CITY OF LYONS, OREGON

PUBLIC WORKS STREET & STORM DRAIN DESIGN STANDARDS

OCTOBER 2021 UPDATE

Enacted by Lyons City Council:

Date: October 26, 2021

By: Lloyd Valentine, Mayor
(Name/Title)

Signature: Lloyd Valentine

Prepared by:
Erwin Consulting Engineering
33923 Bond Road
Lebanon, Oregon 97355
(541) 259-2190

Modified October 2021 by:
Civil West Engineering, Inc
200 Ferry St. SW
Albany, OR 97321
(541) 982-4373

CITY OF LYONS, OREGON
STREET & STORM DRAIN DESIGN STANDARDS

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Purpose

The purpose of this document is to define and set forth design criteria and standards for streets and storm drainage systems for the City of Lyons, Oregon. These standards are presented to establish a consistency and quality for all public improvements and private developments within the City of Lyons.

These standards shall apply to future development projects scheduled to take place within the City of Lyons. The standards herein are not considered to be uniformly applicable as there may be circumstances related to areas within the city that are unique due to the nature of the property involved.

These standards shall be used in conjunction with the *Subdivision Ordinance and all other ordinances for the City of Lyons* on all new developments and shall conform to an appropriate degree of safety, engineering, or construction practice.

I. TRANSPORTATION

A. STREET CLASSIFICATION

1. Definitions
   a. *Alley* - A thoroughfare through the middle of a block giving access to the rear of lots or buildings and secondary access to properties.
   b. *Arterials* - A road designed for high speeds and large capacity intended to serve travel to and from major traffic generators such as cities, major rural areas, and major residential sections. Arterials shall be wide enough to accommodate two lanes, a center turn lane and two bike lanes.
   c. *Bikeway* - A six (6) foot portion of a street right-of-way developed for bicycle traffic.
   d. *Collector* - A road designed for moderate speeds and capacities intended to serve travel between areas of interest. Also ties local residential roads to arterials.
   e. *Cul-de-sac* - A road or street closed to through traffic at one end with a vehicle turn-around.
   f. *Industrial* - A road or street used primarily for heavy industrial traffic loading.
   g. *Local Residential* - A road designed for low speeds and volume intended for short trips. Connects adjacent lands with collector roads.
   h. *Turn lane* - A dedicated traffic lane used at intersections to direct traffic for right and left turns. Center turn lanes separate traffic lanes in opposing directions and are designated for left turns only.
   i. *Turnpike Street* - A public street which has been paved for the handling of vehicular traffic, but which does not have curbs, sidewalks or storm drain facilities.

2. The following table gives the classification and recommended minimum dimensions of standard streets for the City of Lyons.

Table 1 - Street Classification Standards

SEC.	CLASSIFICATION	PAVEMENT WIDTH* (FT)	RIGHT -OF- WAY (FT)	SIDEWALK WIDTH (FT) & QUANTITY	BIKEWAY WIDTH & LANES
A	Cul-de-Sac	28	50	N/A	N/A
B	Local Residential	34	50	N/A	One (1) 6' Lane
C	Collector	44	60	One (1) 5' Sidewalk	Two (2) 6' Lanes
D	Industrial	38	60	One (1) 5' Sidewalk	One (1) 6' Lane
E	Arterial	46	70	Two (2) 5' Sidewalks	Two 6' Lanes
F	Alley	N/A	20	N/A	N/A

* Measured from curb to curb for curbed streets or actual pavement width for turnpike streets with drainage ditches.

3. Where a street has a right-of-way less than 60 feet, a ten (10) foot public utility easement must be dedicated on both sides of the right-of-way.

4. Cul-de-sac shall not be longer than 600 feet from centerline of intersecting street to center of vehicle turn-around and shall serve no more than eighteen (18) dwelling units. The minimum radius of the vehicle turn around shall be 50 feet for the right-of-way and 38 feet for the pavement.

5. Street classifications shall be made by the Planning Commission based upon the Comprehensive Plan.

B. EXTENT OF IMPROVEMENTS

1. Limits of improvements
   a. Street improvements necessary to provide appropriate access to the site shall occur prior to or concurrently with development.
   b. Street improvements shall be extended to the edges of property frontage and/or internal property lines so that improvement will continue in an orderly fashion.
   c. Half-street improvements shall be used only when approved by the City.
   d. Dead end streets shall have an approved Manual of Uniform Traffic Control Devices (MUTCD) barricade at its terminus along with advance warning signs.
   e. Streets with less than required right-of-way shall be reviewed on a case-by-case basis to determine the improvement limits.

C. HORIZONTAL STREET ALIGNMENT

1. Minimum Centerline Radii
   a. 300 feet on arterials
   b. 200 feet on collectors
   c. 100 feet on local residential streets and alleys

2. Stopping sight distance shall be designed in accordance with American Association of State Highway Transportation Officials (AASHTO) standards for the design of speed of the proposed street.

D. VERTICAL STREET ALIGNMENT

1. Stopping sight distance shall be designed in accordance with AASHTO standards for the design of speed of the proposed street.

2. Maximum Grades
   a. The maximum vertical centerline for arterials is six (6) percent.
   b. The maximum vertical centerline for collectors is ten (10) percent.
   c. The maximum vertical centerline for local streets is twelve (12) percent.
   d. The maximum cross-slope on a crowned pavement section is three (3) percent.

e. The maximum cross-slope on a shed-roof pavement section is five (5) percent.

3. Minimum Grades
   a. The minimum longitudinal grade for drainage purposes is 0.50 percent.
   b. The minimum cross slope for drainage purposes is two (2) percent for asphalt concrete pavements.
   c. The minimum cross slope for drainage purposes is one (1) percent for Portland Cement Concrete pavements.

4. Accesses to abutting properties are limited to a maximum of fifteen (15) percent street grade at any point along the length of the access.

E. INTERSECTIONS

1. Alignment
   a. Streets shall be in alignment with existing streets by continuing the centerline.
   b. Staggered street intersections shall leave a minimum distance of 200 feet between the centerlines of two such streets.

2. Intersection Angles
   a. Intersections shall be designed at right angles. Where topography prevents right-angled intersections, the City Engineer must approve intersection design.
   b. The intersection of two arterial or collector and arterial streets shall have at least 100 feet of tangent street prior to the intersection.
   c. The intersection of other streets shall have at least 50 feet of tangent street prior to intersection.
   d. For intersections not at right angles a minimum corner radius of twenty (20) feet along the right-of-way lines of the acute angle shall be used.
   e. The corners of alley intersections shall have a minimum radius of twelve (12) feet.

3. Curb Radii
   a. All intersections shall have a minimum corner radius of twenty (20) feet.
   b. The intersections of collector and arterial streets must provide corner radii, which can accommodate truck turning maneuvers, given the lane widths and configurations of the intersection.

4. Sight Distance
   a. Intersections shall be located to provide the stopping distance required by AASHTO design criteria.

5. Vertical Design
   a. Pavements in intersections shall be designed with a minimum one (1) percent grade for positive drainage of intersection area.

F. PAVEMENT DESIGN

1. Acceptable Materials list
   a. Asphalt Concrete (AC)
   b. Portland Cement Concrete (PCC)
   c. Aggregate Base
   d. Cement Treated Base
   e. Asphalt Treated Base
   f. Subgrade Geotextile Fabric

2. The following table gives minimum pavement sections for the City of Lyons.

Table 2 - Street Pavement Standards

SECTION	CLASSIFICATION	SURFACE COURSE (INCHES)	AGGREGATE BASE (INCHES)	CRUSHED ROCK EQUIV. (INCHES)
A or B	Residential	3.5 AC 6.0 PCC	9.0 2.0	16.0 18.2
C	Collectors	4.0 AC 8.0 PCC	13.0 4.0	21.0 25.6
D E	Industrial & Arterials	4.0 AC 8.0 PCC	17.0 4.0	25.0 25.6
	Truck Routes	5.0 AC 8.0 PCC	20.0 9.0	30.0 30.6
F	Alley (Res.)	4.0 AC 6.0 PCC	17.0 2.0	25.0 18.2
F	Alley (Com.)	4.5 AC 8.0 PCC	17.0 2.0	26.0 23.6

3. Subgrades under street sections using aggregate may be required to be overlaid with Subgrade Geotextile fabric at the discretion of the City Engineer.

G. SIDEWALKS

1. Timing of Construction
   a. Sidewalks in common areas (not in individual ownership) shall be constructed concurrently with the construction of other public improvements for the development.
   b. In certain special cases, sidewalks may be required concurrently with street and other public improvements.
   c. Sidewalks shall be required along industrial and arterial streets.

2. Standards
   a. All sidewalks shall be constructed of 3,300 psi PCC.
   b. Sidewalk sections in non-vehicular traffic areas shall be 4.0 inches PCC over 2.0 inches aggregate.

c. Sidewalk sections in vehicular traffic areas shall match the thickness and base of the approach, commercial drive, or alley it is crossing. This thickness shall not be less than 6.0 inches.
d. The width of a standard street side sidewalk shall be five (5) feet with a two (2) percent cross slope.

3. Sidewalk Access Ramps
   a. Ramps shall be provided at all corners of street intersections and at other sidewalk connections that do not occur in close proximity to an intersection.
   b. All ramps shall be constructed per American National Standards Institute (ANSI) and American Disabilities Act (ADA) regulations.

4. Obstructions and Transitions
   a. Where obstructions like mailbox clusters, poles, and hydrants are located in sidewalk areas, additional sidewalk width in the vicinity of the obstruction is required.
   b. This additional width shall provide the full five (5) foot width of accessible sidewalk.
   c. An additional sidewalk easement shall be provided if the width through the transition does not remain within the public right-of-way.
   d. Mailbox cluster locations must be coordinated with the City of Lyons and the Post Office to assure safe, surfaced access to both sides of the cluster.

H. CURB CUTS

1. Saw cuts shall be used at the outer perimeter of the section to be removed and shall extend to include damaged or deteriorated sections within five (5) feet.

2. The minimum length of curb section to be removed shall be five (5) feet.

I. DRIVEWAYS

1. Standards
   a. Driveways shall be constructed with Asphalt Concrete, Portland Cement Concrete, or a combination of the two as in a commercial drive.
   b. The length of the driveways in residential areas shall extend from the edge of the paved street to garage or carport or a minimum of twenty (20) feet.

2. Driveway Approaches
   a. Single family and duplex residences must have a minimum approach section of 6.0 inches PCC and 2.0 inches of aggregate base.
   b. Driveways for uses other than single family and duplex residences must have a minimum approach section of 8.0 inches PCC and 2.0 inches aggregate base.
   c. Curb transitions on each side of standard driveway cuts shall be constructed according to ANSI and ADA requirements.
   d. The minimum residential driveway throat width is twelve (12) feet, and the maximum width is thirty-six (36) feet.

e. The minimum commercial/industrial driveway throat width is twenty (20) feet, and the maximum width is 36 feet.

3. Commercial Approaches
   a. Commercial approaches shall be required for all private streets accessing arterial or collector streets.
   b. Commercial approaches will be required for parking lots providing in excess of ten (10) parking spaces.

4. Number of Accesses Permitted
   a. No development site will be permitted more than one access, totaling 36feet in driveway width, onto any arterial or collector street.
   b. No development site will be permitted more than two accesses, totaling 36 feet in driveway width onto any residential street.
   c. The number of access points to a single development shall be restricted to as few as practical.
   d. Major development accesses are subject to review and approval by the City.

5. Location
   a. Residential access points shall be a minimum of 40 feet from any intersection. All other access points shall not be located closer than 150 feet from the intersection of two arterial streets or of an arterial and a collector street.
   b. All driveway approaches shall conform with applicable vision clearance standards.

J. STREET LIGHTING

1. Cost Responsibility
   a. The City of Lyons is responsible for costs associated with the operation and maintenance of the street lighting system on its public streets.
   b. All costs associated with any deviation from the standard wood light pole installation shall be borne by the developer to the area power company.
   c. The costs associated with providing trenching for underground street lighting circuits within a development shall be borne by the owner/developer.
   d. Location of lighting to be at a minimum on all street intersections and to be spaced 350 feet to 500 feet unless otherwise approved by the City.
   e. Developer to install energy efficient and cost-effective lighting systems.

2. Design
   a. The City and power company shall designate the type, size, location and spacing of all streetlights within the city.
   b. The standard placement of streetlights shall be at intersections, in the middle of long blocks, in dead-end streets and in long cul-de-sacs.
   c. The City shall determine the timing of street light installations within new subdivisions, considering the extent of development and occupancy of structures.

K. TRAFFIC STUDIES

1. Where a proposed development poses a significant impact on traffic in the vicinity due to the size of the development or its proximity to major street or intersections, a traffic study may be required by the City. The cost of traffic studies shall be fully borne by the developer.

2. Traffic studies shall be prepared by a Registered Professional Traffic Engineer under the guidelines established by the Institute of Traffic Engineers and shall be employed to collect and analyze information and prepare conclusions.

L. TRAFFIC SIGNALS

1. Where the results of a traffic study prepared in conjunction with a proposed development indicate that signal warrants will be met, a signal may be required concurrently with the development of the site.

2. The City will review all developer requests for signal installations to determine if the signal is necessary and appropriate for the proposed location.

3. The developer will be responsible for the full cost of traffic signals which are required as a direct result of a particular development.

4. Where some combination of existing and future background traffic and traffic generated by a development creates the need for a traffic signal, the cost for the signal may be shared by the City and the developer.

M. STREET PATCHING

1. The wearing course shall match the existing pavement in line and grade but in no case shall the pavement thickness be less than four (4) inches placed in two (2) lifts for AC and no less than six (6) inches for PCC.

2. The trench patch width shall extend a minimum of six (6) inches beyond the width of the trench on both sides of the trench.

3. The asphalt surface and compacted aggregate base shall total no less than twelve (12) inches in depth.

4. All existing AC or PCC pavement shall be sawcut prior to repaving.

5. If existing base material is Cement Treated Base (CTB) or Asphalt Treated Base (ATB), then replacement base material shall match existing.

6. For AC trench patching, the joint between replacement AC and existing AC shall be sealed with tack material and sand.

N. CUL-DE-SAC

1. Cul-de-sacs shall not be longer than 600 feet from the centerline of intersecting street to center of vehicle turn-around.

2. Cul-de-sacs shall serve no more than eighteen (18) dwelling units.

3. The minimum radius of the vehicle turn around shall be 50 feet for the right-of-way and 38 feet for the pavement.

4. Hammerheads can be substituted in lieu of cul-de-sacs per the details shown in the Appendix.

II. STORM DRAINAGE

A. EXTENT OF IMPROVEMENTS

1. Limits of Improvements
   a. Storm drain system improvements shall be constructed prior to or concurrently with development.
   b. Storm drain system improvements shall be extended through the development site to the edges of the property frontage and/or internal property lines so that future extensions can continue in an orderly fashion without disruption to the development site.

2. Erosion Control Plan
   a. For development sites five (5) acres or larger, or smaller as required by the State of Oregon, the developer shall prepare an erosion control plan and obtain approval of the plan from the appropriate regulatory agencies.

B. DESIGN CRITERIA

1. Capacity
   a. Storm drain capacity shall be determined by the Rational Method for a ten (10) year event with 15-minute minimum duration time.
   b. Sufficient capacity shall be designed into the system to account for the future growth potential of the area served.

2. Detention & Oil/Water Separation
   a. On site detention shall be provided by the developer to limit site runoff to the historic ten (10) year peak flow from the site.
   b. An approved oil/water separator shall be required.
   c. The storm line shall be inspected by television prior to the installation of the flow control structure.

3. Proximity to Other Utilities
   a. Storm drain lines shall be horizontally separated from other utilities by a minimum of seven (7) feet.

b. Where less than six (6) inches of vertical clearance is provided between a storm drain line and another utility main at a crossing, the lower pipe shall be protected with a concrete collar.

4. Accessibility for Maintenance
   a. Storm drain mains shall be located to maximize for initial inspections and future maintenance activity.
   b. Alignments which utilize side and rear lot lines for storm drain main installation are discouraged.
   c. Where side and rear lot line alignments are unavoidable, provisions for initial and future maintenance vehicle access shall be a consideration.

C. MAIN LINES

1. Sizing
   a. Twelve (12) inches is considered a minimum pipe size for storm drain mains.
   b. Ten (10) inches is considered a minimum pipe size for lines leading from curb inlets or catch basins to storm drain mains.
   c. Ten (10) inches is considered minimum pipe size for storm drains under driveways.

2. Acceptable Materials
   a. Concrete pipe (non-reinforced) may be used for mains fifteen (15) inches or less in diameter only within a residential right-or-way and when its strength meets the loading requirements present.
   b. Concrete pipe (reinforced) class to be determined according to loading requirements.
   c. Polyvinyl chloride (PVC) ASTM D-3034 may be used only within residential right-of-ways and when its strength meets the loading requirements present.
   d. Ductile iron (cement lined).
   e. Double walled, smooth interior Polyethylene pipe may be used only outside paved and/or traffic areas.
   f. Tees and fittings shall be the same class and type material as the main.

3. Grades
   a. All storm drains shall be designed at a grade which will produce an average velocity when flowing full or half-full of at least two (2) feet per second.

D. MANHOLES

1. Where Required
   a. Manholes will be required at all changes in grade, pipe size, or alignment of the main.
   b. Manhole intervals shall not exceed 450 feet.

2. Sizes

a. The standard manhole size is 48 inches inside diameter.
b. For main lines greater than 24 inches in diameter or where a change of flow direction occurs, larger diameter manholes will be required.

3. Acceptable Materials
   a. Manholes shall be made of precast or cast-in-place concrete with neoprene coated Oregon State Highway Division (OSHD) approved steps provided.

4. Marker Posts
   a. Approved marker posts will be required for all manholes and cleanouts which are located outside of public street rights-of-way.

5. Cleanouts
   a. Cleanouts are not acceptable as substitutes for manholes.

E. CURB INLETS

1. Curb inlets shall be space to capture street and roof drain runoff for a ten (10) year storm event. Spacing shall not exceed 300 feet.

2. Precast curb inlet catch basins are the city standard, gutter inlet type catch basins are allowed, in cases of utility conflict, if approved by the City Engineer.

F. WEEPHOLES

1. Weepholes shall be installed with curb installations for new construction.

2. Standards
   a. Weepholes shall be three (3) inches in diameter.
   b. A three (3) inch plastic drainpipe shall be used to form the weephole, and a three-inch plastic coupling shall be installed at the back of the curb for future connection from roof and footing drains.
   c. When sidewalks are connected, the weepholes shall be extended through the sidewalk, with a coupling at the back of the sidewalk.
   d. A minimum of two weepholes shall be constructed per lot at a spacing not to exceed 100 feet.

3. Locations
   a. Weepholes shall be installed no further than ten (10) feet from property lines, at each property line fronting a street.
   b. Weepholes shall be located at curb joints where possible. In no case shall a weephole be located less than four (4) feet from a curb joint if the weephole must be offset from the joint.

G. INSPECTION REQUIREMENTS

1. Television Inspection
   a. Following completion of the storm drain construction and prior to the installation of the flow control structure, all mains, catch basin/curb inlet lines and manholes shall be inspected with a television camera.

b. All television inspection costs to be paid by the owner.
c. If the owner prefers, he may hire an independent contractor acceptable to the City to perform the inspection and provide copies of the report to the City.
d. Any unsatisfactory items revealed by the television inspection shall be corrected at the owner's expense prior to the City's acceptance of the new construction.

H. OPEN DRAINAGEWAYS

1. Open Drainageway Policy
   a. It is the City's policy to preserve and utilize existing open drainageways to convey storm drainage throughout the City.
   b. Channels, constructed and natural, must be approved by the City before used as open drainageways.
   c. Improvements of existing channels may be required in order to utilize the channel to convey storm runoff generated by additional development.

2. Drainageway Dedication Policy
   a. Where development is proposed on land, which adjoins an open natural drainageway, the City may require the dedication of sufficient area to manage storm water drainage, improve water quality, and protect riparian habitat.
   b. The width of any required dedication shall be determined by these standards and as approved by the City.

3. Inlets/Outfalls
   a. Inlets shall be designed and constructed to prevent large amounts of debris and silt from entering the system.
   b. Inlet and outfall structures shall be designed to prevent erosion of the adjacent embankment.
   c. Outfalls shall be designed to remain protected from damage from maintenance equipment and loss of bank support.
   d. Protection of the adjacent embankment may include, but not limited to such measures as construction of wingwalls, slope riprapping, and the use of vegetation for erosion control.

I. PRIVATE SYSTEMS

1. Where Permitted
   a. The system of storm drain lines, which collect and convey runoff from public streets and from the properties that abut those streets, shall be public.
   b. Where a development is in a single ownership or management, such as a commercial development, apartment project, etc. the storm drain system shall be privately owned and maintained.
   c. Where a development is created with private streets, the drainage system to collect runoff from those streets shall be private.
   d. Individual roof and footing drains from buildings are considered private.

e. Runoff collection systems from off-street parking areas are considered private.

2. Maintenance Responsibility
   a. The City does not accept maintenance responsibility for private storm drain systems.
   b. Maintenance responsibility for private storm drain systems shall be clearly established through subdivision conditions, covenants, and restrictions, on the subdivision plat, or through property deed restrictions.
   c. To the extent that the failure of private owners to maintain the storm drain system may potentially have a negative impact on public facilities, the City reserves the right to perform maintenance on those private facilities at the expense of the owner(s).

3. Protection of Public System
   a. In order to protect the integrity of the public storm drain system, the last catch basin in a private collection system which discharges to the public system shall be trapped to capture grease, oil, and debris. This does not supersede Plumbing Code standards but is instead established as a minimum.
   b. As stated above, the City has the right to perform maintenance activities on private systems if necessary to protect the public system, with related expenses charged to the owner(s) of the private system.

J. DETENTION SYSTEMS

1. When Allowed
   a. Detention systems are required when existing storm drainage facilities have limited remaining capacity. The City shall determine when detention facilities are required.

2. Standards
   a. On site ponding in parking areas is an acceptable method of detention when approved by the City.
   b. Detention of storm water shall be limited to a single area with one outlet control, rather than a series of smaller detention areas.
   c. Design calculations shall be provided to verify the sizing and configuration of the detention system.

3. Maintenance Responsibility
   a. The City does not accept maintenance responsibility for private storm water detention systems.
   b. Maintenance responsibility for private storm water detention systems shall be clearly established through subdivision Conditions, Covenants, and Restrictions, on the subdivision Plat, or through property deed restrictions.
   c. To the extent that the failure of private owners to maintain the storm water detention system may potentially have a negative impact on public facilities, the City reserves the right to perform maintenance on those private facilities and charge the expense to the owner(s).

III. GENERAL

A. EASEMENTS

1. Widths
   a. The minimum width required for a single utility line is ten (10) feet and shall be centered on rear or side lot lines.
   b. The minimum width required for a two public utilities side-by-side (not a common trench) is twenty (20) feet.
   c. Utility pole tieback easements may be reduced to six (6) feet in width.
   d. Wider easements may be required under special circumstances.

2. Dedications
   a. All easements dedicated in conjunction with the construction of public improvements shall be prepared by the owner/representative or his agent.
   b. Legal descriptions and exhibit maps for easements shall be submitted for preparation by the City Attorney and execution by the Owner.

3. Water Courses
   a. If a subdivision or partition is traversed by a water course, such as a drainage way, channel or stream, there shall be provided a storm water easement or dedicated drainage right-of-way.
   b. The minimum water course easement shall be twenty (20) feet or the width of the channel plus fifteen (15) feet, whichever is greater.

4. Residential Access (Driveways)
   a. A driveway approach permit is required for driveways serving only one (1) residence.
   b. A driveway approach permit, and a driveway construction plan are required for accesses serving 2-5 residences. The applicant shall submit the driveway construction plan to the City.
   c. Accesses serving six (6) or more residences shall be constructed to street standards. Dedication of public street may be required (see Table 1 & Table 2 in Section 1 - Transportation).

5. Requirements for Driveways serving 2-5 residences
   a. The minimum easement width shall be 20 feet.
   b. The minimum width of a driveway serving two residences shall be 12 feet and 16 feet for a driveway serving 3-5 residences.
   c. No parking shall be permitted on the driveway.
   d. No curbs or walks required for the driveway.
   e. Provisions for drainage shall be approved by the City Engineer.
   f. Maximum driveway length, not including the turn-around, shall be 500 feet. If variance on length is approved a twelve (12) foot by forty (40) foot turnout is required.
   g. When a driveway serving more than two residences exceeds 150 feet in length a turn-around at the end of the driveway is required. This turn around shall meet the following;
      1. Cul-de-sac with 35-foot circular, level, paved vehicle turn

around or

2. A level, hammerhead-configured, paved surface with each leg of the hammerhead having a minimum depth of 40 feet and a minimum width of 20 feet.

h. Driveway grades shall not exceed twelve (12) percent.

i. Turning radius shall be 29 feet or greater on inside curves and 45 feet or greater on outside curves.

j. Unobstructed vertical clearance shall be thirteen (13) feet, six (6) inches or greater.

k. No vehicular obstruction within a twenty (20) foot wide vehicular access corridor, including trees, fences, landscaping, or structures will be allowed.

l. Driveway shall be located a minimum of 30 feet from a street intersection.

m. If the driveway serves more than five (5) residences, the access shall be named with the name to be approved by the Planning Commission. Address shall be issued off the named driveway.

n. Provisions for easement shall be made between all parties involved. The easement shall be recorded with the deed by the Owner/Applicant and a certified copy submitted to the City as part of permanent record.

o. Provisions for a maintenance agreement shall be made between all parties involved. The maintenance agreement shall be recorded with the deed by the Owner/Applicant and a certified copy submitted to the City as part of permanent record.

B. WEATHERIZATION

1. When Required

   a. Weatherization of a project site shall be required when construction will continue through the winter.

   b. Weatherization shall be required when an uncompleted site will sit through the winter, even if construction activity is not taking place.

   c. At any time during construction, specific weatherization measures shall be required if the integrity of the City's existing public facilities appear to be affected by the work.

2. Acceptable Methods

   a. The City shall review and approve all weatherization measures proposed by a contractor.

   b. Generally, loose or baled straw, bark dust, or hydroseeding are considered acceptable materials for protecting bare slopes susceptible to erosion.

3. Restoration

   a. Any damage caused to adjacent private or public property as a result of failure to properly weatherize a site shall be immediately and fully restored by the contractor.

C. FIRE HYDRANTS

1. Fire hydrants are to be installed per the Water Districts requirements regarding materials and workmanship.

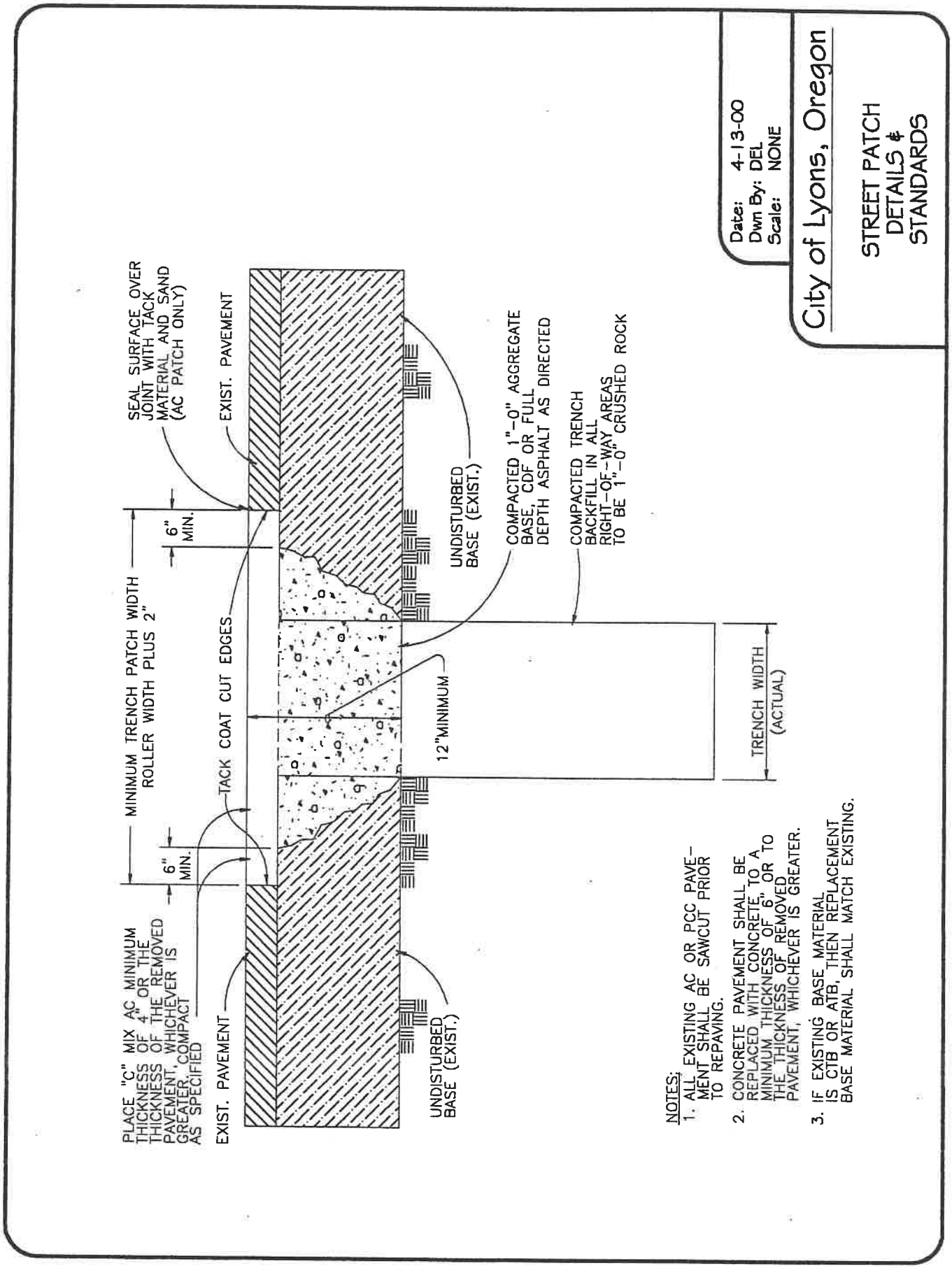
2. Fire hydrant type and locations to be approved by the local Fire District.

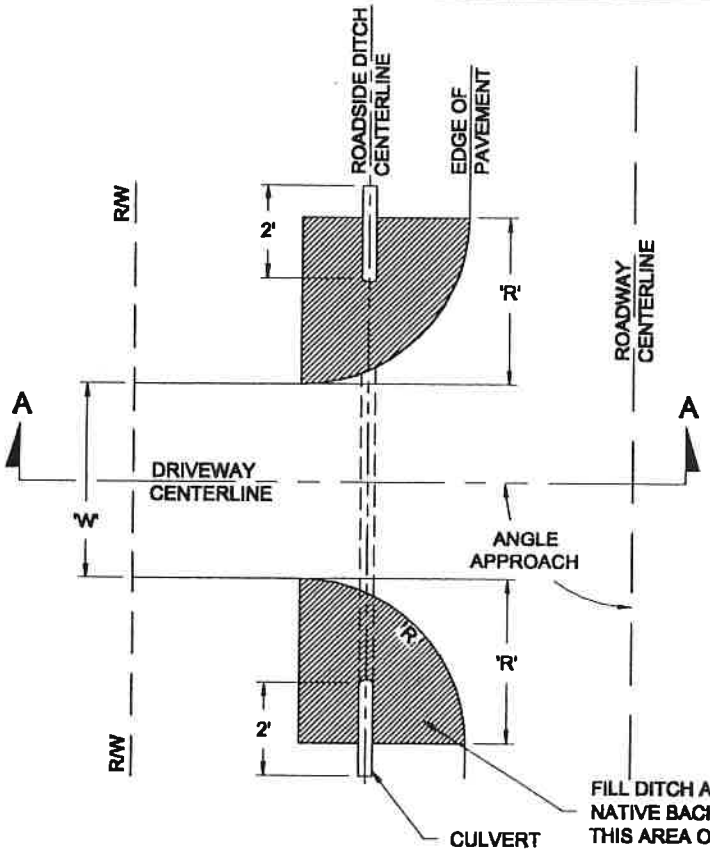
3. Fire hydrants are to be installed such that the hydrant locations measured along street routes are not separated by more than 500 feet.

4. Fire hydrants are to be installed at every street intersection unless otherwise directed by the City Engineer.

APPENDIX

EXHIBIT # 1


City of Lyons, Oregon
STREET PATCH DETAILS & STANDARDS
Date: 4-13-00
Dwn By: DEL
Scale: NONE
SEAL SURFACE OVER JOINT WITH TACK MATERIAL AND SAND (AC PATCH ONLY)
EXIST. PAVEMENT
MINIMUM TRENCH PATCH WIDTH ROLLER WIDTH PLUS 2"
6" MIN.
TACK COAT CUT EDGES
PLACE "C" MIX AC MINIMUM THICKNESS OF 4" OR THE THICKNESS OF THE REMOVED PAVEMENT, WHICHEVER IS GREATER, COMPACT AS SPECIFIED
EXIST. PAVEMENT
UNDISTURBED BASE (EXIST.)
UNDISTURBED BASE (EXIST.)
COMPACTED 1"-0" AGGREGATE BASE, CDF OR FULL DEPTH ASPHALT AS DIRECTED
COMPACTED TRENCH BACKFILL IN ALL RIGHT-OF-WAY AREAS TO BE 1"-0" CRUSHED ROCK
12"MINIMUM
TRENCH WIDTH (ACTUAL)
NOTES:
1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT PRIOR TO REPAVING.
2. CONCRETE PAVEMENT SHALL BE REPLACED WITH CONCRETE TO A MINIMUM THICKNESS OF 6", OR TO THE THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER.
3. IF EXISTING BASE MATERIAL IS CTB OR ATB, THEN REPLACEMENT BASE MATERIAL SHALL MATCH EXISTING.



NOTES:

1) APPROACH ANGLE SHALL BE AS NEAR A 90° ANGLE AS IS PRACTICAL AND IN NO CASE SHALL IT BE LESS THAN 45°.

2) WIDTH "W" AND FLARE RADIUS "R" SHALL BE:

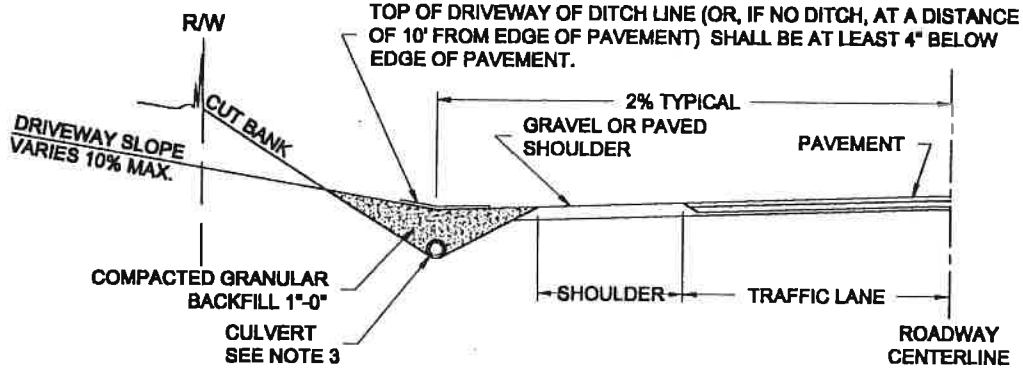
	W	R
RESIDENTIAL	12' – 36'	15'
COMMERCIAL	20' – 38'	25'

3) MINIMUM CULVERT DIAMETER IS 10 INCHES (ADS-N12 OR EQUIVALENT) AND SIZE TO CONVEY STORM WATER FROM 25 YEAR EVENT.

4) SURFACING SHALL BE AS FOLLOWS:

COMMERCIAL AND INDUSTRIAL DRIVEWAYS SHALL BE PAVED TO STANDARDS SET BY THE CITY OF LYONS OR IT'S ENGINEER ON A SITE SPECIFIC BASIS. PAVEMENT SHALL SUPPORT ANTICIPATED TRAFFIC.

RESIDENTIAL DRIVEWAYS SHALL HAVE A MINIMUM SURFACE OF 8 INCHES OF 1"-0" CRUSHED ROCK. PAVED DRIVEWAYS SHALL BE AT LEAST 2-1/2 INCHES. THE MINIMUM SURFACE SHALL BE 2-1/2 INCHES OF ASPHALT CONCRETE OVER 6 INCHES OF 1"-0" CRUSHED ROCK. ALL ROCK SHALL BE COMPACTED IN PLACE TO 95% OF RELATIVE MAXIMUM DENSITY PER ASSHTO T99.



SECTION A-A

Date: 4-13-00
Dwn By: DEL
Scale: NONE

City of Lyons, Oregon

DRIVEWAY APPROACH STANDARDS

EXHIBIT # 2

NOTES:

1) RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTION THROUGH DRIVEWAYS SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 6". CONCRETE STRENGTH SHALL BE 3300 PSI.

2) CONCRETE FOR COMMERCIAL USE AND ALLEY APPROACHES SHALL HAVE A MINIMUM NOMINAL THICKNESS OF 8". CONCRETE STRENGTH SHALL BE 3300 PSI.

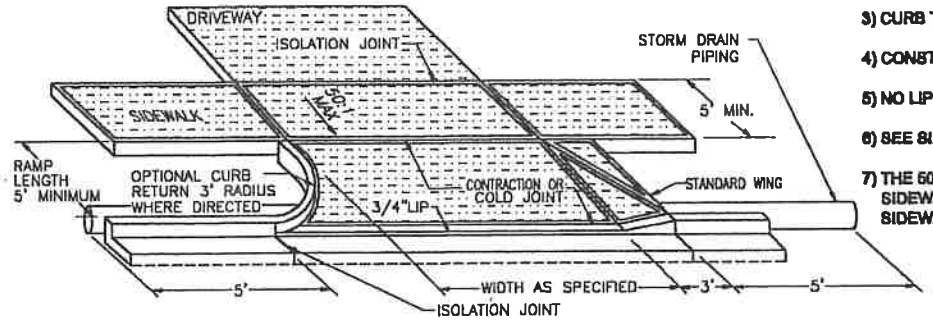
3) CURB TRANSITIONS FOR COMMERCIAL USE AND ALLEY APPROACHES SHALL BE 5 FEET.

4) CONSTRUCT CONTRACTION JOINT IN CENTER OF DRIVEWAY WHEN DRIVEWAY WIDTH EXCEEDS 15 FEET.

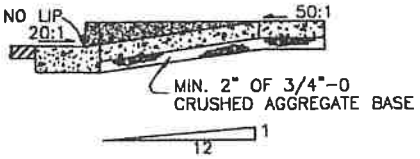
5) NO LIP AT GUTTER IF USED AS SIDEWALK ACCESS RAMP.

6) SEE SIDEWALK DETAILS FOR RESTRICTIONS AND SPECIFICATIONS NOT SHOWN.

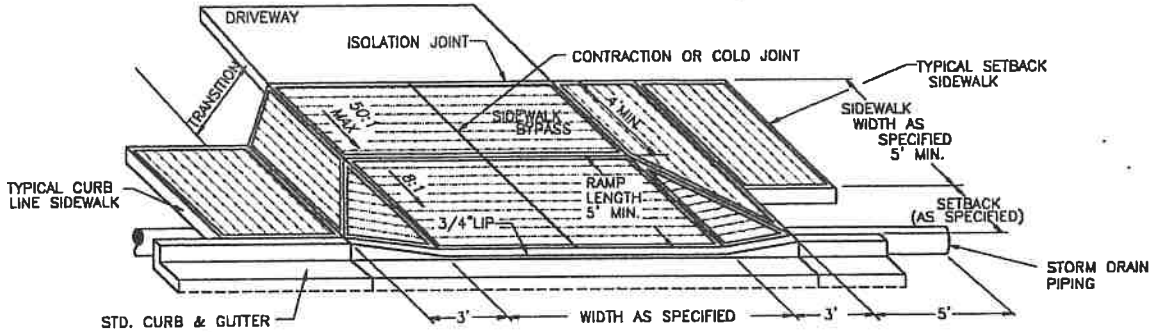
7) THE 50:1 CROSS-SLOPE OF SIDEWALK IS MEASURED FROM HORIZONTAL. THE 12:1 SLOPE OF SIDEWALK TRANSITION TO DRIVEWAY/ALLEY IS RELATIVE TO THE RUNNING SLOPE OF THE SIDEWALK. THE SLOPE OF THE APRON IS MEASURED RELATIVE TO HORIZONTAL.



DRIVEWAY / ALLEY APPROACH FOR SET-BACK SIDEWALK



TYPICAL SECTION THROUGH RAMP



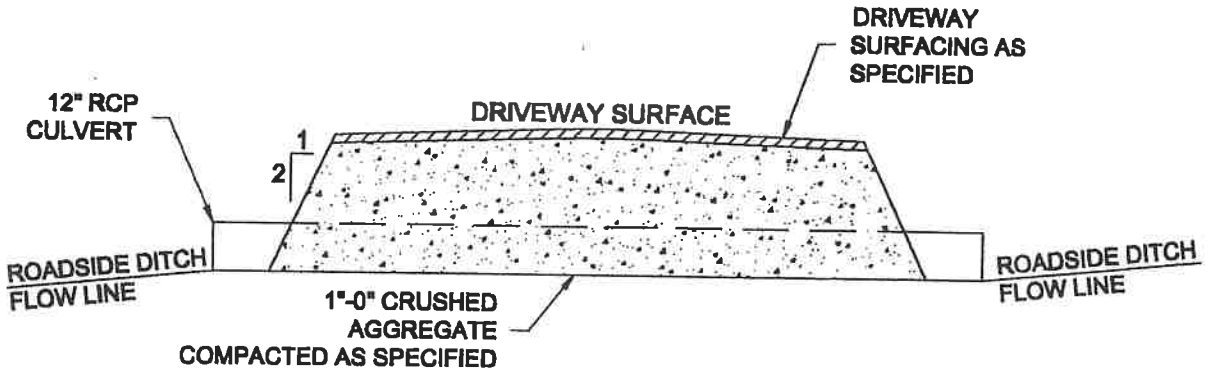
DRIVEWAY / ALLEY APPROACH FOR CURB LINE & PARTIALLY SET-BACK SIDEWALKS

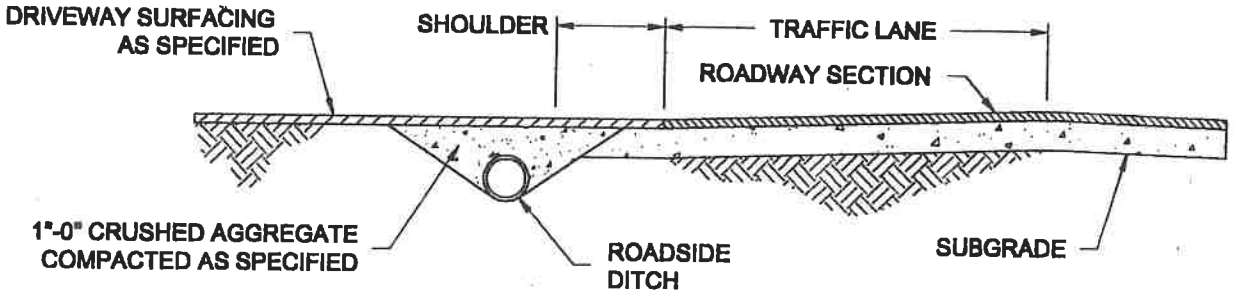
Date: 4-13-00
Dwn By: DEL
Scale: NONE

City of Lyons, Oregon

DRIVEWAY AND ALLEY APPROACHES FOR SETBACK OR BYPASS SIDEWALK

EXHIBIT # 3





Date: 4-13-00
Dwn By: DEL
Scale: NONE

City of Lyons

DRIVEWAY DRAINAGE DETAILS & STANDARDS

EXHIBIT # 4

EXHIBIT # 5

LYONS RURAL FIRE PROTECTION DISTRICT
FIRE APPARATUS ACCESS ROADS ON PRIVATE PROPERTY
SINGLE FAMILY DWELLINGS

Section 1: Fire apparatus access roads serving not more than two single family dwellings shall be provided and maintained in accordance with the provision of this appendix.

This will also include all private roads, including, but not limited to those designated in county records as "Way", "Place", "Lane" or "Drive".

Section 2: Required access. Fire apparatus access roads shall be provided in accordance with the 1994 Uniform Fire Code (UFC), Sections 901 and 902.2 for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45720 mm) from fire apparatus access as measure by an approved route around the exterior of the building or facility.

Exceptions:

1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of the 1994 UFC, Sections 902.2 may be modified by the chief.

2. When access roadways cannot be installed due to location on property, topography, waterways, non-negotiable grades or other similar conditions, the fire chief is authorized to require additional fire protections as specified in the 1994 UFC, Section 1001.9.

More than one fire apparatus road shall be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

Section 3: Access roads shall meet the following minimum standards.

A. Width

1. For up to two (2) dwelling units

   a. Unobstructed width of not less than 20 feet.
   b. Driveable surface of not less than 12 feet with no parking allowed.
   c. Driveable surface of not less than 18 feet width parallel parking on one side.
   d. Roadway length greater than 150-500 feet may be required to have one (1) 12' x 40' turnout.
   e. Roadway length greater than 500' may be required to have (1) 12' x 40' turnout every 400' or fraction thereof as approved by the chief or fire marshal.

   NOTE: the chief or fire marshal shall determine Location of turnouts.

2. From 3 - 79 dwelling units

   a. Unobstructed width of not less than 20 feet.

b. Driveable surface of not less than 32 feet curb-to-curb with parallel parking on both sides.

c. Roadway turnouts shall meet the conditions of Section 3.A. 1 d & e above.

B. Vertical Clearance

1. Fire apparatus access roads shall not have unobstructed vertical clearance of not less than 13 feet 6 inches.

Exception: Upon approval, vertical clearance may be reduced provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical distance.

C. Surface

Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities.

A gravel surface or paved surface with adequate drainage shall be required. The minimum roadway improvements shall be 1"-0 crushed rock with a depth of 6-8".

D. Turning Radius

The turning radius of a fire apparatus access road shall be 29' inside and 45' outside.

E. Turnarounds

All dead-end fire apparatus access roads in excess of 150 feet in length may be provided with approved provision for the turning around of fire apparatus.

F. Bridges

When a bridge is required as part of a fire apparatus access road, it shall be constructed and maintained in accordance with national, county and/or city recognized standards. See 1994 UFC, Article 90, Standard a.1.1 (Page 1-391, Section 9003 - Recognized Standards). The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

Vehicle load limits shall be posted at both entrances to bridges when required by the chief.

A licensed engineer must provide certification.

NOTE: Live loads differ from fire department to fire department with most gross weight of 60,000 pounds. The chief shall provide any requirements above the 60,000 pounds, if needed, when approving bridges prior to certification by a licensed engineer.

G. Grade

The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief.

No street grade shall exceed 12% without approval of the chief or fire marshal.

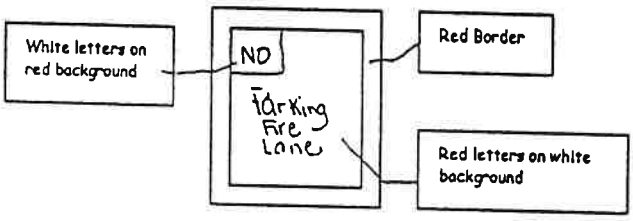
H. Obstruction

1. The required width of any fire apparatus access road shall not be obstructed in any manner including parking of vehicles. Minimum required widths and clearances established under this section should be maintained at all times.

2. When "no parking" is required, it shall be in accordance with the following:

   a. Fire lane curbs or road surfaces shall be painted bright red with white letters. The stroke shall be 1" with letter 6" high to read "No Parking Fire Lane". Spacing for signage shall be every 25'.

   b. Vertical signs shall be mounted so that the tops are no more or less than 7' high. They shall be 12" wide by 18" high. Signs shall have red letters and border on a white background. The word "NO" shall be presented in reverse color arrangement in the upper left-hand corner.



I. Signs

When required, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both.

NOTE: Approved signs shall comply with Linn County standards for signs.

The chief or fire marshal may authorize any changes to the above standards as needed within the jurisdiction.

Plans for the fire apparatus access roads shall be submitted to the fire department for review and approval prior to construction.

LYONS FIRE DISTRICT

Bob Johnston, Fire Chief

Dated this 7th day of June, 2002.

LYONS RURAL FIRE PROTECTION DISTRICT
FIRE APPARATUS ACCESS ROADS ON PRIVATE PROPERTY
APPENDIX 2 - MULTI-FAMILY DWELLINGS

Section 1: Fire apparatus access roads serving more than one multi-family (duplex or greater) dwelling, serving more than two single-family dwellings, or serving any commercial building, shall be provided and maintained in accordance with the provision of this appendix.

This will also include all private roads, including, but not limited to those designated in county records as "Way", "Place", "Lane" or "Drive".

Section 2: Required access. Fire apparatus access roads shall be provided in accordance with the 1994 Uniform Fire Code (UFC), Sections 901 and 902.2 for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45720 mm) from fire apparatus access as measure by an approved route around the exterior of the building or facility.

Exceptions:

1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of the 1994 UFC, Sections 902.2 may be modified by the chief.

2. When access roadways cannot be installed due to location on property, topography, waterways, non-negotiable grades or other similar conditions, the fire chief is authorized to require additional fire protections as specified in the 1994 UFC, Section 1001.9.

More than one fire apparatus road shall be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

Section 3: Access roads shall meet the following minimum standards.

A. Width

1. For up to four (4) multi-family dwelling units

   a. Unobstructed width of not less than 20 feet.
   b. Driveable surface of not less than 20 feet
   c. Dead-end fire apparatus access roads in excess of 150' in length shall be provided with fire apparatus turnarounds and/or approved second means of access as approved by the chief or fire marshal.

2. From 5 - 100 multi-family dwelling units

   a. Unobstructed width of not less than 24 feet.
   b. Driveable surface of not less than 24 feet.

c. Dead-end fire apparatus access roads in excess of 150' in length shall be provided with fire apparatus turnaround and/or approved second means of access as approved by the chief or fire marshal.

3. Commercial

a. Unobstructed width of not less than 20 feet.
b. Driveable surface of not less than 20 feet.
c. Dead-end fire apparatus access roads in excess of 150' in length shall be provided with fire apparatus turnaround and/or approved second means of access as approved by the chief or fire marshal.

B. Vertical Clearance

1. Fire Apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

Exception: Upon approval, vertical clearance may be reduced provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.

C. Surface

A paved surface with adequate drainage shall be required and constructed and maintained in accordance with national, county and city recognized standards.

D. Turning Radius

The turning radius of a fire apparatus access road shall be 29' inside and 45' outside.

E. Turnarounds

All dead-end fire apparatus access roads in excess of 150 feet in length may be provided with approved provision for the turning around of fire apparatus.

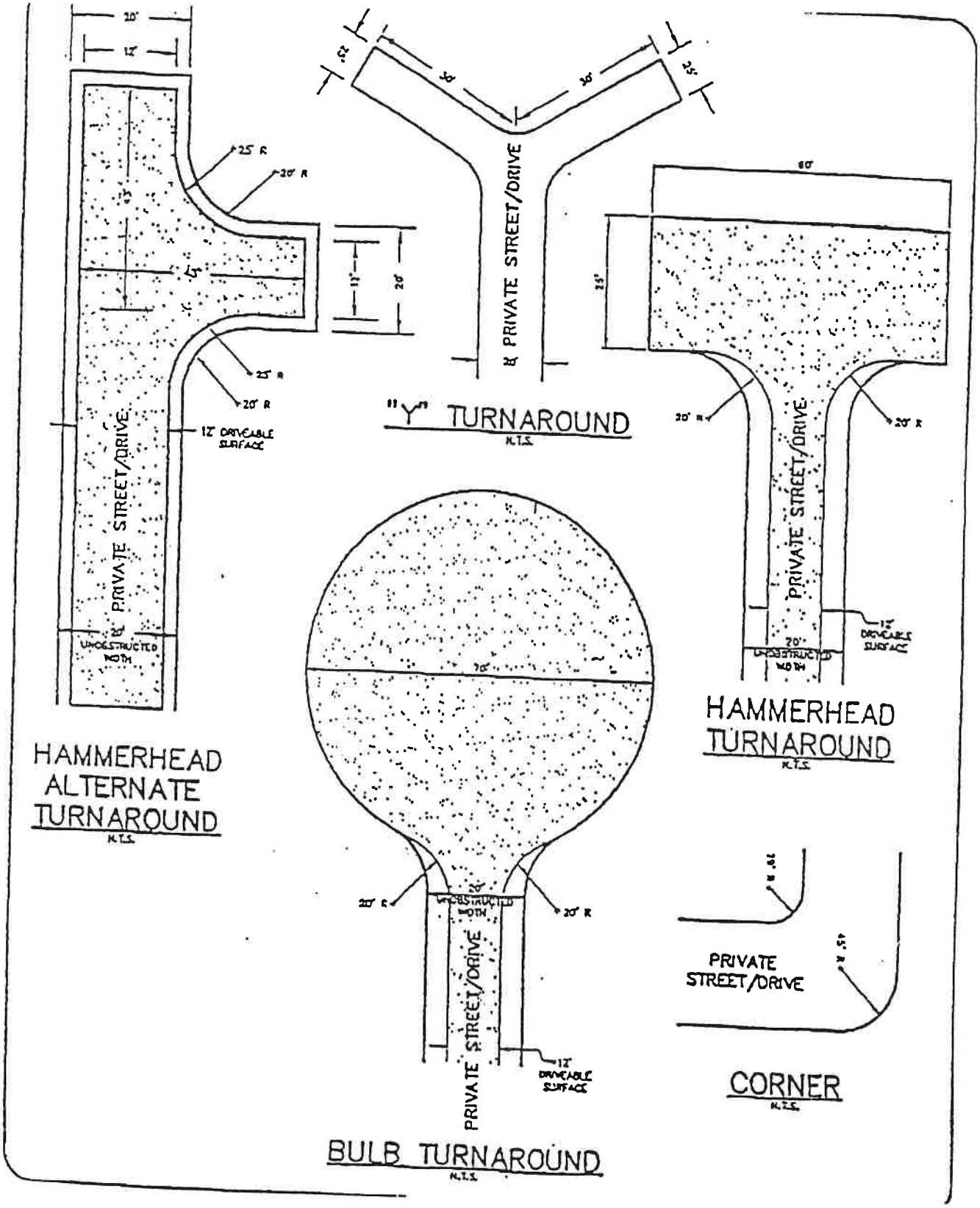
F. Bridges

When a bridge is required as part of a fire apparatus access road, it shall be constructed and maintained in accordance with national, county and/or city recognized standards. See 1994 UFC, Article 90, Standard a.1.1 (Page 1-391, Section 9003 - Recognized Standards). The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

Vehicle load limits shall be posted at both entrances to bridges when required by the chief.

A licensed engineer must provide certification.

NOTE: Live loads differ from fire department to fire department with most gross weight of 60,000 pounds. The chief shall provide any requirements above the 60,000 pounds, if needed, when approving bridges prior to certification by a licensed engineer.


PRIVATE STREET/DRIVE
25' R
20' R
12' DRIVEABLE SURFACE
UNOBSTRUCTED
HAMMERHEAD ALTERNATE TURNAROUND
N.T.S.
PRIVATE STREET/DRIVE
"Y" TURNAROUND
N.T.S.
PRIVATE STREET/DRIVE
HAMMERHEAD TURNAROUND
N.T.S.
PRIVATE STREET/DRIVE
BULB TURNAROUND
N.T.S.
PRIVATE STREET/DRIVE
CORNER
N.T.S.