

Town of Dallas

Street and Traffic Standards Policy

Table of Contents

Street Standards Details

S-100: Local Residential Street (20 or less lots)

S-100U: Local Residential Street Utility Layout

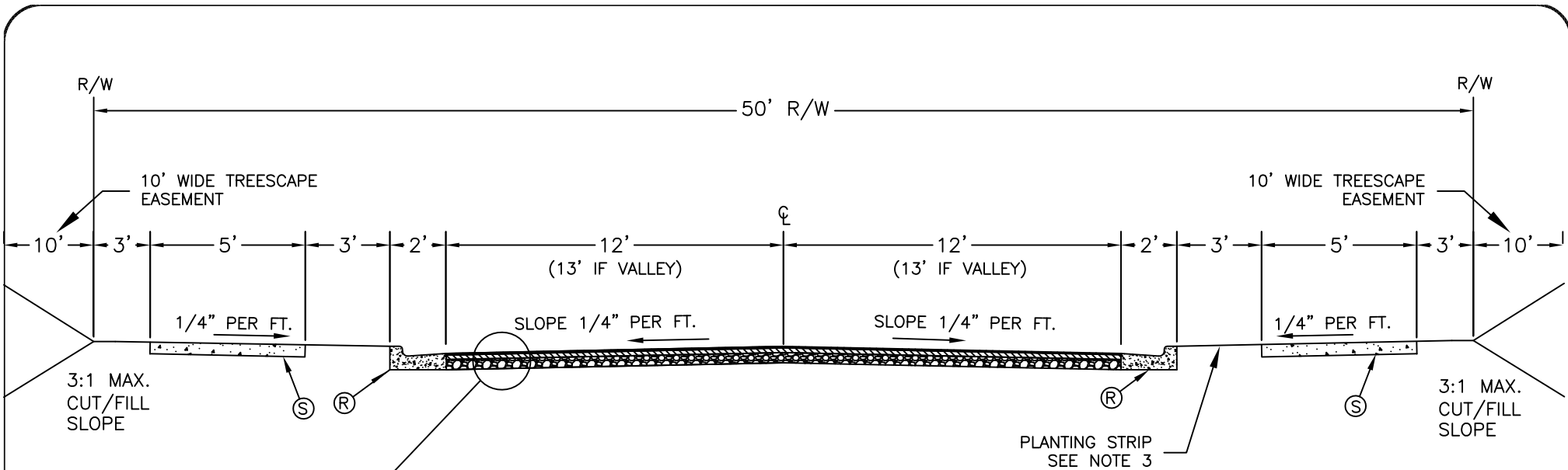
S-101: Local Residential Street (21-80 lots)

S-102: Local Collector/ Commercial Street (>80 lots and/or 2+
intersections) S-103: Local Industrial Street

S-104: Local Residential Cul-De-Sac Detail

S-105: Local Residential Street- Variable Width Option

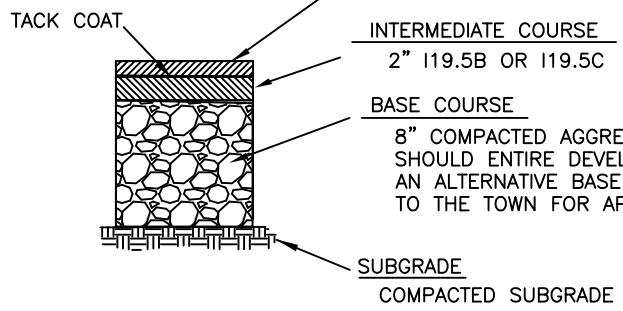
Traffic Impact Analysis Requirements



SURFACE COURSE
1" S9.5B

FINAL LIFT TO BE APPLIED UPON MEETING ONE OF THE FOLLOWING CONDITIONS:
1) 75% DEVELOPMENT OCCUPANCY,
2) 1 YEAR FROM INTERMEDIATE COURSE PLACEMENT,

- NOTES:**
- FOR EXPLANATION OF RIGHT-OF-WAY WIDTHS REFER TO TOWN OF DALLAS SUBDIVISION ORDINANCE.
 - ZONING SETBACKS MEASURED FROM R/W
 - PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN MAY AUTHORIZE A SUITABLE GRADE.



TYPICAL PAVEMENT SECTION

- KEY**
- (R) 2' STANDARD CURB AND GUTTER OR 2'-0" VALLEY GUTTER WITH APPROVAL
 - (S) 4" THICK CONCRETE SIDEWALK

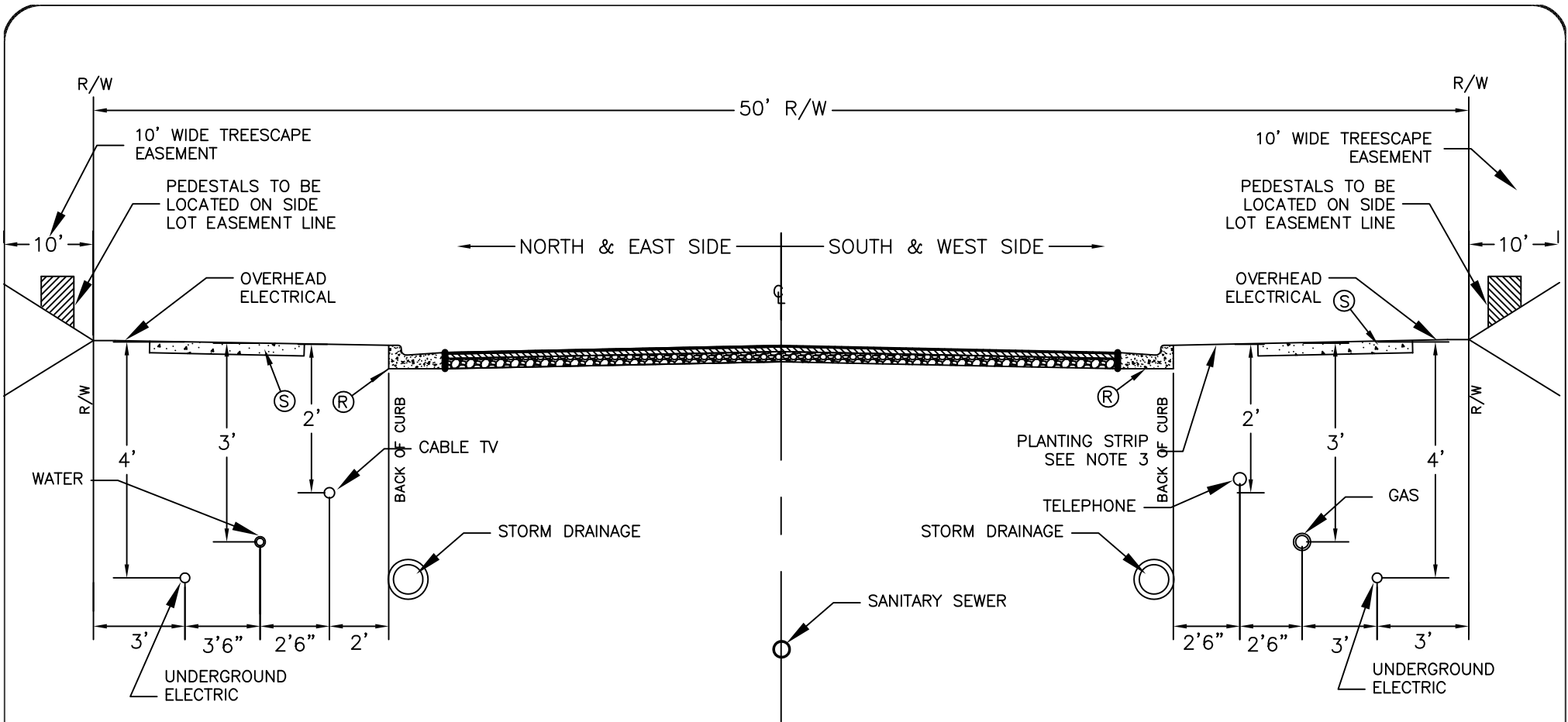
NOT TO SCALE

*NO ON STREET PARKING ALLOWED
*SERVING NO MORE THEN 50 LOTS

**TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ**

**LOCAL RESIDENTIAL STREET
TYPICAL SECTION**

STD. NO.	REV.
S-100	19



KEY

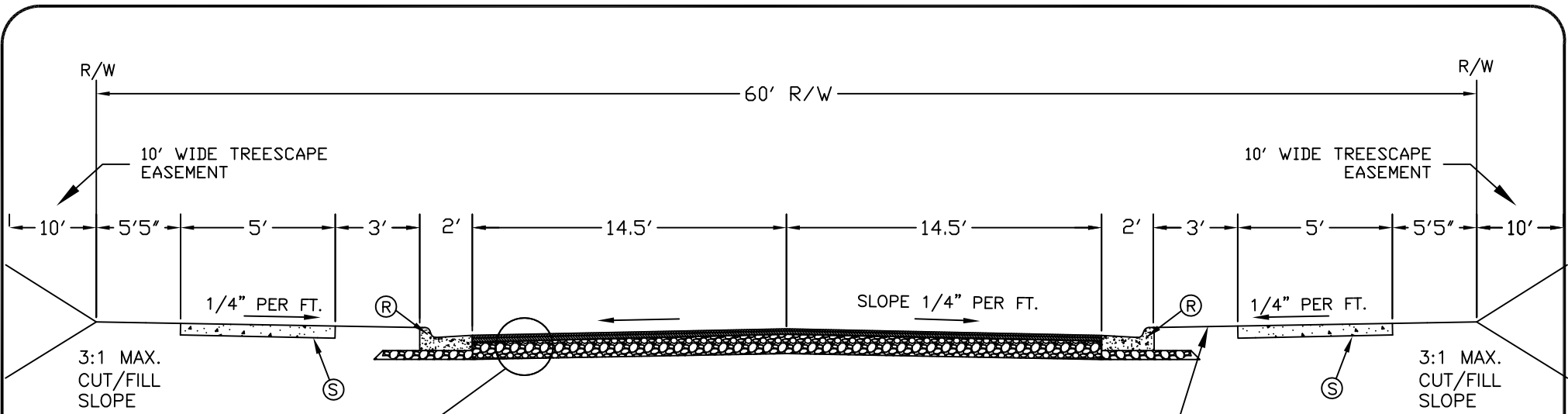
- (R) 2' STANDARD CURB AND GUTTER OR 2'-0" VALLEY GUTTER WITH APPROVAL
- (S) 4" CONCRETE SIDEWALK

NOT TO SCALE

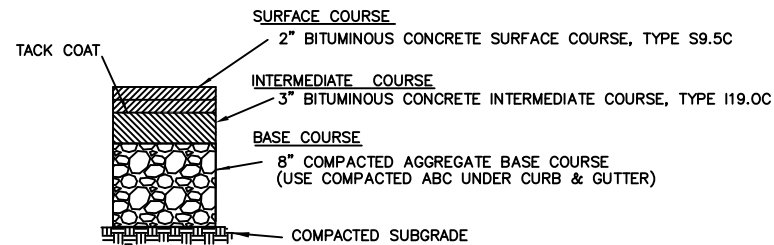
**TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ**

LOCAL RESIDENTIAL STREET
TYPICAL UTILITY LAYOUT

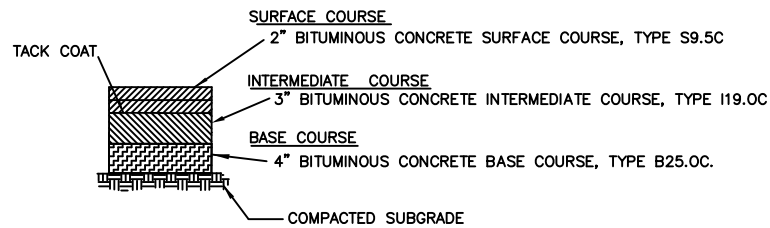
STD. NO.	REV.
S-100U	19



EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:



TYPICAL PAVEMENT SECTION WITH STONE BASE



TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION

NOTES:

1. USE OF VALLEY GUTTER IS PROHIBITED.
2. WIDER SIDEWALKS MAY BE REQUIRED UNDER CERTIAN CIRCUMSTANCES.
3. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT DESIGN TO THE TOWN.
4. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY THE TOWN BASED ON SPECIFIC TRAFFIC PARAMETERS.
5. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM THE TOWN.
6. ZONING SETBACKS MEASURED FROM TOTAL R/W.
8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN MAY AUTHORIZE A SUITABLE GRADE.

KEY

- (R) 2' STANDARD CURB AND GUTTER ONLY
- (S) 4" CONCRETE SIDEWALK

*ON STREET PARKING ONE SIDE ALLOWED

*SERVING <50 LOTS OR SERVING +4 INTERSECTIONS

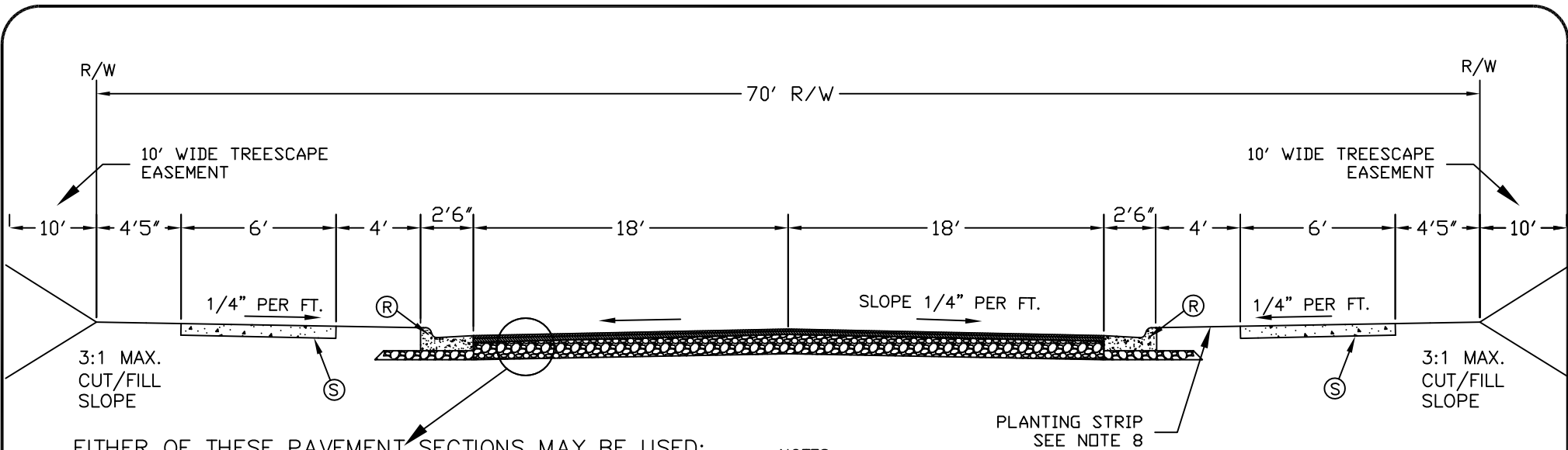
NOT TO SCALE

TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ

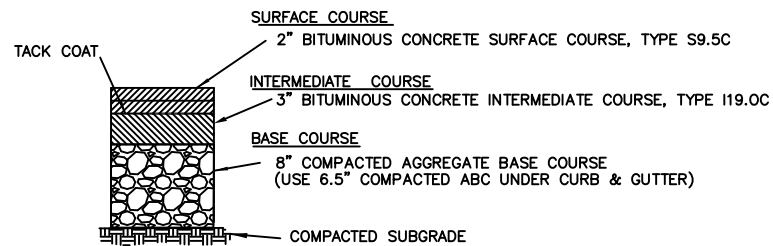
LOCAL COLLECTOR
TYPICAL SECTION

12-2-21

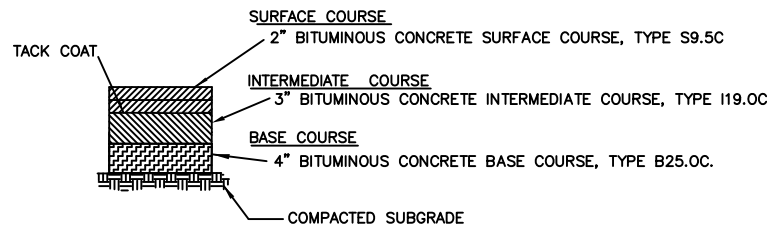
STD. NO.	REV.
S-101	1



EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:



TYPICAL PAVEMENT SECTION WITH STONE BASE



TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION

NOTES:

1. USE OF VALLEY GUTTER IS PROHIBITED.
2. WIDER SIDEWALKS MAY BE REQUIRED UNDER CERTIAN CIRCUMSTANCES.
3. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT DESIGN TO THE TOWN.
4. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY THE TOWN BASED ON SPECIFIC TRAFFIC PARAMETERS.
5. AMENITY ZONE (HARDSCAPE) ALLOWED IN LIEU OF PLANTING STRIP WITH PRIOR APPROVAL FROM THE TOWN.
6. ZONING SETBACKS MEASURED FROM TOTAL R/W.
8. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN MAY AUTHORIZE A SUITABLE GRADE.

KEY

- (R) 2'-6" STANDARD CURB AND GUTTER ONLY
- (S) 4" CONCRETE SIDEWALK

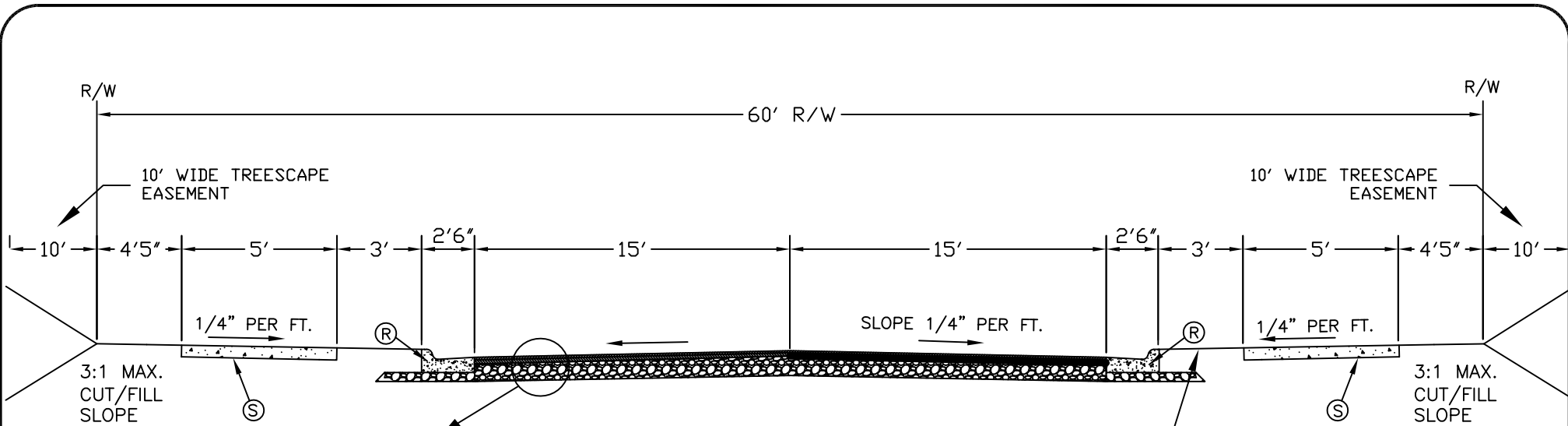
*ON STREET PARKING ONE SIDE ALLOWED

NOT TO SCALE

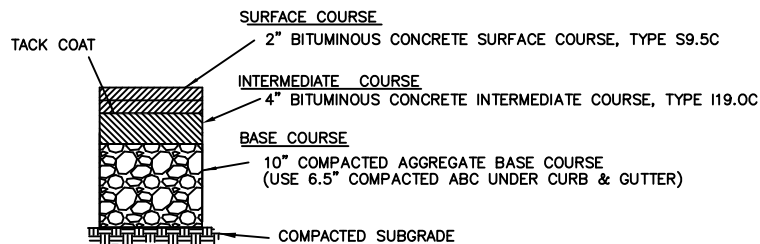
TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ

COMMERCIAL STREET
TYPICAL SECTION

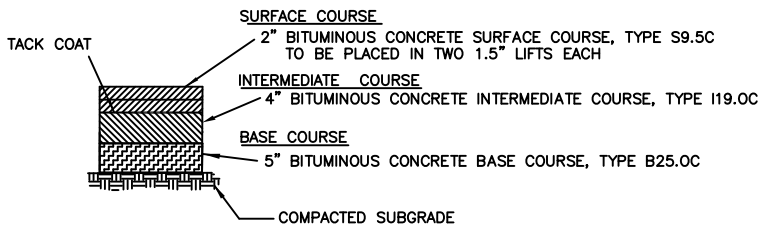
STD. NO.	REV.
S-102	19



EITHER OF THESE PAVEMENT SECTIONS MAY BE USED:



TYPICAL PAVEMENT SECTION WITH STONE BASE



TYPICAL FULL-DEPTH ASPHALT PAVEMENT SECTION

PLANTING STRIP
SEE NOTE 8

NOTES:

1. USE OF VALLEY GUTTER IS PROHIBITED.
2. DEVELOPER MAY SUBMIT AN ALTERNATIVE PAVEMENT DESIGN TO THE TOWN.
3. AN ALTERNATIVE PAVEMENT DESIGN MAY BE REQUIRED BY THE TOWN BASED ON SPECIFIC TRAFFIC PARAMETERS.
4. ZONING SETBACKS MEASURED FROM TOTAL R/W
6. PLANTING STRIP ADJACENT TO SIDEWALK SHALL BE GRADED TO 1/4" PER FOOT (MIN.) UP TO 1 1/4" PER FOOT (MAX.), EXCEPT WHERE EXCESSIVE NATURAL GRADES MAKE THIS REQUIREMENT IMPRACTICAL. IN SUCH CASES, THE TOWN MAY AUTHORIZE A SUITABLE GRADE.

KEY

- (R) 2'-6" STANDARD CURB AND GUTTER
- (S) 4" CONCRETE SIDEWALK

NOT TO SCALE

TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ

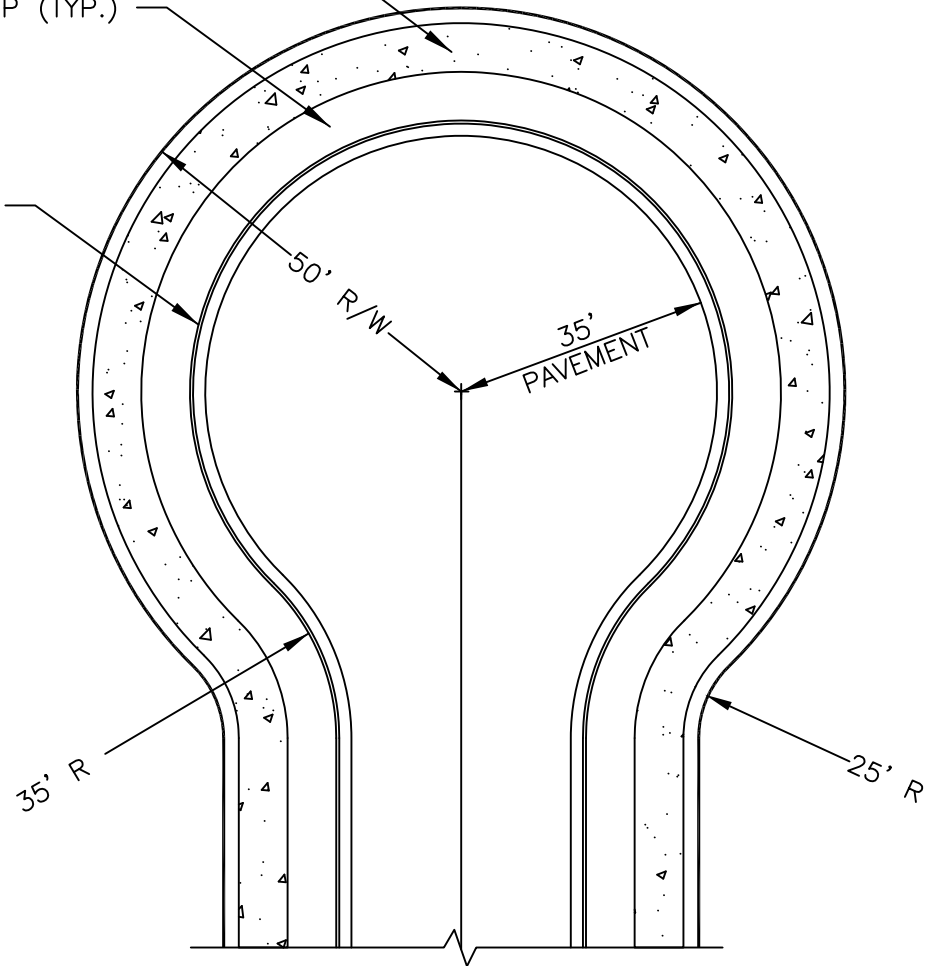
LOCAL INDUSTRIAL STREET
TYPICAL SECTION

STD. NO.	REV.
S-103	19

SIDEWALK (TYP.)

PLANTING STRIP (TYP.)

CURB AND GUTTER (TYP.)



NOTES:

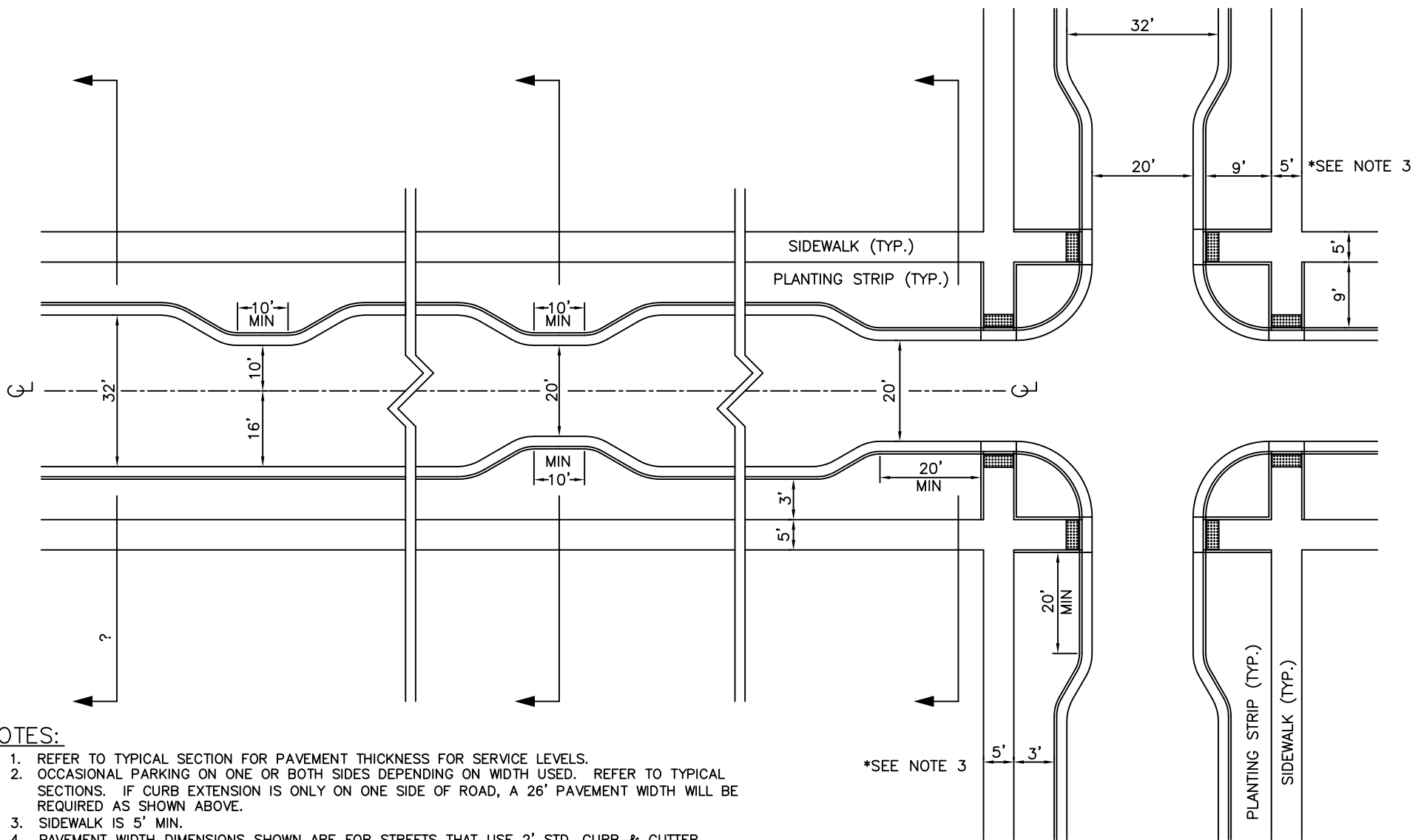
1. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE TOWN FOR REVIEW AND APPROVAL.
2. PAVEMENT SECTION SHALL CONFORM WITH THE DESIGN REQUIREMENTS FOR ADJACENT STREETS.
3. THE CROWN FOR PAVEMENT SHALL HAVE A MINIMUM 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.

NOT TO SCALE

TOWN OF DALLAS
 LAND DEVELOPMENT STANDARDS
 INCLUDES TOWN ETJ

LOCAL RESIDENTIAL CUL-DE-SAC
 TYPICAL DETAIL

STD. NO.	REV.
S-104	19



NOTES:

1. REFER TO TYPICAL SECTION FOR PAVEMENT THICKNESS FOR SERVICE LEVELS.
2. OCCASIONAL PARKING ON ONE OR BOTH SIDES DEPENDING ON WIDTH USED. REFER TO TYPICAL SECTIONS. IF CURB EXTENSION IS ONLY ON ONE SIDE OF ROAD, A 26' PAVEMENT WIDTH WILL BE REQUIRED AS SHOWN ABOVE.
3. SIDEWALK IS 5' MIN.
4. PAVEMENT WIDTH DIMENSIONS SHOWN ARE FOR STREETS THAT USE 2' STD. CURB & GUTTER. ADJUST WIDTHS ACCORDINGLY IF VALLEY GUTTER ARE USED.
5. TAPERS TO BE DONE AS A 2:1 TAPER WITH APPROPREATE RADIUS SO AS TO MAKE SMOTH TRANSITIONS IN AND OUT.

*SEE NOTE 3

NOT TO SCALE

**TOWN OF DALLAS
LAND DEVELOPMENT STANDARDS
INCLUDES TOWN ETJ**

**LOCAL RESIDENTIAL STREET
VARIABLE WIDTH OPTION**

STD. NO.	REV.
S-105	19

TOWN OF DALLAS TRAFFIC IMPACT ANALYSIS REQUIREMENTS

Transportation impacts, and how to mitigate them, are an important consideration for our community when a significant development is proposed. Public policy makers, citizens and developers all have a stake in understanding and responding to additional demands on the transportation system. A Transportation Impact Analysis (TIA) is a tool used to evaluate the incremental impacts on the surrounding transportation infrastructure and how to mitigate them to maintain safe traffic and transportation operations.

- 1) TIA Determination - The Town shall determine the need for a TIA upon receipt of any development application (by-right or rezoning) accompanied by a sketch or schematic plan. The development applications could include, but are not limited to, multi-family developments, single family developments, commercial developments, or annexation requests. If warranted, the transportation consultant hired by the developer and approved by the Town shall prepare the TIA. At the discretion of the North Carolina Department of Transportation (NCDOT) and the Town, a transportation technical memorandum, in lieu of a full TIA report, may be allowed for some developments. If proposed street connections are not consistent with adopted plans, then an explanation or proposed transportation mitigation alternative that is equal or better shall be discussed in the study. NCDOT and the Town will be responsible for determining whether the alternative mitigation plan meets and/or exceeds the performance standards of the proposed street connections in the adopted plans.

- 2) Minimum Thresholds for TIAs - A TIA will be required to accompany the development plan when expected gross trip generation is 1000 total trips or more both entering and exiting the site in a 24-hour period, and/or 100 total trips both entering and exiting the site during either the AM or PM peak hours. The gross trip generation will be calculated by the Town and NCDOT based on information (proposed project summary and development plan) provided by the applicant and the final determination for requiring the TIA will be made by the Town. The Town may also determine the need for a TIA or Transportation Technical Memorandum based on special circumstances associated with the development, even if the gross trips falls below this threshold. This may be due to location, an intersection or thoroughfare nearby that is at or above capacity, the nature of the use, or one of the following:
 - a) Traffic generated from a non-residential development that could potentially significantly impact adjacent residential neighborhoods.
 - b) Traffic operation issues for current and/or future years on nearby streets are expected to be significantly worsened by traffic generated from the proposed new development.
 - c) Major and minor thoroughfares near the site are experiencing significant/unacceptable delays.
 - d) Traffic safety issues exist at the intersection or street that would serve the proposed new development.
 - e) The proposed land use differs significantly from the adopted Comprehensive Land Use Plan for the Town.

- f) The internal street or access system is not anticipated to accommodate the expected traffic generation.
 - g) The proposed development project includes a drive-through facility, or other uses such as schools that require significant on-site circulation that may have an off-site impact to adjoining roads and/or intersections.
 - h) The amount, behavior and/or assignment of traffic is significantly different from a previously approved TIA, or more than 24 months have passed since completion of previous TIA.
- 3) Scoping Meeting – A mandatory scoping meeting is required prior to beginning the TIA to discuss the requirements and strategies for a TIA specific to the site and the proposed development. Background information shall be submitted by the applicant five or more business days prior to the scoping meeting and shall include a conceptual site plan showing proposed access points, proposed land use and densities, structure and parking envelopes. The Town, the applicant’s consultant, and the applicant(s) are required to attend the mandatory scoping meeting, and representatives from the NCDOT District office and Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) will be invited and encouraged to attend as needed. The applicant may invite members of his/her development team as needed.
- 4) Scoping Document – A Scoping Document, documenting the understood scope and parameters of the TIA, shall be prepared by the transportation consultant. The Scoping Document shall be signed by the applicant, the Town, and the NCDOT District Engineer (if access to a state road is involved) before the consultant can begin work on the TIA. Failure by the applicant to provide accurate information or failure by the transportation consultant to follow the Scoping Document shall result in disapproval of the TIA. If significant changes are made to the parameters outlined in the Scoping Document, a revised Scoping Document will be required.
- 5) Fees – All fees associated with the development of the TIA shall be the sole responsibility of the applicant. This includes all fee from the consultant, review fees from the Town, review fees from NCDOT, or any fees related to permit or gathering of information. If in the process of the study, the Town request additional information outside the scope of the project, the Town may enter into an agreement with the consultant to provide that additional information at the Town cost.
- 6) Transportation Mitigation Agreement (TMA) – Upon completion of the TIA, certain on- or off-site transportation mitigation measures may be required as recommended by the TIA. If so, the transportation consultant shall prepare a Transportation Mitigation Agreement (TMA) which will summarize the following:
- a) Development plan
 - b) Phasing and timing of development (if applicable)
 - c) Site access and points of ingress/egress
 - d) On and off-site improvements required to adequately mitigate the project impacts to the Town’s transportation system, including vehicular, pedestrian, and bicycle improvements
 - e) Trigger points and deadlines for construction of any improvements

The TMA must be signed by the applicant, Town and NCDOT (if the mitigation involves a state roadway). All required mitigation measures must be implemented prior to final Certificate of Occupancy (CO) or prior to the issuance of the first Zoning Permit for residential developments. If the development program is planned to be phased, the TIA shall address the phasing of improvements for each phase of development and the applicant shall provide a financial guarantee as outlined in the Town's Land Development Code in the amount of 120% of all phased transportation improvements prior to issuance of the CO or Zoning Permit for the first phase. The cost estimate will be performed by the developer's consultant, reviewed and approved by the Town and submitted to the applicant to provide payment. The cost estimate will include costs for planning/design, permitting, construction and right-of-way. CO's may be issued prior to completion of the Mitigation as long as a development agreement is in place prior to beginning development.

- 7) TIA Outline and Contents – The outline and contents of what is required to be included in the TIA will be discussed at the scoping meeting and included in the Scoping Document. A detailed summary of the expected content and methodologies to be used in the TIA is discussed below.
 - a) Cover/Signature page – Includes the project name, location, name of the applicant, contact information for the applicant, and date of the study. The name, contact information, registration number, signature, and seal of a duly qualified and registered professional engineer in the State of North Carolina are also required to appear on this page.
 - b) Table of Contents – Includes a list of all section headings, figures, tables, and appendices included in the TIA report. Page numbers shall denote the location of all information, excluding appendices, in the TIA report.
 - c) Executive Summary – Includes a description of the study findings, a general description of the project scope, study horizon years, expected transportation impacts of the project, and mitigation measure recommendations. Technical publications, calculations, documentation, data reporting, and detailed design shall not be included in this section.
 - d) Project Description – Includes a detailed description of the development, including the size of the parcel, development size, existing and proposed uses for the site, anticipated completion dates (including phasing). It shall also include the square footage of each use and/or the number and size of dwelling units proposed, and a map and copy of the site plan provided by the applicant.
 - e) Site Description – Includes a description of the project location within the Town and region, existing zoning and use (and proposed use if applicable), and key physical characteristics of the site, including general terrain and environmentally sensitive or protected areas.
 - f) Site Access – A complete description of the ingress/egress of the site shall be explained and depicted. It shall include number of driveways, their locations,

distances between driveways and intersections, access control (full-movement, leftover, right-in/right-out, etc.) types of driveways (two-way, one-way, etc.), traffic controls, etc. Internal streets (lanes, flow, and queuing), parking lots, sidewalks, bicycle lanes, and designated loading/unloading areas shall also be described. Similar information for adjacent properties, including topographic grade relationship, shall be provided to evaluate opportunities for internal connections. The design, number, and location of access points to collector and arterial roadways immediately adjacent to the site must be fully analyzed. The number of access points shall be kept to a minimum and designed to be consistent with the type of roadway facility. Driveways serving the site from state roads shall be designed in accordance with the NCDOT's Policy on Street and Driveway Access and/or the Town standards, as applicable.

- g) Study Area – The limits of the study area shall be based on the location, size and extent of the proposed project, and an understanding of existing and future land uses and traffic conditions surrounding the site. The limits of the study area for the TIA shall be reviewed and approved by the Town and NCDOT staff at the mandatory scoping meeting. At a minimum, the study area shall include all streets and signalized intersections within a 1-mile radius of the proposed site and/or where site traffic estimated for build-out of the project will constitute 10% or more of any signalized intersection approach during the peak hour. During the scoping meeting, staff may reduce the radius due to conditions specific to the site based on request by applicant and supported with valid reasoning. Unsignalized intersections between the required signalized intersections will be added to the scope as directed by the Town. To initially determine the impacts, the developer's consultant shall develop a database of recent peak-hour intersection turning movement counts. The applicable intersection counts will be equated to current year baseline volumes. Based on the proposed development program submitted by the applicant, a preliminary trip generation analysis, distribution and assignment will be performed within the area surrounding the site and compared to the current year base volumes. Related impacts or current operational problems, may dictate that other intersections be included in the study area as determined by Town staff and/or NCDOT staff. A narrative describing the study area shall identify the location of the proposed project in relation to the existing transportation system and list the specific study intersections and/or segments. Any unique transportation plans or policies applicable to the area (e.g., bus service and future plans) shall be mentioned. A site location map shall be provided and shall identify natural features, major and minor roadways within the study area, study intersections, and a boundary of the site under consideration.
- h) Existing Conditions – Shall include a narrative and map that represents AM and PM peak-hour turning-movement volumes for all intersections within the study area. Traffic volumes shall represent 15-minute interval weekday turning-movement counts (Tuesday through Thursday), include heavy-vehicle, pedestrian and bicycle counts, no more than twelve months old and shall be collected during periods of the year when local schools are in session and during weeks that have no observed federal, state, or local holidays and periods. The required count timeframes are from 6:30-8:30AM and 2:00-7:00PM. The PM count timeframe is expected to cover peaking characteristics caused by shift changes for local industrial plants, local area school

dismissal times, as well as typical employment PM peaking characteristics; however, site-specific conditions may necessitate additional or different traffic counting hours and/or days depending on the development program and location within the Town. These unique circumstances will be determined and directed by the Town. The Town will determine if modified peak hours or weekend analyses shall be included in the TIA at the mandatory scoping meeting. For example, 12- or 16-hour turning movement counts shall be required to complete the analysis if a traffic signal warrant analysis is required as part of the TIA. The source of existing traffic volume information shall be explicitly stated (e.g., existing counts, new counts collected by the applicant, NCDOT counts, etc.). If previous counts were obtained, only counts collected within the one year of the scoping meeting will be deemed acceptable. Summary sheets for existing turning movement counts shall be included in the appendix of the TIA report. A separate narrative and map shall be prepared to describe the characteristics of surrounding major roadways, including functional classification, number of lanes, posted speed limit, existing average daily traffic volumes, typical cross section, intersection control, and lineal distance between major roadways. Field notes for the existing conditions investigation may be included in the appendix of the TIA report.

- i) Future Year Conditions – Unless otherwise approved by the Town, future year conditions for a single-phase development shall be analyzed for the year the development is expected to be at full occupancy (build-out year) and five years after the build-out year (build-out + 5). For multiple-phased developments, the scenarios shall be completed in order, with any improvements specified by development included in the subsequent build scenarios, including five years after the full build-out year (build-out + 5). Specific analysis periods to include in the study shall depend greatly upon the development program, proposed project phasing plan, and significant improvements programmed for the surrounding transportation system. The approved offsite developments and transportation projects to be included in the base future-year background conditions for the transportation system within the study area shall be determined during the scoping meeting. Transportation improvements assumed in the future-year background conditions analysis may include those with an expected completion date concurrent with that of the development and funded either by the Town, NCDOT, or indicated as a required condition of approval from another nearby development application. Only projects approved by the Town at the scoping meeting may be included in the analysis as future existing infrastructure. Those improvements committed by other projects must be clearly identified in the report as approved offsite development road improvements. Adjacent development traffic information used in the development of the future year background traffic volumes shall be included in the appendix of the TIA report. Unfunded, planned infrastructure projects may be mentioned in the TIA, but the description shall specifically identify that these projects are not included in the background condition. Future year background traffic volumes shall be forecasted using historical growth rate information, regional models, and/or TIA reports for development approved by the Town but not yet built. A narrative and map shall be prepared that presents turning movement volumes for each peak hour for all intersections identified within the study area. Future year base traffic volumes, other development volumes, and site traffic

volumes shall be clearly separated and combined in the map.

- j) Trip Generation – Base trip generation for the proposed land use(s) shall be calculated using data published in the latest version of the Institute of Transportation Engineers’ (ITE) Trip Generation Manual. Data limitations, data age, choice of peak hour of adjacent street traffic, choice of independent variable, and choice of average rate versus equation shall be discussed at the mandatory scoping meeting. Local trip generation rates may be acceptable if appropriate validation is provided by the applicant to support them. Any deviation from ITE trip generation rates shall be discussed in the mandatory scoping meeting and documented in the Scoping Document if approved by the Town and NCDOT. The NCDOT Municipal School Transportation Assistance (MSTA) calculator shall be used to calculate projected trip generations for school sites.
- i) Internal Capture – Base trip generation may be reduced by rate of internal capture when two or more land uses are proposed using methodology recommended in the most current Trip Generation Handbook published by the ITE, or research published by the National Cooperative Highway Research Program (NCHRP) Transportation Research Board. Reductions for internal capture shall be applied to multi- or mixed-use sites only. The internal capture reduction shall be applied before pass-by trips are calculated.
- ii) Pass-by Trips – Pass-by trips are those made as intermediate trips between an origin and primary destination (i.e., home to work, home to shopping, etc.). However, pass-by trips are not diverted from another roadway. Base trip generation may be reduced by rate of pass-by capture using methodology recommended in the most current Trip Generation Handbook published by the ITE. Pass-by trips associated with the development program may not exceed 10% of the peak-hour volume reported for the adjacent public street network. This network shall include the streets that provide primary access to/from the site. For example, if a site access drive that connects to a low-volume local street, which its primary access is to a major collector road, the traffic on the major collector shall be used as the adjacent street for pass-by calculation purposes. Evaluation of diverted trips may apply depending on the specifics of each site. A trip generation table shall summarize all trip generation calculations for the project
- k) Trip Distribution – External trip distribution shall be determined on a project-by-project basis using one of several sources of information available to transportation and land planning professionals. Potential sources for determining project trip distribution may include the regional travel demand model, market analysis, existing traffic patterns, or professional judgment. At the Town’s direction, multiple trip distributions may be required for differing land use types. Regardless of methodology, the procedures followed and logic for estimating trip distribution percentages must be well-documented in the TIA. Trip distribution percentages proposed for the surrounding transportation network shall be discussed during the scoping meeting and shall be approved by the Town and NCDOT before proceeding with the TIA. A map showing the percentage of site traffic on each street included in

the study area shall be included in the TIA.

- l) Trip Assignment – Project traffic shall be distributed to the surrounding transportation system based on the site’s trip generation estimates and trip distribution percentages. Future year build-out traffic forecasts (i.e., future year background traffic plus project traffic) shall be represented in graphic formats for AM and PM peak-hour conditions at all intersections included in the study area. If the project will be built in phases, traffic assignments shall be reported for each phase. Pass-by traffic shall be included at the driveways and access points for evaluating driveway volumes. Multiple assignment analyses may be required if the traffic control at the access drives varies (i.e., right-in/right-out vs. stop controlled vs. signalized).

- m) Operations Analysis – The TIA shall include multi-modal operations analyses including vehicular, pedestrian and bicycle, to allow for the safe and convenient travel for all modes. Level-of-Service (LOS) and delay is the primary measures of effectiveness for impacts to the transportation system, and is defined by the most current edition of the Highway Capacity Manual (HCM). Operations analyses shall be performed for the existing and all future year scenarios. Impacts from the proposed project shall be measured by comparing the future year background conditions to the future year build-out conditions. Requirements for mitigation are described here in.
 - i) Vehicular Capacity Analysis - Unless otherwise noted, Synchro LOS and delay shall be reported for all signalized intersections and approaches identified in the study area. Based on HCM, LOS for unsignalized intersections is not defined as a whole; instead, only the individual stop-controlled or yield approaches shall be reported based on the HCM reports determined through the Synchro analysis. Existing signalized intersections shall be modeled based on existing signal timing plans provided by either the Town or NCDOT. Existing signal timing plans shall be included in the appendix of the TIA report. If a traffic signal is part of a coordinated system it must be analyzed as such under all conditions. Other standard practices and default input values for evaluating signalized intersections shall be consistent with the most recent guidelines published by the NCDOT, Traffic Engineering and Safety Systems Branch, Congestion Management Unit (“Capacity Analysis Guidelines”). The Town may also require safety, traffic simulation, gap and/or other analyses appropriate for evaluating a development application. Additional analyses and/or traffic capacity or simulation tools (such as VISSIM or Transmodeler) required for the TIA shall be identified during the scoping meeting. All TIA reports submitted to the Town shall use Synchro, SimTraffic, VISSIM and/or Transmodeler analysis software for signalized and unsignalized intersections, or Sidra Software for roundabouts, consistent with policies released by the NCDOT. A narrative, table, and map shall be prepared that summarizes the methodology and measured conditions at the intersections reported in LOS (LOS A – F), the intersection and approach signal delay for signalized intersections, the approach delay for unsignalized intersections, and 95th percentile queue lengths for all movements. Capacity analysis worksheets and auxiliary turn-lane warrants for unsignalized intersections shall be included in the appendix of the TIA report.

- ii) Pedestrian Operations Analysis - Unless otherwise noted, methodology provided in the latest edition of the Highway Capacity Manual shall be used to evaluate pedestrian LOS for the intersections identified in the study area. The current methodology is based on geometric data, demand data, and signal control data including, but not limited to:
- Number of lanes on the major street
 - Crossing distance
 - Traffic volumes
 - Motorist yielding rates to pedestrians
 - Cycle Length
 - Walk Time
 - Presence of pedestrian phase
- iii) Bicycle Operations Analysis – The bicycle LOS at intersections identified in the study area shall be evaluated using locally accepted methodology. This current methodology assesses bicyclists’ comfort based on geometric and traffic signal features including, but not limited to:
- Number of lanes crossed
 - Presence of conflicting turning movements
 - Presence of bike lanes

Under this methodology, intersection features are assigned points, where the LOS for each approach is calculated based on the accumulation of points for each geometric and traffic signal feature identified in the worksheet. Currently, this methodology does not take into account demand volumes; therefore, the bicycle LOS would not differ between AM and PM peak hours, and thus would not need to be reported for both under this methodology.

- n) Queuing Analysis – 95th percentile and simulation analysis of future year queues shall be consistent with NCDOT’s Traffic Engineering and Safety Systems Branch, Congestion Management Unit current practices and published Capacity Analysis Guidelines. Turn lanes and storage lengths for the major street (uncontrolled) approaches at unsignalized intersections shall be identified using volume thresholds published in the NCDOT’s Policy on Street and Driveway Access to North Carolina Highways (see Warrant for Left- and Right-Turn Lanes Nomograph, pg. 80). Recommendations for left and right-turn lanes serving the site shall be designed to account for both the NCDOT warrants described above and to meet future year capacity needs identified through the capacity analyses. For projects that include drive-through facilities, pick-up/drop-off areas, or entrance gates, a queuing analysis may be required by the Town to ensure that vehicle stacking will not adversely impact the public transportation system. The queuing analysis must be performed using accepted transportation engineering procedures approved by the Town. If a TIA is required for a new school site, the internal circulation and ingress/egress of the site shall be modeled using a “dummy signal” in the Synchro software as prescribed by NCDOT Municipal School Transportation Assistance (MSTA) department.

- o) Crash Analysis – A summary of crash data (type, number, and severity) for the most recent 3-year period at each study location is required. Traffic Engineering Accident Analysis System reports will be provided by the Town and/or NCDOT and shall be included in the appendix of the TIA report. For locations with prevalent crash types and/or frequency, a discussion shall be included describing factors that may be contributing to the incidents. At a minimum, the proposed development features shall not contribute to factors potentially involved in the existing crash rates. If contributing factors are identified, recommendations to eliminate or mitigate these features shall be included.
- p) Traffic Signal Warrants – Town staff and/or NCDOT may consider potential signal locations at the scoping meeting. However, traffic flow progression is of paramount importance when considering a new traffic signal location. A new traffic signal shall not cause an undesirable delay to the surrounding transportation system. Installation of a traffic signal at a new location shall be based on the application of warrants criteria contained in the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD) and engineering judgment. Traffic signal warrants shall be included in the appendix of the TIA report. Additionally, spacing of traffic signals within the Town must adhere to NCDOT requirements. Pedestrian movements must be considered in the evaluation and adequate pedestrian clearance provided in the signal cycle split assumptions. If a signal warrant analysis is recommended in the TIA, the Town and/or NCDOT may decide to defer a signal warrant analysis until after the development has opened to allow use of actual turning movement counts at an intersection. The TIA recommendations must clearly state that this analysis shall occur at a specified date following the opening of the development. The applicant must issue a bond or letter of credit in the name of the Town for the estimated cost of the signal warrant analysis and resulting signal prior to final approval of the TIA. The cost shall be established based on an engineer's estimate provided by the engineer of record for the applicant or by the consultant identified by the Town; however, final approval of the dollar amount rests with the Town.
- q) Mitigation Measure Recommendations – This section of the TIA report shall provide a description of the study's findings regarding impacts of the proposed project on the existing and future transportation system and describe the location, nature, and extent of all mitigation measures recommended to the applicant to improve and/or maintain the future year background level-of-service (LOS) conditions through phasing and ultimate build-out of the project. This mitigation will be identified by measuring the impact between the future year background conditions and the future year build-out conditions. The applicant is required to mitigate transportation deficiencies caused solely by the projected impact of their proposed development, and not unacceptable background conditions or other deficiencies caused by offsite development within the defined study area. The applicant shall be required to identify mitigation improvements to the transportation network if at least one of the following conditions exists when comparing the multimodal operations analyses of future year background conditions to future year build-out conditions:

- i) the total average delay at an intersection or individual approach increases by 25% or greater, while maintaining the same LOS,
- ii) the LOS degrades by at least one level,
- iii) or the LOS is "D" or worse in background conditions and the proposed project shows a negative impact on the intersection or approach

If the background LOS (intersection or approach) is inadequate (i.e., "D," "E," or "F"), the applicant will be expected to mitigate only the impact caused by the proposed project. For example, if the background LOS of an approach is LOS F with 85 seconds of delay, and the project traffic increases the delay to 95 seconds at LOS F, the applicant will be required to mitigate the added 10 seconds of delay on the approach, not required to mitigate the inadequate background delay. Town staff and NCDOT will review the recommendations in the final version of the TIA and will have the ultimate determination in the scope of the required mitigation measures.

A Transportation Mitigation Agreement (TMA) may apply if mitigation requirements are needed.

For multi-phase developments, the capacity analyses scenarios shall address the phasing of improvements for each phase of development. The build-out + 5 scenarios will require the analysis of only five years beyond the full build-out year. The build-out + 5 scenario analysis is not used for mitigation purposes. A narrative and table shall be prepared that summarizes the methodology and measured conditions at the intersections reported in LOS (LOS A–F) and average control delay for each intersection and approach.

A narrative and map shall also be prepared that describes and illustrates recommended improvements, by development phase if necessary, for mitigating the projected impact of the proposed development.

- r) Compliance with Adopted Transportation Plans – All TIA reports must include a statement of compliance with plans, programs, and policies adopted by the Town of Dallas for maintaining a safe and efficient multi-modal transportation system.