Title 13

PUBLIC SERVICES

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Chapter 13.04

WATER SYSTEM CONSTRUCTION

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13.04.010 Compliance required.

All development shall comply with the then-current requirements of the Grand Water and Sewer Service Agency as may be adopted or amended by the Grand Water and Sewer Service Agency. (Ord. 305 Exh. A § 5 (part), 1999)

13.04.020 General conditions.

A. These specifications are for the use of developers or individuals when constructing water lines that will become a part of the Grand Water and Sewer Service Agency ("GW&SSA") system. Due to the nature of these specifications, it should not be construed that all conditions spelled out in these documents will be met in every project or that all conditions that may be encountered in a project are covered by these documents. If a project encounters conditions not covered in these documents, GW&SSA shall be contacted for additional specifications.

B. District rules and regulations governing the extension of water mains are as follows:

1. Size of Water Main. The district manager shall determine the size of the main required to serve any part of the district. No main less than eight inches in diameter shall be placed in the water distribution system. Smaller sizes may be permitted at the discretion of the district manager.

2. Specifications for Installation of Water Mains. All culinary water mains used underground shall be approved by the district manager, according to specifications as approved by the board of trustees. The water mains shall be laid not less than forty-two (42) inches below the ground and of sufficient strength to stand the water pressure.

3. Water Main Extension Costs.

a. When water mains are extended, the property owners benefited thereby, as determined by the district, shall pay all of the costs of extending such mains insofar as such costs relate to the size main required to serve the property benefited.

b. The district manager shall propagate rules and regulations setting forth the method of determining the portion of the cost of main extension to be borne by the district, which regulations shall be submitted to the board of trustees for approval.

4. Extension of Water Mains in Subdivisions. The subdivider shall install all water mains required to serve a platted subdivision, including cross-connecting mains. The subdivider shall install mains to the farthest point or points of his or her subdivision. The district may participate in the cost of installing such mains as provided above.

5. Reimbursement for Water Main Extension. When any person constructs a waterline through undeveloped areas to serve his or her property or constructs lines on the perimeter of his or her property, such person shall pay the entire cost of such water lines. If he or she has furnished the district a recapitulation of the construction costs and has entered into an agreement with the district within ninety (90) days of the completion of such water lines, then, at the time the property abutting such water line is developed and connections are made to the water line, the district may collect a charge per front foot, and if so collected, shall reimburse the original installer to the extent of the collection so made. The amount to be repaid to the person may be the original cost to the person of the excess extension, plus any amount added pursuant to the agreement with the person to recognize the effects of inflation. However, in no event shall the amount to be collected be less than the original construction cost. The right to reimbursement under the provision of this section shall not exceed a period of ten (10) years from the execution of the agreement. The board of trustees may approve an extension to the agreement exceeding ten (10) years.

6. Expiration of Reimbursement Right. The subdivider's right to reimbursement under a water main extension contract shall not exceed a period of ten (10) years from the date of the execution of the contract. All payments shall cease at that time regardless of the amount that has at that time been received by the subdivider, unless, upon the recommendation of the district manager, the board of trustees shall approve a contract exceeding ten (10) years.

7. Subdivision Extensions Constructed Under Private Contract. The subdivider shall install the main in his subdivision by private contract, subject to approval of the plans and specifications by the district and to the district's inspection of actual construction.

8. Construction and Financing of Connection Loops. Connecting loops and cross-ties within a subdivision shall be constructed by the subdivider. If ties or connections are made to such line, the reimbursement provisions of the above sections of this article shall apply. The district shall finance

connecting loops in the nature of a general improvement of the water system; the district shall collect the change based on assessments in proportion to benefits received by the property to be served.

9. Extent of Extensions. All water main extensions shall be made to the farthest limit of the property to be served.

10. Warranty of Materials and Construction. The developer shall warrant all portions of the water system constructed under the private contract for a period of one year. Any and all repairs required during the one-year period shall either be performed by the developer or his or her agents or shall be performed by the district with all costs for materials and labor reimbursed by the developer to the district. (Ord. 305 Exh. A § 5(A), 1999)

13.04.030 Special project conditions.

A. Existing Utilities. It shall be the responsibility of the developer to contact utility companies to determine the exact location of all utilities and their service connections. The developer shall make an independent investigation as to the location, type, and shall be responsible for the protection of these utilities. In the event these utilities or service connections are damaged, they shall be repaired at no additional expense to the owner.

B. Protection of Existing Utilities. A proposed pipeline in some areas may cross existing water lines of the city of Moab and GW&SSA. The developer shall take all reasonable precautions to protect the existing water lines at all time. Gas, power and telephone lines also may be crossed by proposed water lines in some places. The developer shall take all reasonable precaution to preserve and protect these lines.

C. Construction Through Private Property.

1. The developer shall negotiate easement agreements with private property owners along the construction route of water lines. In general, these agreements provide for a twenty (20) foot wide permanent easement. Such easements shall be dedicated to GW&SSA.

2. The developer shall confine all his or her operation to the area within the easement limits. In general, the easement area is intended to provide reasonable access and working area for efficient operation by the developer. If additional easement width and/or additional access roads are desired, the developer shall negotiate with and compensate the private property owners for such use.

D. Work on State and County Roads. The developer will obtain all required licenses for construction on state and county roads, and secure digging permits and post required bonds. All work within the rights-of-way of state highways shall be in accordance with the most recent edition of the state's "Specifications for Excavation on State Highways."

E. Existing Water Lines. The developer shall excavate and expose all existing pipelines at the locations where connections are to be made. The developer shall determine the exact size, the type of pipe, and the earth cover over the existing lines at each connection point. The developer shall give a twenty-four (24) hour notice to customers of interruption of water service and disruptions minimized.

F. Water for Construction. Water required for consolidation of trench back-filling and other construction purposes shall be provided and paid for by the developer. The water supply for testing and disinfection will be supplied from the existing GW&SSA supply system.

G. Canal and Ditch Crossings. The developer shall make all necessary arrangements with and obtain permission from canal and ditch owners prior to crossing with construction.

H. Public Convenience and Safety.

1. During the progress of the work, adequate provision shall be made by the developer to accommodate the normal traffic over the road or street being used, so as to cause a minimum of inconvenience to the public. Means of ingress and egress for occupants of property adjacent to the work, with convenient access to driveways, houses and buildings shall be provided when applicable.

2. The developer shall provide and maintain barriers, guards, lights, and temporary bridges and post flagmen and watchmen when and where necessary to effectively guard the public from danger involved with the work being done. (Ord. 305 Exh. A § 5(B), 1999)

13.04.040 Excavations.

A. General. The developer shall perform all excavation required for the construction of water lines, manholes, and other structures. The excavation shall include the removal and disposal of all materials of whatever nature encountered, including water, and all obstructions that would interfere with the proper construction and completion of the required work

B. Classification of Materials. No classification of excavated materials will be made and excavation and trenching work shall include the removal and subsequent handling of all earth, shale, loose or cemented gravel, loose rock, solid rock, and other materials of whatever nature excavated or otherwise removed in performance of the contract work.

C. Cutting Pavements and Walks.

1. Concrete and bituminous pavement, and all types of concrete base pavement, may be cut only where, in a manner, and to the extent specified by the district. Cuts shall be no larger than necessary to provide adequate working space for proper installation of pipe and pipeline appurtenances.

2. The outer edges of all cuts through pavements, curbs, gutters, driveways, areaway slabs, and walks shall be sawn or cut along neat lines as specified herein, unless otherwise permitted by the district. All cuts shall be made to straight or accurately marked curve lines and, unless otherwise required, shall be parallel to the center line of the trench.

3. All curbs, gutters, sidewalks and driveways shall be removed to the next joint or scoring line beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed to neat, plane faces.

D. Control of Groundwater. Trenches shall be kept free from water during excavation, fine grading, pipe laying and jointing, and pipe embedment operations. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in all cases where the static groundwater is above the bottom of any trench or bell hole excavation, such groundwater shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress. The discharge from trench de-watering shall be conducted to natural drainage channels, gutters, drains, or storm sewers. No sanitary sewer shall be used for disposal of trench water. Surface water shall be prevented from entering trenches.

E. Excavation for Pipelines. Excavation for pipelines shall follow lines parallel to and equidistant from the location of the pipe center line. Trenches shall be excavated to the depths and widths required to accommodate the construction of the pipelines, as follows:

1. Except in ledge rock, cobblerock, stones or water-saturated earth, mechanical excavation of trenches shall not extend below an elevation four inches above the bottom of the pipe after placement in its final position. All additional excavation necessary for preparation of the trench bottom shall be made manually. Excavation shall not be carried below the elevation required to install the pipe to the grade shown on the drawings. Any unauthorized excavation made below grade for any reason shall be backfilled in accordance with these specifications.

2. Excavation for trenches in ledge rock, cobblerock, stones, mud, or other material unsatisfactory for pipe foundation shall extend to a depth of at least four inches below the bottom of the pipe. Bedding of special material shall be placed and thoroughly compacted with pneumatic tampers in four-inch lifts to provide a smooth, stable foundation. Special foundation material shall consist of suitable earth materials free from roots, sod, or vegetable matter. Trench bottoms shall be hand-shaped as specified in subsection (E)(1) of this section.

i. Where unstable earth or muck is encountered in the excavation at the grade of the pipe, a minimum of twelve (12) inches below grade will be removed and back-filled with crushed rock or gravel to provide a stable subgrade.

3. The maximum width of trench measured at the top of the pipe, shall be as narrow as possible but not wider than fifteen (15) inches on each side of water pipe.

F. Gravel Foundation for Pipe.

1. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, where water must be drained to maintain a dry bottom for pipe installation, and at other locations as previously defined, the subgrade shall be excavated to the specified depth and replaced with crushed rock or gravel.

2. Gravel for pipe foundation shall be clean crushed rock or gravel conforming to the following gradation:

Screen	%Passing
1”	100
1/2”	5

3. The gravel material shall be deposited over the entire trench width in six-inch maximum layers; each layer shall be compacted by tamping, rolling, vibration, spading, slicing, rodding, or by a combination of two or more of these methods. In addition, the material shall be graded to produce a uniform and continuous support for the installed pipe.

G. Location of Utilities. It shall be the responsibility of the developer to contact all utility companies to determine the exact locations of all utilities and their service connections. All existing public utilities and structures will be left in place and the developer shall conduct his or her operations in such a manner as to protect them from damage at all times, and the developer shall be responsible for all damage to existing utilities and structures resulting from his or her operations.

H. Interruption Resulting from Damage to Utilities. The developer shall take all reasonable precautions against damage to existing utilities. However, in the event of a break in an existing water line, gas line, sewer line, or underground cable, the developer shall immediately notify a responsible official of the organization operating the interrupted utility. The developer shall end all possible assis-

tance in restoring service and shall assume all costs, charges or claims connected with the interruption and repair of existing utilities.

I. Blasting.

1. Blasting will not be allowed except by special permission of the district. When the use of blasting is necessary, the developer shall use utmost care not to endanger life or property. The developer shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property, and he or she shall be fully responsible for all damage attributable to his or her blasting operations. Signals warning persons of danger shall be given before any blast. Suitable weighted plank coverings of timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation or trench.

2. Excessive blasting or overshooting will not be permitted, and any material outside the authorized cross section, which may be shattered or loosened by blasting, shall be removed. The district shall have authority to order any method of blasting discontinued, which leads to overshooting or is dangerous to the public or destructive to property or to natural features.

J. Sheeting, Bracing and Shoring of Excavations.

1. Excavation shall be sheeted, braced and shored as required to support the walls of the excavations to eliminate sliding and settling and as may be otherwise required to protect the workmen and existing utilities, structures and improvements. All such sheeting, bracing and shoring shall comply with the requirements of the Utah State Industrial Commission.

2. The developer shall be fully responsible for the adequacy of methods and materials used in trench sheeting, bracing, shoring and/or other systems provided to protect workmen. Injury to or death of workmen resulting from inadequate trench safety measures shall be the full and complete responsibility of the developer.

K. Removal of Sheeting or Shoring.

1. Sheeting or shoring that does not extend below the centerline of the pipe may be removed at the discretion and responsibility of the developer after the trench backfill has been placed and compacted to a level one foot above the top of the pipe. Following removal of the sheeting or bracing, the trench shall be immediately back-filled and compacted or consolidated.

2. Where it is necessary to drive sheeting below the centerline of the pipe, it shall be driven down below the bottom of the pipe. If the sheeting is so driven, the sheeting below a point one foot above the top of the pipe shall be left in place. The developer may, at his own discretion and responsibility, cut the sheeting at a point one foot above the top of the pipe and remove the upper portion thereof. Bracing must be left in place until after the backfill has been placed and completed to a level one foot above the top of the pipe.

L. Backfilling. No backfill shall be placed around or over any pipeline structure until such line or structure has been entirely completed and has attained sufficient strength to sustain the loads imposed. Backfill around pipes shall be placed, however, as soon as possible after installation of the pipe. Backfill shall be carefully placed around and over the pipes and structures and not be permitted to fall directly on a pipe or structure from such a height or in such a manner as to cause damage. Backfilling shall proceed uniformly on each side of the pipe to prevent lateral displacement. (Ord. 305 Exh. A § 5(C), 1999)

13.04.050 Backfilling, consolidation and compaction.

A. General. This section establishes the requirements for backfilling around over all pipe and all appurtenant structures and lines. Unless otherwise authorized by the district, native excavated materials shall be used for backfilling. All backfill shall be consolidated or compacted unless otherwise authorized by the district.

B. Backfilling. No backfill shall be placed around or over any pipeline or structure until such line or structure has been entirely completed and has attained sufficient strength to sustain the loads imposed. Backfill around pipes shall be placed, however, as soon as possible after installation of the pipe. Backfill shall be carefully placed around and over the pipes and structures and shall not be permitted to fall directly on a pipe or structure from such a height or in such a manner as to cause damage. Backfilling shall proceed uniformly on each side of the pipe to prevent lateral displacement. Backfilling of trenches shall conform to the following requirements:

1. Backfill in Improved Areas.

a. Bottom of trench needs compaction if disturbed.

b. Finished road surface will be within one-half inch of existing grade adjacent to trench.

c. Developer will furnish Grand County with documented compaction tests; or shall accept responsibility for repatching if there is more than three-fourths inch of variation from adjacent surface grade (no time limit).

d. Road patching must be performed within forty-eight (48) hours of trenching when working within twelve (12) feet of Grand County roads.

e. Developers must meet MUTCD regulations for safety signing.

2. Backfill in Unimproved Areas.

a. Where the trench is in an unimproved easement or right-of-way, the backfill shall be consolidated to eighty (80) percent of standard maximum dry density as determined by AASHTO T-99.

C. Consolidation of Backfill. Consolidation of backfill shall be accomplished by those methods in which water is used as the essential agent to produce the desired condition of density and stability. Water may be applied by flooding or jetting; in addition, consolidation methods shall be considered to include pooling or vibrating of flooded or jetted backfill as aids in obtaining the desired results. The use of consolidation methods shall be subject to all of the following requirements:

1. Application of Water. The developer shall apply water in a quantity and at a rate sufficient to saturate thoroughly the entire thickness of the lift being consolidated.

2. Use of Vibration. In the event that application of water alone fails to produce the required relative density throughout the entire thickness of the lift, the developer may supplement the consolidation process by using vibration methods. Vibration may be applied by probe-type vibrators inserted in the saturated backfill or by vibration rollers or plates applied to the surface.

3. Lift Thickness. Material shall be placed in lifts not thicker than five feet prior to consolidation. In the event that the developer fails to obtain the required relative density throughout the entire thickness of the lift, the district may direct the use of thinner lifts as necessary. The district may also direct the excavation as necessary of any unconsolidated backfill so as to reduce the entire thickness of the lift.

4. Precautions. All precautions necessary shall be taken by the developer to prevent damage and movement (including floating) of the pipeline, structures, and adjacent improvements and utilities. The allowance of the use of consolidation methods shall not be construed as guaranteeing or implying that the use of such methods will not result in damage to adjacent ground. The developer shall make his or her own determination in this regard and shall assume all risks and liability for settlement or lateral movement of adjacent ground, improvements or utilities, either on the surface of the ground or underground.

D. Jetting. If jetting is used as consolidated method the procedure shall comply with the following:

1. Jets shall be inserted at not more than four-foot intervals (staggered) throughout the length of the backfilled area and shall be slowly forced down to the bottom of the trench or top of the previously jetted lift and held until the trench backfill is completely saturated with water. Depth of jetted lift shall not exceed five feet.

2. The minimum size of hose and equipment shall be such as to provide a minimum pressure of thirty-five (35) pounds per square inch at the discharge. The jet shall be rigid iron pipe with a minimum diameter of one inch.

3. After the water-settled trench has set for several days, any depression in the trench shall be filled, mounded over, and wheel rolled with fully loaded five-yard trucks to compact the material thus placed.

4. The developer shall furnish water for consolidation.

E. Compaction of Backfill.

1. Where compaction of backfill is required, it shall be compacted by means of sheepsfoot rollers, pneumatic tire rollers, or other mechanical tampers.

2. Where compaction methods are used, the material shall be placed at a moisture content such that after compaction the required relative densities will be produced. Also, the material shall be placed in lifts, which, prior to compaction, shall not exceed twelve (12) inches.

3. If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

4. The developer, at no expense, shall make all relative density tests to the district.

F. Imported Backfill Material. In the event the native excavated material is not satisfactory for backfill and consolidation, the developer shall dispose of the native material and provide imported granular backfill material. This granular material shall pass a three-inch square sieve and shall not contain more than fifteen (15) percent of material passing a two hundred (200) mesh sieve, and shall be of such character as to permit water to pass through it quickly.

G. Backfill Around Structures. Backfilling and compaction around manholes and other sewer structures shall comply with the requirements for backfilling and compaction of trenches. (Ord. 305 Exh. A § 5(D), 1999)

13.04.060 PVC pipe and fittings.

A. Scope. This section covers requirements for the furnishing and installation of PVC plastic pipe and fittings.

B. PVC Plastic Pipe. PVC plastic pipe shall be made from clean, virgin, Type 1, Grade 1, unplasticized polyvinyl chloride (PVC) and shall meet the requirements of the latest revision of ASTM D-1784, ASTM D-2241, and conform to the requirements set forth in the latest version of AWWA C-900, with standard dimension ration of 18 (CI 200 psi) for all pipe, unless otherwise stated. All pipe and fittings shall be NSF approved.

C. PVC Pipe Fittings.

1. Pipe and fitting joints shall be rubber gasket bell and spigot type.

2. Fittings shall be short body cast iron or ductile iron, iron pipe size for PVC application and in accordance with AWWA C-110. They shall be capable of withstanding without bursting, hydrostatic tests of 3.0 times the rated water working pressure. The fittings shall be furnished with mechanical, bell and spigot, or flange joints and shall conform to the dimensions and weights given in AWWA C-110 and AWWA C-111.

3. Service connections to PVC plastic lines shall be bronze service saddles specifically designed for plastic pipe (equal to Mueller M13481).

D. Cutting, Cleaning and Inspection. Cutting of pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner using a method that will not damage the pipe. Before installation, each piece shall be inspected for defects. All defective, damaged or unsound pipe shall be rejected.

E. Installation.

1. The bottom of the trench shall be hand shovel shaped to provide uniform bearing for the full length of the pipe barrel. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with adjoining pipe to prevent sudden offsets. Pipe bedding and trench backfill shall be as defined in the section covering bedding for sewer lines and backfill for utility lines.

2. As work progresses, interior of pipe shall be cleared of dirt and other superfluous materials. Trenches shall be kept free from water until pipe jointing has been completed, and pipe shall not be laid when condition of trench or weather is unsuitable for such work. At all times when work is not in progress, all open ends of pipe and fillings shall be securely closed so that no water, earth, or other substance will enter pipe or fittings. Where the installation instruction of the pipe manufacturer is in conflict with these specifications, the pipe manufacturer's instructions shall govern.

F. Concrete Blocking. All fittings at bends and branches in water pipelines shall be provided with concrete thrust blocking as shown on the drawings. Blocking shall be of 5-bag concrete, poured in place, and shall bear against solid undisturbed earth at the sides and bottom of the trench excavation, and shall be shaped to not obstruct access to the joints of the pipe or fittings. All valves at temporary ends of lines and temporary ends of branch line connections shall be provided with concrete blocking.

G. Detectable Wire. A detectable wire capable of being detected with electronic pipe locators shall be installed at a depth of twenty-four (24) inches below the surface directly above each PVC water line and polyethylene service lateral. (Ord. 305 Exh. A § 5(E), 1999)

13.04.070 Valves, hydrants and miscellaneous items.

A. General. This section covers valves, hydrants, and meters required in the project construction, together with other miscellaneous items to be installed.

B. Gate Valves. Gate valves shall conform to AWWA Specification C-500. Valves shall be of cast iron body, bronze mounted, double disc, parallel seat, and non-rising stem design with O-ring seals. Valves shall be of mechanical joint connection design for buried service and flanged connection design for installation in structures. Buried valves shall have two-inch operating nuts, and valves in structures shall have hand wheels.

C. Valve Boxes. All buried valves shall be installed complete with two-piece, cast iron, screw type, five and one-fourth inch shaft valve box, of the "slip" type.

D. Fire Hydrants.

1. Fire hydrants shall be "traffic model" type designed to conform to AWWA Specification C-502 and shall be of either the compression or toggle joint type. Hydrants shall be Mueller Centurion Super 200 A423.

2. All nozzles shall be provided with National Standard threading. A one-half cubic yard gravel sump shall be provided at each hydrant. All hydrants shall be supplied complete with a flanged by mechanical joint end auxiliary gate valve and box. Each hydrant shall also be supplied with O-ring seals, a National Standard pentagon operating nut which is designed for clockwise rotating closing, and a five-inch ASA one hundred fifty (150) pound flanged inlet.

E. Couplings. Couplings shall be equal to the product of Smith-Blair and Dresser.

F. Pipe Class. Superseding data to the contrary, all pipe fittings, valves and appurtenances shall be of a class equal to or exceeding that designated for pipe in each area.

G. Air and Vacuum Valves. Air and vacuum valves shall be of 200 PSI rating, cast iron body, stainless steel float construction, and shall be equal to the APCO No. 141 or 142 manufactured by the Valve and Primer Corporation.

1. Air Relief Valve Vent Piping. The open end of an air relief vent pipe from automatic valves shall where possible, as determined by district management, be extended to at least one foot above grade and provided with a screened (No. 14 mesh, noncorrosive) downward elbow. Alternately, the open end of the pipe may be extended to as little as one foot above the top of the pipe if the valve's chamber is not subject to flooding and provided with a drain-to daylight (see subdivision 2 below). Blow-offs or air relief valves shall not be connected directly to any sewer.

2. Chamber Drainage. Chambers, pits or manholes containing valves, blow-offs, meters, or other such appurtenances to a distribution system, shall not be connected directly to any storm drain or sanitary sewer. They shall be provided with a drain to daylight. Where this is not possible, underground gravel filled absorption pits may be used if the site is not subject to flooding and conditions will assume adequate drainage. Where a chamber contains an air relief valve, and it is not possible to provide a drain-to-daylight, the vent pipe for the valve shall be extended to at least one foot above grade (see subdivision 1 above). Only when it is both impossible to extend the vent pipe above grade, and impossible to provide a drain-to-daylight may a gravel-filled sump be utilized to provide chamber drainage (assuming local ground conditions permit adequate drainage without ground water intrusion).

H. New Water Services.

1. Pipe for water services shall be two hundred (200) psi, Iron Pipe size one-inch or three-fourths inch iron pipe size high molecular weight polyethylene tubing. Polyethylene tubing shall bear the NSF stamp of approval, and shall conform to AWWA C-901.

2. Connection to main lines shall be made through AWWA thread type corporation stops with pack joints, equal to Mueller H-15029. Detectable wire shall be placed above each service lateral to a depth of twenty-four (24) inches below the surface.

3. Meters shall be connected through copper-setters with integral pack joints and inverted-key angle valve on the inlet riser, drilled for wire sealing.

I. Meter Yokes. Meter yokes shall be of flexible copper with horizontal inlet and outlet, complete with pain stop, and shall be equal to Mueller H-14906.

J. Pressure Gauges. Pressure gauges shall be equal to U. S. Gage Co., Figure No. 5005 ASA "A" Specification Gauge with four and one-half inch dial. Maximum range for gauges shall be one hundred sixty (160) PSI. (Ord. 305 Exh. A § 5(F), 1999)

13.04.080 Disinfection and flushing of water lines.

A. General. All water lines shall be disinfected and flushed as outlined in this section.

B. Disinfection. All water mains shall be disinfected in accordance with AWWA Standard C651-92. The developer shall provide the district with detailed procedures for the adequate flushing, disinfection and microbiological testing of all water mains.

C. Testing. The use of water for culinary purposes from new water mains shall not be permitted until bacteriologic tests indicate the water is free from contamination. (Ord. 305 Exh. A § 5(G), 1999)

13.04.090 Restoration of surface improvements.

A. General.

1. The developer shall be responsible for the protection and the restoration of a replacement of any improvements existing on public or private property at the start of work or placed there during the progress of the work.

2. Existing improvements shall include but are not limited to permanent surfacing, curbs, gutters, sidewalks, planted areas, ditches, driveways, culverts, fences and walls. All improvements shall be reconstructed to equal or better, in all respects, than the existing improvements removed.

B. Gravel Surface. Where trenches are excavated through gravel surfaced areas such as roads and shoulders, parking areas, unpaved driveways, etc., the gravel surface should be restored and maintained as follows:

1. The gravel shall be placed deep enough to provide a minimum of six inches of material.

2. The gravel shall be placed in the trench at the time it is backfilled. The surface shall be maintained by blading, sprinkling, rolling, adding gravel, etc., to maintain a safe, uniform surface satisfactory to the district. Excess material shall be removed from the premises immediately.

3. Material for use on gravel surfaces shall be obtained from sound, tough, durable gravel or rock meeting the following requirements for grading:

Passing 1-inch sieve:	100%
Passing 3/4-inch sieve:	85--100%
Passing No. 4 sieve:	45--65%
Passing No. 10 sieve:	30--50%
Passing No. 200 sieve:	5--10%

C. Bituminous Surface. Where trenches are excavated through bituminous surfaced roads, driveways, parking areas, the surface shall be restored and maintained as follows:

1. A temporary gravel surface shall be placed and maintained as required in subsection B of this section after the required backfill and compaction of the trench has been accomplished.

2. The gravel shall be placed to such depth as to provide six inches below the pavement and shall be brought flush with the paved surface.

3. The area over trenches to be resurfaced shall be graded and rolled with a roller weighing not less than twelve (12) tons, or with the rear wheels of a five-yard truck loaded to capacity, until the subgrade is firm and unyielding. Mud or other soft or spongy material shall be removed and the void filled with gravel and rolled and tamped thoroughly in layers not exceeding six inches in thickness. The edges of trenches that are broken down during the making of sub-grade shall be removed and trimmed neatly before resurfacing.

4. Before any permanent resurfacing is placed, the developer shall trim the existing paving to clean straight lines as nearly parallel to the centerline of the trench as practicable. Said straight lines shall be made except as specifically permitted by the district.

5. Existing bituminous paving shall be cut back a minimum of six inches beyond the limits of any excavation or cave-in along the trench so that the edges of the new paving will rest on at least inches of undisturbed soil.

6. Within forty-eight (48) hours of the opening of a road cut, the bituminous surface shall be restored by standard paving practices to the thickness shown on the drawings and/or defined in the proposal.

7. Pavement restoration shall include priming of pavement of edges and sub-base with Type MC-70 bituminous material to the level of the adjacent pavement surfaces.

D. Concrete Surfaces. All concrete curbs, gutters, sidewalks and driveways shall be removed and replaced to the next joint or scoring line beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged sections, the damaged portions shall be removed and reconstructed to neat, plane faces. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements. Where necessary, lamp black or other pigments shall be added to the concrete to obtain the desired results.

E. Work on State Roads. All pavement and gravel surface repair on state roads shall be in accordance with the latest edition of Specifications for Excavation on State Highways, as prepared by the Utah State Department of Highways. Minimum thickness for bituminous pavement replacement on state roads is three inches.

F. Miscellaneous Improvements.

1. It shall be the developer's responsibility to restore to their original condition all irrigation ditches, levees, culverts, gates, fences, drainage ditches and all such improvements that are cut or disturbed during construction. Topsoil in farming areas shall be stored separate from subsoil during pipe trench excavation. Topsoil shall be replaced during backfill operations as nearly as possible to its original condition, thereby assuring suitable soil for reseeding. All sections of pasture, grain fields, etc., which are damaged or destroyed by the developer during the construction of lines shall be reseeded according to what the property owner desires and the time of year. Before reseeding, the top-

soil shall be trimmed to fine lines free from unsightly variations, lumps, ridges or depressions. The developer shall make a satisfactory settlement with each landowner for all farm crops that are damaged or destroyed by the developer during construction.

2. If reseeded areas do not show a "catch" at the time of completion and final acceptance of the line, an amount of money determined by the district shall be retained until the time such growth appears. (Ord. 305 Exh. A § 5(H), 1999)

Chapter 13.08

SEWER SYSTEM

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Article 1. Regulations

13.08.010 Purpose.

The underlying purpose and intent of this article is to promote the health, safety, convenience and general welfare of the inhabitants of Grand County, state of Utah. (Ord. 166 § 1, 1984)

13.08.020 Compliance required.

It is unlawful for any person to cause, suffer or permit the disposal of sewage, human excrement or other liquid wastes in any place and manner, except through and by means of an approved plumbing and drainage system, installed and maintained in accordance with the requirements of this article. (Ord. 166 § 2, 1984)

13.08.030 Connection to sewer required.

A. Every building in which plumbing fixtures are installed shall have a connection to a public or private sewer.

B. When a public sewer, intended to service any lot or premises is available in any thoroughfare or right-of-way abutting any lot or premises, drainage piping from any building or works shall be connected to the public sewer.

C. When no public sewer intended to serve any lot or premises is available in any thoroughfare or right-of-way abutting such lot or premises, drainage piping from any building or works shall be connected to a private sewage disposal system.

D. For the purpose of this article, the public sewer is available when located within three hundred (300) feet of any property line with any building used for human occupancy, except such instances where the lot or premises are located below the level of the sewer line and no public lift station is available to service the line.

E. No permit shall be issued for the installation, alteration or repair of any private sewage disposal system or part thereof, on any lot or premises when the public sewer system is available. (Ord. 166 § 3, 1984)

13.08.040 Unlawful discharge, injury or removal.

It is unlawful for any person to injure, break or remove any part of any public sewer or of any public sewer, appliance or appurtenance, or to discharge into a public sewer any inflammable gas, gasoline, oil or petroleum by-product or any calcium carbide or residue therefrom, or any other matter whereby chemical reaction shall injure said sewer or part thereof, or to become dangerous to health, life or property, or any liquid or other material or substance which will evolve in inflammable gas when in contact with water, sewage or fire. Oil separators installed in any building where volatile fluids are used, must not be connected directly with the sewer. (Ord. 166 § 4, 1984)

13.08.050 Use of private system unlawful when.

It is unlawful for the owner, his or her agent or any other person having charge of or occupying any building used for residential, commercial or industrial purposes, after having been given notice that an acceptable public sewer is ready to receive connections and twenty (20) days from the giving of such notice having expired, to maintain or use or cause or permit to exist any privy vault, septic tank or cesspool to which the building is connected or which is used by the occupants of the building. (Ord. 166 § 5, 1984)

13.08.060 Public sewer system--Notice of availability.

When an accepted public sewer is ready to receive connections with the property as above provided, the county board of health or the Utah State Board of Health shall cause appropriate notice to be served upon owner, agent or other person having charge of or occupying the property that the public sewer is ready to receive connections therewith, and that after twenty (20) days from service of the notice, the use of privy vaults, septic tanks or cesspools on the property must be discontinued, the plumbing disconnected therefrom, and that all plumbing must be connected with the public sewer. Such notice shall either be served as provided by the law of the state of Utah for the service of summons in civil cases, or by first class United States mail, postage prepaid, in a sealed envelope addressed to the owner at his or her regular place of residence, or to the agent of the owner or any other person occupying or having charge of the property where the agent lives, where the privy, septic tank or cesspool is located or where the building or house, the plumbing of which is to be connected, is built. The expense of the preparation and service of notice shall be paid by the owner, district or system, and shall not be an expense of the county, board of health or Utah State Board of Health. (Ord. 166 § 7, 1984)

13.08.070 Charges to be collected when public sewer available regardless of connection.

Whenever an accepted public sewer is ready to receive connections as above provided, and the Spanish Valley Water and Sewer Improvement District, or the county board of health, or the Utah State Board of Health shall have caused appropriate notice to be served upon owner, agent or other person having charge of or occupying the property that the sewer is ready to receive connections therewith; then after twenty (20) days from service of the notice, the Spanish Valley Water and Sewer Improvement District shall charge and collect from the owner, agent or other person having charge of or occupying the property, the same service fees and charges as other sewer users in the same class, whether the property is connected to the sewer system or not. (Ord. 166 § 8, 1984)

13.08.080 Violation--Penalty.

Any person who shall violate any of the provisions of this article shall, upon conviction thereof, be punished by a fine not exceeding two hundred ninety-nine dollars ($299.00) or by imprisonment in the county jail for a period not exceeding six months, or by such fine and imprisonment. (Ord. 166 § 7, 1984)

Article 2. Construction Standards

13.08.090 Compliance required.

All development shall comply with the then-current requirements the Grand Water and Sewer Service Agency as may be adopted or amended by the Grand Water and Sewer Service Agency. (Ord. 305 Exh. A § 4 (part), 1999)

13.08.100 General conditions.

These specifications are for the use of developers or individuals when constructing sewer lines that will become a part of the Grand Water and Sewer Service Agency (hereinafter referred to as

"GW&SSA" or "District") system. Due to the nature of these specifications, it should not be construed that all conditions spelled out in these documents will be met in every project. Nor should it be construed that all conditions may be encountered in a project are covered by these documents. If a project encounters conditions not covered in these documents, GW&SSA shall be contacted for additional specifications.

A. Size of Sewer Mains. The district manager shall determine the size of the main required to serve any part of the district. No main less than eight inches shall be placed in the sewer collection system.

B. Specifications for Installations of Sewer Mains. All sewer collection mains used underground shall be approved by the district manager, according to the specifications as approved by the board of trustees. The sewer mains shall be laid at a depth and grade sufficient to serve all lots adjacent to the main, and if required by the district, at a sufficient depth and grade to enable the main to be extended to serve other properties. The district manager must approve all depths and grades.

C. Extension of Sewer Mains--Payment of Costs.

1. When sewer mains are extended, the property owners benefiting thereby, as determined by the district, shall pay all of the costs of extending such mains insofar as such costs relate to the size main required to serve the property benefited.

2. The district manager shall propagate rules and regulations setting forth the method of determining the portion of the cost of main extension to be borne by the district, which regulations shall be submitted to the board of trustees for approval.

D. Extension of Sewer Mains in Subdivisions. All sewer mains required to serve a platted subdivision shall be installed by the subdivider. The subdivider shall install mains to the farthest point or points of his subdivision. The district may participate in the cost of installing such mains as provided in subsection (C)(2) of this section.

E. Reimbursement for Sewer Main Extension. When any person constructs a sewer main through undeveloped areas to serve his or her property or constructs lines on the perimeter of his or her property, the entire cost of such sewer mains shall be paid by such person. If he or she has furnished the district a recapitulation of the construction costs and has entered into an agreement with the district within ninety (90) days of the completion of such sewer lines, then, at the time the property abutting such sewer lines is developed and connections are made to the sewer line, the district may collect a charge per front foot, and if so collected, shall reimburse the original installer to the extent of the connections so made. The amount to be repaid to the person may be the original cost to the person of the excess extension, plus any amount added pursuant to the agreement with the person to recognize the effects of inflation. In no event shall the amount to be collected be less than the original construction cost. A person's right to reimbursement under the provision of this section shall not exceed a period of ten (10) years from the execution of the agreement. The board of trustees may approve an extension to the agreement exceeding ten (10) years.

F. Expiration of Reimbursement Right. The subdivider's right to reimbursement under a sewer main extension contract shall not exceed a period of ten (10) years from the date of the execution of the contract. All payments shall cease at that time regardless of the amount that has at that time been received by the subdivider, unless, upon the recommendation of the district manager, the board of trustees shall approve a contract exceeding ten (10) years.

G. Subdivision Extensions Constructed Under Private Contract. The subdivider shall install the main in his or her subdivision by private contract, subject to approval of the plans and specifications by the district and to the District 5 inspection of actual construction.

H. Extent of Extensions. All sewer main extensions shall be made to the farthest limit of the property to be served.

I. Extensions on Perimeter of District. Sewer main extensions along streets or easements lying partly inside and partly outside the district boundaries may be made based on special assessment against abutting property owners. The district may pay the assessment on land lying outside the district boundaries and, if so paid, may make provision for the collection of such payment from those property owners at the time the land is annexed.

J. Warranty of Materials and Construction. The developer shall warranty all portions of the sewer system constructed under the private contract for a period of one year. Any and all repairs required during the one-year period shall either be performed by the developer or his or her agents or shall be performed by the district with all costs for materials and labor reimbursed by the developer to the district. (Ord. 305 Exh. A § 4(A), 1999)

13.08.110 Special project conditions.

A. Existing Utilities. It shall be the responsibility of the developer to contact utility companies to determine the exact location of all utilities and their service connections. The developer shall make his or her own independent investigation as to the location, type and shall be responsible for the protection of these utilities. In the event these utilities or service connections are damaged, they shall be repaired at no additional expense to the district.

B. Protection of Existing Utilities. The developer shall take all reasonable precautions to protect all existing utilities at all times during construction.

C. Work on State and County Roads. The developer will obtain all required licenses for construction on state and county roads, securing of digging permits and posting of required bonds. All work within the right-of-way of state highways shall be in accordance with the most recent edition of the state's Specifications for Excavation on State Highways.

D. Construction Through Private Property.

1. The developer will negotiate easement agreements with private property owners along the construction route of the sewer. In general, these agreements should provide for a twenty (20) foot wide permanent easement and a fifty (50) foot wide construction easement. Easements should be dedicated to the Grand Water and Sewer Service Agency.

2. The developer shall confine all his or her operations to the area within the easement limits. In general, the easement area is intended to provide reasonable access and working area for efficient operation. If additional easement width and/or additional access routes are desired, the developer shall negotiate with private property owners.

E. Water for Construction. Water required for consolidation of trench backfilling and other construction purposes shall be provided and paid for by the developer.

F. Public Convenience and Safety.

1. During the progress of the work, adequate provisions shall be made by the developer to accommodate the normal traffic over the road or street being used as to cause a minimum of inconven-

ience to the public. Means of ingress and egress for occupants of property adjacent to the work, with convenient access to driveways, house and buildings shall be provided when applicable.

2. The developer shall provide and maintain barriers, guards, lights and temporary bridges and post flagmen and watchmen when and where necessary in order to guard the public effectively from danger involved with the work being done.

G. Cleanup.

1. Throughout all phases of construction, the developer shall keep the construction areas in a clean condition free from rubbish and debris. All material and equipment required in connection with the construction of any portion of the work shall be removed from the site as soon as the use of the materials and equipment at that location is no longer necessary, and the area shall be thoroughly cleaned by sweeping with power and/or hand brooms or by other means which will produce results equal to or better than conditions prior to construction.

2. Care shall be taken to prevent spillage on streets over which hauling is done, and any such spillage or debris deposited on streets due to the developer's operations shall be immediately removed and the streets cleaned.

H. Canal and Ditch Crossings. The developer shall make all necessary ar-rangements with and obtain permission from canal and ditch owners prior to crossing with construction. (Ord. 305 Exh. A § 4(B), 1999)

13.08.120 Excavations.

A. General. The work covered by this specification consists of furnishing all labor, tools, materials, equipment, and in performing all operations in connection with the excavation, trenching and backfilling for underground pipelines and appurtenances.

B. Classification of Materials. No classification of excavation materials will be made and excavation and trenching work shall include the removal and subsequent handling of all earth, shale, loose or cemented gravel, loose rock, solid rock, and other materials of whatever nature excavated or otherwise removed in performance of the work.

C. Control of Groundwater. Trenches shall be kept free from water during excavation, fine grading, pipe laying and jointing, and pipe embedment operations. Where the trench bottom is mucky or otherwise unstable because of the presence of groundwater, and in all cases where the static groundwater is above the bottom of any trench or bell hole excavation, such groundwater shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress. The discharge from the trench de-watered shall be conducted to natural drainage channels, gutters, drains, or storm sewers. No sanitary sewer shall be used for disposal of trench water. Surface water shall be prevented from entering trenches.

D. Excavation for Pipelines. Excavation for pipelines shall follow lines parallel to equidistant from the location of the pipe centerline. Trenches shall be excavated to the depths and widths required to accommodate the construction of the pipelines, as follows:

1. Except in ledge rock, cobble rock, stones, or water-saturated earth, mechanical excavation or trenches shall not extend below an elevation four inches above the bottom of the pipe after placement in its final position. All additional excavation necessary for preparation of the trench bottom shall be made manually. Excavation shall not be carried below the elevation required to install the pipe to the

grade shown on the drawings. Any unauthorized excavation made below grade for any reason shall be backfilled in accordance with these specifications.

2. Excavation for trenches in ledge rock, cobble rock, stones, mud, or other material unsatisfactory for pipe foundation shall extend to a depth of at least four inches below the bottom of the pipe. A bedding of special material shall be placed and thoroughly compacted with pneumatic tampers in four-inch lifts to provide a smooth, stable foundation. Special foundation material shall consist of suitable earth materials free from roots, sod, or vegetable matter. Trench bottoms shall be hand-shaped as specified in subsection (D)(1) of this section.

a. Where unstable earth or muck is encountered in the excavation at the grade of the pipe, a minimum of twelve (12) inches below grade will be removed and backfilled with crushed rock or gravel to provide a stable sub-grade.

3. The maximum width of trench measured at the top of the pipe, shall be as narrow as possible but not wider than fifteen (15) inches on each side of the water pipe.

E. Gravel Foundation for Pipe.

1. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, where water must be drained to maintain a dry bottom for pipe installation, and at other locations as previously defined, the subgrade shall be excavated to the specified depth and replaced with crushed rock or gravel.

2. Gravel for pipe foundation shall be clean crushed rock or gravel conforming to the following gradation:

Screen	% Passing
1”	100
1/2”	5

3. The gravel material shall be deposited over the entire trench width in six-inch maximum layers; each layer shall be compacted by tamping, rolling, vibration, spading, slicing, rodding, or by a combination of two or more of these methods. In addition, the material shall be graded to produce a uniform and continuous support for the installed pipe.

F. Length of Open Trench. Unless by special permission of the district the maximum length of open trench shall not be greater than five hundred (500) feet or the distance necessary to accommodate the average amount of pipe installed in a single day, whichever is greater. The length of open trench is the collective length, including excavation, pipe laying, and backfilling at any one location.

G. Excavation for Structures.

1. All structures shall be founded on undisturbed original subsoil and all unauthorized excavation below the specified structure subgrade shall be replaced with concrete monolithic with that of the slab above or with course gravel thoroughly compacted into place.

2. All excavation for concrete structures which extend down to or below the static groundwater elevation shall be de-watered by lowering and maintaining the ground water at an elevation below the bottom of such excavations at all times when work thereon is in progress. No water shall be permitted to come in contact with concrete within a period of twelve (12) hours after placing.

3. Sub-grade for all concrete structures, regardless of type of location, shall be firm, dense and thoroughly compacted and consolidated; shall remain firm and intact under the feet of the workmen engaged in sub-grade surfacing, laying reinforcing steel, and depositing concrete. Where necessary, a layer of concrete of sufficient strength and thickness to withstand subsequent construction operations shall be installed below the specified sub-grade elevation and the structure concrete deposited thereon. Coarse gravel or crushed stone may be used for subsoil reinforcement if satisfactory results can be obtained thereby. Such material shall be applied in thin layers, each layer being embedded in the subsoil by thorough tamping. All excess soil shall be removed to compensate for the displacement of the gravel or crushed stone, and the finished elevation of any subsoil reinforced in this manner shall not be above the specified sub-grade.

H. Protection of Existing Utilities and Structures. It shall be the responsibility of the developer to contact all utility companies to determine the exact locations of all utilities and their service connections. All existing public utilities and structures will be left in place and the developer shall conduct his or her operations in such a manner as to protect them from damage at all times, and the developer shall be responsible for all damage to existing utilities and structures resulting from his or her operations.

I. Deviations Occasioned by Existing Utilities or Structures. Where gas, water, sanitary sewer, storm drain, telephone, electrical, or other existing underground utilities interfere with the design, grade or horizontal alignment of the proposed pipeline, the developer shall change the grade or alignment of the new pipeline or shall arrange with the owners of the utilities for their removal or reconstruction. Wherever structural obstructions are encountered during the progress of the work and interfere to such an extent that an alteration in the design alignment and/or grade is required, the district shall order deviation from the line and/or grade or will arrange with the owners of the structures for their removal, relocation or reconstruction. Cost of removal, modification and/or replacement of existing structures or utilities shall be borne by the developer.

J. Interruption Resulting from Damage to Utilities. The developer shall take all responsible precautions against damage to existing utilities. However, in the event of a break in an existing water line, gas line, sewer line, or underground cable, the developer shall immediately notify a responsible official of the organization operating the interrupted utility. The developer shall lend all possible assistance in restoring service and shall assume all costs, charges or claims connected with the interruption and repair of existing utilities.

K. Blasting.

1. Blasting will not be allowed except by special permission of the district. When the use of blasting is necessary, the developer shall use utmost care not to endanger life or property. The developer shall comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property and he or she shall be fully responsible for all damage attributable to his or her blasting operations. Signals warning persons of danger shall be given before any blast. Suitable weighted plank coverings of timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation or trench.

2. Excessive blasting or over-shooting will not be permitted, and any material outside the authorized cross-section, which may be chattered or loosened by blasting, shall be removed. The district

shall have authority to order any method of blasting discontinued that leads to overshooting or is dangerous to the public or destructive to property or natural features.

L. Sheeting, Bracing and Shoring of Excavations.

1. Excavation shall be sheeted, braced and shored as required to support the walls of the excavations to eliminate sliding and settling and as may be otherwise required to protect the workers and existing utilities, structures and improvements. All such sheeting, bracing, and shoring shall comply with the requirements of the Utah State Industrial Commission.

2. The developer shall be fully responsible for the adequacy of methods and materials used in trench sheeting, bracing, shoring, and/or other systems provided to protect workers. Injury to or death of workers resulting from inadequate trench measures shall be the full and complete responsibility of the developer.

M. Removal of Sheeting or Shoring.

1. Sheeting or shoring that does not extend below the centerline of the pipe may be removed at the discretion and responsibility of the developer after the trench backfill has been placed and compacted to a level one foot above the top of the pipe. Following removal of the sheeting or bracing, the trench shall be immediately backfilled and compacted or consolidated.

2. Where it is necessary to drive sheeting below the centerline of the pipe, it shall be driven down below the bottom of the pipe. If the sheeting is so driven, the sheeting below a point one foot above the top of the pipe shall be left in place. The developer may, at his own discretion and responsibility, cut the sheeting at a point one foot above the top of the pipe and remove the upper portion thereof. Bracing must be left in place until after the backfill has been placed and completed to a level one foot above the top of the pipe.

N. Backfilling. No backfill shall be placed around or over any pipeline structure until such line or structure has been entirely completed and has attained sufficient strength to sustain the loads imposed. Backfill around pipes shall be placed, however, as soon as possible after installation of the pipe. Backfill shall be carefully placed around and over the pipes and structures and not be permitted to fall directly on a pipe or structure from such a height or in such a manner as to cause damage. Backfilling shall proceed uniformly on each side of the pipe to prevent lateral displacement.

O. Cutting Pavements and Walks.

l. Concrete and bituminous pavement and all types of concrete base pavement, may be cut only where, in a manner, and to the extent specified by the district. Cuts shall be no larger than necessary to provide adequate working space for proper installation of pipe and pipeline appurtenances.

2. The outer edges of all cuts through pavements, curbs, gutters, driveways, areaway slabs, and walks shall be sawn or cut along neat lines as specified herein, unless otherwise permitted by the district. All cuts shall be made to straight or accurately marked curve lines and, unless otherwise required, shall be parallel to the centerline of the trench.

3. All curbs, gutters, sidewalks and driveways shall be removed to the next joint or scoring line beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed to neat, plane faces. (Ord. 305 Exh. A § 4(C), 1999)

13.08.130 Backfilling, consolidation and compaction.

A. General. This section establishes the requirements for backfilling around over all pipe and all appurtenant structures and lines. Unless otherwise authorized by the district, native excavated materials shall be used for backfilling. All backfill shall be consolidated or compacted unless otherwise authorized by the district.

B. Backfilling. No backfill shall be placed around or over any pipeline or structure until such line or structure has been entirely completed and has attained sufficient strength to sustain the loads imposed. Backfill around pipes shall be placed, however, as soon as possible after installation of the pipe. Backfill shall be carefully placed around and over the pipes and structures and shall not be permitted to fall directly on a pipe or structure from such a height or in such a manner as to cause damage. Backfilling shall proceed uniformly on each side of the pipe to prevent lateral displacement. Backfilling of trenches shall conform to the following requirements:

1. Backfill in Improved Areas.

a. The bottom of a trench shall be compaction if disturbed.

b. Finished road surface will be within one-half inch of existing grade adjacent to trench.

c. Developer will furnish Grand County with documented compaction tests; or shall accept responsibility for repatching if more than three-fourths inch of variation from adjacent surface grade occurs (no time limit).

d. Road patching must be performed within forty-eight (48) hours of trenching when working within twelve (12) feet of Grand County roads.

e. Developers must meet MUTCD regulations for safety signing.

2. Backfill in Unimproved Areas. Where the trench is in an unimproved easement or right-of-way, the backfill shall be consolidated to eighty (80) percent of standard maximum dry density as determined by AASHTO T-99.

3. Consolidation of Backfill. Consolidation of backfill shall be accomplished by those methods in which water is used as the essential agent to produce the desired condition of density and stability. Water may be applied by flooding or jetting; in addition, consolidation methods shall be considered to include pooling or vibrating of flooded or jetted backfill as aids in obtaining the desired results. The use of consolidation methods shall be subject to all of the following requirements:

a. Application of Water. The developer shall apply water in a quantity and at a rate sufficient to saturate thoroughly the entire thickness of the lift being consolidated.

b. Use of Vibration. In the event that application of water alone fail to produce the required relative density throughout the entire thickness of the lift, the developer may supplement the consolidation process by using vibration methods. Vibration may be applied by probe-type vibrators inserted in the saturated backfill or by vibration rollers or plates applied to the surface.

c. Lift Thickness. Material shall be placed in lifts not thicker than five feet prior to consolidation.

d. Precautions. All precautions necessary shall be taken by the developer to prevent damage and movement (including floating) of the pipeline, structures, and adjacent improvements and utilities. The allowance of the use of consolidation methods shall not be construed as guaranteeing or implying that the use of such methods will not result in damage to adjacent ground. The developer shall make his or her own determination in this regard and shall assume all risks and liability for settlement or lateral movement of adjacent ground, improvements or utilities, either on the surface of the ground or underground.

e. Jetting. If jetting is used as consolidated method the procedure shall comply with the following:

i. Jets shall be inserted at not more than four-foot intervals (staggered) throughout the length of the backfilled area and shall be slowly forced down to the bottom of the trench or top of the previously jetted lift and held until the trench backfill is completely saturated with water. Depth of jetted lift shall not exceed five feet.

ii. The minimum size of hose and equipment shall be such as to provide a minimum pressure of thirty-five (35) pounds per square inch at the discharge. The jet shall be rigid iron pipe with a minimum diameter of one inch.

iii. After the water-settled trench has set for several days, any depression in the trench shall be filled, mounded over, and wheel rolled with fully loaded five-yard trucks to compact the material thus placed.

iv. The developer shall furnish water for consolidation.

4. Compaction of Backfill.

a. Where compaction of backfill is required, it shall be compacted by means of sheepsfoot rollers, pneumatic tire rollers, or other mechanical tampers.

b. Where compaction methods are used, the material shall be placed at a moisture content such that after compaction the required relative densities will be produced. Also, the material shall be placed in lifts, which prior to compaction shall not exceed twelve (12) inches.

c. Prior to compaction each layer shall be evenly spread, moistened and worked.

d. If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

e. All relative density tests shall be made by the developer at no expense to the district.

5. Imported Backfill Material. In the event the native excavated material is not satisfactory for backfill and consolidation, the developer shall dispose of the native material and provide imported granular backfill material. This granular material shall pass a three-inch square sieve and shall not contain more than fifteen (15) percent of material passing a two hundred (200) mesh sieve, and shall be of such character as to permit water to pass through it quickly.

6. Backfill Around Structures. Backfilling and compaction around manholes and other sewer structures shall comply with the requirements for backfilling and compaction of trenches. (Ord. 305 Exh. A § 4(D), 1999)

13.08.140 Portland cement concrete.

A. Scope. This section of the specifications defines materials to be used in Portland cement concrete work and requirements of mixing, placing, finishing and curing.

B. Materials.

1. Cement. Portland cement shall be Type II and shall comply with the Standard Specification for Portland Cement (ASTM C-150).

2. Aggregates. Concrete aggregates shall conform to Tentative Specifications for Concrete Aggregates (ASTM C-33).

3. Water. Water used in mixing concrete shall be clean and free from deleterious amounts of acids, alkalis or organic materials.

4. Air-Entraining Agents. An air-entraining agent shall be used in all concrete. The agent shall conform to ASTM Designations C-175 and C-260. The amount used shall be such as to provide for an air content of forty-one (41) percent plus or minus one percent. The agent shall be added as a solution to the mixing water and shall be dispensed by mechanical equipment capable of accurate measurement.

5. Admixtures. Admixtures shall not be permitted to be used in Portland cement concrete for this project.

6. Reinforcing Steel. All bar material used for reinforcement of concrete shall be intermediate grade steel conforming to the requirements of ASTM designation A-15 and shall be deformed in accordance with ASTM Designation A-305.

C. Concrete Mix. All concrete shall have a minimum twenty-eight (28) day compressive strength of 3000 PSI. The maximum aggregate size shall be one inch and the cement content shall be a minimum of six sacks per cubic yard. The maximum and minimum slumps shall be four inches and twenty-one (21) inches respectively.

D. Forms. Forms shall be substantially built and adequately braced so as to withstand the liquid weight of concrete. All linings, studding, walling and bracing shall be such as to prevent bulging, spreading, or loss of true alignment while pouring and displacement of concrete while setting.

1. The lining of the forms shall be of such type and workmanship as to prevent escape of mortar and shall be smooth and neatly joined so as to produce concrete surfaces of uniform, smooth texture and shall be so placed as to cause the form marks to conform to the general lines of the structure.

2. Forms for curved sections shall be so constructed and placed that the finish surfaces of the walls not deviate appreciably from the arc of the curve.

3. The placing of moldings in the form shall chamfer exposed vertical and horizontal edges of the concrete.

E. Reinforcement and Embedded Items.

1. Reinforcing steel shall be clean and free from rust, scale, paint, grease or other foreign matter that might impair the bond. It shall be accurately bent and shall be tied to prevent displacement when concrete is poured. Reinforcing steel shall be held in place by only metal or concrete ties, braces and supports. No steel shall extend from or be visible on any finished surface.

2. The developer shall use concrete chairs for holding the steel away from the subgrade, and spreader or other type bars for securing the steel in place. The spreader bars shall be not less than three-eighths-inch in diameter.

F. Preparations.

1. Before batching and placing concrete, all equipment for mixing and transporting the concrete shall be cleaned, all debris and ice shall be removed from the place to be occupied by the concrete, forms shall be thoroughly wetted (except in freezing weather) or oiled, and masonry filler units that will be in contact with concrete shall be well drenched (except in freezing weather), and the reinforcement shall be thoroughly cleaned of ice or other coatings. Water shall be removed from spaces to receive concrete.

2. When placing concrete on earth surfaces, the surfaces shall be free from frost, ice, mud and water. When the subgrade surface is dry soil or pervious material, it shall be sprayed with water immediately before placing of concrete or shall be covered with waterproof sheathing paper or a plastic membrane. No concrete shall be placed until the surfaces have been inspected and approved by the district.

G. Concrete Mixing. The concrete shall be mixed until there is a uniform distribution of the materials. Sufficient water shall be used in mixing concrete to produce a mixture which will flatten and quake when deposited in place, but not enough to cause it to flow. Sufficient water shall be used in concrete in which reinforcement is to be embedded to produce a mixture which flows sluggishly when worked and which, at the same time, can be conveyed from the mixer to the forms without separation of the coarse aggregate from the mortar. In no case shall the quantity of water used be sufficient to cause the collection of a surplus in the forms.

H. Depositing.

1. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. The concrete placing shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the space between the bars. Concrete that has partially hardened or been contaminated by foreign material shall not be deposited on the work, nor shall retempered concrete be used.

2. When pouring is once started, it shall be carried on as a continuous operation until the placing of the panel or section is completed. The top surface shall be generally level. All concrete shall be vibrator compacted during the operation of placing and shall be thoroughly worked around reinforcement and embedded fixtures and into the corners of the forms.

I. Placing Concrete in Cold Weather.

1. No concrete shall be poured where the air temperature is lower than forty (40) degrees Fahrenheit. When there is likelihood of freezing during the curing period, the concrete shall be protected by means of an insulating covering to prevent freezing of the concrete for a period of not less than seven days after placing.

2. Adequate equipment for protecting concrete from freezing shall be available at the job site prior to placing concrete. Particular care shall be exercised to protect edges and exposed corners from freezing. In the event heating is employed, care shall be taken to insure that no part of the concrete becomes dried out or is heated to temperatures above ninety (90) degrees Fahrenheit. The housing, covering, or other protection used shall remain in place and intact at least twenty-four (24) hours after the artificial heating is discontinued.

J. Finishes. The requirements for finishing of concrete surfaces shall be as specified in this paragraph immediately after removal of forms, all form-tie holes, honeycomb, aggregate pocket voids, and holes shall be cut to solid concrete, thoroughly wetted, brush coated with neat cement grout, cement mortar composed of one part cement to two parts fine aggregate. Mortar shall be placed in layers as required, with each layer being compacted into place. The final layer shall be finished flush and in the same plane as contiguous surfaces.

1. All formed surfaces which are exposed to view shall receive a rubber float finish.

2. Walkway surfaces of manhole base slabs shall receive a magnesium float finish. Flat bottom slabs of sewer conduit shall receive a steel troweled surface finish.

K. Curing. All concrete surfaces shall be kept moist for a minimum period of seven days after placing. The developer shall have the option of using any method which will assure moisture retention. Proposed curing methods will be subject to review and approval of the district. (Ord. 305 Exh. A § 4(E), 1999)

13.08.150 Sanitary sewer construction.

A. General. The developer shall furnish and install all gravity sanitary sewer pipe required for the construction of the project as specified in this section and as shown on the drawings.

B. Pipe. Pipe used in sewer line construction shall be as follows:

1. PVC sewer pipe shall be made of compounds conforming to ASTM D-1784 with a cell classification of 13364-B with a minimum tensile modulus of 500,000 PSI. PVC sewer pipe must meet the entire dimensional, chemical, and physical requirements as outlined in ASTM D-3034 and shall have a maximum SDR of 35 and conform to all other performance specifications of ASTM D-3034. The pipe shall carry the IAPMO UPC Seal of Approval.

2. PVC sewer pipe shall be installed according to the requirements of ASTM b-2321 and the manufacturer's requirements.

C. Joints. Couplings for PVC plastic pipe shall be of the rubber gasket bell and spigot type, and the rubber gaskets shall conform to the requirements of ASTM 1869.

D. Fittings. Fittings shall be made of PVC plastic conforming to ASTM D-1784, have a cell classification as outlined in ASTM D-3034, and carry the IAPMO UPC Seal of Approval.

1. Fittings such as saddle outlets, elbows, tees, wyes; etc. shall be of the same material and compatible in construction to the adjacent pipe.

E. Pipe Laying. All pipe installation shall proceed upgrade on a stable foundation with joints closely and accurately fitted. Manufacture installation requirements shall be rigidly adhered to in addition to the following:

1. Rubber gaskets shall be fitted properly in place, and care shall be taken in joining the pipe units to avoid twisting of gaskets. A pure vegetable joint lubricant shall be applied uniformly to the mating joint surfaces to facilitate easy positive joint closure.

2. Pipe shall be installed with uniform bearing under the full length of the barrel, with suitable excavations being made to receive pipe bells.

3. Select material shall be compacted around the pipe to firmly bed the pipe in position. If adjustment of position of a pipe length is required after being laid, it shall be removed and rejointed as for a new pipe. When laying is not in progress, the ends of the pipe shall be dosed with tight-fitting stopper to prevent the entrance of foreign material.

4. In addition to the above requirements, all pipe installation shall comply with the specific requirements of the pipe manufacturer.

F. Gravel Foundation for Pipe.

1. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, it shall be excavated to such depth as may be necessary and replaced with crushed rock or gravel compacted into place.

2. Gravel foundation for pipe shall be clean crushed rock or gravel with one hundred (100) percent passing one-inch and maximum of five percent passing a No. 4 sieve.

G. Installation Requirements for Line and Grade. All sewer pipe shall be installed accurately to the defined line and grade. Variance from established line and grade shall not be greater than one thirty-second of an inch per inch of pipe diameter and not to exceed one-half inch; provided, that such variation does not result in a level or reverse sloping invert; provided also, that variation in the invert elevation between adjoining ends of pipe, due to nonconcentricity of joining surface and pipe interior surfaces, does not exceed one sixty-fourth inch per inch of the pipe diameter, or one-half inch maximum.

H. PVC Pipe Embedment. The bottom of the trench shall be of stable materials. In general, coarse-grained soils, free of rocks and stones, such as graded crushed rock, gravel, sand, and other granular materials are considered stable materials. A stable material shall be placed under the pipe haunches and up to the spring line in uniform layers not exceeding six inches in depth. When bedding is required, the same material should be used for both bedding and haunching. Stable material, free of rocks and stones, shall be used to backfill the trench from the springline of the pipe to a point at least twelve (12) inches above the top of the pipe. Each six-inch layer of bedding, haunching and initial backfill shall be placed, then carefully and uniformly compacted to ninety (90) percent of the Standard Proctor (T-99) density. Extra fine sand, clay, silt, or large soil lumps shall not be allowed as bedding, haunching or initial backfill material. The remaining backfill over the top of the initial backfill shall be placed in accordance with Section 13.08.130. Pipe foundation gravel for bedding shall be paid for as defined in Section 13.08.100(C). However, haunching and initial backfill materials and labor shall be included as a part of the unit price per linear foot for the PVC and Armco Truss Pipe materials. Details of this particular bedding and backfill requirements are found in the data Is of the contract drawings.

I. Bedding Material. Bedding material shall be one of the following, at the developer's option:

1. Sand. Sand bedding shall be a clean sand-gravel mixture free from organic matter and conforming to the following gradation when tested in accordance with ASTM D-422.

U.S. Standard Sieve Size	Percent Passing by Weight
3/4"	100
3/8"	70--100
No. 4	55--100
No. 10	35--95
No. 20	20--80
No. 40	10--55
No. 100	0--10
No. 200	0--3

2. Pea Gravel. Pea gravel bedding shall be a clean mixture free from organic matter and conforming to the following gradation when tested in accordance with ASTM D-422.

U.S. Standard Sieve Size	Percent Passing by Weight
1 1/2"	100

3/4”	30--75
1/2”	15--55
1/4”	0--5

3. Gravel Sand.

U.S. Standard Sieve Size	Percent Passing by Weight
1 1/2”	100
3/4”	30--75
1/2”	15--55
1/4”	0--40
No. 200	0--3

4. Cracked Rock. Crushed rock bedding shall be a clean mixture free from organic material and conforming to the following gradation when tested in accordance with ASTM D-422.

U.S. Standard Sieve Size	Percent Passing by Weight
5/8”	100
1/4”	50--65
No. 40	8--23
No. 200	0--10

J. Tests. Tests for both displacement and leakage shall be conducted on the installed sanitary sewer system.

1. Displacement Test. The displacement test conducted shall be conducted by the district and shall consist of the following: a light will be flashed between manholes or, if the manholes have not as yet been constructed between the locations of the manholes, by means of a flashlight or by reflecting sunlight with a mirror. If the illuminated interior of the pipe shows broken, misaligned or displaced the developer shall remedy pipe or other defects, the defects designated by the district.

2. Air Tests.

a. All sanitary sewers shall be tested with low-pressure air to determine the quality of installation. Length of line tested at one time shall be limited to the length between adjacent manholes.

b. Each section of the sewer shall be tested between successive manholes by closing the lower end of the sewer to be tested and the inlet sewer of the upper manhole with stoppers. Low pressure air is introduced into the sealed section of the line until internal air pressure reaches 4 PSI (greater than the average back pressure of any groundwater that may be over the pipe). At least two minutes must be allowed for the air pressure to stabilize.

c. Minimum air pressure at the beginning of the air pressure test should not be less than 3.5 PSIG. After the air pressure has stabilized at 4 PSIG in the pipe for at least two minutes, air introduction into the pipe should be stopped, and time for the pressure to decrease to 2.5 PSIG should be

noted in seconds with a stopwatch. The time noted for this pressure drop should not be less than the time shown in the following table:

TEST TIME IN SECONDS

Length	4”	6”	8”	10”	12”
25	3	6	10	16	23
50	5	11	20	32	46
75	8	17	31	48	69
100	10	23	41	64	91
125	13	29	51	79	114
150	15	34	61	95	137
175	18	40	71	111	160
200	20	46	81	127	188
225	23	51	91	143	205
250	25	57	102	159	205
275	28	63	112	175	205
300	31	69	122	175	205
325	33	80	132	175	205
350	36	91	142	175	205
375	38	103	142	175	205
400	40	103	142	175	205
450	42	103	142	175	205
500	51	103	142	175	205

(Ord. 305 Exh. A § 4(F), 1999)

13.08.160 Manholes.

A. General. Developer shall furnish and install watertight precast concrete manholes. Manholes shall be furnished complete with steps, cast iron rings and covers.

B. Concrete Bases. Manhole bases may be either precast or cast-in-place unless otherwise specified. Precast manhole bases shall have pipe inverts and a neoprene boot for each pipe connecting to the manhole.

1. Where sewer lines enter manholes the invert channels shall be smooth and semicircular in cross section, conforming to the details shown on the drawings. Changes of direction of flows within

the manholes shall be made with a smooth curve with as long a radius as possible. The floor of the manhole outside the channels shall be smooth and slope toward the channel at not less than one-half inch per foot.

2. The connecting boots shall be made of neoprene compound meeting ASTM C-443 Specifications. The boot shall have a wall thickness of three-eighths inch. The boot shall either be cast in-place in the precast base or attached to the precast base by means of an interval expanding band. When the boot is attached to the precast base, a watertight seal between the boot and the precast base must be accomplished.

3. An external band shall be supplied and used to clamp and seal the boot to the pipe. The band shall be made of 300 series nonmagnetic corrosion-resistant steel. After the band has been placed, it shall be completely coated with a bituminous material.

4. Concrete for manhole bases shall comply with the requirements of section on Portland cement concrete of these specifications.

C. Wall and Cone Sections.

1. All manholes shall be precast, sectional, reinforced concrete pipe of either forty-eight (48) or sixty (60) inch I.D., as specified. Both cylindrical and taper sections shall conform to all requirements of ASTM Designation C-76 for reinforced concrete culvert pipe with the following exceptions:

a. The throat section of the manhole shall be eccentric sections, adjustable by use of pipe sections, up to eighteen (18) inches in height.

b. The taper section of the manhole shall be a maximum of three feet in height, shall be of eccentric conical design, and shall taper uniformly to thirty (30) inches inside diameter.

c. The pipe used in the base section shall be furnished in section lengths of one, two, three and four as required.

d. Reinforcing steel shall consist of a circular cage with a minimum cross sectional area of 0.25 square inch of steel per foot for cylindrical sections and 0.20 square inch per foot for cone section.

2. All joint surfaces of precast sections and the face of the manhole base shall be thoroughly cleaned and wet prior to setting precast sections. Steps shall be constructed in manholes. Joints shall be set in mortar consisting of one part cement and one and one-half parts sand, with sufficient water added to bring the mixture to workable consistency.

3. Bituminous jointing material may be used in lieu of cement mortar and shall be installed in accordance with manufacturer's recommendations. All joints shall be watertight and free from appreciable irregularities in the interior wall surface.

D. Iron Castings. All iron casting shall conform to the requirements of ASTM Designation A-48 (Class 10) for gray iron castings.

1. Rings and covers shall be equal to the twenty-four (24) inch Salt Lake City Standard with machined bearing surfaces and with cover a weight of one hundred fifty (150) pounds and ring weight of two hundred thirty-three (233) pounds. In addition to the foundry name and year of manufacture, the cover shall be marked "Sewer" and each sewer manhole shall be supplied with an approved dust pan.

2. All manhole rings shall be carefully set to grade. Manholes placed in asphalt surfacing shall require a concrete ring around the cast iron ring and cover to be flush with the existing pavement. (Ord. 305 Exh. A § 4(G), 1999)

13.08.170 Sewer line within well and spring protection zones.

A. Sewer pipe main and laterals shall be constructed of mechanical joint ductile iron pipe. Other types of pipe and joints may be used if equivalent joint integrity is demonstrated and if the district grants prior written approval.

B. Lateral to main connections shall be shop fabricated or saddled with mechanical clamping watertight.

C. Following installation, the sewer main, laterals and manholes shall be air pressure tested and comply with recommendations as presented in the April 1964 issue of the Journal of Sanitary Engineering Procedures of the American Society of Civil Engineers before being accepted for use.

D. Sewer pipe to manhole connections shall be made using a shop fabricated sewer pipe seal ring cast into the concrete manhole base. Further, a mechanical joint pipe connection must be installed within twelve (12) inches of the manhole base on each pipe connection within the manhole.

E. The sewer manhole base and walls shall be fabricated in a single concrete pour to a height of at least twelve (12) inches above the pipe soffit of the connecting sewer. Manholes shall be adequately reinforced with steel. (Ord. 305 Exh. A § 4(H), 1999)

13.08.180 Restoration of surface improvements.

A. General.

1. The developer shall be responsible for the protection and the restoration of a replacement of any improvements existing on public or private property at the start of work or placed there during the progress of the work.

2. Existing improvements shall include but are not limited to permanent surfacing, curbs, gutters, sidewalks, planted areas, ditches, driveways, culverts, fences and walls. All improvements shall be reconstructed to equal or better, in all respects, than the existing improvements removed.

B. Gravel Surface. Where trenches are excavated through gravel surfaced areas such as roads and shoulders, parking areas, unpaved driveways, etc., the gravel surface shall be restored and maintained as follows:

1. The gravel shall be placed deep enough to provide a minimum of six inches of material.

2. The gravel shall be placed in the trench at the time it is backfilled. The surface shall be maintained by blading, sprinkling, rolling, adding gravel, etc., to maintain a safe, uniform surface satisfactory to the district. Excess material shall be removed from the premises immediately.

3. Material for use on gravel surfaces shall be obtained from sound, tough, durable gravel or rock meeting the requirements for roadbase gravel.

C. Bituminous Surface. Where trenches are excavated through bituminous surfaced roads, driveways, parking areas, etc., the surface shall be restored and maintained as follows:

1. A temporary gravel surface shall be and maintained as required in subdivision 2 of this subsection after the required backfill and compaction trench has been accomplished.

2. The gravel shall be placed to such depth as to provide six inches below the pavement and shall be brought flush with the paved surface.

3. The area over trenches to be resurfaced shall be graded and roiled with a roller weighing not less than twelve (12) tons, or with the rear wheels of a five-yard truck loaded to capacity, until the subgrade is firm and unyielding. Mud or other soft or spongy material shall be removed and the void

filled with gravel and rolled and tamped thoroughly in layers not exceeding six inches in thickness. The edges of trenches that are broken down during the making of subgrade shall be removed and trimmed neatly before resurfacing.

4. Before any permanent resurfacing is placed, the developer shall trim the existing paving to clean straight lines as nearly parallel to the centerline of the trench as practicable. The straight lines shall be made.

5. Existing bituminous paving shall be cut back a minimum of six inches beyond the limits of any excavation or cave-in along the trench so that the edges of the new paving will rest on at least six inches of undisturbed soil.

6. Within forty-eight (48) hours of the commencement of work, the bituminous surface shall be restored by standard paving practices to the thickness shown on the drawings and/or defined in the proposal.

7. Pavement restoration shall include priming of pavement of edges and sub-base with Type MC-70 bituminous material to the level of the adjacent pavement surfaces.

D. Concrete Surfaces. All concrete curbs, gutters, sidewalks and driveways shall be removed and replaced to the next joint or scoring lines beyond the actually damaged or broken sections; or in the event that joints or scoring lines do not exist or are three or more feet from the removed or damaged sections, the damaged portions shall be removed and reconstructed to neat, plane faces. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements. Where necessary, lamp black or other pigments shall be added to the concrete to obtain the desired results.

E. Work on State Roads. All pavement and gravel surface repair on state roads shall be in accordance with the latest edition or Specifications for Excavation on State Highways, as prepared by the Utah State Department of Highways. Minimum thickness for bituminous pavement replacement on state roads is three inches.

F. Miscellaneous Improvements.

1. It shall be the developer's responsibility to restore to their original condition all irrigation ditches, levees, culverts, gates, fences, drainage ditches and all such improvements that are cut or disturbed during construction. Topsoil in farming areas shall be stored separate from subsoil during pipe trench excavation. Topsoil shall be replaced during backfill operations as nearly as possible to its original condition, thereby assuring suitable soil for reseeding. All sections of pasture, grain fields, etc., that are damaged or destroyed by the developer during the construction of lines shall be reseeded according to what the property owner desires and the time of year. Before reseeding, the topsoil shall be trimmed to fine lines free from unsightly variations, lumps, ridges or depressions.

2. The developer shall make a satisfactory settlement with each landowner for all farm crops that are damaged or destroyed during construction.

3. If reseeded areas do not show a "catch" at the time of completion and final acceptance of the line, an amount of money determined by the district shall be retained until the time such growth appears. (Ord. 305 Exh. A § 4(I), 1999)

STORM WATER AND FLOOD CONTROL

Sections:

13.12.010 General.
13.12.020 Drainage study required.
13.12.030 Design.
13.12.040 Drainage system plans.
13.12.050 Waiver of drainage study requirements.
13.12.060 Protection of historical flood and drainage ways.

13.12.010 General.

A. Complete storm water management systems or the entire subdivision area shall be designed by a professional engineer, licensed in the state of Utah and qualified to perform such work, and shall be shown graphically. All existing drainage features that are to be incorporated in the design shall be so identified. If the final plat is to be presented in sections, and appropriate development stages for the drainage system for each section indicated. The determination of necessary drainage facilities is to work in accordance with an approved hydrology report.

B. Design of the storm water management system shall be consistent with general and specific concerns, values, and standards of the Spanish Valley Master Storm Water Management Plan, as well as those of regional and state storm drainage control programs. Design shall be based on environmentally sound site planning and engineering techniques. It is especially critical that storm water management systems be designed for an entire drainage basin rather than just for specific sites.

C. The best available technology shall be used to minimize off-site storm water runoff, increase on-site infiltration, encourage natural filtration functions, stimulate natural drainage systems, and minimize off-site discharge of pollutants to ground and surface water. Best available technology may include measures such as retention basins, recharge trenches, porous paving and piping, contour terraces, and swales. (Ord. 305 Exh. A § 2(A), 1999)

13.12.020 Drainage study required.

A drainage study is required for all subdivisions. The amount of detail and the approval authority varies according to lot size.

A. Lot sizes of one acre or larger, or a density of one DU per acre or less require a drainage analysis which contains the following:

1. Site plan with topography at two-foot intervals and showing historic drainage;
2. Hydrologic calculations for the ten (10) year are to include detention and release rate requirements and one hundred (100) year storms calculations for channel components and conveyance requirements. Calculations are required for both historic and developed conditions;
3. A summary in narrative and mapped form of the expected impacts on downstream property owners.

B. The county road department and the county engineer shall review the drainage analysis.

1. Lot sizes of less than one acre, or a density greater than one DU per acre requires a full two phase drainage study and plan which shall contain the following:

a. Phase 1 shall contain the same information as required for the drainage analysis specified in subsection (B)(1) of this section. The Phase I study shall be submitted with the PUD or Preliminary Plat.

b. Phase II shall contain the calculations for all drainage facilities, final design and the final drainage plan. The Phase II drainage study shall be submitted with the final plat.

2. The methodology for drainage studies shall be the Rational, SCS TR-55, or equivalent. (Ord. 305 Exh. A § 2(B), 1999)

13.12.030 Design.

The storm water management systems shall be designed to meet all the following criteria:

A. Permit the unimpeded flow of natural watercourses in accordance with the requirements of the Spanish Valley Master Storm Water Management Plan;

B. Ensure adequate drainage of all low points;

C. Surface water must drain away from cul-de-sacs;

D. Where surface water cannot be drained along the street due to grade restrictions catch basins, drain lines and drainage easements shall be provided;

E. Provide detention such that after development the peak rate of flow from the site for a one hundred (100) year twenty-four (24) hour storm will not exceed the historic corresponding flow that would have been created by a similar storm prior to development. Runoff greater than that occurring from the one hundred (100) year twenty-four (24) hour storm will be passed over an emergency spillway. (Ord. 305 Exh. A § 2(C), 1999)

13.12.040 Drainage system plans.

A. The drainage system shall be designed to consider the drainage basin as a whole and shall accommodate not only runoff from the subdivision area but also, where applicable, the system shall be designed to accommodate the runoff from those areas adjacent to and upstream from the subdivision itself, as well as its effects on lands downstream.

B. All proposed surface-drainage structures shall be indicated on the plans. All existing ditches and channels shall be indicated and on all cross sections of proposed ditches and channels provided.

C. All appropriate designs, details and dimensions needed to clearly explain proposed construction materials and elevations shall be included in the drainage plans. (Ord. 305 Exh. A § 2(D), 1999)

13.12.050 Waiver of drainage study requirements.

A. A waiver of the drainage study requirement will be considered when the following conditions exist:

1. The amount of impervious surface will not be increased by more than fifteen (15) percent;

2. The site is not characterized by unusual topography or drainage patterns;

3. The site does not lie within the boundaries of the one hundred (100) year floodplain or other significant floodplain or floodway.

B. A request for waiver of the drainage study shall contain:

1. A letter explaining the reasons for the waiver;

2. A topographic or slopes map that shows the predominant drainage patterns;

3. Calculations of the change in impervious area, after development;

4. Calculations of detention pond storage as specified in Section 13.12.030(E).

C. All waiver requests shall be referred to the county engineer. If the county engineer determines that the waiver is reasonable and that a full drainage study is not necessary, the planning commission may grant the waiver. (Ord. 305 Exh. A § 2(E), 1999)

13.12.060 Protection of historical flood and drainage ways.

A. Statement of Policy.

It is the policy of Grand County that the storm water of the Spanish Valley be serviced by historical flood and drainage ways. Therefore, all historic flood and drainage ways as outlined in the Spanish Valley Master Storm Water Management Plan, and hereafter amended, shall be protected from alteration such that their primary function as storm water facilities shall be upheld.

B. System Requirements.

1. The flood and drainage ways outlined in the Spanish Valley Master Storm Water Management plan shall be installed and/or protected such that their capacities equal or exceed the flows outlined in the management plan with one-foot minimum freeboard The flood and drainage ways shall have a minimum
capacity of twenty (20) cubic feet per second.

2. All other ordinances inconsistent with the provisions of this section are amended to require that each individual or entity requesting a building permit or acceptance by Grand County of a subdivision plat in which any building or subdivision is proposed, shall, prior to the granting of any building permits and prior to the acceptance and approval of any subdivision plat by Grand County, comply with and agree to the following conditions:

a. Each such individual or entity shall agree on behalf of himself or herself and his or her successors, assigns to pay his or her pro rata share of costs for the protection and upgrading of the storm water management system, at such time as the system shall be extended to service the structure or development for which the building permit or plat approval is sought.

C. Penalties. Any person violating any of the provisions of this section shall be deemed guilty of a Class B misdemeanor, and upon conviction thereof, shall be punishable by a fine in an amount less than three hundred dollars ($300.00) or imprisonment for a period of not more than six months, or by both such fine and imprisonment. Such persons will be required to repair the storm water management system and make restitution for any damages caused as a result of their actions. Building permits for any associated lands will be restricted until such time as restitution and repairs are made. (Ord. 284 §§ A, B and D, 1997)