Clark County Department of Building & Fire Prevention

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Samuel D. Palmer, Director/Building & Fire Official · Girard Page, Fire Marshal

Permit Type: 105.6.15, 106.35, 105.7.11, 105.7.17
Control Number: A.0
Effective Date: 9/14/11

TITLE: **Underground Fire Service Mains, Fire Hydrants and Fire Access**

SCOPE: Fire hydrants and fire access shall be provided for the protection of buildings, or portions of buildings, in accordance with Appendix C, Section 507 and Section 503 of the Clark County Fire Code as adopted and amended. Design shall comply with the Clark County Uniform Design and Construction Standards (UDACS) for public installations or NFPA 24 for private installations, as applicable.

PURPOSE: To standardize Fire Prevention requirements throughout Clark County by providing a uniform method of specifying and installing underground fire service mains, fire hydrants and fire access roads in order to facilitate firefighting operations during emergencies and to facilitate developers by standardization of requirements.

DEFINITIONS:

Assessor's Parcel Number (APN): A unique number assigned to each property by the Clark County Assessor's office.

Listed: Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction

PERMIT FEES:

Permit fees shall be assessed in accordance with the Permit Fee Schedule as adopted in the Clark County Fire Code. For applications that are expedited, additional fees shall apply.

SPECIFICATIONS AND REQUIREMENTS:

An application must be completed for each submittal. A minimum of three sets of plans shall be submitted with the permit application. Plans shall show compliance in accordance with the Clark County Fire Code and NFPA 24, as adopted and amended. All submittals must be legible and readable or the plan shall be issued a correction letter for cause.

I. Plans

Three (3) sets of water plans drawn to scale are to be submitted to the Fire Prevention for approval prior to the installation of new or relocated fire hydrants. When only existing hydrants are provided, a submittal of only one (1) set of plans is acceptable. Plans must include the following information"

A. Vicinity map indicating major cross streets adjacent to project, as well as actual project location.
B. Fire Prevention general notes must be provided on plans. Copies of current FP general notes are at: www.clarkcountynv.gov/building/fire-prevention
C. FP approval stamp on all utility sheets, fire lane access plan and current FP notes.
D. Fire flow information block shall include:
   1. Required fire flow
   2. Square footage
   3. Construction type per the IBC
   4. Building height
   5. Number of stories (including basements, if applicable)
   6. Occupancy type per the IBC
   7. Type of sprinkler system provided, if any
      Reductions in fire flow will be given for all fire sprinkler systems
   8. High-piled storage, if any
   9. Number of hydrants installed
E. Exact location of water main connections, stubs, etc. Four or more hydrants require two sources of water.
F. Size and location of all underground fire sprinkler system laterals.
G. Exact location, size, manufacturer and type of new and existing water mains.
H. Exact location, number, and type of new, relocated and existing fire hydrants.
I. Exact location of hydrant isolation and control valves.
J. Exact location, size, manufacturer and type of new/existing DCDA's and other water meter assemblies.
K. Details of thrust blocks including type of cement, exact location and dimensions in accordance with N.F.P.A. #24, 2007 Edition.
L. Curb lines, sidewalks, alleys, driveways, walls, fences, property lines, vehicle parking layouts (indicate whether or not parking is covered or uncovered), power poles, adjacent structures, all on site buildings, any other items which are pertinent to hydrant placement.
M. Emergency vehicle access plan indicating fire lane on and off property, whenever access routes are not obvious, or when required by the fire code official. Street widths must be provided.

II. Fire Hydrant System Design/Distribution/Timing

The number, spacing and type of fire hydrants shall meet the approval of the Fire Prevention. Fire hydrants shall be located adjacent to and accessible from fire apparatus access roads. Fire hydrants shall be spaced along fire apparatus access roads as follows:

A. The spacing of fire hydrants should normally start by placing fire hydrants at all intersections.
B. In residential areas (R-3 occupancies and single family dwellings built under the IRC only) hydrants shall be spaced not to exceed 500 feet, or 600 feet if buildings are protected by approved automatic fire sprinkler systems.
C. The maximum distance from a one- or two-family dwelling to a fire hydrant shall not exceed 300 feet, as measured from an approved point on a street or road frontage to a fire hydrant. An approved point is defines as the property line furthest from the hydrant, at a right angle to the street.

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D. In all commercial, industrial and multi-family residential (R-1 and R-2 occupancies) areas hydrants shall be spaced not to exceed 300 feet or 400 feet if buildings are protected by approved automatic fire sprinkler systems.

E. The maximum distance from a hydrant to the end of a dead-end street shall not exceed 200 feet.

F. The maximum distance from a fire hydrant to a fire department connection (FDC) supplying fire sprinklers and/or standpipes shall not exceed 100 feet, as measured by an approved route. An approved route is defined as an unobstructed path of travel on which hose can easily be laid.

G. The minimum number of fire hydrants required to meet the fire flow shall be based on a maximum flow of 1,500 gallons per minute per hydrant. All hydrants utilized in providing the fire flow shall be within 750 feet of the structure being protected as measured along the street or approved fire apparatus access road.

H. Fire hydrants on adjacent properties shall not be considered unless fire apparatus access roads extend between properties and recorded easements are established

I. Where streets are provided with median dividers, or have four or more travel lanes and a traffic count of more than 30,000 vehicles per day, hydrants shall be spaced at a maximum of 1,000 feet along both sides of the street; arranged on an alternating basis at 500–foot intervals.

J. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide water for transportation hazards

K. No fire hydrant shall be located within 25 feet of any structure, or 6 feet of driveway, power pole, light standard, or any other obstruction. For wall, fence and planter locations, a perimeter around the hydrant measuring a minimum of 3 feet from its exterior shall be maintained clear of all obstructions at all times.

L. Hydrant placement in cul-de-sacs: a hydrant shall not be placed in the circular portion of a cul-de-sac.

M. Sectional control valves shall be installed so that no more than 2 fire hydrants and/or 2 sprinkler lead-ins can be out of service due to a break in a water main.

N. Fire hydrants shall be located 4 feet to 7 feet from the back of curb. Where it is not possible to locate the hydrant a minimum of 4 feet from the back of the curb, or where curbs are not provided, the hydrant shall be protected against vehicular impact in accordance with Section 312 of the Clark County Fire Code.

O. Hydrants shall be located a minimum of 6 feet away from the beginning of a turning radius.

P. Two sources of water supply are required whenever 4 or more fire hydrants and/or sprinkler lead-ins are installed on a single system.

Q. When fire sprinkler laterals are proposed, any control valves in the lateral must be P.I.V. type and electrically supervised.

> **EXCEPTION**: When prior approval is obtained from the Fire Prevention, gate valves in underground water lines may be abandoned in place. Fire Prevention must witness abandonment of the valve.

R. Hydrants shall be provided for construction in accordance with Section 1412 of the Clark County Fire Code.

S. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Prevention prior to placing the hydrant out of service.

T. Supply lines feeding fire hydrants shall have a minimum diameter of 6 inches, with a dead-end maximum length of 150 feet of 6-inch underground pipe supplying only one hydrant.

III. Fire Hydrant Installation Specifications

Painting of curbs and/or asphalt parking areas shall be completed by the installer prior to final inspection and shall be as follows:

A. **Existing**. When property with existing fire hydrant protection is developed, existing fire hydrants are required to be upgraded to meet the current requirements for Fire Hydrant Installation Guideline.

B. **Painting:** Hydrants shall be painted safety yellow for public and safety red for private, shall have their location marked in the adjacent fire access lane by a blue reflective pavement marker and shall have red painted curbs 15 feet in each direction. Where curbs are not provided, paint shall be applied along the roadside for 15 feet in each direction. Hydrant markings shall be in accordance with Section 507 of the Clark County Fire Code. All cap, hose nozzle and pumper nozzle threads shall be free of dirt, rust, etc., and shall be lightly greased. All fire hydrant locations shall be identified per 507.5.7 of Clark County Fire Code, to include the placement of blue colored reflective marker.

C. **Protection of fire hydrants from physical injury:** Protective poles shall be installed when a hydrant is subject to physical injury or when deemed necessary by the Fire Prevention. The poles shall be installed in accordance with Section 312 of the Clark County Fire Code.

D. Hydrants shall be installed so that the breakaway flange is located no higher than 6 inches nor less than 2 inches from the 3' x 3' x 10" concrete pad which is reinforced with a minimum of #4 rebar installed throughout the pad.

IV. Fire Hydrant Specifications

Hydrants that are proposed for installation in public water systems shall be in accordance with approved fire hydrants as allowed by the water purveyor. Hydrants proposed for installation on private water systems shall be in accordance with approved fire hydrants as allowed by the Fire Prevention.

V. Fire Access Roads

A. Approved fire apparatus roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.

Exception: The *fire code official* is authorized to increase the dimension of 150 feet (45 720 mm) where:

B. The building, except for a Group H and/or high-pile storage occupancy, is equipped throughout with an approved automatic sprinkler system installed in accordance with Sections 903.3.1.1, 903.3.1.2, or 903.3.1.3 of the Clark County Fire Code.

a. Where the building is protected with an approved automatic sprinkler system in accordance with minimum requirements, the fire apparatus roads shall extend to within 250 feet (76 420 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building.

b. Where the building is protected with an approved upgraded automatic sprinkler system in accordance with the minimum requirements for the upgraded sprinkler system design, the fire apparatus roads shall extend to within 350 feet (106 680 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building. For the purposes of this section, an upgraded sprinkler system shall be in accordance with the following table:

Minimum Code-Required System	**Upgraded System for 350 feet from fire apparatus lanes**
NFPA 13D	NFPA 13R
NFPA 13R	NFPA 13, Light Hazard
NFPA 13, Light Hazard	NFPA 13, Ordinary Hazard Group 1, with quick-response sprinklers
NFPA 13, Ordinary Hazard Group 1	NFPA 13, Ordinary Hazard Group 2
NFPA 13, Ordinary Hazard Group 2	NFPA 13, Extra Hazard Group 1
NFPA 13, Extra Hazard Group 1	NFPA 13, Extra Hazard Group 2
NFPA 13, Extra Hazard Group 2	As approved by the *fire code official*

C. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.

D. There are not more than two Group R-3 or Group U occupancies or single-family dwellings built under the IRC.

E. For buildings constructed in accordance with high-rise provisions, fire access along two adjoining sides of the building shall be permitted.

F. **Specifications.**

a. Dimensions

Fire apparatus access roads shall have an unobstructed width of not less than 24 feet (7315 mm), exclusive of shoulders, except for approved access gates in accordance with Section 503.6 of the Clark County Fire Code, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

Parallel Parking Permitted on Both Sides. Where parallel parking is permitted on both sides of the fire apparatus access road, the minimum clear width of the fire apparatus road shall be shall be 36 feet (10 972 mm), measuring 37 feet (11 277 mm) from back-of-

curb to back-of-curb for L curbs and 39 feet (11 887 mm) from back-of-curb to back-of- curbs for roll curbs.

Parallel Parking Permitted on One Side Only, Commercial Only. For commercial developments where parallel parking is permitted only on one side of the apparatus road, the minimum clear width of the fire apparatus road shall be 30 feet (9144 mm), measuring 31 ft (9448 mm) from back-of-curb to back-of-curb for L curbs, or 33 ft (10058 mm) from back-of-curb to back-of-curb for roll curbs. Parallel parking on one side only for the purpose of narrowing the roadway width is not permitted for fire apparatus roads serving one- and two-family dwellings. Fire lane markings, provided in accordance with Section 503.3 of the Clark County Fire Code, shall be provided on the side of the road where parallel parking is prohibited.

Parallel Parking Prohibited on Both Sides, Commercial Only. For commercial developments where parallel parking is prohibited on both sides of a fire apparatus road, the minimum clear width of the fire apparatus road shall be 24 feet (7315 mm), measuring 25 ft (7620 mm) from back-of-curb to back-of-curb for L curbs, or 27 ft (8229 mm) from back-of—curb to back-of-curb for roll curbs. The prohibition of parallel parking on both sides for the purpose of narrowing the roadway width is not permitted for fire apparatus roads serving one- and two-family dwellings. Fire lane markings, provided in accordance with Section 503.3 of the Clark County Fire Code, shall be provided on both sides of the road where parallel parking is prohibited.

Parking Lot Drive Aisles. Where fire apparatus access roads pass though parking lots consisting of marked perpendicular and angled parking spaces, such fire apparatus access roads shall have a minimum clear width of 24 feet (7315 mm), as measured from the edges of the marked parking spaces.

b. **Surface.** Fire apparatus access roads shall be designed and maintained to support a minimum vehicle load of 18,000 pounds per axle and shall be provided with an approved "paved" surface so as to provide all-weather driving capabilities.

   Exception: Temporary access roads serving only buildings under construction shall not be required to be paved, but shall comply with all other requirements of section 503.2.3 of the IFC, as amended.

c. **Turning radius.** The turning radius of a fire apparatus access road shall be no less than 52 feet outside and 28 feet inside turning radius.

d. **Dead ends.** Dead-end fire apparatus access roads in excess of 150 feet (45,720 mm) in length shall be provided with approved provisions for the turning around of fire apparatus.

e. **Grade.** The gradient for a fire apparatus access road shall not exceed 12 percent.

f. **Angles of approach:** Angles of approach/departure shall not exceed 6 percent for 25 feet prior to or after the grade change.

g. **Markings.** Fire apparatus access roads shall be marked where required to prohibit parking and other obstructions. Marking shall consist of painting the curb, or the side of the street, where no curb is present, with a suitable coat of industrial red enamel along the entire length of road where parking is prohibited. Each section of curb that is painted red shall also be marked by signage stating "NO PARKING FIRE LANE". Signs are to be installed no higher than 10 feet or less than 6 feet from the surface of the roadway. Signs shall be located at each end of painted curb, and additionally in between so that the maximum separation between signs is 100 feet, as measured along the centerline of the fire apparatus access road.

In lieu of providing multiple signs, where a minimum of one sign is provided at every entrance stating “ON-STREET PARKING IN MARKED FIRE LANES PROHIBITED”, fire lanes may be marked by painting the words “NO PARKING FIRE LANE”, over the face of the red-painted curbs. The words on the curbs shall be painted in white letters not less than 4 inches in height with a brush stroke of not less then ¾ inch. The maximum separation between words shall be 50 feet, as measured along the centerline of the fire apparatus access lane.

h. Traffic calming devices. Speed bumps and/or speed humps shall not be permitted within the required width of fire apparatus access roads.

Exception: Speed humps are allowed on private fire apparatus access roads serving commercial and industrial buildings when approved by the *fire code official*. The location(s), the number permitted, and the design of the speed hump(s) shall meet the approval of the *fire code official*.

VI. Private hydrants - Once plans are approved, an installation permit is required followed by inspections. An Inspection permit can be obtained by completing an application. One set of plans that have been reviewed and accepted by FP will be submitted and returned to customer with a new permit number. Additional fees will apply. “Next Day” plan review is available for an additional fee.

VII. Public hydrants - Once plans are approved, a Bond Release permit is required followed by an inspection. A Bond Release permit can be obtained by completing an application. One set of plans that have been reviewed and accepted by FP will be submitted and returned to the customer with a new permit number. Fees will apply. “Next Day” plan review is available for an additional fee.

VIII. Fire Prevention General Notes

UNIFORM GUIDELINES
INSTALLATION AND SPECIFICATION OF FIRE HYDRANTS

A. All work shall be done in strict accordance with the Clark County Fire Code as amended, and the 2007 Edition of National Fire Protection Association Pamphlet #24.

B. Fire hydrants and water supplies for fire protection shall be and made serviceable prior to and during the time of construction in accordance with Section 1412 of the Clark County Fire Code, as amended.

C. If during construction it becomes necessary to close any control valve or place a hydrant out of service, approval shall be obtained from the Fire Prevention prior to placing the hydrant out of service.

D. Painting of curbs and/or striping of asphalt areas and protection of hydrants from physical injury shall be per the Fire Hydrant Installation Specifications of the Fire Prevention.

E. No fire hydrant shall be located within 25 feet of any structure, or 6 feet of a driveway, power pole, light standard, or any other obstruction. For wall, fence and planter locations, a perimeter around the hydrant measuring a minimum of 3 feet from its exterior shall be maintained clear of all obstruction at all times.

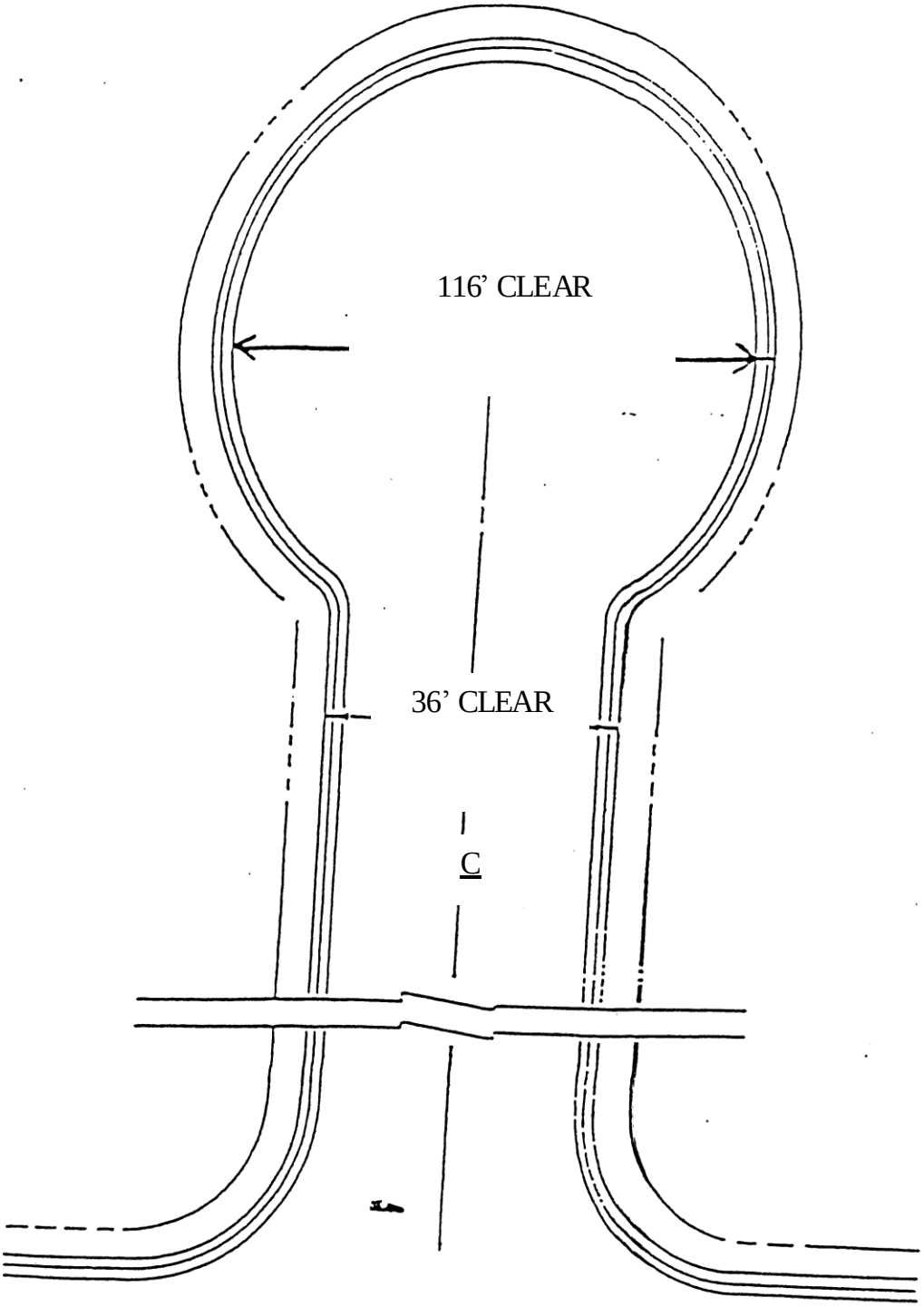
F. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus, with a minimum vehicle load of 18,000 pounds per axle, and shall be surfaced and paved so as to provide all-weather driving capabilities.
Exception: Temporary access roads serving only buildings under construction shall not be required to be paved, but shall comply with all other requirements of Section 503.2.3 of the Clark County Fire Code.

G. Prior to acceptance of any fire service main, a satisfactory hydrostatic test with piping joints uncovered must be conducted. Approved plans, an installation permit and a contractor's materials and test certificate must be provided at time of inspection. Schedule inspection at www.clarkcountynv.gov/building/fire-prevention.

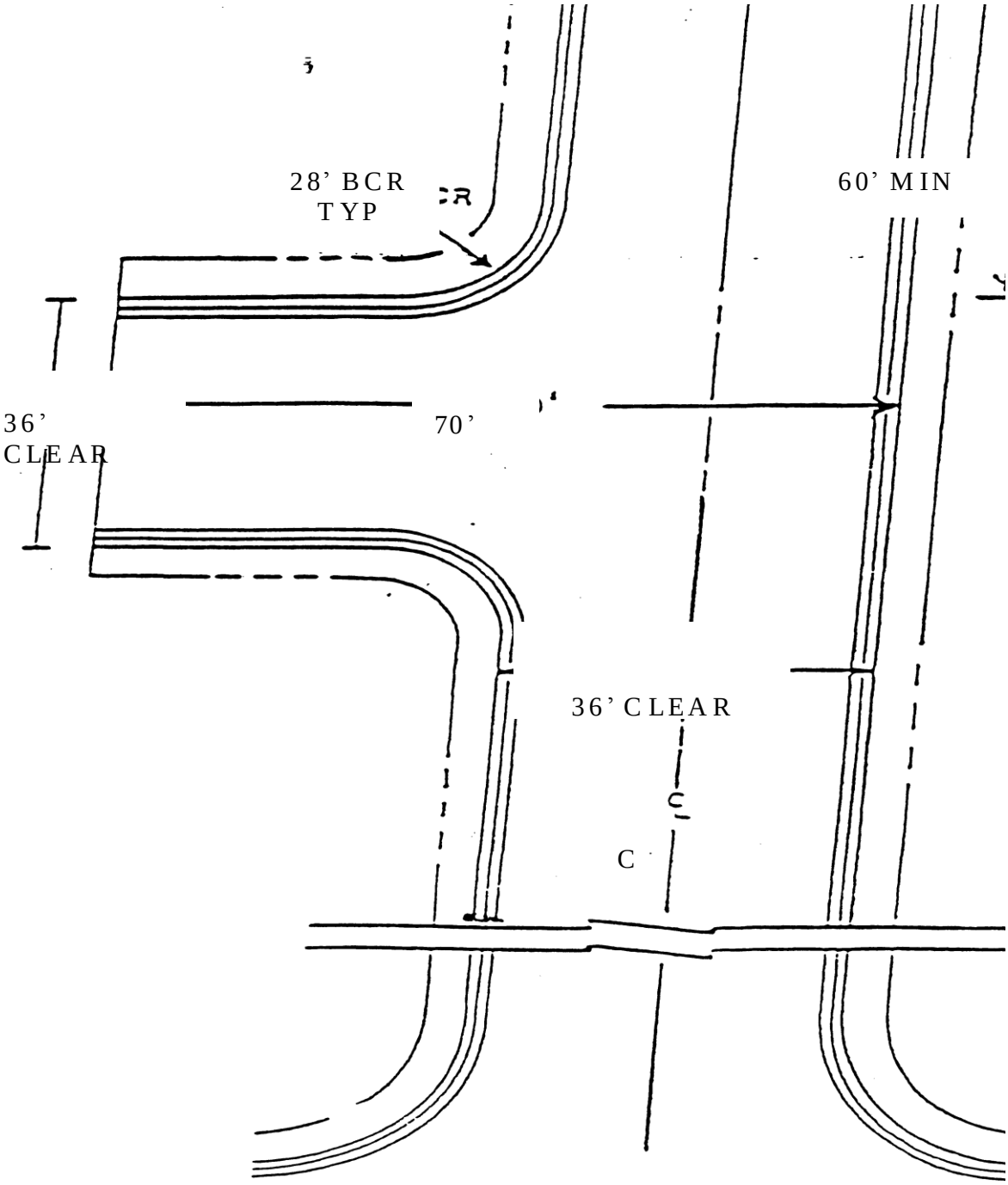
H. Fire hydrants shall be located 4' to 7' from back of curb and a minimum of 6 feet away from turns.

I. Blue reflective markers must be installed before final hydrant acceptance can be attained (Section C107 of the Clark County Fire Code, as amended)

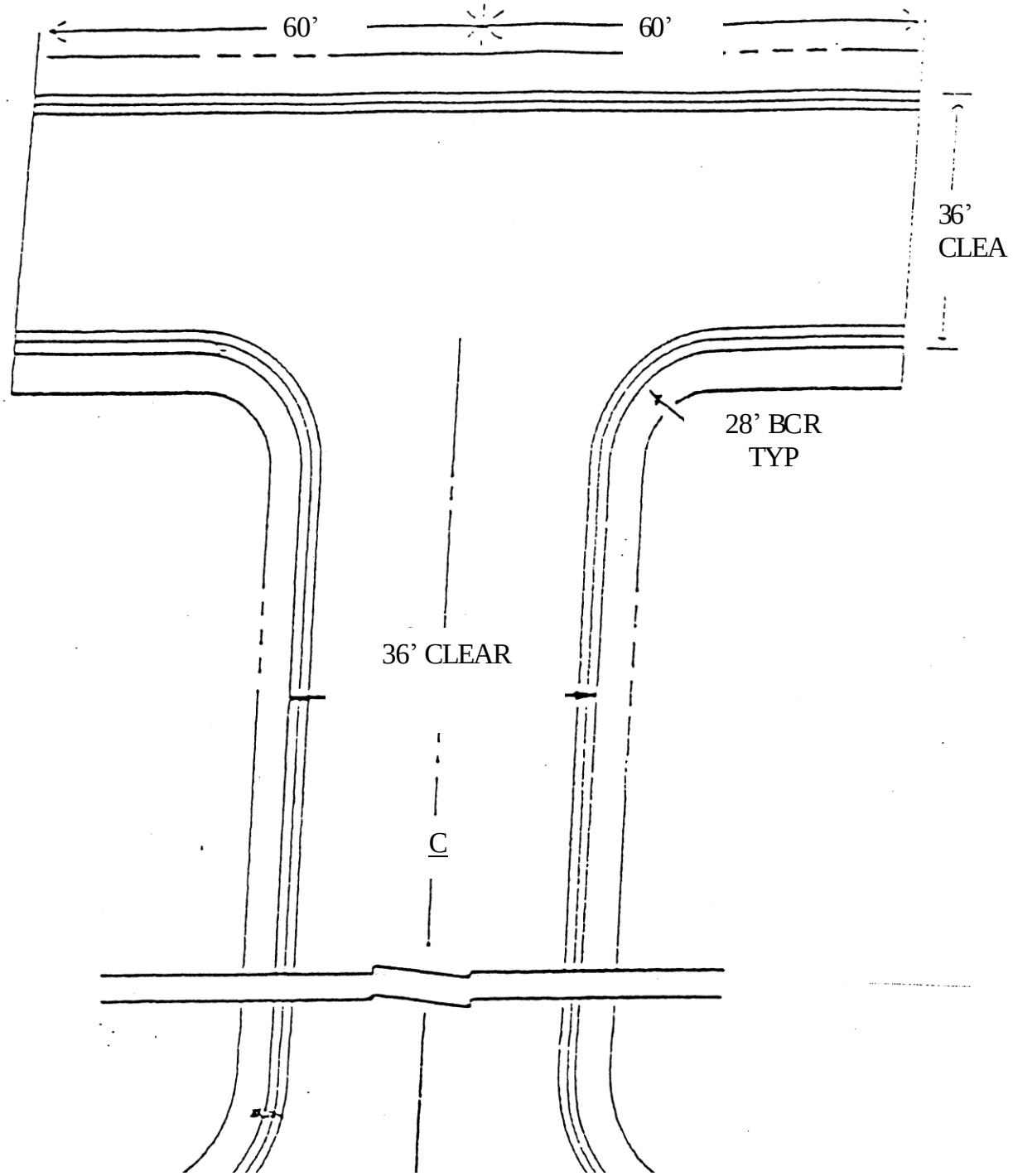
J. Hydrants that are proposed for installation in public water systems shall be in accordance with approved fire hydrants as allowed by the water purveyor. Hydrants proposed for installation on private water systems shall be in accordance with approved fire hydrants as allowed by the Fire Prevention.



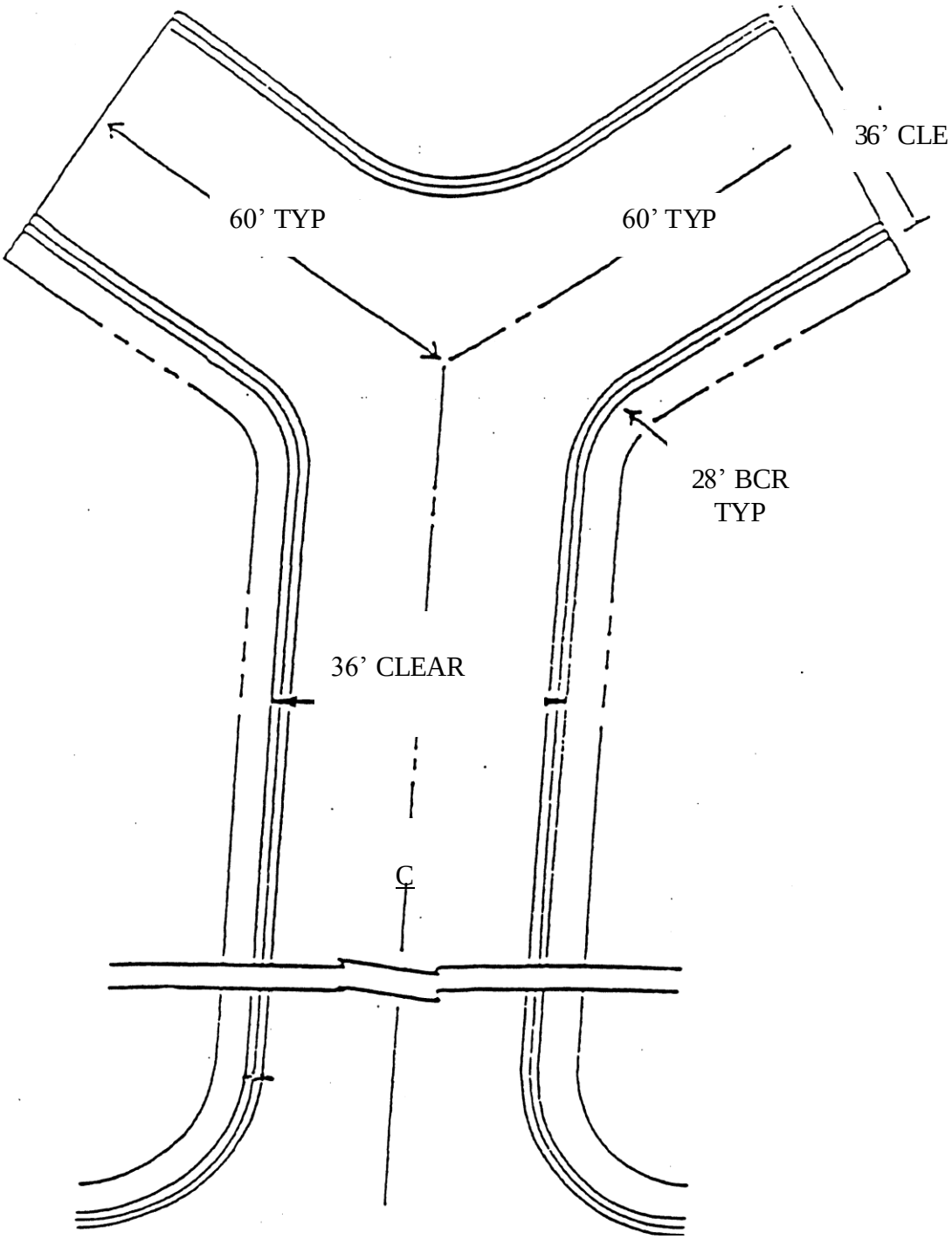
116’ DIAMETER CUL-DE-SAC



ACCEPTABLE ALTERNATIVE TO 116' TURNAROUND



ACCEPTABLE ALTERNATIVE TO 116’ TURNAROUND



ACCEPTABLE ALTERNATIVE TO 116’ TURNAROUND

PERMIT REVISIONS AND RESUBMITTALS:

Revisions to approved plans are required to be submitted and approved. Revisions will be assessed additional plan review fees. A copy of the previously approved plan shall accompany the revised submittal to facilitate the review. Clearly indicate all changes to the revised plans by clouding the change with a delta number signify the date of plan change. When several changes have been made, the Plans Checker may also require a detailed list of changes.

Re-submittals to address a Letter of Correction will require a full submittal. These plans require a copy of the red lined plan from the previous submittal to facilitate the review. Clearly indicate all changes by clouding the change with the delta number to signify the date of plan change.

PLANS CHECK STATUS INSTRUCTIONS:

The status of the review can be checked by logging on to:
www.clarkcountynv.gov/building/fire-prevention

INSPECTIONS THAT MAY BE REQUIRED AND SCHEDULING INSTRUCTIONS:

If approved, an inspection will need to be scheduled. To schedule an inspection, go to www.clarkcountynv.gov/building/fire-prevention.
A fire inspector will review your site in accordance with the approved plans and this guideline.

The Fire Prevention (FP) may witness and accept inspection, testing and maintenance of fire and life safety systems conducted by approved individuals as required by and within the scope and authority of the Clark County Fire Code.

This Guideline does not take the place of the Fire Code and does not take precedence over any Fire Code requirement or position taken by the Fire Chief. When a conflict exists between the requirements of this Guideline and the Fire Code or the opinion of the Fire Chief, the Fire Code or opinion of the Fire Chief prevails.

Technical Assistance, when required by the Fire Chief, will require a Technical Opinion and Report prepared by a State of Nevada licensed: qualified engineer, specialist, laboratory, or fire safety specialty organization acceptable to the Fire Chief and the owner. The Fire Chief is authorized to require design submittals to bear the Wet Stamp and Signature of a professional engineer.

Acceptance of Alternative Materials and Methods requires a Technical Opinion and Report prepared by a State of Nevada licensed: qualified engineer, specialist, laboratory, or fire safety specialty organization acceptable to the Fire Chief and the owner. The Fire Chief is authorized to require design submittals to bear the Wet Stamp and Signature of a professional engineer.