CITY OF LOWELL

MINIMUM STANDARD SPECIFICATIONS FOR STREETS

Revised December 2022

CITY OF LOWELL
MINIMUM STANDARD SPECIFICATIONS FOR STREETS
TABLE OF CONTENTS
MARCH 2008

MINIMUM STREET STANDARDS
SECTION 1, GENERAL REQUIREMENTS

1-1 Permits:

All permits required to accomplish the work shall be the responsibility of the Developer/Owner or the Engineer of Record. Such permits may include but are not limited to permits for work within Highway Department R/W, railroad crossing permits, stormwater prevention and "Notice of Intent" for Erosion Control (ADEQ).

1-2 Plans and Specifications:

Detailed Plans and Specifications shall be required for all new streets and street extensions and shall be prepared by a Professional Engineer registered to do business in the State of Arkansas.

The *Standard Specification for Highway Construction* as promulgated by the Arkansas State Highway and Transportation Department, latest edition, and the *Standard Drawings* of the Arkansas Highway Department shall be the basis for the preparation of the Detailed Plans and Specifications and shall apply in all cases except where these standards are in direct conflict with them.

Approval of the Detailed Plans and Specifications by the City of Lowell does not constitute warranty of the Plans and Specifications and does not relieve the Engineer of Record of his professional responsibility in the design of the facilities or in the preparation of any engineering reports done in association with the project.

1-3 Responsibility of the Developer/Owner:

The Developer/Owner shall be responsible for installation of all proposed streets and half- street improvements of existing streets adjacent to proposed developments up to the centerline of the adjacent street. Developer shall be responsible for all design and construction, and for all costs associated therewith.

The Developer/Owner shall provide all engineering services required for planning, design, investigations, inspection, testing, and related activities necessary for street development, and shall be responsible for construction of street improvements in accordance with the design approved by the City as satisfying the requirements of these standards.

The Developer shall post a letter which 1.) Acknowledges that they are familiar with the plans and specifications approved by the city, 2.) acknowledges the conditions of the approval, and 3.) agrees to honor those conditions. This letter must be received by the city prior to the beginning of construction and shall be of the form shown in Appendix "C".

The City shall be provided the right of access during the planning, design, and construction phases of street development. The Developer shall schedule all activities to provide the City with adequate notice and review time.

1-4 Engineering Services:

All engineering services, including but not limited to, planning, design, investigations, inspection, and testing shall be under the supervision of a Professional Engineer registered in the State of Arkansas (Engineer of Record).

The design data, plans, specifications, and related information shall bear the name of the Engineer of Record. The registration seal of the Engineer of Record shall be placed on each street of the Plans along with his/her signature.

Soils investigations, materials testing, and quality control testing shall be performed by a laboratory approved by the Mayor's designee. All reports submitted shall bear the name of the Engineer of Record.

Written certification by the Engineer of Record that materials and construction conform to the approved Plans and Specifications is required. Inspection and testing requirements are outlined in Section 7 of these Standards.

1-5 Plan Submittal:

Plans, Specifications, and all data submitted in conjunction with the plans and specifications shall constitute a complete design. Approval by the City will not be issued until all requirements have been fulfilled. Approval of the Plans and Specifications shall remain in effect for one (1) year from the approval date. After that time a new set of Plans and Specifications must be submitted and any regulations or rules promulgated between the time of the original submittal and the new submittal date must be followed.

All significant changes in the design or construction of a project or development, including all significant changes in the Plans and/or Specifications, shall be submitted to the City for approval. The City shall be notified immediately of all significant field changes in order that a timely approval may be issued.

1-6 Observation of Construction by the City:

The observation of street construction by the City will be limited to general observations of the project at various stages as outlined in Section 7 of the Standards. The City reserves the right to observe the construction at all times.

1-7 Acceptance by the City:

After the Final and Acceptable Completion of the street construction, the Developer/Owner shall provide a Maintenance Warranty Bond/Letter of Credit to the

City which guaranties the maintenance, repair, and/or reconstruction of the project for a minimum period of 12 months after the date of the Maintenance Warranty. The Maintenance Warranty shall be a minimum amount of 50 percent of the cost of construction of the improvements. Should the Mayor's designee determine that the construction of the streets is of questionable quality, he may require an extended warrantee period and may require the warranty to be for a higher percentage of the construction cost.

Formal Acceptance of the project by the City will be made in writing after the posting of the Maintenance Warranty. The date of the formal acceptance shall be the same date as given in the Maintenance Warranty.

See Section 7-6 of the specifications for additional details regarding final acceptance of projects.

1-8 Need for Traffic Study:

A formal Traffic Study by the Developer/Owner may be required in connection with the development if, in the opinion of the Mayor's designee and/or Planning Director, it is required to properly determine future street loading, construction costs, the developer's/owner's off site responsibilities, etc.. A Traffic Study may also be required as a condition of development by the Planning Commission. If a traffic study is required, the traffic consulting firm shall be approved by the City. All costs for the traffic study shall be paid by the Developer/Owner.

1-9 Definitions:

AASHTO – American Association of State Highway and Transportation Officials

ACCEPTABLE COMPLETION – This term shall mean substantial completion of the street construction as established by the CITY.

ADEQ – Arkansas Department of Environmental Quality

AHTD – Arkansas State Highway and Transportation Department

ASTM – American Society for Testing and Materials

CBR – California Bearing Ratio

CITY – The City of Lowell, Arkansas, and its employees expressly authorized by the Mayor to accomplish the specified task.

CONTRACTOR – The licensed contracting company hired by the Developer/Owner to construct the street improvements.

DEVELOPER/OWNER – The person, firm, partnership, corporation or other entity planning, constructing, altering or reconstructing a public street.

ENGINEER OF RECORD – The Arkansas Registered Professional Engineer responsible for the design of the improvements, usually engaged by the Developer/Owner.

ESAL – Equivalent Single Axle Load

FINAL INSPECTION – The final inspection shall be the formal inspection of the street construction by the CITY, the ENGINEER OF RECORD, and the CONTRACTOR, which results in a declaration of acceptable completion.

FORMAL ACCEPTANCE – Acceptance of the street construction in writing after a Maintenance Warranty has been submitted to and approved by the CITY.

MAINTENANCE WARRANTY – The security instrument which binds the Owner/Developer to a minimum one (1) year responsibility for street construction repairs and/or reconstruction in the event of street construction failure. The mayor's designee may require extension of the warranty period as deemed necessary.

STREET CONSTRUCTION – Where this or similar terms are used, it shall mean construction of the street, curb and gutter, paving, drainage, sidewalks, street lighting, signage, and pavement markings whether on the street or not, and all other appurtenances normally associated with street construction and approved as part of the street plans, whether on-site or off-site.

SUBSTANTIAL COMPLETION – The construction stage at which point all improvements and associated appurtenances have been fully constructed and are functional.

USGS – United States Geological Survey

MINIMUM STREET STANDARDS
SECTION 2, DESIGN DATA AND PLAN SUBMISSION

2-1 General:

The submittal shall be complete with all necessary information included for review of the project. The material required shall include, but shall not be limited to the Design Report, the Plans, the Specifications, and the Drainage Report. No review based on a partial submittal will be made. The final review will be concurrent with the review of all public improvements, including water, sewer, and drainage.

2-2 Design Report:

The Design Report shall be a separately bound document and shall contain all information not normally shown on the plans or given in the specifications, including design calculations, results of soil borings, soil test results, and any other design data used in the development of the Plans and Specifications.

2-3 Horizontal and Vertical Datum:

All elevations shall be based on the USGS survey and all horizontal controls shall tie to the State Plane Coordinate System.

2-4 Plans:

The Plans shall be submitted on 24" x 36" sheets. No other size will be allowed unless specifically approved by the City.

Plans shall be submitted at the scale necessary to make the plans easily read and interpreted. Plans shall be on a scale of not less than 1"=50'. The layout shall include, but shall not be limited to the following information:

1. Street right of way, proposed and existing
2. Existing and proposed utility easements
3. Curve data
4. Stationing
5. Location and size of existing and proposed utilities
6. Location and size of existing and proposed drainage facilities
7. Intersection Radii
8. Soil boring locations
9. California Bearing Ration (CBR) Test Locations
10. Elevations at the beginning, mid-point, and end of the radius returns at all intersections
11. A legend showing typical symbols used in the plans
12. Existing and proposed property lines
13. North arrow

14. Street and Right of way dimensions
15. Sidewalks and trails

Street profiles shall be shown on a horizontal scale to match the layout with a vertical scale of not less than 1"-5'. Information to be shown with the profiles shall include, but shall not be limited to:

1. Existing ground elevations
2. Proposed top of curb grades on each side of the street
3. Vertical curve data
4. Proposed and existing drainage and utility line crossings (size and location)
5. Proposed finished grades
6. Cross sections at a maximum spacing of 50 feet. Additional cross sections shall be provided at driveways and other locations where needed for clarification purposes.
7. Sidewalks and trails

A typical street section shall be included in the Plans and shall show the following:

1. Pavement type, width and thickness
2. Cross slope and crown
3. Locations of profile grade
4. Curbs
5. Existing and proposed grades
6. Right of way width
7. Sidewalks or trails, if required
8. Landscaping, if required

Revisions to drawings shall be indicated above the title block and shall show the nature of revisions and the date made.

2-5 Specifications:

Technical specifications shall include material requirements and methods of construction, quality control requirements, sampling, and testing procedures and frequency as delineated in other sections of these standards.

2-6 As-Built Plans:

"As-Built" plans shall depict an accurate account of the construction. Construction plans which are "rubber stamped" and submitted for the purposes of "As-Built" Plans are not acceptable.

One set of "As-Built" plans shall be required along with the final costs associated with the Street construction, and shall be due prior to the filing of the Final Plat.

MINIMUM STREET STANDARDS

SECTION 3, STREET DESIGN PRINCIPLES

3-1 General:

The principle governing the design of streets shall conform to the requirements of these standards, to the standards that may be referenced herein, and to appropriate City Ordinances.

General criteria with regard to street classification and other characteristics shall be as stated in other sections of these standards.

Parking, parking lots, driveways, stormwater drainage, and erosion control requirements are specified in separate ordinances and are not included in these standards.

3-2 Alignment:

Horizontal curves shall be circular curves with a minimum centerline radii of not less than 150 feet for residential streets and 200 feet of collector streets. Curves on street with higher classifications shall be designed on an individual basis. A tangent of at least 100 feet shall separate reverse curves.

All vertical curves shall be parabolic type curves. Minimum vertical curve lengths (L) shall depend on the design speed and shall be equal to K times A where K equals the coefficient as shown in the table below, and A equals the algebraic difference in grades when the grades are expressed as a percentage. (Lmin=KxA)

Vertical Curve Coefficient (K)

Speed (mph)	K Values Crest	K Values Sag
25	20	30
30	30	40
35	40-50	50

3-3 Intersections:

Intersections shall be planned and designed to provide a safe system for present and prospective traffic. Intersections shall be graded to provide positive drainage and shall conform to the alignment and grading requirements of these standards.

The following standards shall apply to intersection design:

Design Consideration	Ordinary	Hilly
Approach speed	25 mph	20 mph
Sight distance (Min.)	250 feet	200 feet
Grade within 100 feet	1% to 2%	2% max
Minimum Angle	75 degrees	75 degrees
Minimum Curb Radius		
Local Streets	30 feet	30 feet
Collector Streets	50 feet	50 feet
Arterial	60 feet	60 feet
Minimum Jogs		
Local Streets	150 feet	150 feet
Collector Streets	200 feet	200 feet
Arterial	300 feet	300 feet

It is understood that the sight distances listed above are a minimum and the longer sight distances may be required where topography will allow and/or when streets with a classification of collector or higher are involved.

3-4 Cross Sections and Right of Way Widths:

Pavement cross sections shall conform to the details included in these standards and are found in Appendix "E". Skewed street sections will not be allowed without specific approval of the Mayor's designee.

The minimum right of way shall be: Principle Arterial with Median – 100; Principle Arterial with Turning Lane – 100'; Collector Street 50 or 60'; Local Street – 50'. Greater widths may be required if needed to accommodate a particular street design. ***Typical street cross sections shall be Principle Arterial with Median – 68', Principle Arterial with Turning Lane – 62', Collector – 30 or 38', Local Street – 30'. (measured from back of curb to back of curb.)***

Required width and right-of-way for Collector Streets will be determined by an individual study of each street by the Project's Design Engineer and the Mayor's Designee.

Pavement cross slopes for all streets shall be a minimum of 2% with a minimum crown height of 6". Gutters shall be sloped to match the street with a minimum 2% slope.

On the elevated side of a uniform cross slope or super-elevated street, the gutter may slope toward the street centerline provided the gutter cross slope does not exceed the cross slope of the adjacent lane. Transitions from normal crowns to uniform cross slope or super-elevated sections shall provide for minimum longitudinal grades. Super-elevated sections shall conform to the AHTD standard drawings.

3-5 Railroad Crossings:

Grade crossings at railroads shall provide for the same minimum sight distances as street intersections. The Engineer of Record shall be responsible for all coordination with the railroad company connected with approval of the crossing and shall work with the City in obtaining a Joint Use Agreement with the railroad.

3-6 Minimum and Maximum Grades

The minimum grades shall be that grade required to provide positive drainage for the street, but in no case shall the minimum longitudinal grade on any street be less than 0.40%. The maximum allowable grade for local streets shall be 12% and for collector and arterial streets the maximum grade shall be 8%. In situations where topography does not allow for compliance with these standards, a waiver may be requested from the planning commission. Where grades are greater than 10% for distances of more than 300 feet, the paving material shall be concrete unless the Mayor's designee specifically authorizes the use of an asphalt design.

3-7 Sight Distance Requirements and Design Speeds:

Minimum sight distance for local streets shall be 250 feet under ordinary conditions and 200 feet for hilly conditions. Collector Streets and Arterial Streets shall have a minimum sight distance of 350 feet, depending on the topography. The Arkansas Highway and Transportation Department definition of site distance shall apply. The design speed shall be 25 mph for local streets (Green map lines on Master Street Plan); Collector Streets 30 mph (Blue map lines on Master Street Plan); and, Arterial Streets (except State Highways) 35 mph (Black map lines on Master Street Plan).

Exceptions to these design speeds can only be made by the Mayor's designee and/or City Engineer.

3-8 Dead End Streets

All dead end streets require a cul-de-sac at their end. The maximum length for a dead end street shall be 660 feet. The minimum radius required for cul-de-sac right-of-way shall be 50 feet with the street radius of 40 feet to back of curb. The Planning Commission may grant a Variance to the maximum length for dead end streets where it can be determined that terrain is a deterrent to through street development. The local fire code may have more stringent requirements. The most restrictive regulation shall govern cul-de-sac design.

3-9 Driveways in City Right of Way

Driveway design widths and construction shall be in accordance with residential and commercial construction plans submitted and approved by the Planning Commission and the Building Inspection Department. Concrete thickness of all drives from the street

gutter to the property right of way line will be a minimum of 6 inches, on a minimum 3 inch thickness of compacted Class 7 Aggregate Base Course. Asphalt thickness for residential drives within City right of way shall be 2 inches of asphalt over 4 inche3s of compacted Class 7 Aggregate Base Course. Asphalt thickness for commercial drives within City right of way shall be 3 inches of asphalt over 6 inches of compacted Class 7 Aggregate Base Course. The slope of the driveway within the City right of way shall match the cross slope of the sidewalk which shall have a cross slope of no more than 2%.

3-10 Storm Structurers Located within the Right-Of-Way or Drainage Easement.

All curb inlets, junction boxes, catch basins, & etc. shall be cast in place concrete with appropriate steel rebar reinforcing. The structures should be installed to ensure a tight fit with the storm pipe penetrating the wall and ensure at least 6" of separation from the outside wall of the storm pipe to the inside corner of the structure. All storm pipe located with the city Right-Of-Way or Drainage Easement shall be reinforced concrete, high density polypropylene pipe can be approved by the city engineer or street superintendent as an alternative if at least 24" of cover is maintained and if the pipe is located outside of the pavement section of a street.

MINIMUM STREET STANDARDS
SECTION 4, PAVEMENT DESIGN

4-1 Pavement Types

Street pavement sections shall be either flexible type with an asphalt concrete surface, rigid type consisting of a Portland Cement Concrete section and surface, or Permeable Pavers. Curb and gutter shall be Portland Cement Concrete.

Flexible pavements may be composed of a crushed stone base course with an asphaltic concrete surface.

Rigid structures shall be full depth Portland Cement Concrete to the designed thickness with a crushed stone drainage/leveling course of no less than 3 inches on Local Streets and Collector Streets, and no less than 4 inches on Arterial Streets.

Permeable pavers shall be composed of 30" minimum thickness of clean 3" gravel, with a 6" clean ¾" choker layer, 3" clean ¼" bedding layer, a 3" paver thickness. A filter fabric will be required between the stone layers and native material along the sides only. Permeable pavers may only be used for streets with a local classification on the master street plan.

Pavement sections shall be designed in accordance with the procedures and criteria of the AASHTO Guide for Design of Pavement Structures, latest edition, and the criteria contained herein. Any conflicts shall be resolved in favor of the more stringent criteria resulting in a stronger and deeper pavement section.

References to various materials, testing and construction shall refer to the latest editions of AASHTO, ASTM, and the Standard Specifications of the Arkansas State Highway and Transportation Department.

Typical design requirements are summarized in Appendices "A" and "B".

4-2 Pavement Materials and Construction:

All pavement materials, construction methods, standards, time and temperature constraints, seasonal constraints, and performance requirements shall be in accordance with the latest edition of the AHTD Standard Specifications for Highway Construction, and this set of requirements (Sections 4 & 5, Pavement Design) unless specifically approved otherwise in writing by the Mayor's designee for a specific and individual exception. All testing shall be in accordance with Section 7, Inspections and Testing.

4-3 Subgrade Material:

Subgrade soils shall be all materials used for Subgrade including in-situ materials and fill materials. Subgrades for pavement shall be stabilized by mechanical compaction or by

other methods approved in writing by the Mayor's designee. Stabilization methods such as fabrics and chemical stabilization may be submitted for approval when supported by engineering data and calculations to substantiate the adequacy of the stabilization procedure.

The top 24" of the Subgrade shall be a material not susceptible to frost action unless modified with cement, lime or other method approved specifically by the Mayor's designee to resist frost action (Soils classified as A-4 and A-5, including sandy silts, fine silty sand or lean clays are highly susceptible to frost action).

In-situ soils meeting the requirements outlined in these specifications may be utilized as subgrade material. In-situ soils used as subgrade shall be scarified to 2 minimum depth of 8 inches below finish subgrade, re-compacted and tested as described in Section 7 of these specifications. Fill material for subgrade shall be placed in lifts not to exceed 8 inches compacted depth.

Methods and procedures for establishing the total depth of soil replacement and/or modifications shall be specified by the design engineer and included in the project plans and specifications. The minimum depth of replacement shall be 24 inches in the absence of engineering data showing otherwise.

A "bridge lift" is defined as material that meets the requirements of these standards and is utilized to span areas of unsuitable material that lie below the 24 inch subgrade requirement. Bridge lift depth shall be determined by a geotechnical firm but in no case shall the lift be less than 24 inches in depth. A bridge lift will be placed in one lift in its entirety or as otherwise directed by the geotechnical firm and approved by the City and will require a "wheel roll" test prior to construction of the final 24 inch subgrade. Additional bridge lift depth may be required by the City dependant on field conditions.

The adequacy of in-situ soils and fill material as pavement subgrade shall be evaluated based upon the soils classifications, liquid limit, and plasticity index and California Bearing Ratio (CBR) values.

All soils with a liquid limit greater than 40, or a plasticity index greater than 15, or a CBR value of less than eight (8) shall be undercut and removed from the street section or improved by a designed method of stabilization accepted by the Mayor's designee.

Soils with a CBR of eight (8) or greater, and classified as GM or GC soil, shall be accepted as "Hillside" material and no further treatment or upgrade will be required.

Subgrade compaction requirements including the moisture density requirements shall be shown both on the plans and in the specifications (minimum 95% modified proctor required).

Sampling and testing of subgrade materials shall be as set forth in Paragraph 4-8 of these Standards.

Pavement designs that utilize a subbase course shall include test data and specifications for the subbase material in the calculations submitted to the Mayor's designee for review and approval.

4-4 Base Course:

Base course material shall be crushed stone meeting the requirements of AHTD class 7 aggregate base course as specified in the AHTD specifications (Division 300, Bases and Granular surfaces, AHTD Standard Specifications, latest edition). Base course materials shall be certified by the supplier to meet the AHTD class 7 requirements and identified as to the type of material, properties (including gradation, density and proctor), and source.

The base course for full depth asphalt pavement designs shall utilize plant mix bituminous base and binder courses conforming to AHTD Specifications (Division 400, Asphalt Pavements, AHTD Standard Specifications, latest edition).

4-5 Surface Course:

The surface course for flexible pavement designs shall utilize plant mix bituminous base and binder courses conforming to AHTD Specifications (Division 400, Asphalt Pavement, AHTD Standard Specifications, latest edition). The City will consider other design mixes, including "Superpave" mixes on an individual basis.

The surface course for rigid pavement shall be reinforced or non-reinforced (as determined by design calculations) Portland Cement Concrete as specified in the AHTD specifications (Division 500, Rigid Pavement, AHTD Standard Specifications, latest edition). Joint spacing details and specifications shall be submitted for all rigid pavement design.

4-6 Curb and Gutter:

All curb and gutter shall be Portland cement concrete conforming to AHTD Standard Drawing GC-1 Type A (Curbing Details) with a minimum width of 24 inches. Mountable curbs will not be allowed in the City of Lowell without written authorization of the Mayor's designee. Construction of all concrete curb and gutter shall utilize the following specifications:

Materials Concrete shall be Class "A" or Class "S" Portland Cement Concrete in accordance with Section 802 or 501, AHTD Standard Specifications with a 28 day compressive strength 3,500 psi. Admixture shall not be used unless specifically approved by the Engineer. Maximum slump shall not exceed 4".

Expansion joints shall be made with preformed expansion joint filler of a nonextruding type conforming to ASTM Designation D1751.

Joint sealing compound for contraction joints shall be CRS-2 Asphalt Emulsion meeting the requirements of ASTM Designation D3405.

Curing compound shall be a white pigmented membrane-forming liquid conforming to the requirements of ASTM Designation C309, Type 2.

Forms Forms shall be made of metal or wood and shall have a depth equal to or greater than the thickness of the pavement slab. The minimum length of each section of form used shall be ten (10) feet. Each section or form shall be uniform and free from undesirable bends or warps.

The maximum deviation of the top surface of any section shall not exceed one-eighth (1/8) inch, or the inside face not more than ¼ inch from planned alignment. The method of connection between sections shall be such that the joint thus formed shall be free from movement in any direction. Forms shall be of such cross-section and strength and so secured as to resist the pressure of the impact and vibration of any equipment which they support, without springing or settlement.

Every 10 foot length of form shall have at least three form braces and pin sockets which shall be spaced at intervals of not more than 5 feet, having the end brace and socket not more than six inches from the end of the form. Approved flexible forms shall be used for construction where the radius is 150 feet or less.

The subgrade under the forms shall be cut and compacted to grade so that the form when set will be uniformly supported for its entire length at the specified elevation. Remove all soft and yielding areas and replacing with suitable material compacted. Forms shall be joined neatly and in such a manner that the joints are free from play or movement in any direction. The supply of forms shall be sufficient to permit their remaining in place for at least twelve hours after the concrete has been placed. All forms shall be cleaned and oiled prior to use.

The alignment and grade elevations of the forms shall be checked by the Contractor and the necessary corrections made immediately before placing the concrete. When any form has been disturbed or any subgrade there under has become unstable, the forms shall be reset and rechecked.

Placing Concrete The subgrade shall be moist, but not muddy, at the time of placing of the concrete. If required by the Engineer, the prepared subgrade shall be saturated with water the previous night, or not less than 6 or more than 20 hours prior to placing the concrete. If the subgrade subsequently becomes too dry, it shall be sprinkled again ahead of placing the concrete, in such a manner as not to form mud or puddles of water.

Contractor shall give the Engineer at least eight hours advance notice before placing concrete and the subgrade shall be checked and approved by the Engineer before any concrete is placed.

The concrete shall be mixed in quantities required for immediate use and shall be deposited on the subgrade to the required depth and width of the curb and gutter in successive batches and in a continuous operation without the use of intermediate forms or bulkheads. The concrete shall be placed as uniformly as possible in order to minimize the amount of additional spreading necessary. While being placed, the concrete shall be vibrated with suitable tools so that the formation of voids or honeycomb pockets is prevented.

The concrete shall be especially well vibrated and tamped against the forms along all joints. Care shall be taken in the distribution of the concrete to deposit a sufficient volume along the outside form lines so that the curb section can be consolidated and finished simultaneously with the slab.

No concrete shall be placed around manholes or other structures until they have been adjusted to the required grade and alignment.

Mechanical Placement Curb and gutter placed by slip-form or extruding equipment will be accepted providing it complies with all of the above requirements other than forms.

Finishing The curb shall be tooled to the required radii as soon as possible after the concrete takes its initial set. The gutter shall be shaped with a wood float at least 4 feet long. After the face forms and templates are removed, the joints shall be tooled and the surface shall be finally finished with a hard bristle broom to remove all imperfections without additional mortar or dryer. In all cases, the resulting surface shall be smooth and of uniform color, free from sags, twists or wraps and true to the specified lines and grades shown on the plans.

Expansion Joints Expansion joints shall be formed with bituminous preformed expansion joints one-half inch thick or as specified on the plans and precut to exact cross section of curb and shall be placed at all driveway radii, intersection radii, stationary structures and at intervals of not more than two hundred feet, and at the location shown of the plans or standard drawings, so that they are not moved by depositing and compacting the concrete at these joints. Preformed expansion joint filler shall be of nonextruding type and shall conform to ASTM Designation D1781.

Contraction Joints Contraction Joints shall be sawed or formed with templates at intervals between not greater than 15 feet and at the location shown on the plans or standard drawings and shall be sawed to a depth of 1 ½" and a width of ¼". Asphaltic material used in filling these joints shall be as specified in Section 501 AHTD Standard Specifications or as approved by the Engineer. Contraction joints in proposed medians shall match the location of joints in pavement. A template shall be ¼" thick, cut to the configuration of the curb section shown on the plans. Templates shall be secured so that depositing and compacting the concrete does not move them. Unless otherwise shown on the plans, and as soon as the concrete has hardened sufficiently, the templates shall be rounded with an edging of 1/8" radius.

Curing Immediately after the finishing operation has been completed and as soon as marring of the concrete will not occur, the entire surface of the newly placed concrete shall be cured according to Section 501 of AHTD Standard Specifications.

Cold Weather Protection As specified in Section 501 AHTD Standard Specifications.

Backfilling After curing, the curb shall be immediately backfilled to within 4" of the top of curb to eliminate any possibility of washing beneath the curb. The remaining 4" shall be topsoil.

Driveway Entrance At all entrances to residences or commercial buildings the concrete curb shall be removed by saw cutting each side of the entrance. After cutting, the exposed ends will be rounded off by applying grout to provide a pleasing appearance. Removal of curb by sledgehammer without first saw cutting shall not be allowed. The practice of excavating behind the curb and gutter and then backfilling with the broken curb section concrete is not acceptable. Any backfill shall be Class 7 crushed limestone. For additional directions regarding the construction of driveway entrances, see the section of these specifications on curb cuts for driveways.

4-7 Subsurface Drainage:

The requirement for drainage layers, subsurface drainage, and underdrains shall be evaluated by the design engineer or an individual project basis. Pipe underdrains shall be installed at all locations where subsurface moisture will affect the stability of the subgrade or result in unsatisfactory pavement performance.

Special attention is called to the typical need for all streets in cut sections and on hillsides to include subsurface drainage systems. The design engineer shall be required to perform, or acquire, geotechnical and subsurface investigation to determine the need of subsurface drainage for each street and segment therefore to be designed and constructed.

4-8 Pavement Section Design Requirements

Unless specifically authorized in writing by the Mayor's designee as an exception for a specific project, all pavement sections shall be designed in accordance with the AASHTO guide for Design of Pavement Structures, latest edition.

In lieu of formal designs for Local Streets and Sidewalks, the designer may use the minimum criteria provided in Appendices "A" and "B".

A minimum design period (traffic analysis/forecast) of 20 years shall be used for pavement section design. A formal traffic study with projections and supporting data shall be submitted for all street classifications (except Local Streets) to provide minimum ESAL criteria.

All street designs shall use a factor of 4.5 for the Initial (present) serviceability index. All street designs shall use a factor of 2.5 for the terminal serviceability index.

Subgrade soils shall be all materials used for subgrade including in-situ materials and fill materials. The investigation and evaluation of subgrade soils shall be an integral component of all pavement designs and shall include the following minimum requirements:

A. Geotechnical: All testing and geotechnical work shall be provided by a firm approved by the Mayor's designee and provided at the expense of the developer or the design engineer. The geotechnical firm shall provide copies of all test results, reports, soils classifications and subsurface drainage requirements directly to the Mayor's designee.

B. Sampling and Testing: The investigation and sampling of soils shall conform to AASHTO T 86 (ASTM D420) or latest revision and test procedures referenced therein. The sampling of in-situ subgrade soils may be accomplished by boring or excavation of test pits. The minimum sampling and testing frequency shall be one (1) density test, one (1) liquid limit, one (1) plasticity index, one (1) gradation and soils classification and one (1) CBR for each 500 feet of street or section thereof, or change in subgrade material, with a minimum of three sets of tests per project. The minimum depth of boring or excavation for in-situ materials shall be four (4) feet below the top of the elevation of the final compacted subgrade. Additional depth shall be required when deemed necessary by the design engineer or the Mayor's designee.

For import material, the minimum sampling and testing frequency shall be one (1) density test, one (1) liquid limit, one (1) plasticity index, one (1) gradation and soils classification, and one (1) CBR per supplier. Said test results shall be within 90 days of import placement and initial testing. If date of information provided is more than 90 days prior to import placement, new samples and testing will be required and results from field density tests will not be accepted until updated information is provided.

Additional sampling and tests will be requested when deemed necessary by the Mayor's designee. The specific locations for all additional samples shall be determined by the Mayor's designee's representative.

C. Soil Classification: Subgrade soils shall be classified in accordance with AASHTO system and the Unified Soil Classification system. All tests required for the classification of the soils shall be performed and reported unless specifically waived by the Mayor's designee.

D. Load Bearing Strength: Load bearing strength of soils shall be determined by the California Bearing Ratio (CBR) test in accordance with AASHTO T 193 or ASTM D 1883. The frequency and location for samples for CBR tests shall be as noted in Section 4-8(B) above with the specific sample for the CBR test taken at the proposed finished subgrade elevation.

Subgrade support capacity for all pavements (resilient modulus for flexible pavements and modulus of subgrade reaction for rigid pavements) shall be determined from the load

bearing strength (CBR) of the soils based upon the correlation contained in the AASHTO guide for the design of Pavement Structures except where other correlation data are approved in writing by the Mayor's designee.

5-1 General

All utilities to be located within the street right of way shall be installed in accordance with the specifications of the utility company involved and shall be subject to City Ordinances governing utilities in street rights of way. Utilities shall be placed in easements outside street rights of way except for street crossings that are placed perpendicular to the street unless approved by the City.

Utilities or encasements for utilities either under the street or located within 3 feet of the back of the curb shall be installed prior to the subgrade being completed.

Minimum depth of water and sewer lines and testing requirements for backfill shall be as specified in the Standard Specifications for water line construction or Standard Specifications for sewer line construction.

Flowable Fill may be utilized as backfill for utility crossings if authorized specifically by the City.

Where encasement pipe is installed for future utility installation the encasement shall extend, as a minimum, from 3 feet from the back of the curb on one side of the street to 3 feet back of the curb on the other side of the street. Where a storm drain pipe or french drain is located parallel to the street, the encasement pipe shall extend a minimum of 3 feet beyond the outside edge of the drainage pipe.

Encasement shall extend from right of way to right of way when required by the individual utility companies to avoid conflict with sidewalks, etc.

MINIMUM STREET STANDARDS
SECTION 6, EROSION CONTROL

6-1 Requirement for Erosion Control:

Erosion control measures shall be taken during construction to minimize the amount of silt and soil from entering adjacent streams and storm drainage facilities and to protect slopes and fill areas.

6-2 Permits Required:

All construction activity shall comply with state ADEQ regulations.

6-3 Permanent Erosion Control Measures:

Permanent erosion control measures shall include seeding and mulching, sodding, etc. and shall be used in all areas within the right of way and temporary construction easements in accordance with the provisions of the City's ordinance on the physical alterations of land and the approved erosion control plan approved in conjunction with the street improvements.

MIMIMUM STREET STANDARDS
SECTION 7, INSPECTIONS AND TESTING

7-1 General:

Materials and construction employed in street improvements will be subject to inspection and quality control testing. All testing shall be provided by the Developer.

7-2 Inspections:

The Developer shall provide for inspections of street improvements during construction. The inspections shall be accomplished under the supervision of the Engineer of Record. The Engineer of Record shall provide certification that all materials and construction conform to the approved plans and specifications and with these minimum street standards.

The Engineer of Record shall furnish full time inspection on the job as required by state law. This law is interpreted by the City to mean that a representative of the Engineer of Record must be on the job whenever a critical construction activity is taking place.

All field tests required for a project shall be witnessed by the City, the Engineer of Record, and the Contractor, or their authorized representatives.

A 24 hour notice is required on all tests. Calls to the City for the purpose of setting test times shall be made to the Mayor's designee's office by 10:00 a.m. for test on the following day. Tests delayed by weather or other factors will be rescheduled on the same basis. If a representative of the City cannot be present, the Mayor's designee may authorize the Engineer of Record to witness the test and certify the results to the City.

It is the responsibility of the Engineer of Record and the Contractor to coordinate the scheduling of such tests with the City.

Prior to final acceptance by the City, the project shall be subjected to a joint final inspection by the City, the Engineer of Record, and the Contractor.

7-3 Quality Control Testing

The Developer/Owner shall provide quality control testing for all materials and construction involved in the street improvements. All testing shall be accomplished by a testing firm approved by the Mayor's designee.

Minimum test requirements and minimum frequency of sampling and testing shall be given in Paragraph 7-5. Projects will be evaluated individually and additional testing may be required. The inclusion of tolerances in project specifications will be subject to approval by the Mayor's designee. Deficiencies in quality of materials and/or construction exceeding the tolerance limits will not be approved.

Submission of test results shall be coordinated with the various stages of construction. Sampling and testing locations will be subject to approval of the City.

Exceptions to the number of required tests for materials may be granted at the sole discretion of the Mayor's designee when current test data are available.

7-4 Construction Inspection Checklist

Construction Stage	**Inspection Items**
Subgrade	*Street subgrade constructed to accurate grade and within specified tolerances. *Moisture condition of subgrade. *Subgrade stability; proof rolling will be required in addition to density tests.
Base Course	*Base course constructed to accurate grade and within specified tolerance. *Surface texture uniform (no evidence of segregation). *Moisture condition of base course. *Base course stability (proof rolling required in addition to density tests).
Curb and Gutter	*Curb and gutter alignment and grade accuracy. *Cross section in conformance with typical detail. *Concrete finish as specified. No toppings or thin patches permitted. No cracks or other defects. *Joint spacing accurate. Joint filler and sealer complete. *Where removal and replacement of curb and gutter is required, the replacement section shall extend from joint to joint or as directed by the Mayor's designee.
Surfacing	*Grade and cross section accurate. Surfaces within prescribed tolerance. *Texture and finish uniform. *Joints straight and smooth. Joint filler and sealer completed. No cracks or openings at joints. *Finish pavement surface shall not be lower than the top of gutter. *No ponding of water.

7-5 Additional Tests and Testing Frequency:

Density tests on subgrades and base courses shall be taken every 300 feet or portion thereof, except that each cul-de-sac street shall have one test taken regardless of its length. The subgrade shall be compacted to 95% of Modified Proctor with a moisture content between optimum and +2% of optimum. The base course shall be compacted to 95% of Modified Proctor with a moisture content between optimum and +2% of optimum on local streets and higher classified streets. The minimum base course thickness shall be

6 inches for flexible pavement sections and 3 inches for rigid pavement on local streets. Base course shall not be more than ¼ inch less than specified thickness.

Asphalt streets shall be cored every 300 feet or portion thereof for the purpose of checking density and thickness, except that each cul-de-sac street shall have at least one core taken regardless of length. The location of the core shall be chosen so as to accurately represent the quality of the asphalt laid in a particular area. Samples over a "run" shall be averaged for the purpose of determining asphalt thickness except that in no case shall thickness be ¼ inch less than that specified. Maximum thickness used for averaging purposes shall be the specified thickness plus ½ inch.

Minimum asphalt density shall be 92.0% of the maximum theoretical density. No density of less than 90% shall be acceptable. Asphalt with densities less than 92% and more than 90%, may be left in place and an extended warranty of 5 years for 100% of the cost will be required on the deficient pavement. Where densities are less than 90%, the paving shall be removed and replaced.

Minimum thickness of concrete streets shall be 6 inches and minimum 28 day compressive strength shall be 3500 psi. A set of cylinders shall be taken for each 100 cubic yards poured or portion thereof.

Curb and gutter concrete should also be 3500 psi. One set of cylinders shall be taken for each 1000 feet of curb and gutter poured, or portion thereof.

Concrete streets shall be cored every 300 feet or portion thereof for the purpose of checking thickness. Thickness shall not be more than 0.50 inches deficient. Areas of more than 0.50 inches deficiency shall be removed and replaced. The City may at its sole option choose to leave the deficient concrete slab in place and accept an extended warranty of 5 years for 150% of the cost of the deficient concrete.

Concrete testing out less than 85% of design strength shall be removed and replaced. Concrete testing out at 98% of the design strength shall be deemed to meet the specifications. An extended five-year warranty for 150% of the cost for concrete pavement shall be provided to the City on concrete falling between 98% and 85% of design strength.

Any failed density or thickness test may be offset by taking of new tests in accordance with the procedures contained in the latest edition of the Arkansas State Highway and Transportation Department's Standard Specifications for Highway Construction.

Additional material and in place testing may be required. Such tests, if required by the City, shall be accomplished and evaluated in accordance with the applicable sections of the Standard Specifications for Highway Construction, Arkansas State Highway and Transportation Department.

All core test holes for concrete and asphalt streets shall be filled with non-shrink grout flush with the final surface within 24 hours of test.

7 – 6 – Final Acceptance

Newly constructed public streets will be accepted by the City to become part of the City's public infrastructure as part of the final plat process for subdivisions, or part of the certificate of occupancy process for developments, in accordance with the following provisions.

1. The developer must demonstrate that the pavement and curb and gutter adequately provide for removal of run-off. This may be accomplished either by wetting the pavement to allow the City to check for low points and non-draining areas, or by waiting until after rainfall to schedule the inspection for this purpose.

2. Before acceptance, street construction shall be completed. In some cases, the Planning Commission may accept streets into the public infrastructure prior to completion, upon presentation by the developer of an appropriate bond; however, the curbs, drainage, detention facilities, base, and operating fire hydrants shall be in place before a bond will be accepted.

3. Upon completion, and at the request of the developer or the developer's engineer, streets and drainage infrastructure shall be inspected by the City. Any deficiencies noted during this inspection shall be corrected and the areas reinspected until found acceptable.

4. Record (as-built) drawings shall be delivered to the City, reflecting any changes to the streets and storm drainage systems. These drawings shall be submitted in both paper and electronic format.

5. After the Final and Acceptable Completion of the street construction, the Developer/Owner shall provide a Maintenance Warranty to the City which guaranties the maintenance, repair, and/or reconstruction of the project for a minimum period of 12 months after the date of the Maintenance Warranty. The Maintenance Warranty shall be a minimum amount of 50 percent of the cost of construction of the improvements. Should the Mayor's designee determine that the construction of the streets is of questionable quality, he may require an extended warrantee period and may require the warranty to be for a higher percentage of the construction cost.

   Formal Acceptance of the project by the City will be made in writing after the posting of the Maintenance Warranty. The date of the formal acceptance shall be the same date as given in the Maintenance Warranty.

6. At the City's discretion, streets that fail to meet any aspect of these standards may be approved .

7. All Bonds shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, and U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act. Bonding company shall be acceptable to the City.

8. The developer shall obtain an NPDES permit that will be in effect and will not be cancelled by a Notice of Termination with ADEQ for the term of the one year maintenance warranty.

9. After installation of the storm sewer, utilities, and curbs, the grade behind the curbs shall be backfilled and brought to final grade with compacted materials approved by the city. The final four inches of material shall be topsoil. The surface from the back of curb to the right of way, all disturbed easements, areas, and all lot areas exclusive of building pads shall be restored with vegetation to prevent erosion. Minimum restoration shall be fertilizer, seed, and straw with a seed mix suitable for lawns in Northwest Arkansas.

7 – 7 Warranty Period Responsibilities

1. During the warranty period, the developer will be responsible for continuing the following activities:

   A. Mow areas of the subdivision that do not have ongoing construction activities, including detention ponds. Mow at least monthly during primary growing season, and as needed at other times.

   B. Water sodded and seeded areas, as required to maintain growth. Watering may be reduced or eliminated only when rainfall is sufficient to maintain growth.

   C. Remove sediment and debris from curb inlets, junction boxes, storm sewers, and detention ponds. This must be done as often as necessary, based on activities in the subdivision.

   D. Maintain erosion control measures in areas that do not have ongoing construction activities. This includes inspection, removal of accumulated sediment, and repair or replacement of damaged/deteriorated erosion control measures.

2. The City will conduct warranty period inspections from time to time during the warranty period. If defects are noted, the City will inform the engineer or developer or contractor, in writing, of the defect. A 30 day period is allowed for correction of any reported defect. It is not allowed to accumulate these defects as punch list items and repair them at the end of the warranty period. If the defect is

not repaired at the end of 30 days, the City will notify the bond issuer of the failure of the developer or contractor to comply, and the intentions of the City to repair the defect at the bond issuer's expense and request payment therefore.

3. Repairs made during the warranty period shall be warranted from the date of the repair for the same amount of time as the original construction was warranted.

MINIMUM STREET STANDARDS
SECTION 8 – SIDEWALKS

8-1 General

Sidewalks are to provide for safe pedestrian circulation within the City and promote pedestrian transportation. Sidewalks are defined as a pedestrian way constructed along public or private right-of-way to provide pedestrian access removed from traffic lanes.

8-2 Location and Width

Sidewalks will be built to meet all current Federal "Americans with Disabilities Act" requirements. Sidewalks will be required on all new streets in the City of Lowell. Sidewalks on Local Streets shall be constructed at the location listed in the following table and of the width listed. All sidewalks on Local Streets shall incorporate handicap ramps at all driveways and intersection corners. Sidewalks on Collector Streets and Arterial Streets may be located either at the back of curb or at the distance in back curb listed in the following table. The width of all sidewalks on Collector Streets and Arterial Streets shall be in accordance with the width shown in the table. All sidewalks on Collector Streets and Arterial Streets shall incorporate handicap ramps at all driveways and intersection corners. Cast-in-Place Detectable Panels shall be installed on all handicap ramps inside walks at intersection crossings.

Street Type	Distance from Back of Curb	Minimum Width of Surface	Walk Placed Back of Curb	Minimum Width of Surface
Local Street	6 feet	5 feet	N.A.	N.A.
Collector Street	6 feet	5 feet	N.A.	N.A.
Arterial Street	6 feet	5 feet	N.A.	N.A.

Determination of the best position for sidewalks on Collector Streets and Arterial Streets shall be made by an individual study of each street by the Project Design Engineer and the Mayor's Designee.

8-3 Design Requirements

All sidewalks shall meet all current Federal Americans with Disabilities Act (ADA) design and construction requirements.

Transverse slopes shall not exceed 2% (0.02 ft/ft).

When adjacent to streets, sidewalks shall be constructed at an elevation 1% above the adjacent curb and shall slope toward the street at a grade not exceeding 2%. On the property side, there shall be a minimum of two (2) feet between the sidewalk and the beginning of a slope.

Where sidewalks cross driveways, said driveway shall be designed and graded such that the sidewalk cross-slope and grade continues through the driveway the same width as the adjacent sidewalks. Slope shall not exceed 2% where sidewalk crosses driveway. If this is not possible, handicap ramps must be constructed in the sidewalk at the driveway.

Utility poles, utility boxes, mailboxes, and other similar obstructions shall not be located in the sidewalk. Sidewalk location behind back of curb may be varied at the discretion of the City to avoid such obstacles.

Sidewalks shall be constructed of Portland cement concrete with a minimum 28-day compressive strength of 3,500 pounds per square inch. Alternative materials must be approved in writing by the Mayor designee and/or Planning Commission. Sidwalks shall be a minimum of four inches (4") thick.

Compacted granular base course shall be a minimum of three inches (3") thick.

Transverse tooled joints shall be provided perpendicular to the sidewalk at intervals equal to the sidewalk width.

Expansion joints shall be installed perpendicular to the sidewalk at intervals equal to five (5) times the sidewalk width. Joint material shall be the same as approved for AHTD sidewalk construction (AASHTO M213). Alternate material must be approved in writing by the City.

Wheelchair ramps shall be installed in accordance with current ADA requirements including the placement of detectable warning devices. Accessible ramps shall be constructed where sidewalk intersects a curb, driveway, street and alley. Width of ramp shall match width of adjoining sidewalk. Detectable warning device shall extend two (2) feet in the direction of travel and shall be the full width of the curb ramp or flush pedestrian access surface. Detectable warning device shall be placed such that the domes align in the predominant direction of pedestrian travel. Detectable warning device shall be located so that the nearest edge of the device is 6 inches from the face of curb. Maximum slope of ramp shall be 8.33% in the direction of travel. Cross-slope shall not exceed 2%.

8-4 Construction

An excavation shall be made six inches (6") minimum below grade line at all points.

Said excavation to be well and firmly tamped with rammer and brought to a firm and solid surface upon which to construct the sidewalk.

Excavation to be filled with a minimum of three (3") inches of Class 7 Aggregate Base Course and firmly tamped down, said base to be at least three inches (3") deep after tamping.

After the Class 7 Aggregate Base Course has been compacted and inspected by the City Building Inspection Department, four inches (4") of Class S (3,500 psi) Portland Cement Concrete shall be placed, tamped to consolidate concrete, brought to a smooth level surface with the top of the form, then floated well and troweled to a smooth surface, or if required by the City, a broom finish surface. Tooled transverse joints shall be placed perpendicular to the sidewalk at intervals equal to the width of the sidewalk. Concrete shall be properly protected from damage until sufficiently hard for use.

Subgrade and form work for sidewalks shall be required to be inspected by City Building Inspector prior to pouring of the sidewalk.

8-5 Warranty

Developer shall guarantee installation of sidewalk and appurtenances for a period of one year after acceptance of the final plat or receipt of Certificate of Occupancy.

Sidewalks must be completed before the Certificate of Occupancy will be issued and permanent connection to utilities permitted. The owner(s) of record will be required to install sidewalks on any lot(s) which remain undeveloped three years after filing of the final plat or upon notification by the City, the City shall have the right (but shall not be required) to construct the sidewalks and to charge the cost thereof to the property owner(s) through placement of a lien on the real property. The final plat and protective covenants shall state these requirements.

MINIMUM STREET STANDARDS
SECTION 9 – CURB CUTS FOR DRIVEWAYS

9-1 Cuts or breaks without Permit Unlawful.

Hereafter it shall be unlawful for any person or persons to cut existing street curb and gutter until a permit for such cutting has been approved by the director of engineering or his designated representatives. The permit will be issued by the city engineer or his representatives and copies shall be furnished to the street superintendent and the building inspector.

9-2 Permits

Planning approval and permitting by building services is hereby authorized and directed to issue curb cut permits; upon proper application to cut curbs for driveways as they may be approved by the director of engineering or his designated representatives.

9-3 Enforcement Officers.

(a) Except as specifically provided otherwise in this chapter, the director of engineering, or his designated representative shall enforce the provisions of this section. Unless provided otherwise, the term "director" as used in this chapter shall mean the director of engineering or his designated representatives, and the term "department" shall mean the engineering department.

(b) The director shall first approve all construction placed upon all public streets, alleys, easements, or other public right-of-way, or any area contained in a preliminary plat which has been approved by the city.

(c) The director may prescribe procedures and technical specifications not in conflict with this code that may be found necessary to maintain the proper condition or repair to the existing curb and gutter on city streets.

(d) No person shall willfully or wantonly and without authority cut, break or remove, or in any manner displace any curb and gutter or paved street, or any part thereof.

(d) No person shall recklessly or intentionally drive any car, truck, tractor, or wagon into or on the existing curb and gutter of any paved street.

9-4 Traffic Safety

Any person making any cut in existing curb and gutter, sidewalk or any paved street for the purpose of constructing a new driveway shall at all times while such work is being done, comply with the provisions of the Uniform Traffic Safety Manual, latest edition.

9-5 Curb Cuts for Driveways.

All requests for curb cuts for driveways shall require the approval of the director.

1. Curb cuts for driveways on state highways will be handled in accordance with the current requirements of the Arkansas State Highway Department and will not require any permits from the City of Lowell.

2. Where work is carried on, in or adjacent to any street, the contractor shall, at his own expense, furnish and erect such barricades, fences, lights, and danger signals and shall provide such watchmen and take such other precautionary measures as are necessary for the protection of persons and property.

3. A sufficient number of barricades shall be erected to keep vehicles from being driven into any excavation work or materials.

4. In making excavations or making improvements to any street, sidewalk or driveway, all materials or earth removed and new materials necessary for new work shall be handled in a safe manner and placed where it will cause the least possible inconvenience for the public. In no case shall any of such material or earth be scattered over the surface of the street pavement.

5. In existing residential subdivisions platted before construction of sidewalks was required, driveway contractors may remove only the curb portion of the curb and gutter at the site if the existing gutter is in good condition. The curb may be separated from the gutter pan by a neat full depth saw cut and saw cuts must be used to separate the curb at the point where the driveway flare begins.

6. If the gutter is in poor condition, the contractor must remove the complete curb and gutter using a neat full depth saw cuts. A driveway contractor may also select this option even if the gutter is in good condition.

7. In new residential subdivisions platted with the requirement that sidewalks must be constructed and wheelchair ramps provided at all driveways. Construction of the driveway, sidewalk and wheelchair ramp should conform to the construction shown on Figure 1 or Figure 2. If modified curb Type I is not constructed, the curb may be separated from the gutter pan by a neat full depth saw cut and saw cuts must be used to separate the curb at the point where the 12:1 slope begins on the wheelchair ramp in Figure 1. If the driveway is constructed using Figure 2, the contractor must remove the complete curb and gutter using a neat full depth saw cut at the point where the radius to the driveway flare begins.

8. When constructing new driveways in both subdivisions platted before and after sidewalks and wheelchair ramps were required by subdivision regulations, a six inch (6”) thick concrete driveway apron must be constructed to an expansion joint at the property

line. A minimum three inch (3") of Class 7 Base Course is required under all six inch (6") thick driveway apron concrete to the property line.

9. No broken concrete, including the curb and gutter sections that are removed at the driveway construction site are to be used in the subgrade for the new driveway or sidewalks.

10. For construction of new driveways in residential areas with Portland cement streets the contractor must only remove the curb with a neat full depth saw cut and follow all the previous listed directions which are appropriate.

11. For commercial driveways the contractor must remove the complete curb and gutter unless the new driveway is abutting new curb and gutter constructed as a part of the project. Then the driveway curbing and apron must either be keyed to the gutter pan or the complete apron including the usual gutter pan can be poured together.

12. Commercial driveways that have sidewalks and wheelchair ramps shall follow the details shown in Figure 1 and Figure 2 that are appropriate, or any special instructions from the director.

9-6 Application for Permits

Application for permits for curb cuts for driveways must show the location of the proposed cuts on the site's project drawings or furnish a sketch showing the location. The director shall approve all permits for curb cuts pursuant to the provisions of this document.

9-7 Fee

A person who by the provisions of this document is required to obtain a permit shall pay to the city a fee of $25.00 to cover the inspection of each curb cut area to insure that curb cuts for both residential and commercial driveways are made in accordance with this document.

The director shall inspect the curb cut area after the excavation for the driveway is complete and before any base material, asphalt or concrete is placed for the construction of the driveway. A final inspection shall be performed after the driveway construction and clean up is complete.

MIMIMUN STREET STANDARDS
SECTION 10 STREET CUTS AND BORES

10-1 Cuts or bores without permit unlawful.

Here after it shall be unlawful for any person or persons to bore or break the surface of any street or alley in the city for the purposes of installing service or utility lines or for any other purpose except in the case of an emergency, until a permit for such breaking has been approved by the director of engineering, or his designated representatives, and copies of such permit are filed with the city police department and city fire department, and notice is given to the local utility companies

10-2 Pemits.

Planning approval is required prior to Building Services issuing a permit, upon proper application, to bore, cut or break streets or alleys within the city for the purposes of install utility or service lines or for such other purposes as may be approved by the director of engineering or his assigns. Such permit shall be granted only after a written application has been filed, all fees have been paid, and surety bonds are in place as set forth herein. Information to be indicated in such application shall include:

1. Name and address of the owner or agent in charge of the property abutting the proposed work area.
2. The name and address of the party doing the work.
3. A map that indeicates the location of the work area and the dimensions of the excavation area or the area to be bored.
4. A plan or a clear description of the work to be done.
5. A traffic control plan that meets the "Manual on Uniform Traffic Control Devices" latest edition.
6. Signed agreement to comply with the provisions of Section 10 of these standards.

10-3 Enforcement officers.

(a) Except as specifically provided otherwise in this chapter, the director of engineering, or his assigns, shall enforce the provisions of the section. Unless provided otherwise, the term "director" as used in this chapter shall mean the director of engineering, or his designated representatives, and the term "department" shall mean the engineering department.

(b) The director shall first approve all construction placed upon all public streets, alleys, easements, or other public rights of way, or any area contained in a preliminary plat which has been approved by the city planning commission for dedication as public rights of way.

© The director may prescribe procedures and technical specifications not in conflict with this code, and may be found necessary to maintain a proper condition or repairs to the pavement on any street, alley, sidewalks, street and alley crossings and other public grounds.

(d) No person shall willfully or wantonly and without authority cut, break or remove, or in any manner displace, any curbing, guttering, street crossing, paved street, or any part thereof.

(e) No person shall recklessly or intentionally drive any car, truck, tractor, or wagon into or on the curbing or concrete guttering of any paved street.

10-4 Traffic safety.

Any person making any cut in any pavement, curbing, or sidewalk or repairing or constructing any pavement, sewers, public utility lines or other works, or making any excavation in, upon, under, or adjoining a street, alley, sidewalk or other public grounds, whether paved or unpaved, shall, at all times while such work is being done, comply with the provisions of the Uniform Traffic Safety Manual, latest edition.

10-5 Bored crossings.

The intent of this article is that all street and alley crossings by utilities and other parties shall be required to be bored unless an open cut is approved by the director. Bored crossings generally shall meet the following requirements:

1. Copper lines or other service lines in under street bores shall not be spliced.
2. Street bores must be thirty inches (30) below the bottom of the street.
3. Bore holes shall not be larger than the size of service line being installed with a three-fourths inch to one inch (3/4" to 1") tolerance for lines up to three inches (3").
4. Contractors must obtain Permits for all projects involving street bores. Contractors must have the Permit on job site from initiation to completion of project.
5. Bores for service lines three inches (3") and larger in diameter must be encased in steel encasement pipe.
6. Encasement pipe sections must be welded with continuous weld and extend twelve inches (12") past curb lines.
7. The director may grant exceptions to the boring requirements. Exceptions must be approved prior to commencing any boring activities.

10-6 Permits for boring.

All boring shall be conducted only by Arkansas State Licensed Contractors in the boring specialty classification. Permits for boring will only be required for bores under

paved streets, driveways and sidewalks may be bored without a permit. No fees will be charged by the City of Lowell but a permit must be obtained from the director. Any damage to street, pavement, driveways, sidewalks or lawn areas which result from the operations of the boring contractor which develop within a period of one year (1) must be repaired to the satisfaction of the director or loss of work privileges in the City of Lowell may result.

10-7 Street cuts.

All requests for street cuts shall require the approval of the director. All street cuts shall be made and repaired in accordance with Figure 3, depending on the type of street surfacing cut.

1. Street cuts required on State Highways will be handled in accordance with the current requirements of the Arkansas State Highway Department and will not require any City of Lowell permits.

2. Cuts by employees of the city on any part of the pavement on any street, sidewalks, alley or other public grounds in the scope of their employment shall be subject to the approval of the director and no permit shall be required, provided that all other portions of this article shall be a fully complied with by the city employees as by other persons.

3. Any cut on a city street, right of way, or easement will require a driving plate and barricades in accordance with the standard, as necessary to prevent harm to persons and property. The driving plates and barricades must also be in place whenever necessary to permit the passage of pedestrian and vehicular traffic and as necessary to prevent property damage and injury to persons.

4. Where work is carried on, in or adjacent to any street, alley, or public place, the contractor shall, at his own expense, furnish and erect such barricades, fences, lights, and danger signals and shall provide such watchmen and take such other precautionary measures as are necessary for the protection of persons and property.

5. A sufficient number of barricades shall be erected to keep vehicles from being driven into any excavation, work or materials.

6. Handling of excavated material.

In making excavations or making improvements in or to any street, sidewalk, alley or other public grounds, all material or earth removed and new material necessary for repairs or for new work shall be handles in a safe manner and placed where it will case the least possible inconvenience to the public. In no case shall any of such material or earth be scattered over the service of the pavement.

7. Failure to make repairs promptly.

No trench or opening made on any of the paved streets, alleys, sidewalks or other public grounds of this city shall remain open longer than is absolutely necessary, and in no event more than three days, except by special written permission of the director. If a cut remains open for longer than three days and the party making it failed to secure the necessary extension of time, and having been notified to refill the same, failed to do so, then such refilling shall be made under the direction of the director at the expense of the party making the cut.

8. Maintenance of cuts, removal of debris.

a. The parting making the cut shall remove all of the surface materials and earth excavated and leave the surface of the street and parking in a neat, sightly and clean condition.

b. Cuts temporarily repaired shall be maintained by and at the expense of the party making such cuts until the cuts have been repaired.

9. Backfilling generally.

a. Immediately upon the completion of any job, the backfilling of cuts made into the earth beneath any street, alley, sidewalk, street or alley crossing, or other public ground under permit from the director shall be made up to the original street surface in layers.

b. The layers shall not exceed six inches (6") in thickness and each layer shall be thoroughly rammed and tamped to a density of 95 percent modified proctor density according to the AASHTO T-180. Such tamping procedure shall continue until the excavation is filled up to the proper line.

c. Only Arkansas Highway and Transportation Department Class 7 Base, or equal, selected materials shall be used in making the backfill. No broken concrete, rubble, or debris shall be used as backfill, unless approved in writing by the director.

c. If the refilling of any excavation is not done in accordance with the provisions of this article and the rules and regulations of the city and in a manner satisfactory to the director, then the director shall have the right to cause all the materials to be removed from the excavation and have the same refilled in a proper manner at the expense of the party originally making the excavation.

10. Settling.

If the backfilling of any trench or opening settles prior to the making of permanent repairs, such trench or opening settles prior to the making of permanent repairs, such trench or opening shall immediately be brought to proper grade by the party making the cut as directed by the director. If settlement should take place at any time within two years after a cut has been permanently repaired the necessary amount of pavement shall

be removed in accordance with the direction of the director, the proper amount of backfilling done, and repairs made to the pavement at the expense of the party responsible for the original cut.

11. Length of excavation.

No excavation shall be made in any street, sidewalk, alley, or other public ground more than 400 feet in length at any one time, except by special written permission of the director.

12. Emergency cuts and excavations.

a. Nothing in this article shall prevent any person from opening any pipeline, conduit, or public utility in any street, alley, sidewalk, driveway, or other public ground as may be necessary for the preservation of life or property when necessity may arise during the hours of the offices of this city are closed.

b. The person making such excavation shall make application to and receive from the director a permit therefore within 24 hours after the offices of the city are first opened subsequent to the making of such excavation.

13 Repairs generally.

a. An applicant for the permit required by the provisions of this ordinance shall be responsible for making repairs to paving and curb cuts and said repairs shall be made in accordance with the provisions of this section.

b. In all instances the applicant making the cut of excavation shall backfill to grade immediately and, if not permanently repaired at the time, the cut shall be patched temporarily. The permanent repair will be made as soon as practicable after the excavation backfill is stable.

c. In addition to the procedure described in subsection b above, all cuts and excavations made in streets paved with Portland cement concrete situated within the following areas shall be repaired by the applicant by removing and replacing all existing paving lying between existing expansion and/or contraction joints. In every instance, the applicant responsible for making repairs to newly cut streets shall pay all costs encountered for repair and/or relocation of all existing utilities. All work performed pursuant to the provisions of this article shall be done in accordance with established standards of the city.

14. Cave-ins.

a. If the sides or walls of an excavation cave in at any time during the process of the work, leaving the foundation of the pavement surrounding the cut insufficient to fully support the pavement, all of the pavement so undermined by the cave-in shall be broken down and the opening in the surface of the pavement increased until the extreme edge of the insufficient foundation is reached.

b. Such additional repairs to the pavement shall be immediately covered by an additional permit issued pursuant to the provisions of this article.

c. The permit fee charged in such cases shall be based on the scale of a continuous cut.

15. All street, curb and gutter and sidewalks removed incidental to making pavement cuts shall be repaired to a condition equal to its condition before being disturbed by the contractor,

Figure 3. The detail for permanent paving cut repair for both Portland cement and concrete paving and asphaltic concrete paving is included at the end of this section.

10-8 Application for permits.

The applicant for a permit to cut or break a street must furnish all the information required by Section 10-2 permits of these standards.

(1) Applicant. A person who is required by the provisions of this ordinance to obtain a permit shall make written application to the director upon a form furnished by the director. The application shall state the dimensions and the exact location of the work and such other information as the director may require.

(2) Issuance. The director shall approve a permit pursuant to the provisions of this ordinance if the applicant and proposed work comply with all applicable provisions of this chapter.

10-9 Fee.

(a) A person who is required by the provision of this ordinance to obtain a permit shall pay to the city the fee of $300, for transverse crossing of streets. The fee for any longitudional cut in street pavement will be determined by the director of engineering on a case by case basis.

(b) For a period of one year following the final acceptance of a paving project, no paving cut permit shall be issued allowing a pavement cut to the paving project, unless a fee which is triple the amount of the fee otherwise charged for such permit is paid.

If an emergency situation occurs, then the regular fee shall be collected. An emergency shall be deemed to exist when the paving cut is necessary for the preservation of life or property.

(c) The permit fee charged in cases where a cut is made larger than that contemplated in the permit shall be based on the scale of a continuous cut.

(d) No fees shall be required for those projects for which costs are borne by the city.

Section 10-10 Bond

(a) An applicant for the permit required by the provisions of this ordinance shall file with the city a bond in the sum of $5,000.00 executed by a surety company authorized to transact business in the state.

(b) The conditions of the bond shall provide that the principal shall pay promptly all charges or fees levied by this article, and further that the principal will properly maintain for a period of two years in accordance with requirements set forth in detail in all backfill of any trenches excavated by the principal across or along any street in the city. The bond shall be further conditioned that if the principal shall fail to correct any and all settling of cuts in a manner satisfactory to the director, then the director shall have the settlement corrected in a proper manner at the expense of the principal. The expenses shall be computed by the director. The bond shall be further conditioned that the principal shall indemnify and save the city harmless from any and all loss, costs, damage, expense, action, or cause of action, or liability of any kind, including reasonable attorney fees, which the city may suffer or be required to pay or which may accrue against it or be recovered from the city by reason of loss, damage or injury incurred by any person by reason of any cutting, altering, or excavating on any street in the city by the principal, his agents, servants, or employees, or by reason of the neglect, failure or refusal of the principal, his agents, servants, or employees to erect, place and maintain proper safety devices, crossing signals or barricades about such work during the process of construction or repair.

(c) The provisions of subsection (a) shall not apply to utility companies operating under franchise or under congressional grant in the city; provided however, that if the work, is sublet to a contractor, either the contractor will be required to furnish the bond or the utility company shall provide the bond.

1. Record. A record of the permits issued when a fee is charged under this section shall be included in the director's report to the city council, if required.

2. Limitations of work authorized, permit duration, etc.

    a. Permits issued pursuant to the provisions of this document shall in no case be taken to cover a cut at any other point nor of a dimension greater than six inches either way than that shown on the permit. If it is found

necessary to make a greater cut, a new permit shall be obtained and taken out and an additional deposit made.

b. No permit shall be issued more than five days before the cut or excavation is to be made or work thereon commenced.

c. No person shall allow his name to be used to obtain a permit for any other person.

d. In no case shall two parties be allowed to use the same opening without the written permission of the director.

APPENDIX “A”
Pavement Design Criteria

General Design Requirements

Formal traffic studies with projections and supporting data shall be submitted for design of all streets, except local streets to provide minimum ESAL criteria

Design period shall be 20 year minimum

Initial (present) serviceability index factor shall be 4.5

Terminal serviceability index factor shall be 2.5 minimum

All designs shall be in accordance with the AASHTO Guide for Design of Pavement Structures, latest edition

Structural Number Layer Coefficients

Pavement Materials	**Min. Thickness of course (inches)**	**Structural Coefficient per inch thickness**
Asphaltic Concrete Surface	2	0.44
Asphalt Concrete Binder	2	0.44
Asphalt Stabilized Base	4	0.34
Crushed Stone Base	6	0.14
Portland Cement Concrete	6	*

APPENDIX "B"
Typical Pavement Designs

Minimum Pavement Design Criteria

In lieu of formal, designs the following minimum street pavement sections may be used, however, the City reserves the right to require a formal design.

Type Street	**Flexible Composite**	**Rigid**
Local Streets	2" Asphaltic Concrete 2" Asphaltic Binder Course 6" Class 7 Base	6" P.C. Concrete 3" Class 7 Base

All rigid pavement designs require a joint layout plan and associated details.

In lieu of formal designs all sidewalks and handicap ramps shall be constructed of four inch (4" thickness of P.C. concrete on a three inch (3") thickness of compacted Class 7 aggregate base course.

ALL OTHER STREET CLASSIFICATIONS SHALL REQUIRE FORMAL DESIGN

1. Formal designs for collector streets and arterial streets by the Project Design Engineer to determine specific pavement sections required for a specific subgrade and specific project requirements. These designs shall be submitted to the Mayor's designee for review. Soils testing is required in compliance with the pavement design standards and a minimum acceptable subgrade CBR value of 8 shall be required.

2. For rigid pavements joint spacing and joint design shall be in accordance with the AASHTO Guide for Design of Pavement Structures.

3. Collector streets and arterial streets may be designed either as flexible asphalt pavements or rigid P.C. concrete pavements by the Project Design Engineer.

APPENDIX “C”
Acknowledgment Form Letter

Mayor’s designee
City of Lowell
201 Presidential Drive
Lowell, AR 72745

Re: Name of Project

Dear Sir,

This letter is to certify that I am familiar with the approved Plans and Specifications relating to the above referenced project and it is my intent to construct the improvements in connection therewith in full accordance with the approved Plans and Specifications and with the terms and conditions of the formal Letter of Approval as issued by the City of Lowell.

Signed

Owner/Developer