

**Exhibit A**

**Clarkston Town Manual of Design and  
Construction Standards**

**1<sup>st</sup> Edition**

**2022**



**CLARKSTON, Utah**

Founded 1864



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## **CHAPTER 1**

### **GENERAL IMPROVEMENT REQUIREMENTS**

#### **1.1 SCOPE OF WORK**

This section defines the general requirements for improvements to be designed and constructed as public infrastructure.

Subdivider shall be required to provide public improvements within each subdivision to reduce their impact on current town services and budgets and to ensure a livable community.

The improvements shall include all public utilities (i.e.; water, or storm sewer) grading, erosion control, traffic signing, traffic control and street improvements adjacent to and in front of all lots and along all dedicated streets, alleys or other easements which connect with existing improvements of the same kind or to the boundary of the development nearest existing improvements. Layout must provide for future extension beyond proposed development and must be compatible with the contour of the ground for proper drainage and for servicing future development. All utility lines and street improvements shall be installed to the boundary lines of the development.

When development occurs beyond the reach of available utilities or streets it shall be the responsibility of the developer to extend any and all required utilities or streets to service the end of the developer's property. Such utilities or streets shall be constructed of sufficient size and capacity to accommodate all property that has the potential to be served by such utility or street. All necessary right-of-ways or easements must also be acquired by the developer for the benefit of Clarkston Town and at no cost to the Town except as covered in other applicable Town Ordinances. The developer is encouraged to work with adjacent property owners that will benefit from said utility or roadway improvements for the purpose of mutual participation. The developer however is responsible for all upfront costs associated with the design, acquisition, and construction of the offsite improvements.

Options may be available to the developer upon request to Clarkston Town in the establishment of a reimbursement district or payback agreement, which include undeveloped areas that may benefit from utility or street improvements. Such districts shall be accomplished by means of mutual agreements.

#### **1.2 CONSTRUCTION DRAWINGS**

Complete and detailed construction plans, drawings and specifications prepared by an engineer duly licensed in the State of Utah of all improvements shall be submitted to "Clarkston Town Attention Town Engineer" for review and approval prior to issuance of a permit. It is incumbent on the design engineer to fully familiarize themselves with the most current version of the Clarkston Town Manual of Design and Construction Standards and prepare plans and plats accordingly. If, upon initial review, the Town Engineer deems the construction plans or plat to be deficient or incomplete, the plans will be returned to the developer / design engineer for revisions. The Town will not design the development or project through the "red line process". Prior to receiving preliminary plat approval for subdivisions, said completed and approved construction drawings shall be submitted to "Clarkston Town Attention Town Engineer". The plans containing the appropriate approval signatures and the current adopted specifications shall be the only valid documents from which the contractor shall construct the permitted

improvements. The contractor shall have a copy of the approved plans and permit available at the construction site and shall make them available to the Town's representative upon request.

Construction Details: Plans and profiles will include all construction details such as typical curb and gutter sections; sidewalks, street cross sections; cross drains; location and elevations of manholes; catch basins, storm sewers and their appurtenant works; elevation and location of fire hydrants, water and secondary water mains, type of pipe, valves and their appurtenant works; location, size and elevations of sewer mains with grades and type of pipe, manholes, cleanouts and other appurtenant works.

### **1.3 ELECTRIC DELIVERABLE REQUIREMENTS**

Prior to probationary acceptance, surveys in electronic format shall be submitted and accepted by Clarkston Town.

The electronic drawings shall be in either Computer Aided Drafting (CAD) or Geographic Information Systems (GIS) file format. The acceptable formats are AutoCAD 14 or later. The deliverables for CAD submittals are AutoCAD drawing files and Microsoft Excel files. The deliverables for GIS submittals will be Arc Info export files or Arc View shape files and Portable Document Format (PDF).

All CAD and GIS files shall be registered to the North American Datum 83 (NAD 83) Utah State Plane North Zone coordinate system (grid) and NAVD 88 vertical datum with ties to two public monuments. Information on monuments is available through Cache County Surveyor.

### **1.4 ENGINEER'S SEAL REQUIRED ON DOCUMENTS**

Any final plan, map, sketch, survey, drawing, document, plat, specification or report shall bear the seal of a Utah licensed professional engineer and/or surveyor when filed with Clarkston Town Corporation. This is a State requirement and applies to all documents filed with Clarkston Town including but not limited to filings related to site plans, preliminary and final plats, improvement plans, specifications or report of a building or structure. Additionally, the signature of the individual named on the seal and the date shall appear across the face of each original seal.

The Town's Design Standards do not relieve the developer's engineer from being responsible for examining and understanding local project conditions, confirming the correlation of all design standards with the techniques of construction, coordination of the standards with that of all other industry standards, providing the engineering Standard of Care, and for the complete and satisfactory design of the project.

### **1.5 STANDARD FOR CONSTRUCTION DRAWINGS**

The following instructions are for the purpose of standardizing the preparation of drawings to obtain uniformity in appearance, clarity, size and style. These plans and designs shall meet the standards defined in the specifications and drawings herein outlined. Plans and specifications shall be delivered in duplicate. The minimum information required on drawings for improvements are as follows:

All drawings and/or prints shall be clear and legible and conform to good engineering and drafting practice, Auto CAD drawings plotted. Final Plats shall be plotted on Mylar sheets (4 mil). Size of drawings sheet shall be 24" X 36" with 1-1/2" border on left side and 1/2" border on all other sides. An electronic copy of the drawings shall be submitted along with the final plans being appropriately stamped

& signed.

Specifications shall be shown in a legible, systemized manner on the construction plans and/or on eight and one-half inch by eleven-inch (8½" x 11") sheets attached to the construction drawings. In lieu of submitting specifications, the professional engineer may reference on the construction drawings the most recent set of standard specification adopted by the Town.

A. In general, the following shall be included on all drawings:

1. North arrow (plan)
2. Scale: 1" = 50' horizontal with a minimum of 1" = 100', 1" = 5' vertical with a minimum of 1" = 10' (other appropriate scales as approved by the Town Engineer)
3. Elevations referenced to Utah State Plane North Zone, NAD 83 (No assumed elevations will be acceptable)
4. Stationing and elevations for profiles
5. Location map
6. Index map
7. General and Construction notes
8. Title block, located in lower right corner of sheet to include:
  - a. Name of Town
  - b. Project title (subdivision, etc.)
  - c. Specific type and location of work
  - d. Signature block for approval signature of Town Engineer and date
  - e. Name, address, phone, etc. of engineer or firm preparing drawings with license number, stamp and signature
9. Details at 1" = 10' or other appropriate scale to adequately provide required information
10. Location of construction benchmarks with elevations indicated
11. Name of engineer, design firm, and contact information shown on the plans

B. Curb and gutter, drains and drainage structures, sidewalks and street surfacing drawings shall show:

1. Plan and profile views must be shown for centerline of road. Profiles of both top back of curbs and centerline are required where approved deviations from standard cross sections

are proposed.

2. Where no curb is proposed, profile of edge of pavement must be shown
3. Existing profile of centerline and at both right-of-way lines and labeled accordingly
4. All existing elevations shall be shown in parentheses - i.e.; (ex. elevation)
5. All existing utilities within and adjacent to area proposed for construction must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts, cover or clearance requirements exists.
6. Stationing, top back of curb elevations, centerline elevations, and curve data
7. Flow direction and type of cross drainage structures at intersections with adequate flow line elevations, cross drains, catch basins, storm sewers and their appurtenant works, elevations of manholes, special details, etc.
8. Typical cross section for all street sizes and variations
9. 100' minimum of existing plan and profile design when connection to existing improvements
10. 300' minimum of future plan and profile design when roadway is to be extended (must also include 300' of existing profile along future R/W lines)
11. Soil Boring Log along centerline

**C. Sewer drawings shall show:**

1. Location, size, and slope of mains. Slopes shall be indicated in increments of hundredths of a percent (i.e. 0.04%).
2. Stationing of manhole center lines, lateral connections, and crossings
3. Plan and Profile, bearings, and lengths of segments.
4. Manhole size, location and flow line elevation, lid elevations
5. Type of mainline pipe
6. Profile crossings of all other existing or proposed utilities with invert elevation with type and size of utility
7. All existing utilities within and adjacent to area proposed for construction. Must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts cover or clearance requirements exists.
8. An overall development plan view of the sewer (Horizontal scale 1" = 200')

9. Lateral locations and station for each lot or building served

D. Culinary Water drawings shall show:

- a. Minimum scale: 1" = 50' horizontal with a minimum of 1" = 100'
- b. Location and size of water mains, valves, hydrants, elevations of hydrants, etc.
- c. Type of pipe
- d. When development occurs across pressure zones include pressure reducing valve stations in improvement designs.
- e. All existing utilities within and adjacent to area proposed for construction must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts, cover or clearance requirements exists.

E. Secondary Water drawings shall show:

1. Minimum scale: 1" = 50' horizontal with a minimum of 1" = 100'
2. Location and size of pipes, valves, fittings, appurtenant structures, etc., including stationing.
3. Type of pipe
4. All existing utilities within and adjacent to area proposed for construction must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts, cover or clearance requirements exists.

F. Storm Sewer drawings shall show:

1. Minimum scale: 1" = 50' horizontal with a minimum of 1" = 100', 1" = 5' vertical with a minimum of 1" = 10'.
2. Location, size, elevation and slope of mains and lateral connections
3. Location, size, elevation and details of inlets, junction boxes, etc.
4. Stationing of manhole center lines, lateral connections, and crossings
5. Manhole size, location and flow line elevation, lid elevations
6. Flow rate (design storm per CVSWDS), hydraulic grade line and velocity (all indicated in profile for each pipe section)
7. Type of mainline pipe



8. Profile crossings of all other existing or proposed utilities with invert elevation, type, and size of utility
9. All existing utilities within and adjacent to area proposed for construction. Must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts, cover or clearance requirements exist.

#### G. Drainage and Grading Plans

1. Plans showing site general layout and drainage patterns with spot elevations of final grades
2. Existing contours at one-foot intervals
3. All existing utilities within and adjacent to area proposed for grading. Must include actual existing elevations obtained from field survey/exploratory excavation where potential conflicts, cover or clearance requirements exist.
4. Detention facility details as well as inlets, outlets, and piping facilities
5. Calculations to substantiate design (include in submittal but not to be included on plans)

#### H. Erosion Control Plans

1. Plans showing site general layout and drainage patterns and outlets for water exiting construction site
2. Desilting basin details as well as inlets, outlets and piping facilities
3. Calculations to substantiate design (include in submittal but not to be included on plans)
4. Erosion Control Construction notes
5. Plan sheet shall include an emergency phone number and name of the developer's responsible person who will be available 24 hours a day if an emergency situation arises.

#### I. Traffic Signing and Traffic Control Plans

1. All traffic signing and traffic control plans shall be designed and installed according to the Manual on Uniform Traffic Control Devices (MUTCD).
2. All traffic signing and traffic control plans shall be submitted to Clarkston Town for review and approval prior to field installation.

### **1.6 ENGINEERING PERMITS**

Any Person desiring to perform work of any kind in a Public Way or on Town owned property within the Town shall make application for a permit. The decision by the Town to issue a permit shall include, among other factors determined by the Town, the following:

- A. The capacity of the Public Way to accommodate the facilities or structures proposed to be installed in the Public Way;
- B. The capacity of the Public Way to accommodate multiple utilities, such as electrical, telephone, gas, sewer, water or other conduits or pipes.
- C. The damage or disruption, if any, of public or private facilities, improvements, or landscaping previously existing in the Public Way;
- D. The public interest in minimizing the cost and disruption of construction from numerous excavations in the Public Way;
- E. Compliance with the Town “Manual of Design and Construction Standards”
- F. Any other restrictions or requirements as established by current Clarkston Town ordinance(s).

No person shall be eligible to apply for or receive permits to do work within the Public Ways of the Town, save and except they are one of the following:

1. Contractors licensed by the State of Utah to perform the type of work requested.
2. Providers (Utility Companies), provided that all work shall be performed by a contractor licensed by the State of Utah and identified on the permit.
3. The Town acting through its Public Works Department.
4. Property owners who are replacing sidewalk in front of their own residence.

The Town Engineer, or designated Representative, may deny the issuance of permits to applicants, including providers, who have shown by past performance that, in the opinion of the Town, they will not consistently conform to the Engineering Regulations, Specifications, Design Standards, or the other Town requirements.

It shall be unlawful for any Person to commence work upon any Public Way until the Town has approved the application and until a permit has been issued for such work.

A permit is not required from the Town for hand digging excavations for the installation or repair of sprinkler systems, mailboxes, or landscaping.

### **1.7 PRECONSTRUCTION CONFERENCE**

For a construction project a determination shall be made, either during the plan review process or at the time of permit issuance, as to whether a certain project will or will not require a preconstruction conference. All subdivisions planned unit developments, or other projects of significant magnitude and complexity will require a preconstruction meeting. If required, a preconstruction conference shall be held before any excavation or other work is begun in a development. The meeting will be held at Clarkston Town Office with: (a) Town Engineer or Engineer’s representative (Inspector or Engineer); (b) developer;

(c) Clarkston Town Development Engineer; (d) developer's design engineer; (e) Town Public Works representative; (f) all contractors and subcontractors involved with installing the development improvements; (g) representatives of the affected utility companies; (h) others as may be necessary.

It will be the responsibility of the developer to reserve the Town facilities and to notify all parties required to attend the preconstruction conference. Capital Projects shall have all meetings scheduled by the Clarkston Town Project Manager. Such facility reservations can be accomplished by calling (435) 563-9090 Monday through Thursday 9 am. to 1 pm.

The meeting will be conducted by the Town Manager/Engineer or their representative. Items to be discussed shall relate to project scheduling, materials used, coordination with all affected parties and other important items as may be deemed necessary by the Town Manager/Engineer. Minutes will be taken and distributed to all in attendance. The contractor will not be permitted to proceed with construction unless this meeting takes place and those responsible for all construction activities are in attendance.

### **1.8 INSPECTION**

All construction work involving the installation or repair of public improvements in developments shall be subject to inspection by the Town. It shall be the responsibility of the person responsible for construction to ensure that inspections take place where and when required as indicated in the specifications, on the permit and as discussed in the preconstruction conference. Certain types of construction will require continuous inspection, while others will only require periodic inspections. The type and amount of inspection performed by Clarkston Town shall be at the sole discretion of the Town Manager/Engineer.

Continuous inspection may be required on the following types of work:

1. Placement of street surfacing
2. Placing of concrete for curb and gutter, sidewalks, and other structures
3. Laying of drainage pipe, water pipe, valves and hydrants
4. Testing and backfilling as per approved specifications
5. Any connections to Clarkston Town Utilities
6. Street grading and gravel base placement and compaction

For construction requiring continuous or periodic inspection, no work shall start until an inspection request has been made to the Town by the person responsible for the construction and the required submittals received and approved by the Town. Requests for inspection on work requiring continuous inspection shall be made at least two (2) working days prior to the commencing of the work. Notice shall also be given 24 hours in advance of the starting of work requiring periodic inspection, unless specific approval is given otherwise. Work installed without required inspection will be required to be removed and reinstalled at the Contractor's expense.

### **1.9 CONSTRUCTION COMPLETION INSPECTION**

A FINAL INSPECTION shall be made by the Town Engineer and/or a Public Works representative after all construction work is completed. Any faulty or defective work shall be corrected by the persons responsible for the work within a period of thirty (30) days of the date of the inspection report defining the faulty or defective work. If the contractor fails to complete the required work, the Town Engineer, at his/her discretion, may arrange to have the work completed and bill the contractor, may use the monies in escrow or otherwise held by the Town to complete the defective work and/or may withhold future permits from the affected contractor or subcontractor.

### **1.10 "AS-BUILT" DRAWINGS**

“As-Built drawings will be required prior to final payment and release of security bonds for all improvement projects or accepting of development improvements. 1 paper copy (Mylar for Final plat only) as well as an electronic copy in accordance with section 1.5 “Standard for Construction Drawing” of this manual is required.

As-Built Drawings shall depict all changes and deviations from the submitted plan set. The drawings shall include but not necessarily be limited to changes with the following:

- A. Culinary water main line, hydrant and valve locations
- B. Culinary water service lateral and meter locations
- C. Fire flow test data in gpm at 20 psi (3,500 gpm for a duration of 4 hours)
- D. Minimum water pressure of 40 psi during peak day (R309-105-9 UCA)
- E. Storm drain lines, manholes and grades
- F. Sub surface drain lines
- G. Changes in grade

### **1.11 POST-CONSTRUCTION CONFERENCE**

Within 20 days after the Contractor has completed all Punch List work to the satisfaction of Engineer/Public Works and after the Engineer/Public Works has indicated that the Work is acceptable, but prior to final application for payment, or accepting of development improvements, the Contractor shall attend a conference with the Engineer and others to discuss:

- 1. Project successes and failures;
- 2. Project procedures;
- 3. Change orders or work directives from the project;
- 4. Retainage and final payment;
- 5. Procedures pertaining to the processing of payments; and

6. Submittal of the “as-builts”; and
7. To review or discuss other items deemed necessary by Engineer or Contractor.

The conference will be held at a mutually agreed time and place attended by Contractor, its’ superintendent, and its’ Subcontractors as appropriate. Other attendees will be:

1. Engineer and/or Resident Project Representative
2. Representatives of Owner and Governmental representatives as appropriate.
3. Others as requested by Contractor, Owner, or Engineer.

The purpose of the conference is to review the project’s successes and shortcomings, discuss improvements for future projects and improved communications.

ENGINEER will preside at the Post-Construction Conference and will arrange for recording and distributing minutes to all persons in attendance.

### **1.12 GUARANTEE OF WORK**

The Contractor shall warrant and guarantee (a retainage of an escrow or other security in the amount as dictated by Town ordinance or contract) that the improvements and every part thereof, will remain in good and serviceable condition for a period, as dictated by Town ordinances or contract, after the date of the Construction Completion Inspection Report by the Town Engineer or his/her representative.

In addition to the security for performance agreement described in the Subdivision Improvements section of Title 11 of the Municipal code, the subdivider shall present a warranty deposit to the Town equal to the percentage allowed by state law UC 10.9a-604.5 (3) (b), of the total cost for all improvements.

A warranty period shall commence upon the date that all improvements required by the Town to be installed within the subdivision have been completed to the satisfaction of the Town and a final inspection thereof has been made approving the same. The warranty period shall commence at that date and shall continue for a period of one year thereafter. If any deficiencies are found by the Town during the warranty period in materials or workmanship, the subdivider shall promptly resolve such defects or deficiencies and request the Town Engineer to re-inspect the improvements. At the end of the one-year warranty period, the subdivider shall request the Town Engineer to make a final warranty period inspection of all improvements. If the Town Engineer verifies that the improvements are acceptable, the Town Engineer shall notify the Town manager prior to releasing the warranty deposit posted by the subdivider. In the event deficiencies are found and not corrected within the one-year warranty period, the warranty deposit shall be forfeited to the Town. The Town shall then use the proceeds to correct the deficiencies. Any funds remaining shall be released to the subdivider upon approval of the Town council, and any costs incurred by the Town to correct deficiencies shall be billed to and paid by the subdivider.

The warranty deposit may be made separately or with the security for performance agreement. In any event, the warranty deposit, shall be made prior to the signing of the final plat by the mayor and Town recorder.

Additionally, the Contractor shall make all repairs to and maintain the improvements and every part

thereof in good condition during that warrantee period at no cost to the Town.

The Developer/Contractor will be responsible to see that the backfilling and compaction are properly and adequately done. Settlement of trenches within a period of one (1) year after final acceptance of the project shall be considered incontrovertible evidence of inadequate compaction, and the Developer/Contractor shall be responsible for correcting the condition in accordance with the provisions of these standards and specifications.

Where new roadways have been constructed as part of a project/development, the Developer/Contractor shall provide a Chip Seal surface over the new asphalt after the twelve-month warranty period. The Chip Seal surface must be completed within 6 months of the end of the warranty period. Escrow funds will be held in the amount of 125% of the estimated cost of the Chip Seal until completed and accepted by the Town.

The escrow will then be released. Should the Developer/Contractor fail to provide the Chip Seal within 6 months, the Town will contract for those services and use the escrow to cover costs and return any balance. Should the cost of Chip Seal be in excess of the amount in escrow, the Developer/contractor will be billed for the balance. Refer to the most recent APWA Specifications for requirements for fog seal, slurry seal or chip seal (2012 APWA Specifications Sections 32 01 13.50, 32 01 13.61 and 32 01 13.64 respectively).

### **1.13 ENVIRONMENTAL SAFETY**

It shall be the responsibility of the contractor to observe all best practices relative to ensuring a positive and non-hazardous environmental climate during all phases of construction.

Concrete washout point or points shall be established only after consultation with Clarkston Town or the Clarkston Town Engineer to ensure that no conflict exists with well or spring protection ordinance(s). Unauthorized concrete washouts will be prosecuted as a Class B misdemeanor due to possible contamination of the aquifer. This shall apply to both the operator and the respective company.

The developer or contractor must dispose of the residue concrete and/or concrete by-products upon completion of the project. Any petroleum-based spills in excess of the equivalent of one liquid quart must be immediately reported to the Town. The use of pesticides or herbicides is prohibited without prior clearance from the Town.

### **1.14 DEVELOPMENT SAFETY**

It shall be the responsibility of the developer and/or developer's representative to maintain and enforce all federal, state and local safety codes involved with the development.

All excavations shall be conducted in a manner resulting in a minimum amount of interference or interruption of street or pedestrian traffic. Inconvenience to residents and businesses fronting on the Public Way shall be minimized. Suitable, adequate and sufficient barricades and/or other structures will be available and used where necessary to prevent accidents involving property or persons. Barricades must be in place until all of the Permittee's equipment is removed from the site and the excavation has been backfilled and proper temporary gravel surface is in place, except where backfilling and resurfacing is to be done by the Town; in which case the barricades, together with any necessary lights, flares or torches, must remain in place until the backfill work is actually commenced by the Town. From sunset to

sunrise, all barricades and excavations must be clearly outlined by adequate signal lights, torches, etc. The appropriate agencies shall be notified, including police, fire, and school district, at least 24 hours in advance of any planned excavation requiring street closure or traffic detour.

**CHAPTER 2**  
**STREET DESIGN**

**2.1 GENERAL**

- A. The arrangement, character, extent, width, grade, and location of all streets shall be in conformity with the official Town plan, regulations, and any further plans adopted by the Town.
- B. Subdividers shall locate streets within the subdivision so that the streets connect with existing public streets and shall meet the provision of the adopted Town master street plan or the transportation section of the general plan. Those streets which have not been designated on the master street plan shall be as required by the planning commission and Town council.
- C. The arrangement of streets in new developments shall make provision for the continuation of the existing streets in adjoining areas and shall provide access to adjoining land that is not subdivided, insofar as such may be deemed necessary for public use by the Clarkston Town Planning and Zoning Commission. Streets shall be designed and constructed to the points of the compass. If geographical/geological conditions prevent this from being observed, any deviations must first be approved by the Clarkston Town Planning and Zoning Commission. The street arrangement shall not cause unnecessary hardship to owners of adjoining property when they plat their own land and seek to provide for convenient access to it. Minor streets shall approach the major or collector streets at an angle of not less than eighty-five (85) degrees.
- D. All roads constructed as part of a new development/project shall extend to the furthest point of the property.
- E. Street widths:
  - 1. Major Streets - Arterial and collector streets shall conform to the widths designated on the Clarkston Town Transportation Major Street Plan wherever a development falls in an area for which a Master Street Plan has been adopted. For areas where the street plan has not been completed at the time the preliminary plan is submitted to the Planning and Zoning Commission, arterial or collector streets shall be provided as required by the Planning and Zoning Commission. Right-of-way widths are 99 feet.
  - 2. Local Streets - Local streets shall generally have a minimum right-of-way width of 99 feet.
  - 3. Turning Area - Where a street longer than 150 feet is designed to remain only temporarily as a dead-end street, an adequate turning area shall be provided as follows:
    - a. Where the street dead-ends into a subsequent phase of the same development, a temporary, all-weather 80-foot diameter asphalt paved turnaround with a 100-foot diameter permanent easement or right-of-way on the subsequent phase property shall be provided.
    - b. Where a street dead-ends against property which is not part of a subsequent development phase, an 80-foot diameter asphalt paved turnaround with a



100-foot diameter permanent easement of right-of-way shall be incorporated at the terminus of the phase/subdivision. The recordable easement may be required at the end thereof to remain available for public use so long as the dead end exists. The Town may require improvements to be installed in temporary turnaround areas.

4. Intersections - The intersection of more than two streets at one point shall not be allowed, but where such occur roundabouts may be appropriate. Streets shall intersect at a 90-degree angle, or as near to a right angle as practicable, but not to exceed 5-degree deviation. Street intersections shall be rounded with a radius of 25 feet measured at the edge of asphalt for local streets and 25 feet for arterials and collectors. A minimum of a 13 feet radius shall be used at the intersection of right-of-way lines. AutoTURN, or equivalent, shall be used in commercial and industrial areas to evaluate intersection adequacy.
- F. Temporary turnarounds shall be required on all streets which shall be extended in the future and which exceed 150 lineal feet from the centerline intersections of the closest intersecting street. Additional right-of-ways or easements necessary to construct and maintain the temporary turnaround are also required. At such time that the temporary turnaround is removed due to adjacent improvements, the developer shall remove the temporary turnaround and construct the typical street section.
- G. Access to developments: Subdivisions containing ten (10) lots or more shall have at least two (2) street connections with existing public streets on an approved final plat for which a financial guarantee has been filed.
- H. When a subdivision abuts or contains an existing or proposed arterial, the Planning and Zoning Commission shall require limited access streets, reverse frontage with screen planting contained in a non-access reservation along the rear property line, deep lots with rear service alleys, or such other treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic. The same will be required on major streets where deemed in the best interest of the community.
- I. Street Visibility: In order to provide visibility for traffic safety, that portion of any corner lot shall be cleared of all growth (except isolated trees) and obstructions above a level of three feet (3') higher than the centerline of the street for a distance of at least thirty feet (30') from the right of way line. If directed, ground shall be excavated to achieve visibility. Trees and hedges over four feet (4') high shall not be permitted within six feet (6') of the street right of way.
- J. All streets within the Town shall be improved with pavements bounded by integral concrete curbs and gutters to an overall width in accordance with generally accepted road construction standards, rules and regulations, or as now or hereafter adopted by the Town council.
- K. Low Impact Development (LID) practices should be considered and implemented where possible in preliminary design. LID practices may include, but are not limited to, storm water swales, curb cuts, etc. If LID practices are not possible an explanation of reasoning needs to be presented to the Town Engineer.

- L. All roads constructed as part of a new development/project shall have a Chip Seal surface placed after the end of the 12-month warranty period. The Chip Seal shall be placed after end of the warranty period, but no more than 6 months.
- M. All patches/repairs/new construction on existing roads that run parallel to the curb and leave less than five (5) feet of existing asphalt on that half of the road shall place new asphalt from curb to centerline.

## **2.2 CURB, SWALES, SIDEWALK AND RAMPS**

- A. Curbs and gutters shall be installed by the developer through his/her contractor on existing and proposed streets in accordance with all the appropriate specifications of Clarkston Town. Curbs and gutters on all urban streets shall be concrete of the standard high back type unit, not less than two and one-half feet (2½') in overall width, and not less than seven inches (7") thick where the curb abuts the street pavement. In the case where a development/project connects to existing curb & gutter, match the existing curb & gutter. Curbs shall not be less than 7-inches thick where the curb abuts the street pavement.
- B. Handicap ramps, as per the approved Standard plan, and in compliance with the Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities (ADAAG) shall be constructed where any portion of the curb at a legal pedestrian crossing or marked crosswalk or any portion of the sidewalk in immediate contact with such curb is removed, except where there is an existing handicap ramp, then replacement of such portions removed shall occur. Truncated dome plastic panels cast into the concrete shall be yellow in color. Technical infeasibilities require approval from Town Engineer. Curbs, gutters, and sidewalks shall meet the minimum requirements of the ADA. All curb corners shall have a radius of not less than twenty-five feet (25'). ADA Standards more current than this version of the Manual shall prevail.
- C. Assure proper drainage away from ramps, roadway, and sidewalk. Stormwater inlets and catch basins shall be provided within the roadway improvements at points specified by the Town Engineer.
- D. All new projects require the installation of sidewalks and Curb & Gutter. Unless otherwise approved, sidewalks shall be located on both sides of the road according to Town Standards with a park strip located between the edge of road or curb and the sidewalk. Sidewalks shall be installed according to the specifications of Clarkston Town. Sidewalks shall be a minimum of 5 feet wide with a minimum of 4 inches of compacted untreated base course material as foundation materials. Depth of sidewalks and trails shall be 4 inches, except at residential driveways, which shall be 6 inches (Industrial/Commercial shall be a minimum of 8 inches thick) with a minimum of 4 inches of compacted untreated base course material as foundation materials. Sidewalks adjacent to curbs, when allowed by Clarkston Town, shall provide for sufficient area for pedestrian safety while simultaneously providing areas for snow storage during winter months. These sidewalks shall be a minimum of 6 feet in width. Trails shall be a minimum of 10 feet wide with a minimum of 4 inches of compacted untreated base course material as foundation materials. Sidewalks and Trails shall have full depth expansion joints with on-half inch minimum thickness expansion joint material at an interval of no less than 200 feet.
- E. Street drainage and drainage structures will be required as outlined in Drainage Design section.

## F. Driveways

1. All driveway approaches shall meet the following specifications:

	Residential	Commercial/Industrial
Minimum Width	10 feet	24 feet
Maximum Width	30' or 35% of lot frontage whichever is less	35'
Minimum Concrete Thickness	6 inches	8 inches
Minimum Base Course Thickness	4 inches	4 inches
Minimum Distance Between Driveways	See Driveway Offsets	20 feet

2. Driveway Location – Driveways for all uses except single-family homes shall not be closer than eight feet (8') to an adjacent interior property line and shall be set back a minimum of eighty feet (80') from the intersection of two (2) arterial streets and fifty feet (50') from any other street classification intersection. Special restrictions apply on State Highways. Projects or developments within 200 feet of a State Highway shall require input and approval from the Highway Department.
3. 3. Driveway Offsets - All single-family residential driveways shall be offset from other driveways by no less than twice the flare width. All others shall have a minimum separation of 10'.
4. 4. Common Driveways - Driveways along the property lines may be installed for common use of both adjacent properties only upon approval by the Town Engineer and guaranteed by a recorded access agreement. Such driveway width shall be limited to the maximum allowable individual driveway width. Common driveway width may be extended by up to 10' for Commercial and Industrial zones.
5. 5. All driveways shall have a swale at least 6" deep, midway between the asphalt and sidewalk, or no less than 4 feet from the edge of the road, or be piped with a minimum of 18" culvert with flared end sections.

### **2.3 STREET SECTIONS**

- A. All proposed streets, whether public or private, shall conform to the Town Street Cross Section Standards as adopted by the Town. Those streets which have not been designated on the master street plan shall be as required by the planning commission and Town council.
- B. All public streets shall be graded and surfaced in accordance with the standards, rules, regulations and specifications of Clarkston Town.
- C. Streets that are the primary access to a subdivision shall be constructed from back of curb to back of curb all others that are not the primary access roads shall be constructed with asphalt to the

center of the street plus an additional ten (10) feet of asphalt surface. The asphalt for the following standard street right of way (ROW) widths not considered to be the primary entry road are:

- D. All cut and fill slopes shall be a maximum of three (3) feet horizontal to one (1) foot vertical unless otherwise justified by a detailed soils investigation.
- E. Roadway structural section is dependent on subsurface conditions and traffic volume. They shall be determined by developer's licensed geotechnical engineer and approved by the Town Engineer. A soils investigation shall be submitted that includes:
  - 1. Soil borings along roadway centerline and other areas as needed
  - 2. Analysis on the overall bearing capacity of the soil
  - 3. Recommendation for structural street cross section
  - 4. Recommendation as to the requirements for land drain to adequately collect groundwater which could adversely affect development
  - 5. Cut and fill slope requirements
  - 6. Compaction requirements
  - 7. A geotechnical analysis shall be performed to determine the structural section. However, the minimum section shall be 3" Asphalt, 4" Untreated Base Course and 12" Structural Fill.
  - 8. If the soils report determines the California bearing ratio (CBR) is less than 5, a geotechnical pavement design must be completed.
- F. Pavement structure design for all streets shall be per AASHTO standards for pavement design and the following design parameters:
  - 1. Minimum Level of Reliability:
    - a. Arterials – 95
    - b. Collectors – 90
    - c. Local – 80
  - 2. Design Life – 20 years on all roads
  - 3. Minimum CBR Value for Materials:
    - a. Granular Borrow – 30
    - b. Untreated Base Course – 70

4. Design Loads – All roads shall account for a minimum of 5% trucks
5. Asphalt Binder – Revision to APWA 32 12 05 2.1 Asphalt Binder. All HMA shall have an asphalt binder of PG58-34 or PG64-34.
  - a. All laboratory test results required in the AASHTO procedure shall be provided to the Town Engineer.
  - b. Traffic coefficient derivation and data shall be provided to the Town Engineer.
  - c. The Project Engineer will be required to submit pavement structure design data for all sheets.

#### **2.4 GEOMETRIC DESIGN CRITERIA**

- A. The Vertical alignment shall be such as to minimize grade breaks along the centerline and curb lines. Allowable grade breaks shall not exceed 1% for local streets and minor streets. Maximum slope is 0.5% for collectors and arterials. Eliminate grade breaks in excess of the above criteria by means of a vertical curve of a one hundred feet (100') minimum in length for local streets unless otherwise approved, and three hundred feet (300') for major arterials. Vertical curve lengths shall be designed in accordance with the American Association of State Highway Transportation Officials (AASHTO) "Green Book"-A Policy on Geometric Design of Highways and Streets latest edition.
- B. Minimum slope allowed is 0.5% (applies to all gutter grades)
- C. Intersecting Street angles may vary between 85 and 95 degrees.
- D. Curve data is required for all centerline and curb line curves and also for all curb returns within intersections.
- E. Minimum horizontal centerline radius of 275' is required on all collector and higher classification streets. Local streets shall be designed with a minimum centerline radius of 165' unless otherwise waived by the Town Engineer to provide a means for traffic calming. No angle points shall be allowed along centerlines except as allowed within intersections. Horizontal curve lengths shall be designed in accordance with the AASHTO "Green Book"-A Policy on Geometric Design of Highways and Streets latest edition.
- F. Compound Curves, Broken Back Curves and Spiral Curves are not allowed on any roads within Clarkston Town.
- G. Roundabouts shall be designed following Federal Highway Administration's publication No. FHWA-RD-00-067 "Roundabouts: An Informational Guide" and the Guide & Manual on Uniform Traffic Control Devices (MUTCD). Concept shall be approved in advance by Town and the engineer.
- H. Minimum tangent between curves with a length of twice the right-of-way width is required along the centerline of all public roads.

- I. If possible the horizontal alignment shall be straight through the intersections, but where horizontal curves cannot be avoided, the following shall be observed
  - 1. Use a curve of sufficient radius to provide adequate sight distance and eliminate the need for super elevation. Under no condition shall the curve radius be less than that required for the street classification.
  - 2. Do not begin or end a curve within an intersection.
  - 3. Eliminate angle points in excess of 2 degrees on major or secondary roads by use of a large radius curve.
  - 4. Angle points up to 5 degrees are permissible at the intersection of two local streets.
  - 5. Curve radii and super elevation shall consider the design speed for the given road
  
- J. Jogs between intersecting centerlines of streets shall not be less than 150' for Local Streets with other Local Streets and shall not be less than 300' for any street classification intersecting a Collector or Arterial Street.
  
- K. Edge of Asphalt Radius = 25' – all intersections, (local, collector & arterial). Curb returns in commercial areas shall be evaluated using AutoTURN, or equivalent, to evaluate the need for larger radii to accommodate commercial traffic.
  
- L. Street Grades - Street grades over a sustained length shall not exceed the following percentages: on arterial public streets, 8 %; on local and collector streets, 10 %. In no event shall the street grades exceed those indicated, except where the topography makes it impracticable to keep within such grade, and where evidence, which is satisfactory to the Town Engineer, is given that a lower grade is not possible. Street grades near intersections shall be designed for adequate stopping and starting by adjusting grades on both sides of the intersection. Grades of all streets shall be a minimum of 0.5% unless specifically authorized by the Town Engineer. The cross slope of the street cross section is defined on the standard drawings.
  
- M. Alleys - Alleys shall have a minimum width of 24 feet. Alleys may be required in the rear of business lots but will not be accepted in residential blocks except under unusual conditions where such alleys are considered necessary by the Planning and Zoning Commission.
  
- N. Intersection Landings - A landing is defined as the area between the through street roadway and the point at which the side street grade begins to exceed 3%. The required minimum lengths of the landings are as follows:

Minor arterial	200 feet
Collector	100 feet
Local street	50 feet
Cul-de-sac	25 feet

## **2.5 MISCELLANEOUS**

- A. **Street Signs** - The developer shall install and pay the cost of traffic control signs, street name and other street signs required of his/her development, under the direction of the streets department lead. All signs and traffic control devices shall be designed and installed according to the current Manual on Uniform Traffic Control Devices (MUTCD). Street name signs shall not be mounted upon Stop signs, but be located on opposite corners as directed by the Streets Department. Signs required of the developer but installed by the Town shall be paid within 30 days after the installation. The required signage shall be included in the escrow for improvements of the development and will not be released until either installed by the developer or until payment of the costs incurred by the Town to install the necessary street signs has been made.
  
- B. **Street Trees or Shrubs** - Trees and shrubs planted on the Town right-of-way (area between property line and street or road pavement) will be determined on a case-by-case basis. Factors to be considered will include, but not be limited to, interference with or impact upon sub-surface infrastructure, overhead utilities, visibility and subsequent maintenance. Allowed plants, trees, and shrubs will become the property of the Town at the expiration of twelve months from planting; however, the adjacent property owner is required to maintain the flora according to applicable Town standards. Typically, trees planted in the front yard, shall be no closer than 3 feet to the front property line. Trees and shrubs shall not interfere with proper sight triangle(s). Refer to the most recent AASHTO Green Book for detailed drawing and description of the “sight triangle” that is required at intersections (Section 9.5.2 in 2011 AASHTO Green Book).
  
- C. **Survey Monuments** - Permanent survey monuments shall be accurately set and established at the intersections of centerlines of streets within the development and intersections with centerlines of existing streets and the beginning and ends of curves on centerlines or points of intersections or tangents. All permanent survey monuments shall remain in place or be reset at the developer's expense when approved by the Town Engineer, after curbs and gutter, sidewalks, base and pavement are installed. Monuments shall be of a type specified in Town standards, and all development plans shall be tied to a section corner or monument of record, as established by the Cache County Surveyor.
  
- D. **Bridges** - Design and construction of new bridges or box culverts, whether essential for the overall circulation plan of the Town or required only to serve a development, shall be approved in advance by the Town. For bridges identified as essential structures to the Town, the bridge shall be built to full right of way width, and in the case of a bridge required to serve only a development, the developer shall pay the total cost of construction. The developer shall comply with all the conditions imposed by the Town relative to the bridge location, design & construction. All bridge design shall be performed by a professional engineer as per applicable state laws.
  
- E. **Protection strips** - shall not be permitted at the end of or within the boundaries of a public street or proposed street or within any area intended for future public use.

## CHAPTER 3

### STREET LIGHTING DESIGN

#### 3.1 GENERAL

- A. A street lighting plan in conformance with the standards identified as “Typical Street Lighting Layout” in chapter 8.2 and Appendix A of these standards, shall be prepared for all major subdivisions. Street lighting plans shall indicate the location and height of luminaires, and luminaire style to be constructed. The style of luminaires and luminaire poles shall be as shown in the Manual of Design & Construction Standards. The developer shall provide street lighting in all new residential, commercial and industrial subdivisions, including poles, luminaires, and wiring. Lighting shall be “Dark Sky Friendly” according to the International Dark-Sky Association. Electrical wiring and connections shall be installed by an electrical contractor licensed in the State of Utah. Wiring shall conform to the most current electrical code(s). The lighting shall conform to the goals and policies of Clarkston Town and as approved by the Planning and Zoning Commission and the Clarkston Town Council. The developer is responsible to construct the lighting, connections and fusing to Rocky Mountain Power standards. The developer is responsible to coordinate with the Town to request electrical hookup by Rocky Mountain Power.
- B. Street lighting within Clarkston Town is to be designed in such a manner as to ensure the safe flow of nighttime pedestrian and vehicular traffic on dedicated public sidewalks and streets without being intrusive on the privacy of residences. Street lighting shall be placed at all intersections, at the end of cul-de-sacs, and at spacing not to exceed four hundred feet (400’) measured along the street right of way line.
- C. All obstructions within traveled roadways shall be protected by signs, barricades, and lights where necessary for the safety of the traveling public. All barricades and obstructions shall be protected at night by signal lights which shall be suitably distributed across the roadway and kept burning from sunset to sunrise.
- D. In specially designated areas of the Town, provide a level of street lighting which will contribute to economic growth, a sense of community identity, a reduction in street crime, and a feeling of security among the citizenry.
- E. Policies
  - 1. Provide street lighting at a level which reflects traffic safety needs.
  - 2. Provide multiple lights along each standard block of a commercially zoned district or location.
  - 3. Provide one 4,000K (neutral) Phillips Lumileds Luxeon R LEDs, per the standard drawing. Luminaire per the standard drawing at each roadway intersection, end of cul-de-sac, and at no less than 400 feet intervals on long roadways. These “intersections” include only those roadway junctions which carry through traffic, or which are formed by roadways which serve more than five residences. The style of fixture and pole shall be that as found in the Standard Drawing. Incorporate “Dark Sky Friendly” lighting according to the International Dark-Sky Association.



4. The Town Council or such Town staff member so designated by the Town Council shall administer all Town Street lighting and is at liberty to require additional street lighting in order to satisfy foreseen traffic safety needs or to eliminate safety hazards. These traffic safety considerations may include the following;
  - a. half block street intersection
  - b. cul-de-sacs
  - c. bending roadways
  - d. parking lot entrances and exits

## CHAPTER 4

### SITE DESIGN

#### 4.1 GENERAL

- A. The Town's general plan shall be used as an advisory guide for all subdivision layouts.
- B. Where trees, waterways, scenic points, historical spots or other Town assets and landmarks, as determined by the planning commission, are located within a proposed subdivision, reasonable steps should be taken to preserve these features.
- C. All grading design and earthwork shall comply with the most recent International Building Code Chapter 33.
- D. Fill slopes shall be no steeper than 2 horizontal to 1 vertical (2:1), or as determined by a soils engineer. All fills shall be compacted to a minimum of 90 percent of maximum density.
- E. Cut slopes shall be no steeper than 2 horizontal to 1 vertical (2:1), or as determined by a licensed geotechnical engineer.
- F. All public streets shall be maintained free of dust and mud caused by grading or construction operations.
- G. Compaction tests are required on all engineered fills and other locations which will be load bearing. All testing shall comply with the specification of Clarkston Town.
- H. All building pads at rough grade shall have a 1% slope from pad towards the street or designed drainage outlet.
- I. Dust shall be controlled during all phases of construction either by means of a water truck or other approved method.
- J. The minimum finished slope of any designed grade shall be 1% for soil, asphalt or gravel and 0.50% for concrete.
- K. Open ditches or canals shall not be allowed within or adjoining a subdivision except along rear or side lot lines. The subdivider shall work with irrigation, drainage or ditch companies as to:
  - 1. Methods of covering, realigning or eliminating ditches or canals within or adjoining the subdivision;
  - 2. The size of pipe and culverts required;
  - 3. The responsibility for the periodic inspection, cleaning and maintenance of such ditches, pipes and culverts. In cases where canals or ditches cross public roads or proposed public roads, specifications and grades for pipe or culvert must be approved by the Town Engineer.

- L. The subdivider shall install curbs, gutters and sidewalks on existing and proposed urban streets in all subdivisions and along all streets bordering such developments.

## **4.2 SUBDIVISIONS**

### **A. Blocks**

1. Clarkston Town blocks will measure six hundred sixty (660) feet by six hundred sixty (660) feet corner to corner along the points of the compass for a total of 435,600 square feet.
2. Streets with an outlet on both ends shall not exceed one thousand two hundred feet (1,200') in length, measured along the centerline. Blocks shall be wide enough to adequately accommodate two (2) tiers of lots.
3. Dedicated walkways through the block may be required where access is necessary to a point designated by the planning commission. Such walkways shall be a minimum of five feet (5') in width with a fifteen foot (15') dedicated right of way, but may be required to be wider where determined necessary by the planning commission. The subdivider shall surface the full width of the walkway with a concrete surface, install a vinyl fence or its equal four feet (4') high on each side and along the full length of each walkway and provide barriers at each walkway entrance to prevent the use of the walkway by any motor vehicle or by any other non-motorized vehicle wider than four feet (4').
4. Measurement shall be from right-of-way to right-of-way.
5. The width of streets and roads, as determined in accordance with the Clarkston Town Transportation Master Plan shall not be included in the block measurements.
6. Blocks and streets intended for business or industrial use shall be designed specifically for such purposes with adequate space set aside for off-street parking and delivery facilities as required in the land use ordinance.

### **B. Lot Design and Location.**

1. The lot arrangement and design shall be such that lots will provide satisfactory and desirable sites for building, and be properly related to topography, other natural conditions, existing or probable future utilities and right-of-ways, and to the character of surrounding development and to existing requirements and zoning ordinances. A subdivision should not create lots which would make improvement impractical due to size, shape, steepness of terrain, location of watercourses, problems of sewerage, driveway grades or other physical conditions. All lots shown on the preliminary and final plats must conform to the minimum requirements of Title 10 of the Clarkston Town Code, for the zone in which the subdivision is located.
2. Lots shall not be of such depth as to encourage the later creation of a second building lot at the front or rear.

The subdivider may be required to construct a fence, that includes a gate to access the park strip, which meets the requirements established by the planning commission along the rear lot lines of

double frontage lots. The subdivider shall also be required to landscape the park strip areas along those streets listed above or where double frontage lots are created. Where plant materials are required, automatic sprinkling systems shall be provided by the developer.

3. All side lines of a lot shall be approximately at right angles to straight street lines and radial to curved street lines.
4. All lots shall have the minimum required frontage on a dedicated street, improved to standards hereinafter specified, with a pavement width equal to at least twenty-five feet (25') and all main access roads to be at least back of curb to back of curb in width.
5. Remnants of lots less than the minimum size required by the zoning after the subdividing of a larger tract shall be added to adjacent lots rather than allowed to remain as unusable parcels. In no event shall the development of land create a lot which does not conform to the Zoning Ordinance requirements of Clarkston Town. No remnant parcel may be used for the purpose of detaining storm water.
6. Lots abutting upon a watercourse, drainage way, channel, stream or water body shall have additional depth or width, as required to assure that house sites are not located in the 100-year floodplain.
7. In the subdividing of any land, regard shall be shown for all natural features, such as trees, watercourses and bodies, which, if preserved, will add attractiveness to the proposed development.
8. Where a proposed residential lot is adjacent to a limited access highway, major highway, or major Town street, there shall be no direct vehicular access from individual lots to such roads
9. Buildings constructed on corner lots shall comply with the minimum setback for both streets, as provided in the Town Zoning Ordinance.
10. In front of areas designed for commercial use, or where a change of zoning to a zone which permits commercial use is contemplated, the street width shall be increased by such amount on each side as may be deemed necessary by the Planning and Zoning Commission to assure the free flow of through traffic without interference by parked or parking vehicles, and to provide adequate and safe parking space for such commercial or business districts.
11. Where the land included in a development includes two or more parcels in separate ownership and the lot arrangement is such that a property ownership line divides one or more lots, the land in each lot so divided shall be transferred by deed to either single or joint ownership before approval of the final plan, and such transfer certified to the Planning and Zoning Commission by the County Recorder.
12. Lots deemed by the Council to be uninhabitable shall not be platted for occupancy, nor for such other uses as will increase danger to health, life or property, but such land within the plat shall be set aside for such uses as shall not produce unsatisfactory conditions.
13. All plans, drawings, and details must conform with current Clarkston Town ordinances relating to planning, design and construction.

14. All subdivisions that contain or abut a canal, river, or stream shall dedicate to the Town permanent fifteen-foot (15') right of way along the west or south bank of said waterway, unless actual property is dedicated to the county for trails. The right of way, which shall be measured from the inside bank of the waterway, will be for the purpose of providing permanent public access to the waterway for maintenance and recreational purposes. In the event the proposed development borders the east and north banks and the west and south banks have already been developed, then the dedication shall be from the east and north banks. Any subdivision of property, subdivision, or lot located within 100 horizontal feet of an irrigation canal, ditch or lateral shall provide written notification to the irrigation company and supply the Town with a copy. The irrigation company will be allowed to provide comment. No dwelling shall be allowed within 10 horizontal feet of an irrigation canal without written approval from the irrigation company.
- C. Lot Grading- For residential developments, the plan shall be prepared in a manner that will allow the following conditions to be met prior to, or as part of, actual building construction. If necessary, individual lot grading plans will be required prior to issuance of building permits:
1. A minimum fall of six inches (6") in the first ten feet (10') away from any building is required, or as required by the most current edition of the International Building Code, whichever is more stringent;
  2. A maximum gradient of twenty-one percent (21 %) within four feet (4') of the foundation;
  3. Usable minimum yard area of three hundred (300) square feet with a maximum slope of five percent (5%);
  4. A minimum foundation exposure of eight inches (8") above finished grade;
  5. Slopes of three to one (3:1) and steeper must be sodded or have other acceptable erosion control materials and plantings and will be accepted only when the developer and his/her engineer can show this to be the most feasible approach and is accepted by the Town Engineer;
  6. Driveways or other accesses to Town streets and roads shall be designed in such a manner as to prevent draining water from any source, including but not limited to rain, snow melt, and irrigation surplus or cleaning, from flowing directly or indirectly onto the street or road surface.
  7. Entry walks shall not exceed five percent (5%);
  8. Minimum depth of cover for any sewer line shall be five feet (5').
  9. Do not cover or conceal the water meter lid or access to it. Water meters shall not be located behind fences.
  10. Do not cause the water meter to be more than eighteen inches (18" to 24") below the meter lid. See Section 5.01.I.

11. Grading shall allow for all utility requirements to be met, i.e. Plumb meter barrels an aligned meters at proper depth.

#### **4.3 EROSION CONTROL**

- A. Erosion Control Plan - Projects disturbing 1 acre or more must file a Notice of Intent with the Utah Division of Water Quality prior to construction. After receiving a proper permit from either the State of Utah (with a copy to Clarkston Town) or from the Town of Clarkston, a copy of the erosion control plan must be kept on site until construction is complete.
- B. An Erosion Control plan must be incorporated into projects to minimize soil erosion and to avoid sedimentation into the Town swells and storm sewer system, onto adjacent properties or into natural drainage courses.
- C. All grading and earthwork shall comply with the most recent International Building Code Chapter 33.
- D. Erosion control devices shall consist of one or more of the following: check dams, sandbags, hay bales, desilting basins, silt fences, berms, dikes, contour grading or other approved devices.
- E. Erosion control devices shall be modified as needed as the project progresses and plans of these changes submitted for approval as required.
- F. All public streets and storm drain facilities shall be maintained free of mud and debris caused by grading or construction operations.
- G. Graded areas adjacent to fill slopes located at the site perimeter must drain away from the top of the slope at the conclusion of each working day.
- H. All loose soil and debris which may create a potential hazard to offsite property shall be fully protected onsite to prevent any damage or be removed from the site as directed by the Inspector.
- I. Desilting basins or excavated pits are required prior to discharge into any private or public street, into any Town, State or County storm sewer system, onto adjacent properties or into natural drainage courses.
- J. Desilting basins shall not be removed or made inoperable without the approval of the Inspector.
- K. All silt and debris shall be removed from all devices within 24 hours after each storm event.
- L. All utilities must be protected to prevent damage due to erosion. If damage occurs, it shall be the responsibility of the developer to repair such damage at no cost to such utility and within a reasonable period.
- M. Erosion control devices shown on the approved plan may be removed when approved by the Inspector if the grading operation has progressed to the point where they are no longer required.

## CHAPTER 5

### CULINARY WATER SYSTEM DESIGN

As a condition of approval of the subdivision, the town council shall require each developer, which has not received preliminary approval prior to the adoption hereof, to provide one acre-foot of usable water per dwelling unit, residential lot, commercial lot, or separate parcel created by the subdivision whichever is greatest, to the Town. This contribution of water is intended to assist the Town in meeting the water supply needs brought on as a result of the development. This requirement or usable water may be satisfied through the application of one or a combination of the following options:

- A. Culinary quality water which, in the opinion of the Town, would qualify for conversion to a municipal use with a point of diversion residing in an existing Town diversion point or that may be transferrable to an existing Town diversion point.
- B. If the Town Engineer determines the Town has an adequate existing water supply and a sufficient water right to meet the foreseeable future needs of the Town, a subdivider or developer may in lieu of providing water, pay the amount identified in the most current "prevailing fee schedule" as set forth by the Town council. Fees collected by the Town shall be earmarked for the purpose of obtaining additional water rights or developing existing water resources. The Town may refund any fees received in accordance with this option if the subdivider or developer provides water in accordance with these standards.

#### 5.1 GENERAL

- A. Design of all portions of the culinary water distribution system shall comply with the State of Utah Administrative Rules for Drinking Water as amended for local conditions. Such systems shall be in accordance with Town standards and subject to the approval of the Town Engineer.
- B. Standard centerline alignment of culinary water lines will be no less than ten feet from the edge of the asphalt pavement.
- C. All culinary water systems shall be constructed of Ductile Iron pipe. Minimum mainline diameter shall be 8 inches. The use of C900 PVC pipe may be warranted where corrosive soil conditions exist. The Developer shall conduct soil corrosivity analysis along the pipe alignment(s) at minimum intervals of 600 feet, at the depth of the pipe(s). Where conditions are suspected, the Town Engineer may require additional testing at a greater frequency. A qualified laboratory shall perform and provide soil corrosivity tests.
- D. Minimum pressure allowed to each individual service shall not drop below 40 PSI.
- E. Magnetic locator tape is required with all new pipe installations. Tape shall be located in first lift above the pipe and be centered on pipe alignment. When C900 PVC is used, tracer wire shall also be installed along the pipe.
- F. Valves shall be located in all intersections. Locate additional valves so that a maximum segment length of 600' can be isolated.
- G. Fire hydrants shall be installed in all subdivisions in locations designated by the fire department

and Town Engineer. Fire Hydrants shall be spaced such that no structure requiring fire protection is more than 600 feet from a fire hydrant. Fire hydrants shall be of the dry barrel design with a minimum 5 ft bury. The gate valve for the service line shall be connected to the main line with a flanged fitting. Hydrants shall be Clow or East Jordan Iron Works (EJ) with 3 outlets.

- H. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. The material and backfill zones shall be as specified by the standards referenced in Subsection (1), above. As a minimum: for plastic pipe, backfill material with a maximum particle size of  $\frac{3}{4}$  inch shall be used to surround the pipe; and for ductile iron pipe, backfill material shall contain no stones larger than two (2) inches.
- I. Under no circumstances shall the pipe or accessories be dropped into the trench.
- J. The open ends of all pipelines under construction shall be covered and effectively sealed at the end of the day's work.
- K. Above Water Crossings: The pipe shall be adequately supported and anchored, protected from damage and freezing, and accessible for repair or replacement.
- L. Underwater Crossing:
  - 1. A minimum cover of two (2) feet or greater, as local conditions may dictate, shall be provided over the pipe.
  - 2. When crossing water courses that are greater than fifteen (15) feet in width, the following shall be provided:
    - a. Pipe with joints shall be of special construction, having restrained joints for joints within the surface water course and flexible restrained joints at both edges of the water course.
    - b. Isolating valves shall be provided on both sides of the water crossing at locations not subject to high ground water or flooding, so that the section can be isolated for testing or repair.
    - c. A means shall be provided, such as a sampling tap, not subject to flooding, to allow for representative water quality testing on the upstream and downstream side of the crossing.
    - d. A means shall be provided to pressure test the underground water crossing pipe.

## **5.2 METERS**

- A. All culinary water service lines shall be stubbed into each subdivision lot five feet (5') beyond the street property line at which point the meter barrel, setter and other appurtenances are to be installed in accordance with Town standards. The water meter itself will be installed by the Town upon request of the owner or developer and upon payment of the required connection fee. Minimum size shall be one inch (1") diameter for residential connections. One inch (1") service lines shall be constructed of either low lead copper Type K meeting AWWA standards or



constructed of blue polyethylene pipe meeting AWWA C901 and include a minimum 12-gauge tracer wire from the main line to the meter. Service lines larger than one inch (1") shall be constructed of blue polyethylene pipe meeting AWWA C901, and include a tracer wire from the main line to the meter. Tracer wires shall be long enough to come up and out of the meter barrel two (2) feet. Crimp type fittings shall not be allowed on service lines. Connections, other than the universal nut on meter setters, shall be compression type. All taps to existing lines will be completed by the Contractor and inspected by Clarkston Town. The location of water service shall generally be located five (5) to ten (10) feet from the street property line of the lot served, and be located within the front PUE, five (5) feet behind the sidewalk. Water services and sewer laterals shall be located at opposite corners of the lot. Water and sewer laterals shall be separated by a minimum of ten feet (10'). No joint trench will be allowed. Taps to lines in new subdivisions shall be completed and tested by the developer. Service saddles shall be epoxy coated with double stainless-steel straps. Refer to Appendix A of this manual for construction drawings.

- B. Meter setters shall be copper with an angle ball valve, a double check backflow preventer, and have Universal Nut connections. Compression type connections shall not be allowed. Setters shall be manufactured by Ford or A.Y. McDonald.
- C. Meter barrels shall be installed plumb and to finished grade. Barrels for 1-inch meters shall be 21-inch diameter and white in color. Barrels for 1.5-inch meters shall be 30-inch diameter and white in color. Meters larger than 1.5-inch shall be located in a concrete vault and include a meter bypass with a valve. Meter shall be located 18 to 24 inches below lid. Setter shall be plumb. Meter barrels shall have a minimum 48" diameter clearance from the center of the lid to permanent structures, fences, boulders or landscape for repairs and maintenance. No meter box shall be allowed in any driveway, driveway flare or sidewalk. Under extenuating circumstances approved by the Town, a meter located in a paved area, shall be in a 4 ft x 4ft x 4ft vault with a 24" lid. Water meters are not allowed in flower beds, etc. Meters shall be readily accessible for maintenance. Meter barrel extensions shall not be allowed, meter and barrel shall be raised as a whole where required. No meter shall be closer than 18" to 24" to any sidewalk or driveway.
- D. Clustered meters serving multiple dwellings/buildings, shall have the address engraved, or milled, into the meter lid. Arrangement of the cluster shall be in a logical manner and mimic the arrangement of the units being served. Taps shall be no closer than 1.5 ft, or as directed by the manufacturer.
- E. Inner block developments will be assessed on a case-by-case basis for clustered meters. Preference will be given to meters located adjacent to the building being served.
- F. All other utilities crossing the water main shall do so at as close to a right angle as possible.
- G. Perpendicular or skewed crossings between other utilities and water mains shall have clearance of at least 18 inches. Closer tolerances require a reinforcement concrete cradle in combination with no mechanical joints of either utility within 10 feet horizontally of the crossing or additional separation. Reinforcement shall be as per the current specifications. A 20 feet long separation sleeve may also be required as per current State of Utah Division of Drinking Water Standards. Cover over utilities and between railroad tracks or roadways shall be sufficient to adequately protect such utilities from potential loading of track or roadway either during construction or final finished surface. If cover is insufficient to adequately protect utility, encasement or casings shall be provided to protect affected utility.

- H. **Easements** - If the installation of a water system requires easements to Clarkston Town, the developer of such system shall convey such easements by deed for Clarkston Town. If easements are necessary for the installation and maintenance of public culinary water systems, such easements shall be a minimum of 20 feet in width with the water line centered within the easement. No buildings, utilities or structures shall be erected or constructed within such easements as to interfere with the activities necessary to properly access and maintain or replace such lines or water structures.
  
- I. **Disinfection & Testing** – All new main lines must be subjected to a 200 psi gauge pressure test for two hours in accordance with 3.4 Pressure Test of Part II of the Design Standards and Specifications Manual. All new main lines must be disinfected and subjected to a disinfection test in accordance with 3.7 Disinfection Test of Part II of the Design Standards and Specifications Manual and AWWA standards. Tests will be under the supervision of the Clarkston Town Public Works Department.
  
- J. Concrete collars are not required on valves and manholes.

## CHAPTER 6

### STORM DRAINAGE DESIGN

All subdivisions shall meet the current storm water design standards. Clarkston Town has adopted the Cache Valley Storm Water Design Standards (CVSWDS). Refer to the most current version. Each subdivision shall retain the volume of the ninetieth percentile (90%) storm and detain any amount beyond that amount with a release rate of no more than 0.1 cubic foot per second (0.1 cfs) or historical records whichever is less. With all storm water detention and retention areas, ponds, and sub-terrain structures to be retained on lots created by the sub divider to be sold to individuals and/or dedicated to the Town of Clarkston. The final plat shall indicate that Town employees shall have access to said storm water structures for periodic inspections.

#### 6.1 GENERAL

- A. A system to collect, convey, and dispose of stormwater shall be designed and constructed for all subdivisions. Professional engineers designing such systems shall refer the most recent version of the stormwater design standards adopted by the Town for guidance.
- B. Post-development peak runoff rates, including sheet flow, shall not exceed pre-development peak rates. Acceptable storm drainage and detention facilities will be required to meet this requirement.
- C. All storm water facilities must adequately handle runoff from the site development as well as all upstream contributing flows for specified storm events.
- D. Ditches and canals shall not be approved as a suitable means for storm drainage water disposal or conveyance without the written permission of the appropriate ditch or canal company. Ditches, canals or other waterways shall not be permitted within property dedicated or to be dedicated for public use.
- E. On site detention of stormwater may be required when in the opinion of the Town Engineer adequate facilities for stormwater disposal do not exist beyond the limits of the subdivision. Detention basins shall be sized in accordance with the most recently adopted stormwater design standards adopted by the Town. Retention basin should be avoided and only allowed when, in the opinion of the Town Engineer, no other reasonable option is available. Subsurface drains or other mechanism shall be constructed in conjunction with the retention basin which will ensure all the retained water will dissipate within seventy-two (72) hours.
- F. Conveyance of stormwater to any drainage facility owned by the Utah department of transportation shall be acceptable only upon approval of that department.
- G. The stormwater conveyance system, including pipes, inlet and outlet structures, junction boxes, etc., shall be designed to accommodate a 10-year storm event of proper duration for the drainage area being designed.
- H. A drainage system shall be designed to:
  - 1. Generally, honor all natural drainage divides and create no adverse impact on downstream properties.

2. Account for all off-site storm water and
  3. Convey discharge surface waters to the flow line of a natural watercourse or an adequate existing underground or above-ground conveyance system.
  4. Comply with the Town's Storm Water Master Plan.
- I. Design shall consider the provision of drainage easements for offsite contributory runoff through the site, to allow future improvements of adjacent developments.
  - J. A new discharge of concentrated storm water from a pipe, culvert, channel, or other drainage structure shall not be created through lands of another without first obtaining a permanent storm drainage easement and constructing a channel to guarantee continuity of an outfall from the point of discharge to the nearest natural or man-made watercourse.
  - K. If off-site downstream construction and easements are required to construct an adequate channel outfall, no plans shall be approved until such storm drainage easements, have been obtained and recorded.
  - L. All storm water conveyance systems that are to be maintained or become the responsibility of Clarkston Town are to be designed in a right-of-way that is dedicated or will be dedicated to Clarkston Town.
  - M. Storm water design and construction methods must adequately address potential problems which may arise during construction or by design so as not to pollute, erode, deposit sediment or cause any other degradation to existing natural condition.
  - N. All subdivision plat amendments must preserve easements for storm water conveyance.

## **6.2 DRAINAGE CALCUATIONS**

- N. Drainage calculations by a professional engineer shall be provided to show that all storm water facilities can adequately handle runoff from the site development as well as all upstream contributing flows.
- O. Calculations shall include a copy of the of the site grading and drainage plan, at the plan scale with the boundaries, acreages and C-factors of the interior drainage areas shown.
- P. Calculations shall also include a map at an appropriate scale delineating the boundaries, flow paths, acreages and C-factors of the drainage areas upstream of the development, which contribute storm water to the development.
- Q. Construction drawings shall show the location, size, flow line elevations, profiles and details of drainage facilities and structures, including, but not limited to swales, ditches, culverts under public streets and private drives, drop inlets, storm sewers and detention/retention ponds. Typical cross sections of all swales and ditches shall be shown.
- R. Profiles of streets shall show profiles of swells, storm sewers and cross sections of culverts

together with points of intersection. Profiles shall show clearance of such drainage facilities with water mains and sanitary sewers.

### **6.3 HYDROLIC PROCEDURES**

- A. Clarkston Town utilizes the most recent version of:
  - 1. Cache Valley Storm Water Design Standards (CVSWDS)

Additions and/or modifications to the CVSWDS, specific to Clarkston, are as follows;

- B. The maximum allowable discharge, or storm water runoff leaving the site, during the 100-yr event shall not exceed 0.1 cfs per acre.
- C. Storm water retention shall meet the 90th percentile rule that was adopted by the State Division of Water Quality. Thereby retaining the water that was calculated to be the 90th percentile of the last 30 years at a weather station. This value has been determined to be 0.65 inches.
- D. An inflow and outflow hydrograph will be required on all retention/detention basins.

### **6.4 ROAD DRAINAGE**

- A. Roads shall be designed for a minimum storm frequency of a 10-yr return period.
- B. The design spread for a 10-yr event shall be limited so that a minimum of 10 feet in each travel direction shall be kept free of flooding.
- C. Drainage flowing in street gutters shall be intercepted 100 percent, during a 10-year storm, prior to entering an intersection with another public street.
- D. No concentrated flow greater than one cubic foot per second shall cross a sidewalk or curb.
- E. Roadways shall be designed to handle a storm frequency of a 100-yr return period within the road right-of-way to prevent flooding of adjacent properties.
- F. Sag vertical curves classified as minor arterial or higher require the placement of three inlets in each curve. One inlet at the low point and one flanking inlet on each side of the low point. The flanking inlets shall be placed so that they will limit the spread in the low gradient approaches to the sag point and will act in relief of the sag inlet if plugged.
- G. No reverse curb and gutter shall be allowed in public rights-of-way.

### **6.5 STORM SEWERS**

- A. Storm sewer trunk lines and laterals shall be designed to adequately handle runoff from a 10-year storm or 2-hour 25-year storm.
- B. The hydraulic gradient of storm sewers for the post-development shall be lower than the gutter

line or grate inlet top elevation at all points.

- C. Allowable storm sewer pipe material is as follows:
  - 1. Concrete (reinforced or non-reinforced)
  - 2. High Density Poly Ethylene (HDPE) corrugated with smooth interior wall (ADS type)
- D. Pipe size shall be determined by required capacity but in no instance shall the minimum mainline size be less than 12" diameter.
- E. Cover over utilities and between railroad tracks or roadways shall be sufficient to adequately protect such utilities from potential loading of track or roadway either during construction or final finished surface. If cover is insufficient to adequately protect utility, encasement or casings shall be provided to protect affected utility.
- F. Minimum cover for storm sewer pipe shall be two feet vertically from finish grade to the outside crown of pipe, except where structural correction is provided and approved. Requests for less than two feet of cover shall be recorded on the plans and clearly denoted.
- G. Clearance between other utilities shall be at least 18 inches. Closer tolerances require reinforcement concrete cradle or other acceptable separation.
- H. Test pits will be required and shall be shown on the plans for all crossings which involve gas lines, water mains 12 inches in diameter and larger, sanitary sewer crossings which have minimum clearance, and all fiber optic telephone service lines. Test pits shall be dug, and clearances verified prior to installing any portion of the storm sewer system.
- I. Lines shall be installed with no horizontal or vertical deflection, unless authorized by Engineer.
- J. Storm Sewer manhole spacing shall be 350 feet maximum.
- K. Storm Sewer manholes shall be 4' diameter for in-line manholes where grade changes occur. 5' diameter manholes are required when deflection angle is greater than or equal to 45 degrees, when the manhole is a junction manhole of three or more lines, for sewers whose inside diameter is 12" or greater, or when the cover above invert elevations is 14 feet or greater. In all cases, manholes shall be sized to the minimum required to adequately properly accept a sealing boot per the manufacturer's requirements. All manholes shall be constructed with steps for maintenance access.
- L. All storm sewer taps, either public or private, into existing storm sewer piping shall be limited to 4" and 6" and shall be constructed by the contractor and inspected by Clarkston Town. All connections shall require a storm drain manhole to be constructed.
- M. M. Slopes resulting in a velocity greater than 10 ft/sec shall utilize drop manholes or reinforced concrete pipe to reduce damage to the invert of the pipe. Special design considerations shall be used for pipes with slopes greater than 10%. Pipes on slopes greater than 20% shall be anchored with concrete blocks at intervals and sized by a professional engineer.

- N. Curb inlets shall be of the “open back” type.
- O. All pipe connections to manholes, catch basins, and structures, shall be grouted.

## **6.6 SUBSURFACE DRAINAGE**

- A. When connected to the storm sewer, allowable Sub-Drain pipe materials are as follows:
  - 1. Concrete (reinforced or non reinforced)
  - 2. HDPE (High Density Polyethylene) corrugated with smooth interior walls for service laterals only (ADS type)
  - 3. PVC (Poly Vinyl Chloride) for service laterals only
- B. When connected to the storm sewer install magnetic locator tape 12 inches below finished grade centered along the subsurface drainage pipe alignment.
- C. If drains are used around building foundations, a typical section and layout of the peripheral drain shall be shown on the development plan and on individual grading plans. The upper end invert shall be a minimum of six inches (6”) below the finished grade of the basement floor and laid at a minimum grade of two percent (2%). Such drains shall not be connected to the sanitary sewer system under any circumstance.
- D. If the installation of a subsurface system requires easements to Clarkston Town, the developer of such system shall convey such easements by deed for Clarkston Town. If easements are necessary for the installation and maintenance of public subsurface systems such easements shall be a minimum of 20 feet in width with the line centered within the easement. No buildings, utilities or structures shall be erected or constructed within such easements as to interfere with the activities necessary to properly access and maintain or replace such lines or structures.
- E. Subsurface drainage lateral shall be clearly marked with identifiable tape or other approved method in order to avoid confusion with other drainage systems. Connections to the mainline shall be accomplished via adapters provided by the manufacturer.
- F. Subsurface drainage manholes shall be 4' diameter for in-line manholes where grade changes occur. 5' diameter manholes are required when deflection angle is greater than or equal to 45 degrees, when the manhole is a junction manhole of three or more lines, for sewers whose inside diameter is 12" or greater, or when the cover above invert elevations is 14 feet or greater. In all cases, manholes shall be sized to the minimum required to adequately properly accept a sealing boot per the manufacturers requirements. All manholes shall be constructed with steps for maintenance access.
- G. Sumps designed as part of the development’s detention systems shall only be allowed when approved by the Town Engineer and only when no available outlet exists and the soil conditions are such that will adequately permit the water to infiltrate properly. In areas within a well or spring protection zone, sumps will not be allowed unless first approved by the State of Utah Division of Drinking Water and the State of Utah Division of water quality. Under no circumstance will a sump be created without the above approval in writing. Subsurface drains or other mechanism shall be constructed in conjunction with the retention basin which will ensure

all the retained water will dissipate within seventy-two (72) hours.

- H. The capacity of sumps can only include the void area in calculating the required storage volume available. Percolation tests submitted by the developer must demonstrate that sumps can adequately dissipate the generated storm runoff in a reasonable time period.
- I. The developer must also demonstrate that the sump will not affect neighboring structures or basement areas.

## **6.7 CHANNELS AND CULVERTS**

- A. Channels and culverts shall generally be designed to adequately handle runoff from the design storm.
- B. The sides of all conveyance channels shall be extended until a minimum of six inches of free board is provided above the ten-year event water surface elevation within the conveyance channel.
- C. Conveyance channels with side slopes steeper than 3H:1V shall be stabilized by paving, riprap, gabions, or other approved measures.
- E. Culverts shall be designed and installed to account for ultimate right-of-way and road widths.
- F. Culvert design calculations shall include exit velocities.
- G. Culvert exit velocity shall be consistent with the maximum velocity in the natural channel or shall be mitigated by using energy dissipation devices and / or channel stabilization in accordance with "UDOT Manual of Instruction – Roadway Drainage".
- D. Reinforced concrete, or steel, flared end sections, with bars, shall be installed at the open ends of all storm drainage pipe. Concrete end walls may be accepted for pipes 42 inches in diameter or less subject to approval by the Engineer.

## **6.8 DETENTION/RETENTION FACILITIES**

- A. Detention and Retention basins shall be designed to adequately handle runoff from the design storm with 1 foot of freeboard.
- B. Basin outflow shall be limited to the maximum rate which maintains the adequacy of the channel and shall not exceed the rate shown in the CVSWDS. If a channel does not exist at the point of discharge, then one shall be constructed to convey the drainage to a stable outlet.
- C. Detention and Retention basins shall be designed with an emergency overflow for events greater than the 100-year storm event that safely conveys flood waters to a nearby street or other acceptable facility.
- D. Hand or computer-generated routing calculations are required along with inflow and outflow hydrographs.



- E. All above ground retention/detention facilities shall be designed to handle the design storm with a maximum depth of 2 feet and pass the 100-year storm while maintaining a minimum of one foot of freeboard. Sites designed with underground detention facilities shall be provided with a means of conveying the 100-year storm, or 0.1% storm, to a stable outlet without damage to structures, embankments, adjacent properties and other critical installations and without causing erosion.
- F. The use of pumps to drain detention facilities will not be allowed due to excessive and continual maintenance costs.
- G. Minimum conduit diameter for basin outlets shall be 12 inches. Basins requiring a lesser orifice size for flow control shall be provided with a manhole structure fitted with the required orifice. Orifice plates shall be removable and include a handle for lifting/removal. Above ground basins shall be provided with a low flow channel capable of conveying initial inflow and nuisance flows to the control structure without eroding the basin sides or bottom. Preference will be given to an under-flow pipe for this purpose.
- H. Safety measures shall be incorporated into the design of all stormwater detention facilities. These may include, but are not limited to safety ledges, fencing, warning signs, anti-vortex devices, stadia rod indicating depth at the lowest point, and outlet structures designed to limit public access.
- I. All detention and retention facilities must comply with current USEPA standards as a minimum.
- J. Detention and retention basins shall be designed to provide the following:
  - 1. Side slopes of 3:1 maximum
  - 2. All weather vehicular maintenance access around the entire basin (min 10-foot width)
  - 3. Lot shall provide normal frontage requirements
  - 4. No flag lots shall be used for detention facilities
  - 5. Flow through design which eliminates “wet basin” and conveys nuisance flows. A pipe under the basin for this purpose is preferred.
  - 6. Cross slope within basin shall provide adequate drainage. Under no circumstances shall the slope be less than 1% across any portion of the basin
  - 7. All retention/detention lots or easements shall be properly surveyed, and corners permanently marked prior to acceptance of improvements
  - 8. Shall be of a permeable material or xeriscape.
  - 9. Shall have a sprinkler system if landscape consists of grass and/or plants.
  - 10. Retention/detention lots shall have written access easements described and shown on the final plat and/or deed, for the purpose of non-restricted periodic inspection by the Town.

**K. Retention / Infiltration systems will be considered for review only if a soils and geo-technical report is provided which discusses soil permeability, potential effects on ground water and potential effects on underlying geologic strata. A percolation test will be required to determine the capacity of retention basins. The percolation test results shall include reductions, or adjustments, in measured infiltration rates to account for final surface improvements including live grass sod. All the retained water shall dissipate within seventy-two (72) hours. The developer must also demonstrate that the sump will not affect neighboring structures or basement / below grade areas.**

## CHAPTER 7

### MISCELLANEOUS DESIGN

All utilities including power, cable television, and telephone shall be underground and shall be so placed prior to road improvements such as asphalt surfacing, curb and gutter, and sidewalk.

#### 7.1 EASEMENTS

- A. Easements for culinary water, sewer, power, irrigation water, storm water drainage, wetlands and/or other utilities or purposes shall be provided by the developer and designated on the improvement plans and final plat or separate document as required to accommodate the utility systems in the development. Where natural drainage channels, interceptor systems, or flood hazard or sensitive area overlay zones cross the development, the developer must obtain the necessary permits to modify such drainage facilities, and designate the channels, systems, or flood hazard zones, and any associated restrictions, on the plat as well as provide the necessary easement dedication.
- B. Public utility easements shall be established on the sides of each subdivided lot. Minimum widths shall be five (5) feet on the sides of lot and (5) feet on the back of lots that abut other lots with a (5) feet wide easement. In the case where the back or side of a lot does not abut a lot with a PUE, then a (10) feet wide easement shall be established. In all instances, the intent is to have a (10) feet wide PUE between and around lots.
- C. Easements shall be provided along each side of the centerline of any watercourse or drainage channel whether or not shown in the comprehensive plan. All subdivisions that contain or abut a canal, river, or stream shall dedicate to the Town a permanent fifteen-foot (15') right of way along the west or south bank of said waterway, unless actual property is dedicated to the county for trails. The right of way, which shall be measured from the inside bank of the waterway, will be for the purpose of providing permanent public access to the waterway for maintenance and recreational purposes. In the event the proposed development borders the east and north banks and the west and south banks have already been developed, then the dedication shall be from the east and north banks. Sufficient width shall be provided to allow proper maintenance and protection and to provide for water runoff and installation and maintenance of storm sewers.
- D. Easements and area descriptions shall be of sufficient width to completely identify and provide for access and maintenance of the utility or identified restricted area.
- E. Easements to be dedicated to Clarkston Town which are not shown and described on the dedication plat shall be submitted to the Town Engineer on forms provided by the Town. Said easements shall include, by attachment, a drawing of the easement being dedicated and a complete legal description of the easement. The Developer shall record the easements at no cost to the Town and provide a copy thereof.
- F. Under no circumstance shall permits be issued or construction allowed without the proper easements in place to accomplish the work.
- G. If easements are necessary to cross abutting private property to permit drainage or utility access of the development, it shall be the responsibility of the developer to acquire and record such

easements at no cost to the Town.

- H. Both legal and physical accesses are required to all manholes, cleanouts, valves or other structures requiring periodic maintenance. Physical access shall consist of an all-weather surface sufficient to provide the need of all routine maintenance and repair equipment.

## **7.2 PUBLIC LAND DEDICATION, PARKS, OPEN SPACE**

- A. Where a proposed park, playground, or open space on the comprehensive plan is located in whole or in part in a subdivision, the Planning and Zoning Commission shall require that such area or areas be shown on plats in accordance with the requirements specified in this section. Such area or areas shall be dedicated to the Town by the subdivider if the Town approves such development.
- B. The Planning and Zoning Commission shall require that plats show sites of a character, extent and location suitable for the development of a park, playground, or other recreation purposes.

## **7.3 MONUMENTATION/STAKING**

- A. Survey stakes shall be placed at both front and back lot corners to completely identify the lot boundaries on the ground.
- B. All surveying, both horizontal and vertical, shall be tied to Cache County Monumentation, using UTM NAD 83 datum Zone 12 and NAVD 88 vertical datum.
- C. Hubs set for the construction of inlet boxes, manholes or other structures shall include a minimum of at least two hubs to adequately locate and align structure.
- D. Back lot corners shall be marked with a metal pipe or rod driven into the ground, and projected front lot corners shall be identified with permanent plugs in the sidewalk or back of the curb.
- E. All lot corners must be in place prior to the issuance of building permits and after the completion of all development improvements.
- F. It shall be the responsibility of the lot owner to ensure that all lot corners are in place prior to the final inspection. The Town is not responsible to replace survey stakes or markers.
- G. Care must be taken to not disturb, remove or alter any existing monumentation found, recorded or otherwise encountered during the development of property.
- H. Monuments shall be installed at all corners of platted subdivisions as well as major points of centerline road alignments which include Points of Intersection (PI) and/or Points of Curvature (PC), Points of Tangency (PT).
- I. Monuments for subdivision corners and road alignment key points shall be marked with two-inch (2") diameter brass caps. These caps may be set in concrete or be affixed to thirty-inch (30") lengths of galvanized pipe and shall be properly marked for identification as to location, shall carry the true elevation, shall be referenced if subject to destruction, and again shall show the proper identification and license of the certifying surveyor.

- J. All monumentation must be installed by the developer as required of the subdivision or as removed or disturbed during construction.

## CHAPTER 8

### CONSTRUCTION DRAWINGS

#### **8.1 PLAT TITLE BLOCK**

Clarkston City Standard Plat Title Block can be found in Appendix A.

#### **8.2 ROAD DRAWINGS**

The following list details the page number and drawing title. See Appendix A for the detail drawings.

RD-01A	Typical 99' Roadway Cross Section
RD-01B	Typical Partial Street Roadway Cross Section
RD-02A	Driveway Locations
RD-02B	Driveway Without Curb & Gutter
RD-03	Asphalt Patch Longitudinal
RD-04	Standard Temporary Turn-Around
RD-05	Typical Street Lighting Layout
RD-06	Standard Street Name Sign
RD-07	Standard Regulatory and Warning Sign

#### **8.3 CULINARY WATER DRAWINGS**

The following list details the page number and drawing title. See Appendix A for the detail drawings.

CW-01	¾" and 1" Water Meter with 1" Water Service
CW-01B	Water Service Relocation
CW-02	Trench Details
CW-03	Reduced Pressure Backflow Prevention (Ground)
CW-04	Reduced Pressure Backflow Prevention (Suspended)
CW-05	Double Check Valve Backflow Prevention (Surface)
CW-06	Double Check Valve Backflow Prevention (Sub-Surface)
CW-07A	Pressure Reducing Valve (PRV) EFI Station

CW-07B	Pressure Reducing Valve (PRV) HydeC Station
CW-08	Gate Valve
CW-09	Vent Cover
CW-10	Fire Hydrant Assembly
CW-11	1 ½" and 2" Meter
CW-12	2" Air Vac Combination
CW-13	Blow-Off Hydrant
CW-14	Thrust Block Details

**APPENDIX A**  
**CONSTRUCTION DRAWINGS**



CLARKSTON CITY STANDARD PLAT TITLE BLOCK

SURVEYOR'S CERTIFICATE

I, \_\_\_\_\_ do hereby certify that I am a Registered Civil Engineer, and or Land Surveyor, and that I hold certificate No. \_\_\_\_\_ as prescribed under the laws of the State of Utah. I further certify that by authority of the Owners, I have made a survey of the tract of land shown on this plat and described below, and have subdivided said tract of land into lots and streets hereafter to be known as \_\_\_\_\_ and that same has been correctly surveyed and staked on the ground as shown on this plat.

BOUNDARY DESCRIPTION

DATE \_\_\_\_\_

OWNER'S DEDICATION

Known all men by these presents that \_\_\_\_\_ the \_\_\_\_\_ undersigned owner ( of the above described tract of land, having caused same to be subdivided into lots and streets to be hereafter known as the

do hereby dedicate for perpetual use of the public all parcels of land shown on this plat as intended for Public use. Owners hereby agree to warrant and defend and save the City harmless against any easements or other encumbrance on a dedicated street which will interfere with the City's use, maintenance, and operation of the street

In witness whereof \_\_\_\_\_ have hereunto set \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20 \_\_\_\_\_

PERSONAL ACKNOWLEDGMENT

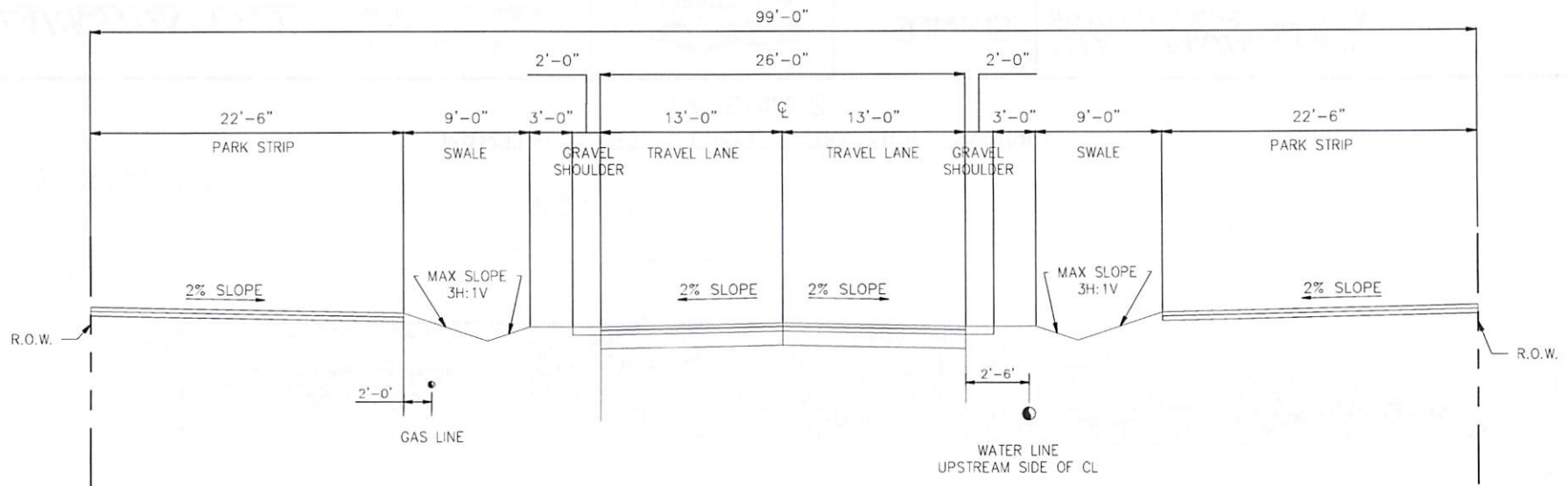
STATE OF UTAH : S.S.  
County of Cache :  
On the \_\_\_\_\_ day of \_\_\_\_\_ A.D. 20 \_\_\_\_\_, personally appeared before me, the undersigned Notary Public, in and for said County of Cache in said State of Utah, the signer ( ) of the above Owner's dedication \_\_\_\_\_ in number, who duly acknowledged to me that \_\_\_\_\_ signed it freely and voluntarily and for the uses and purposes therein mentioned.  
MY COMMISSION EXPIRES: \_\_\_\_\_

NOTARY PUBLIC  
RESIDING IN CACHE COUNTY

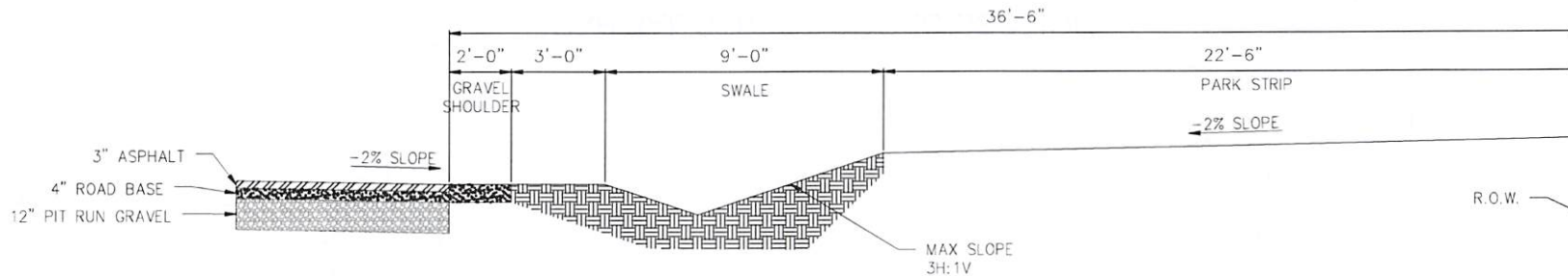
NOTE:

1. IT WILL BE THE DEVELOPER'S RESPONSIBILITY TO USE APPROPRIATE NOTARY ACKNOWLEDGMENT.

<p><u>QUEST COMMUNICATIONS</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY QUEST COMMUNICATIONS</p>	<p><u>PACIFICORP</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY PACIFICORP</p>	<p><u>CLARKSTON CITY FIRE DEPARTMENT</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY CLARKSTON CITY FIRE DEPARTMENT</p>	<p><u>CLARKSTON CITY MUNICIPAL SEWER</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY CLARKSTON CITY MUNICIPAL SEWER</p>	<p><u>CLARKSTON CITY MUNICIPAL WATER</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY CLARKSTON CITY MUNICIPAL WATER</p>	<p><u>CITY COUNCIL</u> PRESENTED TO THE CLARKSTON CITY COUNCIL THIS _____ DAY OF _____ A.D. 20 _____ AT WHICH TIME THIS SUBDIVISION WAS APPROVED AND ACCEPTED</p>	<p>RECORDED # _____ STATE OF UTAH, COUNTY OF CACHE, RECORDED AND FILED AT THE REQUEST OF _____ DATE _____ TIME _____ BOOK _____ PAGE _____</p>
<p><u>QUEST COMMUNICATIONS</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY THE CLARKSTON PLANNING COMMISSION</p>	<p><u>PACIFICORP</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY _____</p>	<p><u>QUESTAR</u> APPROVED THIS _____ DAY OF _____ A.D. 20 _____ BY QUESTAR</p>	<p><u>CLARKSTON CITY ENGINEER</u> I HEREBY CERTIFY THAT THIS OFFICE HAS EXAMINED THIS PLAT AND IT IS CORRECT IN ACCORDANCE WITH INFORMATION ON FILE IN THIS OFFICE</p>	<p><u>APPROVAL AS TO FORM</u> APPROVED AS TO FORM THIS _____ DAY OF _____ A.D. 20 _____</p>	<p>ATTEST: _____ CLERK MAYOR</p>	<p>FILE # _____ CACHE COUNTY RECORDER</p>



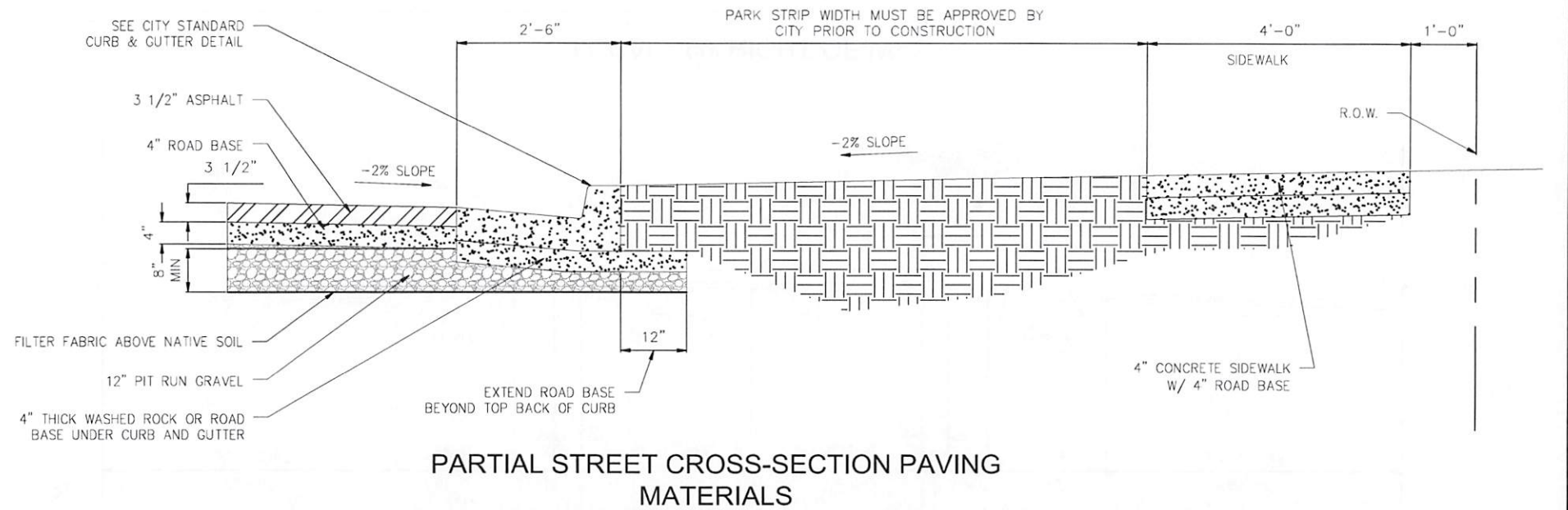
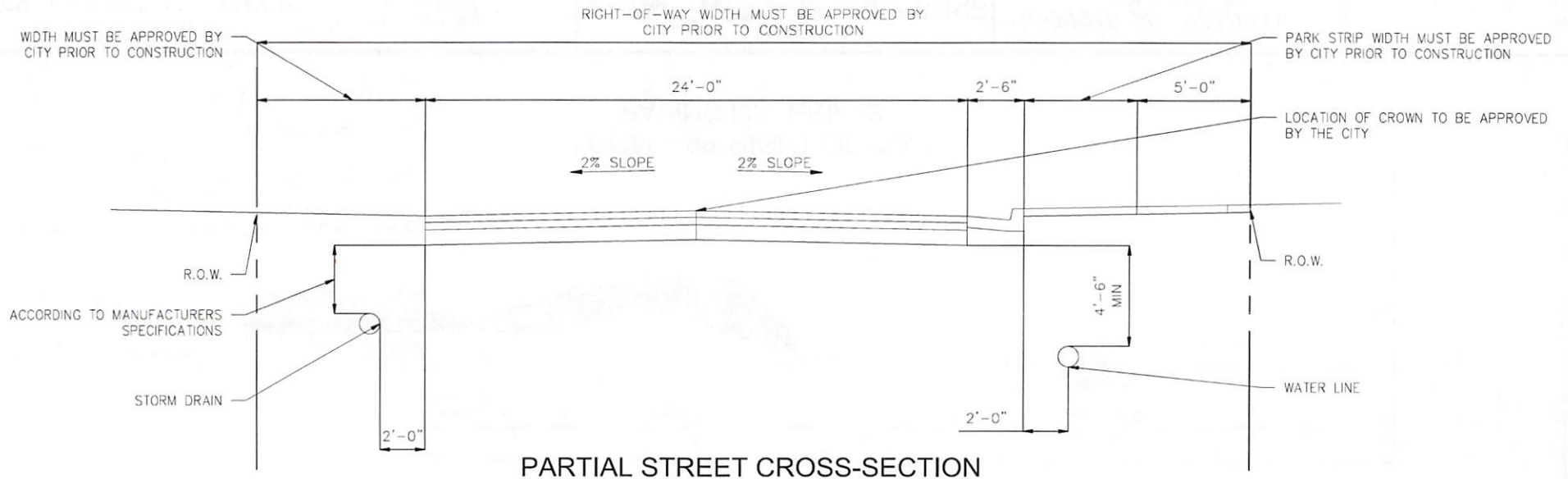
LOCAL - 99' RIGHT-OF-WAY



LOCAL - 99' RIGHT-OF-WAY  
PAVING MATERIALS

NOTE:

1. IF THE SOILS REPORT DETERMINES THE CALIFORNIA BEARING RATIO (CBR) IS LESS THAN 5, A GEOTECHNICAL PAVEMENT DESIGN MUST BE COMPLETED.
2. MINIMUM THICKNESS OF BITUMINOUS SURFACE, UNTREATED BASE COURSE AND GRANULAR SUBBASE ARE 3, 4, AND 12 INCHES RESPECTIVELY.
3. THE 2' GRAVEL SHOULDER SHALL BE MADE OF GRAVEL OR ROAD BASE MATERIAL.
4. THE 3' ADDITIONAL SHOULDER SHALL CONSIST OF NATIVE VEGETATION.



**CLARKSTON CITY**

50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090

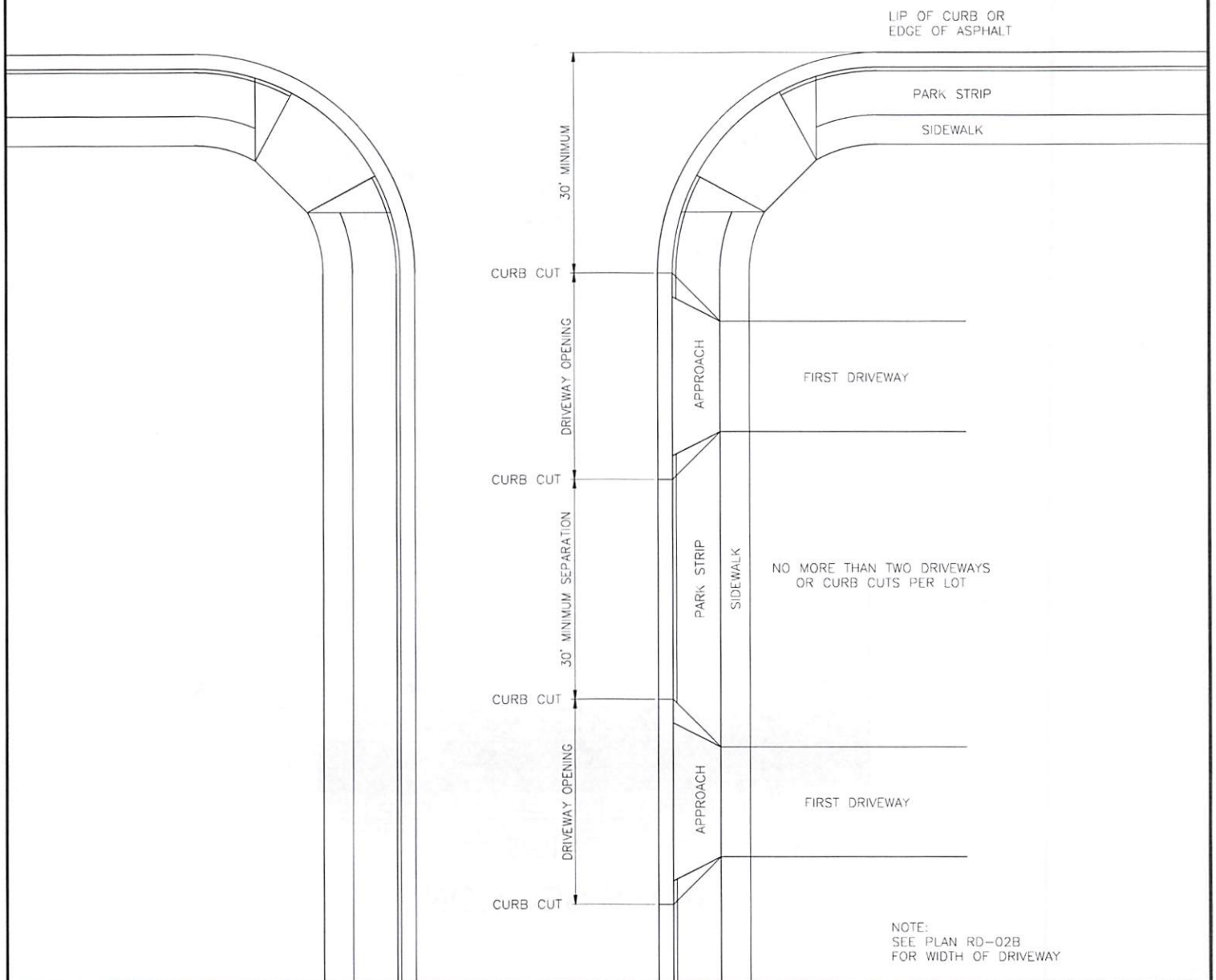


TYPICAL PARTIAL STREET  
ROADWAY CROSS SECTION

RD-01B

DATE: 06-02-22

STREET INTERSECTION



**CLARKSTON CITY**  
50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090

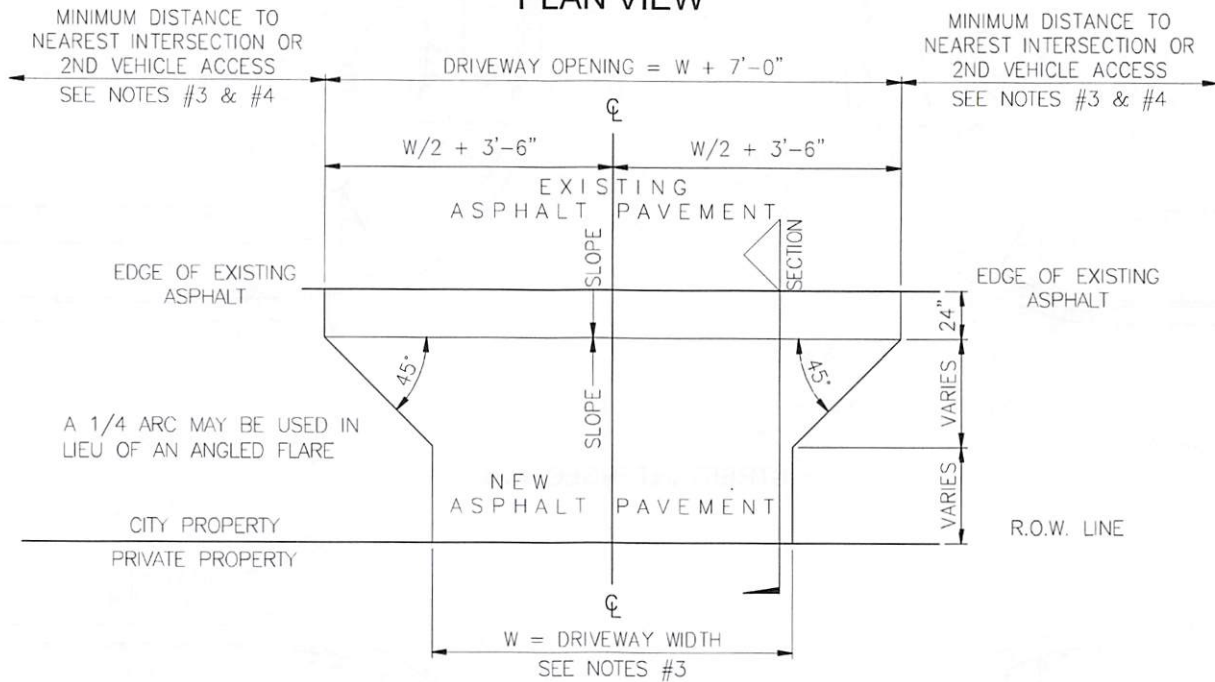


*DRIVEWAY  
LOCATIONS*

RD-02A

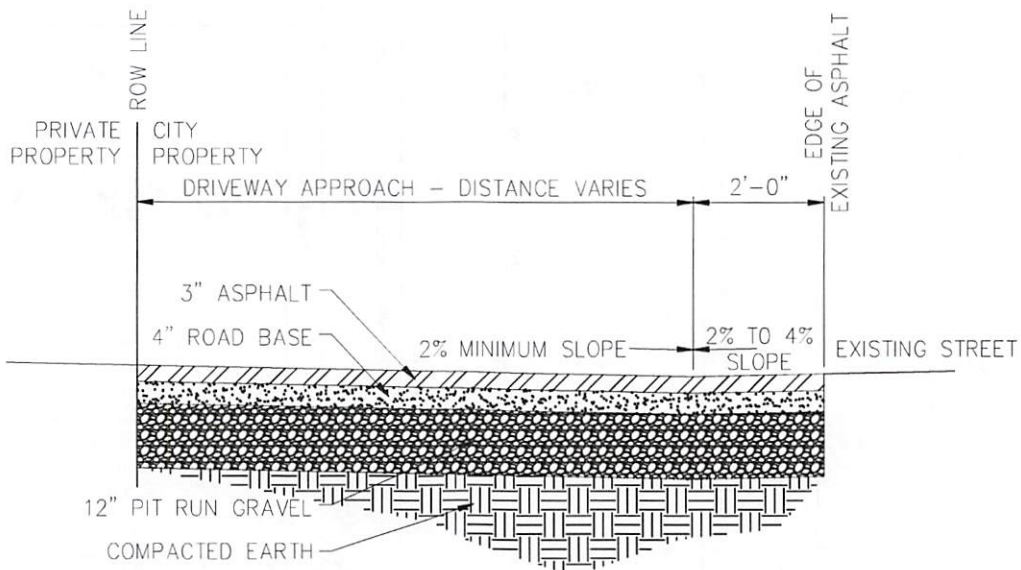
DATE: 06-02-22

## PLAN VIEW



**NOTES:**

1. ALL NEW ASPHALT WITHIN THE CITY RIGHT-OF-WAY SHALL BE 3 1/2" THICK OVER A 4" THICK ROAD BASE AND 12" THICK PIT RUN GRAVEL
2. IN COMMERCIAL ZONES, DRIVEWAY WIDTH SHALL NOT EXCEED 50 FEET. IN RESIDENTIAL ZONES, DRIVEWAY WIDTH SHALL NOT EXCEED 25 FEET.
3. NO DRIVEWAY SHALL BE CLOSER THAN 30 FEET TO A STREET INTERSECTION OR TO A SECOND DRIVEWAY OR CURB CUT. SEE DRIVEWAY LOCATIONS PLAN
4. NO LOT SHALL HAVE MORE THAN TWO VEHICULAR ACCESS POINTS OR CURB CUTS.



## CROSS SECTION

**CLARKSTON CITY**

50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090



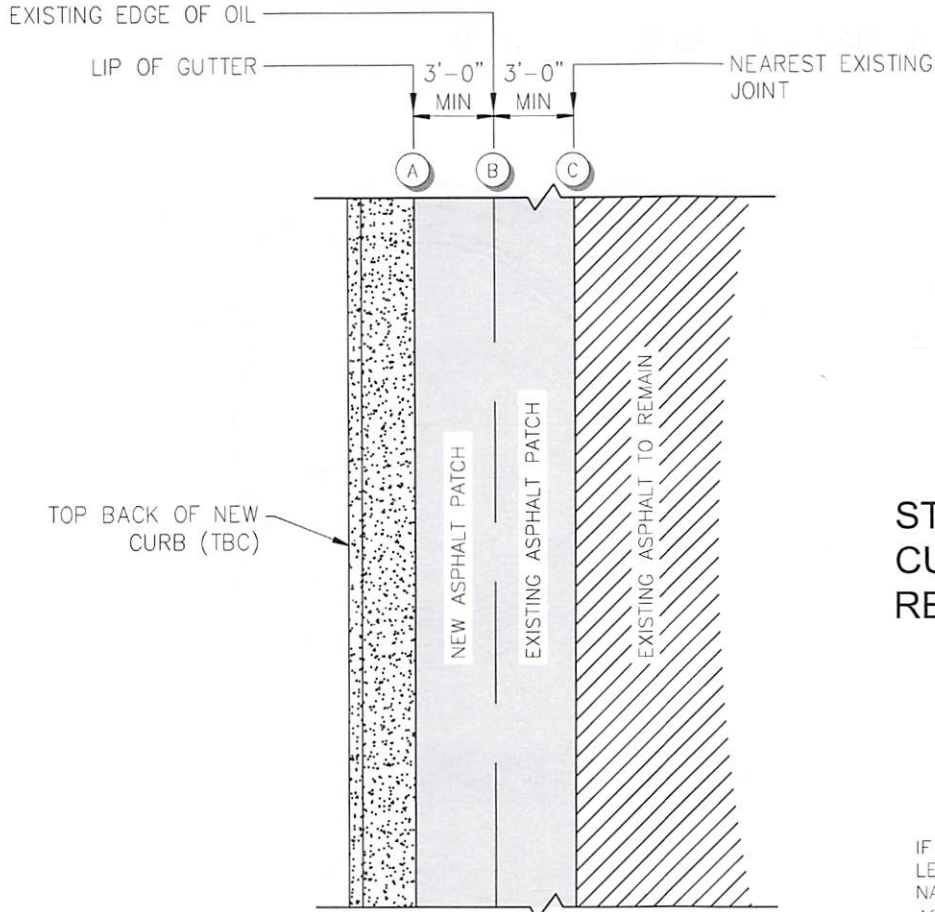
*DRIVEWAY WITHOUT  
CURB & GUTTER*

RD-02B

DATE: 06-02-22



# PLAN VIEW OF STREET

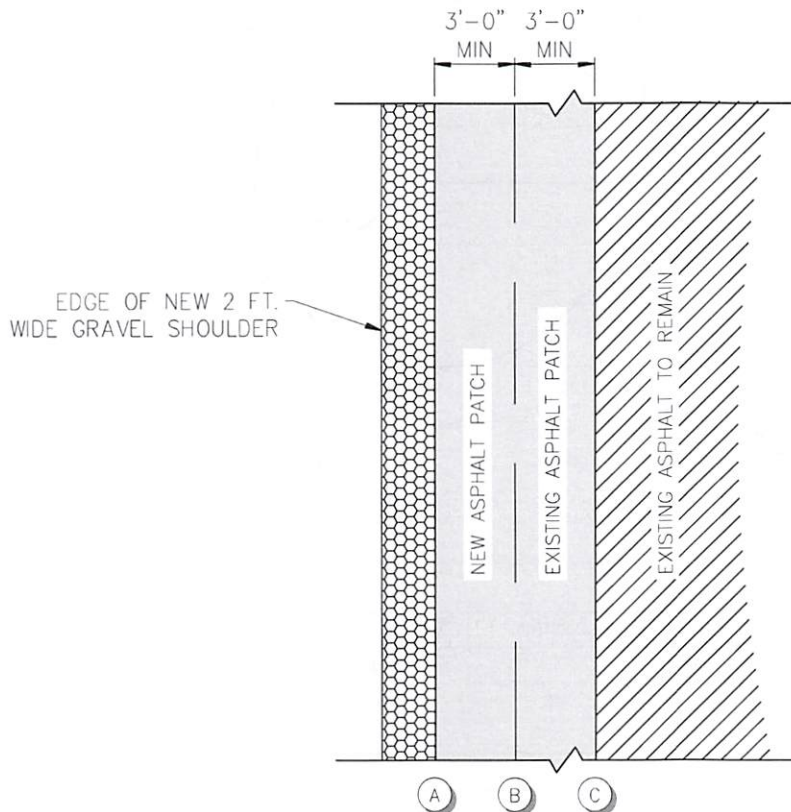


## STREETS WHERE NEW CURB & GUTTER IS REQUIRED

IF THE EXISTING ASPHALT PATCH IS LESS THAN 3 FEET WIDE AT ITS NARROWEST POINT, THEN INSTALL NEW ASPHALT BETWEEN LINES (A) AND (C)

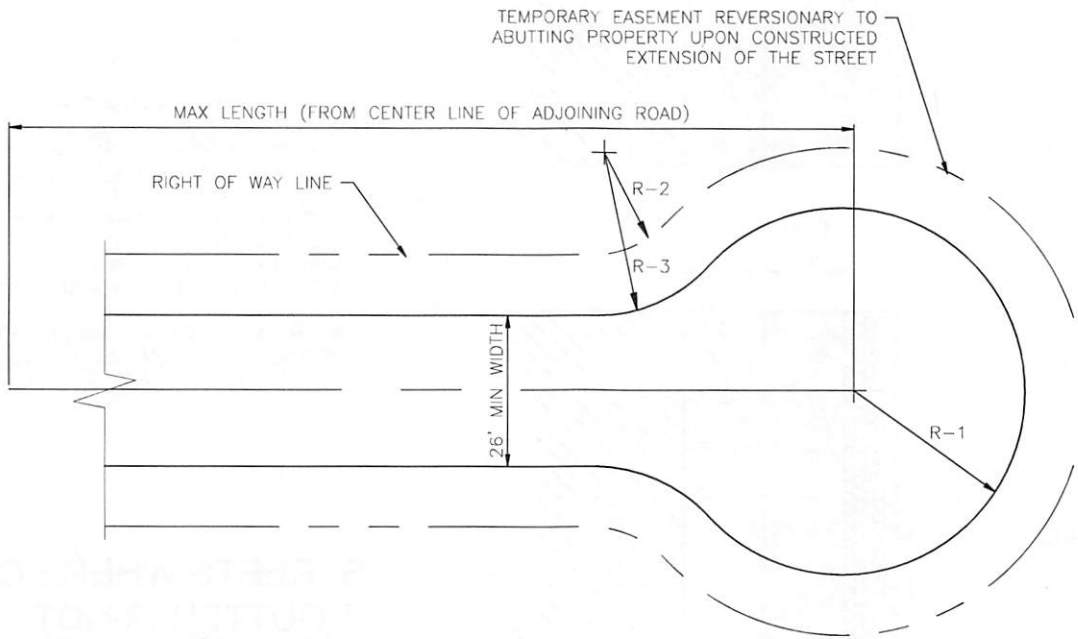
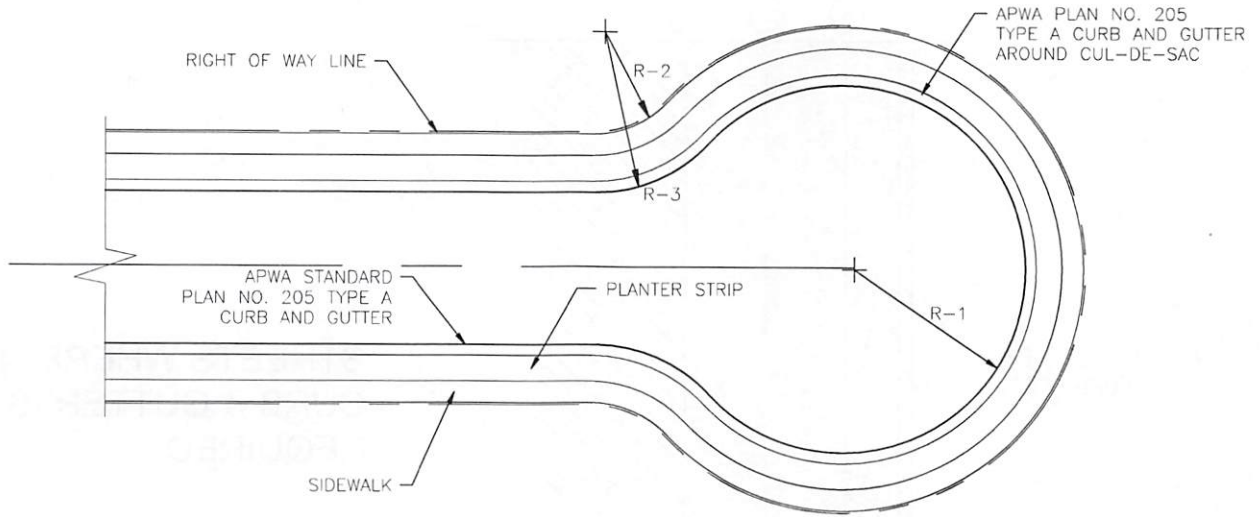
IF THE EXISTING ASPHALT PATCH IS GREATER THAN 3 FEET WIDE AT ITS NARROWEST POINT, THEN INSTALL NEW ASPHALT BETWEEN LINES (A) AND (B)

WHERE NEW ASPHALT ADJOINS EXISTING ASPHALT, PRIME AND SEAL THE EDGE OF THE SAW CUT WITH TACK OIL



## STREETS WHERE CURB & GUTTER IS NOT REQUIRED

STANDARD TEMPORARY TURN-AROUND



ALL TEMPORARY TURN-AROUND VARIATIONS MUST HAVE APPROVAL OF CITY ENGINEER.

	RESIDENTIAL	INDUSTRIAL	MAX LENGTH
R-1	48	55	500
R-2	30	30	500
R-3	15	28	500

**CLARKSTON CITY**

50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090



STANDARD TEMPORARY  
TURN-AROUND

RD-04

DATE: 06-02-22



**LEGEND**

★ STREET LIGHT

MID LOT SPACING  
BY APPROVAL ONLY

SPACING:  
250' FOR  $\le 80'$  R.O.W.  
200' FOR  $\ge 80'$  R.O.W.

INTERSECTION  
LIGHTING

**CLARKSTON CITY**

50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090

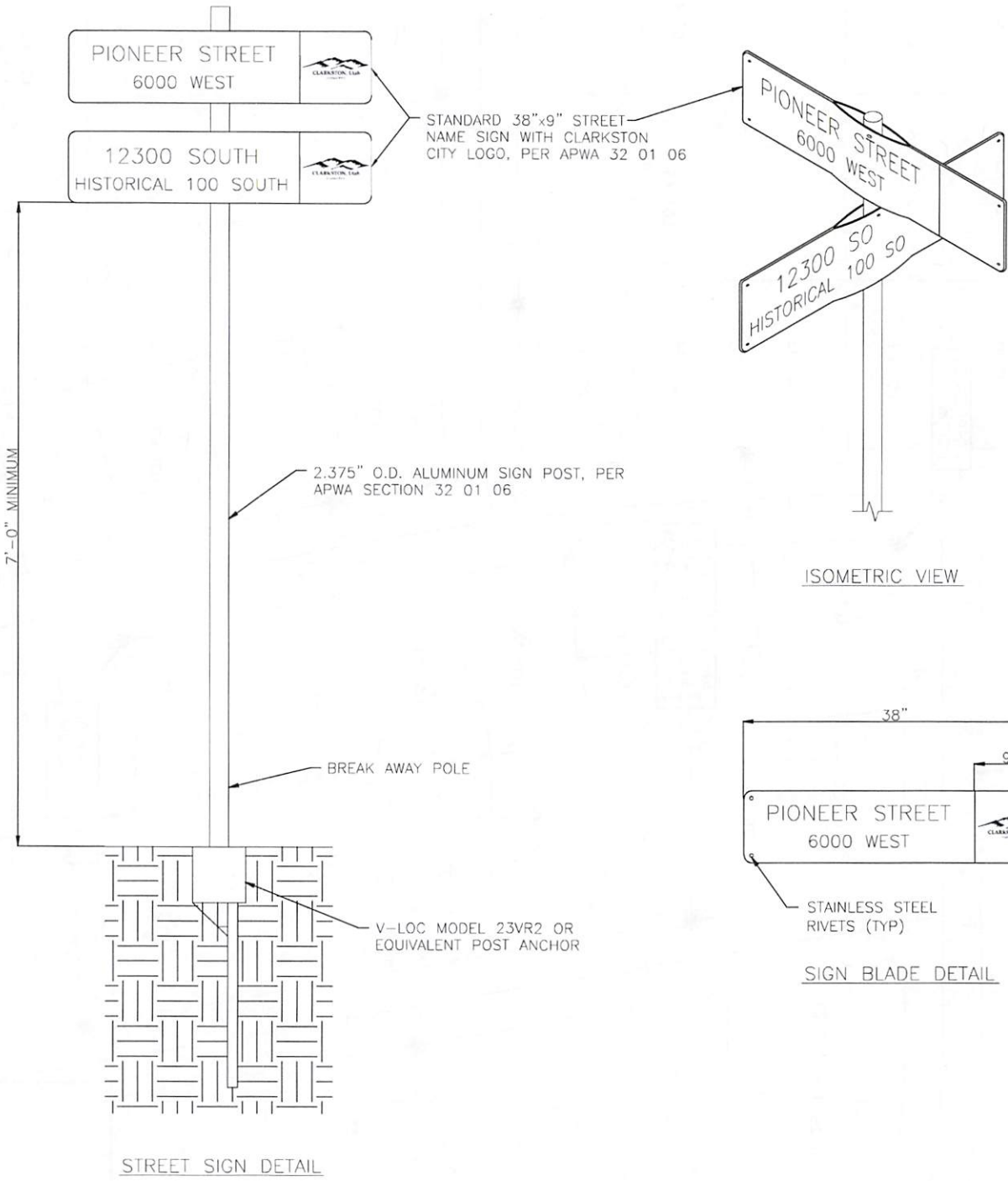


TYPICAL STREET  
LIGHTING LAYOUT

RD-05

DATE: 06-02-22





STANDARD 38"x9" STREET NAME SIGN WITH CLARKSTON CITY LOGO, PER APWA 32 01 06

2.375" O.D. ALUMINUM SIGN POST, PER APWA SECTION 32 01 06

BREAK AWAY POLE

V-LOC MODEL 23VR2 OR EQUIVALENT POST ANCHOR

ISOMETRIC VIEW

SIGN BLADE DETAIL

STREET SIGN DETAIL

NOTES:

1. INSTALL PER APWA 32 01 06.
2. EACH SET OF STREET NAME SIGNS SHALL HAVE ITS OWN SIGN POST. NO OTHER SIGNS SHALL BE MOUNTED ON THE POST WITH THE STREET NAME SIGNS.
3. ALL STREET NAME SIGNS SHALL BE 7'-0" MINIMUM FROM GROUND TO BOTTOM OF SIGN.

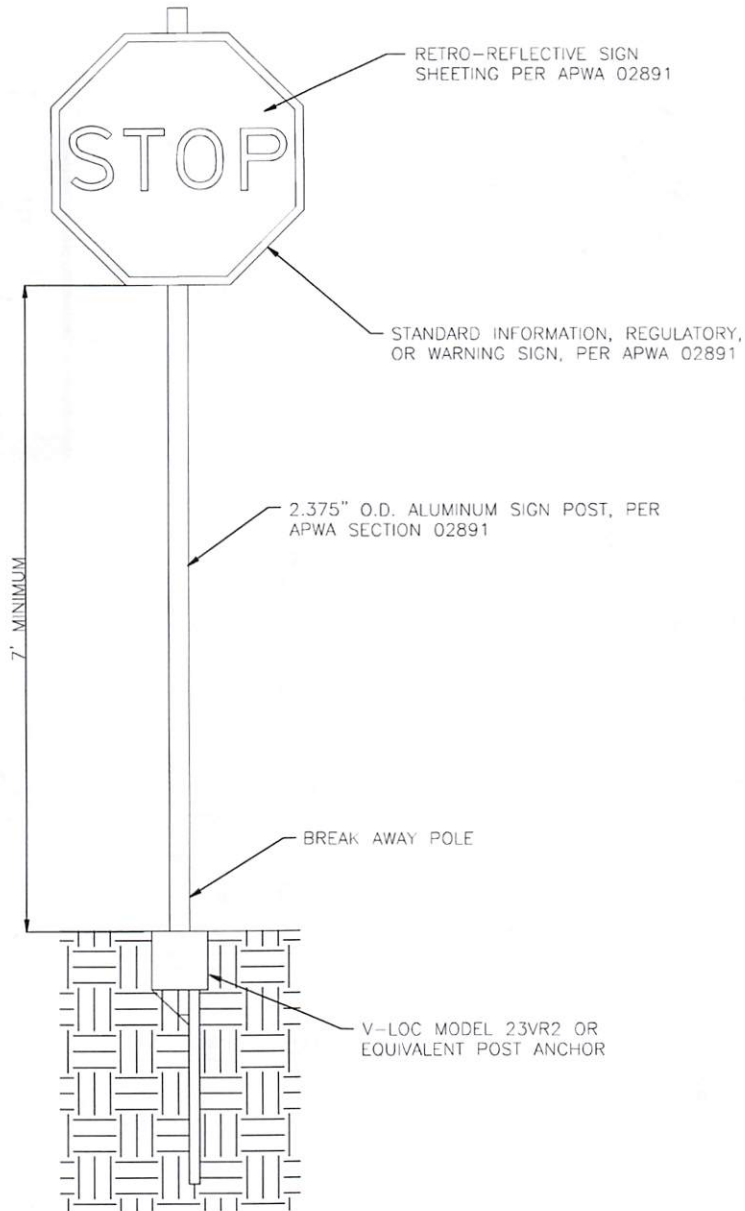
**CLARKSTON CITY**  
 50 SOUTH MAIN  
 PO BOX 181  
 CLARKSTON, UTAH 84305  
 TEL: (435) 563-9090



STANDARD STREET NAME SIGN

RD-06

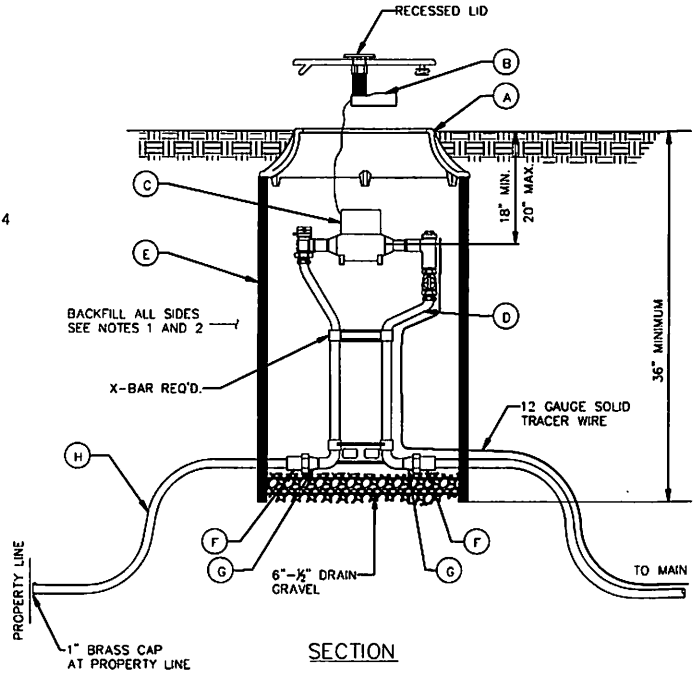
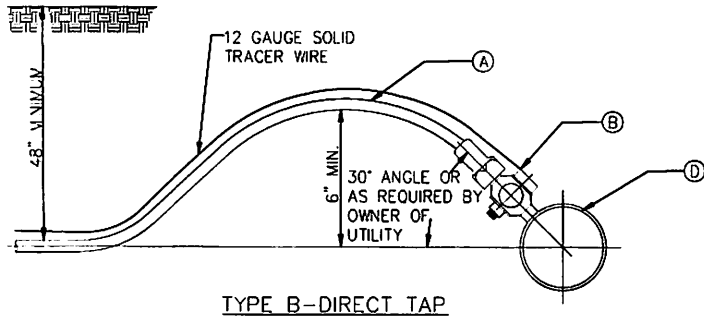
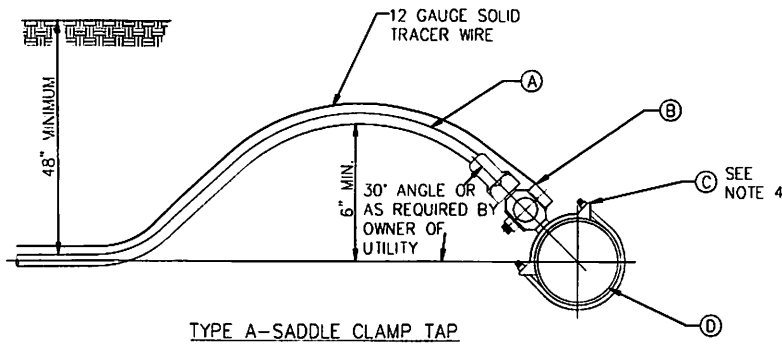
DATE: 06-02-22



REGULATORY AND WARNING SIGN DETAIL

- NOTES:
1. INSTALL PER APWA 32 01 06.
  2. EACH SET OF STREET NAME SIGNS SHALL HAVE ITS OWN SIGN POST. NO OTHER SIGNS SHALL BE MOUNTED ON THE POST WITH THE STREET NAME SIGNS.
  3. ALL STREET NAME SIGNS SHALL BE 7'-0" MINIMUM FROM GROUND TO BOTTOM OF SIGN.

**3/4" AND 1" WATER METER  
WITH 1" WATER SERVICE**



LEGEND		
No.	ITEM	DESCRIPTION
(A)	3/4" COPPER TUBE SIZE POLY PIPE BELOW 2ND WEST 1" COPPER TUBE SIZE POLY PIPE ABOVE 2ND WEST	CTS POLY PIPE
(B)	1" CORPORATION STOP	FORD—FB 1001—4—0 OR AY MCDONALD 4764
(C)	SERVICE SADDLE CLAMP	FORD—FB 11001—4—0 OR JCM INDUSTRIES 406
(D)	WATER MAIN PIPE	(D.I., P.V.C.) *

\* DI PIPE MAY BE DIRECT TAPPED  
\* IF DIRECT TAP USE CC THREADS

**A** DETAIL — 1" MINIMUM SERVICE TAPS  
D-1 SCALE: NTS (TYP)

LEGEND		
No.	ITEM	DESCRIPTION
(A)	FRAME AND COVER	21" CAST IRON (grass) 21" DUCTILE IRON (traffic) THE WORDS "WATER METER" CAST INTO COVER. 4" DIA. RECESSED HOLE REQ'D IN COVER
(B)	RADIO UNIT	PROVIDED BY CLARKSTON CITY
(C)	WATER METER	PROVIDED BY CLARKSTON CITY
(D)	WATER METER YOKE	COPPER METER YOKE FORD OR MUELLER
(E)	METER BARREL	21" WHITE HOPE OR CORRUGATED PVC BARREL
(F)	CONNECTION	COMPRESSION FITTING
(G)	BUSHING	1" MALE X 3/4" FEMALE BUSHING
(H)	1" POLY PIPE	CTS POLY PIPE

**B** DETAIL — 3/4" METER  
D-1 SCALE: NTS (TYP)

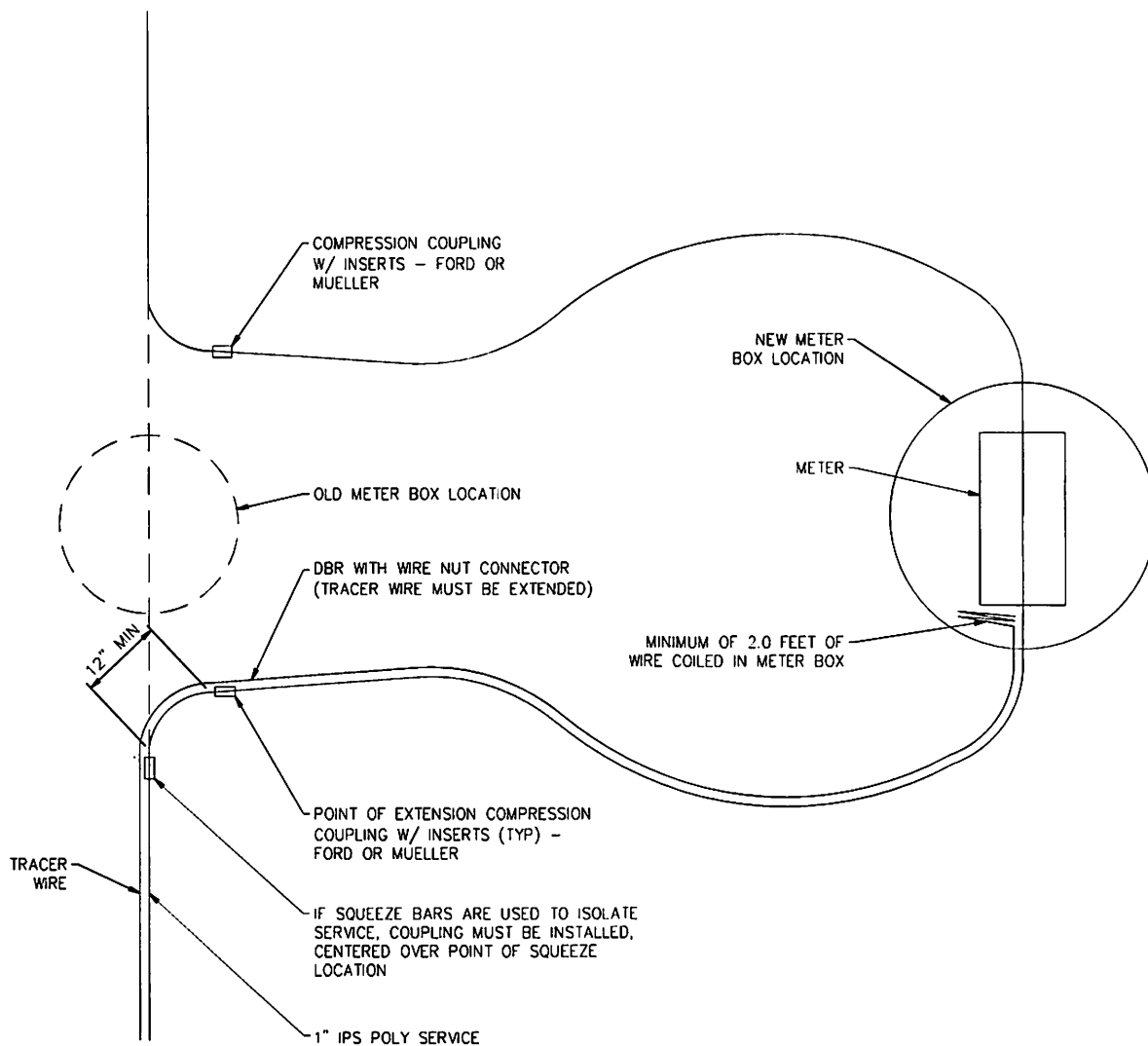
**NOTES FOR  
3/4" AND 1" SERVICE TAPS**

- INSPECTION: PRIOR TO BACKFILLING AROUND THE METER BOX, SECURE INSPECTION OF INSTALLATION BY ENGINEER.
- BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER APWA SECTION 02320.
- TAPPING: PLACE TAPS A MINIMUM 24 INCHES APART. USE A TAPPING TOOL WHICH IS SIZED CORRESPONDING TO THE SIZE OF THE SERVICE LINE TO BE INSTALLED. NO TAPS WITHIN 24 INCHES OF THE END OF PIPE.
- PVC PIPE: A SERVICE SADDLE CLAMP IS REQUIRED ON ALL PVC PIPE UNLESS SPECIFIED OTHERWISE.
- TAPE: TEFLON TAPE IS REQUIRED ON ALL TAPS.
- 4' CLEARANCE FROM FENCES, BOULDERS, PERMANENT STRUCTURES, ETC.
- 24" FROM SIDEWALK AND DRIVEWAY & DRIVEWAY FLARE

PERSONAL PUMPS ARE NOT ALLOWED PER  
STATE CODE

**NOTES FOR  
3/4" METER WITH 1" SERVICE LINE**

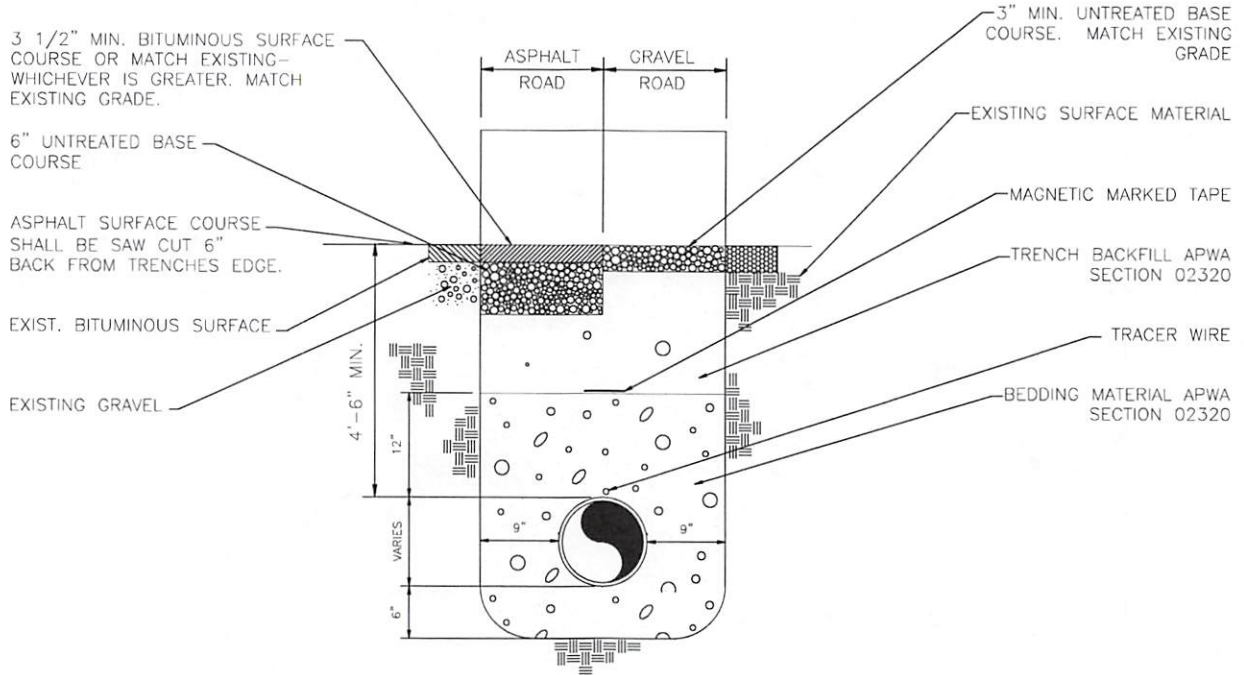
- INSPECTION: PRIOR TO BACKFILLING AROUND THE METER BOX, SECURE INSPECTION OF INSTALLATION BY ENGINEER.
- BACKFILLING: INSTALL ALL BACKFILL MATERIAL PER APWA SECTION 02320 IN LIFTS NOT EXCEEDING 6 INCHES AFTER COMPACTION. COMPACT EACH LIFT TO A MINIMUM RELATIVE DENSITY OF 95 PERCENT.
- METER IN TRAFFIC AREAS: PROVIDE SAME TYPE OF METER BOX AS REQUIRED FOR 1 1/2" AND 2" SERVICE METERS.
- METER: CLARKSTON CITY WILL PROVIDE AND INSTALL METER.
- PIPE: INSTALL IPS POLY PIPE TO PROPERTY LINE. COORDINATE WITH UTILITY AGENCY FOR TYPE OF PIPE TO BE USED OUTSIDE OF RIGHT-OF-WAY.
- PLACEMENT:
  - DO NOT INSTALL METERS BOX UNDER DRIVEWAY APPROACHES, SIDEWALKS, OR CURB AND GUTTER.
  - IN NEW CONSTRUCTION, INSTALL METER NEAR CENTER OF LOT IN PARKSTRIP.
  - IF METER IS LOCATED IN DRIVEWAY, HOMEOWNER IS REQUIRED TO LOCATE METER OUTSIDE OF DRIVEWAY AT HIS EXPENSE.
- 4' CLEARANCE FROM FENCES, BOULDERS, PERMANENT STRUCTURES, ETC.
- 24" FROM SIDEWALK AND DRIVEWAY & DRIVEWAY FLARE



**NOTES**

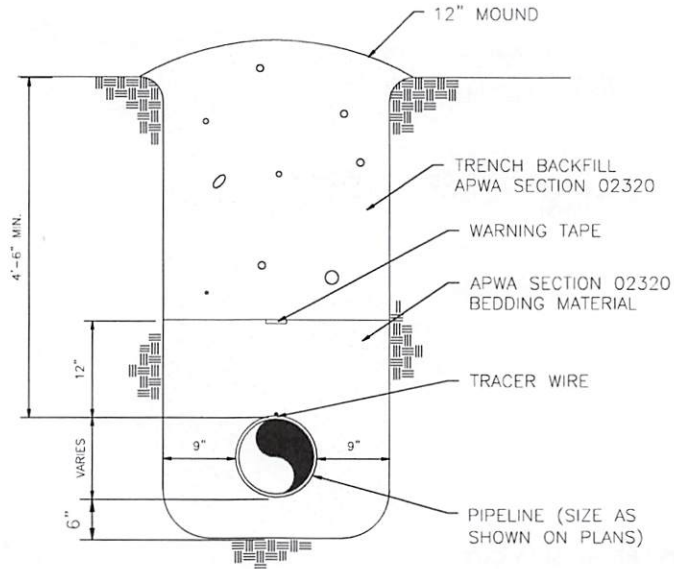
1. POINT OF CONNECTION MUST BE FRESHLY CUT
2. CRIMP LOCATION MUST BE MINIMUM OF 12" FROM POINT OF EXTENSION
3. INSPECTION MUST BE SCHEDULED WITH ENGINEERING DEPARTMENT MINIMUM 48 HOURS IN ADVANCE (INSPECTION MUST BE MADE BEFORE BACKFILL OF EXCAVATION)
4. ALL CONNECTIONS AND NEW FITTINGS MUST BE SHOT BY GIS DEPARTMENT

TRENCH DETAILS



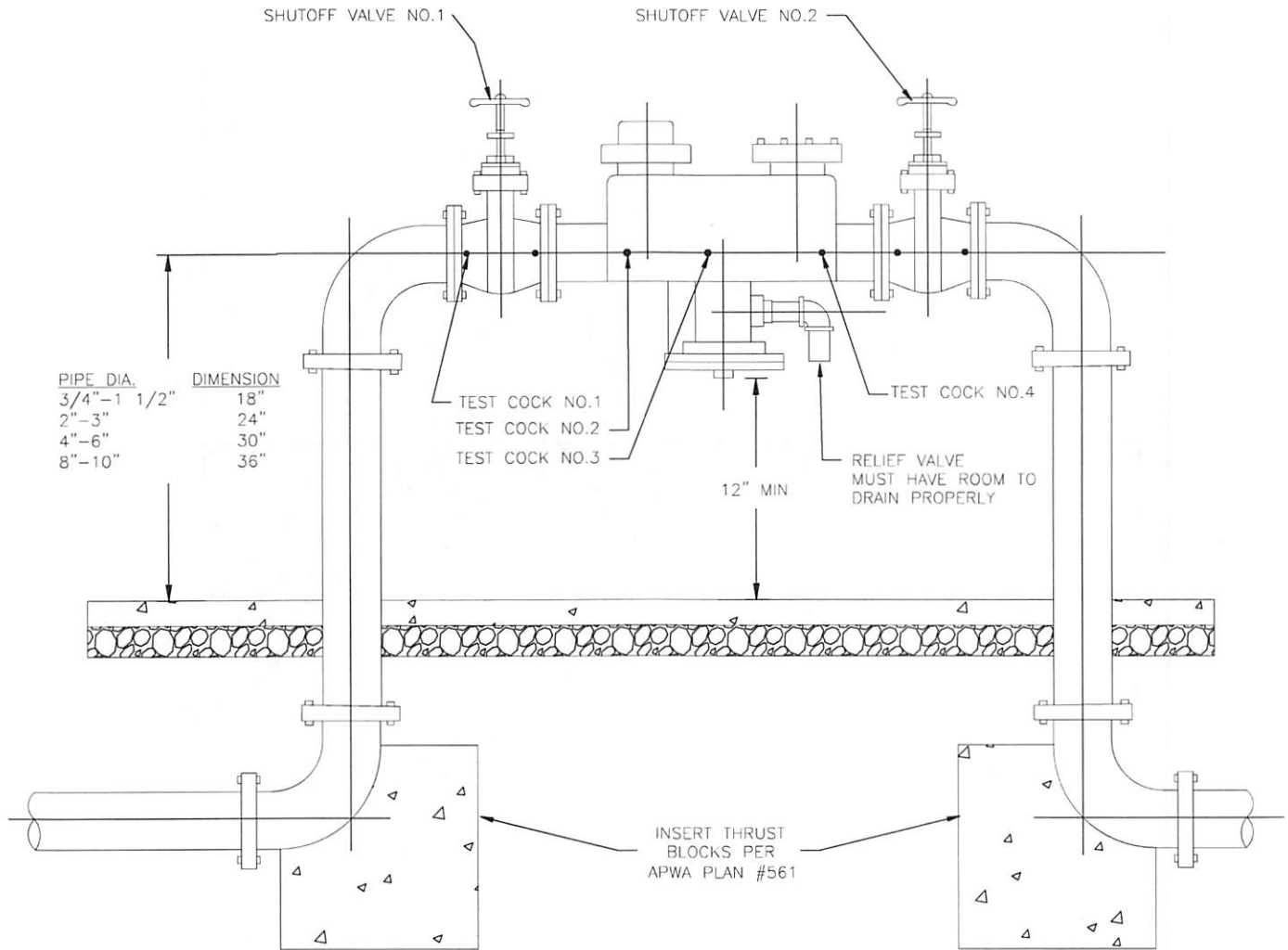
DETAIL - ROADWAYS

NOTE:  
BEDDING MATERIALS SURROUNDING PIPE SHALL BE 3/4" MINUS FOR PVC PIPE AND 2" MINUS FOR DUCTILE IRON PIPE.



DETAIL - UNDEVELOPED/UNTRAVELLED AREAS

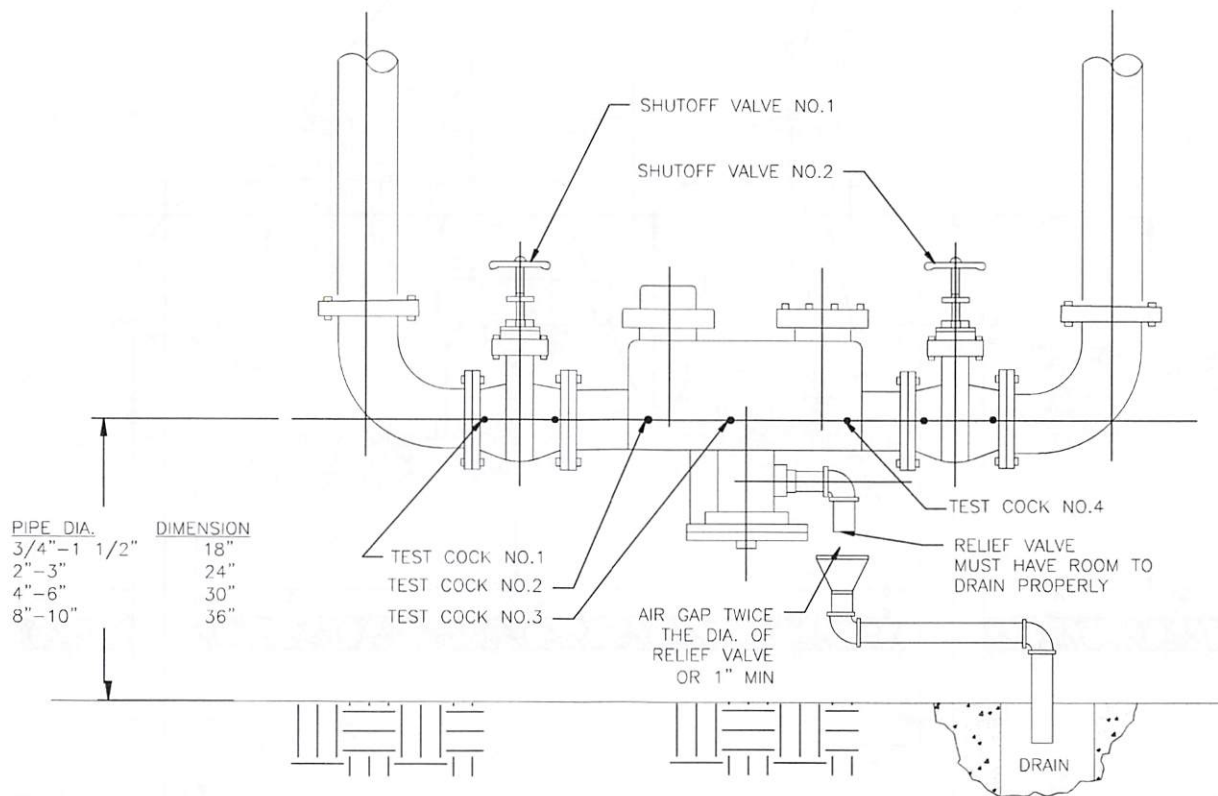
NOTE:  
BEDDING MATERIALS SURROUNDING PIPE SHALL BE LESS THAN 3/4" FOR PVC PIPE AND LESS THAN 2" FOR DUCTILE IRON PIPE.



NOTES:

1. UNIT MAY BE INSTALLED IN METAL OR CONCRETE ENCLOSURE. ENSURE THAT ENCLOSURE DRAINS FREELY.
2. PIPE LINE SHALL BE FLUSHED BEFORE INSTALLATION.
3. MOUNT UNIT IN UPRIGHT POSITION. INSTALL SUPPORTS PER MANUFACTURER RECOMMENDATION.
4. ALLOW CLEARANCE AROUND UNIT TO CONDUCT TESTING AND REPAIRS.
5. NEW INSTALLATION SHALL BE INSPECTED AND TESTED BY LICENSED BACKFLOW PREVENTION TESTER.
6. EXCEPT FOR MACHINED SURFACES, COAT ALL ITEMS EXPOSED TO ATMOSPHERE WITH EPOXY PAINT. COLOR TO BE SELECTED BY ENGINEER.
7. SHALL NOT BE INSTALLED IN A VAULT.





NOTES:

1. UNIT MAY BE INSTALLED IN METAL OR CONCRETE ENCLOSURE. ENSURE THAT ENCLOSURE DRAINS FREELY.
2. PIPE LINE SHALL BE FLUSHED BEFORE INSTALLATION.
3. MOUNT UNIT IN UPRIGHT POSITION. INSTALL SUPPORTS PER MANUFACTURER RECOMMENDATION.
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7. SHALL NOT BE INSTALLED IN A VAULT.

**CLARKSTON CITY**

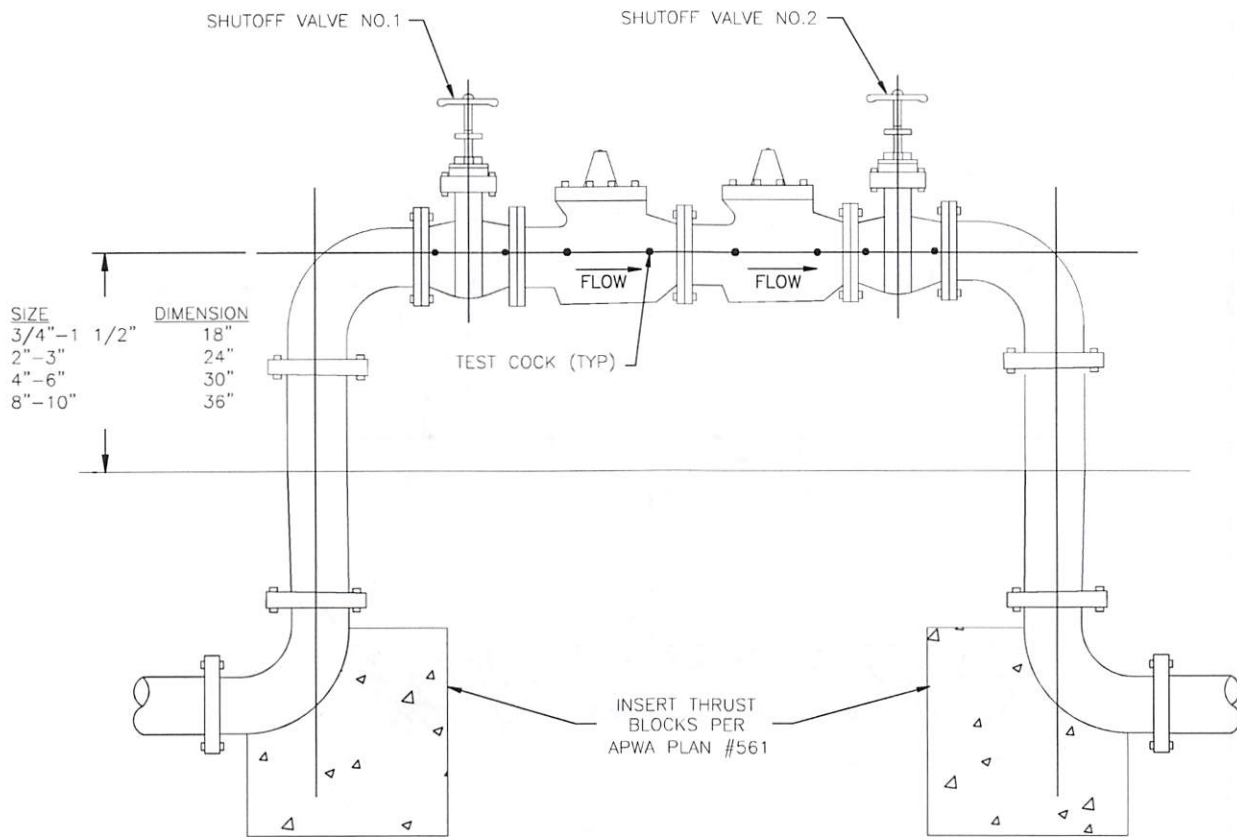
50 SOUTH MAIN  
PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090



*REDUCED PRESSURE  
BACKFLOW PREVENTION  
(SUSPENDED)*

CW-04

DATE: 06-02-22



NOTES:

1. ABOVE GROUND INSTALLATION PREFERRED. UNIT MAY BE INSTALLED BELOW GROUND IF DRAINAGE ENSURES UNIT WILL NOT BE SUBMERGED.
2. PIPE LINE SHALL BE FLUSHED BEFORE UNIT IS INSTALLED.
3. MOUNT UNIT IN UPRIGHT POSITION IN A HORIZONTAL PIPE RUN. INSTALL SUPPORTS PER MANUFACTURER RECOMMENDATION.
4. ALLOW CLEARANCE AROUND UNIT TO CONDUCT TESTS AND REPAIRS.
5. NEW INSTALLATION SHALL BE INSPECTED AND TESTED BY LICENSED BACKFLOW PREVENTION TESTER.
6. ENSURE TEST COCK PLUGS ARE INSTALLED SECURELY AND ARE LEAK PROOF.

**CLARKSTON CITY**

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PO BOX 181  
CLARKSTON, UTAH 84305  
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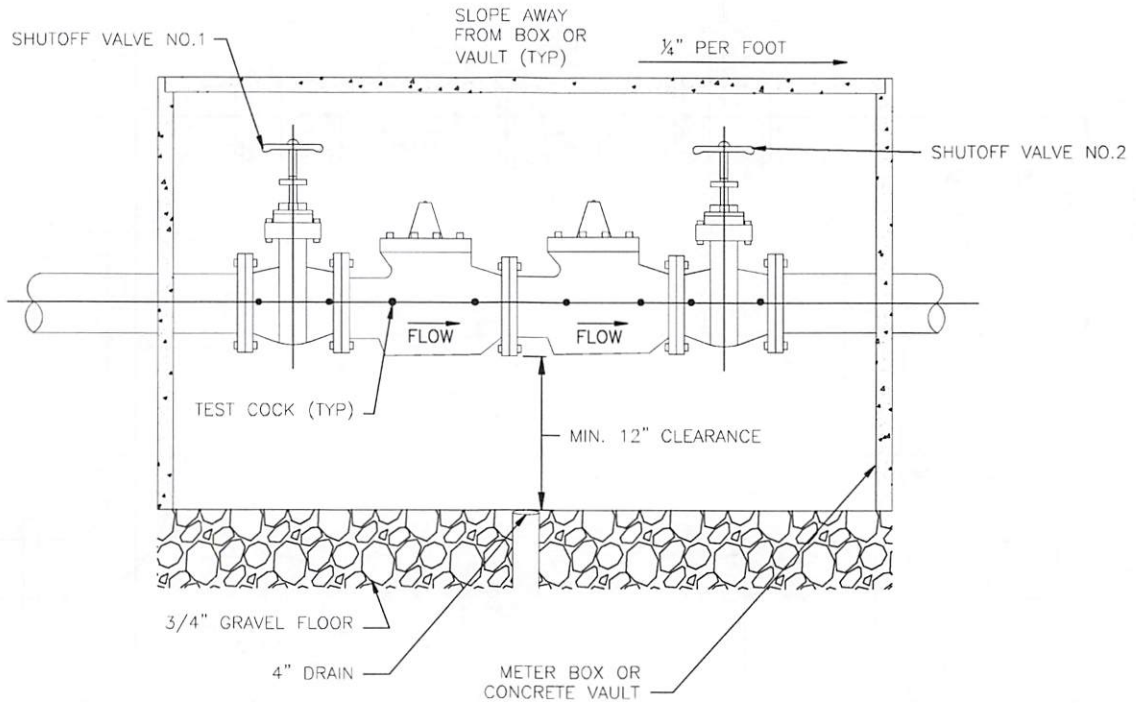


*DOUBLE CHECK VALVE  
BACKFLOW PREVENTION  
(SURFACE)*

CW-05

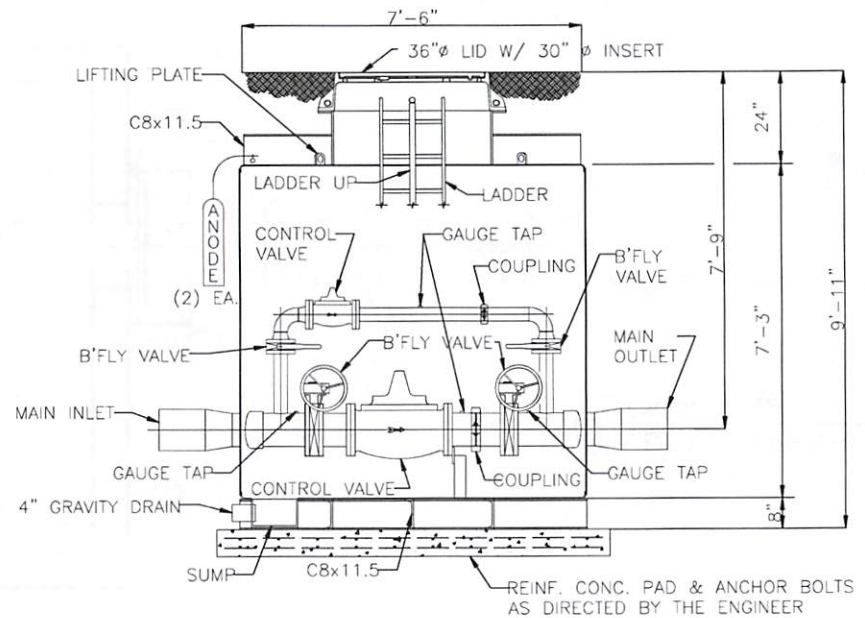
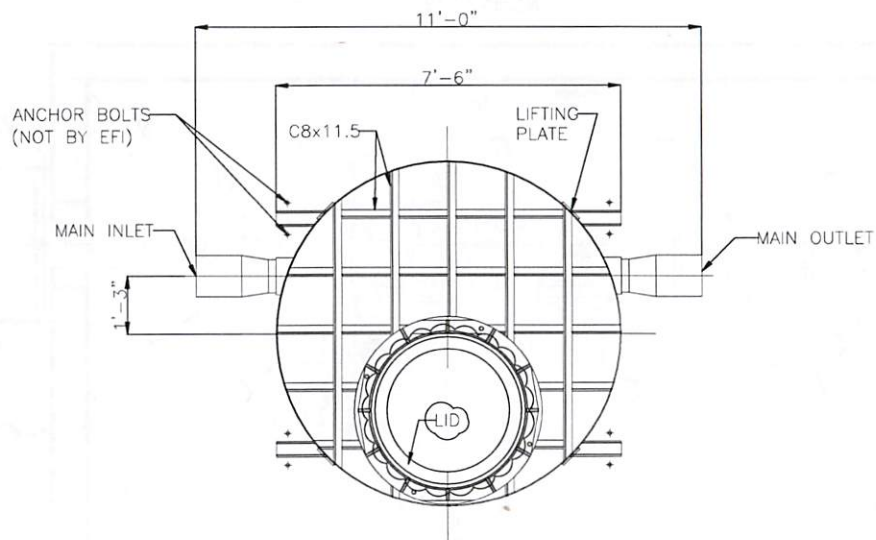
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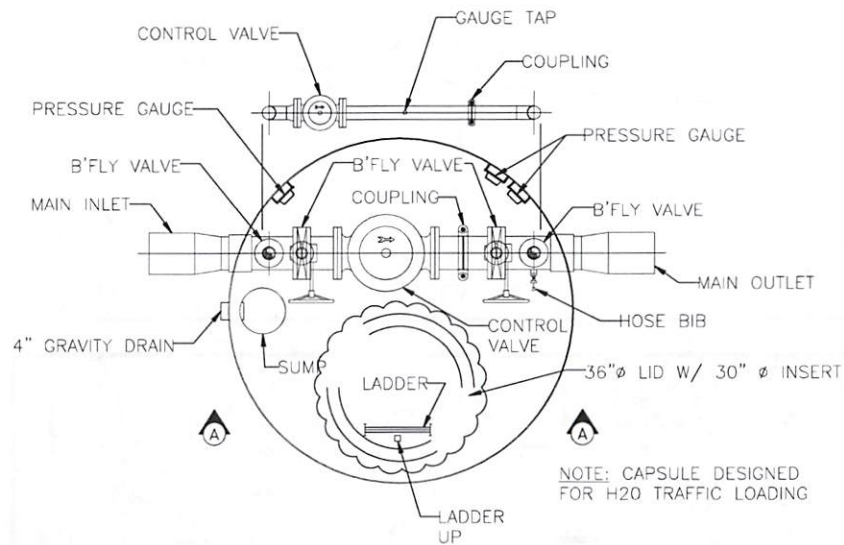


NOTES:

1. ABOVE GROUND INSTALLATION PREFERRED. UNIT MAY BE INSTALLED BELOW GROUND IF DRAINAGE ENSURES UNIT WILL NOT BE SUBMERGED.
2. PIPE LINE SHALL BE FLUSHED BEFORE UNIT IS INSTALLED.
3. MOUNT UNIT IN UPRIGHT POSITION IN A HORIZONTAL PIPE RUN. INSTALL SUPPORTS PER MANUFACTURER RECOMMENDATION.
4. ALLOW CLEARANCE AROUND UNIT TO CONDUCT TESTS AND REPAIRS.
5. NEW INSTALLATION SHALL BE INSPECTED AND TESTED BY LICENSED BACKFLOW PREVENTION TESTER.
6. ENSURE TEST COCK PLUGS ARE INSTALLED SECURELY AND ARE LEAK PROOF.
7. CONCRETE BOX SHALL BE APWA CLASS 4000.
8. ENSURE TEST COCK PLUGS ARE INSTALLED SECURELY TO AVOID BACKFLOW THROUGH TEST COCKS.
9. TRAFFIC RATED ACCESS HATCH REQUIRED IF IN ROADWAY / PARKING LOT



## SECTION A-A



## INTERIOR PLAN

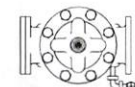
### CONTRACTOR'S NOTES

DO NOT SHIM STATION. IT IS INTENDED THAT THE MAIN FLOOR MEMBERS BE IN CONTINUOUS CONTACT WITH THE CONCRETE PAD.

CONTRACTOR SHALL PROVIDE GALVANIZED STEEL MUSHROOM HEAD STYLE OR ELBOW STYLE VENT PIPING.

CONTRACTOR SHALL RUN POWER TO METER BASE.

### PRV DETAIL



NIPPLE X ELBOW X NIPPLE X BALL VALVE W/ HOSE ADAPTER AND CAP INSTALLED IN FACTORY THREADED TAP ON DOWNSTREAM SIDE VALVE. IF THREADED TAP IS NOT FACTORY CAST, PROVIDE A HOSE BIB BETWEEN PRV AND GATE VALVE. DO NOT INSTALL ON GAGE TAP.

### GENERAL NOTES

THE ACTUAL SIZE OF THE CONTROL VALVES, PIPES, AND BUTTERFLY VALVES WILL VARY DEPENDING ON FLOW REQUIREMENTS OF THE STATION.

ALL PIPING AND EQUIPMENT WILL BE ADEQUATELY SUPPORTED AND BRACED.

CAPSULE & STRUCTURAL STEEL: ASTM A-36.

STRUCTURAL TUBING: A500, GRADE B SCHEDULE 40 STEEL PIPE

MANUFACTURER REQUIRES A 3-4 MONTH LEAD TIME PRIOR TO DELIVERY OF PRV.

**CLARKSTON CITY**

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PO BOX 181  
CLARKSTON, UTAH 84305  
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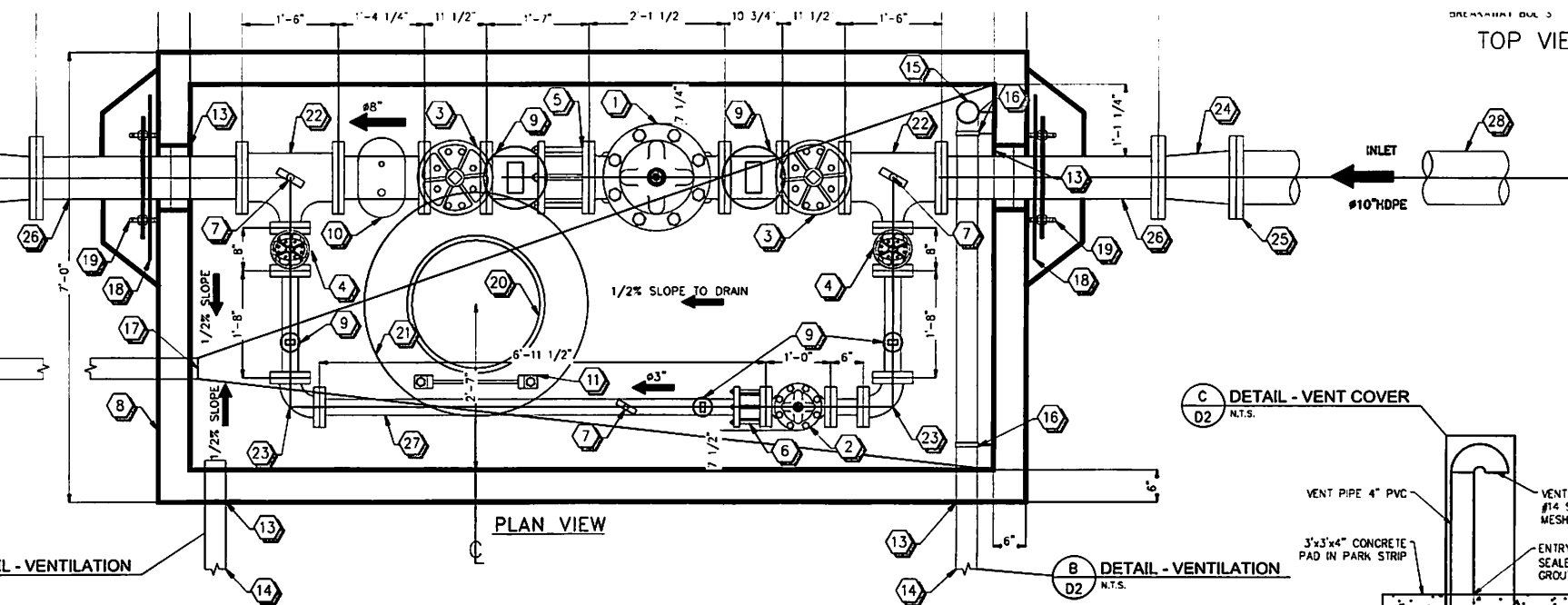


**PRESSURE REDUCING  
VALVE (PRV) EFI STATION**

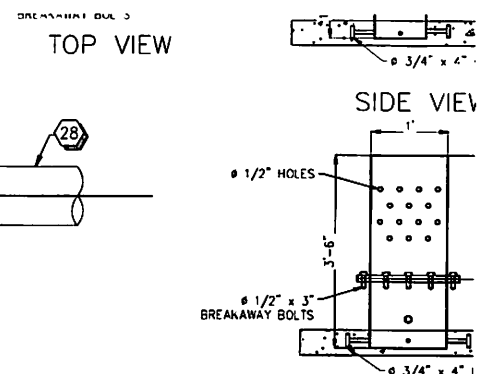
CW-07A

DATE:

06-02-22



PLAN VIEW

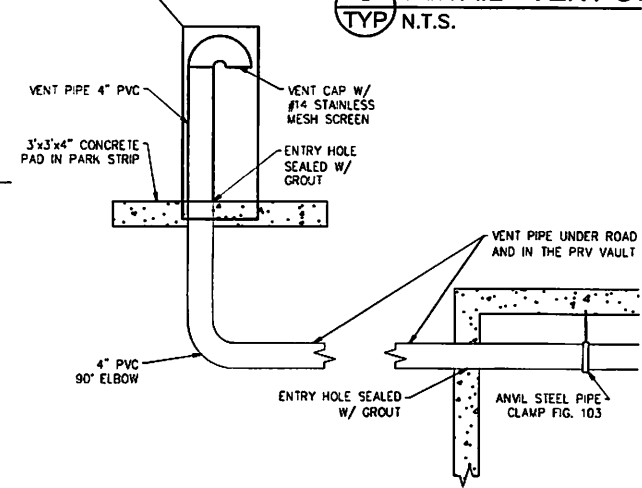


TOP VIEW

SIDE VIEW

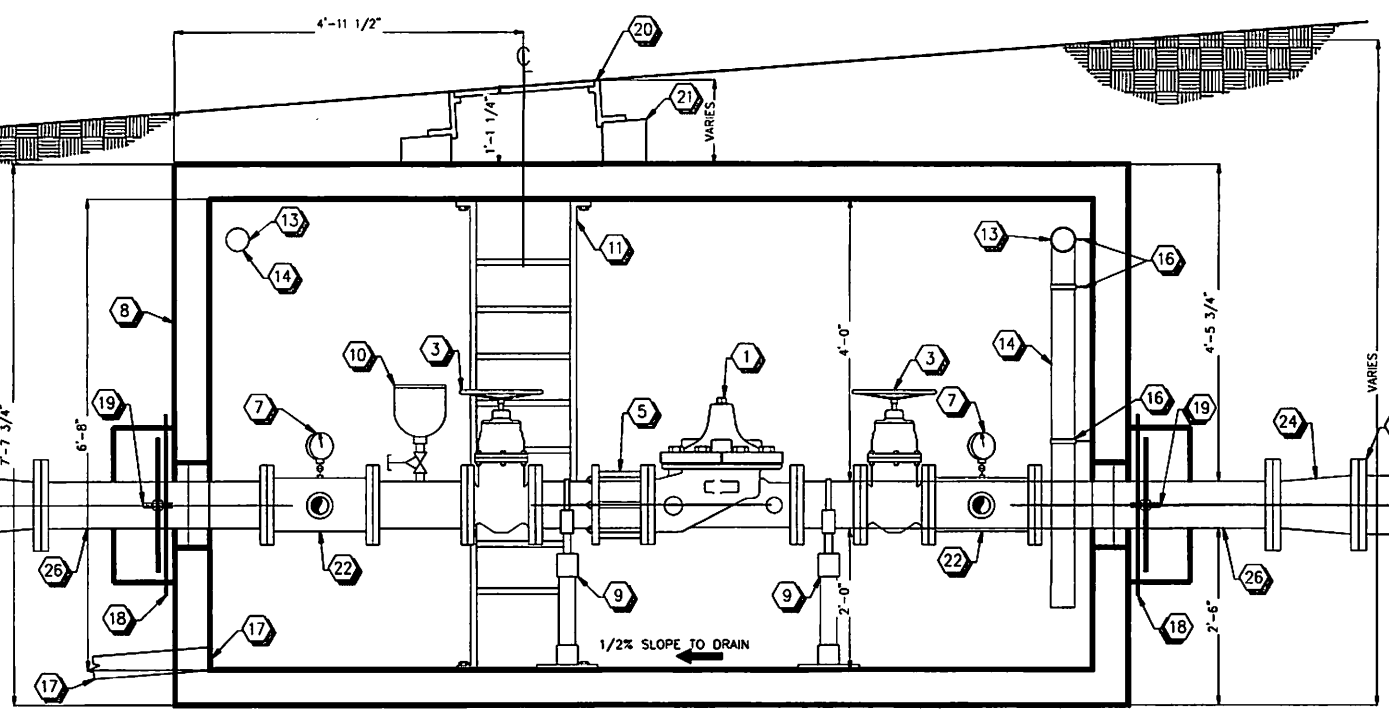
C DETAIL - VENT COVER  
D2 N.T.S.

C DETAIL - VENT COVER  
TYP N.T.S.

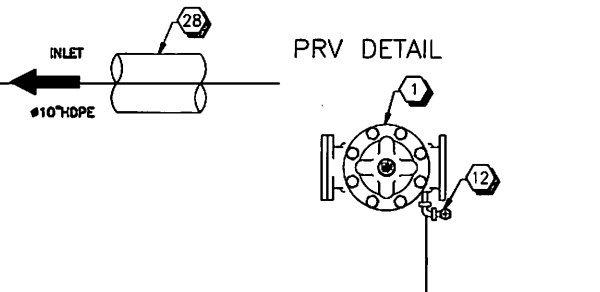


B DETAIL - VENTILATION  
TYP N.T.S.

NOTES:  
1. LOCATE VENT IN THE PARK STRIP



ELEVATION

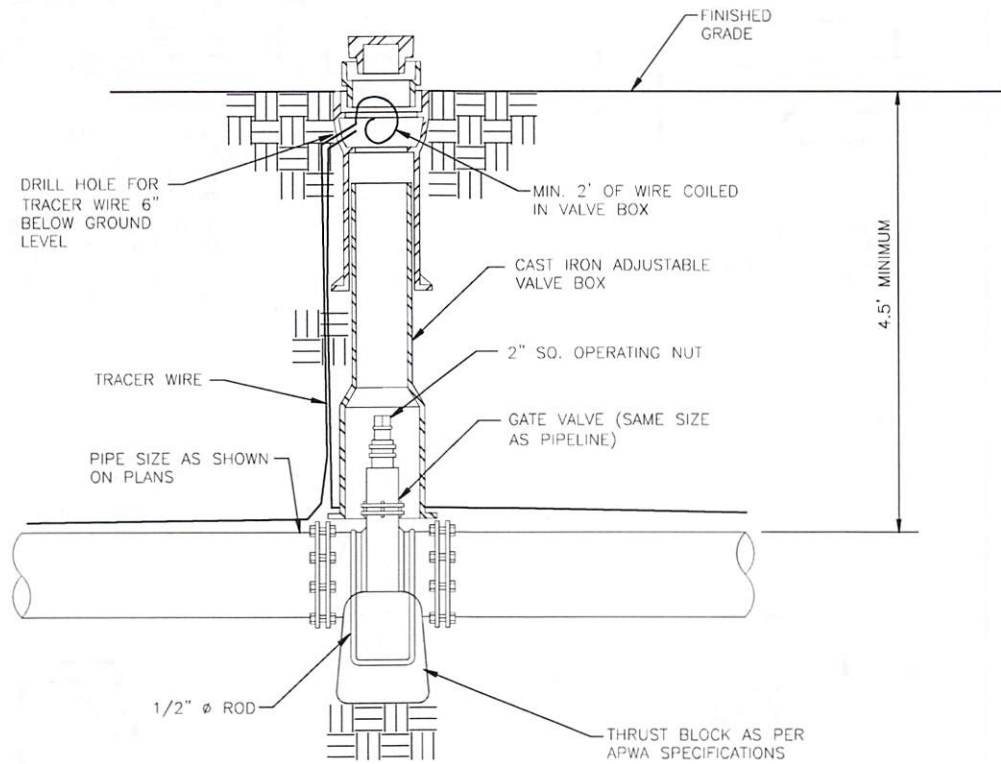


NIPPLE X ELBOW X NIPPLE X BALL VALVE W/ HOSE ADAP AND CAP INSTALLED IN FACTORY THREADED TAP ON DOWN SIDE OF VALVE ON THE LADDER SIDE OF VALVE. IF THREADED TAP IS NOT FACTORY CAST, PROVIDE A HOSE BIB BETWEEN BALL VALVE AND GATE VALVE. DO NOT INSTALL ON GAGE TAP.

A DETAIL - PRV VAULT  
TYP N.T.S.

NOTES:  
1. VAULT #10565 (H-20 LOADING)  
INSIDE DIMENSIONS

STANDARD FABRICATION & FINISHING SPECIFICATIONS



NOTE: VALVE BOX SHALL BE CLEAN, PLUMB AND PROPERLY ALIGNED ON THE VALVE.

GATE VALVE

**CLARKSTON CITY**

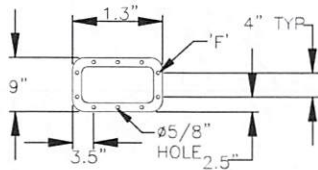
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PO BOX 181  
CLARKSTON, UTAH 84305  
TEL: (435) 563-9090



GATE VALVE

CW-08

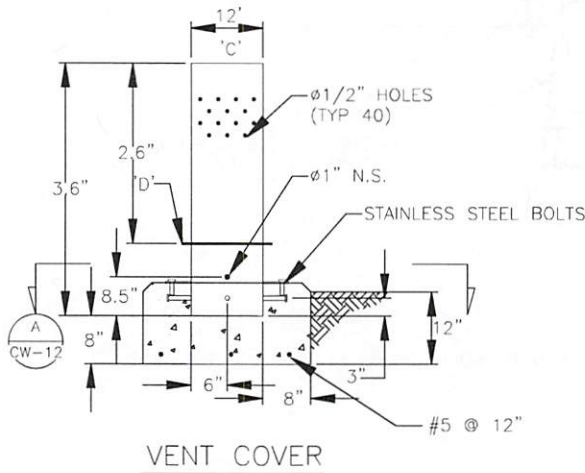
DATE: 06-02-22



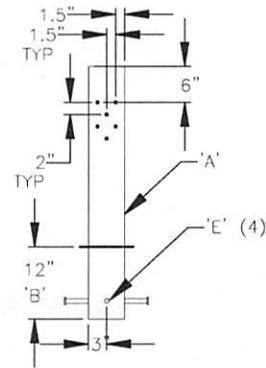
A SECTION- VENT COVER  
CW-12

PARTS LIST		
ITEM	QTY	DESCRIPTION
A	1	TS 12" x 6" x 1/4" x 2'-6"
B	1	TS 12" x 6" x 1/4" x 12"
C	1	1/4" PL - 6" x 1'-0"
D	2	1/4" PL - 9" x 1'-3"
E	4	Ø3/4" x 4" H.S.A.
F	10	Ø1/2" x 3" BREAKAWAY BOLTS

1. OPEN TO AIR-PLACE A NO. 14 MESH NON-CORRODIBLE SCREEN OVER THE OPEN END OF P.V.C. PIPE. ATTACH W/S.S. HOSE CLAMP.
2. HOT DIPPED GALVANIZED STEEL STAND PIPE FOR AIR VENT.
3. 1 1/2" MIN. CHAMFER ALL AROUND CONCRETE BASE.



VENT COVER



SIDE VIEW  
ITEMS REMOVED FOR CLARITY

VENT COVER

NOTE:  
SIZE OF VENT COVER CAN VARY  
DEPENDING ON SIZE OF VENT.

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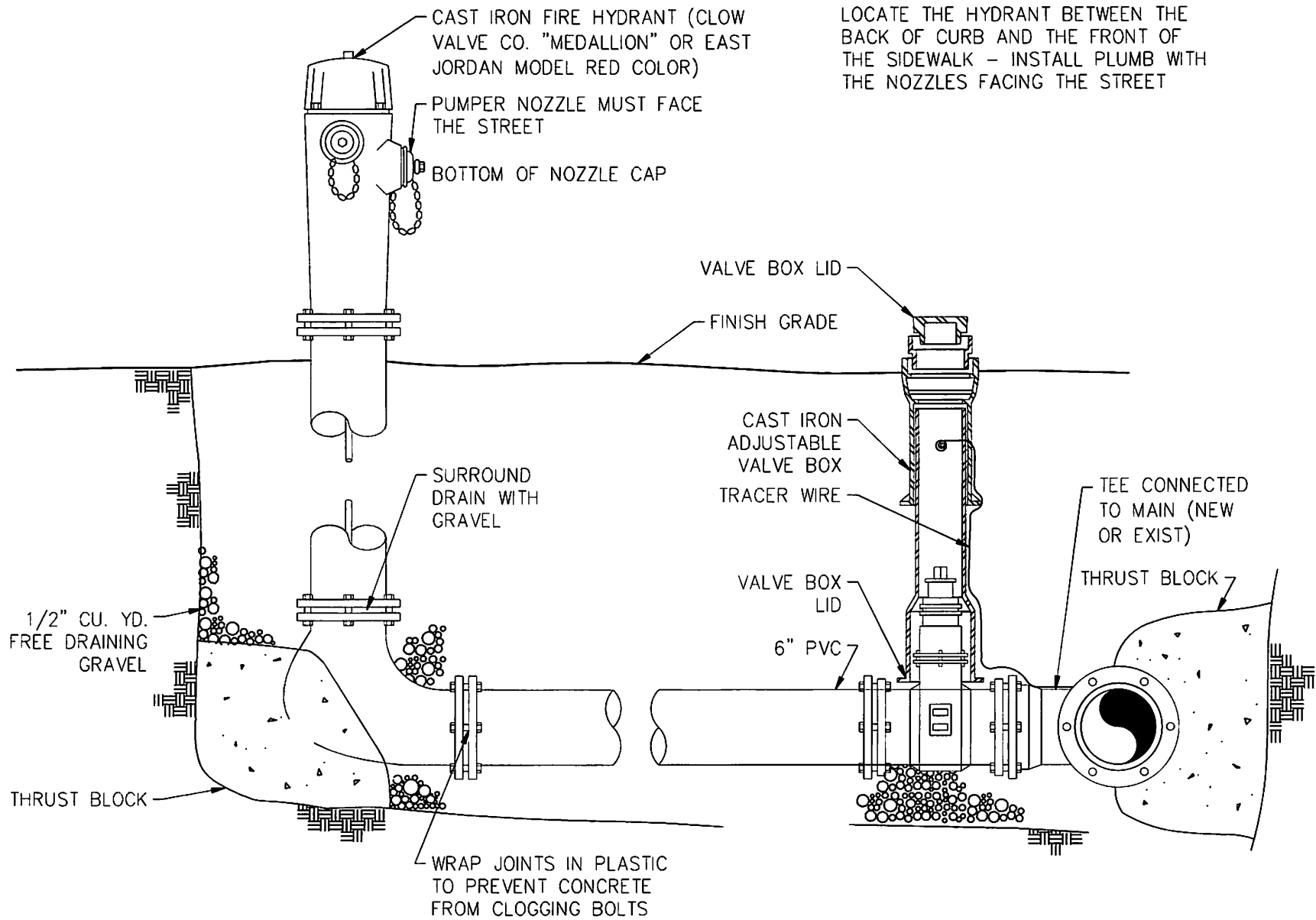


VENT COVER

CW-09

DATE: 06-02-22

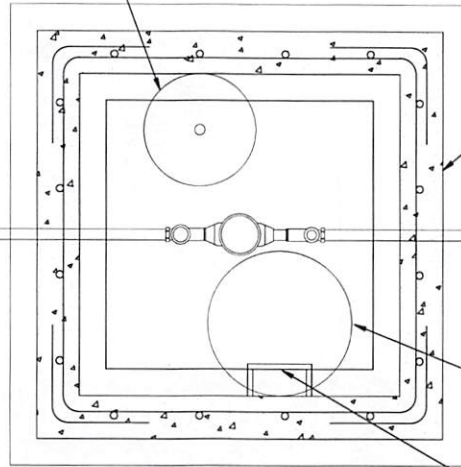




LOCATE THE HYDRANT BETWEEN THE BACK OF CURB AND THE FRONT OF THE SIDEWALK - INSTALL PLUMB WITH THE NOZZLES FACING THE STREET

15" DUCTILE IRON LID WITH  
2" DIA. KNOCK OUT

B  
CW11

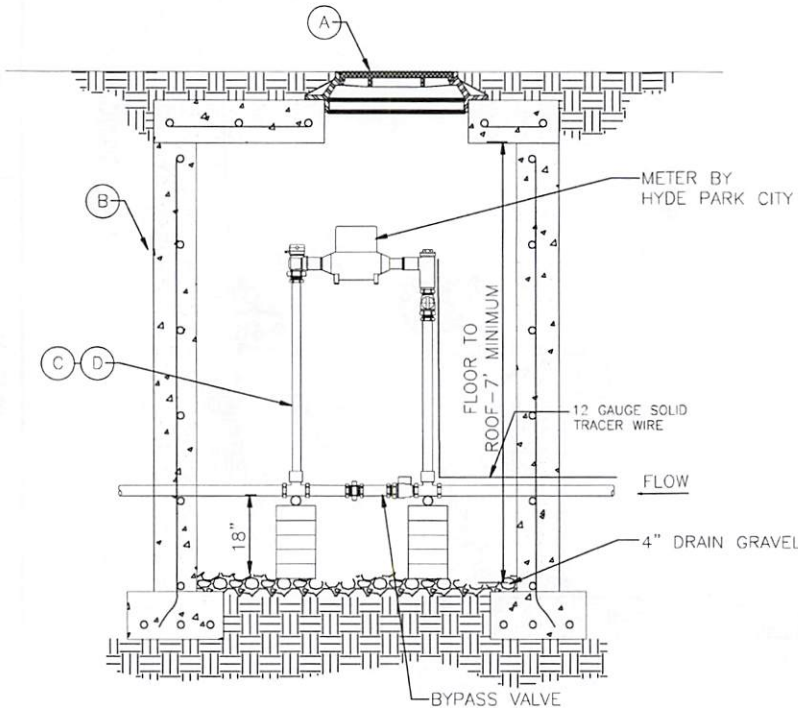


CONCRETE BOX PER  
PLAN 505

27" FRAME AND LID  
PLAN No. 502  
(LID TO SAY "WATER METER")

MANHOLE STEPS  
12" O.C.

A PLAN-METER  
CW11



METER BY  
HYDE PARK CITY

FLOOR TO  
ROOF-7" MINIMUM

12 GAUGE SOLID  
TRACER WIRE

FLOW

4" DRAIN GRAVEL

BYPASS VALVE

B SECTION  
CW11

LEGEND

No.	ITEM	DESCRIPTION
(A)	27" FRAME AND COVER	PLAN No. 502
(B)	CONCRETE BOX	PLAN No. 505
(C)	AY MCDONALD TELESCOPING WETHER SETTER CUSTOM SETTER WITH BYPASS	
(D)	AY MCDONALD TELESCOPING WETHER SETTER CUSTOM SETTER WITH BYPASS	

NOTE: THE VAULT ROOF SHALL BE DESIGNED FOR EACH LOCATION BY THE APPLICANTS ENGINEER.

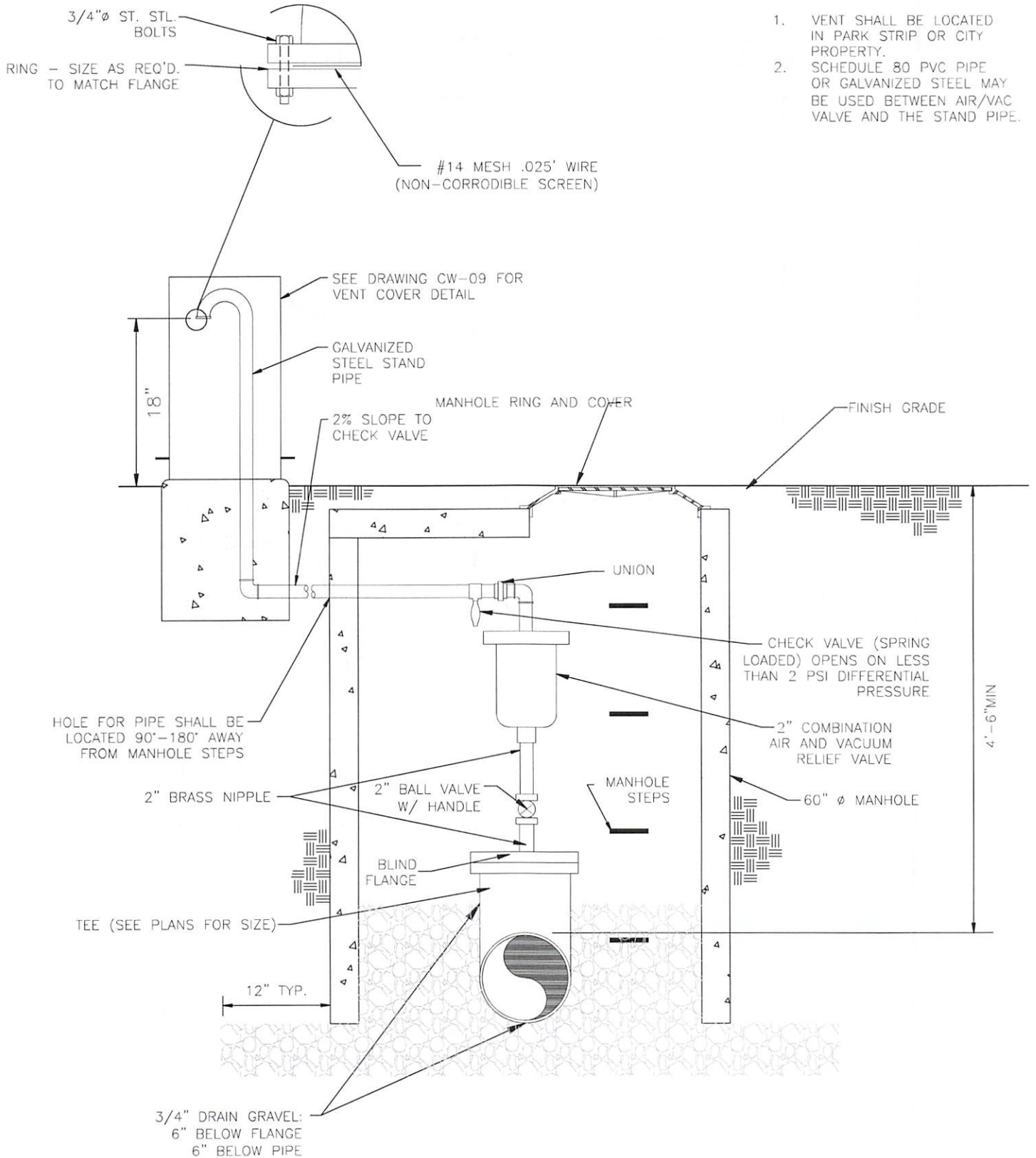
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1/2" AND 2"  
METER

CW-11

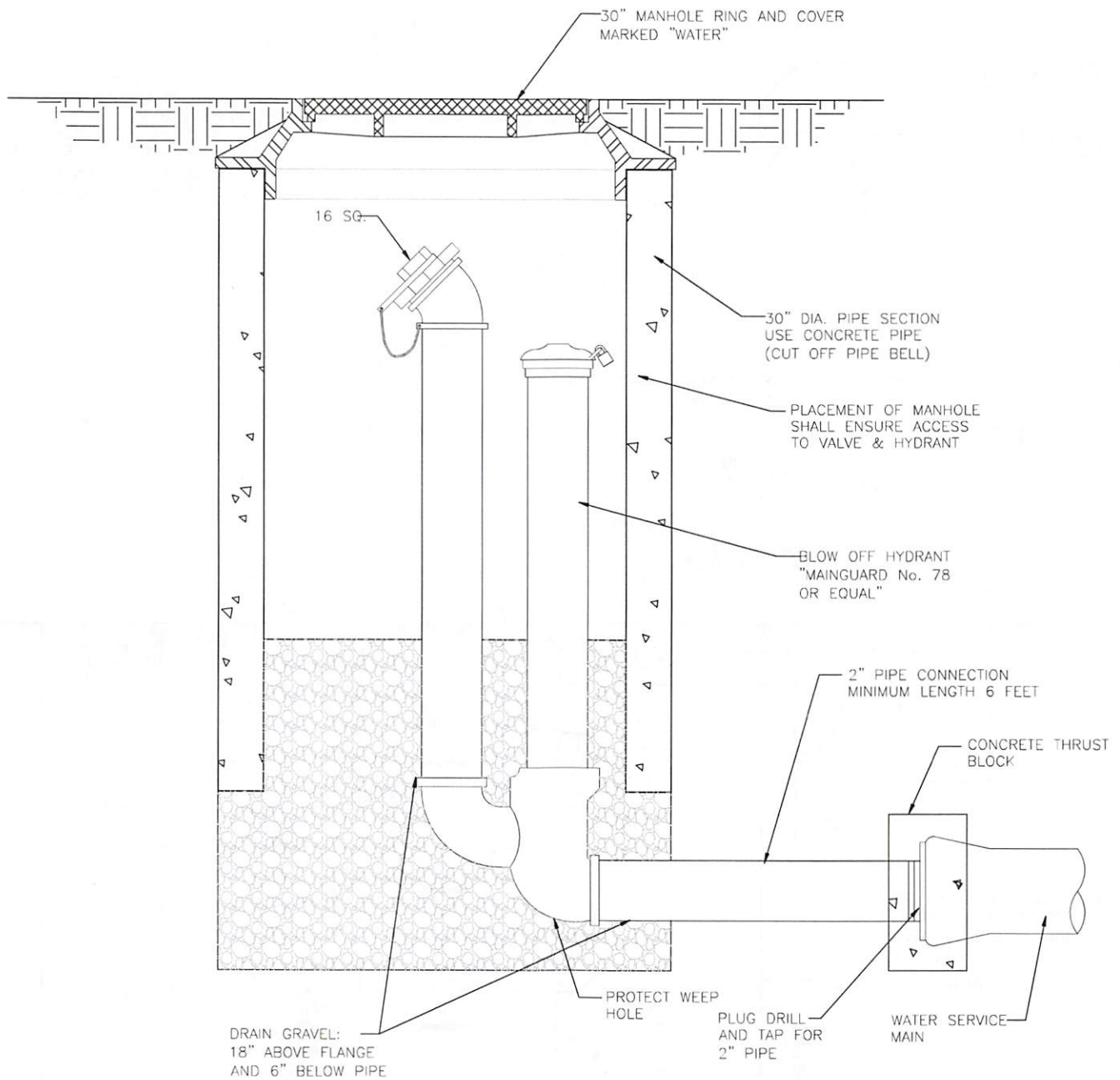
DATE: 06-02-22



NOTES:

1. VENT SHALL BE LOCATED IN PARK STRIP OR CITY PROPERTY.
2. SCHEDULE 80 PVC PIPE OR GALVANIZED STEEL MAY BE USED BETWEEN AIR/VAC VALVE AND THE STAND PIPE.





1. INSPECTION: PRIOR TO BACKFILLING AROUND THE ASSEMBLY, SECURE INSPECTION OF INSTALLATION BY ENGINEER.
2. BACKFILL: INSTALL AND COMPACT BACKFILL MATERIAL PER APWA SECTION 02320.
3. CONCRETE: CLASS 4,000 PER APWA SECTION 03304. APPLY A SEALING/CURING COMPOUND PER APWA SECTION 03390.
4. WORKING PARTS: ALL WORKING PARTS SHALL BE BRONZE-TO-BRONZE DESIGN, AND BE SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING.
5. POST HYDRANTS: SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH A 36" BURY. HYDRANTS WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT.
6. LOCKING: HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO., OR APPROVED EQUAL.

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*BLOW-OFF HYDRANT*

CW-13

DATE: 06-02-22

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.

**NOTE**  
FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L<sub>1</sub> ON BOTH SIDES OF FITTING.

PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.												
BEND ANGLE	PIPE SIZE											
	4	6	8	10	12	14	16	18	20	24		
11.25	2	2	3	4	4	5	5	6	6	7		
22.5	3	5	6	7	9	10	11	12	13	15		
45	7	10	13	15	18	20	23	25	27	31		
90	17	24	31	37	43	49	55	60	65	75		

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

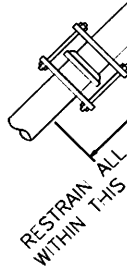
CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.

DIP HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.												
BEND ANGLE	PIPE SIZE											
	4	6	8	10	12	14	16	18	20	24		
11.25	1	2	3	3	4	4	5	5	5	6		
22.5	3	4	5	6	7	8	9	10	11	13		
45	6	8	11	13	15	17	19	21	23	27		
90	14	20	26	31	37	41	46	51	56	64		

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PIPE TYPE = PVC  
L<sub>1</sub> = 5'  
L<sub>2</sub> = 2'

**EXAMPLE:**  
GIVEN: BEND ANGLE = 45'  
PIPE SIZE = 6"  
PIPE TYPE = PVC  
L = 10'



JR  
ER

PVC TEE RESTRAINED LENGTHS L, IN FT.												
BRANCH SIZE DIA.	RUN SIZE DIAMETER											
	4	6	8	10	12	14	16	18	20	24		
4	*	*	*	*	*	*	*	*	*	*		
6	*	*	*	*	*	*	*	*	*	*		
8	*	*	*	*	*	*	*	*	*	*		
10	*	*	*	*	*	*	*	*	*	*		
12	*	*	*	8	*	*	*	*	*	*		
14	*	*	*	*	25	5	*	*	*	*		
16	*	*	*	*	*	44	24	4	*	*		
18	*	*	*	*	*	*	60	43	6	*		
20	*	*	*	*	*	*	*	78	45	*		
24	*	*	*	*	*	*	*	*	110	*		

\* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

**NOTES:**  
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.  
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 20' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

DIP TEE RESTRAINED LENGTH L, IN FT.												
BRANCH SIZE DIA.	RUN SIZE DIAMETER											
	4	6	8	10	12	14	16	18	20	24		
4	*	*	*	*	*	*	*	*	*	*		
6	*	*	*	*	*	*	*	*	*	*		
8	*	*	*	*	*	*	*	*	*	*		
10	*	*	*	1	*	*	*	*	*	*		
12	*	*	*	*	13	*	*	*	*	*		
14	*	*	*	*	*	24	13	*	*	*		
16	*	*	*	*	*	*	36	25	14	*		
18	*	*	*	*	*	*	*	47	37	16		
20	*	*	*	*	*	*	*	*	58	39		
24	*	*	*	*	*	*	*	*	*	79		

\* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

**NOTES:**  
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.  
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 20' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

**EXAMPLE:**  
PIPE TYPE = DIP  
PIPE SIZE = 16"  
L = 36'

RESTRAIN ALL JOINTS WITHIN THIS DISTANCE  
MECHANICAL RES UNIT CONNECTIO



PVC REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)										
D2 \ D1	6	8	10	12	14	16	18	20	24	
4	55/38	133/69	226/93	341/118	-	-	-	-	-	
6	-	53/40	116/71	194/99	286/123	392/147	-	-	-	
8	-	-	48/39	108/72	178/101	258/127	349/151	-	-	
10	-	-	-	48/40	108/73	167/103	240/130	320/155	-	
12	-	-	-	-	47/40	100/74	160/104	228/132	382/182	
14	-	-	-	-	-	45/40	97/74	154/105	285/160	
16	-	-	-	-	-	-	45/39	94/74	209/134	
18	-	-	-	-	-	-	-	44/39	144/106	
20	-	-	-	-	-	-	-	-	90/74	

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)										
D2 \ D1	6	8	10	12	14	16	18	20	24	
4	35/24	85/44	144/60	218/75	-	-	-	-	-	
6	-	34/36	74/45	125/63	183/78	251/93	-	-	-	
8	-	-	31/25	69/46	114/64	165/81	223/96	-	-	
10	-	-	-	30/25	66/47	107/66	153/83	205/99	-	
12	-	-	-	-	30/25	64/47	102/66	145/84	243/116	
14	-	-	-	-	-	29/25	61/47	98/67	181/101	
16	-	-	-	-	-	-	28/25	60/47	133/85	
18	-	-	-	-	-	-	-	28/25	92/67	
20	-	-	-	-	-	-	-	-	57/47	

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

**EXAMPLE:**  
PIPE TYPE = PVC  
D<sub>1</sub> = 8"  
D<sub>2</sub> = 6"  
L<sub>1</sub> = 40'  
L<sub>2</sub> = 53'

R  
W

**EXAMPLE:**  
PIPE TYPE = DIP  
PIPE SIZE = 10"  
L = 73'

TREN

PVC DEAD END RESTRAINED LENGTHS L, IN FT.										
PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
52	73	96	115	136	155	174	192	211	246	

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP DEAD END RESTRAINED LENGTHS L, IN FT.										
PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
33	47	61	73	86	98	111	122	134	156	

**NOTES:**  
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

SAFE  
CAL

**NOTES:**

BASED ON:

CE  
TED

ABLE

PRIOR

CRE  
JECT