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SECTION 0400

STREETS AND APPURTENANCES

0401 GENERAL REQUIREMENTS

0401.1 Definition

This section includes requirements relating to the designs for streets and appurtenances including earthwork, subgrade, base course(s), wearing surfaces, concrete curb and gutters, proper backfill, sidewalks and signage.

0401.2 City of Owasso Review

The City of Owasso reserves the right to make changes in street alignment, street grade, and any street appurtenance placements. Design calculations shall be presented within the engineering report for review by the Engineer.

0401.3 City of Owasso Land Use Master Plan

The City of Owasso has approved a Land Use Master Plan. Copies are available for review by designers. Street configurations shall conform to the Land Use Master Plan (if applicable) and the most recent updates available through the Engineer.

0401.4 Maintenance Bond

The construction contractor shall post a maintenance bond(s) or Irrevocable Letter(s) of Credit in an amount equal to 100 percent of the construction costs including the road subbase, paving courses and curb and gutters for a two-year period after completion and acceptance of all improvements. Separate bonds are required if different contractors install portions of the total roadway section. Bonds shall be written such that the City is the grantee.

0401.5 Alignment Surveys

Alignment surveys for street projects shall be performed as specified in Section 0110, General; Paragraph 0116.3, Alignment Surveys.

0401.6 Plan Requirements

All construction plans shall comply with Subsection 0117 of the Engineering Design Criteria.

0402 STREET FUNCTIONAL CLASSIFICATION

Urban streets are all roadways within urbanized Owasso. Urbanized Owasso includes all currently developed areas within the City limits. The right-of-way requirements, number of lanes, and turn lane and median requirements contained within this section apply only to the urbanized and developing areas of Owasso.

0402.1 Primary (or Principal) Arterial

Primary arterial streets are section line roads used to distribute traffic throughout the City and link major community-wide traffic generators. All primary arterial streets within the City limits have a design requiring a minimum of five travel lanes (12-foot-wide inside lanes, 13-foot-wide outside lanes and a 14-foot-wide center turn lane) within 120 feet of right-of-way. Left turn lanes are required at intersections with all other arterials. In some instances, traffic volume may require left turn lanes for collector streets intersecting with arterial streets. Additional medians or rights-of-way may be required based upon traffic generation or unique conditions. Curb and gutter shall be installed on all primary arterial streets.

0402.2 Primary (or Principal) Arterial Boulevard

Primary arterial boulevards are section line roads used to convey traffic within the City in heavily commercialized areas. All primary arterial boulevards within the City limits require a minimum of four travel lanes (12-foot-wide inside lanes, 13-foot-wide outside lanes) and a center barrier median within 120 feet of right-of-way. Left turn lanes are required at intersections with all other arterials, collectors, and commercial centers. Additional lanes and right-of-way may be required based upon traffic generation or unique conditions. Curb and gutter shall be installed on all primary arterial boulevards.

0402.3 Secondary (or Minor) Arterial

Secondary arterial streets are section line streets intended to distribute traffic throughout the City and link major community-wide traffic generators, but because of limited right-of-way or adjacent land development, are not planned to be constructed to the primary arterial standard. A secondary arterial will typically consist of four travel lanes (two 12-foot-wide inside lanes and two 13-foot-wide outside lanes) within a 100-foot right-of-way. Left turn lanes are required at intersections with all other arterials. In some instances, traffic volume or other unique circumstances may require left turn lanes where collector streets intersect with arterial streets. Additional medians, acceleration/deceleration lanes and rights-of-way may be required based upon traffic generation or unique conditions. In some cases, a center turn lane will be required.

0402.4 Residential/Commercial Collector

Collector streets allow traffic to move from the local street system to the arterial system. Residential collectors typically have two 18-foot-wide travel lanes in a 60-foot right-of-way. Commercial collectors require an 80-foot right-of-way including two 12-foot traffic lanes and a 14-foot center turn lane. At intersections with arterial streets, the commercial collector traffic way shall increase to 50 feet through a 100-foot transition and the right-of-way shall increase to 86 feet. For residential collectors at arterial intersections, the right-of-way increases to 76 feet with no increase in traffic way width. However, if a center island is proposed, the minimum width of the travel lanes shall be 18 feet in both cases.

0402.5 Residential (or Local)

Local streets provide access to property abutting public rights-of-way and a means to travel to the higher classified street system. Local streets have two 13-foot-wide travel lanes within a 50-foot right-of-way. At intersections with arterial streets, lane widening or additional left and right turn lanes may be required based on traffic generation or other unique conditions.

0403 DESIGN CRITERIA

0403.1 Roadway Design

- A. Minimum street widths: Width of streets shall be according to the classifications below. Future planned designations of major streets are shown on the Owasso Land Use Master Plan map. Pavement widths are measured from curb face to curb face.

<u>Street Name</u>	<u>Minimum Street Width Requirements</u>		
	<u>Right-of-Way</u>	<u>Pavement</u>	<u>Shoulder</u>
Primary Arterial and Boulevard	120 feet	64 feet	Curb and Gutter
Secondary Arterial	100 feet	50 feet	Curb and Gutter
Commercial Collector	80 feet	38 feet	Curb and Gutter
Residential Collector	60 feet	36 feet	Curb and Gutter
Residential (Local)	50 feet	26 feet	Curb and Gutter

- B. Shoulders: Paved or earthen shoulders may be allowed by the Engineer under special circumstances.
- C. Design speeds: Design speeds shall be 25 mph on all residential and collector streets, 35 mph on secondary arterial streets and 45 mph on primary arterial streets, except as modified by the Engineer.
- D. Horizontal curves:
1. Minimum radii: The minimum centerline radii for streets are listed below.

<u>Street Type</u>	<u>Minimum Centerline Radii</u>
Primary Arterial and Boulevard	600 feet
Secondary Arterial	400 feet
Commercial Collector	400 feet
Residential Collector	200 feet
Residential (Local)	150 feet

2. Super elevation: Super elevations shall be reviewed on a case-by-case basis.
- E. Vertical curves:
1. Justification: For residential streets, sag vertical curves shall be allowed only if the algebraic difference between the two intersecting grades exceeds 2%.
 2. Minimum grade: The minimum grade for gutters and centerline shall be 0.5%.

3. Maximum grade: The maximum grade for non-arterial streets shall be limited to 8%. Where the topography is hilly, grades will be permitted up to a maximum of 12% providing such grade does not exceed 500 feet in length from PT to PC. Grades at intersections are limited per Paragraph 0403.2A.
4. Minimum length: The minimum lengths of vertical curves for the various streets are as follows:
 - a. Residential (Local) Streets- 100 feet
 - b. All Collector Streets- 150 feet
 - c. All Arterial Streets- 200 feet
- F. Centerline: The centerline of paving shall be the centerline of right-of-way where dedication has been made according to the major street plan. All other cases shall be determined by the Engineer.

0403.2 Intersection Design

A. General:

1. Streets shall intersect one another at right angles (90°) unless topography and other design factors require a waiver by the Engineer.
2. Proposed residential areas shall preferably use three (3) leg intersections within the development.
3. Grades for collector streets, at intersections with all arterials, shall not exceed 3% for a distance of 50 feet back from the radius points.
4. Grades for all legs of all residential/residential intersections shall not exceed 4% for a distance of 50 feet back from the radius points.
5. Grades for residential streets, at intersections with all arterials, shall not exceed 2% for a distance of 50 feet back from the radius points.
6. The minimum radii on curb returns at intersections are as follows:
 - a. At intersections of residential/residential streets, the minimum radius on curb returns shall be 25 feet.
 - b. At intersections of all other streets other than residential/residential intersections, the minimum radius of curb returns shall be 40 feet.
 - c. The minimum radius on the returns for industrial districts shall be 40 feet. Larger radii may be required for industrial districts if specified by the Engineer.

7. Points of access to arterial streets from residential areas shall be limited in number and shall be no closer than 600 feet from arterial street intersections, unless otherwise approved by the Engineer.

B. Sight distance:

1. Intersection shall be designed with adequate corner sight distance in accordance with the ODOT Roadway Design Manual, latest edition. The intersection sight area shall be kept free of obstacles by appropriate design and plat restrictions.
2. The corner sight distances for streets are as listed below:

<u>Mainline Design Speed</u> <u>mph</u>	<u>Minimum Corner Sight Distance (feet)</u>			
	<u>Non- Stop Controlled Intersection (2x2 lanes)</u>	<u>Stop Controlled Intersection (2x2 lanes)</u>	<u>Yield Controlled Intersection (2x2 lanes)</u>	<u>Stop Controlled Left Turn Inter. (4x4 or 5x5 lanes)</u>
	<u>feet</u>	<u>feet</u>	<u>feet</u>	<u>feet</u>
20	90	325	205	470
25	110	400	240	585
30	130	490	290	705
35	155	595	355	820
40	180	705	420	940
45	200	795	505	1055

3. Sight distance triangle: To maintain sight distance, restrictions on height of embankment, locations of buildings, and screening fences may be necessary. Landscaping in the sight distance triangle shall be low-growing, and shall not be higher than 3 feet above the level of the intersecting street pavements. Tree overhang shall be trimmed to a line at least 8 feet above the level of the intersections.

C. Right-of-way:

1. For primary arterial/secondary arterial intersections, the minimum 120-foot right-of-way shall be maintained on all four legs in proximity to the intersection. The right-of-way for the secondary arterial leg shall maintain a 120-foot width for 200 feet from the center of the intersection and, from that point, shall have a 150-foot-long transition from the 120-foot right-of-way to the normal 100-foot right-of-way.
2. Variations to this right-of-way requirement shall be granted in accordance with the procedure for plat variations contained in the Subdivision Regulations of the City of Owasso, Oklahoma.

0403.3 Traffic Impact of Developments

- A. Geometric design criteria: Signalized intersection design (i.e., storage, tapers, grades, etc.) shall be based on National Cooperative Highway Research Report 279, *Intersection Channelization Design Guide*, Transportation Research Board, National

Research Council, latest edition or other pre-approved guidance. All calculations shall be shown within the engineering report.

B. Turn lanes:

1. Right lanes: A right turn lane shall be required when any of the following conditions are met:
 - a. The development is within 1,000 feet of an arterial type intersection to the right.
 - b. The arterial will be at or above 130 percent of level C capacity (as defined in the *Highway Capacity Manual*, Traffic Research Board) with the addition of the traffic from the development. The projected vehicles turning right out of the development is greater than 300 vph during peak hour.
2. Left lanes: A left turn lane shall be required when any of the following conditions are met:
 - a. The development is within 1,000 feet of an arterial type intersection to the left.
 - b. The arterial will be at or above 130 percent of level C capacity (as defined in the *Highway Capacity Manual*, Traffic Research Board) with the addition of the traffic from the development
 - c. The projected vehicles turning left out of the development is greater than 150 vph during peak hour.

C. Acceleration/deceleration lanes:

1. General: Developer shall provide an analysis to determine if impact of development will be 100 vehicles per hour (vph) or greater. When a development will have a significant impact on the traffic pattern (100 vph increase, or more) of the adjacent streets, driveways, and intersections, the Developer shall provide a traffic impact analysis within an engineering report showing all calculations to determine the extent of need for additional lanes. Each development will be evaluated based on the traffic into and out of the development, the traffic load on the arterial, and current and planned configuration of the arterial, as shown in the most recent version of the Owasso Land Use Master Plan and the trip generation rates for the proposed development, including future phases.
2. A deceleration lane is a right turn lane into a development that allows traffic to safely slow to a turning speed without slowing traffic behind them on arterial road. The lane shall have a width of not less than 13 feet, a length not less than 80 feet plus corner radius measured from the center line of the road on which the right turn is to be executed to the start of the taper, and a taper length of 175 feet as shown in the Standard Details.

3. An acceleration lane is an approach lane for right turn traffic exiting a development that allows traffic to obtain adequate speeds before entering the arterial road. Acceleration lanes shall only be required in special circumstances where traffic or other conditions indicate the need. The lane shall have a width of not less than 13 feet, a length not less than 100 feet plus corner radius measured from the center line of the road on which the right turn is to be executed to the start of the taper, and a taper length of 175 feet as shown in the standard drawings.
4. Deceleration lanes are required for residential development at intersections of collector or residential streets with arterial streets. Commercial and industrial development requirements will be reviewed on a case-by case basis. Construction of deceleration lanes shall be per Paragraph 0403.4 and constructed with portland cement concrete (PCC) per the table in Paragraph 0403.4.
5. Engineer may waive requirement for acceleration/deceleration lanes if arterial street widening is planned within the next five years. In this case, the Developer will pay the City a fee-in-lieu of equal amount to the value of a deceleration and acceleration (if required) lanes designed as specified above and shown in the Standard Details.
6. Acceleration (and deceleration lanes if required) shall be designed in such a manner that they are consistent with surrounding streets. In the event that the taper from one deceleration lane intersects an acceleration lane from an existing entrance or that two entrances are within 600 feet (centerline to centerline) the taper from the existing lane shall be removed through the end of the taper and replaced with full width lane. This shall include a full-depth saw cut at the lane width end of the original taper and the complete removal of the original taper.
7. Acceleration (and deceleration if required) lanes shall be continuous if the centerline spacing of two parallel streets is less than 600 feet. Any variance to the this standard will be reviewed by the Engineer on a case by case basis.

0403.4 Pavement Design

- A. General: Design of pavement, base, and subgrade thickness shall be based on the standard minimum thicknesses selected by the City of Owasso. Requirements may increase based on studies conducted by the design engineer, particularly for arterial streets.
- B. Standard minimum thicknesses:
 1. The minimum thickness of an asphalt street section shall be as given below and as show in the Standard Details.

Minimum Thicknesses for Asphalt Street Construction

	<u>Residential Minor (and Collector) Streets</u>	<u>Commercial and Industrial Local and Collector Streets</u>	<u>Arterial Streets</u>
Asphalt Traffic Course	2 (2) inches	3 inches	2 inches

Asphalt Base Course	4.5 (6) inches	7 inches	6 inches
Compacted Aggregate Base (w/separator fabric)*	8 inches	10 inches	10 inches
Treated Subgrade*	8 inches	10 inches	10 inches
	*Either/or		

2. The minimum thickness of a concrete street section shall be as given below and as shown in the Standard Details.

Minimum Thicknesses for Concrete Street Construction

	<u>Residential Minor (and Collector) Streets</u>	<u>Commercial and Industrial Local and Collector Streets</u>	<u>Arterial Streets</u>
Concrete	6 inches	10 inches	8 inches
Compacted Aggregate Base (w/separator fabric)*	8 inches	10 inches	10 inches
Treated Subgrade*	8 inches	10 inches	10 inches

*Either/or

C. Pavement parameters:

1. Asphalt: Asphalt shall be Types A (base course) and Type B (traffic course) insoluble mix in accordance with ODOT standards, most recent version.
2. Concrete: Paving concrete shall be Class AA (4,000 psi), designed and proportioned in accordance with ODOT standards, most recent version.
3. Materials will be appropriately tested at the contractors expense to ensure compliance with specifications

D. Compacted Aggregate Base: Aggregate shall be Type A in accordance with ODOT standard specifications, most recent version.

E. Treated subgrade:

1. Subgrade material shall be modified to produce a plasticity index (PI) of 10 or less. The amount of treatment shall be a percentage (by weight) of the following materials as established by testing the existing soil:
 - a. Fly ash (used for clays and silts with plasticity index of 10 or greater) and/or
 - b. Lime (used for clays and silts with plasticity index of 20 or greater)
2. Any subgrade material that shows pumping action will be replaced with aggregate as directed by the Engineer.

- F. Road sections in rock cuts: A full, uniform roadway section shall extend full depth through rock cut areas. The rock shall either be removed and replaced with material conforming to the designed section or the rock may be pulverized by rolling to produce a homogeneous material with not nodules larger than 2 inches in diameter. The resulting material must meet placticity requirements.
- G. Separator fabric and fabric reinforcement: Separator fabric shall be placed between the aggregate subbase (when applicable) and subgrade and shall conform to ODOT standard 712.05. Paving fabric reinforcement shall only be required for street rehab projects (overlays).
- H. Subbase Drainage System: Where severe soil conditions exist or continuous seepage of water is present, a subbase drainage system shall be required.
- I. Curb and gutter:
 - 1. Concrete streets: Portland cement concrete streets shall have an integrally placed curb or doweled-joint curb and gutter section of the same mix design as for street paving. Curbs shall be in accordance with the Construction Standards and Standard Details.
 - 2. Asphalt streets: Asphaltic concrete streets shall have a portland cement concrete curb and gutter. The curb shall be in accordance with the Construction Standards and Standard Details.
 - 3. Types: All curb sections shall be barrier curb or mountable type curbs. Handicap ramps shall be located at intervals as required by ADA.
- J. Construction joints:
 - 1. Joints in portland cement concrete shall be located in accordance with Standard Details. A joint layout plan shall be reviewed by the Engineer. Contraction joints shall be sealed with silicon sealant.
 - 2. Joints in portland cement concrete paving, curbs and gutters shall be constructed in accordance with ODOT standards unless otherwise accepted by the Engineer.

0404 STREET APPURTENANCES

0404.1 Storm Sewer

Storm sewer mains (running parallel to street) shall not be located under street pavement unless accepted by Engineer.

- A. The following pipe is allowed for storm drainage:

<u>Description</u>	<u>AASHTO</u>	<u>ASTM</u>
Reinforced concrete culvert and pipe	M170	C76
Reinforced concrete arch culvert	M206	C506
Reinforced concrete elliptical culvert	M207	C507
Reinforced concrete low-pressure pipe	M242	C361

Metallic (zinc or aluminum) coated, corrugated steel pipe	M36	
Corrugated aluminum alloy culverts and underdrain	M196	
High Density Polyethylene (HDPE)	M252	D3350

- B. Preformed end sections for HDPE or metal pipe are not allowed. Pipe shall be fitted with concrete wingwalls and apron or slope walls.

0404.2 Concrete Storm Sewer Pipe Joints

- A. For zero internal head storm applications use AASHTO M170, M206, or M207 concrete products with Omni-Flex seals or butyl rope (Ram-neck), installed according to the manufacturer's recommended external joint openings. Use manufacturer's gap sheet.
- B. For concrete storm sewers with low internal head [up to 30 feet], use AASHTO M242 concrete products with ASTM C443 confined O-ring or Forsheda gaskets.

0404.3 Structures and Specific Details

- A. Loading: All structures subject to vehicular traffic shall be designed for H-20 loading.
- B. Bridges: All bridge design shall meet the requirements in the latest edition of Standard Specifications for Highway Bridges prepared by AASHTO.

0404.4 Sidewalks

- A. All sidewalk layouts and designs shall be submitted to the Engineer for review and approval.
- B. Sidewalks shall be required on both sides of residential, collector, and arterial streets.
- C. All sidewalks shall be of Class A portland cement concrete (3,000 psi). Sidewalks shall include pedestrian bridges across creeks and streams where applicable.
- D. The finished thickness of portland cement concrete sidewalks shall not be less than 4 inches and the width shall be not less than 4 feet. Sidewalks across driveways shall be 6 inches thick and reinforced with welded wire fabric. Surfaces shall be cured to retain moisture.
- E. In general, sidewalks shall be constructed within the dedicated right-of-way except at intersections or as required by the City. In commercial areas, sidewalks shall be no less than 3 feet from the outside curb line of the street pavements except in unique situations where five-foot-wide or greater sidewalks may abut the outside curb line. Residential sidewalks shall be one foot from property line, except along arterial street frontage where utilities or other structures may require variations.

- F. Sidewalks must provide access for the safe and convenient movement across curbs of physically disabled persons, including those persons in wheelchairs. Wheelchair ramps shall be constructed in accordance with the Standard Details and the Americans with Disabilities Act (ADA).
- G. To accommodate wheelchair access, 5-foot wide “bumpouts” (5 feet long with 10-foot long transitions) shall be provided every 200 feet in accordance with ADA. Driveways may be utilized as appropriate, provided that the cross-slope of the driveway on each side of the sidewalk does not exceed 2%.
- H. Transverse crack control joints shall be placed at 5-foot intervals. Joints shall be tooled or sawed to a depth of one inch.
- I. Expansion joints shall be placed at curbs, driveways, or abutting structures but shall not exceed 20-foot intervals.

0404.5 Driveway Approaches

A. General:

- 1. Any driveway exceeding maximum grades shown in Paragraph C below shall have an approach sketch submitted for review by the Engineer.
- 2. All subgrade shall be compacted to 95% standard proctor density before any paving material shall be placed. Tests may be required at the discretion of the Engineer.
- 3. All private roads, driveways, or streets serving residential, commercial, or industrial developments within the City, the use of which is not restricted, but is open to the public, either by connection with an existing street or because the design thereof, does constitute a thoroughfare accessible to the public and shall be constructed to specifications required for local streets.

B. Approach types:

<u>Description</u>	<u>Approach Type</u>
Local Street with side ditches and drainage pipe	I
Street with side ditches, no drainage pipe	I
Streets with curb and gutter	II

- 1. Type I driveway approach:
 - a. Neither the intersection point of the driveway approach with the edge of pavement or the end of drainage culvert pipe shall extend past the projected side property line, unless written permission is given by the affected property owner.
 - b. Type I driveway approaches shall be Class AA (4,000 psi) concrete, 6 inches minimum thickness. For driveway thickness of 8 inches or greater, dowels

are required at contraction joints and at joint connections with the street.

- c. Drainage pipe shall be constructed of reinforced concrete. The minimum pipe diameter shall be 15 inches. Concrete headwalls or slopewalls are required. Elevations/inverts shall conform to the Master Drainage Plan.
- d. A drainage culvert pipe may not be required if the proposed driveway is located in an area with little to no contributing drainage area and has a shallow ditch, 12 inches depth or less. The design engineer shall investigate the need for drainage culvert pipe and present findings to the Engineer.

2. Type II driveway approach:

- a. Type II driveway approaches shall be Class AA (4,000 psi) concrete, 6 inches minimum thickness. For driveway thickness of 8 inches or greater, dowels are required at contraction joints and at joint connections with the street.
- b. At right-of-way line, the drive shall be at least the same elevation as the top of the existing curb.
- c. New curb returns shall meet and match the existing curb.
- d. Removal of the existing curb to receive the driveway approach shall be per the Standard Details.
- e. Immediately after finishing operations, curing shall be accomplished by either wetted earth, cotton mats, wet burlap bags, membrane curing compounds, or other methods accepted by the Engineer.
- f. Sawed contraction joints shall be made as soon as the concrete has set firmly enough to support the concrete saw without tracking. The joints shall be filled with silicon sealant or other material accepted by the Engineer.
- g. All exposed edges shall be tooled to no less than ¼ inch radius (curb backs and slabs).

C. Approach grades and dimensions:

- 1. Minimum approach width is 10 feet for residential and 24 feet for commercial.
- 2. Grades suggested for driveway conditions are listed below.

<u>Condition</u>	<u>Approach</u>	<u>Maximum Grade Change</u>	
		<u>Desirable</u>	<u>Maximum</u>
High Volume Driveway	6%	0%	3%
Low Volume Driveway on Arterial or Collector Streets	6%	3%	6%
Low Volume Driveway on local street	10%	6%	12%

3. The maximum difference between the downward cross slope of the street (usually 2.0% or less) and the upward slope of the driveway approach shall not exceed 12.0%.
4. Any driveway approach exceeding the stated grades shall require Engineer approval. A drawing of the proposed approach is required.

0404.6 Signage

- A. Street and traffic control sign plans: plans shall be prepared by the design engineer.
- B. Developer's installation: The Developer shall be responsible installation of all appropriate street signs. The following is a list of signs based on the latest version of the Manual of Uniform Traffic Control Devices (MUTCD) for which the Developer is responsible (may not include all applicable signs):

<u>Designation</u>	<u>Description</u>
--	Street Names
OM	Object Markers
R1-1	Stop
R1-2	Yield
R2-1	Speed Limit
R4-7	Keep Right
R4-8	Keep Left
R5-1	Do Not Enter
R5-9	Wrong Way
R6-1	One Way
W8-5	Bicycle Crossing
W11A-2	Pedestrian Crossing Symbol
W14-1	Dead End or Not a Through Street
W15-1	Playground Ahead
	School Crossing

- C. Traffic control signage: All traffic control signage shall be constructed in accordance to the (MUTCD).
- D. Street signage: Street signs shall be placed at each intersection. Signs shall designate the street names in both directions.
 1. Sign height: Six (6) inches

2. Sign width alternatives: 24 inches or 36 inches depending on the length of the street name. Developer shall allow a one-inch margin on each end of the sign.
 3. Sign Blade Thickness: 0.08 inches
 4. Orientation: Double-sided
 5. Color: Green (Public streets)
 6. Red (Private streets).
 7. Signs shall be extruded.
- E. Sign posts:
1. Sign posts shall be 2” galvanized round steel tubing.
 2. Lettering: Letters for street signs shall meet the following criteria:
 - a. Street name: 4-inch, white, heat activated reflective letters
 - b. Street designation: 4-inch, white, heat activated reflective letters (i.e., ST, E AVE, ST NO, etc.)

0404.7 Striping

- A. Plans for striping, turn arrows, stop bars, cross-hatching and words shall be reviewed by the Engineer.
- B. All striping and other traffic control symbols shall be full-thickness thermoplastic including striping for deceleration (or acceleration) lanes.

0404.8 Lighting

- A. General:
 1. Street lights shall be installed by the franchised vendor providing the electrical service and shall be shown on preliminary and final street plans. Lighting shall comply with City Subdivision Standards administered by the Community Development Department.
 2. Four basic objectives shall be considered in providing street lighting: aesthetics, traffic safety, security, and intersection identification. The objectives to be considered are directly related to the function of the street to be lighted.
 - a. For major thoroughfares, the primary objectives are aesthetics and traffic safety.
 - b. For minor streets and local collectors, the primary objectives are security and intersection identification.

3. Light poles shall be located a minimum of 5 feet to back of curb or future curb, including turn lanes.
 4. Wooden poles shall not be used in residential neighborhoods.
 5. Any upgrade in lighting fixtures (metal pole or decorative globe) is the responsibility of the Developer and/ or homeowners' association with a contract with the electric utility. The City reserves the right to approve the fixtures.
- B. Scheduling: Street lighting shall be chronologically integrated with development to avoid conflicts with other contractors and workmen. Street lighting shall not be installed until all required offsite improvements such as water mains, sanitary sewer mains, paving, and drainage structures are completed and accepted by the City. However, it shall be installed prior to extensive development to avoid interference with private landscaping.

0405 APPLICABLE STANDARD DETAILS

STRT-01	Residential Minor Street
STRT-02	Residential Collector Street
STRT-03	Secondary/Primary Arterial Street
STRT-03A	Commercial/Industrial Collector Street
STRT-04	Residential Collector Intersection with Arterial
STRT-05	Residential Driveway and Curb Cut
STRT-06	Commercial Driveway
STRT-07	Curb and Gutter
STRT-07A	Valley Gutter
STRT-09	Acceleration/Deceleration Lanes
STRT-10	Acceleration/Deceleration Lanes with Passing Lane
STRT-11	Street Intersection Layout
STRT-12	Concrete Pavement Joint Plan, Sheet 1
STRT-13	Concrete Pavement Joint Plan, Sheet II
STRT-14	Concrete Pavement Joint Details
STRT-15	Residential Cul-de-Sac
STRT-16	Typical Curb (H/C) Ramp, Type A
STRT-17	Typical Curb (H/C) Ramp, Type B
STRT-18	Typical Curb (H/C) Ramp, Arterial
STRT-19	Type I (PCC) and Type II (AC) Paving Patch
STRT-20	Street Replacement for Utilities
STRT-21	Pavement Cuts for Utilities
STRT-22	Manhole and Valve Box in Streets
STRT-23	Paving Base Drainage
STRT-24	Stop Sign and Barricade
STRT-25	Utility Locations at Streets
STRT-26	Right-of Way Grading
STRT-28	High Pressure Pipeline Marker

END OF SECTION

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