

CITY OF LEWISTOWN

Standards for Design and Construction

April 2006

Table of Content

	Page Number
Section I General Provisions	
Standards	3
Right of Way Permit	3
City Fees	3
Applicable Laws & Indemnification	4
Traffic & Pedestrian Control	4
Liability Insurance & Bonding	4
Survey Monumentation	5
Pavement Restoration	5
Storm Water Discharge Permit	6
Construction Inspection	6
Guarantee for Equipment, Materials & Workmanship	6
Stop Work Order	6
Relocation of Utilities	6
Utility Plan Requirements	7
Section II Design Standards	
Design & Development Requirements	8
Water Systems	8-11
Sanitary Sewer Systems	11-13
Detention/Retention Ponds	14
Roadways & Walkways	15
Street Intersections	15
Street Lighting	16
Sidewalks	16
Driveways	16
Placement of Utilities	16
Section III Construction Standards	
Project Requirements	17
Construction Standards	18
Construction Inspection, Testing & Quality Control	19
Compaction	19-20
Appendix A	
Standard Drawings Table of Content	21

**Section 1
General Provisions**

Standards

The latest published edition of the Montana Public Works Standard Specifications are adopted on their entirety, except as amended by the latest edition of the City of Lewistown Standards for Design and Construction. With respect to the design and/or construction of public facilities, any conflicts of differences between the Montana Public Works Standard Specifications, City of Lewistown Subdivision Regulations, and the City of Lewistown Standards for Design and Construction shall be resolved in favor of the City of Lewistown Standards for Design and Construction.

Right of Way Permit

All construction, excavation or other work on public or private property which will necessitate the use of the public right-of-way or easement shall require a Public Right-of-Way Permit issued by the Public Works Department. The work authorized by the Permit includes, but is not limited to street construction and repair, water, sewer, and storm system construction and repair, utility connections and repair landscaping, sidewalk, curbing and driveway construction and repair. The Permit will not be issued until all insurance and bonding requirements have been met. The contractor is required to have all applicable permits required under federal, state, county or city jurisdiction.

In an emergency which requires repairs to be made immediately, the Contractor may excavate and complete repairs without first having obtained a Permit prior to beginning the work. During normal working hours the Contractor shall notify the Public Works Department at 535-1770 prior to beginning the work. If the emergency occurs after normal working hours prior to beginning the work the Contractor must notify police dispatch at 535-1800. In either case, the Contractor shall obtain a Permit no later than the next scheduled City work day.

All provisions of the Standards for Design and Construction for the City of Lewistown shall be complied with regardless of the circumstances of the construction.

City Fees

Water and Sewer Connection Fee. A connection fee shall be paid for the connection of each new water (City of Lewistown Code 3-3-1 (A) and 3-3-11 (D)) and sewer service (City of Lewistown Code 4-6-9) to the system. This fee must be paid even if a service line has previously been stubbed to the property line or other accessible location. Connection fees for water and/or sewer must be paid before a Building Permit will be issued by the Building Department.

Construction of Water Service. When it is necessary to tap an existing water main for a service connection, the City will provide the equipment, labor and materials required to tap the main, install the service line from the main to the curb stop. The City will charge the Owner a Tapping Fee, this includes the equipment, labor and materials required to complete the work. The Owner will be responsible for the construction of the service line from the curb stop to the point of service.

Construction of Sewer or Storm Service. When it is necessary to tap an existing sewer or storm main for a service connection, the Contractor will provide the equipment, labor and materials required to tap the main, install the service line from the main to the point of service and restore the public right of way to its existing condition.

Applicable Laws and Indemnification of City

The Contractor shall give all notices and comply with all federal, state and local laws, ordinances and regulations affecting the conduct of the work and shall indemnify and hold harmless the City against any claim or liability arising from, or based on, the violation of such law, ordinance, regulation, etc., whether by himself or his employees.

Traffic and Pedestrian Control

A Traffic and Pedestrian Control Plan shall be submitted and approved by the Public Works Department for all work within the public right of way. The latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) shall be followed to create the Plan. The location and description of all Traffic and Pedestrian Control Devices shall be shown on the plan. All devices shall be kept in place and maintained in good visible condition throughout the project. The Public Works Department reserves the right to reject any device observed to be in substandard condition. Emergency access to the work area shall be maintained at all times.

All barricades and obstructions shall be protected at night by suitable signal lights which shall be kept illuminated from sunset to sunrise. Suitable warning signs shall be placed and illuminated at night to show in advance where construction, barricades or detours exist.

If flagging is required it shall be accomplished by competent and properly equipped flag persons. Flagging shall be accomplished as described in the Montana Department of Transportation Flagger's Handbook and the MUTCD.

Liability Insurance and Bonding

Liability Insurance for Work Within Existing Public Right of Way and/or Easement. The Contractor shall procure and maintain, at the Contractor's expense, during the construction period, Contractor's Liability Insurance in accordance with the Supplementary Conditions to the General Conditions of the Montana Public Works Standard Specifications.

All construction work within the public right of way or easement will require the Property Owner/Contractor to provide the City with a Performance Bond. The bond shall be equal to the value of the project and shall remain in force for one year. Contractors furnishing the City with an annual bond of \$5,000 will not be required to furnish additional bonding if the \$5,000 bond meets the requirements of these standards. (See City Code of Lewistown

Bonds may be in the form of a Surety Bond, a Certificate of Deposit (CD), a Certified Check or an irrevocable Letter of Credit issued by a bank licensed to do business in the state of Montana.

The City of Lewistown also requires all Primary Contractors and Subcontractors to have a current City Business License.

Survey Monumentation

When a street is to be reconstructed, prior to any excavation, a thorough search shall be made for existing intersection monuments. If found, such monuments shall be perpetuated by standard survey methods including referencing to at least three (3) accessories such as a chiseled "X" on a storm drain hood, fire hydrant base bolt, fire hydrant operating nut, drilled hole in curb, or property pin.

Monumentation. Monuments shall be a minimum 5/8" diameter rebar or drivable metal rod, at least 18" long. The monument shall be capped with a brass or aluminum cap identifying the responsible professional land surveyor with name and number. The cap shall be recessed at least 1/8" below the final asphalt surface.

Pavement Restoration

The Contractor signing the Public Right-of-Way Permit shall be responsible for pavement replacement. The Contractor shall restore all surfaces within fourteen calendar days after completing the backfill work. All excavations within 36" of the edge of the asphalt shall require removal and replacement from the edge of the asphalt to the excavation edge. Asphalt patch areas that fall within the wheel path of the vehicular travel lane shall be increased in size to the center of the lane or adjacent lane. Under no circumstance will the edge of a patch area be allowed to fall within the wheel path. Any damage to the existing asphalt surface caused by the Contractor's operations shall be repaired at the expense of the Contractor, including but not limited to gouges, scrapes, outrigger marks, backhoe bucket marks, etc. A slurry seal type covering will be considered the minimum repair. The Contractor shall be responsible for maintaining the area in a smooth and drivable condition until the permanent pavement is placed. If the ground is frozen, the road cut shall be temporary repair shall be maintained by the Contractor for safe winter usage. The permanent restoration shall be made as soon as the ground is thawed in the spring, or as directed by the Public Works Department. Pavement repairs shall be in accordance with the Standards for Design and Construction.

If the Contractor fails to restore the pavement within the fourteen day period, or fails to maintain the trench or area as required, the City will complete the restoration or maintenance, and all labor, equipment, material and administrative costs will be billed to the Contractor.

Storm Water Discharge Permit

No sediment laden or polluted water shall be discharged off of any construction or building site. The current Montana Pollutant Discharge Elimination System may require a storm water discharge permit for construction activity. If required, a Storm Water Erosion Control Plan must be approved by the Montana Department of Environmental Quality prior to construction. A copy of the approved Storm Water Erosion Control Plan shall be provided to the Public Works Department.

Construction Inspection

Maintenance and repair work within public right-of-way or easement shall be inspected and approved by the Public Works Department. It is the Contractor's responsibility to notify the Public Works Department of the work requiring inspection at least twenty-four (24) hours in advance so the Public Works Department may schedule and perform such inspections. Inspections will occur within normal business hours (7 AM to 4 PM Monday – Friday). Any inspections required after normal business hours or on weekends will be billed at a rate of not less than \$30.00 per hour, with a two hour minimum required.

Guarantee for Equipment, Materials and Workmanship

The Contractor shall guarantee all materials and equipment furnished, as well as, the construction work performed for maintenance and repair work on existing public infrastructure for a period of one (1) year from the date of written acceptance of the work by the City.

Stop Work Order

A written Stop Work Order may be issued by the Public Works Department if the work in progress does not meet the Standards for Design and Construction for the City of Lewistown, Montana, or for any other valid reason. Work may resume only after a written Resume Work Order has been issued by the Public Works Department.

Relocation of Utilities

Requests to relocate an existing public utility shall be submitted in writing to the Public Works Department. A sketch shall be included that illustrates the existing location of the utility and the preferred relocation site. The request shall describe in detail the circumstances for the request. The Public Works Department may require the utility

relocation to be designed by a licensed engineer. If the relocation is approved by the Public Works Department the utility shall be relocated by a bonded and insured utility contractor. Under no circumstances will the City of Lewistown pay for costs associated with the relocation of the utility.

Utility Plan Requirements

The following general notes must appear on all plan sets:

- A) All construction will conform to the latest Edition of the Montana Public Works Standard Specifications are except as amended by the latest edition of the City of Lewistown Standards for Design and Construction.
- B) Any existing or new valves which control the City of Lewistown's water supply shall be operated by City of Lewistown personnel only.
- C) The Contractor shall notify the Water Department a minimum of 24-hours prior to beginning any work.
- D) Contractor shall field-verify line and grade of existing connections.

Plans for water facilities shall show the following:

- Size, type and structural class of proposed new water line(s), including AWWA specifications
- Bedding class
- Type of excavation and backfill
- Existing water lines including size and material
- Proposed valves, fittings, fire hydrants, and service lines, with stationing
- Depth of cover from finish grade to proposed water line(s)
- Requirements for pipe deflection, if necessary
- Type of joint restraint, if required
- Size of gravity thrust blocks based on calculated design
- Existing or proposed pressure reducing valves

Plans for sanitary sewer facilities shall show the following:

- Size, type, and structural class of proposed new sewer line(s), including ASTM specifications
- Slope of each proposed pipeline segment
- Bedding class
- Type of excavation and backfill
- Existing sewer lines and manholes including size, material, field-verified invert elevation and field-verified slopes
- Proposed manholes with stationing and rim and invert elevation

- Existing and proposed sewer service lines with size and stationing
- Existing and proposed cleanouts

Plans for storm sewer facilities shall show the following:

- Size, type and structural class of proposed new storm sewer line(s), including ASTM specifications
- Slope of each proposed pipeline segment
- Bedding class
- Type of excavation and backfill
- Proposed manholes with stationing and rim and invert elevations
- Proposed inlets and inlet service lines with stationing and invert elevations
- Points of storm water discharge.

Section II Design Standards

Design and Development Requirements

Design Requirements. All water, sanitary sewer, storm drainage and roadway systems necessary to provide service to and within a development shall be constructed at the Developer's expense and shall be designed by a Professional Engineer licensed in the State of Montana. Plans, specifications and design reports shall bear the seal of the Engineer in responsible charge of the design.

Water and sanitary sewer system designs shall be reviewed concurrently by the City Engineer or Representative and the Montana Department of Environmental Quality, with the approval of both required. Storm drainage and roadway designs shall be submitted to and approved of by the City Engineer or Representative. All required approvals shall be obtained prior to beginning construction Design calculations and testing results shall be submitted to the City Engineer or Representative as required or requested.

Development Requirements. All subdivisions and developments shall be in compliance to The Subdivision Regulations of the City of Lewistown, Montana Subdivision Regulations and these Standards for Design and Construction.

It shall be the responsibility to the Developer to construct all roadways and utilities from the existing facilities to the far property line of the development or such other point within the development that may be specified by the City Engineer or Representative. All utilities shall be within a public right-of-way or easement to permit free and unobstructed access.

It is the responsibility of the Developer to obtain and provide the City with all easements and right-of-ways necessary to extend roadways and utilities to the far property line of the development. The Developer shall obtain written approval from the City of Lewistown Public Works Department stating they have reviewed and approved the location of easements for the future extension of roadways and utilities which shall be submitted with

the final plat along with an 11" by 17" legible copy of the approved final plat showing the utility and/or easement locations.

There shall be reserved along the front lot line and side street lot line of each residential lot a 10 foot (10') wide utility easement along, contiguous and adjacent to the lot line to provide an area between the sidewalk and easement line for the placement of privately owned underground utilities.

All new utilities shall be placed underground, wherever practical. Underground utilities that are placed in the street right-of-way or easement shall be located between the back of the sidewalk and the easement line, water and sewer being the only exceptions. No underground utilities, except service sweeps from the utility trench to the street lights, utility boxes, pedestals, vaults, or transformers shall be placed in the boulevard between the back of curb and sidewalk or within a sidewalk itself. No above ground utility boxes, pedestals, vaults, or transformers shall be placed within the radial extension of an easement, proposed roadway, or access way to any City facility.

Water Systems

Water systems shall be designed, constructed, and tested in accordance with the current editions of circular WQB 1-Montana Department of Health and Environmental Sciences – Standards for Water Works, The Montana Public Works Standard Specifications and The Standards for Design and Construction, Lewistown, Montana,

A master water plan shall be submitted for each subdivision or other major development prior to approval of any portion of the water system. Prior to design the city will issue written approval. An overall plan of the development should include all areas outside of the study area which would naturally be served through the study area shall be submitted.

Precautions shall be taken to protect the interiors of pipes, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. All openings in the pipeline shall be closed with a watertight plug when pipe laying is stopped at the close of the day's work or for other reasons. Rodent-proof plugs may be used where it is determined that watertight plugs are not practical and where thorough cleaning will be performed by flushing or other means.

Any proposed water booster stations must be approved by the City of Lewistown and their representatives.

Water Main Design

All water main extensions will require the Design Engineer to submit a written report to the City Engineer or Representative which addresses the fire and domestic flow requirements. The report shall include flow test results at the nearest hydrant to the

development which shows the static pressure at zero flow from the hydrant and the minimum residual pressure of 20 psi with available flow from the hydrant.

The City will perform the required hydrant flow testing and will provide the test data to the Design Engineer, at a cost of \$30.00 per hour, if so requested.

Abandonment of water service lines. A service line that is to be abandoned shall be excavated at the tap on the water main, the corporation stop shut off, and the service line cut at the corporation. Any visible leak at the corporation shall be repaired prior to backfill. It shall be the responsibility of the owner of the new service line to abandon the old service at the main. Failure to abandon service lines not in use will result in termination of water service to the property

Buried Warning Tape and Trace Wire. The Contractor shall bury warning tape and trace wire with all pipeline and service lines. The tape shall be three inches wide, blue, marked "Caution Water Line Buried Below". Trace wire shall be #14 TW direct bury copper wire. Trace wire shall be taped to service where it enters the building and is brought to the surface at each valve or other appurtenance that is at the ground level. Trace wire shall be buried with the pipe and the warning tape placed 18 inches below the finished surface.

Isolation Valves. All connections to an existing water main will begin with a new valve. Isolation valves shall be installed at all intersections. Distance between isolation valves shall not exceed 500 feet, unless approved by the City Engineer or Representative.

Fire Flow. Fire flow requirements shall be determined by the City Engineer or Representative and Lewistown Fire Department.

Minimum Pipe Sizes. The minimum diameter of all mains shall be eight (8) inches unless a smaller conforming to AWWA C-900 Standards. All water main piping larger than twelve (12) inches in diameter shall conform to AWWA c-905 Standards. For Ductile Iron Mains are required to conform to Class 50, 51 and Class 350 AWWA standards.

Water Service Lines. Structures containing two or more separate ownership, such as townhouses or condominiums shall have separate service lines, service valves and meters for each residence. Structures containing two or more residences, offices or businesses that are rental units under common ownership may have one service line, valve and meter for all occupants within a single structure.

Minimum Depth. A minimum depth of cover of six and one-half (6 ½) feet below final grade will be maintained over all water mains.

Separation. When water pipes cross sanitary or storm sewer lines, the water line must have a minimum of eighteen (18) inches of vertical separation. A minimum of ten (10) feet of horizontal separation shall be maintained between any water main and any sanitary or storm sewer main.

Gate Valves. Gate valves shall be Mueller Resilient Wedge Gate Valves or an approved equal conforming to AWWA C-509 Standards. All valves under 12 inches in diameter shall be a gate valve.

Butterfly Valves. Butterfly valves shall be Mueller Lineseal Butterfly Valves, or an approved equal conforming to AWWA C-504 Standards. All valves over 12 inches in diameter shall be butterfly.

Fire Hydrants. Fire hydrants shall be Waterous or as accepted by the Public Works Department. The placement of all fire hydrants shall be subject to the approval of the Public Works Department. Hydrant spacing shall not exceed 500 feet along streets in residential areas, 300 feet in commercial areas and 150 feet in industrial areas.

Air Relief. Air relief shall be provided at all high points in the line where air can accumulate by means of hydrants, services, or air relief valves. The need for air relief valves will be decided on a case by case basis.

Pressure Reducing Valves. Pressure reducing valves shall be installed when the anticipated average-day line pressure exceeds 120 psi.

Service Clamps. Service clamps for PVC water mains shall be H-13000 Series Mueller Bronze or an approved equal, designed for use with AWWA C-900 PVC pipe.

Corporation Valves and Service Valves. Corporation valves and service valves shall be Mueller 300 Series ball valves, or an approved equal

Service Fittings. Service fittings shall be Mueller Insta-Tite or 110 Series compression fittings or an approved equal.

Curb Boxes. Curb boxes shall be Mueller H-10308 or an approved equal, cast iron extension type with arch pattern base, 1.5 inch I.D., upper section, minimum length 6.5 feet, equipped with stationary rod and a pentagon brass plug.

Service Pipe. Service pipe between ¾" and 2" K-copper shall be used from the curb stop to the point of service. At no time will any line less than ¾" be allowed.

Tapping Sleeves. Tapping sleeves shall be Romac SST III or an approved equal.

Ductile Iron Fittings. Ductile iron fittings shall be Class 350 fittings conforming to AWWA C-153 Standards. The fittings shall be mechanical joint style unless other wise specified by the Public Works Department.

Valve Boxes. Main line valve boxes shall be designed for slip or screw type adjustment.

Mechanical Joint Restraints. Mega lugs or similar mechanical joint restraining devices may be used. Thrust blocks shall be required at all mega lugs and similar mechanical joint restraining devices.

Blow-offs. Valved blow-offs shall be installed at all main dead-ends that do not have a fire hydrant. Minimum size of blow-off shall be 2 inches.

Sanitary Sewer Systems

Sanitary sewer systems shall be designed, constructed and tested in accordance with the current edition of WOB 2 Montana Department of Environmental Quality – Design Standards for Wastewater Facilities, Montana Public Works Standard Specifications and Standards for Design and Construction Lewistown, Montana.

New sewer lines shall be sized to flow at no more than 75 percent of full capacity at peak hour conditions upon the full build-out of the development. The effects of the proposed development's sewer loading on the existing downstream sewer lines shall be analyzed.

The following shall apply to the design of all sanitary sewers:

The City of Lewistown will require the developer to submit a written report of the effects of the proposed subdivision on the Lewistown Wastewater Collection System, prior to design and construction of the subdivision. The cost of upgrading downstream wastewater main shall be born by the developer.

Minimum design contributing wastewater flows shall be: residential- 87 gpd/capita; commercial- 20 gpd/employee; and wet weather infiltration- 100 gpd/acre.

Any proposed lift stations must be approved by the City of Lewistown and their representatives. (See STD-323 Appendix A pages 11-13, as well as STD-324 page 14)

Gravity Sewers. Unless waived by the City Engineer or Representative, the Design Engineer shall submit a written report for all improvements or additions to the sanitary sewer system. The report shall assess the ability of the existing collection system to handle the peak design flow from the project and the impact on the Wastewater Treatment Plant.

Manhole Spacing. The maximum distance between manholes shall be 400 feet for pipe with a diameter between eight (8) to fifteen (15) inches. For pipe eighteen (18) to thirty (30) inches the maximum spacing shall be 500 feet.

Barrel Size. The alignment and number of pipes into the manhole will determine the barrel size for the size of pipe used. All 48 inch manholes will have eccentric cone top sections if the total manhole height is greater than six feet. All other manholes will have flat tops.

All drop manholes shall be "inside drop" with a minimum barrel diameter of 60 inches. The internal diameter of the manhole barrel shall be typically as follows:

<u>Sewer Pipe Size</u>	<u>Barrel Size</u>
12" or less	48"
15" to 27"	60"

Manhole Channels. All manholes shall have full-depth channels. When a smaller main is being connected to a larger main at a manhole, the manhole inverts shall be set so that the 8/10 depth of flow or each main is equal in elevation. The minimum drop across a manhole (invert in to invert out) is 0.1 feet.

Minimum Pipe Size. The minimum diameter of any gravity sanitary sewer main shall be eight (8) inches. Main lines will be designed for flow not available slope. PVC pipe SDR 35 or equivalent shall be used for all gravity flow mains unless otherwise approved.

Minimum Depth. Sewer mains shall have a minimum depth of cover of four (4) feet below final grade. All sewer mains and services with less than five (5) feet of cover will be adequately insulated, as approved by the Public Works Department. The depths of sewers shall be in accordance with MDEQ Circular 2. (MDEA Circular 2, Paragraph 33.2 states, "In general, sewers should be sufficiently deep to receive wastewater from basements and to prevent freezing. Insulation shall be provided for sewers that cannot be place at a depth sufficient to prevent freezing.").

Sanitary Sewer Service Lines The minimum diameter of a service is four (4) inches. Services are to be installed perpendicular to the main and connected with in-line gasketed wyes. Structures containing two or more residences under separate ownership, such as townhouses or condominiums, shall have separate sewer service lines for each residence. Structures containing two or more residences, offices or businesses that are rental units under common ownership may have one service line for all occupants within a single structure.

Sanitary Sewer Manhole Ring and Cover. The sanitary sewer manhole ring and cover shall be Neenah 301 Frame and Cover or an approved equal. The cover shall be marked Sewer. Adjustment rings will be 2", 4" and 6" in thickness.

Storm Drainage Systems

Publicly owned storm inlets shall comply with the applicable Montana Public Works Standard Specifications drawings. Where inadequate overflow paths are provided, inlets must be oversized 50-percent to accommodate plugging.

The size of the outlet pipes form storm water inlets shall be based upon the design capacity of the inlet. The outlet pipes shall connect to the storm sewer main with a manhole.

Combination manhole/inlets may be used where approved.

Storm Water Collection and Transportation. Storm water within public street right of way shall be carried within the curb and gutter or within underground piping and appurtenances to the detention/retention facility. No storm water shall traverse the paved area of any through street. Developments upstream and adjacent to existing storm water piping shall be designed for storm water retention. After retention the storm water may be discharged to existing storm water piping.

Curbs and Gutters. Streets and roads shall be designed to ensure proper drainage. Curbs and gutters shall be required in all subdivisions. Curbs and gutters of adjoining properties shall be extended to match the new curb and gutter.

Storm Water Discharge. Drainage systems shall not discharge into any sanitary sewer facility. Runoff that is discharged directly into a stream shall meet all applicable standards. All discharge permits shall be obtained by the developer and a copy provided to the Public Works Department.

Manhole Spacing. The maximum spacing between storm manholes shall be four hundred (400) feet.

Minimum Pipe Size. The minimum diameter of any gravity storm drainage main shall be 12 inches. Laterals may be 8 inches.

Minimum Depth. Storm sewer mains shall have a minimum depth of cover of two (2) feet below final grade. Storm sewers shall be placed to maintain a minimum horizontal clearance of five (5) feet and a vertical clearance of six (6) inches from any sanitary sewer.

Minimum Pipe Slope. The pipe slope shall be designed to provide a minimum velocity of not less than 2.5 feet per second.

Storm Drain Manhole Rings and Covers. The storm drain manhole rings and covers shall be Neenah 301 Frame and Cover, or an approved equal. The cover shall be marked Storm.

Detention/Retention Ponds

Basin located in areas accessible to the public shall have a maximum depth of 1.5 feet in depth and a maximum basin depth of 2.5 feet. Deep basins designed only for storm water detention shall be placed in remote areas and be fenced. Basins serving multiple lots shall be located in common open spaces owned by a Homeowners or Property Owners Association. Locating a basin within an easement on a lot will not be permitted unless approved by the governing body. Public park land shall not be used for storm water

detention or retention ponds unless approved by the City of Lewistown or their representative.

Detention/Retention ponds will be designed for the storm frequency and intensities per City of Lewistown Code 9-9-3 or as approved by the City of Lewistown or their representative.

Roadways and Walkways

All unpaved roads within two (2) miles of the City Limits shall meet the City's gravel road standards. Gravel road standards shall be the same as paved road standards with the omission of the asphalt or concrete surface.

All new streets will be built to City Road Standards (see Standard Drawing COL1, SD-1 or SD-2) prior to dedication, unless an agreement is reached for timely construction to City specifications.

All unpaved roads shall be connected to a public road maintained by the County, City or State.

An unpaved road which abuts a paved City road will have a forty (40) foot paved apron connecting the unpaved road to the paved road.

All streets and roads within a subdivision shall either be dedicated to the public or be private streets or roads to be owned and maintained by an approved property owners' association.

Width of street are as defined in the City of Lewistown Code 9-9-3.

Street Intersections

All streets shall intersect streets at a 90 degree angle, if topography permits and no less than 80 degrees for a minimum distance of 60 feet as measured along the centerline.

No more than 2 streets may intersect at any one point

Two streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be offset at least 125 feet for local roads and 300 feet for collector or arterials.

Intersection of local streets with arterials shall be kept to a minimum.

Hilltop intersections are prohibited, except where no reasonable alternative exist. Intersections on local streets within 100 feet of a hilltop are prohibited. Intersections on arterial or collector streets within 200 feet are prohibited.

All street shall be named. New names of streets aligned with existing streets shall be the same as those of the existing streets and shall be taken from an approved list obtained from the 9-1-1 Coordinator for the City of Lewistown.

Prior to design and construction of a major subdivision a Traffic Impact Study (TIS) shall be performed by the developer. This requires the written approval of the Public Works Department.

The City of Lewistown will be reimbursed for the labor and material cost for the required street signs within the subdivision. Furthermore, the developer will install the approved sign posts at the locations designated by the Public Works Department.

Street Lighting

Street Lighting will be installed as per City of Lewistown Code Title 9-Chapter 11 in its entirety.

All new utilities shall be placed underground. Except for sewer and water, underground utilities, if placed in the street right-of-way, shall be located between the back of curbs and the right-of-way lines. Such underground facilities shall be installed after the street has been brought to grade and before it is surfaced, to eliminate the necessity for disturbing such surfacing for the connection of individual services.

Sidewalks

See City of Lewistown Code 9-3 in its entirety. The minimum sidewalk width is five feet. Sidewalks will be required for all new developments.

See Appendix A pages 1-7 for specified drawings.

Driveways

The nearest edge of any residential driveway shall be not less than thirty five (35) feet from the edge of the pavement to the nearest intersecting street. All new driveway locations shall be reviewed and approved by either the Building Department (Residential Site Plan) or the Public Works Department (Application for Driveway Construction) prior to beginning construction.

Placement of Utilities

In areas developed without alleys only water, sewer and storm sewers may be placed within the street right-of-way. No underground utilities, except service sweeps from the utility trench to the street lights, utility boxes pedestals, vaults, or transformers shall be

placed in the boulevard between the back of curb and sidewalk or within the sidewalk itself.

All applicable laws, rules and regulations of appropriate regulatory authority having jurisdiction over utilities shall be observed.

Utility Easements A “utility easement” granted to the public is required for all public utility mains not located within public street right-of-way. An easement shall be a minimum of thirty (30) feet wide for one or two utility mains. An additional ten (10) feet is required for each additional main that occupies the easement. Wider easements may be required for larger utility lines.

At no time will the utility line in question be less than nine (9) feet from the edge of the easement or less than ten (10) feet from a parallel utility line.

No permanent structures shall be placed within a utility easement unless an encroachment permit has been obtained. Trees or other significant landscaping features shall not be placed within ten (10) feet of any utility main.

Section III Construction Standards

Project Requirements

Contractors installing water, sanitary sewer, storm sewer and roadways or any other public improvements shall be subject to the following requirements:

Any Contractor working within an existing Public Right of Way or Easement must have a current Lewistown City Business License. These can be purchased from the City Office located at 305 W Watson.

Insurance and bonding shall be in accordance with the Liability Insurance and Bonding section of the General Provisions of this document.

Pre-Construction Conference Prior to any construction starting a preconstruction conference shall be held. The Public Works Department, the Project Engineer, the Owner, and the Contractor shall be represented. Items to be discussed at the pre-construction conference are construction schedule, shop drawings submittals, utility installation, materials testing, quality control, maintenance bond, and other items as necessary.

Shop Drawing Submittal If the proposed items are to be installed different from the approved plans and specifications, shop drawings shall be submitted for review not later than ten (10) business days prior to the proposed installation.

Within 90-day of project completion, the Engineer shall sign and submit as-built drawings to the Public Works Department. Failure to provide all of the necessary close-out documentation within 90-days may result in delaying approval for future projects submitted by the Engineer until such time as necessary documents are provided.

Construction Standards

All water, sanitary sewer, storm drainage, and roadway systems, or any other construction of infrastructure within the public right-of-way or easement, shall be constructed, inspected, and tested in accordance with the current edition of The Montana Public Works Standard Specifications and Standards for Design and Construction of the City of Lewistown and other standards referenced elsewhere in this document. With respect to the design and/or construction of public facilities, any conflicts of differences between the Montana Public Works Standard Specifications, City of Lewistown Subdivision Regulations, and the City of Lewistown Standards for Design and Construction shall be resolved in favor of the City of Lewistown Standards for Design and Construction.

Underground Utilities All underground electrical, gas, phone and TV cable lines must be installed at least three (3) feet horizontally from water, sanitary sewer and storm sewer mains and services.

Construction Inspection, Testing and Quality Control

The following quality control procedures will apply to all utility and roadway construction projects. The City reserves the right to conduct independent quality control testing at the City's expense during any phase of the construction. The Contractor shall bear the expense of failed tests and the expense of bringing the material into conformance with the required specifications.

- 1) All water main valves and fittings, fire hydrants, sewer manholes, wet wells and sewer/water main crossings shall be inspected and approved by the Professional Engineer, or a designated representative, prior the back filling.
- 2) A Professional Engineer, or designated representative, shall be present for all tests required in Section 02660 and Section 02730 of the Montana Public Works Standard Specifications. A written record of all test results shall be submitted to the Public Works Department.
- 3) A Professional Engineer, or designated representative, shall provide the Public Works Department with photocopies of daily inspection reports, including Proctors and compaction test results for all projects. These reports shall be submitted weekly.

Disinfecting and Flushing Water Mains

- 1) Continuous Feed Method. The continuous feed method shall be used to disinfect all water mains
- 2) - Chlorine Concentration The initial concentration of chlorine for pipe disinfection shall be not less than 25 parts per million (ppm) and not more than 250 ppm. A Public Works representative shall verify this concentration during the application process. All service lines and hydrant runs must be included in the disinfection process.
- 3) Residual Chlorine A minimum residual chlorine concentration of 10 ppm is required at the end of the required 24 hour disinfection period. A Public Works representative shall verify this concentration prior the flushing.
- 4) Clearing the Main of Heavily Chlorinated Water After the applicable retention period, heavily chlorinated water should not remain in prolonged contact with pipe. The heavily chlorinated water shall be flushed from the main until measurements indicate that the chlorine concentration is no higher than that generally prevailing in the system.
- 5) Disposing of Heavily Chlorinated Water Heavily chlorinated water shall not be disposed of in sanitary sewers or storm drains. The Contractor shall dispose of all heavily chlorinated water in an environmentally safe manner. If there is any question that the heavily chlorinated water will cause damage to the environment, a reducing agent shall be applied to neutralize the chlorine.
- 6) Bacteriological Testing Unless otherwise approved by the Public Works Department, samples for bacteriological testing will be taken not less than five (5) days after the chlorine concentration in the water main has been reduced to normal operating levels.

Samples shall be taken by the Contractor a minimum of two (2) separate locations to be determined by the City's Inspector.

Compaction

The following minimum compaction testing procedures shall apply to all utility and roadway construction projects. An independent testing laboratory shall be retained to provide the following tests and frequency. Random longitudinal test locations are required. The following are minimum compaction test requirements. The Professional Engineer or a designated representative may require additional tests. For projects containing less than 300 linear feet of improvements, a minimum of one compaction test for each improvement shall be required. A minimum of five compaction tests shall be preformed for each project.

- 1) Utility Trenches and Underground Structures:

For trenches, density tests shall be taken at twelve (12) inches above the pipe, and at 2 foot intervals, as well as, at the surface.

The minimum density shall be 95% Standard Proctor, \pm 3% optimum moisture.

Horizontal Frequency:

1. Utility Mains – One set of test every 150 feet.
2. Service Lines – One set of test per three (3) services based on utility type.
3. Open Pit – Minimum of one test (Open Pit – at each manhole, water valve, storm inlet, curb inlet, vault, etc.)

Each test location shall be separated horizontally from a prior test location.

2) Street sub grade:

All sub-base: 95% Standard Proctor, \pm 3% optimum moisture. Three random density tests, every 300 linear feet of street.

All crushed gravel base: 95% Standard Proctor, \pm 3% optimum moisture. Three random density tests every 300 linear feet of street.

Television Inspection The City of Lewistown reserves the right to inspect all underground utility systems by the use of a television camera prior to final acceptance. The inspections will be done by a private contractor at the Developer's expense. Any deficiencies shall be corrected at the Contractor's expense.

Appendix A Standard Drawings

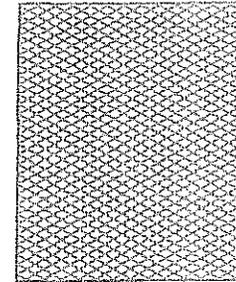
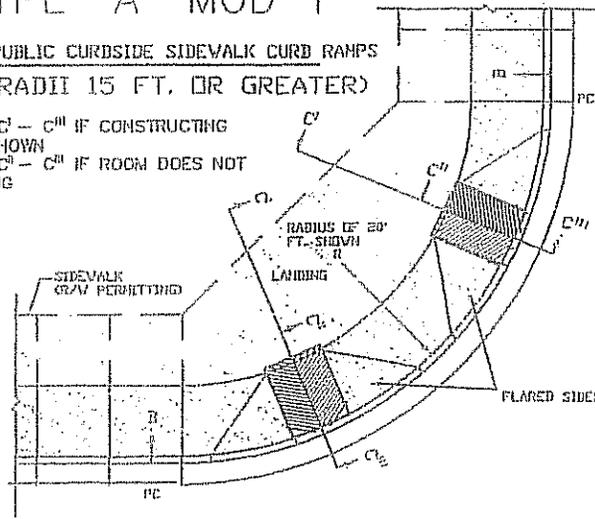
Table of Content

<u>Pg.</u>	<u>Drawing</u>	<u>ID</u>
22	Type A Ramp Mod. 1	STD-101
23	Type A Ramp Mod. 2	STD-102
24	Type D Ramp Mod. 2	STD-108
25	Type A Ramp with Bulbouts	STD-112
26	Typical L Type Curb/Gutter	STD-121
27	Typical Sidewalk Driveway Section	STD-141
28	Typical Sidewalk Spec. Business District	STD-144
29	Abandon Water Lines	STD-310
30	Oil and Sand Separator	STD-313
31	Grease and/or Garbage Separator	STD-314
32	Standard Sewer Lift Station page 1	STD-323
33	Standard Sewer Lift Station page 2	STD-323
34	Standard Sewer Lift Station page 3	STD-323
35	Force Main to Gravity Sewer Manhole Piping	STD-324
36	Residential Street Specification	COL-001
37	Collector Street	SD-1
38	Local Street	SD-2

TYPE "A" MOD 1

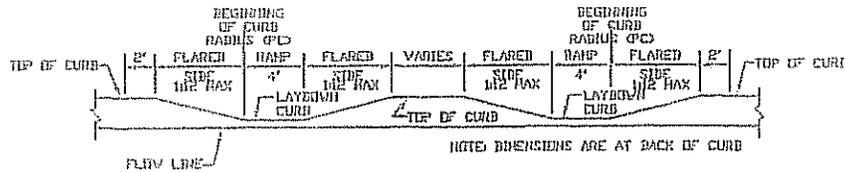
DIAGONAL PUBLIC CURBSIDE SIDEWALK CURB RAMP (FOR RADII 15 FT. OR GREATER)

USE X-SECTION C^I - C^{III} IF CONSTRUCTING
A LANDING AS SHOWN
USE X-SECTION C^I - C^{III} IF ROOM DOES NOT
PERMIT A LANDING



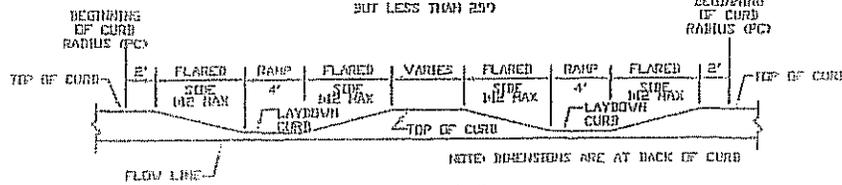
TYPICAL RAMP GROOVING

RAMP SURFACE SHALL BE GROOVED IN A HERRINGBONE PATTERN WITH 1/4" GROOVES APPROXIMATELY 1 1/2" EL OR STAMPED WITH EXPANDED METAL WITH A MINIMUM 1/2" OPENING AND 1/4" DEPTH



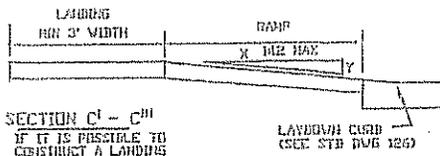
SECTION D-B

OR EQUAL TO OR GREATER THAN 15',
BUT LESS THAN 25'

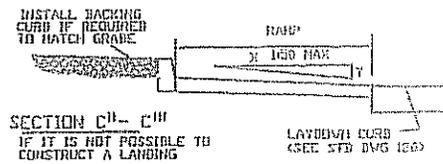


SECTION D-B

OR EQUAL TO OR GREATER THAN 25'



SECTION C^I - C^{III}
IF IT IS POSSIBLE TO
CONSTRUCT A LANDING



SECTION C^I - C^{III}
IF IT IS NOT POSSIBLE TO
CONSTRUCT A LANDING

1. THE STANDARD LANDING LENGTH IS 4 FEET. THE MINIMUM LANDING LENGTH IS 3 FEET. IF LANDING CANNOT BE PROVIDED SEE STD DVG # 103
2. THE SURFACE OF THE PUBLIC SIDEWALK RAMP TO CONTRAST VISUALLY WITH THE ADJOINING PUBLIC SIDEWALK SURFACES. THIS CAN BE OBTAINED BY USE OF COLORED CONCRETE, PATTERNING THE CONCRETE SURFACE, OR OTHER APPROVED METHODS.
3. WHERE EXISTING SITE DEVELOPMENT CONDITIONS PROHIBIT THE STRICT AND FULL COMPLIANCE OF ALL ADA CRITERIA, PROVIDE ACCESSIBILITY TO THE MAXIMUM EXTENT FEASIBLE.
4. SEE STD DVG 141 FOR CONSTRUCTION DETAILS.

Type "A" Ramp
Mod 1

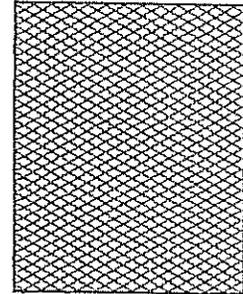
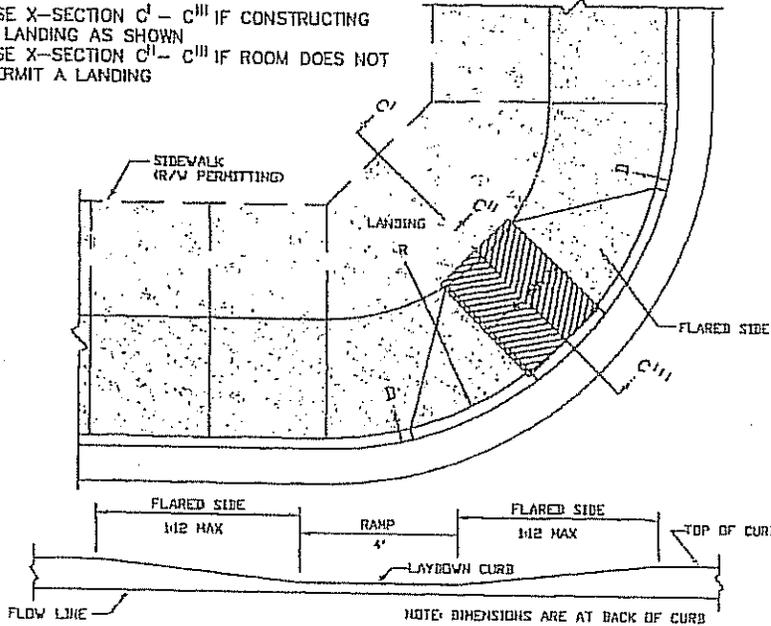
Engineering Division

STD-101

TYPE "A" MOD 2

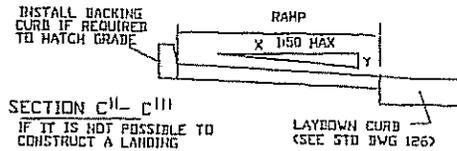
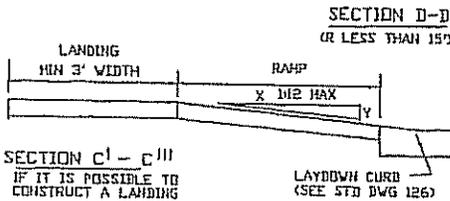
SINGLE DIAGONAL PUBLIC CURBSIDE SIDEWALK CURB RAMP
(FOR RADII LESS THAN 15 FT.)

USE X-SECTION C^I - C^{III} IF CONSTRUCTING
A LANDING AS SHOWN
USE X-SECTION C^I - C^{III} IF ROOM DOES NOT
PERMIT A LANDING



TYPICAL RAMP GROOVING

RAMP SURFACE SHALL BE GROOVED IN A HERRINGBONE PATTERN WITH 1/4" GROOVES APPROXIMATELY 1 1/2" O.C. OR STAMPED WITH EXPANDED METAL WITH A MINIMUM 1 1/2" OPENING AND 1/4" DEPTH



NEW CONSTRUCTION:

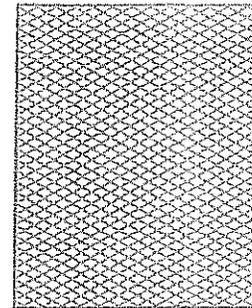
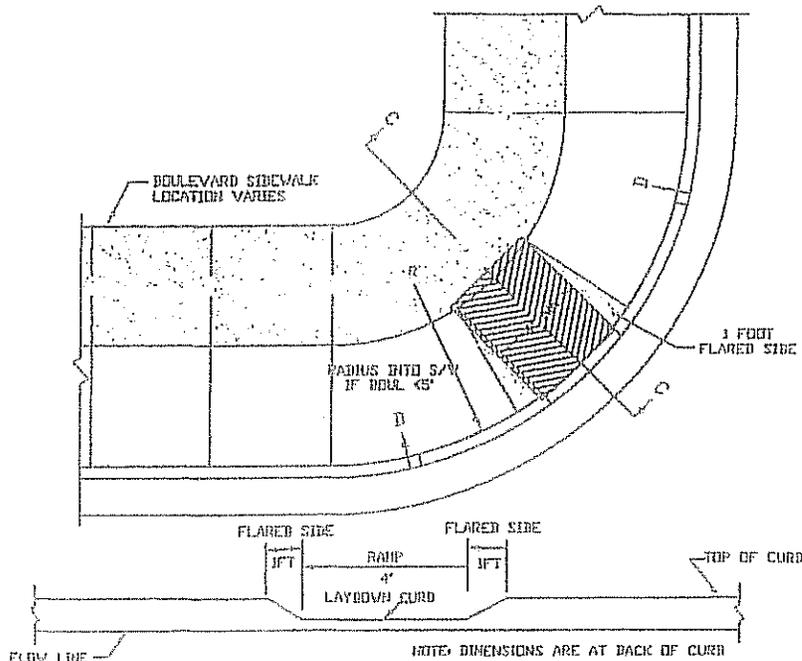
NOTE: SINGLE DIAGONAL PUBLIC SIDEWALK CURB RAMPS SERVING TWO STREET CROSSING DIRECTIONS ARE NOT PERMITTED IN NEW CONSTRUCTION. (SEE STD DWG # 101)

1. THE STANDARD LANDING LENGTH IS 4 FEET. THE MINIMUM LANDING LENGTH IS 3 FEET. IF LANDING CANNOT BE PROVIDED SEE STD DWG # 103
2. THE SURFACE OF THE PUBLIC SIDEWALK RAMP TO CONTRAST VISUALLY WITH THE ADJOINING PUBLIC SIDEWALK SURFACES. THIS CAN BE OBTAINED BY USE OF COLORED CONCRETE, PATTERNING THE CONCRETE SURFACE, OR OTHER APPROVED METHODS.
3. WHERE EXISTING SITE DEVELOPMENT CONDITIONS PROHIBIT THE STRICT AND FULL COMPLIANCE OF ALL ADA CRITERIA, PROVIDE ACCESSIBILITY TO THE MAXIMUM EXTENT FEASIBLE.
4. SEE STD DWG 141 FOR BEDDING AND JOINT DETAIL.

Type "A" Ramp Mod 2		
Engineering Division		STD-102

TYPE "D" MOD 2

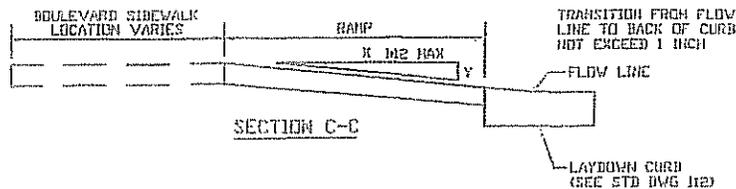
SINGLE DIAGONAL PUBLIC BOULEVARD SIDEWALK CURB RAMP
(FOR RADII LESS THAN 15 FT.)



TYPICAL RAMP GROOVING

RAMP SURFACE SHALL BE GROOVED IN A HERRINGBONE PATTERN WITH 1/4" GROOVES APPROXIMATELY 1 1/2" OC. OR STAMPED WITH EXPANDED METAL WITH A MINIMUM 1 1/2" OPENING AND 1/4" DEPTH.

SECTION D-D
(R LESS THAN 15')



NEW CONSTRUCTION:

NOTE: SINGLE DIAGONAL PUBLIC SIDEWALK CURB RAMPS SERVING TWO STREET CROSSING DIRECTIONS ARE NOT PERMITTED IN NEW CONSTRUCTION. (SEE STD DVG # 107)

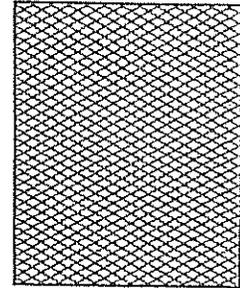
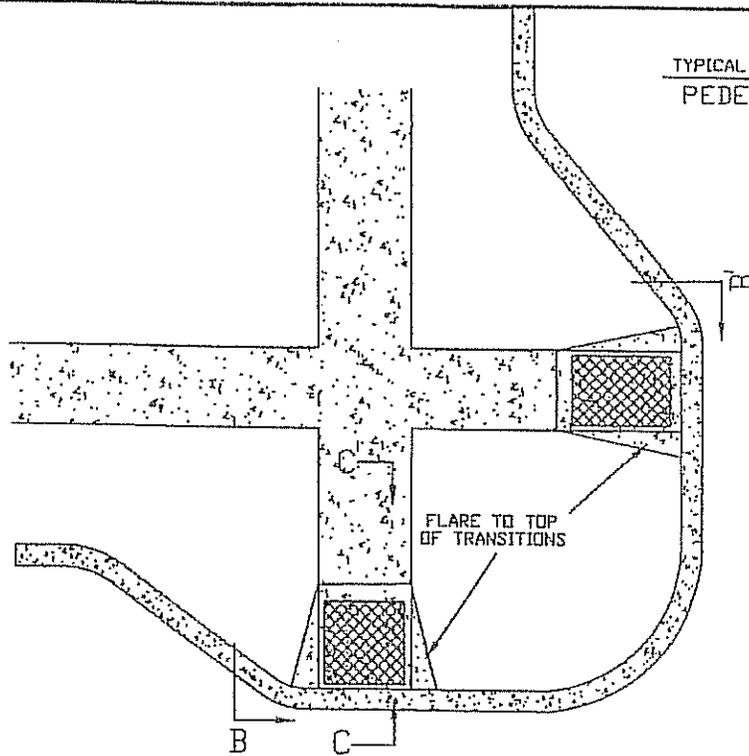
1. THE STANDARD LANDING LENGTH IS 4 FEET. THE MINIMUM LANDING LENGTH IS 3 FEET.
2. THE SURFACE OF THE PUBLIC SIDEWALK RAMP TO CONTRAST VISUALLY WITH THE ADJOINING PUBLIC SIDEWALK SURFACES. THIS CAN BE OBTAINED BY USE OF COLORED CONCRETE, PATTERNING THE CONCRETE SURFACE, OR OTHER APPROVED METHODS.
3. WHERE EXISTING SITE DEVELOPMENT CONDITIONS PROHIBIT THE STRICT AND FULL COMPLIANCE OF ALL ADA CRITERIA, PROVIDE ACCESSIBILITY TO THE MAXIMUM EXTENT FEASIBLE.
4. SEE STD DVG 141 FOR BEDDING AND JOINT DETAIL.

Type "D" Ramp
Mod 2

Engineering Division

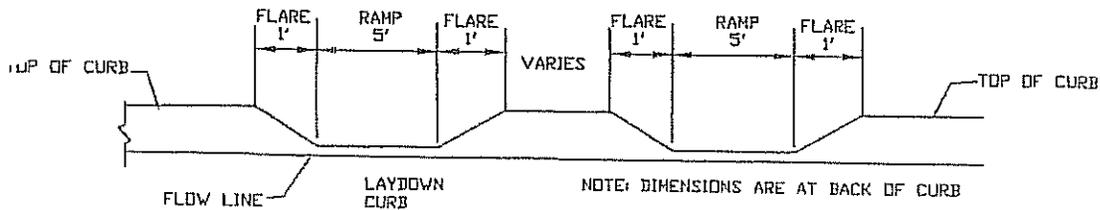
STD-408

TYPICAL SIDEWALK CURB RAMPS FOR PEDESTRIAN BULB OUTS

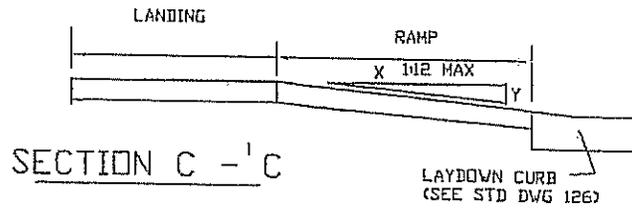


TYPICAL RAMP GROOVING

RAMP SURFACE SHALL BE GROOVED IN A HERRINGBONE PATTERN WITH 1/4" GROOVES APPROXIMATELY 1 1/2" OC OR STAMPED WITH EXPANDED METAL WITH A HERRINGBONE PATTERN 1 1/2" OPENING AND 1/4" DEPTH



SECTION B'-B



SECTION C - C

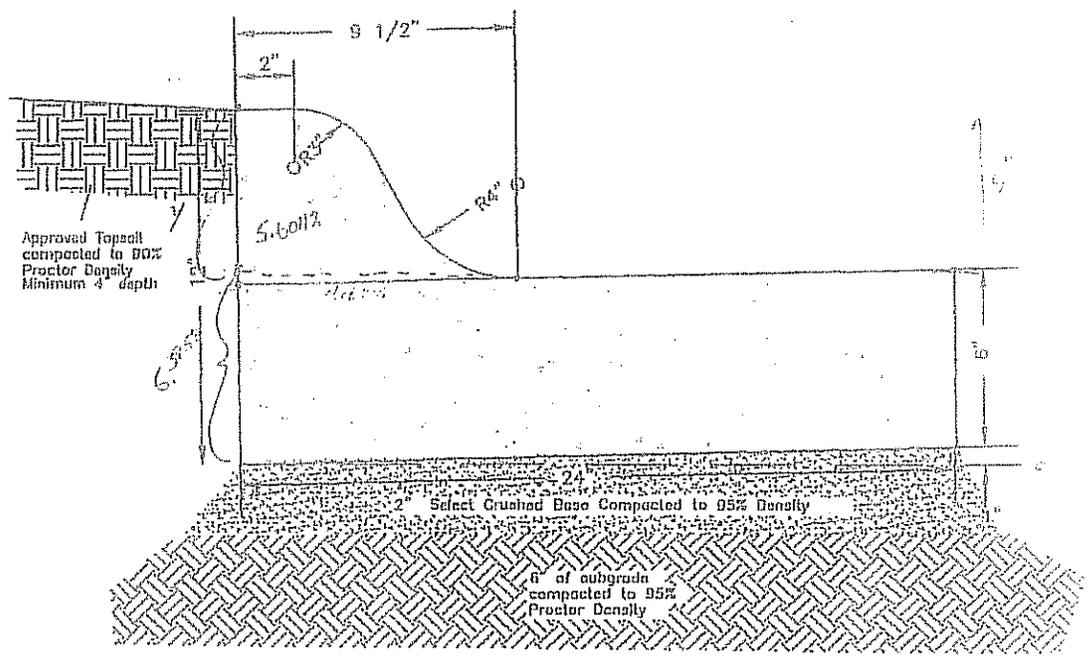
1. THE SURFACE OF THE PUBLIC SIDEWALK RAMP TO CONTRAST VISUALLY WITH THE ADJOINING PUBLIC SIDEWALK SURFACES. THIS CAN BE OBTAINED BY USE OF COLORED CONCRETE, PATTERNING THE CONCRETE SURFACE, OR OTHER APPROVED METHODS.
2. WHERE EXISTING SITE DEVELOPMENT CONDITIONS PROHIBIT THE STRICT AND FULL COMPLIANCE OF ALL ADA CRITERIA, PROVIDE ACCESSIBILITY TO THE MAXIMUM EXTENT FEASIBLE.
3. SEE STD DWG 141 FOR CONSTRUCTION DETAILS.

Type "A" Ramp
For Boulevard Sidewalks w/ Bulbouts

Engineering Division

STD-112

Typical "L" Type Curb/Gutter Section

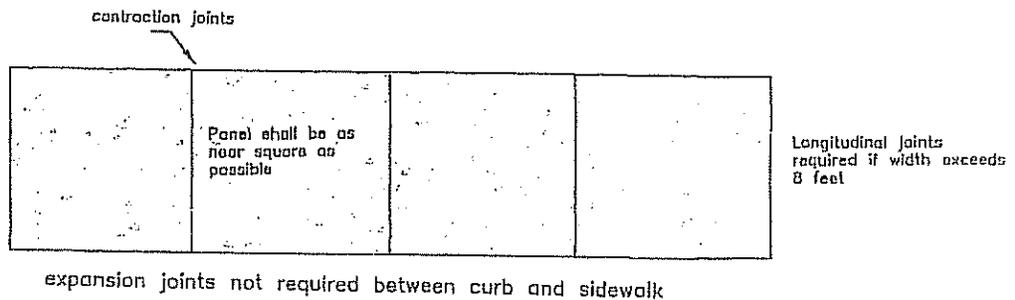


1. Contraction joints shall be placed every 10 feet and shall be 3/4" deep
2. Expansion joints of 1/2" mastic material shall be placed at the following locations:
 - P.C.s and P.T.s of curves
 - Grade breaks
 - 4' on either side of a drainage structure
 - At other locations as specified by engineer
3. No sidewalk shall be placed without a final form inspection by the Engineer
4. Construction materials and procedures shall conform to existing City and State Standard Specifications.

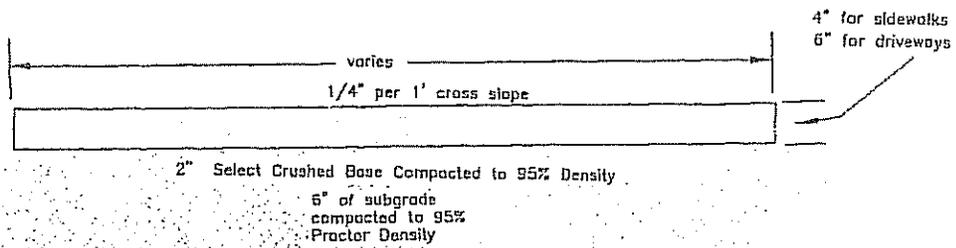
Typical "L" Type Curb/Gutter Section

STD-421

Typical 4" sidewalk and Typical 6" driveway section



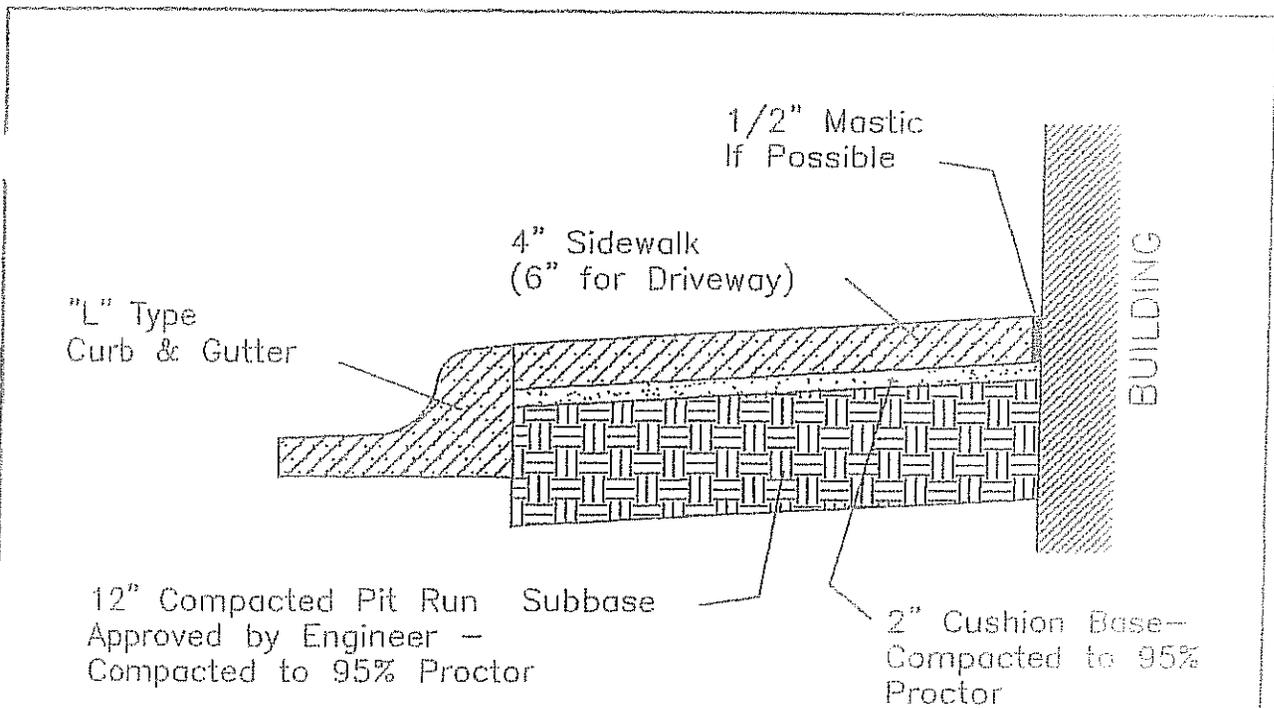
Minimum sidewalk width 5' for residential, 7' for arterial and collectors



1. Contraction joints shall be spaced so as to form as near square panel as possible, no single panel shall exceed 8' on any side. Contraction joints shall be 3/4" deep.
2. Expansion joints of 1/2" mastic material shall be placed at the following locations:
 - P.C.s and P.T.s of curves
 - Grade breaks
 - At driveways
 - At other locations as specified by engineer
3. No sidewalk shall be placed without a final form inspection by the Engineer
4. Construction materials and procedures shall conform to existing City and State Standard Specifications.

Typical Sidewalk and Driveway Section

STD-141



NOTE:

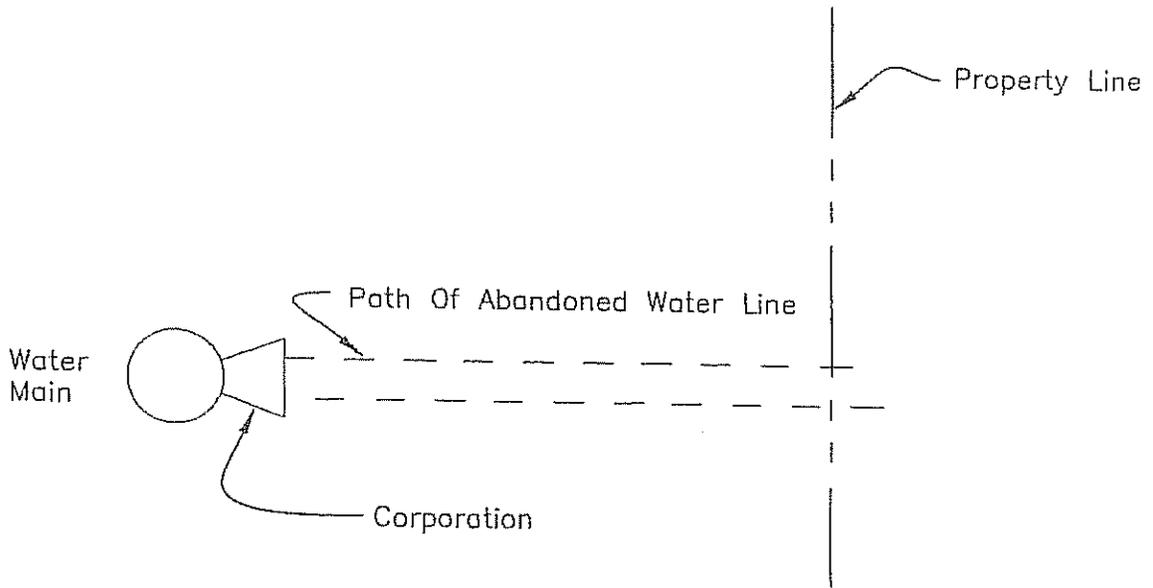
12" Of Subbase Shall Be Removed & Replaced With 12" Of Approved Pit Run - Excavation Of Deleterious Material Below The 12" Excavation Will Be At The Discretion Of The Engineer

SPECIFICATIONS

1. All concrete must meet City specifications with the exception of the cement factor which is increased to 564 lbs/cy or six sacks.
2. Temporary sidewalks shall be used as specified in standard drawings 171 and 172.
3. Other applicable standard drawings:
 - A. No. 121 - Type "L" Curb & Gutter
 - B. No. 147 - Tree Planter Blockout
 - C. No. 142 - Typical Sidewalk for Downtown
 - D. Construction Traffic Control Plans

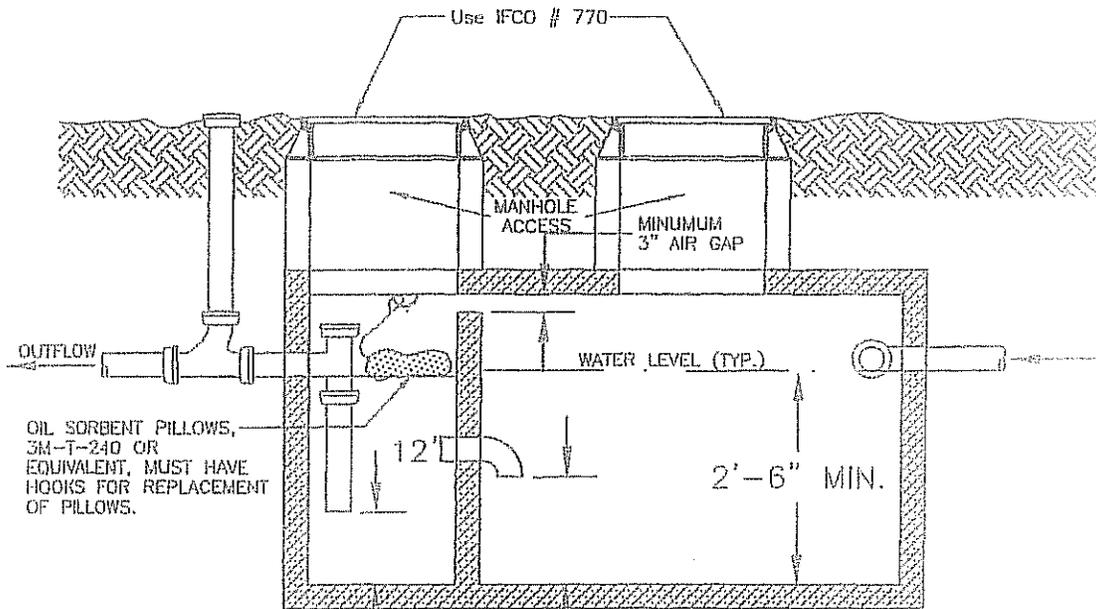
Typical Sidewalk Specifications Central Business District		
		STD-444

ABANDONED WATER LINES

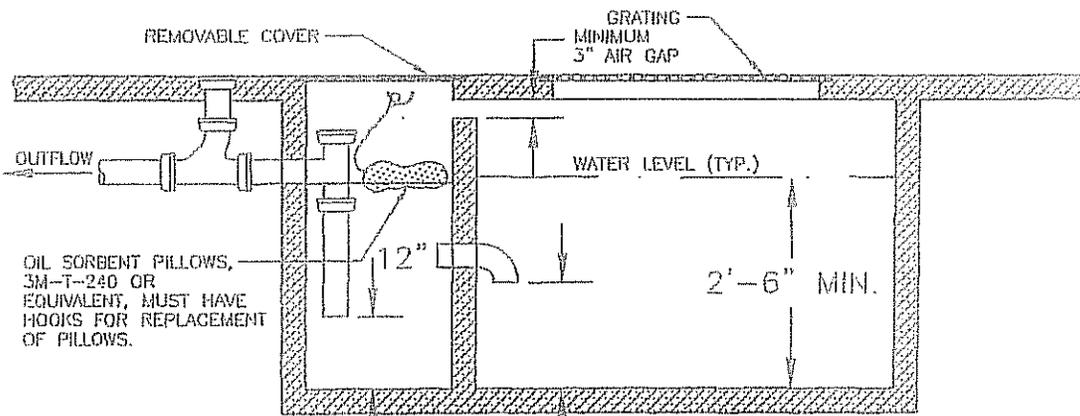


NOTE: Water Line Must Be Disconnected At The Corporation.

	Abandoned Water Lines		
Engineering Division			STD-310



1/2 LIQUID DEPTH
FOR EXTERNAL USE



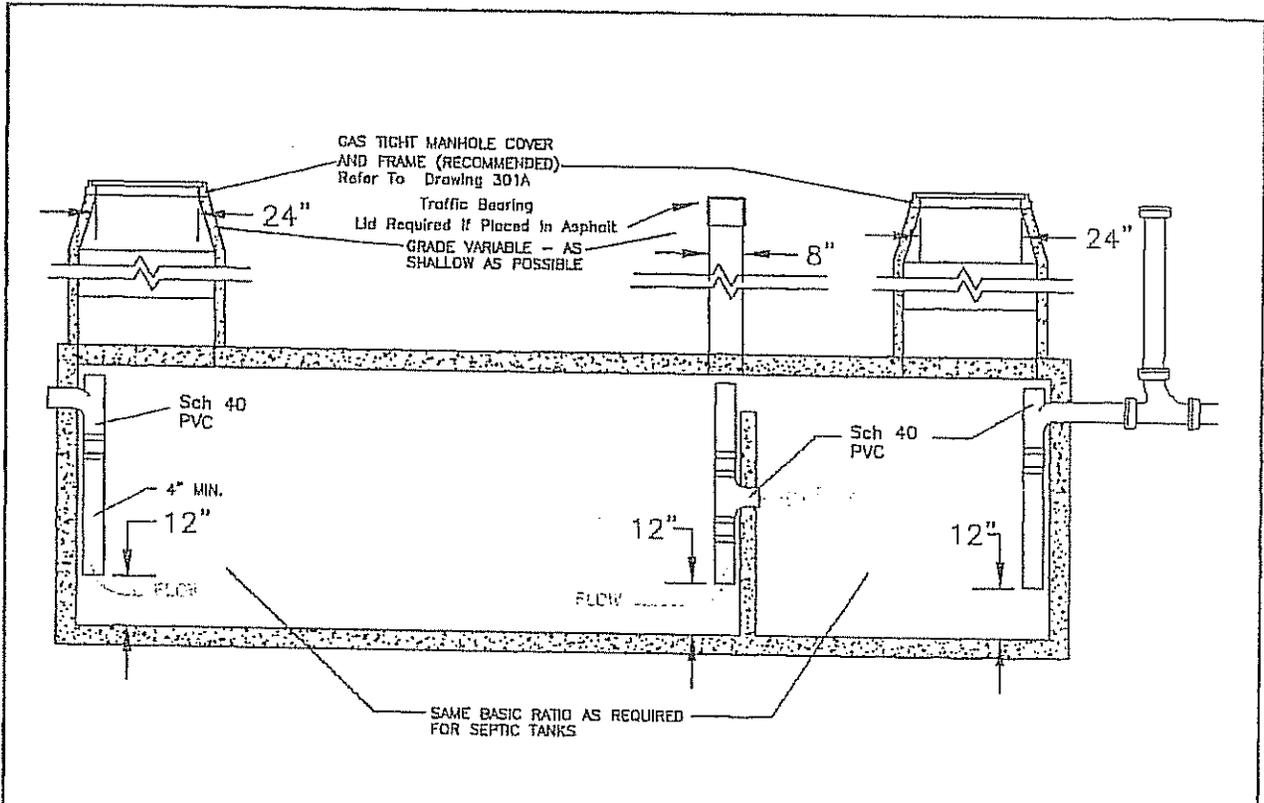
1/2 LIQUID DEPTH
FOR INTERNAL USE

INTERCEPTOR SHALL BE SIZED
IN ACCORDANCE WITH THE
UNIFORM PLUMBING CODES,
SECTION #02. INLET
COMPARTMENT LENGTH MUST
NOT BE LESS THAN 2/3rds
OF THE TOTAL LENGTH.
(1,000 GALLONS MINIMUM
CAPACITY)

Oil And Sand Interceptor

Engineering Division

STD-313

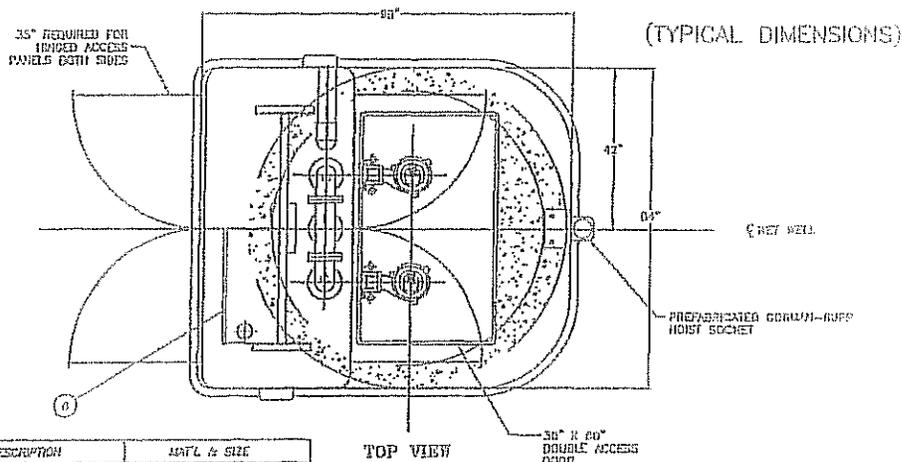


SIZE FORMULA - The size of the interceptor shall be determined by the following formula:

$$\text{Number of meals per peak hour} \times \text{Waste flow rate} \times \text{Retention time} \times \text{Storage factor} = \text{Interceptor size (liquid capacity)}$$

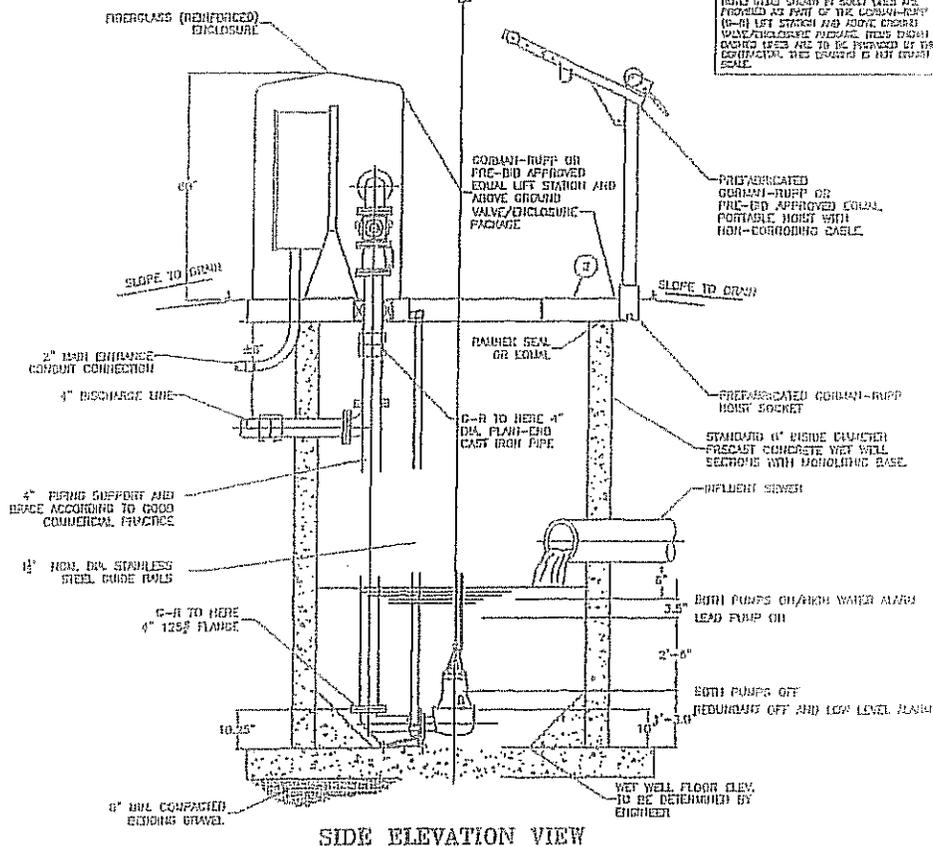
See Uniform Plumbing Code APP. H.

Grease And/Or Garbage Interceptor		
Engineering Division		STD-314



NO.	DESCRIPTION	MAT'L & SIZE
(1)	PUMP	CAST IRON
(2)	BASE	CAST CONCRETE
(3)	PISTON VALVE	CAST IRON 2"
(4)	CHECK VALVE	CAST IRON 2"
(5)	NET WELL VIEW	PLC 4"
(6)	CONTROL PANEL	STEEL

TOP VIEW



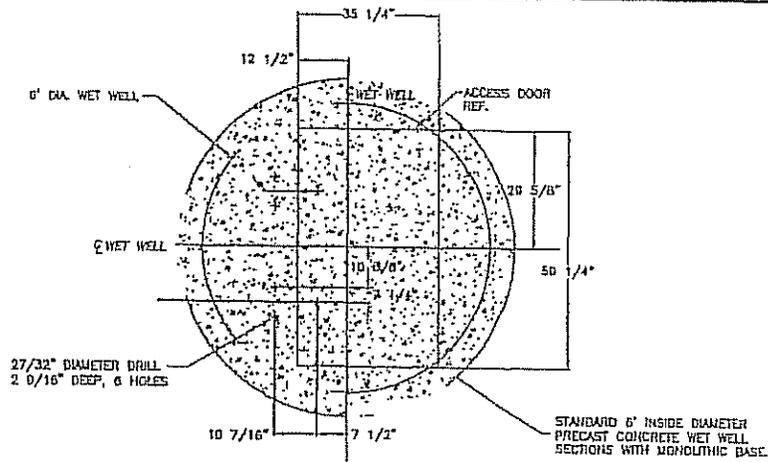
SIDE ELEVATION VIEW

STANDARD SEWER LIFT STATION

Sheet 1 of 3

Engineering Division

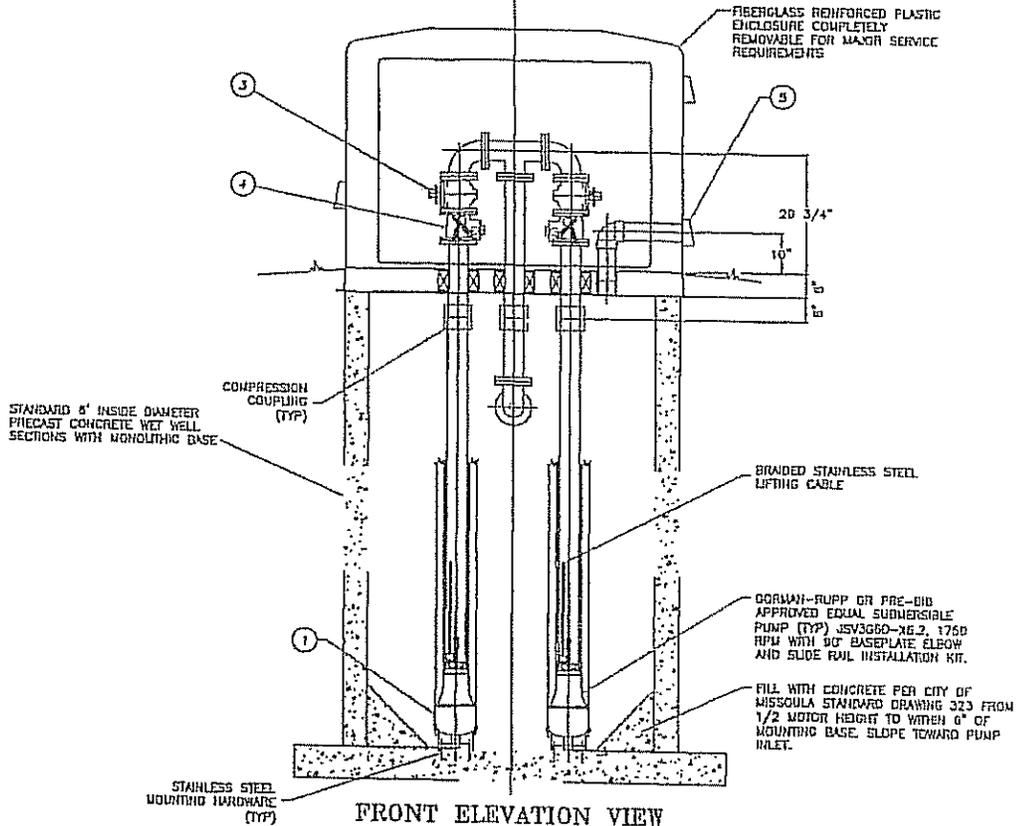
STD-323



TOP VIEW (BASE PLATE ANCHOR LOCATIONS)

ITEM	DESCRIPTION	MAT'L & SIZE
(1)	PUMP	CAST IRON
(2)	BASE	CAST CONCRETE
(3)	PLUG VALVE	CAST IRON 4"
(4)	CHECK VALVE	CAST IRON 4"
(5)	WET WELL VENT	PVC 4"
(6)	CONTROL PANEL	STEEL

NOTE: ITEMS SHOWN IN SOLID LINES ARE PROVIDED AS PART OF THE CORNWALL-RUPP LIFT STATION AND ABOVE GROUND VALVE/ENCLOSURE PACKAGE. ITEMS SHOWN IN DASHED LINES ARE TO BE PROVIDED BY THE CONTRACTOR. THIS DRAWING IS NOT DRAWN TO SCALE.



FRONT ELEVATION VIEW

STANDARD SEWER LIFT STATION

Sheet 2 of 3

Engineering Division

STD-323

CITY OF MISSOULA STANDARD ABOVE GROUND LIFTSTATION REQUIREMENTS

In Addition to Montana Department of Environmental Quality Circular 2, Chapter 40
The Following is Required:

1. All new sewage pumping stations shall be Gorman-Rupp J Series, packaged duplex factory-built submersible pumps with aboveground valve package or pre-bid approved equal. All stations shall be engineered and sized for each specific situation.
2. All pumps in lift stations shall be powered by 460 volt, 3 phase motors.
3. The units shall have the following options included:
current or future systems utilized by the Wastewater Division.
 - a. Dry contacts—high and low water alarm SPDT and phase failure
 - b. Pump start delay to reduce starting load
 - c. Submersible transducer liquid level control
 - d. Station heater
 - e. Station insulation package
 - f. Redundant high water float and a secondary float control assembly
 - g. Spare pump and motor with cable and parts for any critical component not readily available current or future systems utilized by the Wastewater Division.
4. Control panel shall include phase monitor and redundant high water float wired normally closed.
5. Radio telemetry equipment shall be Isaacs 900 Mega Hertz transmitter or equal and A repeater system if necessary required on all new lift stations. They shall be compatible with the current or future systems utilized by the Wastewater Division.
6. All lift stations shall be provided with backup generator power. At a minimum a generator shall have the following:
 - a. Wired for 460 volt, three phase
 - b. Weather-tite enclosure
 - c. Automatic transfer switch
 - d. Standard muffler
 - e. Liquid cooled, diesel powered engine
 - f. Generator sized to step start the duplex pumps and provide additional power for any other lift station components.
7. Special groundwater protection is required for the wet well and shall consist of the following:
 - a. Wet well joints shall have O-ring gasket joints meeting ASTM C443. Install an external joint wrap Cadilloc or approved equal on all joints.
 - b. The exterior of the wet well shall have a minimum of 1/16" thickness exterior coating of "culvert mastic MF#75CM" or an approved equal meeting ASTM A849-90 sprayed or brush applied.
 - c. The wet well shall be tested in accordance with ASTM C1244-93, test method for concrete sewer manholes by the negative air pressure (vacuum) test.
 - d. Wet well inlets shall include a compression-type flexible connection, cast into the wet well wall, providing 10 degree deflection as manufactured by A Lok Products or approved equal.
 - e. Entire wetwell shall be coated with UX-397 Uv resistant aromatic pure Polyurea or equal to a thickness of 125 mills.

STANDARD SEWER LIFT STATION

Sheet 3 of 3

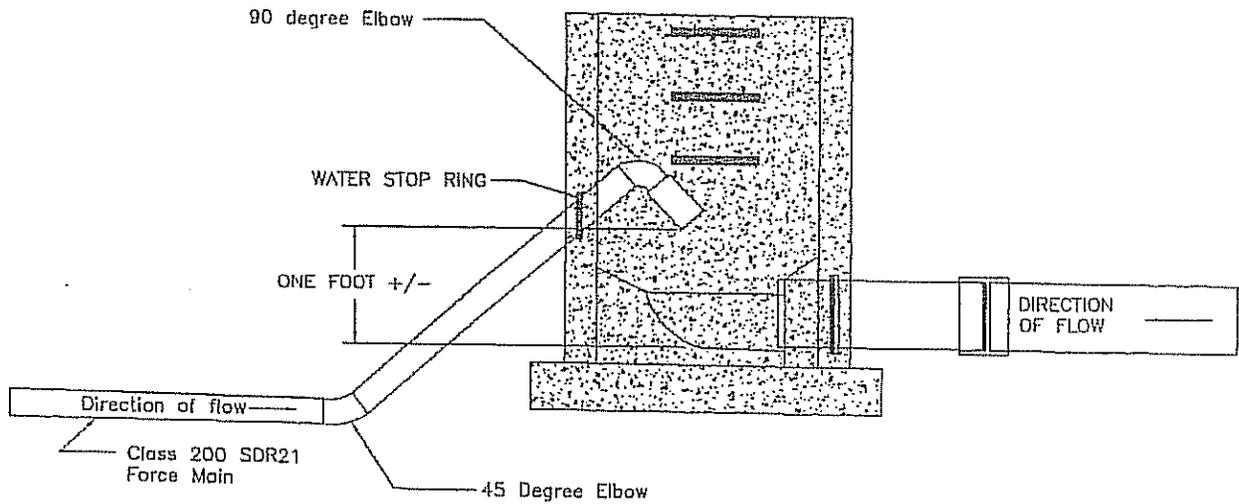
Engineering Division

STD-323

NOTE 1: FORCE MAIN SHALL HAVE PIPE RESTRAINERS OR THRUST BLOCKS FOR 2" PIPE AND ABOVE.

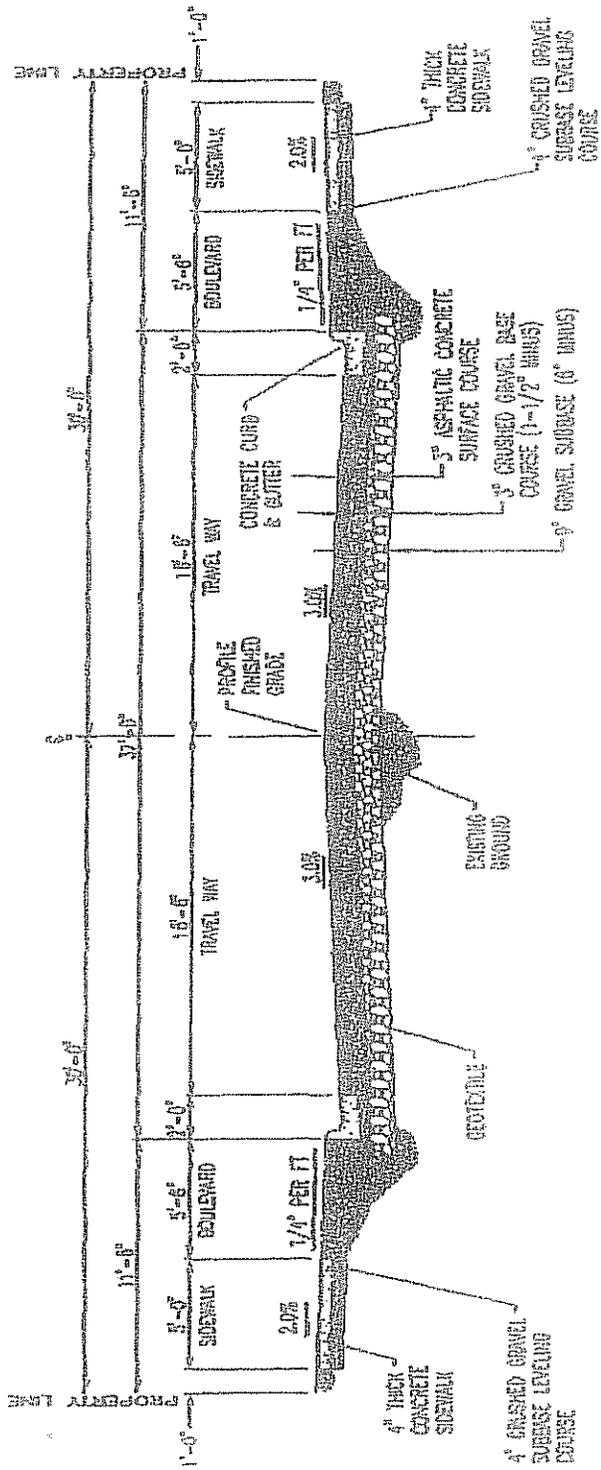
NOTE 2: NIPPLE FROM 90 DEGREE BEND SHALL BE INCREASED ONE PIPE SIZE FOR PRESSURE DEFUSSER.

NOTE 3: ALIGN THE DEFUSSER DISCHARGE WITH THE CENTER OF THE GRAVITY PIPE.

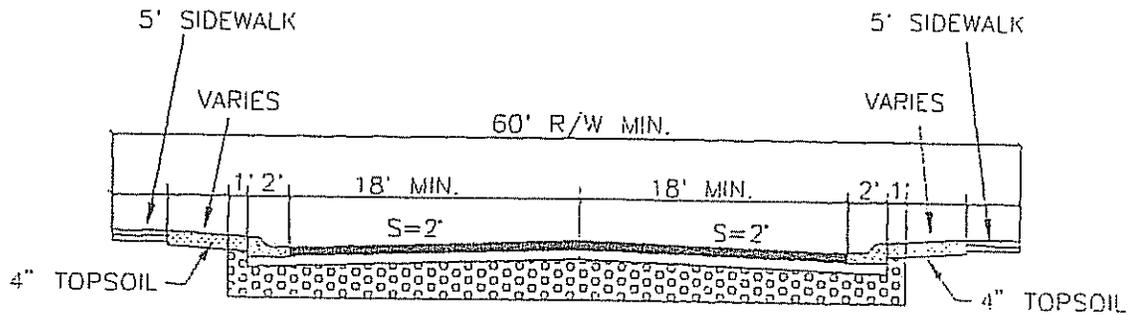


FORCE MAIN TO GRAVITY SEWER MANHOLE PIPING DETAIL

	Force Main to Gravity Sewer Manhole Piping		
Engineering Division			STD-324



1/4" INCH ROAD SECTION



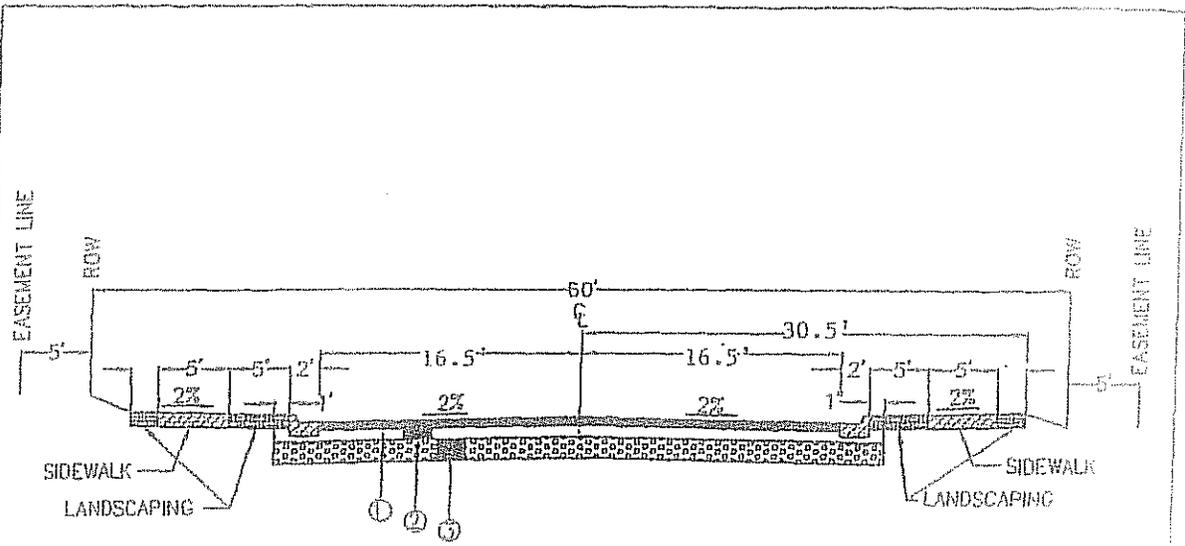
4" ASPHALT/ 95% COMPACTION PER ASTM D-1559
 3" CRUSHED GRAVEL/97% COMPACTION PER AASHTO T-99
 18" SELECT SUB-BASE/ 95% COMPACTION PER AASHTO T-99

1. Thicknesses of asphalt, 3/4" crushed gravel and sub-base shall be as shown unless an alternate design is approved. The City may accept an alternate street design from a Professional Engineer if the traffic loads and soil analysis justify different requirements. The final street design must be approved by the City Engineer.
2. The width of pavement will depend on local conditions such as width of existing streets in the area, anticipated traffic volumes, future extensions, etc.
3. The width of the R/W may have to be increased due to road slopes, utilities, traffic volume or other requirements.
4. Unless otherwise approved by the City Engineer all topsoiled areas to be sodded by the Developer.
5. No parking will be allowed on collector streets.
6. The maximum grade shall be 7% for distances not to exceed 150 feet per 300 feet of roadway.

CONSTRUCTION STANDARDS

COLLECTOR STREET

SD-1



- ① 4" ASPHALT - DENSITY AND SURFACE REQUIREMENTS SHALL BE IN ACCORDANCE WITH MPWSS SECTION 02510 PARAGRAPH 3.2B
- ② 6" CRUSHED GRAVEL BASE, -3/4" DIAMETER@95% DENSITY (± 3% OPTIMUM MOISTURE) PER AASHTO T-99
- ③ 9" SELECT SUB-BASE@95% DENSITY (± 3% OPTIMUM MOISTURE) PER AASHTO T-99

1. THICKNESSES OF ASPHALT, CRUSHED GRAVEL AND SUB-BASE SHALL BE AS SHOWN, UNLESS AN ALTERNATE DESIGN IS APPROVED. THE FINAL STREET DESIGN SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO START OF CONSTRUCTION.
2. THE WIDTH OF THE RIGHT-OF-WAY MAY BE INCREASED DUE TO UTILITIES, OR OTHER REQUIREMENTS.
3. THE MAXIMUM GRADE SHALL BE 8%.
4. ON STREET PARKING GOVERNED BY CITY OF KALISPELL SUBDIVISION REGULATIONS.

UTILITY NOTE:

ALL NEW UTILITIES SHALL BE PLACED UNDERGROUND. EXCEPT FOR SEWER AND WATER, UNDERGROUND UTILITIES, IF PLACED IN THE STREET RIGHT-OF-WAY OR EASEMENT, SHALL BE LOCATED BETWEEN THE BACK OF THE SIDEWALK AND THE EASEMENT LINE. NO UNDERGROUND UTILITIES SHALL BE PLACED IN THE BOULEVARD BETWEEN THE BACK OF CURB AND SIDEWALK.

CONSTRUCTION STANDARDS	LOCAL STREET	SD-2
------------------------	--------------	------