PAVING CRITERIA

Sec. 1. - Introduction

a) *Short title.* This ordinance shall be known and may be cited as "The TexAmericas Center Paving Criteria." This ordinance may also be cited as the "TexAmericas Paving Guidelines", "TAC Paving Guidelines", "Paving Guidelines", “TexAmericas Center Paving Ordinance”, “TAC Paving Ordinance” or the ‘Paving Ordinance”.

(b) *Minimum standards.* The requirements of these regulations are minimum permissible standards; and it is expected that developers and the respective decision-making authority will normally strive for quality developments which exceeds these minimum requirements.

Sec. 2. – Purpose

The paving criteria as herein established have been made for the purpose of promoting public welfare and safety by construction of appropriate pavement sections at TexAmericas Center (TAC). They have been prepared to promote the development and the utilization of the property in a manner that provides an attractive and high-quality community environment, protects the public interest by having standards for, but not limited to, the location, design, and type of streets, provides for efficient traffic circulation throughout TAC property.

Sec. 3. - Definitions

For the purpose of this ordinance, the following words and phrases used in this ordinance shall have the following meanings, except where the context clearly indicates a different meaning:

Primary Road means a street designed to facilitate rapid and heavy traffic movements and which primarily provides vehicular circulation to various sections of TAC property and which, as a secondary function, provides direct access to abutting property.

Secondary Road means a street used primarily for circulation within business parks or developments to carry traffic from these developments to Primary Roads or to carry traffic through or adjacent to commercial, industrial or high density areas.

Consulting engineer means a professional engineer or engineering firm authorized to practice in the state and engaged by TAC or by any developer to design and supervise improvement projects.

Developer means any private individual or group of individuals requesting or implementing public improvements.

Operations Department means TAC’s Chief Operations Officer or TAC’s duly authorized appointee.

Board of Directors means the TexAmericas Center Board of Directors.

Rural Section Street means a street characterized by a pavement section that does not have a curb at the edge of the pavement section and a drainage ditch parallel to the road to carry stormwater runoff.

Urban Section Street means a street characterized by a pavement section that contains a concrete curb at the edge of the pavement.

All other words and phrases used in this article shall have the generally accepted meanings consistent with their usage by the engineering profession or the legal profession, whichever is applicable.

Sec. 4. - Governing standard specifications for materials and methods of construction.

All applicable sections of the most current version of the publication titled Standard Specifications for Construction of Highways, Streets and Bridges, adopted by the Texas Department of Transportation, and including all applicable approved revisions thereof are hereby adopted as the standard specifications for materials and methods of construction for streets within TAC. All materials used in street construction shall conform in all respects to the applicable provisions of such publication.

Sec. 5. - Right-of-way

Prior to construction of any street improvement, which is to be operated and maintained by TAC, its lessees, successors and or assignees, the following right-of-way widths shall have been dedicated by duly recorded formal instrument:

a) *Primary Roads* – One hundred fifty feet (150') feet

b) *Secondary Roads* – Seventy-five feet (75').

Sec. 6. - Pavement widths and street section.

Roads constructed at TAC may be either be of an Urban or Rural section street meeting the following criteria:

a) *Urban section street.* In general, all new street improvements constructed within TAC shall be of urban cross section with curb and gutter and shall be designed and constructed to the following minimum widths measured face to face of curb:

   1) Typical Sections

      i. Primary Road – Four 12' travel lanes;

      ii. Secondary Road – Two 12' travel lanes and a 12' paved median.

   2) Boulevard Sections.

      i. Primary Roads – Four 12' travel lanes and a 20' median;

      ii. Secondary Roads—Two 12' travel lanes and a 12' median.

b) *Rural section streets.* Existing roads may be improved or upgraded to meet the minimum criteria below:

   1) Typical Sections

      i. Primary Roads - A total minimum crown width, measured from outside edge of shoulder to outside edge of shoulder of 54 feet with a minimum pavement surfaced width of 48 feet.

      ii. Secondary Road - A total minimum crown width, measured from outside edge of shoulder to outside edge of shoulder of 42 feet with a minimum pavement surfaced width of 36 feet.

   2) Boulevard Sections

      i. Primary Roads - Same dimensions as the typical section plus a 3' shoulder adjacent to each lane of traffic;

      ii. Secondary Roads - Same dimensions as the typical section plus a 3' shoulder adjacent to each lane of traffic;

   c) *Cul-de-sac.* The minimum outside pavement diameter for the cul-de-sac or closed-end turnaround, shall be 100 feet, whether urban or rural section. The minimum pavement width around the cul-de-sac shall be 31 feet back-to-back of curb for urban section improvements and 30 feet edge-to-edge of pavement for rural section improvement, with any resultant center unpaved island construction with curb and gutter around its perimeter.

Sec. 7. - Standard cross-sectional shapes.

a) *Street crown.* All street sections shall be constructed with a cross section that will provide minimum transverse slopes as follows:

   1) Two percent (2%) for Primary & Secondary Roads from centerline to gutter line or centerline to outside edge of shoulder.

b) *Monolithic (integral) concrete curb.* A concrete curb constructed monolithically with a concrete street slab shall be six inches (6") in height above gutter elevation, have a two-inch (2") top width, a three-

inch (3”) radius top to face, a three-inch (3”) face at 30 degrees to vertical, thence a four-inch (4”) radius face to gutter low point, for a total curb width at gutter line of 9.5 inches.

c) *Concrete curb and gutter section.* Concrete curb and gutter sections constructed independently shall be a minimum 24-inch (24”) width, minimum 12-inch (12”) height, and the curb shape shall conform to that described in subsection (b) of this section for monolithic curb.

d) *Parallel drainage, rural street section.* Where rural section street construction is utilized, the street drainage within or abutting such subdivision shall be designed and constructed to meet the following minimum criteria (For drainage purposes and design, Primary and Secondary Roads should utilize the criteria labeled as ‘Arterials’ in the TexAmericas Center Minimum Drainage Criteria):

1) Drainageways parallel with streets, which carry only the runoff from such street and the abutting property, shall carry a minimum Q_{25} design storm with no overflow.

2) The street drainageways shall be shaped, graded and improved in such manner that erosion will be controlled and side slopes will not exceed 4:1 front slope and 3:1 back slope to facilitate safety and maintenance.

3) Street and drainage plans submitted shall include notes designating culvert pipe or box culvert size required for future access driveways along street. Minimum allowable pipe size shall be 15-inch diameter.

4) All cross-drainage structures under rural section streets shall be constructed with approved headwalls or sloped concrete-lined end sections.

Sec. 8. - Minimum standards of structural design and construction.

a) *Roadbed soils.* Roadbed soils with a plasticity index (P.I.) of 20 or greater shall not be considered acceptable subgrade material. Such high P.I. material must be stabilized in an approved manner or replaced with a minimum of twenty-four inch (24”) thick approved subbase material. The design engineer shall require soil tests at each apparent change of soil characteristic along the street length or at intervals not exceeding 500 feet of street length. In instances where roadbed soil is stabilized or replaced, appropriate laboratory tests shall be performed in a like manner on the new or stabilized material.

b) *Subgrade.* Acceptable roadbed soils or subbase materials shall be worked a minimum six-inch depth and compacted to a minimum 95-percent (95%) Standard Proctor Density to be considered acceptable subgrade for further construction. Prior to testing for subgrade density, a certified independent testing laboratory under the direction of the design engineer shall supervise the proof rolling of the subgrade in accordance with Item 216 of the herein adopted state department of transportation standard specifications. Once proof rolling is complete and any required repairs made, the independent testing laboratory shall test for required density with a minimum of one test for each soil type or at a minimum of one test for each 500 feet of street length or part thereof.

c) *Rigid pavement design.*

1) *Primary Road.* Individual design based on projected and assigned traffic volumes by individual study.

2) Secondary Road. Over the required subgrade or subbase, the minimum thickness requirement for Portland Cement Concrete (PCC) pavement shall be six inches (6”) with No. 3 steel reinforcing bars 24 inches (24”) center to center or No. 4 steel reinforcing bars 36 inches (36”) center to center spacing. The concrete shall be designed to produce a 4,000 psi nonreinforced compressive strength at 28 days. The concrete pavement shall be properly placed and cured with doweled expansion and construction joints, plus neatly sawed dummy joints at approved spacing. All joints to be sealed with approved material in an approved and timely manner. Any uncontrolled cracks occurring shall be saw cut or routed and properly sealed. The actual placement of the concrete pavement shall be monitored by a certified independent testing laboratory under the direction of the design engineer to ensure that the paving activity complies with the herein adopted state department of transportation standard specifications and the mix design, including

slump, concrete temperature and water/cement ratio. Concrete strength tests will be required at a minimum of one test per each 250 cubic yards or part thereof.

d) *Flexural pavement design.*

1) *Primary Road.* Individual design based on projected and assigned traffic volumes by individual study.

2) *Secondary Road.*

i. *Non-stabilized flexible base.* Over the required subgrade or subbase, the minimum thickness requirement for a non-stabilized flexible base course shall be one of the following:

1. Pit run gravel shall be eight inches (8") in thickness with a plasticity index (P.I.) of not less than five (5) nor more than fifteen (15). It shall meet gradation and all other requirements as listed for a Type B, Grade 3 flexible base material under Item 247 of the adopted standard specifications.

2. Crushed stone shall be eight inches (8") in thickness with a meeting gradation and all other requirements as listed for a Type A, Grade 1 flexible base material under Item 247 of the adopted standard specifications. The non-stabilized flexible base material shall be shaped and compacted to a minimum 95 percent (95%) Standard Proctor Density and properly primed with an approved asphalt to be considered acceptable for further construction or surfacing. Laboratory density tests shall be performed at adequate intervals to ensure consistent density. The responsible design engineer shall determine appropriate test locations, with a minimum of one test for each 500 feet of street length or part thereof.

ii. *Hot-mix asphaltic concrete (HMAC) flexible base.* Over the required subgrade or subbase, an approved asphalt primer shall be applied, then a minimum thickness of five inches (5") of HMAC flexible base may be applied. The HMAC base shall meet gradation and all other requirements for Type A (coarse-graded base course) or approved equal as listed under Item 340 of the adopted standard specifications.

iii. *Flexible surfacing.* The standard flexible surfacing for Secondary Roads shall be a minimum thickness of two inches (2") of hot-mix asphaltic concrete (HMAC) meeting the gradation and all other requirements for Type D (fine-graded surface course) or approved equal as listed under Item 340 of the adopted standard specifications.

iv. *Design speed*. The horizontal and vertical alignment shall meet the following minimum design speed as defined in the most recent edition of the American Association of State Highway and Transportation Officials *Policy on Geometric Design of Highways and Streets* (AASHTO green book):

1. Primary Roads: 50 miles per hour.

2. Secondary Roads: 35 miles per hour.

Sec. 9. - Engineering requirements.

a) Any street constructed within the jurisdiction of this article shall be designed by a qualified professional engineer, duly registered to practice engineering in the state. The engineers signed, sealed plans and specifications, design data and supporting test reports for such street construction shall be submitted to and approved by the Operations Department, prior to start of any construction.

b) As construction proceeds, the design engineer shall submit status reports to the Operations Department, accompanied by appropriate certified test reports, at completion of subbase or subgrade preparation, at completion of flexible base construction where applicable, during flexible surfacing or rigid pavement construction as appropriate. Upon completion of construction of any streets improved hereunder, the design and supervising engineer responsible for the street shall submit one reproducible set of as-built plans, signed, sealed and dated, together with the engineer's signed, sealed, dated statement that the work was performed under the engineer's supervision, that

the engineer has inspected same and the construction does conform in all respects to the requirements and provisions of this article.

Sec. 10. - Acceptance of completed improvements.

Upon completion of any street constructed under the jurisdiction of this ordinance, the prime contractor responsible for the street construction or the developer of the property shall file with TAC, on forms acceptable to the TAC attorney, a contract guaranteeing the correction or replacement of any or all construction that is found faulty or inadequate in any respect during the 12-month period immediately following completion of construction, submission of an as-built plan and acceptance by the Operations Department. Acceptance by the Operations Department shall be in writing following receipt of as-built data and a maintenance contract.

Sec. 11. - Alternative surety provisions for construction of certain streets.

a) No permit or plans approvals shall be issued by TAC for the construction or improvement of any property abutting or adjoining any street where permanent street improvements are constructed or reconstructed under the provisions of this ordinance, unless and until such street fully conforms in all respects with the provisions of this ordinance, except as is provided in subsection (b) of this section.

b) Building, electrical, plumbing and related development permits may be issued by TAC for private development on property abutting a street which has not been fully constructed to comply with subsection (a) of this section, upon the providing of alternate surety in the manner as hereinafter set forth. Notwithstanding the issuance of development permits, final inspection and/or occupancy permits will be withheld, until such street has been completed and does comply as required in subsection (a) of this section.

    1) In order to secure development permits prior to TAC acceptance of abutting streets, the subdivider or developer of the property shall post performance and payment bonds or an irrevocable letter of credit with TAC, in favor of TAC and in a form acceptable to TAC's attorney, in an amount not less than 100 percent of the estimated cost of constructing such abutting streets.

    2) Performance and payment bonds shall be from an approved surety company licensed to do business in the state and shall be so constructed as to guarantee the completion of specified street improvements, to comply with the requirements of this article within the 12-month period immediately following date of issuance, or the surety company will cause satisfactory completion within the following 12-month period.

    3) The irrevocable letter of credit shall be from a national bank, state bank or savings and loan association located in the state and shall be so constructed as to guarantee the completion of specified street improvements to comply with the requirements of this article within the 12-month period immediately following date of issuance, or TAC shall have the right to require the institution issuing the letter of credit to immediately pay into an escrow account, in the name of TAC, an amount equal to the cost of completing the specified street improvements, as estimated by TAC, up to the original total value stated in such letter of credit.

    4) The responsible design engineer employed by the developer shall develop an estimate of cost for the specified street improvements to be covered by the above-required bonds or letter of credit and shall submit a signed, sealed copy of such estimate, together with the plans and specifications for the improvements, for approval by the Operations Department prior to submittal of bonds or letter of credit by the developer.

Sec. 12. - Standard details.

NOTES:

1. REFER TO GEOTECHNICAL INVESTIGATION & RECOMMENDATIONS FOR FILL MATERIAL PROPERTIES, PAVEMENT THICKNESS, ENTRAINED AIR AND OTHER DESIGN ITEMS NOT SPECIFICALLY REFERRED TO IN PAVING CRITERIA.
2. ALL EDGES OF PAVEMENT WITHOUT CURBS SHOULD BE THICKENED TO 9" AND TRANSITION BACK TO REQUIRED THICKNESS OVER A MINIMUM DISTANCE OF 3 FEET.
3. ALL DIMENSIONS ARE FROM BACK OF CURB UNLESS OTHERWISE NOTED.
4. UNLESS NOTED, ALL FILL PLACED UNDER PAVING SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 6 INCH LIFTS.
5. EXPANSION JOINT SPACING SHALL BE 90' MAXIMUM EACH WAY WITH NO KEYWAYS AND SAWED DUMMY JOINTS SHALL BE 12' EACH WAY AND SAWCUT TO A DEPTH OF 1-$\frac{3}{4}$" WITHIN 4-18 HOURS OF PLACEMENT. GROOVED OR TOOLED DUMMY JOINTS WILL NOT BE ALLOWED.
6. CONSTRUCTION JOINTS SHALL BE USED AT THE END OF EACH DAY'S PAVING AND WHERE INTERRUPTIONS SUSPEND OPERATIONS FOR 30 MINUTES OR MORE.
7. ALL PAVEMENTS TO BE REMOVED SHALL BE SAWCUT (PARALLEL, PERPENDICULAR AND/OR RADIAL TO THE CENTERLINE OF DRIVES OR TO CURB LINES, AS APPLICABLE) IN A NEAT LINE, MINIMUM 1-1/2" DEEP, AND THE PAVEMENT REMOVED IN SUCH A MANNER AS TO PRESERVE THE EXISTING TRANSVERSE REINFORCING STEEL TO THE MAXIMUM EXTENT POSSIBLE.
8. RIGID PAVEMENT REINFORCEMENT TO BE SUPPORTED ON CHAIRS TO ENSURE PLACEMENT AT THE MIDDLE OF THE PAVEMENT SECTION.
9. BAR LAPS SHALL BE 30 DIAMETERS IN LENGTH.
10. ALL STRIPES SHALL BE 4" WIDE, UNLESS OTHERWISE NOTED.
11. SUBGRADE MATERIAL SHALL HAVE A PI OF LESS THAT TWENTY (20). EXISTING MATERIAL WITH A GREATER PI SHALL BE UNDERCUT AND REPLACED WITH TWENTY FOUR INCHES (24") OF SELECT FILL OR SHALL BE CHEMICALLY STABILIZED.

STABILIZATION NOTES

LIME TREATMENT OF SUBGRADE SHOULD BE IN ACCORDANCE WITH ITEM 260, "LIME TREATMENT FOR MATERIALS USED AS SUBGRADE (ROAD MIX)," TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES, CURRENT EDITION WITH THE FOLLOWING EXCEPTIONS:

CURING PROCEDURES SHOULD BE STRICTLY FOLLOWED. TRAFFIC ON TREATED SUBGRADE SHOULD BE KEPT TO A MINIMUM DURING CURING.

PRIOR TO USE BY SIGNIFICANT TRAFFIC, THE TREATED SUBGRADE SHOULD BE COVERED WITH BASE, CONCRETE OR SOME TEMPORARY WEARING SURFACE TO AVOID DEGRADATION.

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PAVING NOTES
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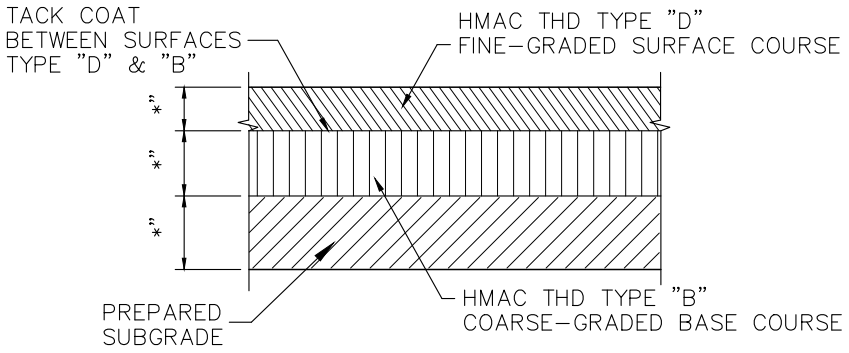

- Full Depth Asphalt Pavement

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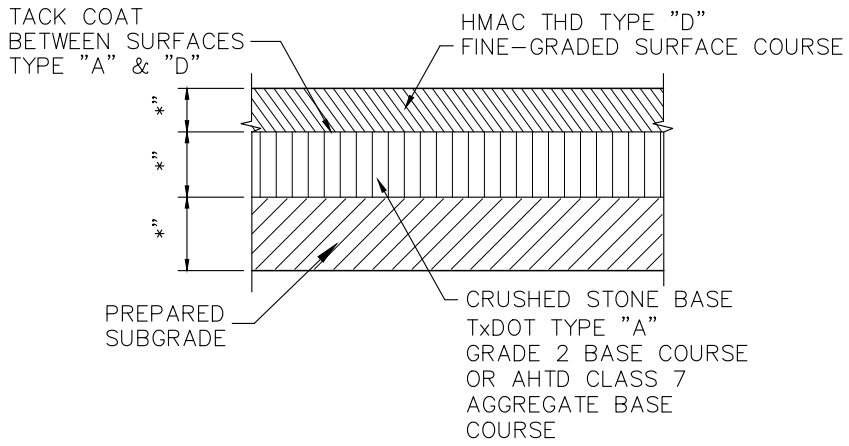

- Asphalt Over Crushed Stone Base

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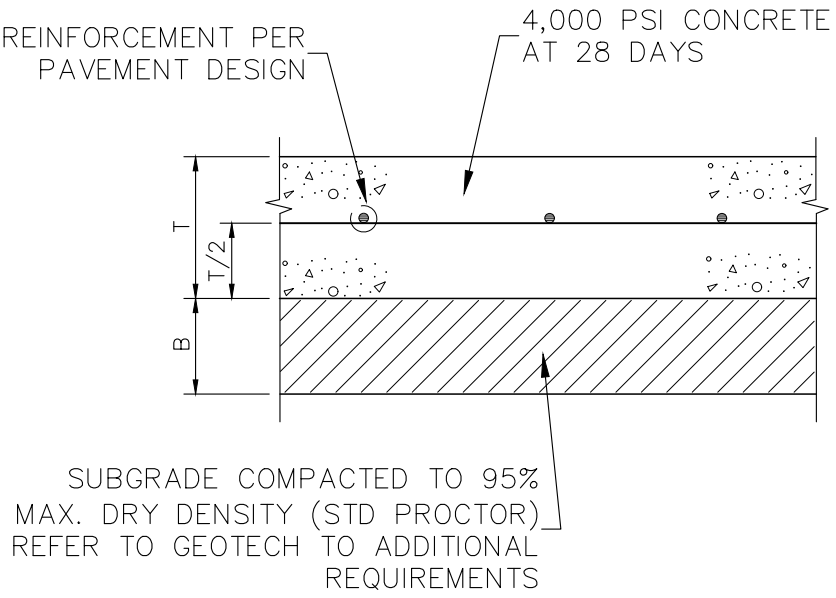
FLEXIBLE PAVEMENT DETAILS
PAVEMENT CRITERIA DETAILS



- Rigid Pavement Section

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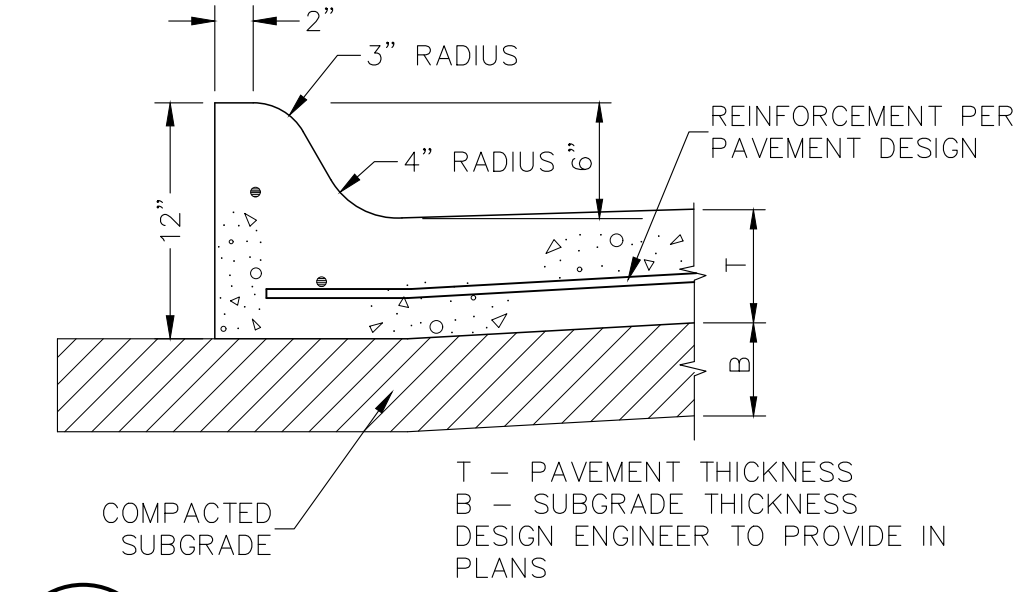
RIGID PAVEMENT DETAILS
PAVEMENT CRITERIA DETAILS



- Monolithic/Integral Curb

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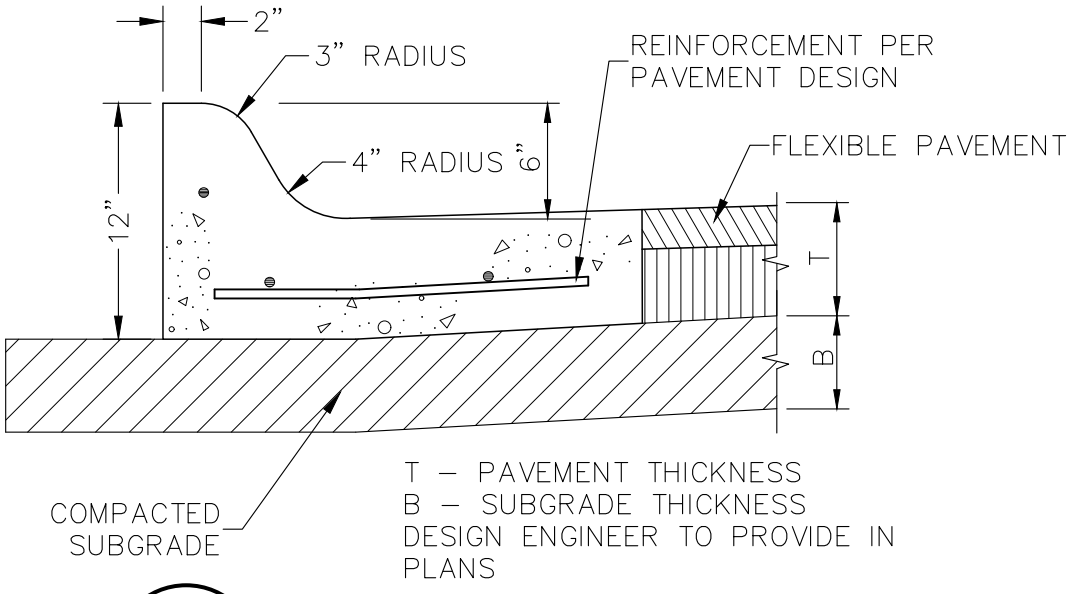

- Separate Curb

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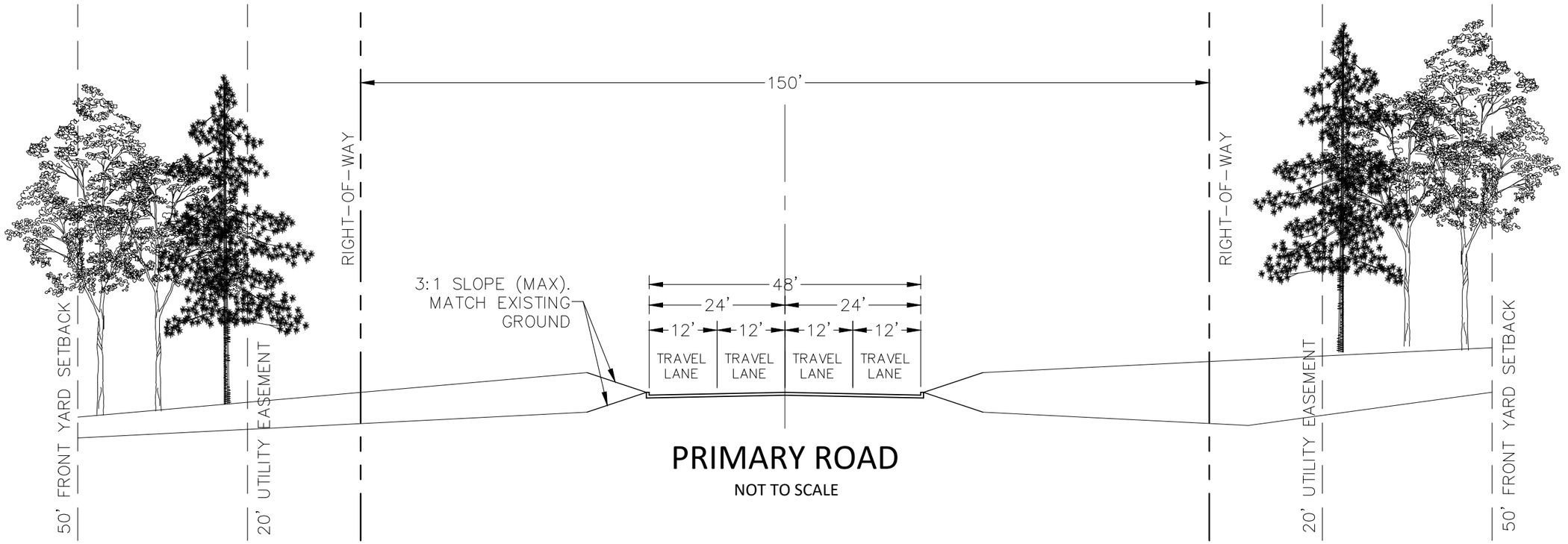
CURB DETAILS
PAVEMENT CRITERIA DETAILS



PRIMARY ROAD

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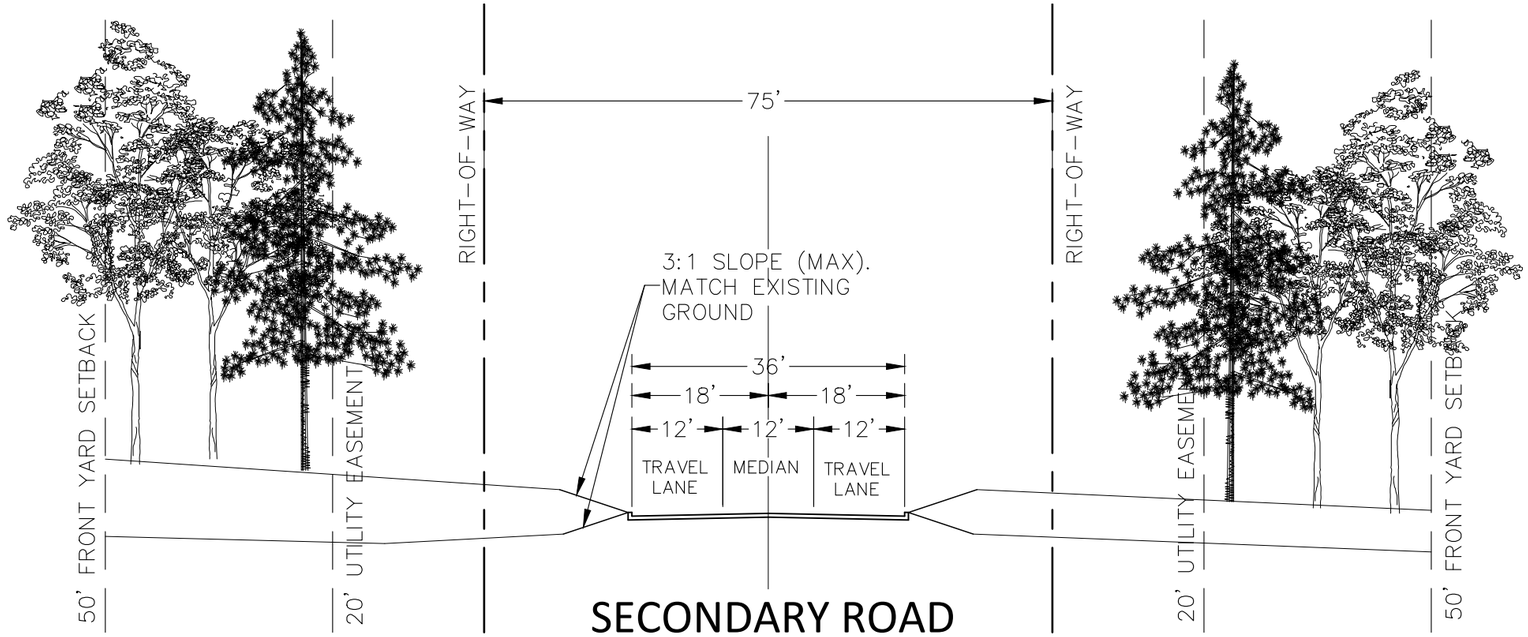

SECONDARY ROAD

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URBAN TYPICAL PAVEMENT SECTION
PAVEMENT CRITERIA DETAILS

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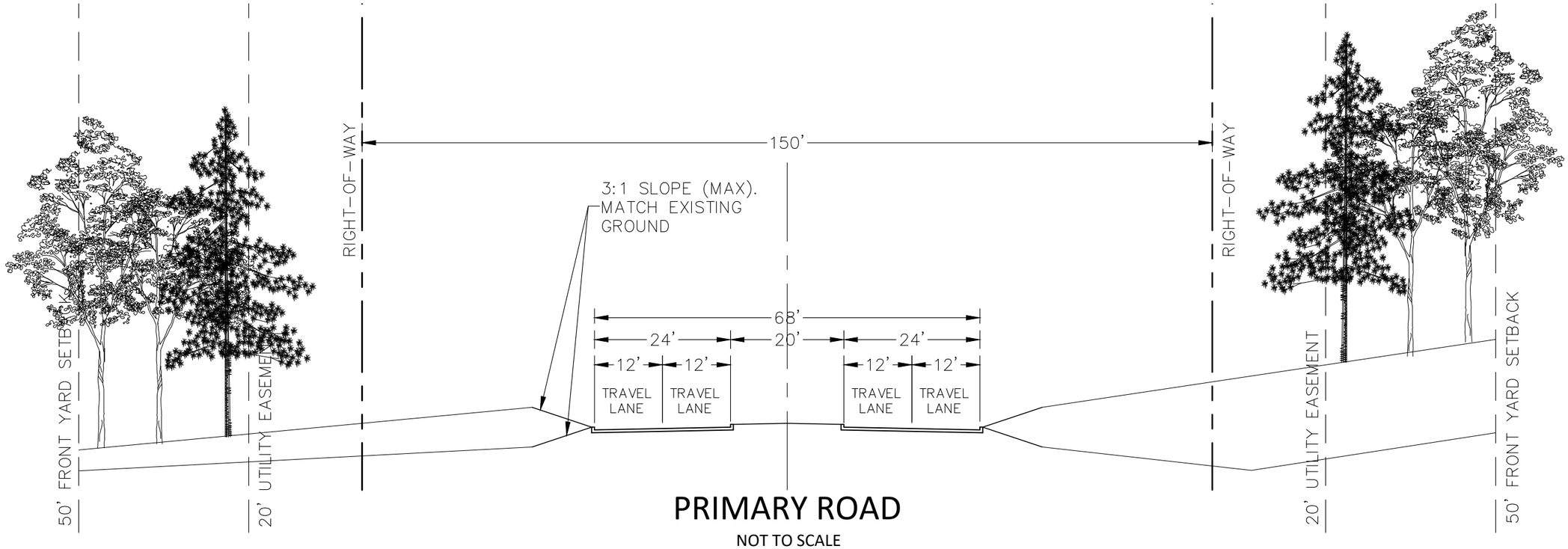

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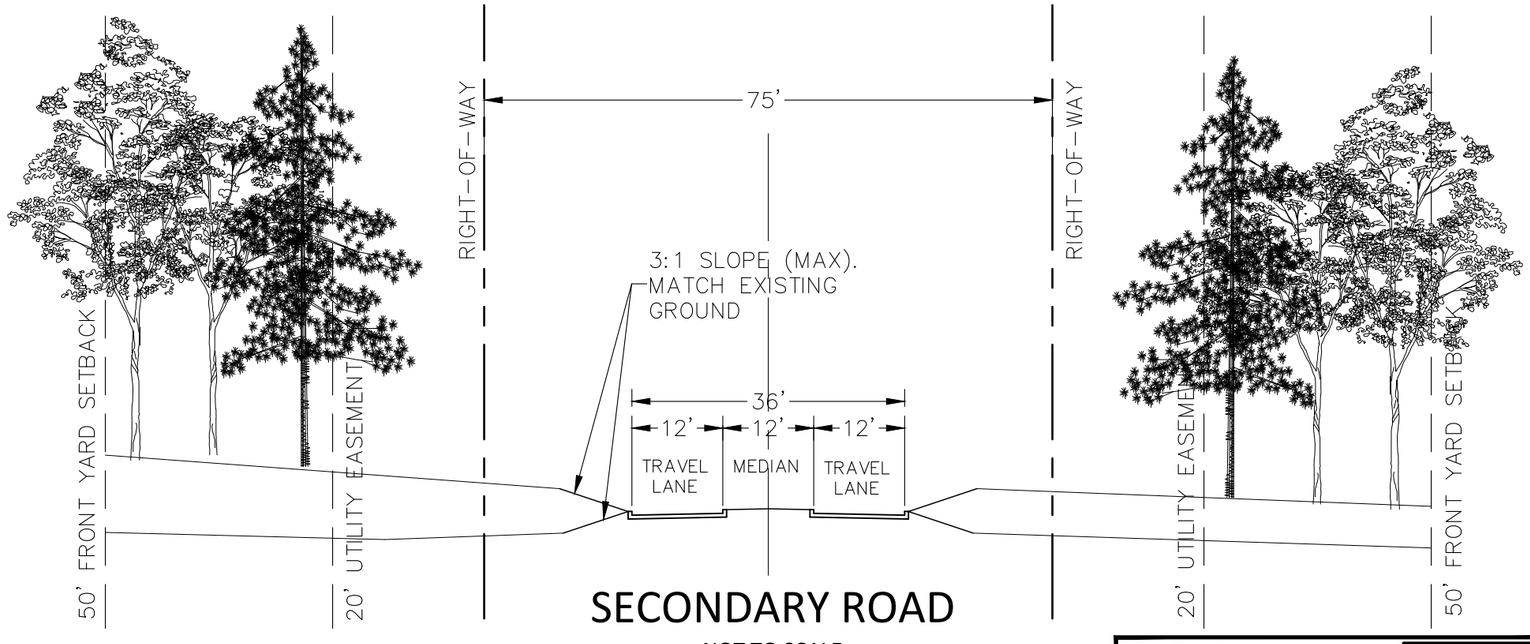

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URBAN BOULEVARD PAVEMENT SECTION
PAVEMENT CRITERIA DETAILS

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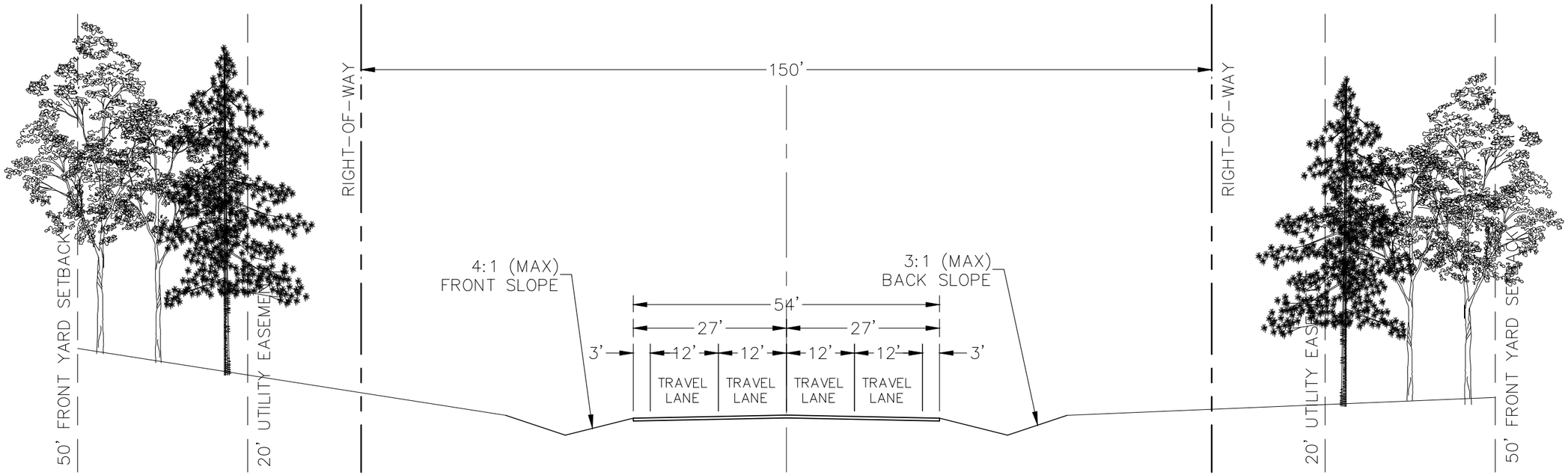

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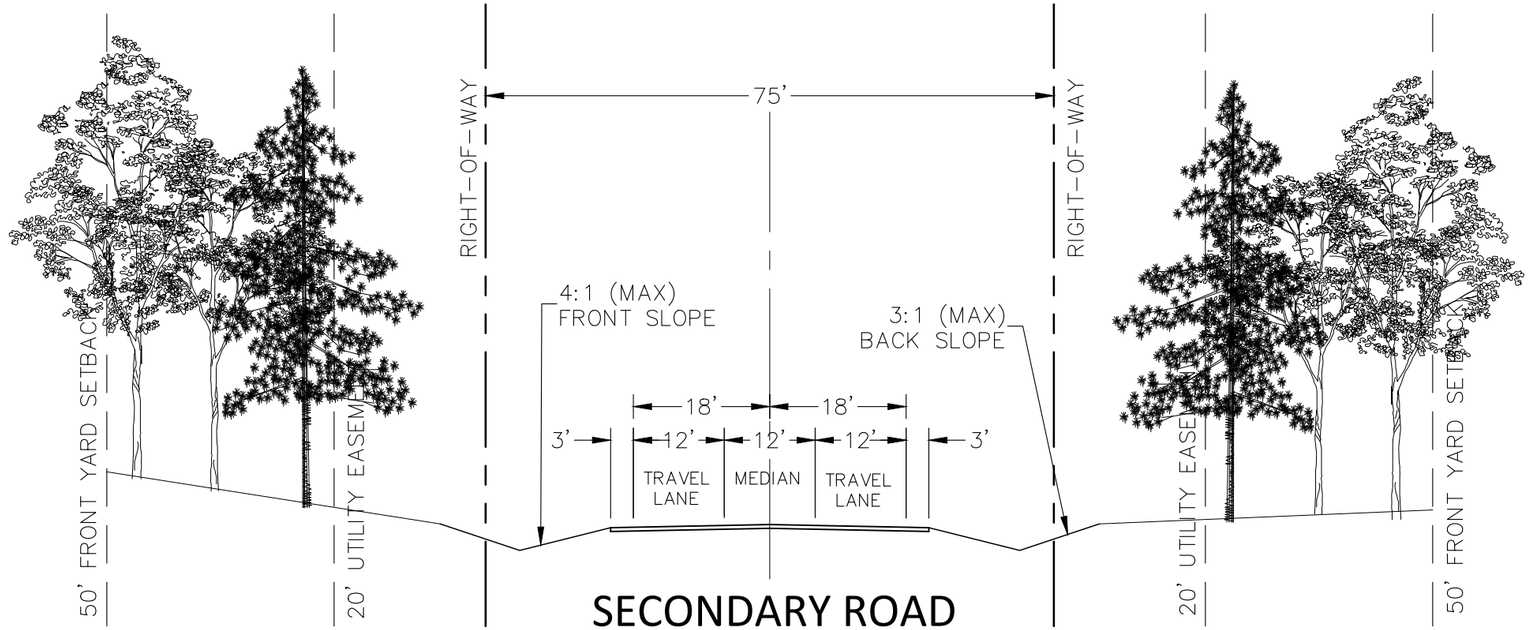

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RURAL TYPICAL PAVEMENT SECTION PAVEMENT CRITERIA DETAILS

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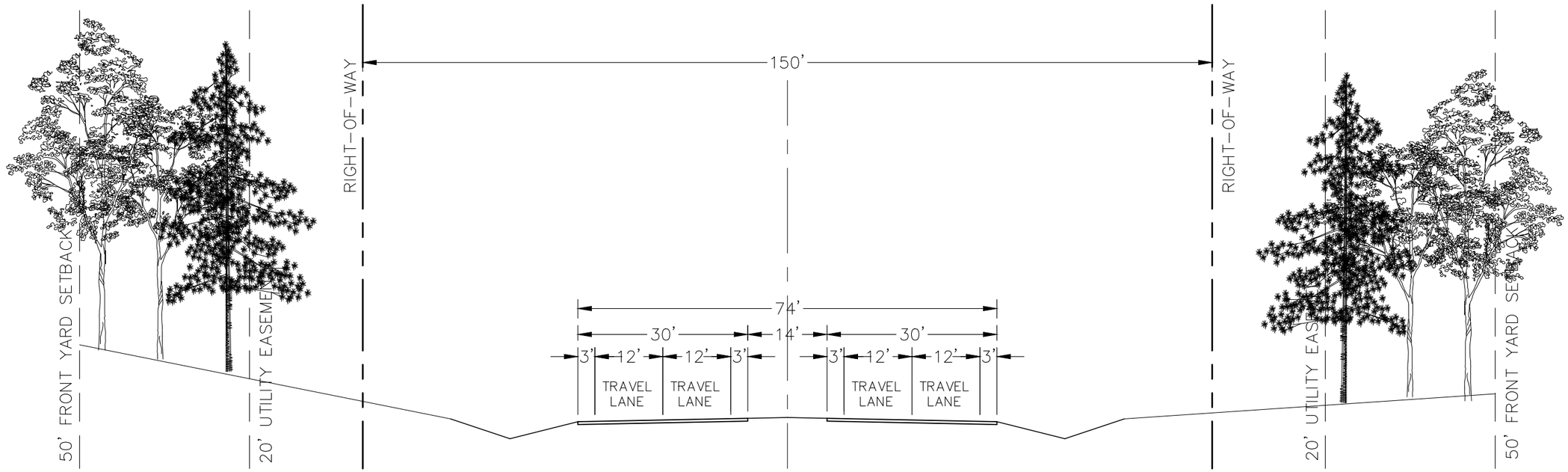

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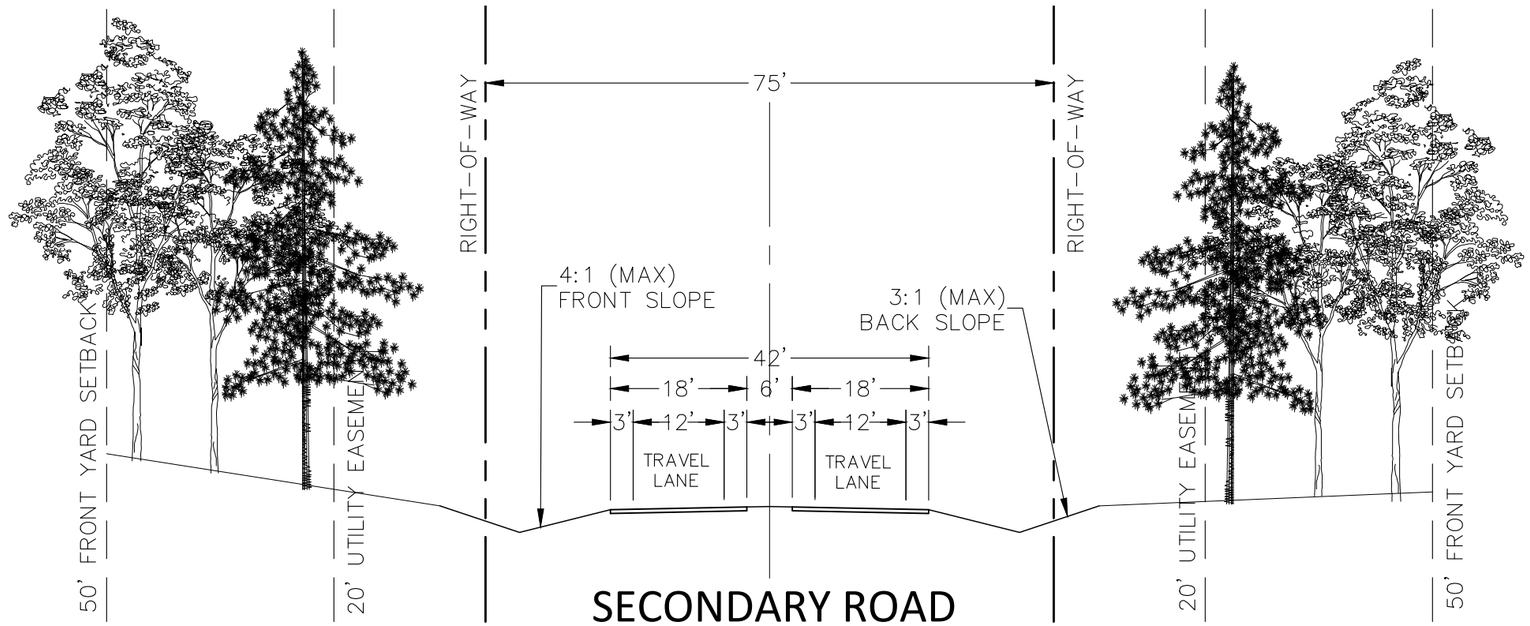

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RURAL BOULEVARD PAVEMENT SECTION
PAVEMENT CRITERIA DETAILS

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