed in accordance with rules and regulations adopted by the county in which such road or street is located. Such rules and regulations for construction of private subdivision streets and roads shall, in addition to specifying standards for the design and construction of such private streets and roads, establish a mechanism to provide for the perpetual maintenance of such private streets and roads, but in no event shall the State or county be responsible for such maintenance. In addition, the following provisions shall apply to all such streets and roads:

(1) In the event that the county has not adopted rules and regulations for construction of private subdivisions, streets and roads or such rules and regulations have been established and there is no mechanism contained therein to provide for the perpetual maintenance of private subdivision streets or roads, all such roads or streets shall be constructed in accordance with standards set forth by the Department of Transportation, Division of Highways, for streets and roads dedicated to public use.

(2) Private roads or streets shall not be accepted for maintenance by the State until the right-of-way for the streets or roads has been dedicated to the public use, accepted by the State and the streets and roads constructed or reconstructed at the expense of the property owners in accordance with the standards established by the Department of Transportation, Division of Highways, for streets and roads dedicated to public use in accordance with Chapter 5 of Title 9.

(3) In the event any real property with road frontage or a private road or street, constructed or reconstructed pursuant to this section, which road or street is not to be maintained by the State, is conveyed subsequent to such construction or reconstruction, the deed conveying such real property shall contain a statement that such private street or road is not maintained by the State.

(4) Any private road, street or thoroughfare in the State shall be constructed either in accordance with state standards and pursuant to department rules and regulations or pursuant to rules and regulations established by the county. In either event, a mechanism for perpetual maintenance must be established. The State and county shall have concurrent jurisdiction to enforce the requirements of this section by legal or equitable means. The county shall withhold the issuance of building or occupancy permits for any structure abutting such road, street or thoroughfare to insure compliance with the requirements of this section.

(f) The Department of Transportation, Division of Highways, is hereby authorized to inspect all suburban community street construction and to establish and collect fees for the inspection of said street construction in amounts deemed necessary to defray costs of administering this section. All fees collected shall be placed to the credit of the Department of Transportation, Division of Highways.

(g) All roads and streets situated in unincorporated suburban communities throughout the State which were built between July 1, 1951, and July 1, 1975, whether paved or unpaved, shall, upon dedication of a right-of-way to public use, henceforth be under the absolute care, management and control of the Department of Transportation, Division of Highways, and shall

be maintained, repaired and reconstructed by the said Department of Transportation, Division of Highways. Said right-of-way shall be determined by the Department of Transportation, Division of Highways, in accordance with physical conditions, but in no case shall be less than 30 feet in width. Dedication of the right-of-way must occur prior to June 30, 1978, to qualify for the aforementioned responsibilities under the auspices of this section.

(i) In connection with the Department's review of subdivision proposals affecting the transportation system, it is authorized to collect fees for the costs of administering the subdivision approval process.

Title 17 – Highways, Chapter 1, Section 141 – Regulation of Traffic; Exceptions

(a) The Department shall have jurisdiction and control of all state highways of this State outside of the limits of incorporated cities and towns for the purpose of regulating traffic and for the use and operation of all vehicles thereover, and may adopt any and all rules and regulations respecting the use of such highways and the operation of all vehicles upon the same.

(b) Each rule and regulation adopted pursuant to this section shall be in the form of a resolution signed by the Secretary or the Secretary's designee. A permanent record of these shall be kept by the Department and at the time of adoption a copy of each shall be forwarded to the Department of Safety and Homeland Security and to the New Castle County police, if within their jurisdiction.

(c) Pursuant to this section, the Department is authorized to perform all engineering studies and traffic investigations necessary to implement this section and Chapter 41 of Title 21, and to install, maintain, operate and remove all traffic control devices necessary to implement Chapter 41 of Title 21 and regulations adopted thereunder.

(d) The Department, on the basis of engineering studies and traffic investigations, may prohibit the operation of trucks or other commercial vehicles or impose limitations as to the weight thereof on designated highways which prohibitions and limitations shall be posted as set forth in § 4505 of Title 21.

(e) Nothing in this section shall be construed as granting the Department the power to make any rules and regulations respecting the use of highways contrary to Delaware law.

Title 17 – Highways, Chapter 1, Section 146 – Access to state-maintained highways

(a) The Department is authorized to adopt standards and regulations for the location, design, construction, reconstruction, maintenance, use and control of vehicular and pedestrian access to and from any state-maintained highway in order to protect public safety, to maintain smooth traffic flow, to maintain highway right-of-way drainage, to regulate drainage from property leading into or carried by the highway drainage system and any other public purpose, as determined by the Department.

(b) No person, firm, corporation or the like shall construct, open, reconstruct, maintain, modify or use any crossing or entrance onto a state-maintained highway, street or road, including any drainage modifications leading into or carried by the highway drainage system, without first having complied with standards and regulations adopted by the Department and having obtained a permit issued by the Department.

(c) Any person, firm, corporation or the like who constructs, opens, reconstructs, maintains, uses or modifies an entrance onto or an exit from a state-maintained highway, street or road without first having complied with standards and regulations adopted by the Department and having obtained a permit from the Department for such entrance or exit shall be punished by a fine of not less than $100 nor more than $1,000 for each offense, and a further sum in an amount equal to the amount fined for the initial offense for each and every day such violation exists.

(d) For purposes of this section, whenever the use to which a property is being put is changed such that there will be a significant alteration in the character, flow or volume of traffic, as determined within the sole discretion of the Department, a new permit shall be required.

(e) The Justice of the Peace Courts shall have jurisdiction over violations of this section.

(f) In addition to whatever legal or equitable remedies are available, the Department may install barricades across or remove any entrance or exit constructed, opened, reconstructed, maintained, modified or used in violation of this section and the standards or regulations adopted pursuant thereto, at the expense of the property owner.

Title 17 – Highways, Chapter 5, Section 508 – Dedication of new roads for state maintenance; approval required; security.

(a)(1) No person, firm or corporation shall construct, or cause to be constructed any new road or street outside the corporate limits of any city or town and intended to be dedicated by the owner thereof to the public use, including the initial installation of traffic and street name signs, unless such road or street is in conformity with plans and specifications approved by the Department and with this section. At a minimum, the initial installation of street name signs must include the placement of such signs at each intersection of the new street with any other street, capable of being read from each direction on any street at each intersection. The new road or street shall be a continuation of an existing or proposed public road designed to be part of the general highway system of the State. Such construction shall be performed pursuant to a written agreement, signed by the developer as hereinafter defined incorporating but not limited to the plans and specifications approved by the Department, the posted security for completion, the location of any decorative subdivision entrance signs installed by the developer, and whatever other terms the Department, in its sole discretion, determines may be necessary. The owner or person actually engaged in any development or construction of residential or commercial property as determined by the Department which will affect or require access onto state-maintained highways, streets and roads shall be known as the "developer" for purposes of this section.

(2) Pursuant to the terms of this section and such rules, regulations, standards and/or regulations as may be adopted by virtue thereof, the Department shall accept such roads or streets constructed in compliance herewith into the state maintenance system; provided, however, that with regard to any road or street constructed to serve any dwelling, building or facility, etc., other than single family residences, the Department shall have the sole discretion as to whether such road or street shall be accepted into the state maintenance system.

(b) Before commencement of any construction undertaken pursuant to this section, including the installation of utilities within the dedicated right-of-way, the developer shall first post with the Department a good and sufficient bond, certified check, Letter of Credit or other form of security in a manner and form approved by the Department and in such amount as may be fixed, but not to exceed 10% of the estimated cost of such construction as approved by the Department, which bond, certified check, Letter of Credit or the like, shall be conditioned on the faithful performance and satisfactory completion of the obligations imposed by subsection (a) of this section. In the event the developer, regardless of corporate name, has been adjudged by the Department to be in violation of this section and/or has not maintained a satisfactory record of compliance on repair and construction completion as determined by the Department, then the Department may require a bond, certified check, Letter of Credit or other form of security, consistent herewith in an amount not to exceed 100 percent of the cost of such construction.

(c)(1) The Department shall inspect any new road or street being constructed in accordance with this section as well as any construction including utilities within the road or street right-of-way to insure that the construction is in conformity with standards, plans and specifications approved by the Department. Upon

dedication of the right-of-way to the public use and satisfactory completion of the street or road construction including its connection to an existing state maintained road within the sole judgment, discretion and approval thereof by the Department, the Department shall so notify the developer that the new road or street has been accepted into the state maintenance system and that the dedicated right-of-way has been accepted according to the terms of such acceptance.

(2) A signature from a Department inspector shall be obtained before the Department can accept a road from a developer into the state maintenance system.

(3) The Department shall inform by letter an officer of the maintenance association, if any, in the development in which the road will be dedicated, that the Department has accepted the road from the developer. The Department shall send copies of such letter to the state Senator and state Representative. Such letter shall indicate the acceptance date of the roadway(s) and an explanation of the State's 3-year good faith warranty.

(4) The Department, upon acceptance, shall thereafter assume the sole and absolute care, management and control of the new road or street as a public road or street. Until such time as the Department accepts the new road or street, the developer or the developer's legal successor in interest shall be solely responsible for maintenance thereof.

(5) The Department's standards for newly constructed residential subdivision streets include a decorative sign that includes the name of the subdivision and a logo of the State's famous patriot, Caesar Rodney. These new signs shall be installed at each newly approved subdivision and shall be paid for by the developer or developers of such subdivision. Existing subdivisions may also request the Department to install these new signs in place of other signs previously used by the Department. Such requested replacement signs shall be paid for by the subdivision or from Community Transportation Funds allocated by a legislator requesting such signs. The Department shall replace existing standard signs damaged by vandalism, accident, or the ravages of time with standard signs under its regular maintenance program, unless the decorative alternative has been requested under the provisions of this subsection.

(d) In order to carry out the purpose of this section, the Department shall make and publish rules, regulations, standards and/or specifications for planning, designing, constructing and maintaining any new road or street.

(e) The bond, certified check, Letter of Credit or other acceptable forms of security, posted with the Department shall be immediately due and owing upon failure of the developer to meet the obligations set forth in the agreement executed pursuant to this section. Upon failure of the developer to comply with the standards, plans and specifications and/or with the terms of the said construction agreement, the Department may:

(1) Withdraw any approval to construct such road or street which it has given pursuant to this section and may thereafter notify the appropriate governmental agency to cease issuance of occupancy permits for dwellings in the construction area;

(2) Proceed to forfeiture of the bond, certified check, Letter of Credit or other form of security;

(3) Move to fine violators pursuant to this section;

(4) Seek specific performance of the developer's agreement;

(5) Within its sole discretion, conditionally accept and satisfactorily complete the road or street and recover damages in the amount of completion costs and incidental expenses from the developer; and/or

(6) Institute whatever other legal or equitable actions necessary to cause the streets to be completed.

1.3 ACCESS APPLICATION AND APPROVAL PROCESS

This section outlines the procedures to be followed by developers and/or property owners in order to obtain approval of a commercial access or a State-maintained subdivision street. ~~A full review of the plans includes, at minimum, comments from the Traffic Section, the respective Maintenance District, Bicycle and Pedestrian Group, and Planning before the letter is issued. Other Sections from DelDOT shall be included as needed.~~ Access applications, construction permits and procedures for residential units are outlined in Chapter 7. The estimated review time by DelDOT is based on a complete submission. Incomplete submissions will be returned to the developer for resubmission. This process is illustrated in Figure 1-2.

DelDOT reviews the site plan in accordance with these *Standards and Regulations for Subdivision Streets and State Highway Access*. When the plan meets the requirements of DelDOT, a "No Objection to Recordation" letter shall be issued to the governing land use agency. The initial stage fee as outlined herein shall be paid prior to issuance of the "No Objection" letter.

DelDOT will also review construction plans for subdivision streets and/or entrances in accordance with *Standards and Regulations for Subdivision Streets and State Highway Access*. Construction plans must be signed and sealed by a land surveyor or professional engineer registered in Delaware as outlined in Chapter 4.

The construction stage fee must be paid prior to review of the semi-final construction plan. If the requirements outlined in this *Standards and Regulations for Subdivision Streets and State Highway Access* are not met by the second semi-final plan submission, then a new application and construction stage fee shall be required prior to further reviews. Upon review and final approval of the final construction plan, DelDOT will issue an approval letter.

Any site being considered by DelDOT for access on to a State-maintained roadway shall be evaluated to determine if it will also impact any other DelDOT programs. These programs include, but are not limited to, the Corridor Capacity Preservation Program (CCPP), the Capital Transportation Program (CTP), the Transportation Enhancement (TE) Program, the Highway Safety Improvement Program (HSIP), and the Pavement Rehabilitation Program. If a plan would have an effect on any of these programs, DelDOT may require additional reviews and additional requirements to be met.

1.3.1 APPLICATION

The application with supporting documents and the appropriate number of plans as outlined in Chapter 6 shall be submitted to the ~~Public Works~~ Subdivision Engineer ~~of the District County in which the construction shall take place~~ for review and approval. The ~~locations and addresses of the District offices are as follows:~~ mailing address is Department of Transportation, P.O. Box 778, 800 Bay Road, Dover, DE 19903.

~~***Figure 1-1 DelDOT Districts Public Works Engineers***~~

~~**New Castle County** (DelDOT Canal District)~~ ~~250 Bear-Christiana Road~~ ~~Bear, DE 19701~~
~~**Kent County** (DelDOT Central District)~~ ~~930 Public Safety Blvd.~~ ~~Dover, DE 19901~~
~~**Sussex County** (DelDOT South District)~~ ~~23697 DuPont Blvd.~~ ~~Georgetown, DE 19947~~

1.3.1.1 Approval of Application

The approval of the application shall be subject to the following conditions:

1. The application shall be properly and clearly completed as determined by DelDOT. Applications found to be unsatisfactory shall be returned for correction and resubmission.

2. The location, design, and construction of driveways and entrances shall meet the geometric requirements of DelDOT. Necessary provisions for drainage, pavement types and thicknesses, sight distance and other construction details shall conform to the current requirements of DelDOT.

3. When access provisions cannot be provided in accordance with DelDOT's requirements due to limitations particular to the site or where the applicant refuses to comply, the access application for the intended use may be denied.

1.3.2 REVIEW OF THE PLAN

The following documents shall be submitted to the ~~Public Works~~ Subdivision Engineer of the appropriate District to start the review process for a commercial entrance or proposed subdivision:

- Application for access to a State-maintained roadway.
- Design checklist.
- Site plan.
- Site Street Plan.
- Preliminary entrance plan.
- Initial stage fee (See Appendix C)

DelDOT's site plan and site street plan requirements are outlined in Chapter 3. DelDOT must review and approve the site plan and issue the "No Objection" letter prior to granting entrance approval. Submission of a site plan and issuance of a "No Objection" letter is required independent of the local land use agency's requirements.

The requirements for the entrance plan are outlined in Chapter 4. DelDOT(e.g. Traffic, Maintenance Section, Bicycle and Pedestrian Group, and Planning at minimum) will review and comment on the preliminary entrance plan prior to issuance of a "No Objection" letter to the local land use agency.

Once DelDOT has issued its "No Objection" letter for the site plan, the semi-final entrance plan can be submitted along with the construction stage fee. DelDOT will then distribute the semi-final plan to the support sections (e.g., Traffic Section, Pavement Management Section) for review and comment.

Upon addressing all comments provided by DelDOT in a comment / response letter, the final construction plan can be submitted. When DelDOT notifies the applicant that the final construction plan meets the requirements outlined in these *Standards and Regulations for Subdivision Streets and State Highway Access*, the applicant shall submit the appropriate number of signed and sealed sets of plans for final approval by DelDOT (see Chapter 4).

1.3.3 APPROVAL OF THE PLAN

Following DelDOT's approval of the construction plan, the applicant's engineer shall receive two ~~one~~ copies of the approved plan from the Subdivision Engineer. The approved construction plan shall be valid for six months.

1.3.4 CONSTRUCTION

The applicant shall submit construction documents (application, security, plans) for the work as outlined in Chapter 6. After review and approval of the security and the required construction documents, the Public Works Engineer shall issue the Notice to Proceed (NTP). No work shall be undertaken until DelDOT issues a NTP. For commercial sites, a Commercial Entrance Construction Permit (see Appendix E) will be issued in addition to NTP.

Upon completion of the construction to the satisfaction of DelDOT, in accordance with the terms of the Permit, DelDOT shall release the security and issue an entrance permit or begin the acceptance procedure when appropriate.

1.4 REVIEW FEES

Review fees (as applicable) will be assessed for all development proposals as follows stages:

- Traffic Impact Study Review (*pending review and approval of the general assembly*).
- The Initial Stage.
- The Construction Stage.

The following applies to determining and collecting fees to cover the costs of administering the review of a typical land development proposal. All fees are non-refundable.

1. Traffic Impact Study Review: A Fee of $5000 is collected when an applicant requests confirmation of the Scope of Work for the study.

2. Initial Stage: Fees are collected at the time of submission of the ~~approved~~ record plan for DelDOT's review. The fees associated with this stage reimburse DelDOT for all plan review activities before final plan approval by the local land use agency. An "Initial Stage Fee Calculation Form" must be submitted with the fee (See Appendix C), which is calculated as follows:

    - Minor residential subdivision: $100.
    - Major residential subdivision: $400 plus $10 per lot.
    - Non-residential development: $500 plus $20 per lot or $500 plus $20 per 1,000 square feet of gross floor area, whichever is greater.
    - Mixed use development: calculated for each land use separately and added together.

3. Construction Stage: Fees are collected at the time of submission of the construction plans for the Department's review. The fees associated with this review reimburse the Department for the technical review of subdivision street plans and highway access plans. A "Construction Stage Fee Calculation Form" must be submitted with the fee (see Appendix C), which is calculated as follows:

    - Minor residential subdivision: N/A.
    - Major residential subdivision: 125% of the Initial Stage Fee for a major residential subdivision as identified in Item 2.
    - Non-residential development: 150% of the Initial Stage Fee for non-residential development as identified in Item 2.

4. Non-Conforming Submissions: Some plan submissions will not fit into the previously described categories. Developments such as subdivisions with private streets; mobile home parks; golf courses; and borrow pits fall into this category. Plans for such non-conforming developments shall be considered as one lot non-residential. Therefore, the Initial Stage Fee for these developments will be $520.

~~5. National Pollutant Discharge Elimination System (NPDES) fees: The applicant is required to pay National Pollutant Discharge Elimination System (NPDES) fees when DelDOT reviews a stormwater management facility as part of an offsite improvement project where DelDOT has the review and approval authority for the facility. The fee is $195 per plan.~~

All fees shall be submitted to the Subdivision Engineer or designee with the appropriate fee calculation form and plan submission. The Subdivision Engineer shall review for accuracy the fee calculation form with respect to the plan and fee submitted. Once reviewed and approved for accuracy, the reviewer will give the check/money order to the Division's financial management unit. The financial management unit will record the payment, assign an internal control number, and initiate the process to deposit the fee with the DelDOT Office of Finance.

1.4.1 FEE ADMINISTRATION

The Department will not accept a record plan or construction plan submission without a

respective fee calculation form and payment. Should any payment received be deemed insufficient, one of the following two options is available at the discretion of the Department:

- Funds will be accepted and deposited in accordance with the Department's Cash Receipts Policy. The Department shall notify the applicant that no action on paperwork submitted will take place until the balance of required fees is received.

- All documents subject to review by the Subdivision Engineer will be returned to the applicant. Documents can be resubmitted with correct fees at a later date.

Only checks or money orders will be accepted and shall be made payable to the Delaware Department of Transportation.

The Department's Cash Receipt Policy must be followed in order to be in compliance with Title 29 of the Delaware Code, Section 6103 (all receipts in excess of $100 per day must be deposited daily). The date that applications/fees are received in the Division's financial management unit in the Department's administration building in Dover will be used and recorded for this purpose.

Separate spreadsheets have been developed to track and record fees received by the Division's financial management unit for Initial Stage Fees and Construction Stage Fees. These spreadsheets are utilized to record the payment, verify fees received and perform monthly reconciliation of revenues.

1.5 DEFINITIONS

AASHTO Standards – Policies and Standards published by American Association of State Highway and Transportation Officials.

Acceleration Lane – A speed-change lane, including tapered areas, for the purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can more safely merge with through traffic.

Access – Any driveway or other point of access such as a street, road, or highway that connects to the general street system. Where two public roadways intersect, the secondary roadway shall be considered the access.

Access Category – One of five categories described in Chapter 9 of the *Standards and Regulations for Subdivision Streets and State Highway Access* that determines the degree to which access to a state highway is controlled.

Accessway – A connection other than a sidewalk or walkway that provides bicycle and pedestrian passage between streets, between a street and a destination, or connecting to an existing or proposed trail.

Alley – A privately maintained street dedicated for public use which provides secondary access along the rear lot line of adjoining properties. Alleys are intended to accommodate access to parcels and service delivery such as trash collection and utility service.

Applicant – An individual or firm seeking either approval from DelDOT for an access application or from a local government for rezoning, conditional use or subdivision application.

Applicant's Engineer – An engineer licensed in Delaware and retained by the applicant to perform engineering services associated with their expertise.

Approved Study Area – The study area approved for analysis by DelDOT in the Traffic Impact Study or Traffic Operational Analysis Scope of Work Letter.

Area-Wide Study – A study performed, generally in lieu of an individual TIS, for a designated area to determine the area-wide impacts of proposed developments within the specified study area that encompasses more than one possible development project.

Average Daily Traffic (ADT) – The total volume of traffic during a given time period in whole days greater than one day and less than one year, divided by the number of days in that time period.

Boulevard Street – A street which typically functions as a collector street which involves a landscaped median of varying width which divides opposing travel lanes by green space.

Bypass Lane – A paved area to permit through traffic to bypass left-turning vehicles stopped on the travel lane.

Commercial Access Street – A street typically within a planned business park that serves as a frontage street to abutting properties and which conducts traffic between commercial access streets and major collector and arterial roadways.

Commercial Entrance – An entrance to serve a non-residential site.

Committed Developments – Developments that are recorded or largely approved by the local jurisdiction but which have not yet been constructed.

Community Constraints – Limitations on development created by community facilities, cultural or historic features, preserved open space or farmland preservation areas.

Community Facilities – Public destinations of significance to a community including but not limited to schools, libraries, parks, senior and recreational centers, as well as other neighborhood facilities such as pools and tot lots.

Connectivity – A measure of how efficiently a transportation network provides access between destinations. It is measured using a Connectivity Ratio.

Connectivity Ratio - The ratio of links (street segments) to nodes (intersections and cul-de-sac heads). It is determined by dividing the number of street segments (street sections between intersections and/or cul-de-sac ends) by the number of intersections and cul-de-sac ends. For purposes of this calculation, proposed street intersections with existing roads and stub roads for future access to vacant developable lands shall count as 0.5 intersections.

Connector Street – A continuous street or streets entirely in the suburban development subdivision street category beginning and ending on the state numbered road system, and having a high volume of through traffic.

Construction Entrance – A temporary access for the ingress and egress of construction vehicles.

Crossover – An opening in a median on a divided highway provided for crossing and turning traffic.

Cul-de-Sac Street – A subdivision street with a single point of access which terminates at a circular paved turn-around. Also referred to as a "dead-end street".

Deceleration Lane – A speed change lane for vehicles leaving Category 1 functional classification roadways.

Delaware MUTCD – Manual on Uniform Traffic Control Devices.

Design Hour Volume (DHV) – A traffic vehicle volume determined for use in the geometric design of highways. It is the 30th highest hour vehicular volume experienced in a one-year period.

Divided Highway – A highway with separated roadways for traffic in opposite directions, such separation being indicated by depressed dividing strips, raised curbing, traffic islands, or other physical separations.

Division of Planning, Development Coordination Section (DelDOT) – The unit charged with the responsibility for reviewing subdivision and site plans, traffic impact studies, and development proposals within DelDOT, or such other unit or unit(s) that may be charged with the responsibility at some future date.

Driveway – An access that is not a public street, road, or highway.

Entering Lane – Traffic lane used exclusively for vehicles entering a roadside establishment.

Exiting Lane – Traffic lane used exclusively for vehicles leaving a roadside establishment.

Frontage – The length along the highway right-of-way of a single property tract or roadside development.

Frontage Road – Means a public street or road auxiliary to and normally alongside of and parallel to a highway, constructed for the purposes of maintaining local road continuity and controlling direct access to the main highway.

Full Movement Roadway – A roadway whose turning movements are not restricted when intersecting with a roadway of higher classification or designation.

Functional Classification – A classification system that defines the purposes and hierarchy of all streets and highways within a network (classification system maps can be found on DelDOT's website).

FWOP (Future Without Project) – In a TIS, denotes the anticipated future traffic condition at a location without the addition of traffic generated by the proposed project.

FWP (Future With Project) – In a TIS, denotes the anticipated future traffic condition at a location after the addition of traffic generated by the proposed project.

Gradient or Grade – The rate or percent change in slope, either ascending or descending from or along the highway.

Gross Floor Area – The sum of the total horizontal areas of every floor of every building on a lot. The measurement of gross floor area shall be computed by applying the following criteria:

a. The horizontal square footage is measured from the face of all exterior walls.
b. Enclosed storage, mechanical areas, mezzanines and similar structures shall be included as gross floor area wherever at least seven feet are provided between the finished floor and the ceiling.

No deduction shall apply for horizontal areas void of actual floor space, for example, elevator shafts and stairwells.

High Density Development – Development that will result in a minimum of 50 employees per acre, or 9 residences per acre.

Higher Level Roads – Streets classified as one of the following: major collectors, minor and major arterials, freeways, and interstates.

Higher Order Streets – All streets which are classified above the street being described.

Industrial Street – A Street in an area for manufacturing or industrial use as defined by the local land use agency's zoning code which is located in an unincorporated community and meets the following requirements:

a. The aggregate internal street system contains a minimum of 500 linear feet of road surfacing.
b. The internal street system connects to existing or proposed State-maintained roadways.

Interchange – A facility that grade separates intersecting roadways and provides directional ramps for access movements between the roadways. The structure and the ramps are considered part of the interchange.

Interconnectivity – Physical connections of roadways and sidewalks between two or more independent developments or residential subdivisions**.**

Intra-connectivity – Physical connections of streets and sidewalks within a single development or residential subdivision**.**

Lane – The portion of a roadway for the movement of a single line of vehicles which does not include the gutter or shoulder of the roadway.

Level of Service – A term used for indicating whether traffic is moving at ideal, average or poor conditions, measured on a scale from "A" to "F".

Limited Access Highway – Highways, streets or roadways to which owners or occupants of abutting lands and other persons have no legal right of access to or from the same, except at such points and in such manner as may be determined by the public authority having jurisdiction over such highway, street or roadway.

Limited Movement Roadway – A roadway whose turning movements are restricted, typically to right turn only, when intersecting with a roadway of higher classification or designation.

Linkages – Roadways, sidewalks, access-ways and walkways that connect between adjacent development parcels and subdivisions.

Local Land Use Agency – The County or municipality that is responsible for reviewing and approving the applicant's subdivision.

Local Road – All roadways under DelDOT jurisdiction that are generally referred to by county maintenance route numbers. These roads are not subdivision streets and are not roadways classified under the federal highway system.

Local Transportation Circulation Plan – A plan providing proposed locations for future roadways designated as minor collector or higher level, within a particular geographic area, that has been approved by DelDOT and the County or local jurisdiction to which it pertains. For the purposes of these Regulations, an Approved Local Transportation Circulation Plan shall include any roadway or segment that was identified on an approved SSP of a previously approved development.

Local Roadway Network – Those roadways comprising all roadway classifications designated as major collector or lower level (including minor collector, commercial collector, commercial access street, subdivision street, loop street, boulevard street, cul-de-sac, service road and alley).

Loop Street – A subdivision street with one or two points of access on a collector street or other higher order street.

Lot – A bounded area of land portrayed on a recorded or unrecorded plan, which usually also shows nearby streets and other physical features, as well as other lots and parcels. The lots delimited by plans are a basis of separate legally established parcels, usually for houses or other buildings. The resulting parcels may contain more than one lot, especially where lots are small. Occasionally lots are delimited to transfer land from one parcel to another. Since parcels and lots are related, the terms are often used interchangeably.

Major Residential Subdivision – A subdivision of six or more residential lots.

Service Road – A subdivision street which is adjacent and generally parallel to a limited access arterial roadway or highway which is intended to provide access to properties which adjoin or that are in close proximity to the limited access arterial roadway or highway.

Median – The portion of a divided highway separating the traveled ways for traffic in opposing directions.

Median Left-Turn Lane – A speed change lane within the median to accommodate left-turning vehicles.

Minor Residential Subdivision – A subdivision of five or fewer residential lots.

Mixed Use Development – Development that consists of two or more land uses within the same building lot or area.

Multi-modal Access – Ability of pedestrians, bicyclists and transit vehicles to enter, exit or use a transportation facility.

Natural Area or Feature – May include slopes in excess of DelDOT standards for maximum slopes, uplands natural areas, wetlands, or other bodies of water.

Neighborhood Commercial District – Commercial districts that serve to provide goods and services to the surrounding neighborhoods, generally consisting of older buildings with unique architectural style.

Net Dwelling Unit Density – The computation of dwelling unit density that excludes land area dedicated to the public use or for use as open space.

Non-Subdivision Road – Any road under DelDOT jurisdiction that is not a Type I, Type II or Type III Subdivision Street.

Opposite Parcel - A parcel located across a roadway or street from the frontage of another parcel.

Parcel – A uniquely described piece of land whose boundaries are established by legal instrument such as recorded deed, court order or a recorded plot which is recognized as a separate legal entity for the purposes of transfer of title.

PCPHGPL – Passenger cars per hour of green time per lane

Pedestrian Refuge Areas – Areas protected by curb, landscaping or some other similar device so as to provide shelter for pedestrians traveling across vehicle travel lanes.

Physical Constraint – Limitation on development or access created by topographical features on the development parcel, or adjacent parcels, e.g. spacing of existing adjoining streets, freeways, railroads or other physical structures.

Potentially Developable or Redevelopable Land – Land that is not restricted from development by virtue of factors such as farm land preservation, wetlands or other environmental constraints, parkland, etc.

Public Works Engineer – The DelDOT individual assigned to issue permits and supervise construction.

Record plan (Approved) –

a. A complete plan which defines property lines, proposed street and other improvements, and easements.
b. A plan of private streets to be dedicated to public use.

Residential Access – An entrance serving a private single-family residential unit from an abutting State-maintained roadway.

Residential Site – A private single-family residential lot.

Right-Turn Lane – An auxiliary lane, or speed change lane for turning vehicles leaving a State-maintained roadway.

Roadway – The portion of a highway, including the travel-ways and shoulders.

Scope Confirmation Letter – A letter prepared by an applicant's engineer, for confirmation by DelDOT, that outlines the requirements of a TIS based on the Scoping Meeting for the Application.

Scoping Meeting – A meeting requested by an applicant to discuss the requirements and study area of a Traffic Impact Study.

Section Area – A 1 mile radius area surrounding the proposed development.

Sidewalks – Paved pedestrian pathways installed along arterial, collector, and local roadways, and subdivision street frontage.

Shared-Use Path – For the purposes of this manual, a shared-use path is a generic term used to refer to a right of way provided for non-motorized traffic (typically bicycle and pedestrian traffic). A shared-use path can be constructed of

concrete, bituminous concrete, pavers, compacted material, or a combination of such materials. Access-ways, walk-ways and multi-use trails are shared-use paths.

Shoulder Area – The portion of roadway adjacent to the travel-way for accommodating stopped vehicles and providing lateral support to the base and wearing courses.

Site Plan – The plan sheet(s) signed by a licensed engineer or surveyor that depict the existing and proposed condition of a development site to scale and showing all pertinent information required by DelDOT and the local land use authority to receive the necessary planning or zoning board approvals. The site plan is generally recorded as part of the land use approval process.

Site Street Plan (SSP) – A plan document submitted to DelDOT as part of a complete application for development approval of subdivision streets or of access to development parcels that are 5 acres or larger, depicting proposed local street layout and proposed locations for connections to higher order roads.

Sight Distance – The distance visible to the driver of a passenger vehicle measured along the normal travel path of a roadway from one point to another point at a specified height above the roadway.

State-maintained Roadway – The entire width between the right-of-way of a publicly maintained roadway when any part thereof is open to the use of the public for purposes of multi-modal travel or the entire width of every roadway declared to be a public highway by any law of this state. It includes bridges, culverts, sluices, drains, ditches, waterways, embankments, walls, trees, shrubs, fences, etc.

Stopping Sight Distance – The distance required by a driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the roadway becomes visible. It includes the distance traveled during driver perception and reaction times and the vehicle braking distance.

Storage Length – Additional lane length added to an auxiliary lane to store the maximum number of vehicles anticipated to accumulate in the lane during a peak volume period. It prevents stored vehicles from interfering with the function of the deceleration lane or the through travel lanes.

Stub Street – Temporary dead end street for future connectivity with the adjacent property.

Strip Development – See Minor Residential Subdivision

Subdivision Street – A street within a community or industrial park, categorized into three levels as follows:

a. **Type I** – Subdivision streets with less than 500 ADT.
b. **Type II** – Subdivision streets with between 501 to 3000 ADT.
c. **Type III** – Subdivision streets with more than 3000 ADT.

Suburban Community – Any unincorporated community within the state of Delaware:

- Containing at least 5 separate and distinct property owners; provided, that each parcel of land, condominium or other individually owned unit of a multiunit building shall be deemed to have no more than 1 owner for the purposes of this subchapter;

- In the case of individually owned parcels of land whose streets in the aggregate equal a minimum of 500 linear feet of road surface or in the case of condominium or other type of individually owned units of multiunit buildings whose streets in the aggregate equal a minimum of 300 feet of road surface; and

- Which, in the opinion of the county government and DelDOT, is so situated as to form a unit which is reasonably and economically capable of being improved by the laying, repairing or completion of streets, signs, sidewalks and installation of surface drainage and storm sewers.

In addition to the foregoing such unincorporated community within this State must be:

- Located on a highway which is part of the state highway system or will be connected to the state highway system when the projects provided for are complete and which street shall be either maintained by the DelDOT upon completion pursuant to the requirements of Title 17 of the Delaware Code and DelDOT's *Standards and regulations for Subdivision Streets and State Highway Access*; or

- Built pursuant to county rules and regulations requiring design and building standards and a means or mechanism to provide for the perpetual maintenance of such suburban community streets as provided herein.

Subdivision –

a. The division or re-division of a lot, or a parcel of land, by any means, including a plan or a description of metes and bounds, into two or more lots, tracts, parcels, or other divisions of land for the purpose of, whether immediate or future, lease, transfer of ownership, or building development.
b. The division or allocation of land for the opening, widening, or extension of any street or streets, or other public facilities.

Traffic Divider – A median type formation used to separate entering and exiting traffic.

Traffic Generator – An establishment or facility which produces and attracts traffic that did not previously exist and which causes that traffic to leave and enter the adjacent roadway. Traffic generation shall be expressed in terms of Average Daily Traffic (ADT). Each vehicle using the facility is to be counted twice (in and out).

Traffic Impact Study (TIS) – A study conducted during the development approval process to determine the impacts that traffic generated by the proposed development will have on the surrounding street network and the improvements needed to the transportation system in order to mitigate those impacts.

Traffic Island – A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge.

Traffic Operational Analysis – An evaluation or series of evaluations conducted during the TIS and site entrance reviews that are used to determine the ability of a proposed development project to operate safely and with adequate access. Analyses conducted under the heading of "Traffic Operational Analysis" may include Queuing Analysis, Highway Capacity Manual Analyses, and Accident Analyses.

Transportation Improvement District (TID) – A geographic area defined for the purpose of securing required improvements to transportation facilities in that area.

Travel Demand Management (TDM) – A strategy or a set of strategies proposed by an applicant to mitigate the traffic impacts of a project by reducing the number of single occupied vehicles traveling to the site during the peak hour. TDM strategies can include such things as car and van pools, flex and staggered employee hours, transit or shuttle service.

Walkways – Pathways within commercial development sites that can range in size from a minimum 5 foot width to accommodate pedestrians, to a maximum 12 foot width to accommodate pedestrians and bicyclists.

~~Figure 1-2 Land Development Process~~

CHAPTER 2 TRAFFIC IMPACT STUDIES

2.1 PURPOSE

In order to accommodate a proposed development access, traffic must operate safely and at satisfactory levels of service (LOS).

The purpose of this Chapter is to provide for a clear process for determining transportation impacts associated with new development so that the impacts can be mitigated and system capacity can be preserved.

To focus transportation improvement resources consistent with state objectives, this Chapter has identified two sets of level of service standards, one for developed, developing and planned development areas and one for all other areas, which typically are rural areas.

A Traffic Impact Study (TIS) may be initiated by DelDOT, the applicable land use agency, or by the Applicant in anticipation of submission of a subdivision proposal for review.

Depending on the size of and expected trip distribution for a project, a TIS scope may include, but is not limited to, the following types of operational analyses:

a. Highway Capacity Manual/LOS Analysis – This analysis may be required to determine whether the approaches at the site entrance(s) and approaches of nearby intersections operate within acceptable LOS.
b. Queuing Analysis – This analysis may be required to determine whether existing and proposed left-turn storage at the site entrance(s) and nearby intersections is adequate, to assess U-turn lane storage adequacy, or to determine that lane queuing does not block access to turn lanes or spill back into upstream intersections.
c. Safety Analysis – This analysis may consist of a number of factors including review of adequacy of sight distance, accident data, and *Manual on Uniform Traffic Devices* (MUTCD) and DelDOT *Road Design Manual* compliance. More specifically:
   - An Applicant may be asked to evaluate the sight distance at the entrance driveway(s), at intersections within the study area, and at proposed intersections within the subdivision to be constructed.
   - An accident analysis may be required if locations within the proposed study area are known or alleged to be high accident locations. The analysis will be used to determine whether a problem exists, and if so, how the proposed project relates to the problem, and what modifications or improvements need to be made to ensure safe access on the State-maintained roadway system and safe operation on adjacent roadways and intersections.
   - An analysis to provide for an evaluation of roads near the site relative to MUTCD and *Road Design Manual* standards may be requested. This analysis would be requested to identify deficiencies in signing, striping, cross-section or geometry that represent or would represent an unsafe condition.
d. Bicycle, Pedestrian and Transit Facility Analysis - The analysis may be required to identify and evaluate related impacts and

need for enhancements to bicycle, pedestrian, and transit access, circulation, and facilities within the study area.

2.2 AUTHORITY AND RESPONSIBILITY

Whenever the DelDOT Division of Planning, Development Coordination Section (DelDOT) determines that a development proposal exceeds the analysis warrants as defined in Section 2.3, a TIS shall be completed for such proposed development if in the opinion of DelDOT a TIS is necessary. The scope of the TIS shall be based on the type and intensity of the proposed land use change or development.

Independent of the TIS report, the DelDOT Subdivision Section may require an Operational Analysis during its review of site access issues as outlined in Section 3.9.

2.2.1 USE OF TIS FINDINGS

If a TIS is required for a proposed development, DelDOT will direct its preparation for use in determination of impacts to the transportation network. Using the findings of the TIS, DelDOT may provide transportation network improvement and modification requirements to be built or funded by the Applicant, as appropriate. DelDOT may also use the TIS to make recommendations to the local land use agency having land use jurisdiction over the property, or for any other purpose that DelDOT deems appropriate.

2.2.2 AREA-WIDE STUDY

At DelDOT's option, the department may require the Applicant to provide resources to conduct an Area-Wide Study in lieu of a TIS, the results of which will be used to determine transportation impacts and necessary transportation network improvements associated with multiple development proposals or sites. The Applicant shall not be required to pay more than its fair share of the cost of such an Area – Wide study.

2.2.3 STUDY COSTS

If the Applicant desires to proceed with a development for which a TIS is required, the Applicant shall assume full responsibility for all costs incurred in its preparation, or for a portion of the costs associated with the Area-Wide Study.

2.2.4 QUALIFICATIONS TO PERFORM A TRAFFIC IMPACT STUDY

All TIS document submittals shall be signed and sealed by a professional engineer licensed in the State of Delaware.

2.2.5 REQUIREMENTS OF A NEW TIS

If a TIS is prepared for a proposed development and DelDOT finds that existing or projected future conditions in the study area have changed significantly after the completion of the TIS, DelDOT may require a new, revised, or updated TIS at its sole discretion before issuing a Letter of No Objection or, where a DelDOT Letter of No Objection is not required, before approving entrance plans. DelDOT will take reasonable measures in scoping the study to avoid the need for additional work once the study is complete. However, it is the Applicant's responsibility to obtain plan approvals while their TIS is still valid and to demonstrate that validity as necessary.

Once DelDOT has issued a Letter of No Objection or, where a DelDOT Letter of No Objection is not required, has approved entrance plans, DelDOT may require a new, revised or updated TIS only if the development changes in a way that necessitates a new record plan. However, in the review of the entrance plans for that development, DelDOT may require an

Operational Analysis, which may result in new or different requirements for improvement of the entrances and adjacent intersections.

2.3 TRAFFIC IMPACT STUDY WARRANTS

2.3.1 BASIS FOR RECOMMENDATION

A TIS may be required under any of the following conditions:

1. When a proposed land use change or development will generate 400 vehicles per day (vpd) or more in average weekday or weekend trips, or if it will generate 50 vehicles per hour (vph) or more during any one hour time period, as determined by DelDOT.
   a. No deductions shall be allowed for internal or pass-by trips when determining warrant requirements for a TIS. The Applicant may, however, present information at the Scoping Meeting and DelDOT, in its sole discretion, may waive the TIS report based on internal trip data presented.
   b. Peak-hour shall be the highest of the a.m., p.m., or weekend peak hour trip generation as determined in accordance with Section 2.9.6.
   c. Daily traffic volumes shall be the higher of the weekday, Saturday or Sunday volumes as determined in accordance with Section 2.9.6

   or
2. When a new access entrance for an existing land use is proposed for a state-maintained roadway, and the total trips generated by the site would be increased by 400 vpd or 50 vph in the peak hour;

   or
3. When in a local land use process, DelDOT finds that a development and/or change in zoning is proposed for an area where roadways or intersections operate ~~at or~~ below LOS D in a developed, developing or planned development area or, LOS C in a rural area. The criteria shall not be required in cases where the proposed rezoning would result in the same or fewer trips being generated from the site;

   or
4. When requested by a local land use agency that has more stringent TIS warrant requirements than those provided in this section, DelDOT may, at its option, or as required by agreement with the local land use agency, provide a review of the project using the more stringent TIS requirements; or
5. When in the opinion of the DelDOT, it is in the public interest to obtain further traffic information on a proposed development.

2.3.2 AREA-WIDE STUDY FEE

Provisions of Sections 2.3.1.1 and 2.3.1.2 notwithstanding, if a development will generate fewer than 2000 vpd, fewer than 200 vehicles in any hour of any day, and the Applicant has not been required to conduct a TIS under the provisions of Section 2.3.1.3, 2.3.1.4 or 2.3.1.5, the Applicant, ~~at its discretion, will~~ may be permitted, in lieu of conducting a TIS, to contribute funds equal to ten ~~five~~ dollars ($10.00 ~~$ 5.00~~) per daily trip to be generated by the development (Area-Wide Study Fee). The Area-Wide Study Fee shall be paid in conjunction with the Initial Stage Fees as discussed in Section 1.4. DelDOT shall apply the collected fee to complete an Area-Wide Study that includes the development or transportation improvements that benefit the development. Payment of an Area-wide Study Fee in lieu of a TIS will not preclude the Applicant's responsibility for funding and/or construction of its share of off-site improvements. Those improvements may be determined to be needed by the Area-Wide Study or other studies, e.g. TIS for other nearby developments.

Figure 2-1 Volume Warrants for Traffic Impact Studies (TIS)

Section 2.3.2 provides that for development generating at least 400 vehicles per day (vpd) and 50 vehicles per hour (vph) but still fewer than 2,000 vpd and 200 vph, the developer generally has the option of contributing toward an area-wide study rather than conducting their own TIS.

Section 2.3.3 provides that TIS are generally not required for developments generating fewer than 400 vpd and 50 vph.

~~THE TABLE BELOW ADDRESSES ONLY VOLUME-BASED WARRANTS.~~

~~REFER TO SECTION 2.3. FOR OTHER WARRANTS THAT MAY APPLY~~

THE TABLE BELOW IS INTENDED AS A QUICK REFERENCE. IT IS NOT A SUBSTITUTE FOR THE WARRANTS IN SECTION 2.3.1.

Land Use	TIS Not Warranted (Fewer than 400 vpd and 50 vph)	Eligible To Pay Area-Wide Study Fee (Fewer than 2,000 vpd and 200 vph)
Single Family Detached Houses	35 units	194 units
Apartments	41 units	304 units
Townhouses or Condominiums	57 units	380 units
Mobile Homes	34 units	341 units
Age-Restricted Single Family Detached Houses	70 units	465 units
Motel	44 rooms	236 rooms
General Office Building	20,000 square feet	134,200 square feet
Medical/Dental Office Building	11,100 square feet	45,000 square feet
Specialty Retail Center (Excludes convenience stores, pharmacies, banks, restaurants and gas stations)	9,000 square feet	39,800 square feet
Convenience Store (no fuel pumps)	N/A	2,700 square feet
Pharmacy with Drive-Through Window	N/A	21,000 square feet
Drive-in Bank	N/A	3,700 square feet
Fast Food Restaurant with Drive-Through Window	N/A	3,300 square feet
Gasoline/Service Station with Convenience Market	N/A	12 vehicle fueling positions

This table was compiled using the 8th edition of the ITE Trip Generation report. It is valid only to the extent that the rates and equations in that report remain applicable.

2.3.3 DEVELOPMENT GENERATING FEWER THAN 400 VPD AND 50 VPH

Developments generating fewer than 50 vph in any hour and 400 vpd shall be subject to the provisions of this chapter only if a TIS is required under the provisions of Section 2.3.1.4 or 2.3.1.5.

2.3.4 WAIVERS OF TIS DUE TO LOCATION WITHIN A TRANSPORTATION IMPROVEMENT DISTRICT

If a development does not meet the criteria of Section 2.3.2 or 2.3.3, DelDOT, at its sole discretion, may waive its requirement for a TIS if all of the following conditions apply:

1. All of the development entrances are located within the boundaries of a ~~TID~~ Transportation Improvement District.

2. The TID has been created:

   a. By virtue of

      i. An act of the General Assembly; or
      ii. An action of the Council of a Metropolitan Planning Organization; or
      iii. A Memorandum of Agreement between DelDOT and the relevant local government(s);

      and

   b. For purposes that include the implementation of transportation improvements that are based on forecast traffic volumes;

      and

   c. In conformance with the circulation element of a comprehensive plan or a related master plan;

3. The traffic forecasts used in the creation of the TID are for a year no sooner than the expected completion date of the subject development, as determined under Section 2.9.10 and one of two conditions apply:

   a. The subject development was explicitly accounted for in the traffic forecasts used in the creation of the TID; or

   b. The traffic entering and exiting the subject development would not result in an increase of more than five percent in the forecast traffic volume at any of the development entrances.

4. A specific set of transportation system improvements has been identified as necessary within the TID based on forecast traffic and other relevant factors, such as safety or structural adequacy.

5. The Applicant has agreed in writing to contribute toward the cost of the identified transportation improvements and that contribution is based on the subject development's percentage contribution to the increase in the peak hour traffic passing through the facility to be improved, with the said increase being measured from the base year to the forecast year.

The completion of a TIS and the subsequent agreement of a developer to comply with requirements resulting from the study process shall be considered to meet requirements 2.a.iii and 5 above if DelDOT finds that the TIS included all facilities that would have been included in the TIS for which a waiver is sought.

DelDOT reserves the right to require a bond or similar security as a means of guaranteeing that the pledged funds will be available when needed and/or that any required work will be completed on time and to the satisfaction of DelDOT.

2.4 TRAFFIC IMPACT STUDY PROCESS

2.4.1 TRAFFIC IMPACT STUDY PREPARED BY APPLICANT'S TRAFFIC ENGINEER (OPTION A)

To conduct a TIS, the Applicant shall complete the following steps:

1. A request shall be made to DelDOT to schedule a mandatory Scoping Meeting in accordance with Section 2.5.1. The Applicant shall provide a copy of this letter to the applicable local land development agency concurrent with its submission to DelDOT.

2. A Scoping Meeting shall be held with DelDOT, and at DelDOT's discretion, with representatives of the local land use agency to discuss the proposed development and the scope of work for the project TIS.

3. DelDOT shall provide a memorandum, which will serve as the meeting minutes and scope of work for the study. ~~When the Applicant's engineer supplies a proposed Scope of Work Letter in accordance with Section 2.5.2, DelDOT shall provide a confirmation of the Scope of Work Letter, incorporating necessary revisions and additions to the Applicant's engineer for completion of the TIS.~~

4. If the Applicant wishes to proceed with this option, they shall provide a check in accordance with Section 2.5.3. The estimated time for DelDOT to review the ~~a draft~~ Final TIS under Option A after the Applicant's engineer has submitted the Final TIS is 20 business days. Completion of a draft TIS review letter in a form suitable for discussion with the Applicant can be expected ~~with the final TIS completion~~ approximately 20 business days after DelDOT's review of the TIS for a total of 40 business days ~~that date~~.

5. Count and Trip Distribution Data. After the Applicant receives the Scope of Work Memorandum, the Applicant's engineer will complete traffic counts and the proposed trip distributions for the developments to be addressed in the TIS. The count data and proposed distribution shall be submitted to DelDOT prior to completion of any additional analysis. Once submitted, DelDOT will review the count and trip distribution information and will approve the data or, in the alternative will provide requirements for revisions to the data, which could include provision of future base volumes, the provision of growth factors to be used in calculating such volumes, or modifications to distribution percentages.

6. Preliminary Traffic Impact Study Report. After acceptance of the traffic count data, the Applicant's engineer will complete the elements of the report indicated in Sections 2.6 and 2.7 and shall submit one copy of the information to DelDOT as the "Preliminary Traffic Impact Study" (PTIS). This information allows DelDOT to review the base data prior to completion of the full analysis by the Applicant's engineer, saving the Applicant's engineer from potential resubmissions of more detailed analyses if a correction is required by DelDOT to the base data or assumptions. DelDOT shall respond by approving the PTIS either as submitted or with required amendments or additions. If significant problems are found, e.g., changes are needed to volumes in several report figures, further submissions at this stage will be required.

7. Traffic Impact Study Report. After acceptance of the PTIS by DelDOT, the Applicant's Engineer shall complete the TIS in accordance with the analysis provisions of Section 2.8 and submit three copies of the full report (including the Preliminary TIS sections) to DelDOT for review. The final

TIS report may be rejected by DelDOT if the report deviates from the approved PTIS, either through failure to make revisions or the inclusion of new, un-reviewed volumes.

8. Department Recommendations and Requirements for Access. When DelDOT finds that the TIS is satisfactory and agrees with its conclusions, DelDOT shall establish conditions for approval of construction of subdivision streets and for approval of access to state-maintained roadways, and shall provide a letter detailing the conditions to the Applicant. Either prior to or at the same time that the Applicant is provided with the conditions letter, DelDOT may also provide copies of its requirements, recommendations and conditions to other relevant agencies, including the local land use agency. The Applicant shall still be subject to the plan review and entrance plan requirements of Development Coordination Section.

2.4.2 TRAFFIC IMPACT STUDY PREPARED BY DELDOT'S TRAFFIC ENGINEER (OPTION B)

1. A request shall be made to DelDOT to schedule a mandatory Scoping Meeting in accordance with Section 2.5.1. The Applicant shall provide a copy of this letter to the applicable local land development agency concurrent with its submission to DelDOT.

2. A Scoping Meeting shall be held with DelDOT and, at DelDOT's discretion, with representatives of the local land use agency to discuss the proposed development and the scope of work for the project TIS.

3. DelDOT shall provide a memorandum, which will serve as the meeting minutes and scope of work for the study. DelDOT shall also provide a cost estimate from their traffic engineer to prepare the TIS in its entirety.

4. If the Applicant wishes to proceed with this option, they shall provide a check made payable to DelDOT, in the full amount of the cost estimate. On receipt of that check, DelDOT will issue a notice to proceed to their traffic engineer.

5. DelDOT's traffic engineer will complete the draft final TIS in approximately 40 business days. Upon completion of the draft final TIS, DelDOT will schedule a meeting to discuss the results with the Applicant.

6. Department Recommendations and Requirements for Access. When DelDOT finds that the TIS is satisfactory and agrees with its conclusions, DelDOT shall establish conditions for approval of construction of subdivision streets and ~~a~~ for approval of access to state-maintained roadways, and shall provide a letter detailing the conditions to the Applicant. Either prior to or at the same time that the Applicant is provided with the conditions letter, DelDOT may also provide copies of its requirements, recommendations, and conditions to other relevant agencies, including the local land use agency. The Applicant shall still be subject to the plan review and entrance plan requirements of Development Coordination Section.

7. DelDOT will provide a copy of the completed TIS to the applicant.

2.5 SCOPE OF WORK DETERMINATION AND CONFIRMATION

2.5.1 LETTER TO REQUEST SCOPING MEETING

An Applicant considering submission of a subdivision or site plan development application shall request in writing, using the Scoping Meeting Request Form found in Appendix O, a Scoping Meeting with DelDOT to discuss elements of the project and project analysis assumptions.

The Scoping Meeting Request ~~Information~~ Form found in Appendix O ~~includes the following information~~:

a. Project name;
b. Name and address of the applicant;
c. Contact information for scheduling meeting;
d. Location of project;
e. Copy of tax map showing block number, lot number, parcel number and lot lines;
f. Total acreage of the project site;
g. Current and proposed zoning of the project site;
h. Proposed land use;
i. Proposed number and location of site access points;
j. Proposed build-out year, or if project is to be phased, phase-in dates;
k. Indication as to whether a land use application has been submitted to the local government land use department for review;
l. Indication as to whether a subdivision or land development plan has been submitted to DelDOT's Subdivision Section for review, and, if one has been submitted, a copy of the plan;
m. Indication as to whether a site plan for the project has been prepared, and, if one has been prepared, a copy of the plan;
n. Any other analysis assumptions the Applicant proposes using for the study;
o. Evidence that the Applicant and the current property owner were notified of the request for the meeting; and
p. Names and titles of people anticipated to attend the Scoping Meeting;

One copy of the request for Scoping Meeting letter shall be sent to the applicable local land use agency concurrent with the submission of the letter to DelDOT. The Applicant may be requested to demonstrate to DelDOT that it has provided a copy of the letter to the land use agency. Failure to provide a concurrent copy of the request for Scoping Meeting letter to the local agency may result in the delay or postponement of the Scoping Meeting.

2.5.2 SCOPING MEETING

DelDOT will schedule the Scoping Meeting. At the Scoping Meeting, the following TIS topics shall be ~~DelDOT at a minimum will~~ discussed:

a. Intersections and roadway segments to be studied. Note: In considering the study area limits, DelDOT shall consider the area of influence of the proposed development on the surrounding roadway network. DelDOT will also consider local requirements for area of influence when determining the study area limits;
b. The impact of any significant committed developments within a two-mile radius of the exterior boundaries of the project on the project study area;
c. The availability of accident data within the proposed study area and the requirements for analysis based on that data;
d. Method to be used to project traffic growth;
e. Traffic count locations and proposed schedule for manual and Automatic Traffic Recorder (ATR) counts;
f. Times and days of analysis;
g. Any anticipated seasonal variations of use;
h. Methods to be used to generate, distribute and assign trips;
i. When appropriate for use in the TIS analysis, pass-by and internal trip capture assumptions;
j. Other information and assumptions to be used in the analysis for the report.

Within 20 business days DelDOT will supply a Memorandum of the Scoping Meeting Minutes, if requested by the Applicant, an estimate for Option B. The cost estimate for Option B proposal will expire after 40 business days.

2.5.3 CONFIRMATION OF SCOPE OF WORK FOR THE TIS

If after the receipt of the Scoping Meeting Memorandum the Applicant decides to proceed

with the project, the Applicant's engineer shall provide DelDOT with confirmation that they agree with the Scoping Meeting Memorandum or with any changes they find necessary. At this time they shall also identify if they want to proceed with Option A or Option B.

If after the Applicant chooses Option A, their confirmation of the Scoping Meeting Memorandum shall be accompanied by a fee in the amount of $5000, in the form of a check made payable to the Department of Transportation. An estimated time for review of a TIS under Option A after the Applicant's engineer has submitted the Final TIS is 20 business days. Completion of a draft TIS review letter in a form suitable for discussion with the Applicant can be expected approximately 20 business days after that date, for a total of 40 business days.

If the Applicant chooses Option B, their confirmation of the Scoping Meeting Memorandum shall be accompanied by a check made payable to the Department of Transportation in the full amount of the estimate for Option B. After receipt of payment, DelDOT will issue its Traffic Engineer a Notice to Proceed (NTP) with the Final TIS preparation. An estimated time for a draft Final TIS and comment letter in a form suitable for discussion with the Applicant ~~under Option B~~ is approximately 40 business days with final TIS and comment letter completion approximately 20 business days after that date.

DelDOT may revise a scope of work if the TIS is not submitted within a 12-month period from the date of the Scope Confirmation Letter, or within a time period earlier than 12 months should conditions in the study area change. A revised scope of work may require a restart of the TIS process, including a requirement for a new processing fee.

2.6 TRAFFIC IMPACT STUDY REPORT FORMAT

All TIS submittals shall be signed and sealed on the first page by a licensed Delaware Professional Engineer.

The pages of the TIS shall be numbered and the topics shall be addressed in the same sequence as they appear in this subsection.

The following outline details the Topic Sections to be contained in a TIS*:

a. Table of Contents;
b. List of Figures;
c. List of Tables;
d. Executive Summary;
e. Project Description;
f. Study Area;
g. Existing Traffic and Transportation Conditions;
h. Trip Generation;
i. Pass-by and Internal Capture Trips (if appropriate)
j. Trip Distribution;
k. Trip Assignment;
l. Future Traffic
    - Traffic Analysis
    - Analysis Years
    - Peak Hour Factors;
m. Safety Evaluation and Adequacy of Sight Distance;
n. Geometric Design, Operational and Circulation Improvements;
o. Impacts on Bicycles, Pedestrians, and Transit;
p. Capacity Analyses;
q. Mitigation Identification;
r. Recommendations;
s. Conclusions; and
t. Appendices
    1. Traffic Count Summary Sheets
    2. Collision Diagrams

3. List of Committed Developments
4. Trip Generation, Distribution and Assignment Calculations for the subject development and all committed developments
5. Capacity Analysis Worksheets
6. Critical Movement Summation Forms and Signal Timing Sheets
7. DelDOT and Applicant Correspondence
8. Support for Recommendations

**While Items 2.6.e through l and t.1. and t.4. constitute the contents of the Preliminary TIS as discussed in Section 2.8, they should also be submitted as part of the final TIS document.*

2.7 CONTENT OF TRAFFIC COUNT AND TRIP DISTRIBUTION SUBMISSION (OPTION A ONLY)

To avoid repetition of work in preparation of the Preliminary TIS and expedite the review process, traffic count data and proposed trip distributions for the subject development and all committed developments shall be submitted for review as follows:

1. Prior to beginning preparation of the Preliminary Traffic Impact Study, described in Section 2.8, the Applicant shall submit to DelDOT a single copy of the data from the tasks completed in accordance with the work outlined in Sections 2.9.5.1, 2.9.5.3 and 2.9.7, and the proposed trip distributions for all committed developments.
2. DelDOT shall review the items listed in paragraph 1 above and respond by approving them for use in the Preliminary TIS either as submitted or with required amendments or additions. If significant problems are found, e.g. unacceptable traffic counts, a resubmission at this stage will be required. At this time, DelDOT will also provide any additional data needed for the Applicant's engineer to project future traffic in accordance with Section 2.9.10.

2.8 PRELIMINARY TRAFFIC IMPACT STUDY REPORT CONTENT SUBMISSION (OPTION A ONLY)

To avoid repetition of analyses and expedite the review process, a Preliminary TIS report shall be completed as follows:

1. Prior to beginning the analysis work outlined in Section 2.9.11, the Applicant shall submit to DelDOT a single copy of the data from the tasks completed in accordance with the work outlined in Sections 2.9.2. through 2.9.10 and corresponding to report topics 3.e through l and t.1. and t.4. in Section 2.6. Furthermore, diagrams of future peak hour traffic both with and without site traffic added shall be included in the report.

2. DelDOT shall review the Preliminary TIS and respond by approving the Preliminary TIS either as submitted or with required amendments or additions. If significant problems are found, e.g., unacceptable traffic counts, a resubmission at this stage will be required.

2.9 TRAFFIC IMPACT STUDY CONTENT

The TIS shall evaluate the intersection and roadway sections detailed in the Scoping Meeting Memorandum for the proposed development. The following information shall be included:

2.9.1 EXECUTIVE SUMMARY

An Executive Summary shall be included at the beginning of the TIS report. The Executive Summary shall discuss the analysis and conclusions and identify recommended transportation improvements.

2.9.2 SITE INFORMATION

The following information shall be included in site information:

1. Name(s) and address(es) of the site owner and Applicant;
2. Lot location noting tax parcel numbers, municipality (if incorporated), county;
3. Routes of access, with their direction and milepoint;
4. Size and type and zoning of all existing and proposed land use on the site;
5. A topographic site map (if available) and aerial photos; and
6. Sketch plan of site (24" x 36") that includes the right-of-way (throughout), curb lines, entrances and lane striping of both sides of roadways adjacent to the site.

2.9.3 PROJECT DESCRIPTION

The TIS shall provide a comprehensive project description including, but not limited to, the following:

1. Site plan showing block number, lot number, lot lines, proposed site access (including existing to remain), and proposed transportation improvements;
2. Project phasing and schedule: development staging identifying the year of development activities per phase and proposed access plans;
3. Narrative on the intended use of the site, including the range of uses allowed without additional land-use approvals and the ITE land use code(s) used to generate trips:
   a. Residential developments should be described in terms of number and type of dwelling units, e.g., 32 single-family homes;
   b. Non-residential uses should be described in terms of use and gross leasable floor area or another relevant descriptor, e.g., industrial type of warehousing, or general or medical office;
4. Frequency of use:
   a. Anticipated peak days and hours of operation should be described;
   b. Any anticipated seasonal variations of use should be discussed;
5. Intensity of use:
   a. At a minimum, the proposed use and buildable area (in square feet) of the site must be specified;
   b. For residential uses the buildable area (i.e., density) shall be described as the number of dwelling units per acre;
   c. For non-residential uses the buildable area shall be described in terms of floor area ratio and gross square footage by use which should be specific (e.g. medical office vs. office);
6. Digital photographs of the site shall be provided showing sufficient detail of relevant features impacting traffic, including but not limited to, existing and proposed access entrances, adjacent entrances on both sides of the street, and features and intersections within the influence area.

2.9.4 TIS STUDY AREA DESCRIPTION

The TIS shall provide a complete evaluation of existing conditions and include maps and tables displaying the following information for the study area identified in the Scoping Meeting Memorandum:

1. Study Area/Vicinity Map. A map showing the street system including street names, functional classifications and entrance locations as specified in Chapter 3;
2. A description of ~~and rationale for~~ the study area limits including intersections, roadway weaving sections and ramps to be studied;
3. Schematic diagram(s) of existing and future roadways and intersections including traffic control, geometric features (pavement, lane and shoulder widths, channelization, etc.) sidewalks, bikeways and roadway striping;

4. Any functional, operational or programmatic activities, including public and private operators or carriers, which affect trip making activity such as ridesharing participation, park and rides, transit services, or other travel demand management methods;
5. Intersection lane configurations in the study area;
6. Traffic signal information including traffic signal locations, type and capabilities of existing signal hardware, and the signal timing chart, time of day chart, split charts and signal progressions from the Traffic Management Center;
7. Existence of any privately owned shared access agreements or cross access easements;
8. Description, location and schedule of proposed transportation improvements and/or public or private mitigation, within the study area; and
9. Digital photographs of each approach of each intersection included within the study area, as well as other locations as may be requested by DelDOT in the Scoping Meeting Memorandum, sufficient to determine relevant features including, but not limited to, traffic controls, striping and signing locations.

2.9.5 EXISTING TRAFFIC AND TRANSPORTATION CONDITIONS

The report shall provide an inventory of the following traffic and transportation existing conditions for the Study Area identified in the Scoping Meeting Memorandum:

1. Narrative and flow diagrams of seasonally adjusted peak hour traffic through the study area and identification of peak hours. **N.B.:** Flow diagrams must be continuous. Separate diagrams of each intersection are not acceptable;
2. Narrative describing existing pedestrian, bicycle and transit conditions within the study area. Transit information should include routes, stop and shelter locations, route numbers, headways, frequency, passenger boardings, pull outs, and times of service;
3. Existing Condition Traffic Data.
   a. Unless explicitly eliminated from the Scope of Work by DelDOT, the Applicant shall provide traffic count data generally taken on a Tuesday, Wednesday, or Thursday, within 12 months of the application date.
   b. Classified peak hour manual turning-movement counts[1] for one day shall be supported by one week of machine counts.
   c. To be acceptable, manual count volumes must be within 10 percent of the machine count volumes for the same time periods on each approach that day.
   d. For weekday a.m. and p.m. peak hours, manual counts shall be factored to agree with the highest of the weekday machine counts for the highest a.m. and p.m. peak hours respectively.
   e. For Saturday peak hours, manual counts do not need to be factored if they are within 10 percent of machine counts. To be acceptable the manual count must include the peak hour identified from the machine counts.
   f. Two-way (i.e., showing separate counts for each travel direction), all lane, ATRs shall be placed in the locations required in the Scoping Meeting Memorandum. If an ATR malfunctions, the counter should be restarted on the nearest whole day to make up the week (e.g. if a count starts on a Monday morning and the ATR breaks down on Wednesday afternoon, the Monday and Tuesday data will be useable but the count will need to be started again on a Wednesday morning to complete the week).

[1] Classified counts are traffic counts that group trucks of 6 wheels or more, public transit buses, automobiles and pedestrians for each intersection movement. Pedestrian counts shall be made where right turn on red is permitted or where pedestrian traffic is or can be expected.

g. All counts shall be included in the traffic impact study as an appendix. The ~~Applicant's~~ Engineer shall provide evidence of proper calibration of automatic traffic recorder (ATR) equipment.

h. Traffic counts shall be shown by 15-minute intervals over a period long enough to establish relevant peak hour(s). The manual peak hour count period is generally two hours.

i. Traffic counts shall not be taken on, or the day before or after, holidays or other special events when traffic may not be representative of average daily traffic.

j. Days and times of manual turning movement peak hour counts shall be subject to review and approval ~~approved~~ by DelDOT and should normally be conducted on a Tuesday, Wednesday, or Thursday from 7 a.m. to 9 a.m. and from 4 p.m. to 6 p.m. However, these days and times may differ depending on the type of development proposed.

k. Counts also shall be provided for weekends if weekends are the peak traffic period for either the existing street or the proposed development.

l. Counts to be made on streets near a school shall be done when the school is in session.

m. If another TIS has been done in the area (provided that counts used in the TIS were taken within the past year) and DelDOT believes that it is relevant to the proposed project, DelDOT may, in its sole discretion, provide copies and the traffic counts from such a TIS may be used. Other traffic counts may be available from the Traffic Section, but must be deemed acceptable by DelDOT prior to their use in a TIS analysis for the project. If DelDOT allows the use of previous count data, it may also require actual sample counts at locations of its choosing to use as a verification of prior counts, and may require adjustments to the prior counts based on sample count verifications.

n. Vehicle classification must be sufficient to address the needs of the TIS, in most cases simply determining a percentage of heavy vehicles. However, where large percentages (i.e., 5 percent or higher) of multi-axle vehicles are present it may be necessary to more finely stratify the classification in order to conform to the machine count. Also, if a turning movement volume is less than 100 vph, 5 percent heavy vehicles shall be assumed and vehicle classification is unnecessary.

o. Seasonal variations in traffic volumes shall be considered. A seasonal adjustment factor may be provided by DelDOT to be applied to the volumes, and/or DelDOT may require traffic counts during summer periods in eastern Sussex County or along routes containing a high percentage of resort-oriented traffic.

p. During the counting period, the counter shall record the basic weather conditions, and any features or events particular to the count location such as detours, construction, or accidents. These conditions and events shall be included within the traffic count information provided to DelDOT by the ~~Applicant's~~ Engineer when submitting the counts. An event occurring during the manual count will not necessarily disqualify the count from use in the analysis if the event has not materially impacted traffic flow conditions. However, events such as steady rain, snow-covered surfaces, accidents or detours which block or substantially lower the rate of traffic flow through an intersection shall automatically require that the intersection volumes be recounted during a period of normal traffic flow conditions. DelDOT in its sole discretion shall determine the validity and usability of count data supplied by the ~~Applicant's~~ Engineer.

q. Any new traffic counts should be submitted to DelDOT both electronically as PETRA, Excel or UTDF ~~or Excel~~ files and as draft report figures showing peak hour volumes posted on continuous flow diagrams of the road network. Individual location diagrams are not acceptable. Peak hour time period, day and date of count shall be shown on the forms.

r. At or after the Scope of Work meeting, DelDOT may approve alternative proposals for counting programs as long as they conform to the intent of the program as outlined above.

4. Crash Data

a. If an intersection in the study area or a location along the site frontage has been addressed in current or past Highway Safety Improvement Programs (HSIPs) the ~~Applicant's~~ Engineer should report on the status or results of its inclusion in the program.

b. For all other intersections in the study area and locations along the site frontage, the ~~Applicant's~~ Engineer should provide collision diagrams showing crash data for the most recent three-year period for which data is available.

2.9.6 TRIP GENERATION

The trip generation section of the TIS shall include a narrative describing the methodology used to generate site trips.

Estimates of the proposed development's trip generation shall be made for peak period traffic. Selection of the peak period used in the analysis shall be justified and shall consider, at a minimum, the peak period for the proposed development, and the peak period for surrounding streets. DelDOT may, in the Scoping Meeting Memorandum, require other time periods based on known or anticipated marginal or substandard traffic capacity or traffic safety. Except as directed and approved by DelDOT, trip generation estimates shall be based on ITE's *Trip Generation* (latest published edition) using the procedures of the *Trip Generation Handbook*. DelDOT may approve different trip generation rates when trip generation rates are not available in ITE's *Trip Generation* or if different rates are justified.

The seventh edition of ITE's *Trip Generation* does not specifically address duplex dwellings, defined as single structures, each containing exactly two distinct dwellings. For the purposes of this chapter, until ITE provides specific guidance to the contrary, treatment of duplex dwellings shall be consistent with their architectural characteristics, (i.e., structures in which two dwellings resembling single-family detached houses share a common wall shall be treated as two single-family detached houses; structures in which two dwellings resembling townhouses share a common wall shall be treated as two townhouses; and structures, in which the dwellings are stacked, one above the other, shall be treated as apartments or condominiums, depending on their form of ownership. DelDOT shall provide the final determination on how a building is to be classified based on its characteristics.

Previous traffic counts ~~taken by the Applicant's Engineer or others~~ at similar sites for the same use may be used with the approval of DelDOT. If new counts are to be done to determine a trip generation rate, the sites to be counted shall be subject to DelDOT review and approval and DelDOT shall be given sufficient notice of the counts that they may be observed to ensure accuracy. Secondary measures of traffic, such as receipt counts or parking lot traffic may be accepted in some cases. In all cases, the method of trip generation must meet with the approval of DelDOT.

A tabular summary indicating the entering, exiting and total trips for a.m., p.m., and weekend peak hours and the weekday and weekend daily trips shall be provided.

2.9.7 TRIP DISTRIBUTION

The TIS ~~Applicant's Engineer~~ shall provide:

1. Trip distribution documentation in the form of a narrative of rationale and procedures, possibly including a gravity model or site specific survey. Traffic generated by the proposed development shall be distributed within the study area using engineering judgment based on knowledge of surrounding traffic characteristics;
2. Proposed trip distributions for the developments to be addressed in the TIS should be submitted for review with the traffic counts;
3. Road network diagram(s) of percentage distributions to and from the site shall be included in the TIS report;
4. Trip distribution shall be done by assigning percentages of the traffic entering and leaving the site to the principal directions of travel. This shall be done separately for different types of land use within the site. Generally, inbound and outbound percentage distributions in the a.m. peak hour should be the reverse of the p.m. peak hour. Where a different distribution is used, it must be justified; and
5. The source of the distribution assumptions shall be noted in this section if it is not original to the report.

2.9.8 TRAFFIC ASSIGNMENT

Road network diagrams of traffic assignment shall be included in the report.

The traffic assignment shall follow logically from the trip distribution. Any special conditions must be explained.

Peak-hour traffic volumes covering the analysis area shall be depicted graphically. They must identify site generated, background, pass-by, and total traffic.

Entering and exiting traffic shall be routed on public roadways and the Applicant's site unless Applicant can demonstrate that there is or will be a cross-access easement. Routing on any other site shall be permitted only with the expressed approval of DelDOT.

The source of the assignment shall be noted in this section if it is not original to this report.

2.9.9 PASS-BY AND INTERNAL CAPTURE TRIPS

The source for determining pass-by and internal capture trips should be the ITE *Trip Generation Handbook*. DelDOT, at its sole discretion may provide guidance to apply pass-by percentages where no information is provided in the ITE *Trip Generation Handbook*.

Justification shall be provided for any credits or reductions for pass-by trips or mixed-use developments. Included shall be an explanation of how these trips are being captured and a demonstration that the existing traffic volume is high enough to support the pass-by rates used. Assumed internalization must be supported by a sketch plan showing a balanced and interconnected site circulation system.

Because of the highly subjective nature of pass-by trips and internal capture trips, it is important to discuss them at the Scoping Meeting. An agreement on the rates or an agreement on the approach must be reached at the meeting and included in the Scoping Meeting Memorandum.

2.9.10 FUTURE TRAFFIC

Road network diagrams of future peak hour traffic, both with and without site traffic added, shall be included in the report.

There are three acceptable ways of projecting future peak hour traffic:

1. Through growth factors by which existing volumes should be multiplied;
2. Through assumptions made, in conjunction with, and subject to the approval of,

DelDOT and the local zoning/land development agency, as to types and levels of development for the undeveloped land in the study area which are then used to generate and distribute trips for these developments; or

3. Through use of forecast volumes from a DelDOT travel demand model.

DelDOT shall determine which method, or combination of methods, is appropriate and will consider local requirements in making its determination.

DelDOT shall provide applicable growth factors and/or, if the land development agency requests, a list of committed development to address.

Future peak hour traffic should be calculated for conditions in the project's year of completion (build out year) and, if specified by DelDOT, at other significant conditions such as before or after highway projects are completed:

a. For residential developments, calculation of the project's year of completion shall assume a total of two years from the Scoping Meeting date for design and plan approvals and a minimum of one year per 50 dwelling units, provided that for a development containing two or more dwelling types (detached houses, townhouses, and apartments) the calculation may be based on the dwelling type that predominates;
b. For non-residential developments, calculation of the project's year of completion shall assume a total of two years from the scoping meeting date for design and plan approvals and a minimum of one year of construction.

   An exception to the assumption of two years from the scoping meeting date for design and plan approvals may be permitted at DelDOT's sole discretion if the applicant provides a letter from the local land use agency advising that plan approvals can be expected sooner.

Peak hour factors for use in the analysis of future conditions should be determined when the future volumes are calculated. Future peak hour factors shall be subject to DelDOT review and approval. Calculation of peak hour factors is further addressed in Section 2.9.11.6.6.

2.9.11 ANALYSIS

2.9.11.1 General Criteria

The impact analysis section shall include a narrative of the standards and methodology used for each element of the analysis.

The TIS shall evaluate access, safety, operation, capacity, circulation, level of service, and performance of the transportation system within the proposed development's Study Area as outlined in this section.

The TIS ~~Applicant~~ shall include analysis results in tabular format wherever possible. Tables shall show evaluation criteria, including level of service and delay, for all intersections and roadway segments identified in the Scoping Meeting Memorandum for analysis for each of the following applicable conditions:

1. Existing;
2. Future without Project;
3. Future with Project and proper entrance; and
4. Future with Project, proper entrance, and off-site improvements

2.9.11.2 Safety Evaluation

Existing and potential safety problems resulting from conflicting turning movements between and among entrances, intersections, and internal traffic shall be corrected or improved as required.

Entrances on both sides of the streets fronting the site, in both directions, shall be shown on the site plan at lengths as indicated in **Figure 3.1** in Chapter 3. The safety evaluation shall include a discussion and, where necessary, calculations demonstrating that movements to and from the

entrance will not conflict with the turning movements from adjacent entrances.

On-site entrance stacking and queuing impacts, the on-site roadway network for the project, and the potential for shared access with adjacent development also shall be assessed.

2.9.11.3 Geometric Design, Operational and Circulation Improvements

Geometric design, operational and circulation improvements including, but not limited to, acceleration lanes, deceleration lanes, turning lanes, traffic signals, roundabouts, creation of one-way streets, and channelization shall be considered, evaluated, and required when determined necessary.

No operational analysis completed under the TIS process shall be construed to relieve the Applicant of any operational analysis required during the access review for the development.

2.9.11.4 Adequacy of Sight Distance

Entrance and intersection sight distance requirements shall meet DelDOT standards.

Adequacy of sight distance shall be demonstrated at:

1. Identified locations within the scope of work area; and
2. The proposed road access point(s) for both the existing road configuration and for the ultimate road configuration based on improvements planned for the development and improvements identified in the applicable local Comprehensive Plan Transportation Element.

2.9.11.5 Impacts and Opportunities for Bicycles, Pedestrians and Transit

1. The analysis shall identify and evaluate related impacts on bicycle, pedestrian, and transit access, circulation, and facilities.
2. Opportunities to provide for improved bicycle, pedestrian and transit access and circulation shall be noted in the analysis.

2.9.11.6 LOS Analysis

1. A Level of Service analysis will be used to determine the impacts and required improvements, if any, that a proposed site will have on the roadway network within the study area.
2. Capacity analyses shall be completed for all intersections, roundabouts, roadway sections, weaving sections and ramps itemized and included within the study area outlined in the Scoping Meeting Memorandum.
3. The TIS ~~Applicant~~ shall include ~~complete~~ a LOS analysis for each of the following conditions:
   a. Existing;
   b. Future without project (FWOP);
   c. Future with project and proper entrance (FWP); and
   d. Future with project, proper entrance and off-site improvements (if needed) (FWP and improvements)

   Results of the LOS analysis for each condition shall be provided in a tabular format that includes the LOS and delay for each approach analyzed at each analysis location.
4. Analysis Criteria and Assumptions – Unless expressly authorized by DelDOT, all analyses shall be done in accordance with the 2000 Highway Capacity Manual (HCM), or superseding edition, procedures.
5. Analysis Software – The analysis should be completed using the most recent version of the Highway Capacity Software (HCS) that implements the HCM, and include completed input worksheets from the HCM software analysis, as well as any printed output from the software. If a detailed output format is submitted, then input worksheets are unnecessary.
6. Peak Hour Calculations – The Applicant's engineer shall calculate the peak hour factors for existing conditions. Except where directed otherwise by DelDOT to account for an unusual condition, the Applicant's engineer shall use the total entering volume

to determine the peak 15-minute interval and the peak hour and then compute an overall intersection peak hour factor (PHF). Generally existing PHFs shall be applied to future conditions as well. Where the traffic counts are agreed to be a poor indicator of future PHF's, one of the following three PHFs shall be selected according to the total intersection volume in the future conditions. For a total interstection volume of 500vph or less, use 0.80. For a total intersection volume of 500 vph to 1,000 vph, use 0.88. For a total intersection volume over 1,000 vph, use 0.92. ~~where the counts are very low and significant growth is expected, a PHF of 0.92 should be assumed, except that for intersections where the total intersection volume is between 501 and 1,000 vph, a PHF of 0.88 should be used and where the total intersection volume is 500 vph or less, a PHF of 0.80 should be used. The TIS shall include calculate the peak hour factors for existing conditions. If no increases in volumes are projected, the TIS shall use those observed peak hour factors for future conditions as well. All peak hour factors must be calculated by lane group.~~

7. Lane Utilization Factors – Except as directed by DelDOT, all signalized intersection analyses shall use the HCM default lane utilization factors.
8. Percentage of Heavy Vehicles – The percentage of heavy vehicles should be determined from traffic counts ~~and should be calculated separately for each turning movement~~. For unsignalized intersections, the percentage of heavy vehicles should be calculated separately for each turning movement. For signalized intersections, the percentage of heavy vehicles should be calculated separately for each lane group. Where the traffic counts are agreed to be a poor indicator of future heavy vehicle percentages, e.g. where the counts are very low and significant growth is expected, 7% and 9% should be assumed for two-lane highways and multi-lane highways, respectively, in rural areas; 6% and 8% should be assumed for two-lane highways and multi-lane highways, respectively, in all other areas; and 3% should be assumed for intersections. To account for traffic from specific uses that generate unusually heavy vehicle volumes, e.g. industrial facilities, DelDOT may specify higher percentages. ~~Any modification of default values in the HCS software shall be listed in the report within the appropriate section(s) along with the reasoning for the modification.~~
9. Base Saturation Flow Rates – North of the Chesapeake and Delaware (C&D) Canal, base saturation flow rates for signalized intersections should be maintained at the HCS default value of 1,900 pcphgpl. South of the C&D Canal, base saturation flow rates for signalized intersections should be reduced to 1,750 pcphgpl unless data is available or provided to indicate that a higher value is appropriate. A procedure for collecting such data is provided in Chapter 16, Appendix H of the 2000 HCM. The Applicant's engineer is encouraged to collect data where little or none is available. ~~For specific facilities or circumstances where DelDOT determines that use of software other than HCS is more appropriate, it may authorize the use of that software at its sole discretion.~~

2.9.12 LOS STANDARDS

2.9.12.1 General

LOS standards shall be applied based on the location of the proposed development.

1. Development in Developed, Developing or Planned Development Areas

If a proposed development is located within a developed, developing or planned development area, all intersections, roundabouts, roadway sections, weaving sections and ramps analyzed will be subject to the LOS standards for those areas even if the intersection, roundabout, roadway section, weaving section or ramp is in a rural area..

2. Development in Rural Areas

If a proposed development is located in a rural area, all intersections, roundabouts, roadway sections, weaving sections and ramps shall be subject to the LOS standards for such areas even if the intersection, roundabout, roadway section, weaving section or ramp is inside a developed, developing or planned development area. Levels of service shall, in most cases, correspond directly to those in the HCM unless specified to the contrary.

3. Local Government Standards

DelDOT recognizes that the standards in this manual will not be appropriate to all areas. A local government, as part of its adopted comprehensive plan, may determine that acceptance of a lower LOS (D, E or F) for some portion of the day is necessary and appropriate for the pattern of development they seek to create. If a proposed development is located in, or affects, such an area, DelDOT will consider the local government's standards to the extent that adherence to them does not result in substandard LOS or unacceptable operational condition outside that area.

4. Development in Areas Designated for Re-Development

If a proposed development is located in an area, or on a land parcel or parcels of land, designated as a "re-development" site by either state or local government, with local government concurrence DelDOT may accept the existing Level of Service provided that the proposed development makes sufficient improvements, to DelDOT's satisfaction, to retain the existing measured Level-of-Service.

2.9.12.2 Uninterrupted-flow Standards

LOS for uninterrupted flow locations will be measured by density and volume to capacity ratio (V/C) and conform to the values shown in Exhibits 20-2, 21-2, and 23-3 of the HCM.

When a development is in a developed, developing, or planned development area, an increase in the uninterrupted-flow V/C ratio to the low point of LOS D (approaching LOS E) will be allowed

When a development is in a rural area, an increase in the uninterrupted-flow V/C ratio to the low point of LOS C (approaching LOS D) will be allowed in the FWP condition.

In analyzing facilities for which HCS does not calculate V/C ratios, e.g. multi-lane highways and freeways, separate calculation is required as determined by DelDOT.

2.9.12.3 Signalized Intersection Standards

All signalized intersections shall be analyzed using the following criteria for evaluating impacts and needed improvements:

1. Sites in developed, developing or planned development areas: For each intersection, deterioration up to 55 seconds (the bottom of LOS D) will be allowed for the FWP Condition.
2. Sites in rural areas: For each intersection, deterioration up to the 35 seconds (bottom of LOS C) will be allowed for the FWP condition.
3. Regardless of LOS, DelDOT shall require turning lane improvements to accommodate 95th percentile queue lengths.
4. The analysis shall document that the impacts of queuing from adjacent intersections or traffic restrictions have been addressed.
5. The analysis shall document the interaction of conflicting movements at adjacent entrances.
6. The analysis shall note changes made in signal timing and phasing (i.e. protected, permitted, etc). **The Applicant shall obtain approval from DelDOT prior to incorporating phasing changes in its analysis.**
7. Minimum green times must be equal to or greater than minimum pedestrian crossing times on each approach unless specifically authorized by DelDOT.
8. If there is a traffic signal within 2,640 feet of the site, an arterial analysis as in the HCM Chapter 15 may be required.
9. In determining the signal timing for FWOP it shall be assumed that the existing traffic signal hardware will still be in use. Any

recommendations for timing modification must be supported by the hardware and appropriate for the future year no-build traffic volumes. The build analysis may use traffic signal timing changes that are possible with new traffic signal hardware, provided the hardware is a recommendation for mitigation, and should comply with the standards for progression.

In addition to the HCM analysis, the TIS shall include Critical Movement Summation forms in an Appendix to the TIS for all existing or proposed signals. CMS calculations shall be done using the standard form shown in Figure P-4 in Appendix P.

2.9.12.4 Roundabouts

References to the HCM and HCS notwithstanding, the current US version of aaSIDRA and National Cooperative Highway Research Program (NCHRP) Report 572 shall be used for the analysis of roundabouts. For developments in developed, developing or planned development areas, the minimum acceptable LOS shall be D. For developments in rural areas, the minimum acceptable LOS shall be C.

2.9.12.5 Unsignalized Intersection Standards

For unsignalized intersections LOS will be measured by control delay per Exhibits 17-2 and 17-22 of the HCM.

Turns may not cause excessive disruption to through traffic and may not be allowed when acceptance of substandard gaps is promoted. In some cases, elimination of the movement and diversion of the demand to a nearby location is the preferred treatment. Comments on the interaction of conflicting movements at adjacent access points may be required.

For developments in developed, developing or planned development areas, the maximum allowable delay for each movement shall be 35 seconds (bottom of LOS D) in the FWP condition.

For developments in rural areas, the maximum allowable delay for each movement shall be 25 seconds (bottom of LOS C) in the FWP condition.

Unacceptable delay during a peak hour at a site entrance is not necessarily a justification for the installation of a traffic signal. While the installation of a signal may be appropriate at some point, in which case an agreement to fund that signal shall be required, DelDOT determines whether to install signals on the basis of 12-hour warrant studies.

Where the FWP volume on a stop-controlled approach would be 10 vph or less, any LOS problem that might exist is considered to be negligible and its mitigation is not required.

2.9.12.6 Weaving Area Standards

For the weave area, LOS will be measured by weaving speed and non-weaving speed and conform to the values shown in Exhibit 24-2 of the HCM.

For non-freeways, the potential for site traffic to cause deterioration of the weaving area traffic flow and the methods to quantify such deterioration shall be discussed at the scoping meeting. Although weaving and non-weaving speeds are independent, it is desirable that these speeds be balanced. The addition of FWP traffic shall maintain the balance.

2.9.12.7 Ramp Standards

Ramp standards are based on density, the primary measure of effectiveness, and the level of service criteria shown in Exhibit 25-4 of the HCM.

- For a study location applicable to a site in a developed, developing or planned development area, with a merge or diverge influence area, the maximum allowable density shall be to 35 pc/mi/ln (bottom of LOS D) in the FWP condition.

- For a study location applicable to a site in a rural area, with a merge or diverge influence area, the maximum allowable density shall be 28 pc/mi/ln (bottom of LOS C) in the FWP condition.

2.10 MITIGATION IDENTIFICATION

In order to protect the Delaware transportation system from potentially adverse impacts of the proposed development, to fulfill an identified need for public services within the impacted area related to the development, or both, mitigation measures will be required when deficiencies have been identified or LOS results do not meet the standards set forth in Section 2.9.12.

The TIS shall identify methods of mitigating on-site and off-site deficiencies for present and proposed phases of the development. The report shall indicate the level of improvement to the deficiency, including the capacity deficiencies identified in Section 2.9.12, provided by the mitigation.

The focus of the traffic analysis or mitigation should not be limited to the specific location ~~identified~~ where an unacceptable deterioration of the LOS standards has been identified. In many cases it is preferable to direct site-generated traffic to other roadways. In other cases, improvements apart from the deficient location may divert enough background traffic to make room for the site generated traffic and thus mitigate the impacts. Most capacity analyses assume that each intersection is acting independently; therefore, the analysis must account for the presence and operational characteristics of adjacent entrances.

The TIS shall list any factors that have been modified during analysis and the reasons for the modification.

Build out year and project phasing impacts shall be considered in the mitigation section of the report.

Mitigation shall be consistent with improvements identified in the transportation element of the relevant local government's Comprehensive Plan. At a minimum, the TIS shall consider ultimate rights-of-way and additional streets, bicycle, transit, and pedestrian connections and extensions and intersection improvements that are identified in the Transportation Element of the relevant local government's Comprehensive Plan. Mitigation measures may also include, but are not limited to, additional street connections and street extensions, turn lanes and turn lane extensions, signalization, signal modifications, installation of medians, shared access and other access management strategies, geometric improvements such as lane geometry improvements, and intersection realignments, structure widenings, frontage roads, local or collector roads, and alternative access.

Where stop-controlled intersections do not meet the minimum performance standard, an additional street connection or a street extension to distribute traffic from the site to another access point, preferably on a different road, shall be considered as a potential mitigation measure.

Mitigation measures must be evaluated with regard to their operational safety and effectiveness before being recommended. A measure that provides adequate capacity but creates an operational problem is not acceptable.

Mitigation measures that involve changes in the number or usage of lanes at an intersection or the phasing at a signalized intersection will require conceptual approval from DelDOT prior to submission of the TIS. If the Applicant's engineer or DelDOT's engineer proposes mitigation that involves such measures, then they shall meet with representatives of DelDOT's Traffic and Subdivision Sections, preferably at the same time, to discuss those changes and seek approval before submitting the TIS for review. If a measure is not approved, the ~~Applicant's~~ engineer is responsible for

finding an acceptable alternative. The ~~Applicant's~~ engineer shall document the meeting(s) in the TIS, including the date(s) of the meeting(s), the names of those attending, the measures discussed, and the results of the meeting(s). Failure to obtain approval for mitigation measures that require it shall be cause for DelDOT to return the TIS for revisions.

The mitigation section of the TIS may include a travel demand management plan in accordance with DelDOT and local requirements. This is an optional plan. The trip reduction anticipated in an approved travel demand management plan shall be deemed to reduce the site trips, thereby also reducing site traffic impacts and associated fair share financial obligations.

2.11 RECOMMENDATIONS

If safety or capacity analyses using the existing or anticipated highway system and full development show that unsatisfactory levels of service will result, or that pedestrian, bicycle and transit accessibility and compatibility is compromised, recommendations should be made as to how this may be prevented.

Recommendation Narrative – A narrative discussing the recommendations, including a development phasing plan, if needed, to maintain Levels of Service in accordance with Section 2.8.12 shall be included in the recommendations.

Access Driveway/Entrance – In all cases, a site entrance that meets the requirements of access in accordance with DelDOT's Standards and Regulations for Subdivision Streets and State Highway Access shall be required.

All proposed improvements shall be supported by, and consistent with the analyses performed.

The following types of recommendations are anticipated:

a. Phasing development to the completion of programmed highway projects;
b. Reducing the proposed density of development (where appropriate), or construction of off-site improvements by the Applicant;
c. Improvements necessary for safe and efficient flow of vehicle, bicycle, pedestrian, and transit movements and access;
d. Operational improvements to the roadway network; and
e. Travel Demand Management Strategies.

2.11.1 DEPICTION AND INCLUSION OF RECOMMENDATION SUPPORT

All proposed recommended mitigation improvements, including needed off-site improvements, as well as all site entrance(s) shall be illustrated at a scale of no more than 1" = 100', with 1" = 50' or 1" = 30' preferred. The drawing(s) shall show both existing and the recommended improvement conditions. In cases where improvement conditions repetitively extend, the improvements may be shown with line extensions between the end points of the improvement if there are no significant changes to the proposed features within the extensions.

If the recommended improvements include the installation of a traffic signal or the retiming of an existing signal, the proposed timing shall be appended to the TIS. Proposed signals that would be needed the day a development opens, such as at a shopping center entrance, shall be supported by 12-hour MUTCD warrant investigations. Copies of those investigations shall be appended.

2.12 REQUIRED TIS APPENDICES

Appendices shall include the following:

a. Traffic count summary sheets;
b. Collision diagrams;
c. List of committed developments;
d. Trip generation, distribution and assignment calculations for the subject development and all committed developments;
e. Capacity Analysis Worksheets;
f. Critical movement summation forms and signal timing sheets for all signalized intersections in the study area;
g. DelDOT and Applicant correspondence; and
h. Support for recommendations

CHAPTER 3 SITE PLAN DESIGN

3.1 PURPOSE

This chapter is intended to provide those seeking access ~~entrances~~ to state-maintained roadways and/or who wish to construct subdivision streets that will ~~to~~ be maintained by DelDOT with:

- Specific standards and design guidance needed to assure adequate site plan design in the development of site transportation facilities; and
- The elements that need to be provided to DelDOT on the site plan and site street plan so that DelDOT can provide the applicable local land use agency with a No Objection to Recordation Letter; and

In most cases, if the requirements of this chapter are met, the result will be the issuance of a "No Objection to Recordation" letter from DelDOT to the local land use agency.

Site plans shall be in the format required by the land use agency. The elements that DelDOT requires as part of this chapter shall be added to those plans.

The standards established by DelDOT reflect the best judgment as to design criteria for particular conditions. In addition to safety considerations, particular emphasis is given in this chapter to incorporating design elements that address multi-modal access to and through the development. The Applicant's site plan must be completed within the context of the surrounding area, providing street types and connections consistent with the needs of the existing and future transportation network. Requirements for transportation facility right-of-ways, traffic calming, and operational analysis are also addressed in this chapter.

Design features that fall outside normal design criteria and accepted practice are to be determined using sound engineering judgment and should be thoroughly documented. The final design must meet the needs and expectations of DelDOT and the community, as well as providing for the users' safety.

3.2 MINOR RESIDENTIAL SUBDIVISIONS

If a property owner is seeking to subdivide its property into five or less lots through the local land use agency process and is not constructing any internal subdivision streets, the property owner must coordinate access with DelDOT. DelDOT has established requirements for access, drainage, and adequacy of adjacent roadway right-of-way. These elements will have to be addressed prior to DelDOT issuing its "No Objection to Recordation" letter.

Chapter 9 outlines the minimum standard for the spacing of residential drives and shall be used to determine entrance locations. If this spacing cannot be met for each individual lot, pairs of lots shall be required to have combined access.

3.2.1 PERMIT APPLICATION PROCESS

An initial stage fee calculation form (see Appendix C) and fee is to be submitted with ~~six~~ three paper copies and one electronic copy of plans, which include the entrance drawing, to the Subdivision ~~Public Works~~ Engineer ~~of the District in which the construction shall take place~~. If revisions are required, three corrected copies shall be submitted to the Subdivision ~~appropriate~~ section.

3.2.2 PLAN REQUIREMENTS

The access to subdivided lots on the Functional Classification Network shall be clearly portrayed on the subdivision plan.

The location and design of driveways and entrances shall meet the general geometric requirements of DelDOT. In addition, sight distance and drainage requirements shall conform to Sections 5.4 and 5.7 of these *Standards and Regulations for Subdivision Streets and State Highway Access*.

The plan for a residential strip development on a State-maintained roadway shall include:

1. A title block containing:
   a. Name of proposed residential strip development.
   b. Name of nearest town or county.
   c. Maintenance number of highway being accessed.
   d. Graphic Scale (1" = 30' preferred, 1" = 20' acceptable).
   e. Date.
   f. Name, address, and telephone number of engineer or surveyor preparing plan.
   g. Seal of engineer or surveyor (Delaware License).
2. A data block containing:
   a. Gross acreage of property.
   b. Zoning.
   c. Present use.
   d. Proposed use.
   e. Sewer Provider.
   f. Water Provider.
   g. Tax Parcel Number.
   h. Total number of lots.
3. The following note shall be added to the minor subdivision record plan:

   If the residual ~~residential~~ lands of the applicant are ever developed into a major subdivision, then the access to these parcels shall be from an internal subdivision street.
4. The access to subdivided lots along the Functional Classification Network will be clearly portrayed on subdivision plan. See Chapter 7 for detailed access requirements.

3.2.3 APPROVAL

The applicant shall make revisions or additions to the design upon receipt of comments from DelDOT. Once all comments have been addressed, DelDOT will issue a "No Objection to Recordation" to the local land use agency.

When access provisions cannot be provided in accordance with DelDOT's requirements due to limitations particular to the site or where the applicant refuses to comply, the access application for the intended use may be denied. DelDOT will issue an "Objection to Recordation" to the local land use agency.

3.3 COMMERCIAL OR MAJOR RESIDENTIAL SUBDIVISIONS

If a property owner / developer is seeking to subdivide their property into six or more residential lots or ~~and~~ are constructing internal subdivision streets or is ~~are~~ developing a commercial site through the local land use agency process, they must coordinate access with DelDOT. Furthermore, the developer shall submit the following two required plans to DelDOT for review and approval prior to DelDOT issuing its "No Objection to Recordation" letter to the local land use agency.

1. Site Plan – The site plan shall be in the format required by the local land use agency supplemented with DelDOT's requirements as outlined in Section 3.4. These elements shall be addressed prior to DelDOT issuing its "No Objection to Recordation" letter.
2. Site Street Plan – The site street plan is required by DelDOT and shall contain connectivity elements outlined in Section 3.5. These elements shall be addressed prior to DelDOT issuing its "No Objection to Recordation" letter.

Refer to Sections 4.3 and 4.4 for subdivision construction plan and commercial entrance plan requirements respectively. Also see Chapter 6 for permit application process.

3.4 SITE PLAN REQUIREMENTS

The site plan shall be prepared in accordance with the local land use agency's requirements. The following elements are supplemental information required by DelDOT to be addressed and/or included on the site plan.

These elements shall be addressed prior to DelDOT issuing its "No Objection to Recordation" letter to the local land use agency. For a complete checklist see Appendix D.

1. Initial stage fee calculation forms.
2. Notes:
   a. Note outlining the date a traffic impact study was completed and requirements submitted to the local land use agency (if applicable).
   b. Note outlining any traffic improvement.
   c. Note specifying the maintenance of the proposed subdivision streets (if applicable).
3. Site Plans:
   a. Adjacent existing roadway rights-of-way.
   b. Label any necessary right-of-way or easement dedication or reservation.
   c. New street names (if applicable).
   d. New street right-of-way widths (if applicable).
   e. Future interconnection note (if applicable).
   f. Dimensions of relevant physical features.
4. Preliminary entrance plan shall include but not limited to the following (see Chapter 4 for complete list of requirements).
   a. Traffic generation diagram.
   b. Adjacent entrances.
   c. Functional classification of adjacent roadway.
   d. Layout of required auxiliary lanes.
   e. Sight distance calculations.

3.4.1 SITE ENTRANCE

Intersections of subdivision streets with State-maintained roadways are to be designed in accordance with these *Standards and Regulations for Subdivision Streets and State Highway Access*. The location and design of entrances and exits onto State-maintained roads are governed by the criteria established in Chapter 9 and the detailed design elements listed in Chapter 5.

Site plans should include a preliminary entrance design and preliminary street construction plans if applicable as outlined in Section 4.1. Considerations must be given to the location of the entrance to ensure the necessary elements listed in Section 5.2 can be met.

3.4.1.1 Traffic Information

The site plans must show:

- Traffic generation(from ITE Manual, latest edition) and distribution for the site.
- Truck percentage for the site.
- Existing and buildout ~~projected (10-year)~~ volumes for the site, *(DelDOT will provide projected volumes upon request).*
- Existing and projected (10-year) directional distribution volumes for the adjacent roadway *(DelDOT will provide projected volumes upon*

request). The minimum projected 10-year volumes should be 20% greater than the existing volumes plus the site traffic.

- Posted speed limit.
- Coordination with School districts regarding existing and proposed school bus routes and volumes.

3.4.1.2 Adjacent Entrances

All site plans and Site Street Plans for commercial or residential subdivision access onto a State-maintained roadway must show the location of existing and proposed entrances according to Figure 3-1. This distance is required for each side of the entrance and shall include entrances on both sides of the road. If there are no entrances within this distance, then show the distance to the nearest entrance.

Figure 3-1 Requirements for Adjacent Entrances on Site Plans

Roadway with Posted Speed Limit	Show Entrances Within*
35 mph or less	300 feet
40 – 45 mph	450 feet
50 – 55 mph	600 feet

* *Distances measured from site access*

The type of use served by each entrance shall be noted as well as any restrictions in movements.

3.4.1.3 Existing Roadway Features

Each site plan shall clearly show the lane configuration of the existing roadway, including any turn lanes, shoulders, bike lanes, existing right-of-way, utilities, drainage features, pedestrian and transit facilities. All drawings shall be to scale.

3.4.1.4 Gateway Feature Easements

An easement shall be established at the entrance of all subdivisions for the purpose of a planned or future neighborhood sign or structure. This easement shall be located outside of any existing or proposed right-of-way. If there is no easement area available because of limited site frontage, provisions may be made to locate the gateway feature within the right-of-way provided that a right-of-way use agreement is executed and the gateway feature does not pose a sight distance or safety hazard. The ability to locate a gateway feature within the right-of-way will be at the sole discretion of DelDOT.

3.5 CONNECTIVITY

3.5.1 PURPOSE AND SCOPE

The purpose of this Section is to set forth requirements for achieving a connected transportation system in the State of Delaware.

When local travel is restricted by a lack of connecting routes, local trips are forced onto the regional network. The aggregate effect of a disconnected local street network will be to reduce the effectiveness of the overall regional and local roadway system.

In addition to improving the flow of through trips on DelDOT collector and arterial streets, interconnections will provide Delaware residents and travelers with the following benefits:

- Alternative routes to local destinations to provide redundancy during road closures;
- Opportunities for community interaction by eliminating barriers between developments;
- Alternative mode choices (driving, transit, bicycling or walking);
- Improved access to community facilities and shopping centers;
- A reduction in travel times and vehicle miles traveled for trips to local and regional destinations;
- Improved air quality because of reduced delay;
- Reduced emergency response times because

of more direct access for fire, police and EMS vehicles;

- More effective use of municipal resources for municipal service delivery (utility routing, sanitation vehicles, school bus routing, etc.); and
- Improved regional long-distance travel as arterial road capacity is better utilized for regional trips through the transfer of local trips to local roads.

The connectivity requirements in this section are provided so that the hierarchy of streets (including bicycle and pedestrian connections) is used most effectively to encourage safe and efficient circulation and access for motor vehicles, bicycles, pedestrians, and transit.

3.5.2 OVERVIEW AND APPLICABILITY

This section provides connectivity requirements for all development projects having access to state roads and/or proposing DelDOT maintained public roads for subdivisions.

Applications for parcels of less than 5 acres and generating less than 200 ADT shall include on their site plan any road proposed as part of an approved Local Transportation Circulation Plan. Proposed development parcels less than 5 acres shall be designed to connect to existing linkages on adjacent parcels.

For all residential, mixed-use, or commercial developments or redevelopments generating 200 ADT or greater ~~5 acres or larger~~, the Applicant shall submit as part of a complete application to DelDOT, a "Site Street Plan" (SSP) as provided for in Section 3.5.3.

Requirements for requests to address connectivity through alternate provisions are addressed in Section 3.5.8.

3.5.3 SITE STREET PLANS (SSP)

3.5.3.1 Objectives of the Site Street Plan

The SSP shall be developed to provide or incorporate a street system that will allow access to and from the proposed development, as well as access to all existing and future development within the SSP Area. The SSP shall attain the following objectives:

- Encourage pedestrian and bicycle travel by providing short, direct public right-of-way routes to connect residential uses with nearby existing and planned commercial services, schools, parks and other neighborhood facilities; and
- Provide bike and pedestrian access ways or walkways on public easements or right-of-way when full street connections are not possible, at spacing that shall be consistent with the provisions of Section 3.5.4 except where prevented by topography, barriers such as railroads or freeways, or environmental constraints such as major streams and rivers; and
- Identify and, where possible, create opportunities to extend and connect local streets in previously developed areas; and
- Serve a mix of land uses on contiguous local streets; and
- Encourage compliance with posted speed limits; and
- Consider narrow street design alternatives that feature total right-of-way of no more than 50 feet, including pavement widths of no more than those noted in Figures ~~Sections~~ 5.23 and 5.24 of Chapter 5, sidewalk widths of at least five feet and landscaped pedestrian buffer strips that include street trees; and
- Limit the use of cul-de-sac designs and closed street systems to situations where topography, preexisting development or environmental constraints prevent full street connections. Include a street design that accommodates and promotes multi-modal access (buses, bicycles and pedestrians) to land uses, improves area circulation, and reduces out-of-direction

travel.

3.5.3.2 Site Street Plan Content

1. SSP Dimension and Scale

The SSP shall be a plan sheet or sheets, produced separately from the site plan, that shows all proposed subdivision roads for the project and all DelDOT Local and higher order roads within a one mile radius of the center point of the project. The one mile radius from the center point shall be known as the "SSP Area".

The SSP shall be produced at a scale sufficient to provide information about how the proposed development's transportation network will be connected to surrounding parcels and the overall SSP Area transportation network.

2. Identification of Connections to Multiple Local or Higher Order Roads.
   a. The SSP must show connections from the development to at least three different Local or higher order roads. Each such identified road must be situated in a different compass direction from the development parcel. The connection may be shown either directly from the development or through connections to other parcels within the SSP area.
   b. If requested by the Applicant, DelDOT may, in its sole discretion, determine that unusual topographic features, existing development, or a natural area or features exist to make a connection infeasible (Infeasibility Determination) and permit the Applicant to show fewer than 3 connections to higher order roads on the SSP.

3. Adjacent and Opposite Parcel Information

The Applicant shall identify the following information from adjoining and opposite land parcels on the SSP:

- The location and spacing of existing or proposed stub streets that intersect with or connect to the Applicant's proposed development site;
- The location of any Type III subdivision street, Local or higher order road within the adjacent parcel, whether or not such road would connect to the Applicant's proposed development site;
- The location and spacing of existing or proposed bicycle and pedestrian connections, including bicycle striping on roadways, sidewalks, and shared-use trails within a ¼ mile of site frontage;
- Identification of the existing and proposed land uses adjacent to and opposite the site; and
- Adjacent and opposite parcel access driveways and entrances showing dimensions, location and spacing of any access entrances located within the distances indicated in Section 3.4.1.2.

4. Existing Transportation Network

In addition to the information to be provided for the land parcels adjacent to and opposite the proposed development, the Applicant shall also identify on the SSP:

- All existing Local and higher order roads within the SSP Area; and
- Any local or higher order road that has been identified for construction in an Approved Local Transportation Circulation Plan, including SSPs that have been previously approved by DelDOT and the local land development authority. Planned roads that have not yet been constructed shall be indicated on the SSP.

5. Proposed Transportation Network and Connections

The proposed transportation network for the SSP shall be determined based on the following criteria:

   a. Proposed roadways and connections identified in an Approved Local Transportation Circulation Plan shall be included in the transportation network. DelDOT shall determine if an Approved Local Transportation Circulation Plan is complete or if it should be supplemented to accommodate the proposed development or for modifications to the

SSP Area since the approved plan was completed;

b. Local and higher order DelDOT road spacing at distances not exceeding 2640 feet (1/2 mile);

c. Type III Subdivision Streets at a spacing of at least every 1,320 feet (one-quarter mile);

d. Type I and Type II Subdivision or, if applicable, Industrial Street spacing at intervals of no more than 660 feet; and

e. Pedestrian and bicycle accommodation spacing as identified for Development Area types as described in Section 3.5.4.

6. Local and Higher Order DelDOT Road Information and Requirements

a. The Applicant may ~~shall~~ be required at DelDOT's discretion to provide direct connection to all Local or higher order roads identified in Section 3.5.3.2.2 that abut or traverse the Applicant's property.

b. If fewer than the three local or higher order roads traverse or abut the Applicant's property, the Applicant will be required to provide at least one connection to one of the identified roadways and shall construct that portion of the other connections that traverse the Applicant's property consistent with the provisions of the Construction paragraph of this connectivity section.

c. The SSP shall be developed to provide for DelDOT Local or higher order road spacing through the SSP Area at distances not exceeding 2640 feet (1/2 mile).

d. A portion of a local or higher order road may need to be constructed through the Applicant's site based on the spacing of existing roadways, and of roadways proposed in Approved Local Transportation Circulation Plans.

7. DelDOT Subdivision Streets - Information and Requirements.

a. The subdivision street system shall provide ~~allow~~ multi-modal access and multiple routes from each development to existing or planned neighborhood centers, parks and schools, without requiring the use of Local and higher order roads, unless DelDOT has made an Infeasibility Determination.

b. ***Type III Subdivision Streets –***

- The SSP shall be developed to provide for Type III Subdivision street spacing through the SSP Area at distances not exceeding 1320 feet (1/4 mile) unless DelDOT has made an Infeasibility Determination.

- A portion or portions of Type III Subdivision streets may need to be constructed through the Applicant's site based on the spacing of existing roadways, and of roadways proposed in Approved Local Transportation Circulation Plans.

- Spacing of Type III Subdivision Streets within the development parcel shall take into consideration the location of the nearest parallel Type III Subdivision Streets located on adjacent parcels. The Applicant shall attempt to space its parallel roads so as to attain the required Type III Subdivision Street spacing across adjacent properties.

c. ***Type I and Type II Subdivision Streets, Industrial Streets*** **-** The Applicant shall show on the SSP and, if not currently existing, construct streets in the following fashion:

- *Residential, Commercial and Mixed-Use Development or Redevelopment* **–** Type I and Type II Subdivision or, if applicable, Industrial street connections shall be spaced at intervals of no more than 660 feet as measured from the near side right-of-way line, unless DelDOT has made an Infeasibility Determination.

- *High Density Residential or High Density Mixed Use Development* **–** Subdivision street connections at intervals of no more than 330 feet shall be provided in areas planned for the highest density residential and mixed-use development. Where the street pattern in the area immediately surrounding the site meets this

spacing interval, the existing street pattern should be extended into the site.

- *Large Lot Subdivisions* – The above provisions not withstanding, subdivisions with lot sizes of one acre or more may use a Type I and Type II subdivision street spacing of up to 1,320 feet.

8. Bicycle and Pedestrian Connectivity

Existing and proposed bicycle and pedestrian connections shall also be shown on the SSP as provided in Section 3.5.4.

9. Transit Connectivity

Existing and proposed transit stops, shall also be shown on the SSP with applicable bicycle and pedestrian connectivity as provided in Section 3.5.5.

10. SSP Roadway Construction

- The Applicant shall show on its site plan and construct all proposed roadway segments, or portions of roadway segments, noted on the SSP that traverse the Applicant's property and have a DelDOT classification level of Major Arterial or below.
- The Applicant shall provide a dedication of Right-of-Way for any roadway designated above a Major Arterial on its site plan and shall construct a collector roadway within that right-of-way unless DelDOT determines such construction to be unnecessary.

~~11. Local concurrence with an SSP that calls for future connection or construction of local or higher order roads.~~

~~For DelDOT to approve an Applicant's site access or provide a Letter of No Objection based on a SSP prepared by the Applicant, the Applicant must demonstrate that the local land use agency is in agreement with the provisions of the site street plan. The local land use agency approval must be sufficient to deem the SSP an Approved Local Transportation Circulation Plan or an acceptable amendment to an existing Circulation Plan.~~

3.5.4 BICYCLE AND PEDESTRIAN SPACING AND CONNECTIVITY

3.5.4.1 Bicycle Compatibility

Bicycles shall be accommodated on all Subdivision and higher order roads within the proposed development in accordance with standards provided in ***AASHTO's Design Guidelines for Bicycles.***

3.5.4.2 Sidewalks

1. Sidewalks shall be installed along all DelDOT Arterial, Collector, and Local roadway frontage of the proposed development by the owner or Applicant. DelDOT may require a shared use path be installed at such locations in lieu of a sidewalk.
2. For residential subdivisions and developments in developed, developing and planned development areas:
   a. The Applicant shall provide sidewalks along both sides of subdivision streets where the development has a net density of three dwelling units or greater, or DelDOT determines, in its sole discretion, that sidewalk would connect the development to transit or other local destinations;
   b. The Applicant shall provide sidewalks along both sides of development project streets where the development has access to transit or is of such a nature that it is reasonable to assume, as determined by DelDOT, that it will attract pedestrians;
   c. The Applicant shall provide sidewalk along at least one side of a street for a residential subdivision or development that does not meet the density standards in paragraphs a and b or where there are physical or environmental constraints that make sidewalks on both sides of a street impractical.
   d. Other paragraphs of this section notwithstanding, no sidewalk shall be placed ~~in~~ along any street that DelDOT determines, in its sole discretion, has physical or environmental constraints.

3. For residential subdivisions and developments in rural areas sidewalk shall only be placed in those locations that DelDOT determines are, or will be at some future time, necessary to make pedestrian connections to transit or to land uses that are likely to attract pedestrian traffic.
4. Permanent ~~Sidewalk~~ easements. The Applicant shall provide permanent ~~sidewalk~~ easements as necessary to DelDOT along residential subdivision street or development street frontage for those locations where DelDOT is not requiring the installation of sidewalk at the time of the development's construction.
5. Sidewalks shall be constructed in accordance with Chapter 5 of this manual ~~DelDOT standards~~ and shall meet Americans with Disabilities Act requirements. Sidewalk widths may be widened to provide for a shared-use path if determined or approved by DelDOT.
6. Sidewalks shall be separated from the edge of road, pavement, driveways, and site entrances in accordance with Chapter 5 of this manual. Where a sidewalk is planned to adjoin the pavement edge of parking lot areas, such sidewalk shall be grade-separated from the parking lot surface by at least a six-inch vertical face curbing.
7. Sidewalks shall be free of utility poles, bushes, plants, and all other obstructions.

3.5.4.3 Walkways

All development in commercial and mixed use developments, and other development for which a conditional use approval is required by the land use authority, should provide a system of internal pedestrian connections to encourage safe and convenient pedestrian movement within the site. These pedestrian connections, known as walkways, should also link the site with the public street sidewalk and shared-use trail system.

Walkways are recommended between parts of a site where the public is invited or allowed to walk. Walkways should be included as part of office/warehouse and retail/warehouse combinations. Walkways are not recommended between buildings or portions of a site such as truck loading docks and warehouses that are not intended or likely to be used by pedestrians.

Locating Walkways - A walkway into the site should be provided for every 330 feet of street frontage or for every eight aisles of vehicle parking if parking is located between the building and the street, whichever is lesser. A walkway should also be provided to any sidewalk or access-way abutting the site.

Walkway Connections - Walkways should connect building entrances to one another and from building entrances to adjacent public streets and existing or planned transit stops. On-site walkways should connect with walkways, sidewalks, bicycle facilities, alleyways and other bicycle or pedestrian connections on adjacent properties used or planned for commercial, multifamily, institution, or park use. DelDOT may request connections to be constructed and extended to the property line at the time of development.

Walkway Routing - Walkways should be as direct as possible when connecting. Driveway crossings should be minimized. Internal parking lot circulation and design should provide reasonably direct access for pedestrians from streets and transit stops.

Walkway Design - Walkways should be paved and should maintain at least five feet of unobstructed width. Walkways bordering parking spaces should be at least seven feet wide unless concrete wheel stops, bollards, curbing, landscaping, or other similar improvements are provided which prevent parked vehicles from obstructing the walkway. Stairs or ramps should be provided where necessary to afford a reasonably direct route. The slope of walkways without stairs should conform to DelDOT standards. Walkways should be differentiated from parking areas and circulation aisles by grade, different paving material, landscaping or other similar method.

Walkway ADA Compliance - The Americans with Disabilities Act (ADA) contains different

and stricter standards for some walkways. The ADA applies to the walkway that is the principal building entrance and walkways that connect transit stops and parking areas to building entrances. Where the ADA applies to a walkway, the stricter standards of ADA should be applied.

3.5.4.4 Access-ways

Access-ways shall be used to provide bicycle and pedestrian passage between streets, and/or existing or proposed trails when the spacing between streets is inadequate to accommodate convenient pedestrian and bicycle travel. Access-ways are similar to walkways constructed in commercial or mixed use developments but are generally wider so as to accommodate bicycle traffic in residential areas. A shared-use path ~~trail~~ may be identified within a development project as an access-way however access-ways will typically carry less traffic, be less wide and require less total right-of-way than a shared-use path ~~trail~~. Access-ways differ from sidewalks in that they do not generally run along the right of way of roads and streets.

Access-ways shall be provided as part of all new developments and redevelopments where the net dwelling unit density is greater than 1 dwelling unit per acre.

Access-ways shall be provided for pedestrians and bicycles on public easements or rights-of-way where full street connections are not possible, with spacing between full street and access-way connections of no more than 330 feet, except where prevented by topography, barriers such as buildings, railroads or freeways, or environmental constraints such as major streams and rivers (all collectively to be called "constraints").

Access-way Width and Right-of-Way - The width of the right-of-way for Access-ways must be sufficient to accommodate expected users, and provide a safe environment, taking into consideration the characteristics of the site and vicinity, such as the existing street and pedestrian system improvements, existing structures, natural features, and total length of the access-way connection.

Access-ways generally shall be set at a width of 8 feet, with a total right-of-way of 18 ~~28~~ feet.

If, due to constraints, a full width access-way cannot be provided, the maximum access-way width and right-of-way given the constraints shall be provided, but shall in no case be less than a minimum of five feet, with a 15 ~~25~~-foot-right of way.

Access-ways shall be provided as follows:

- If due to constraints any block that is longer than 660 feet as measured from the near side right-of-way line of the subject street to the near side right-of-way line of the adjacent street, an access-way shall be required through and near the middle of the block.
- If due to constraints, any block is longer than 1,320 feet as measured from the near side right-of-way line of the subject street to the near side right-of-way line of the adjacent street, then two or more access-ways may be required through the block.
- Where a street connection is not feasible, one or more new access-ways to the following shall be provided as a component of the development: an existing transit stop, a planned transit route as identified by DTC and/or DelDOT, shopping center or a community facility. The access-way shall be reasonably direct.
- DelDOT, in consultation with the applicable land use agency, may require an access-way to connect from one cul-de-sac to an adjacent cul-de-sac or street.
- In a proposed development or where redevelopment potential exists and a street connection is not proposed or possible, one or more access-ways may be required to connect a cul-de-sac to public streets, to other access-ways, or to the project boundary to allow for future connections.
- A new access-way to a school shall be provided as a component of a development proposal if the addition of an access-way would reduce walking or bicycling distance by at least 50 percent over other available

sidewalks, walkways or access-ways and the reduced walking or bicycling distance is greater than 200 feet.

Access-way Design Standards – Access-ways shall be as short as possible and wherever practical, straight enough to allow one end of the path to be visible from the other.

Access-ways shall be located to provide a reasonably direct connection between likely pedestrian and bicycle destinations.

Access-ways through parking lots should be physically separated from adjacent vehicle parking and parallel vehicle traffic through the use of curbs, car stops, landscaping, trees, lighting, and such other methods as may be desirable, if not otherwise provided in the parking lot design.

Where possible, access-ways shall converge with streets at traffic-controlled intersections for safe crossing.

3.5.4.5 Roadway Crossing by Bicycles and Pedestrians

The Applicant shall be required to install marked crosswalks, which function to create a visual and tactile connection between barrier-free access curb ramps for the purpose of demarcation of appropriate pedestrian and bicycle street-crossing locations in the following instances:

- At points of intersection between sidewalk at major collector and arterial streets and at all corners along a major collector or arterial street where subdivision streets intersect the collector or arterial street.
- At all signalized intersections adjoining the development site.
- At key locations to provide marked street crossing access to active or passive parkland and open space areas, schools, playgrounds, neighborhood shopping centers, transit and similar pedestrian destinations within and adjoining the development site.
- *Pedestrian Refuge* – If at all feasible, pedestrian refuge areas shall be constructed across roadways of 4 or more travel lanes at key locations where a marked crosswalk is to be installed.

3.5.5 TRANSIT FACILITIES

The Applicant shall identify all existing or proposed transit facilities on the SSP.

3.5.5.1 Major Industrial, Institution, Retail, and Office Developments

Industrial uses, office, institutional uses or retail establishments larger than 150,000 s.f. shall provide either a transit stop on site or adjacent to the site, or a pedestrian connection to a transit stop.

Pedestrian connections shall be made to any transit facility within 1,320 feet of the boundary line of a site. The connections should take the most direct route practicable. Users should be able to see the ending of the connection from the entrance point, if possible.

Transit Stops. If transit service exists along the frontage of the development, or if, after consultation with DTC, it is determined that the development is a feasible candidate for transit service, and there is no existing transit stop within 1,320 feet of the site, pedestrian routes and transit facilities shall be designed to support transit use through provision of improvements. These improvements may include passenger shelters, landing pads, walkways to the transit stop location, or some combination thereof, as required by Delaware Transit Corporation or DelDOT, in consultation with the applicable land use authority

3.5.5.2 Residential Developments

1. School and Transit Bus Stop Requirements – All subdivision and residential site development proposals involving more than 50 dwelling units shall be required to designate and reserve locations for transit and school bus stop accommodations within and/or adjacent to the proposed development, as directed by DelDOT or DTC.
2. School Bus Stop Locations –

The following specifies school bus stop locating procedures:

The developer shall notify the local public school district of the location, character and layout of the proposed subdivision or residential site development as early as possible in the plan development process, but in any case, by registered mail no later than 30 days prior to the date of the public meeting at which such proposal will be considered for approval. The purpose of this notification is to offer the local public school district the opportunity to provide input and direction with respect to the most appropriate and serviceable location for school bus stops within the proposed development. If available, the applicant/ developer shall use a School District Notification Form provided by the local jurisdiction developed for this purpose.

a. The local public school district shall have at least 30 days to provide commentary to both the applicant/developer and to the local jurisdiction with respect to school bus stop provisions. Such commentary shall describe preferred locations of bus stops within and adjoining the proposed development site. Should the local school district choose not to respond within the prescribed period, the development proposal may proceed through the review and approval process.

3.5.5.3 Public Mass Transit Provisions

As part of the plan review process, a copy of the proposed subdivision plan or residential site development plan shall be provided to the Delaware Transit Corporation or its authorized designee, for review and recommendations relative to the reservation and designation of areas for public mass transit stops and related provisions. Review commentary and recommendations shall be offered during the normal plan review period prescribed by this ordinance. A delay in the issuance of review commentary by the Delaware Transit Corporation, shall not result in a postponement of the plan review process.

3.5.5.4 Transit at Mixed – Use Centers

To facilitate transit usage and circulation, Mixed-Use Centers should provide transit stops at key nodes with easy access to the surrounding thoroughfares. Transit routes through the Mixed-Use Center shall be designed to accommodate the technical requirements of bus operations. Transit easements through and within mixed use centers shall be provided as requested by DTC. A coherent and easily maneuverable path through the Mixed-Use Center should be designed to permit transit to move freely and efficiently throughout the mixed-use center.

3.5.5.5 Bus Stop Design Criteria

1. Local and Minor Collector Streets.

   The following specifies bus stop design and construction for local and minor collector streets:

   a. On local and minor collector streets, bus stops shall consist of designated curbside bus stops where transit and school buses may stop within the travel lane of the street for the purpose of boarding and discharging passengers. Every effort shall be made to designate such bus stops as joint use facilities for use by school bus and transit service vehicles.

   b. On-Street Bus Stop. On-street bus stops served by the Delaware Transit Corporation or its authorized designee, shall be designated by standard Delaware Transit Corporation bus stop identification signage and shall conform to one of the following design standards:

      - The bus stop is designated adjacent to and immediately before a street intersection. This configuration may be when a far side or mid-block stop can not be used ~~preferable at locations involving very limited right-turning traffic volumes.~~ The near-side bus stop shall be at least 90 feet in length or an alternative length specified by the Delaware Transit Corporation; or

- The bus stop is designated adjacent to and immediately after a street intersection. This configuration may be preferred in locations where there are high volumes of right-turning traffic, at locations immediately following a right-turn by the bus and where significant numbers of passengers would transfer from an intersecting bus route. The far-side bus stop shall be at least 80 feet in length or an alternative length specified by the Delaware Transit Corporation; or
- The bus stop is designated along the curbside in locations between and separated from intersecting streets. The mid-block bus stop shall be at least 130 feet in length or an alternative length specified by the Delaware Transit Corporation.

2. Bus Stop Design Criteria – Major Collector ~~Local~~ or Higher Order Roads.

The following specifies bus stop design and construction for arterial and major collector roads:

- Where required by the Delaware Transit Corporation or requested by the local school district, bus stops on arterial and major collector roads shall be designed as Bus Turnout Areas. These areas consist of a pull-off area of sufficient dimensional attributes to permit a bus to pull over to the curbside and out of the travel lane for purposes of boarding and discharging passengers.
- Bus Turnout Areas shall be designed as integral features of the pedestrian sidewalk network and shall conform to design and minimum dimensional requirements.
- Every effort shall be made to designate planned Bus Turnout Areas as joint use facilities for both school bus and transit service vehicles.

Bus turnout areas shall be required when:

a. Peak hour curb lane traffic count exceeds 250 vehicles per hour; and

b. Existing land development patterns and the local street system does not permit continuous internal neighborhood circulation and linkage for transit service off of arterial and/or major collector streets; and

c. The nearest existing Bus Turnout Area or similar transit facility is more than 1,320 feet (1/4 mile) walking distance from the main entrance of the proposed subdivision.

3.5.6 INTRA-CONNECTIVITY

In addition to minimum roadway spacing requirements, the Applicant shall demonstrate that the proposed development will provide adequate connectivity by calculating the project's connectivity ratio.

a. Minimum Required Connectivity Ratio.

All Site Street Plans shall demonstrate that the proposed subdivision street system will achieve a ***connectivity ratio of 1.4 or greater***.

b. Connectivity Ratio Calculation.

The connectivity ratio is determined by dividing the number of street segments (street sections between intersections and/or cul-de-sac ends) by the number of intersections and cul-de-sac ends. For purposes of this calculation, proposed street intersections with existing roads and stub roads for future access to vacant developable lands shall count as 0.5 intersections.

c. Connectivity Ratio for Phased Development

If a subdivision is planned to be constructed in distinct development phases, then the Site Street Plan shall demonstrate that the initial phase individually and in conjunction with all subsequent phases, will achieve and maintain the minimum connectivity ratio requirement.

d. Recordation of Connectivity Ratio

The Record Subdivision Plat shall reflect compliance with the minimum connectivity

ratio requirement.

3.5.7 INTERCONNECTIVITY

Linkages shall be provided among adjoining subdivisions in order to allow convenient and effective travel among neighborhoods. Benefits include ease of access, association with neighbors, alternative travel routes for residents, sidewalk networks on local streets and internal circulation routes for service providers such as school buses, sanitation vehicles, and emergency management personnel.

3.5.7.1 Linkages to Existing Adjacent Developments with no Connection

When proposed development is being planned adjacent to previously developed land and the previously developed land has not incorporated linkage street stubs to its perimeter as part of its recorded plan, the proposed development shall provide access-way connections if at all possible.

If required by DelDOT, the Applicant shall provide right of way for a future access-way connection, and/or a full street connection, within the span of each such property boundary line.

3.5.7.2 Linkages to Existing Adjacent Developments with Connection

When proposed development is being planned adjacent to previously developed land and the previously developed land has incorporated linkage street stubs to its perimeter as part of its recorded plan, the proposed development must incorporate street connections to the existing linkage street right-of-way stubs as part of its street system.

1. S**idewalk Interconnections.** All development plans shall provide for sidewalks along future public street connections to adjacent developable parcels along each property boundary that abuts potentially developable or re-developable land in accordance with the provisions for sidewalks.
2. **Access-ways or Walkways** for bicycles, pedestrians, and emergency vehicles shall connect the on-site circulation system to existing adjacent bicycle and pedestrian connections, and to entrances open to the public that abut the property. Connections may approach parking lots on adjoining properties if the adjoining property used for such connection is open to public pedestrian and bicycle use, is paved, and is unobstructed.

3.5.7.3 Linkages to Undeveloped or Re-developable Property

Where abutting properties are undeveloped or can be expected to be redeveloped within the next ten years, the location and potential arrangement of streets, bicycle and/or pedestrian connections shall be provided at the following spacing to provide for the continuation of these connections into surrounding areas:

1. **Subdivision Street Type I and II Interconnections**. All development plans shall provide for linkage street stubs at a ratio of one per 660 linear feet of the boundary line or fraction thereof, which adjoins potentially developable or re-developable land.
2. **Subdivision Street Type III or Higher Order Road**. All development plans shall provide for future public street connections to adjacent developable parcels by providing a collector road street connection as a continuation of the site circulation and spaced at intervals: 1) in accordance with an approved DelDOT and County local traffic circulation plan; or 2) if no such plan exists, not to exceed 1320 feet along each development plan boundary or as measured from the nearest parallel collector road to the site.
3. **Development Adjacent to Vacant Land.** Where new development is adjacent to vacant land likely to be subdivided in the future, all streets, sidewalks bicycle lanes, and access-ways in the development's proposed street system shall continue through to the boundary lines of the area under the same ownership as the subdivision, if directed by DelDOT or the

appropriate land use agency to provide for the orderly subdivision of such adjacent land or the transportation and access needs of the community.

4. **Redevelopment Projects.** All redevelopment projects shall retrofit existing streets to provide increased vehicular and pedestrian connectivity.
5. **Sidewalk Interconnections.** All development plans shall provide for sidewalks along future public street connections to adjacent developable parcels along each development plan boundary that abuts potentially developable or re-developable land in accordance with the provisions for sidewalks.
6. **Walkway and Access-way Interconnections.** All development plans shall provide for future public walkways and/or access-ways, as applicable, to connect to adjacent developable parcels by providing such connections as a continuation of the walkways or access-ways provided for the development in accordance with the walkway and access-way standards for each development plan boundary that abuts potentially developable or re-developable land.
7. **Stub Street Turn-Around Area.** The right-of-way stubs shall be planned and constructed to the subdivision boundary line for future connections as outlined in Section 5.1.4.2., Temporary Dead End Streets.

3.5.7.4 Non Residential Cross-Access Interconnectivity

Developments should minimize or eliminate curb cuts along adjacent streets. Where possible, vehicular access should be shared with the adjacent properties and/or alleys should be used for access.

1. **Cross-Access Requirement**. In order to reduce dependency on vehicular access to major collector streets and to promote efficient and convenient access to destination points along roadway corridors, shared entrances, cross-access easements, connecting driveways and street linkages are required wherever practicable.
2. **Aisle length between Cross-access and Street**. A minimum distance of 60 feet shall be required between a cross-access-way and an intersection or driveway entrance to allow for car storage between the cross-access and the driveway.
3. **Cross-Access Types and Locations**. Locations and types of cross-access will vary from site to site and are dependent upon a number of factors including: overall size of the properties involved, building types and land uses of the properties being served, locations of the existing and proposed buildings, locations of existing and proposed parking lots and site utility and landscape requirements.
4. **Non-residential, Mixed Use and Multi-family Housing.** Each property containing or designated for nonresidential or multi-family dwelling units should provide at least one vehicular access to each abutting property. This should most often be accomplished by joining adjacent parking lots and sharing entrances.
5. **Recordation**. Cross-access easements shall be shown on the site plan for the development and recorded at the applicable local recordation office.
6. **Cross-Access Construction**.
   a. Development plans shall indicate the location of cross-access easement(s).
   b. The access connection shall be completed if an immediate or near term benefit (as determined by DelDOT) can be derived by completing the link.
   c. If no immediate or near term benefit would be derived, development plans should provide cross access and construction easements and arrange the site design so that when the adjoining property owner extends the connection to the property line, the link will be completed. If the link is to be completed in the future, the grade of the connection, parking, landscaping and other improvements must be set to allow for extension into the adjacent lot.
7. **Internal Access Driveways**. Whenever possible, internal access drives should be

located to join together existing public streets and/ or connect to adjacent private drives so that the internal circulation functions as an integral part of the surrounding transportation network.

8. **Waiver.** When cross-access is deemed impractical by DelDOT on the basis of topography, the presence of natural features, or vehicular safety factors, this requirement may be waived provided that appropriate bicycle and pedestrian connections are provided between adjacent developments or land uses.

3.5.7.5 Street and Bicycle and Pedestrian Connection Hindrances

1. Street, bicycle, and/or pedestrian connections are not required where one or more of the following conditions exist:

    a. Where a community facility location, or physical or topographic conditions make a general street, access-way or walkway connection impracticable. Such conditions include but are not limited to the alignments of existing connecting streets, freeways, railroads, slopes in excess of DelDOT standards, wetlands or other bodies of water where a connection could not reasonably be provided;
    b. Existing buildings or other development on adjacent lands physically preclude a connection now and in the future, considering the potential for redevelopment; or,
    c. Where the installation of a street, bicycle, and/or pedestrian connections would violate provisions of leases, easements, covenants, or restrictions written and put into affect prior to the effective date of these regulations.
2. DelDOT shall make the final determination as to whether or not a connection shall be made.

3.5.8 ALTERNATIVE COMPLIANCE

It is recognized that it may not always be possible for an Applicant to provide all of the street, bicycle, and transit connections required in Section 3.5 of this Chapter. DelDOT is amenable to working with developers and engineers to address special conditions which may be present so as to necessitate the use of alternative methods of compliance. Specifically, upon request by an applicant, DelDOT may approve an alternative SSP which may not fully comply with the requirements of Section 3.5, if that alternative SSP provides connectivity consistent with Section 3.5.8.2.

3.5.8.1 Procedure

Alternative compliance development plans shall be prepared and submitted in accordance with submittal requirements for plans as set forth in this Chapter. The plan and design shall clearly identify and discuss the modifications and alternatives proposed and the ways in which the plan will better accomplish the purpose of this Chapter than would a plan which achieves strict compliance with the specific standards of this Chapter.

3.5.8.2 Review Criteria

To approve an alternative plan, DelDOT must first find that the proposed alternative plan:

- Has a minimum connectivity ratio of 1.4; and
- Accomplishes the purposes of this Connectivity Section equally well or better than would a plan and design which complies with the standards of the Manual; and
- That any reduction in access and circulation for vehicles maintains facilities for bicycle, pedestrian, and transit, to the maximum extent feasible.

In reviewing the proposed alternative plan, DelDOT shall take into account whether the alternative design: minimizes the impacts on natural areas and features; fosters non-vehicular access, enhances neighborhood continuity and connectivity; and provides direct, sub-arterial street access to any parks, schools, neighborhood centers, commercial uses, and employment uses, within or adjacent to existing or future adjacent

development within one mile.

3.5.9 DEVELOPER SSP CHECKLIST

Developers should assess the checklist that follows early during the site street plan development. The questions that follow can help design professionals create site plans that meet the connectivity requirements of this section.

Overall System Review

- Has the Plan attained required Connectivity Index minimums?
- Have all adjacent stub streets been identified and connected?
- Does the plan meet ADA standards?
- Are utilitarian paths direct? Do they provide for connections to pedestrian magnets nearby? Can pedestrians take advantage of "shortcut paths" that encourage walking instead of driving?
- Does the pedestrian system consider the type and probable location of future development on adjacent or nearby parcels of land? Is there flexibility to provide direct connections to adjacent parcels; should that be desired in the future?
- Are building entrance areas convenient to the pedestrian? Are they clearly evident through design features, topography, signing, or marking?
- Are walkways along the street buffered from traffic as much as possible?

Travel Safety

- Are crossings of wide expanses of parking lot held to a minimum? Are pathways generally visible from nearby buildings and free from dark, narrow passageways?
- Are sight lines at intersections adequate for pedestrian and motorist visibility? Are pedestrians able to see on-coming traffic, given typical speeds?
- Do Access-ways and Walkways lead to road crossing points with the least conflict?
- In general, are pedestrian/vehicle conflict points kept to a minimum?

Are pedestrians given adequate time to cross the road at signalized intersections?

3.6 RIGHT-OF-WAY

DelDOT has jurisdiction over the public right-of-way, which provides for pavement, drainage, pedestrian facilities, lighting, landscaping and the roadside. The applicant's engineer is responsible for defining and verifying the existing right-of-way and/or easements on State-maintained roadways. The right-of-way must be evaluated to determine if the existing width can accommodate the construction and maintenance of any improvements within the right-of-way. DelDOT must approve the placement of anything within the right-of-way.

3.6.1 SITE PLAN RIGHT-OF-WAY

A plan showing the right-of-way for the street system and dedicated right-of-way for the existing State-maintained roadway shall be drawn in accordance with the requirements of the local land use agency. The widths of the right-of-way shall be in accordance with Figure 3-2.

Figure 3-2 Minimum Right-of-Way Width

Roadway Type	Minimum Right-of-Way Width
Subdivision Street – Type I *	50 feet
Subdivision Street – Type II, III *	60 feet
Industrial Street (plus 15 foot wide storm drainage easement on both sides)	60 feet
Local Road	60 feet
Collector (Major and Minor)	80 feet

***Provide** an additional ten-foot drainage easement on both sides for subdivision streets with open drainage.*
***Note:** At intersection streets the right-of-way shall have a minimum radius of 25 feet~~., concentric to the edge of pavement.~~*

3.6.2 CONTROL OF RIGHT-OF-WAY

The site plan shall contain one of the following notes relative to future maintenance of the internal street system:

- State Maintenance – Subdivision streets constructed within the limits of the right-of-way dedicated to the public use shown on this plan are to be maintained by the Delaware Department of Transportation (DelDOT) following the acceptance of the streets. DelDOT assumes no maintenance responsibilities within the dedicated street right-of-way until the streets have been accepted by DelDOT.
- Municipal Maintenance – Subdivision streets constructed within the limits of the right-of-way dedicated to the public use shown on this plan are to be maintained by the municipality following the acceptance of the streets. DelDOT assumes no maintenance responsibilities within the dedicated street right-of-way.
- Private Streets – Maintenance of the streets within this subdivision shall be the responsibility of the Developer, the property owners within this subdivision or both (Title 17, Section 131). DelDOT ~~the State~~ assumes no responsibility for the future maintenance of these streets.

3.6.3 ACCEPTANCE OF RIGHT-OF-WAY DEDICATED TO THE PUBLIC USE

DelDOT will only accept the maintenance of roadways with right-of-way dedicated to public use. The dedication of right-of-way shall be approved by DelDOT ~~the State~~ prior to recording the plan by the local land use agency.

Following recordation of the plan, no construction shall take place within the limits of the dedicated right-of-way without the written permission of DelDOT.

The maintenance responsibility of DelDOT within the dedicated right-of-way is outlined in Chapter 6.

3.6.4 RIGHT-OF-WAY MONUMENTS

The developer shall be required to furnish and place right-of-way monuments on the dedicated subdivision street right-of-way in accordance with these *Standards and Regulations for Subdivision Streets and State Highway Access*, and the requirements of the land use agency. If there is no local ordinance concerning right-of-way monuments, the monuments shall be placed along the right-of-way lines, on one side of the street at every change in horizontal alignment.

Right-of-way monuments shall be placed to provide a permanent reference for re-establishing the centerline and right-of-way line. Right-of-way monuments shall be set and/or placed by a Professional Land Surveyor (PLS) licensed in Delaware. Right-of-way monuments shall be located and punched so the center is on the right-of-way line. Details of standard right-of-way

monuments are shown in DelDOT's Standards Construction Details.

3.6.5 DEDICATION OF RIGHT-OF-WAY

The subdivision of property adjacent to a State-maintained roadway is subject to a dedication of right-of-way sufficient to provide a total roadway right-of-way in accordance with the minimum standards shown in Figure 3-3.

This width provides for future roadway improvements to accommodate the forecast traffic based on the site plan and the local land use agency's comprehensive plan. Figure 3-4 shows typical sections for various road types.

To meet DelDOT's multi-modal initiatives, a 15-foot easement beyond the minimum right-of-way, listed in Figure 3-3, must be established ~~dedicated~~ to provide for multi-modal infrastructure. The need for the easement will be determined during DelDOT's review. If an easement is required, then the following note should be added to the plan:

"A 15-foot multi-modal path easement is hereby established for public use as per this plat."

If the right-of-way for the State-maintained roadway was acquired as a permanent easement, then the right-of-way dedication will be from the centerline along with the following note:

"A X-foot wide strip of right-of-way is hereby dedicated to public use as per this plat."

If the right-of-way for the State-maintained roadway was acquired in fee, then the right-of-way dedication will be from the existing right-of-way line along with the following note:

"An additional X-feet of right-of-way is hereby dedicated to public use as per this plat."

The applicant's engineer shall verify how the right-of-way was acquired for the road in order to determine which dedication note to use.

DelDOT cannot require a dedication of land ~~dedicated right-of-way~~ along a State-maintained roadway for a minor subdivision plan for farms that are (1) subdivided into smaller farms, and (2) subdivided merely for the purpose of transferring land to family members for their use as a primary residence or residences. The right-of-way that would normally be dedicated shall be reserved in accordance with section 3.6.6.

Figure 3-3 Minimum Standards for Total Roadway Right-of-Way

Department of Transportation Functional Classification Map	**Minimum Dedicated Right-of-Way**
Freeway or Expressway Principal Arterial	50 feet of right-of-way from 1) Innermost ~~Inside~~ edge of the through lane(s) ~~travelway~~ on divided highway, see Figure 3-4 or 2) Centerline on multi-lane undivided or two-lane highway.
Minor Arterial Major or Minor Collector	40 feet of right-of-way from centerline.
Local Road or Street (All roads other than Subdivision Streets not shown)	30 feet of right-of-way from centerline.

3.6.6 RESERVATION OF RIGHT-OF-WAY

Where DelDOT has established future right-of-way lines beyond what is shown in Figure 3-3, the portion adjacent to proposed subdivisions shall be reserved for future right-of-way.

Set back requirements by the local zoning code are to be measured from the reserved right-of-way line.

3.6.7 REDUCED RIGHT-OF-WAY

Upon request, DelDOT shall consider a reduction in the required right-of-way for subdivision streets. DelDOT shall accept the maintenance of subdivision streets with reduced right-of-way as outlined in Chapter 6.

Reduction in right-of-way is intended to permit greater flexibility in community design while retaining adequate safeguards to provide the traveling public with sufficient travelway for anticipated traffic.

Reduced right-of-way can be applied to:

- Streets that are dedicated to public use and shall not require widening due to future land development.
- Areas where upright or barrier-type curbs and gutters are utilized along all interior streets.
- Group, semi-detached, two-family, and single family dwellings constructed on fee simple lots.
- Subdivision streets Type I.
- Areas where the site plan has incorporated the use of alleys to serve as the major access to the lots.

DelDOT shall only consider a reduced right-of-way if the following criteria are met:

1. Proposed reduced right-of-way is consistent with the local land use agency's ordinances.
2. The reduced right-of-way line shall be located at the back of the curb. The minimum reduced right-of-way width shall be 28 ~~26~~ feet.
3. A 10-foot permanent easement shall be provided along each side of all streets on a lot to allow DelDOT personnel to undertake

routine and emergency maintenance work and shall also be available for utility and construction purposes, and permanent placement of signs and traffic control devices.

4. On-street parking within the reduced right-of-way shall be reduced by providing:
   - Two spaces (minimum) on each lot; and
   - One space per every three units (overflow parking) which may be provided within the public right-of-way. The number and location of overflow parking within the public rights-of-way shall be subject to DelDOT approval. These parking bays are perpendicular and shall be graded wherever possible to slope toward the street. Regardless of the slope, away from or toward the street, a concrete gutter shall be required along the street right-of-way line for carrying stormwater flow, creating a physical separation of streets from parking bays and demarcation of the reduced right-of-way. Sidewalks shall be constructed parallel to the curb line.

     The barrier type around the perimeter of the parking bays (when required) shall be subject to DelDOT approval.
5. Whenever possible, all utilities, except for surface drainage appurtenances, shall be located outside the right-of-way.
6. Turnarounds, independent of the parking bay areas, must be provided at the end of the streets to permit maneuvering of service and emergency vehicles.
7. Any utility work within the permanent easement shall proceed only after prior notice of at least 24 hours has been given to DelDOT.

3.7 DELDOT NOISE POLICY

Any development proposed to be constructed in the proximity of any roadway with a functional classification of principal arterial, freeway or interstate will be required to perform a noise analysis and shall meet the requirements of DelDOT's Noise Policy No. D-03 (see Appendix L).

3.8 LANDSCAPING

Landscaping is an important aspect of the roadside. Street trees can be added within the right-of-way of a subdivision street under the following conditions:

1. The subdivision streets are designed using PCC Integral Curb and Gutter Type 3.
2. There is a minimum offset of four feet from the back of the curb to the trunk of the tree.
3. There is a note outlining the future maintenance of the trees on the record plan.
4. Trees are chosen from the approved list of street trees (see Appendix N for list of approved trees).
5. Placement of landscaping shall not impact sight distance.

Median islands within a subdivision may also be landscaped, provided the following criteria are met:

1. If street trees are proposed, the islands must have PCC Curb, Type 1 with an 8-inch vertical face. There is a minimum offset of four feet from the back of the curb to the trunk of the tree.
2. If no street trees are being proposed, PCC Curb, Type 2 may be used.
3. There is a note outlining the future maintenance of landscaping on the record plan.
4. Placement of landscaping shall not impact sight distance.

See Chapter 10 and Appendix A of DelDOT's *Road Design Manual* for additional information.

3.8.1 REFORESTATION REGULATIONS AND ORDINANCES

The requirements established by these regulations, including but not limited to the right-of-way dedication/reservation, auxiliary lanes at the entrance, sight triangles, and drainage features, shall be incorporated into the site plan prior to any evaluation of tree impacts as required by the local land use agency.

3.9 OPERATIONAL ANALYSIS

To ensure safe access to all proposed land development plans, the developer may be required to prepare an operational analysis for review by DelDOT. This operational analysis may consist of but not limited to one or more of the following evaluations:

1. *Queuing Analysis* – This analysis may be required to determine whether existing and proposed left-turn lane at the site entrance and nearby intersections is adequate. The 95th percentile (98th percentile at signalized intersections) maximum queue shall be used for the purpose of this analysis.
2. *Highway Capacity Manual Analysis* – This analysis may be required to determine whether the operation of the site entrance and nearby intersections is adequate.
3. *Accident Analysis* – This analysis may be required if the entrance is proposed at a known or alleged high accident location to determine whether a problem exists, and if so, how the entrance might relate to the problem, and what remedies might be possible.

This information shall be used to determine what modifications or improvements need to be made to ensure safe access to the State-maintained roadway system.

3.10 AGREEMENTS

3.10.1 SIGNALS

The need for installation of new traffic control signals and/or the modification of existing traffic control signals to accommodate traffic from commercial establishments or subdivisions shall be determined by DelDOT in accordance with the warrants prescribed by the *Manual on Uniform Traffic Control Devices* (Delaware MUTCD). All costs, basic or incidental, to the construction, operation, or maintenance of the signal shall be borne by the applicant. Furthermore, the cost of modifications to the system which may be required in the future in order to provide for traffic to or from the roadside development shall be paid for by the applicant.

When DelDOT, in its sole discretion, determines that a traffic control signal may be required in the future, the developer shall enter into a signal agreement with DelDOT prior to obtaining ~~a permit to construct the~~ entrance approval. The agreement shall be kept on file by the DelDOT Traffic Section and used to assess costs when DelDOT finds it necessary to install or modify a signal at the location addressed in the agreement.

The following information must be supplied to the DelDOT Traffic Section for the preparation of the agreement. See Appendix I for a sample Traffic Signal Agreement Letter.

1. Name and address of the company or developer entering into the agreement.
2. Name and address of the development or subdivision.
3. Name of all intersections and/or streets affected (location of signal).
4. Name and title of the person who shall be signing the agreement.

Recording fees associated with signal agreements are to be paid by the developer. This fee shall be submitted to DelDOT with the executed agreement.

3.10.2 OFF-SITE IMPROVEMENT AGREEMENT

During the land development process, DelDOT may determine the need for road improvements beyond the entrance to the site. These improvements shall be required as part of the entrance approval. The developer shall enter into an agreement with DelDOT outlining the implementation of the improvements. This may be for the actual design, right-of-way acquisition, construction, and inspection of the improvements, or monetary contribution for the actual construction of the improvements. This agreement shall be executed prior to entrance plan approval. See Appendix B for regulations regarding improvements requiring new rights-of-way and Appendix H for public road construction applications, forms and agreements.

3.10.3 TRAFFIC MITIGATION AGREEMENTS (TMAs)

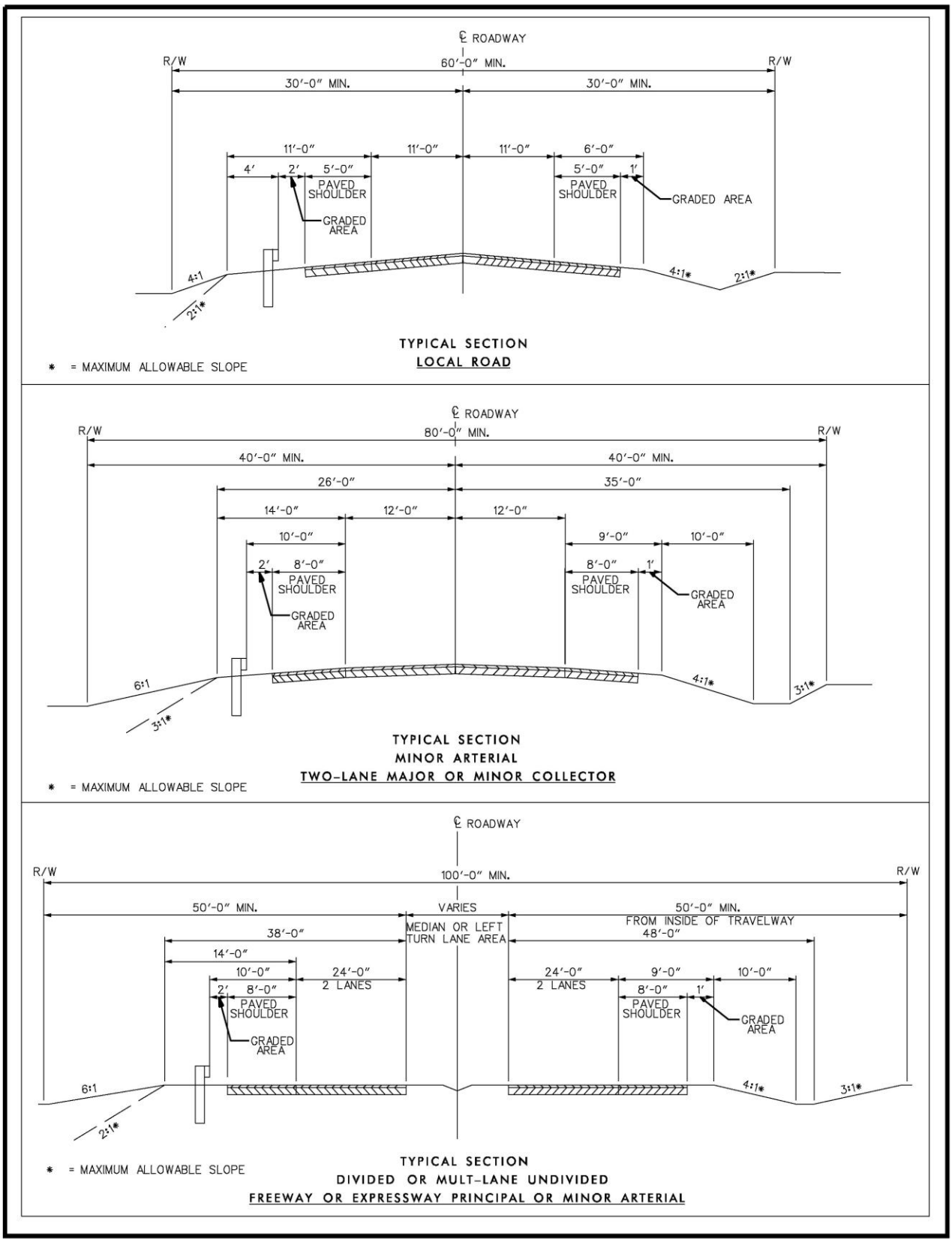
Land use agencies may have adopted specific level of service or adequate facilities requirements. If these requirements cannot be met, the applicant may, through the local land use agency's process, seek a waiver from such level of service requirements. As a condition of such a waiver, a Traffic Mitigation Agreement between the applicant and DelDOT shall be executed. DelDOT's participation in such agreements shall not be unreasonably withheld.

3.11 TRAFFIC CALMING

Traffic calming shall be considered in the site street plan development. The circulation plan should identify areas when there is a potential for higher volumes of traffic and where traffic calming shall be considered.

DelDOT's Traffic Calming Design Manual (TCDM) provides detailed guidance regarding the appropriate use, design, signing and marking of traffic calming measures approved for use in Delaware.

Figure 3-4 Typical Section – Various Roadway Types (Not to Scale)



CHAPTER 4 CONSTRUCTION PLANS

4.1 PLAN SUBMISSIONS

General criteria for a plan submission are summarized as follows:

- Plans must comply with DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*. Construction plans must be signed and sealed by a land surveyor or professional engineer registered in Delaware. It is the engineer's responsibility to meet the standards and plan requirements. Plan approval does not release the developer's responsibility to meet the standards. If pavement, geotechnical and/or structural design are included, then a professional engineer registered in Delaware and qualified to perform the design must sign and seal the plans. Exceptions may be permitted at the sole discretion of DelDOT where the proposed development has an average daily traffic generation of less than 100 trips, each vehicle being counted twice (in and out).
- The construction stage fee must be paid prior to review of the semi-final plans as outlined in Chapter 1. If the requirements outlined in these *Standards and Regulations for Subdivision Streets and State Highway Access* are not met by the second semi-final plan submission, then a new application and construction stage fee shall be required prior to further reviews.
- ~~The applicant is required to pay National Pollution Discharge Elimination System (NPDES) fees, as outlined in Chapter 1, when DelDOT reviews a stormwater management facility as part of an offsite improvement project where DelDOT has the review and approval authority for the facility. This payment shall be submitted with the preliminary plans.~~
- The maximum plan sheet size shall be 24" x 36". Larger plan sheets shall be returned without review.
- Drafting work shall be neat, legible and reflect locations of existing and proposed features based on actual field surveys. All text height shall be 0.1 times the scale of the plan sheet. All text shall be legible when plans are produced at half size.
- Entrance geometry and construction details shall be drawn to a scale of 1" = 30' or 1" = 20', with the former being preferable. Where the proposed development has an average daily traffic generation of less than 100 trips, a scale of 1" = 50' may be permitted.

4.1.1 PRELIMINARY PLANS

Preliminary construction plans shall be prepared showing the feasibility of constructing a subdivision street system or commercial entrance prior to recording the right-of-way with the land use agency. This plan shall be drawn to a scale of no less than 1" = 100'. The plan shall provide, at a minimum, the following information:

- Location map showing the relationship of the site to existing State-maintained roadways.

The location map shall be drawn to a scale of no less than 1 inch = 1 mile.

- Topography of the site shall extend beyond the limits of the property to include the proposed positive drainage outfall, critical features of the existing highway for a minimum distance of 500 feet beyond the proposed entrance location, and such other features as may be necessary in order to determine the feasibility of the project.
- Contours showing the common elevation of the existing ground within the limits of the topographic survey. The contour interval for various ground slopes shall be as follows:

Figure 4.1 Contour Interval for Various Ground Slopes

Average Ground Slope	Contour Interval
Less than 0.5%	1.0 feet with spot grades
0.5% to 5.0%	1.0 feet
Over 5%	2.0 feet

- Lot layout within the site showing relationship of lots to the proposed internal street system.
- Centerline stationing for the internal street system showing the proposed horizontal and vertical alignments.
- Schematic drainage system with supporting preliminary drainage calculations to show the feasibility of the design, including retention areas and outfall.
- If turning lanes and bypass lanes are required to be constructed on the existing highway to serve the site, they must be shown to ensure feasibility of the design.

To facilitate review of the plans, the entrance shall be staked in the field and the drainage outfalls shall be located in order to determine the feasibility of the design.

The applicant shall stake the preferred entrance location based on the following procedures:

- Place two wooden stakes at the entrance. The stakes shall be visible 24 inches to 36 inches above the ground. The stakes shall be placed 24 feet apart, and as close to the roadside property line as possible, while being clearly visible from the road. The stakes shall not be set closer than five feet from the edge of pavement.
- Tie ribbons or apply yellow paint to the top of stakes to make them clearly visible.
- Write the property owner's last name on each stake.

4.1.2 SEMI-FINAL PLANS

Semi-final construction plans shall be reviewed by DelDOT following the "No Objection" letter issued to the land use agency. The plans are to be prepared in accordance with DelDOT requirements. Four complete sets of semi-final construction plans shall be required for the review.

One copy of back-up calculations for design elements outlined in Chapter 5 (i.e., entrance design, sight distance triangles, typical section elements, pavement design, drainage design, and signing and striping) and a complete set of stormwater and sediment/erosion control drawings must be submitted for review with the semi-final plans.

4.1.3 FINAL PLANS

The final construction plans and special provisions must include all revisions required by DelDOT. Final plans must be signed and sealed by a land surveyor or professional engineer registered in Delaware.

For subdivision street construction plan approval, two Mylar sets of the final plans shall be submitted.

For commercial entrance and subdivision entrance construction plan approval in which the

subdivision is located within a town or city limits, six paper sets of final plans shall be submitted.

If the developer intends to phase the construction of a fully reviewed subdivision, then two copies of the signed and sealed title sheet, listing the streets to be constructed in a particular phase, shall be submitted along with an application and security that reflects the streets listed on the title sheet. Subsequent phases will be approved in the same manner. Any phased plan will have to meet the current standards and regulations at the time of approval.

4.2 ELECTRONIC PLAN SUBMISSION

DelDOT's roadway inventory management system tracks information relative to all State-maintained roadways including their location, width, length, drainage features, and signing.

In an effort to keep the system updated, DelDOT requires the following information to be provided to the Development Coordination office prior to acceptance of any subdivision street.

1. **Prior to Construction Plan Approval –**

   Along with the Mylar construction plans, the developer shall submit an electronic file containing the plan sheets. These plans may be submitted in AutoCAD, Microstation, or PDF format. In order to minimize the required data storage space, DelDOT requires only the construction plan sheet files for projects (e.g., .dwg files). All files shall be purged prior to submittal.

   The developer's engineer shall provide DelDOT with a street map in electronic format. The map, which shall be used for the acceptance drawing, shall include the following information:

   - The property boundaries.
   - Proposed street right-of-way (width-dimensioned).
   - Existing State-maintained roads.
   - A distance (actual field measurement) from each site entrance to the nearest intersection.
   - A minimum of two GPS points as points of reference (Concrete monuments shall be placed at the GPS points).

2. **Prior to Street Acceptance –**

   The developer's engineer shall provide DelDOT with an acceptance drawing in an electronic format. As part of the requirement for electronic plan submission, the drawing shall delineate the portion of subdivision streets proposed for acceptance.

3. **Prior to Street Acceptance of the Final Phase of Construction –**

   The developer's engineer is required to submit the approved as-built construction plan, annotated in red to show all revisions necessitated by field conditions, to the District Engineer or designee prior to the recommendation for acceptance. In addition, the engineer shall also submit an electronic plan version of the as-built construction plan for the entire subdivision to the Development Coordination office. This as-built plan shall replace the original construction plan in the State's electronic inventory.

4.3 SUBDIVISION CONSTRUCTION PLAN CHECKLIST

Any plan submitted to DelDOT for review must contain all elements listed in this section. When a plan is submitted for review, it will be checked to ensure the required elements are on the plan. If any elements are not relevant to the particular site then these elements shall be outlined in the submittal letter. If all elements are not on the plan, the plan will be returned to the engineer for resubmission with no comments provided by DelDOT.

Semi-final and final construction plans shall be prepared in accordance with the following subsections.

4.3.1 TITLE SHEET

A title sheet shall include the following (see Figure 4.5 for a sample title sheet):

1. Name of subdivision.
2. Section of the subdivision or name of the streets to be considered by this plan.
3. Identification of subdivision streets as public or private (see Section 3.6.2).
4. General location map.
5. County in which subdivision is located.
6. Total sheets in subdivision street construction plan.
7. Plan view of entire subdivision indicating streets to be constructed by this plan and their relation to all other streets within the subdivision. Show north arrow for reference.
8. General Notes (see Appendix J).
9. Index of sheets.
10. Legend of utilities.
11. Signature block.
    a. Seal of individual properly licensed in Delaware to perform the engineering and design for the preparation of construction plans for subdivision streets.
    b. Signature of engineer and date.
    c. Signature block and date for Subdivision Engineer approval. Approval applies only to the section of the subdivision being bonded.

4.3.2 TYPICAL SECTION SHEETS

Typical section sheets are required as part of subdivision construction plans. They are required for each major change of section and shall include the following:

1. Typical Street Sections.
    a. Width of street, shoulders and right-of-way.
    b. Cross-slope of pavement, shoulders and side slopes.
    c. Point-of-Profile Grade Application.
    d. Type of curb.
    e. Depth and type of pavement material.
    f. Locations to place topsoil, seed and mulch.
    g. Underdrain.
    h. Subgrade to be prepared in accordance with DelDOT *Standard Specifications*.
    i. Existing and proposed right-of-way widths and easements.
2. Typical Lateral Ditches and/or Outfall Ditches.
    a. Width of ditch bottom.
    b. Point-of-Profile Grade Application (Ditches longer than 100 feet require a profile).
    c. Side slopes.
    d. Type and depth of ditch protection.
    e. Locations to place topsoil, seed, and mulch.

4.3.3 DETAIL SHEETS

Detail sheets shall provide information to the contractor on construction that is not included in the *Standard Construction Details*, and shall include the following:

1. Special Details.
    a. Intersection roads.
    b. Super-elevation diagrams (when required).
    c. Details of non-standard drainage structures.
    d. Driveway details.
2. Intersection Details.
    a. Intersection radii with station and offsets to curve points.
    b. Location by station and offset to islands.

c. Grade elevations at maximum interval of 25 feet on edge of islands and intersection radii.

4.3.4 PLAN SHEET

Plan sheets shall include the following:

1. Horizontal and vertical control data.
   a. Benchmarks: Maximum spacing is 1000 feet. Show elevation and location. Use NAVD 88.
   b. Centerline stationing and curve data.
   c. Survey references to horizontal control points.
   d. Bearings of centerline tangents.
   e. Stations of intersecting roads.
   f. Limits of construction.
   g. North arrow on each plan sheet.
   h. Right-of-way line, existing and proposed (dimensioned from centerline of road) ~~including proposed~~
   i. Right-of-way monuments.

2. Utilities.
   a. Location of existing and proposed utility lines including sewer, water, power, communication, and cable. A separate set of utility plan sheets may be required depending on the complexity of the plan sheet.

3. Drainage.
   a. Location and elevations of parallel ditches every 50 feet.
   b. Location and type of ditch protection other than seed and mulch.
   c. Drainage flow arrows on pipes, underdrains, and ditches.
   d. Identify and locate drainage structures, storm sewers, and culverts with specific identifiers.
   e. Location, flow line, elevation, typical section and ditch protection for culvert or storm sewer outfall.
   f. A pipe and drainage structure schedule shall be included on each plan sheet. These schedules shall list the structure ID, type, invert, and top elevation, pipe ID, size, length, invert elevations, slopes and type. See Figures 4.3 and 4.4 for storm drainage structure and pipe schedule.
   g. Pipe angles shall be listed in the schedule and shall not exceed the maximum values listed in Figures 5-30 thru 5-32.

4. Minimum scale for construction plans is 1” = 50'. Intersection details shall be at 1” = 30'.

4.3.5 PROFILE SHEET

Profile sheets shall be on same sheet as plan sheets, where possible. Profile sheets shall include the following:

1. Horizontal scale – Horizontal scale shall be same as plan sheet.
2. Vertical scale – Vertical scale shall generally be 1” = 5'.
3. Vertical Curve Data: PVC, PVI, PVT, length of curve, PVI Elevation.
4. Soil information (when available) – Use exaggerated scale and indicate type and depth of material.
5. Drainage features – Identify drainage features with pipe or structure identifier that matches schedule.
6. Existing and proposed utilities.

4.3.6 MAINTENANCE OF TRAFFIC

To ensure that traffic control for construction along State-maintained roadways has been addressed on all land development projects, a Maintenance of Traffic (MOT) plan must be submitted and approved prior to final construction plan approval by the Subdivision Engineer. All MOT plans shall be developed in accordance with the Delaware MUTCD ~~“Traffic Controls for Streets and Highway Construction, Maintenance, and Utility Operations”~~ hereafter referred to as DelDOT’s Traffic Control Manual and shall be submitted to the Subdivision Engineer with the construction plans. The MOT plans shall be

reviewed and approved by the District Safety Officer as part of DelDOT's internal review process.

A MOT plan must be prepared for all projects. Depending on the complexity of the project, the plan may range from a short narrative including the MOT case diagram and its associated case notes in the Delaware MUTCD ~~DelDOT Traffic Control Manual~~ on the plans to a series of sheets detailing the traffic control measures for phased construction as directed by DelDOT. See Appendix J for General Notes for MOT.

A copy of the MOT plan approval letter shall be required to be on the construction site at all times.

4.3.7 ENTRANCE PLAN

Entrance plans shall include the following:

a. Property lines.
b. Existing and proposed right-of-way.
c. Existing and proposed easements.
d. Names of abutting land owners.
e. Planimetric features.
f. Existing grade contours.
g. Proposed finished grade contours.
h. Location of any crossovers.
i. Roadway curves.
j. Existing and proposed entrances serving the adjacent properties on both sides of the road.
k. Proposed sight distance easements.
l. Existing drainage features.
m. Location of existing and proposed buildings.
n. Parking layout.
o. Proposed site drainage.
p. Proposed entrance geometry.
q. Entrance construction details.
r. Typical sections showing the following proposed and existing information:
   - Width of through lane.
   - Width of ~~proposed~~ shoulder.
   - ~~Width of shoulder widening.~~
   - Width of right-of-way.
   - Width of deceleration lane.
   - Width of bypass lane.
   - Width of drainage easement (if applicable).
   - Slope of roadside embankment (front slope and back slope).
   - Cross slope of shoulder.
   - Cross slope of deceleration lane.
s. Proposed limit of construction.
t. Existing roadway lane widths and striping.
u. Dimensions for all entrance radii.
v. Existing and proposed utility poles, signs, etc.
w. North arrow.
x. Site generated ADT and distribution (per the latest edition of the ITE Trip Generation).
y. Mainline ADT (existing and projected) and speed limit.
z. Signing and striping plan.

aa. Existing signal equipment.

At a proposed entrance that requires widening to the existing State-maintained roadway, spot elevations on the proposed edge of pavement and where the proposed pavement meets the existing pavement shall be provided at 25-foot intervals. Spot elevations at the entrance radii shall be given at ten-foot intervals. Corresponding elevations of the existing ground, at the edge of proposed pavement, shall also be provided to assess the proposed cut and fill depth.

4.3.8 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the intended street construction shall be prepared using the cost per linear foot (lf) of roadway being constructed. A separate cost estimate shall be prepared for entrance improvements and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance

with the *Standard Specifications* and a current unit price shall be supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall be accounted for as a separate item in the estimate as illustrated below.

DelDOT, as part of the review, shall approve all the cost~~s~~ estimates. These estimates shall be used to determine the security required for each part of construction.

Figure 4.2 Itemized Cost Estimate Example

Item	**Quantity**	**Unit Cost**	**Total Cost**
Concrete Curbing Type 2	15,000 l.f.	$20.00 per l.f.	$300,000.00
Hot-mix, Type B	2,500 tons	$38.00 per ton	$95,000.00

Figure 4.3 Storm Drainage Structure Schedule

Name	Description			T.G. Elev.	Invert In	Invert In	Invert In	Invert Out	Pipe Angle	Pipe Angle
	Box	Top Unit	Grate							

Figure 4.4 Storm Drainage Pipe Schedule

Pipe	Description							Invert Elevation	
	From	To	Size	Type	Length	Class	Slope (%)	In	Out

4.4 COMMERCIAL ENTRANCE PLAN CHECKLIST

Any plan submitted to DelDOT for review must contain all elements listed in this section. When a plan is submitted for review, it will be checked to ensure the required elements are on the plan. If any elements are not relevant to the particular site then these elements shall be outlined in the submittal letter. If all elements are not on the plan, the plan will be returned to the engineer for resubmission with no comments provided by DelDOT.

This section also applies to the requirements for private subdivision entrances onto State-maintained roadways.

4.4.1 TITLE SHEET

Title sheets shall include the following:

1. A title block containing:
   a. Name of proposed business.
   b. Name of nearest town or county.
   c. Maintenance number of roadway being accessed.
   d. ~~Graphic scale (1" = 30' preferred, 1" = 20' acceptable).~~ Scaled drawing of the project.
   e. Date.
   f. Name, address and telephone number of engineer or surveyor preparing plan.
   g. Seal of engineer or surveyor (Delaware license required).
2. A data block containing:
   a. Type of business.
   b. Gross acreage of property.
   c. Approximate gross leasable floor plan.
   d. Traffic generation (ADT) with trip distribution shown.
   e. Peak hour traffic distribution in terms of vehicles per hour (vph).
   f. Parking spaces required.
   g. Parking spaces furnished.
   h. Local government responsible for land use approval.
3. General location map. ~~A 1" = 800' key map measuring six square inches, with all crossroads clearly marked.~~
4. A North arrow.
5. General Notes (see Appendix J).
6. Sheet index with total sheet count.

4.4.2 ENTRANCE PLAN

Entrance plans shall include the following:

a. Property lines.
b. Existing and proposed right-of-way.
c. Existing and proposed easements.
d. Names of abutting land owners.
e. Planimetric features.
f. Existing grade contours.
g. Proposed finished grade contours.
h. Location of any crossovers.
i. Roadway curves.
j. Existing and proposed entrances serving adjacent properties.
k. Proposed sight distance easements.
l. Existing drainage features.
m. Location of existing and proposed buildings.
n. Parking layout.
o. Proposed site drainage.
p. Proposed entrance geometry.
q. Entrance construction details.
r. Typical sections showing the following proposed and existing information:
   - Width of through lane.
   - Width of ~~proposed~~ shoulder.
   - ~~Width of shoulder widening.~~
   - Width of right-of-way.
   - Width of deceleration lane.

- Width of bypass lane.
- Width of drainage easement (if applicable).
- Slope of roadside embankment (front slope and back slope).
- Cross slope of shoulder.
- Cross slope of deceleration lane.

s. Proposed limit of construction.

t. Existing roadway lane widths and striping.

u. Dimensions of all entrance radii.

v. Existing and proposed utilities ~~poles, signs, etc~~.

w. North arrow. Graphic scale (1" = 30' preferred, 1" = 20' acceptable).

x. Site generated ADT and distribution (per the latest edition of the ITE Trip Generation).

y. Mainline ADT (existing and projected) and speed limit.

z. Signing and striping plan. (A separate sheet may be required)

At a proposed entrance that requires widening to the existing State-maintained roadway, spot elevations on the proposed edge of pavement and where the proposed pavement meets the existing pavement shall be provided at 25-foot intervals. Spot elevations at the entrance radii shall be given at 10-foot intervals. Corresponding elevations of the existing ground, at the edge of proposed pavement, shall also be provided to assess the proposed cut and fill depth. The proposed spots along a curb line should show top and gutter line of curb.

4.4.3 MAINTENANCE OF TRAFFIC

To ensure that traffic control for construction along State-maintained roadways has been addressed on all land development projects, a Maintenance of Traffic (MOT) Plan must be submitted and approved prior to final construction plan approval by the Subdivision Engineer. All MOT plans shall be developed in accordance with the Delaware MUTCD ~~DelDOT Traffic Control Manual~~ and shall be submitted to the Subdivision Engineer with the construction plans. The MOT plans shall be reviewed and approved by the District Safety Officer as part of DelDOT's internal review process.

MOT plans must be prepared for all projects. Depending on the complexity of the project, the plan may range from a short narrative and with a reference to a case number in the DelDOT Traffic Control Manual to a series of sheets detailing the traffic control measures for a phased construction as directed by DelDOT.

A copy of the MOT approval letter shall be required to be on the construction site at all times.

4.4.4 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the entrance improvements shall be prepared and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance with the *Standard Specifications* and a current unit price supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall be accounted for as a separate item as illustrated in Figure 4.2.

DelDOT, as part of the review, shall approve all the cost~~s~~ estimates. These estimates shall be used to determine the security required for each part of construction.

4.5 OFF-SITE IMPROVEMENT PLANS

The developer's engineer shall prepare and submit to DelDOT for review and approval all right-of-way plans, construction plans, specifications, and estimates for the project as outlined in the Off-site Improvement Agreement described in Section 3.10.2. All required

submissions to internal DelDOT support sections shall be made to the Development Coordination Section and then shall be distributed throughout DelDOT in accordance with these regulations, the engineer shall design the project in accordance with the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, DelDOT *Standards Specifications*, Policies, and Practice. The engineer shall notify DelDOT in writing of any conflicts with AASHTO or DelDOT *Design Standards, Specifications*, Policies or Practice. Plan presentation should comply with the model plans that are available on DelDOT.gov.

In instances where the engineer determines that it is not in the best interest of the project to comply with these standards, the engineer shall provide to DelDOT a written justification and rationale for their decision. DelDOT shall have the final authority on any process modifications or design exceptions.

The plan submissions will consist of a preliminary, semi-final, and final (or contract) plan submission. The engineer shall establish review dates with concurrence from DelDOT. The submittals shall include design plans, specifications and cost estimates for construction of the project.

The engineer shall coordinate with the utility companies to determine existing facility locations and to start the discussions on possible relocations.

Existing deeds, plot plans and existing roadway plans shall be used to establish and verify the existing right-of-way. The engineer is responsible for attesting to the right-of-way shown on the plans.

The engineer will work through the Development Coordination Section and the Pavement Management Section for pavement evaluation and design verification. This may include pavement cores and subgrade soils analysis. The engineer will work with Design Services for hazardous material/contaminated site delineation.

The engineer will work with Design Services on identifying environmental or cultural resources that are present within the existing and/or proposed right-of-way. The engineer shall prepare, apply for, and obtain all necessary permits and environmental or historic documentation required by federal, state, and local authorities. Copies of the permits and supporting documentation shall be provided to DelDOT prior to final plan approval.

DelDOT will provide assistance in identifying but not obtaining all necessary permits and coordination for off site road improvements. The following, but not limited to, may be required to construct the off-site improvements:

- Right-of-way.
- Utility coordination.
- 404 – Wetlands.
- 4f – Historical Sites.
- 6f – Parklands.
- NPDES Permit for erosion control.
- Subaqueous Land Permit – for wetland impacts.

4.5.1 PRELIMINARY CONSTRUCTION PLANS (SEE CHECKLIST IN APPENDIX D)

Preliminary construction plans shall include the following:

a. Title sheet.
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Construction plan with proposed design (including conceptual drainage layout and clear zone).
g. Existing and proposed profile including existing drainage.

h. Grades and Geometrics showing where coordinates are to be given (edge of gutter, begin/end of transitions, and critical curve points) for proposed geometrics and tick marks where grades will be given (edge of gutter in intersections, super-elevation transitions, and critical points).

i. Conceptual stormwater management or a waiver from the SWM Engineer.

j. Construction details.

k. Conceptual construction phasing, detailed enough for discussion and brainstorming.

l. Conceptual environmental compliance plan,

m. Lighting plans (including proposed pole locations).

n. Signing and striping and coordination conduit plans with proposed striping and existing signs shown.

o. Signalization plans (including proposed signal pole locations).

The developer's engineer shall ensure proper coordination with appropriate agencies. The preliminary construction plans shall be reviewed by the following stakeholders:

~~The preliminary construction plans shall be reviewed by the following stakeholders. The developer's engineer shall ensure proper coordination with appropriate agencies:~~

a. To utility companies for overhead facility relocation design (to determine real estate needs), and underground facility conflict review. Based upon extent of underground utility conflicts and coordination with Utilities Section, request appropriate number of utility test pits and designation where necessary through Utilities Section. Also, provide locations and approximate depths of large cuts and fills.

b. To Stormwater Engineer for review and comment.

c. To Traffic for review and comment pertaining to signal design, proposed signing, and striping, and detour plan consideration.

d. To Construction for overall plan review and comment.

e. To Roadside Development Administrator to determine tree replacement requirements and subsequent real estate needs. The engineer shall coordinate tree impact and mitigation analysis with a landscape architect.

f. To Design Services for documentation of proposed impacts to environmental and cultural resources. The engineer should also keep Design Services aware of all correspondence that has occurred between the resource agencies and the developer.

Continued coordination with affected utility companies is required at this stage. Projects that require overhead utility relocation must have the location of relocated facilities soon after the preliminary plan submission. This is required so the proper amount of real estate can be acquired or dedicated to facilitate the relocation, and coordination of these facilities can be coordinated with other aerial items such as signal poles and light poles. It is also imperative that the utility test hole information be analyzed to determine which underground utility conflicts cannot be avoided. Once it is determined that it is not possible to avoid the utility conflict, the affected utility company needs to be informed as soon as possible so underground relocation design can commence. If underground relocation will impact real estate needs, it should be identified at this time. It should also be noted that any conflicts that arise after preliminary plan submittal, as the result of a design change, should be brought to the attention of the affected utility company as soon as it is identified.

For projects with complex maintenance of traffic issues, a coordination meeting should be held with Construction and Traffic (including the Safety Section) to receive their input.

Depending on complexity of project, at least one Design Public Workshop will typically be held soon after the preliminary plan submittal.

The Subdivision Engineer should allow no less than 30 ~~45~~ days review time from the date of submittal.

4.5.2 SEMI-FINAL CONSTRUCTION PLANS (95%)

Semi-final construction plans (95%) shall include the following:

a. Title sheet.
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Construction plan with final proposed design (including final drainage with pipe sizes and inverts).
g. Existing and proposed profile including existing and proposed drainage, underground utilities with test hole data, soil boring, and test holes plotted.
h. Grades and geometrics with final geometrics and grades.
i. Semi-final stormwater management plans and report or a waiver from the SWM Engineer.
j. Construction details.
k. Construction phasing, M.O.T., and erosion control plans (with semi-final utility construction phasing taken into account).
l. Detour plans.
m. Final Environmental Compliance Plan.
n. Lighting plan.
o. Landscaping plan.
p. Utility relocation plans (overhead utility relocations required; with underground facility relocation design when possible. Where underground facility relocation impacts real estate needs, horizontal location is required).
q. Signing and striping and coordination conduit plans with final striping and proposed signs and sign locations shown (including final sign structure locations).
r. Signalization plans.
s. Semi-final cross sections (existing surface, proposed surface, LOC, existing and proposed right-of-way, clear zones).

The developer's engineer shall ensure proper coordination with appropriate agencies: The semi-final construction plans shall be reviewed by the following stakeholders:

a. To Stormwater Engineer with Semi-final Stormwater Report for review and comment.
b. To Construction with marked up Semi-final special provisions for review and comment.
c. To Traffic for review and comment.
d. To Specifications Engineer for review and comment.
e. To Roadside Development Administrator to ensure proper selection of tree types for replacement policy.
f. To Design Services for documentation of proposed impacts to environmental and cultural resources. Any permits that have been issued shall be made available to the Design Services Section.
g. Other submittals are to be made to the following for general review and comment: Materials and Research, Quality Section, Chief Safety Inspector, Bicycle/Pedestrian Coordinator, Architectural Accessibility Board (for approval), DTC, Chief Engineer and others as determined by the Subdivision Engineer.
h. To utility companies for final utility relocation design. Coordination will occur with the Quality Section to determine the construction time necessary for the project taking into account the time detailed in the final utility statements. The construction sequencing bar charts will be updated and ultimately included in the final advertisement package.

The Subdivision Engineer should allow no less than 30 ~~45~~-days review time from the date of submittal.

4.5.2.1 Semi-Final Right-of-Way Plans

Semi-Final Right-of-Way plans shall be developed in accordance with the DelDOT standards. These plans will be submitted for review to Design Support. The Design Support Section shall review these plans from a technical

perspective as well as attesting to the need based on the design parameters established during the initial project scoping. The following section lists the requirements for semi-final right-of-way plans.

- Title sheet
- Symbol sheet
- Geometric sheet
- Mosaic
- Right-of-way plans
- Right-of-way data sheets
- Right-of-way tabulation sheets

See Appendix D for the right-of-way plan checklist.

4.5.3 FINAL CONSTRUCTION PLANS (100%)

Final construction plans (100%) shall include the following:

a. Title sheet (signed & sealed).
b. Plan sheet index.
c. Notes and legend sheet.
d. Typical sections.
e. Horizontal and vertical control.
f. Final construction plan.
g. Existing and proposed profile including existing and proposed drainage, underground utilities, soil boring, and test holes plotted.
h. Grades and Geometrics with final geometrics and grades.
i. Final stormwater management plans and report.
j. Construction details.
k. Construction phasing, M.O.T., & erosion control plans (with utility construction phasing included).
l. Detour plans.
m. Lighting plan.
n. Landscaping plan.
o. Utility relocation plan.
p. Final signing and striping and coordination plans.
q. Signalization plans.
r. Final cross sections (existing surface, proposed surface & box, LOC, existing & proposed right-of-way, clear zone, existing & proposed drainage, relocated and proposed utilities).

The developer's engineer shall also submit final construction plans to the following and make proper coordination with appropriate agencies:

a. To Stormwater Engineer with final Stormwater Report.
b. Construction
c. Utilities
d. Traffic

~~The Subdivision Engineer should allow no less than 30-45 days review time from the date of submittal.~~

4.5.3.1 Final Right-of-Way Plans

Final right-of-way plans shall include the following:

- Title Sheet (signed & sealed).
- Symbol sheet.
- Geometric sheet mosaic.
- Right-of-way plans.
- Right-of-way data sheets.
- Right-of-way tabulation sheets.
- Semi-final cross sections (existing surface, proposed surface, LOC, existing & proposed right-of-way).

See Appendix D for the right-of-way plan checklist.

The right-of-way plans will remain in the semi-final status until all comments from the Design Support Section have been addressed. Once the final right-of-way plans meet all the established criteria they shall be approved as to process by the Subdivision Engineer, the Manager of the Design

Support Section and the Assistant Director-Design.

4.5.4 COST ESTIMATE

Following the approval of the final construction plan, a cost estimate for the roadway improvements shall be prepared and shall be provided to DelDOT for review. Each item of construction shall be listed in accordance with DelDOT's *Standard Specifications*. The method of measurement for each item shall be in accordance with the *Standard Specifications* and a current unit price supplied for each item.

The itemized construction cost estimate shall be broken down to provide sufficient detail to allow DelDOT to establish the accuracy and completeness of the estimate. Each material shall be accounted for as a separate item as illustrated in Figure 4.2.

DelDOT, as part of the review, shall approve all the costs. These estimates shall be used to determine the security required for each part of construction.

4.6 INDUSTRIAL PARK STREETS

Industrial park streets shall follow the standard construction plan development procedure, as previously outlined in Section 4.3.

4.7 STANDARDS AND SPECIFICATIONS

4.7.1 STANDARDS

DelDOT has developed *Standard Construction Details* to provide consistency on State-maintained projects. *Standard Construction Details* may be purchased from DelDOT and are also available on DelDOT's website (www.DelDOT.gov).

The *Standard Construction Details* shall be utilized in the construction unless there is some unusual circumstance requiring a special design. The plans shall show construction details only for those construction elements not shown in the *Standard Construction Details*.

If there are engineering elements including but not limited to, structural designs required on a plan that are not included in the *Standard Construction Details* then detailed engineering shop drawings signed and sealed by a professional engineer shall be submitted to DelDOT for review and approval. All structural elements shall be designed in accordance with AASHTO LRFD *Bridge Design Manual* (latest revised edition). DelDOT's Bridge Section will have the review and approval authority.

The project shall be constructed using the latest revised *Standard Construction Details* in effect at the date of Notice to Proceed.

4.7.2 SPECIFICATIONS

Specifications for frequently used construction items have been prepared by DelDOT. Hard copies of these *Standard Specifications* may be purchased from DelDOT or are available online at (www.DelDOT.gov).

The construction of subdivision streets shall be in accordance with the current DelDOT *Standard Specifications*. Should it be necessary to construct an item for which a standard does not exist or where it is desired to modify the *Standard Specifications*, special provisions shall be developed to provide the contractor the necessary information to construct the item. These special provisions as well as any other relevant information shall be bound and submitted with the final construction plans for review and approval.

The project shall be constructed using the latest revised *Standard Specifications* in effect at the date of Notice to Proceed, and the special provisions, as approved by DelDOT.

4.7.3 SPECIAL PROVISIONS

Special provisions shall be a bound document included as part of the final plan submission. This document shall include direction to the contractor on items that are not found in the *Standard Specifications*. These items may include, but not limited to, easements, environmental permits, special record plan notes, ~~and~~ TIS recommendations, and agreements. This document may also include additional information, as requested by DelDOT, to assist in the implementation of the construction.

4.8 STORMWATER MANAGEMENT

DelDOT will work cooperatively with regulating agencies responsible for enforcing Delaware Sediment and Stormwater Regulations (DSSR) to ensure stormwater is adequately controlled. These agencies include Delaware Department of Natural Resources and Environmental Control (DNREC), New Castle County Land Use Engineering, New Castle County Conservation District, Kent Conservation District (KCD), and Sussex Conservation District (SCD).

Stormwater management shall meet State regulations in terms of quality and quantity as outlined in the Erosion and Sediment Control Stormwater Management (ES_2M) Design Guide.

Stormwater management shall be designed for all existing and proposed roadway work and total project runoff including roadway runoff shall be managed by a private stormwater management facility.

When determining the need for stormwater management, the impervious areas added to the existing State-maintained roadway shall be considered. If stormwater management is required it shall be managed by a private stormwater management facility. The area of the entrance construction shall be included in the analysis and clearly documented in the stormwater report.

When the proposed development is limited to the site and the entrance, the review of design and construction of stormwater management facility is performed by a non-DelDOT delegated agency for DSSR enforcement. In this case, the non-DelDOT delegated agency shall attest that the DSSR within DelDOT right-of-way have been met and shall be documented in a memo and forwarded to DelDOT's Stormwater Engineer for files.

If the proposed roadway work is not contiguous with the land development proposal, the review of design and construction of stormwater management facility shall be performed by DelDOT's ES_2M for DSSR enforcement. The Stormwater Engineer will sign the plans upon determination of full compliance of the plans and reports with the requirements of DSSR indicating that the plans meet the requirements of State and Federal stormwater laws. DelDOT's ES_2M shall require 30 calendar days to review the plans and stormwater management report.

Plans for review shall be developed in half size (11"x17") and arranged similar to DelDOT plans for consistency and ease of review. Section 1 of ES_2M Design Guide contains a checklist which shall be completed and submitted with the plans along with a transmittal memo requesting the plans to be reviewed by DelDOT.

The stormwater management report shall be required in order to assess conformance with the provisions of DSSR. Section 2 of ES_2M Design Guide describes the content of organization of the report that shall be followed.

The following shall also apply to all site designs:

1. Stormwater facilities, excluding bioswales, shall be located a minimum of 20 feet from the State right-of-way.

2. Any stormwater management pond shall be designed so that the invert of all inlet pipes is

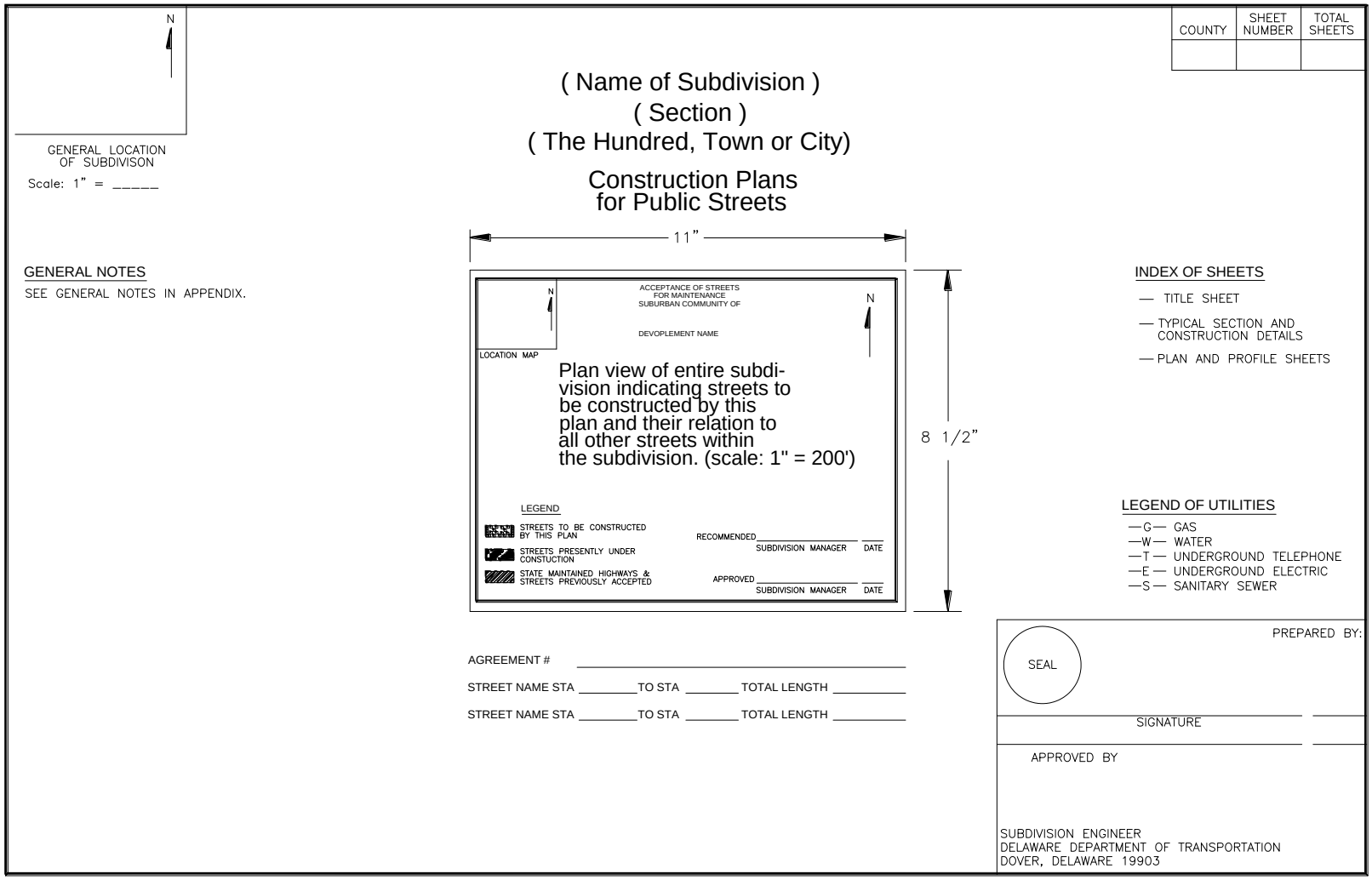
above the normal pool elevation. Exceptions to this requirement will only be considered if requested in writing with supporting documentation. In no case shall the normal pool elevation exceed the invert of the nearest drainage inlet.

3. DelDOT shall not allow the outflow from stormwater management ponds to discharge into the State right-of-way if there is the ability to discharge the run-off to a different location.

4. Where the outfall for any stormwater management pond outlets onto the State right-of-way, a detailed hydraulic and stormwater analysis shall be required to determine the impacts to the roadway drainage system and to ensure stormwater impacts for surrounding property owners is minimized (see Section 5.7).

5. If there is an identified drainage problem and the proposed site will impact the problem area, the applicant shall contribute towards mitigation through management of stormwater, wherever possible.

Figure 4.5 Sample Title Sheet



CHAPTER 5 DESIGN ELEMENTS

5.1 GEOMETRIC DESIGN OF SUBDIVISION STREETS

5.1.1 GENERAL

The design of subdivision streets is to be in accordance with the latest standards published by the *American Association of State Highway and Transportation Officials* (AASHTO), DelDOT's *Road Design Manual*, DelDOT's *Bridge Design Manual*, DelDOT's *Design Guidance Memorandums* and DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*. Where conflicts exist, DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* shall take precedence.

In instances where the engineer determines that it is not in the best interest of the traveling public to comply with these standards, the engineer shall provide to DelDOT a written justification and rationale for their decision. DelDOT shall have the final authority on any process modifications or design exceptions.

The street layout of a subdivision has the following elements that must be considered by the developer:

- Horizontal and vertical alignment.
- Intersection design.
- Sight distance.
- Typical sections designed to support the traffic volumes anticipated for each road segment.
- Connectivity of both vehicular and pedestrian traffic.
- Traffic calming.

5.1.2 DESIGN CRITERIA FOR SUBDIVISION STREETS

The Design criteria for subdivision streets shall be in accordance with Figure 5-2.

5.1.3 INTERSECTION DESIGN OF SUBDIVISION STREETS

The intersection design of subdivision streets shall be in accordance with the following:

1. The corner radii of internal subdivision streets shall meet the requirements of Figure 5-1. The use of larger radii may be considered if there is a need to accommodate larger vehicles. Any entrance for a new subdivision shall meet the requirements of Section 5.2

Figure 5-1 Intersection Design Radii

Intersection of Subdivision Street		Radii
Type I	Type I	15 feet
Type I	Type II	20 feet
Type II	Type II	25 feet
Type II	Type III	25 feet

Type III	Type III	Set to meet design vehicle

2. Street profiles within 40 feet of the nearest edge of pavement of the intersection may not exceed 5% to provide for sight distance.

3. 90° intersections are preferred. Intersection angles less than 70° are not permitted.

4. The distance required to remove the roadway crown at an intersection is to be established using a maximum relative slope between the profiles of the edge of pavement and centerline of one foot in 150 feet. The roadway crown of the major street is to be maintained.

5. Signing and striping shall be in accordance with Delaware MUTCD ~~as adopted by DelDOT~~.

6. Roundabouts may be used for intersection design within subdivisions. The design shall conform to the standards outlined in the FHWA publication: "Roundabouts: an Informational Guide." At a minimum, the roundabouts shall include a center island, truck apron and splitter islands on all approaches.

Figure 5-2 Design Criteria for Subdivision Streets

Type of Subdivision Street	Design Speed	Sight Distance*	Maximum Grades**	Minimum Horizontal Radii	Minimum K-Value	
					Sag	Crest
Type I (< 500 ADT)	25 mph	150 feet	10%	150 feet	26	12
Type II (501 – 3000 ADT)	30 mph	200 feet	8%	300 feet	37	19
Type III (> 3000 ADT)	35 mph	225 feet	7%	500 feet	49	29
Industrial Streets	35 mph	225 feet	7%	500 feet	49	29

* *Sufficient right-of-way dedicated to the public use shall be provided to maintain the required line-of-sight.*

** *Maximum street grades can be waived on an individual basis subject to DelDOT's engineering judgment with respect to the severity of the topography. Minimum street grades should be 0.5%.*

Notes:

1. *Vertical curves will ~~not~~ be required on streets with an algebraic grade difference equal to or ~~of~~ greater than one percent (1%).*
2. *Deviations from these criteria shall only be considered if presented in writing and if it has been proven to the satisfaction of DelDOT that the required criteria cannot be met.*

5.1.4 DEAD END STREETS

5.1.4.1 Permanent Dead End Streets

The use of cul-de-sac and other closed end street situations is to be limited to those situations where the developer's engineer can justify that full street extensions are not possible based on topography, preexisting development or environmental constraints.

Cul-de-sacs must be incorporated in the design of all permanent dead end streets except those eligible to be constructed within a reduced right-of-way. The minimum design criteria for cul-de-sacs are:

1. Design radii shall be in accordance with Figure 5-3.

2. Base material for cul-de-sacs is to extend a minimum of two feet beyond the edge of paving when an open drainage design is utilized (no curbs).

3. The maximum length for a permanent dead end street is 200 feet.

Figure 5-3 Design Radii for Cul-de-Sacs

Radius*	Cul-de-sacs	Cul-de-sacs with Center Islands
Right-of-Way	50 feet	60 feet
Outside Edge of Pavement	38 feet	46 feet
Center Island	N/A	24 feet

* *Measured to the face of curb.*

Developers planning streets with reduced right-of-way should select one of the turn-around designs shown in Figure 5-4 in lieu of the standard cul-de-sac. Any alternative design must have prior approval of DelDOT.

5.1.4.2 Temporary Dead End Streets

Temporary dead end streets shall be constructed to the property line of the development in order to provide for future development of adjacent lands. A temporary turn around must be provided when the length of a temporary dead end street exceeds 200 feet. The additional right-of-way needed to accommodate a temporary turn around can be provided through a temporary easement which must be clearly labeled on the site plan. If the street segment is accepted for State maintenance, DelDOT will maintain the temporary dead end street in accordance with Section 3.6.3.

Based on anticipated future development and flow patterns, those streets with more than 500 ADT upon completion of the initial phase development plus the future development must be designed to the appropriate subdivision street level with the corresponding right-of-way width.

If the temporary dead end street shall ultimately provide connectivity to the adjacent property, the following shall apply:

- For all projects with planned connectivity, a note stating "Future Connection to Adjoining Property" shall be prominently displayed on the Record Subdivision Plan.
- For all projects where the connection stub street is constructed as part of the initial or only phase of construction, a sign stating "Street Connection to Future Development" shall be installed by the developer at the end of the stub street prior to the first Certificate of Occupancy being issued. Maintenance of the sign shall be the responsibility of the developer until DelDOT accepts the streets into the State maintenance system.
- For projects where the connection is not constructed until future phases, stub streets shall be constructed to extend to the end of the radii at the intersection with the future street. A sign stating "Future Internal Street and Connection to Future Development" shall be installed by the developer at the end of the stub street. The sign shall be placed immediately after the placement of the base paving course. Maintenance of the sign shall be the responsibility of the developer until DelDOT accepts the streets into the State maintenance system. See Figures 5-5 through 5-7 for stub street sign details.

Figure 5-4 Design Alternatives in lieu of Cul-de-Sacs in Reduced Right-of-Way
(Not to Scale)

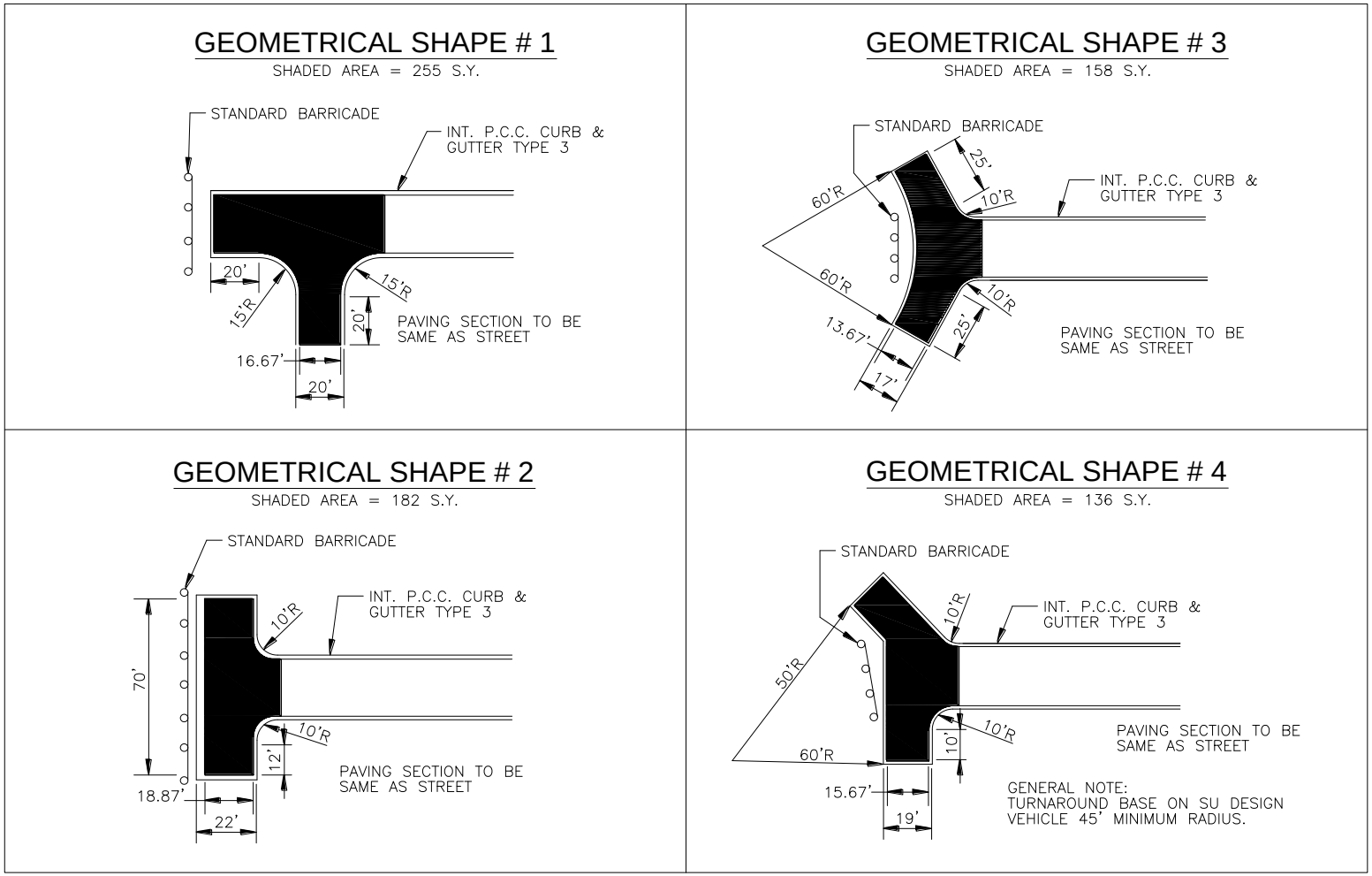
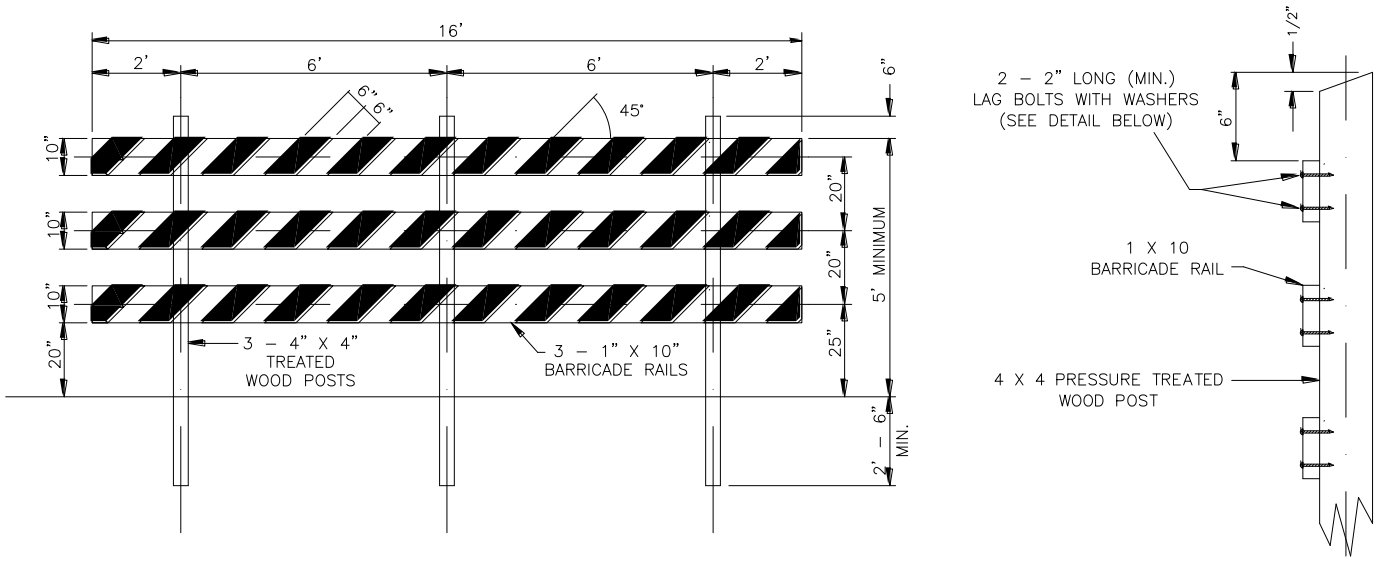


Figure 5-5 Stub Street Signs – Barricade Detail
(Not to Scale)



MARKINGS FOR BARRICADE RAILS SHALL BE ALTERNATE ORANGE AND WHITE STRIPES, SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES.

ATTACH BARRICADE RAIL TO THE 4"X4" PRESSURE TREATED WOOD POST BY USING LAG BOLTS (2" LONG, MINIMUM) WITH WASHERS. TWO BOLTS PER RAIL PER POST SHALL BE REQUIRED.

BARRICADE DETAIL

Figure 5-6 Stub Street Signs – Post and Rail Detail
(Not to Scale)

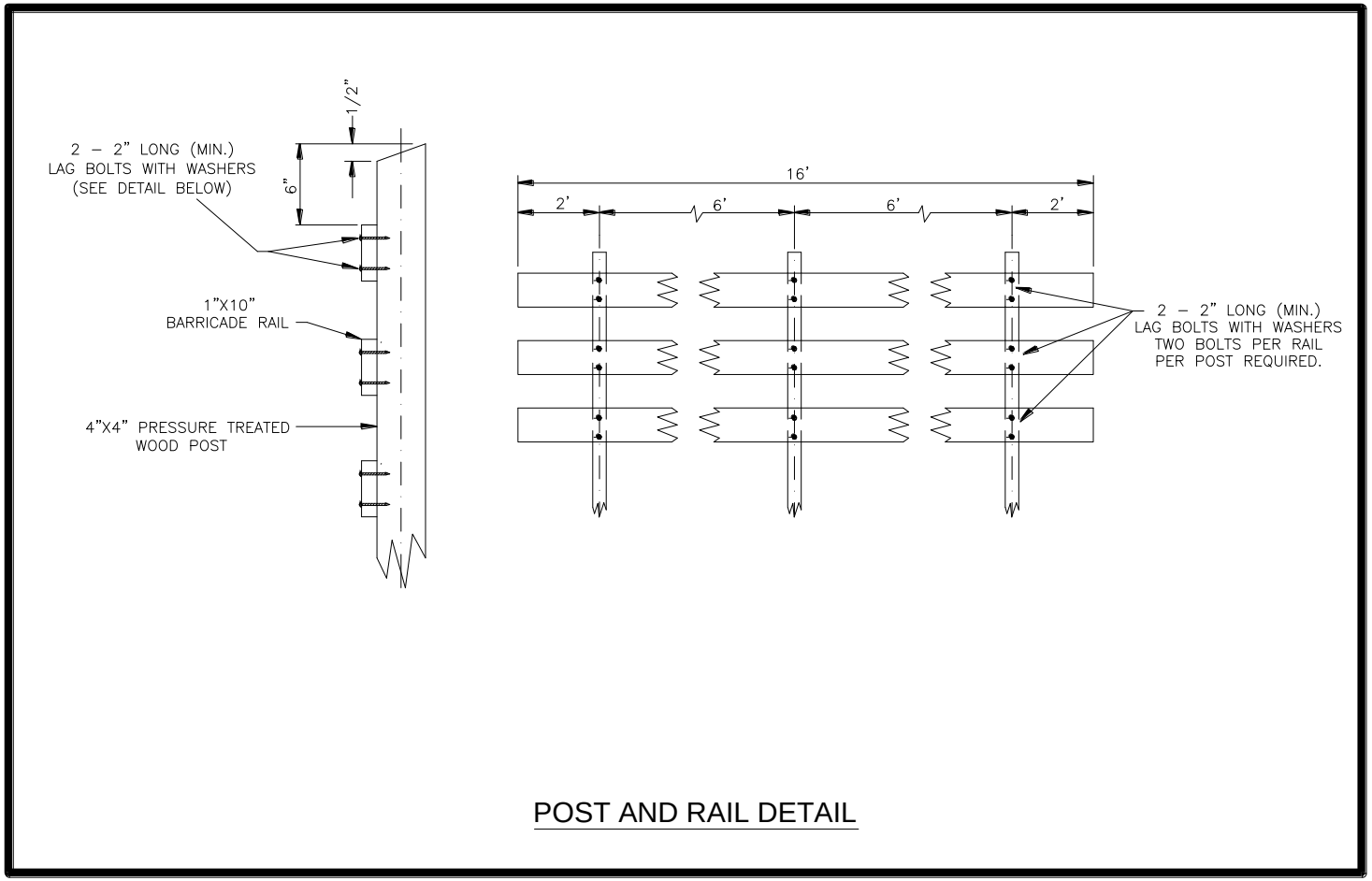
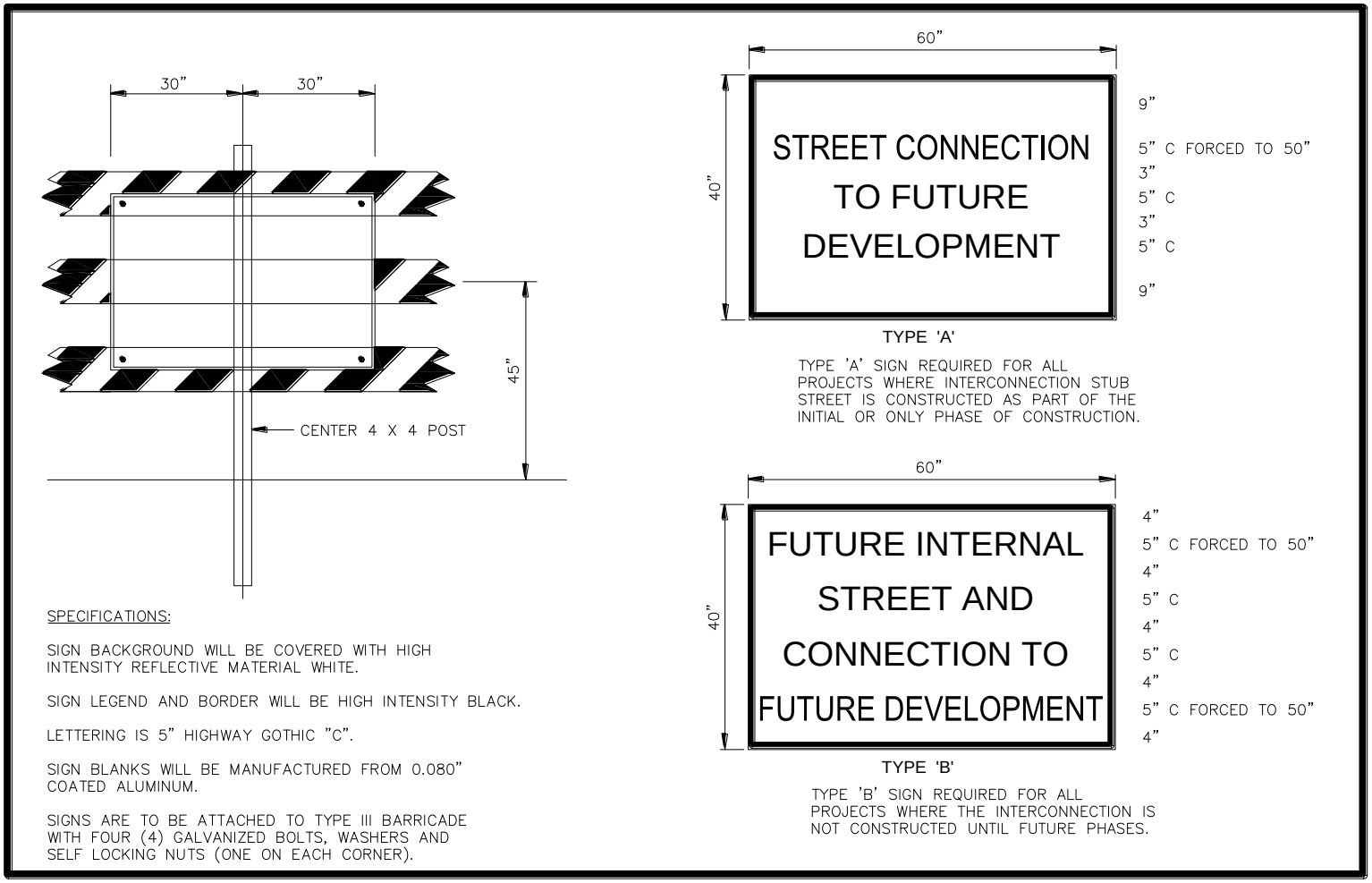


Figure 5-7 Stub Street Sign Detail
(Not to Scale)



5.1.5 SIDEWALKS

Sidewalks are an integral part of DelDOT's infrastructure program. They facilitate and encourage safe and convenient pedestrian travel within communities and among different land uses. They provide safe and reasonable access to public transportation and other alternative modes of transportation, thereby helping alleviate vehicular traffic and reduce emissions. They also reinforce the Americans with Disabilities Act (ADA) by increasing the access opportunity for mobility-impaired individuals. DelDOT requires all subdivision streets to have sidewalks.

All sidewalks and curb ramps are subject to ADA compliance.

5.1.5.1 Placement

In establishing the location of sidewalks, consideration must be given to drainage facilities, sideslopes, new traffic control and signing devices, intersection crossovers, striping, utility appurtenances, mailboxes with posts, and transit stops, in order to avoid conflicts in the design.

For new sidewalks, a minimum width of five feet, not including the width of the top of curb, is required. Wider sidewalks may be preferred or required by local ordinance depending upon the volume and nature of two-way pedestrian traffic. Narrower sidewalks may be allowed subject to consistency with ADA requirements, and surrounding roadside or geographic constraints. A cross slope of 1% is required, with 2% being the maximum.

A buffer between the sidewalk and curb shall be considered. For increased user safety, sidewalks should be as far away from travel lanes as practical. A buffer width of at least five feet between the edge of a sidewalk and the edge of a shoulder, curb, or traveled way is preferred. A five-foot wide strip improves safety, driver comfort, and provides an area for snow removal and mailbox posts.

5.1.5.2 Material

Standard material for any sidewalk or walkway is usually Portland Cement Concrete. However, sidewalk or walkway materials are not limited to Portland Cement Concrete. Upon approval, and when funding is available, more aesthetic materials such as brick, asphalt, or other stable, firm, slip resistant material surfaces may be used. In addition, alternative paving materials that are environmentally sensitive and reduce impervious areas may be used.

Minimum thickness can vary according to materials, but must be at least four inches for Portland Cement Concrete (PCC) on four inches of graded aggregate base course (GABC). A minimum thickness of six inches of PCC and six inches of GABC is required at entrance and driveway areas.

5.1.5.3 Ramps

At intersections, paired perpendicular curb ramps are preferred because they provide an accessible route to enter the crosswalk perpendicular to the travel lane. Single ramps at the intersection radius may only be used in exceptional circumstances, and shall not place the user at risk. A 24 inch long strip of detectable warnings (truncated domes) shall be placed along the full width of the ramp at the transition to the street.

Curb ramps should be sited and oriented to achieve maximum visibility and orientation to the pedestrian path of travel. Driveway entrances should be designed to minimize excessive cross slopes. When a turn must be made to enter or exit a ramp, level landings at the top and bottom of ramps of five feet in width are required ~~preferred, with a minimum width of four feet~~.

For more guidance on sidewalks and curb ramps refer to DelDOT's *Road Design Manual*.

5.1.6 SHARED USE PATH

A shared use path is a facility that is physically separated from the roadway and intended for exclusive use of modes other than motorized vehicles. Initially perceived as bicycle paths, these facilities have grown in popularity, serving bicyclists, in-line skaters, roller skaters, wheelchair users, and pedestrians, including, walkers, runners, people with baby strollers, people walking dogs, etc.

These facilities shall be designed in accordance with the Americans with Disabilities Act standards for shared transportation paths. Maximum slope, cross slope and the rate of change in grade shall be carefully examined during the design process. Because of their multi-use attraction they are a valuable addition to the roadway system and to the range of facilities available to planners and engineers seeking to improve conditions and increase options for all categories of travelers. They can serve both a transportation and recreational function and have proven to be a significant generator of bicycle use. Figure 5-8 shows a layout for a typical two-way shared use path.

Guidance for signing and pavement marking of shared use paths is shown in the Delaware MUTCD and the AASHTO publications.

5.1.6.1 Design Criteria

Refer to the DelDOT *Road Design Manual* for the design criteria for shared use paths.

A shared use path should be adequately separated from nearby roadways to prevent operational problems that inconvenience path users. The desirable separation of a shared use path from a roadway is ten feet. The minimum separation of a shared use path from the pavement is five feet. When this minimum is not possible, a crashworthy barrier with a railing system at least 44 inches should be provided. Refer to AASHTO's *Guide for the Development of Bicycle Facilities* for more guidance.

Two-way shared use paths should be at least 10 feet wide. In high use areas it is recommended to increase the width to 12 feet. A cross slope of 1% is required, with 2% being the maximum.

5.1.6.2 Intersections

Intersections with roadways are important safety considerations in shared use path design. There are three basic types of path-roadway intersections: mid-block, adjacent path and complex. If alternate locations are available, the one with the most favorable intersection conditions should be selected.

Mid-block crossings should be located far enough from the intersection to remain outside of the vehicular traffic mix approaching and entering an intersection. If the use of a mid-block crossing is the only option, then a neck-down or curb extension should be considered.

Adjacent path intersections occur when the path is parallel to a roadway and it crosses a driveway or other intersecting roadway such as a T-intersection or a simple four-legged intersection. In designing this type of crossing, it is important to keep the location close to the intersection. This allows the motorist and path user to recognize they are a part of the traffic mix and to be prepared to react accordingly. In this situation, the user is faced with multiple conflicts.

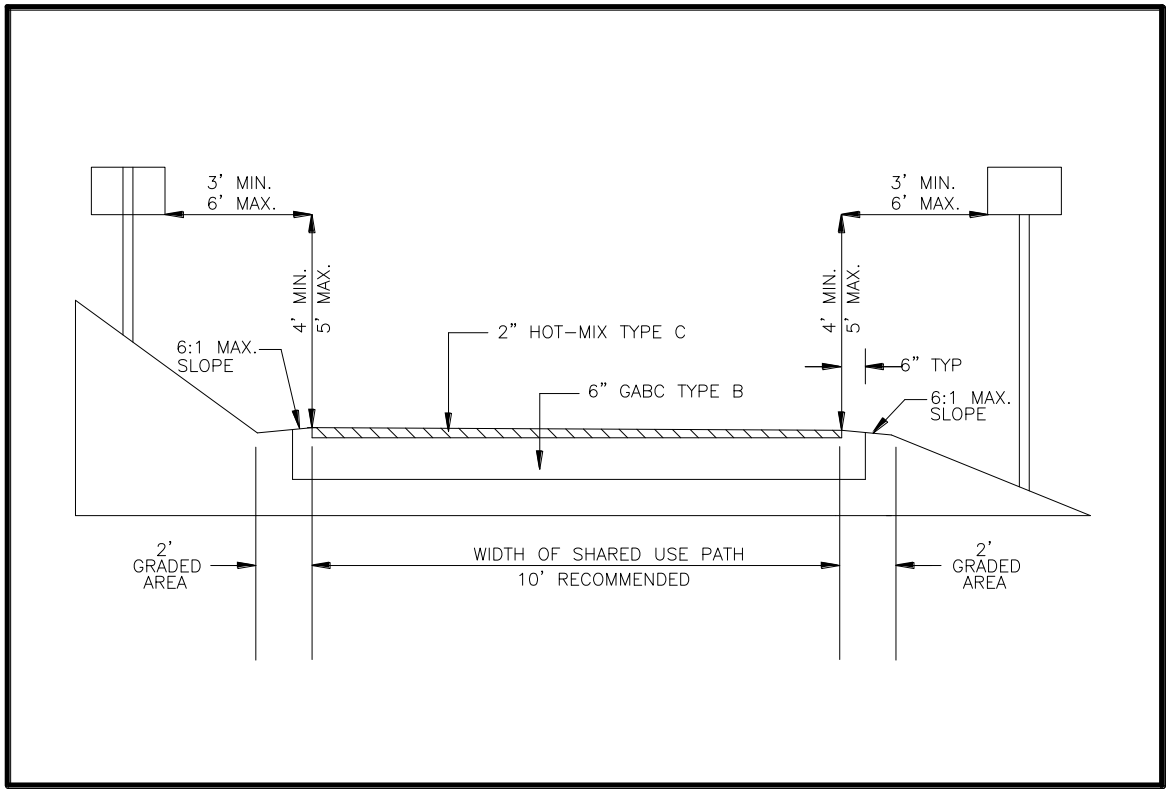
Complex intersections are site-specific and need to be designed to meet the unique issues associated with them.

When shared use paths terminate at existing roads, it is important to integrate the path into the existing system of roadways. Care should be taken to properly design the terminals to transition the traffic into a safe merging or diverging situation. Appropriate signing is required per Delaware MUTCD to warn and direct both bicyclists and motorists regarding these transition areas. Bicycle path intersections and approaches should be on relatively flat grades. Stopping sight distances at intersections should be checked and adequate warning should

be given to permit bicyclists to stop before reaching the intersection, especially on downgrades.

Curb ramps at intersections should be the same width as the shared use path. Curb ramps should provide a smooth transition between the shared use path and the roadway, and should be concrete.

Figure 5-8 Cross Section – Two Way Shared Use Path (Not to Scale)



5.1.6.3 Restriction of Motor Vehicle Traffic

Shared use paths need some form of physical barrier at roadway intersections to prevent unauthorized motor vehicles from using the facilities. Provisions can be made for a lockable, removable bollard to permit entrance by authorized vehicles. The bollard should be permanently reflectorized for nighttime visibility and painted a bright color for improved daytime visibility. When more than one bollard is used, five feet of spacing between posts shall be used. Wider spacing can allow entry to motor vehicles, while narrower spacing might prevent entry by adult tricycles and bicycles with trailers.

An alternative method of restricting entry of motor vehicles is to split the entryway into two five-foot wide sections separated by low landscaping. Emergency vehicles can still enter if necessary by straddling the landscaping. The

higher maintenance costs associated with landscaping should be considered.

5.1.6.4 Other Design Issues

The preferred pavement surface is a good quality all weather surface. Designing the pavement structure is similar to that of a roadway. Design is based on soil investigation to determine the load-carrying capacity of the existing soils. In this case, the controlling load is that of motorized maintenance and patrol vehicles. The pavement selection is influenced by frost damage potential, skid resistance, surface quality, edge support, and surface and subsurface drainage.

Drainage design for shared use paths is similar to that of a roadway. A cross slope ~~of 2%~~ in one direction with no crown is preferred and also simplifies the construction. Side ditches, ground cover, erosion and all other drainage design elements are a part of the path design.

5.1.7 TRAFFIC CALMING

The DelDOT Traffic Calming Design Manual (TCDM) provides detailed guidance regarding the appropriate use, design, signing and marking of traffic calming measures approved for use in Delaware. Generally, traffic calming should be an integral part of a site design so as to reduce the need for speed control devices after subdivision construction.

5.2 ENTRANCE DESIGN GUIDELINES

The design elements required for a specific entrance shall be constructed within the existing right-of-way or easements of the roadway. As outlined in Section 3.6, the engineer is responsible for verifying the right-of-way width and that the required improvements can be constructed.

If the right-of-way cannot accommodate the required entrance improvements, the developer can either acquire the necessary right-of-way or reduce the traffic generated from the site to eliminate the need for the improvement. Insufficient right-of-way cannot be the basis for sub-standard design.

Entrance design elements include right-turn lanes, left-turn lanes, bypass lanes, and drainage features. See Figures 5-9 through 5-11 for typical entrances. Entrance design shall be in accordance with the following guidelines:

1. All entrance-exit facilities shall conform to designs intended exclusively for that purpose. No signs which are contrary to the normal rules of the road (e.g., keep left instead of keep right, etc.) shall be permitted.
2. If pedestrian amenities exist or are placed as part of the land development, the entrance shall be designed to accommodate pedestrians.
3. Median islands shall be permitted in the entrance. The median shall have a minimum width of 4 feet and a maximum width of 16 ~~12~~ feet measured from the face of curb. The nose of the median shall be located based on the turning path for the left-turn movement of the design vehicle.
4. All entrance-exit facilities shall be located not only to provide compatibility with the highway system and adjacent entrances, but also to provide good internal circulation once the motorist has left the roadway. The site shall be designed so that traffic will not back-up on the State-maintained roadway.
5. If an entrance is to be controlled by an electronic gating system, the gate shall be located a minimum of 50 feet from the edge of the shoulder.
6. Where feasible, a major entrance-exit facility on one side of a highway shall be located directly across from a major entrance-exit facility on the opposite side of the highway.
7. When a parcel of land is being developed which fronts on a major and a minor

roadway, the access to this parcel shall be from the minor roadway and not the major roadway. Exceptions may be considered by the Subdivision Engineer.

8. Roadway width shall be consistent with the type of subdivision street intersecting the roadway. See Figure 5-12.
9. The radius of the entrance shall be established using the turning path of the design vehicle. A minimum 25-foot radius shall be used on all entrances.
10. Profiles of entrances and exits shall be designed in accordance with these *Standards and Regulations for Subdivision Streets and State Highway Access*, and AASHTO's standards. Maximum grades shall not exceed 8%. Vertical curve transition shall be provided at the intersection of the driveway profile and the cross slope of roadway shoulder extended.
11. All parking and unparking maneuvers within the immediate area of a commercial entrance shall be avoided. These maneuvers shall not block the entrance and cause the backing-up of traffic onto the highway.
12. No driveways or parking bays shall be located within 50 ~~40~~ feet from the edge of shoulder or pavement of any type of functional classification roadway.
13. A motorist's tendency is to follow pavement joint lines instead of the painted lines which denote the actual travel lanes. A conflict between the pavement joints and travel lanes shall be avoided. If this conflict occurs, the pavement shall be covered with a layer of asphalt paving.
14. The minimum distance between the intersection radius of the entrance with the State-maintained roadway shoulder and the property line of the adjacent property is 5 feet.
15. Spacing of entrances shall comply with the requirements outlined in Chapter 9.

Figure 5-9 Typical Entrance I

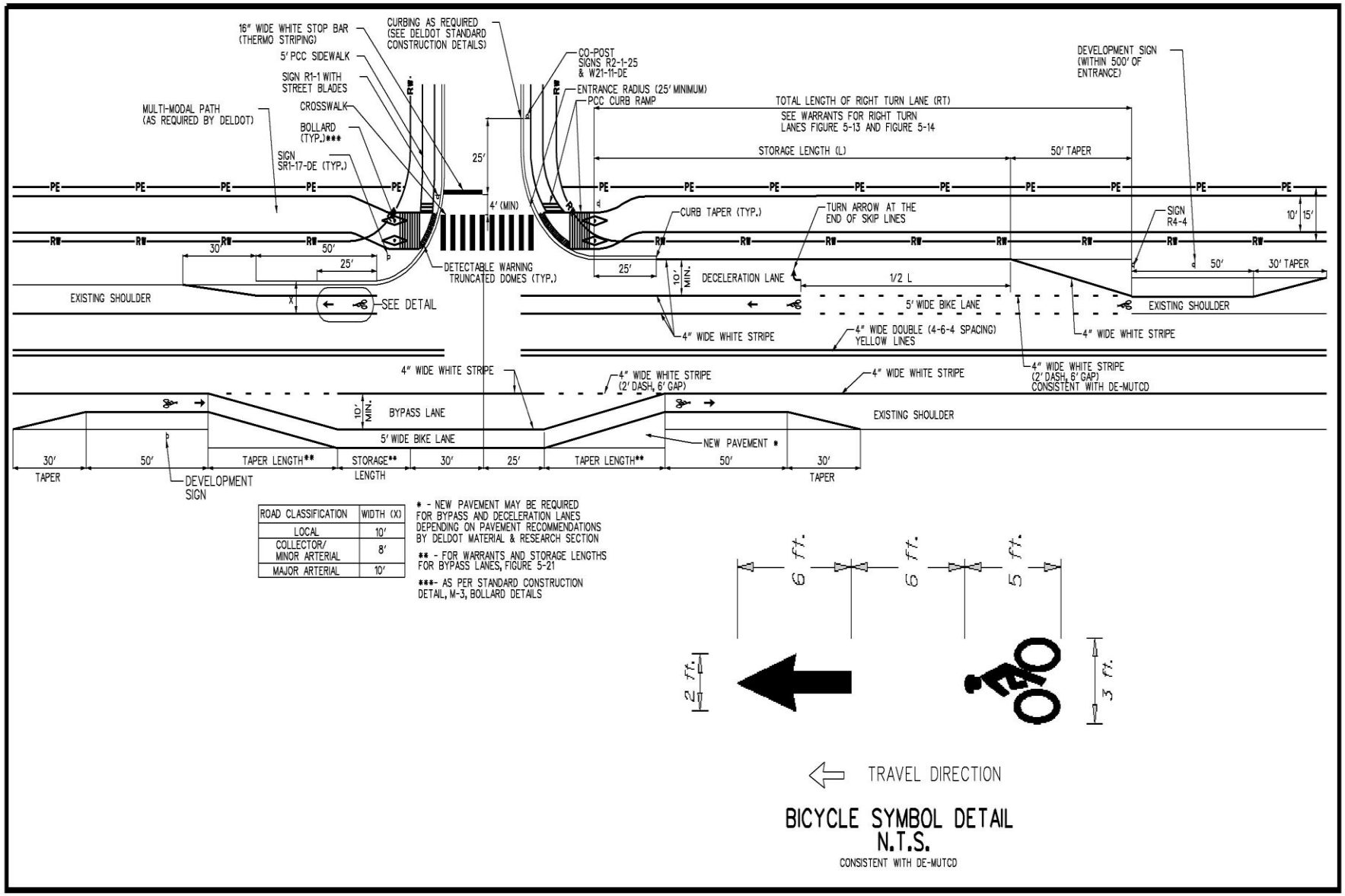


Figure 5-10 Typical Entrance II - Entrance Location for Corner Properties

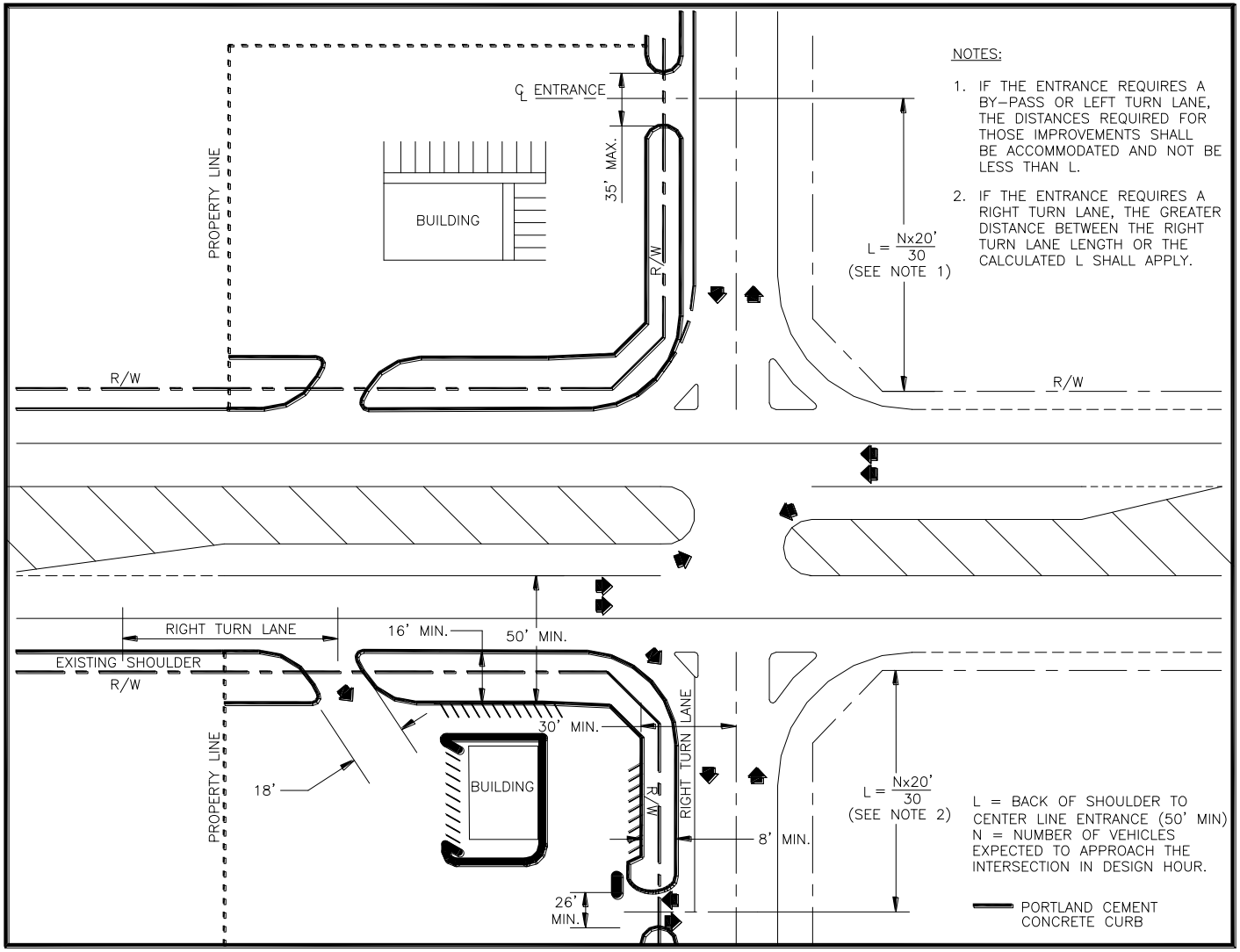
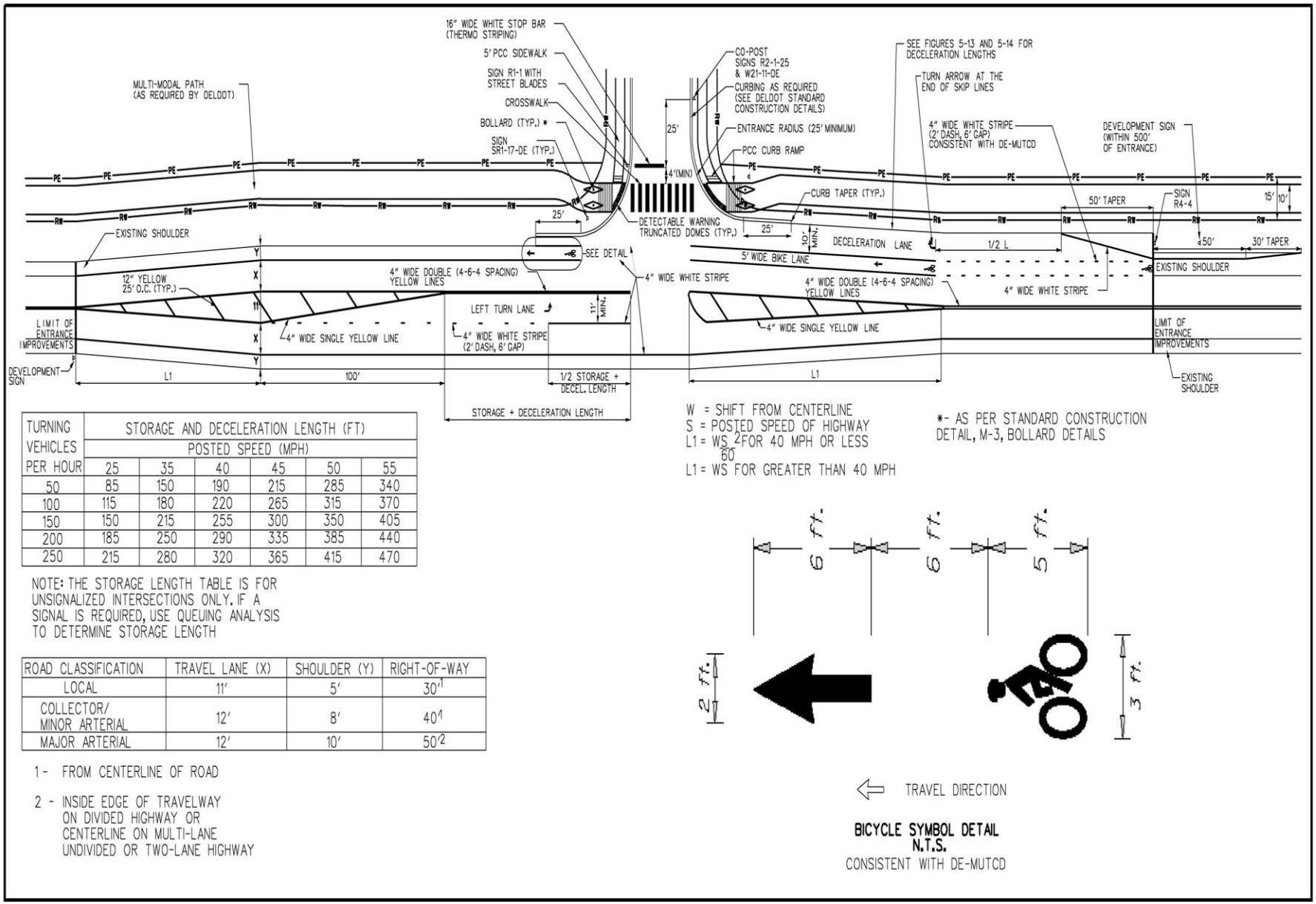


Figure 5-11 Typical Entrance III



TURNING VEHICLES PER HOUR	STORAGE AND DECELERATION LENGTH (FT)					
	POSTED SPEED (MPH)					
	25	35	40	45	50	55
50	85	150	190	215	285	340
100	115	180	220	265	315	370
150	150	215	255	300	350	405
200	185	250	290	335	385	440
250	215	280	320	365	415	470

NOTE: THE STORAGE LENGTH TABLE IS FOR UNSIGNALIZED INTERSECTIONS ONLY. IF A SIGNAL IS REQUIRED, USE QUEUING ANALYSIS TO DETERMINE STORAGE LENGTH

ROAD CLASSIFICATION	TRAVEL LANE (X)	SHOULDER (Y)	RIGHT-OF-WAY
LOCAL	11'	5'	30'[1]
COLLECTOR/ MINOR ARTERIAL	12'	8'	40[1]
MAJOR ARTERIAL	12'	10'	50'[2]

1 - FROM CENTERLINE OF ROAD

2 - INSIDE EDGE OF TRAVELWAY ON DIVIDED HIGHWAY OR CENTERLINE ON MULTI-LANE UNDIVIDED OR TWO-LANE HIGHWAY

Figure 5-12 Entrance Pavement Widths

Subdivision Street	Pavement Width (With Curb and Gutter)	Pavement Width (Without Curb and Gutter)
Type I, II, and III (With Median)	16 feet	18 feet
Type I (Without Median)	22 feet	22 feet
Type II and III (Without Median)	32 feet	32 feet
Industrial Streets	32 feet	32 feet
Commercial Access (1-way)	18 feet	18 feet
Commercial Access (2-way)	24 feet	30 feet

Notes:

1. *If wider pavements are needed, a plan showing the turning path of the design vehicle must be provided.*
2. *If multiple lanes of ingress / egress are required to satisfy the capacity needs of the development, the design must be approved by the Subdivision Engineer.*

5.2.1 BIKE ACCOMMODATION AT ENTRANCES

At intersections, bicyclists proceeding straight through and motorists turning right will cross paths. Striping and signing configurations that encourage these crossings in advance of the intersection, in a merging fashion, are preferable to those that force the crossing in the immediate vicinity of the intersection. Site entrance designs must accommodate bicycle traffic.

The design of a bike lane needs to include appropriate pavement markings and signing approaching and through intersections to reduce the number of conflicts. Guidance for signing and pavement marking of bike lanes is shown in the Delaware MUTCD and AASHTO's G*uide for the Development of Bicycle Facilities.*

A bike lane should be delineated to indicate the separation from the motor vehicle travel lanes with a four-inch wide solid white line. Adequate pavement surface, bicycle-safe grate inlets, and safe railroad crossing shall be provided on roadways where bicycle lanes are being designated. Raised pavement markings and raised barriers can cause steering difficulties for bicyclists and should not be used to delineate bicycle lanes.

5.2.2 AUXILIARY LANES

Auxiliary lanes provide an area for traffic to maneuver outside of the through lanes to improve safety and capacity of the roadway. Auxiliary lanes include right-turn lanes, left-turn lanes, bypass lanes and crossovers. The length of auxiliary lanes depends on local conditions, 10-year projected traffic volumes (from the date of submission), traffic mix, design speed, posted speed, selected level of service, and operating speeds.

5.2.2.1 Right-Turn Lane

Separate right-turn lanes shall be required when warranted in accordance with Figure 5-13 and 5-14. Right-turns can be free flowing, yield or stop-controlled. In order to operate properly, free flowing right-turn lanes must have an adequate deceleration distance with no access

points for drivers to safely merge with and diverge from the through traffic.

5.2.2.2 Left-Turn Lane

Separate left-turn lanes shall be required on two-lane, two-way roadways and divided highways when warranted. When it is determined that a project located on a divided highway shall generate sufficient number of left-turns to warrant the construction of a left-turn lane, it shall be the responsibility of the developer to construct a left-turn lane at the locations designated by DelDOT.

A separate left-turn lane shall be required for all unsignalized subdivision entrances located on undivided highways in accordance with the warrants for left-turns lanes found in Figures 5-15 through 5-18. Projected volumes (10-year) shall be used for Figures 5-13 through 5-18. If the percent distribution of left-turns in the advancing volume during the peak hour is greater than the percentage shown on the intersecting line, a left-turn lane is warranted.

A separate left-turn lane shall be required for all signalized subdivision entrances located on undivided highways in accordance with the most current Highway Capacity Manual guidelines. Projected volumes (10-year) shall be used for the analysis.

When access to a proposed site requires vehicles to utilize an existing left-turn lane, the developer shall perform an operational analysis to determine if there is sufficient storage length. The developer will be required to make any modifications necessary to provide an adequate left-turn lane.

Left-turn lanes may be required when physical characteristics restrict sight distance below AASHTO standards.

Left-turn lanes may be required at age-restricted communities where there is a need to accommodate older drivers.

The pavement design for all left-turn lanes on two-lane, two-way roadways shall be comparable in design to the existing traveled way.

5.2.2.3 Bypass Lane

A bypass lane is a paved shoulder that permits through traffic to bypass a left-turning vehicle which is stopped on the travel lane. They are intended to reduce delay and expedite the movement of through traffic at T-intersections.

An intersection shall be considered for a separate left turn lane first using the warrants outlined in Figures 5-15 through 5-18. If those warrants are not met then consideration should be given for a by-pass lane. Bypass lanes shall be designed in accordance with Figure 5-9. Projected volumes (10-year) shall be used for the analysis. A five foot shoulder shall be provided on the outside of the bypass lane to accommodate bicycles.

Bypass lanes will not be permitted in the following locations. If a by-pass lane is warranted in these locations then a separate left turn lane shall be constructed in accordance with these standards.

- On roads with a Functional Classification of Major Collector or higher.
- Where an existing entrance or State-maintained street lies within the limits of the proposed bypass lane.

5.2.2.4 Crossovers

Crossovers are median openings designed to accommodate U-turn vehicles. Crossovers are provided on divided highways at intervals that serve adjacent properties without greatly inconveniencing property owners and other users.

Crossover design at two-lane crossroads or connecting roads shall be in accordance with standard crossover design found in AASHTO's *Policy on Geometric Design of Highways and Streets (The Green Book).*

The following general guidelines shall be used:

1. Additional crossovers shall not be placed, regardless of existing spacing on highways, where DelDOT has determined that crossovers should not be added for reasons of safety or capacity.

2. Crossovers shall not be placed on limited access highways under any circumstances.

3. It is desirable to maintain an average spacing of 1000 to 1500 feet at crossovers in urban areas and 2000 to 3000 feet at crossovers in rural areas.

4. Closer spacing shall be permitted when DelDOT finds it beneficial for traffic operations and safety.

5. The absolute minimum spacing of crossovers shall be governed by the requirements for left-turn lanes to include required taper lengths, deceleration lengths and storage lengths.

6. DelDOT may remove crossovers when warranted by changes in surrounding land use or when necessary for traffic operation and safety.

7. Minimum crossover width is 40 feet. The crossover width may be increased as required by the intersecting roadway or entrance condition.

8. The pavement design for all crossovers shall be based on anticipated traffic and soil conditions. Figure 5-19 shows a typical crossover design.

5.3 BICYCLE FACILITIES

Suitable accommodations for bicyclists shall be required for all subdivision and commercial site plans. See Figure 5-21 for typical bike lane cross sections.

Unless access is specifically denied, some level of bicycle use can be anticipated on most roadways. All new roadways, except those where bicyclists shall be legally prohibited, should be designed and constructed to encourage use of bicycles as a form of transportation. Guidelines are presented here to help design and construct roadway improvements and separate facilities that accommodate the operating characteristics of bicycles. Additional information including signing layouts, striping, and design details can be found in the Delaware MUTCD and AASHTO's *Guide for the Development of Bicycle Facilities.*

Figure 5-13 Right-Turn Lane Warrants (R ≤ 50')

Projected 10-year Roadway ADT	Right-Turn ADT	Assumed Speed Change on Through Lane	Highway Posted Speed					
			25 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH
			Decel Length	Decel Length	Decel Length	Decel Length	Decel Length	Decel Length
ADT Less Than 2,000	0 – 100	Full Reduction	–	–	–	–	–	–
	101 – 200	25 MPH	–	150	150	150	175	220
	Over 200	20 MPH	150	150	150	175	220	270
2,000 to 4,000 Vehicles	0 – 100	Full Reduction	–	–	–	–	–	–
	101 – 200	25 MPH	–	150	150	150	175	220
	201 – 300	20 MPH	150	150	150	175	220	270
	301 – 400	15 MPH	150	150	180	225	275	330
	Over 400	10 MPH	150	190	235	285	340	395
4,001 to 10,000 Vehicles	0 – 50	Full Reduction	–	–	–	–	–	–
	51 – 100	20 MPH	150	150	150	175	220	270
	101 – 200	15 MPH	150	150	175	220	270	325
	201 – 400	10 MPH	150	180	225	275	315	385
	Over 400	5 MPH	150	235	285	340	395	460
Over 10,000 Vehicles	0 – 50	Full Reduction	–	–	–	–	–	–
	51 – 100	15 MPH	150	150	175	220	270	325
	101 – 200	10 MPH	150	175	220	270	325	380
	201 – 400	5 MPH	150	225	275	330	385	450
	Over 400	0 MPH	190	285	340	395	460	530

***Note**: All decel lengths include a 50-foot taper length.*

* Factors to consider include sight distance, vertical grades, and driver population.

* Note: The decel length table is for unsignalized intersections only. If a signal is required, use queuing analysis to determine the storage lengths

* Stopping Sight Distance - Green Book Exhibit 3-1
* Cycle Length - 120 secs(assumed)
* Minimum Storage Length - 20 feet
* Minimum Deceleration Length - 150 feet
* Length of Vehicle - 25 feet
* Storage Length = (Total Right Turns per hour/Total Cycle Lengths per hour)
* Length of the Vehicle
* Deceleration Length = Stopping Sight Distance + Storage Length

Figure 5-14 Right-Turn Lane Warrants (R > 50)

Projected 10-year Roadway ADT	Right-Turn ADT	Assumed Speed Change on Through Lane	Highway Posted Speed					
			25 MPH	35 MPH	40 MPH	45 MPH	50 MPH	55 MPH
			Decel Length*	Decel Length	Decel Length	Decel Length	Decel Length	Decel Length
Less Than 2,000	0 – 100	Full Reduction	–	–	–	–	–	–
	101 – 200	25 MPH	–	135	135	135	155	200
	Over 200	20 MPH	135	135	135	155	200	250
2,000 to 4,000 Vehicles	0 – 100	Full Reduction	–	–	–	–	–	–
	101 – 200	25 MPH	–	135	135	135	155	200
	201 – 300	20 MPH	135	135	135	155	200	250
	301 – 400	15 MPH	135	135	155	200	250	305
	Over 400	10 MPH	135	155	300	250	305	360
4,001 to 10,000 Vehicles	0 – 50	Full Reduction	–	–	–	–	–	–
	51 – 100	20 MPH	135	135	135	155	200	250
	101 – 200	15 MPH	135	135	155	200	250	305
	201 – 400	10 MPH	135	155	200	250	305	360
	Over 400	5 MPH	135	200	250	305	360	425
Over 10,000 Vehicles	0 – 50	Full Reduction	–	–	–	–	–	–
	51 – 100	15 MPH	135	135	155	200	250	305
	101 – 200	10 MPH	135	155	200	250	305	360
	201 – 400	5 MPH	135	200	250	305	360	425
	Over 400	0 MPH	155	250	305	360	425	495

***Note**: All decel lengths include a 50-foot taper length.*

* Factors to consider include sight distance, vertical grades, and driver population.

* Note: The decel length table is for unsignalized intersections only. If a signal is required, use queuing analysis to determine the storage lengths

*Stopping Sight Distance – Green Book Exhibit 3-1

*Cycle Length – 120 secs(assumed)

*Minimum Storage Length - 20 feet

*Storage Length = (Total Right Turns per hour/Total Cycle Lengths per hour)*Length of the Vehicle

*Minimum Deceleration Length - 150 feet

*Length of Vehicle - 25 feet

*Deceleration Length = Stopping Sight Distance + Storage Length

Figure 5-14 Left-Turn Lane Warrants at Unsignalized Intersections – 25 MPH

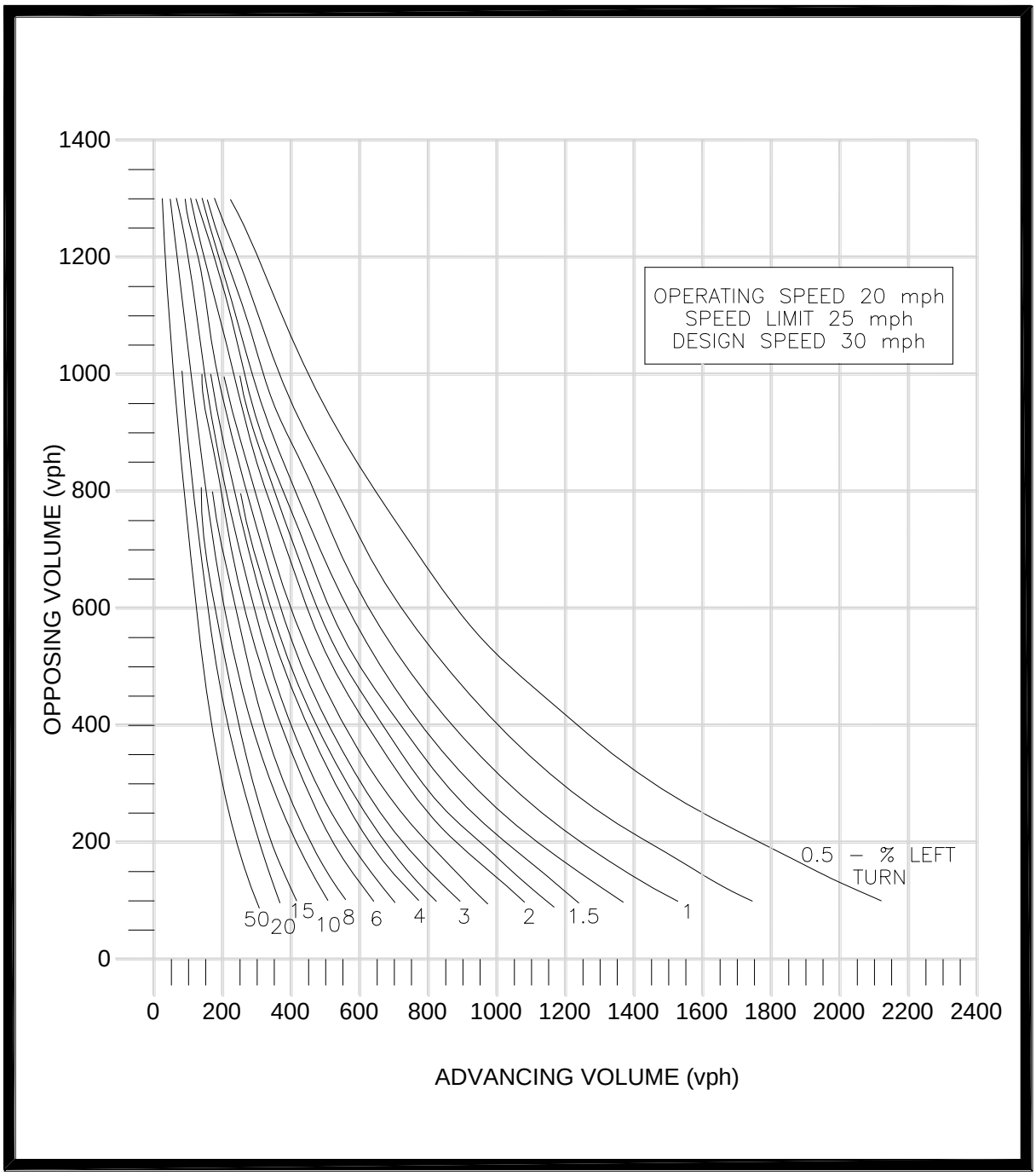


Figure 5-15 Left-Turn Lane Warrants at Unsignalized Intersections – 35 MPH

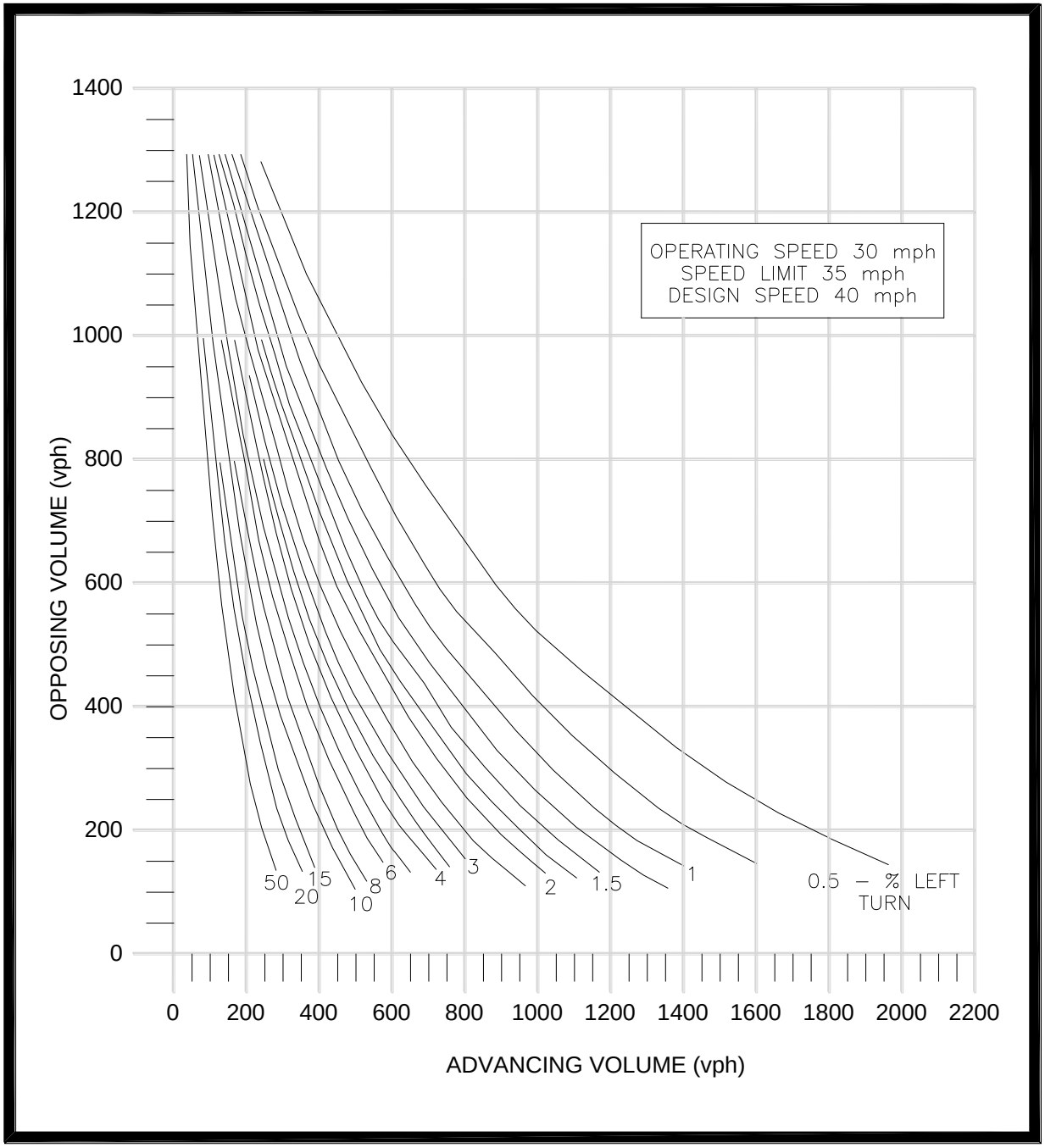


Figure 5-16 Left-Turn Lane Warrants at Unsignalized Intersections – 45 MPH

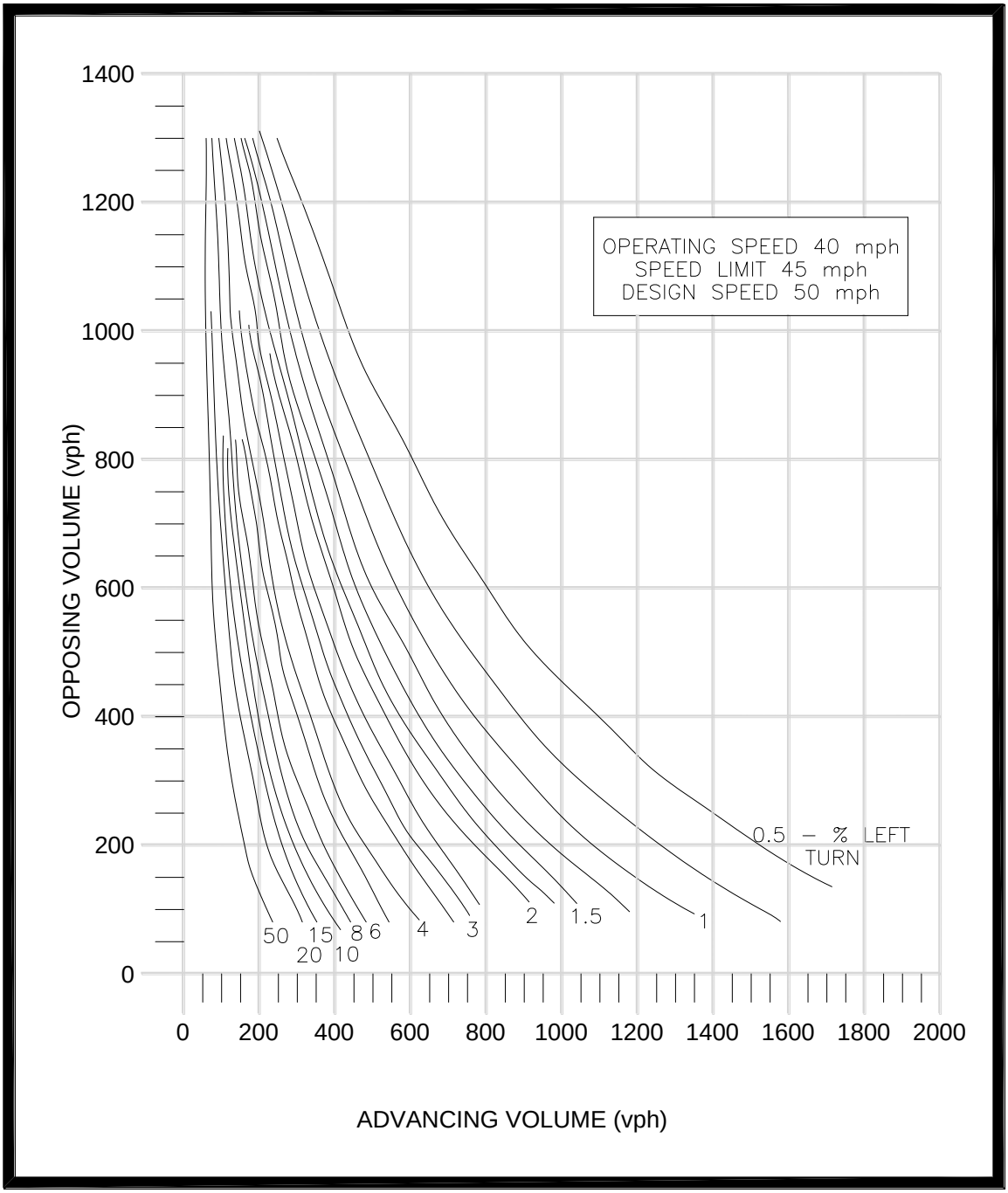


Figure 5-17 Left-Turn Lane Warrants at Unsignalized Intersections – 55 MPH

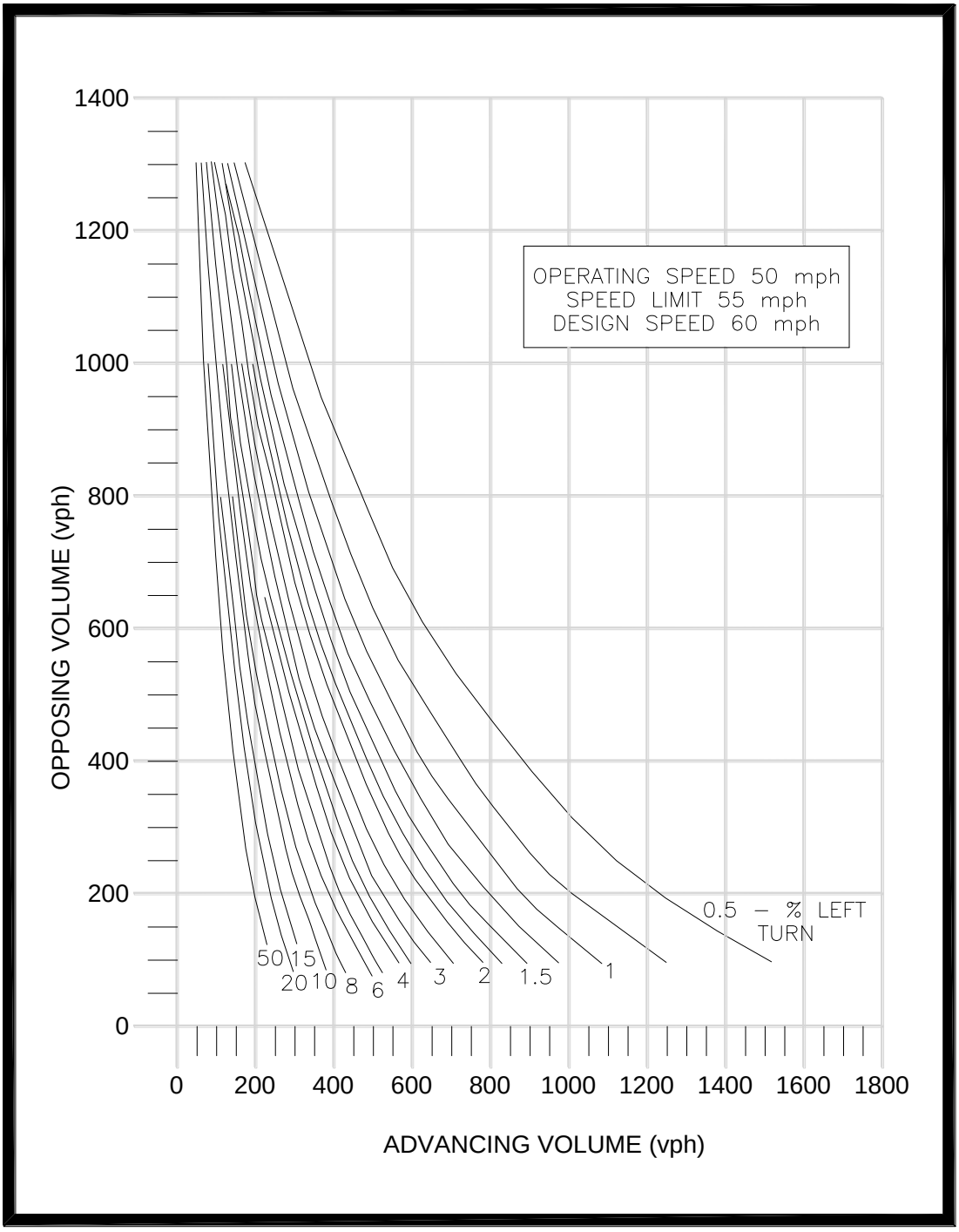


Figure 5-18 Typical Turning Lane Design for Divided Highways

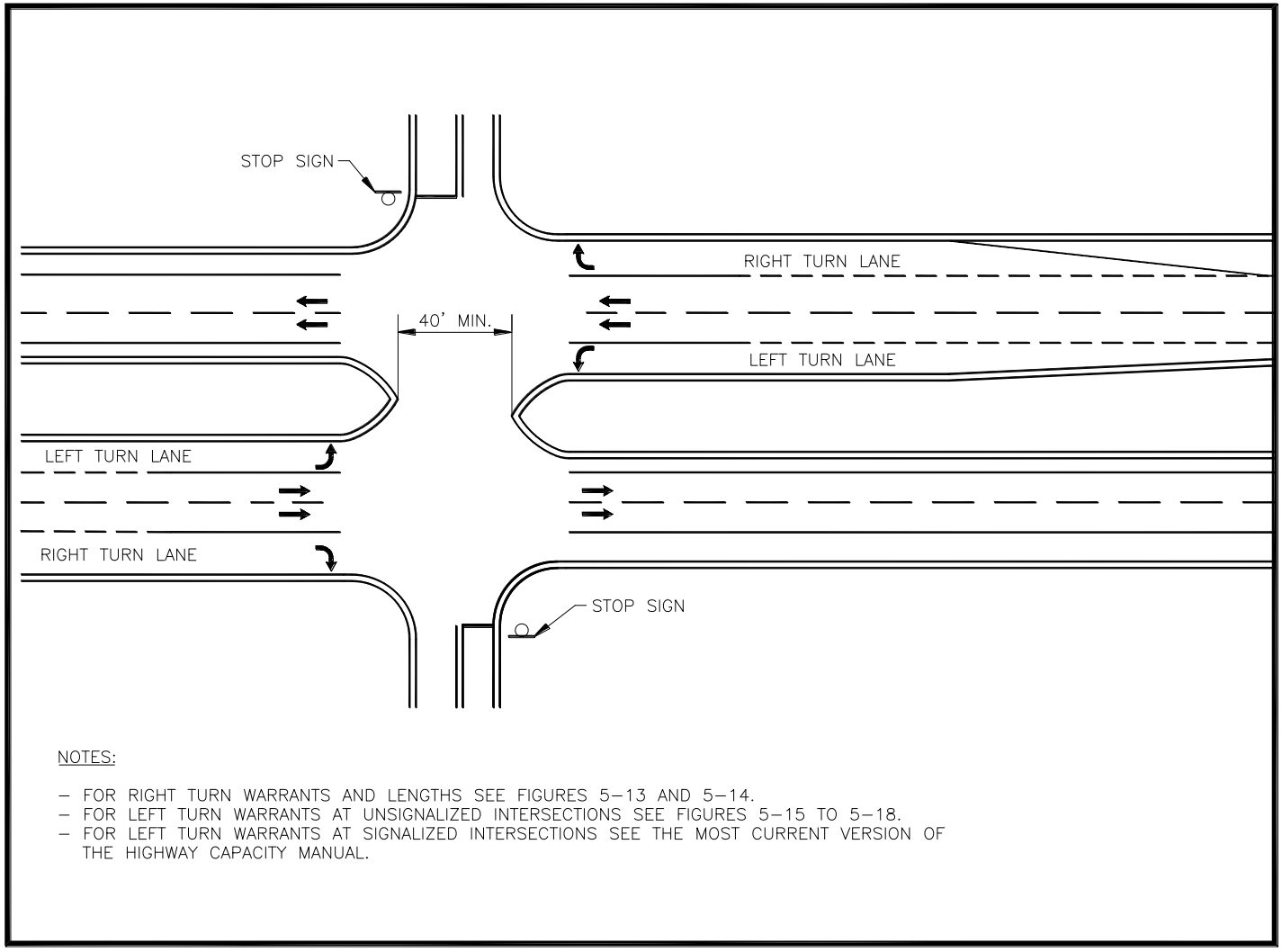


Figure 5-19 Length of Bypass Lanes for Two Lane Highways

Projected 10-year Roadway ADT	Left-Turn ADT	Storage Length (feet)	Taper Length (feet)					Assumed Speed Change on Through Lane
			Highway Posted Speed					
			25 MPH	35 MPH	40 MPH	45 MPH	50 MPH	
Less Than 2,000 Vehicles	0 – 50	–	–	–	–	–	–	–
	51 – 200	–	–	–	–	–	–	–
	Over 200	40	50	50	50	60	75	25
2,000 to 4,000 Vehicles	0 – 100	–	–	–	–	–	–	–
	101 – 200	40	50	50	50	60	75	25
	201 – 300	60	50	50	60	75	100	20
	301 – 400	80	50	60	75	100	125	15
	Over 400	Consider Separate Left-Turn Lane*						
Over 4,000 Vehicles	0 – 50	–	–	–	–	–	–	–
	51 – 100	20	50	50	60	75	100	20
	101 – 200	40	50	60	75	100	125	15
	201 – 400	80	50	75	100	125	150	10
	Over 400	Consider Separate Left-Turn Lane*						

Notes:

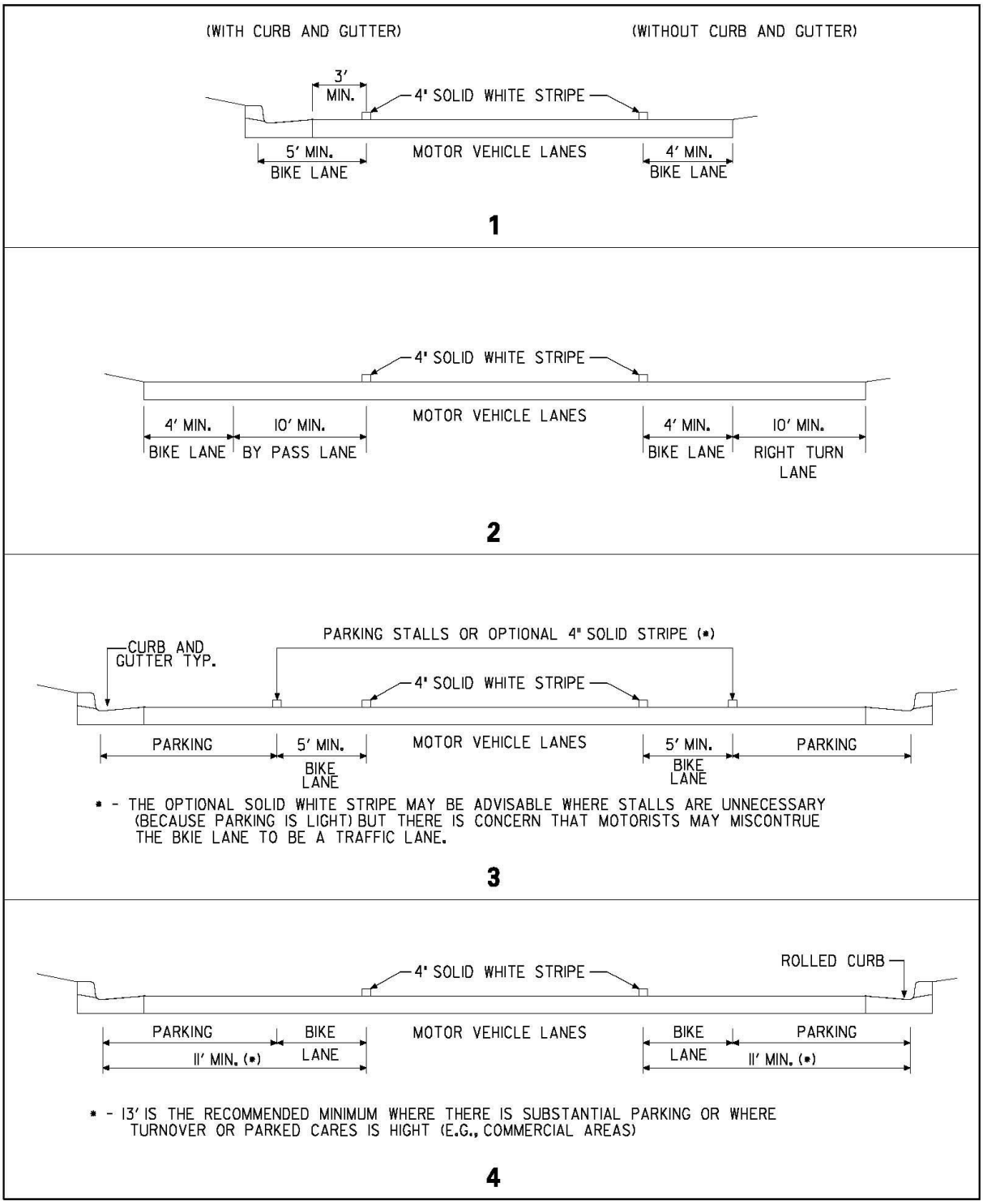
* See warrants for left-turn lane

* Note: The storage length table is for unsignalized intersections only. ~~If a signal is required, use queuing analysis to determine the storage lengths~~

$$\text{Storage Length} = \frac{\text{Left Turn ADT} \times 0.20}{30} \times 20 \text{ ft} \times 1.5$$

* Stopping Sight Distance – Green Book Exhibit 3-1
* Minimum Taper Length = 50 ft.
* Taper Length = Stopping Sight Distance/2.0

Figure 5-20 Typical Bike Lane Cross Sections



5.4 SIGHT DISTANCE

When an entrance is provided to a State-maintained roadway, the area adjacent to right-of-way shall be clear and free of obstructions. When approaching an intersection, a driver should have an unobstructed view of the intersecting roadway and the ability to view any approaching vehicles at the intersection.

1. The entrance location and design shall provide a clear line-of-sight for the driver of a vehicle preparing to enter the roadway in accordance with AASHTO location and design standards.

2. The departure sight triangle (see Figure 5-22) shall be used at entrances where a stopped driver on a minor road approach (entrance) attempts to depart from the intersection and enter or cross a major road. Calculated distance from center of travel lane to 18 feet from edge of through lane ~~10 feet behind stop bar~~ ((a) in Figure 5-22)) shall be used as the decision point in departure sight triangle. For minor subdivision plans, the calculated distance can be a minimum of 14.5 feet.

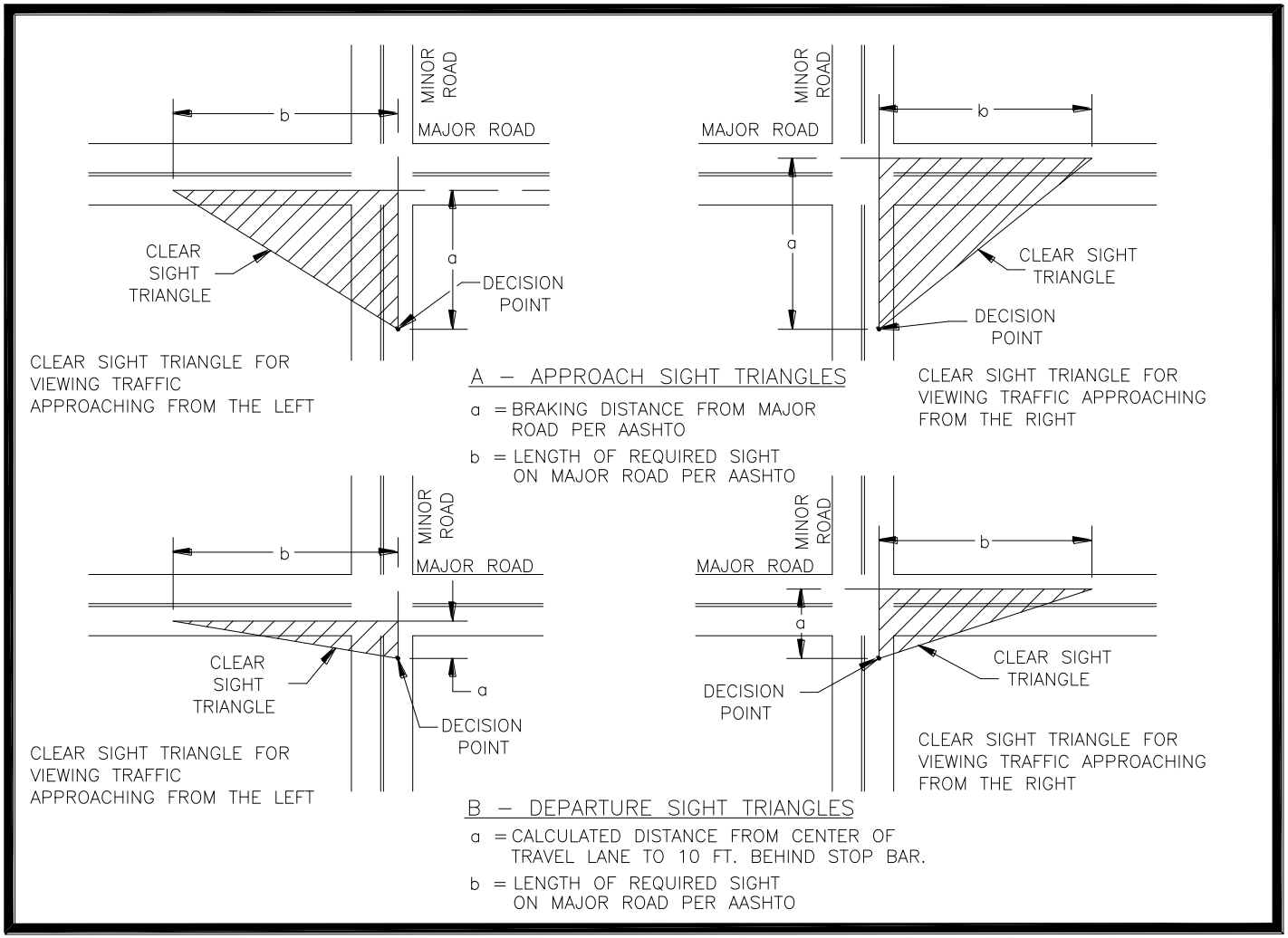
3. Any marquee sign located in conformance with the "Outdoor Advertising" requirements must be placed to maintain the required sight distance.

4. If the sight triangle established in accordance with the AASHTO standards is outside the existing right-of-way an easement shall be established to maintain the required sight distance. See Figure 5-22.

5. At subdivision entrances, the sight triangle shall be maintained and be free of plantings that could obstruct the sight distance.

6. Within the streets of a subdivision the placement of shrubbery or other visual barriers is prohibited within the triangular area formed by the intersection of two curb lines and a line joining the respective points on each of these lines at a distance of 30 feet from the point of intersection. These triangular areas shall be designated on the site plans as sight triangle easements. DelDOT shall have full authority to maintain the required sight distance. Fire hydrants shall not be considered visual barriers or hazardous obstacles.

Figure 5-21 Sight Distance Triangles



5.5 TYPICAL SECTIONS

1. Subdivision Streets – Typical sections for subdivision streets define the roadway width and cross slopes, stormwater runoff accommodations (curbs or ditches/ sideslopes), and clear zones.

2. State-maintained Roadways – If an entrance requires any modification or improvement on the State-maintained roadway, a typical section shall be required. The typical section shall show the proposed pavement widths and sideslopes as outlined in this section.

5.5.1 PAVEMENT WIDTHS

1. Subdivision Streets – Pavement widths vary for each subdivision street. See Figures 5-23 through 5-25 for typical cross sections.

2. State-maintained Roadways – The width of auxiliary lanes associated with the entrance design shall be a minimum of ten feet in width. If accommodations are being made for bikes on the facility, the width of the auxiliary lane shall be increased to a minimum width of 15 feet. The lateral offset of an auxiliary lane shall accommodate a minimum 11-foot wide through lane.

5.5.2 CURBS

Curbing may be used on subdivision streets to accommodate stormwater runoff. ~~When the design velocity of an open ditch section exceeds 4 ft./sec., a curb and gutter system shall be used.~~ Refer to the DelDOT *Standard Construction Details* for acceptable curb types.

A minimum of six inches of GABC type B shall be placed under all curbs and shall extend six inches beyond the back of curb.

Curbs shall be used for all entrances and islands located in the following areas:

- On all collectors and arterials as shown on DelDOT's Functional Classification Map.
- In municipalities and urban areas.
- Where the existing highway is curbed.
- Where necessary to control access.

- When the design velocity of an open ditch section exceeds 4 ft./sec., a curb and gutter system shall be used.

The type of curb to be used must be shown on the entrance drawing. Where the existing roadway is not curbed, the islands and curbs shall be placed no closer than ten feet from the edge of the roadway. Where the roadway is curbed, any curb returns of the driveway shall match the existing curb line.

No portable curb channelization shall be permitted on the entrance facility. Curbing for channelization should be constructed using a mountable-type curbing. Curbing can either be cast in place using forms or can be slip formed. Curbing placed on existing pavement shall be secured to the pavement surface by use of dowels, form pins, rebars, or other suitable means and must be approved by DelDOT. Special details must be included in the construction plans. Channelization may be poured monolithically.

In rural areas curbing may be omitted if access and drainage can be effectively controlled by an existing roadside ditch or other means as determined by DelDOT.

Curbs being used on roadways with a ~~posted~~ design speed limit of 50 mph or greater shall be limited to a 4 inch vertical face.

5.5.3 DITCHES AND SIDESLOPES

1. Subdivision Streets – The ditch and sideslope sections for subdivision streets shall meet the minimum slopes as shown on Figures 5-23 through 5-25.

The minimum depth of a ditch has been established to provide for sub-surface drainage. This minimum depth must be maintained throughout the subdivision. This depth can vary if a swale over a closed drainage system is used.

To minimize rutting and erosion of the roadside due to on-street parking, the site plan shall be developed to allow for three vehicles to be stored in the driveway beyond the right-of-way. A note on the record plan shall state this requirement.

A six-foot grass shoulder shall be treated with an approved turf reinforcement mat to protect the edge of the pavement and to minimize the potential for soil erosion. In addition, design stormwater velocities within the open ditch section shall be limited to a maximum of five feet per second.

2. State-Maintained Roadways – DelDOT's *Road Design Manual* and AASHTO's Roadside Design Guide shall be used when designing sideslopes and ditch sections associated with any entrance improvements.

   If pipes are used at site entrances in conjunction with an open drainage system, the longitudinal slope from the entrance pavement to the top of the pipe shall be six-to-one (6:1).

5.5.4 UNDERDRAINS

The long-term presence of water within the pavement structure is largely responsible, directly and indirectly, for many of the distress and performance problems in pavement systems. The addition of longitudinal perforated underdrains is a feasible and cost-effective option. Underdrains are a system of perforated pipes that collect and transmit the water to an outfall site.

Underdrains shall be installed on all subdivision streets. The typical section shall show the location of the underdrain in accordance with Figures 5-23 through 5-25. Refer to DelDOT's *Standard Construction Details* for dimensions and materials.

If the developer can, through an engineering analysis, signed and sealed by a Professional Engineer registered in Delaware, prove underdrains are not warranted, DelDOT shall grant a waiver on the required underdrains referenced above. All costs associated with the developer's engineering analysis shall be at their cost. DelDOT will not provide any reimbursement.

The engineering analysis shall include the following:

1. Average water table for the last 25 years for the area in question.
2. Soil boring information including characteristics and AASHTO classification.
3. Infiltration rate (tested in accordance with ASTM D5126-90 "Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone").
4. Topography maps for the area in question,
5. USGS wetland delineation maps.

Upon submission of all the information listed above, DelDOT will review the analysis and provide a written response to the developer's request for non-utilization of underdrains.

5.5.5 CLEAR ZONE

The clear zone is defined in AASHTO's Roadside Design Guide as "the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry."

Adequate lateral clearance between the edges of traffic lanes and roadside obstructions has been shown to be a very important safety factor. Vehicles leaving the roadway should have a reasonable opportunity to recover control and

return to the roadway without overturning or colliding with roadside obstacles such as trees, poles, headwalls, or other large objects. The combination of a relatively flat slope and an obstacle-free roadside within the prescribed clear zone helps this situation.

The determination of a clear zone is a function of speed, volume, curvature, and embankment slope. The current edition of AASHTO's Roadside Design Guide should be used for determining clear zone widths. For entrances onto rural collectors and rural local roads, a minimum clear zone width of ten feet from the edge of travel lane shall be provided. For subdivision streets, a minimum clear zone of three feet measured from the back of curb shall be provided.

Some roadside appurtenances, such as guardrails, breakaway light poles and signs using breakaway posts, may be part of a proposed development. If they are located within the specified clear zone they must be crashworthy in accordance with NCHRP Report 350 Test Level III Criteria. They should also be placed in the safest available location, minimizing their use when possible.

For guardrails within the clear zone, it is desirable to maintain a minimum two-foot lateral clearance between the outer edge of the usable shoulder and the face of the rail. Guardrails in and of themselves present a hazard and only should be used as a last resort if objects can not be moved or the required sideslopes can not be provided. At bridge approaches, guardrails should either match the width of the bridge or taper to meet the bridge rail. Refer to DelDOT's *Standard Construction Details* for more information on guardrail types and end treatments.

Figure 5-23 Subdivision Street Typical Section (With Curb)
(Not to Scale)

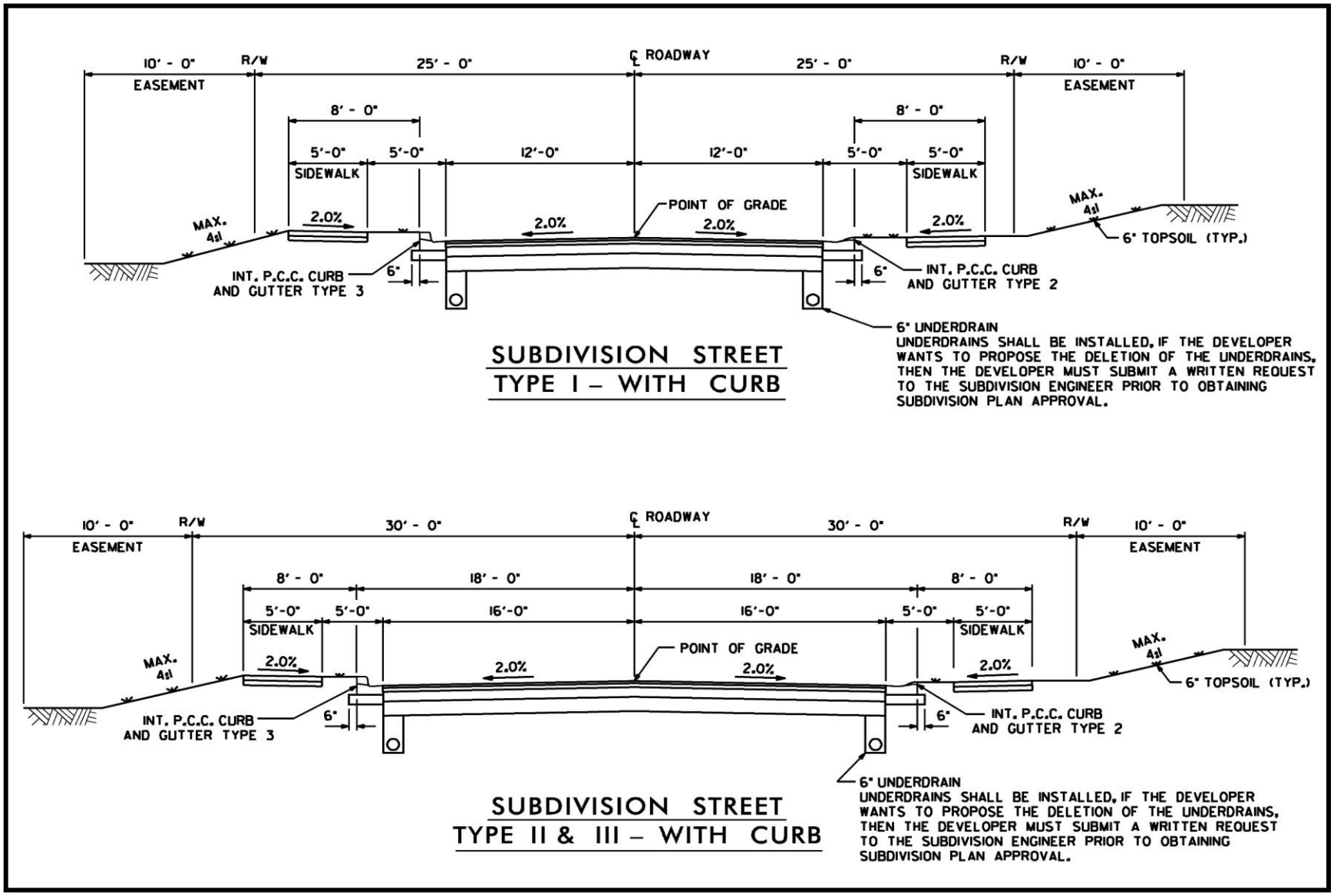
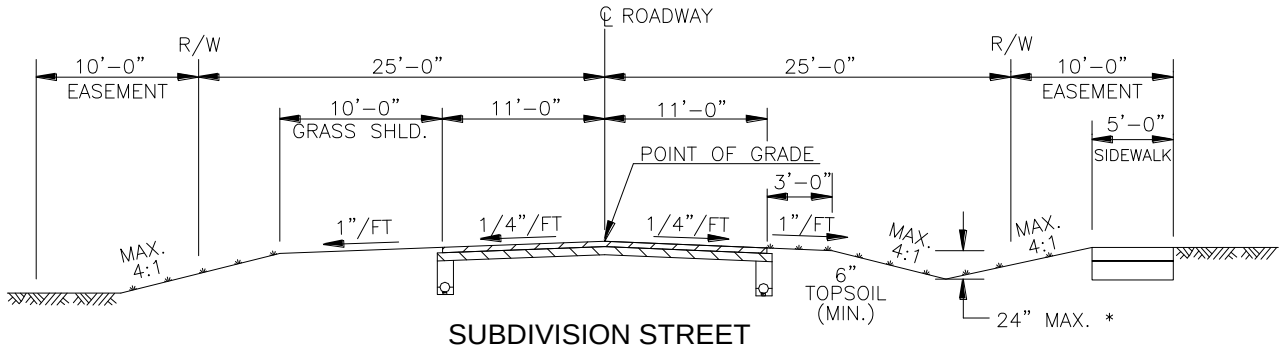
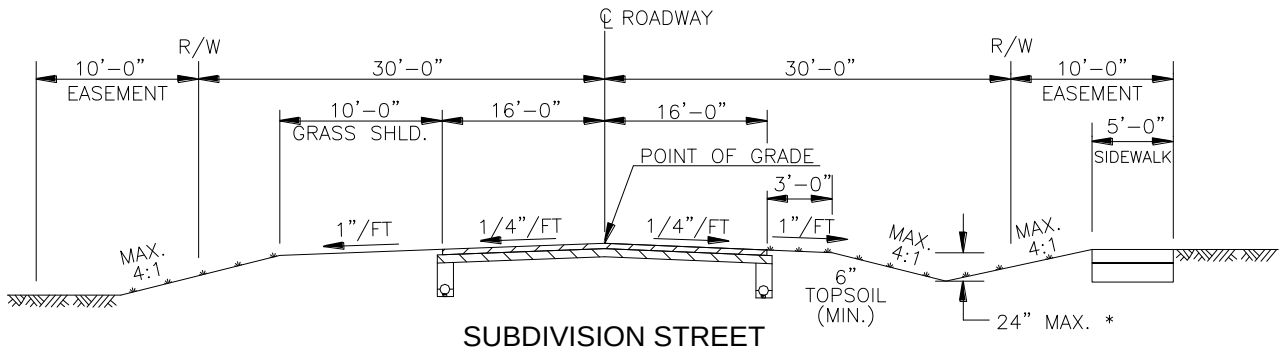


Figure 5-24 Subdivision Street Typical Section (Without Curb)
(Not to Scale)



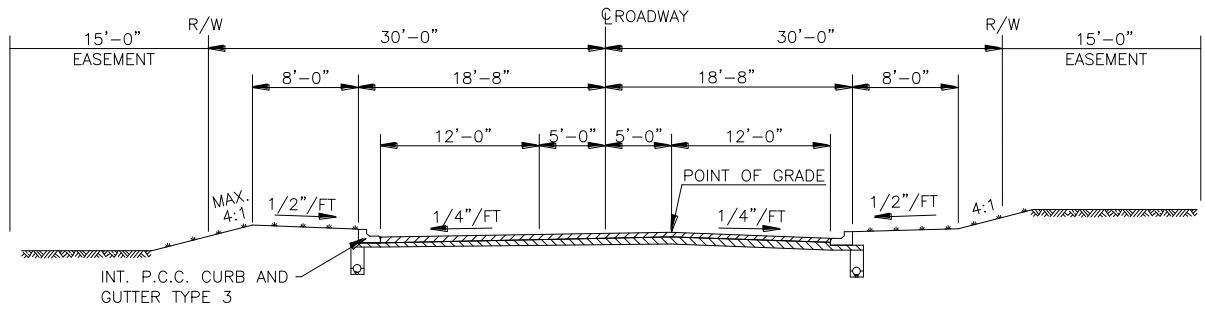
SUBDIVISION STREET
TYPE I - WITHOUT CURB



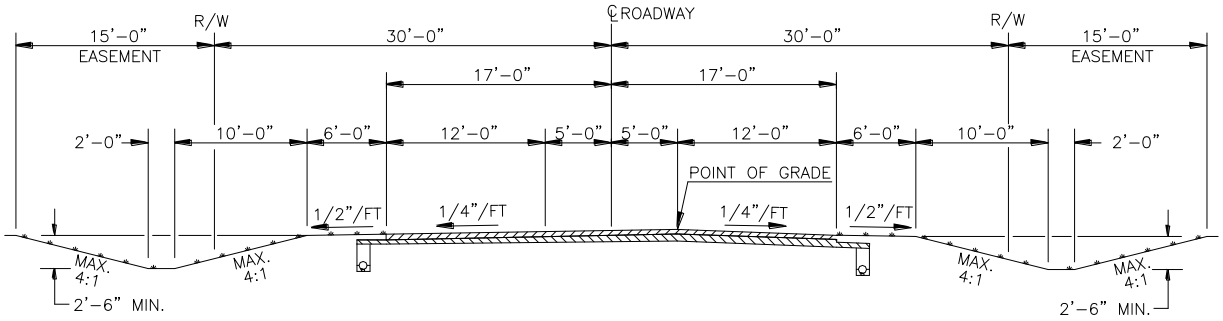
SUBDIVISION STREET
TYPE II AND TYPE III - WITHOUT CURB

* NOTE:
DEEPER DITCHES MAY BE ALLOWED TO ACCOMODATE UNDER DRAIN OUTFALL FOR CONSERVATION DESIGN FEATURES. MUST BE APPROVED BY DELDOT.

Figure 5-25 Industrial Streets Typical Section (With and Without Curb) (Not to Scale)



TYPICAL SECTIONS INDUSTRIAL STREETS
WITH CURB (60' ROW)



TYPICAL SECTIONS INDUSTRIAL STREETS
WITHOUT CURB (60' ROW)

Note:
Place Sidewalk Where Applicable.

5.6 PAVEMENT SECTIONS

Pavement sections are to be designed based on the ADT utilizing the planned roadway and the existing subsurface conditions. Acceptable pavement sections have been provided in Figure 5-22 and 5-23. If there is a concern with existing soil conditions DelDOT may perform subsurface investigations, at no cost to the developer, to determine subsurface conditions and if undercutting may be required prior to pavement box construction. This request shall be made prior to preliminary plan submission. The pavement sections listed in Figure 5-27 and 5-28 are designed to meet the required Structural Numbers (SN) and meet the following four conditions/criteria:

1. At least three and one-half inches of hot-mix asphalt pavement must be placed;
2. At least eight inches of graded aggregate base course (GABC) must be placed;
3. Hot-mix asphalt may only be placed directly over GABC, never placed directly over select borrow or subgrade; and
4. Undisturbed sub-grade and / or select borrow cannot be counted in Structural Number calculations.

Materials placed for construction of roadways in subdivisions, entrances, and industrial roadways must not be constructed in lifts that violate DelDOT's minimum and maximum lift thickness. The allowable lift thickness and structural values for materials used are shown in Figure 5-26.

Figure 5-26 Material Properties

	Lift Thickness		SN Contribution New (old)
	Minimum	Maximum	
Hot-Mix Asphalt Type C	1 ¼"	2"	0.4 (0.35)
Hot-Mix Asphalt Type B	2 ¼"	3"	0.4 (0.35)
Bituminous Concrete Base Course (BCBC)	3"	6"	0.32 (0.29)
GABC	–	8"	0.14 (0.14)

5.6.1 SUBDIVISION STREETS

All subdivision streets and entrances shall be paved with a hot-mix asphalt or Portland cement concrete surface. Pavement sections for internal subdivision streets are to be built to serve the traffic generated from the development upon completion, including all construction related traffic of the development. Should additional phases be planned that will be connected to the portion of the development under construction, the pavement section for the street shall be such that it will support both the phase under construction and the future phases. Figure 5-26 shows examples of pavement sections acceptable for use on internal subdivision streets.

When calculating the structural number of a section, consider whether traffic has been on the layer. For example:

A subdivision has an ADT of 136. Figure 5-27 requires that the structural number at completion be 2.27, while the section in place prior to 80% completion of the development must have a structural value of 1.65. To determine the structural value of the overall section, it is assumed that the materials in place (B and GABC) prior to completion have lost some of their structural value. Therefore, the calculation to determine the structural capacity of the section uses a combination of the new and old SN contribution values and is:

$$SN_{total} = Thickness_C * SN_{C-New} + Thickness_B * SN_{B-Old} + Thickness_{GABC} * SN_{GABC-old}$$

$$SN_{Total} = 1.25*0.4 + 2.25*0.35 + 8*.14 = 2.41 > 2.27$$

The structural number meets the requirements structurally for the overall value and meets the four conditions set forth in the beginning of this section. Once it is established that these are sufficient, the section must be verified to meet the required structural value. This calculation uses all new SN contribution values and is as follows:

$$SN_{80\%} = Thickness_B * SN_{B-New} + Thickness_{GABC} * SN_{GABC-New}$$

$$SN_{80\%} = 2.25*0.4 + 8*.14 = 1.90 > 1.65$$

This calculation shows how the required section is calculated and may be used to adjust thickness requirements of example sections as long as all requirements are met and lift thickness values are not violated.

Figure 5-27 Pavement Design Chart for Internal Subdivision Streets

ADT	Required Structural Number – Overall (prior to 80% completion)	Pavement Section
1 – 150	2.27 (1.65)	1 ¼” Type C 2 ¼” Type B 8” GABC
151 – 500	2.78 (2.05)	1 ½ ” Type C 3” Type B 8” GABC
501 – 1000	3.12 (2.32)	2” Type C 3” Type B 10” GABC (two equal lifts)
1001 – 2000	3.49 (2.63)	2” Type C 3” Type B 12” GABC (two equal lifts)
2001 – 3000	3.73 (2.84)	2” Type C 3” Type B 14” GABC (two equal lifts)
3001 – 5000	4.05 (3.13)	1 ¼” Type C 2 ¼” Type B 6” BCBC 8” GABC
> 5000	Submit data to DelDOT for Pavement design	

5.6.2 ENTRANCES

Pavement sections for entrances on State-maintained roadways are to be designed using the average daily traffic using that entrance or 20% of the mainline traffic, whichever is greater (see Figure 5-27). Other sections to be constructed in conjunction with the entrance to the highway that must be submitted for design by DelDOT are:

- Right-turn lanes.
- Bypass lanes.
- Left-turn lanes.
- Entrances that do not conform to the description listed in Figure 5-28 for each class.
- Class E entrances.

Figure 5-28 Pavement Design Chart for Entrances

CLASS	Required Structural Number	Pavement Section
Class A • Traffic Volume less than 50 ADT • No Trucks	2.40	1 ¼” Type C 2 ¼” Type B 8” GABC
Class B • Traffic Volume 51 to 500 ADT • No trucks	2.78	1 ¼” Type C 3” Type B 8” GABC
Class C • Traffic Volume 501 to 2000 ADT • Less than 15 light duty trucks per day	3.49	2” Type C 3” Type B 11” GABC (two equal lifts)
Class D • Traffic Volume 2001 to 5000 ADT • Less than 50 light duty trucks per day	4.05	1 ¼” Type C 2 ¼” Type B 5” BCBC 8” GABC
Class E • Traffic volume > 5000 ADT • Over 50 trucks per day	Submit data to DelDOT for Pavement design	

5.6.3 INDUSTRIAL STREETS / ENTRANCES

Streets that are to be used as entrances to industrial parks must be built to State requirements. DelDOT must perform all pavement designs for proposed industrial streets, because no industrial street is anticipated to carry similar loadings.

5.7 DRAINAGE DESIGN

5.7.1 GENERAL

Surface runoff water is a serious threat to both the physical integrity and the serviceability of roadway facilities. Runoff water must be adequately controlled so that it may pass through and be removed from the roadway area without damaging the roadway or adjacent properties.

As part of the overall design, the developer's engineer shall provide adequate drainage of the roadway and the site in accordance with all applicable standards. DelDOT has jurisdiction over drainage and any drainage system that impacts the State right-of-way.

A drainage report shall be submitted with the construction plans to verify pipe sizing, Hydraulic Grade Line (HGL), pipe cover, velocities, stabilization and water spread on the roadway.

5.7.2 DRAINAGE CRITERIA

Drainage criteria for different drainage installations are discussed below and summarized in Figure 5-30.

5.7.2.1 Culverts

A culvert is a drainage structure which transports water from a natural drainage course.

Based on the peak flow and watershed area, an appropriate tool for determining runoff shall be determined. The following criteria shall be used for culverts:

- A 25-year storm frequency shall be used.
- The headwater elevation shall be one foot below the edge of the proposed shoulder. The resulting ponding shall not negatively impact the highway or the adjacent property.
- The minimum pipe size shall be 18 inches in diameter.

See Hydraulic Design Series Number 5 (HDS 5), *Hydraulic Design of Highway Culverts*, September 2001, USDOT, FHWA.

5.7.2.2 Storm Sewers

The following criteria shall be used for storm sewers:

- A 10-year storm frequency shall be used.
- For sump conditions a 25-year storm frequency shall be used.
- The hydraulic gradient shall be no higher than one foot below the top of the grate for ten-year storms and just below the top of the grate for 25-year storms.

The following criteria shall be used in calculating HGL:

- Tail water elevation of the outfall, if it is higher than the normal crown of the outfall pipe.

  OR
- Normal crown of the outfall pipe. For dry ponds, the pipe invert elevation shall be equal to the bottom of pond elevation. For wet ponds, the pipe invert elevation shall be equal to or higher than the normal pool elevation of the pond.
- For a storm drain system discharging into a stream, the invert of the discharging pipe shall be no lower than the level of the base flow. If the stream is dry most of the time, the invert shall be at least a foot above the stream bottom. The HGL shall start from the crown of the pipe.

If the Natural Resources Conservation Service (NRCS) method is used in calculating the HGL, the engineer shall specify in the report or on the plans which criterion was used to determine the HGL elevations.

See *Design of Urban Highway Drainage - The State of the Art*, August 1979, USDOT, FHWA for additional information on storm sewer design.

Culverts and storm sewers can be made from Reinforced Concrete Pipe (RCP), Metal Pipe (MP) or High Density Polyethylene (HDPE). The use of these material types is outlined in Figure 5-29. Refer to DGM 1-20 pipe materials for further information.

5.7.2.3 Inlet Design

Inlet design for entrances shall be in accordance with DelDOT's *Road Design Manual*. The following criteria shall be used for inlets within subdivision streets:

- A 10-year storm frequency.
- The spread of water shall be no greater than 8 feet from the flow line of the curb.
- Maximum spacing of inlets is 300 feet.

5.7.2.4 Parallel Ditching

The following criteria shall be used for parallel ditching:

- A 5-year storm frequency.
- The depth of the water in the ditch shall not be higher than six inches below the edge of the proposed shoulder.

Figure 5-29 Material Usage for Culverts and Storm Sewers

	RCP			HDPE	MP
	Class III	Class IV	Class V***		
Embankment Height*	> (1) foot	6 inches to 1 foot	< 6 inches	• 1 foot on local roads. • 2 feet on collectors & arterials.**	• 1 foot on local roads. • 2 feet on collectors & arterials.**

* *From top of pipe to bottom of pavement base.*
** *The use of MP and HDPE must be approved by DelDOT.*
*** *The use of Class V pipe must be approved by DelDOT.*

5.7.2.5 Drainage Easements

Drainage easements are required for all drainage facilities handling subdivision street runoff which are not located within a dedicated right-of-way. Underground drainage facilities shall require a 20-foot drainage easement. The pipe must be located in the center of the easement. Open drainage facilities shall require a width equal to the width of the facility at the proposed ground level plus a 10-foot easement on one side and a minimum of a five-foot easement on the other side of the open drainage facility.

5.7.2.6 Offsite Easements

Drainage easements are required for offsite drainage facilities in order to provide positive drainage from the development to the point of discharge. Development drainage must be carried to a natural or existing drainage course. Copies of drainage easements are to be provided to DelDOT and referenced on the record plan.

5.7.2.7 Drainage Discharge

The outfall shall be carried to a point of positive outfall in order to prevent downstream flooding. A detailed hydraulic and stormwater

analysis downstream any distance as deemed necessary shall be required to determine the impacts to the drainage system and to ensure that stormwater impacts for surrounding property owners is minimized.

5.7.2.8 Drainage Design Report

A drainage design report containing the following minimum data shall be prepared for each project.

a. Drainage area plan.
b. Time of concentration.
c. Weighted runoff coefficient.
d. Design discharge.
e. Type and slope of drainage facility.
f. Spacing of drainage inlets.
g. Erosion protection methods – riprap sizing calculations.
h. Inlet spread calculations.
i. Culverts – headwater elevations.
j. Hydraulic Grade Line (HGL) calculations.
k. Full flow pipe velocity.
l. Actual flow pipe velocity.
m. Difference between inlet grate elevation and HGL elevation.

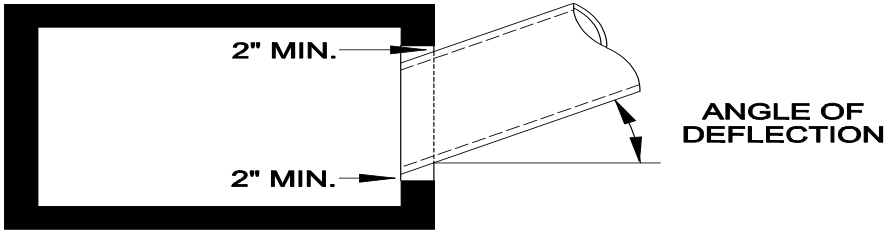
See Figures 5-37 through 5-42 for various drainage charts that are to be used in the preparation of the drainage report.

Figure 5-30 Drainage Criteria

Type	Design Frequency		Minimum Flow Full Velocity (ft/sec)	Maximum Allowable Velocity (ft/sec)	Free Board from Edge of Roadway
	Normal	Sag			
Culvert	25	25	2	–	1 foot
Storm Sewer	10	25	2	8	1 foot
Roadside Ditch	10	10	–	3	6 inches
Inlets	10	10	2	8	–

Figure 5-31 Angle of Deflection for Circular Reinforced Concrete Pipes Entering and Exiting Inlet Boxes

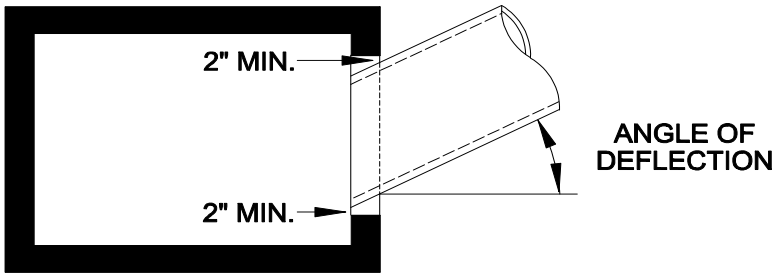
Inlet Size	Pipe Sizes (Including Wall Thickness)												
	12" (16")	15" (19.5")	18" (23")	21" (26.5")	24" (30")	27" (33.5")	30" (37")	33" (40.5")	36" (44")	42" (51")	48" (58")	54" (65")	60" (72")
34" x 18"	47.16°	39.09°	29.95°	18.67°	0.00°								
34" x 24"	47.16°	39.09°	29.95°	18.67°	0.00°								
48" x 30"	61.12°	56.19°	51.04°	45.60°	39.74°	33.26°	25.81°	16.45°	0.00°				
48" x 48"	61.12°	56.19°	51.04°	45.60°	39.74°	33.26°	25.81°	16.45°	0.00°				
66" x 30"	69.59°	66.23°	62.80°	59.29°	55.68°	51.94°	48.03°	43.92°	39.53°	29.51°	15.86°		
66" x 48"	69.59°	66.23°	62.80°	59.29°	55.68°	51.94°	48.03°	43.92°	39.53°	29.51°	15.86°		
66" x 66"	69.59°	66.23°	62.80°	59.29°	55.68°	51.94°	48.03°	43.92°	39.53°	29.51°	15.86°		
72" x 24"	71.40°	68.36°	65.27°	62.12°	58.89°	55.57°	52.14°	48.57°	44.83°	36.62°	26.78°	12.75°	
72" x 48"	71.40°	68.36°	65.27°	62.12°	58.89°	55.57°	52.14°	48.57°	44.83°	36.62°	26.78°	12.75°	
72" x 72"	71.40°	68.36°	65.27°	62.12°	58.89°	55.57°	52.14°	48.57°	44.83°	36.62°	26.78°	12.75°	
34" x ***18"***													
34" x ***24"***	23.28°	4.25°											
48" x ***30"***	40.16°	30.05°	17.47°										
48" x ***48"***	61.12°	56.19°	51.04°	45.60°	39.74°	33.26°	25.81°	16.45°	0.00°				
66" x ***30"***	40.16°	30.05°	17.47°										
66" x ***48"***	61.12°	56.19°	51.04°	45.60°	39.74°	33.26°	25.81°	16.45°	0.00°				
66" x ***66"***	69.59°	66.23°	62.80°	59.29°	55.68°	51.94°	48.03°	43.92°	39.53°	29.51°	15.86°		
72" x ***24"***	23.28°	4.25°											
72" x ***48"***	61.12°	56.19°	51.04°	45.60°	39.74°	33.26°	25.81°	16.45°	0.00°				
72" x ***72"***	71.40°	68.36°	65.27°	62.12°	58.89°	55.57°	52.14°	48.57°	44.83°	36.62°	26.78°	12.75°	



*See Standard Construction Detail D-4 for clarification.

Figure 5-32 Angle of Deflection of Horizontal Elliptical Concrete Pipes Entering and Exiting Inlet Boxes

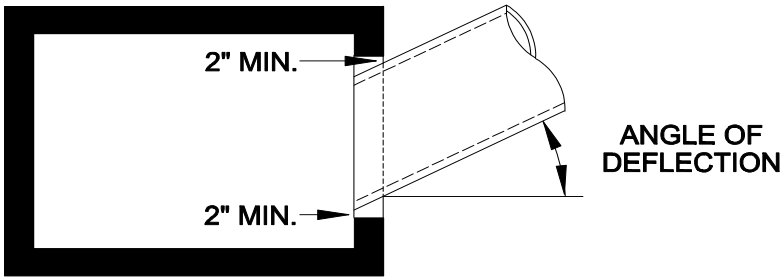
Inlet Size	Pipe Sizes (Including Wall Thickness)								
	14" x 23" (19 1/2" x 28 1/2")	19" x 30" (25 1/2" x 36 1/2")	22" x 34" (29" x 41")	24" x 38" (31 1/2" x 45 1/2")	27" x 42" (34 1/2" x 49 1/2")	29" x 45" (38" x 54")	32" x 49" (41 1/2" x 58 1/2")	34" x 53" (44" x 63")	38" x 60" (49" x 71")
RCP Equiv.	18"	24"	27"	30"	33"	36"	39"	42"	48"
34" x 18"	10.01°								
34" x 24"	10.01°								
48" x 30"	42.31°	26.96°	14.83°						
48" x 48"	42.31°	26.96°	14.83°						
66" x 30"	57.24°	48.60°	43.31°	37.55°	31.84°	24.37°	14.56°		
66" x 48"	57.24°	48.60°	43.31°	37.55°	31.84°	24.37°	14.56°		
66" x 66"	57.24°	48.60°	43.31°	37.55°	31.84°	24.37°	14.56°		
72" x 24"	60.28°	52.63°	48.04°	43.16°	38.48°	32.67°	25.98°	5.46°	
72" x 48"	60.28°	52.63°	48.04°	43.16°	38.48°	32.67°	25.98°	5.46°	
72" x 72"	60.28°	52.63°	48.04°	43.16°	38.48°	32.67°	25.98°	5.46°	
34" x ***18"***									
34" x ***24"***									
48" x ***30"***									
48" x ***48"***	42.31°	26.96°	14.83°						
66" x ***30"***									
66" x ***48"***	42.31°	26.96°	14.83°						
66" x ***66"***	57.24°	48.60°	43.31°	37.55°	31.84°	24.37°	14.56°		
72" x ***24"***									
72" x ***48"***	42.31°	26.96°	14.83°						
72" x ***72"***	60.28°	52.63°	48.04°	43.16°	38.48°	32.67°	25.98°	5.46°	



*See Standard Construction Detail D-4 for clarification.

Figure 5-33 Angle of Deflection of Arched Concrete Pipes Entering and Exiting Inlet Boxes

Inlet Size	Pipe Sizes (Including Wall Thickness)							
	11" x 18"	13 1/2" x 22"	15 1/2" x 26"	18" x 28.5"	22.5" x 36.25"	26 5/8" x 43 3/4"	31 5/16" x 51 1/8"	36" x 58 1/2"
	(15 1/2" x 22 1/2")	(18 1/2" x 27 1/2")	(21" x 31 1/2")	(24" x 34 1/2")	(29 1/2" x 43 1/4")	(34 5/8" x 51 3/4")	(40 5/16" x 60 1/8")	(46" x 68 1/2")
RCP Equiv.	15"	18"	21"	24"	30"	36"	42"	48"
34" x 18"	31.35°	14.68°						
34" x 24"	31.35°	14.68°						
48" x 30"	51.79°	43.97°	37.05°	31.26°	5.34°			
48" x 48"	51.79°	43.97°	37.05°	31.26°	5.34°			
66" x 30"	63.30°	58.27°	54.09°	50.84°	40.50°	28.29°		
66" x 48"	63.30°	58.27°	54.09°	50.84°	40.50°	28.29°	9.62°	
66" x 66"	63.30°	58.27°	54.09°	50.84°	40.50°	28.29°	9.62°	
72" x 24"	65.72°	61.20°	57.48°	54.60°	45.64°	35.66°	23.22°	
72" x 48"	65.72°	61.20°	57.48°	54.60°	45.64°	35.66°	23.22°	
72" x 72"	65.72°	61.20°	57.48°	54.60°	45.64°	35.66°	23.22°	
34" x ***18"***								
34" x ***24"***								
48" x ***30"***	19.52°							
48" x ***48"***	51.79°	43.97°	37.05°	31.26°	5.34°			
66" x ***30"***	19.52°							
66" x ***48"***	51.79°	43.97°	37.05°	31.26°	5.34°			
66" x ***66"***	63.30°	58.27°	54.09°	50.84°	40.50°	28.29°	9.62°	
72" x ***24"***								
72" x ***48"***	51.79°	43.97°	37.05°	31.26°	5.34°			
72" x ***72"***	65.72°	61.20°	57.48°	54.60°	45.64°	35.66°	23.22°	



5.7.3 PERSONNEL GRATE FOR PIPE INLET

Personnel grates shall be installed on pipe inlets to improve safety by preventing people, animals and debris from entering stormwater pipes 12 inches and larger with open inlets (i.e., without a grate or drainage inlet) for which full daylight is not visible when looking through the pipe to the other end.

5.7.3.1 Design Guidance

Since safety grates become blocked by debris, thus potentially decreasing drainage flow and increasing maintenance needs, engineers shall evaluate designs to avoid open inlets to stormwater pipes. One alternative to consider is creating a separation of pipe runs by realigning pipes in a long pipe run into relatively short, straight runs, with daylight visible from the openings.

A personnel grate for a pipe inlet shall be considered as the last resort in designing inlets for storm drain systems. Grates shall be secured to prevent entry by the public but allow access to the storm drainpipe for maintenance and repair.

Construction details and specifications shall be included in the construction plans.

5.7.4 HYDROLOGY

The Rational Method of estimating the storm runoff shall be utilized for all subdivision streets and waterway openings equal to or less than 19 square feet. The proposed method for computing the storm runoff requiring a waterway opening greater than 19 square feet shall be approved by DelDOT. The Rational Method of design is as follows:

$$Q = C\,i\,A$$

Where,

Q = Rate of runoff in cubic feet per second.

C = Weighted runoff coefficient (average of the coefficients assigned to the different types of contributing areas).

i = Average rainfall intensity, inches per hour, for the selected frequency and for duration equal to the time of concentration.

A = drainage area, in acres, tributary to the point under design.

Values of runoff coefficient (C) for various types of contributing areas indicated in Figure 5-34 shall be utilized in the solution of this method of design.

Figure 5-34 Runoff Coefficient (C) for Use in Rational Method

Type of surface	Runoff coefficient (C)
Rural areas	0.15-0.3
Concrete or sheet asphalt pavement	0.8-0.9
Asphalt macadam pavement	0.6-0.8
Gravel roadways or shoulders	0.4-0.6
Bare earth	0.2-0.9
Steep grassed areas (2:1)	0.5-0.7
Turf meadows	0.1-0.4
Forested areas	0.1-0.3
Cultivated fields	0.2-0.4

For flat slopes or permeable soil, use the lower values. For steep slopes or impermeable soil, use the higher values.

Contributing drainage areas shall be evaluated based on the fully developed land in accordance with the existing or proposed zoning.

Figure 5-35 Runoff Coefficient (C) for Different Type of Surface

Type of surface	Runoff coefficient (C)
Flat residential, with about 30% of area impervious	0.40
Flat residential, with about 60% of area impervious	0.55
Moderately steep residential, with about 50% of area impervious	0.65
Moderately steep built up area, with about 70% of area impervious	0.80
Flat commercial, with about 90% of area impervious	0.80

For a more detailed explanation of the Rational Method of design see "Design of Roadside Drainage Channels," published by USDOT, FHWA.

5.7.5 HYDRAULICS

Manning's Equation shall be utilized to express the flow of water in open channels. Manning's Equation is as follows:

$$V = \frac{1.40}{n} R^{2/3} S^{1/2}$$

Where:

V = Velocity in feet per second

n = Manning's coefficient of channel roughness

R = Hydraulic radius, in feet

S = Slope, in feet per foot

Values of Manning's coefficients (*n*) for various types of channel linings as indicated in Figure 5-36 shall be used.

For additional values see "Design Charts for Open-Channel Flow," published by USDOT, FHWA.

Figure 5-36 Manning's Roughness Coefficients (n)

Closed Conduits	
Reinforced Concrete Pipe (RCP)	0.012
Corrugated Metal Pipe (CMP) or Pipe Arch Plain or Fully Coated (Unpaved)	0.024
High Density Polyethylene (HDPE)	0.011
25% of circumference paved	0.021
Fully paved	0.012
Lined Open Channels	
Concrete (float finish)	0.014
Plain riprap	0.040
Grouted riprap	0.035
Swales and Channels with Maintained Vegetation	
Grass (mowed to 2")	0.045
Grass (good stand - 12" height)	0.09
Street Gutters	
Concrete	0.012
Asphalt	0.013

5.7.6 SUMP PUMP DISCHARGES

Sump pump discharges into roadside drainage systems shall be approved in writing by the DelDOT subdivisions inspector prior to installation. Prior to request for approval to discharge sump pump effluent into a roadside drainage system, the developer must provide written justification that there is no other feasible alternative. The developer must prove that the discharge cannot be routed to another outlet that is not within State right-of-way, and

the drainage cannot be contained within the parcel boundaries of the discharge source. This justification shall be approved (in writing) by the Conservation District.

If there is no alternative drainage outlet for the sump pump discharge other than the roadside drainage system (State right-of-way), then DelDOT may allow a connection within State right-of-way.

If there is an existing ditch in front of the property, then the sump pump outlet pipe may discharge into the ditch.

If there is an existing drainage inlet and closed drainage system in front of the property, then the Developer may connect the sump pump outlet discharge pipe directly into the drainage inlet. The hole in the basin must be core drilled (not jack-hammered). After installing the discharge pipe, the hole must be sealed with non-shrink grout to prevent leakage. The connection must be at least 12 inches from any pipe joints.

If there is a closed drainage system in front of the property, but no drainage inlet or ditch line exists, then a direct connection of the sump pump discharge pipe to the existing roadside drainage pipe within State right-of-way will be permitted. The tie-in must be made in the upper half of the pipe. The hole in the pipe must be core drilled (not jack hammered). After connecting the discharge pipe, the hole must be sealed with non-shrink grout to prevent leakage. The connection must be at least 12 inches from any pipe joints.

If there is an existing curb and gutter with no enclosed drainage or ditch in front of the property, then sump pump discharge into State right-of-way may be permitted. However, the sump pump discharge outlet pipe must be terminated at the State right-of-way line.

5.8 EROSION CONTROL

DelDOT will work cooperatively with regulating agencies to ensure proper erosion control. These agencies include Delaware Department of Natural Resources and Environmental Control (DNREC), New Castle County Land Use Engineering, New Castle County Conservation District, Kent Conservation District (KCD), and Sussex Conservation District (SCD).

All developments shall require a written plan for erosion control measures both during and after construction following the requirements outlined in Delaware's Sediment and Stormwater Regulations. The erosion control measures shall be designed following the Delaware Erosion and Sediment Control Handbook (Delaware ESC Handbook) including, but not be limited to, inlet protection, silt fence, stabilized rock construction entrance, sediment traps, stone check dams, temporary and permanent seeding, and mulching as required to minimize erosion during earth moving operations.

In addition to the Delaware ESC Handbook, the Conservation Design For Stormwater Management Guidelines shall be used whenever possible in conjunction with the Erosion and Sediment Control Best Management Practices (BMPS) for all projects.

When the proposed roadway work is limited to the site and the entrance, the review of design and construction of stormwater management and erosion control facilities is performed by a non-DelDOT delegated agency for DSSR enforcement. In this case, the non-DelDOT delegated agency shall attest that the DSSR within DelDOT right-of-way have been met and shall be documented in a memo and forwarded to DelDOT's Stormwater Engineer for files.

If the proposed roadway work is not contiguous with the land development proposal, the review of design and construction of erosion control plans shall be performed by DelDOT for DSSR enforcement. DelDOT will sign the plans

upon determination of full compliance of the plans and reports with the requirements of DSSR indicating that the plans meet the requirements of State and Federal sediment and stormwater regulations. DelDOT shall require at least 30 calendar days to review the erosion control plans.

Plans for review shall be developed in half size (11"x17") and arranged similar to DelDOT plans for consistency and ease of review. Section 1 of ES_2M Design Guide contains a checklist which shall be completed and submitted with the plans along with a transmittal memo requesting the plans to be reviewed by DelDOT.

5.8.1 RIPRAP DESIGN

Ripraps are a section of rock protection placed at the outlet end of culverts, conduits and channels, to reduce the velocity and energy of water such that the flow will not erode the receiving downstream areas.

The design of rock outlet protection depends entirely on location. Pipe outlets at the top of cuts or on slopes steeper than 10%, can not be protected by rock aprons or riprap section due to reconcentration of flows and high velocities encountered after the flow leaves the apron.

For detailed design guidelines see the latest edition of DNREC's *Erosion and Sediment Control Handbook*.

5.9 STRUCTURE DESIGN

Any structure, including supports, erected over a depression or an obstruction, such as water, a highway or a railway, for carrying vehicular or pedestrian traffic or other moving loads that has an opening exceeding 20 square feet shall be reviewed by DelDOT's Bridge Design Section.

All structural designs shall be in accordance with *DelDOT's Bridge Design Manual* and *AASHTO's Load and Resistance Factor Design (LRFD) Bridge Design Specifications in accordance with Appendix Q*.

If there are structural designs required on a plan and not included in the Standard Construction Details, shop drawings signed and sealed by a professional engineer registered in the State of Delaware shall be submitted for review and approval.

Figure 5-37 Rainfall Intensity Estimates and Depths – New Castle County, Delaware

Rainfall Intensity Estimates (in/hr) New Castle County, Delaware										
Frequency (yr)	Duration (min)									
	5	10	15	30	60 (1 hr)	120 (2 hr)	180 (3 hr)	360 (6 hr)	720 (12 hr)	1440 (24 hr)
2	4.97	3.97	3.33	2.30	1.44	0.87	0.62	0.38	0.23	0.13
5	5.83	4.67	3.94	2.80	1.79	1.08	0.78	0.48	0.29	0.17
10	6.42	5.13	4.33	3.13	2.04	1.24	0.89	0.55	0.34	0.20
25	7.13	5.68	4.80	3.55	2.37	1.45	1.05	0.66	0.41	0.25
50	7.60	6.05	5.10	3.84	2.60	1.61	1.18	0.74	0.47	0.29
100	8.06	6.40	5.40	4.13	2.85	1.77	1.30	0.83	0.53	0.34
200	8.44	6.69	5.63	4.38	3.07	1.93	1.43	0.92	0.60	0.39
500	8.88	7.02	5.89	4.69	3.36	2.14	1.60	1.05	0.70	0.46

Interpolation shall be used for intermediate durations.

Figure 5-38 Rainfall Intensity Estimates and Depths – Kent County, Delaware

Rainfall Intensity Estimates (in/hr) Kent County, Delaware										
Frequency (yr)	Duration (min)									
	5	10	15	30	60 (1 hr)	120 (2 hr)	180 (3 hr)	360 (6 hr)	720 (12 hr)	1440 (24 hr)
2	5.06	4.05	3.40	2.34	1.47	0.90	0.65	0.40	0.24	0.14
5	6.01	4.81	4.06	2.88	1.85	1.13	0.82	0.50	0.30	0.18
10	6.68	5.35	4.51	3.27	2.13	1.31	0.95	0.59	0.36	0.21
25	7.54	6.01	5.08	3.76	2.50	1.56	1.14	0.71	0.44	0.27
50	8.15	6.49	5.48	4.13	2.79	1.76	1.29	0.81	0.51	0.32
100	8.76	6.96	5.86	4.49	3.09	1.96	1.45	0.92	0.59	0.37
200	9.32	7.39	6.22	4.84	3.39	2.17	1.62	1.04	0.67	0.43
500	10.02	7.93	6.65	5.29	3.80	2.45	1.85	1.21	0.80	0.52

Interpolation shall be used for intermediate durations.

Figure 5-39 Rainfall Intensity Estimates and Depths – Sussex County, Delaware

Rainfall Intensity Estimates (in/hr) Sussex County, Delaware										
Frequency (yr)	Duration (min)									
	5	10	15	30	60 (1 hr)	120 (2 hr)	180 (3 hr)	360 (6 hr)	720 (12 hr)	1440 (24 hr)
2	5.06	4.04	3.39	2.34	1.47	0.91	0.66	0.40	0.24	0.14
5	6.02	4.83	4.07	2.89	1.85	1.16	0.84	0.52	0.30	0.19
10	6.76	5.40	4.56	3.30	2.15	1.35	0.99	0.61	0.36	0.22
25	7.67	6.11	5.16	3.82	2.54	1.61	1.19	0.74	0.45	0.28
50	8.32	6.62	5.59	4.21	2.85	1.83	1.35	0.85	0.52	0.33
100	8.96	7.12	6.00	4.59	3.16	2.05	1.53	0.97	0.61	0.38
200	9.60	7.61	6.40	4.98	3.49	2.28	1.71	1.10	0.70	0.45
500	10.38	8.21	6.88	5.48	3.93	2.59	1.97	1.28	0.84	0.54

Interpolation shall be used for intermediate durations.

Figure 5-40 Overland Flow Time

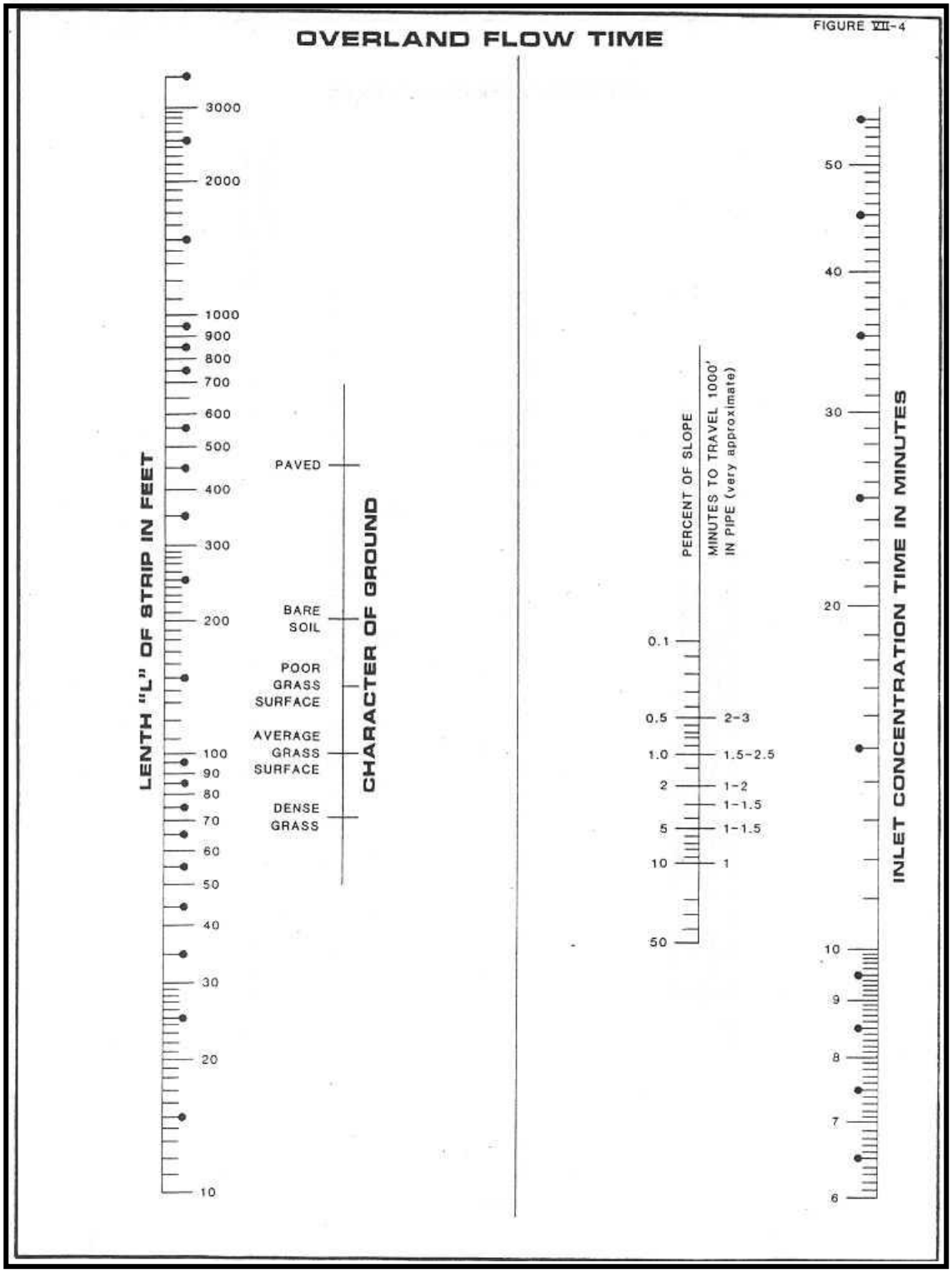


Figure 5-41 Street Flow Time

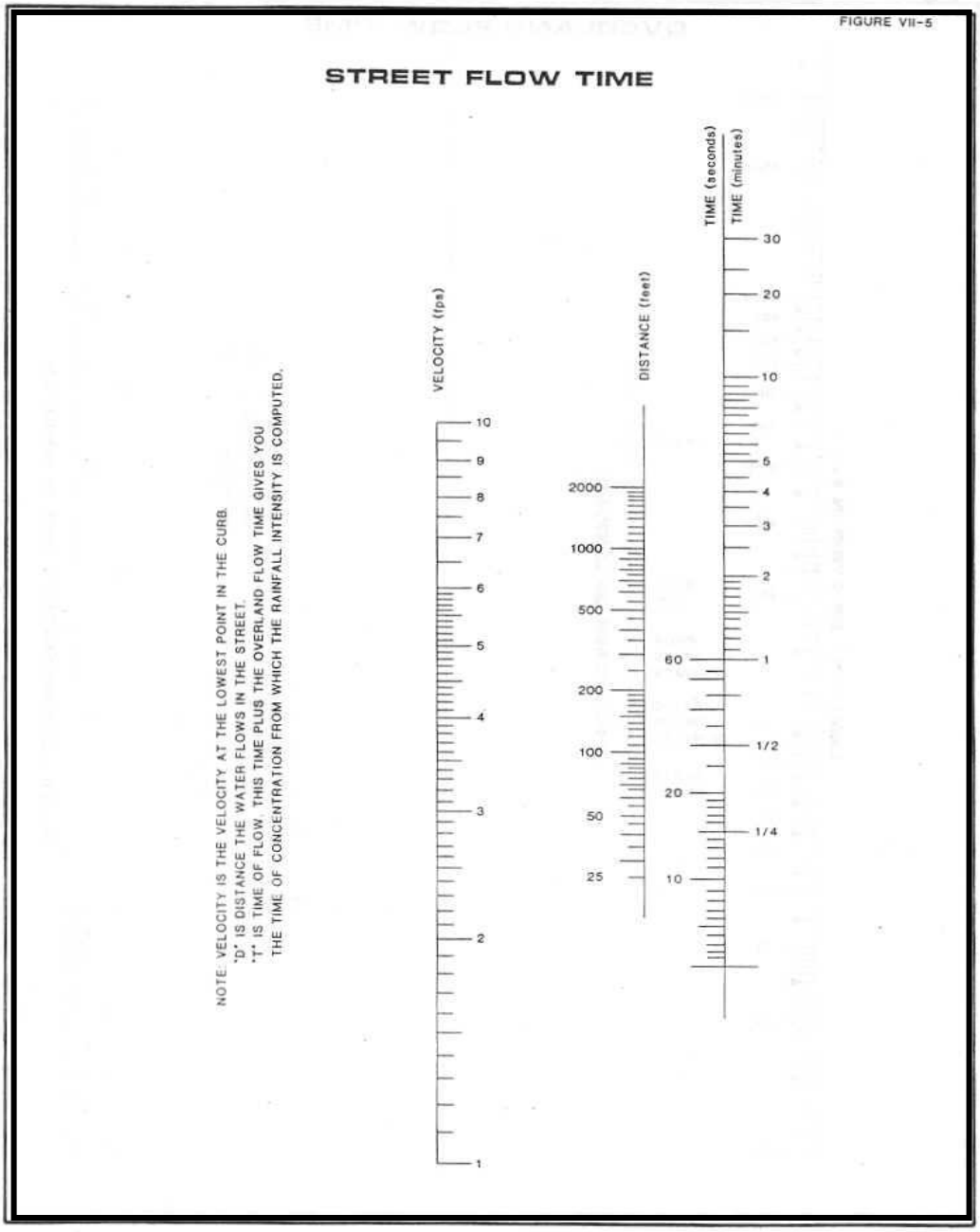
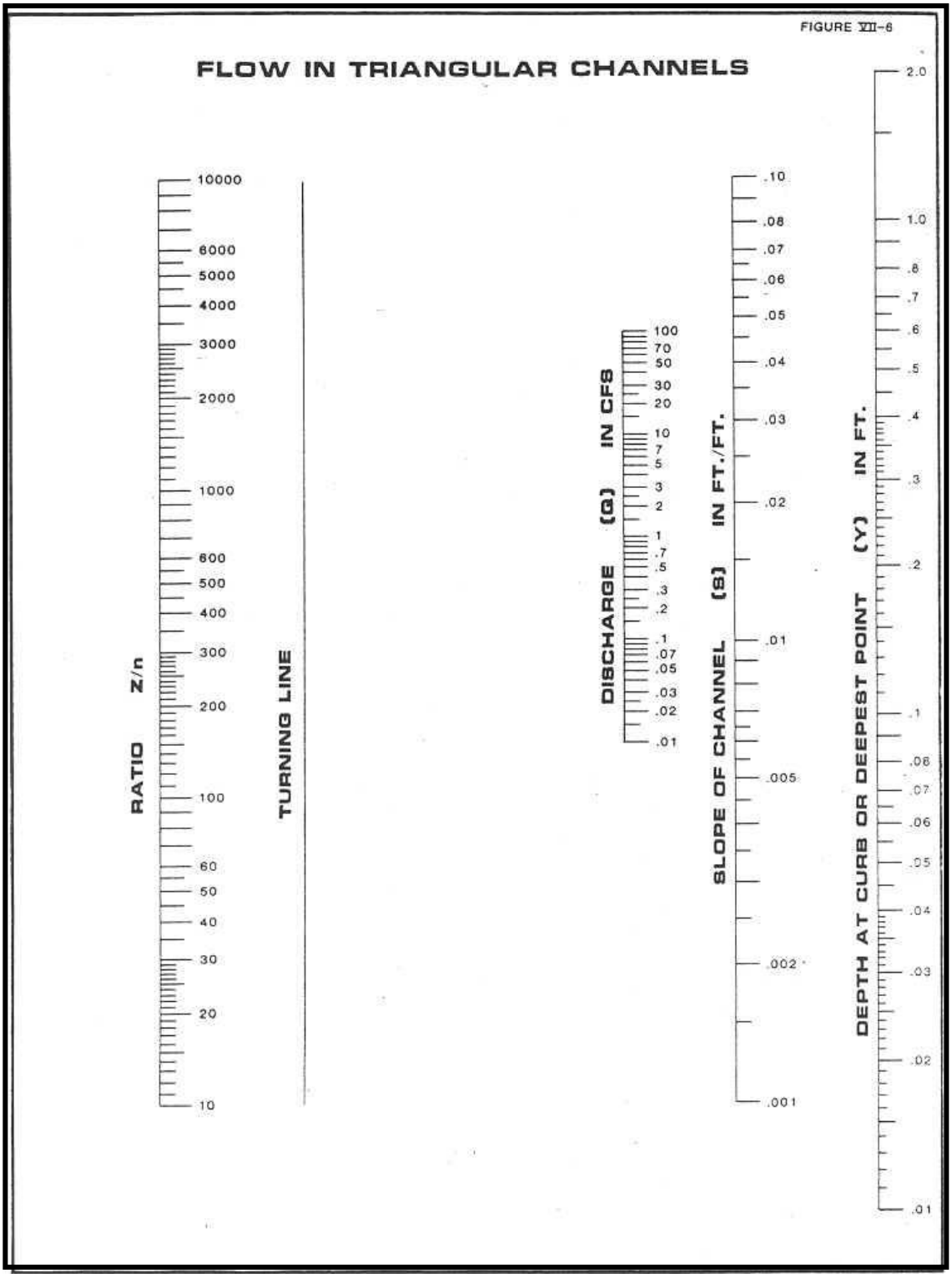


Figure 5-42 Flow in Triangular Channels



5.10 SIGNING AND PAVEMENT MARKING DESIGN

5.10.1 SIGNING

Traffic control signs shall be required for all commercial and subdivision entrances and streets. Traffic control signs shall be installed and maintained by the developer where required. The signs must be included on the construction plan in accordance with DelDOT requirements and the Delaware MUTCD. All advertising signs in conjunction with a business establishment shall be placed in conformance with the current Delaware Code relating to Outdoor Advertising.

5.10.1.1 Placement of Signs

Traffic signs shall be furnished and installed by the developer in accordance with a signing plan prepared by the developer's engineer and approved by DelDOT. Signs shall be installed in accordance with the Delaware MUTCD and Standard Sheet T-5. DelDOT shall provide direction regarding necessary signs and their placement on the signing plan at the time of semi-final construction plan review.

5.10.1.2 Specifications

All signs shall conform to Federal and State specifications applicable to size, color, reflectivity, and fabrication. In order to ensure uniformity, DelDOT shall fabricate signs upon request, provided that the developer bears all costs for the signs. However, developers are encouraged to seek private sources first. Additional information pertaining to the size, colors, and fabrication of signs may be obtained by contacting DelDOT's Sign Shop at the following address:

DelDOT Sign Shop
P.O. Box 778
Dover, DE 19903

5.10.1.3 Maintenance of Signs

The developer of a new subdivision or commercial property is required to purchase, install, and maintain all signs required by DelDOT. Once a development street or entrance is accepted for maintenance by the State, DelDOT shall assume maintenance for all the signs which were required for acceptance and are located within the right-of-way.

5.10.1.4 Signs Required in Suburban Development

1. Street Name Signs

   a. Placement – The location of street name signs shall be in accordance with Figure 5-43.

   b. Specifications – Street name signs shall be fabricated with four-inch letters Type III silver reflective sheeting on a background of six-inch Type II green reflective sheeting mounted on 6¾-inch aluminum sign extrusion, as specified on Standard Sheet T-4.

2. Development Name Signs

   a. Placement – The development name signs shall be installed within the right-of-way of the highway on which the entrance(s) is (are) located. The signs shall be placed within 500 feet of the centerline of the entrance(s). In order to adequately notify motorists of entrances to subdivisions, one set of development name signs can be authorized per major or minor roadway on which there is an entrance.

      The development name signs are not directional signs nor guide signs and the placement of these signs at adjacent intersections near the development or on State-maintained roads other than the road on which the entrance is located is prohibited.

   b. Specifications – All development name signs shall be fabricated on high intensity reflective sheeting mounted on 0.080"

(minimum) aluminum sheet. The signs shall have a silver legend and blue background with a yellow and blue Caesar Rodney image. See Figure 5-44 and 5-45 for details.

3. Regulatory and Warning Signs

   a. Placement – One "Speed Limit 25" / Pictorial "Watch Children" sign combination shall be installed at each entrance to a suburban development. Other signs shall be installed in accordance with DelDOT requirements.

   b. Specifications – All regulatory, warning, and other traffic control signs shall be fabricated from Type III reflective sheeting on 0.080" (minimum) aluminum sheet and shall conform to MUTCD requirements.

5.10.2 PAVEMENT MARKINGS

Pavement markings that are required as part of an entrance design shall be in accordance with current Delaware MUTCD requirements. Type III subdivision streets shall have a centerline and edge line stripesing in accordance with Delaware MUTCD guidelines.

Figure 5-43 Street Name Sign Location

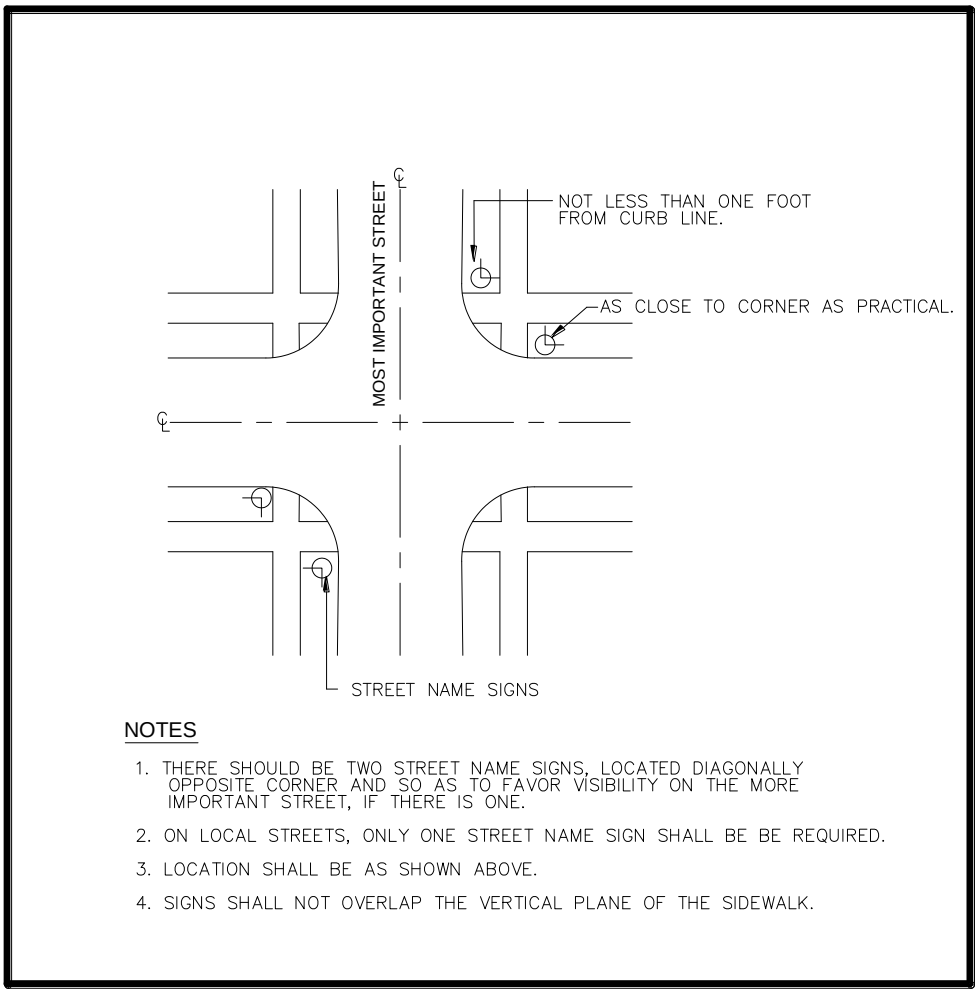


Figure 5-44 Development Name Signs – I

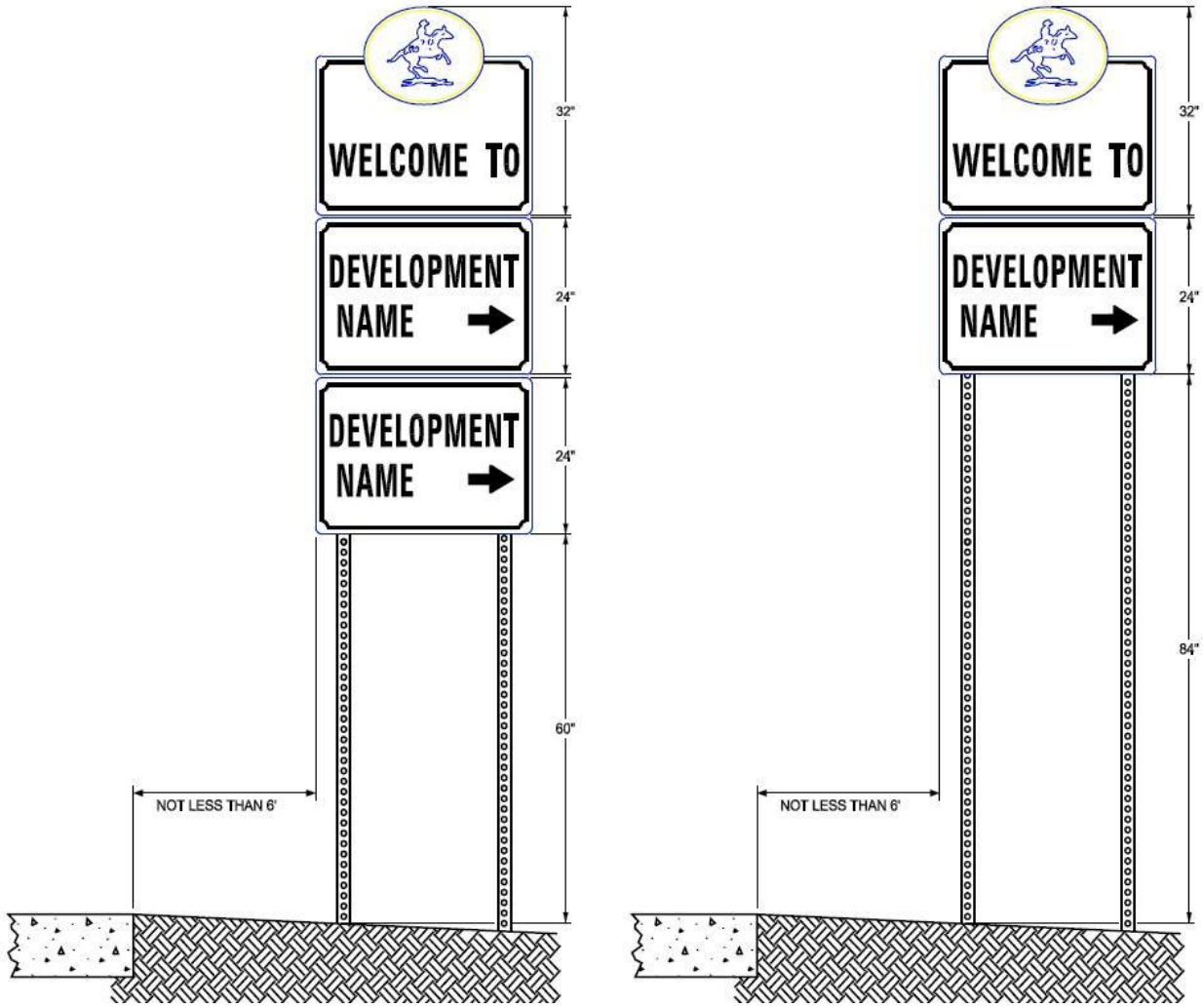


Figure 5-45 Development Name Signs – II

SPECIFICATIONS

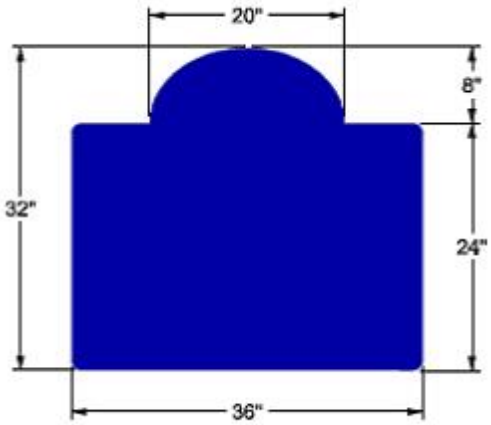
SIGN BACKGROUND WILL BE COVERED WITH HIGH INTENSITY TYPE LLL-REFLECTIVE MATERIAL BLUE (3M SCOTCHLITE 3875 OR EQUIVALENT).

CAESAR RODNEY BACKGROUND WILL BE HIGH INTENSITY TYPE LLL YELLOW (3M SCOTCHLITE 3871) AND RIDER AND BORDER WILL BE BLUE (3M SCOTCHLITE 3875 OR EQUIVALENT).

SIGN LEGEND AND BORDER WILL BE HIGH INTENSITY TYPE LLL SILVER (3M SCOTCHLITE 3870 OR EQUIVALENT).

LETTERING IS 5" HIGHWAY GOTHIC "C"

SIGNS BLANKS WILL BE MANUFACTURED FROM .080" COATED ALUMINUM.



CHAPTER 6 CONSTRUCTION ADMINISTRATION

6.1 CHAPTER PURPOSE

This chapter addresses the permit application process, Notice to Proceed (NTP), and inspection and acceptance procedures for construction of commercial sites, subdivision streets (including industrial streets), and off-site improvements.

Implementation of these procedures will ensure that construction within the State right-of-way is in compliance with these *Standards and Regulations for Subdivision Streets and State Highway Access*, Standard Specification, Standards Construction Details, *Construction Manual* and other applicable DelDOT standards.

6.2 UTILITIES

Any proposed utility work within the right-of-way of a State-maintained roadway shall require a permit in accordance with the *Utilities Design Manual* prior to the start of construction.

Upon completion and acceptance of the subdivision or industrial streets, the utilities that are located within the State right-of-way shall be franchised in accordance with the existing countywide blanket agreement for each individual utility.

The proposed utilities within a new subdivision or industrial street shall be shown on the construction plans as outlined in Chapter 4.

Where feasible, underground utilities shall be placed behind the proposed curb line or in an established utility easement. Utilities that must be located within the dedicated right-of-way shall be installed in accordance with the DelDOT *Utilities Design Manual*.

Utility conflicts with future subdivision street construction shall be corrected by the utility company or the developer at no expense to the State. Any modification to the proposed utility locations shall be reflected on the as-built plans.

Requests for utility permits must be submitted with plans to the Public Works Engineer in the respective county as indicated in Figure 6-1.

Figure 6-1 DelDOT Public Works Engineers

New Castle County (DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701
Kent County (DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901
Sussex County (DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

6.3 COMMERCIAL ENTRANCE PERMIT

6.3.1 APPLICATION PROCESS

This section outlines the application process for the construction of commercial entrances. Prior to issuance of permit for entrance construction the following documents must be submitted to the Public Works Engineer for review and approval:

1. An application for commercial entrance permit (see Appendix E).
2. Proof of ownership from the local land use agency (this must be an official document or on letterhead from the local land use agency) or an affidavit indicating property owner's name and Tax Map I.D. Number.
3. If the applicant is not the current property owner, the power of attorney form in Appendix E must be completed and included in the application. The Power of Attorney form is not used to issue the permit to someone other than the property owner. It just allows someone else to sign for the permit. The permit holder is still the property owner.
4. A copy of the site plan recorded by the local land use agency.
5. Two sets of construction drawings that have been approved by DelDOT's Subdivision Engineer.
6. The itemized construction cost estimate. See Figure 4-2 for a sample cost estimate.
7. A security in the amount of 150% ~~100%~~ of the approved construction cost estimate. The following forms of security shall be acceptable:

    - Surety Bond issued by a bonding company licensed in Delaware.
    - Commercial Letter of Credit issued by a lending institution licensed in Delaware.
    - Certified check with escrow agreement.

    The approved security forms are provided in Appendix E.
8. Approval letter from the Conservation District, if construction occurs in Kent or Sussex County.

6.3.2 NOTICE TO PROCEED (NTP)

After review and approval of the documentation and security, the Public Works Engineer will evaluate the following items prior to issuance of permit for entrance construction which shall serve as the NTP:

1. Preconstruction Conference – The Public Works Engineer will determine if a preconstruction conference is needed prior to issuance of the NTP. The preconstruction conference shall be scheduled by the Public Works Engineer or his/her designee and attended by appropriate representatives of DelDOT, the developer, his/her engineer, and contractor, utility firms and such other agencies as may be deemed appropriate. Items to be discussed at this meeting may include, but are not limited to, the following:

    - Utilities.
    - Contractor and subcontractor.
    - Source of supplies.
    - Maintenance of traffic.
    - Removal of unsuitable materials.
    - Construction access.
2. Utility Coordination.
3. Material Testing.
4. Construction Schedule.

Once the Public Works Engineer is satisfied with the items listed above, the permit for entrance construction will be issued.

6.3.3 INSPECTION AND ACCEPTANCE

DelDOT reserves the right to inspect and approve any construction associated with the proposed entrance in accordance with Section 6.8 and the inspection procedures in DelDOT's *Construction Manual*.

DelDOT also reserves the right to make such changes, additions, and relocations to the approved entrance plans that may be considered necessary to ensure compliance with any applicable design standards and ensure the safety of the traveling public.

A final inspection shall be held by the inspector and may include the Public Works Engineer to verify that the entrance was constructed in accordance with DelDOT standards. Once DelDOT is satisfied with the construction, the inspector shall recommend final acceptance and the release of the security by the Public Works Engineer. The local land use agency shall be notified prior to final acceptance.

In the event of failure to perform the intended construction in accordance with the terms of the commercial entrance permit as determined by DelDOT, the developer shall receive written notice and have fourteen calendar days to provide DelDOT with an approved schedule for completion. If a schedule for completion has not been received within the specified time period, the developer shall receive a second written notice and have an additional seven calendar days to meet in person with DelDOT and present an approved schedule for completion.

Should the developer fail to provide a satisfactory construction schedule or fail to comply with the approved completion schedule, DelDOT shall withdraw its permit and shall have the right to collect ~~utilize~~ the 150% ~~100%~~ construction security to correct the condition. All costs incurred in the removal and/or correction of defective workmanship and/or materials over and above the construction security shall be borne by the applicant.

6.3.4 MAINTENANCE

After the entrance has been constructed to the satisfaction of DelDOT and the commercial entrance permit has been issued, the property owner shall be responsible for the repair of any deficiencies within the entrance for a period of one year. Deficiencies identified by DelDOT shall be repaired in accordance with DelDOT's *Construction Manual*. If repairs are not initiated within three months of notification, then DelDOT shall void the commercial entrance permit and access to the property shall be denied.

DelDOT shall assume ~~the~~ responsibility for future ~~normal~~ maintenance of the entrance within the shoulder area and any necessary cleaning or replacing of drainage pipe, and guardrail repair within the right-of-way. Entrance appurtenances beyond the edge of shoulder are the responsibility of the property owner for maintenance. This includes any traffic control signs (i.e., Stop or Yield) that may need future maintenance. Should the applicant, heirs, or assigns desire to alter or reconstruct any portion of the entrances or appurtenances, application for a new permit must be submitted to DelDOT for approval.

6.4 SUBDIVISION STREETS

6.4.1 APPLICATION PROCESS

This section outlines the application process for the construction of new subdivision streets dedicated for public use and intended for acceptance into State maintenance. Prior to issuance of a NTP the following documents must be submitted to the Public Works Engineer for review and approval:

1. The subdivision site plans recorded by the local land use agency.
2. Letter from the DelDOT Subdivision Engineer stating that the entrance plans are substantially complete and a preconstruction conference can be scheduled by the Public Works Engineer.
3. Subdivision Construction drawings with most recent revisions (six copies).
4. A security ~~in the amount of 10% of the estimated street construction cost~~ using the security determination chart in the construction agreement for subdivision streets (see Appendix F). Hot mix prices shall be

itemized and submitted with the construction agreement.

5. A security in the amount of 150% ~~100%~~ of the estimated cost to construct the main entrance. This security applies to construction of auxiliary lanes, roadway widening, and other modifications to existing State-maintained roadways. If no auxiliary lanes, roadway widening, or other improvements are required then this portion of the security may be waived.

   The following forms of security shall be acceptable:

   - Surety Bond issued by a bonding company licensed in Delaware.
   - Commercial Letter of Credit issued by a lending institution licensed in Delaware.
   - Certified check with escrow agreement.

   The approved security forms for subdivision streets are provided in Appendix F. The security forms for subdivision entrances are the same forms for the commercial entrances.

6. Completed construction agreement for subdivision streets which are to be a minimum of 1000 ft. in length or as approved (see Appendix F).

6.4.2 NOTICE TO PROCEED (NTP)

After review and approval of the construction agreement and security, the Public Works Engineer will address the following items prior to issuance of the NTP:

1. Preconstruction Conference – The Public Works Engineer will determine if a preconstruction conference is needed prior to issuance of the NTP. The preconstruction conference shall be scheduled by the Public Works Engineer or his/her designee and attended by appropriate representatives of DelDOT, the developer, the developer's engineer and contractor, utility firms and such other agencies as may be deemed appropriate. Items to be discussed at this meeting may include, but are not limited to, the following:

   - Contractor and subcontractor.
   - Source of supplies.
   - Street construction schedule.
   - Maintenance of traffic.
   - Removal of unsuitable materials.
   - Security agreement.
   - Utility Coordination.
   - Material Testing.
   - Construction Schedule.

Following approval of the required submissions and a successful preconstruction conference, the Public Works Engineer shall issue the NTP, allowing the developer to proceed with clearing and grading on bonded streets. No construction materials (such as graded aggregate base course, hot-mix or drainage pipe) can be placed until after the construction plans of the subdivision drawings are stamped "APPROVED" by the DelDOT Subdivision Engineer as noted in Permission for Advanced Construction and Policy Implement S-13.

The developer may proceed with clearing and grading at its own risk for a period of thirty calendar days, prior to final approval of subdivision construction plans by the DelDOT Subdivision Engineer. If final approval is not received within thirty calendar days of the NTP, all construction activities shall be stopped and the NTP shall be withdrawn.

Once the DelDOT Subdivision Engineer approves the subdivision construction drawings, two complete full-size and two complete half-size sets of construction drawings shall be forwarded to the Public Works Engineer. The drawings must have the approval stamp of the DelDOT Subdivision Engineer.

Upon receipt of approved construction drawings, the Public Works Engineer will issue a final "Notice to Proceed" letter, allowing the Developer to proceed with permanent street construction within the subdivision.

Construction of the entrance to the subdivision shall be started prior to the 1st ~~50th~~ certificate of occupancy ~~building permit or 25% of the subdivision whichever is less~~. Once construction has started on the roadway it must ~~be actively pursued until completed~~ remain active until completed up to the final lift of asphalt. The entrance may be required to be built sooner at the discretion of the Public Works Engineer.

6.4.3 INSPECTION AND ACCEPTANCE

DelDOT reserves the right to inspect and approve any construction associated with the proposed subdivision in accordance to Section 6.8 and the inspection procedures outlined in the DelDOT *Construction Manual*.

DelDOT also reserves the right to make such changes, additions, and relocations to the approved plans that may be considered necessary to ensure compliance with any applicable design standards and ensure the safety of the traveling public.

Upon completion of the punch list to the satisfaction of DelDOT and the submission of the following documents, the Public Works Engineer shall recommend that the streets be accepted into the State maintenance system.

a. As-built construction plans – The as-built construction plans shall be a print of the approved construction plan annotated in red to show all revisions necessitated by field conditions. The developer's engineer shall prepare this plan and submit it to the Public Works Engineer or his/her designee prior to the issuance of the letter recommending acceptance.

   In addition, the developer's engineer shall also submit an electronic plan version of the as-built construction plans for the entire subdivision to the Public Works Engineer or his/her designee. See Chapter 4 for electronic plan submission requirements.

b. A letter from the local land use agency stating that all work required by the land use agency is complete.
c. A letter from the local Conservation District stating that all work required by the conservation District is complete (if applicable).
d. A letter from the homeowner's association providing contact information.
e. A letter to DelDOT from the developer releasing DelDOT from any claims as a result of any unpaid bills or obligations. An affidavit releasing DelDOT is to be fully executed and furnished to the District Office prior to the issuance of the letter recommending acceptance. See Appendix F for a sample affidavit.

Should the developer fail to satisfactorily complete subdivision street construction in accordance with the construction agreement for subdivision streets as determined by DelDOT, the developer shall receive written notice and have fourteen calendar days to provide DelDOT with an approved schedule for completion. If a schedule for completion has not been received within the specified time period, the developer shall receive a second written notice and have an additional seven calendar days to meet in person with DelDOT and present an approved schedule for completion.

Should the developer fail to provide a satisfactory street construction schedule or fail to comply with the approved completion schedule, DelDOT may withdraw its approval to construct the affected subdivision streets and shall draw upon the security as outlined in the security agreement.

Withdrawal of subdivision street construction approval for failure to complete the streets shall be cause to increase the required construction security ~~from 10%~~ to 100% on future subdivision street construction projects requested by the defaulting applicant.

Following completion of street construction and submission of required documentation to the satisfaction of the District Engineer, the

Subdivision Engineer shall prepare an "Acceptance Drawing and an Acceptance Statement" and recommend acceptance of the streets. The Subdivision Engineer shall approve and sign the acceptance documents for DelDOT and shall notify the local land use agency and local legislators that the streets have been accepted.

Upon acceptance of the streets into the State maintenance system, an entrance permit shall be required for each new entrance to the street as outlined in Chapter 7. The applicant shall be responsible for damage to the curb, gutter, shoulders, and drainage affected by any entrance construction.

In subdivisions where residential streets and cul-de-sacs have been completed and the collector street serving them is complete except for the final lift of hot-mix, the developer shall submit the completed residential streets and cul-de-sacs for acceptance. Additionally, the developer shall provide:

- One-hundred percent security for the cost to complete the collector street.
- A letter to the District Office requesting acceptance of the submitted streets.

6.4.3.1 Road Number Assignment

The Planning Section shall assign maintenance road numbers to the subdivision streets following acceptance by DelDOT.

6.4.4 MAINTENANCE

~~Upon~~ Prior to acceptance of the streets into the State maintenance system, ~~DelDOT~~ the developer agrees to the following ~~limited~~ maintenance responsibilities:

1. DelDOT agrees to maintain the following elements within the dedicated right-of-way or easements:

   a. The paved portion of the roadway.
   b. Curbing and gutters.
   c. Closed drainage system including inlets and pipes that conveys roadway runoff.
   d. Open ditch systems, including entrance pipes, located within the right-of-way and easements that conveys roadway runoff.
   e. Guardrails.

~~2. While retaining all controls over the dedicated right-of-way, DelDOT assumes no responsibility for:~~

   f. Maintenance of grass and plantings in any portion of the right-of-way, including landscaped islands and medians.

   g. Removal of silt and debris that have a minimal impact on the drainage system in open swales, gutters and inlet openings.

   h. Removal and maintenance of ~~future~~ improvements by residents, such as landscaping, underground sprinklers, signs, etc. not shown on the as-built plans.

   i. Maintenance of sidewalks (excluding removal of snow and ice), lighting, and entrance amenities.

   j. Actual removal of snow and ice having a measurable snow accumulation on pavement of 4 inches or more. Measurement of snow accumulation should follow the snow removal reimbursement program guidelines. – ~~DelDOT offers reimbursement of snow removal expenses through the "Snow Reimbursement Program."~~

Upon acceptance of the streets into the State maintenance system, DelDOT agrees to the following limited maintenance responsibilities:

2. DelDOT agrees to maintain the following elements within the dedicated right-of-way or easements:

   a. The paved portion of the roadway.

   b. Curbing and gutters.

c. Closed drainage system including inlets and pipes that conveys roadway runoff.

d. Open ditch systems, including entrance pipes, located within the right-of-way and easements that conveys roadway runoff.

e. Guardrails.

f. Maintenance of grass and plantings in any portion of the right-of-way, including landscaped islands and medians.

g. Removal of silt and debris that have a minimal impact on the drainage system in open swales, gutters and inlet openings.

h. Removal and maintenance of future improvements by residents, such as landscaping, underground sprinklers, signs, etc. not shown on the as-built plans.

i. Maintenance of sidewalks, lighting, and entrance amenities.

j. Actual removal of snow and ice – DelDOT offers reimbursement of snow removal expenses through the "Snow Reimbursement Program."

Alleys should be used within the subdivision street layout in accordance with appropriate subdivision design principles and the requirements of local land use ordinances. While DelDOT encourages the appropriate use of alleys in subdivision street layout, DelDOT shall not accept any maintenance responsibilities for alleys in the public right-of-way.

A permit from DelDOT shall be obtained for any modification to the roadway, curb, sidewalk, or drainage ditches within the right-of-way.

6.5 INDUSTRIAL STREETS

6.5.1 ~~PERMIT~~ APPLICATION PROCESS

The ~~permit~~ application process for industrial streets follows the same procedures as subdivision streets presented in Section 6.4.1. See Apendix G for related forms and agreements.

6.5.2 NOTICE TO PROCEED (NTP)

Requirements for obtaining a NTP for industrial streets follow the same procedures as subdivision streets presented in Section 6.4.2.

6.5.3 INSPECTION AND ACCEPTANCE

The developer is responsible for providing inspection of the bonded industrial park streets as per the construction agreement. The developer's engineer shall be certified by the DelDOT Consultant Control Committee to perform construction engineering.

Upon completion of the industrial park streets within a given phase of construction, if phased, the developer shall request a final inspection of the work. The final inspection shall be attended by appropriate DelDOT personnel and shall generate a final punch list of outstanding items that must be completed by the developer.

Upon completion of the punch list to the satisfaction of DelDOT and the submission of the following documents, the Public Works Engineer shall recommend that the streets be accepted into the State maintenance system.

a. As-built construction plans – The as-built construction plans shall be a print of the approved construction plan annotated in red to show all revisions necessitated by field conditions. The developer's engineer shall prepare this plan and submit it to the Public Works Engineer or his/her designee prior to the issuance of the letter recommending acceptance.

In addition, the developer's engineer shall also submit an electronic plan version of the as-built construction plans for the entire industrial park streets to the Public Works Engineer or his/her designee. See Chapter 4 for electronic plan submission requirements.

b. A letter from the local land use agency stating that all work required by the land use agency is complete.

c. A letter from the local Conservation District stating that all work required by the conservation District is complete (if applicable).

d. A letter to DelDOT from the developer releasing DelDOT from any claims as a result of any unpaid bills or obligations. An affidavit releasing DelDOT is to be fully executed and furnished to the District Office prior to the issuance of the letter recommending acceptance. See Appendix F for a sample affidavit.

Should the developer fail to satisfactorily complete industrial park street construction in accordance with the construction agreement for industrial park streets as determined by DelDOT, the developer shall receive written notice and have fourteen calendar days to provide DelDOT with an approved schedule for completion. If a schedule for completion has not been received within the specified time period, the developer shall receive a second written notice and have an additional seven calendar days to meet in person with DelDOT and present an approved schedule for completion.

Should the developer fail to provide a satisfactory street construction schedule or fail to comply with the approved completion schedule, DelDOT may withdraw its approval to construct the affected industrial park streets and shall draw upon the security as outlined in the security agreement.

Withdrawal of industrial park street construction approval for failure to complete the streets shall be cause to increase the required construction security ~~from 10%~~ to 100% on future industrial park street construction projects requested by the defaulting applicant.

Following completion of street construction and submission of required documentation to the satisfaction of the District Engineer, the Subdivision Engineer shall prepare an "Acceptance Drawing and an Acceptance Statement" and recommend acceptance of the streets. The Engineer shall approve and sign the acceptance documents for DelDOT and shall notify the local land use agency that the streets have been accepted.

Upon completion of all aspects of the initial street construction to the satisfaction of the inspecting engineer, a first final inspection shall be held. After the first final inspection, a three-year waiting period is required prior to the acceptance of said streets into DelDOT's maintenance system. At this time a second final inspection shall be held to ensure that all punch list items from the first final inspection have been corrected and that the streets as designed have held up to the anticipated traffic loading. The three-year waiting period is required by DelDOT because of the significantly higher traffic volumes that are typically generated by an industrial park type development and the heavier vehicle loadings that are experienced by the high percentage of truck traffic.

Should the developer fail to satisfactorily complete industrial street construction in accordance with the construction agreement for industrial streets as determined by DelDOT, the developer shall receive written notice and have fourteen calendar days to provide DelDOT with an approved schedule for completion. If a schedule for completion has not been received within the specified time period, the developer shall receive a second written notice and have an additional seven calendar days to meet in person with DelDOT and present an approved schedule for completion.

Should the developer fail to provide a satisfactory street construction schedule or fail to comply with the approved completion schedule DelDOT may withdraw its approval to construct

the affected streets and shall draw upon the security as outlined in the security agreement.

6.5.4 MAINTENANCE

Upon acceptance of the streets into the State maintenance system, DelDOT agrees to the following limited maintenance responsibilities:

1. DelDOT agrees to maintain the following elements within the dedicated right-of-way or easements:

    a. The paved portion of the roadway.
    b. Curbing and gutters.
    c. Closed drainage system including inlets and pipes that conveys roadway runoff.
    d. Open ditch systems, including entrance pipes, located within the right-of-way and easements that conveys roadway runoff.
    e. Guardrails

2. While retaining all controls over the dedicated right-of-way, DelDOT assumes no responsibility for:

    a. Maintenance of grass and plantings in any portion of the right-of-way, including landscaped islands and medians.
    b. Removal of silt and debris that have a minimal impact on the drainage system in open swales, gutters and inlet openings.
    c. Removal and maintenance of future improvements by residents, such as landscaping, underground sprinklers, signs, etc. not shown on the as-built plans.
    d. Maintenance of sidewalks, lighting, and entrance amenities.
    e. Actual removal of snow and ice.
    f. Permit to change

6.6 OFF-SITE IMPROVEMENTS (PUBLIC ROAD CONSTRUCTION)

6.6.1 APPLICATION PROCESS

During the land development process, DelDOT may determine the need for road improvements beyond the entrance to the site. These improvements shall be required as part of the entrance approval. The developer shall enter into an agreement with DelDOT outlining the implementation of the improvements. This may be for the actual design, construction, and inspection of the improvements, or monetary contribution for the actual construction of the improvements. This agreement shall be executed prior to entrance plan approval. See Appendix B for regulations regarding improvements requiring new rights-of-way.

If a proposed development triggers the need for improvement to the abutting State-maintained roadway beyond the entrance, the following documents shall be obtained and submitted prior to the start of construction.

1. Approved roadway construction drawings (six copies). Refer to DelDOT's publications and forms web page for the checklist for offsite plan development (www.DelDOT.gov).
2. Construction agreement for public roads (off-site improvements).
3. The itemized cost estimate. See Figure 4-2 for a sample cost estimate.
4. Prior to DelDOT issuing a NTP for the construction of the offsite improvements the developer shall provide DelDOT with a security in the amount of 150% of the estimated construction cost as approved by DelDOT.

    The following forms of security shall be acceptable.

    - Surety Bond issued by a bonding company licensed in Delaware.
    - Commercial Letter of Credit issued by a lending institution licensed in Delaware.

- Certified check with escrow agreement.

The approved security forms are provided in Appendix H.

6.6.2 NOTICE TO PROCEED (NTP)

The following requirements must be fulfilled before DelDOT issues a NTP for off-site improvements:

1. Approved construction plans and estimates.
2. Executed construction agreement for public roads (off-site improvements) by the Subdivision Engineer for DelDOT.
3. Security for the proposed work.
4. A preconstruction conference shall be scheduled by the Public Works Engineer or construction group engineer and attended by appropriate representatives of DelDOT, the developer, the developer's engineer and contractor, utility firms and such other agencies as may be deemed appropriate. Items to be discussed at this meeting may include but are not limited to the following:
   - Utilities.
   - Contractor and subcontractor.
   - Source of supplies.
   - Street construction schedule.
   - Maintenance of traffic.
   - Removal of unsuitable materials.
   - Construction access. Copy of construction contract between the developer and his contractor if applicable.
   - Security agreement.

Following approval of the required submissions and a successful preconstruction conference, the Public Works Engineer or DelDOT's Construction Group Engineer shall issue the NTP.

6.6.3 INSPECTION AND ACCEPTANCE

Off-site improvement projects are divided into three levels based on their size and impact on the abutting State-maintained roadway. This categorization helps DelDOT identify the level of involvement with each project, and what division will manage the construction of the project. Figure 6-2 summarizes the three levels of classification for off-site inspection and acceptance:

Figure 6-2 Off-Site Inspection and Acceptance

Level	AADT	Impact	Inspection
Level I	< 2000 veh/day	Construction has no or minimal impact to the traveling public.	DelDOT will provide inspection for Level I projects through the Public Works Section in accordance with the construction agreement and DelDOT's *Construction Manual*.
Level II	2000 – 10,000 veh/day	Construction has some impact to the traveling public.	An engineering firm hired by the developer performs inspection. The developer's engineer shall be certified by the DelDOT Consultant Control Committee to perform construction inspection and engineering. DelDOT's Public Works will coordinate construction inspection.

Level III	>10,000 veh/day	Construction has significant impact to the traveling public	The developer will be required to enter into a construction inspection agreement with an inspection firm currently under contract with DelDOT. Division of Transportation Solutions Construction Section will coordinate inspection.

Note: All work shall be in accordance with the construction agreement and DelDOT's Construction Manual.

The following roles and responsibilities shall apply to both Level II and III impacts:

1. Project Assignment of Personnel

Project staff shall be adequate in number, with appropriate qualifications to control the work in a manner consistent with sound engineering and construction practices. A project supervisor, assigned by the inspecting engineering firm, shall administer the project on behalf of DelDOT and shall be responsible for the implementation of all applicable practices and procedures outlined in Part D "Field Practices and Procedures" of DelDOT's *Construction Manual*. Failure to comply shall result in removal of project staff and stoppage of all construction activities until project staffing requirements are met.

The presence of inspection personnel is required during any and all roadway work within existing or proposed public right-of-way at all times. If the inspecting engineering firm fails to provide required project personnel, DelDOT will provide construction inspection personnel. DelDOT's total construction inspection personnel costs, including salaries, benefits, and related expenses shall be completely funded by the developer. Any changes in key project management personnel shall be immediately brought to the attention of DelDOT.

2. Inspection

During the progress of all associated construction work under the project, the inspecting engineering firm shall furnish appropriate field inspection of workmanship and material usage at the site of the work during the period that the work is actually being performed to determine and verify conformity of all work to the plans and specifications. This shall include inspection of construction equipment to determine conformity with the contract specifications outlined in Part D "Field Practices and Procedures" of DelDOT's *Construction Manual*.

DelDOT will provide materials inspection and testing services. This work shall include, but not be limited to, concrete testing, asphalt concrete testing, and soils testing. The inspecting engineering firm is responsible for documenting material inspections and tests that have been performed at the project site. This includes the collection of all load tickets for review. All loads must comply with the established DelDOT load restrictions.

3. Field Reports

All inspectors shall submit written daily reports and field notes to the project supervisor. These reports shall be retained in the field files for reference. A project diary shall also be maintained for the project.

4. Progress Meetings and Schedule

The project supervisor shall schedule a monthly progress meeting. The required attendees include:

- DelDOT construction.
- Developer representative.
- Inspecting engineering firm.
- Contractor.
- Project administration.

A bi-monthly construction schedule is required to be completed by the contractor and submitted by the project supervisor to the DelDOT

Construction Group Engineer on the last day of every workweek during project construction.

5. Directives and Coordination

General – The Contractor is required to comply with any and all directives made by the project supervisor. Failure to comply shall result in the project supervisor contacting, in writing, DelDOT's Construction Engineer. Based on the severity of the infraction, failure to comply may also result in a DelDOT-directed stoppage of work on the project.

Maintenance of Traffic (MOT) / Erosion and Sediment Control (E&S) – The project supervisor shall be responsible for the coordination of all MOT and all requests that may be made by DelDOT personnel. These requests are to be implemented immediately and considered part of the project. A failure to comply may result in a DelDOT-directed stoppage of work on the project.

Public Relations – The project supervisor shall contact the Public Relations Section with contact information pertaining to the work prior to the start of construction. The project supervisor shall coordinate the response to any public inquiry with DelDOT's Construction office.

Two-Week Advanced Notice – The project supervisor shall coordinate any major MOT operations with DelDOT's Construction office. Two weeks advanced notice shall be provided to DelDOT's Construction office prior to any anticipated road closure or traffic shift. A failure to comply may result in a DelDOT-directed stoppage of work on the project.

6. As-Built Plans

For the preparation of as-built plans, the inspecting engineering firm shall retain one set of record prints of the construction plans. These shall be kept up-to-date by the substitution of revised plan sheets by marks for minor changes that have been made, and by notes from the inspector's diary. The as-built plans shall show in red ink any alterations made in foundations; locations, lengths and elevations of pipe culverts; side ditches, ditch paving, and other drainage items added or altered; final checked stationing; and all other significant variations from the original plans. As-built plans will be required as part of the final acceptance of the off-site improvements.

7. Shop Drawings

The project supervisor shall handle the distribution and coordination for review of shop drawings. DelDOT must approve all shop drawings.

Upon completion of all aspects of the initial street construction to the satisfaction of the inspecting engineer, a first final inspection shall be held. Upon completion of all work to the satisfaction of DelDOT, the developer will be released of liability and the roadway work will be accepted. The local land use agency shall be notified when the work has been accepted.

6.7 CONSTRUCTION RESPONSIBILITIES

The following outlines the applicant's construction responsibilities:

1. The applicant shall furnish all materials and assume all costs of construction deemed necessary by the Public Works Engineer or the Construction Engineer in accordance with the construction permit and the approved plans.
2. All material and construction required to construct the entrance facility shall be in accordance with DelDOT's current *Standard Specifications*.
3. The entrance improvements for a commercial site must be complete and accepted prior to the issuance of the certificate of occupancy by the local land use agency.

   Construction of the entrance to the subdivision shall be started prior to the 1st ~~50th~~ certificate of occupancy ~~building permit or 25% of the subdivision whichever is less~~. Once construction has started on the roadway it must ~~be actively pursued until completed~~ remain active until completed up to the final lift. The entrance may be required to be built

sooner at the discretion of the Public Works Engineer.

4. In the event that poles, lights, signs, traffic signals, or other appurtenances need to be moved for an approved entrance, the applicant shall pay all costs involved in the relocation. The applicant shall resolve with the affected utility any required utility relocation, the time of moving and the required reimbursement.
5. In the event that a mailbox needs to be relocated, DelDOT authorizes the developer to relocate the mailbox with prior notification to the property owner. The developer shall be responsible for any damage to the mailbox and through coordination with the local postal service, shall be required to maintain the mail service at all times.
6. After the construction has been completed to the satisfaction of DelDOT, DelDOT shall assume ownership and maintenance of said construction as outlined in this chapter.

6.7.1 PAVEMENT PLACEMENT GUIDELINES

The first lift of hot mix shall be placed no later than 18 months from the NTP or the beginning of the second winter after the NTP.

The final wearing course of hot mix on subdivision streets shall not be placed until 75% of the houses contributing traffic to those streets have been completed or as directed by the Public Works Engineer.

Prior to placing the pavement sections, the subgrade shall be prepared and test-rolled as detailed in DelDOT's *Standard Specifications*. If the test rolling shows the subgrade to be unstable, the contractor shall scarify, disc, aerate or add moisture and recompact the subgrade to the extent that when retested it shall be stable. If, in the opinion of the Public Works Engineer or the Construction Engineer, there are areas to be removed or undercut, they may be ordered excavated and replaced with approved material.

6.7.2 WORK HOUR RESTRICTIONS

When a developer determines that it would be best to undertake construction / reconstruction work after 9:00 pm or before 7:00 am, and such work is to be conducted immediately adjacent to a residential neighborhood, the developer shall first ensure that residents of the neighborhood are notified in a timely fashion of the desire to undertake such work. The developer shall prepare a notification explaining the benefits and costs to the neighborhood of working under regular hours and the proposed extended hour schedule. Such notification shall include:

- A description of the proposed work to be conducted.
- The proposed use of any equipment that may cause noise.
- Vibration or odor disruptions to the neighborhood.
- An estimate of the time required to complete the project.

The developer may proceed with its extended work hours if it secures approval from a majority of the residents of the affected neighborhood.

If DelDOT determines that the proposed work (regardless of its scheduled time) will produce noise that exceeds that applicable noise ordinances of the appropriate jurisdiction, the developer shall ensure that it seeks and receives a waiver from that jurisdiction before commencing work.

If DelDOT determines that the proposed work may cause any vibration or other damage to neighboring property, the developer shall complete a pre-work survey of the potentially affected properties to determine the baseline condition of those properties. The developer shall monitor the properties during construction to ensure that any vibration or other damage is minimized. If any damage does occur, the developer is responsible to reimburse the property owners.

DelDOT may waive the provisions of this section if it is determined that any such work is

necessary in order to respond effectively to an emergency caused by a natural disaster or an accident.

6.8 INSPECTION

The developer shall provide the District Engineer or his/her designee, access to all parts of the work and furnish such information and assistance as is required to make a complete and detailed inspection as described in DelDOT's current *Standard Specifications*.

During construction, the developer shall provide the District Engineer or his/her designee with at least two working days notice of all major construction activities. These activities shall include, but are not limited to, the following:

- Installation of utilities.
- Installation of drainage pipe and all major structures.
- Test rolling of the subgrade.
- Placement of base material.
- Placement of curbing.
- Placement of paving material (underground utilities must be installed and utility permits closed out prior to placement of paving and seeding).
- Installation of sidewalk.

A DelDOT Inspector must be present during these construction activities. All materials shall be inspected, tested, and approved before being incorporated in the work in accordance with DelDOT's *Standard Specifications* Section 106 – Control of Material.

All inspection of paving materials used and placement of paving materials shall be placed in accordance with the Contractor's Quality Control (QC) Plan. The Contractor's QC Plan shall be prepared in accordance with DelDOT's Special Provision 401699 – Quality Control/Quality Assurance of Hot-Mix Asphalt.

Credit for Hot-Mix Asphalt (HMA) – If the Contractor constructs any pavement that does not meet the requirements outlined in the contract documents, the developer's HMA, will be required to provide DelDOT a certified check for future pavement maintenance based on the amount of pavement that does not meet the specifications. The amount of the certified check will be equal to the average bid prices of the pavement minus the cost of the pavement that does not meet the requirements of the contract documents.

Assessment for Future Maintenance = (Tonnage of HMA in question) x Pavement Bid Cost $\times \left[1 - \frac{\%\text{Compliant}}{100\%}\right]$

The percent compliant is based on the procedures outlined in DelDOT's Special Provision 401699 – Quality Control/Quality Assurance of Hot-Mix Asphalt. The percent compliant is broken down into the amount of material production pay adjustment and the pavement construction pay adjustment. The material production is 70% of the pavement cost and the pavement construction is 30% of the pavement cost. The payment is calculated for each lot tested. The pay adjustment is discussed in greater detail in Special Provision 401699.

Credit for PCC – The PCC credit shall be consistent with DelDOT's *Standard Specifications* section 602.25.

The Developer shall request a final inspection when all work is complete. The District Engineer or his designee may then schedule a final inspection which shall be conducted by the District. DelDOT personnel, accompanied by the developer and/or his/her contractor, and representatives of the appropriate County Public Works or Engineers Office, shall inspect the site and determine those items of work, if any, that must be either completed, replaced or repaired.

The District Engineer shall then provide the developer with a punch list of the remaining work within ten working days. The punch list shall include required letters or documents indicated under Acceptance. Should the developer fail to

request a final inspection, the District Engineer may at his sole discretion provide to the developer a punch list of the remaining work to complete the streets.

The developer shall obtain a sign-off letter from the District Engineer indicating all work is complete before the roadway is accepted into the State maintenance system.

6.8.1 INSPECTION OF CLOSED DRAINAGE SYSTEM

To assure that the storm drainage systems of subdivisions are constructed per DelDOT's *Standard Specifications* prior to acceptance into the State maintenance system, a digital video inspection and report, verifying acceptability of the system, shall be required.

The procedure for inspecting closed drainage systems shall follow DelDOT's *Standard Specifications*.

6.8.2 INSPECTION FEE

Pending review and approval of the Delaware General Assembly, DelDOT shall collect inspection fees on all new commercial entrance and subdivision street construction projects, built on the public right-of-way, whether seeking State-maintenance or not. When fees are collected they shall be collected from the project developer or owner prior to the start of any aspect of entrance or street construction. The fee shall be made payable to DelDOT, at the rate of 10% of the estimated cost of construction as approved by DelDOT for the involved streets. This fee shall be cover ~~valid for~~ a period of five years from the date of the NTP. If construction is not completed within the five-year period, an annual renewal fee of one quarter the current inspection fee shall be required. This fee must be paid at the beginning of each additional year of construction. NTP with initial construction shall not be issued until DelDOT has collected the inspection fee.

If a developer fails to comply with the renewal fee requirements within 100 days of receipt of written notification, DelDOT shall initiate forfeiture of the security bond.

NTP on additional entrance or street construction projects within a development shall not be issued until all outstanding inspection fees have been collected.

CHAPTER 7 RESIDENTIAL ACCESS

7.1 CHAPTER PURPOSE

This chapter describes standards and regulations associated with residential lots abutting State-maintained roadways. Access from residential lots has an impact on the mobility, safety, and efficiency of the abutting roadway. Control of these access points is necessary to maintain safety and increase efficiency of State-maintained roadways while allowing access to individual properties.

Residential access permits are issued by the Public Works Engineer in the respective county. A new permit must be obtained whenever a new or expanded entrance is being requested. Figure 7-1 shows the mailing address for each county.

Figure 7-1 DelDOT Public Works Engineers

New Castle County (DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701
Kent County (DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901
Sussex County (DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

7.2 RESIDENTIAL ACCESS

Property owners of single residential lots wishing to gain access to a local road or a higher classification road according to Functional Classifications (see Appendix K), or a subdivision street already accepted into the State maintenance system shall adhere to the following criteria detailed in this section.

7.2.1 PERMIT APPLICATION PROCESS

The following documentation must be provided when applying for a residential entrance permit for access to a State-maintained road:

1. Any individual desiring to construct or reconstruct an entrance to serve a private single-family residence shall make written application to DelDOT in the District in which the construction is to take place before beginning any construction improvements on the property. The application form is available from the Public Works Engineer. A sample copy is provided at the end of this chapter.
2. The applicant shall include a plan, such as a Lines and Grades Plan, for the single residential lot. The plan shall fully comply with the local land use agency's most recent recorded plan (if any) for the site. The plan shall include sufficient detail including:

   - House location.
   - Driveway location.
   - Property lines.

- Tax Parcel Number.

3. The applicant shall include with the application proof of ownership from the local land use agency in the form of an official document on letterhead.
4. If the applicant is not the current property owner the power of attorney form must be attached with the application. See Appendix E for a sample power of attorney form.
5. The property owner must identify the proposed or existing entrance location. If the residential lot is part of a minor subdivision, a copy of the recorded minor subdivision plan must be included with the application form. If the entrance location has been identified on a recorded plan, the applicant shall stake it accordingly. Otherwise, the applicant shall stake the preferred entrance location. In either case, follow the procedure below:
   - Place two wooden stakes at the entrance. The stakes shall be visible 24 inches to 36 inches above the ground. The stakes shall be placed 24 feet apart, and as close to the roadside property line as possible, while being clearly visible from the road. The stakes shall not be set closer than five feet from the edge of pavement. If stakes are not placed, a permit will not be issued.
   - Tie ribbons or apply yellow paint to the top of stakes to make them clearly visible.
   - Write the property owner's last name on each stake.
6. Upon review and approval of the application and the actual driveway location, the Public Works Engineer shall issue an entrance permit for the construction of the residential entrance. The design requirements outlined in Section 7.2.3 must be met by the applicant.

7.2.2 CONSTRUCTION RESPONSIBILITIES

The property owner shall be responsible for all costs associated with driveway installation including drainage pipe, drainage pipe placement, excavation and backfill, and placing driveway materials. DelDOT will determine if any drainage pipe is necessary and notify the property owner with the size of pipe required.

The property owner shall coordinate with DelDOT for the inspection of the pipe placement, if required.

Should the construction not be completed to the satisfaction of DelDOT, the Department may seek compliance as permitted by the Delaware Code including the closing of the entrance. All costs associated with obtaining compliance shall be assessed to the property owner.

7.2.3 DESIGN REQUIREMENTS

The following design criteria apply to residential access on non-subdivision streets and are illustrated in Figure 7-2.

7.2.3.1 Number of Access Points

No more than one point of access should be provided for each property. If the property frontage allows for the proper spacing as outlined in Figure 9-1, additional access points may be granted.

DelDOT may grant a second point of access to single residential lots in special circumstances. These special circumstances may include:

- Needs of a handicapped resident.
- Proposed entrance location conflicts with septic system.
- No ability to provide a turn around.
- Construction of outbuildings that cannot be served by the original entrance.

7.2.3.2 Entrance Location and Spacing

Spacing of residential access shall comply with the requirements outlined in Figure 9-1. If these minimum requirements cannot be met because of insufficient roadway frontage, then the applicant shall provide a combined access with the adjacent lot.

When a property has frontage on two roadways, the driveway shall be located on the lower volume road. See Section 9.2 for more information on entrance policy and access spacing.

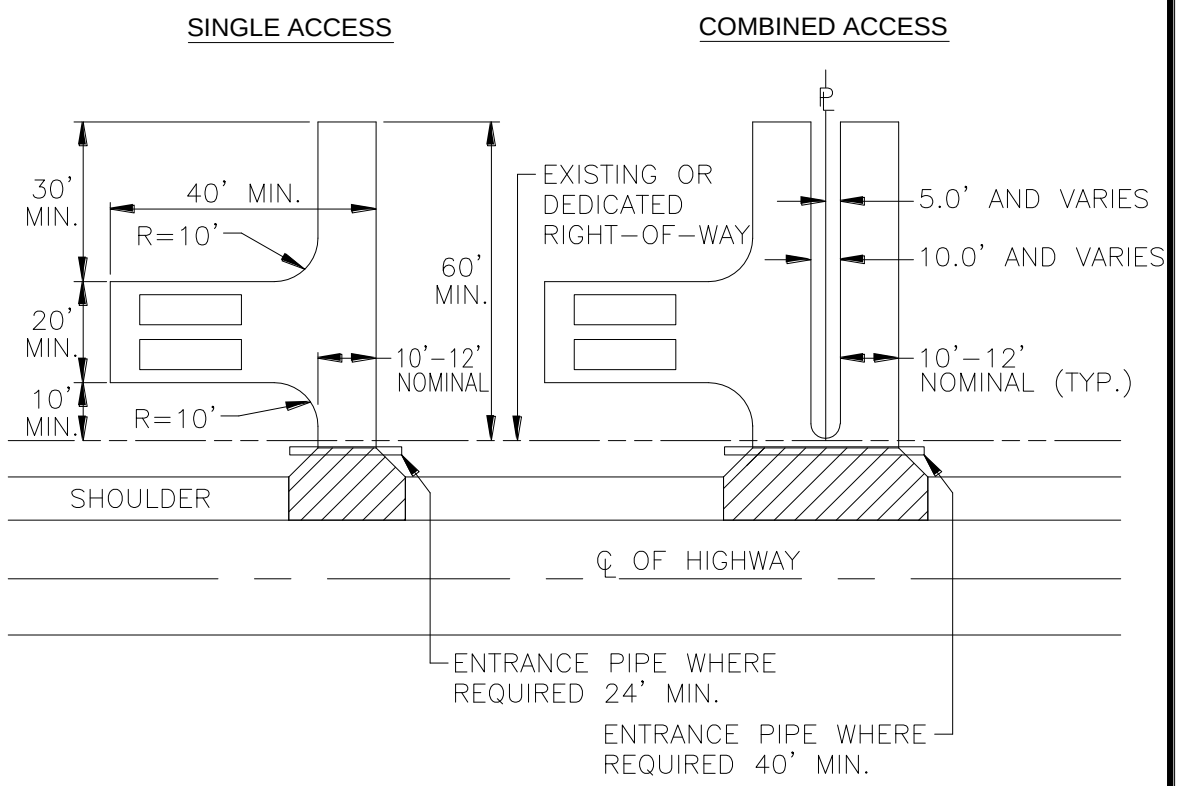
7.2.3.3 Entrance Width

A single residential entrance shall have a width of ten to twelve feet. A combined residential entrance, serving two residential properties, shall have a width of 24 feet to 30 feet. Upon written request, DelDOT may consider entrance widths larger than those listed above to accommodate larger vehicles (See Figure 7-2).

7.2.3.4 Entrance Profile

Profiles of entrances and exits shall be designed in accordance with these *Standards and Regulations for Subdivision Streets and State Highway Access*, and AASHTO's standards. Maximum grades shall not exceed 10%. Vertical curve transition shall be provided at the intersection of the driveway profile and the cross slope of roadway shoulder extended.

Figure 7-2 Residential Access Design Requirements



NOTES

1. DRIVEWAY WIDTHS MAY BE INCREASED WITH DelDOT'S APPROVAL FOR SPECIAL PURPOSE VEHICLES, I.E. FARM VEHICLES, ETC.
2. MINIMUM RESIDENTIAL PAVEMENT SECTION – 6" GRADED AGGREGATE BASE COURSE.
3. ACCESS TO RESIDENTIAL LOTS SHOULD BE LIMITED TO ONE ACCESS POINT. (SEE SECTION 7.2.3.1 FOR EXCEPTIONS)

7.2.3.5 Entrance Drainage Pipe

Pipes are manufactured in various sizes, shapes, and materials. Entrance pipes commonly used in Delaware include:

- Reinforced concrete pipe (RCP) (round or horizontally elongated).
- ~~Corrugated~~ Metal Pipe (~~C~~MP).
- High Density Polyethylene (HDPE).

~~Corrugated~~ Metal Pipes (~~C~~MP) shall not be used in corrosive environments, such as areas with water tables that are tidally influenced, or other areas where ~~C~~MP's have performed poorly. Use of ~~C~~MP must be approved by DelDOT prior to use.

Figure 7-4 below shows minimum cover depths for these pipes.

Figure 7-3 Residential Entrance Pipes

Material		Cover Depth*
RCP Class	III	> 1 ft.
	IV	6 in. – 1 ft.
	V	< 6 in.
HDPE		1 ft.
CMP		1 ft.

** From top of pipe to bottom of pavement base.*

The longitudinal slope from the entrance pavement to the top of the pipe shall be 6:1.

7.2.3.6 Entrance Apron

Aprons shall be placed on residential driveways to facilitate turning movements. Entrance aprons shall be designed in accordance with DelDOT's current *Standard Construction Details* ~~and Figure 7-4~~.

The area of the driveway between the edge of pavement for the State-maintained roadway and the right-of-way should be paved, but may be stabilized with graded aggregate base course as approved by the Public Works Engineer.

7.2.3.7 Entrance Turnaround

Driveways shall be designed to provide storage for vehicles off the State-maintained roadway right-of-way and include a provision for vehicular turnaround to enable entrance to the State-maintained roadway in a forward direction.

7.2.3.8 Sight Distance

Driveways shall be clear and free of obstruction. A driver shall have an unobstructed view of the adjacent roadway and the ability to view any approaching vehicles at the intersection with the roadway.

Design guidelines necessary to provide sufficient sight distance shall be in accordance with AASHTO and Section 5.4 of these *Standards and Regulations for Subdivision Streets and State Highway Access*.

7.3 RESIDENTIAL ACCESS WITHIN SUBDIVISION STREETS

For residential access within subdivisions, the following criteria apply:

- No more than two entrances shall be allowed for each property on subdivision street type I.
- For subdivision street type II, no more than one point of access shall be provided for each property. DelDOT may grant a second access point as outlined in Section 7.2.3.1.
- The area of the driveway between the subdivision street and the right-of-way shall be paved.
- The driveway width may vary from 10 feet to 20 feet.
- An apron ~~(as shown in Figure 7-4)~~ may be placed as necessary.

For sidewalk placement across driveways see Chapter 5 and the *Standard Construction Details*.

~~Figure 7-4 Entrance Apron~~

7.4 MAILBOX REQUIREMENTS

No mailbox or newspaper delivery box (hereafter referred to as mailbox) shall be allowed to exist on the State-maintained roadway right-of-way if it interferes with the safety of the traveling public or the function, maintenance, or operation of the State-maintained roadway. A mailbox installation that does not conform to the provisions of this regulation is an unauthorized encroachment.

7.4.1 MAILBOX INSTALLATION

A mailbox installation that conforms to the following criteria shall be considered acceptable unless, in the judgment of DelDOT, the installation interferes with the safety of the traveling public or the function, maintenance, or operation of the State-maintained roadway.

7.4.1.1 Location

No mailbox shall be permitted where access is obtained from the lanes of a freeway or where access is otherwise prohibited by law or regulation.

Mailboxes shall be located on the right hand side of the roadway in the direction of the delivery route. The bottom of the box shall be set at an elevation established by the U.S. Postal Service, usually between 3.5 and 4 feet above the roadway surface.

On curbed streets the roadside face of the mailbox shall be set back from the face of curb distance between six and twelve inches. On roadways without curbs or all-weather shoulders and which carry low-traffic volumes operating at low speeds, the roadside face of a mailbox shall be offset between eight and twelve inches behind the edge of pavement.

Where a mailbox is located at a driveway entrance, it shall be placed on the far side of the driveway in the direction of the delivery route.

Where a mailbox is located at an intersecting road it shall be located a minimum of 100 feet beyond the center of the intersecting road in the direction of the delivery route. This distance shall be increased to 200 feet when the average daily traffic on the intersecting road exceeds 400 vehicles per day.

7.4.1.2 Structure

Mailboxes shall be of light sheet metal or plastic construction conforming to the requirements of the U.S. Postal Service. Newspaper delivery boxes shall be of light sheet metal or plastic construction of minimum dimensions suitable for holding a newspaper.

No more than two mailboxes may be mounted on a support structure. Lightweight newspaper boxes may be mounted below the side of the mailbox support.

A single 4”x 4” square or 4.5” diameter round wooden post or a metal post with a strength no greater than a 2” diameter standard strength steel pipe and embedded no more than 24 inches into the ground shall be acceptable as a mailbox support. A metal post shall not be fitted with an anchor plate, but it may have an antitwist device that extends no more than ten inches below the ground surface. Mailbox supports shall not be encased in concrete or brick.

The post-to-box attachment details should be of sufficient strength to prevent the box from separating from the post top if the installation is struck by a vehicle.

The minimum spacing between the centers of support posts shall be three-fourths the height of the posts above the ground line.

7.4.2 REMOVAL OF NON-CONFORMING OR UNSAFE MAILBOXES

Any mailbox that is found to violate the intent of this regulation shall be removed by the postal patron upon written notification by DelDOT.

At the discretion of DelDOT, based on an assessment of hazard to the public, the patron shall be granted not less than 24 hours nor more than 30 days to remove an unacceptable mailbox. After the specified removal period has expired, the unacceptable mailbox shall be removed by DelDOT, at the postal patron's expense.

DELAWARE DEPARTMENT OF TRANSPORTATION

APPLICATION FOR RESIDENTIAL ENTRANCE CONSTRUCTION PERMIT

Property Owner's Name :_____**Date:**_____

Mailing Address: _____

_____, _____ _____
City State Zip Code

Telephone No.: (_____)_____ **Cell No.: (_____)**_____

Fax No.: (_____)_____ **E-mail Address:** _____

Tax Map I.D. No.: _____
(Example: SM 00 000 00 00 00 00 000)

Applicant Name:_____

Mailing Address:
_____,
_____ _____
City State Zip Code

Telephone No.: (_____)_____ **Cell No.: (_____)**_____

Fax No.: (_____)_____ **E-mail Address:** _____

Proposed/Existing entrance location (Mailing Address, Maintenance Road Name, or Road No.):

_____

Nearest intersecting road (Name): _____

Distance from entrance to nearest intersecting road: _____**Subdivision Name (If applicable):** _____

Location of proposed entrance shall be physically staked in field with property owner's name, as a condition of this application. Date when you can place stakes up at entrance: _____ **If stakes are not in place, a permit will *NOT* be issued.** **mm/dd/yyAre you requesting a permit for an existing entrance or a proposed entrance? Existing or Proposed**
(Circle one)

If applying for an *existing* entrance:

*** Will you be modifying or relocating the existing entrance? Yes** _____ **No** _____
If yes (explain): _____

*** Was the existing entrance constructed within the past three years? Yes** _____ **No** _____

Describe modification you are proposing on the property *(Single Family Dwelling, Mobile Home, Replacement of Mobile Home, Echo Unit, Building, Additions, etc.):* _____
_____
Additional Comments (Please write on back)

_____
Signature

CHAPTER 8 ADMINISTRATIVE GUIDELINES

8.1 CHAPTER PURPOSE

This chapter contains regulations for access to State-maintained roadways for conditions and occurrences not described thus far. These include temporary/seasonal entrances, construction entrances, special event sites, and access to extremely low volume generators such as utility sites. Controlling access to these sites enhances safety and increases throughput on the State-maintained roadway network.

Furthermore, policies associated with conversion of private streets to public roads, connector streets, and paper streets are discussed in this chapter.

8.2 IMPROPER ENTRANCES

Should DelDOT find that an entrance is in violation of these *Standards and Regulations for Subdivision Streets and State Highway Access*, the following actions shall be taken in order to gain compliance.

1. The Public Works Engineer shall notify the property owner by registered mail of the nature of the violation. The property owner shall be given 20 days from the date of the receipt of the notification to submit to DelDOT a schedule to correct the violation.

2. In the event that the property owner fails to correct the violation within the time specified or to comply with DelDOT's request, the Public Works Engineer shall notify the Property owner by registered mail that the violation is to be corrected within ten days. Failure to comply with the second notification shall cause DelDOT to seek compliance in accordance with the remedies permitted by the Delaware Code, including closing the entrance.

3. All costs incurred by DelDOT incidental to obtaining compliance with these entrance requirements, including closing the entrance, shall be borne by the property owner.

8.3 TEMPORARY / SEASONAL ENTRANCE FOR BUSINESS PURPOSE

When a parcel of land is to be occupied for business purposes for less than 90 days in any consecutive 12-month period, a temporary entrance permit may be issued in lieu of a permanent permit.

In order to secure a temporary permit, the applicant must show that sufficient off-street parking exists on the site as determined by local land use regulations. The applicant must provide a plan showing the parking area and the access point to the roadway, which must not interfere with the safe operation of auxiliary lanes.

Channelization shall be used to delineate the entrance. The channelization may consist of the following: barricades, cones, prefabricated

temporary curbing or other temporary means approved by DelDOT.

The entrance, including the shoulder of the roadway, may be dirt or stone. The permit holder shall be responsible for maintenance of the entire entrance, the limits being defined on the temporary permit. The limits shall include the entrance up to the edge of the traveled way. Any ruts, potholes, etc. in the shoulder of the roadway in the vicinity of the entrance shall be the responsibility of the permit holder to repair. Failure to maintain the entrance area as defined shall cause DelDOT to make the necessary repairs. The entrance shall be closed by DelDOT until the permit holder reimburses DelDOT for the repairs and also posts a bond of sufficient amount to cover any future repairs. A permit shall not be issued to any individual, partnership, corporation, or other entity until all previous obligations created with DelDOT are fully satisfied.

8.4 CONSTRUCTION ENTRANCE

If a property owner seeks to gain access to property for construction purposes and the final entrance plan has not been approved, the Public Works Engineer may issue a construction entrance permit.

A construction entrance permit does not relieve the applicant of the responsibility of obtaining a permit to construct a permanent entrance facility. The permit for construction of a permanent entrance facility shall be complete and accepted by DelDOT's Public Works Engineer prior to utilization of the entrance. The requirement to obtain a surety for the construction entrance may be waived at the discretion of the Public Works Engineer.

8.5 MISCELLANEOUS ENTRANCE

Entrance permits are required for low volume entrances and special events such as used car sales, roadside stands, access to farm fields, and access to utilities. The process for obtaining the permit will follow the same process as a residential entrance permit outlined in Chapter 7.

8.6 PROPERTY CHANGE OF USE / CHANGE OF OWNERSHIP

If an existing business changes ownership and the existing Commercial Entrance Permit is still applicable, no new entrance permit will be required. If an existing property changes use or expands, the existing Commercial Entrance Permit shall be evaluated to determine if entrance improvements will be required. ~~In either case,~~ If the traffic generated by the site exceeds the entrance design, then entrance modifications shall be required and plans shall be submitted as outlined in Chapters 3 and 5.

In the event that an entrance is approved, constructed, and at a later date an additional facility is constructed or the conditions change off the right-of-way in such a manner as to adversely affect the safe or proper use of the entrance, then DelDOT may require a new application or deny use of the entrance until such time as DelDOT is satisfied that the conditions are rectified.

8.7 CONVERSION OF PRIVATE STREETS TO PUBLIC STREETS

Private streets can be converted into public streets with or without being accepted into the State maintenance system.

8.7.1 DEDICATING STREETS TO PUBLIC USE (STATE-MAINTAINED)

The following criteria shall be met in order for a street to be accepted into the State maintenance system:

1. The subdivision where the street is located shall meet the definition of a suburban community as defined in Chapter 1.
2. The homeowner's association or a majority of the property owners must submit a written request for a roadway investigation, in accordance with State guidelines, to the Subdivision Engineer. The letter must give the State all necessary right of entry onto private property to perform the necessary investigations. A copy of the record plan shall accompany the letter.

   Following the investigation, DelDOT will notify the homeowner's association or property owners of the required work necessary to bring the streets up to State standards.
3. The homeowner's association or property owners must have the current subdivision record plan re-recorded, dedicating the streets to public use.

   The plan shall include the words "dedicated to public use" within the street right-of-way and the following note:

   Subdivision streets constructed within the limits of the right-of-way dedicated to the pubic use, shown on this plan, are to be maintained by the State of Delaware at such time that the existing streets are brought up to current State standards and accepted by the State. The State assumes no maintenance responsibilities within the dedicated street right-of-way until the streets have been accepted by the State.
4. The following note must be included concerning the drainage / utility easement:

   The front and side ten feet of each lot hereon are reserved as easements for drainage and utilities unless otherwise noted.
5. A copy of the proposed record plan shall be submitted to the Subdivision Engineer, prior to recordation to ensure that all right-of-way and easements are correct. Once all comments have been addressed, DelDOT will issue a "No Objection to Recordation" letter to the local land use agency.
6. The homeowner's association or property owners must submit construction plans as outlined in Chapter 4 for the reconstruction or the rehabilitation of the existing subdivision streets as determined in No. 2 above. Upon approval of the construction plans, the construction will be governed by Chapter 6 of these Standards and Regulations for Subdivisions Streets and State Highway Access.
7. Once DelDOT's Subdivision Engineer has received a copy of the recorded plan showing plot book and page of recordation, and a letter from DelDOT's Public Works Engineer stating all work has been completed to State requirements, the street will be accepted into the State maintenance system.

8.7.2 DEDICATING STREETS TO PUBLIC USE (NOT STATE-MAINTAINED)

The following is the process for dedicating private streets that are not State-maintained to public use.

The homeowner's association or property owners must have the streets dedicated to public use by either re-recording the record plan or other acceptable method of dedication. Once the roads have been dedicated to public use, they are eligible for improvements funded by the Community Transportation Program, at the request of local legislators.

8.8 PARKING WITHIN THE RIGHT-OF-WAY

8.8.1 COMMERCIAL

The development of a commercial property adjacent to State-maintained roadways shall include provisions for the required parking as specified by the local land use agency outside of the State-maintained roadway right-of-way. Parking is to be provided so as not to interfere or cause the backing up of traffic on the traveled-way as outlined in Chapter 3. Failure to provide the necessary parking area may result in the entrance being closed by DelDOT at the expense

of the owner. Parking shall not be permitted on the shoulder of a State-maintained roadway or on any portion of the right-of-way located outside of a municipality.

8.8.2 SUBDIVISION STREETS

Parking is allowed within subdivision streets except in the following areas:

- Subdivision Streets Type III.
- Within the immediate area of the entrance driveway.
- In turnarounds and cul-de-sacs.
- Near play grounds.
- On curves with a vertical grade.
- Near traffic calming features (e.g., speed humps).

No driveways or parking bays shall be located in subdivisions within 40 feet from the edge of the radius return for the connecting street. This distance shall increase to 60 feet at the entrance to the subdivision.

In order to restrict parking in areas within a subdivision street that can accommodate overflow on-street parking, DelDOT will require support from a significant majority of the residents. DelDOT Traffic ~~Unit~~ Section must receive a petition signed by 75% of the households indicating their support for "Stopping, Standing, and Parking Restriction." DelDOT will determine whether to restrict on-street parking within subdivision streets considering the petition and engineering study. ~~Example locations of situations that may warrant a parking restriction include but are not limited to: Within the immediate area of the entrance driveway, in turnarounds and cul-de-sacs, on horizontal and vertical curves, or near traffic calming features (e.g., speed humps).~~

8.9 PAPER STREET POLICY

The term "Paper Streets" refers to rights-of-way which have been recorded and dedicated to public use but in which no State-maintained streets have been built. In this way they differ from private streets where the rights-of-way have been dedicated and a street has been built but not accepted for State maintenance.

8.9.1 GUIDELINES FOR ACCESS

DelDOT shall regulate access to properties fronting on paper streets as follows:

- Access for one single-family home may be permitted by the Public Works Engineer as though the paper street was the homeowner's driveway only if it has been determined that there are no other buildable lots fronting the paper street.
- In all other cases, the applicant shall be required to construct a street in accordance with DelDOT standards. The street shall be constructed from the existing State-maintained street to the end of the applicant's property. The end of the applicant's property is hereby defined as the width of their building lot, which fronts the paper street.

The minimum required pavement section shall be two inches of Type 'C' Hot Mix over eight inches of stone aggregate base material.

Bonding may not be required if it is determined that the street improvements are minimal and/or do not have any detrimental impact on the surrounding community should the applicant fail to complete its obligation. A security shall be required for performance, and shall be posted in the amount of 10% of the cost to construct the approved street improvements.

Generally, where two or more interconnected paper streets are involved, the Subdivision Section shall determine which paper right-of-way should be improved for access and, if appropriate, shall recommend to the District Engineer what street(s) should be barricaded

Following construction of the streets in accordance with approved construction plans , DelDOT agrees to accept for maintenance the paved portion of these streets including curbing and gutters, and open and closed drainage systems where they exist.

8.10 CONNECTOR STREET

A connector street is a continuous street or streets entirely in the Subdivision Street category beginning and ending on the state numbered road system, and having a high volume of through traffic.

1. DelDOT may transfer certain connector streets into the state maintenance numbered road system. Transfer of connector streets from subdivision streets to maintenance road number designation changes the responsibility for funding from the legislator's Community Transportation Funds to DelDOT's Paving and Rehabilitation Work Programs. Guidelines: All streets in the subdivision street category are eligible for transfer, provided the minimum Annual Average Daily Traffic (AADT) along the length of the road must be above 4,000 vehicles.

2. Acceptance of resurfacing and reconstruction responsibilities for these roads in no way changes existing acceptance agreements which remain in full force and effect. When it comes to the attention of DelDOT that a subdivision street may meet criteria for transfer, the Division of Planning shall conduct a study to determine whether the criteria are met, and whether it is in the best interest of all concerned to effect the transfer. If the study supports the transfer, the Department shall hold a public meeting in the community to receive comments on the proposal. As a minimum, the following must be notified at least two weeks in advance of the meeting:
   - Secretary of Transportation.
   - DelDOT District Engineer.
   - All legislators in whose districts the street is located.
   - All established civic groups in areas through which the street passes.
   - All residences and/or owners located on the street.

   Within 30 calendar days of the public meeting, DelDOT shall decide which maintenance category the street shall be in and publicly notify the above-listed individuals/groups of that decision.
3. The responsibility for administration of these guidelines and certification of eligibility of roads rests with DelDOT's Director of Planning.

8.11 ABANDONMENT/VACATION AND/OR CLOSURE OF AN EXISTING ROAD

This section provides the guidelines for determining the merits of considering a request for the abandonment/vacation and/or closure of an existing road or an interconnection.

When considering any request for abandonment/vacation and/or closure, an Operation Analysis as outlined in the *Standards and Regulations for Subdivision Streets and State Highway Access*, Section 3.9 shall be performed by the Applicant and made available to the local land use agency and DelDOT for review.

The following additional criteria shall be considered:

1. Safety, in terms of pedestrian, bicycle, motor vehicle and property owners,
2. Traffic volumes on the road in question would exceed the capacity of the roadway and the road cannot be reasonably modified to handle the increased volume of traffic,

3. How the closure/abandonment/vacation will affect access to the area via emergency vehicles, school buses, local service providers,
4. Whether the closure/abandonment/vacation is for the benefit of the health, safety and welfare of the public,
5. Affect of the closure/abandonment/vacation upon the local street and pedestrian network,
6. The Local Area Plan has been amended by the local jurisdiction through a public process to allow the closure, if applicable,
7. Affect of the closure/abandonment/vacation upon the provision of transit, including paratransit,
8. How the closure/vacation/abandonment will affect pedestrian and vehicular connectivity if it is rejected and if it is approved, and
9. How the proposal will affect access to, provision of, and maintenance on public utility systems such as drinking water, stormwater, sewer, electric and gas.

CHAPTER 9 ACCESS CATEGORY STANDARDS

9.1 PURPOSE AND USE

The number, spacing, type, and location of access and traffic signals have a direct and often significant effect on the capacity, speed, and safety of the highway. Access to the Functional Classification Network is controlled using a hierarchical five level category system. The design standards within each category are necessary to ensure that the highway will continue to function at the level (category) assigned. Each state highway segment is assigned a category as defined in Sections 9.3 to 9.7.

Traffic signals and their installation are guided by the *Manual on Uniform Traffic Control Devices* (Delaware MUTCD) and regulated by the DelDOT Traffic Section. DelDOT may at its discretion, grant an access to a State-maintained roadway, require design and operational modifications as it deems necessary, restrict one or more turning movements, or deny the access so long as such discretion does not violate relevant law.

The existing design of the highway is not required to meet the design standards of the assigned category at the time it is assigned. All new access permitting and other access design decisions shall meet the design standards in this chapter for the assigned category for the highway or segment of highway.

9.2 ENTRANCE POLICY

9.2.1 LOCATION OF ENTRANCES

Entrances shall be placed to provide safe access to the site while providing the least impact on the existing roadway system. Entrances shall be located to provide the required sight distance, in accordance with AASHTO Standards, where the highway alignment and profile are favorable, where there are no sharp curves or steep grades, and where sight distance in conjunction with the access is adequate for safe traffic operation.

If a proposed development has frontage on two roads, access shall be provided from the lower volume road. Considerations for the placement of entrances should include evaluation of sight distance, location of adjacent entrances, and distance from intersecting streets. Where feasible, entrances shall not be located within 40 feet of an intersection radius or on acceleration and deceleration lanes.

Site circulation should be designed to allow vehicles to easily enter the site not blocking entrances and not be impacted by traffic control devices or parking spaces.

Any site being considered by DelDOT for access on to a State-maintained roadway shall be evaluated to determine if it will also impact any other DelDOT programs. These programs include, but are not limited to, the Corridor Capacity Preservation Program (CCPP), the Capital Transportation Program, the

Transportation Enhancement (TE) Program, the ~~Highway Safety Improvement~~ Hazard Elimination Program ~~(HSIP)~~ (HEP), Pavement Rehabilitation Program, and Community Transportation Fund Program. If a plan would have an affect on any of these programs, that fact may necessitate additional review by DelDOT and additional requirements may need to be met.

When feasible and practical, two adjacent commercial properties shall use a common ingress and egress from the public highway. The original property owner shall establish and record a cross access easement regarding the location and design of such ingress and egress ~~prior to any sale or subdivision of land~~ subject to the review and approval of DelDOT.

9.2.2 NUMBER AND ARRANGEMENT OF DRIVEWAYS

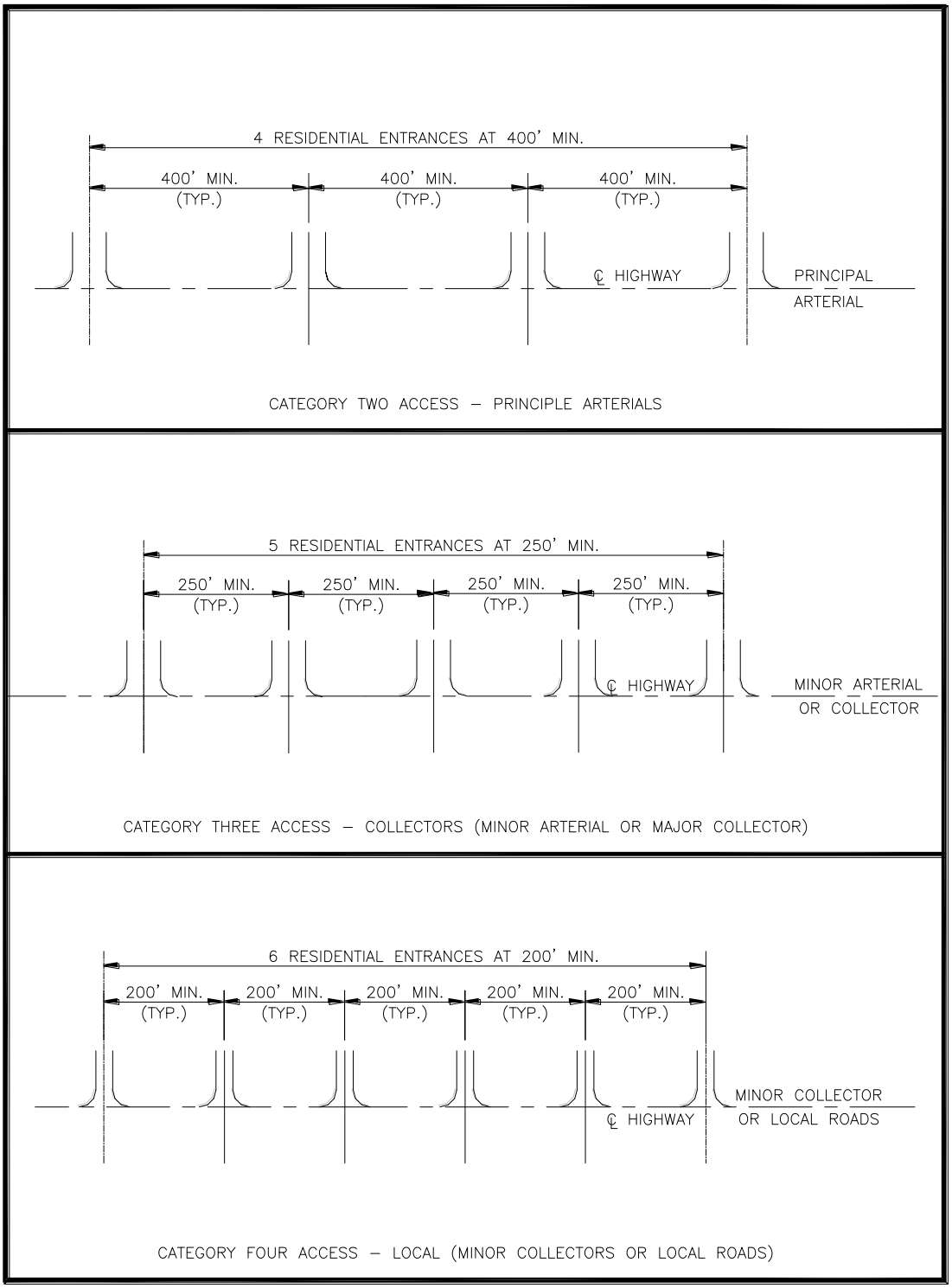
Spacing of residential access shall comply with the requirements outlined in Figure 9-1. If these minimum requirements cannot be met because of insufficient roadway frontage, then the applicant shall provide a combined access with the adjacent lot. Not more than two combined entrance and exit driveways on the same highway shall be provided to any single property tract or business establishment.

DelDOT may consider an exception only where the frontage is 1000 feet or more. In such instances and where exceptions are requested by the developer, DelDOT shall study the proposed driveway design and parking arrangement to determine if any exception may be granted from an overall highway traffic operation and safety standpoint.

9.2.3 DEEDED ACCESS RIGHTS

Along some sections of State-maintained roadway, access rights have been obtained by DelDOT in the form of a recorded deed. Where access is controlled by deed there is no right of direct access through the deeded section. The property owner so affected may inquire with DelDOT about changes or purchase of any deeded access rights. The obtaining or revising of access rights by deed is regulated by the right-of-way acquisition process. Where access is not restricted by deed, an access permit consistent with the requirements of Standards and Regulations for Subdivision Streets and State Highway is still required for the construction and use of a driveway.

Figure 9-1 Spacing of Driveways and Entrances



9.3 CATEGORY ONE (INTERSTATE OR TOLL ROAD)

9.3.1 FUNCTIONAL CHARACTERISTICS

These highways have the capacity for high speed and high volume traffic movements over long distances in an efficient and safe manner, including interstate, interregional, intercity and, in larger urban areas, intra-city travel. Federal aid interstate highways are typical of this category.

9.3.2 DESIGN STANDARDS

All opposing traffic movements shall be separated by physical constraints such as grade separations and median separators. Access, consisting of directional ramps, shall be suitably spaced and designed to provide the minimum differential between the speed of the through traffic stream and the speed of the merging or diverging vehicles. Location and design of access shall be determined on an individual basis by DelDOT. Each access allowed to a Category One highway must receive the specific approval of the Chief Engineer and the FHWA. Access to interstate highways must comply with federal regulations. Temporary access may be allowed during official emergencies or where directly related to a freeway construction project.

9.4 CATEGORY TWO (ARTERIALS)

9.4.1 FUNCTIONAL CHARACTERISTICS

These highways have the capacity for high speed and high volume traffic movements in an efficient and safe manner, providing for interstate, interregional, and intercity, travel needs and some intra-city travel needs. Direct access service to abutting land is subordinate to providing service to through traffic movements. Category Two is the highest category that permits at-grade intersections.

9.4.2 DESIGN STANDARDS

The design of Category Two highways should be capable of achieving a posted speed limit of 35 to 45 MPH where signals are present, and 45 to 55 MPH in rural areas. Typical spacing of intersecting streets, roads, and highways shall be planned at intervals of 2,500 feet. A minimum of 1,250 feet spacing should be permitted only when no reasonable alternative access to the street system exists.

Unless otherwise specifically categorized, all overpasses, underpasses, structures, ramps, and roadway sections between frontage roads and the main highway are Category Two.

Private direct access shall not be permitted unless the property retains deeded rights of access and the property has no other reasonable access to the street system.

All private direct access permitted shall be for right turns only unless:

1. The access does not have the potential for signalization, and
2. The distance required to execute a left turn or a U-turn would exceed one mile, and
3. A left turn movement can be designed that, in the opinion of DelDOT, meets all safety requirements.

No additional access shall be provided upon the splitting or dividing of existing parcels or contiguous parcels under the same ownership or control. All access to the newly created properties shall be provided internally from the existing access. Any new access determined by the permit application shall be consistent with the requirements of *Standards and Regulations for Subdivision Streets and State Highway Access*.

All access provided to a Category Two highway shall be done so with the understanding that if the highway is reconstructed to a Category One, alternative access may be provided by a frontage road or other means.

Opposing roadway traffic movements shall be separated by physical constraints such as grade separation or a median separator of sufficient design to physically prevent illegal movements.

Intersections with high traffic volumes should have either grade separations or interchanges.

Traffic signals should be programmed to allow speeds of 35 to 45 MPH. Signals at intersections with major cross streets may be programmed to optimize traffic on both streets equally. The efficiency of the signal system should be analyzed including volume, capacity, and level of service calculations.

9.4.2.1 Signal Spacing Criteria

The standard for the spacing of all intersecting State-maintained roadways and other accesses that are or may become signalized, shall be at 2,500 feet intervals, plus or minus 200 feet. For the purposes of achieving good arterial capacity and efficiency and to minimize delays to the traveling public the desirable bandwidth and efficiency for traffic signal progression is 80 percent and the minimum is 40 percent.

Exceptions to this 2,500 feet standard shall not be considered or permitted unless the proposal documents that there are no other reasonable alternatives to achieve a 2500 feet interval, there is a proven necessity for the intersection, and a study acceptable to DelDOT is completed. Topography and existing conditions may make 2,500 feet intervals inappropriate or not feasible. In that case, location of the access shall be determined with consideration given to topography, property ownership, unique physical limitations, unavoidable or pre-existing land use patterns and physical design constraints. The final location should serve as many properties and interests as possible to reduce the need for additional direct access to the state highway.

9.4.2.2 Signalized Access Study Requirements

When a study is required, the study shall be completed and signed by a Delaware registered professional engineer using the following standards:

1. Evaluation of current traffic data and 20-year projections and any key year midpoints assuming development of the study area based upon zoning and comprehensive plans.
2. Highway signal progression bandwidth and efficiency analysis including current and anticipated future signalized intersections.
3. An optimum signal cycle as determined by DelDOT.
4. Actual speeds as determined by a spot speed study.
5. A highway bandwidth of 40 percent shall be used where conditions allow but no less than 30 percent bandwidth where existing or future locations may be at or below 30 percent.
6. The green time allowed for the cross street shall be no less than the time necessary to accommodate pedestrian movements.

The study shall also provide the following information:

1. Notation of all existing access, possible future access locations for at least one mile in each direction, and all potential roadway and signal improvements.
2. Current and future arterial travel speed, travel time, and delay time.
3. Traffic generation rate estimates.
4. Information, data and reference sources.
5. An evaluation of the level of service for all geometric elements.
6. Accurate and understandable diagrams.
7. All assumptions and adjustment factors.
8. An analysis of all reasonable alternatives including a no build alternative.

9. A safety analysis including conflict points and movements.
10. A conceptual design showing all geometric elements and approximate dimensions with detailed analysis of any elements below code standards.

Additional information and additional analysis based upon other factors and standards may be required if determined to be necessary for a complete evaluation.

Any access that would reduce the optimum highway bandwidth if a traffic signal were installed shall be limited to right turns unless it meets the three numbered requirements of Section 9.4.2.

9.5 CATEGORY THREE (COLLECTORS)

9.5.1 FUNCTIONAL CHARACTERISTICS

These highways have the capacity for medium to high travel speeds and high traffic volume over medium and long distances in an efficient and safe manner. They provide connections between arterials and local roads. Direct access service to abutting land is subordinate to providing service to through traffic movement.

9.5.2 DESIGN STANDARDS

The design of all Category Three highways should be capable of achieving a posted speed limit of 35 to 45 MPH on urbanized signalized segments and preferably 50 MPH in rural areas. A speed limit of 35 to 45 MPH in urbanized areas is acceptable where posted and there is little or no possibility of achieving higher speeds.

Private direct access to State-maintained roadways shall not be permitted when the property in question has other reasonable access or reasonable opportunity to obtain other reasonable access to a lower functional roadway. If DelDOT determines that denial of direct access to the State-maintained roadway would cause unacceptable traffic operation or safety problems at the alternative access location(s) and to the overall traffic flow of the roadway system, or the proposed location is consistent with the spacing and public intersection requirements of this Section, direct access may be allowed. When direct access is to be allowed, such access shall continue until such time that some other reasonable access to a lower function category street or highway is available. No more than one such access shall be allowed to an individual parcel or to contiguous parcels under the same ownership. A combined driveway may be construed as a single access.

Where local regulations require a secondary access to provide for emergency services, DelDOT may allow an emergency access. Such an access shall not be open for non-emergency uses and shall be maintained by the permittee as a closed access except during emergencies.

When private direct access to a state-maintained roadway is allowed, it will generally be restricted to right turns only. One or both left turn movements may be permitted if the applicant establishes to DelDOT's satisfaction that:

1. The left turn movement would not create unreasonable congestion or safety problems or lower the level of service, and
2. Alternatives to the left turn would cause unacceptable traffic operation and safety problems on the street system, or
3. The access meets the signalization spacing requirements for intersecting public streets, roads and highways, and does not interfere with the location, planning, and operation of the street system and access to nearby properties.

A right turn movement may be restricted if, in the determination of DelDOT, the movement creates an operational problem or safety hazard.

Since intersecting public ways may in time warrant signalization, it is required that all

intersecting streets, roads and highways, that allow left turns meet the signal spacing criteria under Section 9.4.2.1. Those that do not meet these requirements shall be limited to right turns only, unless they meet the requirements of this Section.

No additional access rights shall accrue upon the splitting or dividing of existing parcels or contiguous parcels under the same ownership or control. All access to the newly created properties shall be provided internally from the existing access. Any new access determined by the permit application shall be consistent with the requirements of *Standards and Regulations for Subdivision Streets and State Highway Access*.

When an existing access meets the warrants for a traffic signal as defined in the Delaware MUTCD, and the location does not meet the requirements of Section 9.4.2.1, a median separator may be installed or the access designed to direct vehicles into right turns only. These design solutions may not be practicable or feasible where there are physical constraints such as curbs, sidewalks, structures, and lack of rights-of-way. The access may be required to be reconstructed, or relocated to conform to these *Standards and Regulations for Subdivision Streets and State Highway Access*.

9.5.2.1 Signal Spacing Criteria

The standard for the spacing of all intersecting State-maintained roadways and other accesses that are or may become signalized, shall be in accordance with Section 9.4.2.1.

9.5.2.2 Signalized Access Study Requirements

When a study is required, the study shall be completed and signed by a Delaware registered professional engineer in accordance with Section 9.4.2.2.

9.6 CATEGORY FOUR (LOCAL)

9.6.1 FUNCTIONAL CHARACTERISTICS

These highways have the capacity for moderate travel speeds and moderate traffic volumes over medium and short travel distances providing for intra-city and intercommunity travel needs. There is a reasonable balance between direct access and mobility needs within this category.

9.6.2 DESIGN STANDARDS

The design of all Category Four highways should be capable of achieving a posted speed limit of 30 to 45 MPH. The posted speed limit shall be used to meet the requirements of access to State-maintained roadways unless an approved plan or study shows improvements to the highway require a higher speed limit be used.

One access may be allowed from a State-maintained roadway to an individual parcel or to contiguous parcels under the same ownership or control where such access will not compromise the safety and operation of the highway. Additional access may be provided (see Section 7.2.3.1).

9.6.2.1 Signal Spacing Criteria

The standard for the spacing of all intersecting State-maintained roadways and other accesses that are or may become signalized, shall be in accordance with Section 9.4.2.1.

9.6.2.2 Signalized Access Study Requirements

When a study is required, the study shall be completed and signed by a Delaware registered professional engineer in accordance with Section 9.4.2.2.

9.7 CATEGORY FIVE (ACCESS)

9.7.1 FUNCTIONAL CHARACTERISTICS

Category Five shall be assigned only to roadways that are designed as frontage or service roads where there is no intended purpose of providing for long distance or high volume traffic movements. Access needs will take priority over through traffic movements without compromising safety or operation. Providing reasonable and safe access to abutting property is the primary purpose of this access category. At the request of the local land use agency or their designee, DelDOT may change any frontage or service road to a higher category to support local transportation plans.

9.7.2 DESIGN STANDARDS

One direct access may be allowed from a State-maintained roadway to an individual parcel or to contiguous parcels under the same ownership or control where such access will not be detrimental to the safety and operation of the highway.

Additional access may be allowed when DelDOT determines that:

- There will not by any significant safety or operational problems created by the additional access, and
- Additional access would not cause a hardship to an adjacent property.

All turning movements, including left turns, may be allowed provided adequate safety and design standards are met.

The existing posted speed limit shall be used in any access permit and design decisions.

9.7.2.1 Signal Spacing Criteria

Minimum spacing between signals shall be that which is necessary for the safe operation and proper design of adjacent accesses. Preference in traffic signal timing and operation shall be given to highways and cross streets of a higher access category or function.

Figure 9-2 Access Category Standards

	Functional Classification Roadway Association	Functional Characteristics	Design Standard	Access	Spacing
CATEGORY 1 INTERSTATES OR TOLL ROADS	Urban System • Interstate • Freeways or Expressways Rural System • N/A	• Have capacity for high-speed high-volume traffic movements over long distances. • Travel needs are interstate, interregional, or intercity. • Capable of serving larger vehicles carrying all types of goods with heavier loads than permitted on lower class roadways.	All opposing traffic movements shall be separated by physical constraints such as grade separations and median separators.	• Limited access to intersecting state maintained roadways under strictly controlled conditions. • Temporary access may be allowed during official emergencies or where directly related to a freeway construction project. • Location and design of access shall be determined on an individual basis by DelDOT.	Access, consisting of directional ramps, shall be suitably spaced and designed to provide the minimum differential between the speed of the through traffic stream and the speed of the merging or diverging vehicles.
CATEGORY 2 ARTERIALS	Urban System • Principal Arterial Rural System • Principal Arterial	• These highways have the capacity for high speed and high volume traffic movements. • Posted speed limit of 35 to 45 MPH where signals are present, and 45 to 55 MPH in rural areas. • Travel needs are interstate, interregional, and intercity, travel needs and some intracity travel needs. • Category Two is the highest category that permits at-grade intersections.	• Intersections with high traffic volumes should have either grade separations or interchanges. • Traffic signals should be programmed to allow speeds of 35 to 45 MPH and a desirable bandwidth of at least 50 percent.	• Direct access and service to abutting land is subordinate to providing service to through movement. • All private direct access permitted shall be for right turns only. Exceptions may be considered.	• Typical spacing of intersecting State-maintained roadways shall be planned on intervals of 2,500 feet. A minimum of 1,250 feet spacing may be permitted only when no reasonable alternative access to the street system exists. • Spacing of accesses that do not warrant a signal shall comply with the requirements outlined in Figure 9-1. If these minimum requirements cannot be met, then the applicant shall provide a combined access with the adjacent lot.
CATEGORY 3 COLLECTORS	Urban System • Minor Arterial • Major Collector Rural System • Major Collector	• These highways have the capacity for medium to high travel speeds and high traffic volume over medium and long distances in an efficient and safe manner. • Travel needs are regional, intercity, and intracity.	• Capable of achieving posted speed limit of 35 to 45 MPH on urbanized signalized segments and preferably 50 MPH in rural areas. • See signal spacing criteria for detailed discussion associated with traffic signal spacing.	• Direct access service to abutting land is subordinate to providing service to through traffic movement. • Private direct access to the state highway system shall not be permitted unless DelDOT determines its necessity. When it is allowed, it will generally be restricted to right turns only. • Where local regulations require a secondary access to provide for emergency services, DelDOT may allow an emergency access.	• The standard for the spacing of all intersecting State-maintained roadways and other accesses that are or may become signalized, shall be at 2,500 feet intervals, plus or minus 200 feet. DelDOT may consider exceptions to this spacing, provided an Access Study is performed (see 9.4.2.2 Access Study Requirements). • Spacing of accesses that do not warrant a signal shall comply with the requirements outlined in Figure 9-1. If these minimum requirements cannot be met, then the applicant shall provide a combined access with the adjacent lot.
CATEGORY 4 LOCAL	Urban System • Local Rural System • Minor Collector • Local	• These highways have the capacity for moderate travel speeds and moderate traffic volumes. • Travel is short and movement is to intersecting roadways, usually of the collector classification. • Travel needs are intracity and intercommunity travel needs.	• Capable of achieving posted speed limit of 30 to 45 MPH. • The posted speed limit shall be used to meet the requirements of access to State-maintained roadways unless an approved plan or study shows improvements to the highway require a higher speed limit be used.	One access may be allowed from a State-maintained roadway to an individual parcel or to contiguous parcels under the same ownership. Additional access may be provided.	• The standard for the spacing of all intersecting State-maintained roadways and other accesses that are or may become signalized, shall be at 2500 feet intervals, plus or minus approximately 200 feet. DelDOT may consider exceptions to this spacing, provided an Access Study is performed (see 9.4.2.2 Access Study Requirements). • Spacing of accesses that do not warrant a signal shall comply with the requirements outlined in Figure 9-1. If these minimum requirements cannot be met, then the applicant shall provide a combined access with the adjacent lot.
CATEGORY 5 ACCESS	Urban System • N/A Rural System • N/A	• Access to frontage or service roads. • There is no intended purpose of providing for long distance or high volume traffic movements.	• The existing posted speed limit shall be used in any access permit and design decisions. • All turning movements including left turns may be allowed. • Minimum spacing between signals shall be that which is necessary for the safe operation and proper design of adjacent accesses.	• Access needs will take priority over through traffic movements. • One direct access may be allowed from a State-maintained roadway to an individual parcel or to contiguous parcels under the same ownership or control where such access will not be detrimental to the safety and operation of the highway.	No limit on spacing.

Appendix A ***Manual Updates***

A.1 INTRODUCTION

The purpose of DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* is to set forth the requirements of the State of Delaware, Department of Transportation for access to State-maintained roadways and for the planning, design, construction, and acceptance for maintenance of subdivision streets.

The standards and regulations are intended to regulate and control the location, design, and operation of access points and transportation facilities maintained by DelDOT. All commercial entrances, residential entrances, and subdivision streets are to be designed and constructed in accordance with these requirements. These requirements apply to the following:

- New subdivisions and land developments,
- Changed or expanded subdivisions and land developments,
- Any new access onto a State-maintained roadway, and
- Off-site improvements.

Due to the changing nature of operating policies, organizational structures and responsibilities, and design standards, these standards and regulations shall be updated to provide a comprehensive resource in terms of current policies and regulations, in addition to the current state of practice and design standards to engineers, developers and the general public.

The procedures, roles and responsibilities for updating these standards and regulations are set forth in this appendix.

A.2 ROLES AND RESPONSIBILITIES

The Assistant Director of Planning, Development Coordination, shall be responsible for the content of the *Standards and Regulations for Subdivision Streets and State Highway Access* and for ensuring that it remains up to date. The Assistant Director shall appoint a Subdivision Manual Panel and a Subdivision Manual Coordinator to assist with these tasks.

A.2.1 SUBDIVISION MANUAL PANEL

The Subdivision Manual Panel shall consist of six to eight selected DelDOT personnel with demonstrated expertise in current policies, design standards, administrative procedures, construction, and inspection of subdivision streets and off-site improvements. Panel members will meet periodically to:

1. Review the adequacy of the manual in light of state of the art developments;
2. Deliberate the merits of proposed revisions or additions;
3. Determine the format of proposed changes; and

4. Submit recommended changes to the Assistant Director for review and approval.

The panel shall consist of the following:

- Assistant Director, Development Coordination;
- County Coordinator ;
- The Subdivision Engineer;
- A representative from The Traffic Section; and
- The Public Works Engineers for Canal, Central, and South Districts.

Other key Department employees who have specialized backgrounds and knowledge related to road design, construction, maintenance, and materials may also be included.

A.2.2 SUBDIVISION MANUAL COORDINATOR

The Subdivision Engineer shall serve as Subdivision Manual Coordinator, charged with managing the update of the manual and coordinating the activities of the Subdivision Manual Panel.

The Coordinator shall notify the panel members of the regularly scheduled meetings and prepare the agenda. Between panel meetings, the panel shall submit all suggested comments on the manual to the Coordinator in the format shown in Figure A-1. The Coordinator shall consolidate the comments for discussion purposes and lead the discussion at the meeting. The Coordinator shall attempt to reach group consensus regarding which changes will be made and how they will appear in the *Standards and Regulations for Subdivision Streets and State Highway Access.*

The Coordinator is responsible for preparing the adopted changes in final format, checking for accuracy, reproducing in sufficient quantities, and distributing to all users in DelDOT. The Coordinator shall also maintain a current List of Revisions (see Figure A-2), so individual manual holders may check periodically to ensure that all revisions have been incorporated into their manuals. Revision numbers will consist of the year and the number of revisions for that year. For example, the first revision in 2006 would be Revision No. 06-1.

A.3 TYPES OF CHANGES

Over time, several different types of changes to the manual can be expected. These include:

- Revisions – changing the existing information or the way it is presented through modifications of procedures, techniques, quantities, policies, organizational structure, and/or responsibilities.

- Additions – providing new information about an existing topic or addressing an altogether new subject not currently addressed. This includes the insertion of tables, graphs, and other illustrations to clarify or expand upon the information presented in the text.

- Deletions – removing information that is no longer accurate or relevant.

Regardless of the type of change, it is important that all other chapters, sections, charts, and tables in the manual be carefully reviewed to ensure consistency with the proposed change.

A.4 SOURCES OF CHANGES

Changes to the *Standards and Regulations for Subdivision Streets and State Highway Access* may come from several sources.

1. One source is that of state of the art developments. This encompasses a broad range of developments in roadway design and practice, including changes in materials and work methods. Most of these changes will be prompted by reports documenting

research and development conducted by AASHTO, FHWA, TRB, and other recognized agencies. The Subdivision Manual Panel should regularly review these publications and discuss the merits of adopting the new or revised criteria.

2. Another source is that of special provisions, memorandums, or oral instructions. These often evolve into standard but unofficial practices and procedures. The Coordinator shall assemble, consolidate, standardize, and incorporate them into the manual, making them official and putting them at the disposal of all users in the list of users.

3. Changes in organization and management often trigger the need for changes. When the organizational structure and/or operating policies change, the responsibilities and relationships of organizational units usually need redefinition. Such changes must be clearly documented in the *Standards and Regulations for Subdivision Streets and State Highway Access*.

4. Those individuals who regularly use the *Standards and Regulations for Subdivision Streets and State Highway Access* can provide valuable assistance by identifying needed updating and improvements. They do this individually by submitting their personal suggestions, and collectively by demonstrating which parts of the manual are most used, which need expansion or simplification, and which parts are seldom used.

A.4.1 PROCEDURES FOR MAKING CHANGES

Changes to the *Standards and Regulations for Subdivision Streets and State Highway Access* may be described as urgent or standard. Urgent changes include those of a critical nature that call for immediate updating of the manual and implementation of new criteria or procedures. Standard changes are those that can be collected over a period of time for publication at regularly scheduled intervals.

Making changes too frequently may result in confusion and error. Standard changes shall be made annually, at the same time each year. Even urgent changes should not be made too often.

The regular meeting of the Subdivision Manual Panel shall be scheduled annually. Individuals who wish to propose changes shall notify the Manual Coordinator well in advance of the meeting so that he/she can include them on the meeting agenda.

When an urgent change is proposed or otherwise becomes apparent, the Coordinator shall call a special panel meeting to consider whether the change is indeed urgently needed, and if so, to determine the final published form of the change.

Drafts of newly proposed or revised material shall be submitted to the Assistant Director of Planning, Development Coordination, for review and approval. In the case of significant changes, the Assistant Director shall consult with the Division Director and get approval from the Secretary.

Changes to the *Standards and Regulations for Subdivision Streets and State Highway Access* shall be written (and illustrated) in the same style as the original text. Uniform language and sentence style will preserve the uniformity of the presentation, and be more understandable to the reader. The Coordinator shall take the lead in ensuring that updated material is clear and concise.

Computer software and hardware, word processors, and printers shall be used to compose, format, store, and print the text of the *Standards and Regulations for Subdivision Streets and State Highway Access*. This will greatly facilitate the updating procedure. New or modified illustrations should be given the same attention. The Coordinator is responsible for verifying the accuracy of the revised sheets.

When new pages are created because the changes do not fit onto the existing number of pages, the insertions shall be identified with

letter suffixes after the page numbers. For example, two new pages between 4-14 and 4-15 become 4-14a and 4-14b. The same approach shall be used for the figures. For example, a new figure added between Figure 2-3 and Figure 2-4 would be Figure 2-3a.

Individual pages are not dated in the initial publication. However, when revisions are made to a page, or a new page is added, the revision date shall be clearly shown at the bottom of the page. For example, Revised January 2007. This will provide for easy distinction between new sheets and out-dated sheets.

Attention must be given to changes that require modification of titles and/or page numbers in the Table of Contents.

The loose-leaf format of the *Standards and Regulations for Subdivision Streets and State Highway Access* makes updating a quick and simple task. Users shall be encouraged to keep their copies up-to-date. The Coordinator shall issue changes on sheets that are punched to fit the manual's binder.

When revised materials are distributed, the specific changes in the text and illustrations shall be summarized in the letter of transmittal so that users will not have to search to identify them.

Any amendment requiring notice and comment in the Delaware Register under the Administrative Procedures Act (29 Delaware Code Chapter 101) will take effect upon adoption under that procedure.

Figure A-1. (Sample Form — Suggested Revision to the Standards and Regulations to Subdivision Streets and State Highway Access)

DELAWARE DEPARTMENT OF TRANSPORTATION

Standards and Regulations For Subdivision Streets and State Highway Access

MEMO TO: SUBDIVISION ENGINEER

Subject: Revision to the Standards and Regulations For Subdivision Streets and State Highway Access

Date:

Suggested by:

Suggested Change:

Reason for the Change:

Back-up Source Data:

Figure A-2. (Sample Form — List of Revisions to the Standards and Regulations to Subdivision Streets and State Highway Access)

DELAWARE DEPARTMENT OF TRANSPORTATION Standards and Regulations For Subdivision Streets and State Highway Access LIST OF REVISIONS			
Revision No.	Date	Page	Brief Description

Appendix B ***Improvements Requiring New Rights-of-Way***

B.1 BACKGROUND

Developers proposing real estate rezoning or subdivision applications in Delaware municipalities and counties are required to improve the local transportation system that serves the property if their proposed development triggers the need for the improvement. Many developers are able to make the necessary improvements, while others are hindered by their inability to secure the necessary road right-of-way. Often, prior development along the roadway has already absorbed the capacity created when the road was first built and the surrounding landowners may not feel that there is any benefit in selling the needed right-of-way to enable the next round of development. Prior to these regulations, state law did not authorize acquisition of rights-of way necessary for development-related improvements.

Fundamentally these road improvements are for the public good, as the general public will receive the travel benefits. The need for improvements is most often triggered by new development in combination with pre-existing traffic growth patterns in the area. DelDOT's plan for making roadway improvements is outlined in its Capital Transportation Program (CTP). The needed roadway improvement may be on a different schedule or it may not be in the CTP at all. A further concern is implementing roadway improvements without sufficient public involvement. When the project is DelDOT's, DelDOT utilizes a formal public participation process. However, when a private sector developer carries out the improvements, a similar public participation process may not be followed, or at best it is insufficient.

B.1.1 MAJOR ISSUES

The regulations herein address the following issues and barriers to development:

- Developer's inability to secure right-of-way for necessary improvements.
- DelDOT's Capital Transportation Program
- (CTP) schedule being different than the developer's schedule or not including the needed improvement.
- Lack of a public participation process during the consideration of development-related improvements.
- Lack of clarity and definition regarding DelDOT's role in assuring project quality.

B.1.2 PURPOSE

The Delaware State Senate passed SB 284 on June 8, 2004 and the Delaware House of Representatives passed it on July 1, 2004. SB 284 was signed into law on July 22, 2004 and it is codified at 17 Del.C. Section 507.

Section 507 directs DelDOT to establish rules and regulations to determine where and under what conditions it will:

- Use its real estate process to acquire the necessary right-of-way for improvements;
- Enforce the maintenance of safe operating conditions for the public during construction;
- Involve the public and inform them of the
- reason for and scope of improvements; and
- Assure compliance with applicable environmental and legal requirements.

Developers whose proposals trigger the need for improvements, or necessitate an acceleration of the timing of previously recognized DelDOT projects, shall contribute funds towards the necessary right-of-way acquisitions. Improvements are limited to those that do not negatively impact the State's ability to meet the conformity requirements of the Clean Air Act.

DelDOT's use of this authority is limited to areas where the State's own land use policies support the type and scale of the proposed development. As part of the approval process for transportation improvements built pursuant to this authority, DelDOT is required to consult with area representatives of state and local government. DelDOT retains the discretionary authority to use the provisions of Section 507 and its implementing regulations, or to decide not to make use of this authority in a given instance.

B.2 RELATIONSHIP TO STRATEGIES FOR STATE POLICIES AND SPENDING

Delawareans are concerned about the threat of sprawl, traffic congestion, loss of farmland and open space, diminished air and water quality, and a shortage of affordable housing.

Strategies for State Policies and Spending was adopted by Governor Ruth Ann Minner and published by the Office of State Planning Coordination to coordinate land use decision-making with the provision of infrastructure and services in a manner that makes the best use of Delaware's natural and fiscal resources. Two fundamental policies guide the State Strategies:

- State spending should promote quality, efficiency, and compact growth; and
- State policies should foster order and resource protection, not degradation.

Strategies for State Policies and Spending includes a map that serves as a graphic representation of the areas favored for growth. The map depicts four investment levels, of which the first three are appropriate locations for the application of these regulations: Level 1, Level 2, and Level 3. Level 3, however, is intended for longer-term phased growth or land preservation. For a full description of the investment levels as well as the map, please visit: www.state.de.us/planning/strategies.

The strategies of the State's *Livable Delaware* initiative build on the foundation laid by the *Strategies for State Policies and Spending.* They are intended to encourage growth in areas that the State has agreed are most appropriate for and capable of accommodating this growth in an efficient and cost-effective manner, with a focus on existing communities and growth areas. Through these regulations, detailed herein, DelDOT is empowered to secure right-of-way for roadway improvements that are consistent with and support this key objective of *Livable Delaware*.

B.3 REGULATORY PROCEDURES

The construction of the necessary transportation improvements may occur in one of the following two ways:

Alternative One: DelDOT shall enter into an agreement with the entity seeking development approval whereby they assume direct responsibility for the planning, design, construction, and inspection of off-site improvements. The agreement must include terms giving DelDOT appropriate provisions for

quality assurance and quality control. This is the preferred alternative.

Alternative Two: If DelDOT determines that the aforementioned agreement is not feasible and practical, DelDOT may assume responsibility for the scheduling, planning, design, construction, and inspection of the off-site improvements as a DelDOT project. The following include, but are not limited to, reasons that may cause DelDOT to assume responsibility for the project:

- The project is particularly complex. The project will still be wholly funded by the entity seeking development approval.

- The project is already in the DelDOT's CTP, planning and design are complete, but right-of-way has not been acquired. The developer shall contribute funds towards the necessary right-of-way acquisition and be responsible for any additional costs incurred as a result of the portion of the project being modified.

B.3.1 PROJECT ELIGIBILITY

If a project is not in DelDOT's CTP and found to need right-of-way, it may be eligible for Alternative One. In order to be eligible, the improvements must be offsite (non-entrance and outside the limit of construction at the entrance) and must meet all of the following conditions:

1 The development project for which the improvements are required must

a. Be consistent with the local comprehensive plan;

b. Be consistent with *Strategies for State Policies and Spending,* including location in a Level 1, 2, or 3 State Strategy investment area;

and

c. Be in conformance with the requirements of the Clean Air Act (CAA) regulations.

2 The need for the transportation improvement project must be documented and confirmed during the land use process prior to the developer receiving preliminary plan approval from the local land use agency.

The need and eligibility are confirmed through completion of the following checklist:

Figure B-1 Transportation Improvement Checklist

	Yes	No
Preliminary Plan Approval	☐	☐
Consistent with Comprehensive Plan	☐	☐
State Strategies Level 1, 2, or 3 Investment Area	☐	☐
In conformance with Clean Air Act Regulations	☐	☐

When the project has been found to be eligible, DelDOT may still choose to defer or deny advancement of the project. Project deferral may be considered in cases where a project is located in an active transportation study area, or in an area where a study is about to be initiated, where the results could have a significant impact on or eliminate the need for the subject project.

Project denial may be considered in cases where the project would cause abutting property to lose access or be reduced in value to the extent that it would be rendered economically un-viable. Deferral or denial under these conditions shall be at DelDOT's discretion.

B.3.2 PLAN PREPARATION

Plan preparation for preliminary engineering and final design of transportation improvements (also known as "construction plans") shall be in accordance with Section 4.5 of the *Standards and Regulations for Subdivision Streets and State Highway Access Manual.*

Right-of-Way (ROW) plans shall be in accordance with *DelDOT's Right-of-Way*

Manual. Additionally, right-of-way shall be verified through deed research and examination of plot plans. The *Standards and Regulations for Subdivision Streets and State Highway Access* contains the right-of-way plan checklist.

B.3.3 PUBLIC INPUT PROCESS

Public input for land development is most critical during the exploratory sketch plan phase of the land use process at the local land use agency. During the design of transportation improvements, DelDOT will solicit public input in a formal setting and provide information such as the implementation process, maintenance and protection of traffic (MOT), and potential impacts (e.g. travel time charts showing different alternative routes and project showing how long the public will be inconvenienced).

DelDOT's Public Involvement Policy O-03 illustrates the range and levels at which the public has an opportunity to participate in the planning process. This policy states that public involvement processes shall be proactive and provide complete information, timely public notice, full public access to key decisions, and opportunities for early and continuing involvement. DelDOT shall consult with state and local governmental representatives once the concept plan is submitted. DelDOT is committed to educating the public about transportation issues, services and projects, as well as soliciting information, reaching consensus, and providing a way for the general public to express their needs, ideas, concerns, and perspectives relating to the transportation system.

Public input under this road improvement process shall be in accordance with DelDOT's Public Involvement Policy O-03.

Regardless of whether a developer or DelDOT takes the lead in making the transportation improvement, a minimum of one public meeting is required. One meeting shall be held after preliminary plan review. The need for other meetings, for example showing implementation and maintenance of traffic, will be determined by DelDOT and included in the agreement between DelDOT and the entity seeking development approval. The scope of the meeting can vary, depending on the impacts of the proposed transportation improvements. All adjacent property owners shall be notified in writing 14 days prior to the public meeting, and offered an opportunity to comment. A notice shall be placed in a local newspaper of general circulation advertising the public meeting as well as an estimate of how long and to what extent the public will be affected by the project.

B.3.4 REVIEW PROCESS

The developer's engineer shall prepare and submit to DelDOT for review and approval all construction plans, right-of-way plans, specifications, and estimates for the project. The design of roadway improvements shall be in accordance with the latest standards published by the American Association of State Highway and Transportation Officials (AASHTO), DelDOT's *Road Design Manual*, DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*, and the *Manual on Uniform Traffic Control Devices* (Delaware MUTCD). Where conflicts exist, DelDOT's *Road Design Manual* shall take precedence.

The plan submissions will be required to undergo separate reviews for construction and right-of-way plans:

1. The construction plan submission will consist of a preliminary, semi-final, and final (or contract) plan submission. The submittals shall include design plans, specifications, and cost estimates for construction of the project.
2. The right-of-way plan submissions shall include a semi-final and final plan submission.

The developer's engineer shall establish review dates with concurrence from DelDOT for construction and right-of-way plans. He or she shall also coordinate with the utility companies to determine existing utility locations and possible relocations.

Existing deeds and plot plans shall be acquired to establish and verify the existing right-of-way. The engineer shall attest to the right-of-way shown on the plans.

The engineer will work through DelDOT's Development Coordination Section and the Pavement Management Section for pavement evaluation and design verification. This may include the need for pavement cores and subgrade soils analysis.

The engineer will work with DelDOT's Design Services for hazardous material and/or contaminated site delineation. The engineer shall prepare, apply for, and obtain all necessary permits and environmental or historic documentation required by federal, state, and local authorities. Copies of the permits and supporting documentation shall be provided to DelDOT prior to a Notice to Proceed being issued for construction of the project.

B.3.4.1 INSPECTION

Depending on the size and impact of the project on the abutting state-maintained roadway, the level of inspection will vary. Off-site improvement project inspection shall be in accordance with Section 6.6 of the *Standards and Regulations for Subdivision Streets and State Highway Access Manual*

B.3.5 REAL ESTATE PROCESS

DelDOT's Real Estate right-of-way acquisition process can be used to secure roadway improvements triggered by development. Land acquisition shall be in accordance with DelDOT's most current *Real Estate Management Manual*. DelDOT engages the property owners and tenants in a process of notification, appraisal, and negotiations.

Based on the complexity, DelDOT's Real Estate Section will determine whether an appraisal is necessary or if a valuation waiver can be used. In instances where temporary access to a property is required, DelDOT shall determine the lease value of the property for the duration of the project.

Process Steps:

1. Notification: property owners and tenants will be notified in one or both of the following ways: they will be contacted by a DelDOT Real Estate representative or notified of public workshops.

2. Valuation: property owners will receive fair market value for any land and/or buildings they are required to sell. A qualified, licensed independent appraiser may complete the appraisal, which is approved by an independent authority (DelDOT). Property owners may, at their own cost, obtain their own appraisal.

3. Negotiations: a DelDOT Real Estate representative will contact the property owner with a plan showing the amount of land needed and written confirmation of the amount of compensation being offered. The property owner will be given 60 calendar days to consider the offer. If the offer is accepted, both parties (DelDOT and the seller) sign a binding contract and settlement is held.

4. Acquisition: A deed of conveyance is signed over when the check is delivered at settlement. If the fair market value offer is not accepted, state law recognizes the right of the property owner to refuse the purchase offer and to have the value of the property established through the courts utilizing DelDOT's power of eminent domain (the right of the government to acquire private property for public use). That approach will only be used as an action of last resort.

B.3.6 DESIGN AND CONSTRUCTION ADMINISTRATION

B.3.6.1 Alternative One

The developer shall hire a registered engineering firm possessing a Certificate of

Authorization for all offsite improvement projects. If the developer designs the transportation improvements (Alternative One), the developer shall provide DelDOT with 100% of the right-of-way costs upon completion of the preliminary engineering and final determination of right-of-way. DelDOT will acquire the determined right-of way in accordance with the real estate process in section B.3.5 and DelDOT's *Real Estate Management Manual*.

The developer shall hire a qualified contractor as determined by DelDOT to implement the identified improvements.

The developer shall also enter into a construction inspection agreement with a firm currently under contract to provide such services with DelDOT.

B.3.6.2 Alternative Two

If DelDOT designs and constructs the transportation improvements (Alternative Two), the developer shall provide DelDOT with a certified check for the estimated total cost of preliminary engineering and final design costs as approved by DelDOT. The design fee shall be paid to DelDOT upon final determination of the required improvements and at the same time as final site plan and preliminary entrance plan is submitted for DelDOT's review and approval.

Prior to DelDOT acquiring right-of-way for the offsite improvements, the developer shall provide DelDOT with security in the amount of 100% of the estimated final construction and right-of-way acquisition costs as approved by DelDOT. DelDOT shall issue a Notice to Proceed (NTP) for the construction after the right-of-way acquisition is completed.

The following forms of security shall be acceptable:

- Surety Bond issued by a bonding company licensed in Delaware.
- Commercial letter of credit issued by a lending institution licensed in Delaware.
- Certified check with escrow agreement.

These regulations address the identified need for transportation improvements triggered by new development in cases where such improvements would not otherwise be possible due to right-of-way constraints. In addition to providing a process for meeting a public transportation need, these regulations also establish under what conditions this process may be utilized in support of land use and transportation infrastructure coordination.

Appendix C ***Review Fee Application and Calculation Forms***

DELAWARE DEPARTMENT OF TRANSPORTATION
SUBDIVISION PLAN REVIEW FEE
INITIAL STAGE FEE CALCULATION FORM

For office use only:

Rec'd by: _____

I. Application Information

Development Name: _____
Location: _____
Tax Parcel Number: _____
Owner (applicant) Name: _____
Address: _____
Telephone: _____
Engineer's E-mail: _____
Developer's E-mail: _____

II. Record Plan Submission

A.____ Minor Residential Subdivision (5 or less lots) Number of lots _____ SB 49 Applies ☐
B.____ Major Residential Subdivision (6 or more lots) Number of lots _____
C.____ Non-residential land development
(i.e., commercial, school, office, church) Number of lots _____
Gross Floor Area (square feet) _____

III. Initial Stage Fee Calculations

A. Minor Residential Subdivision (5 lots or less)……..$100

B. Major Residential Subdivision …… $400 + (Number of Lots x $10) = Total fee
$400 + [_____ x $10] = $_____
Number of Lots Total

C. Non-Residential development … $500 + (Number of Lots x $20) = total fee OR
$500 + (Gross floor area/1000 s.f. x $20) = total fee **(WHICHEVER IS GREATER)**

Number of Lots: $500 + [_____ x $20] = $_____
Number of Lots Total

Gross Floor Area: $500 + [_____÷1000 x $20] = $_____
Gross Floor Area Total

D. Mixed Use = _____ + _____ = $ _____
B C Total

IV. Total Amount Remitted: $ _____ Check/M.O. number: _____

V. Signatures

Applicant: _____Date:_____
Applicant
Reviewed by:_____Date:_____DelDOT
(This signature acknowledges receipt of fee and does not constitute approval of project by the Department.)
REMARKS: _____

Remit this form and **check or money order** Payable to the Delaware Department of Transportation. Please send to the Delaware Department of Transportation, Attention: Subdivision Engineer, P.O. Box 778, Dover, DE 19903. The Subdivisions Section can also be contacted via email at subdivision@state.de.us.

DELAWARE DEPARTMENT OF TRANSPORTATION
SUBDIVISION PLAN REVIEW FEE
CONSTRUCTION STAGE FEE CALCULATION FORM

For office use only:

Rec'd by: _____

Application Information

Development Name: _____
Location: _____
Tax Parcel Number: _____
Owner (applicant) Name: _____
Address: _____
Telephone: _____
Engineer's E-mail: _____
Developer's E-mail: _____

I. Construction Plan Submission

A.____ Residential Subdivision

Number of Recorded Lots: _____
Number of lots being constructed this phase: _____

B.____ Non-Residential Development

II. Construction Stage Fee Calculations (attach a copy of the Initial Stage Fee Form)

A. Major Residential Subdivision ……. 125% of Initial Stage Fee

_____ x 1.25 x _____ = $ _____
Initial Stage Fee Phased Const. Ratio Total

(For Phased Construction Plans, adjust total by ratio of Number of Lots for Phase/Total Number of Recorded Lots)

B. Non-Residential Development …… 150% of Initial Stage Fee

_____ x 1.50 = $ _____
Initial Stage Fee Total

C. Mixed Use = _____ + _____ = $ _____
A B Total

III. Total Amount Remitted: $ _____ Check/M.O. Number: _____

Signatures

Applicant: _____Date: _____
Applicant

Reviewed by: _____Date: _____
DelDOT

(This signature acknowledges receipt of fee and does not constitute approval of project by the Department)

REMARKS: _____
_____
_____

Remit this form along with copy of Initial Stage Fee Form and **check or money order** Payable to the Delaware Department of Transportation. Please send to Delaware Department of Transportation, Attention: Subdivision Engineer, P.O. Box 778, Dover, DE 19903. The Subdivisions Section can also be contacted via email at subdivision@state.de.us.

DELAWARE DEPARTMENT OF TRANSPORTATION
AREA-WIDE STUDY FEE
FEE CALCULATION FORM

For office use only:

Rec'd by: _____

VI. Application Information

Development Name: _____
Location: _____
Tax Parcel Number: _____
Owner (applicant) Name: _____
Address: _____
Telephone: _____
Email: _____

VII. Development Description and Trip Generation Calculation

Type of Development	Size (X)	Formula	Average Daily Trips (T)
Single Family Detached Houses	dwellings	Ln(T) = 0.92Ln(X) + 2.71	
Apartments	dwellings	T = 6.06(X) + 123.56	
Townhouses or Condominiums	dwellings	Ln(T) = 0.87Ln(X) + 2.46	
Mobile Homes	dwellings	T = 3.52(X) + 277.51	
Age-Restricted Single Family Detached Houses	dwellings	Ln(T) = 0.85Ln(X) + 2.38	
General Office	thousand gross square feet	Ln(T) = 0.77Ln(X) + 3.65	
Medical/Dental Office	thousand gross square feet	T = 40.89(X) - 214.97	
Specialty Retail (excludes convenience stores, pharmacies, banks, restaurants and gas stations)	thousand gross square feet	T = 42.78(X) + 37.66	
Mixed Use	Attach calculations and supporting documents		
Not listed above	Attach calculations and supporting documents		
Not represented by formula above	Attach calculations and supporting documents		

VIII. Area-Wide Study Fee Calculation

_____ x $10 = $_____
Average Daily Trips (T) Total

IX. Total Amount Remitted: $ _____ **Check/M.O. number**: _____

X. Signatures

Applicant: _____Date: _____
Applicant
Reviewed by:_____Date: _____
DelDOT
(This signature acknowledges receipt of fee and does not constitute approval of project by the Department.)
REMARKS: _____
_____

Remit this form and **check or money order** Payable to the Delaware Department of Transportation. Please send to the Delaware Department of Transportation, Attention: Subdivision Engineer, P.O. Box 778, Dover, DE 19903. The Subdivisions Section can also be contacted via email at andrea.yoder@state.de.us.

Appendix D ***Plan Review Checklists***

CHECKLIST FOR SUBDIVISION RECORD PLAN APPROVAL

Project #:		Reviewer:	
Project Title:		Tax ID #:	
DelDOT #:		Date:	

I. TRAFFIC IMPACT STUDY

	Yes	No	N/A
Traffic Impact Study Required	☐	☐	☐
List Required Offsite Improvements (Reference TIS Requirements)			
1.	☐	☐	☐
2.	☐	☐	☐
3.	☐	☐	☐
Additional Required Improvements (Please list on reverse side)	☐	☐	☐

II. STATE MAINTAINED HIGHWAYS – REQUIRED RIGHT-OF-WAY & EASEMENTS

Local – 30 ft.[(1)(2)]	☐	☐	☐
Major / Minor Collector or Minor Arterial – 40 ft.[(1)(2)]	☐	☐	☐
Principal Arterial or Freeway – 50 ft.[(1)(2)(3)]	☐	☐	☐
Additional Right-of-Way to meet requirements. "An Additional *X-Feet* is Herby Dedicated to Public Use as per this plat"[(1)(4)]	☐	☐	☐
Existing Right-of-Way shown on both sides of frontage roads	☐	☐	☐
Existing Right-of-Way is dimensioned and labeled	☐	☐	☐
15' Permanent Easement for a shared-use path	☐	☐	☐
Sight Triangles using AASHTO *Policy on Geometric Design of Highways and Streets* have been shown and dimensioned. (Figure 5-29)	☐	☐	☐
Permanent Sight Easements have been established	☐	☐	☐
(1) *Reference Sectionr 3.6: Right-of-Way* (2) *From the centerline of roadway of an undivided highway.* (3) *From the inside edge of travelway on a divided highway.* (4) *Reference Section 3.6.5: Dedication of Right-of-Way*			

III. SUBDIVISION STREETS TO BE DEDICATED FOR PUBLIC USE

Type I Street (<500 ADT) Meets Design Requirements[(5)]	☐	☐	☐
Type II Street (501 → 3000 ADT) Meets Design Requirements[(5)]	☐	☐	☐
Type III Street (>3000 ADT) Meets Design Requirements[(5)]	☐	☐	☐
Typical street section (as per manual)	☐	☐	☐
Sufficient pins & monuments along the Right-of-Way	☐	☐	☐
Right-of-Way Dimensioning of Each Street	☐	☐	☐
Street Names Appear within the Right-of-Way Limits	☐	☐	☐
Label "Dedicated to Public Use" Appears	☐	☐	☐
50' Radius is Provided for the Right-of-Way Around Cul-de-Sacs (Figure 5-2)	☐	☐	☐
Temporary Easement for Dead End Streets are labeled[(7)]	☐	☐	☐
Curve Data and Line Chart for all Subdivision Streets	☐	☐	☐
(5) *Reference: 3.6.1 Site Plan Right-of-Way, 5.1 Geometric Design of Subdivision Streets, and Figure 5-1* (6) *Reference Section 3.6.4 Right-of-Way Monuments* (7) *Reference: Section 5.1.4.2 Temporary Dead End Streets*			

IV. GENERAL RECORD PLAN REQUIRMENTS

DelDOT General Notes (Appendix J)	☐	☐	☐
DelDOT Additional Notes, if required (Appendix J)	☐	☐	☐
Street Maintenance Note Shown (Public / Private)	☐	☐	☐
Legend of Line Work	☐	☐	☐
North Arrow Appears in all Plan Views	☐	☐	☐
Interconnections labeled "**FUTURE STREET CONNECTION**"	☐	☐	☐
Drainage Easements Labeled and Dimensioned	☐	☐	☐
Building Set Backs Displayed	☐	☐	☐
Preliminary Entrance Plan included for Right-of-Way Constructability Verification. (8)	☐	☐	☐
Entrance Location Position has been approved by DelDOT.(8)(9)	☐	☐	☐
(8) *Entrance must be able to be constructed within the limits of available Right-of-Way and Easements. Verification includes cross slopes, travelway widths, shoulder widths, foreslopes, and backslopes.* (9) *Reference Section 3.4.1 Site Plan Requirements for a full list*			

V. ROAD PROJECTS IN THE AREA

Road Design	☐	☐	☐
Review	☐	☐	☐
District	☐	☐	☐
Corridor Preservation	☐	☐	☐
SR-1 Grid	☐	☐	☐

VI. REQUIRED FORMS & FEES FOR RECORD REVIEW

Initial Stage Calculation Form (Appendix C)	☐	☐	☐
Initial Stage Fee	☐	☐	☐
Commercial Entrance Permit	☐	☐	☐
Entrance Design Checklist	☐	☐	☐

VII. PLANS REQUIRED FOR APPROVAL

Subdivision (includes entrance)	☐	☐	☐
Entrance only (Subdivision Streets are Private / City Run)	☐	☐	☐
Site Street Plan	☐	☐	☐

VIII. RECORD PLAN COMMENTS

1st comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
2nd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
3rd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐

IX. LETTER OF NO OBJECTION

No Objection letter sent (date of letter)	☐	☐	☐

X. ADDITIONAL COMMENTS:

CHECKLIST FOR SUBDIVISION PLAN APPROVAL

Project #:		Reviewer:	
Project Title:		Tax ID #:	
DelDOT #:		Date:	

I. TRAFFIC IMPACT STUDY

	Yes	No	N/A
Traffic Impact Study Required	☐	☐	☐
List Required Offsite Improvements (Reference TIS Requirements)			
1.	☐	☐	☐
2.	☐	☐	☐
3.	☐	☐	☐
Additional Required Improvements (Please list on reverse side)	☐	☐	☐
Letter Agreement has been executed for offsite improvements	☐	☐	☐
Signal Agreement has been executed	☐	☐	☐

II. RECORD PLAN – LETTER OF NO OBJECTION

DelDOT has sent a Letter of No Objection (date)	☐	☐	☐

III. TITLE SHEET PRESENTATION REQUIREMENTS(1) (Figure 4.5)

Name of Subdivision	☐	☐	☐
Section of the subdivision or name of the streets to be considered	☐	☐	☐
Identification of subdivision streets as PUBLIC or PRIVATE	☐	☐	☐
General Location Map	☐	☐	☐
The Hundred, County or City in which the subdivision is located	☐	☐	☐
Plan view insert of entire subdivision (Required scale: 1" = 200')	☐	☐	☐
Plan view insert location map	☐	☐	☐
DelDOT General Notes & Additional Required Notes (Appendix J for all DelDOT Notes) (located according to Figure 4-5)	☐	☐	☐
Recording Table – County, Sheet Number, Total Sheets	☐	☐	☐
Construction Agreement Number is Shown	☐	☐	☐
Streets Bonding Information is Shown (Street names, to & from stationing, and length to next highest whole #)	☐	☐	☐
Legend of Utilities	☐	☐	☐
Signature Block	☐	☐	☐
North Arrows in Plan View and Location Maps	☐	☐	☐
(1) *Please refer to Figure 4-5 for all placements of the General Location Map, Plan View of Subdivision, DelDOT General Notes, etc.*			

IV. DETAIL SHEET PRESENTATION REQUIREMENTS(2)

Detail Sheets are provided for Special Details	☐	☐	☐
Detail Sheets are provided for Intersection Details	☐	☐	☐
(2) *Reference Section 4.3.3: Detail Sheets*			

V. PLAN SHEET PRESENTATION REQUIREMENTS[3]

Horizontal and Vertical control data[4]	☐	☐	☐
Stationing is shown	☐	☐	☐
Utilities - Proposed and Existing location[5]	☐	☐	☐
North Arrows are shown for all Plan Views	☐	☐	☐
Dimensioning and Labeling of all streets	☐	☐	☐
(3) *Reference Section 4.3.4: Plan Sheet* (4) *Outlined in Section 1 of the above referenced section* (5) *Outlined in Section 2 of the above referenced section*			

VI. PROFILE SHEET PRESENTATION REQUIREMENTS[6]

Profiles are on the same sheet as the corresponding plan view	☐	☐	☐
Horizontal and Vertical scale meets requirements	☐	☐	☐
Vertical Curve Data is listed	☐	☐	☐
(6) *Reference Section 4.3.5: Profile Sheet*			

VII. SUBDIVISION STREETS DESIGN ELEMENTS

Type I Street (<500 ADT) Meets Design Requirements[7]	☐	☐	☐
1. Horizontal Curvature ≥ 150 feet	☐	☐	☐
2. Vertical Curvature meets minimum 'K' Value (Sag ≥ 26, Crest ≥ 12)	☐	☐	☐
3. Maximum Grades ≤ 10%, Minimum Grades ≥ 0.5%	☐	☐	☐
Type II Street (501 → 3000 ADT) Meets Design Requirements[7]	☐	☐	☐
1. Horizontal Curvature ≥ 300 feet	☐	☐	☐
2. Vertical Curvature meets minimum 'K' Value (Sag ≥ 37, Crest ≥ 19)	☐	☐	☐
3. Maximum Grades ≤ 8%, Minimum Grades ≥ 0.5%	☐	☐	☐
Type III Street (>3000 ADT) Meets Design Requirements[7]	☐	☐	☐
1. Horizontal Curvature ≥ 500 feet	☐	☐	☐
2. Vertical Curvature meets minimum 'K' Value (Sag ≥ 49, Crest ≥ 29)	☐	☐	☐
3. Maximum Grades ≤ 7%, Minimum Grades ≥ 0.5%	☐	☐	☐
Typical Sections have been provided for each major change of section	☐	☐	☐
Typical Sections are labeled accordingly (Figures 5-22, 5-23, 5-24)	☐	☐	☐
Typical Sections to verify slopes meet DelDOT requirements[8][9]	☐	☐	☐
Pavement Sections have been determined and displayed with correct labeling	☐	☐	☐
Pavement Section Layers meet minimum and maximum depth requirements (Figures 5-26, 5-27)	☐	☐	☐
Subdivision Curb meets DelDOT requirements	☐	☐	☐
Ten foot wide Shared-Use Path along the Frontage of the roadway (Path is inside 15' Permanent Easement)	☐	☐	☐
Sidewalks that are compliant with ADA law are provided	☐	☐	☐
(7) *Reference Sections 3.6.1: Site Plan Right-of-Way,5.1: Geometric Design of Subdivision Streets and Figure 5-1* (8) *Reference Section 4.3.2: Typical Section Sheets* (9) *Reference Section 5.5: Typical Sections*			

VIII. DRAINAGE[10]

Drainage Report[11]	☐	☐	☐
Drainage – Pipes, Inlets, Ditches, etc.	☐	☐	☐
Schedules for Pipes, Catch Basins, Manholes, etc. (Figures 4-3, 4-4)	☐	☐	☐
Pipe Angles for storm water constructability has been verified	☐	☐	☐
HDPE Pipe Notes and Coverage details are shown	☐	☐	☐
Pipe Coverage for storm water constructability has been verified	☐	☐	☐
Pipe Connection with catch basin meets depth requirements[13] (Double catch basins require	☐	☐	☐

an 8" cover slab; this will in turn require the depth of pipe to be increased.)			
Catch Basins can accommodate proposed pipe size	☐	☐	☐
Correct Inlet Top has been specified (Type B for curbed, Type A for lawn)	☐	☐	☐
Flared End Section are used with Child Safe Covers where required	☐	☐	☐
DelDOT's Subdivision Drainage details and notes are incorporated	☐	☐	☐
Storm Water Management Pond–show 2, 10 & 100 yr. elevations	☐	☐	☐
(10) *Reference Section 5.7: Drainage Design* (11) *Drainage report is required for the verification of pipe sizes, area, actual and full flow pipe velocities, hydraulic grade line (HGL), pipe cover velocities, stabilization and spread on the roadways. Reference Section 5.7.2.8: Drainage Report* (12) *Reference DelDOT Standard Details for depth requirements*			

IX. ENTRANCE PLAN PRESENTATION REQUIREMENTS

A. GENERAL			
Entrance Plan is at the required scale (1" = 30' is preferred, 1"=20' is acceptable)	☐	☐	☐
Throat Width of Entrance dimensioned	☐	☐	☐
Entrance Curb meets DelDOT Requirements and extends 25' past entrance radii	☐	☐	☐
Pavement Sections have been determined and displayed with correct labeling	☐	☐	☐
Pavement Tie-in detail shown in plan set	☐	☐	☐
At a Minimum, the Frontage Road is Improved to its Functional Classification Standards across the Subdivision's Frontage	☐	☐	☐
Spot Elevations tangent to the roadway every 25 feet or less	☐	☐	☐
Spot Elevations on radii every 10 feet and at the PC/PT point	☐	☐	☐
B. TRAFFIC GENERATION(13)			
Traffic Generation Figure Shown	☐	☐	☐
Turning Movement Counts	☐	☐	☐
Posted Speed Limit	☐	☐	☐
Existing Traffic Count on the roadway AADT	☐	☐	☐
Proposed Site ADT	☐	☐	☐
Future Projected 10-year AADT	☐	☐	☐
Truck Percentage for Site	☐	☐	☐
School Bus Projections	☐	☐	☐
Latest Edition ITE Manual Referenced	☐	☐	☐
(13) *Reference Section 3.4.1.1: Traffic Information*			
C. Auxiliary Lanes			
Right-Turn Lane Warrants are met (Figures 5-12, 5-13)	☐	☐	☐
Right-Turn Lane Length and Layout is shown correctly (Figure 5-10)	☐	☐	☐
By-pass Lane Warrants are met (Figure 5-19)	☐	☐	☐
By-pass Lane Length and Layout is shown correctly (Figure 5-8)	☐	☐	☐
Left-Turn Lane Warrants are met (Figures 5-14, 5-15, 5-16 and 5-17)	☐	☐	☐
Left-Turn Lane Tapers and Layout are shown correctly (Figure 5-10)	☐	☐	☐
Bike Accommodations at Entrance(14) (Figures 5-8, 5-10 and 5-20)	☐	☐	☐
Pavement Section for Auxiliary Lane has been approved and displayed with correct labeling	☐	☐	☐
(14) *Reference Section 5.2.1: Bike Accommodations at Entrances*			
D. The Following Items are Shown on the Entrance Plan(15)			
Property Lines shown near entrance(s)	☐	☐	☐
Names and tax parcel numbers of abutting land owners	☐	☐	☐

Location of Existing & Proposed Buildings	☐	☐	☐
Existing & Proposed Right-of-Way lines labeled and dimensioned	☐	☐	☐
Existing & Proposed Easements labeled and dimensioned	☐	☐	☐
Existing & Proposed finished grade contours	☐	☐	☐
Existing & Proposed Utility Poles, Signs, etc.	☐	☐	☐
Existing Roadway Lane Widths & Striping	☐	☐	☐
Existing Drainage Features	☐	☐	☐
Proposed development sign(s) called out	☐	☐	☐
Proposed Limit of Construction shown	☐	☐	☐
Proposed permanent sight distance easements labeled	☐	☐	☐
Proposed Site Drainage	☐	☐	☐
Proposed Entrance Geometry	☐	☐	☐
Site parking layout shown	☐	☐	☐
Dimensions for all entrance radii			
Dimensions for all entrance throat widths	☐	☐	☐
Roadway curves shown on each side of entrance	☐	☐	☐
Location of any Crossovers(16)	☐	☐	☐
Cross Sections supplied at positions of interest (where the roadway widens, etc. or where constructability issues may occur)	☐	☐	☐
Cross Sections include the following:	☐	☐	☐
- Width of Through Lane	☐	☐	☐
- Width of Proposed Shoulder	☐	☐	☐
- Width of Right-of-Way	☐	☐	☐
- Width of Deceleration Lane	☐	☐	☐
- Width of Bypass Lane	☐	☐	☐
- Width of Drainage Easement	☐	☐	☐
- Slope of Roadside Embankment (front & back slope)	☐	☐	☐
- Cross Slope of Shoulder and Deceleration Lane	☐	☐	☐
Cross Sections shown to scale	☐	☐	☐
Entrance Construction Details	☐	☐	☐
Planimetric Features	☐	☐	☐
(15) *Reference Section 4.4.2: Entrance Plan* (16) *Reference Section 5.2.2.4: Crossovers*			
E. SIGNING AND STRIPING			
Signing & Striping Plan w/ Legend	☐	☐	☐
Cross Walk Detail Shown	☐	☐	☐
16" Stop Bar shown (5' behind crosswalk)	☐	☐	☐
Signage Break-A-Way details shown in plan set	☐	☐	☐
Speed Limit (R2-1-25) and Watch Children (W21-11DE) shown at entrances	☐	☐	☐
DelDOT Traffic Comments Provided (date)	☐	☐	☐
F. MAINTENANCE OF TRAFFIC			
Correct MOT cases have been listed with all required notes	☐	☐	☐
MOT General Notes are Shown	☐	☐	☐
MOT Approval (date)	☐	☐	☐

X. REQUIRED FORMS, FEES, AND PLANS FOR SUBDIVISION REVIEW

Construction Stage Calculation Form	☐	☐	☐
Construction Stage Fee	☐	☐	☐

Record Plan is included in plan set	☐	☐	☐
Sewer/Water Utility Plans (Included for information purposes)	☐	☐	☐
Advanced Application Form	☐	☐	☐
Bond has been issued	☐	☐	☐

XI. SUBDIVISION PLAN COMMENTS

1st comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
2nd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
3rd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐

XII. SUBDIVISION APPROVAL

Approval (date of letter)	☐	☐	☐

XIII. ADDITIONAL COMMENTS:

CHECKLIST FOR COMMERCIAL ENTRANCE PLAN APPROVAL

Project #:		Reviewer:	
Project Title:		Tax ID #:	
DelDOT #:		Date:	

I. TRAFFIC IMPACT STUDY

	Yes	No	N/A
Traffic Impact Study Required	☐	☐	☐
List Required Offsite Improvements (Reference TIS Requirements)			
1.	☐	☐	☐
2.	☐	☐	☐
3.	☐	☐	☐
4.	☐	☐	☐
Additional Required Improvements (Please list on reverse side)	☐	☐	☐
Letter Agreement has been executed for offsite improvements	☐	☐	☐
Signal Agreement has been executed	☐	☐	☐

II. STATE MAINTAINED HIGHWAYS – REQUIRED RIGHT-OF-WAY & EASEMENTS

Local – 30 ft.[(1)(2)]	☐	☐	☐
Major / Minor Collector or Minor Arterial – 40 ft.[(1)(2)]	☐	☐	☐
Principal Arterial or Freeway – 50 ft.[(1)(2)(3)]	☐	☐	☐
Additional Right-of-Way to meet requirements. "An Additional *X-Feet* is Herby Dedicated to Public Use as per this plat"[(1)(4)]	☐	☐	☐
Existing Right-of-Way shown on both sides of frontage roads	☐	☐	☐
Existing Right-of-Way is dimensioned and labeled	☐	☐	☐
15' Permanent Easement for a shared-use path	☐	☐	☐
Sight Triangles using AASHTO *Policy on Geometric Design of Highways and Streets* have been shown and dimensioned[(5)] (Figure 5-21)	☐	☐	☐
Permanent Sight Easements have been established	☐	☐	☐

(1) *Reference Section 3.6: Right-of-Way*
(2) *From the centerline of roadway of an undivided highway.*
(3) *From the inside edge of travelway on a divided highway.*
(4) *Reference Section 3.6.5: Dedication of Right-of-Way*
(5) *Reference Section 5.4: Sight Distance*

III. TITLE SHEET PRESENTATION REQUIREMENTS

Name of proposed business	☐	☐	☐
Name of nearest town or county	☐	☐	☐
Maintenance number of roadway being assessed (i.e. Kent County Road ###)	☐	☐	☐
Graphic scale displayed (1" = 30' is preferred, 1"=20' is acceptable)	☐	☐	☐
Date of submission	☐	☐	☐
Name, address and telephone number of engineer or surveyor preparing plans (Can be shown in title block)	☐	☐	☐
Seal of engineer or surveyor	☐	☐	☐

DelDOT General Notes (Appendix J)	☐	☐	☐
North arrow on all maps	☐	☐	☐
Key map showing all crossroads (Size is 6" X 6", Scale is 1"=800')	☐	☐	☐
	☐	☐	☐
Data Block Requirements	☐	☐	☐
-Type of business	☐	☐	☐
-Gross acreage of property	☐	☐	☐
-Approximate gross leaseable floor plan area	☐	☐	☐
-Traffic generation (ADT) with trip distribution shown	☐	☐	☐
-Peak hour traffic distribution in terms of vehicles per hour (vph)			
-Parking spaces required	☐	☐	☐
-Parking spaces furnished	☐	☐	☐

IV. GENERAL PLAN REQUIRMENTS

Legend of Line Work(6)	☐	☐	☐
Building Set Backs Displayed	☐	☐	☐
Entrance Location Position has been approved by DelDOT (7)(8)	☐	☐	☐
Entrance Plan is at the required scale (1" = 30' is preferred, 1"=20' is acceptable)	☐	☐	☐
Adjacent entrance requirements are met based on speed limit (9)(Figure 3-1)	☐	☐	☐
North arrow shown on all plan views	☐	☐	☐
Curve and line table for each road	☐	☐	☐
(6) *Legend of line work should include, but is not limited to the following: existing and proposed right-of-way, proposed property lines, proposed lot numbers, existing wood line, existing contours, wetlands line, 100-year floodplain line, easement line, drainage easement line, minimum building setback line, existing and proposed monuments and pins.* (7) *Entrance must be able to be constructed within the limits of available Right-of-Way and Easements. Verification includes cross slopes, travelway widths, shoulder widths, foreslopes, and backslopes.* (8) *Reference Section 3.4.1: Site Plan Requirements for a full list of requirements* (9) *Reference Section 3.4.1.2: Adjacent Entrances for all requirements*			

IV. TRAFFIC GENERATION(10)

Traffic Generation Figure Shown	☐	☐	☐
Turning Movement Counts	☐	☐	☐
Posted Speed Limit	☐	☐	☐
Existing Traffic Count on the roadway AADT	☐	☐	☐
Proposed Site Generated ADT	☐	☐	☐
Future Projected 10-year AADT	☐	☐	☐
Truck Percentage for Site	☐	☐	☐
School Bus Projections	☐	☐	☐
Latest Edition ITE Manual Referenced	☐	☐	☐
(10) *Reference Section 3.4.1.1: Traffic Information*			

V. AUXILLARY LANES

Right-Turn Lane Warrants are met (Figures 5-12 and 5-13)	☐	☐	☐
Right-Turn Lane Length and Layout is shown correctly (Figure 5-10)	☐	☐	☐
By-pass Lane Warrants are met (Figure 5-19)	☐	☐	☐
By-pass Lane Length and Layout is shown correctly (Figure 5-8)	☐	☐	☐
Left-Turn Lane Warrants are met (Figures 5-14, 5-15, 5-16 and 5-17)	☐	☐	☐
Left-Turn Lane Tapers and Layout are shown correctly (Figure 5-10)	☐	☐	☐
Bike Accommodations at Entrance(11) (Figures 5-8, 5-10 and 5-20)	☐	☐	☐
(11) *Reference Section 5.2.1: Bike Accommodations at Entrances*			

V. ENTRANCE PLAN PRESENTATION REQUIREMENTS [12]

Property Lines shown near entrance(s)	☐	☐	☐
Names and tax parcel numbers of abutting land owners	☐	☐	☐
Location of Existing & Proposed Buildings	☐	☐	☐
Existing & Proposed Right-of-Way lines labeled and dimensioned	☐	☐	☐
Existing & Proposed Easements labeled and dimensioned	☐	☐	☐
Existing & Proposed finished grade contours	☐	☐	☐
Existing & Proposed Utility Poles, Signs, etc.	☐	☐	☐
Existing Roadway Lane Widths & Striping	☐	☐	☐
Existing Drainage Features	☐	☐	☐
Proposed development sign(s) called out	☐	☐	☐
Proposed Limit of Construction shown	☐	☐	☐
Proposed permanent sight distance easements labeled	☐	☐	☐
Proposed Site Drainage	☐	☐	☐
Proposed Entrance Geometry	☐	☐	☐
Site parking layout shown	☐	☐	☐
Dimensions for all entrance radii	☐	☐	☐
Dimensions for all entrance throat widths	☐	☐	☐
Roadway curves shown on each side of entrance	☐	☐	☐
Location of any Crossovers[13]	☐	☐	☐
Cross Sections supplied at positions of interest (where the roadway widens, etc. or where constructability issues may occur)	☐	☐	☐
Cross Sections include the following:			
- Width of Through Lane	☐	☐	☐
- Width of Proposed Shoulder	☐	☐	☐
- Width of Right-of-Way	☐	☐	☐
- Width of Deceleration Lane	☐	☐	☐
- Width of Bypass Lane	☐	☐	☐
- Width of Drainage Easement	☐	☐	☐
- Slope of Roadside Embankment (front & back slope)	☐	☐	☐
- Cross Slope of Shoulder and Deceleration Lane	☐	☐	☐
Cross Sections shown to scale	☐	☐	☐
Entrance Construction Details	☐	☐	☐
Planimetric Features	☐	☐	☐
(12) *Reference Section 4.4.2: Entrance Plan* (13) *Reference Section 5.2.2.4: Crossovers*			

VI. ENTRANCE DESIGN AND CONSTRUCTION[14]

Typical Section of Entrance Drive[15] (Figures 5-22, 5-23, and 5-24)	☐	☐	☐
Entrance Curb meets DelDOT Requirements and extends 25' past entrance radii	☐	☐	☐
Pavement Sections have been determined and displayed with correct labeling	☐	☐	☐
Pavement Tie-in detail shown in plan set	☐	☐	☐
Entrance pavement section layers meet minimum and maximum depth requirements based on the ADT of the site[16] (Figure 5-27)	☐	☐	☐
Subdivision pavement section layers meet minimum and maximum depth requirements based on the ADT of the site[17](Figure 5-26)			
Structural Number (SN) displayed for all pavement section layers			
At a Minimum, the Frontage Road is Improved to its Functional Classification Standards across the Business' Frontage	☐	☐	☐

Existing & proposed spot elevations tangent to the roadway every 25 feet or less	☐	☐	☐
Existing & proposed spot elevations on radii every 10 feet and at the PC/PT point	☐	☐	☐
Ten foot wide shared-use path along the frontage of the roadway (Path is inside 15' Permanent Easement)	☐	☐	☐
Sidewalks that are compliant with ADA law are provided	☐	☐	☐
(14) *Reference Section 5.2: Entrance Design Guidelines* (15) *Reference Section 5.5: Typical Sections* (16) *Reference Section 5.6.2: Entrances* (17) *Reference Section 5.6.1: Subdivision Streets*			

VII. MAINTENANCE OF TRAFFIC

Correct MOT cases have been listed with all required notes	☐	☐	☐
MOT General Notes are Shown	☐	☐	☐
MOT Approval (date)	☐	☐	☐

VIII. SIGNING AND STRIPING

Signing and striping plans submitted as a separate plan sheet	☐	☐	☐
Legend included for signing and striping plan	☐	☐	☐
Cross Walk Detail Shown	☐	☐	☐
16" white stop bar shown and dimensioned 5' behind crosswalk	☐	☐	☐
Signage Break-A-Way details shown in plan set	☐	☐	☐
Traffic Comments Provided (date)	☐	☐	☐

IX. DRAINAGE[18]

Drainage Report[19]	☐	☐	☐
Drainage – Pipes, Inlets, Ditches, etc.	☐	☐	☐
Schedules for Pipes, Catch Basins, Manholes, etc. (Figures 4-3, 4-4)	☐	☐	☐
Pipe Angles for storm water constructability has been verified	☐	☐	☐
HDPE Pipe Notes and Coverage details are shown	☐	☐	☐
Pipe Coverage for storm water constructability has been verified	☐	☐	☐
Pipe Connection with catch basin meets depth requirements[21] (Double catch basins require an 8" cover slab; this will in turn require the depth of pipe to be increased.)	☐	☐	☐
Catch Basins can accommodate proposed pipe size	☐	☐	☐
Correct Inlet Top has been specified (Type B for curbed, Type A for lawn)	☐	☐	☐
Flared End Section are used with Child Safe Covers where required	☐	☐	☐
DelDOT's Subdivision Drainage details and notes are incorporated	☐	☐	☐
Storm Water Management Pond–show 2, 10 & 100 yr. elevations	☐	☐	☐
(18) *Reference Section 5.7: Drainage Design* (19) *Drainage report is required for the verification of pipe sizes, area, actual and full flow pipe velocities, hydraulic grade line (HGL), pipe cover velocities, stabilization and spread on the roadways. Reference Section 5.7.2.8: Drainage Report* (20) *Reference DelDOT Standard Details for depth requirements*			

IX. ROAD PROJECTS IN THE AREA

Road Design	☐	☐	☐
Review	☐	☐	☐
District	☐	☐	☐
Corridor Preservation	☐	☐	☐
SR-1 Grid	☐	☐	☐

X. MISCELLANEOUS ITEMS EFFECTING ENTRANCE

Denial of Access found	☐	☐	☐

Existing Entrances Adjoining	☐	☐	☐
Existing Entrance can be shared	☐	☐	☐

XI. REQUIRED FORMS & FEES FOR ENTRANCE REVIEW

Initial Stage Calculation Form (Appendix C)	☐	☐	☐
Initial Stage Fee	☐	☐	☐
Construction Stage Calculation Form (Appendix C)			
Construction Stage Fee			
Commercial Entrance Design checklist	☐	☐	☐
Highway Entrance Permit Application	☐	☐	☐

XII. PLANS REQUIRED FOR APPROVAL

Entrance only (Subdivision Streets are Private / City Run)	☐	☐	☐
Site Street Plan	☐	☐	☐

XIII. ENTRANCE PLAN COMMENTS

1st comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
2nd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐
3rd comments mailed, phoned, faxed and/or emailed (date)	☐	☐	☐

XIV. ENTRANCE PLAN APPROVALS

No Objection letter sent (date of letter)	☐	☐	☐
Approval (date of letter)	☐	☐	☐

XV. ADDITIONAL COMMENTS:

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Title Sheet				
	Upper Right Title Block				
1	County - project initiation form				
2	Maintenance road number - project initiation form				
3	Sheet numbers				
4	Total sheets				
	Design Designation				
5	Functional class – functional class maps or INFORM				
6	Type of construction – project initiation form				
7	AADT – planning				
8	DHV - planning				
9	Design speed – *Road Design Manual*				
10	% Trucks – planning				
11	Directional distribution – planning				
	Index of Sheets				
12	Follow "Suggested Sequence of Sheets" document				
	Approved Design Exceptions				
13	From contract files				
	Center Title Block				
14	Project title – project initiation form				
15	State contract number - project initiation form				
16	Federal aid project number - project initiation form				
17	Mile posts – from VAX Road Inquiry or Road Information application or INFORM				
18	Roadway length				
19	Structure length				
20	Total length				
	Project Location Map				
21	North arrow				
22	Major routes and roads labeled				
23	Contract limits highlighted and stationing limits shown				
	Plan Sheet Index				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	General				
24	Scale bar				
25	North arrow				
	Title Block				
26	Contract number				
27	County				
28	FAP number – denote by "See Title Sheet"				
29	Sheet number				
30	Total sheets				
	Sheet Producers				
31	Preliminary Tracing – initials of drafter				
32	Design – initials of designer				
33	Checked – initials of reviewer				
	Sheet Layout				
34	Mainline alignment with stationing (stationing runs South-to-North or West-to-East)				
35	Mainline road name				
36	Side street alignment with stationing				
37	Side street road name				
38	Subdivision names, etc. if side roads are not prevalent				
39	Begin contract station (mainline)				
40	End contract station (mainline)				
41	Limit(s) of construction station (side street alignment)				
42	Sheet boarders with sheet type identifiers				
	Sheet Type Legend				
43	Use different symbol (circle, square, octagon, etc.) for each sheet type (plan, profile, grades and geometrics, drainage, construction phasing, MOT and erosion control plans, signing, striping and conduit plans, etc.)				
	Legend Sheet				
	General				
	Title Block				
44	Contract number				
45	County				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
46	FAP number – denote by "See Title Sheet"				
47	Sheet number				
48	Total sheets				
	Sheet Producers				
49	Preliminary Tracing – initials of drafter				
50	Design – initials of designer				
51	Checked – initials of reviewer				
	Existing, Proposed and Utility Legends				
52	Existing detail and proposed construction legend symbols should not to be altered				
53	Additional proposed construction symbols may be given in the area provided				
54	Utilities on the project and their corresponding standard symbols must be shown				
	General and Project Notes				
	General				
	Title Block				
55	Contract number				
56	County				
57	FAP number – denote by "See Title Sheet"				
58	Sheet number				
59	Total sheets				
	Sheet Producers				
60	Preliminary Tracing – initials of drafter				
61	Design – initials of designer				
62	Checked – initials of reviewer				
	General Notes				
63	Project erosion potential checked off				
64	Disturbed area noted				
	Project Notes				
65	Organized by Standard Specification sections (100, 200, 300, etc.) (See list of Commonly Used Project Notes)				
66	Do not repeat Standard Specifications or Special Provisions				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
67	Earthwork Summary complete				
	Typical Sections				
	General				
	Title Block				
68	Contract number				
69	County				
70	FAP number – denote by "See Title Sheet"				
71	Sheet number				
72	Total sheets				
	Sheet Producers				
73	Preliminary Tracing – initials of drafter				
74	Design – initials of designer				
75	Checked – initials of reviewer				
	Typical Sections				
76	Typical sections arranged by increasing stations from bottom of the page to the top of the page				
77	Normal sections and superelevated sections are shown				
78	Separate typical sections for transition areas are generally not necessary				
79	Existing pavement, physical features and original ground shown with dashed lines				
80	Identify type and thickness of existing pavement				
81	Proposed pavement and appurtenances shown with solid lines and shading				
82	Proposed topsoil shown with solid lines and darker shading				
83	Surfacing materials, curb and gutter, safety appurtenances, etc. referenced using identifiers				
84	Thickness of material, if applicable, placed next to identifier				
85	Label construction baseline and right-of-way baseline				
86	Identify proposed lane widths, shoulder widths, median widths, clear zones, existing and proposed right-of-way widths, sidewalk/multi-use path width, ditch width and depth, etc.				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
87	LOC shown				
88	PGA and/or POR shown				
89	Ditch PGA shown				
90	Side slopes given				
91	Pavement cross-slope shown				
92	Underdrain locations shown				
	Typical Section Legend				
93	Provide descriptions of identifiers used on typical sections				
94	Use specification item numbers to call out each individual material used to construct				
95	Be sure that specification item name is correct				
	Horizontal and Vertical Control				
	General				
96	Scale bar				
97	North arrow				
	Title Block				
98	Contract number				
99	County				
100	FAP number – denote by "See Title Sheet"				
101	Sheet number				
102	Total sheets				
103	Sheet Producers				
104	Preliminary Tracing – initials of drafter				
105	Design – initials of designer				
106	Checked – initials of reviewer				
	Datum Reference Note				
107	Horizontal – This contract is referenced to the Delaware State Plane Coordinate System (NAD 83)				
108	Vertical – This contract is referenced to NAVD 88, based on State of Delaware GPS Benchmark XXXX – Elevation XXX.XX feet				
	Construction Alignment Control Schedule				
109	List the following types of points in this schedule:				
110					

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
111					
112					
113					
114					
115	On long tangent sections, POT points are) feet				
	Alignment Layout				
116	Mainline alignment				
117	Mainline stationing				
118	Mainline road name				
119	Construction baseline label				
120	Tangent bearing(s)				
121	Point of beginning				
122	Point(s) of curvature & curve identification number(s)				
123	Point(s) of intersection and curve identification number(s)				
124	Point(s) of tangency and curve identification number(s)				
125	Point of ending				
126	Side street alignment(s)				
127	Side street stationing				
128	Side street name(s)				
129	Tangent bearing(s)				
130	Station equation(s) tying side street(s) stationing to mainline stationing				
	Curve Information				
131	Curve identification number				
132	Curve type (circular)				
133	Radius				
134	Delta				
135	Length of curve				
136	Degree of curve				
137	Tangent length				
138	Middle ordinate				
139	Chord length				
140	Chord bearing				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Horizontal and Vertical Control Data Schedule				
141	All traverse points should be listed in this schedule listing traverse point number, station, offset, northing, easting and elevation.				
	Traverse Points				
142	Label all traverse points with traverse point number and type (DelDOT cap, rebar, spike, PK nail, GPS marker, etc.)				
	Traverse Point Diagrams				
143	Create traverse point diagram detailing how each traverse point has been physically tied down via dimensions to fixed points located in surveying data (Usually three tie points are used for each traverse point)				
144	Number of traverse point diagrams are determined by the designer, but should at a minimum include diagrams at the beginning of the alignment, end of alignment, at intersecting roadways and at an interval of no longer than 1000 ft.				
	Construction Plans				
	General				
145	Scale bar				
146	North arrow				
	Title Block				
147	Contract number				
148	County				
149	FAP number – denote by “See Title Sheet”				
150	Sheet number				
151	Total sheets				
	Sheet Producers				
152	Preliminary Tracing – initials of drafter				
153	Design – initials of designer				
154	Checked – initials of reviewer				
	Construction Baseline (Mainline and Side Streets)				
155	Construction baseline layout & stationing				
156	Construction baseline road name				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
157	Begin contract station				
158	End contract station				
159	Limit(s) of work stationing				
160	Match line stationing				
	Existing Right-of-Way				
161	Right-of-way baseline (Usually the same as the construction baseline)				
162	Label existing right-of-way lines				
163	Dimension existing right-of-way lines from baseline (construction or right-of-way)				
164	Label and dimension easements (PE, drainage, sewer, etc.)				
	Property Information				
165	Label property lines (PL or "Z")				
166	Label property/parcel information				
167	Parcel number (1-R, 1-L, etc.)				
168	Tax Parcel ID number				
169	Parcel owner information				
170	Deed information/instrument number				
171	Blanket easement information (record number & owner)				
	Existing Survey Features				
172	Pattern linear features (fences, woods lines, ditches, guardrail, underground utilities, etc.)				
173	Label surface materials (hot-mix, concrete, stone, grass, etc.)				
174	Label landscape materials (tree sizes, woods, planters, wall heights, etc.)				
175	Label all drainage features (curb types, pipe sizes, material & flow direction, etc.)				
176	Label all structure features (one story frame house, shed, porch, deck, etc.)				
177	Label all utility features (utility pole owner information/number, etc.)				
178	Rotate existing signs, guy wires, valves, fire hydrants, etc. to appropriate orientation (Example: alignment or sheet orientation vs. direction sign faces)				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Proposed Construction Features				
179	Pattern all proposed linear features (curbs, guardrail, etc.)				
180	Place all proposed construction cells and identifiers (drainage inlets, junction boxes, manholes, right-of way monuments, etc.)				
181	Place all construction directive identifiers (Remove by Contractor, Adjust by Contractor, Do Not Disturb, etc.)				
182	Proposed pavement shaded				
183	Pavement width dimensions given at transition points and beginning and near match lines on each sheet				
184	Proposed saw cut locations shown and noted				
185	Proposed drainage pipe shown with flow arrows				
186	Proposed stormwater management facility locations shown				
187	Clear zone (CZ) patterned, labeled and dimension shown				
188	Limits of construction (LOC) patterned and labeled				
	Proposed Construction Schedules				
189	Curbs				
190	Curb ramp				
191	Drainage inlets				
192	Junction boxes				
193	Manholes				
194	Pipe				
195	Flared end section				
196	Convert to junction box				
197	Underdrain				
198	Guardrail				
199	Barrier				
200	Right-of-way monument				
	Proposed Right–of–Way				
201	Parcel identifiers given for parcels with right-of-way impacts (R/W, PE, TCE)				
202	Proposed right-of-way widths shown				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
203	Fee acquisitions and easements patterned and labeled (R/W, DA, PE, TCE)				
	Profile				
	General				
204	Scale bar (horizontal and vertical)				
	Title Block				
205	Contract number				
206	County				
207	FAP number – denote by "See Title Sheet"				
208	Sheet number				
209	Total sheets				
	Sheet Producers				
210	Preliminary Tracing – initials of drafter				
211	Design – initials of designer				
212	Checked – initials of reviewer				
213	Construction baseline stationing given on horizontal axis				
214	Elevations given on vertical axis				
215	Road name labeled under horizontal axis				
	Existing Profile Grade Line (Mainline and side road)				
216	Existing profile grade line shown (thin, dashed line)				
217	Existing grades given every 50' to the left of station line (vertical grid line)				
218	Existing drainage system shown (thin, dashed lines)				
219	Soil profiles shown				
220					
221					
222	on shown				
	Proposed Profile Grade Line (Mainline and side road)				
223	Proposed profile grade line (heavy, solid line)				
224	Proposed grades given every 50' to the right of station line (vertical grid line)				
225	PVC (point of vertical curvature) station labeled on profile				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
226	PVI (point of vertical intersection) station labeled on profile				
227	PVT (point of vertical tangency) station labeled on profile				
228	Proposed drainage system shown (heavy, solid line and shaded)				
229	Drainage identifiers shown				
	Vertical Curve Data				
230	Curve type (symmetric parabolic or asymmetric parabolic)				
231	Direction (sag or crest)				
232	L - length of vertical curve				
233	G1 – ahead tangent grade				
234	G2 – back tangent grade				
235	E – external distance				
236	K – L/A (Length of vertical curve divided by algebraic grade difference)				
237	M – middle ordinate distance				
	Grades and Geometrics				
	General				
238	Scale bar				
239	North arrow				
	Title Block				
240	Contract number				
241	County				
242	FAP number – denote by “See Title Sheet”				
243	Sheet number				
244	Total sheets				
	Sheet Producers				
245	Preliminary Tracing – initials of drafter				
246	Design – initials of designer				
247	Checked – initials of reviewer				
	Grades				
248	Pavement cross slopes denoted by cross slope percentage and direction arrow given at break points (Break point denoted by + station on construction baseline or profile grade line)				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
249	Splined pavement grades around intersecting roadways should be given at 10’ intervals along the intersection curves				
250	In transition areas from normal crown to full superelevation, pavement grades should be given every 50’ along pavement cross slope break lines or a superelevation diagram should be included				
251	Grades should be given at the face of curb or at the edge of gutter pan for curb and gutter (where grades cannot be obtained from typical sections)				
252	Grades and offsets for special roadside ditches should be given at 50’ intervals				
	Geometrics				
253	Pavement widths given at all break points (Break point denoted by + station on construction baseline or profile grade line) or coordinates shown at all pavement width and sidewalk break points				
254	Show radius of all intersection curves and island curves				
	Geometry Layout Schedule				
255	Point type				
256					
257	rve				
258					
259					
260	Point number				
261	Baseline station				
262	Baseline offset (+ right of baseline, - left of baseline)				
263	North coordinate				
264	East coordinate				
265	Elevation (if not given on plan view)				
	Stormwater Management Plans (Stormwater Management Section to provide)				
266					
	Construction Details				
	General				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Title Block				
267	Contract number				
268	County				
269	FAP number – denote by "See Title Sheet"				
270	Sheet number				
271	Total sheets				
	Sheet Producers				
272	Preliminary Tracing – initials of drafter				
273	Design – initials of designer				
274	Checked – initials of reviewer				
275	Details organized on sheet by placing a border around each item being detailed				
276	Title given at the center bottom, inside of the border box for item being detailed (special drainage inlet, butt joint, energy dissipater, etc.)				
277	Sufficient views provided within the border to construct item (plan, elevation, section A-A, section B-B, etc.)				
278	Item view title labeled below each view (plan, elevation, section A-A, etc.)				
279	Item view scale given below the item view title (1/16"=1', ½"=1', etc.)				
280	Sufficient dimensioning provided to construct item				
	Bridge Details (Bridge Section to provide)				
281					
	Environmental Compliance Plan (from Environmental Section)				
	General				
282	Scale bar				
283	North arrow				
	Title Block				
284	Contract number				
285	County				
286	FAP number – denote by "See Title Sheet"				
287	Sheet number				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
288	Total sheets				
	Sheet Producers				
289	Preliminary Tracing – initials of drafter				
290	Design – initials of designer				
291	Checked – initials of reviewer				
292	Natural Resource notes				
293	Cultural Resource notes				
294	Legend				
	Construction Phasing, MOT and Erosion Control				
	General				
295	Scale bar				
296	North arrow				
	Title Block				
297	Contract number				
298	County				
299	FAP number – denote by “See Title Sheet”				
300	Sheet number				
301	Total sheets				
	Sheet Producers				
302	Preliminary Tracing – initials of drafter				
303	Design – initials of designer				
304	Checked – initials of reviewer				
	Project Notes and Details – Construction Phasing, MOT and Erosion Control				
305	Notes and details that apply throughout each phase of the project, including permanent warning signs				
	Phase I – Construction Phasing, MOT and Erosion Control				
306	Phase I work areas shaded				
307	Phase I traffic control devices and configurations shown				
308	Phase I temporary work zone signing shown				
309	Phase I temporary striping shown				
310	Phase I construction sequence by major work items				
311	Phase I special details (on separate sheet				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	if necessary)				
312	Phase I Traffic Control notes				
313	Phase I Erosion Control notes				
314	Phase I Erosion Control schedule shown				
	Phase II, III, etc. – Construction Phasing, MOT and Erosion Control				
315	See Phase I listing				
	Detour Plans (from Traffic Section)				
	General				
316	Scale bar				
317	North arrow				
	Title Block				
318	Contract number				
319	County				
320	FAP number – denote by "See Title Sheet"				
321	Sheet number				
322	Total sheets				
	Sheet Producers				
323	Preliminary Tracing – initials of drafter				
324	Design – initials of designer				
325	Checked – initials of reviewer				
	Landscaping Plans				
	General				
326	Scale bar				
327	North arrow				
	Title Block				
328	Contract number				
329	County				
330	FAP number – denote by "See Title Sheet"				
331	Sheet number				
332	Total sheets				
	Sheet Producers				
333	Preliminary Tracing – initials of drafter				
334	Design – initials of designer				
335	Checked – initials of reviewer				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Project Landscape Notes and Details				
336	Landscaping notes				
337	Planting details				
	Landscaping Plan				
338	Landscaping symbols and identifiers shown				
339	Landscaping legend shown				
340	Landscaping schedule shown				
341					
342					
343					
344	Certified Landscape Architect stamp/seal				
	Lighting Plans				
	General				
345	Scale bar				
346	North arrow				
	Title Block				
347	Contract number				
348	County				
349	FAP number – denote by “See Title Sheet”				
350	Sheet number				
351	Total sheets				
	Sheet Producers				
352	Preliminary Tracing – initials of drafter				
353	Design – initials of designer				
354	Checked – initials of reviewer				
355	Lighting symbols and identifiers shown				
356	Lighting standard schedule shown				
357	Lighting service schedule shown				
358	Lighting notes shown				
359	Special lighting details shown				
	Signing, Striping and Conduit Plans				
	General				
360	Scale bar				
361	North arrow				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	Title Block				
362	Contract number				
363	County				
364	FAP number – denote by "See Title Sheet"				
365	Sheet number				
366	Total sheets				
	Sheet Producers				
367	Preliminary Tracing – initials of drafter				
368	Design – initials of designer				
369	Checked – initials of reviewer				
370	Pavement markings legend shown				
371	Markings identifiers shown				
372	Signing legend shown				
373	Sign cells shown with appropriate legend number				
374	ITS conduit run identifiers shown				
375	ITS conduit legend shown				
	Traffic Signal Plans (from Traffic Section)				
	General				
376	Scale bar				
377	North arrow				
	Title Block				
378	Contract number				
379	County				
380	FAP number – denote by "See Title Sheet"				
381	Sheet number				
382	Total sheets				
	Sheet Producers				
383	Preliminary Tracing – initials of drafter				
384	Design – initials of designer				
385	Checked – initials of reviewer				
	Conduit run schedule shown				
386	Conduit run identifiers shown				
387	Signal notes shown				
388	Signal pole, cabinet boxes, junction well, etc.				

OFF-SITE IMPROVEMENT PLAN REVIEW CHECKLIST

	Construction Plan Sheet	Survey	Preliminary	Semi-Final	Final
	locations shown				
389	Proposed right-of-way shown				
	Quantity Summary (Prepared through VAX)				
	Cross Sections				
390	Stationing of cross sections is from the bottom of the page to the top				
391	Stationing is shown under the cross section with baseline elevation given				
392	Construction baseline shown				
393	Right-of-way line (existing and proposed) shown				
394	Limit of construction shown				
395	Roadway box shown				
396	Underground (overhead if necessary) utility locations Shown				
397	Retaining wall or noise wall locations shown				
398	Cut and fill figures given				

RIGHT-OF-WAY PLAN CHECKLIST

(To be turned in with each plan submission)

Item	Remarks
State contract number	
Project name	
Location	
Type of request	
Date of request	
Date of completion	
In House project (*Team support will provide)	
Consultant project (+Team support will provide)	
Checklist for Existing Right-of-Way Verification	
*Check old contracts for previous acquisitions; If not as acquired, contact team support	
*Check miscellaneous road files for acquisitions through Falcon electronic archives	
*Check with Real Estate for excess land inventory plats for any right-of-way reservations	
*Check bridge maintenance plan through Falcon electronic archives for bridge right-of-way data	
*+Check soil conservation for existing tax ditches	
*Check existing subdivisions, commercial, businesses, etc. for right-of-way dedication	
*+Check incorporated town agreements	
*Flag unusual right-of-way acquisitions	
Place existing right-of-way and other data acquired from the previous plans	
Checklist for Current Ownership Verification	
Prepare a mosaic of the project using the County's property maps	
*Make a copy of the current owners from the County's property report from the internet	
Update the mosaic by comparing your mosaic map to County's original maps (Internet or County Tax Map Books)	
*By using the County's website, place current owner names on the plans	
*+Acquire Tax Ditch Manager's names, normally three (3)	
Apply County's assessment number to each parcel	

RIGHT-OF-WAY PLAN CHECKLIST

(To be turned in with each plan submission)

Item	Remarks
*Make a copy of plans, deeds, wills, etc. for team support files	
Title Sheet Requirements	
Title block	
Labeled "Right-of-way Plans"	
Location map	
Begin acquisition – end acquisition identification	
Scale	
North arrow	
Current approval blocks (If in doubt, contact Quality)	
Current revision blocks (If in doubt, contact Quality)	
Title Block Requirements	
County	
State contract number	
Federal aid project number	
Project name	
Plan sheet number	
Total sheets	
Property Mosaic	
Project location map (property mosaic)	
Road systems	
Project survey baselines	
Begin acquisition – end acquisition identification	
Property lines	
Parcel ownership	
Parcel numbers	
Individual plan sheet key guide and identification	
Scale	
North arrow	
Survey Plan Review Plan Sheet Requirements	
Title block	
Revision block	
North arrow	
Scale	

RIGHT-OF-WAY PLAN CHECKLIST

(To be turned in with each plan submission)

Item	Remarks
Survey baseline and stationing [points of intersect (PIs), points of termination (PTs)]	
Construction baseline and stationing	
Dimensions between baseline and centerline	
Existing right-of-way lines located, labeled and dimensioned from the baseline	
Existing denial of access	
Individual property requirements	
Existing property lines	
Property traverse closures (only upon request by right-of-way)	
Parcel numbers	
Ownership of record	
Deed record number	
Plot existing easements and note blanket easements	
Proper use of symbols	
Preliminary Plan Review Plan Sheet Requirements	
Previous comments addressed or legitimate written responses	
Proposed right-of-way lines including PEs and TCEs (heavier than existing)	
Proposed construction line-work including drainage	
Limits of construction	
Typical section requirements	
Label and dimension existing right-of-way	
Label and dimension proposed right-of-way	
Limits of construction	
Label side slopes	
Plot and label existing utilities and easements	
Semi-Final Plan Review Plan Sheet Requirements	
Previous comment addressed or legitimate responses	
Proposed right-of-way width dimensions	
Proposed curve data (radius, arc length, chord bearing and distance)	
Proposed denial of access lines	
Begin and end stations of denial of access lines	

RIGHT-OF-WAY PLAN CHECKLIST

(To be turned in with each plan submission)

Item	Remarks
Limits of construction (must include all work)	
Permanent easements	
Temporary easements	
Identification line for proposed "Toe" and "Top" of slope	
Offsets at right-of-way line breaks and property lines	
Improvements within 100 feet of right-of-way lines	
Pertinent physical features and pertinent topography	
Update owner names	
Proposed stormwater management	
Proposed utilities	
Proposed landscaping	
Proposed lighting	
Proposed signals	
Proposed erosion and sediment control	
Environmental Compliance Sheet	
Proposed signing and striping	
Maintenance of traffic	
Data Table Sheet Requirements	
Title block	
Revision block	
Assessment number	
Project parcel numbers	
Parcel ownership of record	
Type of acquisition	
Point numbers	
Metes and bounds (R/W, PEs and TCEs)	
Areas (square feet and acres)	
Right-of-way point data table	
Tabulation Sheet Requirements	
Title block	
Revision block	
Project parcel numbers	
Parcel County Assessment numbers	
Parcel ownership of record	

RIGHT-OF-WAY PLAN CHECKLIST

(To be turned in with each plan submission)

Item	Remarks
Plan sheet location numbers	
Parcel construction baseline station location numbers	
Parcel recorded reference per instrument of record (title source)	
Space for Right-of-way Recordation Reference	
Total property areas before acquisition	
Areas of acquisition	
Area occupied by existing right-of-way	
Area remaining (left and right)	
Area of permanent easements	
Area of temporary easements	
Space for remarks	

Additional revisions required:	
Reviewed by:	
Date:	

ENTRANCE DESIGN CHECKLIST

DelDOT File No. _____

PLUS No. _____ RPC No. _____ DAC No. _____

1. Development Name: _____ Urban _____ Rural _____
2. Tax Parcel I.D. No. _____
3. Traffic Generation Rate: _____ ADT; _____Peak Hour; % Peak _____
4. Number, Weight and Type of trucks using entrance weekly: _____

_____

Analysis of Warrants for Deceleration Lane and Bypass Lane:

5. Highway Posted Speed: _____
6. Right Turns in _____VPD; AM Peak _____; PM Peak _____
7. Left Turns in _____VPD; AM Peak _____; PM Peak _____
8. Traffic on Existing Road: _____ AADT; _____Peak Hour %

Length Requirements based on Warrants

9. Deceleration Lane: _____Ft. ; Bypass Lane: _____ Ft.
10. Highway Functional Classification: _____

(Curbed entrance generally required on Minor or Principal Arterial)

11. Required Sight Distance: _____ Ft. [See AASHTO Criteria]
12. Actual Sight Distance: _____Ft. Left; _____Ft. Right.
13. Is site drainage directed to Highway Drainage System? _____ YES; _____NO.

    If YES, drainage plans and calculations required.
14. Has a title search been performed on this property? _____ YES; _____NO.

    If YES, did the Title Search indicate any easements or denial of access to any roadway adjacent to the property? _____ YES; _____NO.

CERTIFICATE OF ACCURACY:

I hereby certify that I am a Registered Professional Engineer or Professional Land Surveyor in the State of Delaware and that the above information has been verified to be true and accurate and the design conforms to DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

Prepared by: _____
Signature

Printed Name: _____

Date: _____

SEAL

Appendix E ***Commercial Site Applications and Forms***

Commercial Entrance Application Checklist

- ☐ Application for Commercial Entrance Permit
- ☐ Verification of property ownership
- ☐ Power of Attorney form (notarized)
- ☐ Construction drawings approved by the DelDOT Subdivisions Engineer
- ☐ Itemized Construction Cost Estimate
- ☐ Security (check type below)
  - ☐ Letter of Credit
  - ☐ Surety Bond
  - ☐ Certified Check
- ☐ Commercial Entrance Construction Permit

DELAWARE DEPARTMENT OF TRANSPORTATION
APPLICATION FOR COMMERCIAL ENTRANCE PERMIT

Property Owners Name :_____Date:_____

Mailing Address: _____,

_____, _____,_____
City State Zip Code

Telephone No.: (_____)_____ Cell No.: (_____)_____

Fax No.: (_____)_____ E-mail Address: _____

Tax Map I.D. No.: _____

Applicant Name:_____

Mailing Address:_____,

_____, _____,_____
City State Zip Code

Telephone No.: (_____)_____ Cell No.: (_____)_____

Fax No.: (_____)_____ E-mail Address: _____

Proposed/Existing entrance location (Mailing Address, Road Name, or Road Number): _____
_____

Nearest intersecting road (Name): _____

Distance from entrance to nearest intersecting road: _____

Date when you will place stakes at entrance: _____ (mm/dd/yy)
applicant shall place wooden stakes on both sides of proposed entrance location. Name of Property Owner must be written on the stakes. If stakes are not in place, a permit will NOT be issued.

Are you requesting a permit for an existing entrance or a proposed entrance? Existing or Proposed
(Circle one)

If applying for a permit for *existing* entrance:
* Will you be modifying or relocating the existing entrance? Yes _____ No _____
If yes (explain): _____

* Was the existing entrance constructed within the past three years? Yes _____ No _____

Describe modifications you are proposing on the property *(building additions, new building construction, parking lot modifications, etc.):*
_____

DELAWARE DEPARTMENT OF TRANSPORTATION
APPLICATION FOR COMMERCIAL ENTRANCE PERMIT

Prior use of property (describe the type of business previously operating on the Property):

_____

_____

Proposed use of property (describe the type of business operation proposed on the Property):

_____

_____

Present square footage of each building (facility): _____

Proposed square footage of each building (facility): _____

Existing Zoning: _____

Proposed Zoning: _____

Off street parking as required by local code:

Spaces required _____ Spaces Provided _____

Federal Tax I.D. No. : _____

(For Escrow Deposits ONLY)

Address to District Public Works Engineer in appropriate District as follows:

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

POWER OF ATTORNEY

KNOW ALL PERSONS by These Presents that _____ (Property Owner) whose address is _____

a corporation/partnership duly organized under the laws of the State of _____,

has made, constitute and appoint _____, whose address and telephone number is: _____

_____

Phone Number: (_____)_____

to represent the aforesaid corporation/partnership before the State of Delaware for the purpose of obtaining the requisite permit and security for the establishment and construction of access to a State maintained highway to serve the following Land Development Project:

_____

_____

located at_____

This Power of Attorney and the authority granted herein hereby binds the undersigned to perform as agreed upon by its agent, named herein, and shall continue to be in full force and effect until such time as the aforesaid entrance/access has been completed and accepted by representatives of the State of Delaware at which time the monetary security required hereby shall be released.

BY: _____
(Signature)

TITLE: _____

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

SAMPLE LETTER OF CREDIT

FOR

COMMERCIAL ENTRANCE CONSTRUCTION

Bank Letterhead

Address to District Permit Supervisor in appropriate District as follows:

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

RE: Irrevocable Commercial Letter of Credit No. _____

_____ *(name of Development)*

in _____County.

Dear Sir or Madam:

We hereby establish our Irrevocable Commercial Letter of Credit in favor of the State of Delaware, Department of Transportation as beneficiary at the request of and for an account of _____(applicant), for an amount or amounts not to exceed _____ ($ _____).

This Letter of Credit is subject to the following terms and conditions:

Effective Date: _____

This credit is to be available by sight draft being presented to

_____ (Name of Bank)

at its main office at _____(Address).

All drafts so drawn must bear the clause "Drawn Under" and the following information: Bank Name, Letter of Credit Number, and date.

The sight draft must be signed by the Director of the Division of Maintenance and Operations stating that " _____(applicant) has failed to perform construction of the site entrance,

in accordance with the entrance construction permit and the irrevocable Letter of Credit in favor of the State of Delaware, Department of Transportation, pertaining thereto. Demand is hereby made in the amount of the enclosed draft."

This Letter of Credit will expire on _____. The bank agrees to notify the State thirty (30) calendar days prior to expiration to permit a request for an extension or to permit the State to draw thereon. Bank agrees that such notice will be sent by registered mail to the appropriate Public Works Engineer as indicated in the table below and shall contain the Development name, applicant name, and County where the property is located.

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

Bank agrees that such notice would be effective only if it is sent by registered mail. In the event such notice is not given, this Letter of Credit shall automatically renew until such notice is received. It shall then expire (60) sixty calendar days from the receipt of such notice. This credit will automatically terminate as of the date the State of Delaware, Department of Transportation, notifies Bank that it has accepted the entrance and exit appurtenances.

Except as otherwise stated herein, no modification or revocations may be made by the undersigned to the irrevocable credit created hereby, without the express written approval of the Public Works Engineer, Delaware Department of Transportation.

All bank charges connected with this Letter of Credit are for the account of the applicant.

This Letter of Credit is neither negotiable nor assignable.

Very Truly Yours,

_____

(Signature)

_____

(Printed Name)

SURETY AGREEMENT

FOR

COMMERCIAL ENTRANCE CONSTRUCTION

KNOW ALL PERSONS BY These Presents that: _____ (applicant) whose address is _____ hereinafter called "Developer" and _____ as surety legally authorized to do business in Delaware, whose address is _____ hereinafter called "Surety" are held firmly bound unto the State of Delaware in the sum of _____ ($ _____) (said sum being 100 percent of the total price agreed upon by DelDOT and the Developer for the construction of the entrance and exit appurtenances as set forth in this Agreement), to be paid to the State of Delaware for the use and benefit of DelDOT if the Developer fails to meet the conditions of this obligation.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the Developer, who is responsible for the construction of the entrance and exit appurtenances set forth in this Agreement for the property known as _____, fails to construct such entrance and exit appurtenances in accordance with the provisions of the fully executed permit for entrance construction, as determined by DelDOT, the bond shall be forfeited in favor of the State of Delaware. Bond forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid permit, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such entrance and exit appurtenances are accepted by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

For Surety Company:

Attest:

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

For Developer:

Attest: Secretary

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

ESCROW AGREEMENT

FOR

COMMERCIAL ENTRANCE CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (Property Owner) whose address is_____ and whose Employer Federal Identification Number is _____, hereinafter call "Developer" having furnished DelDOT a certified check in the amount of _____ ($ _____) (said sum being 150 ~~100~~ percent of the total price agreed upon by DelDOT and the Developer for the construction of the entrance and exit appurtenances as set forth in this Agreement), to be deposited into DelDOT's Escrow Account, does hereby relinquish said amount to the State of Delaware for the use and benefit of DelDOT, to which payment will and truly be made we bind ourselves, our successors and assigns, firmly by these presents.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, who is responsible for the construction of the entrance and exit appurtenances set forth in this Agreement for the property known as _____, fails to construct such entrance and exit appurtenances in accordance with the provisions of the fully executed permit for entrance construction, as determined by DelDOT, the funds shall be forfeited in favor of the State of Delaware. Forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid permit, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such entrance and exit appurtenances are accepted by DelDOT. Upon completion of all work to the satisfaction of DelDOT the funds held in escrow shall be released by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

Attest: Secretary

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Attest: Owner/Developer

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

COMMERCIAL ENTRANCE CONSTRUCTION PERMIT

District: _____ Phone No. (302) _____

Issued To: _____

Business Name: _____

Approved for an estimated volume of traffic of _____ Average Daily Traffic (ADT)

Location:_____

_____

_____

On _____ an inspection of the above entrance was made and the entrance was found to be in compliance with the Delaware Department of Transportation (DelDOT) specifications, traffic and safety standards, and according to plans approved by _____ _____.

Should this property be sold, or the size or type of the business be changed to which there is an increase in volume of traffic, the entrance will require a review by the appropriate District Permit Office as indicated in table below. At such a time a design change may be required, or a new permit will be issued accordingly.

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

By copy of this letter the 100% security offered to DelDOT to guarantee the construction of this entrance is hereby released.

- ☐ Security Bond
- ☐ Irrevocable Commercial Letter of Credit
- ☐ Certified Check
- ☐ None Required

Date Approved: _____ Approved By: _____
Public Works Engineer

Appendix F ***Subdivision Site Applications and Forms***

Subdivision Street Construction Checklist

- ☐ Recorded Subdivision Site Plan
- ☐ Substantial Completion Letter
- ☐ Construction Agreement for Subdivision Streets
- ☐ Construction Drawings approved by the DelDOT Subdivisions Engineer
- ☐ Itemized Construction Cost Estimate
- ☐ Security (indicate type below)
  - ☐ Letter of Credit
  - ☐ Surety Bond
  - ☐ Certified Check
- ☐ Notice to Proceed
- ☐ Release From Liabilities

Agreement No. _____

CONSTRUCTION AGREEMENT

FOR

SUBDIVISION STREETS

This Agreement made and entered into this _____ day of _____, 20_____ by and between the State of Delaware, Department of Transportation, as First Party, hereinafter sometimes referred to as DelDOT, and _____ as Second Party, hereinafter sometimes referred to as Developer, whose address is

_____

_____.

WITNESSETH:

WHEREAS, Developer intends to construct subdivision streets in a public subdivision known as _____, a recorded subdivision in _____ and,

WHEREAS, DelDOT will assume the maintenance of the subdivision streets listed below in this Agreement following the construction by Developer as approved by DelDOT.

NOW THEREFORE, for and in consideration of the mutual covenants, hereinafter stipulated to be kept and performed, it is agreed between the parties as follows:

1. Developer shall construct the subdivision streets listed below in accordance with the approved street construction plans on or before the completion date of _____, 20_____:

Street Name	From	To	Length

Developer agrees that all construction shall be in accordance with the approved construction plans, DelDOT *Standard Specifications* in force on the date of this Agreement, Special Provisions for non-standard construction items and DelDOT *Standards and Regulations for Subdivision Streets and State Highway Access*.

2. Developer agrees to provide DelDOT with a Security Agreement ~~in the amount of ten percent (10%) of the estimated construction cost as approved by DelDOT for the purpose of indemnifying this Agreement. Security can be determined~~ using the following table:

Unit Value of Security per Linear Foot (lf) Table					
	Curbed Section			Uncurbed Section	
Subdivision Street Type I	$26.00 / l.f.			$ 20.00 / l.f.	
Subdivision Street Type II, and III	$36.00 / l.f.			$ 30.00 / l.f.	
Street	Limits		Length (l.f.)	Unit Value of Security ($ / l.f.)	Security Amount ($)
	From (Station)	To (Station)			
			Sub-Total		
Add 150% ~~100%~~ of estimated cost of the roadway entrance shown on the plans					
			TOTAL		

STREET CONSTRUCTION:

Type of Security: Letter of Credit: ☐ Escrow: ☐ Bond: ☐

Street Contractor: _____

_____

(Name)

_____

(Address)

3. Prior to the start of construction Developer shall attend a preconstruction conference scheduled by DelDOT. No work shall begin within the dedicated right-of-way until a Notice to Proceed has been issued by DelDOT.

4. DelDOT will provide periodic inspection to ensure that construction activities are in accordance with approved plans, specifications and subdivision regulations. Developer shall provide DelDOT with access to all parts of the work and furnish such information and assistance as is required by DelDOT to make a complete and detailed inspection as described in the *Standard Specifications*. Deficient items found on periodic inspections shall be corrected by Developer to the satisfaction of DelDOT.

5. During roadway and street construction Developer agrees to control traffic in a safe manner in accordance with the Delaware Manual on Traffic Controls for Street and Highway Construction and Maintenance Operations.

6. Installation of utilities shall be in accordance with DelDOT's *Utilities Design Manual*. Developer agrees to coordinate construction with the utility companies in accordance with the requirements of DelDOT.

7. Regulatory signs and street signs shall be furnished and installed by Developer in accordance with the DelDOT *Standards and Regulations for Subdivision Streets and State Highway Access* and the Traffic Manual. Sight triangles shall be cleared in accordance with the aforementioned Standards and Regulations.

8. DelDOT may require revisions to the construction plans due to errors or omissions, field conditions or changed circumstances.

9. Developer may make a written request to DelDOT for revisions to the approved construction plans. Such request, if approved, shall be approved by DelDOT prior to the start of the proposed construction revision.

10. Subdivision streets and the contiguous highway system shall be kept clear of mud and debris by Developer as a result of construction activities at all times.

11. Developer shall request DelDOT to make semi-final and final inspections when the construction activities are complete. Developer agrees to complete all work including those items of work listed in the semi-final inspection report to the satisfaction of DelDOT on or before the Completion Date specified in Section I of this Agreement.

12. Developer shall furnish DelDOT an as-built print of the approved construction plans with revisions annotated in red to indicate plan revisions and a copy of a letter from the County Department of Public Works stating that all construction work required by County has been completed to their satisfaction.

13. Developer shall save harmless DelDOT from all unpaid bills, debts or obligations of whatever nature owed by Developer to any person, firm, corporation, subcontractor, supplier or the like arising from the subdivision street construction.

14. Failure to complete the subdivision street construction in accordance with this Agreement shall result in forfeiture of the security furnished to DelDOT for liquidated damages and such other action as may be permitted by the State of Delaware Code. Maintenance of the subdivision streets including snow removal, listed in this Agreement shall remain the sole responsibility of the Developer until construction shown on the approved construction plans and approved plan revisions has been completed by Developer, his heirs and assigns, and accepted by DelDOT. Following street acceptance, DelDOT shall be responsible for street maintenance.

15. The Developer and their heirs, successors, assigns and agents guarantee the streets listed in this Agreement against the failure of the pavement or drainage for three years from the date of acceptance by DelDOT. This is a good faith guarantee which shall not be cause for the DelDOT to retain the completion security, but failure to comply may be cause to require a 100 percent security in future cases.

16. This Agreement constitutes the sole understanding by and between Developer and DelDOT and nothing outside this Agreement shall be construed as an alternation, modification and/or revision hereof. This Agreement shall not be modified except in writing subscribed by both parties.

IN WITNESS WHEREOF, the parties hereunto have caused this Agreement to be executed in triplicate, the date first above written.

FOR THE STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION

Final approval for the complete construction of the aforementioned streets will be granted upon execution of Construction Agreement Number _____ and the approved Mylar construction plans.

WITNESS: _____ _____

Subdivision Engineer

FOR THE DEVELOPER

WITNESS: _____ _____

Developer

_____

Typed Name

_____

Signature

_____

Title

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

SAMPLE LETTER OF CREDIT

FOR

SUBDIVISION CONSTRUCTION

Bank Letterhead

Address to District Public Works Engineer in appropriate District as follows:

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

RE: Irrevocable Commercial Letter of Credit No. _____

_____ *(name of Development)*

in _____County, Agreement No. _____

Dear Sir or Madam:

We hereby establish our Irrevocable Commercial Letter of Credit in favor of the State of Delaware, Department of Transportation as beneficiary at the request of and for an account of _____(Developer), for an amount or amounts not to exceed _____ ($ _____).

This Letter of Credit is subject to the following terms and conditions:

Effective Date: _____

This credit is to be available by sight draft being presented to

_____ (Name of Bank)

at its main office at _____(Address).

All drafts so drawn must bear the clause "Drawn Under" and the following information: Bank Name, Letter of Credit Number, and date.

The sight draft must be signed by the Director of the Division of Maintenance and Operations stating that "_____ (Developer) has failed to perform construction of the subdivision streets, in accordance with the **Construction Agreement No.** _____

and the irrevocable Letter of Credit in favor of the State of Delaware, Department of Transportation, pertaining thereto. Demand is hereby made in the amount of the enclosed draft."

This Letter of Credit will expire on _____. The bank agrees to notify the State thirty (30) calendar days prior to expiration to permit a request for an extension or to permit DelDOT to draw thereon. Bank agrees that such notice will be sent by registered mail to the appropriate Public Works Engineer as indicated in the table below and shall contain the Development name, Developer name, and County where the property is located.

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

Bank agrees that such notice would be effective only if it is sent by registered mail. In the event such notice is not given, this Letter of Credit shall automatically renew until such notice is received. It shall then expire (60) sixty calendar days from the receipt of such notice. This credit will automatically terminate as of the date DelDOT notifies Bank that it has accepted the subject roadways for maintenance.

Except as otherwise stated herein, no modifications or revocations may be made by the undersigned to the irrevocable credit created hereby, without the express written approval of the Public Works Engineer, Delaware Department of Transportation.

All bank charges connected with this Letter of Credit are for the account of the Developer.

This Letter of Credit is neither negotiable nor assignable.

Very Truly Yours,

_____

(Signature)

_____

(Printed Name)

SURETY AGREEMENT

FOR

SUBDIVISION STREET CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is _____ hereinafter called "Developer" and _____ as surety legally authorized to do business in Delaware, whose address is _____ hereinafter called "Surety" are held firmly bound unto the State of Delaware in the sum of _____ ($ _____) (said sum being 10 percent of the total price agreed upon by DelDOT and the Developer for the construction of the subdivision streets as set forth in the **Construction Agreement No. _____**), to be paid to the State of Delaware for the use and benefit of DelDOT if the Developer fails to meet the conditions of this obligation.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the Developer, who is responsible for the construction of the subdivision streets set forth in this Agreement for the property known as _____, fails to construct such subdivision streets in accordance with the provisions of the fully executed Construction Agreement for subdivision streets, as determined by DelDOT, the bond shall be forfeited in favor of the State of Delaware. Bond forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Construction Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such subdivision streets are accepted by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

For Surety Company:

Attest: _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

For Developer:

Attest: Secretary _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

ESCROW AGREEMENT

FOR

SUBDIVISION STREET CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is_____ and whose Employer Federal Identification Number is _____, hereinafter call "Developer" having furnished DelDOT a certified check in the amount of _____ ($ _____) (said sum being 10 percent of the total price agreed upon by DelDOT and the Developer for the construction of the subdivision streets as set forth in the **Construction Agreement No. _____**), to be deposited into DelDOT's Escrow Account, does hereby relinquish said amount to the State of Delaware for the use and benefit of DelDOT, to which payment will and truly be made we bind ourselves, our successors and assigns, firmly by these presents.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, who is responsible for the construction of subdivision streets set forth in this Agreement for the property known as _____, fails to construct such subdivision streets in accordance with the provisions of the fully executed Construction Agreement for Subdivision Streets, as determined by DelDOT, the funds shall be forfeited in favor of the State of Delaware. Forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Construction Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such subdivision streets are accepted by DelDOT. Upon completion of all work to the satisfaction of DelDOT the funds held in escrow shall be released by DelDOT upon acceptance of the roadways.

EXECUTED by the parties hereto the day and year first herein written.

Attest: Secretary

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Attest: Owner/Developer

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

NOTICE TO PROCEED

Date

Company
c/o
Address 1
Address 2

SUBJECT:

Dear Sir or Madam:

This letter shall serve as a "Notice to Proceed" with permanent road construction for _____ subdivision under Agreement No. _____ and No. _____.

All work within the subdivision shall be performed in accordance with the following documents:

- Subdivision construction drawings approved by DelDOT on _____.
- Pre-construction meeting minutes issued by DelDOT on _____.
- Construction Agreement for Subdivision Streets.
- DelDOT *Standard Specifications*.
- DelDOT *Standard Construction Details*.

Please contact DelDOT's Subdivision Engineer if you have any questions.

Sincerely,

Name
Public Works Engineer

RELEASE FROM LIABILITIES

As a condition of the acceptance for maintenance by the Delaware Department of Transportation the streets specified in the **Construction Agreement No.** _____ in the subdivision known as _____ in _____ County, I, as Owner and Developer do hereby release and save harmless the Delaware Department of Transportation (DelDOT) from any and all manners of action, causes of action, suits, proceedings, debts, dues, contracts, judgments, damages, claims, and demands what-so-ever, in law and equity and further agree to assume the defense of any claims and pay any and all costs legally incurred by DelDOT in defense thereof arising from any actions by me or my Agents or Contractors created during the course of construction of the streets listed in the aforesaid Construction Agreement, provided such actions against DelDOT are initiated before acceptance of the streets by DelDOT or not later than six months after such date of acceptance.

The undersigned further swears and avers that there are no mechanic's liens or judgments affecting the streets of the subdivision listed in the aforesaid Construction Agreement.

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

Owner/Developer:

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

_____
(Date)

Appendix G ***Industrial Site Applications and Forms***

Industrial Park Streets Construction Checklist

- ☐ Recorded Industrial Park Streets Site Plan
- ☐ Substantial Completion Letter
- ☐ Construction Agreement for Industrial Park Streets
- ☐ Construction Drawings approved by the DelDOT Subdivisions Engineer
- ☐ Itemized Construction Cost Estimate
- ☐ Security (indicate type below)
  - ☐ Letter of Credit
  - ☐ Surety Bond
  - ☐ Certified Check
- ☐ Notice to Proceed
- ☐ Release from Liabilities

Agreement No. _____

CONSTRUCTION AGREEMENT

FOR

INDUSTRIAL PARK STREETS

This Agreement made this _____ day of _____, 20_____, by and between the State of Delaware Department of Transportation, hereinafter called DelDOT and _____ whose address is _____ _____ hereinafter called Developer and _____ whose address is _____ hereinafter called Engineer.

WITNESSETH:

WHEREAS, the Developer intends to complete the construction of the following streets in the public subdivision known as _____, a recorded subdivision in _____ County in accordance with the provisions of this Agreement on or before _____, 20_____:

Street Name	From	To	Length

WHEREAS, the Engineer shall provide construction inspection to ensure that street construction is in accordance with the approved Plans, Specifications and this Construction Agreement. WHEREAS, DelDOT will assume the maintenance of the streets listed in this Agreement following the construction and the three-year waiting period as approved by the Delaware Department of Transportation. NOW THEREFORE, the parties hereby agree as follows:

1. The Developer shall provide DelDOT two reproducible sets of the approved street construction plans prepared in accordance with the requirements of the Delaware Department of Transportation on 22"x36" mylar for the streets listed in this Agreement. The Developer agrees that all construction shall be in accordance with the approved construction plans, the Delaware Department of Transportation *Standard Specifications* and Supplemental Specifications (*Standard Specifications*) currently in force on the date of this Agreement, Special Provisions for non-standard construction items and DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access*.

2. Prior to the start of construction, the Developer shall submit and obtain approval from DelDOT of the following items:
   - Copy of the contract between the Developer and Contractor,
   - Cost Estimate for each construction item, and
   - Security Agreement in the amount of ten percent (10%) of the estimated construction cost as approved by DelDOT.

3. Prior to the start of construction, the Developer shall attend a preconstruction conference with DelDOT. No work within the dedicated right-of-way shall begin until a Notice to Proceed has been issued by DelDOT.

4. The Engineer acting on behalf of DelDOT will provide sufficient inspection to ensure that the construction is in accordance with the approved plans, specifications and subdivision regulations. The Developer shall provide the Engineer with access to all parts of the work and furnish such information and assistance as is required by the Engineer to make a complete and detailed inspection as described in the *Standard Specifications*.

5. During street and road construction the Developer agrees to control traffic in accordance with the Delaware Manual on Traffic Controls for Street and Highway Construction and Maintenance Operations.

6. Installation of utilities shall be in accordance with DelDOT Utility Design Manual. All utilities with exception of service laterals shall be located behind the curb or when curbs do not exist outside the travel lane. The Developer agrees to coordinate the construction with the utility companies in accordance with the requirements of DelDOT.

7. Regulatory signs and street signs shall be furnished and installed in accordance with DelDOT *Standards and Regulations for Subdivision Streets and State Highway Access* and the Traffic Manual. Sight triangles shall be cleared in accordance with *Standards and Regulations for Subdivision Streets and State Highway Access*.

8. DelDOT may require revisions to the construction plans as required by field conditions.

9. The Developer may request revisions to the approved construction plans by making a written request to the District Engineer. Such request shall be approved by DelDOT prior to the start of construction of the proposed revision.

10. Interior streets and the contiguous highway system shall be kept clear of mud and debris as a result of construction activities at all times.

11. The Developer shall request the Engineer and DelDOT personnel to make the first final inspection when the construction is complete. The Developer agrees to complete all work to the satisfaction of the Engineer including those items listed in the first final inspection report within the time specified.

12. The Developer shall furnish the Engineer at the first final inspection a print of the approved construction plan annotated in red to show all revisions necessitated by field conditions and a copy of a letter from the County Department of Public Works stating that all construction as required by the County is complete. DelDOT shall also receive a copy.

13. Upon completion of all aspects of the construction to the satisfaction of the Engineer, the Engineer shall provide a written certification to DelDOT that the construction has been completed in accordance with the approved plans and specifications. The certification shall be accompanied by an as-built plan prepared in accordance with the requirements of *Standards and Regulations for Subdivision Streets and State Highway Access*.

14. After a period of three years from the date that the Engineer has provided the Department with written certification that construction has been completed in accordance with the approved plans and specifications, a second final inspection shall be held by the Engineer and DelDOT personnel to determine eligibility of acceptance of streets into the Department's maintenance system. During the three year waiting period the ten percent (10%) security will remain in effect.

15. The Developer shall save harmless DelDOT from all unpaid bills, debts or obligations of whatever nature owed by the Developer to any person, firm, corporation, subcontractor, supplied or the like arising from the construction.

16. This Agreement shall become void if the Developer fails to obtain a Notice to Proceed within two years of the date of plan approval for street construction.

17. Failure to complete the street construction in accordance with this Agreement may result in forfeiture of the security furnished to DelDOT for liquidated damages and such other action as may be permitted by the Delaware Code.

18. The Developer, its heirs or assigns shall be responsible for maintenance of the streets including snow removal, listed in this Agreement during construction and for a period of three years after completion of the construction

19. Developer shall at no cost to DelDOT reimburse the Engineer for all costs of inspection services required by this Agreement

IN WITNESS WHEREOF, the parties hereunto have caused this Agreement to be executed in quadruplicate, the day and year first above written.

Department of Transportation

_____
Subdivision Engineer

District

_____
Public Works Engineer

Developer

Name: _____

Attest: By: _____

Engineer

Name: _____

Attest: By: _____

SAMPLE LETTER OF CREDIT

FOR

INDUSTRIAL PARK STREET CONSTRUCTION

Bank Letterhead

Address to District Public Works Engineer in appropriate District as follows:

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

RE: Irrevocable Commercial Letter of Credit No. _____

_____ *(name of Industrial Street)*

in _____County, Agreement No. _____

Dear Sir or Madam:

We hereby establish our Irrevocable Commercial Letter of Credit in favor of the State of Delaware, Department of Transportation as beneficiary at the request of and for an account of _____(Developer), for an amount or amounts not to exceed _____ ($ _____).

This Letter of Credit is subject to the following terms and conditions:

Effective Date: _____

This credit is to be available by sight draft being presented to

_____ (Name of Bank)

at its main office at _____(Address).

All drafts so drawn must bear the clause "Drawn Under" and the following information: Bank Name, Letter of Credit Number, and date.

The sight draft must be signed by the Director of the Division of Maintenance and Operations stating that "_____ (Developer) has failed to perform construction of the public road, in accordance with the Construction Agreement for public road construction and the irrevocable Letter of

Credit in favor of the State of Delaware, Department of Transportation, pertaining thereto. Demand is hereby made in the amount of the enclosed draft."

This Letter of Credit will expire on _____. The bank agrees to notify the State thirty (30) calendar days prior to expiration to permit a request for an extension or to permit DelDOT to draw thereon. Bank agrees that such notice will be sent by registered mail to the appropriate Public Works Engineer as indicated in the table below and shall contain the industrial site name, applicant name, and County where the property is located.

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

Bank agrees that such notice would be effective only if it is sent by registered mail. In the event such notice is not given, this Letter of Credit shall automatically renew until such notice is received. It shall then expire (60) sixty calendar days from the receipt of such notice. This credit will automatically terminate as of the date DelDOT notifies Bank that it has accepted the subject roadways for maintenance.

Except as otherwise stated herein, no modifications or revocations may be made by the undersigned to the irrevocable credit created hereby, without the express written approval of the Public Works Engineer, Delaware Department of Transportation.

All bank charges connected with this Letter of Credit are for the account of the Developer.

This Letter of Credit is neither negotiable nor assignable.

Very Truly Yours,

_____

(Signature)

_____

(Printed Name)

SURETY AGREEMENT

FOR

INDUSTRIAL PARK STREET CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is _____ hereinafter called "Developer" and _____ as surety legally authorized to do business in Delaware, whose address is _____ hereinafter called "Surety" are held firmly bound unto the State of Delaware in the sum of _____ ($ _____) (said sum being 10 percent of the total price agreed upon by DelDOT and the Developer for the construction of the industrial park streets as set forth in the **Construction Agreement No. _____**), to be paid to the State of Delaware for the use and benefit of DelDOT if the Developer fails to meet the conditions of this obligation.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the Developer, who is responsible for the construction of the industrial park streets set forth in the aforesaid Agreement for the property known as _____, fails to construct such industrial park streets in accordance with the provisions of the fully executed Construction Agreement for Industrial Park Streets, as determined by DelDOT, the bond shall be forfeited in favor of the State of Delaware. Bond forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such industrial park streets are accepted by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

For Surety Company:

Attest: _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

For Developer:

Attest: Secretary _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

ESCROW AGREEMENT

FOR

INDUSTRIAL PARK STREET CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is_____ and whose Employer Federal Identification Number is _____, hereinafter call "Developer" having furnished DelDOT a certified check in the amount of _____ ($ _____) (said sum being 10 percent of the total price agreed upon by DelDOT and the Developer for the construction of the industrial park streets as set forth in the **Construction Agreement No. _____**), to be deposited into DelDOT's Escrow Account, does hereby relinquish said amount to the State of Delaware for the use and benefit of DelDOT, to which payment will and truly be made we bind ourselves, our successors and assigns, firmly by these presents.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, who is responsible for the construction of industrial park streets set forth in this Agreement for the property known as _____, fails to construct such industrial park streets in accordance with the provisions of the fully executed Construction Agreement for Industrial Park Streets, as determined by DelDOT, the funds shall be forfeited in favor of the State of Delaware. Forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such streets are accepted by DelDOT. Upon completion of all work to the satisfaction of DelDOT the funds held in escrow shall be released by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

Attest: Secretary

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Attest: Owner/Developer

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

NOTICE TO PROCEED

Date

Company
c/o
Address 1
Address 2

SUBJECT:

Dear Sir or Madam:

This letter shall serve as a "Notice to Proceed" with permanent road construction for _____ Industrial Park under **Construction Agreement No.** _____ and No. _____. All work within the right-of-way shall be performed in accordance with the following documents:

- Roadway construction drawings approved by DelDOT on _____.
- Pre-construction meeting minutes issued by DelDOT on _____.
- Construction Agreement for Industrial Park Streets.
- DelDOT *Standard Specifications*.
- DelDOT *Standard Construction Details*.

Please contact DelDOT's Subdivision Engineer if you have any questions.

Sincerely

Name
Public Works Engineer

RELEASE FROM LIABILITIES

As a condition of the acceptance of the Project by the Delaware Department of Transportation the streets specified in the **Construction Agreement No.** _____ in the industrial park known as _____ in _____ County, I, as Owner and Developer do hereby release and save harmless the Delaware Department of Transportation (DelDOT) from any and all manners of action, causes of action, suits, proceedings, debts, dues, contracts, judgments, damages, claims, and demands what-so-ever, in law and equity and further agree to assume the defense of any claims and pay any and all costs legally incurred by DelDOT in defense thereof arising from any actions by me or my Agents or Contractors created during the course of construction of the streets listed in the aforesaid Construction Agreement, provided such actions against DelDOT are initiated before acceptance of the Project by DelDOT or not later than six months after such date of acceptance.

The undersigned further swears and avers that there are no mechanic's liens or judgments affecting the streets of the industrial park listed in the aforesaid Construction Agreement.

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

Owner/Developer:

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

_____
(Date)

Appendix H ***Public Road Construction Applications and Forms***

Public Roads Construction Checklist

- ☐ Recorded Subdivision Site Plan
- ☐ Substantial Completion Letter
- ☐ Construction Agreement for Public Roads (Off-site Improvements)
- ☐ Construction Drawings approved by the DelDOT Subdivisions Engineer
- ☐ Itemized Construction Cost Estimate
- ☐ Security (indicate type below)
  - ☐ Letter of Credit
  - ☐ Surety Bond
  - ☐ Certified Check
- ☐ Notice to Proceed
- ☐ Release from Liabilities

Agreement No. _____

CONSTRUCTION AGREEMENT

FOR

PUBLIC ROADS (OFF-SITE IMPROVEMENTS)

This Agreement made this _____ day of _____, 20_____, by and between the State of Delaware Department of Transportation, hereinafter called DelDOT and _____ whose address is _____ _____ hereinafter called Developer and _____ whose address is _____ hereinafter called Engineer.

WITNESSETH THAT

Whereas, the Developer intends to complete the construction of

Street Name	From	To	Length

located in _____ (County) in accordance with the approved plans prepared by _____ (Consultant Firm) and the provisions of this Agreement herein called Project.

Whereas, Developer will coordinate with DelDOT the scheduling of a public information meeting to provide additional information and answer questions prior to issuance of the Notice to Proceed.

Whereas, the Developer will substantially complete all roadwork outlined in the approved plans and specifications within ____calendar days from the Notice to Proceed.

Whereas, the Engineer shall provide construction inspection to ensure that street construction is in accordance with the approved Plans, Specifications and this Construction Agreement. It will be a requirement that the Engineer have an active Agreement with DelDOT for construction inspection services.

NOW THEREFORE, the parties do hereby agree as follows:

1. The Developer shall provide DelDOT two reproducible set of the approved street construction plans prepared in accordance with the requirements of the Delaware Department of Transportation (DelDOT) on 22"x36" mylar for the streets listed in this Agreement. The Developer agrees that all construction shall be in accordance with approved construction plans, DelDOT's *Standard Specifications* currently in force on the date of this Agreement, Special Provisions for non-standard construction items, and DelDOT's *Standard Construction Details*.

2. Prior to the start of construction, the Developer shall submit and obtain approval from DelDOT of the following items:

   a. Copy of the contract between Developer and the Contractor. The Contractor must be licensed, or have initiated the license application as required by Section 2505, Chapter 25, Title 30, of the Delaware Code.

   b. Security Agreement in the amount of 100% of the estimated construction cost as approved by DelDOT.

3. Prior to the start of construction, the Developer or the Engineer shall submit for approval to DelDOT a work plan that provides for the policies and procedures to be followed by the Developer during the administration of the contract. The work plan shall address the preconstruction meeting, inspection procedures, change orders, plan revisions, quality assurance, final inspection, final closeout, time extensions, and other issues as identified by DelDOT or the Developer. No work within DelDOT right-of-way shall begin until a Notice to Proceed has been issued by DelDOT.

4. The Engineer acting on behalf of DelDOT will provide inspection to ensure that the construction is in accordance with the approved plans and specifications. The Engineer is required to be on the job site whenever roadway work is being done. The Developer shall provide the Engineer with access to all parts of the work and furnish such information and assistance as is required by the Engineer to make a complete and detailed inspection as described in the *Standard Specifications*.

   a. The Engineer, acting on behalf of DelDOT, will be responsible for inspection of workmanship to verify that the construction complies with the plans and specifications. The Engineer will be required to provide a Project Supervisor and any necessary construction inspectors to administer the Project on behalf of DelDOT according to DelDOT's *Standard Specifications* and *Construction Manual*.

   b. The Engineer will be responsible for the implementation of all applicable practices and procedures outlined in Part D "Field Practices and Procedures" of DelDOT's *Construction Manual*. The presence of the Engineer's approved personnel is required during any and all roadway work within existing or proposed public right-of-way at all times. Failure to comply will result in removal of Project staff and stoppage of all construction activities until Project staffing requirements are met.

   c. The Engineer shall submit to DelDOT a roster of all personnel contemplated to be assigned to the Project, together with a detailed resume with respect to education, experience and NICET certification of each individual included on the roster.

   d. Inspection

i. General - During the progress of all associated construction work under the assigned Project, The Engineer shall furnish appropriate field inspection of workmanship at the site of the work during the period that the work is actually being performed to determine and verify reasonable conformity of all work to the plans and specifications. This shall include inspection of construction equipment to determine conformity with the Project specifications outlined in Part D of DelDOT's *Construction Manual*.

ii. Materials Inspection - DelDOT will provide materials inspection and testing services. This work will include, but not be limited to, concrete testing, asphalt concrete testing, and soils testing. The Developer is technically responsible for the notification of readiness and scheduling of materials inspection for those items analyzed prior to delivery. The Engineer shall be responsible for confirming that this work has been done. The Engineer shall be responsible for documenting material inspections and tests that have been performed at the Project site.

iii. Field Reports - All inspectors shall perform written daily reports and field notes; these shall be retained in the field files for reference. A Project diary shall also be maintained for the Project. Diaries must be kept current within three working days.

iv. Daily, Weekly and Special Reports - The Engineer shall make daily and weekly reports, and other special reports as required by DelDOT in accordance with the development of the work.

v. As-Built Plans - For the purpose of preparing as-built plans, the Engineer shall retain one set of record prints of the construction plans. These shall be kept up-to-date by the substitution of revised plan sheets by marks for minor changes that have been made, and by notes from the inspector's daily reports. The as-built plans shall show in red ink any alterations made in foundations; locations, lengths and elevations of pipe culverts; side ditches, ditch paving, and other drainage items added or altered; final checked stationing; and all other significant variations from the original plans.

5. During construction, the Developer agrees to control traffic in accordance with the Delaware Manual on Traffic Controls for Street and Highway Construction and Maintenance Operations. During construction, The Developer shall be responsible for the safety of the general public, the work force and equipment, and the work site. It is not intended that DelDOT or the Developer assume the Contractor's sole and absolute responsibility for the safety of the general public, the work force and equipment, and the work site.

6. Installation of utilities shall be in accordance with DelDOT's Utility Manual. All utilities, with exception of service laterals, shall be located behind the curb or when curbs do not exist, outside the travel lane. The Developer agrees to coordinate the construction with the utility companies in accordance with the requirements of DelDOT.

7. Regulatory signs and street signs shall be furnished and installed in accordance with the *Manual on Uniform Traffic Control Devices*.

8. DelDOT may require revisions to the construction plans as required by field conditions, the costs of any changes required to the construction plans shall be the responsibility of the Developer.

9. The Developer may request revisions to the approved construction plans by making a written request to DelDOT's Construction Engineer. Such request shall be approved by DelDOT prior to the start of construction of the proposed revisions.

10. Interior streets and the contiguous highway system shall be kept clear of mud and debris as a result of construction activities at all times.

11. The Developer shall request the Engineer and DelDOT personnel to make the first final inspection when the construction is complete. The Developer agrees to complete all work to the satisfaction of the Engineer and DelDOT including those items listed in the first final inspection report within the time specified.

12. The Engineer shall furnish DelDOT, at the first final inspection, a print of the approved "As-Built" construction plan annotated in red to show all revisions necessitated by field conditions.

13. The Developer shall save harmless DelDOT from all unpaid bills, debts or obligations of whatever nature owed by the Developer to any person, firm, corporation, subcontractor, supplier or the like arising from the construction.

14. This Agreement shall become void if the Developer fails to obtain a Notice to Proceed within one year of the date of plan approval for road construction.

15. Failure to complete the road construction as outlined in the approved plans and specifications within the calendars days assigned by this Agreement will result in the assessment of liquidated damages. These damages are outlined in the Supplemental Specifications and will require direct payment by the Developer.

16. Failure to complete all aspects of the road construction in accordance with this Agreement may result in forfeiture of all or a portion of the security furnished to DelDOT, in such an amount required to complete the road construction; or the assessment of liquidated damages, if and as outlined in the *Standard Specifications*; and other such action as may be permitted by the Delaware Code.

17. On completion of all aspects of the construction to the satisfaction of the Engineer, the Engineer shall provide a written certification to DelDOT that the construction has been completed in accordance with the plans and specifications. The certification shall be accompanied by an as-built plan prepared in accordance with the requirements of *Standards and Regulations for Subdivision Streets and State Highway Access*.

IN WITNESS WHEREOF, the parties hereto have duly executed this letter Agreement in quadruplicate, under their respective seals, the day and year first above written.

Department of Transportation

_____
Subdivision Engineer

District

_____
Public Works Engineer

Developer

Name: _____

Attest: By: _____

Engineer

Name: _____

Attest: By: _____

SAMPLE LETTER OF CREDIT

FOR

PUBLIC ROAD CONSTRUCTION

Bank Letterhead

Address to District Public Works Engineer in appropriate District as follows:

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

RE: Irrevocable Commercial Letter of Credit No. _____

_____ *(name of public road)*

in _____County, Agreement No. _____

Dear Sir or Madam:

We hereby establish our Irrevocable Commercial Letter of Credit in favor of the State of Delaware, Department of Transportation as beneficiary at the request of and for an account of _____(Developer), for an amount or amounts not to exceed _____ ($ _____).

This Letter of Credit is subject to the following terms and conditions:

Effective Date: _____

This credit is to be available by sight draft being presented to

_____ (Name of Bank)

at its main office at _____(Address).

All drafts so drawn must bear the clause "Drawn Under" and the following information: Bank Name, Letter of Credit Number, and date.

The sight draft must be signed by the Director of the Division of Maintenance and Operations stating that "_____ (Developer) has failed to perform construction of the public road, in accordance with the Construction Agreement for public road construction and the irrevocable Letter of

Credit in favor of the State of Delaware, Department of Transportation, pertaining thereto. Demand is hereby made in the amount of the enclosed draft."

This Letter of Credit will expire on _____. The bank agrees to notify the State thirty (30) calendar days prior to expiration to permit a request for an extension or to permit DelDOT to draw thereon. Bank agrees that such notice will be sent by registered mail to the appropriate Public Works Engineer as indicated in the table below and shall contain the public road name, applicant name, and County where the property is located.

New Castle County	**Kent County**	**Sussex County**
(DelDOT Canal District) Public Works Engineer 250 Bear-Christiana Road Bear, DE 19701	(DelDOT Central District) Public Works Engineer 930 Public Safety Blvd. Dover, DE 19901	(DelDOT South District) Public Works Engineer 23697 DuPont Blvd. Georgetown, DE 19947

Bank agrees that such notice would be effective only if it is sent by registered mail. In the event such notice is not given, this Letter of Credit shall automatically renew until such notice is received. It shall then expire (60) sixty calendar days from the receipt of such notice. This credit will automatically terminate as of the date DelDOT notifies Bank that it has accepted the Project for maintenance.

Except as otherwise stated herein, no modifications or revocations may be made by the undersigned to the irrevocable credit created hereby, without the express written approval of the Public Works Engineer, Delaware Department of Transportation.

All bank charges connected with this Letter of Credit are for the account of the Developer.

This Letter of Credit is neither negotiable nor assignable.

Very Truly Yours,

_____

(Signature)

_____

(Printed Name)

SURETY AGREEMENT

FOR

PUBLIC ROAD CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is _____ hereinafter called "Developer" and _____ as surety legally authorized to do business in Delaware, whose address is _____ hereinafter called "Surety" are held firmly bound unto the State of Delaware in the sum of _____ ($ _____) (said sum being 100 percent of the total price agreed upon by DelDOT and the Developer for the construction of the public road as set forth in the **Construction Agreement No. _____**), to be paid to the State of Delaware for the use and benefit of DelDOT if the Developer fails to meet the conditions of this obligation.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the Developer, who is responsible for the construction of the public road set forth in the aforesaid Agreement for the property known as _____, fails to construct such public road in accordance with the provisions of the fully executed Construction Agreement for Public Roads (off-site improvements), as determined by DelDOT, the bond shall be forfeited in favor of the State of Delaware. Bond forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such Project is accepted by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

For Surety Company:

Attest: _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

For Developer:

Attest: Secretary _____
(Signature)

_____
(Typed Name)

_____
(Position Title)

ESCROW AGREEMENT

FOR

PUBLIC ROAD CONSTRUCTION

KNOW ALL PERSONS by These Presents that: _____ (applicant) whose address is_____ and whose Employer Federal Identification Number is _____, hereinafter call "Developer" having furnished DelDOT a certified check in the amount of _____ ($ _____) (said sum being 100 percent of the total price agreed upon by DelDOT and the Developer for the construction of the public road as set forth in the **Construction Agreement No.** _____), to be deposited into DelDOT's Escrow Account, does hereby relinquish said amount to the State of Delaware for the use and benefit of DelDOT, to which payment will and truly be made we bind ourselves, our successors and assigns, firmly by these presents.

SEALED with our seals and dated this _____ day of _____, _____.

NOW THE CONDITIONS OF THIS OBLIGATION are such that if the Developer, who is responsible for the construction of public road set forth in the aforesaid Agreement for the property known as _____, fails to construct such public road in accordance with the provisions of the fully executed Construction Agreement for Public Roads (off-site improvements), as determined by DelDOT, the funds shall be forfeited in favor of the State of Delaware. Forfeiture shall occur within sixty (60) days of receipt of written notification by DelDOT. Should the Developer complete all construction in accordance with the aforesaid Agreement, then this obligation shall be void and of no effect, or else shall be and remain in full force and virtue until such Project is accepted by DelDOT. Upon acceptance of all work to the satisfaction of DelDOT the funds held in escrow shall be released by DelDOT.

EXECUTED by the parties hereto the day and year first herein written.

Attest: Secretary

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Attest: Owner/Developer

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

NOTICE TO PROCEED

Date

Company
c/o
Address 1
Address 2

SUBJECT:

Dear Sir or Madam:

This letter shall serve as a "Notice to Proceed" with permanent road construction for construction of the public road as set forth in the **Construction Agreement for Public Roads No. _____**. All work shall be performed in accordance with the following documents:

- Subdivision construction drawings approved by DelDOT on _____.
- Pre-construction meeting minutes issued by DelDOT on _____.
- Construction Agreement For Public Roads (off-site improvements).
- Construction drawings approved by the DelDOT.
- DelDOT *Standard Specifications*.
- DelDOT *Standard Construction Details*.

Please contact DelDOT's Transportation Solutions (Maintenance & Operations) if you have any questions.

Sincerely

Name
DelDOT Transportation Solutions (Public Works)

RELEASE FROM LIABILITIES

As a condition of the acceptance of the Project by the Delaware Department of Transportation the streets specified in the **Construction Agreement No.** _____ in _____ (County), I, as Owner and Developer do hereby release and save harmless the Delaware Department of Transportation (DelDOT) from any and all manners of action, causes of action, suits, proceedings, debts, dues, contracts, judgments, damages, claims, and demands what-so-ever, in law and equity and further agree to assume the defense of any claims and pay any and all costs legally incurred by DelDOT in defense thereof arising from any actions by me or my Agents or Contractors created during the course of construction of streets listed in the aforesaid Construction Agreement, provided such actions against DelDOT are initiated before acceptance of the Project by DelDOT or not later than six months after such date of acceptance.

The undersigned further swears and avers that there are no mechanic's liens or judgments affecting the streets listed in the aforesaid Construction Agreement.

Sworn and subscribed before me this ____ day of _____, 20____

Notary Public Signature _____

Owner/Developer:

_____
(Signature)

_____
(Typed Name)

_____
(Position Title)

_____
(Date)

Appendix I ***Traffic Signal Agreement***

TAX PARCEL # _____	Prepared by/return to: _____

TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AGREEMENT

This Agreement, made this _____ day of _____, by and between the State of Delaware, Department of Transportation, hereinafter called "DelDOT" and _____, hereinafter called "Owner".

WITNESSETH THAT

WHEREAS, the parties, in the interest of traffic safety, have indicated their willingness to enter into a mutual Agreement to _____.

NOW THEREFORE, the parties do hereby agree as follows:

1. That DelDOT shall, at its discretion, when warranted, install, modify, maintain, operate, or remove a traffic control signal at said intersection.
2. It is agreed that the design, operation, and timing of said signal shall be the prerogative of DelDOT.
3. Owner hereby waives its right to receive compensation in lieu of the benefit to be received, grants to DelDOT the right to enter upon Owner's property at the location specified above in order to erect, operate, use, maintain, repair, replace and/or remove, or to cause to be erected, operated, used maintained, repaired, replaced and/or removed, any components, appurtenances and accessories necessary to the operation of the signal, together with all rights necessary or convenient for the full and complete use and exercise of the rights herein granted, including the right of ingress and egress thereto and there from, for the sole purpose of exercising the aforesaid rights thereof, but subject to all easements and rights of way of record or now in use across Owner's land. In the exercise of the rights herein granted upon Owner's land, DelDOT will interfere in no unreasonable way and as little as possible with Owner's operations upon its land or its use thereof.
4. It is agreed that all equipment components, appurtenances, and accessories necessary for the modification, operation, and maintenance of said signal which may have to be located, operated, installed, or maintained upon Owner's land shall remain the property of DelDOT, and DelDOT shall have the right to remove and replace the same at its discretion.
5. It is further agreed that all costs related to the modifications of the said signal shall be borne by Owner. When Owner receives the billing costs, it is agreed that they will be paid within 30 days of receipt. Upon installation completion, DelDOT shall either reimburse or bill Owner for any difference between the estimated costs and actual costs.
6. It is also agreed that the Owner's costs shall be a pro rata share of the total cost, based on other Owners in the area who have also entered into a Signal Agreement with DelDOT at this location.

7. It is agreed that this document shall be recorded in the Recorder of Deeds Office for _____ County, and shall be binding upon the Owner and its heirs or assigns, and cannot be modified unless agreed to in writing between both parties.

IN WITNESS WHEREOF, the parties hereunto have caused this Agreement to be executed in quadruplicate, the day and year first above written.

Attest	For the State of Delaware Department of Transportation
_____	_____
Director, Technology and Support Services	Director of Transportation Solutions

STATE OF DELAWARE :

: SS.

COUNTY OF _____ :

BE IT REMEMBERED, that on this _____ day of _____, _____, personally came before me, the Subscriber, a Notary Public for the State and County aforesaid, _____ (Director of Transportation Solutions) known to me personally to be such, and acknowledged this indenture to be her act and deed, and the act and deed of the State of Delaware; that her signature thereto is in her own handwriting and that the seal affixed thereto is the Seal of the Department of Transportation; and that his/her act of acknowledging, signing, sealing and delivering this indenture was duly authorized by the Department of Transportation, pursuant to the authority contained in the Delaware Code, as amended.

GIVEN under my Hand and Seal of Office, the day and year first above written.

_____
Notary Public Signature

_____
Notary Name – Printed or Typed

My Commission Expires: _____

IN WITNESS WHEREOF, the parties hereunto have caused this Agreement to be executed in quadruplicate, the day and year first above written.

Attest Owner

_____ _____

STATE OF DELAWARE :

: SS.

COUNTY OF _____:

BE IT REMEMBERED, that on this _____ day of _____, _____, personally came before me, the Subscriber, a Notary Public for the State and County aforesaid, _____, known to me personally to be such, and acknowledged the signing of said Agreement to be the act and deed for these individuals.

GIVEN under my Hand and Seal of Office, the day and year first above written.

_____
Notary Public Signature

_____
Notary Name – Printed or Typed

My Commission Expires: _____

Appendix J ***General Notes for Construction Plans***

~~***Subdivision Streets and Commercial Construction Plan***~~ ~~***GENERAL NOTES***~~
~~1. All construction and materials shall be constructed in accordance with the Delaware Department of Transportation – Standard Specifications for road and bridge construction dated August 2001 and any addenda thereto.~~ ~~2. The project shall be constructed using the latest revised *Standard Construction Details* in effect at the date of Notice to Proceed.~~ ~~3. All disturbed areas within the State right-of-way, but not in the pavement, shall be topsoiled (6" minimum), fertilized and seeded.~~ ~~4. A 24-hour (minimum) notice shall be given to the DelDOT district permit supervisor prior to starting entrance construction.~~ ~~5. Miss Utility of Delmarva shall be notified three (3) consecutive working days prior to excavation, at 1-800-282-8555.~~ ~~6. All signing and maintenance of traffic is the contractor's responsibility and shall follow the guidelines shown in the Delaware MUTCD "Traffic Control For Streets and Highway Construction, Maintenance, Utility and Emergency Operations" (latest edition).~~ ~~7. Design, Fabrication and installation of all permanent signing shall be as outlined in the "Guide For Fabrication and Installation Of Traffic Control Devices."~~ ~~8. For final permanent pavement markings, epoxy resin paint shall be required for long line striping and thermo will be required for short line striping, i.e. symbols/legends.~~ ~~9. Existing utilities are shown in accordance with the best available information. Completeness or correctness thereof is not guaranteed. It shall be the contractor's responsibility to contact the utility companies involved in order to secure the most accurate information available as to utility location and elevation. No construction around or adjacent to utilities shall begin without notifying their owners at least 48-hours in advance. The contractor shall take the necessary precautions to protect the existing utilities and maintain uninterrupted service and any damage done to then due to his/her negligence shall be immediately and completely repaired at the contractor's expense. To locate existing utilities in the field prior to construction, the contractor shall contact Miss Utility of~~

Subdivision Streets and Commercial Construction Plan

GENERAL NOTES cont.

~~Delmarva (See Note #4).~~

10. ~~All traffic control devices shall be in new or refurbished condition, shall comply with the traffic control manual, and shall be NCHRP – 350 approved and shall be approved by the engineer prior to installation. Traffic control devices shall be maintained in good condition for duration of use.~~

11. ~~All entrances shall conform to DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* and shall be subject to its approval.~~

12. ~~Breakaway posts shall be used when installing all signs.~~

13. ~~Plan location and dimensions shall be strictly adhered to unless otherwise directed by the District Permit Supervisor.~~

14. ~~No entrance and/or roadway construction along Route XX shall occur beginning on May 15th at 12:00 p.m. and ending on September 15th at 12:00 p.m.~~ **~~(This is not a standard general note but is only used when needed)~~**~~.~~

15. ~~Contractor shall supply message boards that are to be placed ten (10) days prior to construction along Route XXX. The proper wording on the message board will need to be coordinated with the District Safety Officer.~~ **~~(This is not a standard general note but is only used when needed)~~**~~.~~

~~Subdivision Streets and Commercial Construction Plan~~

~~GENERAL NOTES~~

1. ~~All construction and materials shall be constructed in accordance with the Delaware Department of Transportation *Standard Specifications* for road and bridge construction dated August 2001 and any addenda thereto.~~
2. ~~All disturbed areas within the State right-of-way, but not in the pavement, shall be topsoiled (6" minimum), fertilized, and seeded.~~
3. ~~A 24-hour (minimum) notice shall be given to DelDOT's Public Works Engineer prior to starting entrance construction.~~
4. ~~Miss Utility of Delmarva shall be notified three consecutive working days prior to excavation, at 1-800-282-8555.~~
5. ~~All signing and maintenance of traffic is the Contractor's responsibility and shall follow the guidelines shown in "Traffic Control For Streets and Highway Construction, Maintenance, Utility and Emergency Operations" (lasted edition).~~
6. ~~Design, Fabrication, and installation of all permanent signing shall be as outlined in the "Guide For Fabrication and Installation Of Traffic Control Devices."~~
7. ~~For final permanent pavement markings, epoxy resin paint shall be required for long line striping and thermo will be required for short line striping, i.e., symbols/legends.~~
8. ~~Existing utilities are shown in accordance with the best available information. Completeness or correctness thereof is not guaranteed. It shall be the Contractor's responsibility to contact the utility companies involved in order to secure the most accurate information available as to utility location and elevation. No construction around or adjacent to utilities shall begin without notifying their Owners at least 48 hours in advance. The Contractor shall take the necessary precautions to protect the existing utilities and maintain uninterrupted service and any damage done to then due to his/her negligence shall be immediately and completely repaired at the Contractor's expense. To locate existing utilities in the field prior to construction, the Contractor shall contact Miss Utility of Delmarva (See Note #4).~~
9. ~~All traffic control devices shall be in new or refurbished condition, shall comply with the traffic control manual, and shall be NCHRP – 350 approved and shall be approved by the Engineer prior to installation. Traffic control devices shall be maintained in good condition for duration of use.~~
10. ~~All entrances shall conform to DelDOT's *Standards and Regulations for Subdivision Streets and State Highway Access* and shall be subject to its approval.~~
11. ~~Breakaway posts shall be used when installing all signs.~~
12. ~~Plan location and dimensions shall be strictly adhered to unless otherwise directed by the Public Works Engineer.~~
13. ~~No entrance and/or roadway construction along Route XX shall occur beginning on May 15th at 12:00 p.m. and ending on September 15th at 12:00 p.m.~~ **~~(This is not a standard general note but is only used when needed).~~**

~~***Subdivision Streets and Commercial Construction Plan***~~
~~***GENERAL NOTES***~~
~~14. Contractor shall supply message boards that are to be placed ten days prior to construction along Route XXX. The proper wording on the message board will need to be coordinated with the District Safety Officer.~~ ~~**(This is not a standard general note but is only used when needed).**~~

Subdivision Streets and Commercial Construction Plan **GENERAL NOTES**
1. All entrances shall conform to DelDOT's Standards and Regulations for Subdivision Streets and State Highway Access and shall be subject to its approval. **2. All disturbed areas within the State right-of-way, but not in the pavement, shall be topsoiled (6" minimum), fertilized and seeded and mulched.** **3. A 72-hour (minimum) notice shall be given to the DelDOT district permit supervisor prior to starting entrance construction.** **4. Miss Utility of Delaware shall be notified three (3) consecutive working days prior to excavation, at 1-800-282-8555.** **5. All signing and maintenance of traffic is the contractor's responsibility and shall follow the guidelines shown in the Delaware MUTCD for Streets and Highways (latest edition).** **6. Design, fabrication and installation of all permanent signing shall be as outlined in the "Guide for Fabrication and Installation of Traffic Control Devices."** **7. For final permanent pavement markings, epoxy resin paint shall be required for long line striping and thermo will be required for short line striping, i.e. symbols/legends.** **8. Existing utilities are shown in accordance with the best available information. Completeness or correctness thereof is not guaranteed. It shall be the contractor's responsibility to contact the utility companies involved in order to secure the most accurate information available as to utility location and elevation. No construction around or adjacent to utilities shall begin without notifying their owners at least 48-hours in advance. The contractor shall take the necessary precautions to protect the existing utilities and maintain uninterrupted service and any damage done to them due to his/her negligence shall be immediately and completely repaired at the contractor's expense. To locate existing utilities in the field prior to construction, the contractor shall contact Miss Utility of Delmarva (See Note #4).** **9. All traffic control devices shall be in new or refurbished condition, shall comply with the traffic control manual, and shall be NCHRP – 350 approved and shall be approved by the engineer prior to installation. Traffic control devices shall be maintained in good condition for duration of use.** **10. Within the construction area Road Work - 1500FT, 1000FT, 500FT and End Of Work,**

permanent signs shall be placed whenever possible. If the above distances are not applicable, a "Road Work Ahead" permanent sign shall be placed, as directed by the South District Inspector. An "End of Road Work" permanent sign shall be placed on the right side, 500' from the work zone. All dimensions are approximate and may be adjusted to meet field conditions as approved by the South District Inspector. All permanent Traffic Control signs shall be seven feet from the bottom of the sign to the top of the ground.

11. Breakaway posts shall be used when installing all signs.

12. Plan location and dimensions shall be strictly adhered to unless otherwise directed by the District Permit Supervisor.

13. No landscaping shall be permitted within the DelDOT right-of-way.

14. Permanent easement note, "A 15-foot wide permanent easement for a 10-foot wide multi-use path is hereby established as per this plat."

15. Taper Curb per local DelDOT District Field Supervisor (Typical for both sides of the entrance). (This is not a standard general note but is only used when needed.)

16. No entrance and/or roadway construction along Route XX shall occur beginning on May 15th at 12:00 p.m. and ending on September 15th at 12:00 p.m. (This is not a standard general note but is only used when needed.)

17. Contractor shall supply message boards that are to be placed ten (10) days prior to construction along Route XXX. The proper wording on the message board will need to be coordinated with the District Safety Officer. (This is not a standard general note but is only used when needed.)

18. "This entrance is considered temporary and at such time that the service road is constructed this entrance will be removed, topsoiled, seeded, mulched and re-graded to assure positive drainage."

19. Private Subdivision street note – "Maintenance of the streets within this subdivision will be the responsibility of the developer, the property owners within this subdivision, or both. The State assumes no responsibility for the future maintenance of these streets."

20. Public Subdivision street note – "Subdivision streets constructed within the limits of the Right-Of-Way dedicated to the public use shown on this plan are to be maintained by the State of Delaware following the completion of the streets by the developer to the satisfaction of the State. The State accepts no maintenance responsibility within the dedicated street Right-Of-Way until the streets have been accepted by the State."

21. The ends if all curbs shall be transitioned to be flush with the pavement at a ratio of twelve to one (12:1). All approach and exit ends of median island and curb shall also be transitioned flush with the pavement at a ratio of twelve to one (12:1). Triangular (pork chop) island curb shall have all corners transitioned flush with pavement at a slope of four to one (4:1). (This is not a standard general note but is only used when needed.)

22. A double yellow centerline will be required along the paved portion of Route X. Stiping of the centerline shall be 4-inch wide line separated by a 6-inch space. The purpose for providing this space is to allow for the installation of raised pavement markers (RPM) and for the maintenance of

these pavements markings. (This is not a standard general note but is only used when needed.)

23. Maintenance of all landscaping within the landscaped island of the roundabout along SCR XXX (ROAD NAME) shown on this plan will be the responsibility of the Developer, the Homeowners Association or both. The State assumes no responsibility for the future maintenance of the landscaping within a roundabout. DelDOT must review and approve any shrubbery planted within the landscaped island prior to installation. If any shrubbery is planted without DelDOT's knowledge and/or approval, then DelDOT has the right to have the Developer remove the plantings, with all costs being paid for by the Developer. (This is not a standard general note but is only used when needed.)

24. Verify if any utilities will need to be relocated due to the addition of the shoulder. For clear zone purposes, all utilities are to be a minimum 10-feet from the edge of travel lane or 5-feet from the edge of pavement. Any utility that does not meet this requirement shall be relocated. (This is not a standard general note but is only used when needed.)

25. It is the contractor's responsibility to insure that paving within the State of Delaware right-of-way is installed to the elevations shown and that no ponding of water exists after paving is complete.

26. All storm drain piping, inlet, manhole and endsection installation within the State of Delaware right-of-way shall be in accordance with the State of Delaware Department of Transportation Standard Specifications for Road and Bridge Construction, August 2001.

27. All storm drain piping designated as RCP is to be reinforced concrete pipe, meeting AASHTO M-170 specifications. See plans for specific class of pipe.

28. Driveways will not be permitted to be placed at catch basin locations.

29. A copy of the up to date approved maintenance of traffic plans and approval letter shall be on the project at all times.

30. When a median is proposed at the entrance, provide the following general note; Any landscaping proposed for the entrance island must be approved by DelDOT prior to planting.

31. When a median is proposed at the entrance, provide the following general note; DelDOT will not be responsible for the maintenance of any landscaping in the entrance island.

32. All steel used in catch basins shall be 60 ksi.

33. Hot-mix shall be placed in accordance with DelDOT Special Provision 4016XX – Superpave Type Hot-mix.}

General Notes for Record Plans
1. All entrances shall conform to the State of Delaware Department of Transportation and will be subject to its approval. **2. Subdivision streets constructed within the limits of the right-of-way dedicated to the public use shown on this plan are to be maintained by the State of Delaware following the completion of the streets by the developer to the satisfaction of the State. The State assumes no maintenance responsibilities within the dedicated street right-of-way until the streets have been accepted by the State.** **3. The Department will not accept any of the streets into the State maintenance system until 75% of the homes are completely constructed for this development. It will be the owner/developers responsibility to notify DelDOT when 75% or X homes have been completely constructed with certificates of occupancy issued by the County.** **4. The final overlay of Hot Mix - Type C for all streets within the development will not be permitted until 75% or 68 homes are completely constructed. If final overlay is conducted without DelDOT's knowledge and/or approval, then DelDOT has the right to have the owner/developer rotomill and overlay, with all costs being paid for by the developer.** **5. Private Street – Subdivision streets constructed within the limits of the right-of-way are private shown on this plan and are to be maintained by the Developer, property owners or both. The State assumes no maintenance responsibilities for the future maintenance of these streets.** **6. Public Street (New) – Subdivision streets constructed within the limits of the right-of-way dedicated to public use shown on this plan are to be maintained by the Delaware Department of Transportation (DelDOT) following the acceptance of the streets. DelDOT assumes no maintenance responsibilities within the dedicated street right-of-way until the streets have been accepted by DelDOT.** **7. Sidewalk Maintenance Note – The following note will need to be added concerning the maintenance responsibility of the sidewalk and multi modal path. "The sidewalk shall be the responsibility of the developer, the property owners or both within this subdivision. The State assumes no responsibility for the future maintenance for the sidewalk."** **8. Multi Modal Maintenance Note – The following note will need to be added concerning the maintenance responsibility of the sidewalk and multi modal path. "The multi modal path shall be the responsibility of the developer, the property owners or both within this subdivision. The State assumes no responsibility for the future maintenance of the multi modal path."** **9. Sidewalk/Path Maintenance Note – The following note will need to be added concerning the maintenance responsibility of the sidewalk and multi modal path, "The sidewalk and multi modal path shall be the responsibility of the developer, the property owners or both within this subdivision. The State assumes no responsibility for the future maintenance of the sidewalk and/or multi modal path."** **10. The following note will need to be added, "All lots shall have access from the internal subdivision street. Each lot will be permitted to have only one access point to serve the entire**

parcel. Horseshoe driveways will not be permitted."

MAINTENANCE OF TRAFFIC (MOT) GENERAL NOTES
1. All construction signs, barricades and drums shall meet the requirements of the latest edition of the Delaware ~~Traffic Control Manual~~ MUTCD.
2. All traffic control devices shall be new or restored to a satisfactory condition.
3. All warning signs drums and barricades shall be retroreflective sheeting.
4. All permanent signs shall be seven feet in height from the bottom of sign to top of ground. Signs shall be mounted on breakaway post. Refer to page 11-B-3, Erection of Signs, of the Delaware ~~Traffic Control Manual~~ MUTCD. Signs 36 inches or larger shall be mounted on two NCHRP-350 approved breakaway posts.
5. When a side road intersects the highway on which work is being performed, additional traffic control devices shall be erected.
6. All excavation shall be properly backfilled at the end of day's work. Refer to pages 51 through 53 of the Delaware ~~Traffic Control Manual~~ MUTCD (dated 2000) or latest edition.
7. All storage of equipment and material shall comply with pages 51 through 53 of the Delaware ~~Traffic Control Manual~~ MUTCD (dated 2000) or latest edition.
8. All flaggers shall comply with pages 80 through 85 outlined in the Delaware ~~Traffic Control Manual~~ MUTCD (dated 2000) or latest edition.
9. Traffic protection devices shall be suitably maintained at all times. Such maintenance shall include washing sign faces, replacing deficient batteries and lights, aligning properly, replacing reflective materials, relocating barriers, and any other maintenance of traffic protection devices deemed necessary by the Engineer to maintain traffic in a safe and effective manner.
10. At the end of each day's operations and before traffic is returned to unrestricted roadway use, Contractor shall apply temporary markings to meet the requirements of Section 748 of the Delaware Standard Specification and the Delaware ~~Traffic Control Manual~~ MUTCD.

Appendix K ***Functional Classification***

DelDOT Functional Classification *(Source: DelDOT Road Design Manual)*	
Urban System Urban areas have population of 5,000 or more. They are further classified into: 1. Urbanized areas: having a population of more than 50,000 and 2. Small urban areas: having a population of between 5,000 and 50,000. *(Source: Road Design Manual)*	
Interstate	Interstates are part of the specially designated national system of highways serving most state capitals and major population centers for the purpose of national defense and the safe and efficient transportation of high traffic volumes. They are capable of serving larger vehicles carrying all types of goods with heavier loads than permitted on lower class roadways.
Freeways or Expressways	Freeways are arterial highways with full control of access having the capacity for high speed and high volume traffic movements over very long traffic movements over very long distances in an efficient and safe manner. The travel patterns are interstate, interregional, or intercity. Opposing traffic movements are physically separated and access is only provided via grade separated interchanges at selected public roads. Expressways are similar to freeways but do allow limited access to intersecting state maintained roadways under strictly controlled conditions. They provide high speed, long distance vehicular service.
Principal Arterial	Principal arterial roadways have the capacity for safely and efficiently carrying traffic flow at high speeds and high volumes for long distances. The travel patterns include interstate, interregional, and intercity. Access and service to abutting properties are subordinate to providing through movement. Opposing traffic movements are separated by a median, usually nontraversable in urban areas. At-grade intersections are permitted but are controlled both in location and design.

DelDOT Functional Classification *(Source: DelDOT Road Design Manual)*	
Minor Arterial	Minor Arterials have a capacity for medium to high speeds or medium to high volume traffic movements over medium to long distances safely and efficiently. The travel needs are regional, intercity, and intracity. Direct access to abutting land is subordinate to providing service to traffic movement. Intersecting highways, streets, or access to crossing movements are permitted but must meet spacing criteria, which allows signalization when volumes warrant.
Major Collector	Major collectors have a capacity for moderate travel speeds and moderate traffic volumes for short travel distances providing for intercity and intracity travel needs. Mobility needs are balanced with direct access to provide the desired service.
Local	Local roads provide good access to adjoining residences and businesses but limited opportunity for through movement of traffic. Travel is short and movement is to intersecting roadways, usually of the collector classification.
Rural System Area with population of less than 5,000. *(Source: DelDOT Road Design Manual)*	
Principal Arterial	Same as urban system.
Minor Arterial	Same as urban system.
Major Collector	Same as urban system.
Minor Collector	Minor collectors are roadways that provide equal treatment and importance to abutting property access and the movement of traffic. They usually intersect with arterial roadways.
Local	Same as urban system.

Appendix L ***DelDOT Transportation Noise Policy***

L.1 INTRODUCTION

This document constitutes the Delaware Department of Transportation's (DelDOT) policy with regard to future noise levels associated with certain types of transportation improvements. It specifies criteria to determine when noise abatement is to be considered for a particular location. It is anticipated that planners and designers will utilize the guidelines set forth in this policy to address traffic noise associated with highways and other transportation-related infrastructure.

This policy is based on the currently accepted practices and procedures used by Federal and state transportation departments to assess highway-related noise levels.

L.2 DEFINITIONS

Barrier – A natural or man-made object that interrupts the path of sound from the sound source to the sound receiver.

Decibel(dB) – A measure used to express the relative level of a sound in comparison with a standard reference level.

DBA – The noise levels in decibels measured with a frequency weighting network, corresponding to the "A-scale" on a standard sound level meter.

Design year – The future year for which traffic projections are made in establishing design criteria for a specific project.

Existing noise levels – The surrounding noise of an area. Measured in dBA, it provides a reference base for determining noise impacts when transportation improvements or new highways are being considered. When calculated, it is based upon noise levels experienced during the peak-hour of traffic.

Forecast traffic – Vehicular volumes predicted by the current long-range transportation plan.

Leg – The equivalent, steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same period.

Leq (h) – The hourly value of Leq (based upon the peak-hour percentage of the annual average daily traffic).

Noise abatement criteria – The maximum noise level recommended for the various land use activity categories.

Noise – Sound that is unwanted or undesirable.

Privacy fence – A barrier, approximately 8 to 12 feet in height, that is normally made of wood boards spaced closely together.

Receptor – An individual or site location registering measurable sound levels.

Traffic noise impacts – Impacts which occur when the predicted traffic noise levels approach or exceed specific absolute noise levels or when the predicted traffic noise levels substantially exceed the existing noise levels.

Transportation-related noise – Noise generated by the motor, tires, etc. of vehicles using the transportation system.

Type I projects – A proposed Federal or Federal aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

Type II projects – A proposed Federal or Federal aid project for noise abatement on an existing highway.

L.3 FEDERAL HIGHWAY ADMINISTRATION GUIDELINES

L.3.1 INTRODUCTION

The Federal Highway Administration (FHWA) has issued regulations for noise evaluation in 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise. This document was formerly included in the Federal-Aid Highway Program Manual 7-7-3. The main objective of 23 CFR 772 is "to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23, U.S.C."

L.3.2 NOISE ABATEMENT CRITERIA

The FHWA has developed specific criteria that serve as the maximum recommended highway traffic noise levels for various types of land use. The noise abatement criteria, depicted in Table 1, are interpreted by DelDOT as values which, when approached or exceeded, require the consideration of traffic noise abatement measures. The Department considers the noise abatement criteria to be approached if traffic noise levels are within one decibel of the values shown in Table L.1.

Figure L.1 Noise Abatement Criteria

Activity Category	Design Noise Level Leg (h)	Description of Activity Category
A	57 dBA	Tracts of land in which serenity and quiet are of (Exterior) extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 dBA	Picnic areas, recreation areas, playgrounds, active (Exterior) sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 dBA	Developed lands, properties or activities not included (Exterior) in categories A and B above.
D	_____	Undeveloped lands (lands, properties or activities not included in categories A, B, or C above).
E	52 dBA	Residences, motels, hotels, public meeting rooms, (Interior) schools, churches, libraries, hospitals and auditoriums (with windows closed).

DelDOT considers noise mitigation when either of the following conditions is satisfied:

- Predicted (design-year) noise levels approach or exceed the NAC levels given in Table L-1. DelDOT considers a noise impact to occur when the design noise level is approached or exceeded (i.e. predicted exterior noise level for a residence at ground level must approach or equal 67 dBA to qualify as a traffic noise impact).

- Predicted (design-year) noise levels substantially exceed existing noise levels. DelDOT considers a substantial increase to be at least 10 dBA.

In general, the Delaware Department of Transportation follows the FHWA criteria, for all Type I highway projects. However, DelDOT has chosen not to conduct Type II projects, which provide noise mitigation along existing highways. This is in accordance with FHWA policy, which indicates that Type II mitigation is not a mandatory requirement. In addition, the recently revised Federal policy places new restrictions on the approval of Type II mitigation. The policy states that Type II abatement projects for new activities and land uses, which come into existence, may only be approved when they are proposed along lands where land development or substantial construction predated the existence of any highway. The granting of a building permit, filing of a plot plan or a similar action must have occurred prior to the date of FHWA approval of the Categorical Exclusion, Finding of No Significant Impact, or the Record of Decision, whichever is applicable for a particular project, for the original highway on new location.

L.4 NOISE ANALYSIS PROCEDURES

The Delaware Department of Transportation conducts all highway noise studies in accordance with current FHWA guidelines and procedures, as specifically outlined in FHWA-DP-45-1R, Sound Procedures for Measuring Highway Noise. Listed below is an outline that summarizes the general procedure utilized by DelDOT when conducting a highway noise study:

1 Identification of Noise-Sensitive Land Uses

a. Obtain roadway plans to identify noise-sensitive land uses (such as residential, schools, etc.) in the vicinity of a proposed project.

2 Determination of Existing Noise Levels

a. Noise meter placed near potential noise-sensitive receptors in "areas where frequent use occurs."

b. Noise levels recorded for a period of time (ranging from a minimum of ten minutes to twenty-four hours) to obtain a representative sample of ambient noise.

c. Classification counts (cars, medium trucks and heavy trucks) and vehicular speeds are documented in the field.

3 Comparison of Computed and Measured Noise Levels

a. Obtain plans of existing roadways.

b. Determine horizontal and vertical coordinates of existing travel lanes, receptors and barriers from plan sheets and profiles.

c. Input roadway, receptor and barrier coordinates into traffic noise prediction model that is consistent with the methodology outlined in FHWA-RD-77-108, Highway Traffic Noise Prediction Model, as well as field-recorded traffic volumes (input as hourly totals), classifications and speeds. Determine if site is predominantly absorptive (grass-covered) or non-absorptive. Also, input the effects of shielding factors such as dense vegetation, rows of homes, etc. Once these items are input into the model, existing noise levels can be calculated and compared with the field measurements. Computer model is considered accurate if computed levels

are within 3 dBA of the field recordation.

4 Design-Year Noise Level Prediction

a. Obtain design-year, peak-hour traffic volumes, truck percentages, truck weight patterns and directional splits.

b. Obtain plans of future roadway improvements.

c. Determine horizontal and vertical coordinates of future travel lanes, receptors and barriers from plan sheets and profiles.

d. Input roadway, receptor and barrier coordinates into traffic noise prediction model, as well as design-year, peak-hour traffic volumes, classifications and speeds. Determine if site will remain predominantly absorptive or non-absorptive. Also, input the effects of shielding factors. Once these items are input into the model, future noise levels at specified receptors can be calculated.

e. Perform similar procedure to compute noise impacts for the "no-build" alternative as well.

5 Projection of Noise Impact

a. Analyze predicted noise levels to determine receptors that will approach or exceed the Noise Abatement Criteria.

b. Compare existing noise levels with predicted levels to determine if there will be a substantial (i.e. > 10 dBA) increase in noise.

6 Mitigation Measures

a. If noise mitigation is deemed necessary based upon the prediction model, analyze different methods that can be utilized to reduce future noise levels refer to Section VII, Paragraph 11.

b. If a barrier is determined to be necessary to reduce noise, input horizontal and vertical coordinates of the barrier into the noise prediction model. Also, input whether the barrier is absorptive or reflective.

c. Utilize OPTIMA software (or compatible model) to perform a noise barrier analysis, based on the barrier information noted above.

L.5 DECISION CRITERIA

The Federal Highway Administration's noise regulations – 23 CFR 772 – require "the highway agency to identify noise abatement measures which are reasonable and feasible." The criteria below shall be used by DelDOT to ensure that noise mitigation measures are both reasonable and feasible. The feasibility and reasonableness of a potential noise abatement measure must be evaluated before the Department will examine detailed noise mitigation concepts.

L.5.1 FEASIBILITY

The evaluation of the feasibility of a noise mitigation measure deals primarily with engineering considerations. The Department will design all noise mitigation measures with the intention of achieving a substantial noise reduction, given the conditions of a specific location. The Department will attempt to design noise mitigation that reduces traffic noise levels by at least 5 decibels, in order to provide noticeable and effective attenuation.

However, there are factors that may limit the ability to achieve substantial noise reduction. These factors include but are not limited to the following:

- Safety conditions
- Access requirements for driveways and entrances
- Maintenance requirements
- Topography
- Drainage
- Other noise sources in the area

L.5.2 REASONABLENESS

The Department will evaluate a number of factors when determining if a noise mitigation measure is reasonable. The criteria that shall be used to determine the reasonableness of a noise mitigation measure are listed below:

1. Views of the impacted residents: DelDOT will not consider noise barriers if most of the impacted residents do not want them. The Department will require that local government officials or community groups submit a letter to DelDOT stating the impacted residents' views, prior to the construction of any noise mitigation measure.
2. Noise levels: As stated in Section III of this Policy, noise mitigation will be considered reasonable only for areas where the predicted noise levels for a project approach or exceed the Noise Abatement Criteria, or if the predicted future noise levels for a project exceed existing noise levels by at least 10 decibels.
3. Cost: A noise mitigation measure will be considered reasonable if the total cost does not exceed $20,000 per benefited residence. A benefited residence is a dwelling unit that would receive a noise reduction of at least 3 decibels from the installation of a noise barrier.
4. Timing of Development: As stated in Section VII of this Policy, noise mitigation will be considered reasonable only for developments that were under construction prior to public knowledge of a Type I transportation project. Public knowledge is considered to be the date of FHWA approval of the Categorical Exclusion, the Finding of No Significant Impact, or the Record of Decision, whichever is applicable for a particular project.
5. Environmental Impacts: A noise mitigation measure will be considered reasonable only if the construction of the measure does not have an adverse impact on the natural environment of the area.

L.6 BARRIER DESIGN CRITERIA

The following is a list of criteria that should be incorporated into the design and construction of a noise barrier by or for the Department.

1 Minimum barrier height – 8 feet from ground level to top of barrier.

2 Lateral clearance – Barrier must be located within highway's right-of-way. Barrier must be placed in accordance with the clear zone requirements as found in DelDOT's *Road Design Manual* and may not adversely affect sight distance requirements. Safety design standards, including pedestrian access, will not be compromised to provide noise mitigation.

3 DelDOT will only provide noise abatement for the ground floor of impacted receptors.

4 DelDOT will provide noise abatement to mitigate transportation-related noise only.

5 Earth Berm Design – Earth berm minimum design standards are under development.

6 Noise Wall Design – All noise walls will be constructed in accordance with the 1989 AASHTO publication, "Guide Specifications for Structural Design of Sound Barriers" or latest edition.

7 Maintenance.

a. Type I Projects

i All noise mitigation measures constructed by the Department in conjunction with a DelDOT project will be located within public right-of-way. DelDOT will provide for the maintenance of all Type I noise walls, earth berms constructed by the Department. In addition, privacy fences constructed by the Department within the public right-of-way, in conjunction with a DelDOT project, will be maintained by DelDOT.

ii Noise mitigation barriers constructed as part of a DelDOT project will necessitate the cooperation of the abutting property owners for maintenance. The Right of Way Plans will indicate the need for an access and maintenance easement with the adjoining property owners. In principal

the easement will provide that the owners will maintain the area abutting the noise mitigation barrier. DelDOT will be responsible for maintaining any drainage ditches built in conjunction with the barrier.

iii DelDOT will not be responsible for the maintenance of noise mitigation measures installed outside of the limits of public right-of-way. Noise barriers, earth berms installed on private property to mitigate noise are the maintenance responsibility of the property owner. In addition, privacy fences installed outside of the limits of public right-of-way, as a mitigation measure, will not be maintained by DelDOT.

b. Mitigation Funded With Suburban Street Funds

i Noise mitigation measures constructed with Suburban Street Funds will not be maintained by DelDOT. Barriers, earth berms or privacy fences installed with Suburban Street funding will be maintained by the property owner and/or community.

ii Should Suburban Street Funds be used to fund mitigation that DelDOT would have been required to construct (i.e. Type I projects), the Department shall be responsible of its maintenance.

8 In order to offer improved aesthetics and minimize maintenance requirements, all efforts will be made to construct earth berms instead of noise walls. However, the feasibility of both earth berms, privacy fences, and noise walls will be examined in all noise studies conducted by DelDOT.

9 If mitigation is warranted, DelDOT will examine the feasibility of a variety of noise mitigation measures. In addition to noise barriers, DelDOT will examine the following measures for abatement feasibility:

a. Acquisition of right-of-way for buffer zones between the receptor and the highway.

b. Traffic management measures, including but not limited to traffic control devices, prohibiting certain vehicle types, time-use restrictions, and reduced speed limits.

c. Horizontal and vertical alignment modifications.

d. Air conditioning and/or insulation for public use or nonprofit institutional structures only.

e. Other potential noise abatement strategies, including but not limited to the following: examining different types of pavement; type, placement or removal of rumble strips, etc.

L.7 FHWA CATEGORY B LAND USE POLICY

DelDOT will provide abatement only for areas that support developed land use. An area is considered to be a developed land use when the proposed development plan is recorded with the appropriate local government agency and is under construction within the noise impact area or is already constructed.

Developments recorded by the local government agency after public knowledge of a highway and/or transportation project will not be eligible for any DelDOT funded noise mitigation. All noise abatement costs will be the responsibility of the developer for developments approved after public knowledge of a highway project.

Public knowledge for Type I transportation facilities is the date of Federal approval of the Categorical Exclusion (CE), Finding of No Significant Impact (FONSI), or the Record of Decision (ROD), whichever is applicable for a particular project.

In situations where the Department is required to conduct a noise analysis for inclusion in an Final Environmental Impact Statement (FEIS) or a Final Environmental Assessment (EA), the results of the analysis will be made

available to local government planners for their use in land planning decisions.

As part of its comments to the appropriate local government agency during the rezoning process, DelDOT will indicate whether transportation-related noise may present potential noise impacts to the rezoned property in the future.

L.7.1 DEVELOPER RESPONSIBILITIES

The Developer of Land Development Projects will be required to conduct a noise analysis based upon the forecast traffic on the roadway adjacent to the proposed subdivision, for any road that is designated in whole or in part on the DelDOT Functional Classification Map as a principal arterial, a freeway or an interstate. The analysis will include examining mitigation measures to shield future abutting property owners from noise impacts.

Should it be determined that a proposed Land Development project will experience a traffic noise impact, the Department may require the Developer to redesign the site plan, changing impacted areas from sensitive land uses to non-sensitive land uses, thus potentially eliminating the need for a noise barrier. The DelDOT letter of no objection to record the subdivision will be contingent upon a subdivision layout that has been designed to minimize noise impacts following highway construction.

DelDOT will require that the Record Subdivision Plans for proposed Land Development projects include provisions for highway noise abatement, if the results of the analysis described above in Paragraph 6 indicate an adverse noise impact will result. The security that is required to indemnify the construction agreement for subdivision streets shall be increased by one-hundred percent of the estimated cost to construct the noise mitigation measures specified on the Record Subdivision Plans for the lots abutting the proposed streets.

DelDOT will be responsible for insuring that the noise mitigation measure is constructed prior to accepting the street construction. The plans for streets serving impacted residences must include construction plans for noise barriers and/or walls. Any abatement measures are to be constructed by the developer concurrently with the streets for the Development. Noise mitigation measures shall be designed and constructed to meet DelDOT requirements. The security will not be released by the Department until the noise mitigation measure is constructed to DelDOT standards. Maintenance of any fence, berm or noise wall will remain the responsibility of the Developer or community, as described in a maintenance agreement with DelDOT. A typical section of an earth berm is included in Appendix A for reference.

With regards to the analysis of existing highways where no widenings are planned, a noise study will only be undertaken by DelDOT when funds have been previously provided by the community or the legislature.

L.8 COMMUNITY INVOLVEMENT

DelDOT will present noise mitigation options and solicit public opinion with respect to those options early in the highway planning stages. Public workshops will be utilized as a forum to identify potential noise impacts, as well as to depict possible mitigation measures.

Upon preliminary DelDOT design of a noise mitigation measure, the affected property owners will be afforded the opportunity to comment on the design.

In the event that a community believes noise mitigation is appropriate and the Department does not agree, the community may request an appeal to the Director of Planning. The Director of Planning will convene a review board consisting of the following individuals: the Director of Highway Operations, the Manager of Project Development, the Road Design Engineer (or the Section Head responsible for the project), the Chief of Real Estate, and the Assistant Director for Design Support, to meet with an equivalent number of community

representatives. This board will evaluate the appeal, examine the noise study data and determine the feasibility of any noise mitigation measure. Should the board and the community not be able to reach an agreement, the matter will be referred to the Chief Engineer for final decision.

L.9 CONSTRUCTION NOISE

The following general steps are to be taken for all Type I projects:

During the project development phase, land uses or activities that may be affected by construction noise will be identified.

The Department will determine the measures which may be needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community.

If necessary, the identified construction noise abatement measures will be incorporated into the plans and specifications.

L.10 DEPARTURE FROM POLICY

There may be extenuating circumstances where unique of unusual conditions warrant special considerations of highway traffic noise impacts and/or implementation of noise abatement measures. These circumstances could involve areas such as (1) those that are extremely noise sensitive, (2) those where severe traffic noise impacts are anticipated, or (3) those containing Section 4(f) resources. Extenuating circumstances will be considered on an individual project basis.

APPENDIX

Typical Section of an Earth Berm **(To be added at a later date)**

Appendix M ***Clean Air Act Exemptions***

In general, exempt projects include all projects which have no emissions impact, and are considered to be neutral or de minimis. For projects such as travel demand management strategies for which air quality effects cannot be accurately assessed in a traditional regional modeling context, other accepted methods (reasonable professional practice) of quantifying their effects are encouraged (40 CFR §93.122(a), as amended by 62 FR 43813, Aug. 15, 1997).

Notwithstanding the other requirements of this section, highway and transit projects of the types listed in Figure M-1 are exempt from the requirement to determine conformity. Such projects may proceed toward implementation even in the absence of a conforming transportation plan/TIP. A particular action of the type listed in Figure M-1 is not exempt if the MPO in consultation with other agencies (see §93.105(c)(I)(iii)), the EPA, and the FHWA (in the case of a highway project) or the FTA (in the case of a transit project)) concur that it has potentially adverse emissions impacts for any reason. States and MPOs must ensure that exempt projects do not interfere with TCM implementation.

Figure M.1 Exempt Projects

SAFETY	
• Railroad/highway crossing. • Hazard elimination program. • Safer non-Federal aid system roads. • Shoulder improvements. • Increasing sight distance. • Safety improvement program. • Traffic control devices and operating assistance other than signalization projects. • Railroad/highway crossing warning devices. • Guardrails, median barriers, crash cushions. • Pavement resurfacing and/or rehabilitation.	• Pavement marking demonstration. • Emergency relief (23 U.S.C. §125). • Fencing. • Skid treatments. • Safety roadside rest areas. • Adding medians. • Truck climbing lanes outside the urbanized area. • Lighting improvements. • Widening narrow pavements or reconstructing bridges (no additional travel lanes). • Emergency truck pullovers.
MASS TRANSIT	
• Operating assistance to transit agencies. • Purchase of support vehicles. • Rehabilitation of transit vehicles.*	• Construction of small passenger shelters and information kiosks. • Reconstruction or renovation of transit

• Purchase of office, shop, and operating equipment for existing facilities. • Purchase of operating equipment for vehicles (e.g., radios, fare-boxes, lifts). • Construction or renovation of power, signal, and communications systems.	buildings and structures (e.g., rail or bus buildings, storage and maintenance facilities, stations, terminals, and ancillary structures). • Rehabilitation or reconstruction of track structures, track, and trackbed in existing rights-of-way. • Purchase of new buses and rail cars to replace existing vehicles or for minor expansions of the fleet.* • Construction of new bus or rail storage/maintenance facilities categorically excluded in 23 CFR part 771.
AIR QUALITY	
• Continuation of ride-sharing and van-pooling promotion activities at current levels. • Bicycle and pedestrian facilities.	
OTHER	
Specific activities which do not involve or lead directly to construction, such as: • Planning and technical studies. • Grants for training and research programs. • Planning activities conducted pursuant to titles 23 and 49 U.S.C. • Federal old systems revisions. • Engineering to assess social, economic, and environmental effects of the proposed action or alternatives to that action. • Noise attenuation.	• Emergency or hardship advance land acquisitions (23 CFR §712.204(d)). • Acquisition of scenic easements. • Plantings, landscaping, etc. • Sign removal. • Directional and informational signs. • Transportation enhancement activities (except rehabilitation and operation of historic transportation buildings, structures, or facilities). • Repair of damage caused by natural disasters, civil unrest, or terrorist acts, except projects involving substantial functional, locational or capacity changes.

*(Note: *In PM-10 non-attainment or maintenance areas, such projects are exempt only if they are in compliance with control measures in the applicable implementation plan.)*

Appendix N ***List of Approved Trees***

Trees can be added within the right-of-way of a subdivision street provided they are chosen from the approved list of street trees. The following table provides the list of approved trees. This list is not all-inclusive and should only be used as a guide for planting street trees in the urban environment. It does not address containerized trees.

Trees must be grown with a structured canopy limbed to a six foot minimum clearance at time of installation.

Annual street tree maintenance must include structural pruning of the canopy until a maximum height clearance of 10 feet has been acquired and maintained.

Containerized trees must receive consistent and frequent attention to maintain a healthy vigor. Feeding, watering and winterization are of particularly importance.

	Botanical Name	Common Name	Type	Variety or Hybrid Names
UE	*Acer buergeranum Var.*	Trident Maple	China	Streetwise
	Acer campestre Var.	Hedge Maple	Euro	Compactum, Leprechaun, Queen Elizabeth, etc.
	Acer davidii	David Maple	China	
UE	*Acer ginnala*	Amur Maple	China & Japan	
	Acer griseum	Paperbark Maple	China	
	Acer nigrum Var.	Black Maple	Native-MidW	Greencolumn
	Acer platanoides Var.	Norway Maple	Euro	Non-fruiting hybrids ONLY
	Acer rubrum Var.	Red Maple	Native-E	Armstrong, Red Sunset, October Glory, etc.
	Acer saccharinum Var.	Silver Maple	Native-E	Blair, Lochstead, Silver Queen, etc.
	Acer saccharum Var.	Sugar Maple	Native-NE	Bonfire, Green Mountain, Mountain Park, etc.
UE	*Acer tataricum Var.*	Tatarian Maple	Eur-Asia	Rubrum
	Acer truncatum x A. platanoides Var.	Purpleblow Maple	Hybrid	Norwegian Sunset, Pacific Sunset
	Acer x freemanii Var.	Hybrid Maple	Hybrid	Autumn Blaze, Marmo, Scarlet Sentinel, etc.
	Aesculus hippocastanum	Horsechestnut	Med Region	
	Aesculus hippocastanum 'Baumannii'	Double Flowering Horsechestnut	Med Region	
	Aesculus x carnea Var.	Horsechestnut	France	Briotii, Ft. McNair, etc.
UE	*Amelanchier arborea*	Downy Serviceberry	Native-E	
UE	*Amelanchier canadensis*	Shadblow Serviceberry	Native-E	
UE	*Amelanchier x grandiflora*	Serviceberry	Hybrid	Princess Diana, Autumn Brilliance
UE	*Amelanchier laevis*	Alleghany Serviceberry	Native-E	
	Betula nigra 'Heritage'	Heritage River Birch	Hybrid	
	Betula platyphylla japonica 'Whitespire'	Asian Clump 'Whtiespire' Birch	Japan	
	Carpinus betulus fastigiata	Columnar European Hornbeam	Euro	
	Celtis laevgiata Var.	Sugar Hackberry	Native-E	All Seasons
	Celtis occidentalis Var.	Common Hackberry	Native-E	Prairie Pride
	Celtis laevgiata x C. occidentalis'	Magnifica Hackberry	Hybrid	

	Botanical Name	Common Name	Type	Variety or Hybrid Names
	Magnifica'			
	Cercidiphyllum japonicum	Katsura Tree	Japan	
UE	*Cercis canadensis Var.*	Eastern Redbud	Native-E	Forest Pansy, Dwarf White, Flame, etc.
UE	*Cercis reniformis Var.*	Redbud	Native-SW	Texas White, Silver Cloud, Tennessee Pink, etc.
	Cladrustis kentukea Var.	American Yellowwood	Native-H	
UE	*Cornus kousa Var.*	Kousa Dogwood	China-H	Autumn Rose, Big Apple, Camden, etc.
	Corylus colurna	Turkish Filbert	SE Euro	
UE	*Crataegus crus-galli*	Thornless Cockspur Hawthorne	Native-E	
UE	*Crataegus laevigata*	English Hawthorne	Euro	
UE	*Crataegus phaenopyrum*	Washington Hawthorne	Native-SE	
UE	*Crataegus punctata*	Dotted Hawthorne	Native-E	
UE	*Crataegus viridis 'Winter King'*	Hawthorne 'Winter King'	Native-E	
UE	*Crataegus Vaughn*	Hybrid Hawthorne	Hybrid	
	Eucommia ulmoides	Hardy Rubber Tree		
	Fraxinus americana Var.	White Ash	Native-E	Windy City, Autumn Purple, Autumn Applause, Greenspire, etc.
	Fraxinus nigra	Black Ash	Native-E	
	Fraxinus pennsylvanica Var.	Green or Red Ash	Native-E	Patmore, Newport, Summit, etc.
	Ginkgo biloba (male clones only) Var.	Maidenhair Tree	China	Magyar, Princeton Sentry, Autumn Gold, Lakeview, etc.
	Gleditsia tricanthos inermis Var.	Thornless Honeylocust Varieties	Native-E	Shademaster, Sunburst, Halka, Trueshade, Continental, etc.
	Gymnocladus dioicus Var. (male clones only)	Kentucky Coffetree	Native-E	Expresso, Prairie Titan, Stately Manor, etc.
	Koelreuteria paniculata	Golden Rain Tree	China & Japan	
	Liquadambar styraciflua Var.	Sweetgum	Native-E	Moraine, Rotunidloba, Shadow Columnar Form, etc.
	Lireodendron tulipifera Var.	Tulip Tree	Native-E	Ardis, Compacta, Aureamarginatum, Fastigiatum, etc.
	Magnolia acuminata Var.	Cucumber Tree	Native-E	Elizabeth, Limelight, Yellow Bird, etc.

	Botanical Name	Common Name	Type	Variety or Hybrid Names
	Magnolia hybrid 'Galaxy'	Galaxy Magnolia	Hybrid	Galaxy
UE	*Magnolia stellata (Tree Form)*	Star Magnolia	Japan	
	Magnolia x loebneri Var.	Merrill or Leonard Messel Magnolia	Hybrid	Dr. Merrill, Leonard Messel
UE	*Malus angustifolia*	Southern Crabapple	Native-E	
UE	*Malus baccata Var.*	Siberian Crabapple varieties	Hybrid	Columnaris
UE	*Malus coronaria*	Sweet Crabapple	Native-E	
UE	*Malus floribunda*	Japanese Flowering Crabapple	Japan	
UE	*Malus hupehensis Var.*	Tea Crabapple	China	Cardinal, Strawberry Parfait, etc.
UE	*Malus x hybrid*	Hybrid Crabapples	Hybrid	Indian Magic, Red Jewel, Molaszam, Narragansett, etc.
	Metasequoia glyptostroboides	Dawn Redwood	China	
	Nyssa sylvatica Var.	Black Gum or Tupelo	Native-E	Miss Scarlet, Red Jeanne, Sheffield Park, etc.
	Ostrya virginiana	American Hophornbeam	Native-E	
	Phellodendron amurense	Amur Corktree	China & Japan	Macho, Shademaster, etc.
	Platanus x acerifolia Var.	London Plane Tree	Hybrid	Bloodgood, Columbia, Liberty, etc.
	Platanus occidentalis	Sycamore	Native-E	
	Prunus cerasifera 'Thundercloud'	Purpleleaf Plum 'Thundercloud'	Western China	
UE	*Prunus serrulata Var.*	Oriental Cherry	Japan	Amanogawa, Kwanzan, Royal Burgundy, etc.
	Prunus x yedoensis Var.	Yoshino Cherry	Hybrid	Afterglow, Akebono
	Prunus sargentii x P. subhirtella 'Accolade'	Accolade Flowering Cherry	Hybrid	
UE	*Prunus virginiana*	Chokecherry	Native-E	
	Quercus acutissima	Sawtooth Oak	China & Japan	
	Quercus bicolor	Swamp White Oak	Native-E	
	Quercus imbricaria	Laurel or Shingle Oak	Native-E	
	Quercus macrocarpa	Bur or Mossycup Oak	Native-E	
	Quercus palustris Var.	Pin Oak	Native-NE & NC	Crown Right, Green Pillar, Sovereign, etc.
	Quercus phellos Var.	Willow Oak	Native-E	Pillow Oak

	Botanical Name	Common Name	Type	Variety or Hybrid Names
	Quercus robar Var.	English Oak	Euro	Attention, Regal Prince, Skyrocket, etc.
	Quercus rubra Var.	Northern Red Oak	Native-NE & NC	Aurea, Splendens, etc.
	Quercus shumardii	Shumard Oak	Native-E & C	
	Sassafras albidum	Sassafras	Native-E	
	Sophora japonica Var.	Pagoda or Scholar Tree	China & Korea	Regent, Princeton Upright, Pendula
UE	*Syringa reticulata Var.*	Japanese Tree Lilac	Japan-N	Ivory Silk, Summer Snow, Chantilly Lace
	Taxodium distichum Var.	Bald Cypress	Native-SE	Shawnee Brave
	Tilia americana Var.	American Basswood	Native-E	Redmond, Wandell, Continental Appeal, etc.
	Tilia cordata Var.	Littleleaf Linden	Euro	Shamrock, Chancellor, Corithian, etc.
	Tilia tomentosa Var.	Silver leaf Linden	Euro	Satin Shadow, Sterling Silver, etc.
	Ulmus americana	American Elm	Native-E NA	
	Ulmus carpinifolia	Smoothleaf Elm	Euro & N. Africa	
	Ulmus parvifolia Var.	Chinese or Lacebark Elm	China, Korea, Japan	Ohio, Dynasty, etc.
	Ulmus wilsoniana Var.	Wilson's Elm	Asia	Prospector
	Ulmus hybrids	Hybrid Elms	Hybrid	Frontier, Homestead, Pioneer, etc.
	Zelkova serrata Var.	Japanese Zelkova	Japan	Green Vase, Village Green, Halka, Spring Grove, etc.

UE = Acceptable to use under and/or within Utility Easement

Appendix O ***Scoping Meeting***

Scoping Meeting Information Form

Please fill in the required information below. The provided information will be used in preparing a scope of work and scheduling a scoping meeting for a traffic impact study for the subject development. You may attach additional pages of information as necessary.

Project Name:

Name and Address of Applicant (Developer)[1]:

Contact Information for Scheduling Meeting[2]:

Lot location (noting route, directional orientation, milepoint, municipality and / or County):

Tax Parcel identification numbers[3]:

[1] For a partnership, limited liability company, corporation, or other entity owning the project, a list of all partners, members, or shareholders having an interest of 10% or greater, along with the percentage of ownership interest of such partner, member or shareholder in the entity shall also be included with this form. Attach a separate sheet if necessary.

[2] Include name of person requesting meeting, a telephone number, and, if desired, an e-mail address.

Acreage:

Is annexation proposed? (Yes / No)

If yes, please list the municipality to which the annexation is proposed:

Current Zoning:

Proposed Zoning:

Proposed land use (*please be as specific as possible*):

Proposed site access points (*number and location*):

Projected build-out year[4]:

Has a land use application been submitted to the local government land use department? (Yes / No):

If yes, please list the date of submission:

Has a subdivision or land development plan been submitted to DelDOT's Subdivision Section for review? (Yes / No):

If yes, please list the date of submission and attach a copy:

---

[3] Please attach a tax map as described in Section 2.5.1 in the Manual.
[4] When determining the projected build-out year, please refer to Section 2.9.10 in the Manual.

Has a site plan been prepared? (Yes / No):

If yes, please attach a copy.

Has the developer and current property owner of the scoping meeting been notified in writing of this meeting request? (Yes / No):

If yes, please attach a copy.

Names and Titles of proposed attendees[5]:

Other relevant information:

NOTE: Failure to properly fill out any of the above sections or attach the requested documents / plans to this form may result in the rejection of the scoping meeting request.

[5] If you would like DelDOT to coordinate their attendance at the meeting, please provide telephone numbers and / or e-mail addresses.

~~DELDOT TRAFFIC IMPACT STUDY SCOPING MEETING INFORMATION FORM~~

- ~~Project name.~~
- ~~Name and address of applicant.~~
- ~~Site location noting route, directional orientation, milepoint, municipality and/or county.~~
- ~~Tax parcel number(s), including block number, lot number and parcel number.~~
- ~~Traffic Analysis Zone number(s).~~
- ~~Size, type and zoning of each different existing and proposed land use on the site.~~
- ~~Proposed times and days to be analyzed.~~
- ~~Proposed build-out year, or if project is to be phased, phase-in dates.~~
- ~~Names and titles of people anticipated to attend the Scoping Meeting.~~

~~REQUIRED ATTACHMENTS:~~

- ~~Tax map.~~
- ~~Sketch site plan including.~~
- ~~Both sides of adjacent roadways.~~
- ~~Existing and proposed access.~~
- ~~Proposed highway improvements.~~
- ~~Proposed study area for the TIS (list of facilities).~~
- ~~Map of proposed study area indicating facilities to be analyzed.~~
- ~~Projected trip generation, distribution and assignment to the road network for each land use and time period proposed to be analyzed.~~
- ~~List of committed developments within a two-mile radius of the exterior boundaries of the projects; discussion of the impacts of those developments on the project area.~~
- ~~List of anticipated required approvals for the proposed development.~~
- ~~Evidence that the applicant and the current property owner were notified of the request for the meeting.~~
- ~~Suggested agenda for Scoping Meeting.~~

~~OPTIONAL ATTACHMENTS:~~

- ~~Other analysis assumptions the applicant proposes using for the study.~~

- ~~Other information that would have a material bearing on the effect of the proposed development, including known transportation improvement projects within the area and available safety/accident data.~~

Appendix P ***Critical Movement Summation (CMS) How-To Guide***

P.1 BACKGROUND

The critical movement summation (CMS) method focuses on "raw" intersection capacity, that is, the ability for an intersection to process a given traffic demand with a given lane use configuration and given phase sequence.

Traffic signal phasing is one component of the analysis, but it is important to note that most of the subtleties of traffic signal phasing and operation are not included in the analysis.

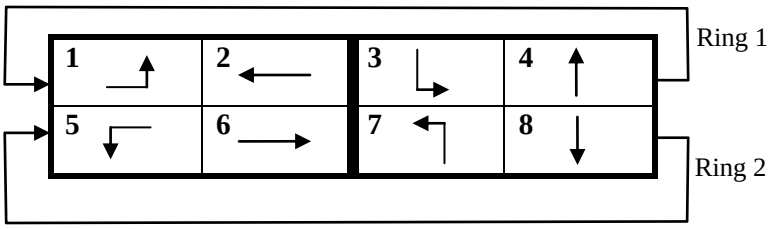
The analyst can use this simple hands-on approach to get right to the point of an intersection's ability to handle traffic demands. CMS looks at each of the "critical" movements at an intersection. It is a volume-based measure.

P.2 PROCESS

Step 1. Gather CMS Inputs

- Hourly Volumes – Use vehicles per hour. If analyzing the peak hour, use the largest sum of 4 consecutive 15-minute periods for that intersection, e.g. 7:45 – 8:45 AM.
- Lane Use Configurations – Determined through observation of existing geometry and operations.
- Signal Phasing – Use National Electrical Manufacturers Association (NEMA) standard 8-phase operation with adjustments as needed. The top line of phasing on the CMS worksheet is intended to show existing phasing. The adjacent line below is workspace intended for conceptual improvements to phasing. See Figure P.1 for a typical NEMA phase numbering schemes.

Figure P-1 Typical Phase numbering Scheme



Step 2. Fill in CMS Worksheet

For each row, fill in the columns:

- Movement (describe in words, e.g. NB through, SB through, EB left, etc.)
- Phase (indicate movement number)
- Volume (in the case of a shared lane, write each volume long-hand, and then sum, e.g. 100 + 150 + 25)
- LU (Lane Use factor, see table at bottom of worksheet.)
- Lane Volume (multiply the Volume by the Lane Use Factor.)
- OL (Opposing Lefts, to be added. See description of Permissive Only Lefts below.)

- LTC (Left Turn Credit, to be subtracted. See description of Concurrent Lefts or Lead/Lead-Lag Left below.)
- Critical Lane Volume (apply OL or LTC to the Lane Volume to get this Critical Lane Volume.)

Step 3. Determine Critical Movements

In the CM column, note the highest of each movement pair (e.g. highest of NB/SB through, highest of NB left/SB left, etc.) with an asterisk*. There should be an asterisk (*) corresponding to each block in the top line of phasing on the CMS worksheet.

Step 4. Sum the Critical Movements

Fill in the "Total" by adding the movements that have asterisks*. Assign a Level of Service (LOS) by using the Level of Service table at the bottom of the CMS worksheet.

P.3 RULES FOR TURNING MOVEMENTS

P.3.1 RIGHT TURNS

If right-turn is "hot" or "free" (i.e. has a dedicated, channelized deceleration and acceleration lanes) and is not signal controlled, leave out of computation.

If right-turn has a dedicated lane and is signal controlled with right-turn-on-red permitted, assume 50% of right-turn volume.

If right-turn has a dedicated lane and is signal controlled with "No right turn on red," assume 100% of right-turn volume.

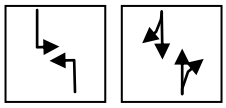
If right-turn has a dedicated lane and is signal controlled for rights to move concurrently with lefts (e.g. NB rights move with WB lefts), reduce the right-turn volume in the amount of the left-turn volume.

If there is a shared through/right lane, add through and right volumes.

P.3.2 LEFT TURNS

Left turns are to be treated as either protected (signalized left-turn arrow) or permissive (no left-turn arrow). If existing condition allows a left-turn movement to be both protected and permissive, analyze as protected (only) in CMS.

P.3.2.1 Concurrent Lefts

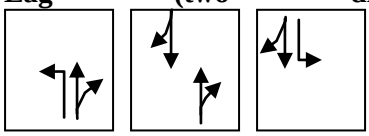


Account for Left Turn Credit (LTC) as follows:

- Calculate lane volumes for left-turn moves
- Apply lane-use factor
- Calculate difference of lefts (e.g. NB/SB lefts or EB/WB lefts)
- Subtract this difference from the through movement that's in the same direction as the greater left-turn volume.

CMS may over or underestimate the impact of left turn traffic on shared left-through-right lane in situations where through opposing volume is high. Additional Analysis (such as the methods of the *Highway Capacity Manual)* may be warranted.

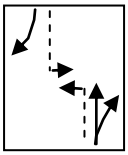
P.3.2.2 Lead Left (one direction), or Lead-Lag (two directions)



Account for Left Turn Credit (LTC) as follows:

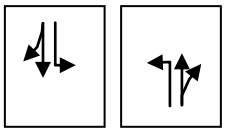
- Identify left-turn volume associated with the lead (or lag) phase.
- Apply lane-use factor.
- Subtract that left-turn volume from the through movement on the same approach.

P.3.2.3 Permissive Only Lefts (no left-turn arrow)



Account for Opposing Lefts (OL) as follows:

- Identify left-turn volume that will be awaiting gaps in the through volume. (These lefts are considered "opposing lefts" – opposing the through volume being analyzed.)
- Add that left-turn volume to the opposing through movement.
- The left turns cannot move until the opposing through movement is complete. So you must consider the total of these two movements, since they cannot move simultaneously.



P.3.2.4 Split Phasing

- Left-turn credit (LTC) does not apply.
- Opposing lefts (OL) do not apply.

P.4 SIGNAL TIMING

CMS can be used as a prerequisite to signal timings. The following steps follow CMS to determine cycle length and required green and clearance (yellow and all red) time:

Step 1. Transfer phasing and Critical Lane Volume (CLV) Inputs from CMS worksheet onto the Traffic Signal Timing Worksheet (see Figure P-2)

Step 2. Determine number of vehicles per cycle per phase. The table included in the Traffic Signal Timing Worksheet can be used to determine the number of cycles in an hour (or simply divide 3600 seconds by the cycle length).

Step 3. Determine green time required from Greenshield's model (see Figure P-3)

Step 4. Determine clearance and pedestrian timings.

Step 5. Determine total time required and compare to cycle length.

P.5 CMS SAMPLE EXERCISE PROBLEMS

See Figures P-5 through P-14 for CMS sample exercise problems.

P.6 SIGNAL TIMING SAMPLE EXERCISE PROBLEM

See Figure P-16 for a sample signal timing exercise problem.

Figure P-2 Traffic Signal Timing Worksheet

Location: _____ Date: _____

Cycle Length: _____ Cycles per Hour: _____ Prepared by: _____

Time of Day: _____

Phases	Movement	Critical lane Volume (CLV)	Vehicles per Cycle	Green Time Required (see Greenshield Figure P-3)	Clearance (Red + Yellow)	Walk + Don't Walk

Total Green			
Total Clearance			
Total Time Required			

Cycle Length	Cycles per Hour
45	80
60	60
75	48
90	40
100	36
120	30
150	24
180	20
210	17
240	15

Figure P-3 Traffic Signal Green Time Requirements (Greenshield's Model)

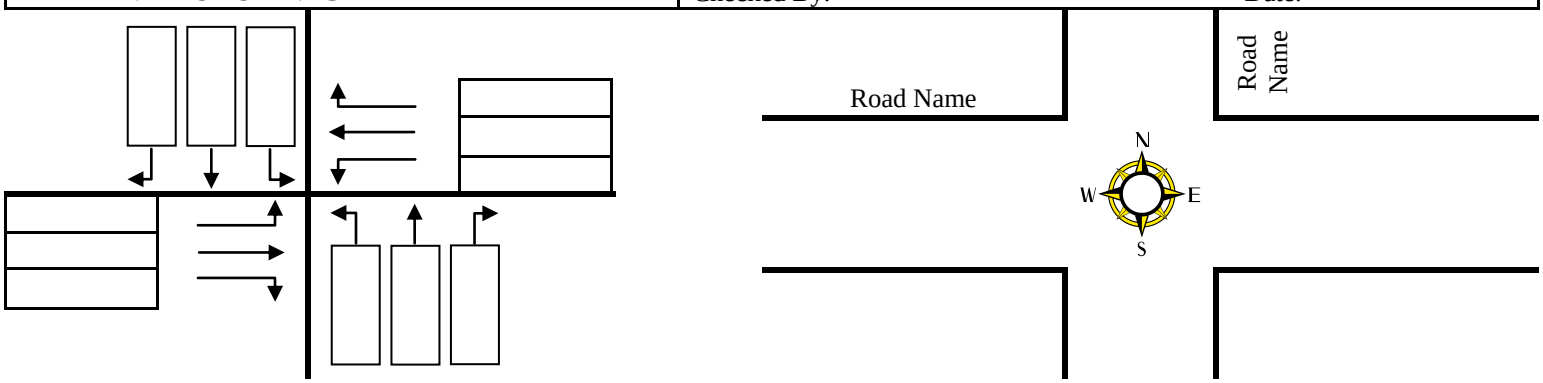
Vehicles per Cycle per lane	Seconds per Vehicle	Cumulative seconds	Vehicles per Cycle per lane	Seconds per Vehicle	Cumulative seconds
1	3.8	3.8	24	2.1	54.1
2	3.1	6.9	25	2.1	56.2
3	2.7	9.6	26	2.1	58.3
4	2.4	12.0	27	2.1	60.4
5	2.2	14.2	28	2.1	62.5
6	2.1	16.3	29	2.1	64.6
7	2.1	18.4	30	2.1	66.7
8	2.1	20.5	31	2.1	68.8
9	2.1	22.6	32	2.1	70.9
10	2.1	24.7	33	2.1	73.0
11	2.1	26.8	34	2.1	75.1
12	2.1	28.9	35	2.1	77.2
13	2.1	31.0	36	2.1	79.3
14	2.1	33.1	37	2.1	81.4
15	2.1	35.2	38	2.1	83.5
16	2.1	37.3	39	2.1	85.6
17	2.1	39.4	40	2.1	87.7
18	2.1	41.5	41	2.1	89.8
19	2.1	43.6	42	2.1	91.9
20	2.1	45.7	43	2.1	94.0
21	2.1	47.8	44	2.1	96.1
22	2.1	49.9	45	2.1	98.2
23	2.1	52.0	46	2.1	100.3

Figure P-4 CMS Blank Sheet

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:
Count Date:
Scenario:
Computed By: Date:
Checked By: Date:



Signal Phasing (Φ)

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)

Remarks:

TOTAL:

LEVEL OF SERVICE:

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

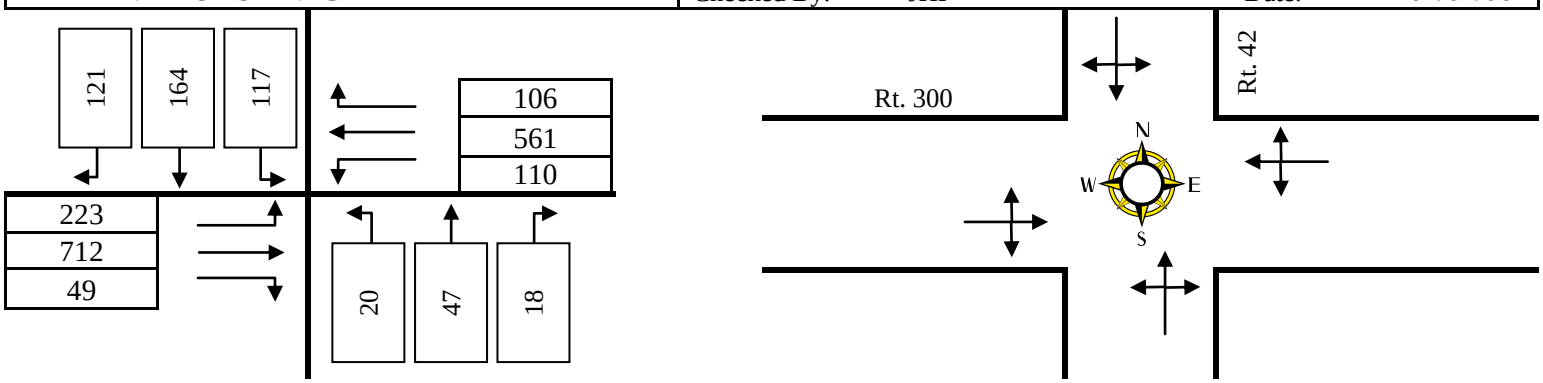
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-5 CMS Example 1 – Permissive Lefts – Shared Lefts

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts – Shared lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

2+6	4+8			

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt. 300 EB.	223+712+49	984	1.00	984	110		1094	*
6	Rt. 300 WB.	110+561+106	777	1.00	777	223		1000	
4	Rt. 42 SB.	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB.	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1516
LEVEL OF SERVICE:	E

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

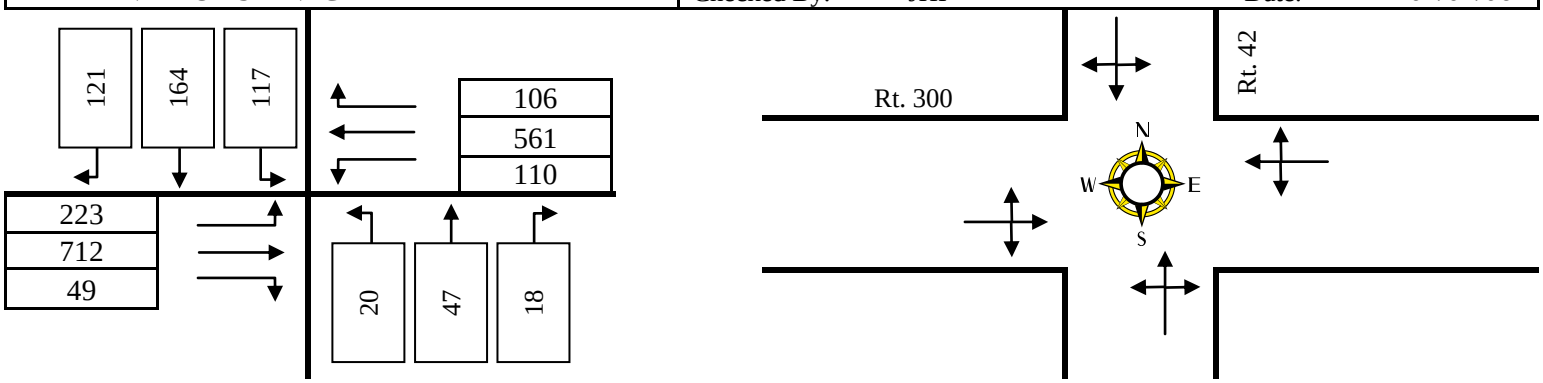
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-6 CMS Example 2 – Split E-W Phasing – Shared Lefts

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Split E-W Phasing – Shared lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

1	2	4+8		

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 EB.	223+712+49	984	1.00	984			984	*
2	Rt. 300 WB.	110+561+106	777	1.00	777			777	*
4	Rt. 42 SB.	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB.	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	2183
LEVEL OF SERVICE:	F

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

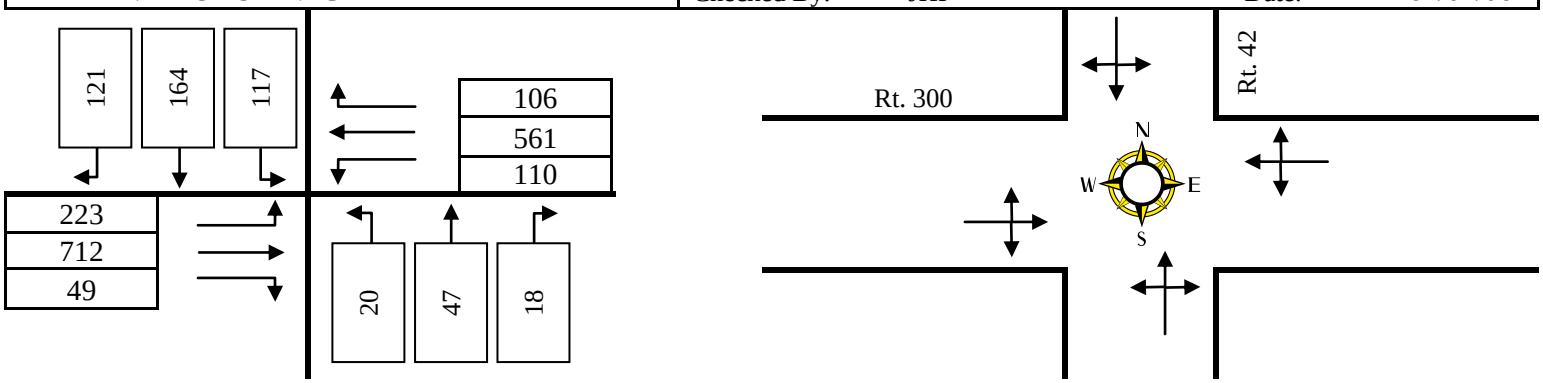
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-7 CMS Example 3 – Split All Phasing – Shared Lefts

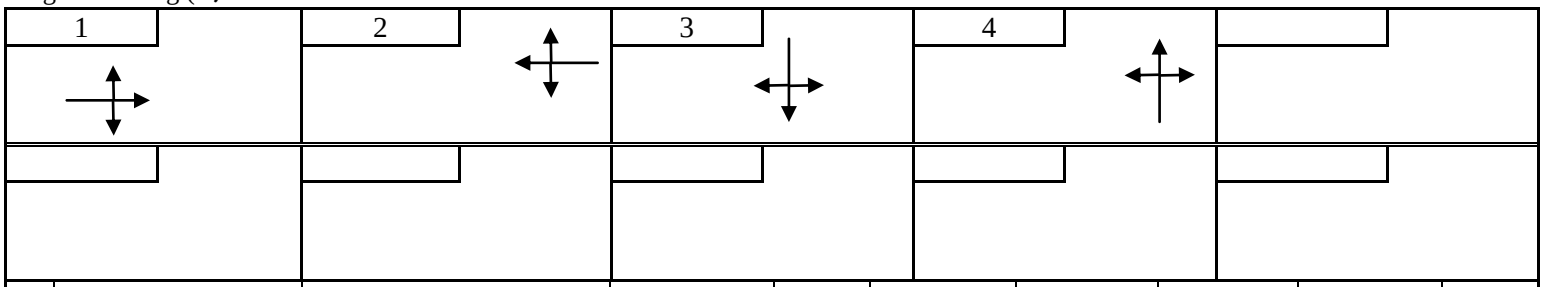
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Split All Phasing - Shared Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 EB.	223+712+49	984	1.00	984			984	*
2	Rt. 300 WB.	110+561+106	777	1.00	777			777	*
3	Rt. 42 SB	117+164+121	402	1.00	402			402	*
4	Rt. 42 NB	20+47+18	85	1.00	85			85	*

Remarks:

TOTAL:	2248
LEVEL OF SERVICE:	F

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

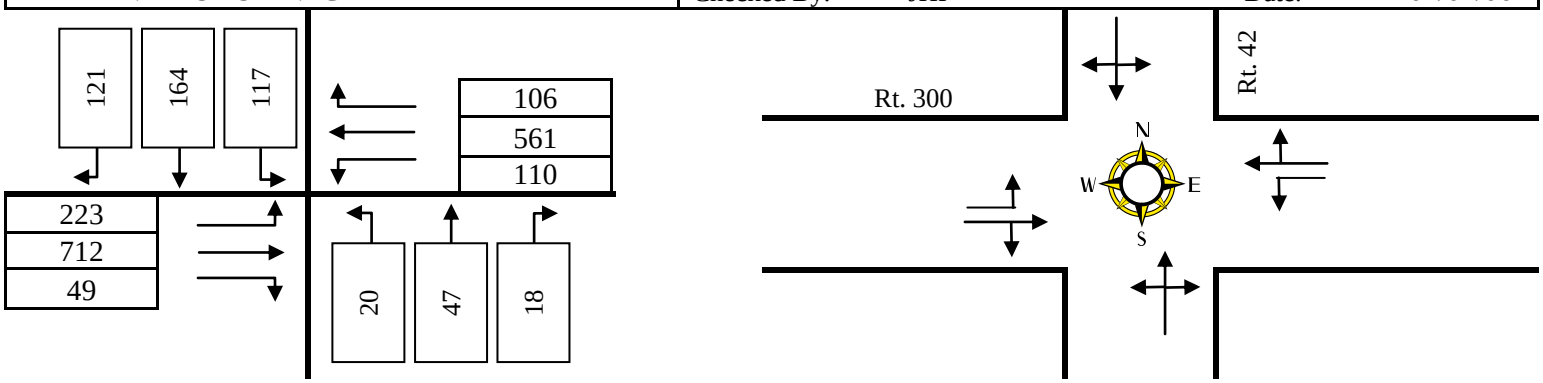
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-8 CMS Example 4 – Permissive Lefts – Separate Lefts

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts - Separate Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

2+6	4+8			

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt.300 EB.	712+49	761	1.00	761	110		871	
6	Rt. 300 WB.	561+106	667	1.00	667	223		890	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1312
LEVEL OF SERVICE:	D

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

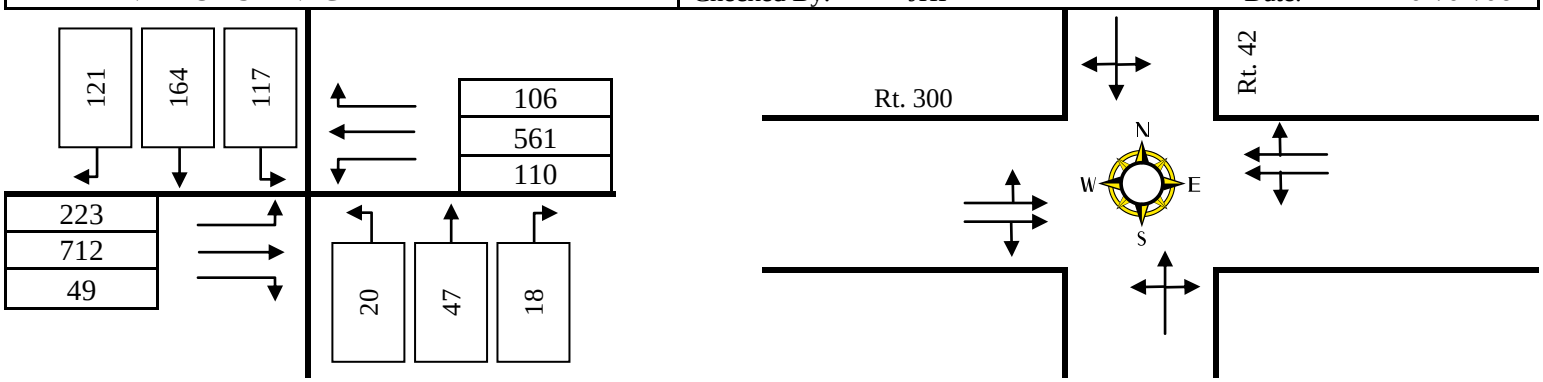
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-9 CMS Example 5 – Permissive Lefts – Two Throughs and a Shared Left

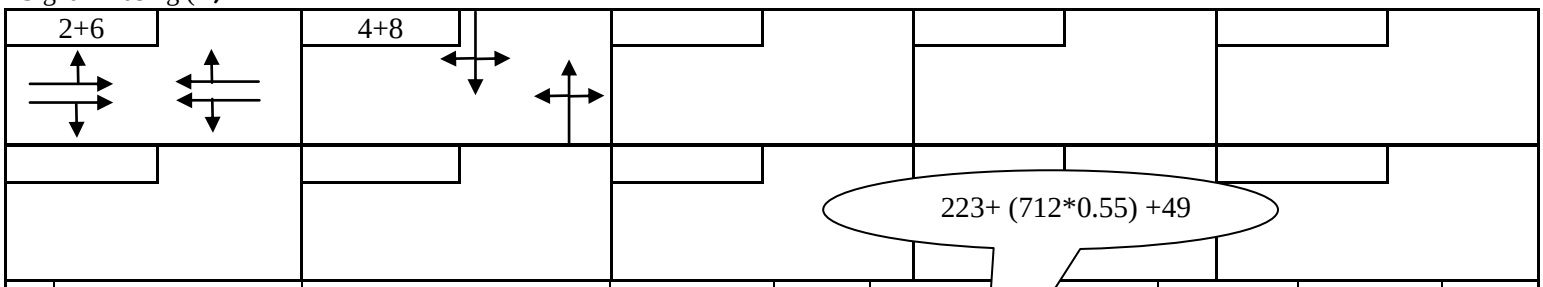
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Permissive Lefts – Two Throughs and a Shared Left		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



223+ (712*0.55) +49

110+ (561*0.55) +106

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
2	Rt.300 EB.				664	110		774	*
6	Rt. 300 WB.				525	223		748	
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1196
LEVEL OF SERVICE:	C

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

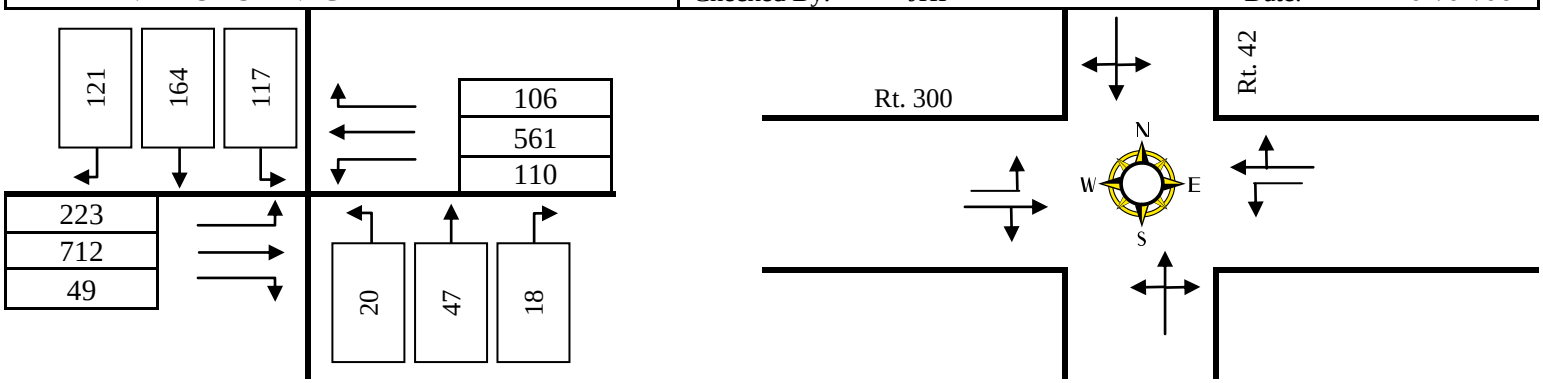
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-10 CMS Example 6 – Protected Lefts – Separate Lefts

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Protected Lefts – Separate Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

1+5	2+6	4+8		

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	1.00	110			110	
5	Rt.300 EB.	223	223	1.00	223			223	*
2	Rt.300 EB.	712+49	761	1.00	761		113	648	
6	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

TOTAL:	1312
LEVEL OF SERVICE:	D

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

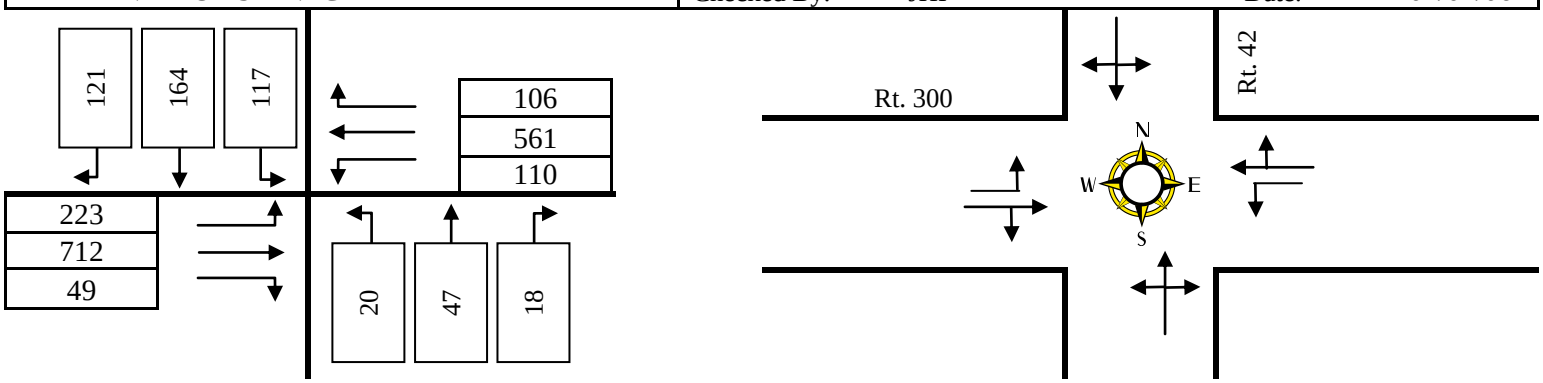
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-11 CMS Example 7 – Split EW – Separate Lefts

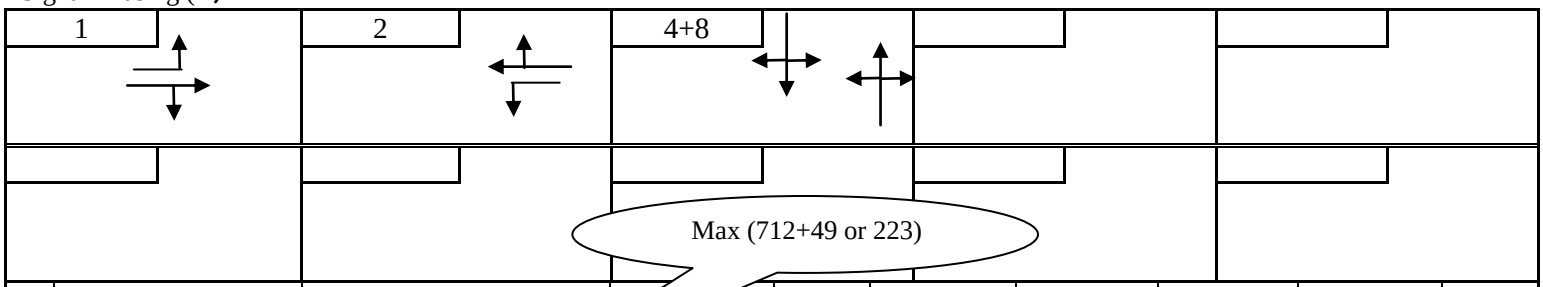
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Split EW – Separate Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt.300 EB.	712+49	761	1.00	761			761	*
2	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	
Remarks:						TOTAL:		1850	
						LEVEL OF SERVICE:		F	

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

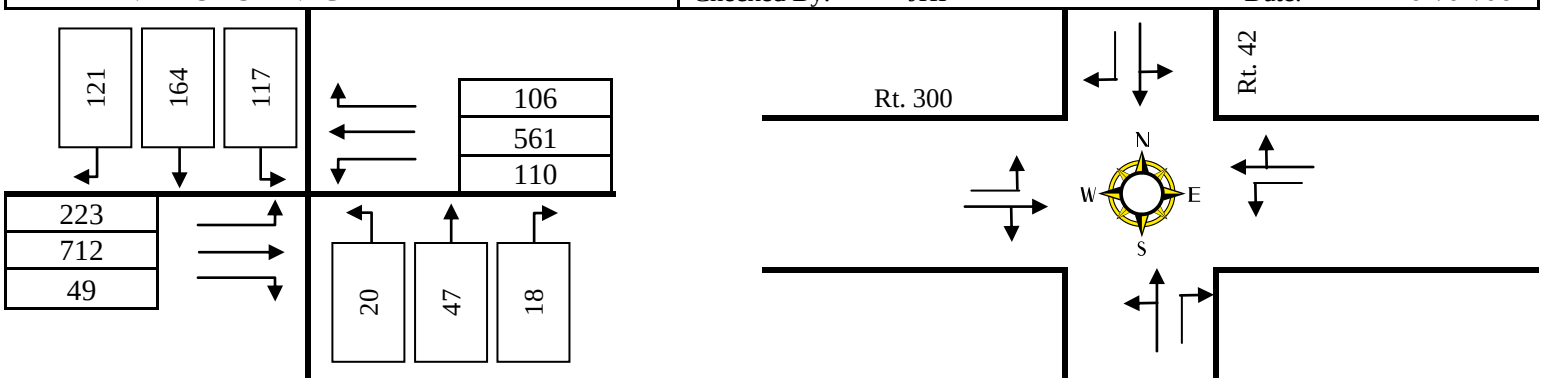
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-12 CMS Example 8 – Protected Permissive Lefts – Separate Lefts – Separate Rights

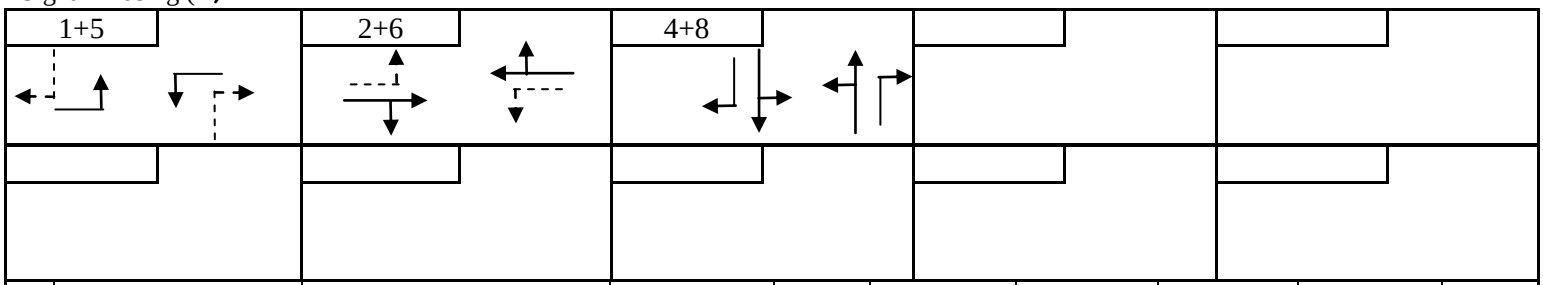
DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Protected Permissive Lefts – Separate Lefts – Separate Rights		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)



Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	1.00	110			110	
5	Rt.300 EB.	223	223	1.00	223			223	*
2	Rt.300 EB.	712+49	761	1.00	761		113	648	
6	Rt. 300 WB.	561+106	667	1.00	667			667	*
4	Rt. 42 SB	117+164	281	1.00	281	20		301	*
8	Rt. 42 NB	20+47	67	1.00	67	117		184	

Remarks:

TOTAL:	1191
LEVEL OF SERVICE:	C

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

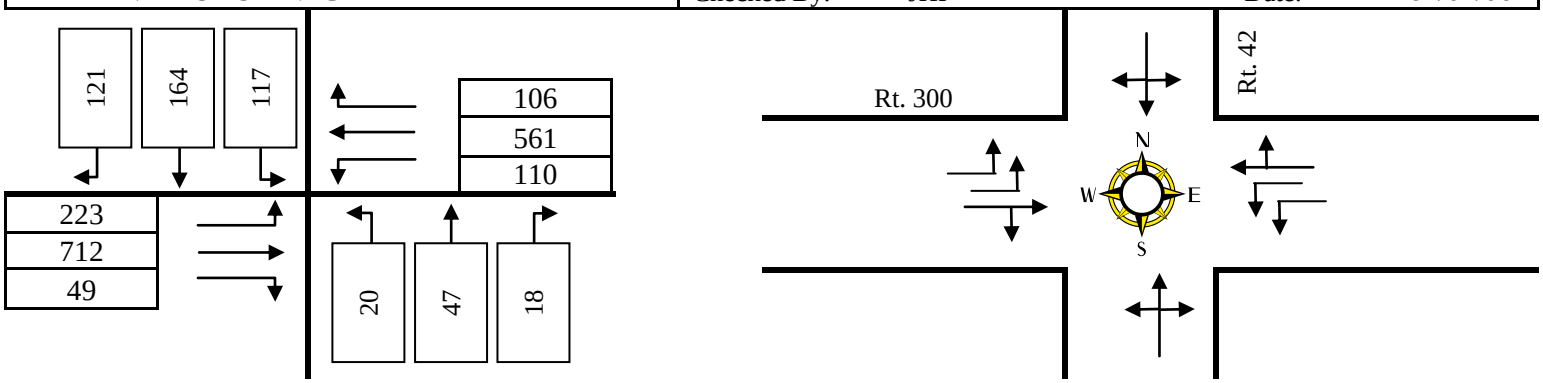
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-13 CMS Example 9 – Protected Lefts – Double Lefts

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Protected Lefts –Double Lefts		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

1+5	2+6	4+8		

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
1	Rt. 300 WB.	110	110	0.55	66			66	
5	Rt.300 EB.	223	223	0.55	123			123	*
2	Rt.300 EB.	712+49	761	1.00	761		62	699	*
6	Rt. 300 WB.	561+106	667	1.00	667			667	
					= (223*0.55)-(110*0.55)				
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	
Remarks:						TOTAL:		1244	
						LEVEL OF SERVICE:		C	

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

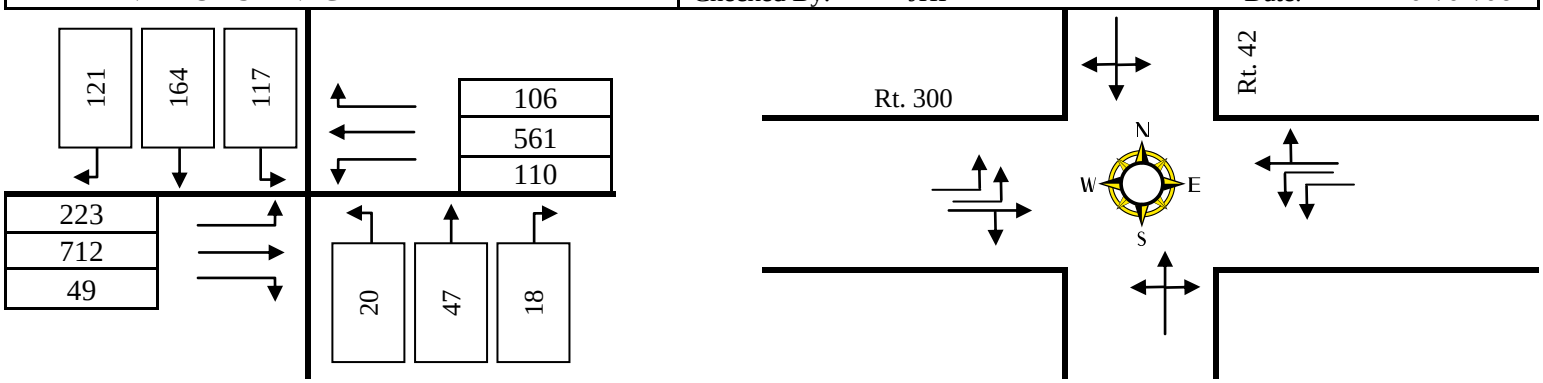
LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-14 CMS Example 10 – Lead-Lag Phasing

DelDOT

CRITICAL LANE MOVEMENT SUMMATION AND LEVEL OF SERVICE

Location:	Rt. 300 and Rt. 42		
Count Date:	12/25/2005		
Scenario:	Existing – Lead-Lag Phasing		
Computed By:	ABC	Date:	01/01/06
Checked By:	JHI	Date:	01/02/06



Signal Phasing (Φ)

5	2+6	1	4+8	

Φ	Movement	Volume		LU	Lane Volume	OL (Add)	LTC (Subtract)	Critical Lane Volume	CM (*)
5	Rt.300 EB.	223	223	0.55	123			123	*
2	Rt.300 EB.	712+49	761	1.00	761		123	638	*
6	Rt. 300 WB.	106+561	667	1.00	667		61	606	
1	Rt. 300 WB.	110	110	0.55	61			61	*
4	Rt. 42 SB	117+164+121	402	1.00	402	20		422	*
8	Rt. 42 NB	20+47+18	85	1.00	85	117		202	

Remarks:

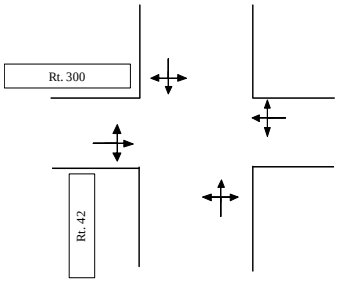
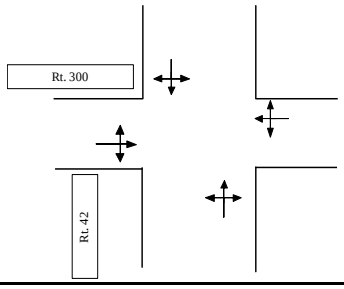
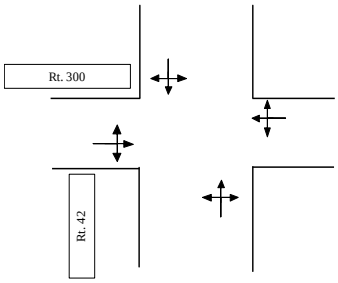
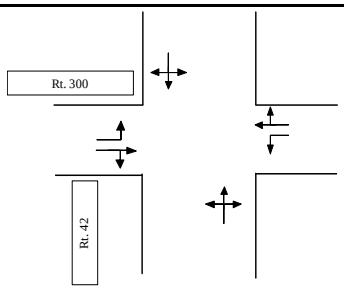
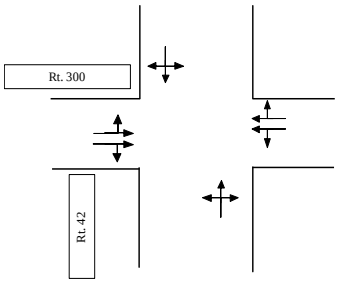
TOTAL:	1244
LEVEL OF SERVICE:	C

Level	Critical Movement Volume
A	Less than 1,000 veh/hr
B	1,000 to 1,150 veh/hr
C	1,151 to 1,300 veh/hr
D	1,301 to 1,450 veh/hr
E	1,451 to 1,600 veh/hr
F	More than 1,600 veh/hr

No. of Lanes	Lane Use factor (LU)
1	1.00
2	0.55
3	0.40
4	0.30

LEGEND	
OL =	Opposing Lefts
LTC =	Left Turn Credit

Figure P-15 Summary of Exercises

Exercise	Picture	Phasing	Number of critical movements	Results	
				Critical Movement Summation	LOS
1		Simple 2-phase (permissive lefts)	2	1516	E
2		Split E-W	3	2183	F
3		Split all	4	2248	F
4		Simple 2-phase (permissive lefts)	2	1312	D
5		Simple 2-phase (permissive lefts)	2	1196	C

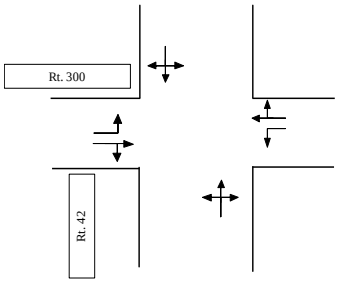
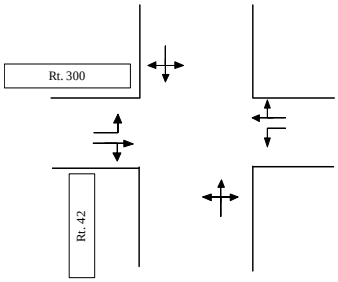
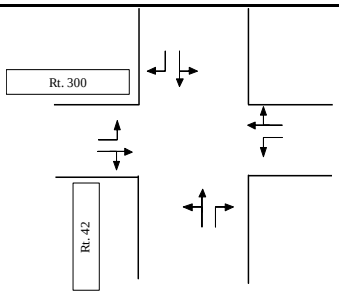
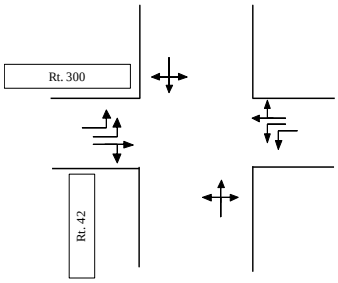
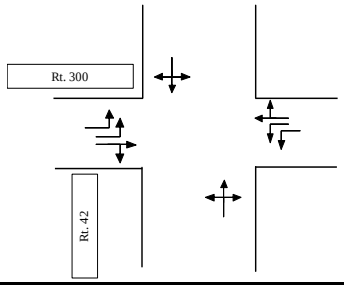
Exercise	Picture	Phasing	Number of critical movements	Results	
				Critical Movement Summation	LOS
6		Exclusive concurrent E-W lefts	3	1312	D
7		Split E-W	3	1850	F
8		Exclusive concurrent E-W lefts with N-S rights	3	1191	C
9		Exclusive concurrent E-W lefts	3	1255	C
10		Lead-Lag E-W	3	1611	F

Figure P-16 Traffic Signal Timing Exercise

Location: Rt. 300 and Rt. 42 Date: 01/01/06

Cycle Length: 100 Cycles per Hour: 36 Prepared by: ABC 01/01/06

Time of Day: AM Peak Hour Checked by: JHI 01/02/06

Phases	Movement	Critical lane Volume (CLV)	Vehicles per Cycle	Green Time Required (see Greenshield Figure P-3)	Clearance (Red + Yellow)	Walk + Don't Walk
2+6	Rt. 300	1094	30	67	3+2	-
4+8	Rt. 42	422	12	29	3+2	-

Total Green	96		
Total Clearance	10		
Total Time Required	106		

Cycle Length	Cycles per Hour
45	80
60	60
75	48
90	40
100	36
120	30
150	24
180	20
210	17
240	15

Appendix Q ***Requirements for Submitting Subdivision Plans to Bridge Design for Review***

- For DelDOT's Bridge Design Section to review any submission, the developer's plan submission **must at a minimum** include the following:
  1. Geotechnical Report
     For all structures requiring a review by DelDOT's Bridge Design Section, a Geotechnical Report must be submitted. Requirements can be found in DelDOT's *Bridge Design Manual* (found on DelDOT's website or purchased from DelDOT.
  2. Hydraulic Report
     For all structures carrying a roadway over a body of water, a Hydraulic Report must be submitted. Requirements can be found in DelDOT's *Bridge Design Manual*.
  3. Appropriate Plans and Details
     Plans musts include all necessary details, notes, and specifications for the construction of the proposed structure such that an adequate review can be performed. These plans must be submitted well in advance of the final submission. Shop drawings must also be submitted for concurrence in advance of the construction. Plans and details shall be in accordance with DelDOT's *Bridge Design Manual*.
  4. All Necessary Calculations
     All designs must be performed in accordance with the latest version of AASHTO's *LRFD Bridge Design Specifications*. Calculations must be provided for all structural elements and must be clear, thorough, and easy to follow. The design of all structural elements must be included in the calculations. Submitting only input and output for computer programs is acceptable **only** if the computer program is pre-approved for use by DelDOT's Bridge Design Engineer. All proprietary structures (i.e., ConSPAN, etc.) must include documentation of the proprietary computer used for the design. Any assumptions made must be highlighted in the design calculation packet.
  5. Load Ratings
     Load ratings in accordance with DelDOT's *Bridge Design Manual* must be submitted for all bridges. The definition of a "bridge" is included in DelDOT's *Bridge Design Manual*.
  6. Constructability
     The proposal must consider constructability in the design. A detailed sequence of construction shall be included with the submission. The Sequence of Construction shall include maintenance of traffic, stream diversion, erection procedures, and any other information pertinent to the construction of the structure. Section 2.5.3 of DelDOT's *Bridge Design Manual* must be addressed in the Sequence of Construction.
- The above items are the **minimum** requirements for any submission for a development or subdivision. If any of these items are not included, the submittal **will be returned without review**.

- In addition to the above submittal requirements, all requirements noted in DelDOT's *Bridge Design Manual* must be met. The manual provides information regarding the design and detailing required by DelDOT. Failure to meet these requirements will result in returning the submittal for revision.

Design of Catch Basins

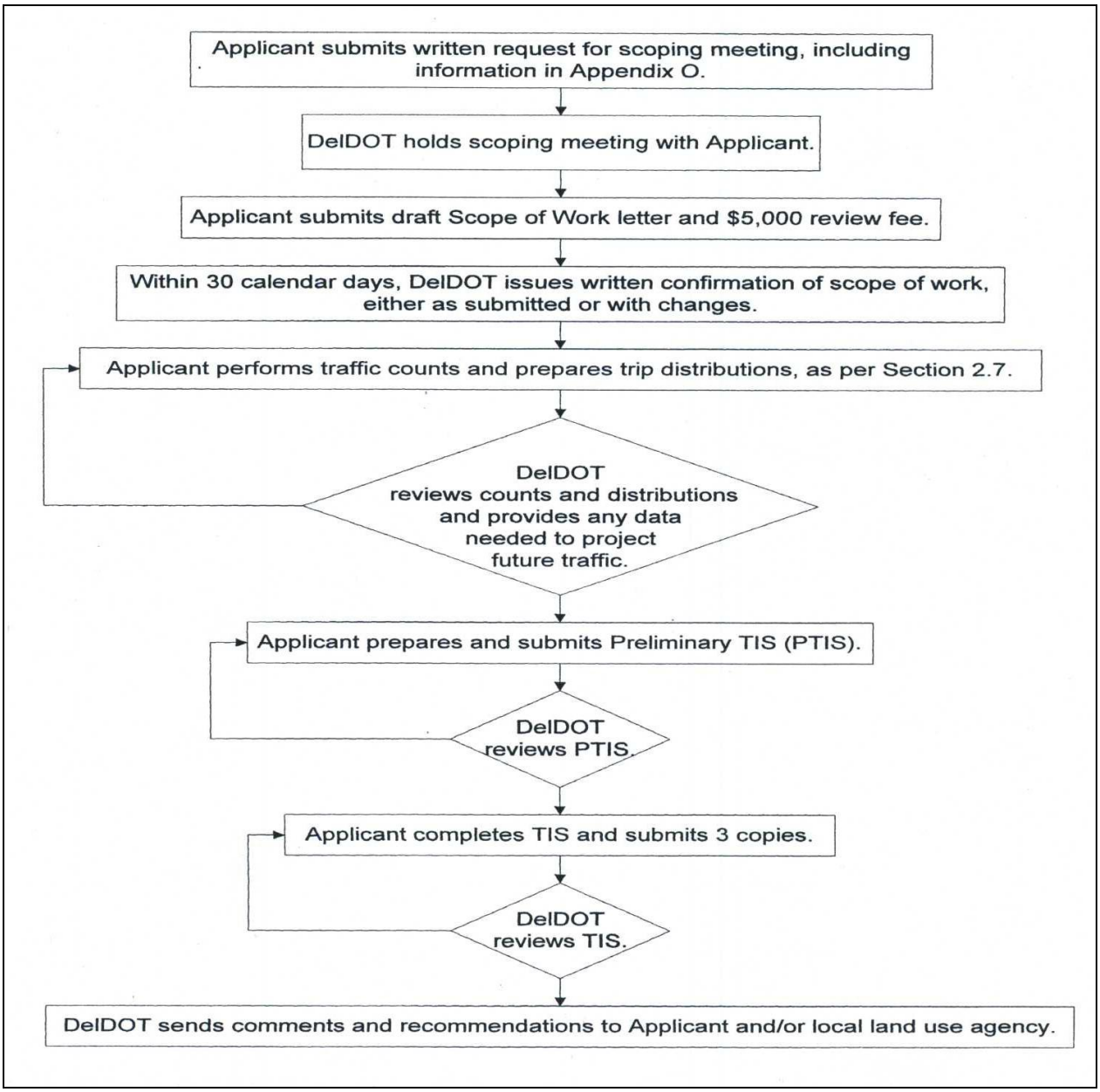
Assumptions:

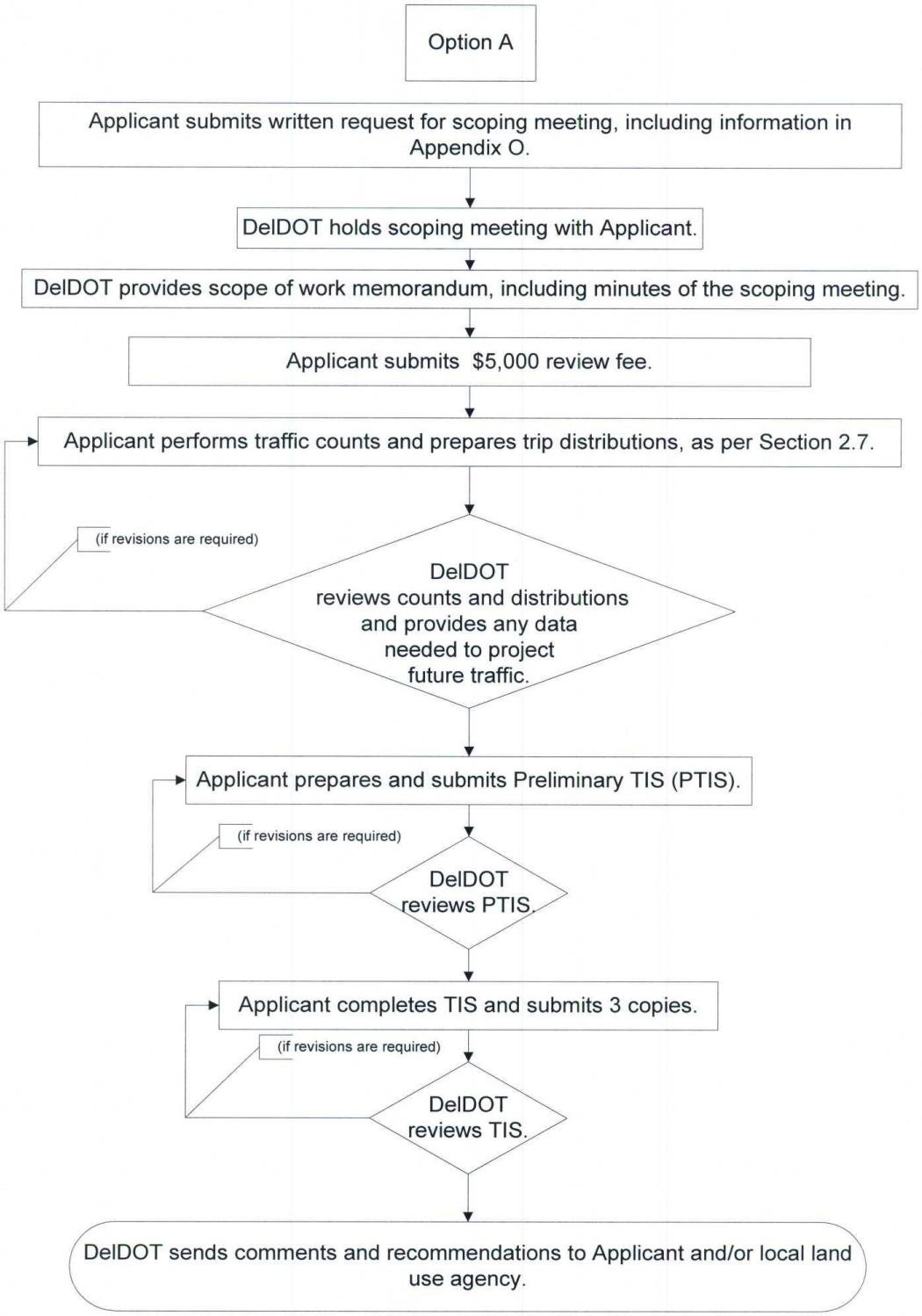
- Minimum Unit Weight of Soil and Soil Surcharge = 125 pounds per cubic foot.
- Minimum Submerged Unit Weight of Soil = 70 pounds per cubic foot
- Minimum Unit Weight of Reinforced Concrete = 150 pounds per cubic foot
- Maximum Soil Friction Angle = 30 degrees
- Water is present to the top of the roadway
- Lateral soil pressures are At-Rest

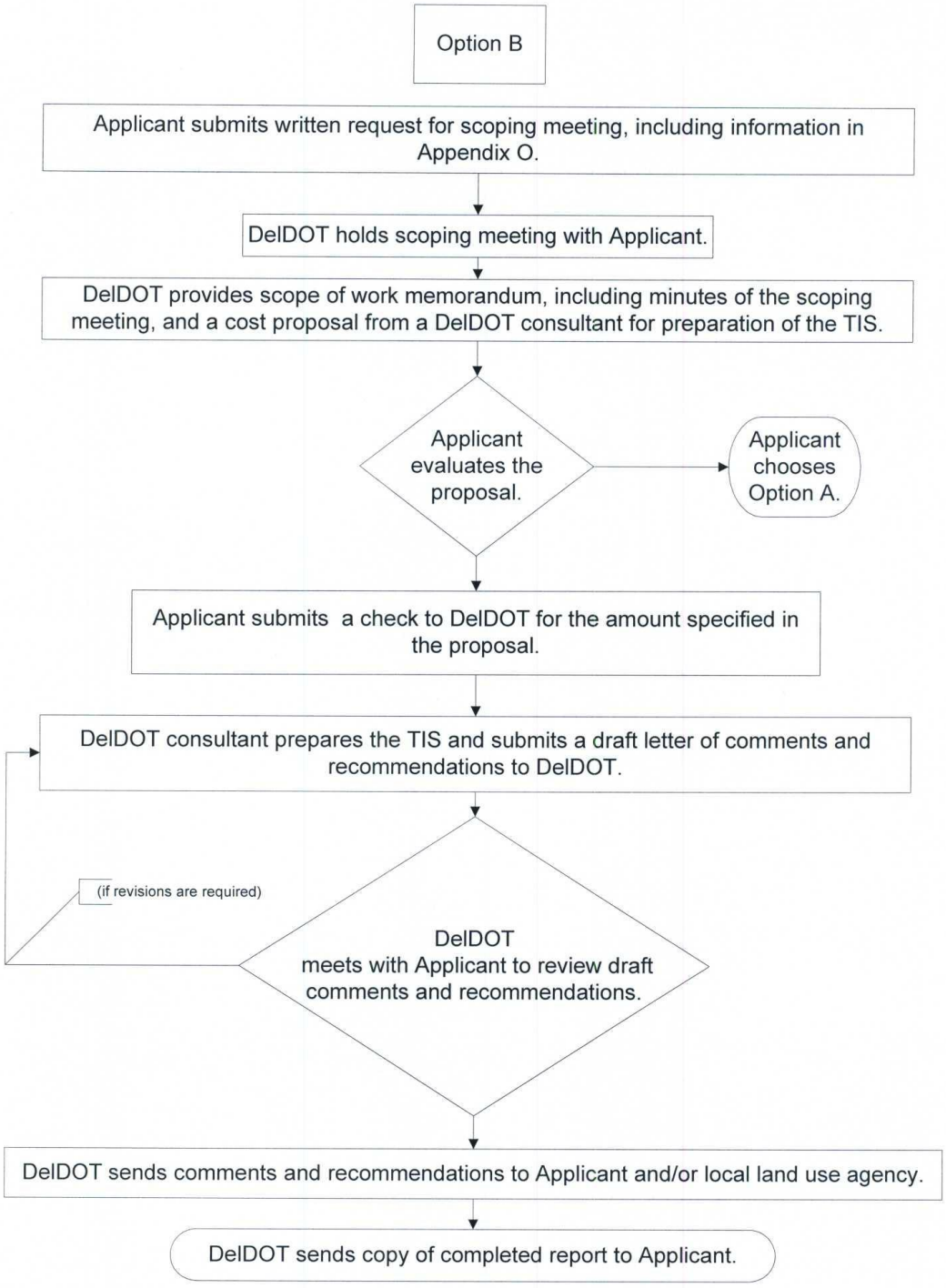
Design

- Current edition of AASHTO LRFD Bridge Design Specifications with interims
  - Live Load shall be HL-93
  - Live Load surcharge shall be determined assuming catch basin is a retaining wall with the traffic against the back face of the wall
  - Design for Strength
  - Design for Service
  - Design for Temperature and Shrinkage
  - Design for Shear
  - Check Fatigue (Top Slab Only)
  - Check Maximum and Minimum Reinforcement Limitations
  - Check development of reinforcement
- Wall Sections act as simple spans between corners
- Bottom 3' of wall acts as cantilever
- Bottom Slab acts 1-way as a simple span
  - Walls are solid
  - Full Live Load
  - Soil Reaction is uniform
  - No water is in basin

Appendix R ***Traffic Impact Study Flowchart***




Option A
Applicant submits written request for scoping meeting, including information in Appendix O.
DelDOT holds scoping meeting with Applicant.
DelDOT provides scope of work memorandum, including minutes of the scoping meeting.
Applicant submits $5,000 review fee.
Applicant performs traffic counts and prepares trip distributions, as per Section 2.7.
(if revisions are required)
DelDOT reviews counts and distributions and provides any data needed to project future traffic.
Applicant prepares and submits Preliminary TIS (PTIS).
(if revisions are required)
DelDOT reviews PTIS.
Applicant completes TIS and submits 3 copies.
(if revisions are required)
DelDOT reviews TIS.
DelDOT sends comments and recommendations to Applicant and/or local land use agency.


Option B
Applicant submits written request for scoping meeting, including information in Appendix O.
DelDOT holds scoping meeting with Applicant.
DelDOT provides scope of work memorandum, including minutes of the scoping meeting, and a cost proposal from a DelDOT consultant for preparation of the TIS.
Applicant evaluates the proposal.
Applicant chooses Option A.
Applicant submits a check to DelDOT for the amount specified in the proposal.
DelDOT consultant prepares the TIS and submits a draft letter of comments and recommendations to DelDOT.
(if revisions are required)
DelDOT meets with Applicant to review draft comments and recommendations.
DelDOT sends comments and recommendations to Applicant and/or local land use agency.
DelDOT sends copy of completed report to Applicant.

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A

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