

DESIGN CRITERIA
FOR THE PREPARATION
OF IMPROVEMENT PLANS



St. Louis County, Missouri
Department of Transportation

January 30, 2019

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**[www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/
 TransportationPublicationsManuals/StandardDrawings](http://www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/StandardDrawings)**

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2.00 Design Criteria Manual - Errata Sheet (2007 - 2019)

<i>Section Number</i>	<i>Revision or Addition</i>	<i>Revision Date</i>
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(2007)

All Text	Complete Revision and Update to the Design Criteria Text	4-13-2007
73.00	Schedule of Unit Prices (Updated Prices)	5-1-2007
50.21	Retaining Wall Design	6-13-2007
35.00	Design-Build Projects Section Updated	9-14-2007
40.40-2	Sidewalks, Curb Ramps and Imprinted Crosswalks	9-20-2007
70.20	Irrevocable Letter of Credit Updated	10-9-2007
40.70-5	Automated Red Light Enforcement System Added	10-26-2007
40.40-1	Sidewalk Construction Revision (6' Adjacent to Curb)	12-7-2007
40.70-3	Street Lighting Revision (Lighting Standards)	12-7-2007

(2008)

74.00	Annual Change of Construction Cost Index (CCI) (Updated for 2008)	1-1-2008
75.10	Trust Fund Contribution Schedules (Updated for 2008)	1-1-2008
73.00	Schedule of Unit Prices (Updated for 2008)	3-4-2008
40.25-1	Sight Distance at Intersections (Corrections to Labels on Drawing)	3-4-2008
40.20-4	Street Standards (Old #29 Removed - Steep Grade, Covered in Section 40.70-2)	3-7-2008
50.20-2	Drainage Structure Design (Item 5 - Remove Director Approval Required)	5-5-2008
20.30-2	Residential Street Design Criteria (Updated <30 Feet Wide Combination Pvmnt.)	6-20-2008
50.20-1	Drainage Structure Design (Changed Item #3 to Trench Drains)	6-20-2008
30.00-5 & 9	Improvement Plan General Requirements (Revised Drawing Sight Distance Box)	7-8-2008
40.20-5	Street Standards (Updated Item No. 31 - Site Distance Criteria)	9-23-2008
50.20	Drainage Structure Design (Allowing HDPE & PVC Storm Sewer Pipe in Right-of-Way {Items 4 thru 7} and Private Driveway Culverts {Item 9})	11-24-2008

(2009)

74.00	Annual Change of Construction Cost Index (CCI) (Updated for 2009)	1-1-2009
75.00	Traffic Generation Assessment and Trust Funds (Chesterfield Valley Trust Fund and Page Number References Updated)	1-20-2009
75.10	Trust Fund Contribution Schedules (Updated for 2009)	1-20-2009
70.00-5	Agreement Guaranteeing Road Improvement (Special Escrow) (Updated Director's Signature Block)	4-23-2009
70.20-13	Irrevocable Letter of Credit (Updated Director's Signature Block)	4-23-2009
30.00-6 & 10	Improvement Plans General Requirements (Added Requirement Item)	6-8-2009
40.40	Sidewalks, Curb Ramps, Imprinted Asphalt Crosswalks and Stamped Concrete Crosswalks (Updated Items 2 & 7, Added Item 8, and Updated Standard Drawing References)	10-1-2009

(2010)

74.00.....Annual Change of Construction Cost Index (CCI) (Updated for 2010) 1-1-2010
75.00.....Traffic Generation Assessment and Trust Funds (Updated for 2010)..... 1-1-2010
75.10.....Trust Fund Contribution Schedules (Updated for 2010) 1-1-2010
75.10.....Trust Fund Contribution Schedules (Updated Chesterfield Valley Trust Funds) 1-4-2010
40.40.....Sidewalks, Curb Ramps, Imprinted Asphalt Crosswalks and Stamped Concrete
Crosswalks (Updated Standard Drawing References, Item 7 & Item 8)..... 4-1-2010
50.10.....Storm Drainage (Revised Item 3 - Erosion Control) 4-1-2010
65.00.....Right-of-Way, Easements, Subordination Agreements and Licenses
(Update Page 1 - Instrument Names & Page Numbers; Page 2, Item #8) 4-1-2010
94.00.....Traffic Handling for Construction (Updated to Reflect Current MUTCD Manual) 4-1-2010
30.00.....Improvement Plan General Requirements (Added Note #15 on Pg. 5 and
Note #12 on Pg. 9) 7-1-2010
20.00.....Pavement Materials (New Section) 10-22-2010

(2011)

74.00.....Annual Change of Construction Cost Index (CCI) (Updated for 2011) 1-1-2011
75.10.....Trust Fund Contribution Schedules (Updated figures for 2011)..... 1-1-2011
40.70.....General Miscellaneous Requirements (Updated Webpages & I-64 Reference) 6-13-2011
40.70.....General Miscellaneous Requirements (Updated School Speed Zone Policy) 6-24-2011
50.60.....Miscellaneous Storm Water Requirements (Added Item 9) 8-1-2011
65.10.....Right-of-Way, Easement, Subordination Agreement and License Forms
(Added Permanent Discharge Easement Form) 8-1-2011
30.00.....Improvement Plan General Requirements (Added Unincorporated Checklist
Item #37 and Municipal Checklist Item #29) 10-28-2011
50.10.....Storm Drainage (Added Item 4, Site Design Guidance) 10-28-2011
50.40.....Flood Plain Study (Item 1, Zone "X" changed to Shaded Zone "X") 12-15-2011
40.40.....Sidewalk, Curb Ramps and Stamped Concrete Crosswalks (Removed
Imprinted Asphalt Crosswalks) 12-20-2011

(2012)

74.00.....Annual Change of Construction Cost Index (CCI) (Updated for 2012) 1-1-2012
75.10.....Trust Fund Contribution Schedules (Updated figures for 2012)..... 1-1-2012
75.00.....Traffic Generation Assessment and Trust Funds (Revised #4, Pg. 75.00-3) 9-10-2012
40.40.....Sidewalks and Curb Ramps (Deleted Stamped Concrete Crosswalks) 10-31-2012

(2013)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2013)..... 1-1-2013
75.00..... Traffic Generation Assessment and Trust Funds (Revised #4, Pg. 75.00-3) 1-1-2013
75.10..... Trust Funds Contribution Schedules (Updated figures for 2013) 1-1-2013
40.70..... General Miscellaneous Requirements (Revised #C, iii, Pg. 40.70-6) 1-25-2013
40.40..... Sidewalks and Curb Ramps (Revised #3 - Sidewalk Variances) 2-15-2013
30.00..... Improvement Plan General Requirements (Sentence 3, Paragraph 2,
Pg. 30.00-2; Added Items 16 (Pg. 4), 30 (Pg. 5), 14 (Pg. 10) & 25 (Pg. 11)) 6-1-2013
94.00..... Traffic Handling for Construction (Updated 94.00-2, Four Lane Pvm. Chart) 7-8-2013
30.00..... Improvement Plan General Requirements (Pg. 30.00-4; revised 15 & 16,
Pg. 30.00-10, revised 13 & 14)..... 8-15-2013
30.00..... Improvement Plan General Requirements (Pg. 30.00-5; revised 31,
Pg. 30.00-11, revised 26) 10/1/2013
30.10..... Specific Requirements for the Preparation of Improvement Plans
(Pg. 30.10-2; revised 31, Pg. 30.00-11, revised 26) 10/1/2013
94.00..... Traffic Handling for Construction (Updated 94.00-2, Four Lane Pvm. Chart) 7-8-2013
94.00..... Traffic Handling for Construction (Updated 94.00-2, Four Lane Pvm. Chart) 7-8-2013
94.00..... Traffic Handling for Construction (Updated 94.00-2, Four Lane Pvm. Chart) 7-8-2013
65.00..... Right-of-Way, Easements, Subordination Agreements and Licenses
(Updated 65.00-2, Revised Item #8) 11-1-2013
50.20..... Drainage Structure Design (Added Polypropylene Pipe as Approved Pipe) 12-9-2013

(2014)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2014)..... 1-1-2014
75.10..... Trust Fund Contribution Schedules (Updated figures for 2014)..... 1-1-2014
50.20..... Drainage Structure Design (Added Polypropylene Pipe 60" as Approved Pipe) 2-3-2014
65.10..... Right-of-Way, Easement, Subordination Agreement and License Forms
(Updated Director's Signature Block on Page 65.10-16) 4-1-2014

(2015)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2015)..... 1-1-2015
75.10..... Trust Fund Contribution Schedules (Updated figures for 2015)..... 1-1-2015
50.40..... Flood Plain Study (Complete Revision)..... 2-1-2015
50.41..... Flood Protection Regulations (Section Deleted - Info Available Elsewhere) 2-1-2015
50.42..... Simplified Flood Plain Studies (Section Deleted) 2-1-2015
Entire Book... Changed Department Name from Highways & Traffic to Transportation 9-1-2015

(2016)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2016)..... 1-1-2016
75.10..... Trust Fund Contribution Schedules (Updated figures for 2016)..... 1-1-2016
40.40..... Sidewalks and Curb Ramps (Removed MoDOT sidewalk requirement section)..... 7-1-2016

(2017)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2017)..... 1-1-2017
75.10..... Trust Fund Contribution Schedules (Updated figures for 2017)..... 1-1-2017

(2018)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2018)..... 1-1-2018
75.10..... Trust Fund Contribution Schedules (Updated figures for 2018)..... 1-1-2018
65.10..... R-O-W, Esmt, Subordination Agreement & License Forms (Added LLC Notary)..... 9-1-2018
70.00..... Agreement Guaranteeing Road Improvement (Added LLC Notary) 9-1-2018
70.20..... Irrevocable Letter of Credit (Added LLC Notary) 9-1-2018

(2019)

74.00..... Annual Change of Construction Cost Index (CCI) (Updated figures for 2019)..... 1-1-2019
75.10..... Trust Fund Contribution Schedules (Updated figures for 2019)..... 1-1-2019
75.00..... Traffic Generation Assessment and Trust Funds (Updated Item #5 on 75.00-3).... 1-30-2019

10.10 Definitions

The definitions of terms used in these guidelines are as follows:

AASHTO - American Association of State Highway and Transportation Officials.

ADA - Americans with Disabilities Act.

ADAAG - Americans with Disabilities Act Accessibility Guidelines.

ANSI - American National Standards Institute.

APWA - American Public Works Association.

ASTM - American Society for Testing and Materials (now ASTM International).

Agreement Guaranteeing Road Improvements - Same as Escrow, Special.

Alley - A secondary means of ingress and egress serving more than one tract of land and used primarily for vehicular service, and which may be used for public utility purposes. Alleys are not maintained by the Department and are normally located adjacent to the rear property lines.

Applicant - The government agency, utility company, contractor, developer or individual seeking permission to work within the right-of-way of any roadway under the jurisdiction of St. Louis County.

Architect - A professional architect registered in the State of Missouri.

Arterial Road System (ARS) - The system of roads classified by the Department, which provides the principal routes for arterial type traffic in both the municipalities and unincorporated St. Louis County. Arterial roads within municipalities are assigned to St. Louis County jurisdiction by state law and county ordinance.

Backfill - The material used to fill an excavation.

Base Flood - The 100-year flood, hereafter referred to as the base flood, is a measure of flooding of a specific magnitude used as a standard in the National Flood Insurance Program. The base flood has a one percent chance of occurrence in any given year. The depicted one percent chance flood has one chance in 100 of being equaled or exceeded in any future one-year period.

Basement - The lowest level or story of a structure, which has its floor below grade on all sides.

Bedding - The material on which the pipe or conduit is supported and protected.

Benchmark - A definite point of known elevation and location and of more or less permanent character. The identity and elevation shall be based on United States Geological Survey (USGS) Datum. Benchmarks established from 1997 Metropolitan St. Louis Sewer District (MSD) Bench Mark Loop System or temporary benchmarks established thereon are acceptable.

Block - An area of land surrounded by public roads, streets, streams, railroad rights-of-way, parks, rural land, drainage channels or other similar areas or facilities.

Bridge - A structure having a clear span greater than 20 feet measured on a horizontal plane along the centerline of the roadway; also a multiple span structure where the total length of spans are in excess of 20 feet. For both single and multiple span bridges, the clear span shall be construed to mean the total distance from stream face to stream face of end bents or outer walls of structure. For multiple pipes, the span shall be construed to mean the total distance measured between the two exterior pipes, provided the clear distance between each pipe is less than one-half the diameter of the pipe.

Building - A structure that is affixed to the land, having one or one or more floors, external walls and a roof.

Building Line (Setback) - A line or lines on a plat designating the area outside of which buildings may not be erected, except landings, open balconies and roof overhangs, as permitted in the Zoning Ordinance.

CAD - Computer Aided Design.

CADD - Computer Aided Design & Drafting.

Channel - A natural or artificial watercourse.

Classified Road - A road that has been designated for future improvement to a specific minimum right-of-way and pavement width. All classified roads are on either the Arterial Road System (ARS) or the County Road System (CRS).

Commission - The Planning Commission of St. Louis County.

Committee (PCL) - Representatives of the Departments of Planning, Public Works and Transportation who meet weekly to review parking, circulation and landscaping provisions of all site development plans, preliminary subdivision plans, final development plans, etc.

Common Ground or Common Land - The land set aside for open space including storm water, retention lakes, ponding or recreational use for the owners of residential lots in a subdivision. This land is conveyed by the developer in fee simple absolute title by a warranty deed to the Trustees. The trust indenture for common land shall provide that it be used for the sole benefit, use and enjoyment of the lot owners present and future and shall be the maintenance responsibility of the trustees of the subdivision. No lot owner shall have the right to convey his interest in common land except as an incident of his ownership of a regularly platted lot.

Construction Cost Index (CCI) - An annual analysis, which measures the effects of wage-rate and material-price trends. The percent change of the construction cost index from December of a given year to December of the following year as published in the Engineering News Record is used to inflate trust fund and traffic generation assessment rates.

County, Incorporated - That part of St. Louis County, Missouri located in a city, town, or village.

County, Unincorporated - That part of St. Louis County, Missouri located outside of incorporated cities, towns, and villages.

County Road System (CRS) - All County maintained roads located in unincorporated St. Louis County, exclusive of roads on the Arterial Road System (ARS).

Creep - The lengthening of concrete pavement due to cycles of contraction and expansion of individual slab sections.

Cross Access - A commonly shared or used private pedestrian way or vehicular driveway that internally connects or serves two or more adjacent properties.

Crossroad Culvert - A pipe or box culvert passing surface drainage carried in side ditches or channels beneath roads to adjacent property.

Department - For the purpose of this publication, the St. Louis County Department of Transportation.

Design Speed - On existing roadways design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5 miles per hour (MPH) greater than the posted speed limit, whichever is greater. On new roadways, design speed shall be 5 MPH greater than the anticipated posted speed limit. For non-residential and residential streets with a pavement width of 32 feet or less, the design speed shall be the anticipated posted speed limit.

Detention - The temporary storage of the differential runoff of storm water by providing permanent facilities, such as dry reservoirs, ponds or other acceptable alternatives.

Developer - The person, firm or corporation who develops and improves a tract pursuant to the requirements of this book and the Subdivision and Zoning Ordinances.

Development - The act of changing and the state of a tract of land after its function has been purposefully changed by man including, but not limited to, structures on the land and alterations to the land.

Differential Runoff - The difference in rate and volume of storm water runoff from a parcel or project between its undeveloped natural condition and its developed condition.

Director - For the purpose of this publication, the Director or Acting Director of the St. Louis County Department of Transportation.

District - A part or parts of the unincorporated areas of St. Louis County for which the Zoning Ordinance establishes regulations governing the development and use of land therein.

Drainage Facility - Any system of artificially constructed drains, including open channels and separate storm water sewers, used to convey storm water, surface or ground water, either continuously or intermittently to natural water courses.

Drive, Multi-Family Access - A private way or driveway which affords a means of vehicular access to parking areas and bays and to abutting building in a multiple dwelling unit subdivision.

Driveway - A privately maintained travel way used for vehicular access to a site and distribution within a site, not including sidewalks.

Driveway, Common (Party) - A single driveway providing vehicular access to two adjoining properties.

Easement - A grant by a property owner to the public, a corporation, or a person, for the use of land for a specific purpose.

Easement, Common Ground - A grant by the developer to the Trustees of a subdivision for the use of land areas surrounded by public rights-of-way.

Easement, Cross Access - A designated private access way for the servicing of aisles or driveways that internally connect two or more properties.

Easement, Multiple Family Access - A designated private access way for the servicing of parking areas and bays and to abutting building developed as multi-family dwellings.

Easement, Permanent Drainage - A grant by a property owner to the County and/or Metropolitan St. Louis Sewer District (MSD) for the purpose of improving, constructing repairing and maintaining drainage structures.

Easement, Permanent Footing - A grant by a property owner to the County for the purpose of improving, constructing, repairing and maintaining a retaining wall footing.

Easement, Permanent Road Improvement, Maintenance, Utility, Sewer and Sidewalk - A grant by a property owner to the County for the purpose of improving, constructing, repairing and maintaining roadway improvements, public or private utilities, storm and/or sanitary sewers and sidewalks.

Easement, Permanent Sidewalk, Sewer and Utility - A grant by a property owner to the County for the purpose of improving, constructing, repairing and maintaining sidewalks, sewers and utilities.

Easement, Permanent Sight Distance - A grant by a property owner to the County for the purpose of controlling and directing grading and the installation and maintenance of plant material, trees and/or structures by the property owner in a manner that will provide and insure sight distance for motorists as required by the County.

Easement, Permanent Storm Water Control - A grant by a property owner to the County and/or the Metropolitan St. Louis Sewer District (MSD) for the purpose of improving, constructing, repairing and maintaining storm water drainage facilities.

Easement, Permanent Storm Water Control Access - A grant by a property owner to the County and/or the Metropolitan St. Louis Sewer District (MSD) to provide for access and upkeep of the area within designated storm water control easements.

Easement, Permanent Traffic Signal - A grant by a property owner to the County for the purpose of improving, constructing, repairing and maintaining traffic signals and appurtenant structures.

Easement, Permanent Utility - A grant by a property owner to a public or private utility company for the purpose of improving, constructing, repairing and maintaining utilities.

Easement, Private Roadway - A designated private access way for the servicing of individual lots within a subdivision.

Engineer - A professional engineer registered in the State of Missouri.

Entrance, Commercial - A driveway providing ingress and egress for commercial site.

Entrance, Residential - A driveway providing ingress and egress for a residential site.

Escrow - An agreement between the developer and St. Louis County whereby the developer establishes funds to cover the cost of completion of required on-site improvements as depicted upon approved construction improvement plans.

Escrow Agent - A title company, bank, savings and loan association, trust company, attorney or any other person or agency approved by the County Counselor to act as escrow agent under the provisions of Section 1005.080 of the Subdivision Ordinance.

Escrow Agent, Special - The Treasurer, St. Louis County, will act as a Special Escrow Agent for cash deposits required in conjunction with uncompleted or unconstructed road improvements.

Escrow, Special - An agreement between the developer and St. Louis County covering the completion of required improvements within the road right-of-way and/or easements not constructed as part of the building and site development.

FEMA - Federal Emergency Management Agency.

Fence, Sight Proof - A fence with an opaque value of seventy (70) percent or greater. Such structure may be a chain link fence in combination with slat or lattice materials.

FHWA - Federal Highway Administration.

Finish Elevation - The proposed elevation of the land surface of a site after completion of all site preparation work.

Finished Grade - The final elevation of the ground surface after development.

FIRM - Flood Insurance Rate Map.

Flood Plain - A geographic area susceptible to periodic inundation from the overflow of natural waterways during the base (100-year) flood. It is determined as to extent in St. Louis County, by the current Federal Emergency Management Agency Flood Insurance Study for St. Louis County, Missouri Unincorporated Areas, with accompanying Flood Insurance Rate Maps and Flood Boundary and Floodway Maps and any future revisions thereof to be made by the Commission or as amended in accordance with the provisions of the Zoning Ordinance.

Floodway - The area designated as Floodway on the Federal Emergency Management Agency Flood Boundary and Floodway Maps. It is derived by determining that portion of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

Floodway Fringe - That area of the 100-year Flood Plain excluding the floodway is known as the floodway fringe. It is also that portion of the 100-year Flood Plain which can be developed without cumulatively raising the base flood elevation more than one foot.

Frontage - The edge of a lot bordering a street.

Geologic Map - Engineering Geologic Map of St. Louis County Missouri by Edwin E. Lutzen and John D. Rockway, Jr., 1971 Missouri Geologic Survey and Water Resources, Engineering Geology Series N. 4 on file with the Department and used to determine areas which require Geotechnical reports.

Geotechnical Report - A report, signed and sealed by an engineer, used to determine extent of development and grading, slope stability in the form of maximum slopes, sink hole conditions, need for interceptor ditches and any items that may affect the extent of development and/or location of structures on the site.

GIS - Geographic Information System.

Grade - The rate of deviation of the ground surface from the horizontal surface, expressed in percentages (i.e., 2%, 3%, etc.).

HBA - Home Builders Association of St. Louis & Eastern Missouri.

Highway - Same as street.

Highway System Plan - A plan depicting the general alignment and nature of road improvements for existing and future classified roads on the Arterial Road System (ARS) and County Road System (CRS); and listing of classification, minimum future pavement width and minimum right-of-way requirements for all classified roads.

Hydraulic Grade Line - A line coinciding with the level of flowing water at any given point along an open channel; or the level to which water would rise in a vertical tube connected to any point along a pipe or closed conduit flowing under pressure.

Improvements - Street pavement, turning lanes, traffic signals, bridges and culverts, sidewalk pavement pedestrian way pavement, utilities, fire hydrants, storm sewers and roadside drainage ditches, erosion and siltation control, sanitary sewers, signs, monuments, landscaping, street lights, and other similar items.

Irrevocable Letter of Credit - A commitment from an authorized lending institution to an approved escrow agent guaranteeing the availability of a sum of money sufficient in amount to cover the costs of construction and completion of required on-site and off-site improvements as depicted upon the approved improvement plans.

Land Surveyor - A professional land surveyor registered in the State of Missouri.

Large Lot Roadway Easement - A private thoroughfare which provides a means of access to lots within a large lot subdivision.

License, Temporary Slope Construction - A grant by a property owner to the County for the purpose of making cuts, fills and sloping embankments, constructing driveways, providing working room and implementing any and all other related construction items in connection with the improvement.

Loading Space - A- durably rust proof, property graded for drainage, off-street space used for the loading and unloading of vehicles, except passenger vehicles, in connection with the use of the property on which such space is located. Each such designated space shall comply with the dimensional requirements set forth in section 1003.165 of the Zoning Ordinance. Off-Street Parking and Loading Spaces shall be located to avoid any maneuvering on public roadways.

Lot - An area of land which is part of a subdivision, the plat of which has been legally approved and recorded in the Office of the Recorder of Deeds of St. Louis County and is intended to be separately owned, developed or otherwise used as a unit or an area of land which was legally approved and the deed recorded in the Office of the Recorder of Deeds.

Lot Area - The total horizontal area within the boundaries of a lot exclusive of any area designated for street purposes.

Lot, Corner - A platted area of land abutting two road rights-of-way at their intersection.

Lots, Double Frontage - A lot having frontage on two (2) non-intersecting streets, as distinguished from a corner lot.

Lot (Parcel) of Record - A lot which is part of a subdivision the plat of which has been legally approved and recorded in the Office of the Recorder of Deeds of St. Louis County, or a parcel of land which was legally approved and the deed recorded in the Office of the Recorder of Deeds of St. Louis County.

MoDOT - Missouri Department of Transportation

Monument - A marker to be made of materials and placed by a land surveyor at locations specified in Section 1005.250 of the Subdivision Ordinance and/or as directed by the Department.

Monuments and Signs, Ornamental Entrance - A structure or device designed or intended to convey information to the public in written or pictorial form, and which identifies residential or non-residential subdivision and/or commercial developments.

MPH or mph - Miles per hour

MSD - Metropolitan St. Louis Sewer District.

Municipality - A city, town, or village which has been duly incorporated in accordance with the laws of the State of Missouri, as a unit of local government. Said definition shall include the City of St. Louis.

MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation and the Federal Highway Administration (FHWA), Washington, D.C., as amended.

NEC - National Electrical Code.

NEMA - National Electrical Manufacturers Association.

NTS or N.T.S. - Not to scale.

Non-Conforming Land Use or Structure - A land use or structure which existed lawfully on the date that this Zoning Ordinance or any amendment thereto became effective and which fails to conform to one or more of the applicable regulations in the Zoning Ordinance or amended thereto, except minimum lot area, yard and setback requirements.

OSHA - Occupational Safety and Health Administration.

On-Street Parking Space - A temporary storage area for a motor vehicle, which is located on a dedicated street right-of-way.

Parcel (Tract) of Land - A separately designated area of land delineated by identifiable legally recorded boundary lines.

Park - An area open to the general public and reserved for recreational, educational or scenic purposes.

Parking Area - An area of land used or intended for off-street parking facilities for motor vehicles.

Parking Bay - A paved vehicle storage area directly adjacent to the access street or privately controlled pavement.

Parking Space - A durably dust proof, properly graded for drainage, usable space, enclosed in a main building or in an accessory building, or unenclosed, reserved for the temporary storage of one vehicle, and connected to a street, alley, or other designated roadway by a surfaced aisle or driveway. Each such designated space shall comply with the dimensional requirements set forth in Section 1003.165 of the Zoning Ordinance.

Parkway - A road or roadway intended to be used primarily for passenger vehicles and developed with a park-like or scenic character, with recreational uses.

Pave (Pavement) - The act or result of applying a hard, watertight material to any ground surface in such manner as to present a uniform surface over large areas.

P.E. - Registered Professional Engineer (in this case registered in the State of Missouri).

Pedestrian Way - An easement or right-of-way designated to facilitate pedestrian access to adjacent streets and properties.

Permit - The Special Use Permit (SUP) issued by the Department.

Permit Application Center (PAC) - Central location for the collection and distribution of permits and permit applications. Source for current project status information and general information.

Person - Any individual, co-partnership, firm, association, company, or combination of individuals, of whatever form or character.

Plan, Concept - Drawing showing the site, internal circulation, adjacent public roads and commercial and residential entrances. Such plans must also show the dimensions and lane use of the existing public roadways.

Plan, General - A plan or any portion thereof for the coordinated development of St. Louis County, adopted in accordance with the St. Louis County Charter.

Plan, Site - A drawing showing plan and section views of the existing conditions and proposed improvements.

Plans, Construction - Same as Plans, Improvement.

Plans, Improvement - The engineering drawings showing the construction details and the types of materials for the physical structures and facilities, excluding dwelling units, to be installed in conjunction with the development of the project.

Plat - A subdivision of land legally approved and recorded.

Property Line - The legally recorded boundary of a lot, tract, or other parcel of land.

PROWAG - Public Rights-of-Way Accessibility Guidelines.

Public Utility Facility, Local - A public utility facility serving a local area only, such as an electric substation or a water or gas pumping or regulating station or a telephone switching center.

Record Plat (Subdivision) - That plat containing the signature of the Director of Planning, which designates final approval and is recorded in the Office of the Recorder of Deeds of St. Louis County.

Right-of-Way (R/W, R.O.W. or ROW) - A strip of land reserved or acquired by dedication, prescription, condemnation, gift, purchase, eminent domain or any other legal means, occupied or intended to be occupied by a street, sidewalk, railroad, utility, sewer, or other similar use.

Road - The entire width and length of the right-of-way or the easement of a road, street, avenue or boulevard or similar item.

Road Right-of-Way Line - The boundary line that divides a parcel of ground or lot from a public or private roadway.

Roadway - That portion of a road intended for use by the general traveling public, typically delineated by curbs, edge lines, edge of pavement.

RR or R.R. - Railroad

Setback (Building Line) - The required minimum distance from a road right-of-way or lot line that establishes the area within which a structure can be erected or placed, except as may be permitted in the Zoning Ordinance.

Sidewalk - A paved area separate from the highway or roadway intended to be used by pedestrians.

Sight Distance Triangle - The triangular area bounded by the property lines of a corner lot and a line connecting two (2) points on the property lines, each measured thirty (30) feet from the intersection of the two property lines. Where applicable, right-of-way lines shall be substituted for property lines.

Sign, Guide - A sign identifying entrances, exits, aisles, ramps, and similar traffic-related information.

Siltation Control - The installation of such devices as sediment ponds, bales of straw, siltation fencing, sodding or seeding and mulching, or other devices to prevent silting of abutting properties and roadway during the period of construction and up to and including such time as permanent ground cover is attained.

Single Lot Development - A development consisting of one or more buildings to be erected on a platted parcel of land or a single lot which is part of a subdivision, intended to be separately owned, developed, and otherwise used as a unit.

SLCRO - St. Louis County Revised Ordinances.

Slope - The rate of deviation of the ground surface from the horizontal surface, expressed in percentages or proportions (i.e., 3 horizontal: 1 vertical, 4 horizontal: 1 vertical, etc.).

Soils Map - Same as Geologic Map.

Soils Report - See Geotechnical Report.

Steep Grade - Roadway grades in excess of 6% or 8% as applicable to the street classification.

Street - A public or private thoroughfare that affords the principal means of access to abutting property, including all facilities that normally occur within the right-of-way. The term shall also include such other designations as highway, thoroughfare, parkway, throughway, road, pike, avenue, boulevard, lane, place, court, but shall not include an alley or a pedestrian way. The pavement requirements for private streets shall be the same as public streets except that special roadway sections may be used for drainage and perpendicular parking.

Street, Access - A private thoroughfare or driveway, which affords a means of access to parking areas and bays and to abutting buildings.

Street, Arterial - A major street so designated by St. Louis County, and utilized primarily for heavy volumes of traffic on a continuous route or for high vehicular speeds with intersections at grade.

Street, Collector - A secondary land service street that moves traffic from the arterial streets, and distributes traffic regionally, to the minor streets. Collector streets also may serve individual lots, parcels, and uses as a secondary or additional function.

Street, Cul-de-Sac - A street terminating in a circular turnaround.

Street, Dead End (No Outlet) - A street having only one point of ingress and egress.

Street, Frontage or Service - A secondary street, generally parallel and adjacent to arterial streets and highways, which provides access to abutting properties and protection from through traffic by way of controlled access points along arterial streets or highways.

Street, Local Access - Same as Street, Minor.

Street, Loop - A short, independent, minor street that usually terminates along the same collector street of its origin.

Street, Minor - A land service facility for access to abutting properties. Minor streets serve the local neighborhood and are in the form of a cul-de-sac or loop street. Any combination of loop and cul-de-sac streets may be utilized without the streets being designated as collector streets provided such an arrangement serves the same function and the maximum fronting lots do not exceed the total allowed within the provisions of the Street Specifications Matrix set forth in Section 1005.180 of the Subdivision Ordinance.

Street, Multi-Family Access - A private way or driveway which affords a means of vehicular access to parking areas and bays and to abutting buildings in a multiple dwelling unit subdivision.

Street, Private - A privately maintained thoroughfare which affords the principal means of public access to abutting property and which is constructed within private right-of-way or easements provided by adjacent property owners.

Street, Public - A street established or dedicated for public use.

Structure - Any assembly of material forming a construction for occupancy or use, excepting, however, utility poles and appurtenances thereto, underground distribution or collection pipes or cables, and underground or ground level appurtenances thereto.

Subdivision - A subdivision is:

- 1) A multiple family subdivision; or
- 2) The division or redivision of tract or tracts of land wherein:
 - a) Any resulting lot or tract is less than ten (10) acres in area, or
 - b) Any resulting side of a lot created by a division is less than two hundred (200) feet in length, unless such side is the original boundary of the original, legally-existing tract; or
- 3) Dedication of a new street right-of-way; or
- 4) Non-Residential Subdivision.

Subdivision, Minor - Any classification of a subdivision wherein the division or redivision of land does not establish more than four (4) lots wherein all the following criteria are met:

- 1) That the proposed subdivision of land does not include an improvement within a street right-of-way, other than concrete sidewalks, landscaping, monuments, lateral extensions of sanitary and storm sewers and water mains. Establishment of a right-of-way only shall not be construed as an improvement per Section 1005.130 of the Subdivision Ordinance. However, concrete sidewalks, landscaping, streetlights, monuments and water mains shall be required unless waived. Requirement of any additional improvements or the use of any special procedure of the Zoning Ordinance shall disqualify the proposed subdivision from consideration as a minor subdivision.
- 2) That the proposed subdivision of land does not include a provision for common land or recreational facilities.

- 3) That the proposed subdivision of land does not adversely affect, as determined by the Director of Planning, the development of the parcel proposed for subdivision as well as the adjoining property.
- 4) That the proposed subdivision of land is not in conflict with any provision of the Subdivision or Zoning Ordinances.
- 5) That where a minor subdivision is proposed that fronts on the existing County maintained road that is proposed for widening improvements as determined by the Department of Planning after a report from the Department of Transportation.

The developer may request to have waived the submission of improvement plans for the construction of sidewalks which involve extensive grading, steep topography, or other unusual conditions which would prohibit construction, verified the Department of Transportation and, in lieu thereof, post bond or escrow to insure that the sidewalks will be installed as part of the street widening improvement. The bond or escrow agreement shall have a twenty-five (25) year term.

Subdivision, Multi-Family Residential - A tract of land, whether divided into separate lots or not, which is intended entirely for the construction of duplexes, multiple family dwellings, row houses and other arrangements of attached or connected building units.

Subdivision, Non-Residential - Either a division or redivision of a tract of land into more than one (1) lot, plat, or site for commercial or industrial purposes, or the dedication or establishment of a street, alley, pedestrian way in conjunction with or use in any such tract.

Subdivision, Single Family, Large Lot - A division or redivision of a tract or tracts of land wherein all lots are three (3) acres or more in area and each boundary side is greater than two hundred (200) feet in length.

Subdivision, Single Family Residential - A division or redivision of a tract or tracts of land into lots, plats, or site for immediate or future sale or building development wherein any such lot, plat, or site is:

- 1) Less than ten (10) acres in area, or
- 2) Has less than three hundred (300) feet of frontage on a street built to County standards, or
- 3) Is ten (10) acres or more in area but not located on a street built to County standards with any side being less than three hundred (300) feet in length, or
- 4) Is so proposed as to include the dedication or establishment of a street, alley, or public way in conjunction with or used in any such tract, or the designation of any additional private roadway easement which serves as the principal means of access to any adjoining properties.

Subdivision Ordinance - Chapter 1005 SLCRO 1997, as amended, which controls and regulates the division and redivision of land for St. Louis County.

Substantial Construction, Development or Work -

- 1) In a project involving structures, the completion of excavation for footings and foundations.
- 2) In a project involving no structures or insignificant structures, the completion of grading.

SUP - The Special Use Permit issued by the Department.

System Development Charge - An assessment which, if approved the State Legislature and St. Louis County voters, would be imposed on all new development, redevelopment or additions to existing development county wide for needed road improvements.

Tax Increment Financing - A mechanism to promote new development and redevelopment within designated areas with public redevelopments costs being financed from the growth in property tax revenues within the designated area.

Title Company - A corporation qualified and acting under the Missouri Title Insurance Law or a corporation which is an issuing agency for an insurance company insuring land titles.

Title Page - Refer to Section 1005.070 of the Subdivision Ordinance entitled "Improvement Plans".

Tract - An area or parcel of land which the developer intends to subdivide and improve, or to cause to be subdivided and improved, pursuant to the requirements of this criteria and applicable St. Louis County Ordinances.

Traffic Generation Assessment (TGA) - An assessment required of developers in the unincorporated areas of St. Louis County where ordinance conditions are imposed on new development, redevelopment or additions to existing development for improvements to area roadways to handle the additional traffic generated by this development.

Trust Fund Areas and Contributions - An area of unincorporated St. Louis County established by legislation to administer traffic generation assessments originating in the area and provide a funding mechanism to allow improvement of the road system in the area to serve development as it occurs.

Unclassified Road - All roads in unincorporated St. Louis County which are not classified, typically a minor or local access street.

Zoning Ordinance - Chapter 1003 SLCRO 1974, as amended, as from time to time amended, which controls and regulates zoning for St. Louis County.

20.00 Pavement Materials

- 1) **Asphalt Binder** - Performance grade (PG) asphalt binders are identified by their desired "high temperature" (e.g. "64", "70", "76", etc.) and "low temperature" (e.g. "-22", "-28", "-34", etc.) characteristics. The temperature numbers represent Celsius degrees and are used in 6-degree increments. The high temperature value is associated with controlling rutting, while the low temperature value is associated with resisting cold weather cracking. The standard binder grade for the St. Louis County region is a PG 64-22. Table 1 & 2 should be used as a guide to select asphalt binder grades for bituminous mixtures.

- 2) **Mix Selection** - Table 1 should be used as a guide in selecting the appropriate asphalt mix. Tables 4A and 4B should be used as a guide for identification of the mix by pay item number and by description. See **PAVEMENT THICKNESS REQUIREMENTS** for additional mix selection discussion regarding minor road spot improvements. Specifying Superpave requires:
 - Mix Type
 - Binder Type
 - Traffic Level
 - Skid Resistance designation

For skid resistance on Arterial Roads an LP, Limestone/Porphyry designation is standard with SP 125 or SP 95 wearing courses (i.e. SP 125 (PG70-22)CLP). An LS, Limestone/Slag designation is available when suppliers decide that it is economically viable.

Table 3 should be used as a guide in determination of Traffic Level assignment in the absence of Equivalent Single Axle Load (ESAL) values.

Table 1 - Asphalt Binder Selection Criteria				
<u>Type of Corridor</u>	<u>Traffic Level</u>	<u>Type of Mix</u>	<u>Asphalt Binder</u>	<u>Skid Resistance</u>
Arterial Roads	B & C	Wearing Course SP 125	PG 70-22*	LP or LS
		Base Course SP 190	PG 64-22*	None
Arterial Roads	D	Wearing Course SP 125	PG 64-22*	LP or LS
		Base Course SP 190	PG 64-22*	None
CRS Roads: Residential & Collectors	E & F	Wearing Course Type "C" Bituminous Pavement or SP 125 Base Course Type "X" Bituminous Pavement or SP 190	PG 64-22	None
Drive Approaches and Parking Lots	F	Wearing Course Type "D" Bituminous Pavement or SP 95	PG 64-22	None
		Base Course Type "X" Bituminous Pavement or SP 190	PG 64-22	None
*Note: Binder may be bumped up one or two levels if truck traffic type and movement requires				

The low temperature number is to remain as indicated in the above table. The high temperature numbers have been set for the traffic loads and operation speeds normally associated with these corridors. The high temperature numbers are recommended minimums and are not to be reduced; however, a PG 64-22 may be raised to a PG 70-22 or PG 76-22, when deemed necessary, to accommodate actual or anticipated traffic conditions.

Table 2 summarizes the Design Traffic Level and PG binder grade adjustments for the wearing course depending on traffic conditions. Typically, the high temperature number should be raised one increment (6 degrees) when:

- Traffic speeds are expected to be in the range of 12 to 45 mph or
- Grades are above 6.0 percent or
- Traffic Levels are above 10,000,000 ESALs

The high temperature number should be raised two increments (12 degrees) for:

- Extremely slow traffic speeds of less than 12 mph (frequent stop and go traffic caused by congestion, stop sign/signal intersection control or bus/truck stopping areas) or
- Areas around trash-transfer stations, quarry entrances/exits or where there is a concentration of truck/bus traffic or
- Truck/bus stopping areas (parking area, rest area, loading area, intersections, etc.) or
- Grades are above 6.0 percent

Use of any other PG asphalt binder must be approved by the Chief Materials Engineer.

If a higher type PG asphalt binder is warranted, it shall be used in the wearing course mixture and in some cases, in the base course mixture. The use of a PG 70-22 or PG 76-22 binder is not recommended for small areas consisting of less than 500 tons or less than 10 feet wide for each mix specified.

The use of recycled materials (Reclaimed Asphalt Pavement and/or Asphalt Roofing Shingles) is allowed by the material manufacturer in accordance with Section 413 of the St. Louis County "Standard Specifications for Road and Bridge Construction" manual, and is not required to be specified.

Table 2 - Adjustment to Wearing Course Binder PG Grade			
<u>Design Level</u>	<u>Standing</u>	<u>Slow</u>	<u>Standard</u>
F	PG 64-22	PG 64-22	PG 64-22
E	PG 70-22	PG 64-22	PG 64-22
D	PG 76-22	PG 70-22	PG 64-22
C	PG 76-22	PG 70-22	PG 70-22
B	PG 76-22	PG 70-22	PG 70-22

Standing: For extremely slow traffic of less than 12 mph (Metro bus stops, Stop sign or signal-controlled intersections).

Slow: When traffic speeds are expected to be in the range of 12 to 45 mph or for traffic levels above 10,000,000 ESALs

Standard: The base binder for the traffic ESAL's or Class as per Table 3 when Slow or Standing traffic is not to be encountered.

Table 3 - Superpave Design Applications

<u>Design Level</u>	<u>Design Traffic (ESALs)</u>	<u>Typical Roadway Applications</u>
F	≤ 300,000	Applications include roadways with very light traffic; volumes such as local roads, country roads, and city streets where truck traffic is prohibited or at a very minimal level. Traffic on these roadways would be considered local in nature, not regional, intrastate or interstate . Special purpose roadways serving recreational sites or areas may also be applicable to this level. Typically used on non-collector CRS roadways.
E	≤ 3,000,000	Applications include many collector roads or access streets. Medium-trafficked city streets and the majority of country roadways may be applicable to this level. Typically used on CRS collectors
D	≤ 10,000,000	Applications include medium-traveled two-lane, multilane and divided collector roads and access streets. Typically used on ARS roadways.
C	≤ 30,000,000	Applications include heavy-traveled two-lane, multilane and divided collector roads and access streets. Typically used on ARS roadways within zones with moderate commercial use. (Hanley and Brentwood are two examples). Also applicable for many state routes, US highways and some rural interstates.
B	> 30,000,000	Applications include heavy-traveled two-lane, multilane and divided collector roads and access streets. Typically used on ARS roadways within zones with heavy commercial use. Also applicable for majority of interstate routes and truck climbing lanes.

Table 4A - St. Louis County Bituminous Pavement Mixes

<u>Bid Tab Information</u>		<u>Application Information</u>		<u>Mix Design Information</u>		
<u>Item No.</u>	<u>Description</u>	<u>Applications</u>	<u>Non-Skid</u>	<u>Required Design Information</u>	<u>Mix Design</u>	<u>Binder</u>
"Low" Type Mixes (Bituminous Pavements) - 405 Items						
405-30.10	Type C Bituminous Pavement	Overlay and construction of CRS roads, detours, temporary pavements, new subdivisions, all shoulders	No	Minimum compacted lift thickness: 1.5 inches	50 Blow Marshall	PG64-22
405-30.20	Type D Bituminous Pavement	Drive Approaches and Parking Lots	No	Minimum compacted Lift Thickness: 1 inch	50 Blow Marshall	PG64-22
405-30.30	Type X Bituminous Pavement	Base construction on CRS roads, detours, temporary pavements, new subdivisions, all shoulders	No	Minimum compacted lift thickness: 2 inches	50 Blow Marshall	PG64-22

Table 4B - St. Louis County Superpave Asphaltic Concrete Pavement Mixes

<u>Bid Tab Information</u>		<u>Application Information</u>		<u>Mix Design Information</u>		
<u>Item No.</u>	<u>Description</u>	<u>Applications</u>	<u>Non-Skid</u>	<u>Required Design Information</u>	<u>Mix Design</u>	<u>Binder</u>
Superpave Mixes (Asphaltic Concretes) - 404 Items						
404-09.XX	Superpave Asphaltic Concrete Mixture SP 95 (x)y /LP / LS x= PG Binder Grade; y= Design Level LP= Limestone-Porphry LS= Limestone-Slag	ARS & CRS Roads. Structural Overlays where complete joint and base repairs have been made. New full-depth construction at least 10' wide. Modified Binders (PG 70-22, 76-22) to only be used where the configuration will permit over 500 tons of production at a time.	Yes (LP & LS mixes only)	Minimum compacted lift thickness: 1 inch. ESALs over Design Life are required to determine aggregate properties and design gyrations. (All Levels)	Gyratory Compactor	PG76-22 PG70-22 PG64-22 (Typ.)
404-12.XX	Superpave Asphaltic Concrete Mixture SP125 (x)y /LP / LS x= PG Binder Grade; y= Design Level LP= Limestone-Porphry LS= Limestone-Slag	ARS Roads only. Structural Overlays where complete joint and base repairs have been made. New full-depth construction at least 10' wide. Modified Binders (PG 70-22, 76-22) to only be used where the configuration will permit over 500 tons of production at a time.	Yes (LP & LS mixes only)	Minimum compacted lift thickness: 1.5 inches. ESALs over Design Life are required to determine aggregate properties and design gyrations. (Levels B-D only)	Gyratory Compactor	PG76-22 PG70-22 PG64-22 (Typ.)

404-12.XX	Superpave Asphaltic Concrete Mixture SP125 (x)y/LP/LS x= PG Binder Grade; y= Design Level LP= Limestone-Porphry LS= Limestone-Slag	CRS Roads only. New full-depth construction at least 10' wide. PG64-22 binder specified unless special traffic loadings require modification. Modified Binders (PG 70-22) to only be used under special loading conditions <u>and</u> where the configuration will permit over 500 tons of production at a time. [LP & LS designation not typically required, unless non-skid required]	No (Yes, if LP & LS mixes only)	Minimum compacted lift thickness: 1.5 inches. ESALs over Design Life are required to determine aggregate properties and design gyrations. (Level E-F only)	Gyratory Compactor	PG70-22 PG64-22 (Typ.)
404-19.XX	Superpave Asphaltic Concrete Mixture SP190 (x)y x= PG Binder Grade y= Design Level Not appropriate for base repairs.	ARS & CRS Roads. New full-depth construction at least 10' wide. PG64-22 binder specified unless traffic loadings indicate modification is required. Modified Binder (PG 70-22,) to only be used under special traffic loading conditions <u>and</u> where the configuration will permit over 500 tons of production at a time.	No	Minimum compacted lift thickness: 2 inches. ESALs over Design Life are required to determine aggregate properties and design gyrations. (All Traffic Levels)	Gyratory Compactor	PG70-22 PG64-22 (Typ.)

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20.10 Arterial Street Design Criteria

1) Right-of-Way and Pavement Width Requirements:

Street Classification	R/W Width	Pavement Width	Standard Dwg. No.
2 Lane Arterial	70	24	C203.60
3 Lane Urban Arterial	60	39 ⁽¹⁾	C203.61
3 Lane Arterial	70	39 ⁽¹⁾	C203.62
4 Lane Arterial	72	51 ⁽¹⁾	C203.63
5 Lane Arterial	84	63 ⁽¹⁾	C203.64
3 Lane Rural Arterial	84	36	C203.65

⁽¹⁾ Pavement widths shown require 6" vertical curb on both sides of the roadway except for streets designed for the Earth City and Chesterfield Valley Areas which, due to roadway grades, require open drainage facilities for stormwater. Refer to Standard Drawings C203.66, through C203.68 for typical sections applicable in these areas.

2) Pavement Thickness Requirements: ⁽²⁾

All classifications and pavement widths	<u>Flexible Pavement</u>
	2" Superpave SP125 Asphaltic Concrete Wearing Surface 10" Superpave SP190 Asphaltic Concrete Base Course; 4" Type 5 Aggregate Sub-Base
	<u>Rigid Pavement</u>
	8" of Portland Cement Concrete* 4" of Type 5 Aggregate Base
	<u>Combination Pavement</u>
	2" Superpave SP125 Asphaltic Concrete Wearing Surface; 7" Portland Cement Concrete Base*; 4" Type 5 Aggregate Sub-Base

⁽²⁾ Pavement thickness on recently improved Arterials may be greater than shown due to federal requirements. Any additional widening to these pavements must match existing conditions as directed by the Department.

* Type "G" Transverse Joints required (Refer to Standard Drawing C502.13).

3) Horizontal and Vertical Alignment Requirements:

Street Classification	Grades ⁽¹⁾	Centerline Alignment	Anticipated Posted Speed Limit ⁽²⁾
2 or 3 Lane Arterial	2% Min., 6% Max.	10 Degree Max. (575' R)	35 MPH min.
4 or 5 Lane Arterial	2% Min., 6% Max.	6 Degree Max. (955' R)	40 MPH Min.

(1) Refer to Exhibit 20.50-1 for Design Control for Vertical Curves.

(2) **Design Speed** - On existing roadways, design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5 M.P.H. greater than the posted speed limit, whichever is greater. On new roadways, design speed shall be 5 M.P.H. greater than the anticipated posted speed limit.

20.20 County Street Design Criteria

1) Right-of-Way and Pavement Width Requirements:

Street Classification	R/W Width	Pavement Width	Standard Dwg. No.
2 Lane Collector	70	24	C203.70
3 Lane Urban Collector	60	39	C203.71
3 Lane Collector	70	39	C203.72

2) Pavement Thickness Requirements:

All classifications and pavement widths

Flexible Pavement

2" Type "C" Bituminous Concrete Wearing Surface;
8.5" Type "X" Bituminous Concrete Base Course;
4" Type 5 Aggregate Sub-Base

Rigid Pavement

7" of Portland Cement Concrete*
4" of Type 5 Aggregate Base

Combination Pavement

2" Type "C" Bituminous Concrete Wearing Surface;
6" Portland Cement Concrete Base;
4" Type 5 Aggregate Sub-Base

* Type "G" Transverse Joints required (Refer to Standard Drawing C502.13).

3) Horizontal and Vertical Alignment Requirements:

Street Classification	Grades ⁽¹⁾	Centerline Alignment	Anticipated Posted Speed Limit ⁽²⁾
2 Lane Collector	2% Min., 8% Max.	20 Degree Max. (275' R)	30 MPH Min.
3 Lane Collector	2% Min., 6% Max.	15 Degree Max. (375' R)	30 MPH Min.

(1) Refer to Exhibit 20.50-1 for Design Control for Vertical Curves.

(2) **Design Speed** - On existing roadways design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5 M.P.H. greater than the posted speed limit, whichever is greater. On new roadways, design speed shall be 5 M.P.H. greater than the anticipated posted speed limit.

20.30 Residential Street Design Criteria

1) Right-of-Way and Pavement Width Requirements:

Street Classification	R/W Width	Pavement Width	Standard Dwg. No.
2 Lane Minor Local ⁽¹⁾	34	20 ⁽³⁾	C203.80
2 Lane Minor Rural ⁽¹⁾	34	20 ⁽³⁾	C203.81
2 Lane Local	50 ⁽²⁾	26 ⁽³⁾	C203.82
2 Lane Rural Local	50 ⁽²⁾	26 ⁽³⁾	C203.83
3 Lane Local	60	38 ^(3,4)	C203.84

⁽¹⁾ The 34' right-of-way width section requires additional drainage and utility easements on both sides of the roadway as determined by the Department. It is limited to cul-de-sac streets serving not more than 13 lots and loop streets limited to 26 lots in "R-1" Zoning Districts.

⁽²⁾ As provided by Section 1005.180 of the Subdivision Ordinance in any residential zoning district where eight (8) or fewer single family lots, including corner lots, are proposed on a cul-de-sac street which will not contain sidewalks, a forty (40) foot right-of-way is permitted with additional easements as required for drainage and utilities.

⁽³⁾ All of the above designated pavement widths shall be constructed with rolled curb with the exception of the following conditions:

- a) Where subdivisions are approved with commercial lot frontages which require vertical curb.
- b) Where subdivision Collector streets are designed with vertical curb and restricted access and adjacent lots are served from the internal cul-de-sac and loop streets.
- c) Where 2 Lane Local streets are approved for improvement with open drainage facilities as shown on Standard Drawings C203.81 and C203.83.

⁽⁴⁾ The 38' pavement width shown for 3 Lane Local streets shall be designed in accordance with the following lane configurations:

- a) 3 driving lanes where adjacent residential lots are served from internal cul-de-sac and loop streets.
- b) 2 driving lanes with 2 emergency parking lanes where adjacent residential lots are served from the collector roadway. However, at major intersections 3 driving lanes with tapers, appropriate pavement joint transitions and posted parking restrictions will be required.

2) Pavement Thickness Requirements:

**All Subdivision Streets
Less Than 30 Feet Wide**

Flexible Pavement

2" Type "C" Bituminous Concrete Wearing Surface
7" Type "X" Bituminous Concrete Base
4" Type 5 Aggregate Sub-Base

Rigid Pavement

6" Portland Cement Concrete
4" Type 5 Aggregate Base

Combination Pavement

2" Type "C" Bituminous Concrete Wearing Surface
6" Portland Cement Concrete Base
4" Type 5 Aggregate Sub-Base

**All Subdivision Streets
More Than 30 Feet Wide**

Flexible Pavement

2" Type "C" Bituminous Concrete Wearing Surface
8.5" Type "X" Bituminous Concrete Base
4" Type 5 Aggregate Sub-Base

Rigid Pavement

7" Portland Cement Concrete
4" Type 5 Aggregate Base

Combination Pavement

2" Type "C" Bituminous Concrete Wearing Surface
6" Portland Cement Concrete Base
4" Type 5 Aggregate Sub-Base

3) Horizontal and Vertical Alignment Requirements:

Street Classification	Grades ⁽¹⁾	Centerline Alignment	Anticipated Posted Speed Limit ⁽²⁾
2 Lane Local	1% Min., 10% Max.,	150' R Min. 150' to 75' R by special approval of Department	25 MPH Min.,
3 Lane Local	2% Min., 8% Max.,	15 Degree Max. (375' R)	30 MPH Min.

(1) Roadway grades less than 2% or in excess of 8%, require special attention to drainage. Refer to Exhibit 20.50-1 for Design Control for Vertical Curves.

(2) **Design Speed** - On existing roadways design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5 M.P.H. greater than the posted speed limit, whichever is greater. On new roadways, design speed shall be 5 M.P.H. greater than the anticipated posted speed limit.

20.40 Non-Residential Street Design Criteria

1) Right-of-Way and Pavement Width Requirements:

Street Classification	R/W Width	Pavement Width	Easement Width	Standard Dwg. No.
2 Lane Local	40	27 ⁽¹⁾	6 ⁽²⁾	C203.90
3 Lane Local	50	39 ⁽¹⁾	6 ⁽²⁾	C203.91
4 Lane Local	60 ⁽²⁾	51 ⁽³⁾	6 ⁽²⁾	C203.92

⁽¹⁾ Pavement widths shown for all classifications require 6" vertical curb on both sides of the roadway except for streets designed for the Earth City and Chesterfield Valley areas which, due to roadway grades, require open drainage facilities for stormwater. Refer to Standard Drawings C203.66 through C203.68 for special typical sections applicable in these areas.

⁽²⁾ Easement width required on both sides of right-of-way.

2) Pavement Thickness Requirements:

All Classifications and Pavement Widths

Flexible Pavement

2" Type "C" Bituminous Concrete Wearing Surface
 8½ " Type "X" Bituminous Concrete Base Course
 4" Type 5 Aggregate Sub-Base

Rigid Pavement

7" Portland Cement Concrete *
 4" Type 5 Aggregate Base

Combination Pavement

2" Type "C" Bituminous Concrete Wearing Surface
 6" Portland Cement Concrete Base
 4" Type 5 Aggregate Sub-Base

* Type "G" Transverse Joints requires (Refer to Standard Drawing C502.13).

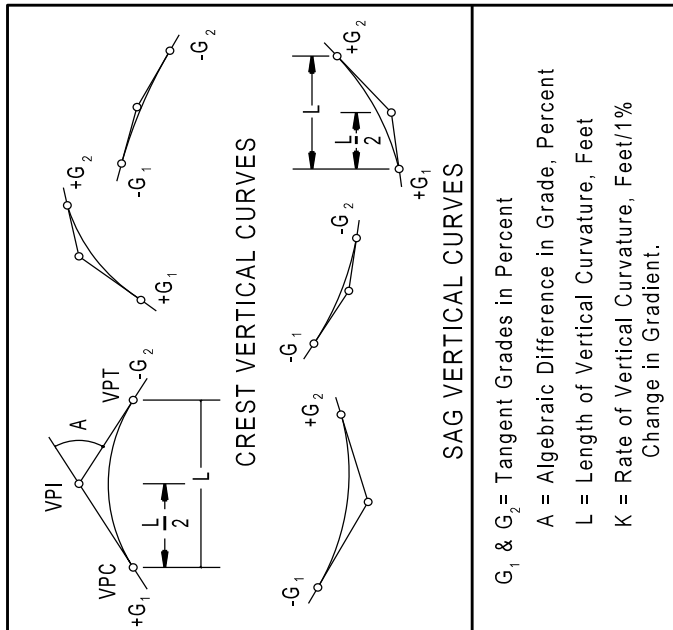
3) Horizontal and Vertical Alignment Requirements:

Street Classification	Grades ⁽¹⁾	Centerline Alignment	Anticipated Posted Speed Limit ⁽²⁾
2 Lane Local	1% Min., 10% Max.	150' R Min. 150' to 75' R by special approval of Department	25 MPH Min.
3 Lane Local	2% Min., 8% Max.,	15 Degree Max. (375' R)	30 MPH Min.
4 Lane Local	2% Min., 8% Max.,	10 Degree Max. (575' R)	35 MPH Min.

⁽¹⁾ Roadway grades less than 2% or in excess of 8%, require special attention to drainage. Refer to Exhibit 20.50-1 for Design Control for Vertical Curves.

⁽²⁾ **Design Speed** - On existing roadways design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5 M.P.H. greater than the posted speed limit, whichever is greater. On new roadways, design speed shall be 5 M.P.H. greater than the anticipated posted speed limit.

NEW	REVISIONS		
5-17-89	9-2-97	5-9-01	4-13-07
			9-1-15



Design Speed M.P.H.	"K" Values for Crest and Sag Vertical Curves										Minimum Value of "L"	
	2 Lane Pavement		3 Lane Pavement		4 Lane Pavement		5 Lane Pavement					
	Crest	Sag	Crest	Sag	Crest	Sag	Crest	Sag	Crest	Sag		
15	10	10	10	10	15	15	10	15	10	15	10	50'
20	20	20	20	20	20	20	20	25	20	25	20	60'
25	25	25	30	30	35	35	30	35	30	35	30	75'
30	35	35	40	40	45	45	40	55	40	55	40	90'
35	50	50	55	50	65	65	50	70	50	70	50	105'
40	80	70	80	70	80	80	70	90	70	90	70	120'
45	120	90	120	90	120	120	90	120	90	120	90	135'
50	160	110	160	110	160	160	110	160	110	160	110	150'
55	220	130	220	130	220	220	130	220	130	220	130	165'
60	310	160	310	160	310	310	160	310	160	310	160	180'
65	400	180	400	180	400	400	180	400	180	400	180	195'
70	540	220	540	220	540	540	220	540	220	540	220	210'

FORMULAS: $K = \frac{L}{A}$ or $L = KA$

EXAMPLE 1 : 4 Lane Pavement,
 Design Speed = 35 m.p.h.
 Crest Vertical Curve where $A = 6.0$
 $L = 65' \times 6.0 = 390'$

EXAMPLE 2 : 2 Lane Pavement,
 Design Speed = 25 m.p.h.
 Crest Vertical Curve where $A = 2.5$
 $L = 25' \times 2.5 = 62.5'$ - Use minimum "L" as shown in right column, $L = 75'$

EXAMPLE 3 : 3 Lane Pavement
 Design Speed = 45 m.p.h.
 Sag Vertical Curve, where $A = 3.0$
 $L = 90' \times 3.0 = 270'$

CAUTION !

Special attention to drainage must be exercised where a "K" Value greater than 160 is used.

SAINT LOUIS COUNTY
 DEPARTMENT OF TRANSPORTATION
 CLAYTON, MISSOURI

RECOMMENDED DESIGN CONTROL FOR VERTICAL CURVES

REVISION DATE: September 1, 2015
 DRAWING 20.50-1

GENERAL NOTES

- On existing roadways, the design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies, or 5m.p.h. greater than the posted speed limit, whichever is greater. For residential and non-residential streets with a pavement width of 32ft. or less, the design speed shall be the anticipated posted speed limit.
- On new roadways, the design speed shall be 5 m.p.h. greater than the anticipated posted speed limit. For residential and non-residential streets with a pavement width of 32 feet or less, the design speed shall be the anticipated posted speed limit.
- Ultimate Pavement Width shall be used to determine the "K" Values.

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30.00 Improvement Plan General Requirements

The concept / site plan must be approved **before** the Department will approve the roadway improvement plans.

Each approved concept / site plan must contain all information required in Section 1003.179 of the Zoning Ordinance and / or Sections 1005.050 and 1005.060 of the Subdivision Ordinance, where applicable, and in addition shall show **existing** and **proposed** right-of-way, easements, edge of pavement, islands, medians, lane usage, intersecting streets and driveways, sidewalks, traffic signal facilities and drainage structures on **both** sides of the roadway along the proposed site frontage and for a distance beyond the site limits to include required tapers, turning lanes, etc., as directed by the Department. Existing utility facilities such as poles, underground vaults, mains, pedestals, fire hydrants, etc., shall be shown and identified. Where possible these facilities should be avoided due to the relocation costs connected with them. For developments within 200 feet of an intersection, the above referenced existing and proposed roadway features must include **all** approaches to the intersection for a distance of 200 feet. The concept / site plan must also include planned future roadway construction improvements by others in the vicinity of the proposed site development.

Concept / site plans should also show the sight distance in each direction for all existing and proposed intersecting streets and driveways which will be affected by the proposed roadway improvements. Sight distance, including Permanent Sight Distance Easements, shall be determined and provided in accordance with the criteria specified in Section 40.25, "Sight Distance at Intersections".

The concept / site plan shall **not** be considered a **construction plan**. Intersection geometrics, median locations, size of channelization islands, radii, taper lengths, traffic signal improvements, easements, etc., are to be considered approximate and may need to be adjusted on the improvement plan. Construction details of any and all required geometric improvements are not considered finally approved until the improvement plan has been reviewed and approved by the Department.

The concept / site plan shall be any scale from 1" = 10' through 1" = 50', so long as the scale is an increment of 10 feet and is sufficiently clear in reflecting the proposed improvements. The concept / site plan shall be prepared on exhibits having a maximum sheet size of 30 inches by 42 inches.

A concept / site plan for a development submitted for the first time to the Department of Transportation for review will require a set of digital or 35mm photographs showing the topography of the site and the existing roadway conditions adjacent to the site. The site photographs should show all existing structures, creeks, and / or detention basins and the grades adjacent to the property lines. The roadway photographs should show existing storm water inlets, pavement construction, road alignment, lane usage, curbing, sidewalk and utilities located within the road right-of-way which may require relocation.

All photographs must be identified by number and shall be accompanied by a photo legend indicating which direction the photographs were taken. Digital photographs are preferred and shall be printed in color on 8.5" x 11" photo printer paper (JPEG photo files must also be provided if requested). If 35mm photographic prints from negatives are provided instead of digital photographs, they shall be no smaller than 4" x 6", printed on photographic paper and mounted two to a page on 8.5" x 11" card stock (one side only). A "North" arrow must be shown on the photo legend. In addition, the name of the company and the date the photographs were taken must be shown in the lower right hand corner of the photo mounted card stock or color printout.

Following concept / site plan approval by the Department, roadway improvement plans for all aspects of the subdivision or site development must be submitted to the Department or through the Permit Application Center, as applicable, for review. No subdivision roadway improvement plans are required for large lot subdivisions, unless the streets therein are proposed by the developer for dedication to St. Louis County for public use. A Special Use Permit will be required for large lot subdivision access to public right-of-way and any required sidewalk within County road right-of-way or easement. Refer to Section 2.5 of the Special Use Permit Application Requirements and Conditions Book.

The improvement plans shall be any scale from 1" = 10' through 1" = 50', so long as the scale is an increment of 10 feet and is sufficiently clear in reflecting the details of the proposed construction. However, all traffic signal plans shall be drawn to scale at 1" = 20'. Improvement plans shall be prepared on exhibits having a maximum sheet size of 30 inches by 42 inches except for plans subject to the subdivision ordinance which limits exhibits to 24 inches by 36 inches. They shall generally consist of the Site Plan (single lot developments) or Title Page with plan view (subdivision developments) with an index of the drawings included with the plans, the Roadway Construction Detail Sheets, including applicable St. Louis County Standard Drawings, the Sanitary / Storm Sewer Plan and Profile Sheets, the Grading, Cross Section and / or Contour Sheets, Hydraulic Computation Forms, Right-of-way and Easement Dedication Plat and other plans / drawings necessary to illustrate the improvements.

After Improvement Plan Approval, permits may be applied for in accordance with the provisions of Section 60.00.



UNINCORPORATED CONCEPT / SITE PLAN CHECKLIST*

Development Name

Submittal Date

Engineer

Circle One for Each Item: **N/A** (Not Applicable) **O/P** (On Plans)
 P/S (Plan Sent) **ATT** (Attached)

Note that "forthcoming" or "to be provided" is not an option

- N/A** **O/P** 1) Location map.
- N/A** **O/P** 2) North arrow and Engineer's scale.
- N/A** **O/P** 3) All site specific zoning ordinance conditions.
- N/A** **O/P** 4) Present and proposed zoning, proposed use.
- N/A** **O/P** 5) P.E. seal and signature, as required.
- N/A** **O/P** 6) Show and dimension about the centerline of right-of-way, all existing and proposed private and public street pavement, driveways, alleyways and sidewalks within the site, and abutting or opposite the site.
- N/A** **O/P** 7) Show and dimension about the centerline of right-of-way, all existing and proposed, public and private street right-of-ways, easements and TSCL's within the site, and abutting or opposite the site.
- N/A** **O/P** 8) Book and page in which right-of-way, easement and TSCL has been recorded.
- N/A** **O/P** 9) Existing and proposed storm sewers, bridges, culverts, sink holes, springs, basins within site and abutting site.
- N/A** **O/P** 10) Existing and proposed 2 foot interval contours based upon U.S.G.S. datum within site and extending 100 feet beyond site.
- N/A** **O/P** 11) Cross access within site and abutting site, as required.
- N/A** **O/P** 12) Geotechnical Statement with P.E. seal and signature, when a geotechnical report is required.

* Additional requirements may be necessary depending on the particular site development.



UNINCORPORATED
CONCEPT / SITE PLAN CHECKLIST*

Development Name

Notes:

- N/A O/P** 13) Sight triangle at all uncontrolled intersections of public street rights-of-way.
- N/A O/P** 14) All proposed improvements will conform to related St. Louis County Capital Improvement Project No. _____.
- N/A O/P** 15) All sidewalks to be constructed to current St. Louis County / ADA Standards.
- N/A O/P** 16) Prior to improvement / construction plan approval, the engineer shall provide a signed and sealed note on the plans for both residential and commercial projects, stating that the unimproved existing sidewalk along the project frontage meets current St. Louis County / ADA Standards.
- N/A O/P** 17) All proposed improvements shall be constructed to St. Louis County Standards.
- N/A O/P** 18) All grading and drainage to be in conformance with St. Louis County and MSD Standards.
- N/A O/P** 19) No slopes shall exceed 3 (horizontal) to 1 (vertical), unless justified by a geotechnical report, which has been accepted / approved by St. Louis County.
- N/A O/P** 20) All driveways intersecting St. Louis County Arterial and classified roadways shall have on-site turnaround capability.
- N/A O/P** 21) Storm water shall be discharged at an adequate natural discharge point. Sinkholes are not adequate discharge points.
- N/A O/P** 22) Required roadway improvements must be completed prior to issuance of building permits in excess of 60% for subdivisions or prior to occupancy for single lot developments.
- N/A O/P** 23) Existing ponds to be eliminated shall be de-watered at a reasonable rate as not to adversely affect downstream properties.
- N/A O/P** 24) Each stub street shall have a sign posted by developer advising: "This street to be extended as part of future development."
- N/A O/P** 25) Steep grade approval will be required prior to construction plan approval.

* Additional requirements may be necessary depending on the particular site development.



UNINCORPORATED CONCEPT / SITE PLAN CHECKLIST*

Development Name

Notes:

- N/A O/P** 26) Improve _____ to one-half of a _____ right-of-way and a _____ pavement or minimum _____ pavement. (Show and reference the appropriate typical section on the plan per Standard Drawings C203.60 through C203.92 of the St. Louis County Department of Transportation Standard Drawings).
- N/A O/P** 27) Provide a sidewalk conforming to St. Louis County ADA standards adjacent to _____. (Sidewalk is to be shown along the entire frontage of the property adjacent to a County roadway. Any variation to this will be determined during construction plan review.)
- N/A O/P** 28) Access to this development from _____ shall be via _____ entrance(s) located _____ to provide required sight distance and constructed to St. Louis County standards as directed by the St. Louis County Department of Transportation.
- N/A O/P** 29) Add the following note to Concept / Site Plans: "All proposed access to St. Louis County roads for new development shall meet minimum St. Louis County sight distance requirements."
- N/A O/P** 30) Any entity that performs work on St. Louis County maintained property shall provide the County with a Certificate of Insurance evidencing general liability coverage (bodily injury and property damage) in the amounts specified as the limits of liability set by the State for public entities. Such certificate shall include "St. Louis County" as an additional insured and shall be provided prior to the issuance of any permit. Certificate shall provide for a 30 day policy cancellation notice to St. Louis County. Upon request, the County will provide the specific amounts for both per person and per occurrence limits.
- N/A O/P** 31) All hydrants, power poles or other potential obstructions within the St. Louis County road right-of-way, shall have a minimum two (2) foot setback from the face of curb, as directed by the St. Louis County Department of Transportation.

* Additional requirements may be necessary depending on the particular site development.

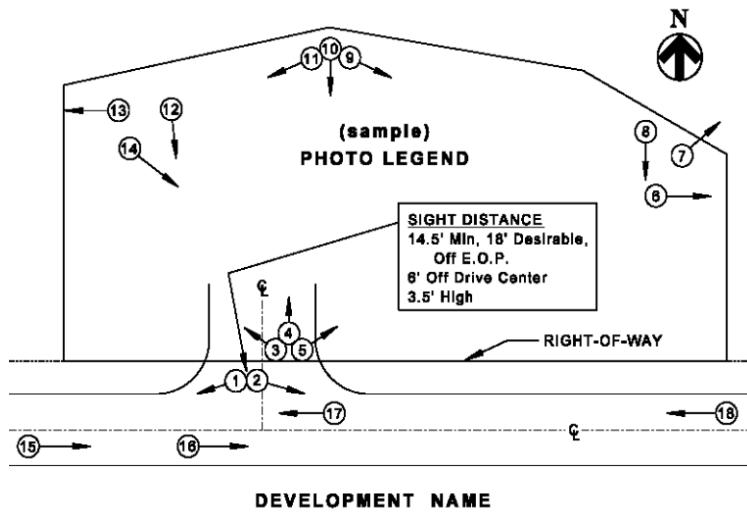


UNINCORPORATED CONCEPT / SITE PLAN CHECKLIST*

Development Name

Supplemental Documents Required to be Submitted with Plan:

N/A ATT 32) Photos identified on a location key showing photo directions and numbers. (See Section 30.00-2, Design Criteria Manual). Photos 1 & 2 below are to be taken at all proposed access locations to verify whether or not there is adequate sight distance.



Photos are to be labeled and identified as shown. If it appears that there is not adequate sight distance a plan and profile of sight lines will be required. See Section 40.25-1 of the Design Criteria Manual.

- N/A P/S 33)** MoDOT concept approval, as required.
- N/A P/S 34)** MSD concept approval.
- N/A P/S 35)** Approved Flood Plain Study reflecting proposed 100-year flood elevation and existing 100-year flood plain limits, as required.
- N/A ATT 36)** Geotechnical report signed and sealed by a professional engineer, as required.
- N/A P/S 37)** Street stub report, as required.

* Additional requirements may be necessary depending on the particular site development.



UNINCORPORATED CONCEPT / SITE PLAN CHECKLIST*

Development Name

- N/A ATT 38)** Traffic Impact Study including traffic signal warrants, as required.
- N/A ATT 39)** Transmittal letter to MSD for all projects within MSD jurisdiction to provide them the opportunity for up-front review of Phase II, Post Construction Stormwater Management Requirements.
- N/A ATT 40)** Pre-construction and post-construction storm water runoff calculations. Post-construction storm water runoff shall mimic pre-construction runoff to the maximum extent possible.

This is to acknowledge that I personally checked the attached plan and related documents for conformance to the Concept / Site Plan Checklist.

Signature

Date

SEAL

Please contact Civil Plan Review at (314) 615-8517 for a preliminary discussion regarding anticipated improvements and access requirements prior to first submittal of the concept / site plan. Please keep in mind that items discussed are subject to change when concept / site plan is submitted and reviewed.

The Design Criteria Manual can be accessed on-line at:
www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/DesignCriteriaManual

* Additional requirements may be necessary depending on the particular site development.



UNINCORPORATED
CONCEPT / SITE PLAN CHECKLIST*

Development Name

Additional Notes / Requirements:

* Additional requirements may be necessary depending on the particular site development.



MUNICIPAL CONCEPT / SITE PLAN CHECKLIST*

Development Name

Submittal Date

Engineer

Circle One for Each Item: **N/A** (Not Applicable) **O/P** (On Plans)
 P/S (Plan Sent) **ATT** (Attached)

Note that "forthcoming" or "to be provided" is not an option

- N/A** **O/P** 1) Location map.
- N/A** **O/P** 2) North arrow and Engineer's scale.
- N/A** **O/P** 3) All site specific zoning ordinance conditions.
- N/A** **O/P** 4) Present and proposed zoning, proposed use.
- N/A** **O/P** 5) P.E. seal and signature, as required.
- N/A** **O/P** 6) Show and dimension about the centerline of right-of-way, all existing and proposed private and public street pavement, driveways, alleyways and sidewalks within the site, and abutting or opposite the site.
- N/A** **O/P** 7) Show and dimension about the centerline of right-of-way, all existing and proposed, public and private street right-of-ways, easements and TSCL's within the site, and abutting or opposite the site.
- N/A** **O/P** 8) Book and page in which right-of-way, easement and TSCL has been recorded.
- N/A** **O/P** 9) Existing and proposed storm sewers, bridges, culverts, sink holes, springs, basins within site and abutting site.
- N/A** **O/P** 10) Existing and proposed 2 foot interval contours based upon U.S.G.S. datum within site and extending 100 feet beyond site.
- N/A** **O/P** 11) Cross access within site and abutting site, as required.
- N/A** **O/P** 12) All proposed improvements will conform to related St. Louis County Capital Improvement Project No. _____.

* Additional requirements may be necessary depending on the particular site development.



MUNICIPAL CONCEPT / SITE PLAN CHECKLIST*

Development Name

Notes:

- N/A O/P** 13) All sidewalks to be constructed to current St. Louis County / ADA Standards.
- N/A O/P** 14) Prior to improvement / construction plan approval, the engineer shall provide a signed and sealed note on the plans for both residential and commercial projects, stating that the unimproved existing sidewalk along the project frontage meets current St. Louis County / ADA Standards.
- N/A O/P** 15) All proposed improvements shall be constructed to St. Louis County Standards.
- N/A O/P** 16) All grading and drainage to be in conformance with St. Louis County and MSD standards.
- N/A O/P** 17) No slopes within St. Louis County right-of-way shall exceed 3 (horizontal) to 1 (vertical).
- N/A O/P** 18) All driveways intersecting St. Louis County Arterial and classified roadways shall have onsite turnaround capability.
- N/A O/P** 19) Storm water shall be discharged at an adequate natural discharge point. Sinkholes are not adequate discharge points.
- N/A O/P** 20) Prior to "Special Use Permit" issuance by the St. Louis County Department of Transportation, a special cash escrow or a special escrow supported by an Irrevocable Letter of Credit, must be established with the St. Louis County Department of Transportation to guarantee completion of the required roadway improvements.
- N/A O/P** 21) Improve _____ to one-half of a _____ right-of-way and a _____ pavement or minimum _____ pavement. (Show and reference the appropriate typical section on the plan per Standard Drawings C203.60 through C203.92 of the St. Louis County Department of Transportation Standard Drawings.)

* Additional requirements may be necessary depending on the particular site development.



MUNICIPAL CONCEPT / SITE PLAN CHECKLIST*

Development Name

Notes:

- N/A O/P** 22) Provide a sidewalk conforming to St. Louis County ADA standards adjacent to _____. (Sidewalk is to be shown along the entire frontage of the property adjacent to a County roadway. Any variation to this will be determined during construction plan review.)

- N/A O/P** 23) Access to this development from _____ shall be via _____ entrance(s) located _____ to provide required sight distance and constructed to St. Louis County standards as directed by the St. Louis County Department of Transportation.

- N/A O/P** 24) Add the following note to Concept / Site Plans: "All proposed access to St. Louis County roads for new development shall meet minimum St. Louis County sight distance requirements".

- N/A O/P** 25) Any entity that performs work on St. Louis County maintained property shall provide the County with a Certificate of Insurance evidencing general liability coverage (bodily injury and property damage) in the amounts specified as the limits of liability set by the State for public entities. Such certificate shall include "St. Louis County" as an additional insured and shall be provided prior to the issuance of any permit. Certificate shall provide for a 30 day policy cancellation notice to St. Louis County. Upon request, the County will provide the specific amounts for both per person and per occurrence limits.

- N/A O/P** 26) All hydrants, power poles or other potential obstructions within the St. Louis County road right-of-way, shall have a minimum two (2) foot setback from the face of curb, as directed by the St. Louis County Department of Transportation.

* Additional requirements may be necessary depending on the particular site development.

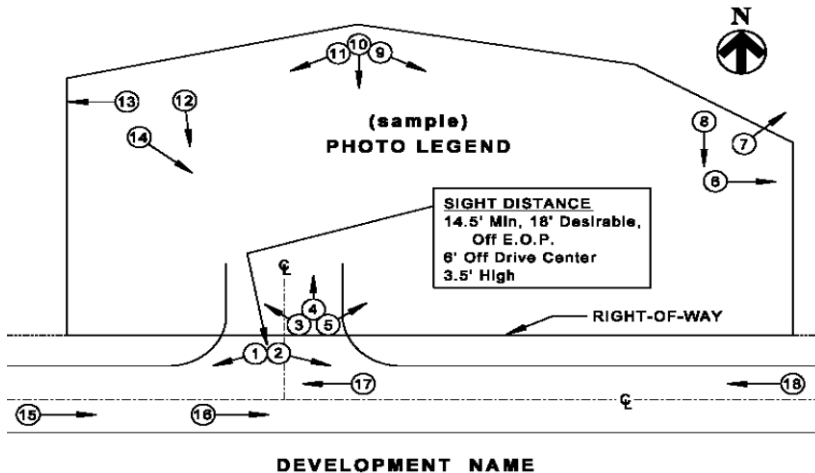


MUNICIPAL CONCEPT / SITE PLAN CHECKLIST*

Development Name

Supplemental Documents Required to be Submitted with Plan:

N/A ATT 27) Photos identified on a location key showing photo directions and numbers. (See Section 30.00-2, Design Criteria Manual). Photos 1 & 2 below are to be taken at all proposed access locations to verify whether or not there is adequate sight distance.



Photos are to be labeled and identified as shown. If it appears that there is not adequate sight distance a plan and profile of sight lines will be required. See section 40.25-1 of the Design Criteria Manual.

N/A P/S 28) MoDOT concept approval, as required.

N/A P/S 29) MSD concept approval.

N/A ATT 30) Traffic Impact Study including traffic signal warrants, as required.

N/A ATT 31) Transmittal letter to MSD for all projects within MSD jurisdiction to provide them the opportunity for up-front review of Phase II, Post Construction Stormwater Management Requirements.

* Additional requirements may be necessary depending on the particular site development.



MUNICIPAL
CONCEPT / SITE PLAN CHECKLIST*

Development Name

Supplemental Documents Required to be Submitted with Plan (Cont.):

N/A ATT 32) Pre-construction and post-construction storm water runoff calculations. Post-construction storm water runoff shall mimic pre-construction runoff to the maximum extent possible.

This is to acknowledge that I personally checked the attached plan and related documents for conformance to the Concept/Site Plan Checklist.

Signature **Date**

SEAL

Please contact Civil Plan Review at (314) 615-8517 for a preliminary discussion regarding anticipated improvements and access requirements prior to first submittal of the concept / site plan. Please keep in mind that items discussed are subject to change when concept / site plan is submitted and reviewed.

The Design Criteria Manual can be accessed on-line at:
www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/DesignCriteriaManual

* Additional requirements may be necessary depending on the particular site development.



MUNICIPAL
CONCEPT / SITE PLAN CHECKLIST*

Development Name

Additional Notes / Requirements:

* Additional requirements may be necessary depending on the particular site development.

30.10 Specific Requirements for the Preparation of Improvement Plan

- 1) **Sealing of Plans by Registered Engineers, Land Surveyors and Architects** - The Missouri Board of Registration for Engineers, Land Surveyors and Architects is rigidly enforcing Missouri law in regard to the requirements for the practice of these professions. In this regard, professional seals and signatures are required on all plans, specifications, estimates, plats, reports, surveys or other like documents and must be affixed to every sheet in a set of documents. Following is a general list of documents for which professional seals are required:

Sketch Plan - No Seals Required by the Department.

Engineer's Seal Required For Submittal of:

- Circulation Plan (if engineering is involved)
- Concept/Site Plan
- Construction Plans
- Department Consultant Plans
- Department In-House Plans
- Department Major Maintenance Projects
- Engineering Reports
- Flood Plain Study (for proposed change in the flood limits)
- Grading Plan
- Hydraulics
- Improvement Plans
- MSD Improvement Plans
- Record Plans-Final Measurement Plans
- Soil Study
- Storm or Sanitary Plans
- Stormwater Pollution Prevention Plan (SWPPP)
- Structures
- Traffic Reports
- Utility Companies-For Major Facilities, Structures, Etc.

Surveyor's Seal Required For Submittal:

- Bench Marks and Level Notes
- Department In-House Plans
- Department In-House Survey
- Department Consultant Plans
- Department Major Maintenance Projects
- Floodplain (identify existing line only-no change in flood limits)
- Land Surveys
- Monuments
- Record Plans
- Record Plat
- Right-of-Way Plans
- Subdivisions
- Topographic Surveys

2) **Site Plan/Title Page** - The Site Plan or Title Page shall be used as the cover sheet for all improvement plans submitted for approval under this section.

- a) Specific details shall include, but not be limited to, the following:
- b) All information required in Section 1003.179 of the Zoning Ordinance and/or Sections 1005.050 and 1005.060 of the Subdivision Ordinance, where applicable;
- c) Key map showing the relationship of the area to be subdivided to the tract and which shall reflect areas of the tract previously subdivided plus adjacent streets;
- d) North arrow and graphic scale;
- e) Title block showing name and address of developer and engineering firm;
- f) One or more bench marks with level notes, in or near the site or subdivision, to which the development is referenced. Refer to Subsection 7 on page 30.10-6 for additional requirements;
- g) List of the standards and specifications followed;
- h) Grading and paving details conforming to St. Louis County standard specifications and requirements;

- i) Existing and proposed survey monuments on site plans for single lot developments or on proposed record plat for subdivisions;
- j) **Metropolitan St. Louis Sewer District (MSD)** - Reference (P-number) and PAC number where applicable.

3) **Roadway Construction Sheets** - All construction details pertaining to the roadway improvements (e.g., pavement widening, curbing, sidewalk, unpaved areas, entrances, etc.) shall be shown as a typical section and in plan and profile. The improvement plans should show existing and proposed right-of-way, easements, edge of pavement, islands, medians, lane usage, intersecting streets and driveways, sidewalks, curb ramps, traffic signal facilities and drainage structures on both sides of the roadway along the proposed site frontage and for a distance beyond the site limits to include required tapers, turning lanes, etc., as directed by the Department. Existing utility facilities such as poles, underground vaults, mains, pedestals, fire hydrants, etc., shall be shown and identified. Where possible these facilities should be avoided due to the relocation costs connected with them. For developments within 200 feet of an intersection, the above referenced existing and proposed roadway features must include all approaches to the intersection.

The improvement plan must also include planned future roadway construction improvements by others in the vicinity of the proposed site development.

Specific details shall include, but not be limited to, the following:

- a) All information required in Section 1005.070 of the Subdivision Ordinance, where applicable.
- b) Pavement widening or resurfacing improvements shall be dimensioned and developed in accordance with the "Standard Typical Section" applicable to the project or roadway (refer to Standard Drawings C203.60 through C203.92).
- c) Pavement widening and resurfacing improvements shall be established about the original right-of-way centerline, unless otherwise directed by the Department.
- d) Road improvements, involving new horizontal or vertical alignments within the site's road frontage, shall be constructed symmetrically about the construction centerline, unless otherwise directed by the Department.
- e) Mathematical profile grade elevations shall be shown at twenty-five (25) foot intervals on vertical curves and fifty (50) foot intervals on tangent sections for all roadway construction. Elevations shall be provided along the pavement edge at street intersection corner roundings at the point of curvature, the point of tangency and at $\frac{1}{4}$ delta angle intervals for 32' radius corners. For all radii larger than 32', elevations at ten (10) minimum foot intervals are required.
- f) Resurfacing or widening profile grade elevations shall be shown at all breaks in grade and at twenty-five (25) foot intervals on the existing centerline and edges of pavement. Also the new centerline and edge of pavement profile elevations shall be shown with required super elevation provided on all horizontal curves.

- g) Existing manholes to be affected by proposed resurfacing shall be adjusted to grade with expansion type adjusters (Nupco Adjust-to-Grade Manhole Castings or approved equal) and/or where the manhole has been previously adjusted to grade shall require adjustment of the manhole masonry necessary to establish the manhole frame and cover at the finished grade elevation.
 - h) The location and type of Joint shall be indicated when it differs from the Pavement Construction Details on Standard Drawings C502.00 to C502.02, and C502.13 to C502.14. All longitudinal joints shall be constructed along proposed lane lines as directed by the Department.
 - i) The type and location of entrance construction or intersection construction shall be indicated (Refer to Standard Drawings C608.00 through C608.36).
 - j) All intersection platforms shall be developed in accordance with Standard Drawing C203.54.
 - k) Compatibility with existing facilities shall be shown for streets, entrances and structures adjacent to and across from the subject site.
 - l) Drawings showing calculations of and provisions for adequate sight distance in each direction shall be provided for all existing and proposed intersecting streets and driveways which will be affected by the proposed roadway improvements.
 - m) If sidewalk is required, the type and location of ADA curb ramps shall be indicated. (Refer to Standard Drawings C608.40 through C608.51)
- 4) **Sanitary/Storm Sewer Plan and Profile Sheets** - All construction details pertaining to the sewer improvements shall be prepared in accordance with the drainage requirements of this booklet (refer to Sections 50.10, 50.20 and 50.30) and shown in plan and profile.

Specific details shall include, but not be limited to, the following:

- a) Existing ground, rock lines where necessitated by involvement with proposed improvements and finished grade elevations shall be shown and identified.
- b) Open trenching of concrete pavements where permitted, shall require the replacement of the entire slab from joint to joint over thoroughly compacted granular backfill.
- c) Open trenching of asphalt pavements where permitted, shall require a saw cut along each edge of the trench and replacement with full depth asphalt over thoroughly compacted granular backfill. The Contractor or Permittee, where a Special Use Permit has been issued authorizing the work, shall be responsible for the repair of settlement, etc., for a period of one (1) year.
- d) Limits of granular backfill and pavement replacement, at all crossings of existing roadway surfaces not bored, shall be shown.

- e) The location of all utilities to be encountered in construction shall be shown. Plans must be submitted to all utilities for verification of conflicts. The department shall be contacted regarding all major utility conflicts within the road right-of-way.
- f) Improvement Plan Approval shall be subject to plan approval by other political subdivisions having jurisdiction over the development.

5) Grading/Cross Section Sheets - All grading details pertaining to the site development shall be shown in plan view by contours or on cross section sheets.

Specific details shall include, but not be limited to, the following:

- a) Existing and proposed contours shall be plotted at two (2) foot intervals. Contour intervals for Grading Plans other than the above shall require special approval.
- b) Site grading shall be compatible with the ultimate roadway elevations.
- c) Existing ground and finished grade elevations for the cross section sheets shall be plotted at any scale between one inch equals fifty feet (1" = 50') horizontal and one inch equals ten feet (1" = 10') vertical, and one inch equals five feet (1" = 5') horizontal and vertical.
- d) Sinkholes (Refer to Section 40.60).

6) Traffic Signal Construction Plan Sheet - If the proposed roadway improvements affect an existing traffic signal, a traffic signal construction plan may be required. A new traffic signal installation shall require a plan. Specific details shall include, but not be limited to, the following:

- a) Plan showing existing and proposed right-of-way, easements, edge of pavement, island, medians, lane widths, intersecting streets and driveways, sidewalks, curb ramps, drainage structures, and other topographic features.
- b) Show on plan sheet all existing and proposed traffic signal concrete bases, pull boxes, detector loops, cable and underground signal conduit using the proper symbols.
- c) Existing utility facilities such as poles, underground vaults, mains, pedestals, fire hydrants, etc., shall be shown and identified.
- d) A summary of quantities sheet and schedules of equipment shall be provided.
- e) Signal Phasing.
- f) Traffic Signal Detail Drawings.

- 7) **Bench Marks** - The bench mark datum source for development in St. Louis County is on the "St Louis County Bench Mark System" webpage located on the internet at:

www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/BenchMarkSystem

The bench marks are based on U.S.G.S. datum. Level notes which tie the bench mark reference to the temporary bench mark located on the site, shall be provided with the submitted plans.

GRADING PLAN CHECKLIST

Development Name _____ Plan Submittal Date _____

- _____ Cover/transmittal letter.
- _____ Plan Cover Sheet
- _____ Name, address of project, owner, and engineering company.
- _____ North arrow and scale on map.
- _____ Lot identification and identification of adjoining property owners.
- _____ Location map.
- _____ Ordinance requirements met.
- _____ Schedule of operation, start, finishing dates.
- _____ Earthwork quantities and haul information (i.e. site hauling to/from, roads traveling, etc.).
- _____ Geotechnical engineer sign and seal plans, if applicable.
- _____ Geotechnical report included (including erosive soils, less than or equal to 5 fps if in report, and all sinkholes, springs, ground water, etc. noted), if applicable.
- _____ All slopes are 3:1 (horizontal, vertical).
- _____ Locate and identify sinkholes, springs, etc. on plan.
- _____ Steep grades and pavement lugs noted.
- _____ No grading in right-of-way until reconstruction plan approval.
- _____ Off-site grading easements shown.
- _____ Steep grade approval prior to grading permit.
- _____ Existing contours (and proposed) with 2' intervals, extend minimum 100' off site.
- _____ Temporary entrance and wash-down area.
- _____ Grading of land does not break existing watersheds.



GRADING PLAN CHECKLIST

Development Name _____ Plan Submittal Date _____

- _____ P.E. seal and signature.
- _____ Silt control measures shown on plans reference County detail numbers.
- _____ Copy of certified letter for details, and hydraulic computations, and off-site grading easements included.
- _____ Copy of NPDES (National Pollutant Discharge Elimination System) Permit, if needed.
- _____ Copy of Corps of Engineers approval for the wetlands and waters of the United States, if required.
- _____ Flood plain study, if applicable.
- _____ All ponds/lakes to be dewatered at a rate so as not to cause erosion or downstream flooding.
- _____ No areas of water ponding.
- _____ Detention basin shown.
- _____ Hydraulic computations for temporary/proposed channels on pipes.
- _____ Off street parking location for construction vehicles shown.
- _____ Bearing and distances of property lines included.
- _____ Benchmark elevation and description along with level loop notes to onsite TBM.
- _____ Requirements for grading approval from Public Works.
- _____ Either show retaining walls and provide copy of Public Works permit authorizing it or show interim contours. (Note: Approved site development plan is shown on grading plan.)
- _____ No mud/erosion to be deposited on public streets.
- _____ Ground cover to be sodded and seeded after grading as directed by St. Louis County Department of Public Works.



GRADING PLAN CHECKLIST

Development Name _____ Plan Submittal Date _____

- _____ Coordination with public utilities, government agencies, and municipalities.
- _____ All blasting that is necessary, requires a permit from Public Works.
- _____ Call out any temporary culverts that may be required, and provide hydraulic analysis, inlet control calculations, storm profile, etc.
- _____ All demolition that is done has a permit issued from Public Works.
- _____ Call out any existing easements and provided concurrence from easement holder for grading with easement.
- _____ No sheet flow over terrace (top of terrace swales), or retaining walls.
- _____ Provide concurrence from any city where the grading operation would have an impact on.
- _____ Call out any specific ordinance numbers.
- _____ Approved Grading Plans.
- _____ Special Use Permit Application for temporary entrances/work in right-of-way.
- _____ Land Disturbance Permit application.
- _____ Inspection Fees.
- _____ Stormwater pollution prevention plan (if disturbance is greater than 1 acre).
- _____ Applicable easement(s).
- _____ Approval of other agencies.



GRADING PLAN CHECKLIST

Development Name _____

Plan Submittal Date _____

Additional Notes / Requirements:



IMPROVEMENT PLAN CHECKLIST

Development Name _____ Plan Submittal Date _____

- _____ Cover Pages [includes: subdivision name, developer address, designer address, engineer seal and signature, scale: 1" = 50" minimum, north arrow, benchmarks (USGS) and survey monuments and level loop notes, and index (3 or more sheets)].
- _____ Lot identification and adjoining property owners.
- _____ Flood Plain Data.
- _____ Key Map, and corporate limits.
- _____ Sewer District.
- _____ Relationship to RR, expressway or utility, and tie to nearest road or boundary marker.
- _____ Coordinated with Planning Engineer.
- _____ Street profiles.
- _____ Horizontal curvatures: _____ Superelevation, _____ Sight Distances.
- _____ Vertical curvatures: _____ Superelevation, _____ Sight Distances.
- _____ Pavement width: _____ Cross Slope, _____ Curb, _____ Curb and Gutter, _____ Shoulder.
- _____ Sidewalk: _____ Width, _____ Typical Location.
- _____ Intersections 70 degrees to 90 degrees internal angle.
- _____ Grade reactions of streets for future expansion.
- _____ Street names (100' maximum intervals).
- _____ Temporary turnaround (when more than 450' from intersection).
- _____ Barricade or barrier type guardrail and terminal crashworthy end sections.
- _____ Off street parking facilities (for apartments and commercial businesses).
- _____ Drainage areas and runoff map.

IMPROVEMENT PLAN CHECKLIST

Development Name _____ Plan Submittal Date _____

- _____ Bypass on street inlets
- _____ Existing waterways (location, cross section, proposed improvements, easements).
- _____ Inlets and manholes (type and size).
- _____ Temporary dams.
- _____ Hydraulic computations.
- _____ Pipes (type, gradient, alignment, size, entrance control, cover).
- _____ Culverts (entrance control, size, type, gradient, alignment, minimum cover for loading, wing walls, head wall, cutoff footing, spillway, erosion protection, adequate lengths for sidewalks and handrails).
- _____ Sinkholes (capping, overflow piping, effect on adjacent property, relief line).
- _____ Existing and proposed sanitary sewers.
- _____ Bridges (adequate width for walks and railroad, approach slabs, loading, construction traffic).
- _____ Soils Engineering Design Report.
- _____ 3:1 (horizontal, vertical) maximum side slopes on earth fill dams.
- _____ Proper spillway.
- _____ Adequate water level control.
- _____ Erosion protection
- _____ Siltation controls: _____ Location; _____ Details; _____ NPDES Permit.
- _____ Road improvements: _____ Cost Estimate; _____ Exhibit; _____ Escrow.
- _____ Include Grading Plan Checklist if advanced grading permit is not obtained.
- _____ Detention basin calculations, high water information.



IMPROVEMENT PLAN CHECKLIST

Development Name _____

Plan Submittal Date _____

Additional Notes / Requirements:

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30.20 Procedure for Plan Review

- 1) **Plan Review Using Redline Plans** - The Department no longer provides a review letter to the consultant engineer and developer detailing the requested plan changes. The Department will furnish the consultant engineer a redline set of plans showing the requested changes. These plans will be transmitted by a standard form letter, a copy of which will be furnished to the developer. If requested by the consultant engineer, the redline plans may be picked up at the Department prior to mailing. If necessary, a brief meeting can be arranged with the review engineer at this time to make sure the requested changes are understood. The original redline marked-up plans should be returned to the Department with the next submittal.
- 2) **Subdivision Improvement Plan Review** - The procedure for reviewing the improvement plans shall be as follows:
 - a) If the subdivision is within the limits of the **METROPOLITAN ST. LOUIS SEWER DISTRICT (MSD)**, there shall be submitted both to the Department and **MSD** copies of paving and street grade plans together with drainage maps and run-off sheets for stormwater. The plans shall be reviewed, corrections or additions shall be made, if needed, and when the plans are satisfactory to the Department and to **MSD**, the appropriate number of copies shall be submitted to both agencies for approval, first by **MSD** and then by the Department. After approval by both **MSD** and the Department, copies of the plan will be forwarded to the Department of Planning for their processing of the subdivision escrow and subdivision inspection fees. Nothing in this section shall prevent the developer from submitting improvement plans to **MSD** prior to the improvement plans being submitted to the Department. Complete approval of the plans by all reviewing agencies and payment of inspection fees constitutes authority to start construction or to post bond or escrow to cover the cost of improvements.
 - b) If the subdivision is not within the limits of **MSD**, there shall be submitted the required number of paving and street grade plans together with drainage maps and run-off sheets for stormwater. The plans shall be reviewed by the Department and the Department of Public Works. The sanitary sewage facilities of the subdivision shall be reviewed by the Department of Public Works. Corrections or additions shall be made, if needed, and when the plans are satisfactory to the reviewing agencies, approval shall be given by both Departments. After approval by both the Department and the Department of Public Works, copies of the plan will be forwarded to the Department of Planning for their processing of the subdivision escrow and subdivision inspection fees. Complete approval of the plans by all reviewing agencies and payment of inspection fees constitutes authority to start construction or to post bond or escrow to cover the cost of improvements.
 - c) Concurrent with the approval of the record plat, the Department of Planning shall establish an escrow which is to be valid for a period of two (2) years or for such longer period as the Director of Planning may determine to be advisable if after review by the Department of Planning such longer period is necessary to facilitate and coordinate provisions for transportation, water, sewage, schools, parks, playgrounds, or other public requirements. If the construction of the improvements shall not have been completed within said two (2) year period or such longer period as the Director of Planning may permit, a resubmission and review of the improvement plans by the Department is required.

- d) Each sheet of the improvement plans shall be dated for initial submittal and subsequent revisions.
 - e) When revised improvement plans are submitted for review or approval, the revised portion of the plans shall be circled in red. The circled portion will be for current submittal only.
- 3) **Utility Relocations** - When utility relocations are required to accomplish the construction proposed within the public right-of-way, the consulting engineer shall make all necessary provisions for the coordination of the construction activities with the utility owner required to relocate same and provide verification of coordination to the Department.
- a) Responsibility for costs connected with the relocation of utilities shall be determined by the following:
 - i) Utilities within right-of-way (without prior rights of utility companies):
 - (1) At utility company's expense when relocation is required to accommodate road improvements contracted for/completed by St. Louis County.
 - (2) At developer's expense when relocation is due to road improvements contracted for/completed by a private development.
 - ii) Utilities within right-of-way (with prior rights of utility companies) or utilities on utility company owned easement:
 - (1) At St. Louis County's expense when relocation is required to accommodate road improvements contracted for/completed by St. Louis County.
 - (2) At developer's expense when relocation is due to road improvements contracted for/completed by a private development.
 - b) The developer should also be aware of extensive delays in utility company relocations and adjustments. Such delays will not constitute a cause to allow occupancy prior to completion of road improvements.

- 4) **Utility Improvement Plans** - When a new underground utility is proposed in the right-of-way of a County roadway, and the County roadway is proposed for future improvement, the Department will furnish typical sections to indicate where the utility line should be placed in order to minimize the possibility of future relocation due to improvement of the roadway to its ultimate configuration.

However, in view of changing Federal requirements, St. Louis County can accept no responsibility for relocations of utilities made necessary by future changes in grade or typical section.

Utility locations requested by the utility owner that are not in compliance with the Department's recommendations must be accompanied by letter acknowledging the utility company's responsibility for future relocation.

- 5) **Department Inspection Fee** - Inspection fees shall be collected by the St. Louis County Department of Transportation at the rate of One Hundred-Eight Dollars (\$108) per hour, based upon the Department's estimate of time required to inspect streets, public or private, including pavement, sidewalks and traffic signal facilities as well as storm sewers and other drainage structures outside of the Metropolitan St. Louis Sewer District (MSD). The Department shall be entitled to full compensation for the time expended in making such inspections. If the estimated fee is inadequate, the necessary additional fees shall be collected by the Department and if the estimated fee is in excess of the amount actually expended, the balance shall be refunded by the Department. Claims for such refunds shall be made to the Department and shall be paid when audited and approved by the Director.

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35.00 Design-Build Projects

St. Louis County Ordinance No. 22792, which was approved by the County Executive on June 7, 2006, added a new chapter to the St. Louis County Revised Ordinances (SLCRO). "Design-Build Projects" was added as Chapter 113. The following specifications are based on this Ordinance.

1) Definitions - The definitions of terms used in this section are as follows:

County - St. Louis County, Missouri.

Design-Build - A project for which the design and construction services are provided to the County under one contract.

Design-Builder - Any individual, partnership, joint venture, corporation or other legal entity that furnishes to the County architectural, engineering, landscape architectural or construction services for a design build project, whether for itself or through subcontracts.

Design-Build Contract - A contract between the County and a design-builder, to furnish the architecture, engineering, landscape architecture, and related design services required for a given County construction project, and to furnish the labor, materials and other construction services for the same construction project.

Design Criteria Consultant - A person, corporation, partnership or other legal entity duly registered and authorized to practice architecture, landscape architecture or professional engineering in the State of Missouri under chapter 327 R.S.Mo., and who has entered into a contract with the County to provide professional design and administrative services in connection with the preparation of a design criteria package.

Design Criteria Package - Performance-oriented specifications for a County construction project sufficient to permit a design-builder to prepare a package to the County's request for proposals for a design-build project.

Director - The County director who is directly responsible for the County construction project.

Evaluation Team - A group of not more than five nor less than three County employees, depending upon the complexity of the particular project as determined by the Director, which has the duty to evaluate the proposals of design-builders. The team, which shall be established anew for each contemplated design-build construction project, shall consist of one or two members appointed by the Director, one or two appointed by the particular Director of the Department for which the project is primarily intended (if different from the Director's Department), and one member who shall be the Chair, appointed by the Director of Procurement.

Proposal - An offer to enter into a design-build contract.

Request for Proposals - The document by which the County solicits proposals for a design-build contract.

Stipend - An amount that may be established to reimburse unsuccessful design-build proposers in certain complex projects to defray the cost of submission of Phase II of the design-build proposal.

2) Determination of Need

- a) The Director shall make a determination of the need to use the design-build procurement process to complete a particular project. In making that determination, the Director shall consider:
 - i) The time available to complete the project and meet the needs of the County to expedite the delivery process.
 - ii) The type of project and its suitability for the design-build process.
 - iii) The size and estimated cost of the project.
 - iv) The level of departmental knowledge and confidence about the project scope and definition.
 - v) The availability of using departmental staff to manage the project.
- b) If the Director makes a determination of the need to use the design-build procurement process to complete a particular project, the Director shall notify the County Council of the determination and the reasons therefor. The design-build procurement process set out in this chapter shall not thereafter proceed except upon the approval of the Director's determination by order of the County Council.

3) Preparation of Request for Proposal; Use of Consultant; Notice

- a) The Director of Procurement, with the consultation of the Director, shall determine the scope and level of detail required to permit qualified persons to submit proposals in accordance with the request for proposals, given the nature of the project. The Director of Procurement, with the consultation of the Director, shall establish in the request for proposal a time, place and other specific instructions for the receipt of proposals. Proposals not submitted in strict accordance with those instructions shall be subject to rejection.
- b) The County Executive may enter into a contract with a consultant to prepare or to assist in preparation of the request for proposal, perform periodic site visits, prepare progress reports, review and approve progress and final pay applications of the design-builder, review shop drawings and submittals, interpret the construction documents, perform inspections upon substantial and final completion, assist in warranty inspections and to provide any other professional service where the Director deems it to be in the public interest to have an independent design professional assisting with the project administration. The consultant shall be selected and its contract negotiated in compliance with applicable law.
- c) Notice of requests for proposals shall be advertised in accordance with Section 107.130 SLCRO. The notice shall include a description of the project, the procedures for submittal and the selection criteria to be used.

4) Elements of Request for Proposals, Soliciting and Review of Proposals

- a) A request for proposals shall be prepared for each design-build contract containing at minimum the following elements:
 - i) The procedures to be followed for submitting proposals, the criteria for evaluation of proposals and their relative weight and the procedures for making the award.
 - ii) The proposed terms and conditions for the design-build contract.
 - iii) The design criteria package.
 - iv) A description of the drawings, specifications or other information to be submitted with the proposal, with guidance as to the form and level of completeness of the drawings, specifications or other information that will be acceptable.
 - v) A schedule for planned commencement and completion of the design-build contract.
 - vi) Budget limits for the design-build contract.
 - vii) Affirmative action and minority or women business enterprise goals or requirements for the design-build contract, if any.
 - viii) Requirements including any available ratings for performance bonds and insurance.
 - ix) Any other information that the Director of Procurement in the exercise of discretion chooses to supply, including without limitation, surveys, soils reports, drawings of existing structures, environmental studies, photographs or references to public records.
- b) The Director of Procurement shall solicit proposals in a three-phase process. Phase I shall be the solicitation of qualifications of the design-builder. Phase II shall be the solicitation of a technical proposal including conceptual design for the project. Phase III shall be the proposal of the construction cost.
- c) The evaluation team shall review the submittals of the proposers and assign points in accordance with the instructions of the request for proposals.

5) Phase I of the Proposal Soliciting Process

- a) Phase I shall require all proposers to submit a statement of qualifications that shall include, but not be limited to:
 - i) Demonstrated ability to perform projects comparable in design, scope and complexity.

- ii) References of owners for whom design-build projects have been performed.
 - iii) Qualifications of personnel who will manage the design and construction aspects of the project.
 - iv) The names and qualifications of the primary design consultants and contractors with whom the design-builder proposes to subcontract, including the participation and/or funding by the contractor or proposed subcontractor(s) in any Department of Labor, Bureau of Apprentice Training approved program. The design-builder may not replace an identified subcontractor or subconsultant without written approval of the Director.
- b) The evaluation team shall review the qualifications of all proposers based on the project requirements. Qualified proposers selected by the evaluation team may proceed to Phase II and Phase III of the selection process. Proposers lacking the minimum qualifications to perform the work will be eliminated and shall not proceed with Phase II and Phase III. A formal evaluation system will be utilized in Phase I; however, no points from Phase I will be included in Phase II or Phase III evaluations.
- c) The Director, with the consultation of the Director of Procurement, shall have discretion to disqualify any proposer that lacks the minimum qualifications required to perform the work. Under no circumstances shall price or fee be a part of the pre-qualification criteria.

6) Phase II of the Proposal Solicitation Process

- a) The Director of Procurement shall invite the five most qualified proposers to participate in Phase II and Phase III of the process. If a minimum of three qualified proposers cannot be identified, the contracting process will cease.
- b) Proposers must submit their design for the project to the level of detail required in the request for proposals. The design proposal should demonstrate compliance with the requirements set out in the request for proposals.
- c) Under no circumstance should the design proposal contain any reference to the cost of the proposal.
- d) The design submittals will be evaluated and assigned points in accordance with the requirements of the request for proposals. Phase II shall count for no more than 50% of the total point score assigned by the evaluation team.

7) Phase III of the Proposal Solicitation Process

- a) The Phase III proposal must provide a firm, fixed cost of construction. The proposal must be accompanied by bid security and any other required submittals, as required by the request for proposal. Phase III shall count for a minimum of 50% of the total point score assigned by the evaluation team.
- b) Cost proposals must be submitted in accordance with the instructions of the request for proposal. Failure to submit a cost proposal on time shall be cause to reject the proposal.

- c) Proposals for Phase II and Phase III will be submitted concurrently. The Phase III cost proposals will be opened only after the Phase II design proposals have been evaluated and assigned points.
 - d) Cost proposals will be opened and read aloud at the time and place specified in the request for proposals, in accordance with Section 107.130 SLCRO 1974, as amended. At the same time and place, the evaluation team will make public its scoring of Phase II. Cost proposals will be evaluated in accordance with the requirements of the request for proposals and the points assigned will be added to the total of Phase II for each proposer.
 - e) The schedule may be considered as an element of evaluation in Phase II Design or Phase III Construction or both.
 - f) The responsive proposer with the highest total number of points will be awarded the contract by the Director of Procurement. The Director of Procurement may reject any and all proposals.
 - g) If all proposals are rejected, the Director of Procurement may solicit new proposals using the same or different design criteria, budget constraints or qualifications.
- 8) **Stipend for Proposals** - As an inducement to qualified design professionals in certain complex projects, the County may pay a total project stipend in the amount up to 1% of the project cost. This amount shall be divided equally between each design-builder who was selected to participate in Phase II and Phase III of the process and whose proposal is responsive but not accepted. Provided, however, that a stipend may be included in a request for proposal only upon the order of the County Council after a request by the Director outlining the need for a stipend due to the particular complexity of the project. Upon payment of the stipend to any unsuccessful design-build proposer, the County shall acquire a non-exclusive right to use the design submitted by the proposer, and the proposer shall have no further liability for its use by the County in any manner. If the design-build proposer desires to retain rights and interest in the design proposed, the proposer shall forfeit the stipend.
- 9) **License or Certificate of Authority** - Any person or entity that enters into a design-build contract pursuant to this Chapter shall be exempt from the requirement that such person be licensed or such entity be authorized by the appropriate board as long as the architectural, landscape architectural, engineering or land surveying services are performed by persons who are duly licensed in this state or by entities that hold current certificates of authority from the board for the appropriate profession.

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40.10 Street Improvements

All streets shall be graded and the roadway improved by surfacing. Roadway surfacing shall be in accordance with St. Louis County standards and specifications. All grading and surfacing shall be done under observation and inspection of the Department and shall be subject to its approval. The treatment of the intersection of any new street with a State highway shall be subject to approval by the District Engineer of the Missouri Department of Transportation (MoDOT).

At such times as a subdivision is proposed adjacent to a street that is accepted and maintained by St. Louis County, that street and other streets required shall be improved to handle the increased traffic due to said subdivision as directed by St. Louis County's Highway System Plan, and the additional right-of-way and the cost of improvement of the right-of-way adjacent to the proposed subdivision shall be included in the overall subdivision improvements. The improvements shall be made to current County specifications and standards.

However, a large lot subdivision shall not be required to make the above improvements. The construction of a standard street intersection approach and right-of-way dedication only may be required as necessary for the relocation and/or widening of an adjoining County road.

In certain cases involving the subdivision of tracts of property, the reservation of right-of-way access may be required for future road improvements as authorized by the tract's preliminary plat.

- 1) **Street Design** - All street construction, modification or widening shall be designed in accordance with the requirements of the Highway System Plan and the classification, design criteria and standards of the Department as follows:

<u>Classification</u>	<u>Section</u>
Arterial	20.10
County	20.20
Residential	20.30
Non-Residential.....	20.40

All construction, details and specifications pertaining to roadway improvements within St. Louis County right-of-way shall be accomplished under the observation and inspection of the Department and shall be subject to its approval.

- 2) **Street Name Signing** - Reflectorized street signs bearing the name of the street, as designated on the record plat, shall be placed at all street intersections. Each and every intersection formed by the developer shall have at least one street name sign for each intersecting street mounted in a bracket on top of one post. Two sets of street name signs on separate posts shall be required at intersections where one street is thirty-eight (38) feet wide or greater, or when one street is an arterial roadway. Refer to Standard Drawings C608.55 and C903.10.

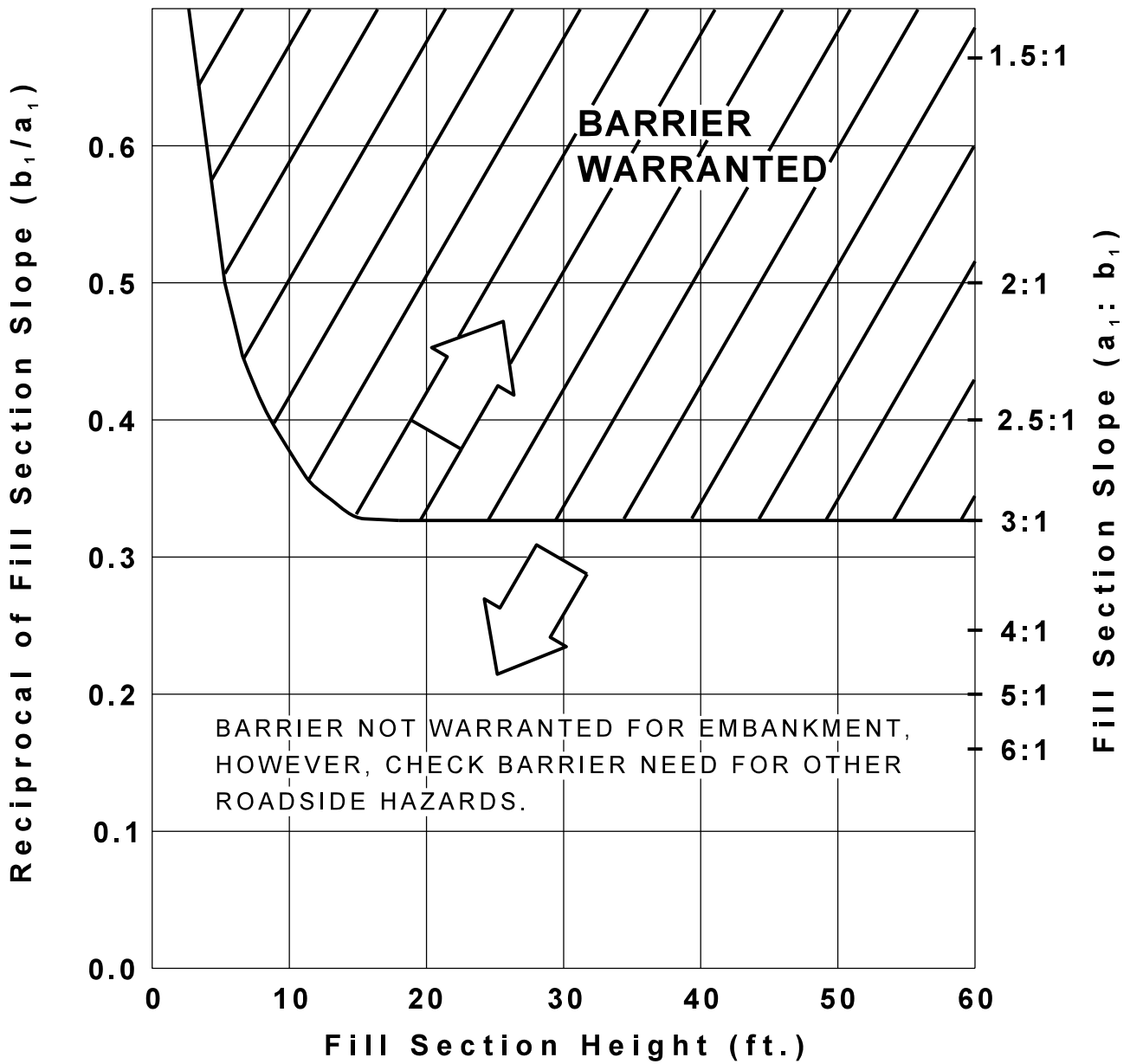
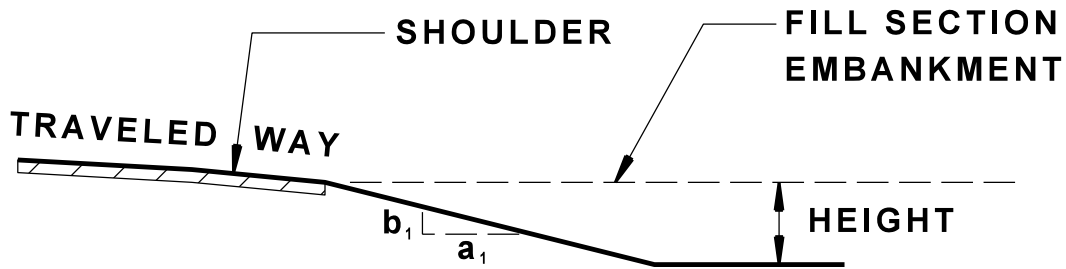
The Department shall approve the location and inspect the installation of street name signs in all subdivisions. The size, height, and type of sign shall be in accordance with the specifications of the Department. Street signs shall not be required for large lot subdivisions other than at each intersection of a designated private roadway easement with an existing or proposed publicly maintained street.

The required sign post location shall depend upon the traffic volume on the roadway and the width of pavement. Each post shall be placed a minimum of 3.5 feet from the back of the curb. Street name sign posts shall be located where they may be used for future "Stop" or "Yield" signs. This means that one set of street name signs shall be installed on the near right corner for the lesser volume roadway. Also, when one of the intersection streets is 32 feet or greater in width, or when one street is an arterial roadway, two sets of street name signs shall be required. Refer to Standard Drawings C608.55 and C903.10.

- 3) **Medians** - Raised median strips may be required by the Department to restrict through and/or left turning movements at or near driveways, commercial entrances and/or street intersections. Refer to Standard Drawings C608.09 and C608.61. Raised medians may also be utilized for ornamental entrance monuments and signs. Where medians are located at four-way street intersections, their widths shall conform to the requirements of Standard Drawing C608.09. For ultimate "T" type street intersections, where the median is proposed on the minor side street, wider medians may be permitted by the Department to accommodate larger entrance monument designs. Refer to page 40.50-1.
- 4) **Guardrail** - Guardrail shall be required to protect traffic from hazardous features. Guardrail will be required for roadway fill sections when the fill height and fill slope for a particular location fall within the "Barrier Warranted" area of the figure shown on page 40.10-3.

Terminal crashworthy end sections will be required for both directions of traffic flow on two-way pavement. Where the distance between terminal sections of two sections of guardrail will be 100 feet or less, one continuous length of guardrail shall be installed.

Guardrail shall be provided for protection of traffic adjacent to creeks and lakes, at bridge ends, piers, signs and headwalls, and other obstacles as directed by the Department. Refer to Standard Drawings C606.01 through C606.23.



(SOURCE: American Association of State Highway and Transportation Officials, "Roadside Design Guide," 2002)

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40.20 Street Standards

The arrangement, character, extent, width, grade and location of all streets and required improvements shall be considered in their relation to existing and proposed streets, to topographical conditions, to public convenience and safety, and in their appropriate relation to the proposed uses of the land to be served by such streets. The following standards shall apply:

- 1) Arrangement of subdivision streets shall conform as nearly as possible to St. Louis County's Highway System Plan and the developer shall make provision for the extension and/or relocation of major, collector and minor streets, which impact the property. Except for dead-end streets, streets normally shall connect with streets already established, or provide for future connections to adjoining unsubdivided tracts, or shall be a reasonable projection of streets in the nearest subdivision tracts.
- 2) Stub streets shall be constructed to the property lines when required to provide for future connections to adjoining undeveloped tracts. Reasonable projections of streets in nearby subdivisions will establish the location of certain stub streets.
- 3) Where a subdivision abuts or contains an existing or proposed major street, the Department of Planning may require frontage or service streets, double frontage lots with screen planting, and non-access strips at the rear of such lots.
- 4) Minor street intersection jogs or discontinuities with centerline offsets of less than one hundred (100) feet shall be avoided.
- 5) Reserved strips of land which control or limit access at the terminus of streets or prevent access to streets located adjacent to undeveloped land are prohibited.
- 6) A subdivision entrance street shall intersect the major or collector street with an interior angle of seventy (70) to ninety (90) degrees unless otherwise approved by the Department. Each entrance street shall be positioned to provide required sight distance along each intersecting roadway as determined by the Department. Refer to Exhibit 40.25-1 for Sight Distance at Intersections criteria.
- 7) A minimum radius of twenty (20) feet at street right-of-way intersection and a minimum radius of thirty-two (32) feet at the back of the curb shall be required. Greater radii and channelization may be required at an intersection with a major or collector street or to provide access for vehicles having large turning radius requirements. The Department may permit a series of comparable cut-off or chords approximating the edge of pavement radius.
- 8) All interior residential streets intersecting on collector streets shall be directly opposite existing or other proposed streets or shall be a minimum of three hundred (300) feet distant, as measured between street centerlines. All other streets intersecting on arterial, county or non-residential streets shall be directly opposite existing or other proposed streets or shall be a minimum of four hundred (400) feet distant, as measured between street centerlines.

- 9) Where a collector street enters or connects with a major street, the Department must approve the entrance plan.
- 10) Streets shall be constructed to St. Louis County standard specifications.
- 11) All stub streets in excess of four hundred and fifty (450) feet in length measured from the centerline of the street intersection to the property line or plat boundary, shall be provided with a temporary turnaround. Permits will not be issued for building construction on lots abutting a temporary turnaround as shown on any recorded subdivision plat unless and until the temporary facility is actually constructed and has been approved by the Department. Refer to Standard Drawing C502.05.

Prior to expiration of the land subdivision bond or escrow agreement required of the development under Section 1005.080 of the Subdivision Ordinance, the removal of temporary turnaround surfacing shall be provided for by an Agreement Guaranteeing Road Improvement (Special Escrow), together with a cash sum or Irrevocable Letter of Credit. Refer to Sections 70.00 and 70.20 for requirements.

The Department of Planning may grant a variance for temporary turnarounds providing that the following conditions are met:

- a) The developer submits to the Department of Planning statements from all prospective lot purchasers affected by the temporary turnaround, excluding the developer himself, declaring that they agree to the use of their driveways for executing the turnaround movements at the terminus of the street and acknowledging that any repairs made necessary due to damage to the driveway caused by the use of their driveway for the turnaround movement shall in no way be deemed the responsibility of St. Louis County; and
 - b) Provide an easement for the turnaround movement approved by the Department.
- 12) All streets shall be designed to meet the minimum requirements set forth in the Street Specification Matrix of the Subdivision Ordinance, Section 1005.180, Street Standards, with the exception of large lot subdivisions to which such requirements are not applicable. The matrix, or variable street specification table, is designed to provide the maximum allowable flexibility in street construction standards, while at the same time, insuring the protection of the public interest. The widths of right-of-way and pavement are allowed to vary as functions of the type of street and the corresponding intensity of use.
 - 13) Any subdivision platted along an existing street shall provide additional right-of-way, as necessary, along a tangent section of road, to meet the width requirements herein set forth. Additional right-of-way in excess of twenty (20) feet may be required when the subdivision is located on the inside of a curved roadway or conditions exist on the opposite side of the right-of-way which dictate right-of-way offset from the right-of-way centerline. When the subdivision is located on only one side of an existing street or County road, one-half of the required right-of-way width shall be provided, measured from the centerline of the right-of-way as originally established, unless otherwise directed by the Department. The centerline must meet the requirements of the Department with regard to radius when located on a curved roadway. Right-of-way dedication requirements along State and County roads will not be credited towards the developer's traffic generation assessment or trust fund contribution except for right-of-way in excess of that allowed by Section 1005.180 of the Subdivision Ordinance. The Department may

request right-of-way dedication in excess of twenty (20) feet if concurred in by the Department of Planning. The developer may appeal such request to the County Council. If the Planning Department does not concur in the requested right-of-way dedication, the Department may appeal to the County Council.

- 14) Roadway easements for the servicing of large lot subdivisions shall have a minimum width of fifty (50) feet.
- 15) A subdivision plat involving new or existing streets crossing railroad tracks shall provide adequate rights-of-way, including approach rights-of-way and slope easements for construction of an underpass or overpass, unless otherwise specified by the Commission. Approval of the State of Missouri Public Service Commission and the Department must be received relative to all railroad crossings. The developer may be required to install crossing signals.
- 16) A street on which residential lots front and which parallels, but is not adjacent to a railroad right-of-way, shall be at a distance from the railroad right-of-way sufficient to provide lots with a minimum depth of one hundred sixty (160) feet.
- 17) Commercial and industrial subdivision streets shall be constructed with vertical curbs on both sides except for locations in the Earth City and Chesterfield Valley Areas which require open drainage facilities for stormwater.
- 18) Where in the best interest of the traveling public, to provide circulation, health and safety measures, the Department may require a street to be dedicated to public use.
- 19) The pavement width set forth in the street specifications matrix (Section 1005.180 of the Subdivision Ordinance) for multiple family access streets does not allow for, nor will parking be permitted on the streets. For each parallel parking space adjacent to these streets, an additional width of 10 feet shall be provided. Additional parking requirements shall be provided herein and/or to the standards established by the Commission.
- 20) If roadways are designated to be private roadways, these roadways shall remain private forever. Maintenance of private roadway will be the responsibility of the property owner(s) or trustees forever. Private roadways are required to be built to public street standards.
- 21) Additional lanes and/or widening, pavement thickness, drainage facilities, granular base and/or traffic control devices may be required to accommodate heavy traffic volumes, unsuitable soil conditions, steep grades or other conditions not apparent at the time of the Preliminary Plan approval.
- 22) The developer shall provide adequate temporary off-street parking for construction employees. Parking on non-surfaced areas shall be prohibited in order to eliminate the condition whereby mud from construction and employees vehicles is tracked onto the pavement causing hazardous road and driving conditions.
- 23) If any public roads are proposed within a development, they must be built above the 100-year flood elevation with proper freeboard, or protected from flood damage by an approved levee. Any roads and/or drives proposed below this elevation, not protected by an approved levee, are to be private and remain private forever.

- 24) A tangent of less than one hundred (100) feet in length shall be avoided between reverse curves on major and collector streets.
- 25) The minimum radius allowed for a street centerline curvature shall be 150 feet.
- 26) Temporary or permanent turnarounds may be requested to accommodate school buses. The turnarounds shall have a pavement radius of fifty-five (55) feet. Refer to Standard Drawings C502.09 and C502.10. If school bus turnarounds are required, the school district will submit verification that they will permit buses to enter the subdivision utilizing the turnarounds.
- 27) Street creep typically occurs opposite "T" intersections, at the ends of cul-de-sacs and on the outside of curves. In order to reduce the adverse effects of street creep, the installation of Type A2 expansion joints (See Standard Drawing C502.13) are required on residential streets at the following locations:
 - a) At end of radius on each approach to a "T" intersection;
 - b) Across the throat of cul-de-sacs;
 - c) The beginning (PC) and the end (PT) of curved sections of street.

For construction details of pavement sections at cul-de-sacs and "T" intersections, refer to Standard Drawings C502.01 and C502.02.

- 28) A pavement lug is required upgrade of a grated trough (refer to Standard Drawing C604.39).
- 29) Prior to any action by the Department on a private roadway or public road right-of-way presently not maintained by St. Louis County, the residents, trustees, and/or property owners along the private or non-County maintained roadway shall be required to sign an affidavit stating the type of materials which have been used to maintain the roadway, the hauler of those materials, and the supplier or source of those materials. Also, in areas that may contain contaminated substances as identified by the U.S. Environmental Protection Agency (EPA), provide verification of review by the Department of Community Health and Medical Care.
- 30) In subdivision developments it is recommended that two (2) access points be established whenever possible for the benefit of emergency vehicles.
- 31) Sight distance criteria shall be based upon the ultimate cross-section specified for the roadway being accessed. Refer to Exhibit 40.25-1 for "Sight Distance at Intersections" criteria. If required sight distance cannot be provided at the access location, acquisition of right-of-way, removal of plant material, reconstruction of pavement, and other off-site improvements, including appropriate Permanent Sight Distance Easements may be needed.
 - a) **Sight Distance for Public and Private Roadways, Commercial Driveways and Multi-Family Access Drives.** These access points shall meet the criteria stated above.
 - b) **Sight Distance at Residential Driveways Serving 3 Residential Lots or More, or Any Residential Driveway with Access on Roads Having an Ultimate Cross-Section of Four (4) or More Lanes.** These access points shall meet the criteria stated above but the driver's eye of the vehicle turning from the intersecting driveway shall be located twelve (12) feet from the edge of the outside lane of the roadway being

accessed. All sight distance assumes grades of 3 percent or less, if greater see AASHTO Geometric Design of Highways and Streets.

c) Sight Distance at Residential Driveways Serving 1 or 2 Residential Lots with Access on Roads Having an Ultimate Cross-Section of Two (2) or Three (3) Lanes.

Sight distance represents a significant design control for residential driveways and they should be located to provide the best visibility possible within the limitations of the property that each driveway serves. The sight distance for residential driveways should meet the minimum sight distance criteria for residential driveways serving 3 residential lots or more. If this criteria cannot be met, even with significant improvements to private property, or public property, the sight distances listed in Table XX (below) will be considered acceptable as the minimum required sight distance. The sight distance for the property access must be maximized, and a significant investment in the property features or public property may be necessary as a result. The sight distance for Table XX (below) will be measured with the driver's eye of the vehicle turning from the intersecting driveway located twelve (12) feet from the edge of the outside lane of the roadway being accessed. All sight distance assumes grades of 3 percent or less, if greater see Table XY (below).

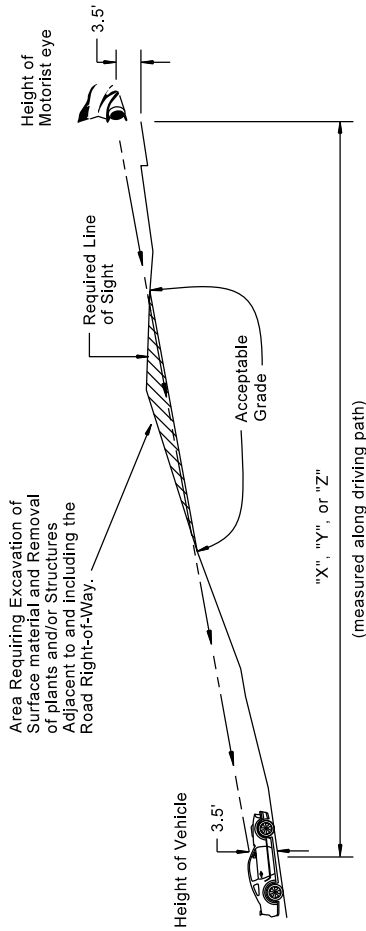
Table XX	
<u>Design Speed (MPH)</u>	<u>St Louis County Minimum Sight Distance for Residential Driveways Serving 1 or 2 Lots (feet)</u>
15	85
20	135
25	180
30	240
35	300
40	390
45	480
50	570

Table XY Adjustment Factors for Table XX Based on Approach Grade								
<u>Approach Grade</u>	<u>Design Speed (mph)</u>							
	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>	<u>40</u>	<u>45</u>	<u>50</u>
-9	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2
-6	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2
-5	1	1	1.1	1.1	1.1	1.1	1.1	1.1
-4	1	1	1	1.1	1.1	1.1	1.1	1.1
-3 to +3	1	1	1	1	1	1	1	1
+4	0	0	0	0	0	0.9	0.9	0.9
+5	0	0	0	0.9	0.9	0.9	0.9	0.9
+6	0	0	0.9	0.9	0.9	0.9	0.9	0.9
+9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

- 32)** When portions of roadway improvements required for the safety of the public require the acquisition of additional right-of-way and easements from private property, the normal sequence of design, right-of-way acquisition and construction shall commence immediately upon approval of the requested rezoning. If the developer is unable to acquire the necessary right-of-way and easements through negotiation with the particular property owners involved, St. Louis County will acquire same through eminent domain proceedings. The cost of appraisals, negotiations, administration, court proceedings and all associated costs incurred by County proceedings shall be paid by the developer.
- 33)** Installation of Landscaping and Ornamental Entrance Monument construction shall be reviewed by the Department for sight distance considerations and approved prior to installation or construction. Refer to Section 40.50.
- 34)** Proposed development-utilizing roadways with structurally deficient pavement within the site, or providing access to the development from such roadways, may be required to overlay the existing road surfacing or make other remedial improvements, as required by the Department, to bring the structural stability of the pavement up to minimum requirements.
- 35)** All longitudinal joints in concrete pavement shall be constructed along proposed lane lines as directed by the Department. Where proposed lane striping and existing longitudinal joints do not coincide, a two (2) inch overlay of Type "C" Bituminous Concrete Wearing Surface shall be required.

NEW	REVISIONS		
9-15-05	12-9-06	4-15-07	3-4-08
			9-1-15

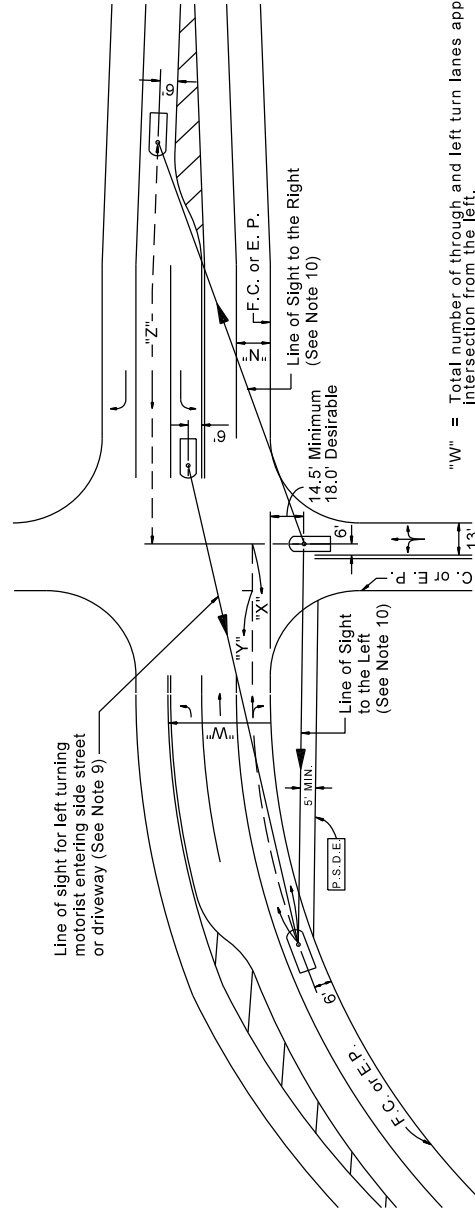
Design Speed on Thru Roadway (M.P.H.)	SIGHT DISTANCE FOR VEHICLE ENTERING ROADWAY FROM STOPPED POSITION ASSOCIATED WITH NEW DEVELOPMENT				Sight Distance for Right Turn Only Intersections ("X")
	Sight Distance for Left Turn From Minor Road ("X" & "Z")		Sight Distance for Left Turn From Major Road ("Y")		
	"W"=1 Lane	"W"=2 Lanes	"W"=2 Lanes	"W"=3 Lanes	
15	170'	180'	190'	125'	145'
20	225'	240'	250'	165'	195'
25	280'	295'	315'	205'	240'
30	335'	355'	375'	245'	290'
35	390'	415'	440'	285'	335'
40	445'	475'	500'	325'	385'
45	500'	530'	565'	365'	430'
50	555'	590'	625'	405'	480'
55	610'	650'	690'	445'	530'
60	665'	710'	750'	490'	575'
65	720'	765'	815'	530'	625'
70	775'	825'	875'	570'	670'



TYPICAL PROFILE ALONG LINE OF SIGHT TO THE LEFT

- 1) Do not scale drawing. Follow dimensions.
- 2) Sight distance design criteria shall be based upon the number of lanes of the ultimate roadway.
- 3) On existing roadways the design speed shall be the 85th percentile speed of motorists on the roadway as established by radar studies or 5 m.p.h. greater than the posted speed limit, whichever is greater.
- 4) On new roadways the design speed shall be 5 m.p.h. greater than the anticipated posted speed limit.
- 5) If "W" is greater than 3 lanes, sight distance data shall be increased by extrapolating from values on the chart.
- 6) If "w" includes a median, sight distance data shall be increased by interpolating between values shown on the chart.
- 7) Height of motorist eye in stopped vehicle = 3.50 ft. Height of the object = 3.50 ft.
- 8) Sight distance requirements shall be satisfied looking left and right for a motorist in each exit lane of a side street or driveway.
- 9) Sight distance requirement for left turning motorist on the through roadway attempting to enter a side street or driveway are measured from a vehicle stopped condition.
- 10) All sight distances assume grades of 3 percent or less. If greater see AASHTO Geometric Design of Highways and Streets.
- 11) Sight distance should be met for signalized intersection.

GENERAL NOTES



- "W" = Total number of through and left turn lanes approaching intersection from the left.
- "X" = Sight distance to the left for a motorist in each exit lane of a side street or driveway. (measured along driving path of nearest lane of approaching motorist)
- "N" = Total number of lanes to be traversed to make a right turn.
- "Z" = Sight distances to the right for a motorist in each exit lane of a side street or driveway. (measured along driving path of nearest lane approaching motorist)
- "Y" = Sight distance required for motorist turning left from major roadway. (measured along driving path of farthest lane of approaching motorist)

[P.S.D.E.] = Permanent Sight Distance Easement.

SAINT LOUIS COUNTY
DEPARTMENT OF TRANSPORTATION
CLAYTON, MISSOURI

SIGHT DISTANCE AT INTERSECTIONS

REVISION DATE: September 1, 2015

DRAWING
40.25-1

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40.30 **Entrance Standards**

All entrance construction within St. Louis County roadway right-of-way shall be constructed in accordance with the St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction", and the Entrance Standards shown on Standard Drawings C608.00 through C608.06, C608.10 and C608.30. Refer to Exhibit 40.25-1 for Sight Distance at Intersections criteria.

- 1) **Residential Entrances** - Residential entrances on existing County roads shall not be less than ten (10) feet wide at the right-of-way line. When the distance between the sidewalk and pavement edge is less than four (4) feet, the minimum entrance width shall be twelve (12) feet.

Residential entrances on existing County roads shall be located so the edges of the curb opening shall be a minimum of five (5) feet from the nearest edge of street inlets and ten (10) feet from the street corner radius point. The edges of the curb opening shall not project beyond the side property line extended normal to the pavement. Clearances and dimensions are shown on Exhibits 40.35-1 and 40.35-2.

In the case of corner lots, no driveways shall be constructed within the sight triangle area bounded by the property lines of a corner lot and a line connecting two (2) points on the property lines each measured thirty (30) feet from the intersection of the two property lines at the intersection. Where applicable, easement lines shall be substituted for property lines.

The distance between adjacent residential entrances shall be a minimum of twenty (20) feet measured along the road right-of-way line. When residential development conditions necessitate reduction of the distance between adjacent residential entrances to ten (10) feet or less, the Department may require a Common Entrance Approach.

- 2) **Commercial Entrances** - Commercial entrances shall not be less than twenty-four (24) feet wide or more than forty (40) feet wide at the right-of-way line. The radius used to increase the opening at the curb or pavement edge shall not be less than ten (10) feet nor more than forty (40) feet. Exception to the width and/or radius may be required, or allowed with special approval by the Department, to insure adequate provisions for large vehicles and/or high traffic volumes.

Commercial entrances shall be located in accordance with the site plan requirements and shall be designed so the edges of the curb opening shall be a minimum of five (5) feet from the nearest edge of street inlets and as far as possible from the street corner radius point. The edges of the curb opening shall not project beyond the side property line extended normal to the pavement.

Clearances and dimensions are shown on Exhibits 40.35-3 through 40.35-5.

In the case of corner lots, no entrances, parking spaces or other obstacles shall be constructed or placed within the sight triangle area bounded by the property lines of a corner lot and a line connecting two (2) points on the property lines each measured thirty (30) feet from the intersection of the two property lines at the intersection. Sign poles may be allowed if they are fifteen (15) inches or less in diameter and if the sign they support is not visually obstructing traffic at the intersection.

The number of commercial entrances for each property or site shall be restricted on the basis of traffic requirements as determined by the Department. The maximum number of commercial entrances allowed, if all traffic requirements are satisfied, shall be as indicated in the following guidelines:

Left Turn Restrictions (When required by the Department)

Frontage (feet)	Max. Number of Commercial Entrances	Method of Restriction	Standard Drawing Number
Less than 200	One (1)	Median	C608.19
200 to 500	Two (2)	Median or Right In - Right Out Channelized Entrance	C608.19 or C608.14
500 to 1000	Three (3)	Median or Right In - Right Out Channelized Entrance	C608.03 or C608.14
More than 1000	As directed by the Department	Median or Right In - Right Out Channelized Entrance	C608.03

Properties that have frontage on two or more streets shall have the number of commercial entrances on each street restricted in accordance with traffic requirements and the above guideline. The distance between adjacent commercial entrances shall be minimum of one hundred (100) feet measured along the road right-of-way line, unless otherwise approved by the Department. When feasible, opposing commercial entrances should be aligned opposite or should be offset a minimum of 100 feet. Higher volume driveways may require greater offset to be determined by the Department.

For a service and/or gas station or a convenience store with gas sales development on a corner lot, the following guidelines are established:

- a) For a new development on a lot for which previous use was not associated with service and/or gas station or a convenience store with gas sales: One (1) entrance intersection from each street shall be permitted and located as far as possible from the street intersection corner.
- b) For redevelopment (complete rebuilding) of a lot for which present use is associated with service and/or gas station or a convenience store with gas sales which is presently served by less than three (3) entrances: One (1) entrance intersection from each street shall be permitted at a location approved by the Department.

For redevelopment of a present use, which is presently served by three (3) or more entrances: The two (2) entrances located farthest from the corner may remain. The

entrance located nearest to the corner on the inbound approach of the intersection shall be removed and the right-of-way restored to surrounding conditions or improved as required. The entrance located nearest to the corner on the outbound approach of the intersection may remain provided that this entrance is restricted, where required by the Department, to right turns in and right turns out by an existing or required median.

For remodeling or renovation of an existing use (i.e. canopy addition, island replacement or addition, dispenser replacement or addition, sales area renovation or addition, car wash addition) all existing entrances shall be permitted to remain except when changes to circulation patterns to the driveways result in an increased emphasis on the entrance located nearest the inbound approach of the intersection. Such entrance shall then be subject to further review and possible elimination by the Department.

- 3) **Left Turn Restrictions** - The restriction of entrance turning movements will require the construction of right in - right out channelized entrances or raised median, as directed by the Department, based upon proximity to the nearest intersecting street or driveway, left turn storage requirements within the public right-of-way, development land use and traffic generation, sight distance limitations and cross access provisions as indicated in the above guidelines.

Where left turns are restricted by the construction of right in right out channelization islands, the Department will require such turning restrictions to be legislated by the applicable city and/or county authority prior to opening the entrance to traffic.

- 4) **Entrance Clearance** - Residential and commercial driveway entrance locations which do not meet the side property line clearance requirements shall not be approved for construction without a consent letter from the abutting property owner.
- 5) **Temporary Emergency Access** - In certain instances, the Department of Transportation may grant temporary access to roadways for emergency vehicles only. The access shall be a 12-foot wide, 12-inch thick rock drive with a standard paved approach within the right-of-way constructed of Type "X" Bituminous Concrete Base - 6" thick and Type "C" Bituminous Concrete Wearing Surface - 2" thick. A gate must be provided across the drive at the right-of-way line with the sign, "Emergency Vehicles Only" on each side of the gate. The gate shall have a lock with the only keys thereto in possession of the St. Louis County Department of Transportation, the St. Louis County Police Department and the appropriate Fire Protection District.
- 6) **Parking Area** - The requirements for off-street parking of the St. Louis County Zoning Ordinance shall be implemented with regard to the minimum dimensions as shown in the Parking Table on page 40.35-7.

All required parking spaces shall be located out of the flood plain.

On-site parallel parking stalls shall be 9' by 22', adjacent to a 22' two-way lane, or 15' one-way lane.

Curbed islands are required at ends of aisles where necessary for traffic control or drainage.

In the event that the desired parking angle is not specified the Parking Table, the St. Louis County Department of Planning may specify other equivalent dimensions associated with the desired parking angle by interpolating the dimensions listed in the table.

In all zoning districts, all parking and loading areas, including driveways, shall be paved, except in the "FP", "PS", "NU" and "R-1" Districts where the Department and the Department of Planning may approve an alternate dust proofing method. Refer to page 40.30-5.

Off-street parking areas in all zoning districts shall provide ingress and egress to any public right-of-way only at such location as approved by the Department.

In a commercial or industrial district, parking space provided in an unenclosed area shall not be closer to the street right-of-way than fifteen feet, but may be located on any other part of the lot in conformance with zoning regulations. The area between the street right-of-way and front yard line, except for required driveways, shall be landscaped and such landscaping shall be adequately maintained. The limitations of this paragraph may be modified in a development plan when authorized under Section 1003.145, Planned Commercial District, or as a Special Procedure under Sections 1003.180 through 1003.189.

For additional requirements, refer to the St. Louis County Zoning Ordinance, Section 1003.165, Supplementary Off-Street Parking and Loading Requirements.

- 7) **Loading Docks** - Loading docks shall be designed so that trucks shall not be forced to maneuver on public or private streets.

A paved area of seventy-five (75) feet in depth (not including public or private street right-of-way) as measured at right angles to the loading dock shall be required for proper maneuvering of large vehicles.

For additional requirements, refer to the St. Louis County Zoning Ordinance, Section 1003.165, Supplementary Off-Street Parking and Loading Requirements.

- 8) **Cross Access** - Cross access is defined as a commonly shared or used pedestrian way or vehicular driveway that connects or serves two or more properties.

The purpose of cross access may be to reduce the number of entrance intersections to an arterial or county street, to provide access via a signalized intersection, to provide direct access between adjacent developments, to provide access to lots not having road frontage, etc.

Cross access may be required as part of the Site Plan or Subdivision Review Procedure, zoning request, and/or special procedure request and shall be provided in accordance with the following conditions:

- a) At the time the site plan is submitted for review, the Department will identify adjacent existing land use and its potential for change, existing traffic volumes and design features of the surrounding roadways, etc. in order to ascertain requirements for cross access. If cross access is required, the plan shall show the area to be included for cross access to include the driveway approach, internal driving and parking lot aisles and their extension to the property line(s) at the area(s) designated for connection to adjacent property.
- b) If cross access has previously been established on adjacent property, the developer will be required to provide cross access and construct a pavement connection to the existing internal driving and parking lot aisle within that area of cross access. In the event that cross access has not previously been established on adjacent property, no pavement

connection to adjacent property is required other than that necessary for the functioning of the site.

- c) The area designated for cross access shall be kept free of all landscaping, fences, trash enclosures, parking/ loading spaces, and/or other improvements except as required by The Zoning Ordinance. Any approved improvements located in the areas designated for cross access shall be removed by the developer who is required to construct the pavement connection.
 - d) A Temporary Slope Construction License shall be provided to facilitate construction of the future cross access by the adjacent development or property owner. Maintenance of cross access areas shall be accomplished by each property owner or as may be agreed to by the owners. The owners shall provide copies of all such agreements to the Department for approval prior to execution and recording.
 - e) The Cross Access Easement Agreement shown on page 65.10-17, and the Temporary Slope Construction License shown on page 65.10-13, may be duplicated for execution and submittal to the Department as part of the improvement plan approval.
 - f) Any modification of the Cross Access Easement Agreement shall be reviewed by the County Counselor and Departments of Transportation, Planning, Public Works and/or the Zoning Enforcement Officer and approved prior to execution and recording.
- 9) **Gated Access** - Gated access for private communities, commercial developments, etc. may be permitted for private residential streets, private commercial streets, etc., provided that an approved turnaround per County standards, is constructed prior to the gate.
- 10) **Alternate Dustproof Surfaces** - Section 1003.165-2,4 (1) of the St. Louis County Zoning Ordinance states, "In all Zoning Districts, all parking and loading areas, including driveways, shall be paved, except in the "FP", "PS", "NU" and "R-1" Districts, where the Department of Transportation and the Department of Planning may approve an alternate dust proofing method."

The Departments of Planning and Transportation consider the following dustproof surfaces as acceptable alternatives to paving driveways and parking areas for single-family residential uses in the "NU", "FPNU", "R-1" and "FPR-1" Districts:

a) **Bricks, Cobblestones or Interlocking Pavers**

- Sand filled joints;
- Clean sharp sand base (1½" thickness before compaction);
- 6" of ¾" minus limestone sub-base;
- Subgrade (compacted to 95% standard proctor).

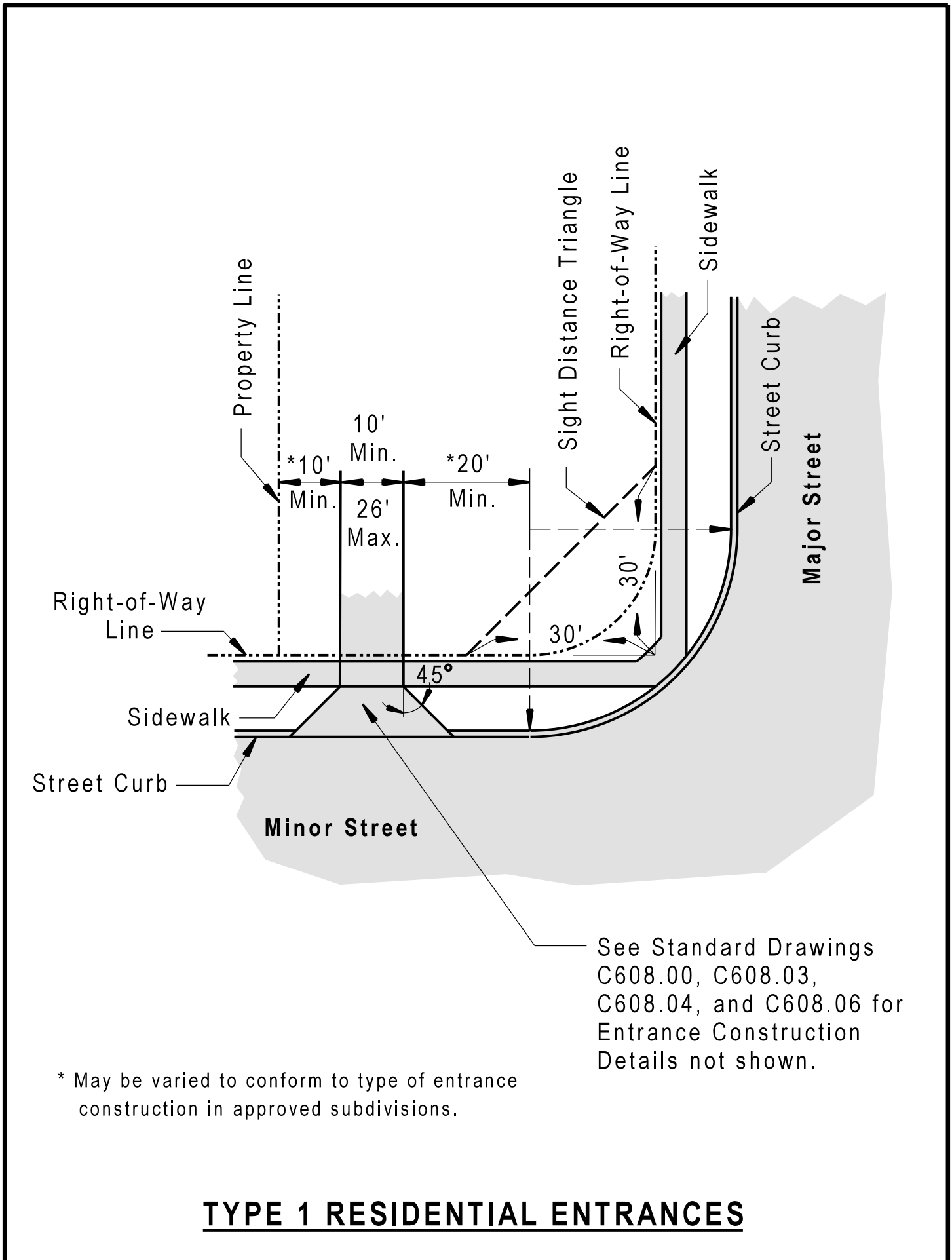
b) Chip and Seal Coat

- 1 to 2 coats ($\frac{3}{8}$ " to $\frac{3}{4}$ ") of bituminous surface treatments;
- 6" gravel, crushed limestone or soil cement stabilization (base primed);
- Subgrade (compacted to 95% standard proctor).

c) C-Gravel

- 8" of C-Gravel ($\frac{3}{4}$ " \pm non-crushed aggregate, such as that found in the Meramec River);
- Subgrade (compacted to 95% standard proctor);
- Use of manufacturer's specifications is recommended;
- All thicknesses shown are minimum;
- Use of a non-woven fabric underlayment between the subgrade and adjacent surfacing material is recommended.

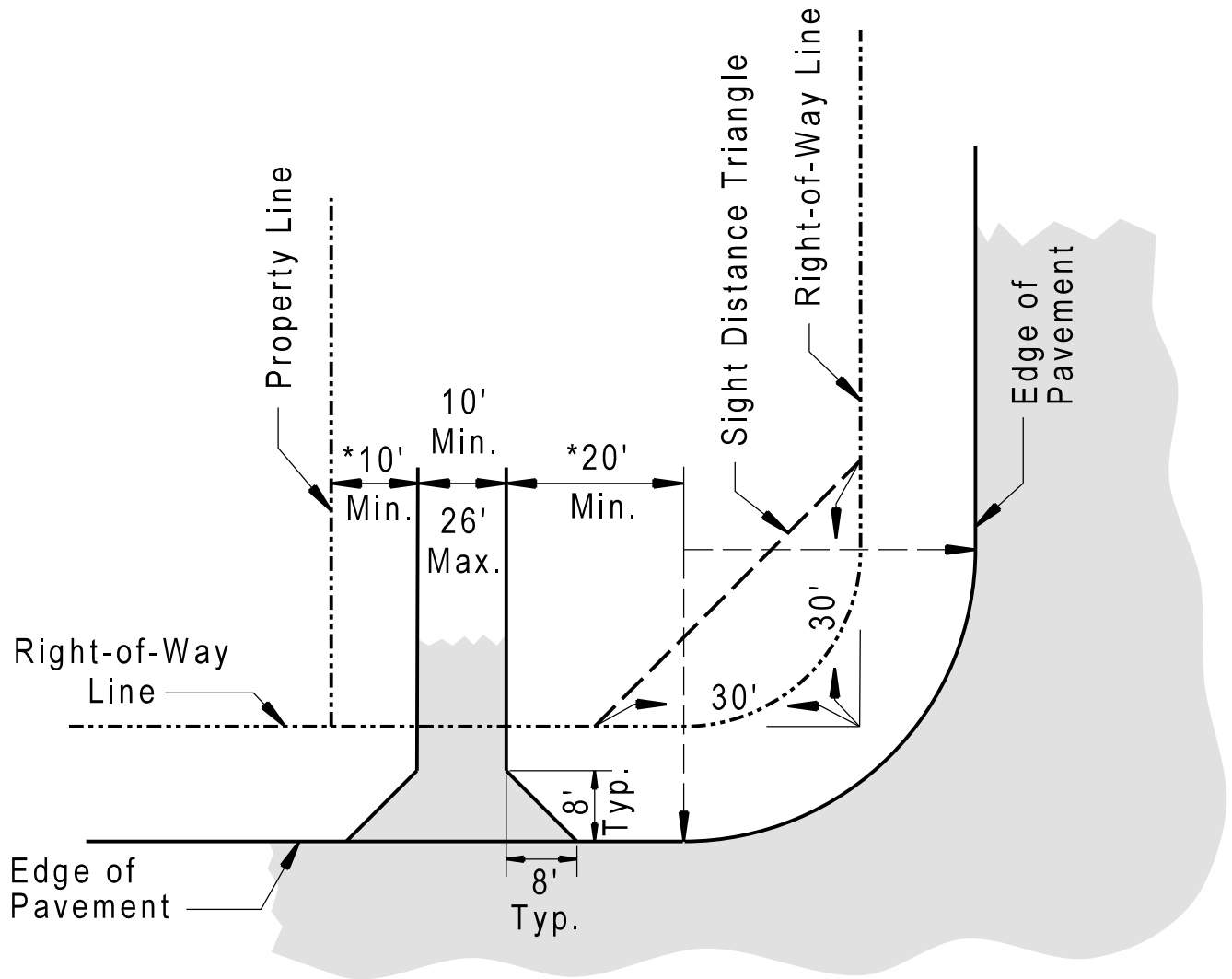
The above described surfaces shall not be used for non-residential land uses in the above mentioned zoning categories, or for driveway entrance construction within the road right-of-way, which is required to meet St. Louis County standards and specifications.



See Standard Drawings C608.00, C608.03, C608.04, and C608.06 for Entrance Construction Details not shown.

* May be varied to conform to type of entrance construction in approved subdivisions.

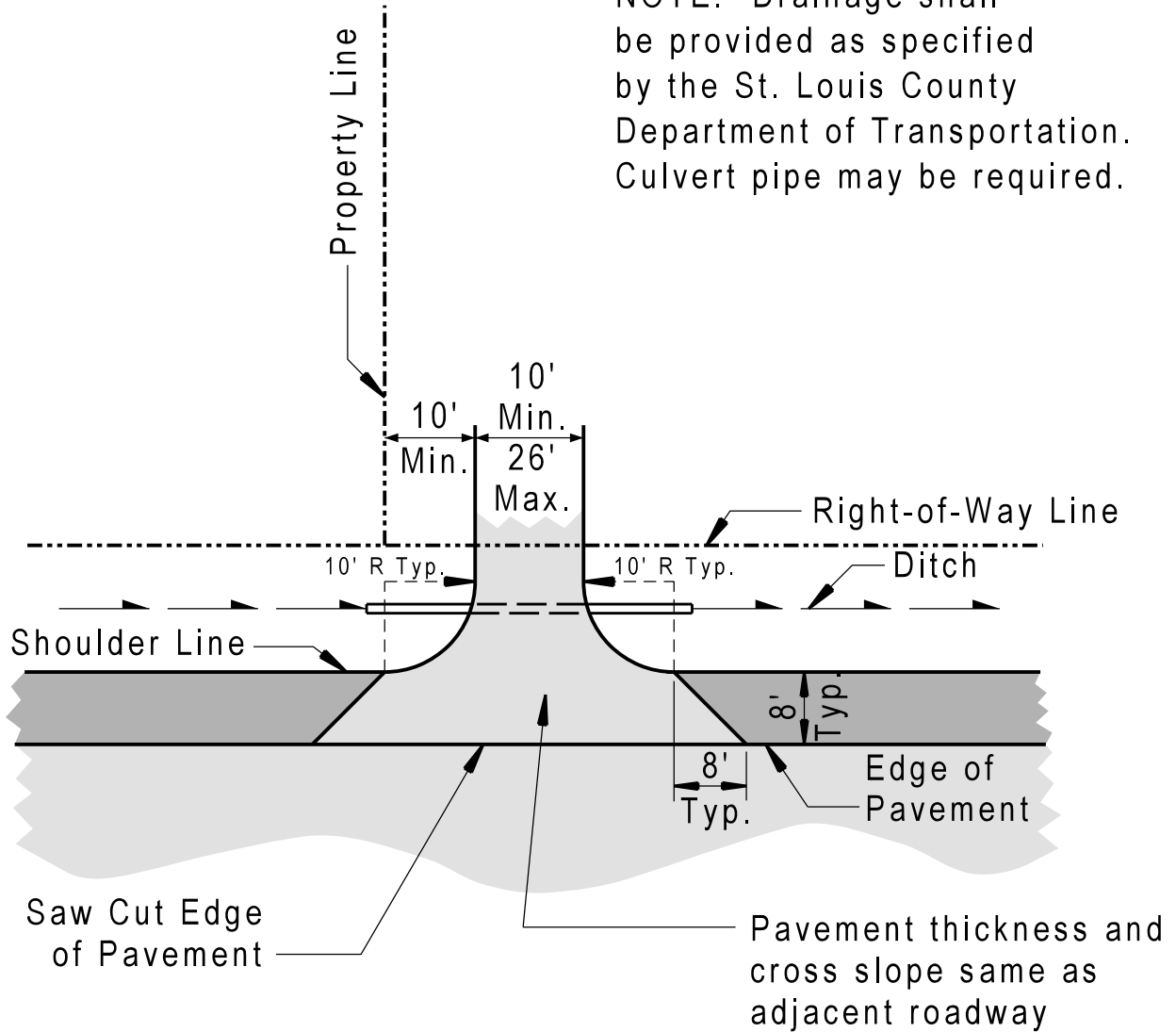
TYPE 1 RESIDENTIAL ENTRANCES



* May be varied to conform to type of entrance construction in approved subdivisions.

TYPE 2 RESIDENTIAL ENTRANCES

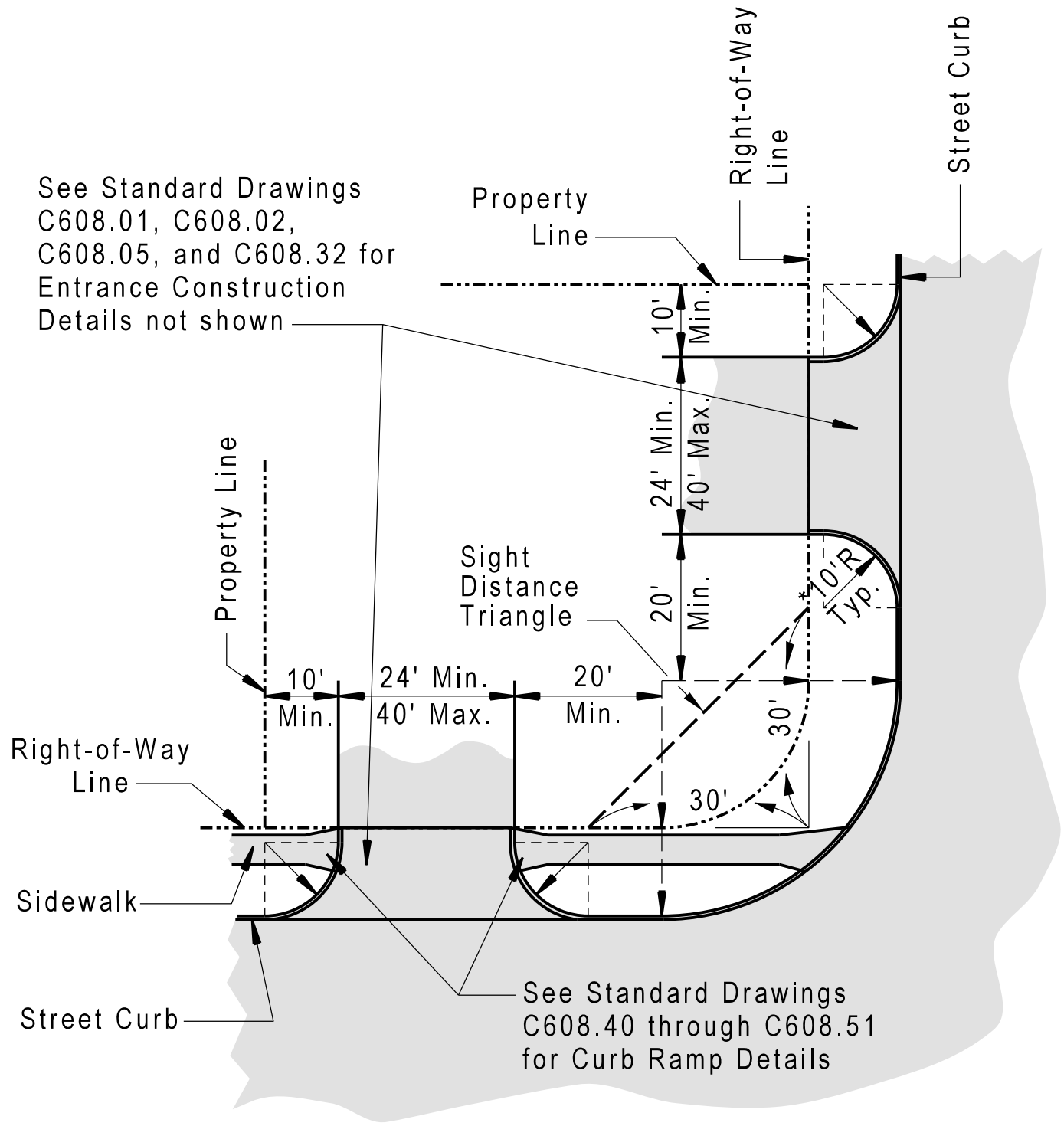
NOTE: Drainage shall be provided as specified by the St. Louis County Department of Transportation. Culvert pipe may be required.



Provide onsite turnaround capabilities and clear vegetation as directed to provide adequate sight distance.

TYPE 3 RESIDENTIAL ENTRANCES

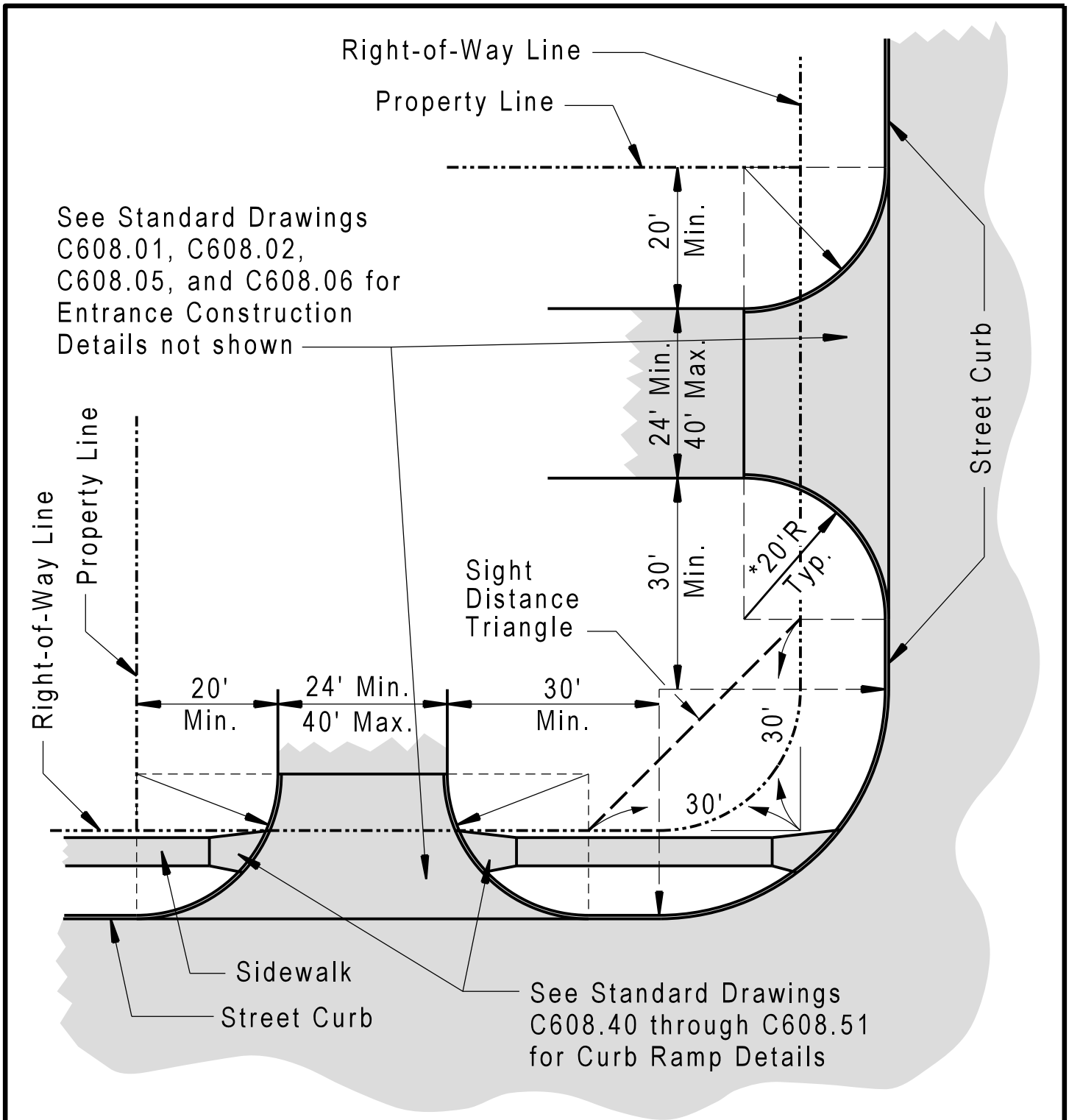
See Standard Drawings
 C608.01, C608.02,
 C608.05, and C608.32 for
 Entrance Construction
 Details not shown



See Standard Drawings
 C608.40 through C608.51
 for Curb Ramp Details

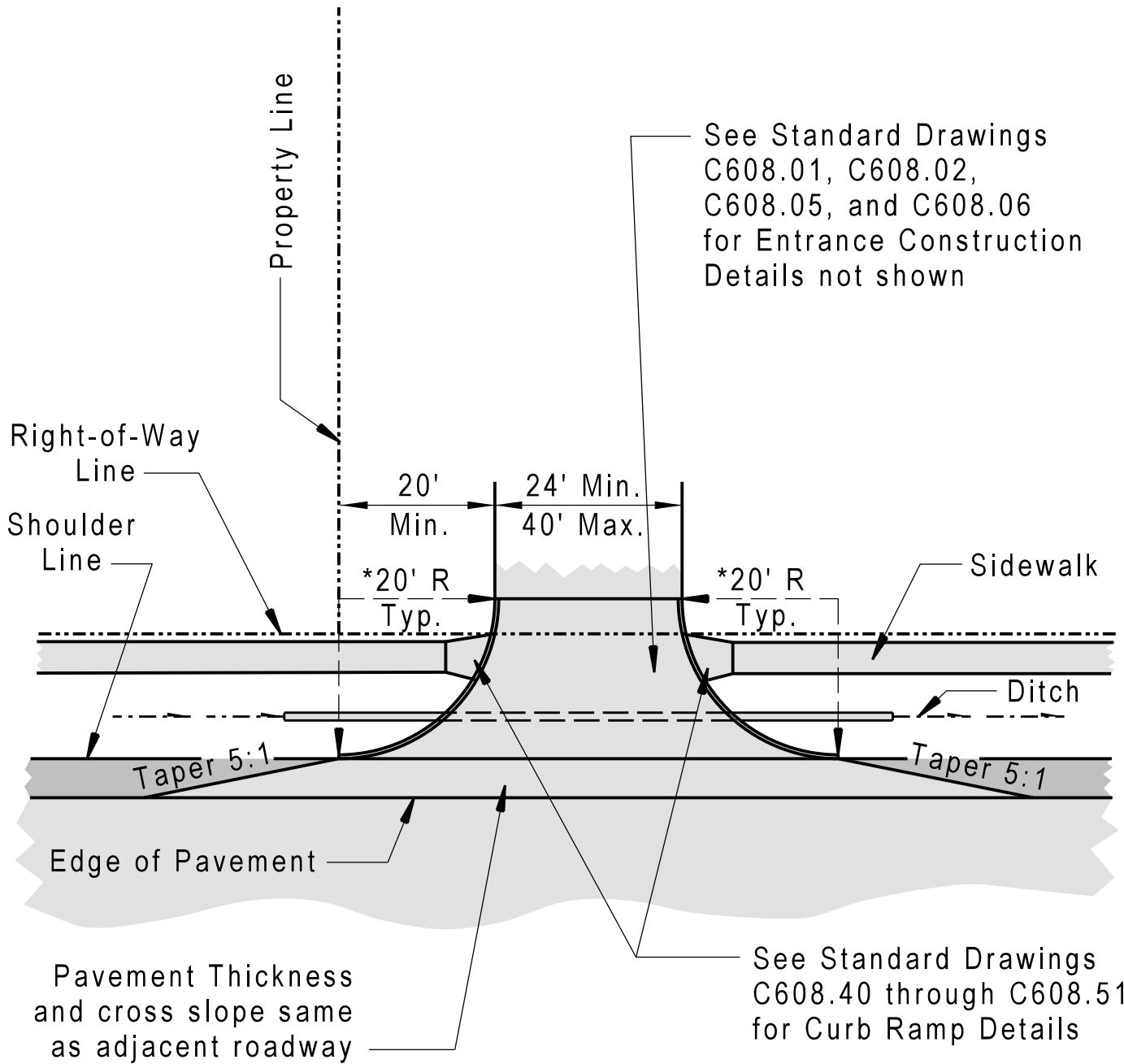
* Entrance radii may be increased as determined by
 the Department of Transportation to provide for
 high traffic volumes or movement of large trucks.

TYPE 1 SPECIAL COMMERCIAL ENTRANCES



* Entrance radii may be increased as determined by the Department of Transportation to provide for high traffic volumes or movement of large trucks.

TYPE 2 SPECIAL COMMERCIAL ENTRANCES



* Entrance radii may be increased as determined by the Department of Transportation to provide for high traffic volumes or movement of large trucks.

TYPE 2 COMMERCIAL ENTRANCE WITH TAPERED APPROACH

PARKING TABLE

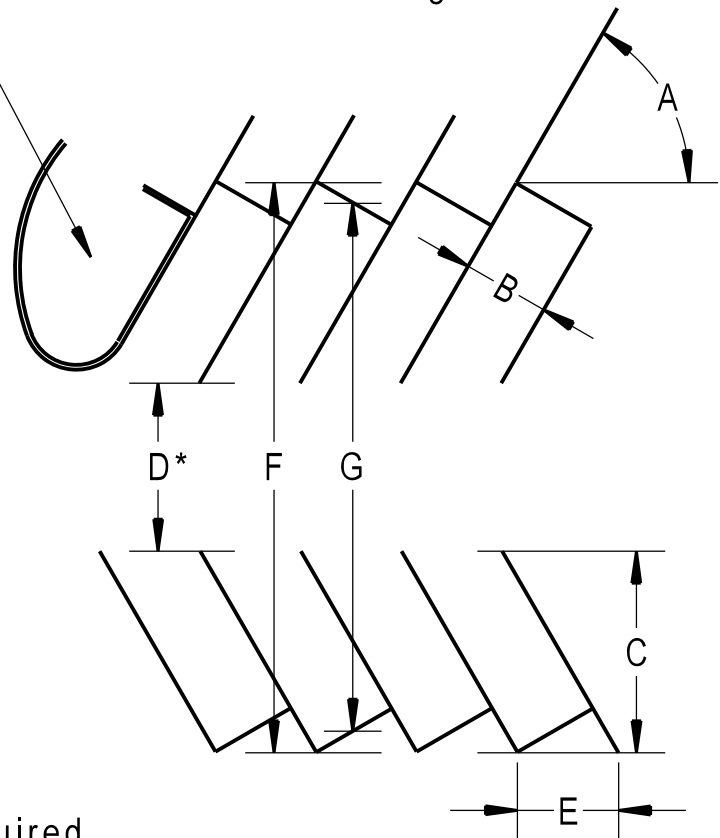
A	B	C	D*	E	F	G
45°	9.0'	19.7'	12.5'	12.7'	51.9'	45.6'
60°	9.0'	21.0'	17.5'	10.5'	59.5'	55.0'
90°	9.0'	19.0'	22.0'	9.0'	60.0'	—

A stall dimension of 8.5'x 18.0' or equivalent may be utilized for off-street parking stalls provided in excess of minimum requirements as set forth in this section when designated for compact cars.

On-site parallel parking stalls shall be 9.0'x 22.0' adjacent to a 22' two way lane or 15' one way lane.

- A Parking Angle
- B Stall Width
- C 19' Min. Stall to Curb
- D* Aisle Width
- E Curb Length Per Car
- F Curb to Curb
- G Center to Center Width of Double Row with Aisle Between

Curbed islands are required at ends of aisles where necessary for traffic control and/or drainage.



* Additional width may be required where the aisle serves as the principal means of access to on-site buildings or structures.

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40.40 Sidewalks and Curb Ramps

All sidewalks and curb ramps within the St. Louis County right-of-way or easement shall be constructed in accordance with St. Louis County Standard Specifications and the current approved American with Disabilities Act (ADA) Accessibility Guidelines (see Standard Drawings C608.40 through C608.56).

Required accessibility improvements associated with residential development shall include new and existing sidewalk that meets current accessibility standards. Sidewalk shall be evaluated and improved across the project's frontage and shall tie into a compliant connection or termination.

Required accessibility improvements associated with commercial development shall include new and existing sidewalk along the project frontage, replacing non-compliant curb ramps, and any upgrades to a connected signalized intersection corner and associated island to ensure that current accessibility standards are met. If the intersection requires upgrades for ADA compliance, the signalized intersection must be brought up to current County design standards.

A signed and sealed note must be added to the plans for both residential and commercial projects indicating that the unimproved existing sidewalk meets current ADA standards.

- 1) **Sidewalk Construction** - Sidewalks shall be a minimum of five (5) feet wide on arterial roads (ARS), county collector roads (CRS) and non-residential street (CRS) sections, and a minimum of four (4) feet wide on residential streets, as shown on Standard Drawing C608.50 (Concrete Sidewalk Details). A minimum sidewalk width of six (6) feet shall be required when sidewalks are adjacent to curbs. Additional width shall also be required in commercial areas. Sidewalks shall be constructed of four (4) inch thick concrete, except across driveways and temporary turnarounds where the thickness shall be increased to match the driveway approach or adjacent pavement thickness, and curb ramps (see Item #2 below). Also, for commercial entrances, the thickness of the first section of sidewalk or curb ramp on each side of the entrance shall be increased to match the driveway approach pavement thickness (see Standard Drawings C608.01, C608.02 and C608.05).
- 2) **Curb Ramps** - All curb ramps shall meet current approved ADA Accessibility Guidelines (ADAAG). Curb ramp requirements are shown on St. Louis County Standard Detail Drawings C608.40 through C608.51. Curb ramps with a detectable warning surface (truncated domes) across the full width of the ramp, shall be provided wherever an accessible route crosses a curb. To view the ADA Accessibility Guidelines, go to the U.S. Access Board website at:

[www.access-board.gov/guidelines-and-standards/
buildings-and-sites/about-the-ada-standards](http://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards)

To view the County's detectable warning standard, go to the Department's "Standard Drawings" website at:

[www.stlouisco.com/YourGovernment/CountyDepartments/
Transportation/TransportationPublicationsManuals/StandardDrawings](http://www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/StandardDrawings)

Choose Standard Drawing C608.51, "Detectable Warning Surface for New Construction and Retrofitting of Curb Ramps". Sidewalks constructed within municipalities adjacent to arterial roadways, may be subject to municipal ordinances or regulations specifying construction that exceeds this Department's requirements.

- 3) **Sidewalk Variances** - Sidewalks shall be provided along road rights-of-way in accordance with the Department's requirements. A determination as to the need for sidewalks is made by reviewing existing conditions, future development and projected pedestrian needs. Only the Planning Commission or the Director of Planning may grant a variance in subdivisions.

The Department's "Sidewalk Policy" publication is located on the St. Louis County Department of Transportation's "Publications & Manuals" webpage at:

www.stlouisco.com/YourGovernment/CountyDepartments/HighwaysandTraffic/HighwayPublicationsManuals.

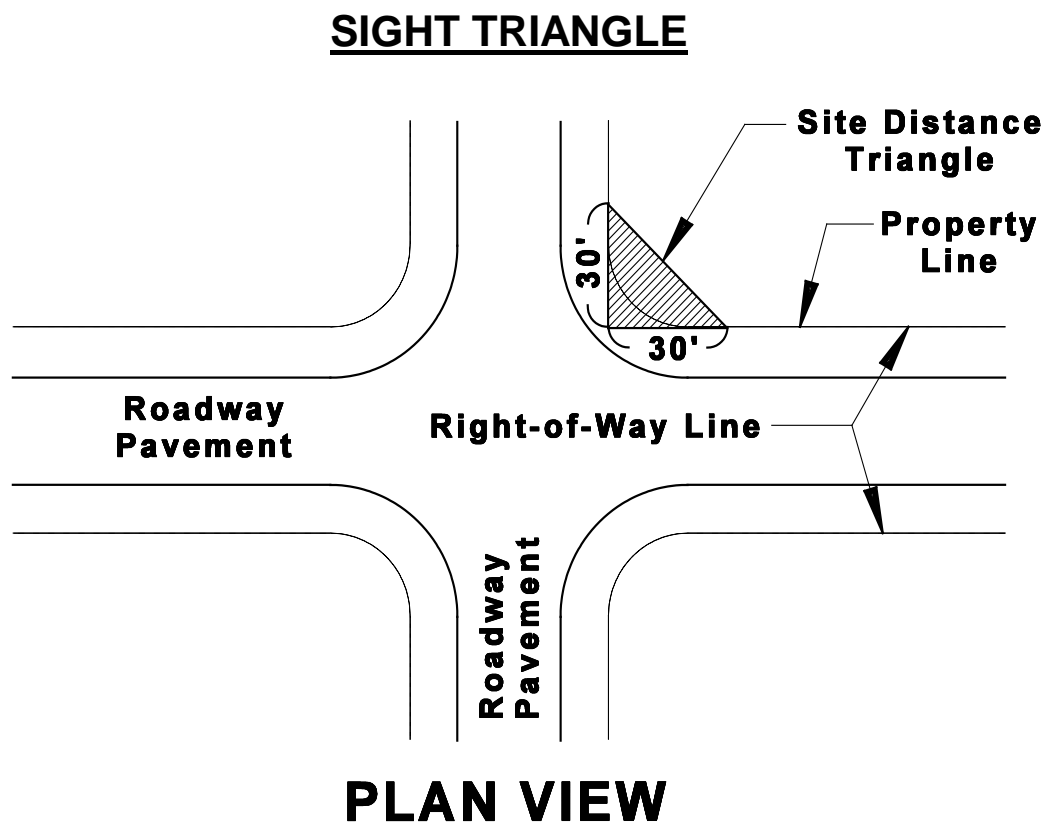
Sidewalks may be required for industrial subdivisions along the frontage of an arterial roadway as directed by the Department.

- 4) **Sidewalk Escrow** - In lieu of sidewalk construction, an Agreement Guaranteeing Road Improvement (Special Escrow) together with a cash sum, may be required by the Department to include all items necessary to the sidewalk construction (i.e., grading, paving, area restoration, etc. - refer to Sections 70.00 and 70.20 for requirements), for future construction by others. The amount of the escrow is subject to the approval of the Department.
- 5) **Sidewalk District** - In areas where there are no sidewalks along County maintained roadways and residents desire the construction of sidewalks, a sidewalk district would be formed involving those properties that would benefit from the construction of a sidewalk. This may require dedication and/or acquisition of right-of-way and related easements and assessment to property owners in the sidewalk district to pay for the cost of construction. Contact the St. Louis County Counselor's Office for information regarding the requirements for formation of such sidewalk district.
- 6) **Sidewalk Credits** - Credit for sidewalk construction within the public road right-of-way will be given against required traffic generation assessment and/or trust fund contributions for the following:
- a) Construction of new sidewalk beyond the site's frontage and adjacent to the public roadway when necessitated by road improvement requirements.
 - b) Removal and reconstruction of all sidewalk necessitated by road improvement requirements.
 - c) No credit is given for a sidewalk constructed within a development's public road frontage.

40.50 Landscaping

All landscaping where permitted within St. Louis County road right-of-way shall be planted and installed in accordance with St. Louis County Standard Specifications. The recommended location for street trees varies between five (5) and ten (10) feet from the road right-of-way line on private property, depending upon the type of tree being planted. Permits shall be required for the planting of hedges, shrubs, landscaping, ornamental entrances and monuments, berm slopes, trees, etc. within the right-of-way and shall not be issued without the approval of the subdivision trustees.

- 1) **Location** - Trees shall not be located within a street right-of-way unless the Planning Commission, or the Director of Planning and the Director of Transportation, has granted a variance. Location of new street trees shall not be allowed within the following areas: three (3) feet of any curbs, twenty-five (25) feet of street lights, or ten (10) feet of street inlets or manholes. No plant material exceeding thirty-six (36) inches in height above the elevation of the adjacent street pavement may be planted within the sight triangle area bounded by the property lines of a corner lot and a line connecting two (2) points on the property lines each measured thirty (30) feet from the intersection of the two (2) property lines at the street intersection. Likewise, no trees may be planted within the triangular area that have bottom branches lower than seven (7) feet above the elevation of the adjacent street pavement.



2) Ornamental Entrance Monuments and Signs - Structures and/or signs proposed at subdivision and commercial development entrances shall conform to the requirements of the Zoning Ordinance.

The width, height, grade and location of all entrance monuments and signs shall be reviewed with relation to the existing and proposed streets and/or major commercial driveway intersections for possible sight distance restrictions affecting nearby vehicular and pedestrian traffic and other requirements as follows:

- a) Ornamental entrance monuments and signs when located in medians approaching street intersections shall be located a minimum of twenty (20) feet from the prolongation of the intersecting road right-of-way or easement line and constructed symmetrically about the median centerline.
- b) Monuments and signs located in proximity to the street intersection corners, shall not be located within the road right-of-way.
- c) Monuments and signs located within the Sight Distance Triangle area of the street intersection corners shall be subject to the height limitations governing trees and plant materials described in previous Item 1 on page 40.50-1.
- d) Ornamental entrance monuments and signs shall not be placed or constructed within the public road right-of-way or easement without authorization by the Department through the issuance of a permit.
- e) Plans shall be provided showing elevation and section views of the proposed construction. Plans shall indicate the location of the adjacent right-of-way, easements, curbing, sidewalk, street pavement, utilities and/or landscaping.
- f) Plans for monuments and sign structures shall be approved by the Department of Public Works prior to issuance of the Department of Transportation's permit. (Where special permits, i.e., building, electrical and/or plumbing are required, they shall accompany the plans.)
- g) Sight distance triangles shall be shown on the plans.
- h) Permit for construction will be issued initially to the developer or later to Trustees or other individuals designated in the trust indentures.
- i) Where the entrance monument and sign have not been specifically provided for in the recorded indentures, amendments shall be recorded prior to plan approval and permit issuance.
- j) Indentures must provide for maintenance and repair of structure and sign authorized by permit.
- k) Indentures must hold County harmless from all claims, demands and suits of any kind arising out of or in conjunction with any permits issued.

- 3) **Permits** - When it is determined that certain barriers (other than trees and shrubbery) do not constitute a hazard or nuisance, the property owner may be notified to obtain a Special Use Permit from the Department. If the property owner fails to submit a request for a permit within thirty (30) days, the barriers shall be removed from the right-of-way.
- 4) **Hazardous Situations** - The following guidelines have been established to properly identify possible plant material and barrier hazards:
 - a) Fences that obscure the sight distance for motorists entering an intersection could be a hazard. Also, fences that are located directly behind the edge of pavement could be a hazard to pedestrians depending upon the width of pavement and the volume of traffic.
 - b) Rocks, railroad ties, or other posts located within the County right-of-way may not necessarily be a hazard. These barriers could be hazards if they are located in the path of normal pedestrian traffic and/or are located so close to the edge of pavement that motorists could strike them.
 - c) Plant material located on the corners of intersections could be a hazard if motorists are unable to see cross traffic approaching.
 - d) Trees with low branches across a sidewalk or walkway could be a hazard to pedestrians.
- 5) **Inspection and Removal** - Within the St. Louis County right-of-way adjacent to the public roadway, certain cases may dictate the need to remove any barriers, plant material, and trees within the public road right-of-way. The discretion and authority to remove such barriers, plant material, and trees in the public road right-of-way is the function of the St. Louis County Department of Transportation.

In order to ensure that plant material, tree and barrier hazards have been removed from County streets and parkways where necessary, the following policy shall be effective:

- a) The Department shall investigate all possible hazards created by plant material, trees and barriers that are known through citizen complaints and/or by report from Departmental personnel.
- b) When it is determined that certain plant material, trees and/or barriers installed by the abutting property owner are hazardous (that is, obstruct or endanger either pedestrian or vehicular traffic) or constitute a nuisance, the Department shall notify the property owner of the hazard or nuisance and request removal of same as soon as possible.
- c) After a reasonable length of time, the Department will conduct a follow-up investigation to determine if the property owner has corrected or removed the hazard or nuisance.
- d) If the notified property owner has not corrected the hazard or nuisance, the Department will make arrangements to remove said hazard or nuisance as soon as possible without further notification to the property owner.

6) **Other Landscaping Concerns**

- a) **Ground Cover** - The Department may require sodding or other means of ground cover to insure erosion control.
- b) **Common Ground or Common Land** - The Department may require the clearing of underbrush, sodding, seeding, and other landscaping improvements in that portion of the common ground or common land that has been altered or graded.

For additional requirements, refer to Section 1005.340 of the Zoning Ordinance.

40.60 Geotechnical Reports

A Geotechnical Report shall be required where grading and proposed improvements on the site are located in an area where soil conditions are susceptible to rapid erosion, landslide, settlement and/or creep. The report shall verify the adaptability of grading and improvements with soil and geologic conditions. A statement of compliance with this study, signed by the Professional Engineer preparing the report, shall be included on all Site Development Plans. The development plan and improvement plans shall be designed to conform to the requirements and conditions of the Geotechnical Report. A Professional Engineer shall be required to inspect construction in accordance with the grading and soils requirements and conditions contained in the report.

The Engineering Geologic Map of Saint Louis County, Missouri (1971), Edwin E. Lutzen and John D. Rockway Jr., contained in the Missouri Geological Survey and Water Resources Engineering Geology Series No. 4 and available through the Missouri Department of Natural Resources shall be used to ascertain whether a Geotechnical Report shall be required. At this time, a report is required for sites located in Units IIa, IIIa, IVa, VI, and Xa, and Units IIb, IIc, and II d when specific site conditions or development type necessitate a report.

In general, all slopes shall be graded to meet St. Louis County's standard 3:1 or flatter slope for both cut and fill. 2:1 slopes may be approved by the Department where their use is supported by detailed soils information. If the preliminary grading plans or site plans propose high terraces, the soils report should indicate measures to intercept and divert surface water from flowing over terraces and walls.

In all areas of questionable soil stability such as sinkholes, ponds, marshy areas, etc., the Department shall be notified prior to commencement of grading so that these locations can be inspected.

Excavation and/or treatment of sinkholes shall be authorized by the Department of Transportation through the issuance of a grading permit prior to commencement of the excavation. Any areas identified as sinkholes will require a sinkhole report. This report will require that the sinkhole(s) shall be inspected to determine if it is functioning with regard to drainage and the sinkhole shall be treated as follows:

- 1) All sinkhole crevices shall be located on the plan. If the sinkhole is either in the public road right-of-way or within 10' of the public road right-of-way, it shall be excavated to the crevice, treated and brought to grade by the construction of a manhole or inlet with outfall pipe, etc.
- 2) Functioning sinkholes shall be utilized as a point of drainage discharge by a standard drainage structure with a properly sized outfall pipe provided to an adequate natural discharge point, such as a ditch, creek, river, etc.
- 3) Non-functioning sinkholes and sinkholes under a proposed building may be capped.
- 4) Sinkholes may be left in their natural state; however, they will still require properly sized outfall pipe or swale to an adequate natural discharge point.

- 5) All sinkholes affecting County right-of-way (typically within ten (10) feet) must be inspected by the Department prior to treatment. Sinkholes not affecting County right-of-way must be inspected by the Department of Public Works. Special siltation measures shall be installed during the excavation of sinkholes and during the grading operations to prevent siltation of the sinkhole crevice.

In general, the following procedure shall be followed in treating sinkholes:

- a) **Excavation** - Prior to filling operations in the vicinity of a sinkhole, the earth in the bottom of the depression will be excavated to expose the fissure(s) in the bedrock. The length of fissure exposed will vary, but must include all unfilled voids or fissure widths greater than 2-inch maximum dimensions which are not filled with plastic clay.
- b) **Closing Fissures** - The fissure or void will be exposed until bedrock in its natural attitude is encountered. The rock will be cleaned of loose material and the fissures will be hand-packed with quarry-run rock of sufficient size to prevent entry of this rock into the fissures, and all the voids between this rock filled with smaller rock so as to prevent the overlying material's entry into the fissures. For a large opening, a structural (concrete) dome will be constructed with vents to permit the flow of groundwater.
- c) **Granular Filter** - Material of various gradations as approved will be placed on top of the hand-packed rock with careful attention paid to the minimum thicknesses. The filter must permit either upward or downward flow without loss of the overlying material.

The fill placed over the granular filter may consist of a granular material or an earth fill compacted to a minimum density of 90% as determined by ASTM D-1557-64T.

- d) **Supervision** - Periodic supervision of the cleaning of the rock fissures must be furnished by the Soils Engineer. Closing of the rock fissures will not begin until the cleaning has been inspected and approved by the Soils Engineer.

During the placement and compaction of earth fill over the filter, supervision by the Soils Engineer shall be continuous. Earth fill densities will be determined during the placement and compaction of the fill in sufficient number to insure compliance with the specification. The Soils Engineer is responsible for the quality of the work and to verify that the specifications are met.

- 6) For reports concerning proposed developments in Units IIa, IIIa, IVa, or Xa, the consultant should prepare conditions within the report covering the following, at a minimum.
- a) **Erosion of Silt-Rich Loessial Soil** - What should be done to minimize surface erosion during and after construction? Also, what measures should be taken to address erosive velocities at discharge points?
 - b) **Developments on Slopes Greater than 20%** - Soil creep is a potential problem on slopes this steep, and developments in these areas will require engineering analysis and solutions.
 - c) **Cut and Fill** - Construction of cut and fill slopes in these areas should be detailed to assure slope stability.

- 7) For reports done on proposed developments in Unit VI, the consultant should prepare a report covering the following, at a minimum.
- a) **Natural Slope Stability** - Are the natural slopes on shale stable enough for the density of development proposed?
 - b) **Swelling Soils** - The potential for swelling soils in Unit VI and their affect on home and road foundations should be discussed.

Additional considerations that can be covered in these reports include affect of stream erosion on private property, foundation design, foundation drainage, road design, excavations, etc.

The reports for the erosion-prone area do not necessarily require subsurface investigation. The shale areas, however, would almost certainly require shallow exploration. The reports shall be prepared under the supervision of and sealed by an engineer.

Developments that require more detailed soils information are those with very dense housing (greater than 3 to 4 houses per acre), extensive grading and site preparation (including cut and fill), steep slopes, etc. Some developments can be less critically reviewed due to minimal site disturbance and low density housing (2 or less houses per acre).

There are other areas besides Units IIa, and VI within the County where dense developments will require sound engineering. An example is the West County area where steep slopes and narrow valleys are encountered. Although landslides in these areas are not likely, erosion and flooding problems will become more severe as this area is developed.

Statement of Compliance with the Geotechnical Report

As indicated previously in this section, a statement of compliance with the Geotechnical Report shall be required prior to St. Louis County's approval of the Site Development Plan, Final Development Plan and/or Improvement Plans required for the development. The statement of compliance shall include, but not be limited to, the following:

(Insert Company Name) and the undersigned engineer have not prepared the plan on this sheet. The seal of the undersigned professional engineer has been affixed at the request of Saint Louis County and is a professional opinion to indicate that the undersigned has reviewed the plans and that in his opinion the grading and improvements relative to slope construction as shown on the plans, as well as the foundations, are compatible with the soil and geologic conditions at the site as described in the geological report for the development dated **(Insert Report Date)**.

(Insert Company Name) and the undersigned assume no responsibility for services by others (pursuant to RSMO 327.411).

Construction means and methods for implementation of the grading plan shall be left to the developer/contractor. Observations of the developer/contractor's compliance with the applicable specifications shall be identified and verified in writing.

Seal

(Insert Company Name Here)

(Engineer's Signature Here)

(Insert Engineer's Name and Registration Number)

40.70 General Miscellaneous Requirements

- 1) **Noise Pollution** - It is possible that substantial sound levels may be present for a development site located adjacent to a Federal Aid highway, and acceptable noise levels established by the Federal Highway Administration (FHWA) for the Federal Aid System may be exceeded. A noise study evaluating the impact of existing and proposed traffic on the development should be provided. Certain noise abatement criteria established by the Federal Highway Administration must be followed in developing the site. This Department has no plans to provide sound attenuation devices for development. The Federal Highway Administration has indicated that "Federal money cannot be spent on noise control projects if the local government has not taken steps to exercise land use control over remaining developed lands adjacent to the highway to prevent further development of incompatible activities." However, after local authorities have taken measures to exercise land use control over undeveloped lands adjacent to highways, noise abatement measures may be employed to protect activities and land uses to prevent further development of incompatible activities.
- 2) **School Speed Zone Policy** - The designation of a school speed zone will be considered in accordance with the following guidelines:
 - a) This policy applies to all St. Louis County maintained roadways.
 - b) Requests for school speed zones should be made by administrators of elementary or middle / junior high schools. This policy does not apply to day care centers, preschools, high schools, trade schools, colleges, or universities.
 - c) School speed zones will be posted no more than 10 MPH under the regularly posted speed limit. In no case, however, will the school speed limit be posted at less than 25 MPH, which is the general speed limit for roadways maintained by St. Louis County.
 - d) A school speed zone will be considered only on a through street adjacent to the front of a school. If the front of a school is along a minor street, the speed limit would not normally be reduced, since the speed limit is most likely already posted at 25 MPH. A school speed limit shall not be installed along a through street adjacent to the side or back of a school, unless the roadway serves as the primary point of pedestrian access to the school.
 - e) Requests for school speed zones will be considered only if students are observed walking to / from school along the through street serving as the primary point of pedestrian access to the school.
 - f) School speed zones will be posted on a "School Speed Limit When Flashing" sign assembly, to alert drivers when the lower speed limit is in effect. This assembly shall have a top mounted, single yellow flashing beacon operated by either solar power or 120 volts AC. The top portion of the sign shall have a black border and black legend **SCHOOL** on a fluorescent yellow-green background. The center portion of the sign shall be a standard speed limit sign. The bottom portion of the sign shall have a black border and black legend **WHEN FLASHING** on a white background.

- g) Each school speed zone sign assembly with flashing beacon shall operate only during the months and days when school is in session. School speed zone times of restriction shall be one hour in the morning when school starts, and one hour in the afternoon when school ends. County personnel will coordinate the times of operation of the flashing beacons with school principals. The beacons shall not be operated for special events / functions.
- h) Each school speed zone sign assembly with flashing beacon shall be located in advance of the school by County personnel in accordance with the current Manual on Uniform Traffic Control Devices (MUTCD), as published by the Federal Highway Administration.

3) **Traffic Signals** - Traffic signals must meet one or more of the warrants as stated in the most current Manual on Uniform Traffic Control Devices (MUTCD) to be considered for installation. If determined necessary by the Department, the costs of their design, installation and materials shall be the responsibility of the developer, property owner, church or school.

If traffic signals or modifications to existing traffic signal facilities are required as part of a development, the developer shall be required to provide equipment and install the traffic signal as directed by the Department. The traffic signal installation, including all conduit detector loops, bases, boxes, power supply facilities, cable / conduit connections to Ameren Missouri, and interconnect, shall be located entirely within the public road right-of-way, a roadway maintenance easement, or a Permanent Traffic Signal Easement.

The construction of County traffic signals, including materials and equipment furnished, shall conform to Section 904 of the St. Louis County "**Standard Specifications for Road and Bridge Construction**" manual. The traffic signal materials and equipment shall be ordered as soon as approvals are received in order to avoid lengthy delays. Delays caused by delivery of materials and equipment shall not constitute a cause to allow occupancy prior to completion of road improvements.

If traffic signals are not warranted at the time of initial development, the developer may be required to provide a cash escrow or irrevocable letter of credit for future traffic signals or a reasonable share of costs for future traffic signals based upon a percentage of traffic volume generated by the development as applied to the intersection to be signalized as approved by the Department. This escrow or letter of credit shall be deposited prior to issuance of building permits.

In addition, the developer may also be required by the Department to install underground conduit and pull boxes for future traffic signals if new driveway approaches are constructed or modifications to existing street intersections are required.

Installation of interconnect conduit and pull boxes for connection to future or existing signals may be required and shall be installed as directed by the Department.

4) **Pedestrian Signals** - When pedestrian signals are determined to be warranted by the Department, the costs of their design, installation and materials shall be the responsibility of the developer, property owner, church or school.

5) **Fire Station Signals** - When fire station signals are determined to be warranted by the Department, the costs of their design, installation and materials shall be the responsibility of the developer or fire district.

6) **Steep Grades**

a) Street grades of greater than 10% **will not** be approved by the Department. Refer to "Arterial Street Design Criteria" (Section 20.10); "County Street Design Criteria", (Section 20.20); "Residential Street Design Criteria" (Section 20.30); and "Non-Residential Street Design Criteria" (Section 20.40-2), for the allowable street grades.

b) All subdivision roadways with grades greater than 8% will require a posting of a "Steep Grade" warning sign in advance of each steep grade. These signs shall be furnished and installed by the developer when the streets are opened to traffic, prior to their acceptance by the Department. The signs shall be placed at the beginning of every cul-de-sac and at both ends of a thru street as directed by the Department. The signs shall follow most current MUTCD guidelines for color, size and height.

c) A steep grade disclosure is required on approved construction plans for the site and must be posted in the display home for the subdivision.

d) Special measures must be implemented to handle the potential drainage problems that often result by the allowance of steep grades. These measures may include, but not be limited to, grated troughs, canted inlets, etc. Special attention must be made to minimize bypass at drainage structures and to ensure that all street drainage is captured in a drainage system prior to leaving the right-of-way. Refer to Standard Drawings C604.31, C604.32, 604.34, 604.35, C604.39, and C604.40.

e) Standard platforms ranging from 2% to 4% for a sixty (60) foot extension back from the edge of the cross street will be required at all side street intersections. Refer to Standard Drawing C203.54.

f) A roadway with steep grades will not receive priority maintenance or snow removal. Maintenance and snow removal will occur on the typical prioritized schedule.

7) **Flat Grades**

a) Street grades of less than 1% **will not** be approved by the Department. Refer to "Arterial Street Design Criteria" (Section 20.10); "County Street Design Criteria" (Section 20.20); "Residential Street Design Criteria" (Section 20.30); and "Non-Residential Street Design Criteria" (Section 20.40), for the allowable street grades.

b) If street grades less than 2% are proposed, recommendations to handle drainage problems created by flat roadways are required.

8) Street Lighting

- a) **Subdivision Street Lighting** - In the unincorporated areas of St. Louis County, streetlights are required to be installed in new subdivision developments as a condition of the development approval. The cost of maintaining the streetlights shall be borne by the subdivision residents as a trustee function. St. Louis County **shall not** be responsible for any of the cost of or maintenance of subdivision street lighting. Street lighting in unincorporated St. Louis County subdivision developments, including illumination standards, is addressed in Section 1005.320.1 of the St. Louis County Subdivision Ordinance, located on the St. Louis County Department of Planning website at:

[www.stlouisco.com/PropertyandRoads/
PlanningZoningandSubdivisionInformation/SubdivisionOrdinance](http://www.stlouisco.com/PropertyandRoads/PlanningZoningandSubdivisionInformation/SubdivisionOrdinance)

- b) **Arterial Road Lighting (by County Projects)** - Street Lighting, as part of arterial road construction projects, shall be provided on arterial roads at the discretion of the St. Louis County Department of Transportation. All lighting materials and equipment shall be furnished, installed and maintained by Ameren Missouri. Initial lighting installation costs and monthly flat rate power charges, shall be borne by St. Louis County.
- c) **Street Lighting by Others** - Street lighting installed by commercial developers, municipalities and other agencies along streets, roadways and right-of-way under the jurisdiction of the St. Louis County Department of Transportation, shall adhere to the requirements, specifications and illumination standards addressed in Section 1005.320.1 of the St. Louis County Subdivision Ordinance, located on the St. Louis County Department of Planning website at:

[www.stlouisco.com/PropertyandRoads/
PlanningZoningandSubdivisionInformation/SubdivisionOrdinance](http://www.stlouisco.com/PropertyandRoads/PlanningZoningandSubdivisionInformation/SubdivisionOrdinance)

- d) St. Louis County **shall not** be responsible for any of installation cost, power charges, or maintenance of street lighting, other than lighting installed as part of an Arterial Road construction project, as described in Item "8b". Many municipalities in St. Louis County provide street lights on County maintained arterial roads, which are installed by permit and maintained by the municipality. Decorative post lights for streetscape programs are allowed within County right-of-way, however, new installations should match the style and spacing of existing nearby decorative street lights.
- e) **Street Lighting Districts** - Residents in the unincorporated area may form a street lighting district to install and maintain streetlights, the cost of which must be borne by the residents in the lighting district with an annual financial report submitted to the St. Louis County Council. Street lighting districts in unincorporated St. Louis County are addressed in the "Street Lighting Maintenance District Guidebook", located on the St. Louis County Department of Planning website at:

[www.stlouisco.com/Portals/8/docs/Document%20Library/
highways/Publications/Street_Light_District_Guidebook_2003.pdf](http://www.stlouisco.com/Portals/8/docs/Document%20Library/highways/Publications/Street_Light_District_Guidebook_2003.pdf)

- 9) **Railroad Tie Retaining Walls** - Railroad tie walls will not be permitted as a means of retaining roadway fill or cuts adjacent to St. Louis County maintained roads. Double or multiple tiered walls shall not be permitted adjacent to a street right-of-way. Where lawn terracing is necessary above the retaining wall, it shall be limited to a 3:1 or flatter slope. (Refer to Standard Drawing C723.00.)

Railroad tie walls may not be utilized for erosion control or bank protection. Railroad tie walls should not be constructed where they are in conflict with stormwater drainage, such as in swales or tops of terraces, etc., unless adequate revisions to the subdivision drainage patterns are provided. Railroad tie walls are not permitted within the flood plain or in detention areas. The responsibility for maintenance of retaining walls located outside of public right-of-way lies with the subdivision trustees or the individual property owners and not the Department.

Railroad tie retaining walls are an acceptable construction method for stabilizing vertical cut and fill areas in areas other than described above. Standard construction details for railroad tie retaining walls have been developed and are routinely utilized in subdivision and commercial construction projects.

The normal method of handling railroad tie retaining walls would be to indicate the proposed railroad tie retaining walls on any grading plans that are submitted to the Department for approval. Prior approval of retaining walls from the St. Louis County Department of Public Works is not required. Subsequent to approval of the grading plan by the Department, which may include provisions for railroad tie retaining walls, building permit applications should be submitted to the St. Louis County Department of Public Works for those railroad tie retaining walls requiring permits.

Railroad tie retaining wall construction up to a maximum height of 48 inches within reasonable proximity to residential structures, is permitted without the requirement for the issuance of a separate permit. This would be allowed under the premise these walls may be considered a part of the structure rather than a part of the site grading requirements.

In lieu of railroad tie retaining wall construction, special approval may be given for an alternate system that utilizes geogrid soil reinforcement along with modular concrete retaining wall units (e.g. Keystone, Versa-Lok, etc.). Final design of any alternate type system shall be based upon adequate site investigations by a qualified Soils Engineer.

It will be necessary to obtain building permits for retaining walls constructed in areas where they cannot be considered to be attendant to the building structure involved.

10) **Automated Red Light Enforcement Systems** - A Special Use Permit from the St. Louis County Department of Transportation is required for the installation of an Automated Red Light Enforcement System within public road right-of-way under the jurisdiction of the St. Louis County Department of Transportation. Separate permits are required for each signalized location installation at which a Red Light Enforcement System is to be installed. The permit must be renewed annually each January. This criteria is intended to provide municipalities; Professional Engineers registered in the State of Missouri (who are preparing the construction plans/documents); and the municipality's approved Licensed Signal Contractor, with the information needed to apply for a Special Use Permit to install most Automated Red Light Enforcement Systems. The following requirements apply to most Automated Red Light Enforcement System installations:

- a) Two (2) sets of plans together with a transmittal letter must be submitted to Civil Plan Review, 6th floor, 41 S. Central, Clayton, MO 63105 to start the review process.
- b) The municipality shall complete and sign the application(s) for the Special Use Permit(s). The application may be filed at any time during the review process but it is to the applicants benefit to file it with the first plan submittal.
- c) The following must be submitted before a permit can be issued:
 - i) Copy of the executed Agreement between the municipality and County.
 - ii) Seven (7) sets of completed Construction Plans with all sheets (including Detail Sheets) sealed, signed, and dated by a Professional Engineer registered and licensed in the State of Missouri, for approval.
 - iii) **Certificate of Insurance** - Any entity that performs work on St. Louis County maintained property shall provide the County with a "Certificate of Insurance" evidencing general liability coverage (bodily injury and property damage) in the amounts specified as the limits of liability set by the State for public entities. Such certificate shall include "St. Louis County" as an additional insured and shall be provided prior to the issuance of any permit. Certificate shall provide for a 30-day policy cancellation notice to St. Louis County. Upon request, the County will provide the specific amounts for both per person and per occurrence limits.
 - iv) Copy of letters to Utility Companies notifying them of the proposed work.
 - v) Verification of the Recording of Easements for installations outside / beyond the County ROW.
- d) The construction plans/documents shall, as a minimum, include the following:
 - i) Cover sheet with title, sheet index, location map with north arrow; and title block with the engineer's name, address, phone number, and client name.

- ii) Plan sheet (ANSI D+ size 24" x 36" sheet preferred) of the intersection showing the following:
- (1) North arrow and scale (plan shall be drawn at 1" = 20' scale).
 - (2) Existing intersection traffic signal equipment* (use County traffic symbols per symbol schedule on Standard Drawing C904.00).
 - (3) **Existing Improvements** - Pavement curbs and curb ramps, sidewalks, sewers and utilities (above and below ground), islands, medians.
 - (4) Show and label existing right-of-way and location of proposed equipment with respect to right-of-way lines.** If equipment is to be located outside of existing right-of-way, show and label proposed or existing (if allowed to use existing) easements. On existing easements, include grantee, type of easement and deed book number and page.
 - (5) Location of proposed red light photo enforcement equipment.
 - (a) Cabinets and poles cannot be located in sidewalks.
 - (b) Face of poles, cabinets, and similar above ground equipment/devices cannot be located less than 2 feet behind the face of roadway curb.
 - (6) General notes (see attached notes that must be on plans).
- iii) Quantity sheet or schedule(s) listing photo enforcement devices / items, pole schedule, size and quantity of conductors and number of cables, conduit, pull boxes, etc.
- iv) Detail drawing sheet(s) showing the following:
- (1) Controller detail for red light photo system to receive power and monitor clearance and red intervals.
 - (2) Pole, base, and arm details.
 - (3) Foundation details.

Notes: Detailed information pertaining to item number ii) above { numbers (2), (3) and (4) }, needs to be shown only in the general area of the proposed construction.

* Conduit owned or maintained by St. Louis County shall not be filled with cable to more than 40% of its cross sectional area.

** Department of Transportation - Traffic Signal Plans and / or Roadway Plans; or Site Development or Improvement Plans for adjacent development on file with the local jurisdiction (municipality) may be possible resources for location of the right-of-way lines.

- v) Show compliance with pertinent items affecting construction listed in the Agreement between City and County.
- vi) Traffic Control Plan related to obstructing traffic during construction.

General Notes - Automated Red Light Enforcement Systems

- a) Existing intersection signals shall remain in normal operation during construction projects, except during the period of time when the traffic signal must be turned off to change over to the new equipment. Traffic signal shutdown shall take place after 9:00 AM on a normal workday, at which time temporary "Stop" signs shall be installed, as directed by the County. The Contractor shall have the new traffic signal equipment in place and in normal operation by 3:00 PM the same day.
- b) It is the responsibility of the contractor / municipality to contact St. Louis County Department of Transportation, Division of Operations (Signals Section) at (314) 615-0213 **a minimum of 48 hours in advance of any traffic signal shutdown or construction work** for locating and spotting existing traffic signal conduit. In the event the contractor damages the conduit and cable, repairs shall be made within 72 hours at their cost by an electrical contractor, as directed by St. Louis County. Conduit owned or maintained by St. Louis County shall not be filled with cable to more than 40% of its cross sectional area.
- c) All work within St. Louis County rights-of-way, or within easements if applicable, shall be to St. Louis County approved standards. All work shall be in accordance with "**St. Louis County Standard Specifications for Road and Bridge Construction, Division 900, Section 904 - St. Louis County Traffic Signals**"; **Section 30.10** of the "**St. Louis County Design Criteria for the Preparation of Improvement Plans**" manual; and drawings "**C904.00 through C904.80 - Traffic Signal Details**" on the St. Louis County Department of Transportation "**Standard Drawings**" website. The Contractor shall obtain a copy of the Section 904 specifications and one set of the "**Traffic Signal Details**" drawings, and shall have said references on the job site at all times during construction / installation of the signalization equipment. All of the publications described above are available for viewing, printing or downloading at:

[www.stlouisco.com/YourGovernment/CountyDepartments/
HighwaysandTraffic/HighwayPublicationsManuals](http://www.stlouisco.com/YourGovernment/CountyDepartments/HighwaysandTraffic/HighwayPublicationsManuals)

- d) Plan reviewers for the St. Louis County Department of Transportation, may determine that unusual circumstances and / or more complex installations dictate the need for additional information on any particular installation.
- e) The contractor shall be responsible for checking the online Standard Drawings and Publications websites to ensure their set of drawings are current. The Standard Drawings in effect for this project will be those drawings available for viewing on the date the signal plans are approved.

- f) The County shall maintain the existing traffic signal, however, any portion of the existing signal installation that is damaged by the Contractor during construction operations shall be repaired at the Contractor's expense.
- g) The Contractor shall notify the St. Louis County Department of Transportation, Division of Construction, at (314) 615-1157, when ready for the construction / installation of the concrete bases and pull boxes (list items as needed). This **notice shall be a minimum of 48 hours in advance of construction work**. The Contractor shall stake the locations of improvements, easements, and / or rights-of-way on the ground prior to this notice in order to facilitate the placement of the new traffic signal equipment. The Contractor shall not proceed with construction until Division of Construction personnel have completed verifying the proposed location of the new traffic signal equipment.
- h) The Contractor shall notify the St. Louis County Department of Transportation, Division of Operations (Signing Section) at (314) 615-0242, **48 hours in advance of any signing related work**. The Contractor shall perform all relocation of existing signs as required by the Engineer. All new signs will be furnished and installed by the St. Louis County Department of Transportation.
- i) Adequate off-street parking shall be provided for construction employees. Parking on non-surfaced areas shall be prohibited in order to eliminate the condition whereby mud from construction and employee vehicles is tracked onto the pavement, causing hazardous roadway and driveway conditions.
- j) All disturbed earth areas within St. Louis County right-of-way shall be sodded.
- k) Any disturbed off site property (i.e. bushes, fences, mailboxes, etc.) shall be replaced, in kind, at the developer's expense.
- l) Existing underground facilities, structures and utilities, if shown on construction plans, shall be considered approximate only. Verification of the locations of all existing facilities, structures and utilities either shown or not shown on construction plans, shall be the responsibility of the Contractor, and shall be verified prior to any grading, excavation or construction of improvements.

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50.10 Storm Drainage

Storm drainage improvements consisting of storm sewers or open channels shall adequately drain the areas being developed. The design of drainage improvements shall be coordinated to the extent possible with present and probable future improvements so as to form part of an integrated system. Adequate provisions shall be made for the disposal of storm water, in accordance with the specifications and standards of the Department of Transportation, the Metropolitan St. Louis Sewer District (MSD) where applicable, or any other legally constituted districts and subject to the approval of the Department. No storm water drainage improvements shall be required for a large lot subdivision except where the development is located within MSD's jurisdiction or where the subdivision street or the individual lot access is requested from an existing public street.

- 1) **Drainage Design** - All construction details and specifications pertaining to storm water drainage shall be in accordance with the St. Louis County Department of Transportation Standards and MSD requirements unless otherwise noted herein. For "Sewer Construction Details" refer to Standard Drawings C604.20 through C604.39, and C604.41 through C604.46. A professional engineer's seal and signature shall be required on all plans submitted for approval.
- 2) **Surface Drainage** - Sheet flow shall not be allowed over terraces. Berms and / or swales shall be provided to collect the flow at the top or bottom of the terrace and carry it to a drainage structure. Total accumulation inside berms and / or swales shall be a maximum of 4 c.f.s. Critical cross-sections, profiles and hydraulic computations shall be provided for ditches and swales with flows in excess of 1 c.f.s., and creeks with flows in excess of 4 c.f.s.
- 3) **Erosion Control** - Erosion control for drainage systems shall be required in swales, ditches, or creeks and at the discharge points of all pipes, when the velocity exceeds 5 feet per second.

Sediment basins, inlet protection, silt control fences, filter rolls (filter socks), fiber rolls and wattles, etc., will be required during the construction period to insure that mud and other debris are not washed into natural water courses, or new, or previously constructed storm sewers adjacent to properties or road right-of-ways. For land disturbance activities greater than 1 acre in size (including test holes; clearing and grubbing; grading; etc.), a "Stormwater Pollution Prevention Plan (SWPPP)" will be required. For requirements, see St. Louis County's "Sediment and Erosion Control Manual - Model Best Management Practices (BMP) for Land Disturbance", located on the Department's "Publications & Manuals" website at:

[www.stlouisco.com/YourGovernment/CountyDepartments/
HighwaysandTraffic/HighwayPublicationsManuals](http://www.stlouisco.com/YourGovernment/CountyDepartments/HighwaysandTraffic/HighwayPublicationsManuals)

Revetment used shall be a minimum length of 10 times the diameter of the discharge pipe.

- 4) **Site Design Guidance** - Long term storm water runoff from projects that disturb an area greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge in to the Municipal Separate Storm Sewer System (MS4), shall ensure that controls are in place that have been designed and implemented to prevent or minimize water quality impacts by reasonably mimicking pre-construction runoff conditions on all affected new development projects and by effectively utilizing water quality strategies and technologies on all affected redevelopment projects, to the maximum extent practicable. Site characteristics shall be assessed at the beginning of the construction / site design phase to ensure adequate planning for storm water program compliance. Design that promotes storm water infiltration within the site shall be emphasized.

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50.20 Drainage Structure Design

All drainage structures, with the exception of bridges, culvert bridges and, in some cases, culverts, shall be designed for HS20-44 loading. Refer to Section 50.22 for design criteria for bridges. Refer to Section 50.23 for design criteria for culverts and culvert bridges.

- 1) **Modified Sumps** - May be required in areas where sidewalk is at back of curb. For construction details refer to Standard Drawing C604.45.
- 2) **Street Inlets** - When steep grades or other unusual conditions are encountered, a double-grated inlet structure may be required in lieu of multiple standard inlet structures upstream, in order to eliminate excessive by-pass.
- 3) **Trench Drains** - Shall be constructed across driveways serving car wash facilities when on-site pavement slopes towards the driveway and road surface to reduce hazardous situations created by water being carried onto the roadways. The trench drains must be constructed off of the St. Louis County right-of-way on private property.
- 4) **Storm Sewer and Drainage Pipes**

- a) **Pipe Selection** - All storm sewer pipes located within the public road right-of-way, shall be reinforced concrete pipe (RCP) Class III minimum, high-density polyethylene (HDPE), polypropylene (PP), or polyvinyl chloride (PVC) storm sewer pipe. High-density polyethylene (HDPE) and PVC storm sewer pipe, from 12 inches to 24 inches in diameter, is allowed in the public road right-of-way, but not under the street pavement. HDPE and PVC plastic end sections are not permitted in the public road right-of-way. Any pipe, conduit or culvert beneath a highway, road or street pavement, or with reasonable probability of being so located, shall be RCP Class III minimum; or polypropylene (PP) storm sewer pipe (from 12 inches to 60 inches in diameter); and in no case shall provide for less than HS-20 loading per AASHTO. For other locations, the minimum live load shall be HS-10 loading. Installation of storm sewer systems located on public road right-of-way shall conform to Section 1103.136, Number 11, Item A of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Within Rights-of-Way".

RCP, HDPE, PP or PVC storm sewer pipes, structures and installation of same for storm sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications for allowable diameter size and specifications. Installation of storm sewer systems on private property shall also conform to Section 1103.136, Number 11, Item B of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Outside of Rights-of-Way". A minimum pipe diameter of 12 inches shall be used for storm sewers located on private property.

- b) **Design Considerations** - Normally, pipes shall be sized using the partial full flow design. However, full flow design shall be allowed, provided adequate computations are provided to determine the hydraulic grade line for the pipe and adequate freeboard is provided. For 36-inch diameter pipes or smaller, a minimum 1% grade

or 3 feet per second velocity will be required. For pipes larger than 36-inch diameter, the minimum grade shall be the grade establishing a self-cleaning velocity of 3 feet per second. Velocities shall not exceed 25 feet per second where practical.

A minimum pipe diameter of 12 inches shall be used for storm sewers. All pipe computations utilizing RCP, HDPE, PP or PVC stormwater sewer pipe, shall be based on a Manning's "n" of 0.013.

Storm sewer pipes may be placed on a curved alignment utilizing alignment radii established by the pipe manufacturer.

c) Construction

- i) All pipe, pipe couplings, and accessories shall be unloaded, stockpiled, hauled, distributed, and otherwise handled in a manner which will prevent damage thereto.
- ii) Special care shall be taken to lay all pipe to exact grade and line. All pipe, when jointed, shall form a true line of sewer. Any pipe that has a grade or joint disturbed after laying shall be taken up and re-laid.
- iii) All pipes shall be laid with the separate sections joined firmly together, with outside laps of circumferential joints pointing upstream, and the centerline of the invert coinciding with the specified alignment of the pipe.
- iv) The interior surfaces of all pipes shall be thoroughly cleaned of all foreign matter before being lowered in the trenches and shall be kept clean during laying operations.
- v) Joints shall be constructed to attain a watertight joint.
- vi) **Marking** - Each pipe, fitting, or special section shall have markings per AASHTO M 294. Required information shall be plainly and permanently marked on each item. Markings shall include: specification designation, the nominal size, the manufacturer's name, trade name or trademark, plant designation code, and date of manufacture (or appropriate code).
- vii) **Deflection** - HDPE, PVC and PP pipe maximum deflection (reduction of the barrel base inside diameter) is 5%. Time of measurement shall be not less than 30 days nor more than 60 days following installation.

5) Reinforced Concrete Storm Sewer Pipes - Reinforced concrete pipe shall conform to the following ASTM Standards and be of the minimum strength designated herein or such higher strength as may be required by the Contract Drawings or Special Provisions.

- a) Round Pipe: ASTM C 76, Class III, Wall B.
- b) Elliptical Pipe: ASTM C 507, Class HE-III.
- c) Arch Culvert Pipe: ASTM C 506, Class A-III.

The class of bedding and the class of pipe shall conform to the requirements of Table I for the applicable overfill height.

<u>Reinforced Concrete Storm Sewer Pipe</u>				
<u>Class of Pipe</u>	<u>Allowable Overfill Heights (feet)</u>			
	<u>Bedding Class</u>			
	<u>C</u>	<u>B</u>	<u>B1</u>	<u>A*</u>
III	1-15	16-18	34-42	---
IV	1-22	23-27	43-65	100
V	1-27	28-33	65-80	124
* With imperfect trench				

TABLE I

All pipes shall be joined using one of the following flexible gaskets:

- **Flat Gaskets** - Flat flexible gaskets shall conform to ASTM C 443. They may be cemented to the pipe tongue or spigot. If there is no recess provided for the gasket, the surface of the tongue shall be cleaned and rubber adhesive applied. Using quick-drying adhesive, gaskets may be applied ahead of the laying operation or in the plant.
 - **O-Ring Gaskets** - O-Ring or roll-on flexible gaskets shall conform to ASTM C 361, Section 4.10. O-ring gaskets shall be recessed in a groove on the tongue or spigot and confined by the bell or groove after the joint is completed. Roll-on gaskets shall be placed around the tongue or spigot and rolled into position as the joint is assembled. The entire surface of the bell that comes in contact with the rubber gasket shall be well lubricated. Lubricant shall be as recommended by the pipe manufacturer. Only the lubricant supplied by the pipe manufacturer shall be used. Adhesive type cements shall not be used.
- 6) High Density Polyethylene (HDPE) Storm Sewer Pipe** - For the purposes of this section, acceptable HDPE pipe is defined as Type S, double wall (smooth interior, corrugated outer wall), high-density polyethylene (HDPE) pipe. HDPE pipe and fittings shall conform to AASHTO M 294 and ASTM F 2306 with annular corrugations and an integral bell and spigot. The manufacturer of the pipe must participate in the AASHTO / National Transportation Product Evaluation Program (NTPEP). The minimum allowed HDPE pipe diameter in public right-of-way applications is 12 inches, and the maximum allowed diameter for public right-of-way applications is 24 inches, and shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications (Part 2 - Materials of Construction, Section G - Pipe, Item 11). Installation of storm sewer systems located on public road right-of-way shall also conform to Section 1103.136, Number 11, Item A of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Within Rights-of-Way".

HDPE storm sewer pipes, structures and installation of same for sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications for allowable diameter size and specifications. Installation of storm sewer systems on private property shall also conform to Section 1103.136, Number 11, Item B of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Outside of Rights-of-Way". A minimum pipe diameter of 12 inches shall be used for storm sewers located on private property.

- a) **Materials** - Virgin material for pipe and fitting production shall be HDPE conforming to the minimum requirements of cell classification 435400C for 12-inch and larger diameters, as defined in ASTM D 3350, except that carbon black content shall not exceed 4%.
- b) **Joints** - All HDPE pipe joints shall be gasketed, bell-and-spigot, push-on type conforming to ASTM D 3212, "Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals". Elastomeric seal (gasket) shall have a basic polymer of synthetic rubber conforming to ASTM F 477. Natural rubber gaskets will not be used. Bells shall span over three corrugations. Joints shall be constructed to attain a watertight joint. Since each pipe manufacturer has a different design for push-on joints, gaskets shall be part of a complete pipe section and purchased as such. Gaskets may be factory installed or field installed as recommended by the pipe manufacturer. Lubricant shall be as recommended by the pipe manufacturer.
- c) **Fittings**
 - i) Fittings shall not reduce or impair the overall integrity or function of the pipeline system.
 - ii) Fittings shall meet the requirements of AASHTO M 294 and ASTM F 2306.
 - iii) Fittings may be either molded or fabricated.
 - iv) Only fittings supplied or recommended by the manufacturer shall be used.
- d) **Acceptance** - Pipe or fittings may be rejected for failure to comply with any requirement of this specification.
- e) **Installation** - Pipe and fittings should be installed in accordance with St. Louis County specifications; MSD specifications; ASTM D 2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications"; and the manufacturer's specifications. In the case of a discrepancy between the specifications, the more restrictive requirements shall govern. The engineer should establish the minimum embedment width based on an evaluation of parameters such as pipe stiffness, embedment stiffness, native or in-situ soil, and magnitude of construction and service loads. The minimum cover for 12-inch to 24-inch pipe is 18 inches to the bottom of flexible pavement or the top of rigid pavement. The class of bedding and pipe shall conform to the appropriate ASTM and AASHTO standard specifications for the applicable allowable overfill height. For pipes 24 inches in diameter and smaller, all flexible pipe bedding shall be "MSD 1", as

described in the MSD Standard Construction Specifications. The maximum cover depth shall be 30 feet.

Installation of storm sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications. A minimum pipe diameter of 12 inches shall be used for storm sewers. The class of bedding and pipe shall conform to the appropriate MSD; ASTM and AASHTO standard specifications for the applicable allowable overfill height. The maximum cover depth shall be 30 feet.

HDPE installations shall not be consolidated by watering (jetting or puddling) and shall not be compacted with hydro hammer type compactors.

- f) **Embedment Requirements** - The method for calculating loads and determining embedment requirements for HDPE sewer pipe shall be in accordance with the appropriate ASTM and AASHTO standard specifications.
- g) **Post Installation Inspection** - Post installation inspection shall be in accordance with St. Louis County Department of Transportation "Standard Specifications for Road and Bridge Construction", Section 730; Missouri Department of Transportation (MoDOT) "Standard Specifications for Highway Construction", Section 730, and the appropriate ASTM and AASHTO standard specifications.

- 7) **Polypropylene (PP) Storm Sewer Pipe** - For the purposes of this section, acceptable polypropylene (PP) culvert pipe is defined double and triple wall PP culvert pipe intended for use in the construction of culverts, sewers, and similar uses, as described in St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction", Section 1041. All PP culvert pipe, couplings and fittings shall conform to ASTM F 2736 for double wall and ASTM F 2764 for triple wall. The manufacturer of the pipe must participate in the AASHTO / National Transportation Product Evaluation Program (NTPEP). The minimum allowed PP pipe diameter in public right-of-way applications is 12 inches, and the maximum allowed diameter for public right-of-way applications is 60 inches, and shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications (Part 2 - Materials of Construction, Section G - Pipe, Item 11). Installation of storm sewer systems located on public road right-of-way shall also conform to Section 1103.136, Number 11, Item A of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Within Rights-of-Way".

All polypropylene culvert pipes, structures and installation of same for sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications for allowable diameter size and specifications. Installation of storm sewer systems on private property shall also conform to Section 1103.136, Number 11, Item B of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Outside of Rights-of-Way". A minimum pipe diameter of 12 inches shall be used for storm sewers located on private property.

- a) **Materials** - Material for polypropylene pipe, coupling and fitting production shall be conforming to the minimum requirements for 12-inch through 60-inch diameters, as defined in ASTM F 2736 and ASTM F 2764, except as noted in Section 1041.3 of the St. Louis County Standard Specifications Manual.

- b) **Joints** - All joints of polypropylene pipe shall provide circumferential and longitudinal strength to maintain the pipe alignment, prevent separation of pipe and prevent infiltration of fill material.
- c) **Fittings**
- i) Fittings shall not reduce or impair the overall integrity or function of the pipeline system.
 - ii) Fittings shall meet the requirements of ASTM F 2736 and ASTM F 2764.
 - iii) Fittings may be either molded or fabricated.
 - iv) Only fittings supplied or recommended by the manufacturer shall be used.
- d) **Acceptance** - Pipe or fittings may be rejected for failure to comply with any requirement of this specification.
- e) **Installation** - Pipe and fittings should be installed in accordance with St. Louis County specifications; MSD specifications; ASTM D 2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications"; and the manufacturer's specifications. In the case of a discrepancy between the specifications, the more restrictive requirements shall govern. The engineer should establish the minimum embedment width based on an evaluation of parameters such as pipe stiffness, embedment stiffness, native or in-situ soil, and magnitude of construction and service loads. The minimum cover for 12-inch to 60-inch pipe is 18 inches to the bottom of flexible pavement or the top of rigid pavement. The class of bedding and pipe shall conform to the appropriate ASTM and AASHTO standard specifications for the applicable allowable overfill height. For pipes 30 inches in diameter and smaller, all flexible pipe shall be double wall and bedding shall be "MSD 1", as described in the MSD Standard Construction Specifications, and as noted in Section 1041.3.1 of the St. Louis County "Standard Specifications for Road and Bridge Construction" manual. The maximum cover depth shall be 30 feet. For pipes 30 inches in diameter and larger, all flexible pipe shall be triple wall and bedding shall be "MSD 1", as described in the MSD Standard Construction Specifications, and as noted in Section 1041.3.1 of the St. Louis County "Standard Specifications for Road and Bridge Construction" manual. The maximum cover depth shall be 30 feet.
- i) Installation of storm sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications. A minimum pipe diameter of 12 inches shall be used for storm sewers. The class of bedding and pipe shall conform to the appropriate MSD; ASTM and AASHTO standard specifications for the applicable allowable overfill height. The maximum cover depth shall be 30 feet.
 - ii) Polypropylene pipe installations shall not be consolidated by watering (jetting or puddling) and shall not be compacted with hydro hammer type compactors.

iii) When flowable fill is used as backfill material use caution. Misalignment or flotation may occur unless added precautions are taken, such as anchoring the pipe or pouring the flowable fill in lifts.

f) **Embedment Requirements** - The method for calculating loads and determining embedment requirements for polypropylene sewer pipe shall be in accordance with the appropriate ASTM and AASHTO standard specifications and manufacturer's guidelines.

g) **Post Installation Inspection** - Post installation inspection shall be in accordance with the appropriate ASTM and AASHTO standard specifications and manufacturer's guidelines. Pipe deflection is to be tested within 30 days of installation by pulling a mandrel through the installed pipe. Testing 10% of the overall project should provide a reasonable indication of installation quality. Recommended mandrel settings shall be in accordance with manufacturer's guidelines for the pipe size and wall type installed. For sanitary installations, after sanitary pipe has been installed, sections of pipe shall be tested for leakage. Pipe shall be tested by water infiltration or by air pressure. The test method must be in accordance with ASTM F 2487 for water and ASTM F 1417 or ASTM C 1103 for air.

8) **Polyvinyl Chloride (PVC) Storm Sewer Pipe** - For the purposes of this section, acceptable PVC pipe is defined as, double wall (smooth interior, corrugated outer wall), Polyvinyl Chloride (PVC) gravity flow storm drainage pipe in nominal diameters 12 inches through 24 inches. PVC stormwater sewer pipe and fittings shall conform to AASHTO and ASTM specifications with annular corrugations and an integral bell and spigot. The manufacturer of the pipe must participate in the AASHTO / National Transportation Product Evaluation Program (NTPEP). The minimum allowed pipe diameter in public right-of-way applications is twelve 12 inches, and the maximum allowed diameter for public right-of-way applications is 24 inches, and shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications (Part 2 - Materials of Construction, Section G - Pipe, Item 8). Installation of storm sewer systems located on public road right-of-way shall also conform to Section 1103.136, Number 11, Item A of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Within Rights-of-Way".

PVC storm sewer pipes, structures and installation of same for sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications for allowable diameter size and specifications. Installation of storm sewer systems on private property shall also conform to as well as Section 1103.136, Number 11, Item B of the St. Louis County Plumbing Code, "Specifications for Storm Sewers - Installation Outside of Rights-of-Way". A minimum pipe diameter of 12 inches shall be used for storm sewers located on private property.

a) **Materials** - All PVC pipe and fittings shall be manufactured and tested in accordance with the appropriate ASTM and AASHTO standard specifications. All fittings shall be compatible with the pipe to which they are attached.

b) **Joints** - All PVC pipe joints shall be gasketed, bell-and-spigot, push-on type conforming to ASTM D 3212, "Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals". Elastomeric seal (gasket) shall

have a basic polymer of synthetic rubber conforming to ASTM F 477. Natural rubber gaskets will not be used. Bells shall span over three corrugations. Joints shall be constructed to attain a watertight joint. Since each pipe manufacturer has a different design for push-on joints, gaskets shall be part of a complete pipe section and purchased as such. Gaskets may be factory installed or field installed as recommended by the pipe manufacturer. Lubricant shall be as recommended by the pipe manufacturer.

c) Fittings

- i) Fittings shall not reduce or impair the overall integrity or function of the pipeline system.
- ii) Fittings shall meet the requirements of AASHTO M 294 and ASTM F 2306.
- iii) Fittings may be either molded or fabricated.
- iv) Only fittings supplied or recommended by the manufacturer shall be used.

d) Acceptance - Pipe or fittings may be rejected for failure to comply with any requirement of this specification.

e) Installation - Pipe and fittings should be installed in accordance with St. Louis County specifications; MSD specifications; ASTM D 2321, "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications"; and the manufacturer's specifications. In the case of a discrepancy between the specifications, the more restrictive requirements shall govern. The engineer should establish the minimum embedment width based on an evaluation of parameters such as pipe stiffness, embedment stiffness, native or in-situ soil, and magnitude of construction and service loads. The minimum cover for 12-inch to 24-inch pipe is 18 inches to the bottom of flexible pavement or the top of rigid pavement. The class of bedding and pipe shall conform to the appropriate ASTM and AASHTO standard specifications for the applicable allowable overfill height. For pipes 24 inches in diameter and smaller, all flexible pipe bedding shall be "MSD 1", as described in the MSD Standard Construction Specifications. The maximum cover depth shall be 30 feet.

Installation of storm sewer systems located on private property, outside of the public road right-of-way, shall conform to current Metropolitan St. Louis Sewer District (MSD) Standard Construction Specifications. A minimum pipe diameter of 12 inches shall be used for storm sewers. The class of bedding and pipe shall conform to the appropriate MSD; ASTM and AASHTO standard specifications for the applicable allowable overfill height. The maximum cover depth shall be 30 feet.

PVC installations shall not be consolidated by watering (jetting or puddling) and shall not be compacted with hydro hammer type compactors.

f) Embedment Requirements - The method for calculating loads and determining embedment requirements for PVC sewer pipe shall be in accordance with the appropriate ASTM and AASHTO standard specifications.

g) Post Installation Inspection - Post installation inspection shall be in accordance with St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction", Section 728; Missouri Department of Transportation (MoDOT) "Standard Specifications for Highway Construction", Section 730; and the appropriate ASTM and AASHTO standard specifications.

9) Bridges - Bridges in flood plain areas shall be designed on a 100-year storm frequency and shall provide a minimum of 1 foot of freeboard between the bottom of the superstructure and the high water elevation. Bridges in non-flood plain areas shall be designed on a 100-year storm frequency and shall provide a minimum of 2 feet of freeboard between the bottom of the superstructure and the high water elevation.

10) Culverts - Crossroad culverts, not at low points, shall be designed on a storm frequency of 15 years with entrance control and a minimum of 2 feet of freeboard at the shoulder line. Culverts, at or near low points in flood plains, shall be designed on a storm frequency of 100 years with entrance control and minimum of 2 feet of freeboard at the shoulder line. Culverts, at or near low points not in flood plains, shall be designed on a storm frequency of 50 years with entrance control and a minimum of 2 feet of freeboard at the shoulder line. Refer to the U.S. Department of Transportation Hydraulic Engineering Circular No. 5, entitled "Hydraulic Charts for the Selection of Highway Culverts". All crossroad culverts shall be RCP storm sewer pipe, precast or poured in-place reinforced concrete. Private driveway culverts may be RCP, HDPE or PVC storm sewer pipe.

Precast concrete box sections will be considered and may be approved. As a minimum, they shall meet the requirements of ASTM C 1433, "Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers". Modifications to the standards may be required in cases of spans greater than 10 feet. The specific box section and type of joint shall be as approved by the Department.

11) Roadways - When a watercourse exists or is proposed approximately parallel to or near an existing or proposed roadway, the low shoulder elevation of the roadway shall be established from the high water elevation with a minimum of 2 feet of freeboard. In certain (levee-protected) areas, this requirement may be reduced by permission from the Department.

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50.21 Retaining Wall Design

All walls built within St. Louis County maintained right-of-way shall be subject to the review of the Department of Transportation. Additionally, the following walls shall also be subject to the Department's design criteria and review:

- Retaining walls supporting the roadway fill of a St. Louis County maintained road, provided that the horizontal distance from the right-of-way line to the fill face of wall is less than 1.75 times the vertical grade difference between the ground elevation at the right-of-way line and the bottom of footing (not bottom of shear key) elevation (**see page 50.21-8**).
- Retaining walls supporting roadway cuts adjacent to St. Louis County maintained roads, provided that the distance between the right-of-way line and face of the wall is less than the exposed wall height.

All retaining walls built for the purpose of retaining roadway fill shall be constructed of cast-in-place reinforced concrete unless specifically authorized by the Director. Retaining walls built in roadway cuts may be either cast-in-place reinforced concrete or mechanically stabilized earth (MSE). MSE wall systems accepted for use by St. Louis County include:

Panel Wall Systems (Walls Over 6' Height Only)

- Reinforced Earth Wall by the Reinforced Earth Corporation (Metallic System Only)
- Retained Earth Systems by Foster Geotechnical
- Soil Embankment System by T & B Structural Systems, Inc.
- Isogrid Retaining Wall System by the Neel Company
- Tensar ARES Retaining Wall System by Tensar Earth Technologies, Inc.
- SSL MSE Plus Retaining Wall System by SSL, LLC
- Tricon Retained Soil Wall System by Tricon Precast, Ltd.

Block Wall Systems (Walls 9' High and Under Only)

- Versa-Lok Retaining Wall by Versa-Lok Retaining Wall Systems, a division of Kiltie Corporation.
- Keystone Retaining Wall by Keystone Retaining Wall Systems, Inc.
- Amastone Modular Block Retaining Walls by Retaining Wall Systems Inc.
- Rockwood Classic Retaining Wall System by Rockwood Retaining Walls, Inc.
- Anchor Diamond Retaining Wall by Anchor Wall Systems, Inc.

Other MSE wall systems may be considered for acceptance on a case-by-case basis. Systems with open voids on the front wall face, such as the Hercules and Loeffelstein systems, will be evaluated on a case-by-case basis.

CAST-IN-PLACE REINFORCED CONCRETE WALLS

Required Geotechnical Information

All retaining wall designs submitted for review by St. Louis County Department of Transportation shall include a geotechnical report, which **must** contain the following information:

- 1) The phi angle of the retained soil.
- 2) The recommended equivalent fluid pressure to be used in the design of the wall. Walls that will accommodate traffic live load surcharge or dead load surcharge from buildings or other substantial structures shall be designed to MoDOT retaining wall criteria for Seismic Performance Category B. As such, the Mononabe-Okabe pseudo-static approach shall be used for determining the design earth pressure. The acceleration coefficient (a) is to be taken as 0.12. All other walls may be designed to the MoDOT requirements for Seismic Performance Category A, meaning the Rankine formula may be used to determine the design lateral earth pressure.
- 3) The frictional resistance of the soil beneath the wall footing for use in sliding calculations.
- 4) Recommendations as to the type and required compaction of the backfill material as well as to the type of backfill drainage that will be required.
- 5) The allowable bearing pressure of the soil beneath the wall footing.

Design Calculations

Design calculations must be legible, signed and sealed by a Registered Professional Engineer in the State of Missouri and meet the following criteria:

- 1) The dimensions of the retaining wall shall be such that slope requirements are met at all locations, including the wrap-around slope at the end of the wall.
- 2) The factor of safety for overturning shall be 2.0 and the factor of safety for sliding shall be 1.5. **Safety factors may not be reduced for seismic design loads.**
- 3) The location of the design fill height for passive pressure shall be the wall toe, not the wall face. From this height, the top one-foot (1') shall be disregarded due to the possibility of erosion and poor compaction at these areas.
- 4) Minimum permissible wall thickness is ten inches (10"). Minimum permissible footing thickness is twelve inches (12"). Sidewalk type walls shall include a two-inch (2") wearing surface on the footing.
- 5) The minimum permissible 28-day concrete strength to be used shall be 3,000 psi.
- 6) All reinforcement shall be Grade 60 deformed bars. Minimum bar size used shall be No. 4.

- 7) Design calculations must be shown for **all** components of the wall, including temperature reinforcement.
- 8) Computer generated output submitted as design calculations must be:
 - a) Signed and sealed by a Registered Engineer in the State of Missouri on the cover sheet. The cover sheet must also indicate the total number of sheets in the design calculation package.
 - b) Have the full name of the person who determined the input data clearly listed.
 - c) Have the name of the software package clearly listed.
 - d) Have the name and business address of the software producer clearly listed.

A sample format for retaining wall calculations may be obtained upon request from the St. Louis County Department of Transportation, Design Division.

Construction Details

As a minimum, construction plans for retaining walls shall contain the following information:

- 1) The beginning and ending stations of the wall.
- 2) Expansion and contraction joints as shown in St. Louis County Standard Drawing C723.20.
- 3) Elevations at the top of the wall at all joint locations and at any break points.
- 4) Top of footing elevations at all joint locations and at any break points.
- 5) Curve data and/or offsets at all changes in horizontal alignment.
- 6) Wall sections representing the entire wall and showing all reinforcement and construction joint details.
- 7) For all walls under St. Louis County Department of Transportation review with grade differences of four feet (4') or more, a 5'-0" chain-link fence must be indicated at the top of the wall, and St. Louis County Standard Drawing C607.12 must be included or referenced with the plans. Consideration shall be given to written requests concerning the use of other guards or railings. All such guards or railings must be a minimum of forty-two inches (42") in height to the top of the top rail. Wrought Iron railings will not be approved for walls to be maintained by St. Louis County. All retaining walls located outside of the public road right-of-way on private property, shall be privately maintained and shall conform to the guard requirements of "Title XI SLCRO 1974" as amended, "Public Works and Building Regulations", Chapters 1115, Sections 105.2.5, 1012.3, 1012.6 and 1806.2 (St. Louis County Ordinance 22,314, Approved May 18, 2005).
- 8) For St. Louis County Projects, wall elevation views must be provided showing all reinforcement details.

- 9) All reinforcement shall be Grade 60 (Grade 420) epoxy coated in the exposed face for walls subject to spraying from adjacent roadways. For design purposes, all walls within twelve feet (12') of the curb line shall be considered as subject to spraying from adjacent roadway.
- 10) For St. Louis County projects, a bar list shall be compiled for all reinforcement used in the wall in accordance with the Concrete Reinforcing Steel Institute's Manual of Standard Practice. Each unique bar or series of bars must be indicated by a unique mark. Deductions shall be made for bends from the nominal bar length to determine the actual bar length. Include the following note on the bar list: "From each heat number, one additional 36-inch long bar for each alternating size, beginning with the smallest size, shall be included for testing at no additional cost".
- 11) For St. Louis County projects, all boring data shall be included in the construction plans.
- 12) For St. Louis County projects, general notes shall be included outlining design loadings and material requirements.
- 13) Architectural surface texturing is required for all cast-in-place reinforced concrete retaining walls constructed in conjunction with roadways to be maintained by St. Louis County. Details for acceptable texturing schemes are available from the St. Louis County Department of Transportation, Design Division.
- 14) For subdivision and permit projects, the "General Notes for Retaining Wall Construction" included at the end of this section shall be incorporated into the plans. Material requirements, class of concrete and minimum 28-day compressive strength shall also be indicated.
- 15) Drain details as indicated in St. Louis County Standard Drawing C723.20.
- 16) For St. Louis County Projects, estimated quantities are required. These quantities shall include those for Class 1 Excavation, concrete quantities, reinforcing steel quantities, fence quantities and architectural surface texturing quantities.
- 17) Changes in footing elevation are to be made using the "Typical Step Footing Details", as shown on St. Louis County Standard Drawing C723.20.

MODULAR BLOCK AND MSE RETAINING WALLS

Required Geotechnical Information

All items required for cast-in-place reinforced concrete walls must be provided.

Design Calculations

Design calculations must be legible, signed and sealed by a Registered Professional Engineer in the State of Missouri and meet the following criteria:

- 1) The dimensions of the retaining wall shall be such that slope requirements are met at all locations, including the wrap-around slope at the end of the wall.
- 2) The factor of safety for overturning shall be 2.0, the factor of safety for sliding shall be 1.5, and the factor of safety for reinforced pullout shall be 1.5. **Safety factors may not be reduced for seismic design loads.**
- 3) The location of the design fill height for passive pressure shall be the wall toe, not the wall face. From this height, the top one-foot (1') shall be disregarded due to the possibility of erosion and poor compaction at these areas.
- 4) Minimum permissible wall thickness is five and a half inches (5.5"). Minimum permissible leveling pad thickness is twelve inches (12") of compacted Type 5 aggregate or six inches (6") of unreinforced concrete for modular walls and twelve inches (12") of unreinforced concrete for MSE walls.
- 5) Design calculations must be shown for **all** components of the wall.
- 6) Computer generated output submitted as design calculations must be:
 - a) Signed and sealed by a Registered Engineer in the State of Missouri on the cover sheet. The cover sheet must also indicate the total number of sheets in the design calculation package.
 - b) Have the full name of the person who determined the input data clearly listed.
 - c) Have the name of the software package clearly listed.
 - d) Accompanied by the name and business address of the software producer.

A sample format for retaining wall calculations may be obtained upon request from the St. Louis County Department of Transportation, Design Division.

Construction Details

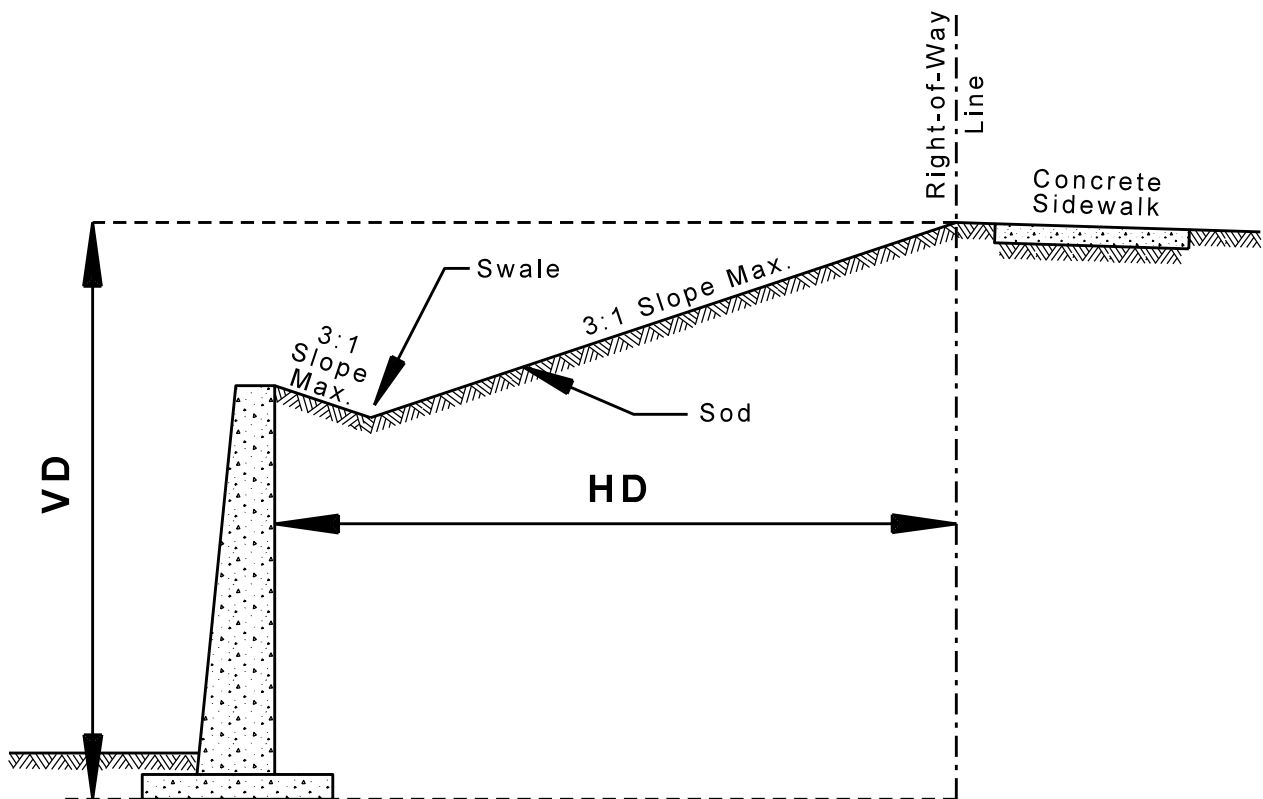
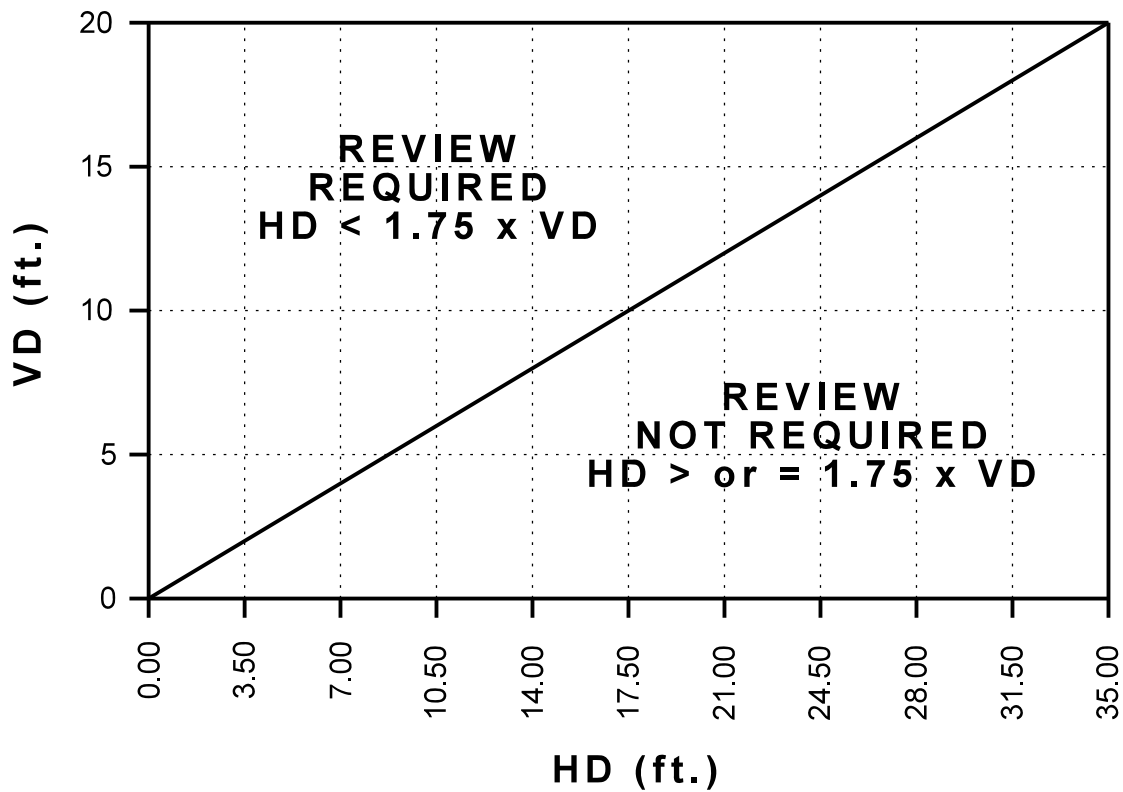
As a minimum, construction plans for modular block and MSE retaining walls shall contain the following information:

- 1) Beginning and ending stations of the wall.
- 2) Elevations at the top of the wall at 25-foot intervals and at any break points.
- 3) Elevations at the bottom of the wall at 25-foot intervals and at any break points.
- 4) Curve data and/or offsets at all changes in horizontal alignment. **If battered wall systems are used on curved structures, show offsets at ten-foot (10') (max.) intervals from baseline.**
- 5) Give the phi angle of the soil to be retained by the reinforced earth.
- 6) Note stating the phi angle of the selected granular backfill is greater than or equal to 34.
- 7) All concrete, **except** facing panels, shall be Class B1.
- 8) Wall sections representing the entire wall and showing typical soil reinforcements, select granular backfill, drain pipe and leveling pad.
- 9) For all walls under St. Louis County Department of Transportation review with grade differences of four feet (4') or more, a 5'-0" chain-link fence must be indicated at the top of the wall, and St. Louis County Standard Drawing C607.12 must be included or referenced with the plans. Consideration shall be given to written requests concerning the use of other guards or railings. All such guards or railings must be a minimum of forty-two inches (42") in height to the top of the top rail. Wrought Iron railings will not be approved for walls to be maintained by St. Louis County. All retaining walls located outside of the public road right-of-way on private property, shall be privately maintained and shall conform to the guard requirements of "Title XI SLCRO 1974" as amended, "Public Works and Building Regulations", Chapters 1115, Sections 105.2.5, 1012.3, 1012.6 and 1806.2 (St. Louis County Ordinance 22,314, Approved May 18, 2005).
- 10) Details of any architectural finishes.
- 11) For walls greater than ten feet (10') in height, the maximum vertical batter shall be 1.5 inches per foot.
- 12) For St. Louis County Projects, all boring data shall be included in the construction plans.
- 13) For St. Louis County Projects, "General Notes" shall be included outlining design loadings and material requirements.
- 14) For St. Louis County Projects, estimated quantities are required. These quantities shall include the total surface area of the retaining wall, fence quantities and underdrains. Any required excavation for MSE walls other than that needed for the leveling pad, will be included in the roadway quantities. Excavation quantities are incidental for modular block retaining walls.

The above information, as well as any additional details and requirements normally provided by the wall manufacturer shall be submitted to the Department for approval.

GENERAL NOTES FOR RETAINING WALL CONSTRUCTION

- 1) St. Louis County Class B Concrete shall be used for all retaining walls with f_c equal to 3,500 psi or less. St. Louis County Class B-1 Concrete shall be used for all retaining walls with f_c equal to 4,000 psi or less. St. Louis County Class B-2 Concrete shall be used for all retaining walls with f_c greater than 4,000 psi. All materials, proportioning, air-entraining, mixing, transporting and slump of the concrete shall be in accordance with Section 501 of the current St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction" manual.
- 2) All reinforcing steel shall conform to ASTM Specification A615, Grade 60.
- 3) All materials and workmanship for the wall shall conform to the current edition of the St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction" manual.
- 4) Pouring retaining wall footings without formwork **will not be permitted**. Pouring retaining wall shear keys without formwork will be permitted unless noted otherwise on the plans.
- 5) Plastic protected bar supports are required wherever the concrete surface is exposed. Bar supports for reinforcement are to be of the earth-bearing base type. Bar supports used to support the upper mat of steel in the footing shall be full height, providing the proper clearances. **STANDEES RESTING ON THE LOWER MAT OF BARS WILL NOT BE PERMITTED.**
- 6) Splices in longitudinal reinforcement shall be a minimum of 24 bar diameters, unless noted otherwise on the plans. Bar splices will not be permitted on other bars unless explicitly shown on the plans.
- 7) Placing form oil or other release agent on the forms **prior** to placement of the reinforcing steel is required.
- 8) Triangular molding, having 0.75-inch width on each of the two (2) form sides, shall be used to bevel all exposed edges on the structure.
- 9) Curing of the concrete is required for 72 hours after placement of the concrete. Transparent membrane or wet burlap may be used to cure wall surfaces. For wall footings, polyethylene sheeting and white-pigmented membrane may also be used if the footing is not exposed. Polyethylene sheeting may also be used to cure the top of the wall while the forms are in place. If burlap is used, it is to be kept continuously wet for 72 hours. If forms are removed from wall surfaces prior to 72 hours, the tie holes are to be patched immediately, and curing using transparent membrane or wet burlap is to begin immediately after the tie hole patching is completed.
- 10) Where earth backfill is specified, it shall be placed in layers not to exceed eight inches (loose measurement) and shall be compacted to at least 95 percent of standard maximum density.



50.22 Bridge Structure Design

The following is an outline of minimum design requirements for bridges built within St. Louis County right-of-way. Bridge design shall generally be in accordance with the Missouri Department of Transportation (MoDOT) Bridge Design Manual. For bridge design items not specifically covered in the MoDOT Bridge Design Manual, the "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials shall be used as design specifications.

The design information in the above mentioned references shall be supplemented and superseded by the following requirements:

GEOTECHNICAL INVESTIGATION AND REPORT REQUIREMENTS

Detailed geotechnical investigations and reports are required for the design of all bridges to be constructed within St. Louis County right-of-way. This report shall be submitted for review by the Department, along with the consultant's recommendation as to the type of foundation to be used for the bridge, prior to the commencement of substructure design.

1) Investigation Requirements

At a minimum, one boring shall be taken per proposed bent. The boring for each bent shall be taken within 10 feet either side of the centerline of the proposed bent measured perpendicular to the centerline of the proposed bent. This boring shall also be taken within 10 feet of either end of the proposed bent. All borings shall be taken to auger refusal or a depth of 100 feet beneath the ground surface, whichever is higher. When auger refusal is obtained, rock cores are to be extracted for a minimum depth of 10 feet.

The above requirements may be waived only with the prior written permission of the Director or his designee.

Drilling and sampling are to be performed in accordance with standard practice and applicable ASTM procedures. A minimum of one (1) undisturbed Shelby tube sample is required per every fifteen-feet (15') of boring depth, provided that auger refusal is not reached in the first ten-feet (10') of boring. A minimum of one Split-spoon sample is required for every five-feet (5') of boring.

2) Laboratory Testing Requirements

- a) Visual classification shall be made for all samples and at changes in strata.
- b) Moisture contents are to be determined for all cohesive samples.
- c) Atterberg limits shall be determined for at least one sample per boring.
- d) Shear strength shall be determined in unconfined compression test for all Shelby tube samples.

3) **Report Requirements**

The report submitted for review by the Department shall contain the following information:

a) **Project and Site Description**

- i) Project Description
- ii) Discussion of known geological characteristics of the area

b) **Exploration Description**

- i) Location of borings
- ii) Method used for determining elevations
- iii) Equipment used
- iv) Drilling methods and sampling frequencies
- v) Problems encountered during the investigation
- vi) Personnel present

c) **Laboratory Testing**

- i) Frequency and type of tests performed
- ii) Location of results

d) **Discussion of Subsurface Conditions**

- i) Description of soil stratigraphy
- ii) Location and competency of rock
- iii) Extent of groundwater encountered

e) **Design Considerations and Recommendations**

- i) General recommendations as to foundation types for the bridge
- ii) **Drilled Piers** (where appropriate)
 - (1) Recommended end bearing pressure
 - (2) Allowable friction
 - (3) Recommended minimum depth

- (4) Anticipated depth
- (5) Recommended minimum diameter
- (6) Handling of groundwater seepage
- (7) Pilot hole requirements
- (8) Rock soundness criteria

iii) **Bearing Piles** (Where appropriate)

- (1) Maximum allowable bearing pressure
- (2) Practical refusal requirements if in excess of St. Louis County "Standard Specifications for Road and Bridge Construction"
- (3) Minimum required hammer energy
- (4) Quality requirements for driving
- (5) Pile top requirements
- (6) Lateral resistance

iv) **Friction Pile** (Where appropriate)

- (1) Allowable skin friction
- (2) Maximum allowable bearing pressure
- (3) Hammer energy requirements
- (4) Quality requirements for driving
- (5) Lateral resistance

v) **Shallow Foundations** (Where appropriate)

- (1) Allowable bearing pressure
- (2) Surface preparation
- (3) Minimum dimensions
- (4) Frost protection
- (5) Frictional sliding resistance

vi) **Anticipated Settlement**

vii) **Seismicity**

- (1) Discussed in terms of AASHTO requirements
- (2) Reports discussing seismicity in terms of IBC or UBC requirements will not be accepted.

viii) **Lateral pressure**

- (1) Recommended design lateral pressure shall be presented. All bridges constructed on St. Louis County Right-of-Way shall be constructed to Seismic Performance Category B requirements. As such, a Mononabe-Okabe pseudo-static analysis will be required to determine the design lateral pressure.

f) **Field Data**

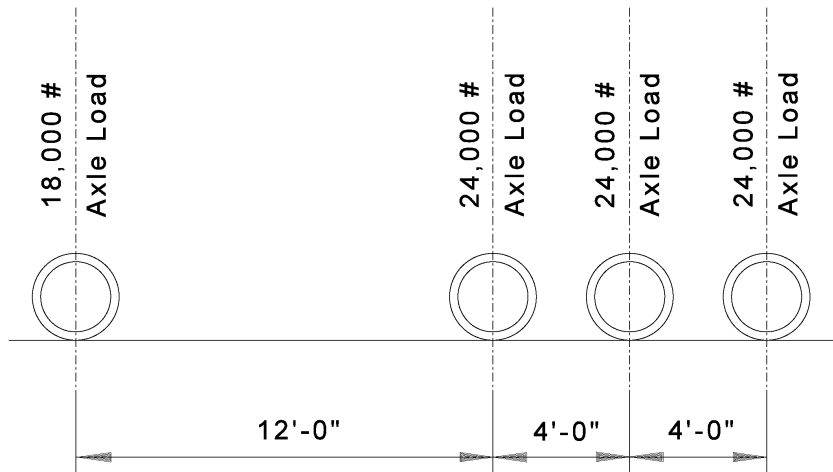
- i) Plan of Site and Borings
- ii) Boring Logs
- iii) Summary of Laboratory Tests
- iv) Description of Terms and Symbols
- v) Photographs of Rock Cores
- vi) Any required design charts
- vii) Mononabe-Okabe calculations

LOAD DESIGN CRITERIA

1) Highway Live Load:

The design loading for each structural component shall be the more severe of:

a) St. Louis County T45 Loading

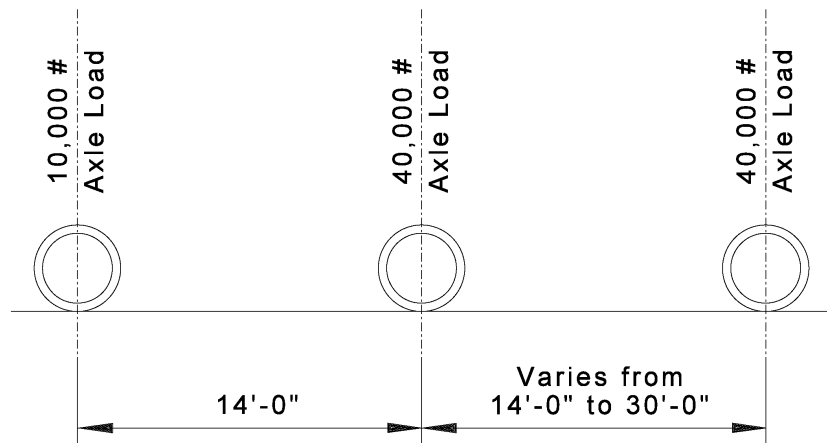


Transverse wheel spacing is to be 6 feet.

This loading is to be applied as a truck loading ONLY. (There is no equivalent lane load for long spans)

b) St. Louis County HS25 Loading

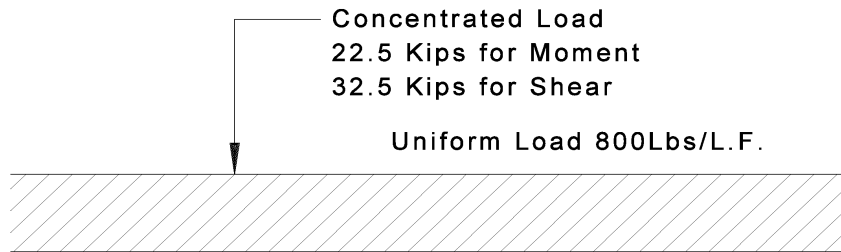
TRUCK LOADING



Transverse wheel spacing shall be 6-feet.

Rear axle spacing to be used shall be that which produces the maximum stress.

LANE LOADING



HS25 loadings shall be positioned as per Article 3.11 of the AASHTO Standard Specifications for Highway Bridges.

Overload provisions (AASHTO Group IA Loading) shall be checked for both HS25 truck and lane loading.

2) Future Wearing Surface

Designs shall include a provision for a future wearing surface of 30 pounds per square foot of roadway surface.

3) Seismic Design

All bridges in St. Louis County shall be designed for Seismic Performance Category B criteria unless stated otherwise in writing by the Director.

STRUCTURAL FORM

1) Substructure

- a) Shallow foundations shall consist of reinforced concrete spread footing keyed into rock or hard shale.
- b) Deep foundations shall consist of reinforced concrete drilled pier keyed into rock or hard shale. Where rock is extremely deep, structural steel pile or cast-in-place monotube friction pile shall be used. Consultants shall make a recommendation as to the type of foundation to be used and obtain written approval from the Director or his designee prior to proceeding with final designs.
- c) The bottom horizontal surface of wingwalls shall maintain an elevation equal to the bottom of the adjacent abutment wall or cap and shall maintain this elevation for the entire length of the wingwall.

2) Superstructure

- a) Short Spans (100 feet or less per individual span): Prestressed concrete "I" girders composite with a minimum 8½ inch thick reinforced (cast-in-place) concrete deck. "I" girders shall be placed on neoprene bearing pads with their ends cast in reinforced concrete diaphragms poured integrally with the concrete deck. Expansion joints are to be eliminated for all bridges of less than 250 feet in total length.
- b) Long Spans (greater than 100 feet per individual span): Structural Steel girders composite with a minimum 8½-inch thick reinforced (cast-in-place) concrete deck. Steel girders shall be placed on neoprene or PTFE bearing devices. Reinforced concrete end diaphragms poured integrally with the deck are to be used. Expansion joints shall be eliminated for all bridges less than 250 feet in total length.
- c) Safety Barriers shall be of the standard fully reinforced cast-in-place concrete type with fully reinforced cast-in-place end sections tied to reinforced concrete approach slabs.
- d) The use of prestressed concrete "double-tee" type girders, precast concrete deck forms, structural steel intermediate diaphragms for precast girders, stay-in-place corrugated metal deck forms or any type of metal decking will not be permitted on St. Louis County Projects unless stipulated in writing by the Director or his designee.
- e) Deck drains must be provided for every 10-foot section of deck for which the roadway gutter line grade is less than one percent (1%).
- f) Bridge plans shall incorporate bridge approach slabs conforming to Standard Drawing C503.00 or C503.01, as well as bridge approach pavement conforming to Standard Drawing C504.00 or C504.01.
- g) All bridges with pedestrian sidewalks shall have a 6-foot guard fence conforming to Standard Drawing C607.15 or 607.25.
- h) Vertical drains conforming to Standard Drawing C715.10 shall be incorporated at all end bents.
- i) Optional longitudinal construction joints shall not be indicated on the plans. Longitudinal construction joints are required for bridge decks wider than 50-feet out-to-out. Longitudinal construction joints shall not be used for bridge decks 50-feet in width or narrower unless staging details dictate.
- j) MoDOT standard bridge deck designs may not be used in their entirety, as MoDOT requires a smaller minimum clearance to reinforcement at the bottom of the slab.
- k) Steel design, including fatigue design, shall conform to Section 10 of AASHTO with the following comments:
 - i) Beam size or girder plate should be designed for strength requirements, for economical design and constructability requirements.
 - ii) If intermediate or longitudinal stiffeners are shown, investigate the feasibility of increasing web thickness to eliminate them.

- iii) In the analysis of rehabilitation projects of steel bridges involving the replacement of the existing deck slab, a fatigue check using the "AASHTO Guide Specifications for Fatigue Design of Existing Steel Bridges", most current edition, should be made.
- iv) For bridges designed to meet Fatigue Case II requirements, the average shear stress method used to determine shear stud spacing indicated in the MoDOT Bridge Design Manual may not be used. A full shear envelope for the bridge shall be determined and spacing groups derived from this envelope.

MATERIAL AND MISCELLANEOUS DETAILING REQUIREMENTS

1) Reinforcing Steel

- a) All reinforcing steel incorporated into bridges on St. Louis County right- of-way shall be Grade 60 bars conforming to ASTM A615, Yield Stress = 60,000 p.s.i.
- b) Epoxy coated reinforced steel shall be used in the entire concrete deck including diaphragms and in barrier units cast above the deck surface. Bar supports must be epoxy coated.
- c) **Clearances** - Minimum concrete cover for reinforcing steel shall be as follows:
 - i) Cast Against Earth.....3 inches
 - ii) Substructure Concrete2 inches
 - iii) Reinforced Concrete Deck
 - (1) Top Mat.....3 inches
 - (2) Bottom Mat 1½ inches
 - iv) Top Surface of Cantilevered Sidewalk2 inches
 - v) Barriers 1½ inches
 - vi) Other Superstructure Concrete 1½ inches
 - vii) Prestressed Girders
 - (1) Strands2½ inches
 - (2) Reinforcing Steel 1½ inches

2) Concrete

- a) Substructure concrete shall be Class B, design 28-day strength, $f_c = 3,500$ p.s.i.
- b) Bridge deck and diaphragm concrete shall be Class B2, design 28-day strength, $f_c = 4,000$ p.s.i. All Class B2 concrete shall have sufficient retarder added to retard the set of concrete 2.5 hours.
- c) Safety barrier and cantilevered sidewalk concrete shall be Class B1, design 28-day strength, $f_c = 4,000$ p.s.i.
- d) Concrete for prestressed girders shall be Class A1, with minimum design required strengths of 4,000 p.s.i. for strand release and 28-day strength, f_c of 5,000 p.s.i.

3) **Structural Steel**

- a) Structural Steel for bridge girders, stiffeners and diaphragms shall conform to the requirements of ASTM A709, Grade 50 (*AASHTO M270, Grade 345*). Shear connector materials shall be indicated to conform with St. Louis County Department of Transportation's "Standard Specifications for Road and Bridge Construction", Section 1037.
- b) Structural steel for slab drains and other miscellaneous items shall be ASTM A709 (*AASHTO M270, Grade 250*). The structural steel for these items shall be indicated to be galvanized in accordance with an appropriate ASTM specification.
- c) Paint for new structural steel shall conform to MoDOT System G requirements.
- d) Paint for existing structural steel shall be specified by the Department.

4) **Protective Materials**

- a) All new bridge decks shall be indicated to receive an epoxy-silane penetrating deck sealer. Material specifications may be obtained from the Department.

DESIGN CALCULATIONS

After the bridge design is complete, the design calculations must be bound, legible, signed and sealed by a Registered Professional Engineer in the State of Missouri and submitted to the Project Manager.

50.23 Culvert and Culvert Bridge Design

The following is an outline of minimum design requirements for culverts and culvert bridges built within St. Louis County right-of-way. Cast-in-place reinforced concrete box culvert and box culvert bridge design shall generally be in accordance with the Missouri Department of Transportation (MoDOT) Bridge Design Manual. However, MoDOT standard drawings for these structures may only be used where specifically permitted herein. Precast concrete box culverts and culvert bridges shall be designed as directed herein. Circular and elliptical reinforced concrete pipe culverts and culvert bridges shall be designed and specified as directed herein. The use of corrugated metal and corrugated aluminum culverts and culvert bridges is not permitted except by the direct written authority of the Director or his designee. For culvert and culvert bridge design items not specifically covered in the MoDOT Bridge Design Manual, the "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials (AASHTO) shall be used as design specifications.

The design information in the above mentioned references shall be supplemented and superseded by the following requirements:

GEOTECHNICAL INVESTIGATION AND REPORT REQUIREMENTS

Detailed Geotechnical investigations and reports are required for the design of all bridges to be constructed within St. Louis County right-of-way. This report shall be submitted for review by the Department prior to the commencement of design.

1) Investigation Requirements

At a minimum, one boring shall be taken per 75 feet of proposed culvert length taken along the centerline of the culvert. The borings shall be taken within 5 feet either side of the centerline of the proposed culvert measured perpendicular to the centerline of the proposed culvert. These borings shall also be taken within the length of the proposed culvert or no more than 5 feet beyond either end of the proposed culvert. All borings shall be taken to auger refusal or a depth of twice the distance between the proposed centerline profile grade and the proposed flow line of the channel, whichever is higher. When auger refusal is obtained, rock cores are to be extracted for a minimum depth of 5 feet.

The above requirements are to be waived for single barrel culverts of less than 8 feet clear span/diameter or with the prior written permission of the Director or his designee.

Drilling and sampling are to be performed in accordance with standard practice and applicable ASTM procedures. A minimum of one (1) undisturbed Shelby tube sample is required per every fifteen feet (15') of boring depth, provided that auger refusal is not reached in the first ten feet (10') of boring. A minimum of one Split-spoon sample is required for every five feet (5') of boring.

2) **Laboratory Testing Requirements**

- a) Visual classification shall be made for all samples and at changes in strata.
- b) Moisture contents are to be determined for all cohesive samples.
- c) Atterberg limits shall be determined for at least one sample per boring.
- d) Shear strength shall be determined in unconfined compression test for all Shelby tube samples.

3) **Report Requirements** - The report submitted for review by the Department shall contain the following information:

a) **Project and Site Description**

- i) Projection Description.
- ii) Discussion of known geological characteristics of the area.

b) **Field exploration**

- i) Location of borings.
- ii) Method used for determining elevations.
- iii) Equipment used.
- iv) Drilling methods and sampling frequencies.
- v) Problems encountered during the investigation.
- vi) Personnel present.

c) **Laboratory Testing**

- i) Frequency and type of tests performed.
- ii) Location of results.

d) **Discussion of Subsurface Conditions**

- i) Description of soil stratigraphy.
- ii) Location and competency of rock.
- iii) Extent of groundwater encountered.

e) Design Considerations and Recommendations

- i) Allowable bearing pressure.
- ii) Surface preparation.
- iii) Buoyancy protection.
- iv) Frost protection.

(Note: St. Louis County Department of Transportation generally considers culverts and culvert bridges to be non-susceptible to frost effects. However, should the consultant find an unusual field condition which indicates that frost damage is possible, mitigating measures must be included in the report.)

- v) Anticipated settlement.
- vi) Lateral pressure.

(1) Recommended design lateral pressure shall be presented. Lateral pressure shall meet MoDOT requirements for Seismic Performance Category B (45 p.c.f. minimum unless a smaller value can be justified by Monabe-Okabe analysis).

f) Field Data

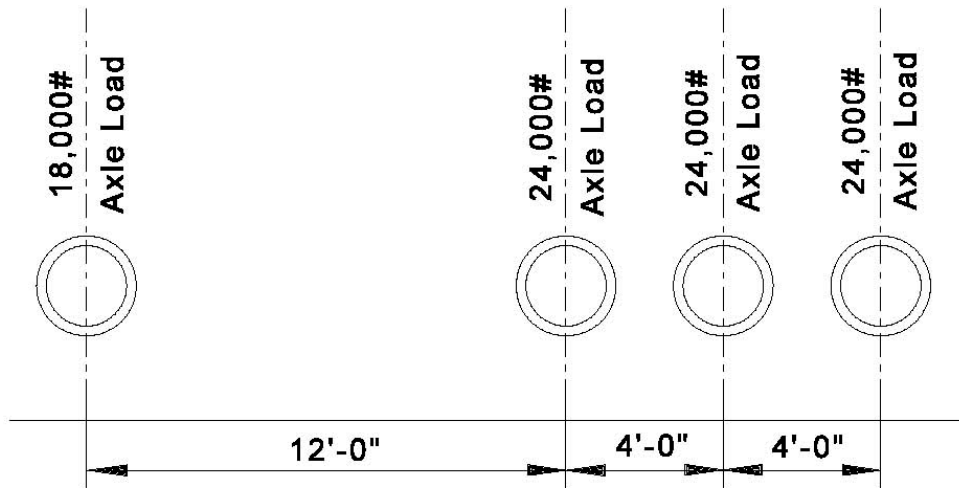
- i) Plan of Site and Borings.
- ii) Boring Logs.
- iii) Summary of Laboratory Tests.
- iv) Description of Terms and Symbols.
- v) Photographs of Rock Cores.
- vi) Any required design charts.
- vii) Mononabe-Okabe calculations, if required.

LOAD DESIGN CRITERIA

The following criteria apply to the design of ALL culverts and culvert bridges to be constructed within St. Louis County right-of-way (may be waived by the Director for single barrel and precast culverts with clear spans of less than eight (8) feet in favor of HS-20 loading, MoDOT standard drawings or ASTM/AASHTO precast culvert specifications):

- 1) **Highway Live Load** - The design loading for each structural component shall be the more severe of:

- a) **Saint Louis County T45 Loading**

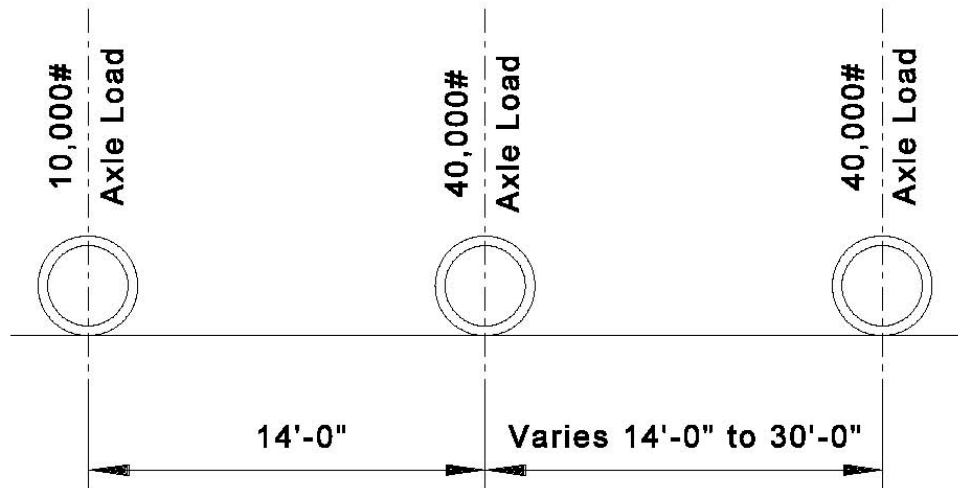


Transverse wheel spacing is to be 6 feet.

This loading is to be applied as a truck loading **ONLY**. (There is no equivalent lane load for long spans)

b) HS25 Loading

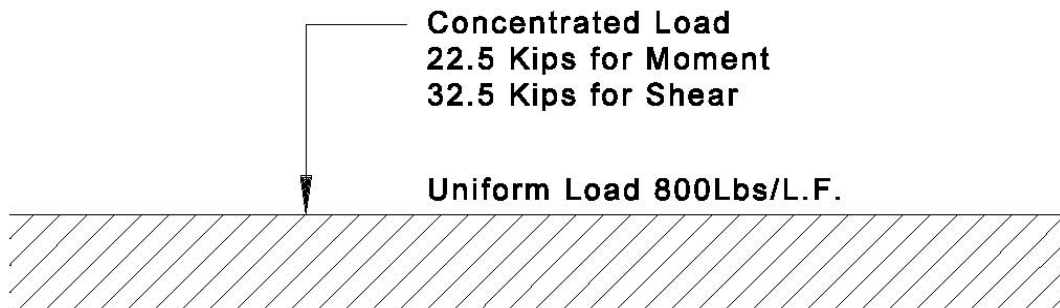
TRUCK LOADING



Transverse wheel spacing shall be 6 feet.

Rear axle spacing to be used shall be that which produces the maximum stress.

LANE LOADING



HS25 loadings shall be positioned as per Article 3.11 of the AASHTO Standard Specifications for Highway Bridges.

2) Future Wearing Surface

Designs shall include a provision for a future wearing surface equivalent to three (3) inches of asphaltic concrete pavement.

3) Load Distribution Through Fill (Cast-in-place reinforced concrete box culverts)

Distribution shall conform to Article 6.4 of the AASHTO Standard Specifications for culverts with design fill heights of greater than two (2) feet. The design fill height shall be considered to be the fill height at the high quarter point between the roadway curbs (or edge of shoulders for roadways without curbs.) Distribution may not carry across transverse expansion joints.

4) Provisions for Precast Reinforced Concrete Box Culverts

As previously stated, ALL culverts and culvert bridges constructed within St. Louis County right-of-way shall be designed to carry the greater of the Modified Military or HS25 loadings. As a result, ASTM C-1433 tables may NO LONGER BE USED to design precast concrete box culverts (except for precast culverts with clear spans of less than 8 feet where specifically approved by the Director). These culverts shall be individually designed using the FHWA's BOXCAR program or other approved method. Precast concrete box culverts may not be used where the fill height at any location within the right-of-way is less than one (1) foot.

STRUCTURAL FORM

1) Culvert Barrels

- a) Culverts and culvert-bridges beneath St. Louis County rights-of-way shall be limited to a maximum of three (3) adjacent barrels in order to prevent excessive debris build-up.
- b) Skewed precast concrete box culvert sections will not be permitted unless specifically approved by the Director or their designee. Skewed precast concrete box culverts may be accomplished by constructing skewed cast-in-place end sections at the culvert ends.
- c) Precast headwalls, toe walls, wingwalls, wingwall footings and aprons will not be permitted. These items are to be constructed cast-in-place and connected to the culvert by the following means:
 - i) Extending the box culvert mesh 15 inches beyond the end of the end culvert section into the cast-in-place work.
 - ii) Using dowel bar splicing anchors to splice #5 bars at 12-inch centers into the cast-in-place work a minimum distance of 15 inches.
 - iii) Schemes involving drilling and grouting of reinforcing bars after casting of the culvert section will **not** be approved.
- d) Elbows in precast concrete box culvert sections will not be permitted. These areas shall be cast-in-place for a minimum distance of five (5) feet either side of the interior elbow angle. The cast-in-place wingwall shall be attached to the remainder of the culvert in a method similar to that used to connect the wingwalls.

- e) Culverts and culvert-bridges beneath St. Louis County rights-of-way shall provide for headwalls and wingwalls sufficient to maintain 3H:IV slopes at all locations.
- f) Cast-in-place reinforced concrete box culverts shall be constructed with:
 - i) Full upstream and downstream aprons extending between the exterior wingwalls.
 - ii) Upstream and downstream toe walls of a minimum one (1) foot thickness extending a minimum of two (2) feet beneath the bottom of the apron.
 - iii) Intermediate wingwalls extending from and having the same thickness as the interior culvert walls. The intermediate wingwall shall be of the same length as the exterior wingwalls.
- g) Precast reinforced concrete box culverts shall be constructed with:
 - i) Full upstream and downstream aprons extending between the exterior wingwalls.
 - ii) Upstream and downstream toe walls of a minimum one (1) foot thickness extending a minimum of two (2) feet beneath the bottom of the apron.
 - iii) Intermediate wingwalls extending from and having the same thickness as the interior culvert walls. The intermediate wingwall shall be of a minimum length equal to one-half the exterior wingwall length.
- h) Precast and cast-in-place reinforced concrete box culverts shall be constructed with traffic safety features (either reinforced concrete safety barrier or three-beam bridge rail) which are integrally connected to the structure, as required.
- i) Culverts or culvert bridges with design fills one (1) foot or less shall incorporate full depth bridge approach slabs conforming to Standard Drawing C503.00 or C503.01.
- j) Chain link fence conforming to Standard Drawing C607.12 shall be installed on all headwalls and exterior wingwalls for all culverts greater than 3½ feet in clear height. If fence is required, it shall be extended for the entire length of the wingwall.

MATERIAL AND MISCELLANEOUS DETAILING REQUIREMENTS

1) Reinforcing Steel

- a) All reinforcing steel incorporated into culverts or culvert bridges on St. Louis County right-of-way shall be Grade 60 bars conforming to ASTM A615, Yield Stress = 60,000 p.s.i.
- b) Welded wire fabric used in the construction of precast concrete box culverts shall be as specified in the St. Louis County Department of Transportation "Standard Specifications for Road and Bridge Construction".

- c) Epoxy coated reinforcing steel shall be used within two (2) feet of the roadway surface. This includes bars which protrude into this area from lower elevations. Bar supports for epoxy coated reinforcement must also be epoxy coated.
- d) **Clearances** - Minimum concrete cover for reinforcing steel in cast-in-place culverts shall be as follows (except where the use of MoDOT standard drawings have been specifically approved by the Director):

Cast Against Earth	3 inches
Clearance to Top Roadway Surface.....	3 inches minimum
Barriers.....	1½ inches
All Other Reinforcement.....	2 inches

For precast concrete culverts, the reinforcement clearances shall be as specified in the Section 1049 of the St. Louis County Department of Transportation "Standard Specifications for Road and Bridge Construction".

2) Concrete

- a) Cast-in-place culvert and culvert bridge concrete shall be Class B, design 28-day strength, $f_c = 3,500$ p.s.i. Should design strengths greater than 3,500 p.s.i. be required for economical design, Class B2 concrete shall be specified.
- b) Precast concrete culvert concrete shall be as specified in Section 1049 of the St. Louis County Department of Transportation "Standard Specifications for Road and Bridge Construction". The minimum design strength shall be 5,000 p.s.i.
- c) Safety barrier concrete shall be Class B1, design 28-day strength, $f_c = 4,000$ p.s.i.

DESIGN CALCULATIONS

After the culvert and bridge design is complete, the design calculations must be bound, legible, signed and sealed by a Registered Professional Engineer in the State of Missouri, and submitted to the Project Manager.

50.24 Type, Size and Location Plans for Culverts, Bridges and Culvert Bridges

Type, Size and Location (T, S & L) Plans shall be required for all Bridges, Culvert Bridges and Culverts of eight-foot (8') clear span or greater as follows:

- 1) For **all** new Subdivision and Special Use Permit Projects. The T, S & L plans for the proposed structure shall be submitted prior to grading plan approval. The completion of a geotechnical report which conforms to Section 50.22 or Section 50.23 is necessary to submit T, S & L plans which will be satisfactory to the Department.
- 2) For St. Louis County Projects designed by consultants where indicated in the consultant contract.

Acceptable T, S & L plans will be submitted on a single 24" x 36" sheet and will be arranged and drafted in a legible manner. The T, S & L plans will contain the following views and information:

Plan View

- 1) Provide span lengths; out-to-out structure length; skew angle; out-to-out structure width; and roadway horizontal clearance between curbs, barriers or railings.
- 2) Show stations and elevations along profile grade line.
- 3) Show station equation for intersecting reference line on roadways.
- 4) Show stations and offsets to roadway tapers that are across or under the structure.
- 5) Bridges are to be laid out with stationing going from the left side of the sheet to the right side of the sheet.
- 6) Culverts are to be laid out with stationing going from the bottom of the sheet to the top of the sheet. (Culvert lengths from the roadway centerline to the culvert ends along its centerline should be rounded off to the nearest 1").
- 7) Show stationing direction on road under, if applicable.
- 8) Show location of point of minimum vertical under-clearance on bridges over roadways or railroads.
- 9) Show horizontal clearances of proposed piers to under-passing roadways.
- 10) Show horizontal clearance from edge of roadway to culvert headwall.
- 11) Show stage construction line and temporary sheet piling location when applicable.

- 12) Show deck drains and spacing.
- 13) Plot boring locations.
- 14) Show proposed channel paving or ungrouted revetment within twenty feet (20') upstream and downstream from bridge.
- 15) Show outline of limits of existing structure (where applicable) including piers.
- 16) Show embankment slopes adjacent to structure.
- 17) Show slope of channel paving at right angle to stream.
- 18) Show any pipe culverts and local drainage near structure.
- 19) Add shoulder-widening note for guardrail where structures are wider than approach roadway. "The width between the guardrails shall be the width between the bridge rails or parapets which will require approach shoulder widening."
- 20) Where required, show proposed bridge approach slabs and bridge approach pavement.
- 21) Show location of bridge railing or barrier, bridge anchor sections, barrier transition, curb transitions, approach sidewalks and guardrail terminations.
- 22) Check for proper drafting (particularly at bridge ends).
- 23) Show railroad mile post information and railroad deck drain note where applicable.
- 24) Show north arrow.
- 25) Show all retaining walls and provide appropriate details.

Elevation View

- 1) Use same scales for vertical and horizontal dimensioning.
- 2) Show bridge exception stations.
- 3) Show back elevation of barrier and/or railing.
- 4) Show estimated footing elevations, pile type with estimated capacities and lengths and battered piles as needed for foundations on piles and allowable soil bearing pressures for foundations and spread footings.
- 5) Show proposed culvert opening dimensions if applicable.
- 6) Show pipe culverts through embankment if required.
- 7) Show pier elevation consistent with pier sketch.

- 8) Plot natural ground line.
- 9) Show stream bed elevation where applicable.
- 10) Show proposed structural excavation datum, if any.
- 11) Place culvert flowline in accordance with the provisions of Section 50.20.
- 12) Show high water elevation and design storm.
- 13) Show pier thickness (stream crossing only).
- 14) Add note for bridges over railroads - "No deck drains will be permitted in the span over tracks or within 10' of cross arms of a railroad pole line."
- 15) Provide vertical scale to determine natural ground elevations.

Upper Left Hand Corner Data

- 1) Show benchmark note.
- 2) Show existing structure description, length, width and old structure number (if applicable).
- 3) Show staging instructions, if applicable.
- 4) Add note when to remove existing structure, if necessary.
- 5) Show salvage materials, if any.

Cross Section

- 1) The following should be shown on each cross section:
 - a) Dimension bridge roadway and shoulder widths.
 - b) Slab thickness.
 - c) Stringer size, spacing, haunches and note indicating composite action (if applicable).
 - d) Rail or barrier type and vertical dimensions.
 - e) Crown configuration and location of profile grade application.
 - f) Median and sidewalks.
 - g) For box culverts, show channel slope.

- h) For curved bridges: Offset tangent, all beams....radii.
- i) Staging details with type of temporary barrier to be used.
- j) **Deck Drains** - Omit drains over roadways and sidewalks, over railroads as previously noted and on the high side of superelevation.

Section thru Abutment

- 1) Show proper type along with a partial elevation of the superstructure extending from the abutment.
- 2) Show bridge exception application location.
- 3) Show approach slab.
- 4) Show only dimensions that are necessary for planning purposes.
- 5) Show all bearing types.
- 6) Show vertical drain.
- 7) Show Class A Underdrain.

Pier Sketch

- 1) Show proper type of pier or abutment used.
- 2) Show correct number of columns.
- 3) Make sketch to scale for aesthetic evaluation of pier shape.
- 4) Add crash wall for bridges over railroads.
- 5) Provide dimension from ground line to top of crash wall.
- 6) Show location and type of all proposed construction joints.

Supplemental Sections

- 1) Show section thru paved slope protection.
- 2) Show section through riprap.

Title Block

- 1) General plan, road name over feature name, project number, bridge number, name of development (if applicable), name and address of consulting engineer, name and address of developer (if applicable).

Profile Grade

- 1) Show location, grades, curve length and elevations and stations of PVC, PVT and PVI.
- 2) Show all profiles for roads over and under.

Horizontal Curve Data

- 1) PI Station, I, D, R, L, T, E, PC Station, SE and SE or crown attainment stations.

Location Sketch

- 1) Show Range, Township, Principle Meridian, Section Numbers, North Arrow and Proposed Structure.

Design Stresses

- 1) Show for both cast-in-place and precast units.
- 2) Indicate both HS-25 and St. Louis County T45 loading unless one loading type controls the design of **all** structural components.
- 3) Indicate future wearing surface loading.
- 4) Indicate the design specifications used.
- 5) For culverts and culvert bridges, indicate the design lateral pressure and surcharge loadings used.
- 6) For bridges, indicate the seismic performance category, acceleration coefficient and site coefficient.

Other

- 1) Required Hydraulic Table for Bridges and Culvert Bridges - All plans submitted for structures which are considered to be bridges or culvert bridges shall contain a completed version of the following table **regardless** of the actual design flow:

<u>HYDROLOGIC DATA</u>
Drainage Area =
Design Discharge = Design High Water Elevation = Frequency =
<u>BASIC FLOOD DATA</u>
Q ₁₀₀ = High Water Elevation =

- 2) Show roadway data (Classification), including design ADT, DHV, and ADTT.
- 3) Show offset sketches for horizontally curved roadways.

50.25 Requirements for Structural Construction Plans

The items which follow are **minimal** requirements for the development of construction plans for bridges, culverts and culvert bridges and are not all-inclusive. The design consultant shall supplement this list with additional material suitable to the specific project to achieve high quality plans. It is the responsibility of the design consultant to see that there are no errors or omissions and possibilities of misinterpretation by the contractor.

The plans shall contain the following details and are to be ordered as follows:

General Plan and Elevation

- 1) The General Plan and Elevation shall essentially be the T, S & L sheet (Section 50.24) with the following items removed:
 - a) Bridge exception.
 - b) Cross-section, section thru abutment, pier sketch etc.
 - c) Roadway data.
- 2) Include all applicable general notes. Typical general notes are included at the end of this section.
- 3) **Summary of Quantities**
 - a) For St. Louis County Projects, existing pay items as listed in "Listing of St. Louis County Bid Item Numbers" should be used when possible. All pay items shall be assigned an item number. Should an appropriate pay item not exist, contact the project manager or plan reviewer with the Department so a new number may be assigned. Incidental items should be included in a specific pay item. Do not make an item incidental to the contract.
- 4) Show slope protection limits and pertinent construction details. Reference Standard Drawing C611.60 for paved concrete slope protection construction details.
- 5) Affix Professional Engineer's seal and signature (all sheets).
- 6) Limits of temporary sheet piling indicating top and bottom elevations and lengths shall be shown in the plan. Add note stating that the information shown is estimated.
- 7) Stage construction line, if any.

Footing Layout, Stage Construction Details, Etc.

- 1) For structures on curved alignment and other unusual situations, a footing layout should be shown.
- 2) Sketches showing the stage removal and stage construction of the superstructure and limits of removal of the substructure should be shown. Generally show 4 elevations views (e.g. for two stage projects): Stage I Removal; Stage I Construction; Stage II Removal; Stage II Construction. Additional elevation views will be required for three stage projects.
- 3) Show location of temporary concrete barrier.
- 4) Removal of Bridge and Removal of Bridge (Partial) shall be accounted for as Lump Sum items. Removal of Bridge (Partial) shall apply to deck replacements, deck widening's and replacement of prestressed concrete deck beams.
- 5) For rehabilitation projects, a plan view showing approximate location and anticipated quantity of half-sole and full-sole deck repairs shall be included. Details for the half-sole and full-sole patching shall be incorporated into the plans, including all special repair zones to protect negative moment reinforcement anchorage.
- 6) The required sequence of construction shall be outlined on this sheet.

Deck Elevations

- 1) A typical haunch detail is required.
- 2) All information such as theoretical haunching, theoretical dead load deflection and finished roadway grades shall be calculated at **tenth points along the girder**.
- 3) **A table showing the plan finished roadway pavement grade above each theoretical haunch location is required.**
- 4) A table showing the theoretical dead load deflection due to the weight of the concrete deck slab shall be included.
- 5) A table showing anticipated theoretical haunch heights shall be included to aid contractors in bidding.

Deck Details

1) Cross Section

- a) Location of longitudinal construction joints, if any, shall be shown.
- b) Cross-slopes, parabolic crown detail (if required), reinforcement clearances, slab thickness and the location of profile grade line must be shown on the cross section.

2) Plan

- a) Top and bottom reinforcement are to be shown as lapped at different locations.
 - b) Minimum lap lengths shall be indicated on the plans.
- 3) Show deck pouring sequence. At least one optional sequence in addition to the basic sequence is required for federally funded projects.
- 4) Show deck drainage system and locations.
- 5) For stage construction, show detail for bar splices near joint.

Bridge Railing Details

1) For New Jersey Safety Barrier, show the following:

- a) Cross section showing all dimensions and reinforcement and an elevation view showing all reinforcement.
- b) Show barrier joint locations. Joints are **required** ten feet (10') from the centerline of an intermediate bent on both sides of the intermediate bent.
- c) Show **BEVEL DETAIL OF FILLED JOINT**. This joint is a ½" filled joint sealed with a backer rod and Dow Corning 888 Silicone sealant or approved equal. Waterstops shall not be used in barrier joints.
- d) Details shall be included for the barrier end section designed to accept a Bridge Anchor Section. Barrier end sections designed to accept the bridge anchor section shall be detailed as in the MoDOT Bridge Design Manual.

2) For Thrie Beam Bridge Railing, show the following:

- a) An elevation view showing all post locations, thrie beam transition section and guardrail terminal section or other approved end treatment.
- b) A cross-section view showing the rail, post and top channel as well as connection device details.
- c) Verify that all relevant Standard Drawings are to be included in the plan set.

Framing Plan and Beam/Girder Details

- 1) A framing plan for steel layout must be shown.
 - a) Show beam/girder spacing and lengths.
 - b) Show diaphragm/cross frame locations for beam/girder structural requirements.
 - c) If curved structure, a table of layout dimensions is required.
 - d) A north arrow is required.
- 2) The Moment table and Reaction table should be shown. The tables should, in general, follow the examples provided at the end of this section.
- 3) Show weld size, flange transitions, shear stud requirements, notch toughness or fracture critical notations, diaphragm/cross frame details, splice design and locations.
- 4) A table of top of Web (or top of Beam for Wide-Flange) elevations must be provided. (Add note: "For Fabrication Use Only".)
- 5) A camber diagram for girders is required.
- 6) Show bearing stiffener details.
- 7) Show intermediate or longitudinal stiffeners, if any.
- 8) Show designation of Notch Toughness Requirements for beams, webs, plates and splice plates.
- 9) A framing plan for Precast Prestressed Concrete I-beams must be shown.
 - a) Show beam spacing and lengths.
 - b) A north arrow is required.
- 10) For precast prestressed concrete beams, the following details must be shown:
 - a) Show beam cross section with all dimensions.
 - b) Show strand layout, draping details, lifting loop details, drain connection insert details.
 - c) Show bar list, bar details, notes and Bill of Material.
 - d) Show required concrete strength at strand release and required 28-day concrete strength.
 - e) Show intermediate diaphragm details.
 - f) Show bearing details.

Abutment Details

- 1) Detailing shall be as per the MoDOT Bridge Design Manual.
- 2) Step heights must be greater or equal to $\frac{3}{4}$ ", otherwise shim plates need to be specified.
- 3) Steps 4" or larger shall be reinforced.
- 4) Show step and bottom of cap elevations. All elevations shall be shown to the nearest 1/100 of a foot.
- 5) Show wingwall details.
- 6) Bridge approach slab shall be connected to the bridge deck slab by means of #5 Bars, 30" long at 18" spacing.
- 7) A table showing proposed pile sizes, estimated required lengths, design bearing, required hammer energy and note concerning practical refusal.
- 8) Details for drilled piers shall be indicated including dimensions, reinforcement and anticipated bottom elevation.
- 9) Quantity for structural excavation must be shown for each individual abutment.
- 10) All reinforcement protruding above or to be placed completely above the bearing seat elevation shall be epoxy coated.

Intermediate Bent Details

- 1) All intermediate bents shall be of the column and cap type and shall be detailed (including seismic detailing requirements) as outlined in the MoDOT Bridge Design Manual.
- 2) Step requirements are the same as for abutments.
- 3) Elevations for the footings, bottom of cap and steps must be shown to the nearest 1/100 of a foot.
- 4) Show details for cofferdams or seal course requirements in stream crossings or high water table situations (if necessary).
- 5) Pile information and drilled pier information is required as per abutments.
- 6) Structural excavation quantities for each individual intermediate bent are required.

Box Culvert Details - The following drawings are required for box culverts:

- 1) Section through box culvert showing all dimensions and reinforcement details. *
- 2) Half-horizontal plan showing the top slab steel and all dimensions is a minimal requirement. A full horizontal plan view is preferable. *
- 3) Half-horizontal section showing the bottom slab, wall steel and all dimensions is a minimal requirement. A full horizontal section is preferable. *
- 4) An elevation of the box culvert showing the wall steel, should these details be unclear in the horizontal section view. *
- 5) A section through wingwalls and apron for each unique wingwall arrangement.
- 6) An elevation view of each unique wingwall.
- 7) A section through the upstream and downstream headwalls. (Note: These will not be the same)
- 8) A section through each unique toewall.
- 9) A plan view showing the layout of the proposed precast concrete box culvert sections. **
- 10) Plan, elevation and sectional views showing reinforcement and dimensions for skewed end sections or elbows in precast concrete box culverts. **
- 11) Details for connecting the precast culvert sections to cast-in-place work. **

* Not required for precast concrete box culverts.

** Not required for cast-in-place concrete box culverts.

Standard Drawings

It is the responsibility of the design consultant to become familiar with St. Louis County Standard Drawings and incorporate their use whenever appropriate. These drawings are available on the St. Louis County Department of Highways and Traffic website in Adobe Acrobat format (PDF) at:

[www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/
TransportationPublicationsManuals/StandardDrawings](http://www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/StandardDrawings)

Special Provisions

It is the responsibility of the design consultant to become familiar with the information contained in the Department's "Standard Specification for Road and Bridge Construction". All plans submitted for review by the Department shall include special provisions to adequately specify work not expressly covered by the Standard Specifications. It is the responsibility of the design consultant to coordinate with the St. Louis County Project Manager, which special provisions are required for each project. For St. Louis County Projects, these provisions shall be submitted on 8½" x 11" paper. For Subdivision and Special Use Permit projects, these special provisions shall be incorporated into the plans.

50.30 Plans and Calculations

Plans shall be any scale from one inch equals twenty feet (1" = 20') through one-inch equals fifty feet (1" = 50'), so long as the scale is an increment of ten (10) feet. Plans shall be prepared on exhibits having a maximum sheet size of thirty (30) inches by forty-two (42) inches except for plans subject to the subdivision ordinance which limits exhibits to twenty-four (24) inches by thirty-six (36) inches. All calculations submitted shall be prepared in a legible manner. Plans and calculations shall be prepared in accordance with this section and shall include the following information:

- 1) **Site Drainage Map** - A drainage map shall be developed from a base reproduction of the site plan or grading plan. The existing and proposed contours shall be shown at 2-foot intervals for the subject property, extending off-site, 100' or less, as determined by the Department for proper design of the proposed improvements. Contour intervals other than the above shall be used as determined by the site topography. Only United States Geological Survey (USGS) Datum shall be used. Locations and elevations of benchmark references are available from the Department and the Metropolitan St. Louis Sewer District (MSD).

The location of existing and proposed property lines, streets, sinkholes, railroads, areas within the tract subject to inundation by storm water and other significant natural features, such as wooded areas and rock formations, etc., shall be included on the map. All existing and proposed storm water facilities, such as inlets, manholes, pipes, culverts, bridges, channels, etc., and all existing and proposed improvements required for proper design review, such as pavement, buildings, etc., shall be included on the map.

The runoff details shall be required, showing individual flows for each existing and proposed structure and cumulative flows in pipes and gutters, including "Q" and area. The map shall show all bodies of water, such as ponds or lakes (including surface area and elevation), and all waterways (including their names or the names of creeks or rivers they flow into).

- 2) **Supplemental Drainage Map** - A supplemental map may be required for areas beyond the site that contribute drainage to the site. It shall be developed from a portion of the USGS Quadrangle Map, MSD Orthophoto Map, aerial map or similar source. It shall include the site boundary and the watershed tributary to the project area.
- 3) **Drainage Structures** - The lateral location of all street drainage structures shall be shown on the plans by the street centerline stationing and the perpendicular offset distance.
 - a) Inlets shall be appropriately sized and spaced, taking into consideration by-pass, depth of flow and gutter capacity (Refer to chart on page 50.35-1). Inlets shall be required when the pavement is superelevated or warped causing water to flow from the gutter line across the roadway.
 - b) For inlets in vertical sag curves, the center of the main chamber shall be placed within one (1) foot of the exact mathematical low point.

- c) Inlets shall be located so the inlet face is two (2) feet six (6) inches behind the back of the roadway curb. The sump shall begin two (2) feet six (6) inches in front of the back of curb. The top elevation of the stone shall remain three (3) inches above the top of rolled curb and level with the top of vertical curb. When required, the nearest two (2) sections of sidewalk on each side of the inlet shall be warped down to the top of the inlet stone elevation. At intersections, inlets shall be placed so no part of the inlet structure or sump is in the curb rounding. Refer to Standard Drawing C604.36.
 - d) Area inlets located in roadway ditches shall be compatible with the ultimate pavement section. Rear yard area inlets shall be required when more than one (1) c.f.s. is concentrated between buildings and crossing sidewalks or curbs.
 - e) By-pass shall be minimized at inlet structures and shall be shown on the hydraulic computations and site drainage map. By-pass shall be used in determining gutter flow downstream. By-pass shall not be considered in sizing of the storm sewer pipe system (i.e., pipe shall be designed for total tributary "Q" regardless of by-pass).
 - f) All manholes shall be located outside of the proposed roadway pavements. Manholes or inlets shall be placed wherever a change in size, grade, or alignment of pipe occurs. A maximum spacing of four hundred (400) feet between structures will be allowed for fifteen (15) inch pipes and smaller. For twenty-one (21) inch pipe and larger, five hundred (500) feet spacing is the maximum allowed.
 - g) All drop structures with incoming pipes twenty-one (21) inch or larger shall have reinforced concrete sides and bottom from the top of the upstream pipe down.
 - h) Erosion protection in the form of asphalt curb, gutters, additional structures, paving and/or revetment may be required at the temporary termination of pavements.
 - i) Subsurface precast storm water structures may be used provided detailed drawings are submitted and approved prior to construction plan approval.
 - j) The type of structure (single, double, grated, etc.), the flowline and top elevations and the "Q" in the upstream gutter line shall be required on the plans and/or profiles. The hydraulic computations shall be attached. The hydraulic grade line elevation at the structure and the amount of freeboard shall be shown on the computation sheets.
 - k) For non-standard structures, two (2) additional sets of plans shall be submitted for review.
- 4) **Drainage Pipes** - The location, length, alignment and grade of all pipes shall be shown on the plans and/or profiles. Also the curve data for radius pipes shall be shown.
- a) At intake structures such as flared end sections or headwalls, entrance control shall be applied. Two (2) foot minimum freeboard shall be required. Upstream inundation shall be checked. Where inundation extends beyond the site property line and exceeds the Design Water Surface Elevation of the natural drainway/channel, a backwater ponding easement from the affected off-site property owner will be required prior to Improvement Plan Approval. Cut-off walls shall be two (2) feet deep on upstream headwalls and three (3) feet deep on downstream headwalls. Refer to Standard Drawing C604.41.

- b) Outfall termination shall occur at a natural drainway/ channel so that the flow does not exceed the natural capacity of the drainway/channel. Concrete outfall pipe, 24 inches in diameter or smaller, shall require a cut-off wall and grouted revetment or paved ditch. Concrete outfall pipe larger than 24 inches in diameter shall have a reinforced concrete headwall or flared end section with cut-off wall and grouted revetment or paved ditch. Corrugated aluminum pipe shall have a concrete collar at its connection to the concrete pipe. Concrete pipe is required when the channel is paved. Refer to Standard Drawing C604.41.

Heavy stone revetment may be required for erosion control. If discharge is at a property line, an attempt shall be made to acquire a discharge easement on the adjacent property prior to plan approval. Where a discharge easement cannot be obtained the outfall pipe shall be set back from the property line a distance determined to allow discharge at the property line to occur without a negative impact to the adjacent property. In which case a Special Escrow shall be required for future extension of the outfall to the property line, discharge elevation shall be at the flowline of an existing ditch or creek.

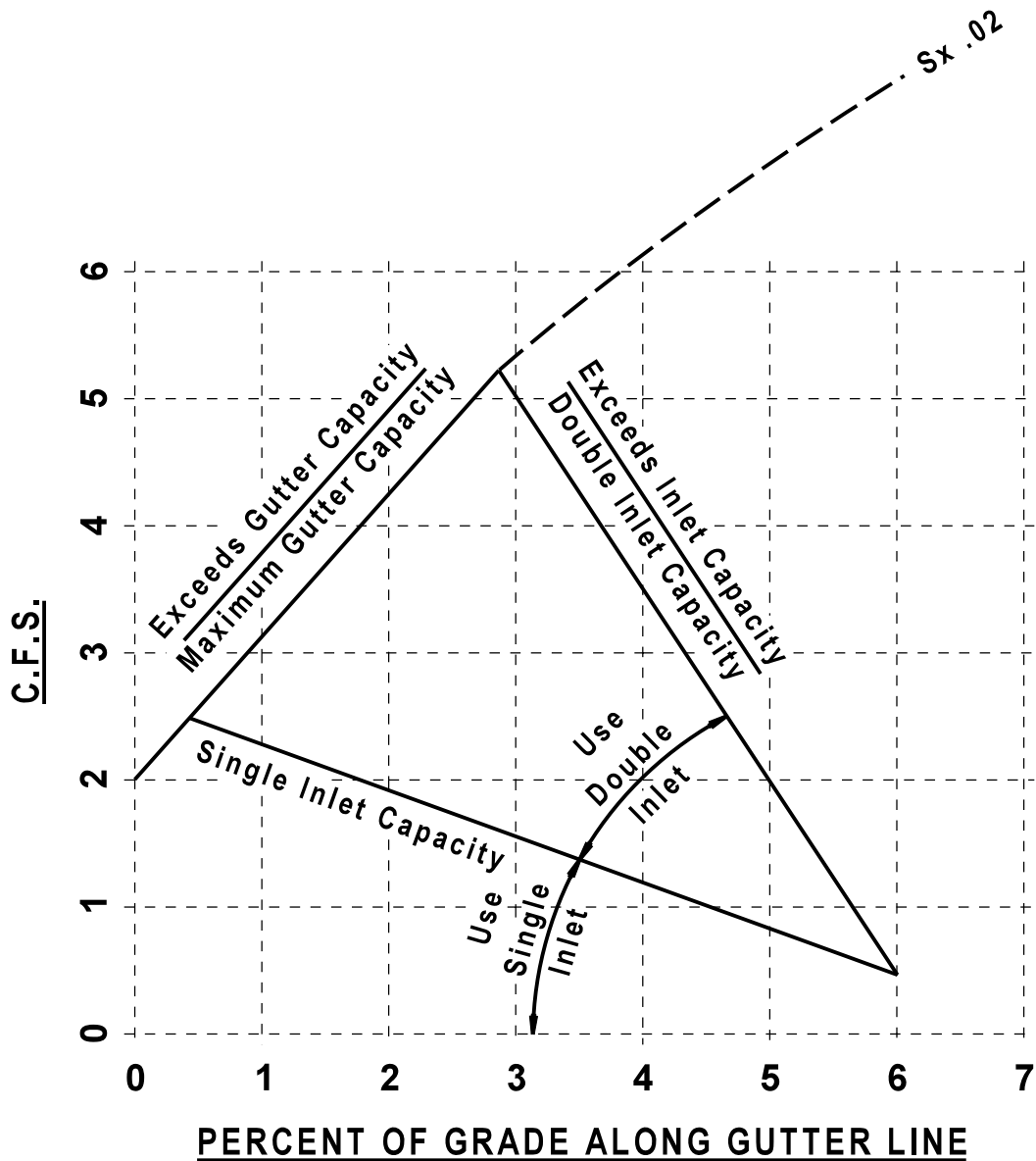
- c) Storm Sewer "Y" connections will be approved only if the trunk sewer diameter is a minimum of 48 inches, the maximum length of the lateral run from the "Y" connection to the inlet is 30 feet, the "Y" connection point is not more than 75 feet from a point of entry into the trunk sewer, and the minimum ratio of diameters of the incoming pipe to the trunk line is 1:3.
- 5) **Sanitary Sewers** - All construction details and specifications shall be in accordance with the applicable requirements for Structures and Pipes within the road rights-of-way. Refer to the Standard Drawings.
- 6) **Bridges** - Two (2) additional sets of plans for bridges shall be submitted. Structure widths shall be designed for the ultimate roadway width, in accordance with the Highway System Plan and Road Classification Guide. Guardrail and fencing shall be required at appropriate locations. Reinforced Concrete Approach Slabs shall be required for all bridges.
- 7) **Culverts** - Two (2) additional sets of plans for poured in-place or precast culverts shall be submitted. Size, type, grade, alignment, minimum cover for the loading, wing-walls, and/or erosion protection in the form of paving or revetment or flood walls shall be shown, including cut-off footings, etc., if required. Any connections to culverts shall be shown with a detail. No utilities shall run through any culvert. Alignment and changes in grade shall be shown the same as for pipes. Slopes from culverts to roadways shall be no steeper than 3:1, and shall be sodded or protected with grouted revetment or paved ditch as required. A soils report will be required in areas of excessive fill beneath the roadway involved with creeks, lakes and/or swampy areas. Inspection of fill material placement to be made by the Department.

- 8) **Dams** - A Soils Engineering Design Report shall be submitted indicating the adequacy of the proposed dam construction. A 3:1 maximum slope shall be required on earth-filled dams. Where the roadway fill serves as the dam embankment, an adequate top width for pavement and sidewalks shall be provided. In such cases, the dam shall be designed to store a one hundred (100) year twenty (20) minute storm with one (1) foot of freeboard, assuming a blocked overflow structure. Berms, guardrail, fence, etc. may also be required. The relief line from the spillway structure or the overflow structure in the dam shall be sized on the total upstream tributary area, using the ultimate runoff factor. An adequate overflow structure of reinforced concrete construction with the openings covered by grates shall be provided. The system shall be designed to maintain the required freeboard and storage and shall be equipped with a drain valve or other approved means of lowering the water level for maintenance purposes shall be provided. Erosion protection shall be required when the stability of the structure may be endangered. Dams greater than thirty-five (35) feet in height must be approved by the Missouri Department of Natural Resources.

For dams proposed in new developments which will support County maintained roadways, contact the Department for special design requirements regarding this construction.

GENERAL NOTES

1. Do Not Scale drawing. Follow dimensions.
2. Low point inlets are controlled by capacity in gutter based on percent of grade of the gutter at the beginning point of the Standard Sump, e.g. 0.5% grade, 2% cross slope, 3" deep, $0.002n = 2.1$ c.f.s..
3. Assume inlet intercepts 100% of flow.



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50.40 Flood Plain Study

- 1) A floodplain study shall be provided for development within floodplain on all tracts or parcels of land within unincorporated St. Louis County identified as numbered and unnumbered A Zones, and AE, AO, and AH Zones on the current Flood Insurance Rate Maps (FIRM) for St. Louis County. No development within these areas shall be permitted except after the issuance of a floodplain development permit.
- 2) All plan sheets of the floodplain study shall be signed and sealed by a Missouri Registered Professional Engineer.
- 3) The floodplain study shall be submitted, reviewed, and approved prior to issuance of any building permits or approval of any Preliminary Plans, Site Plans, or Site Development Plans.
- 4) The base flood elevation and floodplain and floodway limits based on the current FIRM shall be delineated on the plans. The FIRM panel number and the delineated location of the development on the FIRM shall be provided on the plans. Delineation of the surveyed 100-year high water elevation limits shall be provided if different from the FIRM floodplain limits.
- 5) A benchmark from the "St. Louis County Benchmark System" shall be utilized on the plans, and level loop notes signed and sealed by a Missouri Registered Land Surveyor shall be provided from the St. Louis County benchmark to the on-site benchmark(s). The Internet address for the St. Louis County Benchmark System website is:

[www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/
TransportationPublicationsManuals/BenchMarkSystem](http://www.stlouisco.com/YourGovernment/CountyDepartments/Transportation/TransportationPublicationsManuals/BenchMarkSystem)
- 6) All existing and proposed structures shall be shown on the plans along with their low floor elevations. All existing and proposed improvements shall be identified on the plans.
- 7) New construction and substantial-improvement structures shall have the low floor elevated to 1 foot above the base flood elevation.
- 8) New public roadways shall be constructed so that roadway shoulders are set to a minimum of 1 foot above the base flood elevation.
- 9) All necessary permits and approvals from other agencies, including the Metropolitan St. Louis Sewer District (MSD) and the U.S. Army Corps of Engineers, shall be obtained prior to floodplain study approval.
- 10) The floodplain study shall comply with all requirements of Chapter 1003 (the Zoning Ordinance), and Chapter 1008 (Floodplain Management Regulations) of the Revised Ordinances of St. Louis County Missouri.
- 11) If unauthorized fill has been placed on a tract, the floodplain study shall be based upon the existing terrain prior to the placement of the unauthorized fill.

- 12) Any development within regulatory floodway shall be prohibited unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice by a Missouri Registered Professional Engineer that the floodway encroachment will not result in any increase in flood levels during the occurrence of the base (100-year) flood discharge. An Engineering No-Rise certification signed and sealed by a Missouri Registered Professional Engineer shall be provided prior to floodplain study approval for any work within regulatory floodway.

FEMA Flood Insurance Rate Maps (FIRM) are available online through the FEMA Map Service Center. The internet address for FEMA is: www.fema.gov. The direct Flood Map Service Center address is: <https://msc.fema.gov/portal>. Enter **St. Louis County, Missouri** in the Search Box and click on the "Search" button.

50.50 Sump Pump Discharge

- 1) **Drain to a Street Inlet** - Line shall be placed in the one-foot grass area behind the sidewalk and discharge into the street inlet three (3') feet below the top of the inlet.
- 2) **Drain to a Field Inlet in Backyard**
 - a) Line shall connect to a collector line in the backyard located in an easement. The collector line shall discharge into the field inlet three (3') feet below the top of the structure. Within the boundaries of the Metropolitan St. Louis Sewer District (MSD), the connection shall be made in accordance with the requirements of MSD.
 - b) Line may discharge into an open swale through adjacent backyards to the field inlet. The swale must be located in an easement dedicated to Subdivision Trustees for sump pump drainage purposes.
- 3) **Drain to Natural Discharge** - Line may discharge in a natural discharge point located on the same property.
- 4) **Drain to Common Ground** - Line may discharge on the same property where drainage continues to common ground without traversing adjacent lots.
- 5) **Special Conditions**
 - a) In all cases, sump pump discharge lines shall leave the foundation of the building at an elevation that allows gravity flow to a discharge point.
 - b) Lines shall not cross under roadways.
 - c) Lines shall not discharge on sidewalks or at roadway curbs.
 - d) Lines shall not connect directly to a storm sewer pipe.
 - e) Lines in right-of-way shall not be maintained by St. Louis County, but shall be the responsibility of the property owner.
 - f) Special Use Permits for all lines in right-of-way are required.
 - g) Collector line runs are recommended where lines are parallel and draining to the same discharge point.
 - h) Connection to structures shall be grouted and sealed per St. Louis County Standards or the Metropolitan St. Louis Sewer District (MSD) requirements.
 - i) A hold harmless agreement is required to indemnify and hold harmless the County, its agents, officers and employees, from any and all claims, lawsuits and expenses, including attorney's fees and court costs, made, brought or incurred for injuries to persons or property caused by the work contemplated in connection with sump pump discharge lines.

- j)** All easements dedicated for use by sump pumps shall be the maintenance responsibility of the Subdivision Trustees or individual property owner and not the responsibility of St. Louis County.
- k)** In new subdivisions, it is recommended that the Consultant Engineer design the discharge lines into the approved subdivision plans, eliminating the need for separate approval and issuance of a separate Special Use Permit (SUP).

50.60 Miscellaneous Storm Water Requirements

- 1) A land disturbance permit is required prior to any land disturbance (clearing and grubbing, grading, etc.) on the site. No significant change in watersheds as determined by the Department and the Metropolitan St. Louis Sewer District (MSD) shall be permitted.
- 2) Interim stormwater drainage control in the form of siltation control measures are required, in compliance with St. Louis County's Land Disturbance Code.
- 3) Submit to the Planning Commission an engineering plan, approved by the Department of Transportation, showing that adequate handling of the stormwater drainage of the site is provided.
- 4) The developer is required to provide adequate stormwater systems in accordance with St. Louis County Standards and the requirements of MSD where applicable.
- 5) All stormwater shall be discharged at an adequate natural discharge point. Sinkholes are not considered adequate discharge points.
- 6) Ponds and/or lakes will be dewatered at a rate not to exceed a 15-year design storm to protect against erosion and siltation damage to adjacent properties and roads.
- 7) If required by ordinance and prior to any grading of a site, a bond shall be posted in an amount determined by the Department to assure maintenance of the quality of detention areas on adjoining or downstream property. Said bond shall remain in effect through the construction phases and until eighteen (18) months after the completion of the last structure on the site.
- 8) Foundation and building permits will be withheld, by the Department of Public Works, for any lot that adjoins the common ground and/or detention basin areas until a written certification is received, from the Department, stating that the areas have been graded in accordance with the approved plans.
- 9) New flood management projects located within the County are assessed for impacts on water quality. Existing projects are assessed for incorporation of additional water quality protection devices or practices, where feasible. Flood management projects in the plan area can include: regional storm water control (retention basins, detention basins); flood control levees and associated pump stations; storm water drainage conveyance capacity improvements; bridges and culverts; projects involving land buyouts; and designated uses of flood plain land.

Storm water management projects in both development and re-development are assessed for water quality impact, according to MSD's "Rules and Regulations and Engineering Design Requirements for Storm Water Drainage Facilities", which address the "Storm Water Management Plan" water quality requirements under Minimum Control Measure #5 located in the St. Louis County, "Phase II Storm Water Management Plan" and Chapter 10 of the St. Louis County "Operations and Maintenance Manual". Projects within designated levee districts, such as Monarch-Chesterfield, Earth City and Riverport are based on the "Storm Water Master Plan" for these districts. All flood management projects involving channel modification will also be assessed for aquatic and water quality impacts through the Corps of Engineers 404 permit and MDNR 401 water quality certification process.

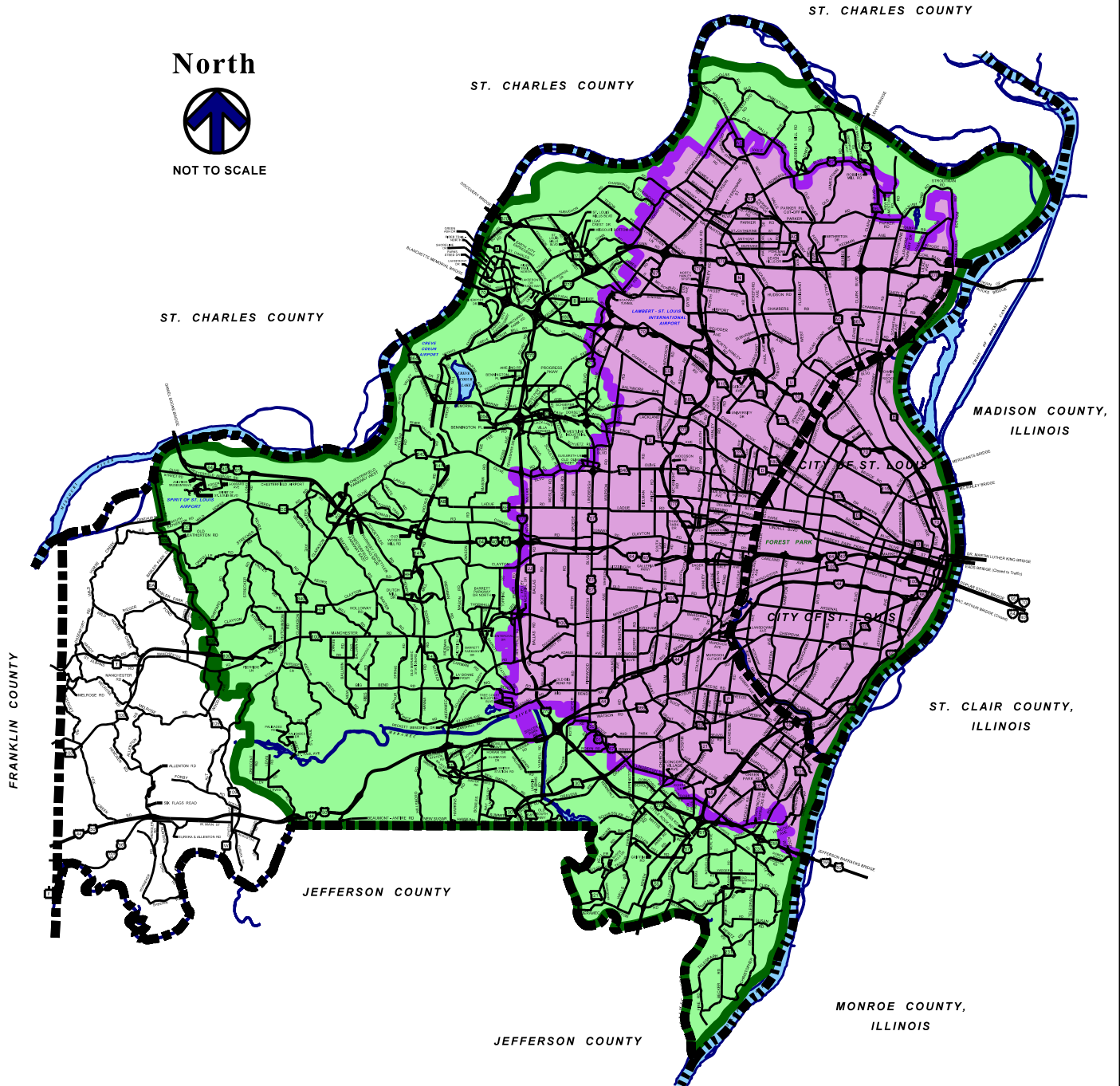
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METROPOLITAN ST. LOUIS SEWER DISTRICT (MSD) BOUNDARIES

North



NOT TO SCALE



- Old Metropolitan St. Louis Sewer District (MSD) Boundary
- New Metropolitan St. Louis Sewer District (MSD) Boundary

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55.10 Area Within Metropolitan St. Louis Sewer District (MSD) Boundary

The procedures and responsibilities of review, permit issuance, inspection, fees and escrows within the Metropolitan St. Louis Sewer District (MSD) (original and annexed) are as follows:

MSD Responsibilities

- 1) Review and approve plans for sanitary sewers, storm sewers, improved channels, detention basins and sinkholes.
- 2) Review and approve flood plain studies in areas that include structures connected to sanitary sewers in accordance with St. Louis County, Federal Emergency Management Agency (FEMA) criteria and MSD criteria.
- 3) Issue permits, after plan approval, for sanitary sewers, storm sewers, improved channels and detention basins.
- 4) Establish an escrow for proposed sanitary sewers, storm sewers, improved channels and detention basins. The escrows are to be released upon completion of MSD requirements.
- 5) Collect inspection fees based on MSD's present ordinances.
- 6) Inspect installation of sanitary sewers and storm sewers to a point approximately one foot above the pipe. Inspect improved channels and detention basins.
- 7) Maintain all public sanitary sewers, public storm sewers and improved channels.
- 8) Review proposed treatment or utilization of sinkholes on sites.

MSD Non-Responsibilities

- 1) Does not review or approve land disturbance plans nor inspect grading.
- 2) Does not inspect sanitary and storm sewer backfill from a point approximately one foot above the pipe to the surface.
- 3) Does not maintain detention basins. This will be the responsibility of the subdivision trustees or private property owners.
- 4) Does not inspect or maintain private storm sewer systems.
- 5) Does not maintain grated troughs, cross road culverts, bridges, roadside ditches, non-MSD standard structures, driveway culverts or pipe runs to the first approved MSD structure downstream.
- 6) Does not maintain unimproved channels and unimproved sinkholes.

St. Louis County Responsibilities

- 1) Review and approve land disturbance plans.
- 2) Review and approve public storm sewers as they affect the public road right-of-way. Review, approve and inspect private storm sewers. This will include off site systems draining to the right-of-way to assure proper size, hydraulic grade lines, backyard drainage which may result in exceeding our criteria of 1 c.f.s. draining between houses and over public sidewalks.
- 3) Review and approve flood plain studies in accordance with St. Louis County and FEMA criteria.
- 4) Establish an escrow through the Planning Department for storm sewers within public road right-of-way and to the first storm structure downstream from right-of-way. Notify the Department of Planning regarding release of escrow upon completion of construction.
- 5) Authorize work through subdivision plan approval or through issuance of a Special Use Permit for storm sewers (within or affecting the public road right-of-way or private storm sewers included with non-residential development) and grading.
- 6) Collect fees for inspection of the storm sewers (as they affect the public road right-of-way) and land disturbance per St. Louis County Ordinance.
- 7) Inspect storm sewer backfill from a point one foot above the pipe to the surface in all areas affecting the public road right-of-way.
- 8) Maintains the following within the public road right-of-way: bridges, crossroad culverts, driveway culverts, roadside ditches, grated troughs, County approved non-standard storm facilities and pipe runs to the first approved MSD structure downstream. Provide emergency maintenance on systems within MSD jurisdiction when conditions threaten the safety of the public. Repairs may be of a temporary or permanent nature.

55.20 Area Outside Metropolitan St. Louis Sewer District (MSD) Boundary

The procedures and responsibilities of review, permit issuance, inspection, fees and escrows as they relate to this area are as follows:

MSD Responsibilities

MSD has no responsibility for sanitary sewers and storm sewers or detention basins. However, if this area is annexed by MSD, all requirements on 55.10 would apply.

St. Louis County Responsibilities

- 1) Review and approve land disturbance plans.
- 2) Review and approve public and private storm sewers, improved channels and detention basins. This will include off site systems draining to the right-of-way to assure proper size, hydraulic grade lines, backyard drainage which may result in exceeding our criteria of 1 c.f.s. draining between houses and over public sidewalks.
- 3) Review and approve flood plain studies in accordance with St. Louis County and Federal Emergency Management Agency (FEMA) criteria.
- 4) Establish an escrow through the Department of Planning for storm sewers, improved channels and detention basins. Notify the Department of Planning regarding release of escrows upon completion of construction.
- 5) Issue permits by plan approval or through issuance of Special Use Permit (SUP) and land disturbance permits for storm sewers, grading, improved channels and detention basins.
- 6) Collect fees for inspection of storm sewers, grading, improved channels and detention basins as they affect the public road right-of-way per St. Louis County Ordinance.
- 7) Inspect storm sewers.
- 8) Maintain the following storm structures within the public road right-of-way: storm sewers, bridges, crossroad culverts, driveway culverts, roadside ditches, grated troughs, and non-standard storm structures. Maintain public storm sewers on private property from the public road right-of-way to the first storm structure downstream from the right-of-way.

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60.00 **Permit Requirements**

No person, firm or corporation shall develop, alter or modify any tract of land or roadway within unincorporated St. Louis County or any roadway designated as an Arterial Road (ARS) within any St. Louis County municipality without first securing the approval of the improvements plans as required by the Department, nor shall any person, firm or corporation undertake such work or cause the same to be undertaken without first obtaining the required permits from the Agency having jurisdiction over the proposed construction.

- 1) **Permit Applicant** - The applicant shall be the owner or the individual or legal entity having the legal right to the control of the facilities being constructed or improved.

- 2) **Plans and Fees** - Applications for permits shall be submitted in accordance with the following:
 - a) The starting point for all permit applications for development projects in unincorporated St. Louis County and in those municipalities which have contracted with St. Louis County for building code administration, land disturbance, and drainage review will be the Permit Application Center (PAC). The PAC is located at:

**St. Louis County Department of Public Works
County Administration Building
41 South Central Avenue - 6th Floor
Clayton, Missouri, 63105**

Telephone No.: (314) 615-4269

All inquiries concerning permits should be made at this office.

-
- b) **Permit Office** - All applications, fees, plans, correspondence and related information shall be submitted directly to:

**St. Louis County Department of Transportation
41 South Central Avenue - 6th Floor
Clayton, Missouri 63105**

Attention: Special Use Permit Section

**Telephone No.: (314) 615-8515
(8:00 a.m. to 4:30 p.m., Monday - Friday)**

Fax No.: (314) 615-7084

At other hours or on Saturday, Sundays and holidays, all telephone communication shall be directed to the St. Louis County Police Department Information Center at (314) 889-2341, or the Department's Dispatcher at (314) 615-1111.

- b) The applicant shall submit four (4) sets of plans for residential developments. They shall be submitted directly to:

**St. Louis County Department of Transportation
41 South Central Avenue - 6th Floor
Clayton, Missouri 63105**

Attention: Plan Review Section

Telephone No.: (314) 615-8517

- d) **Utility Relocations** - When utility relocations are required to accomplish the construction proposed within the public right-of-way, the applicant shall coordinate his activities with the utility forces performing the work. All correspondence, plans and other information relating to the relocations shall be submitted directly to:

**St. Louis County Department of Transportation
41 South Central - 6th Floor
Clayton, Missouri 63105**

Attention: Utilities Coordinator

Telephone No.: (314) 615-8515

Fax No.: (314) 615-7084

Permit taken out for utility work shall name the utility company responsible for the work as the applicant, and the company performing the work as the contractor.

- c) Permits shall cover all construction or other activities within the right-of-way of all public roads in unincorporated St. Louis County and roads under the County Arterial Road System (ARS) within municipalities, as well as certain easements for sidewalk, drainage, etc. Special Use Permits shall not be required for approved subdivision developments.
- d) **Special Use Permit (SUP) Fees** - In Section 1105.060, St. Louis County Revised Ordinances 1974, as amended, the County Council has established permit and inspection fees as follows:

- i) Special Use Permit Fee (Utilities) \$116 per unit
Special Use Permit Fee (Development) \$208 per unit
- ii) Fees for Special Use Permits shall be based on the direct cost to St. Louis County associated with plan review, permit issuance and inspection. Fee deposits shall be determined from the estimated inspection time. The difference between the deposit and the actual cost shall be collected or refunded.
- iii) Checks for permit fees shall be made payable to: "Treasurer, St. Louis County".

- iv) Permit fees shall be based on a unit cost system. Units applicable to new construction shall consist of the following: pavement widening, sidewalk, curb and gutter, grading and restoration, sewers and utility facilities in increments of three hundred (300) lineal feet. Driveway entrances, temporary driveway entrances, drainage structures and utility service connections installed individually shall be considered one (1) unit each.
 - v) When water mains, gas mains, trunk or lateral sewers, or telephone or power conduits are to be installed continuously for a distance within the public right-of-way, permit fees shall be based on one (1) unit for each continuous three hundred (300) feet of trench length of main, sewer or conduit or portion thereof.
 - vi) When individual connections to water mains, gas mains, trunk or lateral sewers, or telephone or power conduits are installed concurrently with such mains, sewers or conduits, the trench lengths of the individual connections located within the public right-of-way shall be totaled and added to the trench length of the continuous mains, sewers or conduits. Permit fees shall be based on the aggregate trench length of main, sewer or conduits including the portion of attendant connections located within the public right-of-way.
 - vii) When telephone or power poles are to be installed continuously, not necessarily consecutively, within the public right-of-way, permit fees shall be based on one (1) unit for each four (4) poles or portion thereof. When fire hydrants are to be installed within the public right-of-way, permit fees shall be based on one (1) unit for each three (3) hydrants or portion thereof.
 - viii) A permit shall be required for the transportation of any over dimension and/or overweight vehicle. The permit fee shall be based on one (1) unit for each individual over dimension and/or overweight move. However, over dimension and/or overweight permits for vehicles regularly used by utilities to transport poles, mains, conduits, etc. shall be obtained annually at the rate of one (1) unit per vehicle or trailer per month.
- d) **Charge for Returned Check** - There is hereby imposed a charge of Fifteen Dollars (\$15) upon any person, firm, corporation or association, who tenders payment of any taxes, licenses, permits, or any other charge or fee, which is required by law or by ordinance to be paid to St. Louis County or any officer or official thereof, by check, and said check is returned for insufficient funds, or for any other reason is returned without payment by the bank or other financial institution upon which it is drawn.
- 3) **Occupancy Permits** - All of the requirements of site development, including right-of-way dedication, pavement widening, driveways, sidewalks, sewers, etc., shall be completed prior to the issuance of an occupancy permit or as otherwise conditioned by the County's Ordinance or required by the Municipality. In the absence of specific ordinance or municipal conditions, the site improvement requirements shall be completed in accordance with the terms and conditions of the Department's Special Use Permit (SUP).

4) **Other Permits** - Permits or approval may be required from one or more of the following agencies:

a) **St. Louis County Department of Public Works
County Government Center
41 South Central Avenue - 6th Floor
Clayton, Missouri 63105**

**Division of Code Enforcement
Telephone: (314) 615-7150**

**Plan Review
Telephone: (314) 615-5485**

b) **Metropolitan St. Louis Sewer District (MSD)
2350 Market Street
St. Louis, Missouri 63103-2555**

Telephone: (314) 768-6200

c) **Missouri Department of Transportation (MoDOT)
1590 Woodlake Drive
Chesterfield Missouri 63017**

Telephone: (314) 340-4100

d) Municipalities

e) Private Sewer Companies

5) **Additional Permit Information** - Refer to the "**Special Use Permit Website**", "**Special Use Permit Application**", and the "**Special Use Permit Manual**" publications, available on the St. Louis County Department of Transportation's Internet "Publications & Manuals website at:

***[www.stlouisco.com/YourGovernment/CountyDepartments/
HighwaysandTraffic/HighwayPublicationsManuals](http://www.stlouisco.com/YourGovernment/CountyDepartments/HighwaysandTraffic/HighwayPublicationsManuals)***

61.00 Permit and Services Fees

PERMIT FEES EFFECTIVE JANUARY 1, 2005

Fees for St. Louis County Department of Transportation's permits and services increased on January 1, 2005. The current permit fees are as follows:

<u>Service</u>	<u>Rate</u>
Special Use Permit	\$ 208 / Unit
Special Use Permit - Utilities *	\$ 116 / Unit
Compression Strength Testing	\$ 11 / Each
Core Drilling and Extraction	\$ 43 / Each
Steel Testing Services	\$ 45 / Each
Subdivision Inspection Fees	\$ 108 / Hour

The Department of Transportation has not had an increase in their rates since 1989. St. Louis County hired an independent firm, MAXIMUS, to conduct a study of all St. Louis County rates in 2003. The new rates listed above are per their recommendation, with the exception of Special Use Permits related to utilities. The study recommended a rate of \$208 per unit, but upon further evaluation of MAXIMUS' figures by our Department, we discovered an error in the methodology and recalculated the rate as shown above.

The St. Louis County Council passed Ordinance 22,102 and Ordinance 22,069 in 2004, which authorizes the increase of these fees. These ordinances can be viewed on-line on the "**St. Louis County Council Archive Search**" at <http://councilarchive.stlouisco.com/>. In the search area type **22,102** ; in the pull down menu below choose "**the exact phrase**"; under "**Indexes to search**" highlight "**Ordinances**"; and then click on the "**Search**" button. Click on the "**22102.DOC**" file in the left-hand column and a copy of the document will appear. Do the same to view Ordinance 22,069.

* **Special Use Permit - Utilities** shall be defined as permits for utility companies, plumbers, banners, over-dimensional moves, etc. that either do not require plans, or that require plans but do not require the seal of a Missouri Professional Engineer (P.E.).

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**65.00 Right-of-Way, Easements, Subordination Agreements
and Licenses**

Right-of-way, easements, subordination agreements and licenses are located as follows:

<u>Subject Name</u>	<u>Page Number</u>
Single Lot Development	65.00-1
Subdivision Developments	65.00-1, 2, 3 & 4
Subordination Agreements (Script Type 1)	65.00-5
Subordination Agreements (Script Type 2)	65.00-6 & 7
Temporary Slope Construction License	65.00-8

SINGLE LOT DEVELOPMENT

When construction or development of residential, commercial, industrial, cultural and institutional uses requires the dedication of right-of-way or establishment of easements and/or licenses as provided for in the Zoning Ordinance, no approval of improvement plans shall be granted until verification or guarantee of the recording of the above instruments has been received by the Department. All dedication documents involved with roadway improvements and storm drainage installations shall be reviewed and approved by the Department prior to recording.

Dedications shall be prepared and executed on forms furnished by the Department or other instruments as approved by the County Counselor.

Instrument forms provided for use in this book are located in Section 65.10, "Right-of-Way, Easement, Subordination Agreement and License Forms".

For right-of-way dedications and establishment of easements and/or licenses as provided for in the Subdivision Ordinance, the following script (starting on Page 65.00-2) shall be used as a standard on plats to be recorded.

SUBDIVISION DEVELOPMENTS

- 1) We, the undersigned, owners of the tract of land herein platted and further described in the foregoing surveyors' certificate have caused the same to be surveyed and subdivided in the manner shown on this plat, which subdivision shall hereafter be known as _____ Plat _____. _____ Drive 50' wide, _____ Court 50' wide and the _____ wide dedication strip along the (North, East, South, West) line of _____ Road (Street, etc.), _____ wide, together with all cul-de-sacs and rounding's located at the street intersections, which for better identification are shown cross hatched on this plat, are hereby dedicated to St. Louis County for public use forever.

- 2) All easements shown on this plat, unless designated for other specific purposes, are hereby dedicated to St. Louis County, Missouri; Laclede Gas Company; AT&T Missouri; Missouri-American Water Company; Ameren Missouri; Metropolitan St. Louis Sewer District; and Charter Communications; their successors and assigns as their interests may appear for the purpose of improving, constructing, maintaining and repairing public utilities and sewer and drainage facilities, with the right of temporary use of adjacent ground not occupied by improvements for the excavation and storage of materials during installation, repair or replacement of said utilities, sewers and drainage facilities.

(If a separate easement is requested by Missouri-American Water Company add their requested wording as follows: An easement is thereby granted to the Missouri-American Water Company, its successors and assigns to lay, repair, replace and forever maintain its water mains and hydrants in the easement delineated and shown on the plat hereon as "Easements to Missouri-American Water Company".)

- 3) Permanent Drainage Easements (PDE) are hereby dedicated to St. Louis County, Missouri, for public use forever.

- 4) Permanent Footing Easements (PFE) are hereby dedicated to St. Louis County, Missouri, for public use forever.

- 5) Permanent Roadway Improvement, Maintenance, Utility, Sewer and Sidewalk Easements (PRIMUS & SE) are hereby dedicated to St. Louis County, Missouri, for public use forever.

- 6) Permanent Sidewalk, Sewer and Utility Easements (PSS & UE) are hereby dedicated to St. Louis County, Missouri, for public use forever.

- 7) Permanent Sidewalk, Sewer and Utility Easements (PSS & UE) abutting Missouri Department of Transportation (MoDOT) right-of-way are hereby dedicated to St. Louis County, Missouri, for public use forever, and said sidewalks are to be maintained by the property owner or Trustees of the aforementioned subdivision.

- 8) Permanent Sight Distance Easements (PSDE) are hereby dedicated to St. Louis County, Missouri, for public use forever, to ensure and protect the clear and unobstructed view of motorists on and entering the adjacent roadway. No part of said easement shall be built on with any structure (including signs, fences or poles) or planting (including any trees, shrubs, grass, or weeds) in any manor whatsoever, nor shall the grade of the land within the easement be changed, unless expressly approved by the Director of the St. Louis County Department of Transportation. Any structure or planting approved by the Director shall be

maintained to provide sight distance. Any structures, plants or grading which is not approved by the Director, or which is not maintained, shall be removed or corrected.

- 9) Permanent Traffic Signal Easements (PTSE) are hereby dedicated to St. Louis County, Missouri, for public use forever.
- 10) All common ground easements, such as cul-de-sac islands and divided street islands, or median strips, are hereby dedicated to the Trustees of the aforementioned subdivision for landscape maintenance. However, no above ground structure, other than required street lights or other public utilities in accordance with the approved improvement plans, may be constructed or installed within a cul-de-sac island, divided street island, or median strip, without authorization by the St. Louis County Department of Transportation through the issuance of a Special Use Permit (SUP).
- 11) Temporary turnaround easements are hereby dedicated to St. Louis County, Missouri for use as a temporary turnaround until such time as the public street is extended and accepted for maintenance by St. Louis County, following which said easement areas are considered to be automatically null and void.
- 12) The Detention Easements as shown on this plat is hereby given, granted, extended and conveyed to the Trustees of the aforementioned subdivision for exclusive right to build and maintain a sewer or sewers, including stormwater improvements, on the strip or strips of ground which have been identified on this plat, and to use such additional space adjacent to the easement so granted as may be required for working room during the construction, reconstruction, maintenance, or repair of the aforementioned sewer or sewers, including stormwater improvements, and may assign its rights in this easements to the State, County, City or other political subdivision of the State.
- 13) The Temporary Slope Construction Licenses (TSCL) shown hereon are for the purpose of making cuts, fills, sloping embankment, constructing drives providing work room and implementing any and all other related construction items, until such time as construction may be completed and accepted by St. Louis County, Missouri. Upon completion and acceptance of the project by St. Louis County, Missouri or its assigns, this easement shall terminate.
- 14) The retaining wall maintenance and access easement as shown hereon is hereby dedicated to the Trustees of the aforementioned subdivision for the purpose of constructing, maintaining and repairing a retaining wall, with the right of temporary use of adjacent ground not occupied by improvements for the excavation and storage of materials during installation, repair or replacement of said retaining wall.
- 15) The entrance monument easements as shown hereon are hereby dedicated to the Trustees of the aforementioned subdivision, its successors and assigns, for the purpose of erecting subdivision signs/monuments and landscape maintenance, and become the sole ownership and maintenance, responsibility of the Trustees, and its successors and assigns.
- 16) Building lines as shown on this plat are hereby established. This subdivision is subject to conditions and restrictions to be filed.
- 17) It is hereby certified that all existing easements are shown on this plat as of the time and date of recording of this plat.

IN WITNESS THEREOF, I have hereunto set my hand this _____
day of _____, 20_____.

(SEAL)

(Name)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20_____
before me appeared _____ to me personally
known, who, being by me duly sworn, did say that they are the _____
of _____, a Corporation of the State
of _____ and that the seal affixed to the foregoing instrument is the
corporate seal of said corporation, and the said instrument was signed and sealed in behalf of
said corporation, by authority of its Board of Directors; and said _____
acknowledged said instrument to be the free act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed by official seal in
the _____ and State aforesaid, the day and year first above written.

Notary Public

My Commission expires: _____

[Where aerial or air space rights are requested above and across dedicated public rights-of-way and/or easements, a Special Agreement must be submitted for approval by the County Counselor and the Department.

In cases where easements are recorded after the preliminary subdivision plat or single lot site plan is approved by St. Louis County, all such prior recorded easements shall necessitate a complete subordination to any and all rights in the public right-of-way or streets to be dedicated to public use. (Refer to "Standard Subordination Script (Type 1)" on page 65.00-5.)

In cases where recorded easements appear on the preliminary subdivision plat or single lot site plan that were recorded prior to approval of said preliminary plat or site plan, a subordination agreement must be executed. (Refer to "Standard Subordination Script (Type 2)" on page 65.00-6.)]

SUBORDINATION AGREEMENTS

The following script shall be used as the standard subordination agreement required when easements across the public right-of-way are recorded after the preliminary subdivision plat or single lot site plan has been approved.

Standard Subordination Script (Type 1)

The easements herein depicted as previously dedicated to _____ in Deed Book _____, Page(s) _____, are hereby made subject to and subordinate to all easements and rights-of-way herein granted to St. Louis County, Missouri.

IN WITNESS WHEREOF, the said party of the first part has hereunto set its hand the day and year first above written.

(Corporation)

Attest: _____ Secretary By: _____ (Title)

(SEAL)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me appeared _____ to me personally known, who, being by me duly sworn, did say that they are the _____ of _____, a Corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation, by authority of its Board of Directors; and said _____ acknowledged said instrument to be the free act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed by official seal in the _____ and State aforesaid, the day and year first above written.

Notary Public

My Commission expires: _____

The following script shall be used as the standard subordination agreement required when easements have been recorded prior to the approval of the preliminary subdivision plat or single lot site plan.

Standard Subordination Script (Type 2)

The easements herein depicted as previously dedicated to _____ in Deed Book _____ Page(s) _____ are hereby made subject to and subordinate to all easements and rights-of-way herein granted to St. Louis County, Missouri.

Cost of all needed relocation of Grantor's facilities or damages to lines, facilities or appurtenances due to County construction will be borne by County.

Grantor reserves for itself, its successors and assigns, all rights it now has in the above described property not herein specifically conveyed, including the right to repair, maintain and expand its facilities. In the event of future improvement, reconstruction or maintenance of Grantor's lines under such road or street, Grantor will replace the existing roadway in accordance with County Standards.

In the event of future improvement or reconstruction of the road or street involved, County will advise Grantor of such contemplated change and, if such contemplated change necessitates the relocation or any other modification of Grantor's facilities, County will reimburse Grantor for cost and expenses incurred by Grantor in relocating or otherwise adjusting its facilities, all of which were originally located on private rights-of-way and which are not included in said new road or street rights-of-way.

IN WITNESS WHEREOF, the said Grantor has caused these presents to be executed the day and year first above written.

(Corporation)

Attest: _____
Secretary

By: _____
Title

(SEAL)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me appeared _____ to me personally known, who, being by me duly sworn, did say that he/she is the _____ of _____, a Corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation, by authority of its Board of Directors, and said _____ acknowledged said instrument to be the free act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed by official seal in the _____ and State aforesaid, the day and year first above written.

Notary Public

My Commission expires: _____

TEMPORARY SLOPE CONSTRUCTION LICENSE

A temporary slope construction license for a period of time not to exceed _____ consecutive days from and after the time of the execution of a certain construction contract for the improvement of _____ Road, during which period of time not exceeding _____ days Defendant's use of the land next hereinafter described will be limited for the purpose of permitting Plaintiff's contractor to enter upon and occupy said land with workmen, materials and equipment in order to shape, smooth, contour and sod the slopes of cuts and fills and construct cross access drives and/or temporary detour road in and upon the following described parcel of land.

65.10 Right-of-Way, Easement, Subordination Agreement and License Forms

Preparation Notes for the Documents Included in this Section:

The documents make reference to an attached Exhibit "A". This attachment can be provided by developing an Instrument Exhibit Plat pursuant to the requirements shown on page 65.10-4.


Use the appropriate notary acknowledgement for each document (individual notary or corporate notary acknowledgment as shown on page 65.10-3).

The documents and exhibits must be a size of 8½" x 11", for execution and recording in the Office of the Recorder of Deeds.


<u>Name of Document</u>	<u>Page Number</u>
General Warranty Deed	65.10-2
Individual and Corporate Notaries	65.10-3
Limited Liability Company (L.L.C.) Notary	65.10-4
Format for Instrument Exhibit Plat (Exhibit "A")	65.10-5
Permanent Roadway Improvement, Maintenance, Utility, Sewer and Sidewalk Easement (PRIMUS & SE or P.R.I.M.U.S. & S.E.).....	65.10-6
Permanent Drainage Easement (PDE or P.D.E.)	65.10-7
Permanent Sidewalk, Sewer and Utility Easement (PSS & UE or P.S.S. & U.E.)	65.10-8
Permanent Sidewalk Easement (PSE or P.S.E.).....	65.10-9
Permanent Traffic Signal Easement (PTSE or P.T.S.E.).....	65.10-10
Permanent Site Distance Easement (PSDE or P.S.D.E.).....	65.10-11
Permanent Retaining Wall Easement (PRWE or P.R.W.E.).....	65.10-12
Permanent Footing Easement (PFE or P.F.E.).....	65.10-13
Temporary Slope Construction License (TSCL or T.S.C.L.).....	65.10-14
Temporary Demolition, Backfill and Construction License (TDB & CL or T.D.B. & C.L.)	65.10-15
Subordination Agreement	65.10-16 & 17
Cross Access Agreement	65.10-18
Permanent Discharge Easement.....	65.10-19

GENERAL WARRANTY DEED

THIS DEED made and entered into this _____ day of _____, 20____, by and between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri, 63105, Grantee.

WITNESSETH: that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, Grant, Bargain and Sell, Convey and Confirm unto the Grantee, the following interests in real estate situated in St. Louis County, Missouri and indicated by the hatched area  on the attached Exhibit "A".

TO HAVE AND TO HOLD the same, together with all rights and appurtenances to the same belonging, unto the Grantee, and to its assigns and successors forever.

A Temporary Slope Construction License for the purpose of making cuts, fills and sloping embankment, constructing drives, providing working room and implementing any and all other related construction items over the real estate indicated by the cross-hatched area  on the attached Exhibit "A" until such time as _____ may be completed and accepted by St. Louis County. Upon the granting or denial of acceptance by St. Louis County or its assigns, this License shall terminate.

Grantor(s) covenant(s) that no installation will be placed on the above platted land as will interfere with the proper construction of the aforementioned project until this license is terminated.

The Grantor(s) hereby covenanting that _____ and _____ heirs, executors and administrators, shall and will Warrant and Defend the title to the premises unto the Grantee, and to its assigns and successors forever against the lawful claims of all persons whomsoever, excepting, however, the general taxes for the calendar year 20_____ and thereafter, and the special taxes becoming a lien after the date of this deed.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.

(Corporation Name) _____

Attest: _____
Secretary

(SEAL) _____

(Individual Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____ to me personally known to be the person(s) described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____
Notary Public

(Corporate Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____ to me personally known, who, being by me duly sworn, did say that they are the _____ of _____, a Corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said Corporation, by authority of its Board of Directors; and said _____ acknowledged said instrument to be the free act and deed of said Corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____
Notary Public

(Limited Liability Company (L.L.C.) Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____, to me personally known, who, being by me duly sworn, did say that they are the Managing Member / Member of _____, L.L.C., and that they executed the foregoing agreement pursuant to the authority given to them by the Operating Agreement of said Limited Liability Company, and acknowledged that they executed the same on behalf of said Limited Liability Company as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

My term expires: _____

Notary Public

Format for Instrument Exhibit Plat (Exhibit "A")

This form has been provided to show the format of the exhibit plat to accompany dedication instruments or special escrow documents. This document must be no larger than 8½" x 11" in size for execution and recording in the Office of the Recorder of Deeds.

Plat preparation shall conform to the applicable requirements of Section 1005.090 of the Subdivision Ordinance. Use of this form as an instrument exhibit requires the right-of-way, easement or license area to be identified with hatching or cross-hatching (whichever is appropriate) on the exhibit and in the boxed space provided within the instrument.

For exhibit purposes, portions of the construction plan which illustrate the improvements to be covered by Agreement Guaranteeing Road Improvement (Special Escrow) can be inserted in this space. Refer to Section 70.00 for requirements.


(Insert the drawing, marked appropriately, in this space)

Exhibit "A"

(Insert the title of the drawing in this space)

**PERMANENT ROADWAY IMPROVEMENT,
MAINTENANCE, UTILITY, SEWER AND SIDEWALK EASEMENT**

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee a permanent easement to improve, construct, repair and maintain roadway improvements, utilities, stormwater and sanitary sewers and sidewalks in and upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT DRAINAGE EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20 ____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do ____ by these presents, grant unto the Grantee a Permanent Drainage Easement to construct, repair and maintain drainage and sanitary sewer structures in and upon the real estate indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do ____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said Grantor(s) ha ____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT SIDEWALK, SEWER AND UTILITY EASEMENT

THIS INDENTURE made and entered into this _____ day of _____ 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do____ by these presents, grant unto the Grantee, a permanent easement to improve, construct, repair and maintain sidewalks, stormwater and sanitary sewers and utilities in and upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever. However, where sidewalk is located adjacent to and abutting Missouri Department of Transportation (MoDOT) road right-of-way, said party of the first part does hereby covenant to St. Louis County that said party of the first part, _____ heirs, successors and assigns, will maintain and repair the sidewalk in perpetuity, it being intended that this covenant shall run with the land.

The Grantor(s) do____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT SIDEWALK EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of _____, State of _____, Grantor(s) part and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee, a permanent easement to construct, repair and maintain a sidewalk in and upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD the same, together with all rights and appurtenances to the same belonging, unto the Grantee, and to its successors and assigns forever. The Grantor(s) hereby covenanting that _____ and _____ heirs, executors and administrators shall and will Warrant and Defend the title to the premises unto the Grantee, and to its successors and assigns forever against the lawful claims of all persons whomsoever, excepting, however, the general taxes for the calendar year 20_____ and thereafter, and the special taxes becoming a lien after the date of this deed.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT TRAFFIC SIGNAL EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee, a Permanent Traffic Signal Easement to construct, improve, repair and maintain traffic signals and appurtenant structures in and upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate's indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT SIGHT DISTANCE EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s), and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the said Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) paid by the Grantee, the receipt of which is hereby acknowledged, grant and convey unto the Grantee, a Permanent Sight Distance Easement as indicated by  on the attached Exhibit "A" to ensure and protect the clear and unobstructed view of motorists on and entering the adjacent roadway. No part of said easement shall be built on in any manner whatsoever, nor shall the grade of the land within the easement be changed, nor shall grantor erect, plat, allow or permit any structure (including sign, fence or pole) or planting (including any tree, shrub or grass or weed) within said easement unless expressly approved by Director of the St. Louis County Department of Transportation. Any structure or planting approved by the Director shall be maintained by Grantor(s). Any structure, plant, or grading which is not approved by the Director or which is not maintained may be removed or corrected by Grantee at the expense of Grantor(s).

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) hereby covenant to ST. LOUIS COUNTY, MISSOURI that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said Grantor(s) ha____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT RETAINING WALL EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s), and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee a permanent easement to construct, repair and maintain a retaining wall and appurtenances in and upon the following described premises situated in the County of St. Louis and State of Missouri, and indicated by  on the attached Exhibit "A" hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.

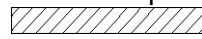
(Corporation Name)

Attest: _____
Secretary

(SEAL)

PERMANENT FOOTING EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s), and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee, a permanent easement for the construction maintenance and repair of a retaining wall footing to be constructed in and upon the following described premises situated in the County of St. Louis and State of Missouri, and indicated by  on the attached Exhibit "A" hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

TEMPORARY SLOPE CONSTRUCTION LICENSE

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s), and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee, a Temporary Slope Construction License upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate indicated by  on the attached Exhibit "A" hereby made a part of this Indenture.

SAID Temporary Slope Construction License is granted for the purpose of making cuts, fills and sloping embankment, constructing drives, sidewalks, temporary roadways, and overhead utilities, etc., if any, providing working room and implementing any and all other construction items until such time as _____ may be completed and accepted by St. Louis County. Upon the granting or denial of acceptance by St. Louis County or its assigns, this license shall terminate.

Grantor(s) covenants that no installation will be placed on the above platted land as will interfere with the proper construction of the aforementioned project until this license is terminated.

IN WITNESS WHEREOF, the Grantor(s) ha_____ executed these presents the day and year first above written.


(Corporation Name)

Attest: _____
Secretary

(SEAL)

TEMPORARY DEMOLITION, BACKFILL AND CONSTRUCTION LICENSE

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s), and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do____ by these presents, grant unto the Grantee, a license to demolish and remove from the land hereinafter described the existing structures thereon, to backfill to adjoining ground level the excavation resulting from said removals and to make cuts, fills and sloping embankments, provide working room and implementing any and all other related incidental construction items, including temporary roadways if necessary, over the following described land, situated in the County of St. Louis and State of Missouri, and indicated by  on the attached Exhibit "A" hereby made a part of this Indenture.

TO HAVE AND TO HOLD the same, together with all rights, immunities, privileges, structure salvage, and appurtenances thereto belonging unto the Grantee as licensee, for the purpose of demolishing and removing the existing structures thereon, backfilling the excavation resulting therefrom and for related incidental construction items as stated herein above over the said land as described until such time as St. Louis County PROJECT NO. _____ has been completed and accepted by ST. LOUIS COUNTY, MISSOURI. Upon such acceptance by ST. LOUIS COUNTY, MISSOURI, or its assigns, this license shall thereupon terminate. Grantor(s) covenants that no installations will be placed on the above described land as will interfere with the proper use proposed by this license until it is terminated.

IN WITNESS WHEREOF, the Grantor(s) ha____ executed these presents the day and year first above written.

(Corporation Name)

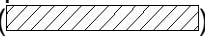
Attest: _____
Secretary

(SEAL)

SUBORDINATION AGREEMENT

THIS AGREEMENT by and between _____ a corporation of the State of Missouri (hereinafter "_____"), Grantor(s), and ST. LOUIS COUNTY, MISSOURI, a political subdivision of the State of Missouri, (hereinafter "County"), Grantee, entered into effective as of the date accepted by County as hereinafter set out,

WITNESSETH:

WHEREAS, _____ has been requested to subordinate its private easement rights pertaining to the property or easement shown hatched on Exhibit "A" () and legally described in Exhibit "B", both attached hereto and incorporated herein by reference, to County, for public street, road, or highway purposes; and

WHEREAS, _____ is willing to accommodate to said request upon the condition that County accepts the provisions hereinafter set out and evidences its said acceptance by the execution hereof in duplicate by its agent duly authorized in accordance with R.S.Mo. 1978 Section 432.070 and County Ordinance No. _____.

NOW THEREFORE, in consideration of the covenants and conditions hereinafter set out, _____ hereby declares its said easement rights pertaining to the property described in Exhibit "B" to be subordinated in favor of County for public street, road, or highway purposes:

- 1) Said subordination shall be without prejudice to _____ rights to maintain, repair, construct, reconstruct, improve, and expand its facilities upon, over or under said street, road, or highway; provided however, that in the event that said future maintenance, repairs, construction, reconstruction, improvement, or expansion of _____ facilities shall damage said street, road, or highway, _____ shall repair said damage, in accordance with County's standards.
- 2) In the event that County shall plan repairs, improvements, widening, or relocation, of said street, road, or highway, County shall give _____ reasonable advance notice thereof, and if the foregoing shall necessitate the relocation, modification, or adjustment of _____ facilities, _____ shall perform same upon County's agreeing to reimburse _____ for the costs and expenses incurred by _____ thereby.

ATTEST: _____

Secretary

By: _____
Title: _____
Date: _____

The foregoing Subordination Agreement is hereby accepted on behalf of St. Louis County by the undersigned, pursuant to authority of the St. Louis County Council by Ordinance No. _____, which is in effect as of the date of this acceptance.

ST. LOUIS COUNTY, MISSOURI

Approved:

Director,
Department of Transportation & Public Works

Approved as to Legal Form:

County Counselor

ATTEST: _____
Administrative Director

By: _____
County Executive

Preparation Notes for Subordination Agreement:

Two (2) fully executed copies of this Subordination Agreement form with the required Instrument Exhibit Plat (Exhibit "A") and Legal Description (Exhibit "B"), must be submitted to the St. Louis County Department of Transportation for processing.

The second paragraph on page 65.10-15 makes reference to an attached Exhibit "A". This attachment can be provided by developing an Instrument Plat pursuant to the requirements shown on page 65.10-4.

The Subordination Agreement and Exhibits, as described on pages 65.10-15 and 65.10-16, must be prepared at a size of 8½" x 11", for execution and recording in the Office of the Recorder of Deeds.

CROSS ACCESS AGREEMENT

THIS AGREEMENT made and entered into this day _____ of _____, 20____, by and between _____, owner of a tract of land described in Deed Book _____, Page _____ of the St. Louis County Records, Grantor(s), and _____, owner of a tract of land described in Deed Book _____, Page _____, of said County Records and _____, owner of Lot _____ of _____, a subdivision according to the plat thereof, recorded in Plat Book _____, Page _____ of said County Records, Grantee(s).

NOW THEREFORE, it is the desire of the Grantor(s) to grant to the Grantee(s) and to their respective successors and assigns, their tenants, subtenants, licensees, and the respective officers, employees, agents, representative, customers and invitees, the nonexclusive right, privilege and easement to use drives and roads as may now or from time to time hereafter be situated on the property of the Grantor(s) for ingress and egress to the property of the Grantee(s), and to the public road by automobile or other passenger vehicle. Said easement being shown on Exhibit "A" and fully described on Exhibit "B", both attached hereto and incorporated herein by reference. Said easement shall be perpetual, and further, shall run with the real estate of the Grantor(s) forever. The Grantor(s) agrees not to obstruct the aforesaid roadway by means of a fence or other barrier, and further, to keep a road open and usable on their property leading from the aforesaid roadway to the public road so that there will be continuing access to the public road through the real estate of the Grantor(s). No such access way shall be relocated, narrowed or otherwise altered without the approval of the St. Louis County Department of Transportation, and the St. Louis County Department of Planning, on a revised circulation plan and the easement hereby established shall apply fully to such altered access way.

IN WITNESS WHEREOF, the said Grantor(s) ha____ executed these presents the day and year first above written.

(Corporation Name)

Attest: _____

Secretary

(SEAL)

PERMANENT DISCHARGE EASEMENT

THIS INDENTURE made and entered into this _____ day of _____, 20 ____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do____ by these presents, grant unto the Grantee a Permanent Discharge Easement for the purpose of draining and discharging storm water onto Grantor's property indicated by //////////////// on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever. The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said Grantor(s) ha_____ executed these presents the day and year first above written.

(Corporation Name) _____

Attest: _____
Secretary

(SEAL)

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70.00 Agreement Guaranteeing Road Improvement **(Special Escrow)**

The Department will, where certain roadway improvements cannot be constructed or completed, require the establishment of a special escrow and agreement guaranteeing the future completion of required improvements.

- 1) This special escrow procedure can be utilized for all forms of development (i.e., residential, commercial, industrial, etc.) and covers:
 - a) Improvements not already provided for under escrow agreement in accordance with Section 1005.080 of St. Louis County's Subdivision Ordinance entitled "Improvements Installed or Guaranteed".
 - b) Improvements previously covered under Section 1005.080, which by virtue of the pending expiration of the land subdivision bond or escrow agreement are renewed by a Special Escrow and agreement under this procedure.
 - c) Improvements requiring acquisition of right-of-way, easements, and/or grading and sloping licenses from adjacent properties, which require litigation.
- 2) The Special Escrow Agreement shall provide that there shall be deposited with St. Louis County to be held in the Department's fund:
 - a) A cash amount not less than; or
 - b) An Irrevocable Letter of Credit (refer to Section 70.20) from a commercial banking institution to St. Louis County guaranteeing the availability of a sum which shall be not less than the amount specified in the estimate of cost of the improvements as reflected by the approved construction plans.
- 3) The special escrow agreement shall be prepared and executed on forms furnished by the Department (format shown on pages 70.00-3 through 70.00-6, preparation notes are on page 70.00-2) and shall be submitted to the St. Louis County Council for approval or disapproval.
- 4) For cash amounts to be deposited with St. Louis County, make check payable to "**Treasurer, St. Louis County**".

Preparation Notes:

Items 1, 3 and 4 on pages 70.00-3 and 70.00-4, make reference to Exhibit "A". This attachment can be provided by modifying the plats used to dedicate right-of-way widening or easements to show sidewalk or other minor improvements to be covered by the Special Escrow. The Exhibit shall measure 8½" x 11" in size. Where major roadway facilities such as a lane widening, storm sewer segments, bridge widening, traffic signals, etc., are approved for Special Escrow, a portion of the construction plan illustrating the improvement shall be developed as an Exhibit pursuant to requirements shown on page 65.10-4.

The Agreement Guaranteeing Road Improvement (Special Escrow - Cash) as shown on pages 70.00-3 through 70.00-6, may be used as a sample in the preparation of forms for execution and submittal to the Department. The forms shall be 8½" x 11" in size.

Seven (7) fully executed copies of this form with exhibits and any other required attachments, must be submitted to the St. Louis County Department of Transportation for processing.

AGREEMENT GUARANTEEING ROAD IMPROVEMENT
(SPECIAL ESCROW - CASH)

THIS AGREEMENT made and entered into this _____ day of _____, 20____, by _____ (hereinafter referred to as "Owner"), and St. Louis County, Missouri (hereinafter referred to as "County").

WITNESSETH:

WHEREAS, the preliminary plans have been approved for the development of _____ on _____ (hereinafter referred to as "Road"), and

WHEREAS, approval is conditioned upon Owner providing right-of-way and easement dedications, temporary slope construction licenses and improvements to said road along the limits of the property in accordance with plans on file with the St. Louis County Department of Transportation (hereinafter referred to as "Department");

NOW, THEREFORE, in consideration of the covenants, promises and agreement herein provided:

IT IS HEREBY MUTUALLY AGREED THAT:

- 1) Owner has deposited with Director of Administration the cash sum of _____ DOLLARS (hereinafter referred to as "Cash Sum"), to be held by County for the purpose of payment for the construction of road improvements by County on the Road as shown on Exhibit "A", attached hereto and by this reference made a part hereof, and subject to modifications determined by Director of the St. Louis County Department of Transportation (hereinafter referred to as "Director") and the substitution of alternate improvements of said Road or its appurtenances in an area other than that appearing on Exhibit "A", if so determined by Director.
- 2) Cash Sum may be expended by Director upon any of the following:
 - a) Issuance of a work order by Director to perform road improvements on the Road, with County forces.
 - b) An order of the County Council, authorizing Director to advertise for bids prior to awarding a contract for construction of road improvements on the Road, as shown on the contract plans.
 - c) Approval by Director of plans by another party for road improvements on the Road, said improvements to be constructed under the direction of the Department.

- 3) The term "road improvements on the road" as used herein shall include the substitution of alternate improvements of said road or its appurtenances in an area other than that appearing on Exhibit "A".
- 4) Owner shall provide required temporary slope construction licenses and dedicate to the County, the necessary easements and/or right-of-way along the road as shown on Exhibit "A".
- 5) Director of Administration hereby acknowledges the receipt of the deposit of the Cash Sum.
- 6) Director of Administration may release to the owner all remaining amounts of the Cash Sum upon certification by Director that the improvements have been constructed in accordance with the approved plans, at which time this Agreement shall terminate.
- 7) County understands and agrees that performance by the owner in full accordance with all terms and conditions of this Agreement shall satisfy in full all participation in road improvements on the road required of the owner as prescribed herein.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement this _____ day of _____, 20____.

By: _____

(Individual Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____ to me personally known to be the person(s) described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____
Notary Public

(Corporate Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____ to me personally known, who, being by me duly sworn, did say that they are the _____ of _____, a Corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said Corporation, by authority of its Board of Directors; and said _____ acknowledged said instrument to be the free act and deed of said Corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____
Notary Public

(Limited Liability Company (L.L.C.) Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____, to me personally known, who, being by me duly sworn, did say that they are the Managing Member / Member of _____, L.L.C., and that they executed the foregoing agreement pursuant to the authority given to them by the Operating Agreement of said Limited Liability Company, and acknowledged that they executed the same on behalf of said Limited Liability Company as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

My term expires: _____
Notary Public

ST. LOUIS COUNTY, MISSOURI

ATTEST:

CHAIRMAN, ST. LOUIS COUNTY COUNCIL

ADMINISTRATIVE DIRECTOR

APPROVED:

**DIRECTOR, DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS**

APPROVED AS TO LEGAL FORM:

COUNTY COUNSELOR

The undersigned, representing the Director of Administration of St. Louis County, hereby certifies that _____ has deposited the cash sum of _____ dollars in the Treasury of St. Louis County, in the Special Transit Account (Fund 533).

TREASURER, ST. LOUIS COUNTY

70.20 Irrevocable Letter of Credit

In accordance with the provisions of the Subdivision Ordinance, the Department will, in conjunction with Agreement Guaranteeing Road Improvement (Special Escrow), accept, as an alternate to the deposit of a cash sum, an irrevocable letter of credit issued in accordance with the following conditions:

- 1) Letters of credit shall guarantee the availability of a sum, which shall not be less than the amount specified in the estimate of cost of the improvements as reflected by the approved construction plans.
- 2) Letters of credit shall be drawn on local commercial banking institutions.
- 3) Letters of credit issued by non-local commercial banking institutions shall provide for confirmation through local commercial banking institutions.
- 4) The base amount of the letter of credit may be reduced commensurate with cost of road improvements completed and accepted by the Department. Developer shall provide cost estimate of completed improvements and submit estimate to the Department for verification forty-five (45) days prior to letter of credit date of renewal.
- 5) For letters of credit which must be renewed, the base amount in effect on the date of renewal or as adjusted in accordance with previous Item 4, shall be increased (but not decreased) in the same proportion as any increase in the construction cost index, as determined by the Director of the St. Louis County Department of Transportation, in effect as of the renewal date over the same index in effect one year before the renewal date.
- 6) The St. Louis County Department of Transportation will notify the developer (Accountee) thirty (30) days in advance of the Letter of Credit expiration. Failure to renew this Letter of Credit in accordance with the terms and conditions of this section, requires that the Department of Transportation draw upon the Letter of Credit the unpaid amount owed.
- 7) Upon completion of the development, the remaining base amount of the irrevocable letter of credit shall be refunded or converted to an Agreement Guaranteeing Road Improvement (Special Escrow) to insure completion of any remaining required improvements. Refer to Section 70.00 for requirements.
- 8) Letters of Credit shall conform to the format shown on pages 70.20-2 through 70.20-10.
- 9) Letters of Credit shall be governed by the laws of the State of Missouri, but subject however, to the Uniform Custom and Practices for Documentary Credits, 2007 Revision, International Chamber of Commerce Commission Publication No. 600, but excluding the provisions of Article 32 thereof (the "UCPDC"). Any dispute or litigation shall be conducted in a St. Louis County, Missouri, Court or a location designated by the County Counselor.

LETTER OF CREDIT

*****NAME OF ISSUING BANK*****

*****Bank Address*****

_____, 20____

IRREVOCABLE LETTER OF CREDIT NO. _____

St. Louis County, Missouri
County Government Center
41 South Central
Clayton, Missouri 63105

Attention: Treasurer's Office

Dear Sir or Madam:

We hereby establish in your favor, [upon the application of and] for the account of **[developer name and address]** ("Account Party") our transferable irrevocable standby letter of credit (the "Letter of Credit") in the amount of **[letter of credit amount words and numbers]** (the "Maximum Available Credit"), subject to the reduction as hereinafter set forth.

For information only: This letter of credit is issued with respect to a road improvement **[identify the project including the engineering firm who created the plans for the project]** ("Approved Plans").

Subject to all of the terms and conditions of this Letter of Credit, the Maximum Available Credit shall be made available by your draft(s) at sight drawn on us accompanied by this letter of credit and any amendments thereto for presentation and by the following documents:

- 1) Your signed certificate, in the form attached hereto as Exhibit A, dated not more than ten days prior to its presentation to us; or
- 2) Your signed certificate, in the form attached hereto as Exhibit B, dated not more than ten days prior to its presentation to us; or

No draft will be paid if the amount thereof is in excess of the Maximum Available Credit hereunder as of the date such draft is to be paid.

Multiple drawings may be presented under this Letter of Credit, which, in the aggregate and subject to the limitations set forth herein, shall not exceed the Maximum Available Credit then in effect and each such drawing honored by us hereunder shall reduce the Maximum Available Credit by the amount of such drawing. The draft(s) drawn under this Letter of Credit must be drawn and presented to our offices at *****Bank Address***, Attention: _____** (or such other officer, department or address designated in writing by us to you at your address shown above or at such other address as you shall advise us of in writing) by hand delivery or by delivery by courier between 9:00 a.m. and 4:30 p.m. (St. Louis, Missouri time) on a Business Day. As used in this Letter of Credit, "Business Day" shall mean any day other than a Saturday, Sunday or a day on which banking institutions in the State of Missouri are authorized or required by law to close.

We hereby agree that all drafts drawn under and in compliance with the terms of this Letter of Credit will be duly honored by us upon delivery of any of the certificate(s) specified above and if presented at our aforesaid office on or before the Expiration Date (as defined below).

If demand for payment is made hereunder in strict conformity with the terms and conditions of this Letter of Credit before 11:00 a.m. (St. Louis, Missouri time) on any Business Day, payment of the amount demanded shall be made in immediately available funds not later than 1:00 p.m. (St. Louis, Missouri time) on the third succeeding Business Day.

Payment under this Letter of Credit to you shall be made by wire transfer of immediately available funds per your instructions.

Only you or a transferee may make drawings under this Letter of Credit. Upon payment as provided above of the amount specified in a sight draft drawn hereunder, the Maximum Available Credit of the Letter of Credit shall be reduced by the amount of the payment.

If demand for payment does not conform to the terms and conditions of this Letter of Credit, we will promptly notify you thereof and of the reasons therefore, such notice to be promptly confirmed in writing to you, and we shall hold all documents at your disposal or return the same to you, if directed by you.

This Letter of Credit is effective immediately and expires on the earliest of **(1)** 4:00 p.m. (St. Louis, Missouri time) on **[date - 1 year from the date issued]**, (the "Expiration Date") as such date may be extended as hereinafter provided; **(2)** when you have drawn and we have paid to you the Maximum Available Credit of this Letter of Credit; or **(3)** the day on which this Letter of Credit is surrendered to us for cancellation; provided, however, notwithstanding the termination by expiration of this Letter of Credit our payment obligation shall survive such expiration with respect to any sight drafts accompanied by a certificate in the form of Exhibits A or B, as the case may be, presented to us for payment prior to the expiration of this Letter of Credit. It is a condition of this Letter of Credit that it shall be deemed automatically extended, without amendment for one year from the present or any future Expiration Date hereof, unless at least 75 days prior to any such date, we shall send you, in the form attached hereto as Exhibit C, notice that we elect not to consider this Letter of Credit renewed for such additional one-year period. This Letter of Credit will expire in full and finally on **[date - 2 years from the date issued]** (the Final Expiration Date).

This Letter of Credit may be amended at the request of the Account Party. Such amendment shall be sent to you in the form attached hereto as Exhibit F.

Upon our receipt, from time to time, from you of a written reduction certificate in the form attached as Exhibit D, we are authorized to reduce the Maximum Available Credit hereunder by the amount stated in such certificate, any such reduction to be effective only at our close of business on the date on which we receive such written reduction certificate.

This Letter of Credit shall be governed by the laws of the State of Missouri, but subject however, to the Uniform Custom and Practices for Documentary Credits, 2007 Revision, International Chamber of Commerce Commission Publication No. 600, but excluding the provisions of Article 32 thereof (the "UCPDC"). Any dispute or litigation shall be conducted in a St. Louis County, Missouri, Court or a location designated by the County Counselor.

Any communications with respect to this Letter of Credit shall be in writing and shall be addressed to us at *****Bank Address*** Attention: _____**, specifically referring thereon to Irrevocable Letter of Credit No. _____.

You may transfer your rights under this Letter of Credit in their entirety (but not in part) to any transferee. Transfer of your rights under this Letter of Credit to any such transferee shall be effected only upon the presentation to us of this Letter of Credit accompanied by a transfer letter in the form attached hereto as Exhibit E, and we consent to such transfer without charges or fees of any kind. Upon such transfer, the transferee shall have no further rights to transfer this Letter of Credit.

This Letter of Credit sets forth in full our undertaking, and such undertaking shall not in any way be modified, amended, amplified or limited by reference to any document, instrument or agreement referred to herein (including, without limitation, the Approved Plans), and any such reference shall not be deemed to incorporate herein by reference any document, instrument or agreement with the exception of Exhibits A through F hereto are incorporated herein by reference as an integral part of this Letter of Credit.

Sincerely,

*****NAME OF ISSUING BANK*****

By: _____
Authorized Officer

EXHIBIT A
TO LETTER OF CREDIT
FORM OF CERTIFICATE FOR "A" DRAWING

_____, 20__

*****Name of Issuing Bank*****

*****Bank Address*****

Attention:

Re: Your Letter of Credit No. _____
In Favor of St. Louis County, Missouri

Dear Sir or Madam:

The undersigned, a duly authorized official of St. Louis County, Missouri (the "Beneficiary"), hereby certifies to *****Name of Issuing Bank***** (the "Bank"), with reference to Irrevocable Letter of Credit No. _____ (The "Letter of Credit"; any capitalized terms used herein and not defined shall have their respective meanings as set forth in the said Letter of Credit) issued by the Bank in favor of the Beneficiary, that:

- 1) The Account Party has failed to complete all improvements required by the Approved Plans.
- 2) The draft in the sum of \$ _____ accompanying this Certificate is not in excess of the Maximum Available Credit of the Letter of Credit and shall result in a reduction of the Maximum Available Credit of the Letter of Credit.

Transfer the funds as stated above to the credit of St. Louis County to *****Name of County Depository***** for the account of ABA _____, Attention _____
Reference _____.

IN WITNESS WHEREOF, the Beneficiary has executed and delivered this Certificate this _____ day of _____, 20_____.

ST. LOUIS COUNTY, MISSOURI

By: _____
Treasurer

EXHIBIT B
TO LETTER OF CREDIT
FORM OF CERTIFICATE FOR "B" DRAWING

_____, 20____

*****Name of Issuing Bank*****

*****Bank Address*****

Attention:

Re: Your Letter of Credit No. _____
In Favor of St. Louis County, Missouri

Dear Sir or Madam:

The undersigned, a duly authorized official of St. Louis County, Missouri (the "Beneficiary"), hereby certifies to *****Name of Issuing Bank***** (the "Bank"), with reference to Irrevocable Letter of Credit No. _____ (The "Letter of Credit"; any capitalized terms used herein and not defined shall have their respective meanings as set forth in the said Letter of Credit) issued by the Bank in favor of the Beneficiary, that:

- 1) The Expiration Date of the Letter of Credit is _____, _____, which date is not more than thirty days from the date of this Certificate.

(EITHER)

- 2) The Beneficiary has not received written notification of any amendment to the Letter of Credit which extends the Expiration Date.

(OR)

- 2) The Beneficiary has received written notification that the Letter of Credit will not be renewed.
- 3) The draft in the sum of \$ _____ accompanying this Certificate is not in excess of the Maximum Available Credit of the Letter of Credit and shall result in a reduction of the Maximum Available Credit of the Letter of Credit.

Transfer the funds as stated above to the credit of St. Louis County to *****Name of County Depository***** for the account of ABA _____ Attention _____
Reference _____.

IN WITNESS WHEREOF, the Beneficiary has executed and delivered this Certificate this _____ day of _____, _____.

ST. LOUIS COUNTY, MISSOURI

By: _____
Treasurer

EXHIBIT C
TO LETTER OF CREDIT
FORM OF NOTICE OF EXPIRATION

_____, 20__

St. Louis County, Missouri
County Government Center
41 South Central
Clayton, Missouri 63105

Attention: Treasurer's Office

Re: Our Letter of Credit No. _____
In Favor of St. Louis County, Missouri

Amount:
Expiration Date:

Dear Sir or Madam:

Please consider this letter as our notification that the above referenced letter of credit will expire in full and finally on the above-mentioned date.

Sincerely,

*****NAME OF ISSUING BANK*****

By: _____
Authorized Officer

cc: *****Account Party*****
*****Account Party Address*****

EXHIBIT D
TO LETTER OF CREDIT
FORM OF REDUCTION CERTIFICATE

St. Louis County
Department of Transportation
1050 N. Lindbergh Boulevard
Creve Coeur, Missouri 63132

_____, 20__

*****Name of Issuing Bank*****

*****Bank Address*****

Attention:

LETTER OF CREDIT NUMBER: _____
IN ORIGINAL AMOUNT OF: \$ _____

Dear Sir or Madam:

This certificate authorizes reduction in the amount of \$ _____ of the above letter of credit. The remaining maximum available credit for this letter of credit is \$ _____.

ST. LOUIS COUNTY, MISSOURI

By: _____
Treasurer

Memo to Developer: for information only.

(This portion will be provided for developer's information and will not form a part of the reduction certificate.)

EXHIBIT E
TO LETTER OF CREDIT
FORM FOR FULL TRANSFER OF LETTER OF CREDIT

_____, 20__

*****Name of Issuing Bank*****

*****Bank Address*****

Attention:

Re: Your Letter of Credit No. _____
In favor of St. Louis County, Missouri

Dear Sir or Madam:

The undersigned, St. Louis County, Missouri ("Transferor") has transferred (and hereby confirms said transfer) all of its rights in and under the above referenced Letter of Credit to **[name and address of Transferee]** ("Transferee"). Transferor confirms that it no longer has any rights under or interest in said Letter of Credit and that you shall have no further responsibility to make payment under said Letter of Credit to Transferor.

Transferor hereby surrenders said Letter of Credit to you and requests that you note the transfer of said Letter of Credit and deliver the Letter of Credit, amended or endorsed to reflect said transfer, to Transferee.

ST. LOUIS COUNTY, MISSOURI

[NAME OF TRANSFEREE]

By: _____
***[Name and Title of Authorized
Official of Transferor]***

By: _____
***[Name and Title of Authorized
Officer of Transferee]***

EXHIBIT F
TO LETTER OF CREDIT
FORM OF AMENDMENT TO EXTEND EXPIRATION DATE

_____, 20____

LETTER OF CREDIT NO. _____
AMENDMENT NO. _____

St. Louis County, Missouri
County Government Center
41 South Central
Clayton, Missouri 63105

Attention: Treasurer's Office

Dear Sir or Madam:

This Letter of Credit is hereby amended as follows:

- 1) Maximum Available Credit is \$ _____.
- 2) The Expiration Date is extended to _____.
- 3) The sentence which states that this Letter of Credit is automatically extended is deleted.
- 4) The sentence which states the full and final expiration date is deleted.

Please consider this letter as our notification that the above-referenced letter of credit will expire in full and finally on the date stated in paragraph 2 above.

Sincerely,

*****NAME OF ISSUING BANK*****

By: _____
Authorized Officer

INFORMATION ONLY. This Letter of Credit relates to:

(ROAD PROJECT NAME)
(ROAD PROJECT NUMBER)

cc: *****Account Party*****
*****Account Party Address*****

AGREEMENT GUARANTEEING ROAD IMPROVEMENT
(SPECIAL ESCROW - IRREVOCABLE LETTER OF CREDIT)

THIS AGREEMENT made and entered into this _____ day of _____, 20____, by _____ (hereinafter referred to as "Owner"), and St. Louis County, Missouri (hereinafter referred to as "County").

WITNESSETH:

WHEREAS, the preliminary plans have been approved for the development of _____ on _____ (hereinafter referred to as "Road"); and

WHEREAS, approval is conditioned upon Owner providing right-of-way and easement dedications, temporary slope construction licenses and improvements to said road along the limits of the property in accordance with plans on file with the St. Louis County Department of Transportation (hereinafter referred to as "Department");

NOW, THEREFORE, in consideration of the covenants, promises and agreement herein provided:

IT IS HEREBY MUTUALLY AGREED THAT:

- 1) Owner has deposited with Director of Administration an Irrevocable Letter of Credit from the _____ in St. Louis in the amount of _____ DOLLARS (\$_____) (hereinafter referred to as "Credit Sum"), to be held by County for the purpose of payment for the construction of road improvements by County on the Road as shown on Exhibit "A", attached hereto and by this reference made a part hereof, and subject to modifications determined by the Director of the St. Louis County Department of Transportation (hereinafter referred to as "Director") and the substitution of alternate improvements of said Road or its appurtenances in an area other than that appearing on Exhibit "A", if so determined by Director.
- 2) Credit Sum may be expended by Director upon any of the following:
 - a) Issuance of a work order by Director to perform road improvements on the Road, with County forces.
 - b) An order of the County Council, authorizing Director to advertise for bids prior to awarding a contract for construction of road improvements on the Road, as shown on the contract plans.
 - c) Approval by Director of plans by another party for road improvements on the Road, said improvements to be constructed under the direction of the Department.

- 3) The term "road improvements on the Road" as used herein shall include the substitution of alternate improvements of said Road or its appurtenances in an area other than that appearing on Exhibit "A".
- 4) Owner shall provide required temporary slope construction licenses and dedicate to County necessary easements and/or right-of-way along the Road as shown on Exhibit "A".
- 5) Director of Administration hereby acknowledges the receipt of the Irrevocable Letter of Credit.
- 6) Director of Administration may release to Owner all remaining credit amounts upon certification by Director that the improvements have been constructed in accordance with the approved plans, at which time this Agreement shall terminate.
- 7) County understands and agrees that performance by Owner in full accordance with all terms and conditions of this Agreement shall satisfy in full all participation in road improvements on the Road required of Owner as prescribed herein.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement this _____ day of _____, 20_____.

[NAME OF OWNER]

By: _____

(Individual Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20_____, before me personally appeared _____ to me personally known to be the person(s) described in and who executed the foregoing instrument, and acknowledged that they executed the same as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____

Notary Public

(Corporate Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____ to me personally known, who, being by me duly sworn, did say that they are the _____ of _____, a Corporation of the State of _____, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said Corporation, by authority of its Board of Directors; and said _____ acknowledged said instrument to be the free act and deed of said Corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal in the County and State aforesaid, the day and year first above written.

My term expires: _____
Notary Public

(Limited Liability Company (L.L.C.) Notary)

STATE OF MISSOURI)
) SS.
COUNTY OF ST. LOUIS)

On this _____ day of _____, 20____, before me personally appeared _____, to me personally known, who, being by me duly sworn, did say that they are the Managing Member / Member of _____, L.L.C., and that they executed the foregoing agreement pursuant to the authority given to them by the Operating Agreement of said Limited Liability Company, and acknowledged that they executed the same on behalf of said Limited Liability Company as their free act and deed.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

My term expires: _____
Notary Public

ST. LOUIS COUNTY, MISSOURI

Attest:

CHAIRMAN, ST. LOUIS COUNTY COUNCIL

ADMINISTRATIVE DIRECTOR

Approved:

Approved as to Legal Form:

**DIRECTOR, DEPARTMENT OF
TRANSPORTATION & PUBLIC WORKS**

COUNTY COUNSELOR

The undersigned, representing the Director of Administration of St. Louis County, Missouri, hereby certifies that _____ has deposited the credit sum of _____ dollars in the Treasury of St. Louis County, Missouri, in the Special Transit Account (Fund 533).

TREASURER, ST. LOUIS COUNTY

Preparation Notes:

Seven (7) fully executed copies of this form with exhibits and attachments must be submitted to the St. Louis County Department of Transportation for processing by St. Louis County.

70.40 Credit Letter

- 1) The St. Louis County Department of Transportation ("Department") will, as part of its Construction Plan Approval Procedure, provide credit letters identifying costs for allowable portions of the proposed improvements which can be credited towards the developer's trust fund or traffic generation assessment contribution, which must be deposited with St. Louis County prior to building permit issuance.
- 2) Where the Department has provided a Credit Letter which covers a portion of the required trust fund or traffic generation assessment contribution, the developer shall deposit the remaining difference, between the credit letter amount and the trust fund or traffic generation assessment contribution, as a cash sum, commensurate with the requested number of building permits.
- 3) Where building permits are requested prior to construction plan approval, the developer shall deposit the required amount of the trust fund or traffic generation assessment contribution, as a cash sum, commensurate with the requested number of building permits. Refund of excess trust fund or traffic generation assessment contributions, deposited in conjunction with building permit issuance, will be permitted by the Department following Construction Plan Approval, as follows:
 - a) Where the credit letter amount meets or exceeds the trust fund or traffic generation assessment amount, previously deposited contributions will be immediately refunded.
 - b) Where the credit letter amount represents a portion of total trust fund or traffic generation assessment contribution, previously deposited contributions will be retained by the Department unless otherwise requested in writing by the developer.
- 4) For multiple phase developments, construction credits from one phase will be applied to a following phase up to the amount of any remaining credit. Upon exhaustion of the credit balance, building permit issuance will be suspended until further trust fund or traffic generation assessments are deposited with St. Louis County.
- 5) If a development is acquired after a contribution has been made or road improvement credits are established, provisions for recovering any previously paid trust fund or traffic generation assessment contributions should be included in the development sales contract.
- 6) Requests for refund of excess trust fund or traffic generation assessment contribution must be made by, and refunds will be returned to, the developer who deposited the contributions or if they designate some other party.
- 7) All construction cost estimates required by this procedure shall be based on the schedule of unit prices shown in Section 73.00 and must be provided by developer's engineer and approved by the Department.

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73.00 Schedule of Unit Prices

The following Schedule of Unit Prices was produced by the St. Louis County Department of Planning and the Department of Transportation for the computation of subdivision escrows and/or bonds.

The calculated unit prices shown are based on a combination of actual prices, bid tab estimates, the Construction Cost Index (CCI) (Section 74.00), and information provided by various sources, including but limited to, the Site Improvement Association; Home Builders Association; St. Louis County Department of Planning; St. Louis County Department of Public Works; the St. Louis County Department of Transportation; etc.

Unit prices are analyzed during the last quarter of each year to determine the pricing adjustments necessary for the upcoming year to reflect a one (1) year inflationary value.

This "Schedule of Unit Prices" has been adopted by the St. Louis County Department of Transportation for use on all construction cost estimates involved with Agreements Guaranteeing Road Improvement (Special Escrow), Credit Letters (issued prior to obtaining building permit) described in Section 70.00 and 70.40 respectively and all other on-site and off-site development related improvements.

Where necessary, improvement items not shown on the "Schedule of Unit Prices" shall be submitted with the estimated cost of construction for approval by the St. Louis County Department of Transportation.

This "Schedule of Unit Prices" shall not be used for cost estimates connected with capital improvement projects designed under contract with St. Louis County.

<i>Item Description</i>	<i>2008 Unit Price</i>
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BARRICADES

Temporary Barricades	\$ 246.00	each
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COMMON GROUND AND GROUND COVER

Cul-de-Sac (Seeding)	\$ 61.50	each
Cul-de-Sac (Sodding)	\$ 594.50	each
Seeding	\$ 0.62	sq yd
Sodding	\$ 8.30	sq yd

CURB & GUTTER

Asphaltic Concrete & Bituminous Concrete Curb - 3" High Rolled	\$ 6.15	lin ft
Asphaltic Concrete & Bituminous Concrete Curb - 6" High Vertical	\$ 10.35	lin ft
Concrete Curb - 3" High Integral Rolled	\$ 8.50	lin ft
Concrete Curb - 6" High Integral Vertical (cul-de-sac)	\$ 10.35	lin ft
Concrete Curb & Gutter - 3" High Rolled	\$ 16.60	lin ft
Concrete Curb & Gutter - 6" High Vertical	\$ 20.70	lin ft

DETENTION / RETENTION BASINS

Apartments / Condominiums	# of Units x \$62 + \$9,330
Industrial / Commercial	# of Acres x \$1,238 + \$15,500
Residential	# of Lots x \$250 + \$7,750

EROSION CONTROL

Apartments / Condominiums	# of Units x \$311 + \$2,480
Industrial / Commercial	# of Acres x \$1,860 + \$1,550
Residential	# of Lots x \$372 + \$1,240

FENCES

Fence, Chain Link - 4' high	\$ 14.60	lin ft
Fence, Chain Link - 5' high	\$ 16.65	lin ft
Fence, Chain Link - 6' high	\$ 19.75	lin ft
Fence, Sight Proof, PVC - 6' high	\$ 38.95	lin ft
Fence, Sight Proof, Wood - 6' high	\$ 36.90	lin ft

GRADING

Apartments / Condominiums	# of Units x \$189 + \$4,635
Industrial / Commercial	# of Acres x \$1,558 + \$3,720
Residential	# of Lots x \$317 + \$3,110

GUARDRAIL

Guardrail (Steel).....	\$	57.40	lin ft
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PERMANENT LAKES

Permanent Lakes – Treatment per Acre of Lake	\$	12,300.00	each
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RETAINING WALLS

Concrete Retaining Wall.....	\$	912.00	cu yd
Large Panel Wall System	\$	61.50	sq ft
Precast Concrete Block Wall (Versa-Lok).....	\$	20.50	sq ft
R.R. Tie Wall (30 ties per 100 sq ft including deadmen).....	\$	29.70	per tie

SIDEWALK, WALKWAYS AND HANDICAP RAMPS

Common Ground Concrete Walkway - 4" Thick.....	\$	4.70	sq ft
Concrete Handicap Curb Ramp with Truncated Domes	\$	1,035.00	each
Concrete Sidewalk - 4" thick – 4' wide.....	\$	4.70	sq ft
Concrete Sidewalk - 4" thick – 5' wide.....	\$	4.70	sq ft
Concrete Sidewalk - 4" thick – 6' wide.....	\$	4.70	sq ft
Concrete Sidewalk - 6" thick (Residential Entrances)	\$	4.90	sq ft
Concrete Sidewalk - 7" thick (Commercial Entrances).....	\$	5.10	sq ft

SIGNS

Street Name Sign.....	\$	246.00	each
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SILTATION CONTROL

Apartments / Condominiums	# of Units x \$56 + \$2,480
Industrial / Commercial	# of Acres x \$774 + \$3,110
Residential	# of Lots x \$158 + \$2,480

<i>Item Description</i>	<i>2008 Unit Price</i>
<u>SINK HOLE TREATMENT</u>	
Capping.....	\$ 610.00 each
Venting.....	\$ 3,880.00 each
Sink Hole Treatment.....	\$ 28,315.00 each
<u>SPRINGS</u>	
Spring Treatment.....	\$ 18,450.00 each
<u>STORM SEWERS</u>	
12" Concrete Collar.....	\$ 207.00 each
15" Concrete Collar.....	\$ 259.00 each
18" Concrete Collar.....	\$ 310.00 each
24" Concrete Collar.....	\$ 388.00 each
27" Concrete Collar.....	\$ 414.00 each
30" Concrete Collar.....	\$ 440.00 each
36" Concrete Collar.....	\$ 544.00 each
42" Concrete Collar.....	\$ 621.00 each
48" Concrete Collar.....	\$ 724.00 each
12" Flared End Section.....	\$ 517.00 each
15" Flared End Section.....	\$ 569.00 each
18" Flared End Section.....	\$ 621.00 each
21" Flared End Section.....	\$ 673.00 each
24" Flared End Section.....	\$ 724.00 each
27" Flared End Section.....	\$ 828.00 each
30" Flared End Section.....	\$ 931.00 each
33" Flared End Section.....	\$ 1,294.00 each
36" Flared End Section.....	\$ 1,347.00 each
42" Flared End Section.....	\$ 1,552.00 each
48" Flared End Section.....	\$ 1,763.00 each
54" Flared End Section.....	\$ 1,865.00 each
60" Flared End Section.....	\$ 2,383.00 each
66" Flared End Section.....	\$ 2,798.00 each
72" Flared End Section.....	\$ 3,418.00 each

Item Description	2008 Unit Price
12" Headwall	\$ 1,219.00 each
15" Headwall	\$ 1,245.00 each
18" Headwall	\$ 1,255.00 each
21" Headwall	\$ 1,300.00 each
24" Headwall	\$ 1,347.00 each
27" Headwall	\$ 1,435.00 each
30" Headwall	\$ 1,609.00 each
33" Headwall	\$ 1,747.00 each
36" Headwall	\$ 1,947.00 each
42" Headwall	\$ 2,070.00 each
48" Headwall	\$ 2,280.00 each
54" Headwall	\$ 2,434.00 each
60" Headwall	\$ 2,665.00 each
66" Headwall	\$ 2,952.00 each
72" Headwall	\$ 3,157.00 each
12" RCP	\$ 34.00 lin ft
15" RCP	\$ 38.00 lin ft
18" RCP	\$ 40.00 lin ft
21" RCP	\$ 44.00 lin ft
24" RCP	\$ 50.00 lin ft
27" RCP	\$ 52.00 lin ft
30" RCP	\$ 55.00 lin ft
33" RCP	\$ 59.00 lin ft
36" RCP	\$ 62.00 lin ft
42" RCP	\$ 75.00 lin ft
48" RCP	\$ 87.00 lin ft
54" RCP	\$ 111.00 lin ft
60" RCP	\$ 133.00 lin ft
66" RCP	\$ 168.00 lin ft
72" RCP	\$ 230.00 lin ft
78" RCP	\$ 256.00 lin ft
84" RCP	\$ 316.00 lin ft
90" RCP	\$ 343.00 lin ft
96" RCP	\$ 404.00 lin ft

<i>Item Description</i>	<i>2008 Unit Price</i>
102" RCP	\$ 425.00 lin ft
108" RCP	\$ 492.00 lin ft
Area Inlet, Single.....	\$ 2,070.00 each
Area Inlet, Double	\$ 2,485.00 each
Area Inlet, Triple.....	\$ 3,105.00 each
Asphaltic Concrete Swale - 5" thick.....	\$ 5.45 sq ft
Box Culvert.....	\$ 727.00 cu yd
Concrete Encasement	\$ 220.00 cu yd
Corrugated Metal Pipe	\$ 2.70 lin ft
Corrugated Metal Pipe, Aluminum.....	\$ 3.00 lin ft
End Pipe.....	\$ 724.00 each
Energy Dissipater.....	\$ 3,625.00 each
Granular Fill per Cubic Yard	\$ 3.70 cu yd
Granular Fill per Lot	\$ 205.00 per lot
Grated Inlet	\$ 2,588.00 each
Grated Trough (Cast-Iron)	\$ 10,350.00 each
Junction Chamber.....	\$ 13,250.00 each
Overflow Structure	\$ 6,210.00 each
Paved Concrete Swale - 4" thick	\$ 4.80 sq ft
Paved Concrete Swale - 6" thick	\$ 6.40 sq ft
Paved Concrete Swale - 7" thick	\$ 8.30 sq ft
Riprap / Grouted - Heavy Stone.....	\$ 57.00 sq yd
Riprap / Revetment - Gabion Basket.....	\$ 210.00 cu yd
Riprap / Revetment - Heavy Stone	\$ 47.00 sq yd
Riprap / Revetment - Light Stone	\$ 47.00 sq yd
Storm Sewer Manhole	\$ 1,350.00 each
Street Curb Inlet, Single.....	\$ 1,350.00 each
Street Curb Inlet, Double	\$ 2,575.00 each
Street Curb Inlet, Triple.....	\$ 2,700.00 each

<i>Item Description</i>	<i>2008 Unit Price</i>
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STREET CONSTRUCTION AND WIDENING

Asphaltic Concrete Pavement (Superpave) -		
2" Type SP125(PG 70-22)CLP Wearing Surface.....	\$	13.00 sq yd
Asphaltic Concrete Pavement (Superpave) - 12" (10" Type		
SP190(PG64-22) & 2" Type SP125(PG 70-22)CLP) (ARS)	\$	82.00 sq yd
Bituminous Concrete Pavement - 2" Type C Wearing Surface	\$	12.30 sq yd
Bituminous Concrete Pavement - 9" (7" Type X & 2" Type C) (CRS).....	\$	56.40 sq yd
Bituminous Concrete Pavement - 10.5" (8.5" Type X & 2" Type C) (CRS)...	\$	67.70 sq yd
Borrow Excavation	\$	12.30 cu yd
Concrete Base - 6"	\$	45.50 sq yd
Concrete Base - 7"	\$	48.30 sq yd
Concrete Pavement - 6" PCC (Non-Reinforced) (CRS).....	\$	35.00 sq yd
Concrete Pavement - 7" PCC (Non-Reinforced) (CRS).....	\$	35.00 sq yd
Concrete Pavement - 8" PCC (Non-Reinforced) (ARS).....	\$	38.50 sq yd
Grading.....	\$	2.80 cu yd
Pavement Lugs 20' - 4' Deep (6% to 11.9% Grade)	\$	2,070.00 each
Pavement Lugs 26' - 4' Deep (6% to 11.9% Grade)	\$	2,590.00 each
Pavement Lugs 38' - 4' Deep (6% to 11.9% Grade)	\$	3,100.00 each
Pavement Lugs 20' - 5' Deep (> 12% Grade).....	\$	2,070.00 each
Pavement Lugs 26' - 5' Deep (> 12% Grade).....	\$	2,590.00 each
Pavement Lugs 38' - 5' Deep (> 12% Grade).....	\$	3,100.00 each
Rock Excavation	\$	24.40 cu yd
Subgrade Excavation.....	\$	2.80 cu yd
Saw Cutting.....	\$	5.75 lin ft
Type 5 Aggregate Base - 4"	\$	4.40 sq yd

STREET LIGHTS

Street Lights - without AmerenUE contract	\$	770.00 each
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<i>Item Description</i>	<i>2008 Unit Price</i>
<u>STREET REMOVAL</u>	
Removal of Asphaltic Concrete & Bituminous Concrete Pavement.....	\$ 20.50 sq yd
Removal of Asphaltic Concrete & Bituminous Concrete Curb	\$ 15.30 lin ft
Removal of Asphaltic Concrete & Bituminous Concrete Driveway	\$ 17.50 sq yd
Removal of Concrete Curb & Gutter.....	\$ 18.50 lin ft
Removal of Concrete Driveway	\$ 26.50 sq yd
Removal of Concrete Pavement.....	\$ 28.70 sq yd
Removal of Concrete Walk.....	\$ 2.60 sq ft
Removal of Temporary Turnaround	\$ 4,600.00 each
<u>STREET REMOVAL AND REPLACEMENT</u>	
Removal & Replacement of Asphaltic Concrete & Bituminous Concrete Pavement	\$ 56.40 sq yd
Removal & Replacement of Asphaltic Concrete & Bituminous Concrete Curb.....	\$ 30.80 lin ft
Removal & Replacement of Asphaltic Concrete & Bituminous Concrete Driveway.....	\$ 43.00 sq yd
Removal & Replacement of Concrete Curb & Gutter.....	\$ 39.00 lin ft
Removal & Replacement of Concrete Driveway	\$ 49.20 sq yd
Removal & Replacement of Concrete Pavement.....	\$ 54.30 sq yd
Removal & Replacement of Concrete Walk.....	\$ 7.30 sq ft
<u>SURVEY MONUMENTS</u>	
Survey Monuments - first 4 monuments.....	\$ 910.00 each
Survey Monuments - monuments after first 4.....	\$ 215.00 each
<u>TREES</u>	
Trees - 1.5" diameter	\$ 140.00 each
Trees - 2.0" – 2.5" diameter	\$ 180.00 each
Trees, Conifer - 4' minimum.....	\$ 88.00 each
Trees, Conifer - 6' minimum.....	\$ 145.00 each

<i>Item Description</i>	<i>2008 Unit Price</i>
<u>TURNAROUNDS</u>	
Non-Residential - 55' R, 7" Portland Cement Concrete (No Center Island) ..	\$ 26,950.00 each
Non-Residential - 55' R, Bituminous Concrete (8.5" Type X & 2" Type C) ...	\$ 26,950.00 each
Residential - 42' R, 6" Portland Cement Concrete	\$ 15,250.00 each
Residential - 42' R, Bituminous Concrete (7" Type X & 2" Type C)	\$ 15,250.00 each
Residential - 55' R, 6" Portland Cement Concrete	\$ 21,450.00 each
Residential - 55' R, Bituminous Concrete (7" Type X & 2" Type C)	\$ 21,450.00 each
Temporary Turnaround - Residential, Bituminous Concrete (7" Type X & 2" Type C)	\$ 6,400.00 each

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74.00 Annual Change of Construction Cost Index (CCI) ⁽¹⁾

<u>Year</u>	<u>Percent Change ⁽²⁾</u>	<u>Year</u>	<u>Percent Change ⁽²⁾</u>
1971.....	10.6%	2000.....	3.1%
1972.....	12.7%	2001.....	0.7%
1973.....	8.0%	2002.....	2.9%
1974.....	6.2%	2003.....	2.1%
1975.....	9.8%	2004.....	3.0%
1976.....	8.7%	2005.....	6.3%
1977.....	8.5%	2006.....	7.2%
1978.....	6.8%	2007.....	1.0%
1979.....	5.3%	2008.....	2.5%
1980.....	7.7%	2009.....	3.4%
1981.....	7.0%	2010.....	1.5%
1982.....	7.2%	2011.....	3.9%
1983.....	7.1%	2012.....	0.9%
1984.....	5.3%	2013.....	2.4%
1985.....	4.3%	2014.....	2.9%
1986.....	4.9%	2015.....	2.9%
1987.....	2.0%	2016.....	11.7%
1988.....	4.7%	2017.....	2.5%
1989.....	0.1%	2018.....	(- 0.1%)
1990.....	1.4%	2019 ⁽³⁾	1.9%
1991.....	(- 0.8%)		
1992.....	1.6%		
1993.....	2.8%		
1994.....	8.5%		
1995.....	3.2%		
1996.....	1.8%		
1997.....	4.1%		
1998.....	2.7%		
1999.....	1.9%		

⁽¹⁾ Adapted from the yearly Construction Cost Index (CCI) published in "Engineering News-Record" (ENR) magazine, published during December of the previous year.

⁽²⁾ CCI percentage change is positive unless noted as negative (i.e. 1991 & 2018).

⁽³⁾ Adopted from the 2019 CCI published in the "Engineering News-Record" magazine, published during December of the previous year.

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75.00 Traffic Generation Assessment and Trust Funds

Traffic generation assessments are imposed on certain new developments to finance the costs of roadway improvements that are necessary to relieve the impact of new development traffic.

Traffic generation assessments are used for infrastructure road improvements and may include lane widening's, geometric improvements, traffic signal facilities, bridges, overlays, purchase of off-site right-of-way, etc., on County and State roads.

- 1) Application** - Within a road trust fund area, the traffic generation assessment is computed for a development as part of the road improvement requirements established by a site-specific zoning ordinance approved by the St. Louis County Council, i.e.: rezoned/amended MXD, PEU, C-8 and M-3 zonings. The ordinance for the development may or may not describe in detail what roadway improvements are to be accomplished with the traffic generation assessment. The specific site could be located along an arterial, collector or a local roadway.

When a site-specific development ordinance is not required or when the development is outside the road trust fund area, an equivalent traffic generation assessment is computed and used as a reference in determining the extent of required roadway improvements. In this case, the authority for roadway improvements is based upon St. Louis County Subdivision Ordinance or Miscellaneous Regulations of the Zoning Ordinance for single lot development.

- 2) Rates** - The traffic generation assessment is calculated by a dollar amount per measurable unit, typically per parking/loading space. The number of parking/loading spaces is determined from the St. Louis County zoning ordinance. Refer to Section 75.10 for the traffic generation assessment rates.

On January 1 of each year, the traffic generation assessment rates are increased or decreased to account for changes in construction costs. The St. Louis County Department of Transportation ("Department") uses the percent change for the construction cost index for the St. Louis area, from December of a given year to December of the following year, as published in the Engineering News Record, to determine the rate of increase or decrease. Refer to Section 74.00, Annual Change of Construction Cost Index.

- 3) Traffic Generation Assessment Trust Funds** - Road trust fund areas were developed for unincorporated St. Louis County where significant roadway improvement needs were determined. As funds became available in each of the trust fund areas, roadway improvements would be completed along the St. Louis County Arterial Road System (ARS) within that trust fund area.

As parts of unincorporated St. Louis County were either annexed or incorporated, portions of, or all of certain road trust fund areas became located within municipalities.

In unincorporated County, traffic generation assessment funds deposited in the trust fund will be used to improve County arterials to relieve the impact from general development traffic. In isolated cases, trust funds may be used on State arterials. Trust fund improvements may include but are not limited to lane widening's, intersection geometrics improvements, traffic signals, or bridges.

Below is a current list of all road trust funds and the municipalities that geographically contain in part or total, the respective trust fund areas:

<u>FUND NO.</u>	<u>FUND NAME</u>	<u>MUNICIPALITY (If Any)</u>
506000	Hawkins - Bowles - Summit - Gravois TGA Trust Fund	Fenton
520000	Kennerly - Kerth TGA Trust Fund	Sunset Hills
521000	Pond - Grover TGA Trust Fund	Wildwood
522000	Columbia Bottom - Larimore - Lilac TGA Trust Fund	
537000	North Oakville TGA Trust Fund	
543000	Big Bend - Oak - Kiefer Creek Corridor TGA Trust Fund	Valley Park, Manchester, Ballwin & Twin Oaks
544000	Oakville TGA Trust Fund	
545000	Robertson Area TGA Trust Fund	Hazelwood
546000	Missouri Bottom TGA Trust Fund	Hazelwood & Florissant
547000	Parker - Redman TGA Trust Fund	
549000	Manchester Road Corridor TGA Trust Fund	Des Peres & Ballwin
550000	Butler Hill - Keller - Bauer Road TGA Trust Fund	
551000	Bluff - Old Halls Ferry Road TGA Trust Fund	Florissant
552000	Eatherton - Kehrs Mill Road TGA Trust Fund	Chesterfield & Wildwood
553000	Route 40 (Interstate 64) Corridor Trust Fund	Chesterfield & Town and Country
554000	Chesterfield Village Road Trust Fund	Chesterfield
555-7851	Ladue / 141 Road Trust Fund	Chesterfield
555-7852	Clayton / 141 Road Trust Fund	Town and Country
555	Gravois / 141 Road Trust Fund	Fenton
556-7892	Chesterfield Valley Trust Fund	Chesterfield & Wildwood
561000	Chesterfield Village - Phases 1, 2 & 3	Chesterfield
701000	Baptist Church - Green Park - Buckley TGA Trust Fund	Green Park
702000	New Halls Ferry Road Corridor TGA Trust Fund	Florissant
703000	Fee Fee - Schuetz - Mason - Midland TGA Trust Fund	Maryland Heights, Creve Coeur & Town and Country
704000	Wild Horse Creek TGA Trust Fund	Wildwood
705000	Fox Creek - Hornecker Corridor TGA Trust Fund	Wildwood, Eureka & Pacific

- 4) **Traffic Generation Assessment Creditable Items** - Credit is given for road improvements to County and State roads including, but not limited to: pavement, aggregate sub-base, grading, rock excavation, storm water improvements, bridges, traffic signals, traffic signal interconnect, channelization islands, stabilized shoulder, off-site (beyond the site's frontage) replacement of existing sidewalk or construction of new sidewalk adjacent to County roadways when necessitated by road improvement requirements, off-site right-of-way or right-of-way in excess of that allowed by Section 1005.180 of the St. Louis County Subdivision Ordinance. Sidewalk, utility relocation, and water quality improvements within the limits of a development's frontage are not creditable items. Improvements considered mandatory for the safety of the traveling public, including improvements required for accessibility compliance, are creditable but not reimbursable from the trust fund. Credits for improvements required by another agency will be considered on a case-by-case basis. Road improvements to Missouri State Routes are creditable towards the traffic generation assessment (TGA) but are not reimbursable from the trust fund. Credits will be granted first to roads under the jurisdiction of St. Louis County, followed by Missouri State Routes.

The engineer shall submit an itemized construction cost estimate of the creditable items based upon the Department's current schedule of unit prices (Refer to Section 73.00) when applicable, or rates for items not found on the schedule, unit prices based on recent contract unit prices shall be submitted for review and approval to the Department during the construction plan review phase.

Right-of-way dedication requirements along State and County roads will not be credited towards the developer's traffic generation assessment except where right-of-way widening requirements of an existing public roadway exceed a width of twenty (20) feet as provided in Section 1005.180 of the Subdivision Ordinance. In cases where excessive right-of-way widening is required, the developer is given credit commensurate with the market value of the property prior to development. In addition, credit is given for interior road improvements which exceed collector road requirements of a sixty (60) foot right-of-way and thirty-nine (39) foot pavement. The cost of allowable portions of the improvements shall be credited towards the developer's traffic generation assessment.

- 5) **Method of Payment** - Traffic generation assessment minus approved credits for roadway improvements shall be deposited with the St. Louis County Department of Transportation by a check payable to "Treasurer, St. Louis County", prior to the issuance of Special Use Permits and/or Land Disturbance Permits, or in the case of no required Special Use Permits or Land Disturbance Permits, prior to the issuance of Building Permits. If development phasing is anticipated, the developer shall provide the traffic generation assessment contribution prior to issuance of Special Use Permits and/or Land Disturbance Permits for each phase, or in the case of no required Special Use Permits or Land Disturbance Permits, prior to the issuance of Building Permits for each phase of development.
- 6) **Developer's Total Obligation** - The developer's total obligation for road improvements shall not exceed the traffic generation assessment amount unless such improvements are considered mandatory for the safety of the traveling public. If the cost of the proposed road improvements exceeds the traffic generation assessment and are not mandatory for the safety of the traveling public, the Department will prioritize the road improvement requirements such that the total cost of road improvements does not exceed an equivalent traffic generation assessment or refund any cost in excess of the traffic generation assessment from the particular fund.

TRAFFIC GENERATION ASSESSMENT AND ROAD TRUST FUND AREAS WITHIN MUNICIPALITIES

- 1) **Traffic Generation Assessment Application** - Municipalities can participate in the County road trust funds established by St. Louis County. This can occur when a municipality has annexed an area of unincorporated County or when a new city is formed by incorporating an area of unincorporated County which geographically includes a part/whole trust fund area.

Each municipality can follow the traffic generation assessment application guidelines used by St. Louis County. A specific rezoning ordinance approved by their city council could specify the traffic generation assessment requirements. Also, the municipality may simply require the developer to conform to conditions established previously by rezoning ordinances approved by the St. Louis County Council prior to the annexation or incorporation. The city ordinance for the development may or may not describe in detail what roadway improvements are to be accomplished with the traffic generation assessment. The specific development could be along a State or County arterial or along a city collector or local roadway.

The traffic generation assessment should be determined by the municipality in cooperation with St. Louis County Department of Transportation. When the municipality provides site development plans a copy of the rezoning petition on the respective site development within the city, the Department of Transportation will provide comments on traffic generation assessment and, if applicable, roadway improvements to County arterial roadways.

- 2) **Traffic Generation Assessment Road Trust Fund Areas** - The current road trust fund areas located within municipalities have been described in an above section. Although the St. Louis County Department of Transportation has established priorities for roadway improvements along arterial roadways prior to annexation/incorporation, we will discuss these priorities with municipal officials. A cooperative ongoing working relationship between the St. Louis County Department of Transportation and the municipalities is important in the ultimate improvement of County arterials through their cities.
- 3) **Traffic Generation Assessment Rates** - In order to maintain uniformity and equity from development to development, the municipality is encouraged to follow the traffic generation assessment rates as established by St. Louis County. The rates are described in Section 75.10 and the annual change in the assessment rates are described in Section 74.00.
- 4) **Traffic Generation Assessment Creditable Items** - The municipality can follow guidelines established by St. Louis County by providing credits to the developer for improvements to municipal streets as well as County or State routes. Although the municipality has the authority to assign other credits for the developer, in order to provide uniformity in the use of credits, we would encourage using the credits described by St. Louis County. Road improvements to municipal streets and State routes are creditable towards the traffic generation assessment but are not reimbursable from the trust fund. Credits for municipal road improvements will be awarded as directed by the St. Louis County Department of Transportation and the municipality. Credits will be granted in the following order: County roads, State routes, Municipal streets.
- 5) **Developer's Total Obligation** - We encourage municipalities to limit the developer's total obligation for road improvements so that they do not exceed the traffic generation assessment, unless, roadways improvements are considered mandatory for the safety of the traveling public. Such safety improvements could include reduction in a hillcrest to provide required sight distance or some other geometric improvement.

**PRESENT ST. LOUIS COUNTY ROAD TRUST FUNDS LOCATED
WITHIN UNINCORPORATED AND INCORPORATED AREAS**

- 1) **Butler Hill - Keller - Bauer Road T.G.A. Trust Fund - (No. 550)** - This trust fund was established to provide the necessary funding to design, acquire right-of-way and easements and construct portions of Keller Road Extension (now known as Suson Hills Drive), Butler Hill Road Relocation, and other roadway improvements, complete with minor roadway adjustments or relocations and traffic signal facilities with interconnects. Refer to 75.10-2 and 75.15-2 for rates and location.

- 2) **Chesterfield Valley Trust Fund - (No. 556)** - This fund was created for roadway improvements, stormwater improvements, sanitary sewer facilities and water main improvements in the Chesterfield Valley Area. Creditable road improvement items are included in the Ordinance conditioning the development. Refer to 75.10-3 and 75.15-3 for rates and location.

To bring this trust fund contribution schedule into consistency with other trust funds, a contribution schedule for zonings approved on or after August 1, 2008, is provided. The previous schedule will be maintained for zonings approved prior to August 1, 2008. Refer to 75.10-4 and 75.15-3 for rates and location.

- 3) **Chesterfield Village Road Trust Fund - (No. 554)** - This trust fund was created to insure completion of the Chesterfield Village Parkway in the northwest, northeast and southeast quadrants of the Interstate 64 (U.S. Highway 40-61) / Missouri State Route 340 Interchange and other arterial roadways within the trust fund area. Refer to 75.10-5 and 75.15-4 for rates and location.

- 4) **Chesterfield Village Trust Fund (Phases 1, 2 & 3) - (No. 561)** - Contributions to this trust fund by new development were terminated by St. Louis County in accordance with provisions of agreement letter with Chesterfield Village, Inc. and St. Louis West Joint Venture. St. Louis County will continue to collect ordinance required deposits for rezoning approved prior to November 10, 1988. These contributions will be used to pay back cash advances provided by Chesterfield Village, Inc., and St. Louis West Joint Venture to complete the construction of Chesterfield Village Parkway, Phase II, Part C. Refer to 75.10-5 and 75.15-4 for rates and location.

- 5) **Clayton / 141 Road Trust Fund - (No. 555-7851)** - The monies accumulating in this fund are earmarked for improvements to Woods Mill Road in the area of Clayton Road, after St. Louis County assumes roadway maintenance responsibility from the State. Refer to 75.10-6 and 75.15-5 for rates and location.

- 6) **Gravois / 141 Road Trust Fund - (No. 555-7852)** - This trust fund was created to design, acquire right-of-way and easements and construct an East-West Arterial Collector Road complete with minor roadway adjustments and relocations, traffic signal facilities with interconnects and a new interchanges and ramps accessing Missouri State Route 30 and Missouri State Route 141. Refer to 75.10-7 and 75.15-6 for rates and location.

- 7) **Ladue / 141 Road Trust Fund - (No. 555-7853)** - This trust fund was created to help defray the cost of engineering, right-of-way acquisition and roadway construction at Missouri State Route 141 and Ladue Road. Refer to 75.10-8 and 75.15-7 for rates and location.
- 8) **Route 40 (Interstate 64) Corridor Trust Fund - (No. 553)** - This trust fund was created to reimburse the Missouri Department of Transportation (MoDOT) for right-of-way acquisition necessary to construct the Timberlake Manor Parkway / White Road bridge over Interstate 64 (U.S. Highway 40-61) and related outer roadway relocations. Refer to 75.10-9 and 75.15-8 for rates and location.
- 9) **Pond - Grover T.G.A. Trust Fund - (No. 521) (Includes the former Manchester Road and Old State Road Trust Funds)** - This trust fund was established to provide needed improvements to the arterial roadways in the Pond-Grover area surrounding the intersection of Missouri State Route 100 and Missouri State Route 109. Refer to 75.10-10 and 75.15-9 for rates and location.
- 10) **Manchester Road Corridor T.G.A. Trust Fund - (No. 549)** - This trust fund was established to serve the anticipated development in the unincorporated area adjacent to Manchester Road west of Interstate 270 (includes collector roads, etc.). Refer to 75.10-11 and 75.15-10 for rates and location.
- 11) **Bluff - Old Halls Ferry Road T.G.A. Trust Fund - (No. 551)** - This trust fund was established for the improvements to Old Jamestown Road and Vaile Avenue construction and completion of the Bluff Road and Old Halls Ferry Road. Extensions would include Old Jamestown Road Relocation, west of Vaile Avenue, and Vaile Avenue Relocation, south of Old Jamestown Road. Refer to 75.10-12 and 75.15-11 for rates and location.
- 12) **Eatherton - Kehrs Mill Road T.G.A. Trust Fund - (No. 552)** - This trust fund was established for improvements of roads in the area along with the realignment of major roads such as Eatherton Road and Kehrs Mill Road. Refer to 75.10-13 and 75.15-12 for rates and location.
- 13) **Parker - Redman T.G.A. Road Trust Fund - (No. 547)** - This trust fund was established for improvements to Parker Road, Old Jamestown Road, Bellefontaine Road, Old Halls Ferry Road, Spanish Pond Road and other County roads in the area. This fund is not intended for improvement to Lewis & Clark Boulevard and Lindbergh Boulevard or other State maintained roadways within the trust fund boundaries. Refer to 75.10-14 and 75.15-13 for rates and location.
- 14) **Missouri Bottom T.G.A. Road Trust Fund - (No. 546)** - This trust fund was established for improvements to Bluff Road Extension, Missouri Bottom Road, Aubuchon Road, Teson Road and other County roads in the area. This trust fund is not intended for improvement to Missouri State Route 115 Relocation or other State maintained roadways within the trust fund area. Refer to 75.10-15 and 75.15-14 for rates and location.
- 15) **Robertson Area T.G.A. Road Trust Fund - (No. 545)** - This trust fund was established for improvements to Fee Fee Road, Phantom Drive, Campus Parkway and Missouri Bottom Road. Funds from this trust fund are not intended for use in the construction of improvements to relocated Missouri State Route 115 or other State maintained roadways within the trust fund. Refer to 75.10-16 and 75.15-15 for rates and location.

- 16) **Oakville T.G.A. Road Trust Fund - (No. 544)** - This trust fund will be used for construction of and/or improvements to Heintz Road, Baumgartner Road, Becker Road, Christopher Drive and Erb Road. Funds from this trust fund are not intended for use in the construction of improvements to Telegraph Road (Missouri State Route 231) or other State maintained roadways within the trust fund. Refer to 75.10-17 and 75.15-16 for rates and location.
- 17) **Big Bend - Oak - Kiefer Creek Corridor T.G.A. Road Trust Fund - (No. 543)** - This trust fund will be used for construction of and/or improvements to Kiefer Creek Road, Oak Street, Big Bend Road, Sulphur Spring Road, Vance Road and Hanna Road. Funds from this trust fund are not intended for use in the construction of Relocated Missouri State Route 141 or other state maintained roadways within the trust fund area. Refer to 75.10-18 and 75.15-17 for rates and location.
- 18) **Columbia Bottom - Larimore - Lilac T.G.A. Road Trust Fund - (No. 522)** - This trust fund will be used for construction of and/or improvements to Columbia Bottom, Coal Bank, Larimore, Prigge and Strodtman Roads and Lilac and Trampe Avenues. Funds from this trust fund are not intended for use in any further improvements to Interstate 270 or the construction of any future extension of Pershall Road (South Service Road of I-270), east of Lilac Avenue. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-19 and 75.15-18 for rates and location.
- 19) **North Oakville T.G.A. Road Trust Fund - (No. 537)** - This trust fund was established for improvements to Baumgartner, Yeager, Ringer, Mattis, Patterson, Milburn and Forder Roads, Mehl Avenue and includes Old Lemay Ferry Road and Robert Koch Hospital Road Relocations. Funds from this trust fund are not intended for use in any further improvements to Interstate 270 or Interstate 55. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-20 and 75.15-19 for rates and location.
- 20) **Hawkins - Bowles - Summit - Gravois T.G.A. Road Trust Fund - (No. 506)** - This trust fund will be used for construction of and/or improvements to Hawkins, Summit, Gravois, Smizer Mill, Crescent, Allen, Lewis and Valley Park Roads, Bowles Avenue, Country Home Drive, Gravois Bypass and Hawkins Road and Praise Boulevard Extensions. Funds from this trust fund are not intended for use in any further improvements to Interstate 44. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-21 and 75.15-20 for rates and location.
- 21) **Baptist Church - Green Park-Buckley T.G.A. Road Trust Fund - (No. 701)** - This trust fund will be used for construction of and/or improvements to Heege Road, Baptist Church Road, Buckley Road, Telegraph Road, Musick Avenue and Kohrs Lane Extension. Funds from this trust fund are not intended for use in any further improvements to Interstate 270, Interstate 255 or Interstate 55. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-22 and 75.15-21 for rates and location.

- 22) **Kennerly - Kerth T.G.A. Road Trust Fund - (No. 520)** - This trust fund was established for improvements to Kennerly, Kerth, Butler Hill and Wells Roads and includes relocations of Meramec Bottom and Hageman Roads. Funds from this trust fund are not intended for use in any further improvements to Interstate 270 or Interstate 55. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-23 and 75.15-22 for rates and location.
- 23) **New Halls Ferry Road Corridor T.G.A. Road Trust Fund - (No. 702)** - This trust fund was established for improvements to Parker Road, Old Halls Ferry Road, Seven Hills Drive and the construction of West Florissant Spur. Funds from this trust fund are not intended for use in any further improvements to Interstate 270. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-24 and 75.15-23 for rates and location.
- 24) **Fee Fee - Schuetz - Mason - Midland T.G.A. Road Trust Fund - (No. 703)** - This trust fund was established for improvements to Conway Road, Creve Coeur Mill Road, Fee Fee Road, Lackland Road, Mason Road, Schuetz Road, Schulte Road, Warson Roads, Marine Avenue, Ross Avenue, and Midland Boulevard. Funds from this trust fund are not intended for use in any further improvements to Interstate 270. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-25 and 75.15-24 for rates and location.
- 25) **Wild Horse Creek T.G.A. Road Trust Fund - (No. 704)** - This trust fund was established for improvements to Wild Horse Creek Road, Ossenfort Road, Manchester Road, Melrose Road, and Bouquet Road. Developers will, however, be given credit for required roadway improvements along other state maintained roadways within the trust fund area. Refer to 75.10-26 and 75.15-25 for rates and location.
- 26) **Fox Creek - Hornecker Corridor T.G.A. Road Trust Fund - (No. 705)** - This trust fund was established for improvements to Fox Creek Road, Allenton-Six Flags Road, Alt Road, Hornecker Road, Eureka Road and Augustine Road. Funds from this trust fund are not intended for use in any further improvements to Interstate 44 and Business Loop 44. Developers will, however, be given credit for required roadway improvements along other state maintained roads within the trust fund area. Refer to 75.10-27 and 75.15-26 for rates and location.

75.10

Trust Fund Contribution Schedules

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**BUTLER HILL-KELLER-BAUER ROAD
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 550)
PER ST. LOUIS COUNTY ORDINANCE NO. 13,171, 1987
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Note: Keller Rd. Name Change to Susan Hill Dr. Per Ordinance No. 13,721

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**CHESTERFIELD VALLEY TRUST FUND (NO. 556-7892)
CONTRIBUTION SCHEDULE (FOR ZONINGS PRIOR TO 8/1/2008)**

Land Use	Rate as of 1/1/1984	Rate as of 1/1/2018 0.1% Decrease**	Rate as of 1/1/2019 1.9% Increase**
Commercial	\$ 1.17/SF	\$ 2.90/SF	\$ 2.96/SF
Office	\$ 0.83/SF	\$ 2.02/SF	\$ 2.06/SF
Industrial	\$ 2,820.46/Acre	\$ 6,974.59/Acre	\$ 7,107.11/Acre
Stormwater	\$ 1,174.84/Acre	\$ 2,905.08/Acre	\$ 2,960.28/Acre

Additional contributions required in the Chesterfield Valley area are:

Water Main (1)	\$ 915.62/Acre	\$ 933.02/Acre
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(1) Contributions collected by St. Louis County for reimbursement of water main installation cost under the jurisdiction of the Department of Public Works.

* Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**CHESTERFIELD VALLEY TRUST FUND (NO. 556-7892)
CONTRIBUTION SCHEDULE (FOR ZONINGS ON OR AFTER 8/1/2008)**

Land Use	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 496.72	\$ 506.16
Retirement Community Condominiums		
General Office	\$ 758.82	\$ 773.24
Quality Restaurant Research Center		
Motel	\$ 1,517.79	\$ 1,546.62
Hotel		
General Retail	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant		
Hospital	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant		
Convenience Store	\$ 15,177.44	\$ 15,465.81
Gas Station		
Manufacturing	\$ 607.07	\$ 618.61
Warehouse	\$ 1,062.44	\$ 1,082.62
Recreational Uses	\$ 524.40	\$ 534.36
Mini-Warehouse	\$ 0.50/SF	\$ 0.51/SF
Car Wash	\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space	\$ 3,725.36	\$ 3,796.14
Additional contributions required in the Chesterfield Valley :		
Stormwater	\$ 2,905.08/Acre	\$ 2,960.28/Acre
Water Main (1)	\$ 915.62/Acre	\$ 933.02/Acre

(1) Contributions collected by St. Louis County for reimbursement of water main installation cost under the jurisdiction of the Department of Public Works.

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**CHESTERFIELD VILLAGE ROAD TRUST FUND (NO. 554)
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

CLAYTON/141 ROAD TRUST FUND (NO. 555)
PER ST. LOUIS COUNTY ORDINANCES 10,290 & 10,291
CONTRIBUTION SCHEDULE

As of	Contribution Per Sq.Ft. Office	Contribution Per Sq.Ft. Retail	Contribution Per Dwelling Unit
1/1/1981	\$ 0.45	\$ 0.90	\$ 800.00
1/1/1982	\$ 0.47	\$ 0.94	\$ 840.00
1/1/1983	\$ 0.49	\$ 0.99	\$ 882.00
1/1/1984	\$ 0.51	\$ 1.04	\$ 926.10
1/1/1985	\$ 0.54	\$ 1.09	\$ 972.40
1/1/1986	\$ 0.57	\$ 1.14	\$ 1,021.02
1/1/1987	\$ 0.60	\$ 1.20	\$ 1,072.07
1/1/1988	\$ 0.63	\$ 1.26	\$ 1,125.67
1/1/1989	\$ 0.66	\$ 1.32	\$ 1,181.95
1/1/1990	\$ 0.69	\$ 1.39	\$ 1,241.05
1/1/1991	\$ 0.72	\$ 1.46	\$ 1,303.10
1/1/1992	\$ 0.76	\$ 1.53	\$ 1,368.26
1/1/1993	\$ 0.80	\$ 1.61	\$ 1,436.67
1/1/1994	\$ 0.84	\$ 1.69	\$ 1,508.50
1/1/1995	\$ 0.88	\$ 1.77	\$ 1,583.93
1/1/1996	\$ 0.92	\$ 1.86	\$ 1,663.13
1/1/1997	\$ 0.97	\$ 1.95	\$ 1,746.29
1/1/1998	\$ 1.02	\$ 2.05	\$ 1,833.60
1/1/1999	\$ 1.07	\$ 2.15	\$ 1,925.28
1/1/2000	\$ 1.12	\$ 2.26	\$ 2,021.54
1/1/2001	\$ 1.18	\$ 2.37	\$ 2,122.62
1/1/2002	\$ 1.24	\$ 2.49	\$ 2,228.75
1/1/2003	\$ 1.30	\$ 2.61	\$ 2,340.19
1/1/2004	\$ 1.36	\$ 2.74	\$ 2,457.20
1/1/2005	\$ 1.43	\$ 2.88	\$ 2,580.06
1/1/2006	\$ 1.50	\$ 3.02	\$ 2,709.06
1/1/2007	\$ 1.58	\$ 3.17	\$ 2,844.51
1/1/2008	\$ 1.62	\$ 3.25	\$ 2,915.62
1/1/2009	\$ 1.70	\$ 3.41	\$ 3,061.40
1/1/2010	\$ 1.79	\$ 3.58	\$ 3,214.47
1/1/2011	\$ 1.88	\$ 3.76	\$ 3,375.19
1/1/2012	\$ 1.97	\$ 3.95	\$ 3,543.95
1/1/2013	\$ 2.07	\$ 4.15	\$ 3,721.15
1/1/2014	\$ 2.17	\$ 4.36	\$ 3,907.21
1/1/2015	\$ 2.28	\$ 4.58	\$ 4,102.57
1/1/2016	\$ 2.39	\$ 4.81	\$ 4,307.70
1/1/2017	\$ 2.51	\$ 5.05	\$ 4,523.09
1/1/2018	\$ 2.64	\$ 5.30	\$ 4,729.24
1/1/2019	\$ 2.69	\$ 5.40	\$ 4,819.10

As of January 1 of each year thereafter, the contribution shall be
increased by five percent (5%) as required by original legislation.

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**GRAVOIS/141 ROAD TRUST FUND (NO. 555)
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

Note: The establishment of the Hawkins-Bowles-Summit-Gravois Traffic Generation Assessment Road Trust Fund authorized by Ordinance Number 15,284, 1990, encompasses the development area previously included in the Gravois /141 Road Trust Fund. Contributions required of future developments located in this area will be determined from and deposited in the Hawkins-Bowles-Summit-Gravois Traffic Generation Assessment Road Trust Fund.

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**LADUE/141 ROAD TRUST FUND (NO. 555)
PER ST. LOUIS COUNTY ORDINANCE NO. 10,711
CONTRIBUTION SCHEDULE**

As of	Contribution per Dwelling Unit	
1/1/1982	\$	300.00
1/1/1983	\$	315.00
1/1/1984	\$	330.75
1/1/1985	\$	347.29
1/1/1986	\$	364.65
1/1/1987	\$	382.88
1/1/1988	\$	402.02
1/1/1989	\$	422.12
1/1/1990	\$	443.23
1/1/1991	\$	465.39
1/1/1992	\$	488.66
1/1/1993	\$	513.09
1/1/1994	\$	538.74
1/1/1995	\$	565.68
1/1/1996	\$	593.96
1/1/1997	\$	623.66
1/1/1998	\$	654.84
1/1/1999	\$	687.58
1/1/2000	\$	721.96
1/1/2001	\$	758.06
1/1/2002	\$	795.96
1/1/2003	\$	835.76
1/1/2004	\$	877.55
1/1/2005	\$	921.43
1/1/2006	\$	967.50
1/1/2007	\$	1,015.88
1/1/2008	\$	1,066.67
1/1/2009	\$	1,120.00
1/1/2010	\$	1,176.00
1/1/2011	\$	1,234.80
1/1/2012	\$	1,296.54
1/1/2013	\$	1,361.37
1/1/2014	\$	1,429.44
1/1/2015	\$	1,500.91
1/1/2016	\$	1,575.96
1/1/2017	\$	1,654.76
1/1/2018	\$	1,737.50
1/1/2019	\$	1,770.51

As of January 1 of each year thereafter, the contribution shall be increased by five percent (5%) as required by original legislation.

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**ROUTE 40 (I-64) CORRIDOR TRUST FUND (NO. 553)
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**POND-GROVER TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 521)
PER ST. LOUIS COUNTY ORDINANCE NO. 15321, 1993
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel Hotel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
General Retail Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Hospital Bank Drive-In Fast Food Food Restaurant	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Convenience Store Gas Station	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**MANCHESTER ROAD CORRIDOR
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 549)
PER ST. LOUIS COUNTY ORDINANCE NO. 16354, 1993
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**BLUFF-OLD HALLS FERRY ROAD
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 551)
PER ST. LOUIS COUNTY ORDINANCE NO. 16181, 1992
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**EATHERTON-KEHRS MILL ROAD
 TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 552)
 PER ST. LOUIS COUNTY ORDINANCE NO. 13173, 1987
 CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**PARKER-REDMAN
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 547)
PER ST. LOUIS COUNTY ORDINANCE NO. 14471, 1998
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**MISSOURI BOTTOM
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 546)
PER ST. LOUIS COUNTY ORDINANCE NO. 14373, 1989
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**ROBERTSON AREA
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 545)
PER ST. LOUIS COUNTY ORDINANCE NO. 14381, 1989
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

OAKVILLE
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 544)
PER ST. LOUIS COUNTY ORDINANCE NO. 14405, 1989
CONTRIBUTION SCHEDULE

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**BIG BEND-OAK-KIEFER CREEK CORRIDOR
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 543)
PER ST. LOUIS COUNTY ORDINANCE NO. 15019, 1990
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**COLUMBIA BOTTOM-LARIMORE-LILAC
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 522)
PER ST. LOUIS COUNTY ORDINANCE NO. 15137, 1990
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**NORTH OAKVILLE
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 537)
PER ST. LOUIS COUNTY ORDINANCE NO. 15216, 1990
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**HAWKINS-BOWLES-SUMMIT-GRAVOIS
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 506)
PER ST. LOUIS COUNTY ORDINANCE NO. 15284, 1990
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**BAPTIST CHURCH-GREEN PARK-BUCKLEY
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 701)
PER ST. LOUIS COUNTY ORDINANCE NO. 16069, 1992
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**KENNERLY-KERTH TRAFFIC
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 520)
PER ST. LOUIS COUNTY ORDINANCE NO. 16104, 1992
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**NEW HALLS FERRY ROAD CORRIDOR TRAFFIC
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 702)
PER ST. LOUIS COUNTY ORDINANCE NO. 16137, 1992
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**FEE FEE, SCHUETZ, MASON, MIDLAND TRAFFIC GENERATION
ASSESSMENT TRUST FUND (NO. 703)
PER ST. LOUIS COUNTY ORDINANCE NO. 16326, 1993
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
Hotel			
General Retail	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant			
Hospital	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Bank Drive-In Fast Food Food Restaurant			
Convenience Store	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Gas Station			
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**WILD HORSE CREEK TRAFFIC
GENERATION ASSESSMENT TRUST FUND (NO. 704)
PER ST. LOUIS COUNTY ORDINANCE NO. 16415, 1993
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel Hotel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
General Retail Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Hospital Bank	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Food Restaurant			
Convenience Store Gas Station	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

**FOX CREEK-HORNECKER CORRIDOR
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 705)
PER ST. LOUIS COUNTY ORDINANCE NO. 16424, 1993
CONTRIBUTION SCHEDULE**

Land Use	As of 1/1/1984 Rate Per Parking Space*	As of 1/1/2018 Rate Per Parking Space* 0.1% Decrease**	As of 1/1/2019 Rate Per Parking Space* 1.9% Increase**
S.F. Dwelling	\$ 450.00	\$ 1,241.80	\$ 1,265.39
Apartments	\$ 180.00	\$ 496.72	\$ 506.16
Retirement Community Condominiums			
General Office	\$ 275.00	\$ 758.82	\$ 773.24
Quality Restaurant Research Center			
Motel Hotel	\$ 550.00	\$ 1,517.79	\$ 1,546.62
General Retail Medical Offices Shopping Centers Nursing Homes High Turn-over Sit Down Restaurant	\$ 825.00	\$ 2,276.60	\$ 2,319.85
Hospital Bank	\$ 1,650.00	\$ 4,553.36	\$ 4,639.87
Convenience Store Gas Station	\$ 5,500.00	\$ 15,177.44	\$ 15,465.81
Manufacturing	\$ 220.00	\$ 607.07	\$ 618.61
Warehouse	\$ 385.00	\$ 1,062.44	\$ 1,082.62
Recreational Uses		\$ 524.40	\$ 534.36
Mini-Warehouse		\$ 0.50/SF	\$ 0.51/SF
Car Wash		\$ 75,912.72/AC	\$ 77,355.06/AC
Loading Space		\$ 3,725.36	\$ 3,796.14

* Except as noted

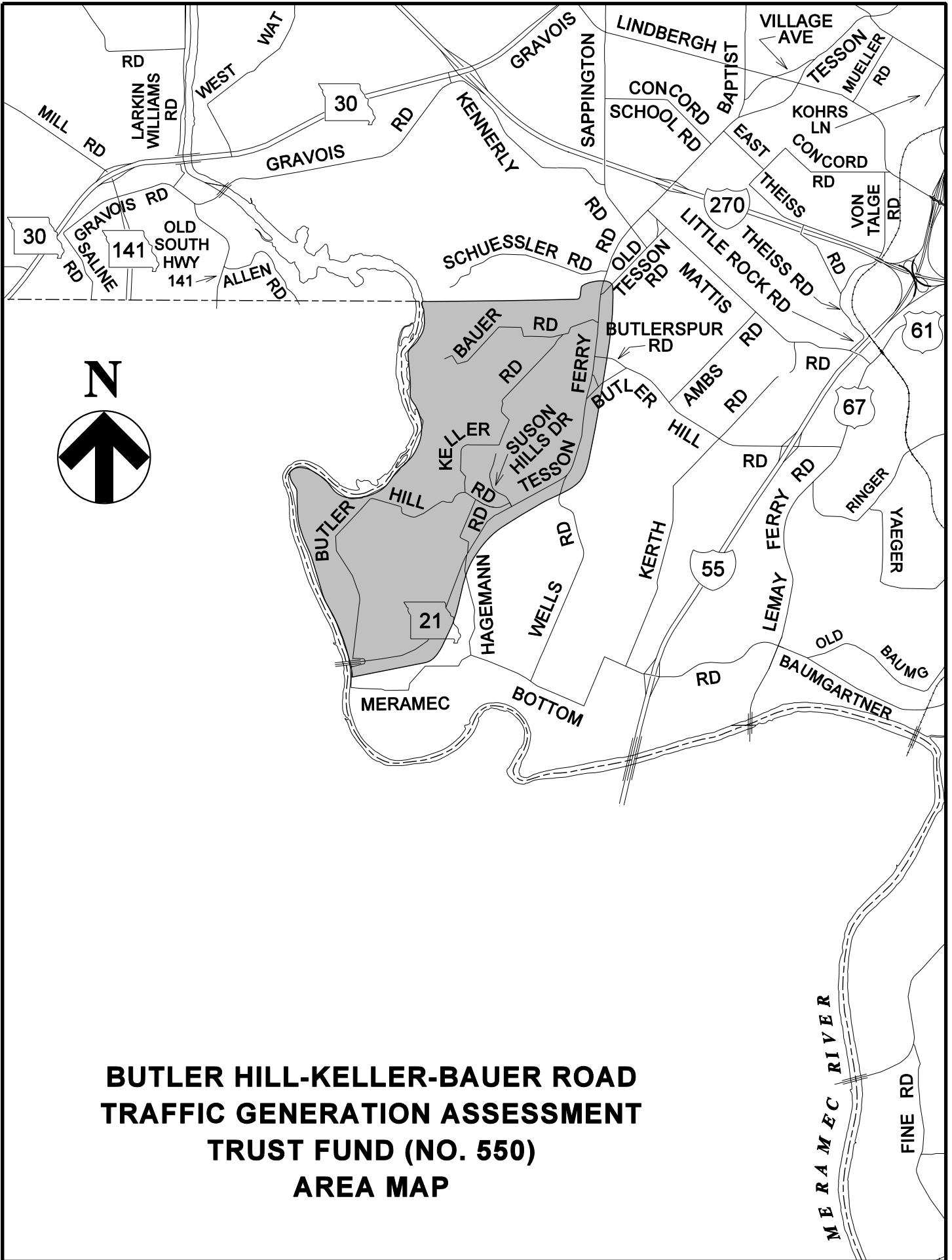
** Based on Construction Cost Index

Contact the St. Louis County Department of Transportation for rates after January 1, 2020.

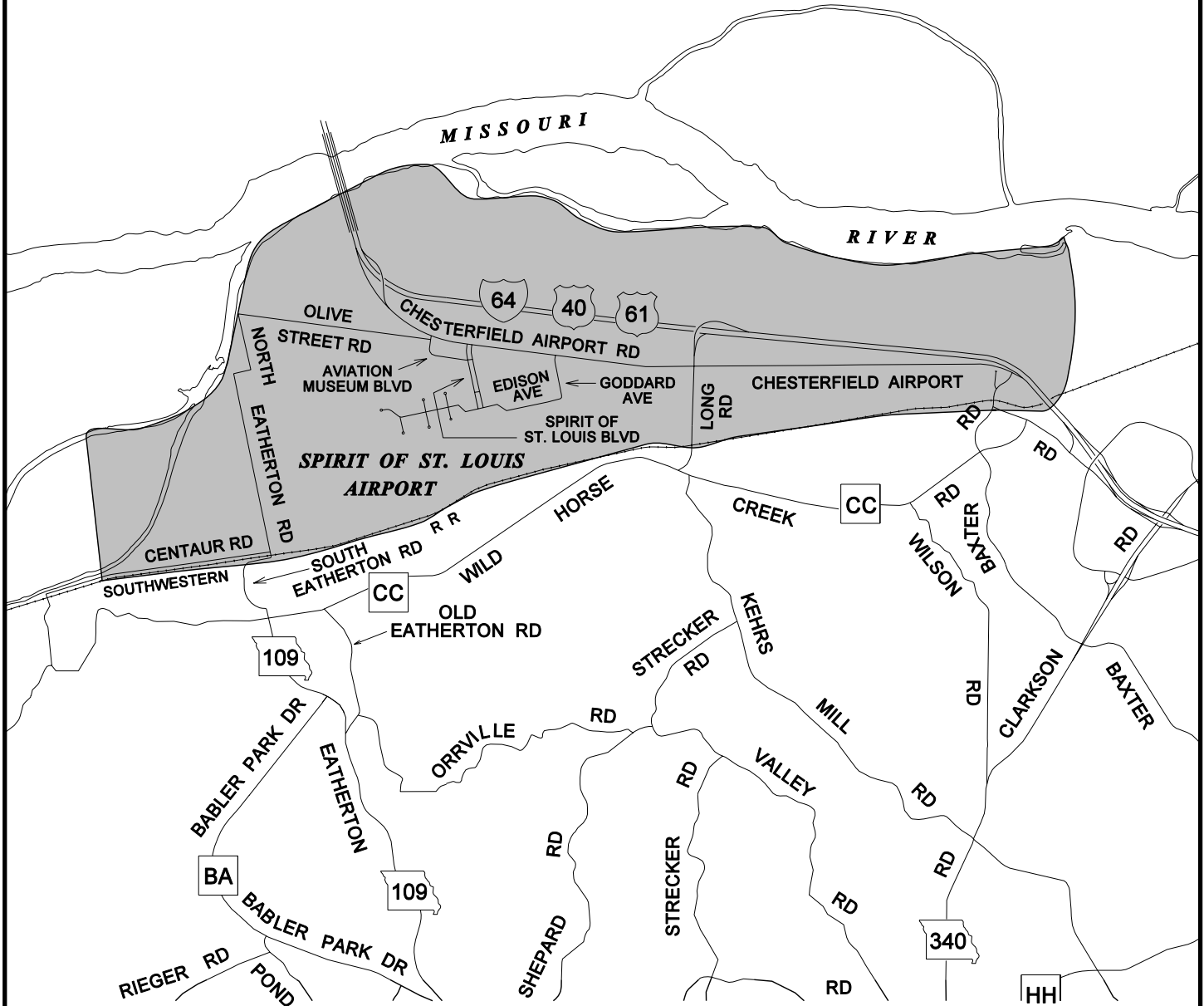
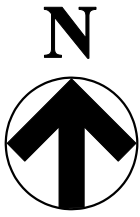
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75.15 **Trust Fund Area Maps**

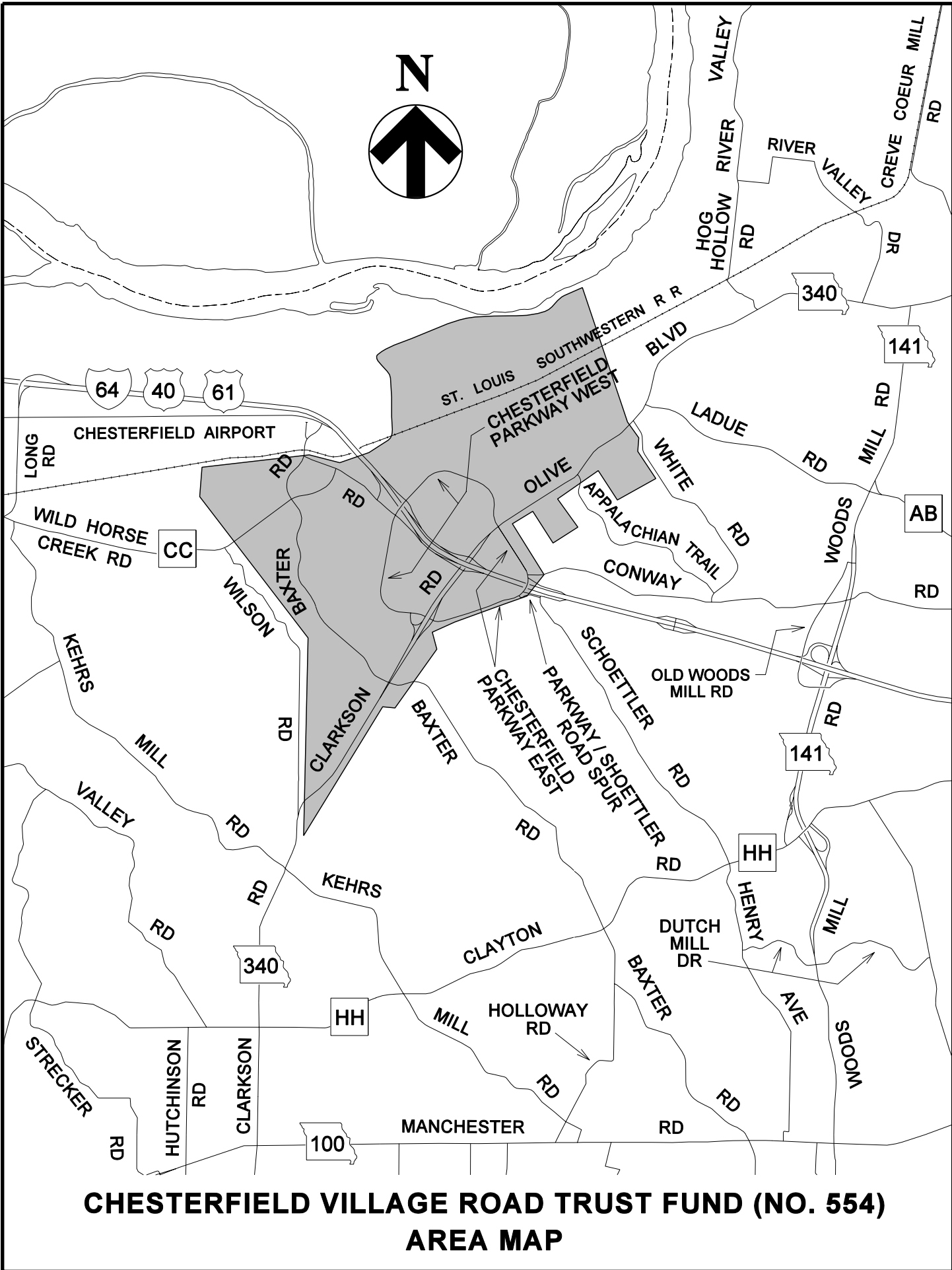
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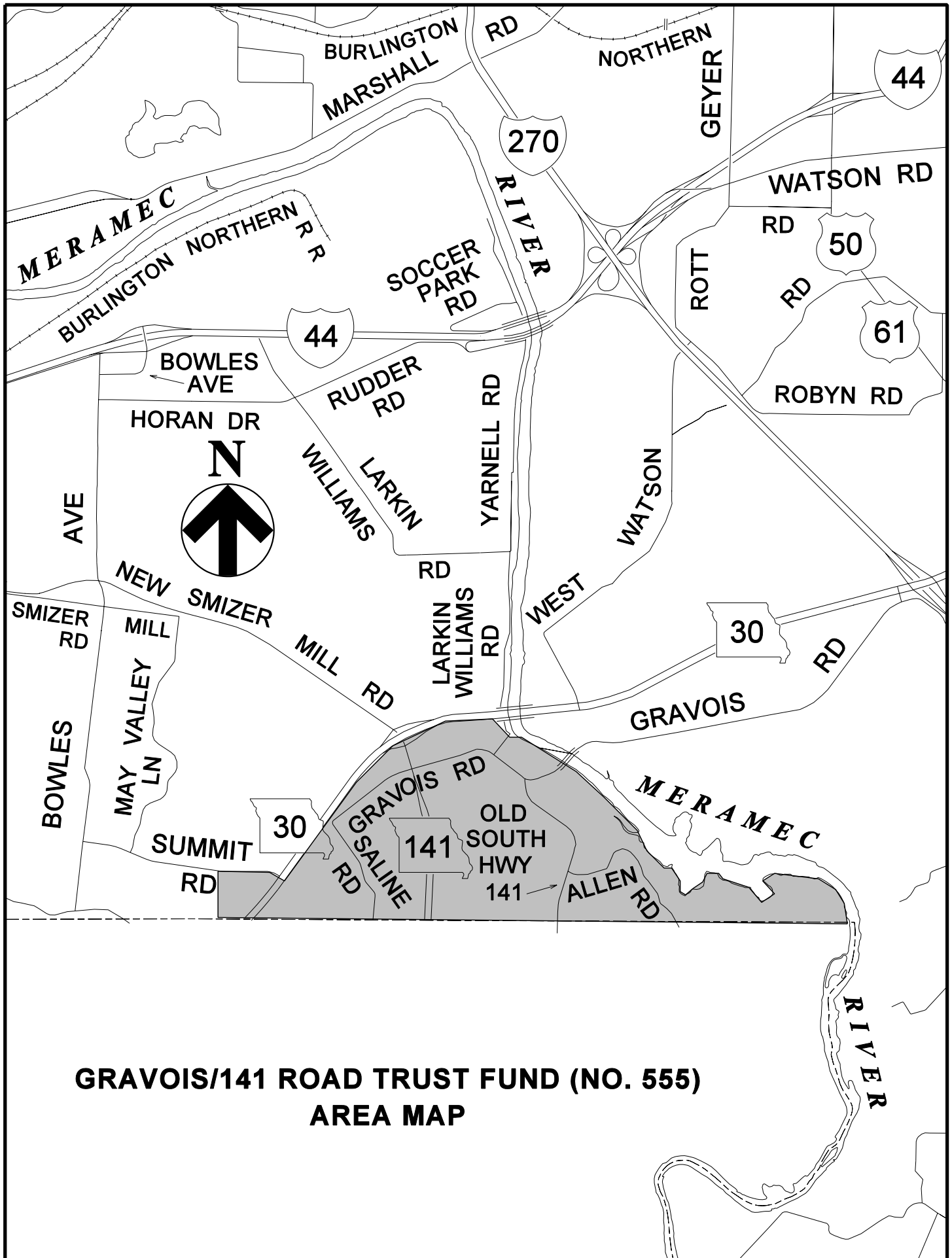


**BUTLER HILL-KELLER-BAUER ROAD
TRAFFIC GENERATION ASSESSMENT
TRUST FUND (NO. 550)
AREA MAP**

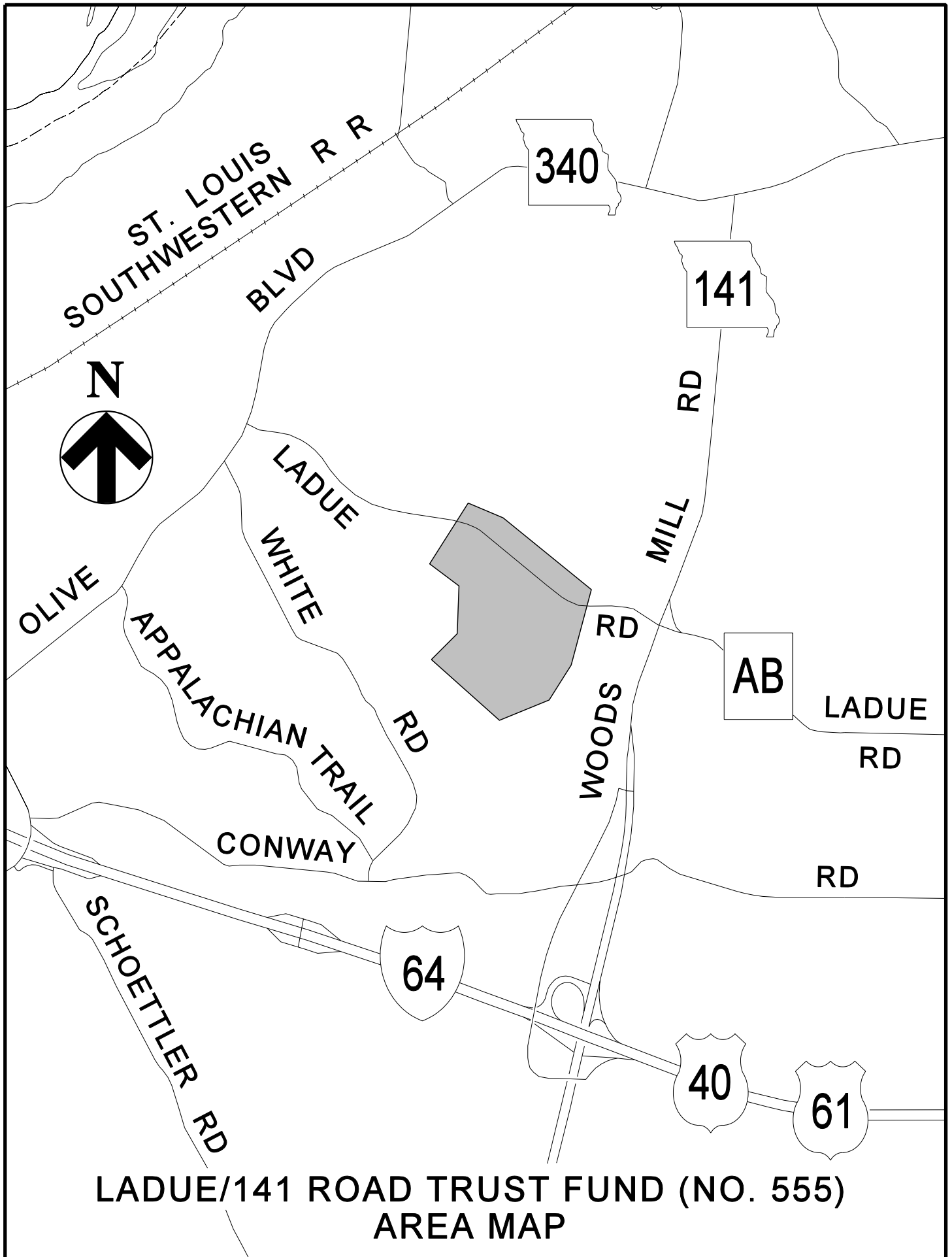


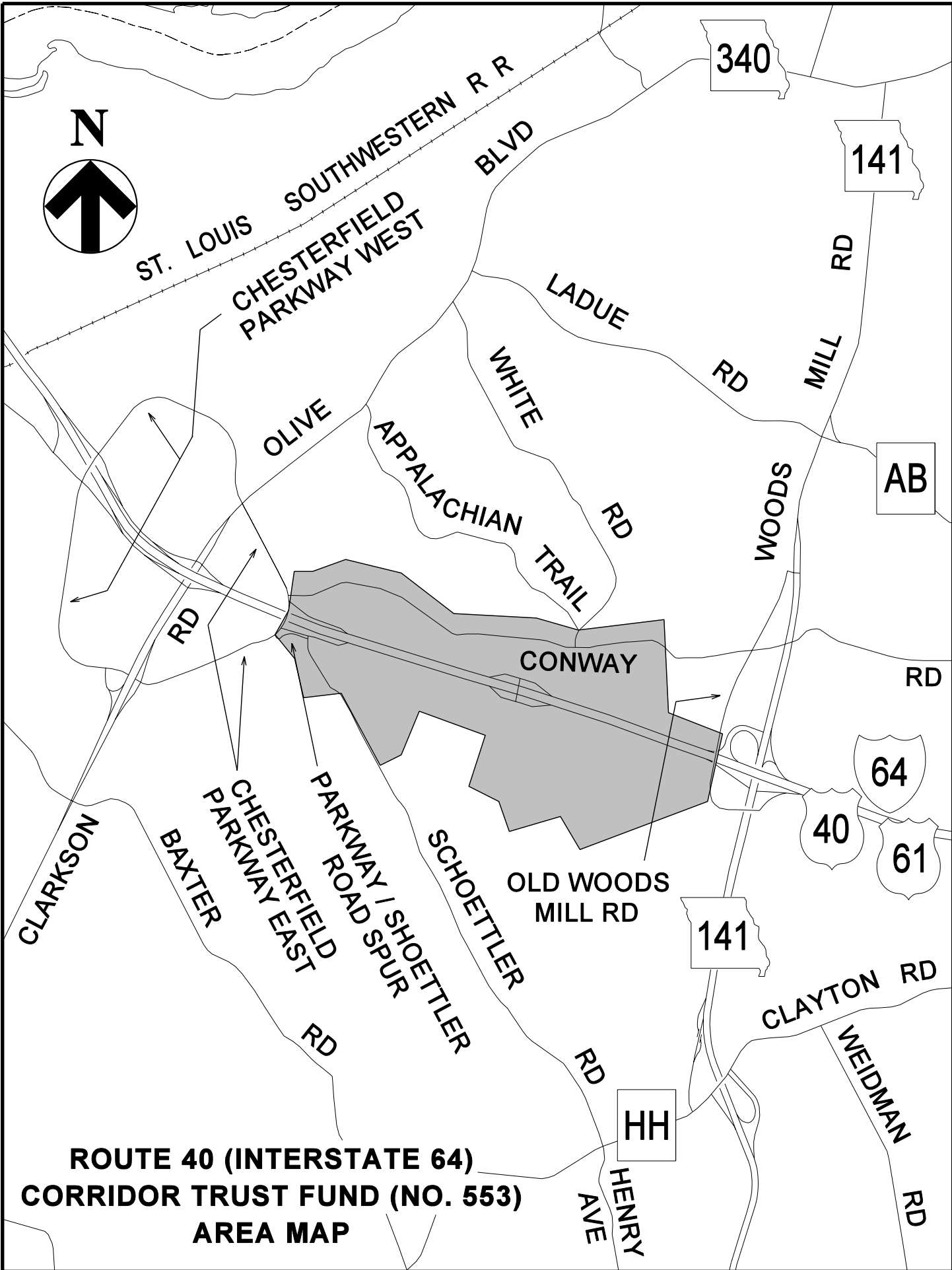
**CHESTERFIELD VALLEY TRUST FUND (NO. 556)
AREA MAP**

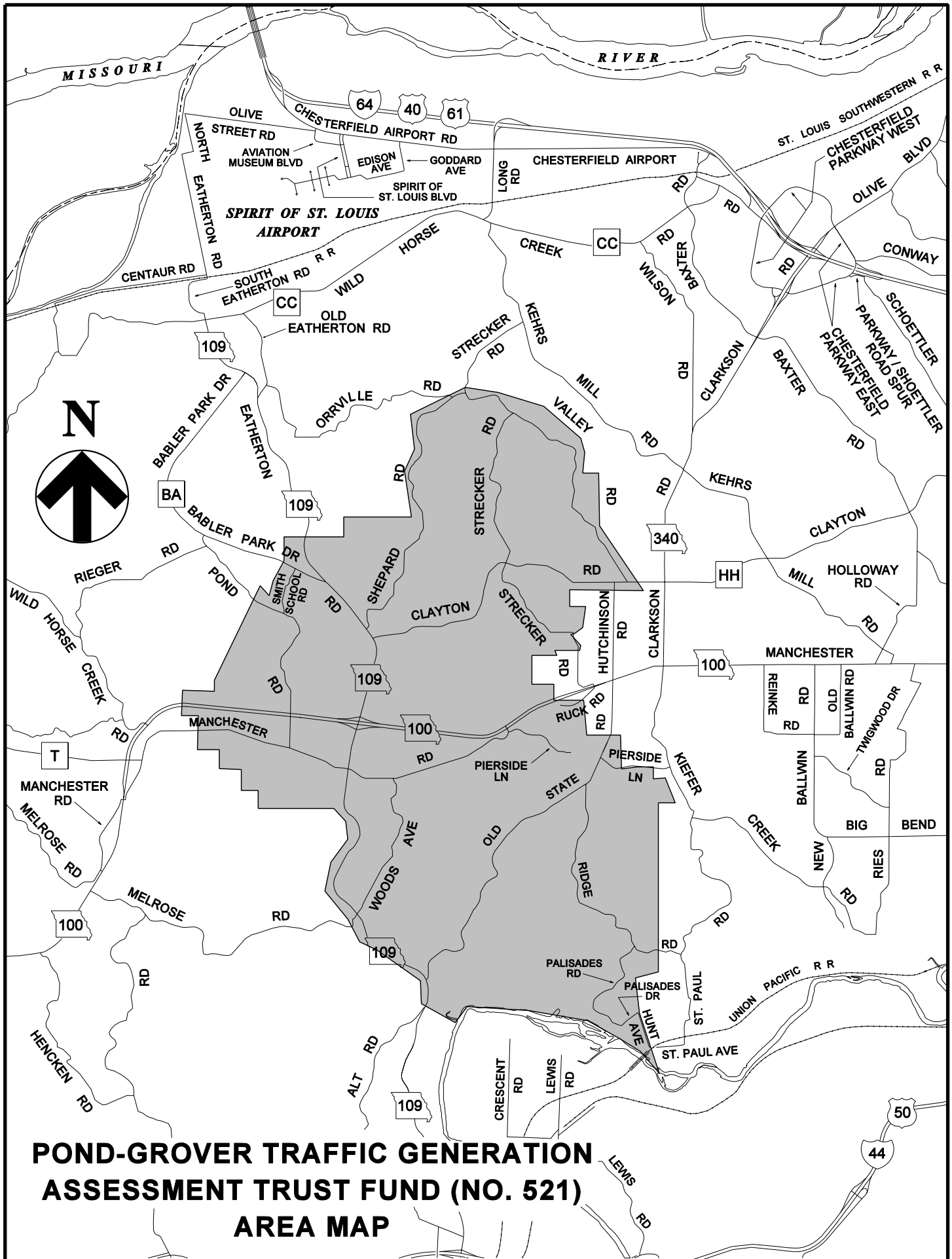


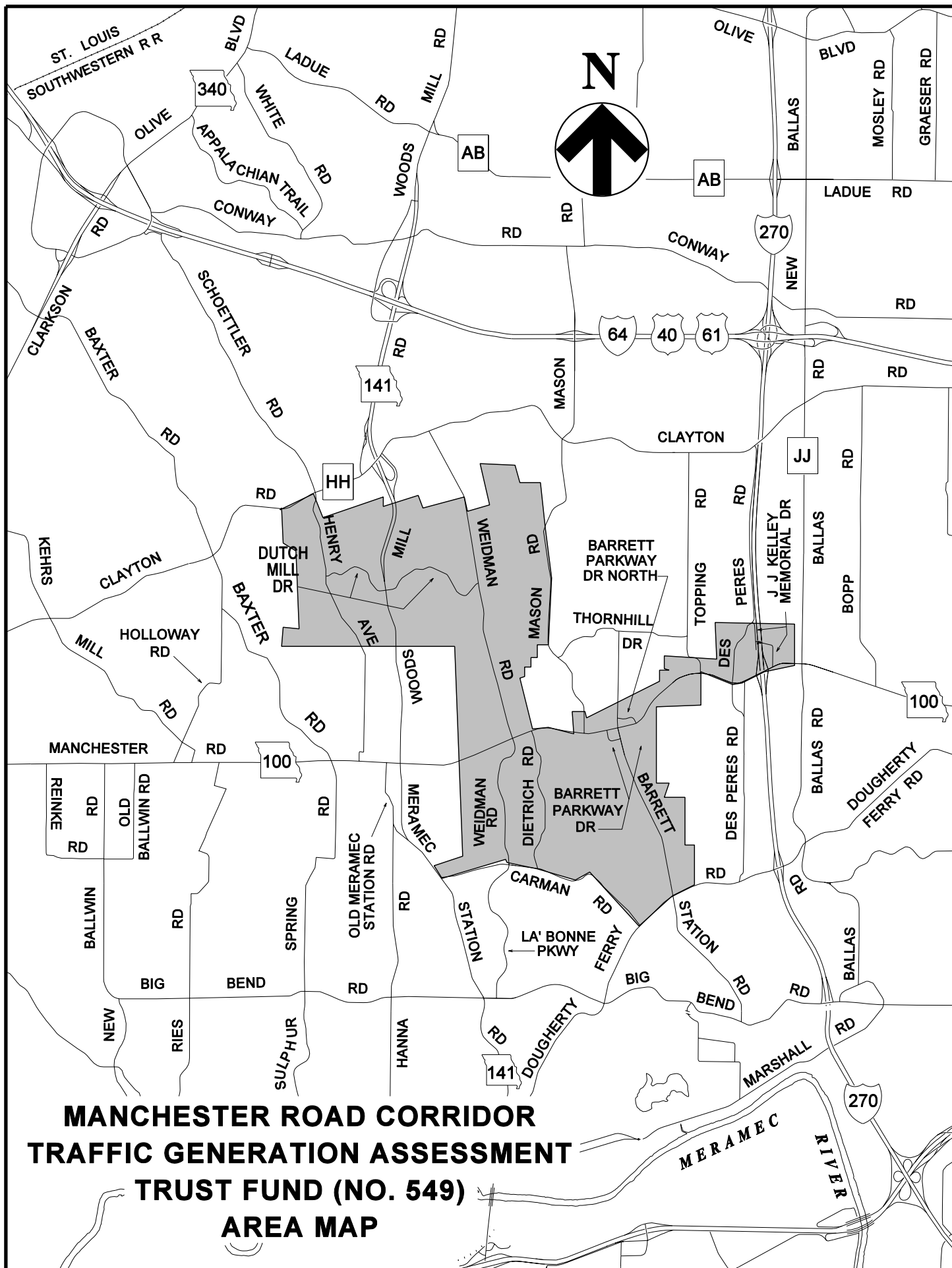


**GRAVOIS/141 ROAD TRUST FUND (NO. 555)
AREA MAP**

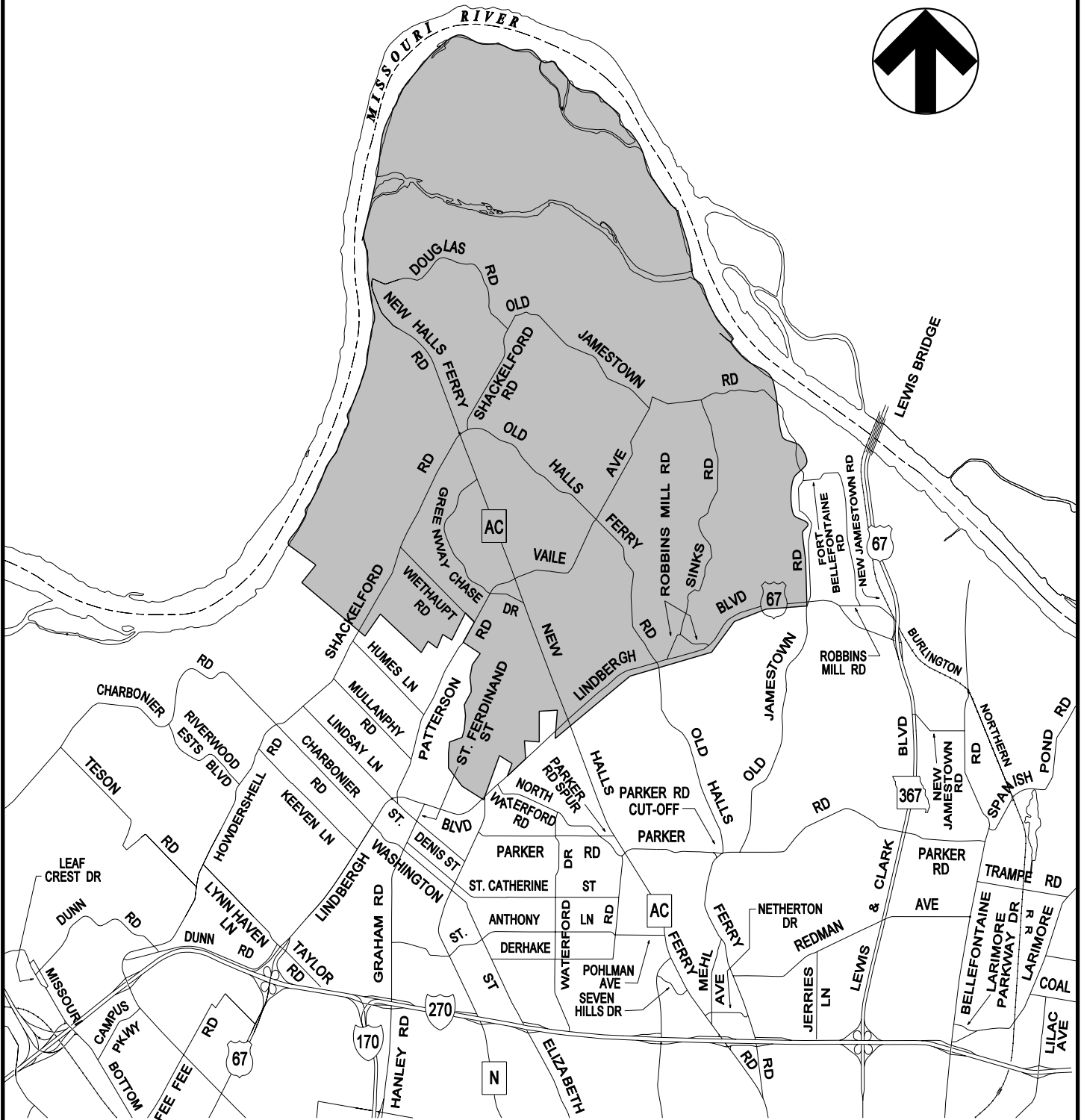




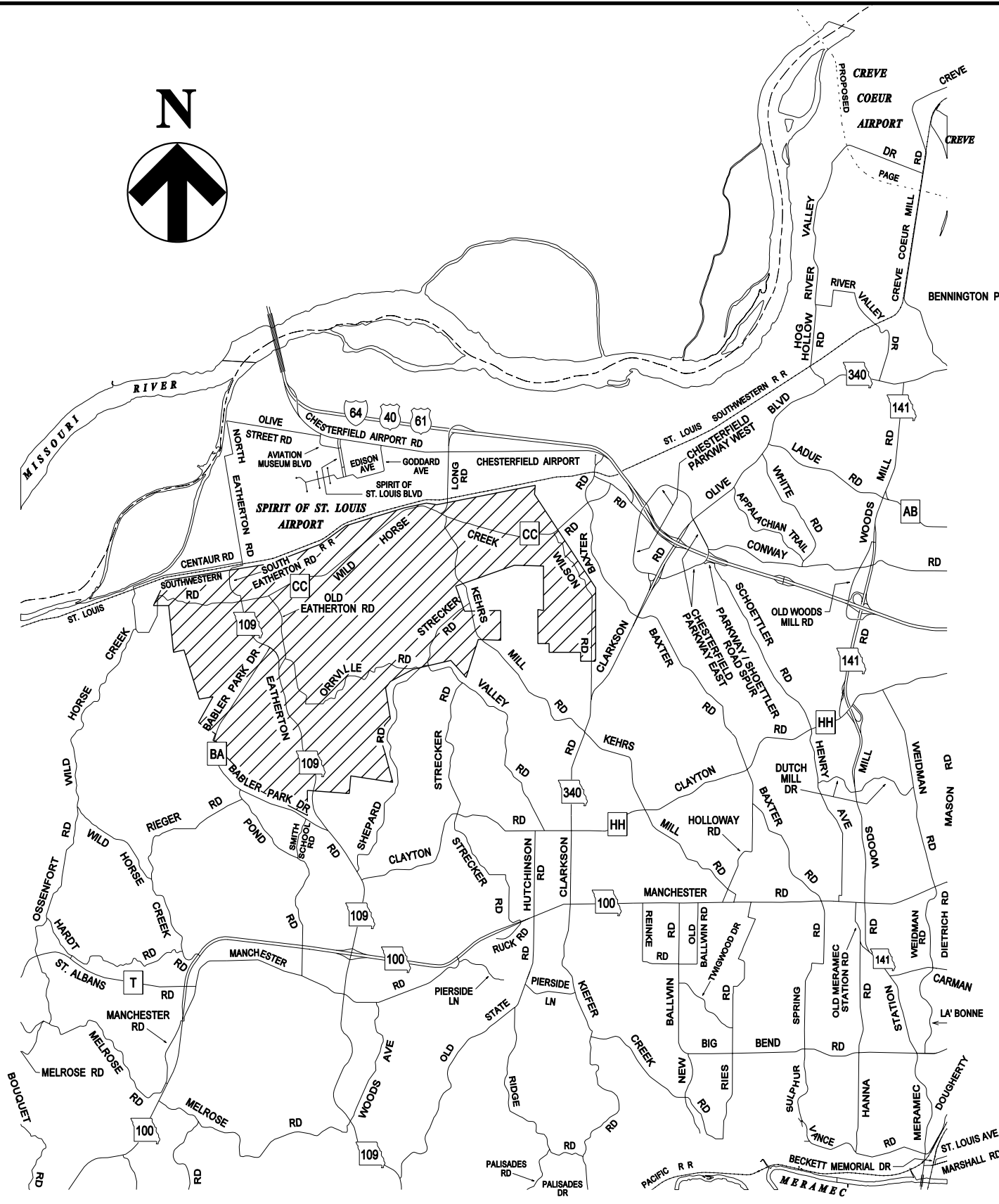
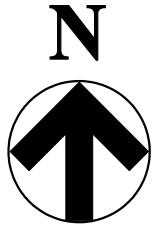




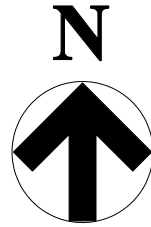
**MANCHESTER ROAD CORRIDOR
TRAFFIC GENERATION ASSESSMENT
TRUST FUND (NO. 549)
AREA MAP**



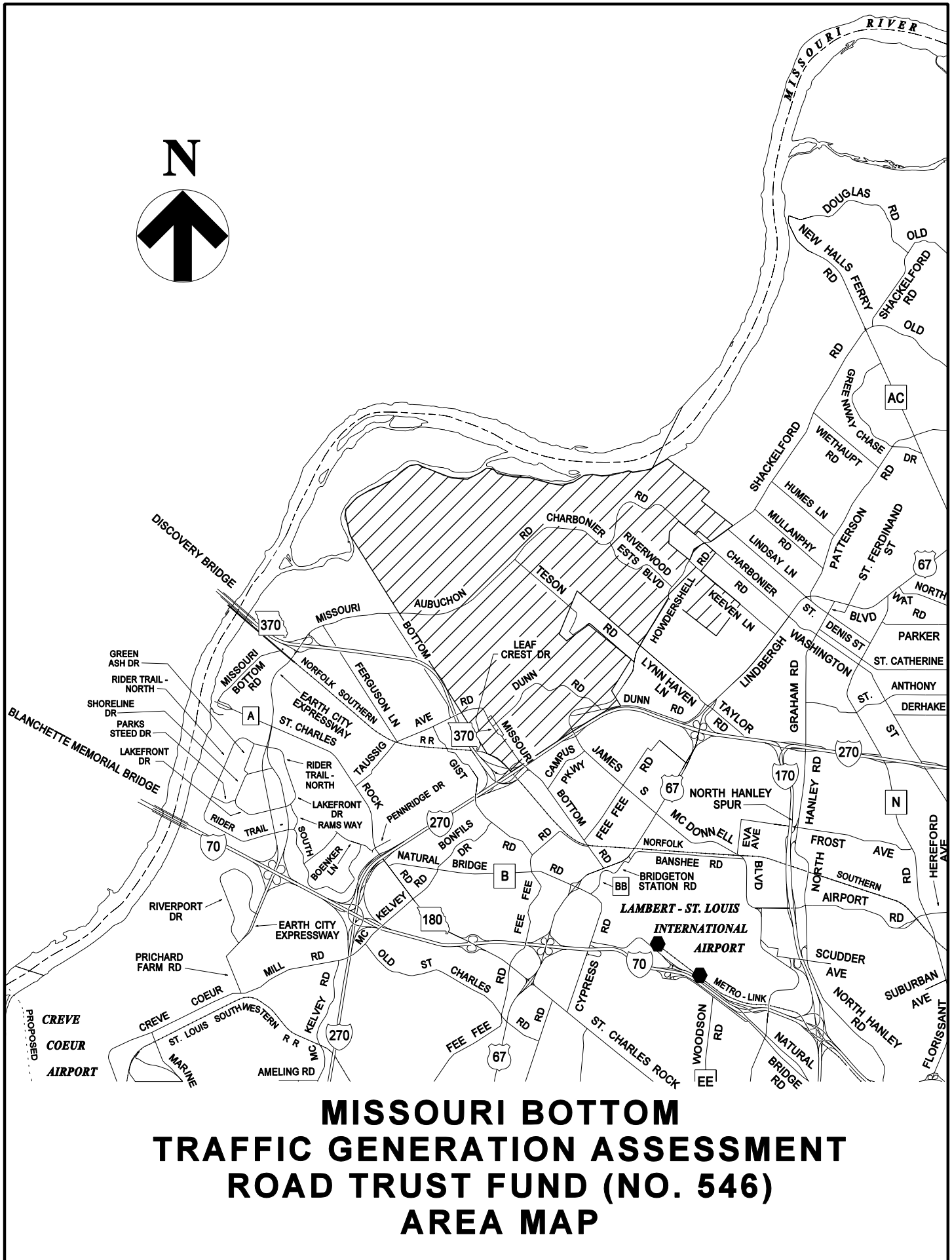
**BLUFF-OLD HALLS FERRY ROAD
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 551)
AREA MAP**

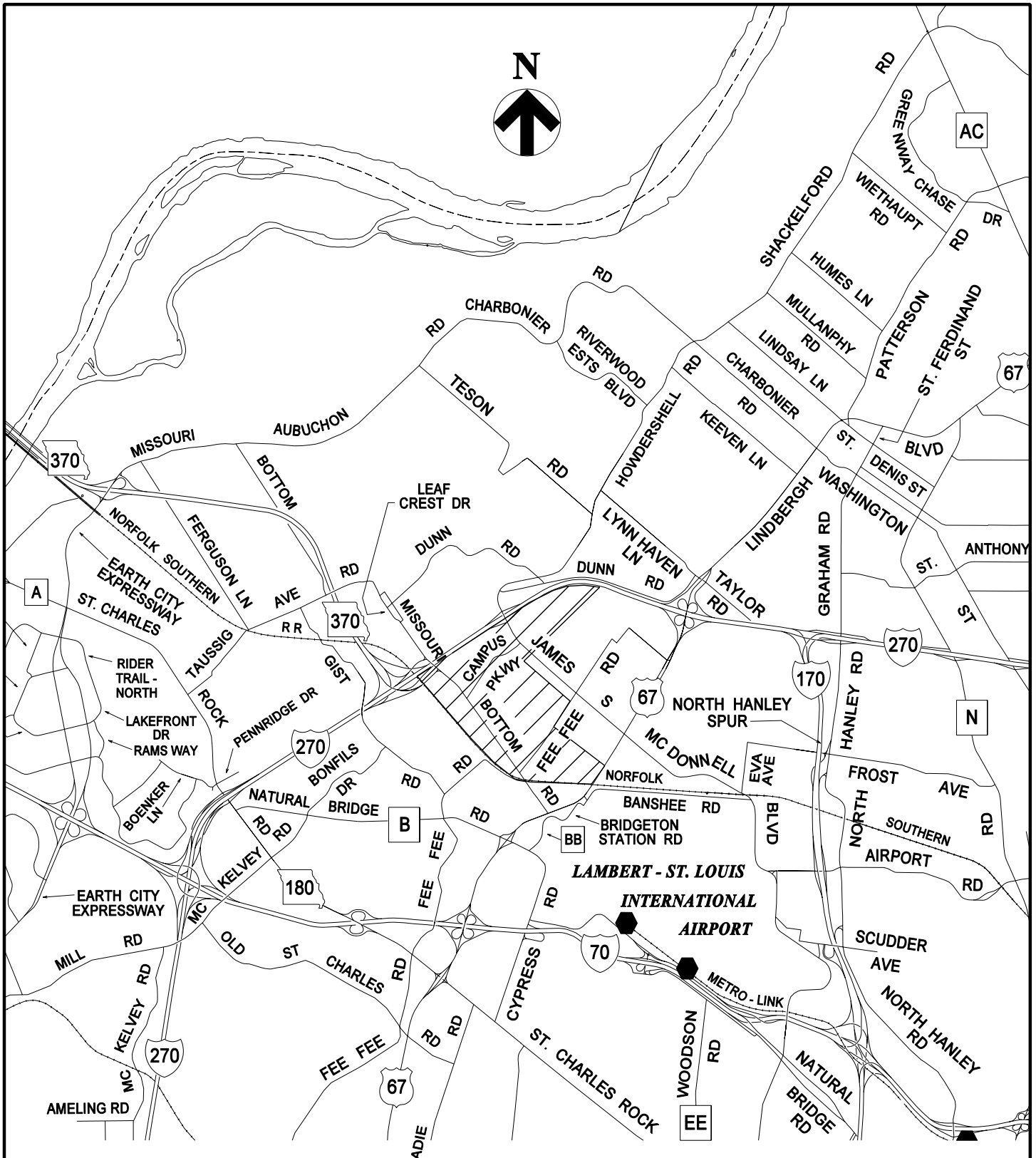


**EATHERTON-KEHRS MILL ROAD
TRAFFIC GENERATION ASSESSMENT TRUST FUND (NO. 552)
AREA MAP**

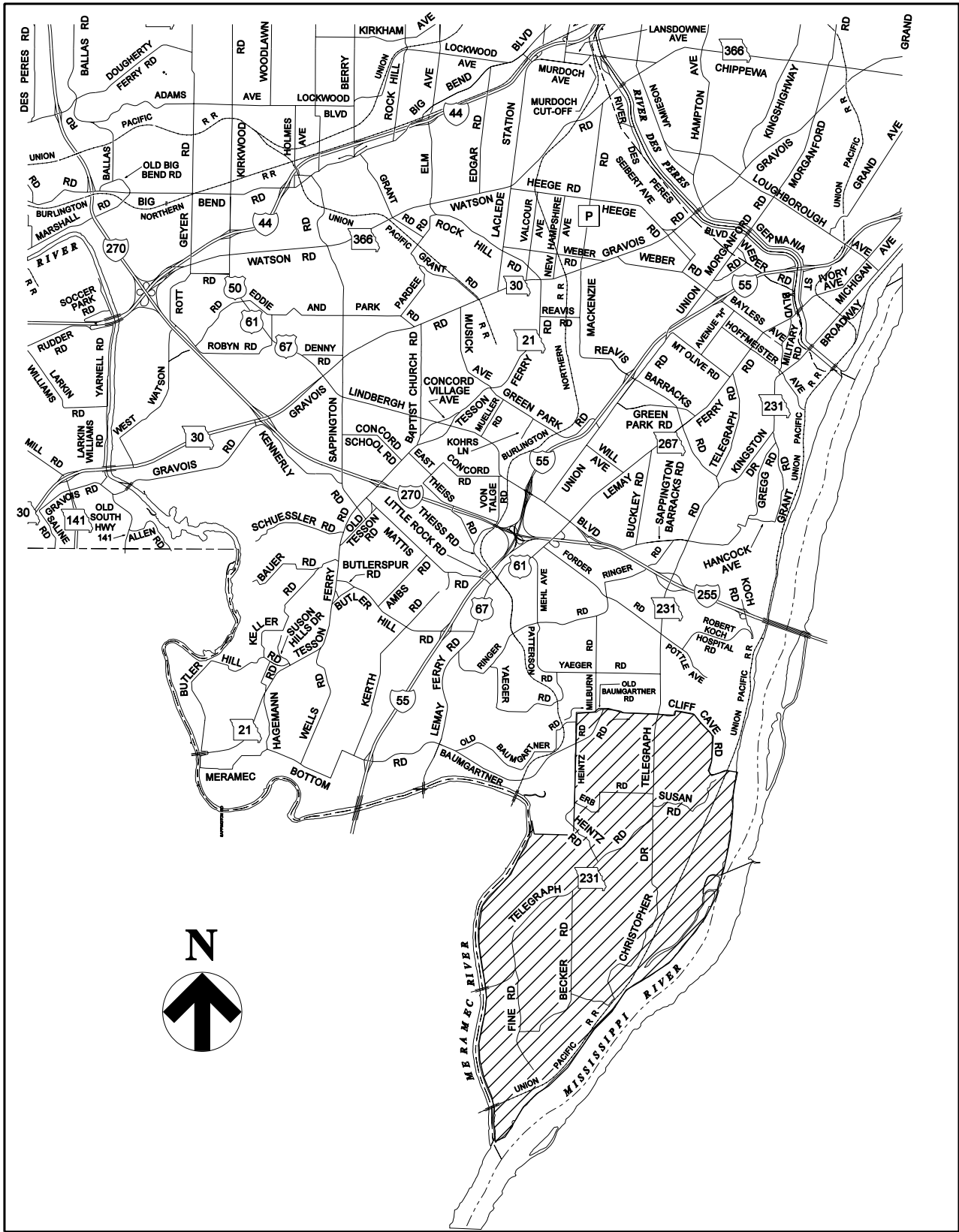


**PARKER-REDMAN
TRAFFIC GENERATION ASSESSMENT
ROAD TRUST FUND (NO. 547)
AREA MAP**





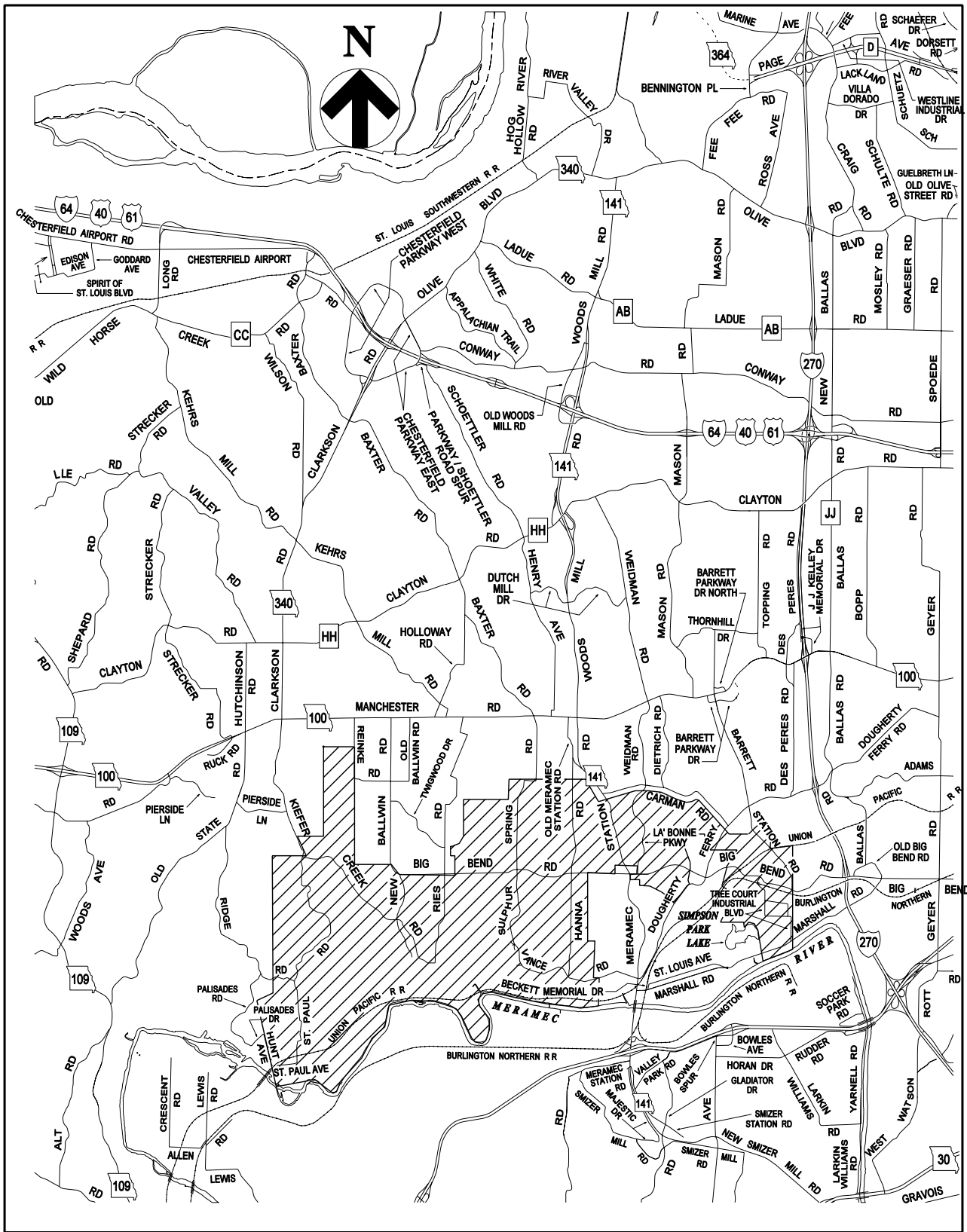
**ROBERTSON AREA
TRAFFIC GENERATION ASSESSMENT
ROAD TRUST FUND (NO. 545)
AREA MAP**



OAKVILLE
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 544)
AREA MAP

12-22-97

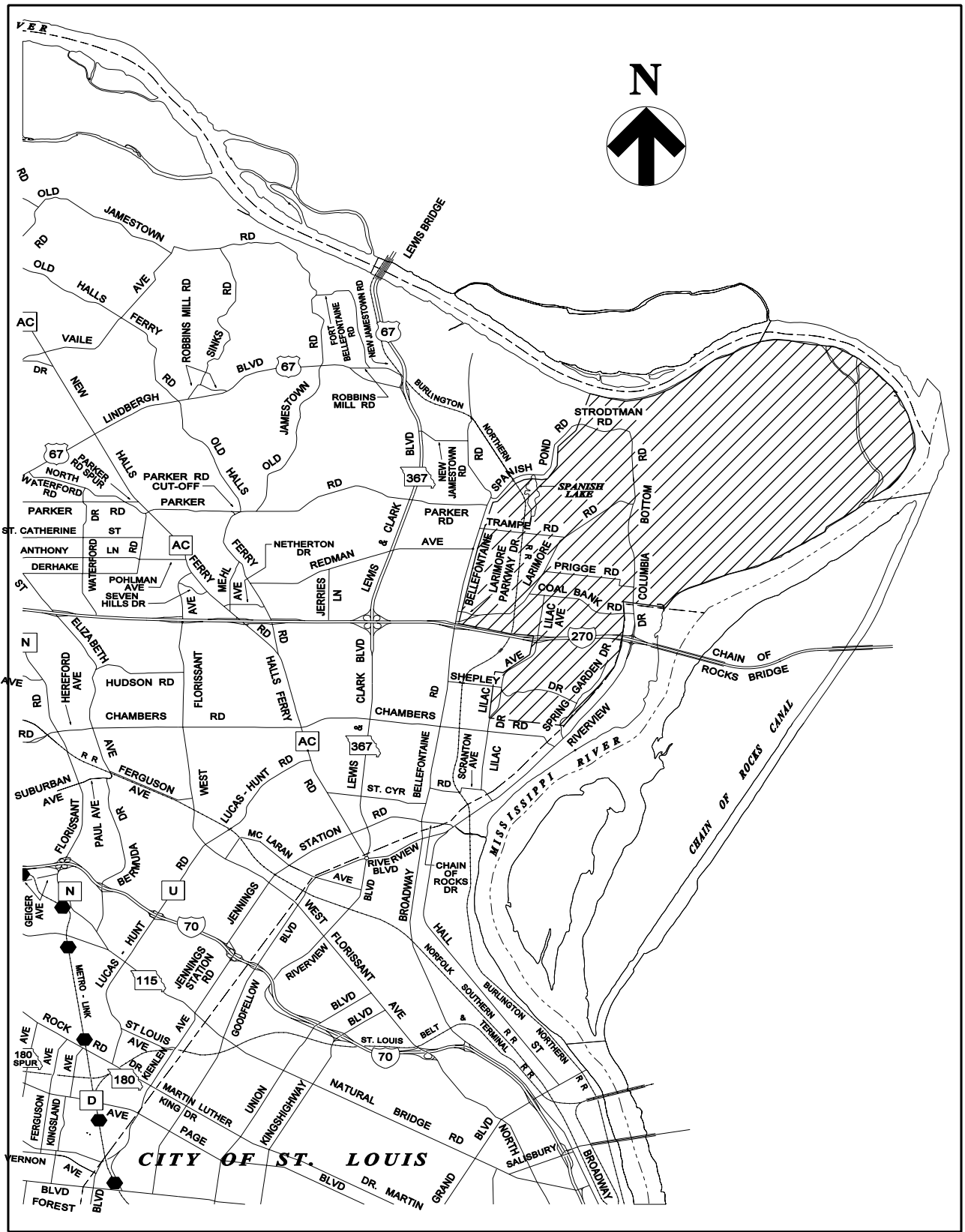
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BIG BEND-OAK-KIEFER CREEK CORRIDOR
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 543)
AREA MAP

12-22-97

75.15-17

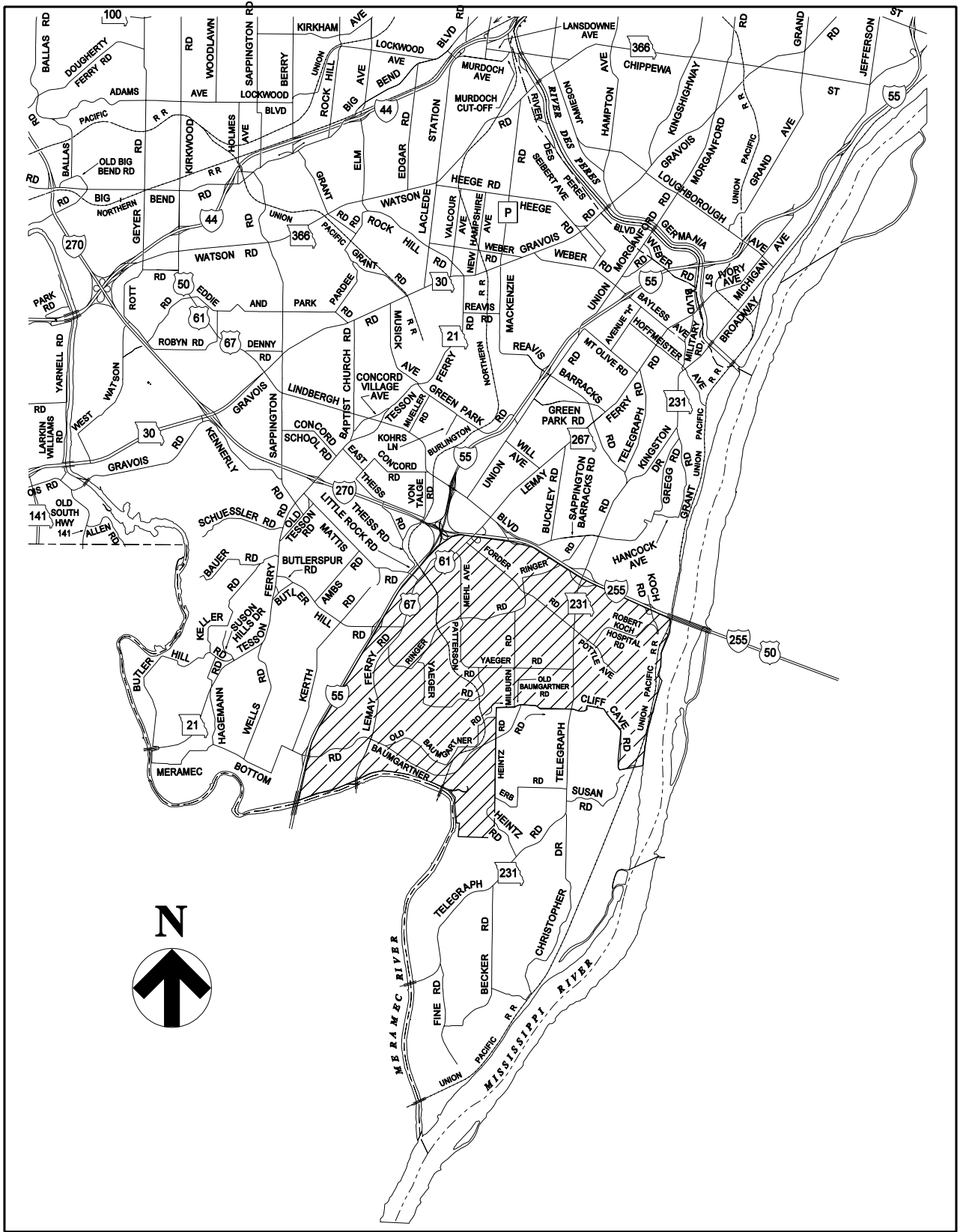


**COLUMBIA BOTTOM-LARIMORE-LILAC
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 522)**

AREA MAP

12-22-97

75.15-18



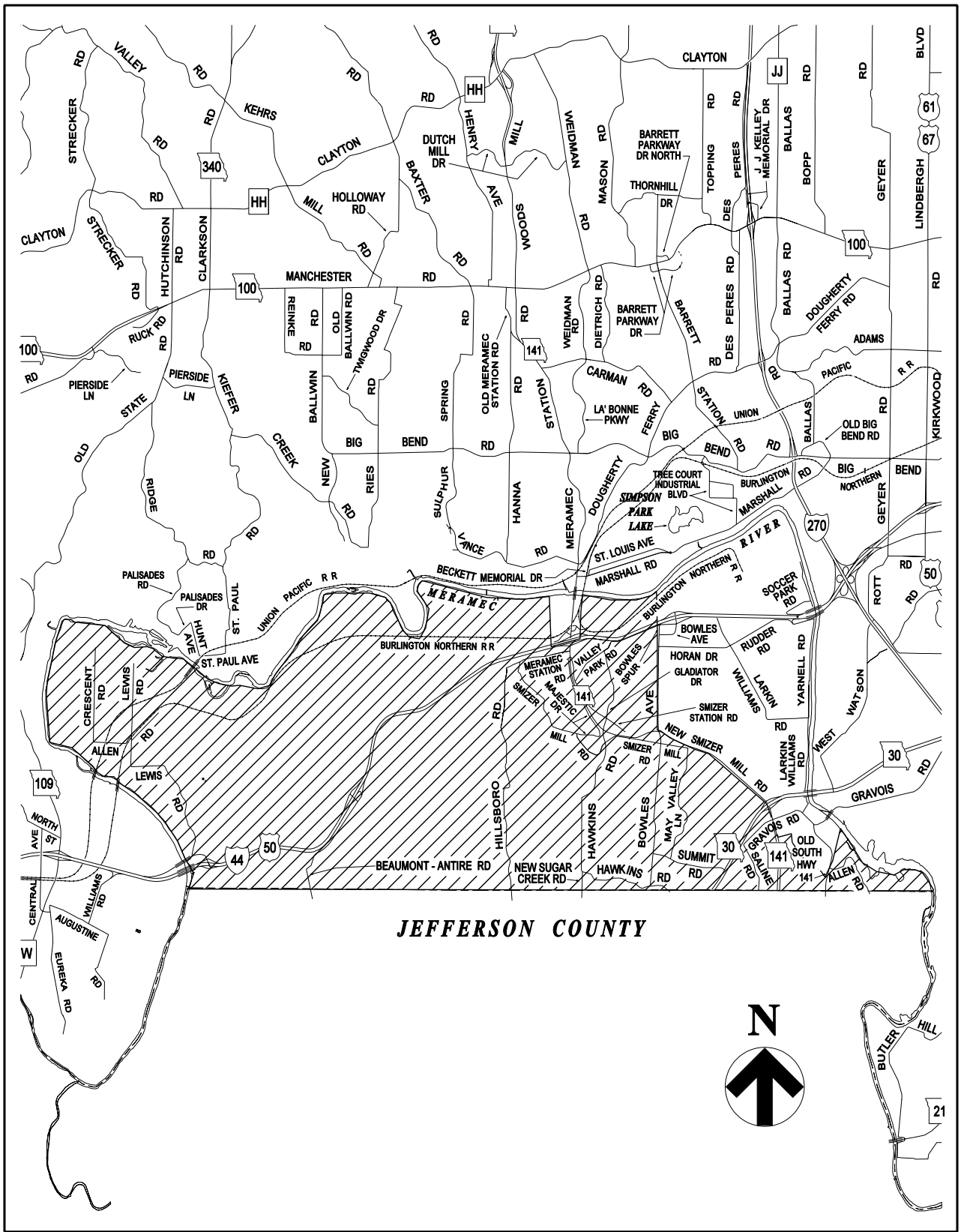
NORTH OAKVILLE

TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 537)

AREA MAP

12-22-97

75.15-19

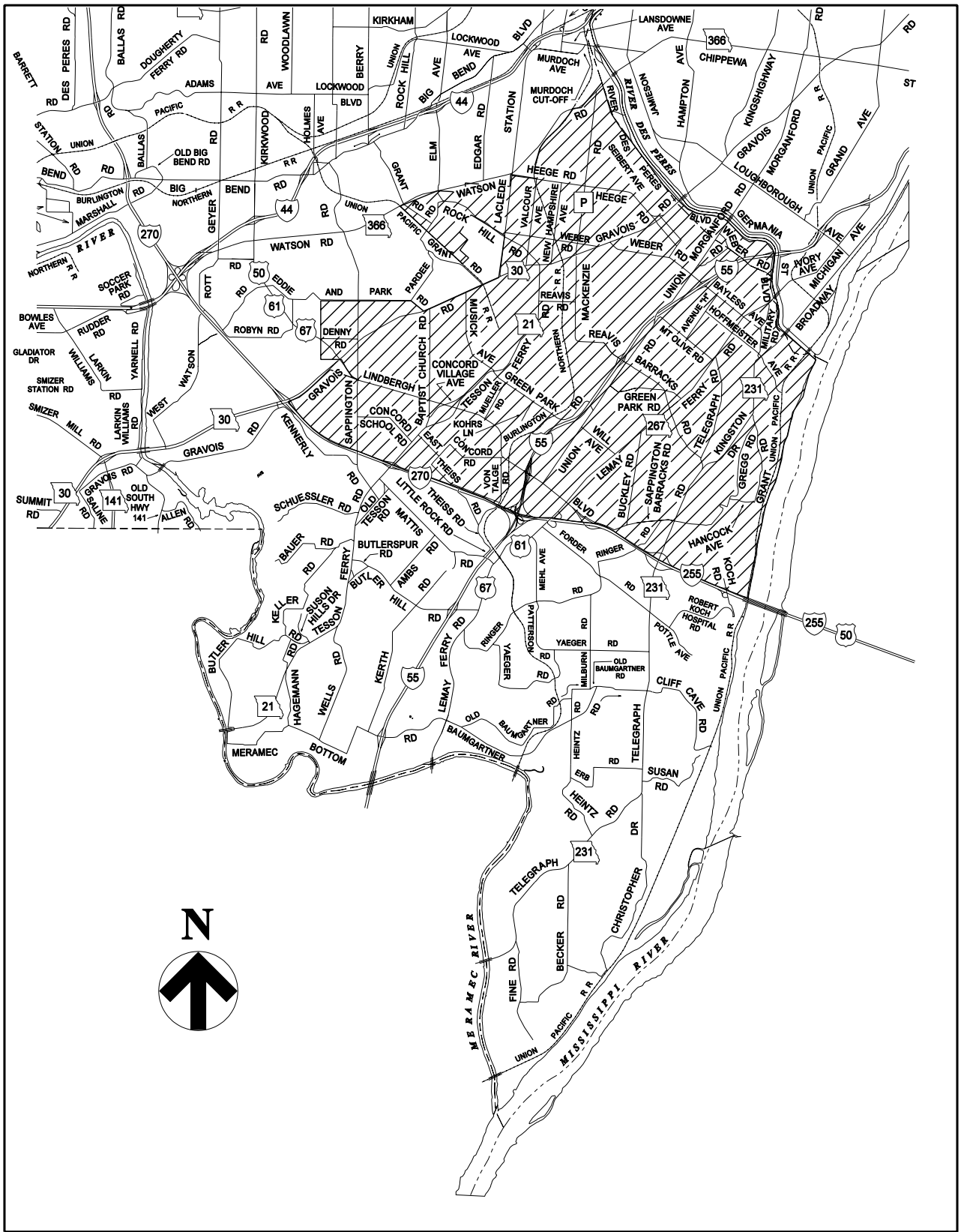


**HAWKINS-BOWLES-SUMMIT-GRAVOIS
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 506)**

AREA MAP

12-22-97

75.15-20

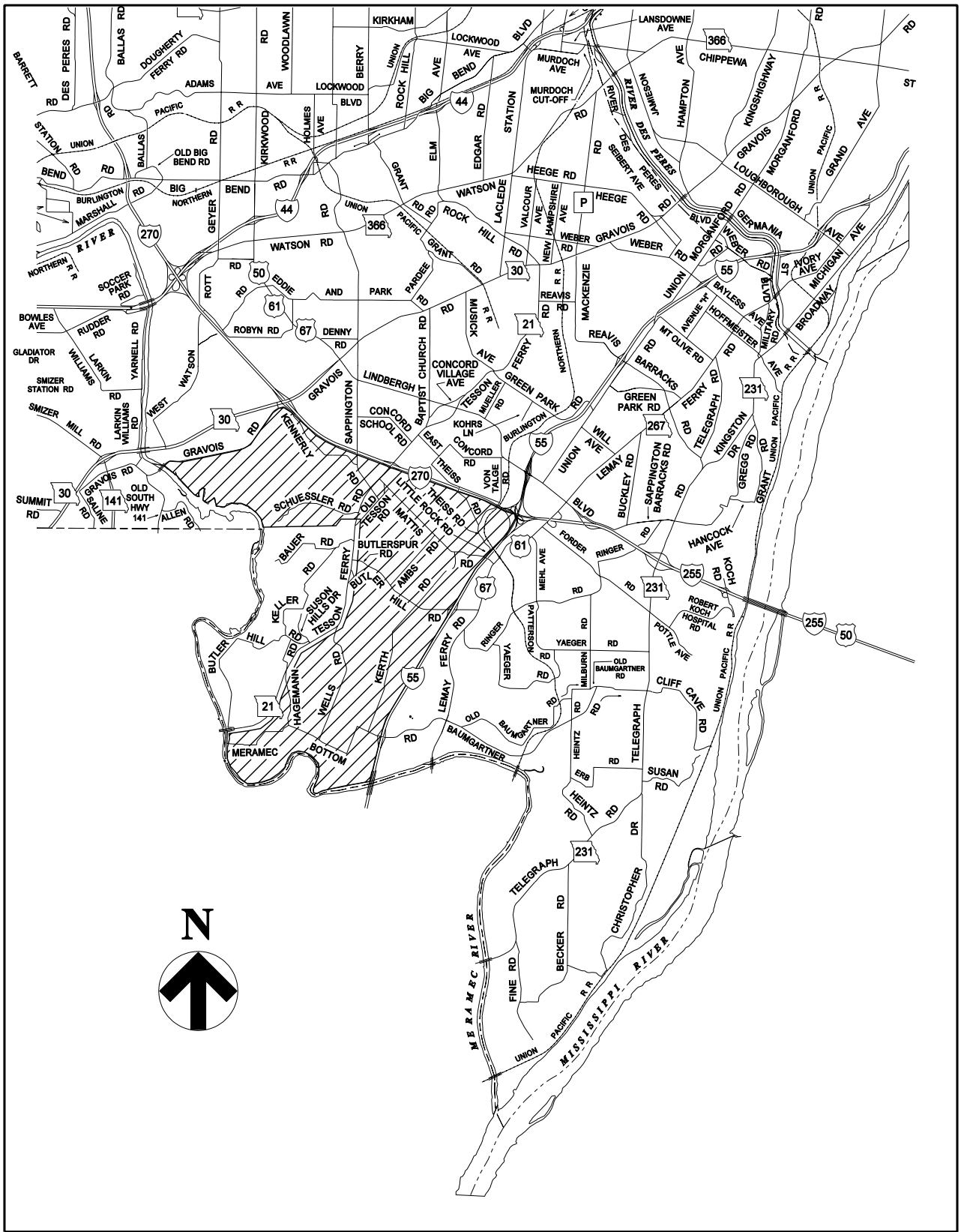


**BAPTIST CHURCH-GREEN PARK-BUCKLEY
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 701)**

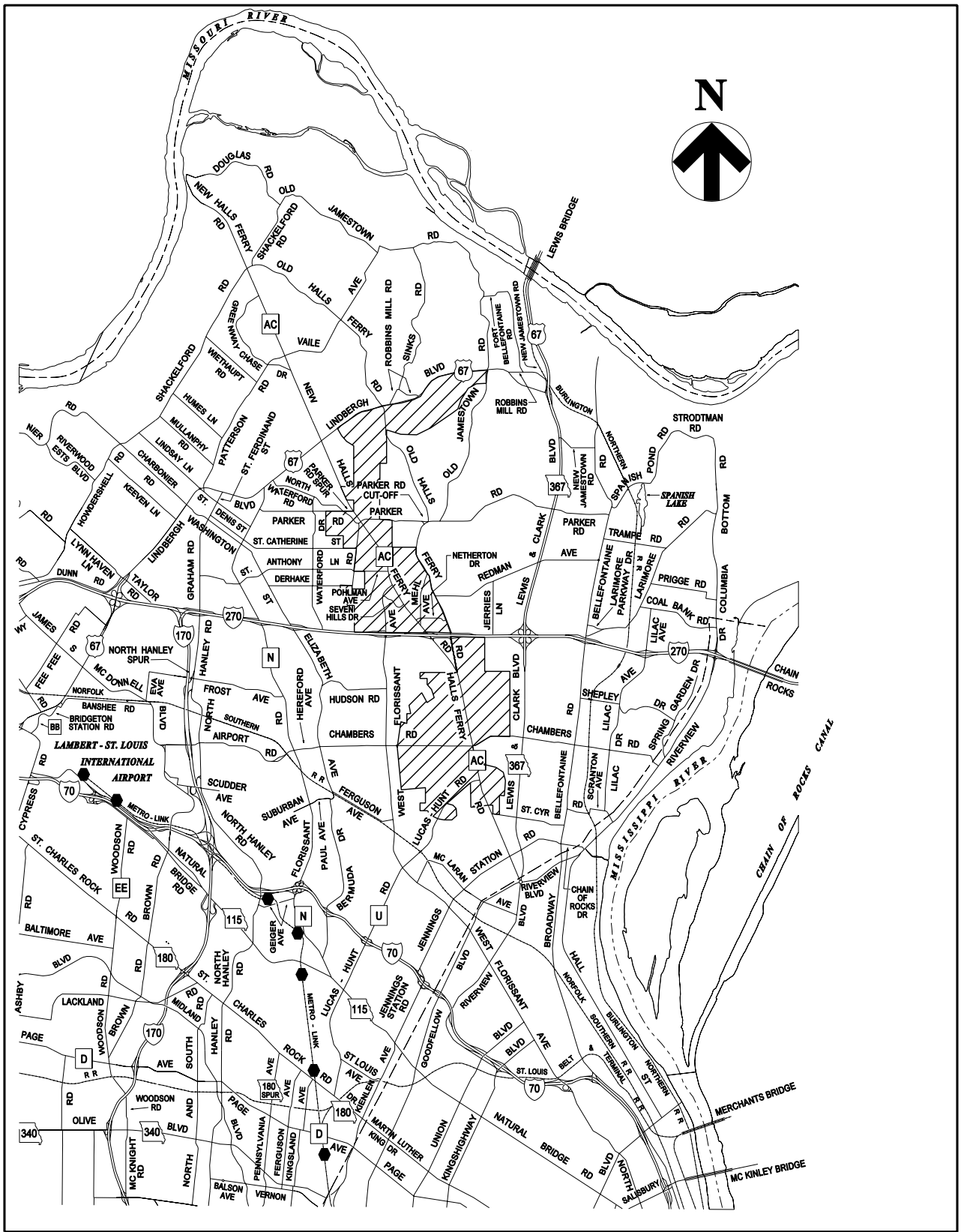
AREA MAP

12-22-97

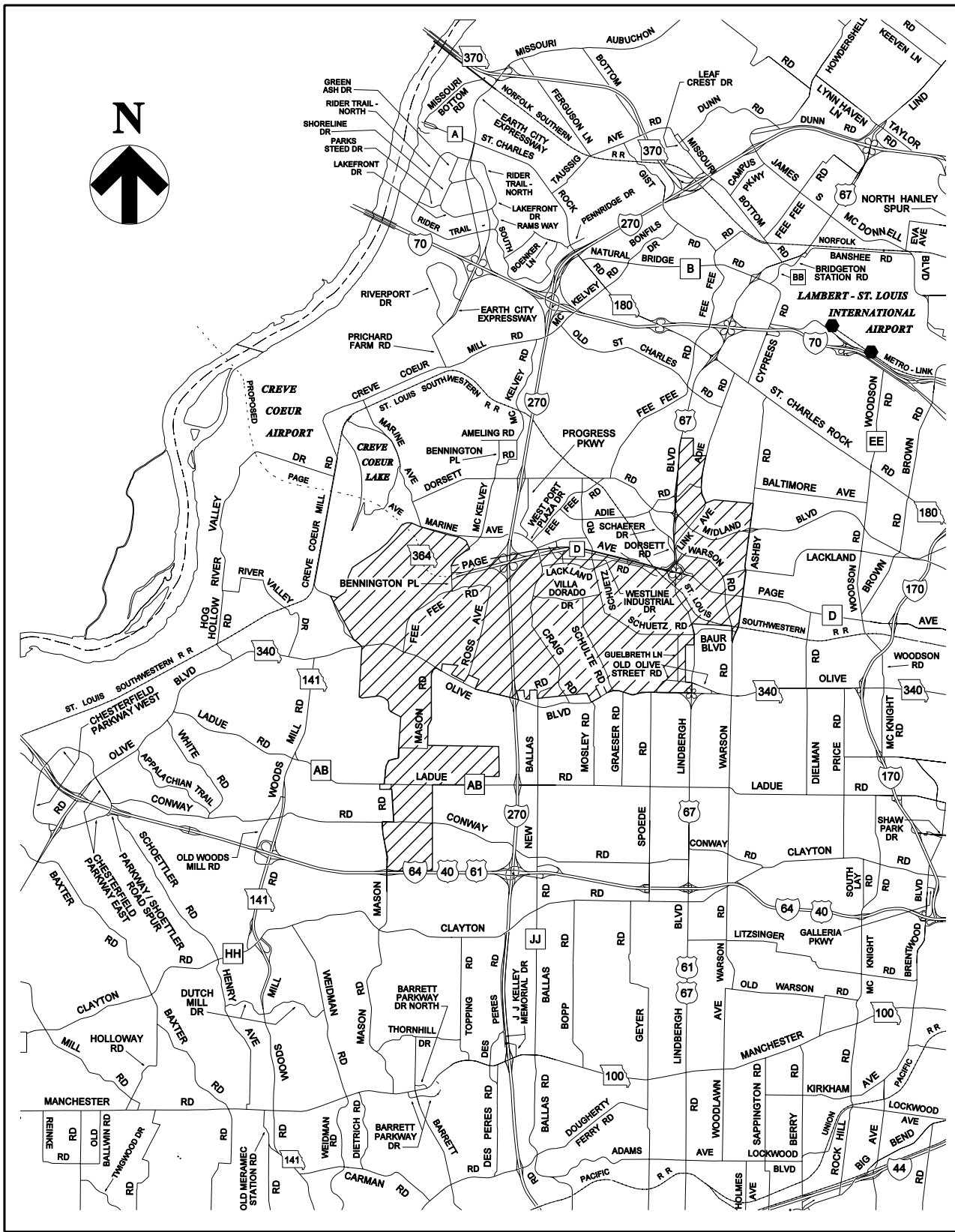
75.15-21



KENNERLY-KERTH
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 520)
AREA MAP
 12-22-97
 75.15-22



NEW HALLS FERRY ROAD CORRIDOR
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 702)
AREA MAP
 12-22-97 75.15-23

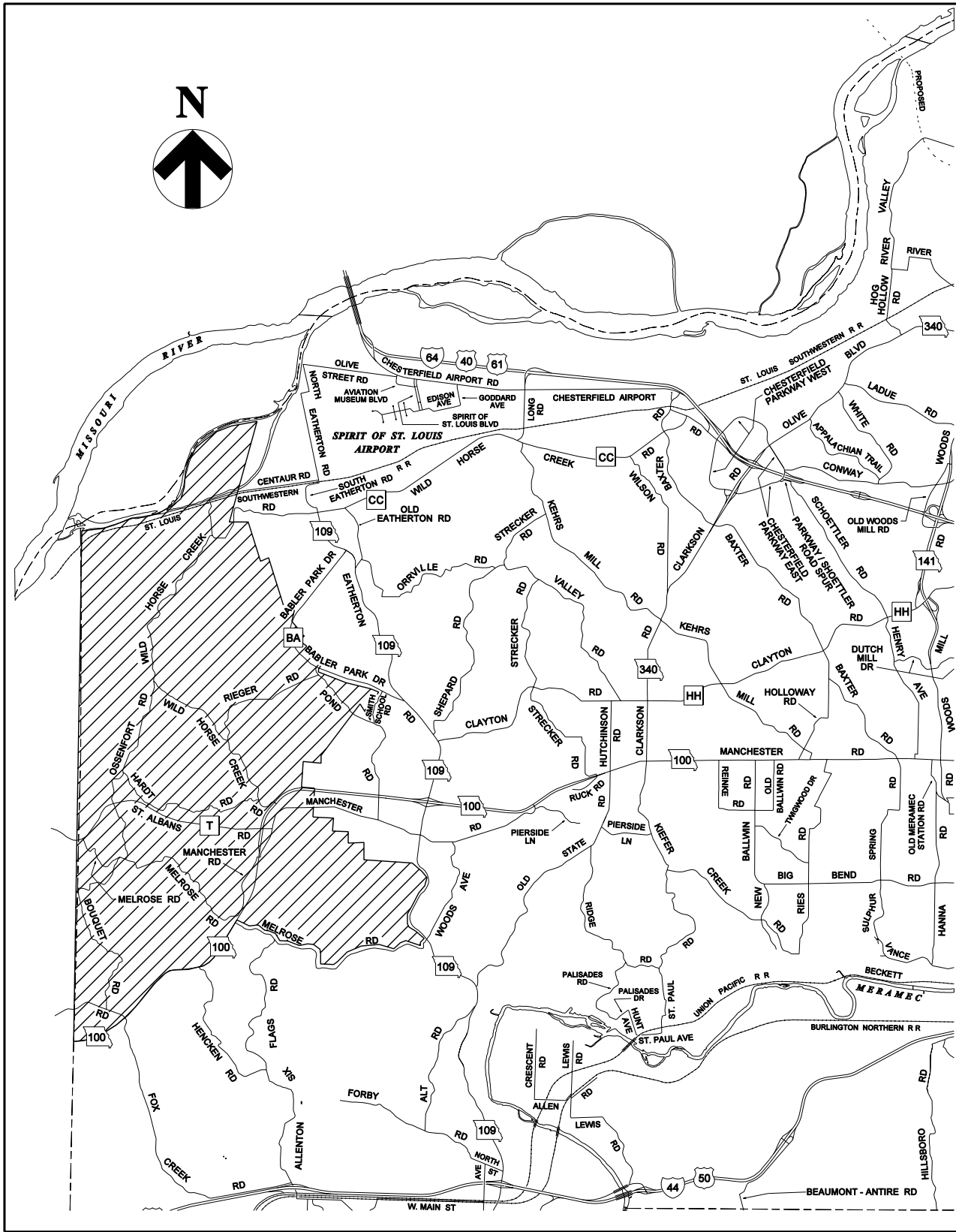


FEE FEE- SCHUETZ-MASON-MIDLAND
 TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 703)

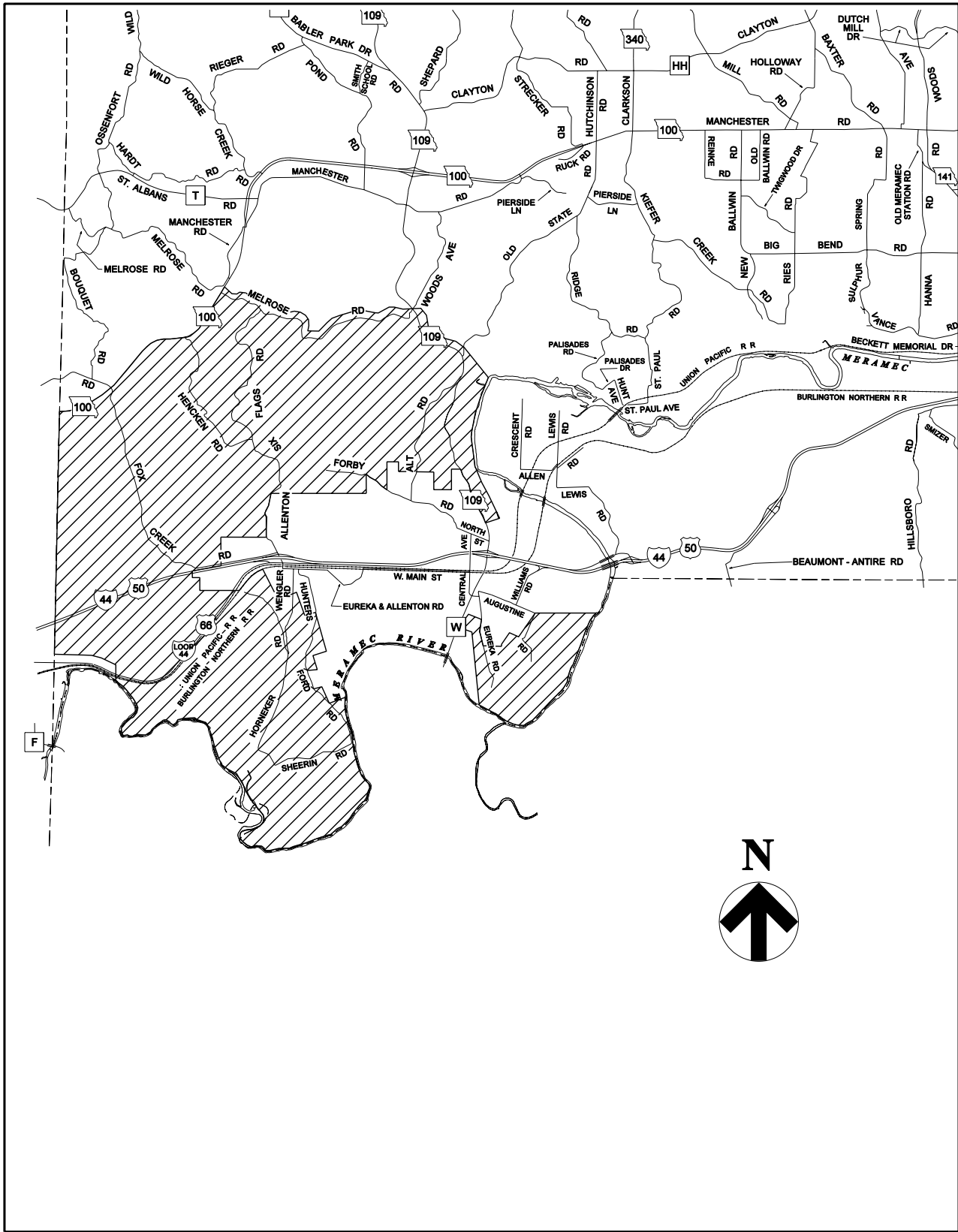
AREA MAP

12-22-97

75.15-24



WILD HORSE CREEK
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 704)
AREA MAP
 12-22-97
 75.15-25



FOX CREEK-HORNECKER CORRIDOR
TRAFFIC GENERATION ASSESSMENT ROAD TRUST FUND (NO. 705)
AREA MAP
 12-22-97 75.15-26

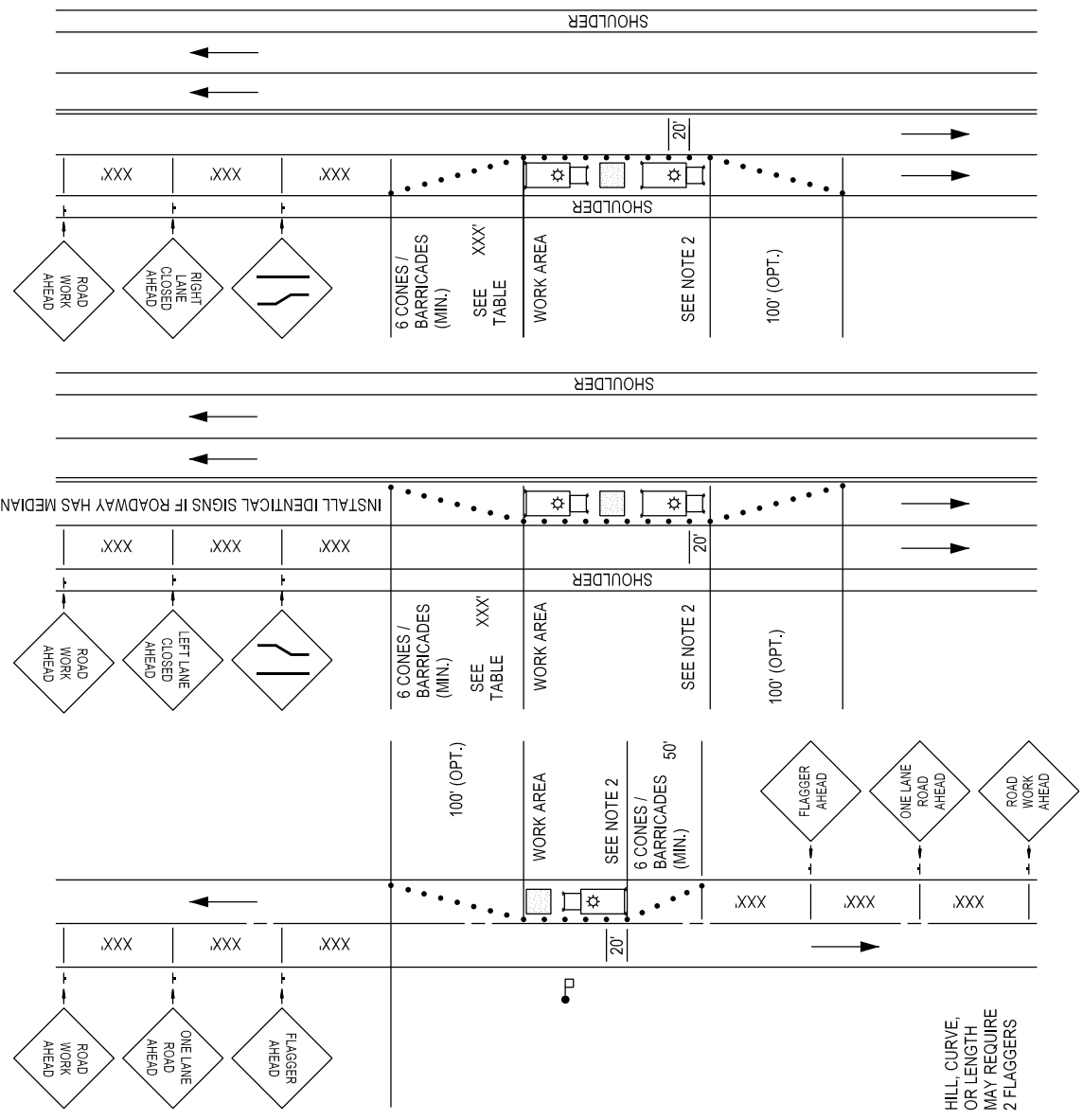
94.00 Traffic Handling for Construction

All detours / lane closures must be handled using traffic control devices conforming to the most current edition of the "Manual on Uniform Traffic Control Devices" (MUTCD), and must be approved by the St. Louis County Department of Transportation ("Department"). The manual, produced by the U.S. Department of Transportation, Federal Highway Administration (FHWA), may be viewed on their Internet website and printed at no charge. The MUTDC Internet website address is <http://mutcd.fhwa.dot.gov/>.

NEW	REVISIONS		
7-28-88	4-16-97	4-13-07	9-1-15
	7-8-13		

GENERAL NOTES

- 1) Do not scale drawing, follow dimensions.
- 2) Truck barricade with flashing lights and / or arrow board may be required as directed by the St. Louis County Department of Transportation.
- 3) All overnight detours when specifically authorized by the St. Louis County Department of Transportation shall use Drums / Barricades with steady burn lights (Optional) for transitioning traffic.
- 4) All signing must be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).



TWO LANE PAVEMENT

SIGN SPACING BY SPEED LIMIT

SPEED	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH
SIGN	200 FT.	200 FT.	350 FT.	350 FT.	350 FT.	500 FT.

FOUR LANE PAVEMENT

TAPER LENGTHS / SIGN SPACING BY SPEED LIMIT

SPEED	25 MPH	30 MPH	35 MPH	40 MPH	45 MPH	50 MPH
TAPER	125 FT.	180 FT.	245 FT.	320 FT.	320 FT.	540 FT.
SIGN	200 FT.	200 FT.	350 FT.	350 FT.	350 FT.	500 FT.

HILL, CURVE, OR LENGTH MAY REQUIRE 2 FLAGGERS

ST. LOUIS COUNTY
DEPARTMENT OF TRANSPORTATION
CREVE COEUR, MISSOURI

TYPICAL APPLICATIONS FOR TRAFFIC CONTROLS

TWO LANE PAVEMENT **CENTER LANE OF FOUR LANE PAVEMENT** **OUTSIDE LANE OF FOUR LANE PAVEMENT**

REVISION DATE: September 1, 2015
DRAWING 94.00-2

95.00 Listing of Standard Abbreviations

The following abbreviations may be used in addition to those provided in Section 101 of the St. Louis County "Standard Specifications for Road and Bridge Construction" manual, or as shown on the St. Louis County Department of Transportation Standard Drawings:

<i>Word</i>	<i>Abbreviation</i>
A	
Abutment.....	abut.
Acre.....	ac.
Actuated.....	act.
Additional.....	addn.
Adjust to grade.....	ATG
Adjust house lead.....	AHL
Adjust house sewer connection.....	AHSC
Affidavit.....	AFFDVT
Aggregate.....	aggr.
Agreement.....	AGREE
Alignment.....	align.
Alley.....	Aly.
Alternate.....	alt. or ALT
Alternating current.....	AC or ac
Altitude.....	alt.
Aluminum.....	AL or alum.
American Association of State Highway and Transportation Officials.....	AASHTO
American National Standards Institute.....	ANSI
American Public Works Association.....	APWA
American Society for Testing and Materials.....	ASTM
American Wire Gauge.....	AWG
Americans with Disabilities Act.....	ADA
Americans with Disabilities Act Accessibility Guidelines.....	ADAAG
Ampere.....	A
And.....	&
And others.....	Et al
And wife.....	Et ux
Angle.....	ang.
Approach.....	appr.
Approved.....	apvd.

Word

Abbreviation

Approximately.....	approx.
Area.....	A
Arterial Road System (St. Louis County).....	ARS
Asphalt or asphaltic.....	AC or asph.
Asphaltic concrete.....	AC or asph. conc.
As required.....	AR
Assignment.....	ASSGMT
Association.....	assoc.
At.....	@
Avenue.....	Ave., AVE or AV
Average.....	avg. or AVG
Average Daily Traffic.....	ADT
Average Weekday Traffic.....	AWT
Azimuth.....	Az, az or α

B

Back of curb.....	B.C. or B.O.C.
Back plate.....	B.P.
Back sight.....	B.S.
Back to back.....	bk. to bk. or B-B
Balance.....	bal.
Base of rail.....	B.R.
Base line.....	BL
Basement.....	bsmt. or bsmnt.
Bearing.....	B
Benchmark or bench mark.....	BM or B.M.
Best Management Practice.....	BMP
Bituminous.....	Bit.
Block.....	Blk.
Boulevard.....	Blvd. or BLVD
Boundary.....	bndry.
Branch.....	Br.
British Thermal Units.....	BTU
Building.....	bldg.
Building Officials and Code Administrators International.....	BOCA
Bypass.....	Byp.

C

Cable Television	CATV
Calculated or calculations	calc.
Candela	CD
Cast Iron Pipe	CIP or C.I.P.
Cement (see Portland cement concrete)	cem.
Center	ctr. or Ctr.
Center mark	+
Center to center	C-C or C-to-C
Centerline or center line	⌀, CL or C/L
Circle	Cir.
Circuit	CCT or CKT
Circular	circ.
City Limits	C/L
Clay pipe	CP
Cleanout	C.O.
Clearing and grubbing	C & G
Commercial entrance	C.E.
Company	Co.
Computer aided design	CAD
Computer aided design & drafting	CADD
Concrete (see Portland Cement Concrete)	conc. (PCC)
Concrete monument	CM or conc. mon.
Concrete pipe	C.P.
Condition	cond.
Construct or construction	const.
Construction Cost Index	CCI
Construction limits	C.L.
Continue or continued	cont.
Conventional	conv.
Corrugated Metal Pipe	CMP or C.M.P.
Corrugated Metal Pipe Arch	CMP Arch or C.M.P. Arch
County	Co.
County Road System (St. Louis County)	CRS
Court	Ct. or CT
Covenants	COVNTS
Creek	Cr. or Crk.
Creosoted	creo.

Cross over or Crossover	Xover or X-over
Cross Section	Xsec or X-Sec
Crossing	Xing, XING or X-ing
Crosswalk	Xwalk or X-Walk
Cubic feet or cubic foot	cu. ft. or ft ³
Cubic feet per second	cfs or ft ³ /s
Cubic inch	cu. in. or in ³
Cubic yard	cu. yd. or yd ³
Culvert	culv.
Curb & gutter	C. & G.
Curb & gutter transition	C. & G. trans.
Cylinder	cyl or cyl.

D

Decibel	dB
Deed of Trust	D-T
Degree(s)	deg. or °
Degree Centigrade	°C
Degree Fahrenheit	°F
Design Build	D/B
Design file (AutoCAD)	dwg or DWG
Design file (MicroStation)	dgn of DGN
Diagonal	diag.
Diameter	dia., diam. or D
Dimension	dim. or DIM
Direct current	dc or DC
Discharge (cfs)	Q
Distance	dist.
Distance vertical curve changes 1%	K
Distribution	distr.
District	Dist.
Divided by or division	div. or ÷
Double	dbl.
Drawing	dwg.
Drive	Dr.
Drop inlet	D.I.

E

Each	ea.
Easement	esmt.
East	E
Eastbound	E.B.
Edge of Pavement	E.P.
Electric	elec.
Electric Light Post	E.L.P.
Elevation	elev. or el.
Elevator	EL
Embankment	emb.
Engineer	Engr.
Entrance	entr.
Environmental Protection Agency	EPA
Equal Employment Opportunity Commission	EEOC
Equation	eq.
Equipment	equip.
Equivalent	equiv.
Established	Est.
Estimate	est.
Et cetera (and so forth)	etc.
Existing	exist.
Existing iron pipe	EIP
Expansion	exp.
Expressway	Expwy., EXPWY or Expy.
Extension	Ext.

F

Face of curb	F.C. or F.O.C.
Face to face	F-F
Federal	Fed.
Federal Aid	F.A.
Federal Aid Interstate	F.A.I.
Federal Aid Primary	F.A.P.
Federal Aid Secondary	F.A.S.
Federal Aid Urban	F.A.U.
Federal Emergency Management Agency	FEMA

Feet or foot.....	ft.
Feet per minute or foot per minute	fpm or f.p.m.
Feet per second or foot per second.....	fps or f.p.s.
Figure(s)	fig. or figs.
Finish.....	fin.
Fire hydrant	F.H.
Federal Highway Administration	FHWA
Flood Insurance Rate Map	FIRM or F.I.R.M.
Flood limits or flow line.....	F.L.
Floor	Fl.
Fluid.....	fl.
Foot per foot.....	ft/ft
Footing	FTG
Forward	fwd.
Foundation	fnd.
Freeway.....	Fwy., FWY or FRWY
Frequently Asked Questions.....	FAQs

G

Gage or Gauge	ga. or Ga.
Gallon	gal.
Gallon per minute.....	gpm
Galvanized	galv. or GV
Garage	gar.
Gas.....	gas or G
Gas drip.....	G.D.
Gas service valve.....	G.S.V.
General.....	Gen.
Geographic Information System	GIS
Grade	gr.
Graded Earth.....	G.E.
Grated Inlet	G.I.
Gravel.....	GVL
Ground	gnd. or G
Grout	grt.
Grubbing	grub.
Gutter	gut. or G

H

Hazardous Material	HAZMAT
Header.....	hdr.
Headwall.....	hdwl.
Heavy	hvy.
Heavy Stone Revetment	H.S.R.
Height	ht. or hgt.
Height of Instrument.....	H.I.
Heights	Hts.
Hertz.....	Hz
High Density Polyethylene	HDPE
High Pressure	H.P.
High Water	H.W.
Highway.....	Hwy., HWY or hwy.
Home Builders Association.....	HBA
Horizontal	hor.
Horsepower.....	hp
Hour.....	hr

I

Improvement	Imp.
Inch.....	in.
Inch per second	ips or i.p.s.
Included.....	incl.
Incorporated	Inc.
Increase	incr.
Infinity	∞
Information	info. or INFO
Inside diameter.....	I.D.
Institute of Electrical and Electronic Engineers	IEEE
International Building Code.....	IBC
Intersection.....	Inter.
Interstate	I (i.e. I-270)
Iron pipe or pin	I.P.
Island.....	Is.
Isolated ground	IG

J

Joint.....	jt.
Joule.....	J
Junction.....	Jct.
Junction Box.....	J.B.

K

Kilovolt-amperes	KVA
Kilowatt.....	kW

L

Lamp Hole.....	L.H.
Land Surveyor.....	L.S.
Lane	Ln., LN or La.
Latitude or Lateral.....	lat.
Leave in Place.....	L.I.P.
Left	lt., lft. or LFT
Length	le. or ln.
Length of Curve.....	L.O.C.
Length of Vertical Curb	L.V.C.
Light Stone Revetment	L.S.R.
Light Standard.....	L.S.
Lighting.....	Ltg. or LTG
Limited.....	Ltd.
Linear or Lineal	lin.
Linear Foot	L.F.
Liquid.....	liq.
Location.....	loc.
Long	lg.
Longitude or longitudinal.....	long.
Low Flow Line	L.F.L.
Low Water	L.W.
Lump Sum.....	L.S.

M

Machine Grading.....	M.G.
Magnetic.....	mag.
Mail Box.....	MB or M.B.
Mainline.....	ML or M.L.
Maintenance.....	maint.
Major.....	Maj.
Manhole.....	MH or M.H.
Manual on Uniform Traffic Control Devices.....	MUTCD
Marker.....	mkr.
Masonry.....	MAS
Material.....	mat.
Maximum.....	max.
Median.....	med.
Meter.....	m
Metropolitan St. Louis Sewer District.....	MSD
MicroStation graphics file (design file).....	dgn or DGN
Mile.....	mi. or MI
Miles per hour.....	MPH or mph
Minimum.....	min.
Minus.....	—
Minute(s).....	min. or '
Miscellaneous.....	misc.
Missouri Department of Transportation.....	MoDOT
Modified.....	mod.
Monument.....	mon.
Mount.....	Mt.
Mounting.....	mtg.
Multiplied by or multiplication.....	×

N

National Association of Home Builders.....	NAHB
National Electrical Code.....	NEC
National Electrical Manufacturers Association.....	NEMA
North.....	N
Northbound.....	N.B.
Northeast.....	NE
Northwest.....	NW
Not to Scale.....	NTS or N.T.S.
Now or formerly.....	N/F or n/f
Number.....	No., no. or #

O

Occupational Safety and Health Administration	OSHA
Obliterate	oblit.
Office	ofc. or off.
Ohm	Ω
Old Iron Pipe	O.I.P.
Opposite	opp.
Optically Limiting	O.L.
Ordinary High Water	O.H.W.
Original	orig.
Ounce	oz.
Outside Diameter	O.D.
Over Flow	O.F.
Overhead	O.H.

P

Parallel	par.
Parking Space	P.S.
Parkway	Pkwy. or PKWY
Pavement	pvmt.
Part number	PN or P/N
Pedestrian	ped.
Percent	pct. or %
Perforated	perf.
Permanent	perm.
Permanent Drainage Easement	PDE or P.D.E.
Permanent Footing Easement	PFE or P.F.E.
Permanent Overhang Easement	POE or P.O.E.
Permanent Roadway Improvement, Maintenance, Utility, Sewer, and Sidewalk Easement	PRIMUS & SE or P.R.I.M.U.S. & S.E.
Permanent Sidewalk, Sewer and Utility Easement	PSS & UE or P.S.S. & U.E.
Permanent Sight Distance Easement	PSDE or P.S.D.E.
Permanent Traffic Signal Easement	PTSE or P.T.S.E.
Place	Pl.
Plus	+
Plus or minus	±
Point	pt.
Point of Beginning	POB or P.O.B.

Point of Compound Curvature	PCC or P.C.C.
Point of Curve	PC or P.C.
Point of Intersection	PI, POI or P.I.
Point of Reverse Curve	PRC or P.R.C.
Point of Tangency	PT or P.T.
Point on Back Tangent	POBT or P.O.B.T.
Point on Curve	POC or P.O.C.
Point on Forward Curve	POVC or P.O.F.C.
Point on Tangent.....	POT or P.O.T.
Point Vertical Curve	PVC or P.V.C.
Point Vertical Intersection	PVI or P.V.I.
Point Vertical Tangent.....	PVT or P.V.T.
Polyvinyl Chloride.....	PVC or P.V.C.
Portable Document Format (Adobe Acrobat)	PDF or pdf
Portland cement concrete	PCC
Pound	lb.
Pounds	lbs.
Pounds per cubic foot	pcf, p.c.f. or lb/ft ³
Pounds per square foot	psf, p.s.f. or lb/ft ²
Pounds per cubic inch.....	pci, p.c.i. or lb/in ³
Pounds per square inch.....	psi, p.s.i. or lb/in ²
Power of Attorney.....	P of A
Power Pole	PP or P.P.
Preliminary	prelim.
Prepared	prep.
Preventative Maintenance	PM
Previous	prev.
Private	Pvt. or pvt.
Professional Engineer.....	P.E.
Profile Grade	P.G.
Project.....	proj.
Property Line.....	PL
Proposed.....	prop.
Public Rights-of-Way Accessibility Guidelines	PROWAG
Publication(s)	pub. or pubs.
Push Button.....	P.B.

Q

Quantity.....	QTY or qty.
Quart	qt.
Quit Claim Deed.....	QCD

R

Radius	R or rad.
Radius point	RP
Railroad	RR, RR. or R.R.
Railway	RY, R.Y. or Ry.
Range	R., Rng. or RNG
Reference	ref.
Reflectorized	reflec.
Reinforced	reinf.
Reinforced Concrete	RC or R.C.
Reinforced Concrete Pipe	RCP or R.C.P.
Release	Rel. or rel.
Relocate or Relocation	reloc.
Remove	rem.
Replace	repl.
Request for Proposal or Request for Pricing	RFP
Required	reqd. or REQD
Resident Engineer	R.E.
Residential	res.
Retaining	ret.
Reverse or Revised	rev. or REV
Revetment	revet.
Revolutions per minute	rpm
Revolutions per second	rps
Restrictions	RESTRNS
Right	rt., rht. or RHT
Right-of-Way	R/W, R-O-W or ROW
Road	Rd. or RD
Roadway	Rdwy.
Round	rnd.
Route	Rte., RTE or rte.

S

Saint	St.
Sanitary	san.
Second(s)	sec. or "
Section(s)	Sec., sec. or secs.
Sediment and Erosion Control Manual	SECM
Service	serv.

Shoulder	Shldr. or SHLDR
Sidewalk	S.W.
Slope	Sl.
Slope Line	S.L.
South	S
Southbound	S.B.
Southeast	SE
Southwest	SW
Specifications	Spec.
Spiral to Curve	S.C.
Spiral to Tangent	S.T.
Square	sq.
Square foot	ft ² or S.F.
Square inch	in ² or S.I.
Square yard	yd ² or S.Y.
Stairway	stwy.
Standard	std. or STD
Station	Sta. or sta.
Steel rebar	S.R.
Stone	Stn.
Stone Monument	SM or Stn. Mon.
Stopping Sight Distance	S.S.D.
Stormwater Pollution Prevention Plan or Storm Water Pollution Prevention Plan	SWPPP
Story	Sty.
Stream	Str.
Street	St. or ST
Street Sign	S.S.
Structure	struc.
Subdivision	subd.
Subordination Deed	SUBN
Superelevation	S.E.
Survey	surv.
System	sys.

T

Tabulation	tab.
Tangent	tan.
Tangent to Spiral	T.S.
Telephone	Tel. or TEL
Telephone Pole	T.P.

Temperature.....	temp., °F or °C
Temporary.....	temp. or TEMP
Temporary Demolition and Backfill License.....	TD & BL or T.D. & B.L.
Temporary Demolition, Backfill and Construction License.....	TDB & CL or T.D.B. & C.L.
Temporary Slope Construction License.....	TSCL or T.S.C.L.
Terminal.....	TRM
Timber.....	tubr.
Time (late night / morning).....	a.m. or A.M.
Time (afternoon / evening).....	p.m. or P.M.
To be Abandoned.....	T.B.A.
To be Abandoned and Filled.....	T.B.A. & F.
To be announced.....	TBA
To be Filled.....	T.B.F.
To be Removed.....	T.B.R.
To be Removed and Relocated.....	T.B.R. & Reloc.
To be Removed and Replaced.....	T.B.R. & R.
To Curve.....	T.C.
Ton.....	T
Top of Curb.....	T/C
Top of Slope.....	T.O.S.
Top of Structure.....	T/S
Top of Wall.....	T/W
Topography.....	topo.
Township.....	T., Twp. or Tps.
Traffic Generation Assessment.....	TGA or T.G.A.
Trail.....	Tr. or TR
Transportation.....	Trans.
Transverse.....	transv.
Traverse.....	trav.
Turning Point.....	T.P.
Typical.....	typ. or TYP

U

Underground.....	UG or U.G.
Underwriters Laboratories.....	UL
Uniform Building Code.....	UBC
Unincorporated.....	Uninc.
Uninterruptable Power Supply.....	UPS

Word***Abbreviation***

United States Army Corps of Engineers	USACE
United States Department of Justice	DOJ
United States Department of Labor	DOL
United States Department of Transportation	DOT
United States Geological Survey	USGS or U.S.G.S.
Upper Flow Line	UFL or U.F.L.
Use in Place	UIP or U.I.P.
Utility easement	UE or U.E.
Utility Pole	UP or U.P.

V

Vacated or vacation	Vac.
Variable	Var.
Vent Pipe	VP or V.P.
Vertical	Vert.
Vitrified Clay Pipe	VCP or V.C.P.
Volatile Organic Chemical Compound	VOCs
Volatile Organic Compound	VOC
Volt / Voltage	V
Volume	Vol. or V.

W

Warning	WARN
Warranty Deed	WD
Water	W.
Water Meter	WM or W.M.
Water Service Valve	WSV or W.S.V.
Watt	W
Week	wk.
Weight	wt.
West	W
Westbound	WB or W.B.
Wheelchair ramp	WCR
Width	Wid.
With	w/ or W/
Within	w/i or W/I
Without	w/o or W/O

X

Y

Yard.....yd.

Yellow Y

Z

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70.00.....Agreement Guaranteeing Road Improvement (Special Escrow)9/1/2018

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73.00.....Schedule of Unit Prices.....9/1/2015

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74.00.....Annual Change of Construction Cost Index (CCI) 1/1/2019

Section 75

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75.10.....Trust Fund Contribution Schedules 1/1/2019

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Section 95

95.00.....Listing of Standard Abbreviations.....9/1/2015

