



Clark County Fire Prevention

Mission Statement: "To provide the highest level of fire protection and related services"

TITLE: FIRE HYDRANTS

SCOPE: Fire hydrants shall be provided in accordance with this "Guide". An approved water main/hydrant system with the required water flow for fire protection shall be provided for facilities, buildings or portions of buildings hereafter constructed or moved into or within the jurisdiction. 2005 Clark County Fire Code, Sec. **903.2** Fire hydrants shall be installed and maintained serviceable prior to and during the time of construction, including bringing construction materials on-site. 2005 Clark County Fire Code Sec. **901.3**.

PURPOSE: To standardize Fire Department requirements throughout Clark County by providing a uniform method of specifying and installing fire hydrants, in order to facilitate fire fighting operations during emergencies and to facilitate developers by standardization of requirements.

At the time of permit application, three (3) sets of plans, drawn to an indicated scale, must be submitted for review and approval. Minimum permit and expedite fees (if required) must be paid at this time. The minimum permit fee for this submittal is \$75. The minimum expedite fee is \$85 per hour. Permit fees increase \$20 per new or relocated fire hydrant. The total expedite fee is one times the permit fee, or \$85 per hour, whichever is greater. You will be notified via telephone when the review is completed. Please be advised the plan review and fees affiliated with this process does not include the required waterline/hydrant installation permit. Installation permits must be obtained by the licensed installing contractor prior to the installation of hydrants and construction of water lines. Installation permit(s) must be obtained before any Clark County Fire Department inspections can occur.

SPECIFICATIONS AND REQUIREMENTS:

I. Plans

Two (2) sets of water plans drawn to scale are to be submitted to the Fire Prevention Division for approval prior to the installation of **new or relocated** fire hydrants. If the project is a State project, three (3) sets of plans must be submitted. When only existing hydrants are provided, a submittal of only one (1) set of plans is acceptable. Plans must include the following information:

- A. CCFD approval stamp on all utility sheets, fire lane access plan and current CCFD notes.
- B. Vicinity map indicating major cross streets adjacent to project, as well as actual project location.
- C. Type of construction of each building, per International Building Code.
- D. Total square footage of each building.
- E. Number of stories (floors) including basement of all buildings.
- F. Use (occupancy) of building such as apartment, retail store, office, warehouse, etc.
- G. Location of any 4-hour walls proposed to reduce fire flow. When 4-hour walls are proposed to reduce fire flows, the Building Department PAC # for the proposed building must be provided.
- H. Whether or not building is protected throughout with an automatic fire sprinkler system. Also indicate if the fire sprinkler system is 13, 13-R or 13-D compliant. Reductions in fire flow will be given for all fire sprinkler systems
- I. Exact location, size, manufacturer and type of new and existing water mains.
- J. Exact location, size, manufacturer and type of new/existing DCDA's and other water meter assemblies.
- K. Exact location, number, and type of new, relocated and existing fire hydrants.
- L. Exact location of hydrant isolation and control valves.
- M. Exact location of water main connections, stubs, etc.
- N. 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.
- O. Fire Department general notes must be provided on plans. Copies of current Fire Department general notes are available in the Fire Prevention Bureau and are attached to this Guideline.
- P. Size and location of all underground fire sprinkler system laterals.
- Q. Details of thrust blocks including type of cement, exact location and dimensions in accordance with N.F.P.A. #24 2002 Edition.
- R. Emergency vehicle access plan indicating fire lane on and off property, whenever access routes are not obvious, or when required by the Chief.

II. Fire Hydrant System Design/Distribution/Timing

The number, spacing and type of fire hydrants shall meet the approval of the Fire Prevention Bureau. 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 of one- and two-family dwellings, hydrants **shall** be spaced not to exceed 500 feet, or 600 feet if buildings are protected by approved automatic fire

sprinkler systems.

- C. In all commercial, industrial and multi-family residential areas hydrants **shall** be spaced not to exceed 300 feet or 400 feet if buildings are protected by approved automatic fire sprinkler systems.
- D. The minimum number of fire hydrants to be installed shall be determined based on the required fire flow. One hydrant shall be provided for every 1,500 G.P.M. of fire flow or fraction thereof.
- E. Fire hydrants on adjacent properties shall not be considered unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads and a written contractual agreement exists.
- F. When a street has a high degree of traffic volume, all hydrants being utilized to deliver fire flow to a proposed development must be located on the same side of the street as the proposed development.

Streets with high traffic volume are usually defined as section and half section line streets, streets with 4 or more travel lanes and federal or state highways regardless of the number of travel lanes.

- G. Where streets are provided with median dividers or arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, the Chief may require hydrants to be spaced on average of 500' - 0" on each side of the street, arranged on an alternating basis.
- H. Where new water mains are extended along streets where hydrants are not otherwise required for protection of structures, hydrants will be required at not less than 1,000 feet spacing and at all intersections.
- I. No fire hydrant shall be located within 25 feet of any structure, or 5 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.
- J. Hydrant placement in cul-de-sacs: a hydrant shall not be placed in the circular portion of a cul-de-sac.
- K. A sectional control valve shall be installed after every two (2) hydrants on a water system, in order that no more than two (2) hydrants will be out of service if there is a break in a water main.
- L. Fire hydrants shall be placed at least 4 feet from back of curb. Fire hydrants shall not be further than 7 feet from back of curb. Fire hydrants shall not be placed in sidewalks or driveways.

EXCEPTION: Sidewalks greater than 5 feet in width and/or when approved by the Fire Prevention Bureau.

- M. Hydrants shall be located a minimum of 6 feet away from the beginning of a turning radius.
- N. Two sources of supply are required whenever there are more than 3 fire hydrants installed on a single system and sources must be looped.
- O. 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 Bureau, gate valves in underground water lines may be abandoned in place. The Fire Prevention Bureau must witness abandonment of the valve.

- P. 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 901.3 of the 2005 Clark County Fire Code.
- Q. If during construction it becomes necessary to close any control valve or place a hydrant out of service, the Fire Department Dispatch Office shall be contacted.
- R. Dead end 6" pipe supplying fire hydrants cannot exceed 150' - 0" in length.

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. **Curb:** A suitable coat of exterior industrial grade enamel (safety red) shall be applied to 30 feet of curb; 15 feet on each side of the hydrant, unless otherwise approved by the Fire Prevention Division.
- B. **Asphalt Parking Lots, Etc.:** A suitable coat of yellow paint (meeting traffic engineering specifications) shall be applied to the asphalt in a striping effect. Area to be striped must be of a size large enough to ensure access to the hydrant, a minimum of 3' wide.
- 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 Bureau. The poles shall meet the following minimum specifications:
 - a. 4 inch outside diameter steel (or comparable material) pipe, grouted and at least 6 feet in length
 - b. The top of the pole shall be parallel with the top of the hydrant; the remainder of the pole shall be concreted in the ground; the hole is to be at least 10 inches in diameter and 3 feet deep.
 - c. The poles shall not hinder operation or maintenance of the hydrants. (Poles are usually installed at the corners of the 3' x 3' x 10" concrete pad).
- D. **Fire Hydrant Markers:** All fire hydrant locations will be identified as to actual location by the placement of blue colored reflective marker adjacent to the fire hydrant on all improved Fire Apparatus Access Roadways with hard surfaces. These reflective markers shall meet the approval of the Fire Prevention Bureau and be placed in accordance with the following specifications:
 - a. **On roadways with no parking permitted on the hydrant side:** the reflective button will be located eight (8) feet from the face of the curb on the hydrant side.
 - b. **On roadways with parking permitted on the hydrant side:** the reflective button will be located sixteen (16) feet from the face of the curb on the hydrant side.

- c. **All other configurations:** shall be approved by the Fire Prevention Bureau.
- E. 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.
- F. All cap, hose nozzle and pumper nozzle threads shall be free of dirt, rust, etc., and shall be lightly greased.
- G. 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. The concrete pad must be reinforced by #3 rebar installed throughout the pad.

IV. Fire Hydrant Specifications

- A. Public fire hydrants approved by the Fire Prevention Bureau shall conform to current American Water Works Standards, C502, entitled "Standard for Dry-Barrel Fire Hydrants". In addition fire hydrants must meet the approval of the local water purveyor with respect to type, model and manufacturer. See section 901.2.2.2 of the 2005 Clark County Fire Code.
- B. Private fire hydrants shall be of a type that is approved by the Fire Prevention Bureau and shall conform to current American Water Works Standards, C502, entitled "Standard for Dry-Barrel Fire Hydrants".
- C. Painting of hydrants shall be as follows:
 - a. Public Hydrants - A suitable prime coat followed by not less than 2 coats of an industrial grade enamel safety yellow in color.
 - b. Private Hydrants- A suitable prime coat followed by not less than 2 coats of an industrial grade enamel safety red in color.

V. Fire Access Roads

- A. Whenever fire department emergency access routes are not readily apparent, or when only portions of a property provide access, or when required by the chief, approved signs or other approved notices, or both, shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof.

Fire apparatus access roads on private property shall be marked by placing approved signs at the start of the designated fire lane, one sign at the end of the fire lane and with signs at intervals of 100 feet (30 480 mm) along all designated fire lanes. Additionally, green reflective markers shall be installed within 25 feet (7620 mm) of the start of the fire lane, at 100 foot (30 480 mm) intervals along the fire lane and at each change of direction. The reflective markers must be installed in the center of the fire lane. Signs to be placed on both sides of an access roadway if needed to prevent parking on either side. Signs to be installed no higher than 10 feet (3048 mm) or less than 6 feet (1828 mm) from the surface of the roadway. The curb along

the roadway, or if a curb is not present, then the pavement or roadway, shall be painted with an 18 inch wide stripe along the perimeter of the fire lane. Paint used to indicate fire lane boundaries must be weather resistant and safety red in color. Pavement striping must be stenciled “NO PARKING – FIRE LANE” at 100 feet (30 480 mm) intervals. Minimum lettering size is 3 inch with ½ inch stroke.

B. Required access.

- a. Fire apparatus access roads shall be provided in accordance with Sections 901 and 902.2 of the Clark County Fire Code 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 (45 720 mm) from fire apparatus access as measured by an approved route around the exterior of the building or facility. See also Section 902.3 of the Clark County Fire Code for personnel access to buildings.
- b. More than one fire apparatus road shall be provided when it is determined by the chief that access by a single road might be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

C. Specifications.

- a. **Dimensions.** Fire apparatus access roads shall be constructed utilizing the following dimensions:
 - i. Public streets – 41 feet back of curb to back of curb
 - ii. Private streets – 37 feet back of curb to back of curb
 - iii. Parking lot drive aisles – 24 feet of drivable surface
 - iv. Alleys, driveways, other thoroughfares, etc. 32 feet of drivable surface, with variation as indicated in 2005 Clark County Fire Code 902.2.2.1
 - v. Vertical clearance shall be not less than 13 feet 6 inches.
- 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.
- 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.

EXCEPTION: Single family detached residences. Dead-end fire apparatus access roads cannot exceed 500 feet in length without an approved turnaround.

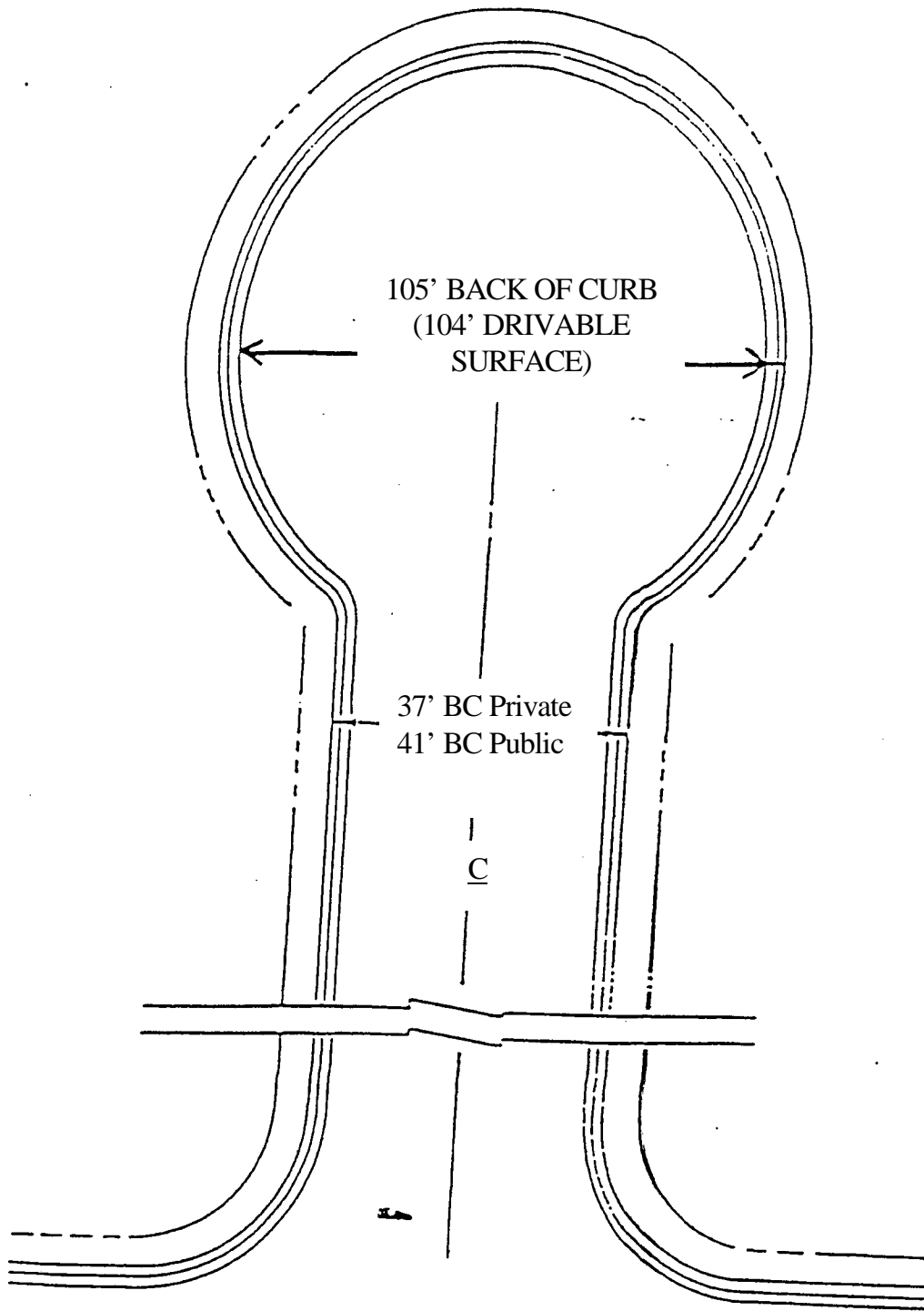
- e. **Bridges.** When a bridge is required to be used as part of a fire apparatus access road, it shall be constructed and maintained in accordance with nationally recognized standards. See Article 90, Standard a.1.1 of the Clark County Fire Code. The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the chief.
- f. **Grade.** The gradient for a fire apparatus access road shall not exceed 12 percent. Angles of approach and angles of departure shall not exceed 6 percent for 25 feet prior to or after the grade change.

UNIFORM GUIDELINES

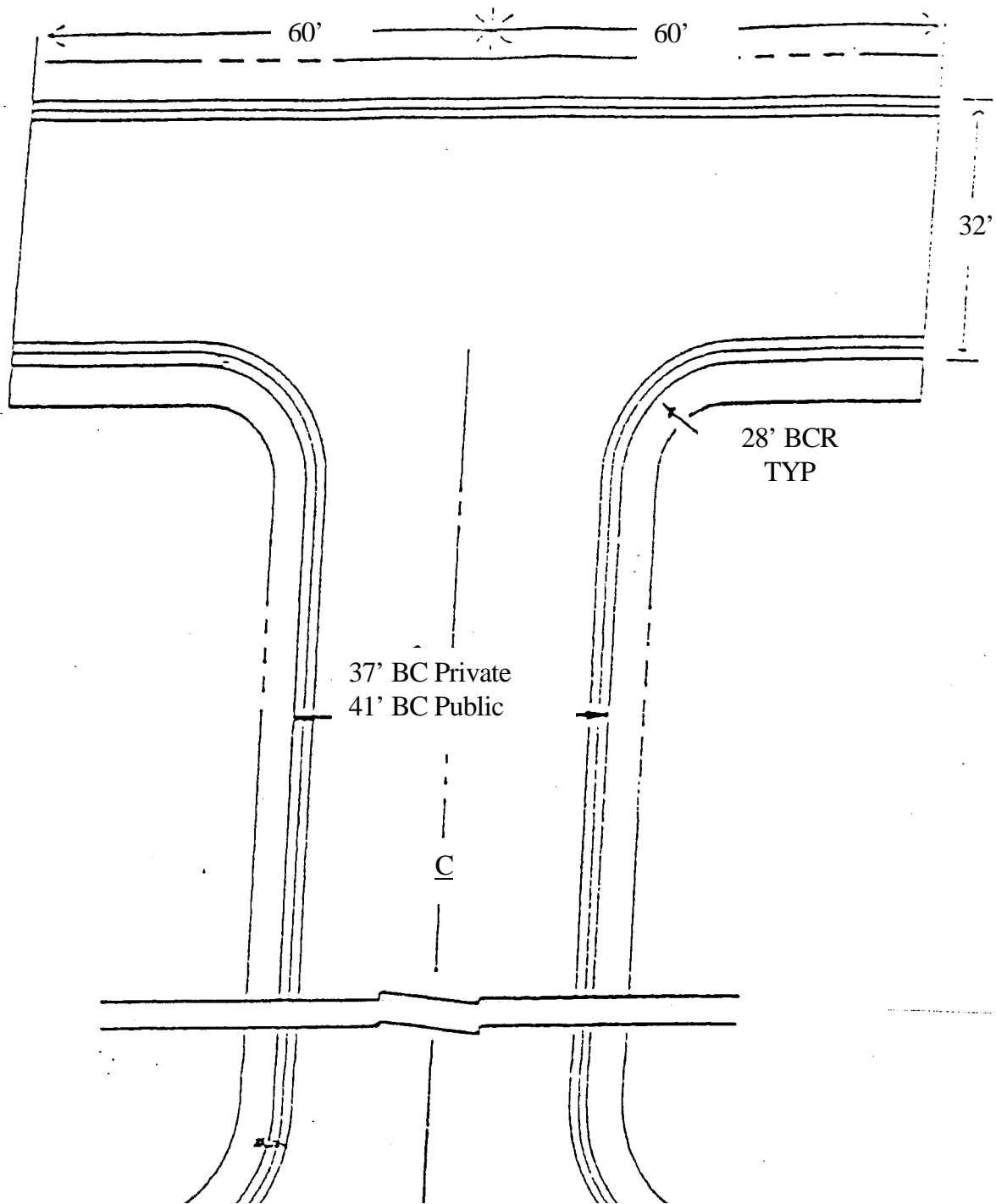
INSTALLATION AND SPECIFICATION OF FIRE HYDRANTS

VI. Fire Department General Notes

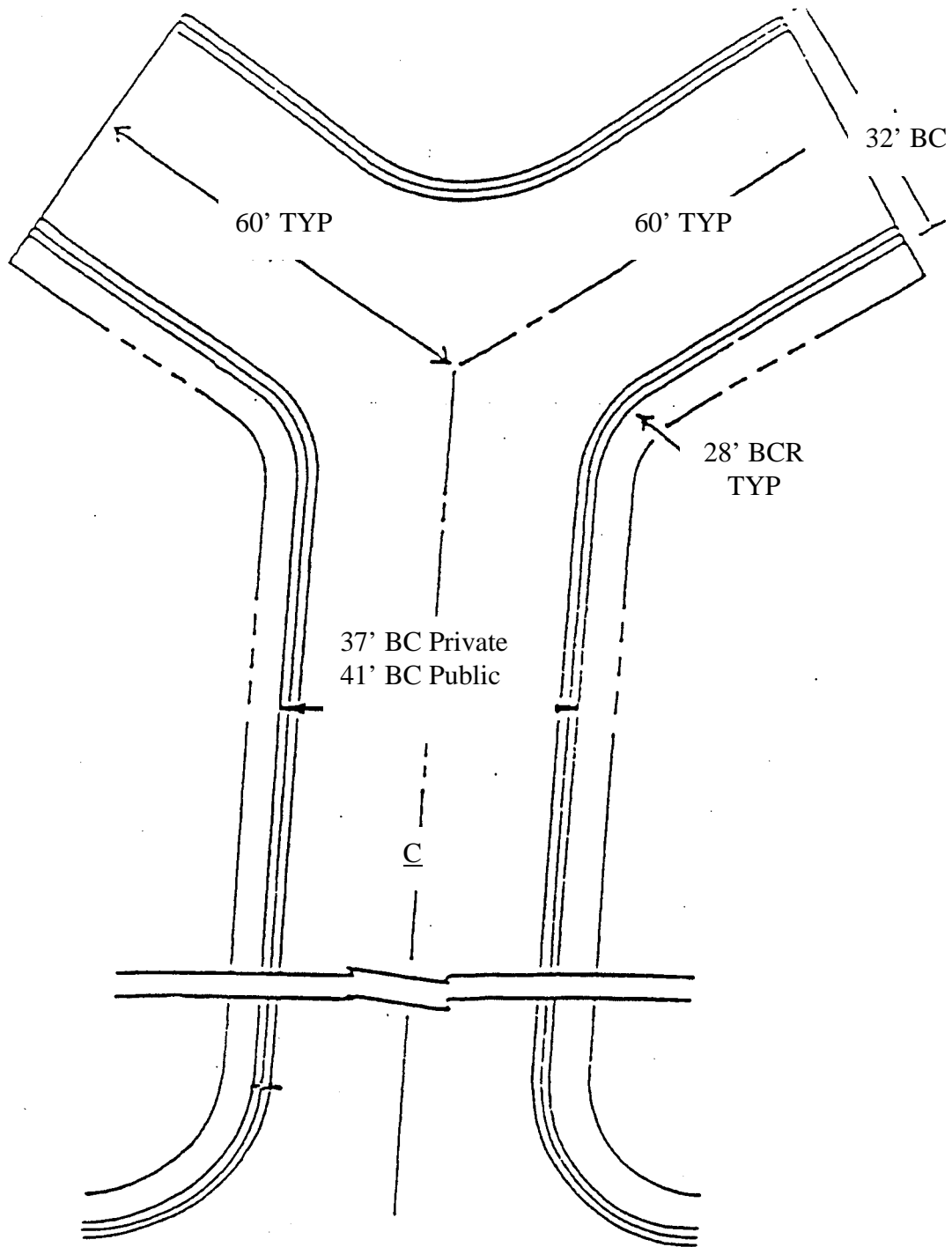
- A. All work shall be done in strict accordance with the 2005 Clark County Fire Code, and the 2002 Edition of National Fire Protection Association Pamphlet #24.
- B. Fire hydrants and water supplies for fire protection shall be and made serviceable prior to and during the time of construction in accordance with Section 901.3 of the 2005 Clark County Fire Code.
- C. If during construction it becomes necessary to close any control valve or place a hydrant out of service, the **Clark County Fire Department** must be contacted.
- 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 Bureau.
- E. No fire hydrant shall be located within 25 feet of any structure, or 5 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. At all times during construction suitable emergency vehicle access road(s) must be maintained. Roadways must be smooth, compacted and capable of supporting the imposed loads of all emergency vehicles.
- 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. Call CCFD inspection hotline at 226-8991 to schedule inspections.
- H. Fire hydrants shall be located 4' to 7' from back of curb.
- I. Blue reflective markers must be installed before final hydrant acceptance can be attained (2005 Clark County Fire Code, Sec. 901.4.3].
- J. Approved (public) fire hydrants for this project are:
 - 1. Kennedy – Guardian Models K81A and K81D
 - 2. Mueller – Super Centurion 250 Model A-423
 - 3. Clow – Medallion Model F-2546LVD
 - 4. Troy Valve – Patriot Model PT8100N Nevada Hydrant



105' DIAMETER CUL-DE-SAC



120' TURNAROUND



ACCEPTABLE ALTERNATIVE TO 120' TURNAROUND

FIRE FLOW INFORMATION BLOCK

Utility Plans submitted for review by the Clark County Fire Department, shall contain the following Fire Flow Information Block and the information contained within as a minimum.

FIRE FLOW INFORMATION BLOCK
USE/OCCUPANCY _____
TYPE OF CONSTRUCTION (IBC) _____
FIRE FLOW _____ GPM @ 20 PSI.
AUTOMATIC FIRE SPRINKLERS _____ YES/NO _____
NFPA 13 _____ 13R _____ 13D _____
ESFR _____ YES/NO _____
SQUARE FOOTAGE _____
LARGEST AREA BETWEEN 4 HOUR WALLS _____
BUILDING HEIGHT _____
OF STORIES INCLUDING BASEMENT _____
HIGH PILED COMBUSTIBLE STORAGE _____ YES/NO _____
OF HYDRANTS INSTALLED _____ NA _____

CLARK COUNTY FIRE DEPARTMENT APPROVAL BLOCK

**CLARK COUNTY
FIRE DEPARTMENT APPROVAL**

BY _____ DATE _____

**APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A
PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE
PROVISIONS OF THE STATE OR COUNTY LAWS.
FIRE FLOW _____ GPM AT 20 PSI RESIDUAL**