GRAND COUNTY CONSTRUCTION STANDARDS

GRAND WATER & SEWER SERVICE AGENCY
MOAB VALLEY FIRE PROTECTION DISTRICT
GRAND COUNTY, UTAH

JULY 2010

Exhibit "A"

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All public or private infrastructure (i.e., streets and roads, storm drainage management systems, water systems, and sewer systems) in accordance with these Grand County Construction Standards shall be designed by a professional engineer, licensed in the State of Utah and qualified to perform such work, and shown graphically and constructed as required by the County Engineer.

These standards do not apply to construction projects funded with B road funds and performed by Grand County.

The County Engineer may grant a Design Exception for construction outside the limits of Spanish Valley to be reviewed by the Planning Commission for recommendation to Council . An Application for a Design Exception shall include; justification for the exception, distance from the proposed construction to existing infrastructure, complete proposed design specifications.

I. ROADS AND STREETS

All construction of roads and streets shall comply with the Utah Chapter of the American Public Works Association (APWA) Manual of Standard Specifications and the APWA Manual of Standard Plans. Said manuals shall be modified as follows:

All roads and streets including access roads shall comply with tables 1 and 2 of the Grand County Construction Standards. Paving shall include a chip seal in the second construction season after placement of the asphalt concrete. All construction shall be in accordance with APWA standards and specifications, except as specifically allowed in these Standards. Subbase, base course, asphalt and concrete inspections shall be scheduled with the County Engineer at least 48 hours in advance.

Only complete projects or project phases identified upon approved project master plans are eligible for acceptance. Acceptance of all work defined in the Subdivision Improvement Agreement excepting the chip seal commences the two year warranty period.

A. Street Standards

1. *Minimum street design and construction standards*

All lots shall have frontage on a street that conforms to the standards of this section.

TABLE 1
MINIMUM STREET CONSTRUCTION STANDARDS

CLASSIFICATION	MAJOR COLLECTOR Greater Than 8,000 Average Daily Trip (ADT)	MINOR COLLECTOR Greater Than 2,000 ADT	LOCAL Type I ADT Between 500 and 2,000	LOCAL Type II Less Than 500 ADT	PRIVATE LANE Less Than 250 ADT	PRIVATE ACCESS TRACT
Compacted Sub-base	12 inches	12 inches	6 inches	6 inches	6 inches	N/A
Compacted Road Base	6 inches	6 inches	4 inches	4 inches	4 inches	4 inches
Pavement	4 inches Asphalt Concrete	3 inches Asphalt Concrete	2.5 inches Asphalt Concrete	2 inches asphalt concrete	2 inches Asphalt Concrete	None
Curb & Gutter	High back	High back	Mountable or high back curb	Mountable or high back curb Yes **	Mountable or high back curb Yes **	Mountable or high back curb Yes **
Side Slopes (from centerline)	2%	2%	2%	2%	2%	2%
Ditch -- Depth	3' minimum	3' minimum	3' minimum	3' minimum	3' minimum	3' minimum
Ditch -- Side Slopes	4:1	4:1	3:1	3:1	3:1	3:1
Culvert -- Diameter	24" minimum	24" minimum	24" minimum	24"minimum	As appropriate	As appropriate

TABLE 2
MINIMUM STREET DESIGN STANDARDS

Classification	Major Collector Public Street	Minor Collector Public Street	Local Type I Public Street	Local Type II Public Street	Private Lane	Private Access Tract	Alley
Design Speed	35	35	25-30	20-30	20-30	10-15	10-15
R-O-W Width	80 ft.	66 ft.	56 ft.	56 ft.	44 ft.	24 ft.	20-30'
Surface Width	60 ft.	50 ft.	34ft. *** 38 ft in OAO zone district	24 ft.	24 ft.	20	20-30'
Travel Lanes	4	2	2	2	2	2	2
Lane Widths	12 ft.	12 ft.	11 ft.	11 ft.	11 ft.	8 ft.	10 ft
Sidewalk Placement	Yes *	Yes *	Yes *	Yes *	Yes *	**None**	**None**
Min.-Max. Grades	.5% - 8%	.5% - 8%	.5% - 10%	.5% - 12%	.5% - 12%	.5% - 12%	.5-12%
Min. Horizontal & Alignment Radius	450 ft.	450 ft.	250 ft.	150 ft.	150 ft.	75 ft.	75 ft.
Intersection Grade	.5% - 3%	.5% - 4 %	.5% - 4%	.5% - 4%	.5% - 12%	N/A	N/A
On-Street Parking	None	Yes	Yes	None	None	None	None
Intersection Sight Distance	350 ft.	350 ft.	300 ft.	300 ft.	300 ft.	N/A	Per AASHTO
Stopping Sight Distance	325 ft.	325 ft.	250 ft.	200 ft.	200 ft.	100 ft.	100 ft.
Curb Return Radius	25 ft.	25 ft.	20 ft.	15 ft.	15 ft.	15 ft.	15
Cul-de-sacs	None	None	ROW Diameter - 100' Min. radius - 40' Max. length – 1,000'	Same as Local	Same as Local	N/A	Per AASHTO
Shoulders	6 ft. - 4 Lanes 0 ft. – 5 Lanes	13 ft. - 2 Lanes 7 ft. - 3 Lanes	8 FT	10 FT	10 FT	None	None

* Sidewalks may not be required in all circumstances. Sidewalk, when required, shall be 5 feet in width in the NB, Neighborhood Business District and the GB, General Business District; or 6 feet in width if installed adjacent to a curb. Sidewalks built in all other district shall be 4 feet in width. .
** Curb and gutter may not be required in all circumstances. Curb and gutter when required shall be of the type determined by the County Engineer.
*** In the Overnight Accommodation Overlay zone (OAO), all County Road surface widths shall be at least 38 feet.

2. *Street Dedications*

All streets shall be dedicated to Grand County for "public" use; provided, however, "private" streets may be permitted, at the sole discretion of the County, subject to the following conditions:

(a) The Planning Commission determines that it is <u>not</u> physically possible to provide for through street access to adjoining property (i.e., the subject property terminates at a waterway, escarpment or other reasonably insurmountable physical impediment to through access) in order to provide for the orderly development of a street system; and

(b) Plat notes and covenants or other documents make it clear that the county will not maintain the streets and include the following provisions:

1. An undivided interest in the right-of-way shall be conveyed to each of the individual lots being served by the lane;

2. A homeowners' association or other entity with assessment authority shall be established through subdivision covenants or other document that will be responsible for the perpetual maintenance of the private lane or private access tract;

3. Upon approval of such subdivision covenants or other document by the County Council, those portions of such covenants or other document which pertain to private road maintenance may not be amended without the prior written approval of the County Council; and

4. The plat shall include a plat note that will provide disclosure to all successors and assigns, as follows: "Note: the private lane or private access tract shown hereon lacks the right-of-way and travel surface required by the county for a public street, and therefore the private lane or private access tract cannot be dedicated to the county for improvement or maintenance, but will remain the responsibility of the Homeowners Association in perpetuity".

3. *Private Street Standards*

Notwithstanding other provisions to the contrary, the Planning Commission may permit deviations from otherwise required design specifications (pursuant to paragraph I.A.2., above) as follows:

(a) Private Lane

1. The right-of-way shall be 44 feet;

2. The travel surface may be finished with 2 inches of gravel or armor coating (chip and seal), instead of 2 inches bituminous asphalt;

3. Curb treatment Shall be required as recommended by the County Road Supervisor and County Engineer; and

4. Pervious pavements may be approved as an alternative by the County Engineer.

5. Sidewalks shall be required in accordance with the Sec. 7.4 of the Grand County Land Use Code.

(b) Private Access Tract

A private access tract may be permitted to serve a maximum of 3; provided that, at a minimum, such access tracts shall have:

1. The right-of-way width of 24 feet;

2. The opening width and travel surface width of 20 feet;

3. The interior curve radii of 75 feet;

4. A grade shall not exceed eight (8) percent; The Road Supervisor and County Engineer may approve design exceptions up to 12 percent at their discretion;

5. All entrances and exits shall be located and constructed such that vehicles approaching or using them will be able to obtain adequate sight distance in both directions along the roadway necessary to maneuver safely and without interfering with roadway traffic;

6. An entrance/exit approach grade shall slope downward and away from the road surface at the same rate as the normal shoulder slope, but in no case at more than 4 percent for a distance equal to the width of the shoulder, and in no case for less than 15 feet from the pavement edge;

7. The angle of approach from the adjacent roadway shall be between 60 and 90 degrees;

8. No features may interfere with the drainage system of the adjacent street or roadway;

9. The developer shall pay for and install drainage structures that will become integral parts of the existing street or roadway drainage system, the dimensions of all which must be approved by the County Road Supervisor and County Engineer prior to installation;

10. A turnaround, satisfactory to the Fire Chief, will be provided where the access tract is more than 150 feet long;

11. Curb treatment shall be required where recommended by the County Engineer; and County Road Supervisor.

(c) To increase the number of residences up to six (6) served by a private access tract the following are required:

a) All roads walkways and driveways shall be calculated as impervious for the design of all storm water management and treatment structures.

b) Dust control treatment shall be included.

c) Right of way width increased to 44 feet.

d) Turnarounds shall be cul-de-sacs.

e) A plan must be submitted that demonstrates an effort to use green technologies within the subdivision pursuant to the current ICC Building Code.

f) Limits of clearing and grading are demonstrated on the plan.

g) Storm water management plans are developed to minimize concentrated flows and simulate flows found in natural hydrology by the use of vegetative swales, French drains, wetlands, dry wells and similar features.

h) Permeable materials are used for paving that is proposed.

i) Landscaping that is required will be regionally appropriate and grouped for similar watering needs.

d. Alley

1. Alleys shall be designed as follows:
   a) Right-of-way shall be a minimum of 20 feet and a maximum of 30 feet in width.
   b) The intersection of an existing alley with a road shall provide adequate sight distance.
   c) Alleys shall not intersect.
   d) Pavement width shall be the full width of the right-of-way, except at intersections of roads, where curb returns with radii equal to the curb-to-property-line dimension shall be constructed.

2. No new alleys shall be accepted into the County's maintained road system.

3. Alleys are to be privately maintained.

4. *Subdivision Street Classification*

Streets for the entire subdivision area shall be designed by professional engineer, licensed in the State of Utah and qualified to perform such work, and shall be shown graphically. The determination of which street design and construction standards apply to streets shall be based on the following criteria, provided that the private lane and/or private access standard shall be permitted subject to the sole discretion of the County:

(a) Major Collector. Any street identified in the Spanish Valley Transportation Plan as a major collector.

(b) Minor Collector. Any street within a subdivision that (1) connects with a minor collector in another subdivision or developed area or (2) any street that in the opinion of the County Engineer that will or should function as a minor collector street shall meet the Minor Collector standards.

(c) Local Type I. -A Local Type I begins at the point where any two streets intersect.

(d) Local Type II. Any paved street not meeting the definition of a local type I that is to be maintained by the County. (A loop, cul-de-sac, or dead-end street that has no possibility of extension to another County road).,

(e) Private Lane or Private Access Tract. Any street that is not to be maintained by the County.

(f) Driveway. Provides access to one residence.

5. *Relations to Adjoining Street System*

The arrangement of streets in new subdivisions shall make provision for the continuation of the existing streets in adjoining areas (or their proper protection where adjoining land is not subdivided) at the same or greater width (but in no case less than the required minimum width) unless variations are deemed necessary by the Planning Commission. Where the Planning Commission determines that it is desirable to provide for street access to adjoining property in order to provide an orderly development of a street system, proposed streets shall be extended by dedication to the boundary of such property. Stub streets thus provided which are in excess of 100 feet in length shall require a temporary turn-around with a minimum radius (paved or graveled surface) of 50 feet.

6. *Street Widths*

Street widths shall be as specified in Table 2, Minimum Street Design Standards; provided, however, where an adopted arterial and collector street plan specifies more restrictive standards, the requirements of the adopted plan shall apply.

7. *Cul-de-sacs and dead-ends*

Cul-de-sacs (dead-end streets) shall be used only where unusual drainage or land ownership configurations exist that makes other designs impractical. Except where a waterway, escarpment or other reasonably insurmountable physical impediment prevents through access, all streets shall terminate at a property line so as to facilitate connection to future or existing streets. The length of a cul-de-sac shall be measured from the centerline intersection with the intersecting street to the center point of the turnaround. Cul-de-sacs shall be the construction standards specified in Table 1, herein. Notwithstanding other provisions to the contrary,

(a) A cul-de-sac up to a maximum of 1000 feet in length may be permitted to serve up to a maximum of 20 dwelling units; and

(b) All driveways longer than 150 feet shall have a turnaround, satisfactory to the Fire Chief.

8. *Horizontal Street Curves*

Horizontal street curves shall be as specified in Table 2 unless otherwise approved by the County Engineer.

9. *Vertical Curves*

Vertical curves shall be used at all changes of grades exceeding one (1) percent and shall be designed to provide minimum sight distances of two hundred feet for minor streets and three

hundred feet for all other streets, except that vertical curves for collector and arterial streets shall be in accordance with the policy on Geometric Design of Highways and Streets published by the American Association of State Highway and Transportation Officials (AASHTO).

10. *Street Intersections*
Streets will intersect each other as near as possible at right angles. Minor streets shall approach the arterial or collector streets at an angle of not less than 80 degrees. Offsets in opposing street alignment centerline at intersections between 10 feet and 150 feet shall be prohibited. Intersections of minor streets with major streets shall be kept to the minimum. No more than four streets shall enter an intersection. Street intersections shall have a vertical alignment such that the grade shall not exceed 3 percent for a minimum distance of 50 feet each way from the centerline of the intersection.

11. *Corner Returns*
Curbs at all intersections shall be rounded with curves having a radius such that a uniform off-set from the property lines is achieved, as shown in the County's standard specifications. Property lines at street intersections shall be rounded with a curve having a 15-foot radius.

12. *Roads in Mountainous Terrain (as defined in AASHTO)*
Notwithstanding any other provisions to the contrary, roads in mountainous terrain (as defined in AASHTO) shall be designed at less than maximum allowable slope in order that they can be safely negotiated and that snow can be removed during winter.

13. *Frontage on Major Highways*
Where a subdivision or new development abuts a major highway or arterial street, direct vehicular access shall be consolidated and otherwise limited in accordance with the requirements of UDOT. Frontage roads may be required.

14. *Streets in Planned Unit Developments*
These standards shall also apply in Planned Unit Developments, unless otherwise modified by the County Council.

15. *Half R.O.W.*
The dedication of half R.O.W.in any subdivision is prohibited, except on the borders of the subdivision where dedication of the additional street width by adjacent properties is possible and likely. Said half R.O.W. shall be of sufficient width to accommodate construction of the full pavement width (and depths) required for the appropriate street classification, including curb and gutter on both sides of the street and sidewalk on the side which is being developed. Half R.O.W. are only applicable to streets with ROW dedicated to Grand County. Private Lane and Private Access Tract streets shall not be constructed as half streets. All proposed streets shall be constructed, in all cases, full width.

16. *Off-site Streets*
Off-site streets that provide primary access to subdivisions shall be adequate in the County Engineer's opinion to provide safe vehicular access. Where such off-site streets do not conform to the standards of this section and no approved capital improvements plan addresses the street standard deficiency, the developer shall be required to demonstrate that such street(s) are adequate to serve the anticipated development, and to protect the public health, safety and general welfare at full buildout under existing zoning. Where such demonstration is not made, the developer shall be required to construct all improvements necessary.

17. *Driveway Approach Pavement*
Driveways shall be constructed in a manner that shall not cause raveling of the roadway pavement or impairment of the roadway drainage system and shall be approved by the County Road Supervisor and an encroachment permit shall be issued.

18. *Warranty*
All development improvements shall be warranted for a period of at least two years.

19. *Construction Upon Existing Pavement or Chip Seal Surfaces*

When improvements to existing surfaced county roads are proposed and where recommended by the County Engineer and Road Supervisor the Compacted Sub Base and Compacted Road Base may be omitted if the pavement thickness is increased by two inches.

B. Street Names

No street or road name shall duplicate an existing street or road name. Cul-de-sacs shall have different names as the street or road from which they originate. Street or County Road numbers within the Spanish Valley shall be based on the Moab Grid System. This system designates which streets shall carry the directional prefix (North, South, East, and West) and the numbering sequence. In subdivisions, street names shall be designated on the Preliminary Plat or PUD plan. The Zoning Administrator shall confirm that the names are in accordance with this policy and if not advise the applicant as to the revisions that should be made. Street or road names shall maintain the existing name if the new street or road is or could be an extension of an existing street or road. Street or road names shall be approved by County Road Supervisor, Zoning Administrator and County Recorder.

C. County Roadway Crossings

All County road crossings shall be accomplished through a road boring process unless boring is deemed impractical by the County Road Supervisor and County Engineer. All cuts made in county street pavements shall be permitted and completed according to county policy in effect at the time of construction and shall be made in accordance with APWA Standard Plans and Specifications. Testing performed by the Encroachment Permit Applicant is required and shall be approved by the County Road Supervisor and County Engineer. Public utilities may enter into a Memorandum of Understanding in regards to County Roadway Crossings.

D. Sidewalks (or Trails), Curbs and Gutters

All roadway improvements required by this standard to include; sidewalks, curb and gutter, and drainage structures, associated with county roads (public roads with ROW dedicated to Grand County) shall be dedicated to Grand County at the time of the road dedication. Where topography or other conditions dictate, the Planning Commission may require a trail on one (1) side of such new or existing streets in lieu of required sidewalks.

E. Easements

Where alleys are not provided, easements of not less than 10 feet on each side of all front, rear, and side lot lines shall be required where necessary for poles, wire, conduits, storm or sanitary sewers, gas and water mains and other public utilities, except that where the required building setback from the property line in the zone where the property is located is less than 10 feet the required easement width is equal to the required setback distance.

1. Easements of greater width may be required along property lines where necessary for surface overflow or for the extension of main sewers or similar utilities.

F. Underground Utilities

Unless the Planning Commission and County Council determine, upon application by the subdivider, supported by recommendation of the County Engineer, that it is not feasible to do so, all power lines, telephone lines, and other normally overhead utility lines shall be placed underground by the subdivider.

II. STORM WATER MANAGEMENT

A. General

1. Complete storm water management systems for 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 final hydrology report.

2. 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" and the Grand County Design Criteria for Drainage Studies Within Spanish Valley, 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. If improvements are identified and necessary in the Grand County Storm Drainage Master Plan downstream of the proposed development to Pack or Mill Creek and no approved capital improvement plan exists to address the necessary improvement the developer shall be required to demonstrate that such existing drainage features are adequate to serve the anticipated development and to protect the public health, safety and general welfare at full buildout under existing zoning. Where such demonstration is not made, the developer shall be required to install the necessary improvements as identified in the Grand County Storm Drainage Master Plan.

3. Reimbursement for Storm Water Improvements
When any person constructs a storm water improvements though undeveloped areas to serve his property or constructs storm water improvements on the perimeter of his property, such person shall pay the entire cost of such storm water improvements. If he has furnished the County a summary of the construction costs proposal and has entered into an agreement with the County prior to the construction of such storm water improvements, then, at the time the property served by such storm water improvements is developed and connections are made to the storm water improvements, the County may collect a fee proportional to the basin upstream of the storm water improvements, 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 (less the proportional cost due to their impact upon the basin), 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 10 years from the execution of the agreement.

4. 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.

B. Drainage Study Required

A drainage study is required for all subdivisions except as defined in Section II. E. The amount of detail and the approval authority varies according to lot size.

1. Drainage studies shall include the following:

   (a) Site plan with topography at 2 foot contour intervals and showing all historic drainage patterns and improvements.

   (b) All channels are to be designed to convey the 100 year storm. All detention basins are to be designed to store a volume of water equal to the difference between the historic 100 year storm flow and the post development 100 year storm flow. All detention basins shall be designed for a maximum discharge equal to the predevelopment 10 year storm flow. All detention basins shall be designed with a 100 year storm flow spillway. Refer to the Grand County Design Criteria for Drainage Study within Spanish Valley for acceptable calculation methodology all calculations and methodologies shall be approved by the County Engineer.

   (c) All expected impacts to downstream property owners shall be mapped and described in a narrative within hydraulic and hydrologic reports or studies.

2. The County Road Department and the County Engineer shall review all hydraulic and hydrologic Drainage Analysis.

   (a) All development requires a drainage study. This requirement may be waived by the County Engineer when the impervious area of the proposed development is less than 7,000 square feet and less than15% of the lot area.

   (b) The methodology for drainage studies shall be in accordance with the Grand County Storm Drainage Master Plan and Grand County Design Criteria for drainage studies within Spanish Valley and shall be approved by the County Engineer.

C. Design

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

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

2. Ensure adequate drainage of all low points.

3. Surface water must drain away from cul-de-sacs.

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

5. Provide detention such that after development the peak rate of flow from the site for a 100-year 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 100-year 24-hour storm will be passed over an emergency spillway.

6. All finish floor elevations shall maintain a one foot freeboard during a 100 year 24 hour event. All finish floor elevations shall be one foot above FEMA 100 year floodway. Studies shall be required demonstrating the required freeboard when adjacent streets, detentions basins, or drainage channel banks are within one foot or above the proposed finish floor elevation. Certification of this requirement by a Surveyor licensed in the State of Utah shall be required prior to the issuance of any building permit. No development shall be allowed that creates a violation of this requirement for any existing structure. This requirement may be met by storm drainage systems that covey the 100 year storm.

D. Drainage System Plans

1. 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.

2. 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.

3. All appropriate designs, details, and dimensions needed to clearly explain proposed construction materials and elevations shall be included in the drainage plans.

4. All building envelope elevations shall be shown on drainage plans.

E. Waiver of Drainage Study Requirements

1. A waiver of the Drainage Study requirement will be considered when the following conditions exist:

(a) The amount of impervious surface will not be increased to more than 15 percent of the lot area and is less than 7,000 square feet.

(b) The site is not characterized by unusual topography or drainage patterns.

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

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

(a) A letter explaining the reasons for the waiver.

(b) A topographic map that shows the predominant drainage patterns.

(c) Calculations of the change in impervious area, after development.

3. 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 County Engineer may recommend said waiver.

III. FIRE PROTECTION

All development shall comply with applicable requirements of the current adopted edition of the International Fire Code and to amendments as may be adopted by the Local Fire Districts

IV. SEWER

Grand Water & Sewer Service Agency is the sewer authority. The Agency has adopted the sewer construction standards.
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 & Sewer Service Agency Board of Trustees.

All facilities that will become a part of the Grand Water & Sewer Service Agency (hereinafter referred to as "GW&SSA" or "Agency") system shall be constructed in accordance with APWA Standard Specifications and Standard Plans unless modified herein. All newly installed sewer infrastructure shall be pressure tested, inspected, and approved by Agency personal prior to backfilling. The Agency will require two copies of completed as-built drawings of the development plans prior to acceptance.
If a project encounters conditions not covered by the APWA standard, GW&SSA shall be contacted for additional specifications.

A. General Conditions

1. *Size and type of Sewer Mains*
The Agency Manager shall approve the design of the sewer collection system within the district. No main less than 8 inches shall be placed in the sewer collection system. Sewer Mains shall be PVC sewer pipe and fittings meeting the standards of ASTM D3034. Such pipe shall be manufactured with a rubber gasketed joining system which meets ASTM D3212 and shall be a standard dimensional ratio of 35 (SDR 35).

2. *Specifications for Installations of Sewer Mains*
All sewer collection mains and infrastructure shall be approved by the Agency Manager prior to the start of construction. Said sewer mains shall be laid at a depth and grade sufficient to serve all lots adjacent to the main, and if required by the Agency, at a sufficient depth and grade to enable the main to be extended to serve other properties.

3. *Sewer line grades*
Unless otherwise approved be the Agency Manager, all newly installed sewer mains shall

meet the following minimum grades

a) 8-inch sewer lines – 0.0040 foot/foot
b) 10-inch sewer lines – 0.0028 foot/foot
c) 12-inch sewer lines – 0.0022 foot/foot
d) 15-inch sewer lines - 0.0015 foot/foot
e) 18-inch sewer lines – 0.0012 foot/foot
f) 21-inch sewer lines – 0.0010 foot/foot
g) 24-inch sewer lines – 0.0009 foot/foot

4. *Sewer Lines Within Well and Spring Protection Zones*
All sewer line installation within well or spring protection zones shall be installed in accordance with State of Utah Administrative Rule R309-515-6.

5. *Sewer Laterals*
Sewer laterals are generally located 5 feet to the low side of the centerline of lot. No lateral shall be allowed in any driveway, driveway flare, or sidewalk**.** All sewer laterals shall terminate on the customer's side of the utility right of way. Terminations shall consist of a cleanout, "WYE" fitting and caps. All cleanouts shall be installed with a cap and an electronic marker 12 -18 inches above final grade.

6. *Manhole Sections and Bases*
Manhole sections and bases will be precast. Cast-in-place type manholes may be used with prior approval by the Agency Manager.

7. *Manhole Section Placement*
Manhole sections will be installed at every change of pipe direction, grade, or at a distance of no greater than 400 feet. All end-of-line sewer lines will require an end-of-line manhole.

8. *Flushing and video*
All newly installed sewer infrastructure shall be flushed with construction water. The Agency shall be provided with a DVD video showing sewer infrastructure to be free of defects.

9. *Mapping*
All laterals, manholes, and inverts shall be recorded with survey grade survey equipment with sufficient information to tie the as built improvements into the Agency's existing hydraulic sewer model.

B. Special Project Conditions

1. *Warranty of Materials and Construction*
The developer shall warranty all portions of the sewer system for a period of two (2) years. Any and all repairs required during the warranty period shall either be performed by the developer or their agents or shall be performed by the Agency with all costs for materials and labor reimbursed by the developer to the Agency.

2. *Working Conditions*
All work must comply with the Code of Federal Regulations – 29 (OHSA Standards).

3. *Work on City, County, and State Roads*
Prior to commencement of construction, the developer shall obtain all required licenses and/or permits for construction within City, County, or State road ROW. Encroachment permits and bonds are required for all work with in road ROW. 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".

4. *Water for Construction*
Water required for construction purposes shall be provided and paid for by the developer and shall be obtained in accordance with Agency policy.

5. *Irrigation Canal and Ditch Crossings*
   The developer shall make all necessary arrangements with and obtain permission from canal and ditch owners prior to impacting with construction.

6. *Blasting*
   Blasting will not be allowed except by special permission of the Agency Manager.

V. WATER

Grand Water & Sewer Service Agency is the water authority. The Agency has adopted the water construction standards.
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 & Sewer Service Agency Board of Trustees.

All facilities that will become a part of the Grand Water & Sewer Service Agency (hereinafter referred to as "GW&SSA" or "Agency") system shall be constructed in accordance with APWA Standard Specifications and Standard Plans unless modified herein. All newly installed water infrastructure shall be pressure tested and disinfected. Agency personnel must inspect and approve infrastructure prior to backfilling. The Agency will require two copies of completed as-built drawings of the development plans prior to acceptance.
If a project encounters conditions not covered by the APWA standard, GW&SSA shall be contacted for additional specifications

A. General Conditions

1. *Size and type of Water Mains*
   The Agency Manager shall approve the design of the water distribution system within the district. No water main less than 8 inches shall be placed in the water distribution system. Water system static design pressures shall be between 50 and 110 PSI

2. *Specifications for Installations of Water Mains*
   All water lines and infrastructure shall be approved by the Agency Manager prior to the start of construction. Unless otherwise approved or required by the Agency Manager, all water main lines 24 inches and smaller shall be PVC C900 or C905 DR 18 class 150.

3. *System Looping*
   Unless otherwise approved by the Agency Manager, all water mains shall be looped.

4. *Meter pits*
   Location of water service shall generally be located 5 feet from the high side of the center line of the lot being served. Unless approved by the Agency Manager, meter pits shall not be installed in drive approaches. Meter pit lids shall be recessed to allow for automatic meter reading transmitters.

5. *Separation*
   All culinary water lines shall maintain a minimum of 10 foot separation between sanitary sewer and 5 foot separation between secondary water systems. All water lines that cross sanitary sewer and secondary water lines; or cannot meet the minimum separation shall be installed in accordance with State of Utah Administrative Rule R309-550-7.the Utah Department of Environmental Quality's criteria for separation of drinking water mains.

6. *Fire Hydrants*
   Fire Hydrant flows and location shall be approved by the local fire authority. All fire hydrants shall be Muller Super Centurion 250 3 way with one 6 inch and two 2.5 inch connections.

7. *Flush Valves (blow-off valve)*

Unless system design requires a fire hydrant at the end-of-line, Flush valves shall be installed at all end-of-line locations.

8. *Mainline Valves*

Mainline valves shall have a cast iron body with a bronze seat. Valves shall be located at all intersections in line with corner lot property lines. The number of valves shall be as follows:

90° Elbow – 1 valve
Tee – 2 valves
Cross – 3 valves

Additional valves may be required by the Agency. In situations of long stretches of mainline, unless approved by the Agency Manager, valves shall be installed at locations not to exceed 1,000 feet. All mainline valves smaller than 12 inches shall be gate valves, all mainline valves 12 inches and larger shall be short body butterfly valves.

9. *Service Lines*

Service lines up to 2 inch may be either type K copper or polyethylene pipe (IPS) with compression fittings. Service lines larger than 2 inch shall be type K copper. No splices shall be allowed between the corporation stop and the meter setter. Corporation stops shall be a Mueller ball-valve type B-25028/B-2529 or equal.

10. *Air Release Assembly*

Air release assemblies locations shall be approved by the Agency Manager and will typically be installed at all design high points of the water line. Air release assemblies shall be an ARI D-040. The size of the valve shall be no smaller than 1/8th the size of the main line size.

B. Special Project Conditions

1. *Warranty of Materials and Construction*

The developer shall warranty all portions of the water system for a period of two (2) years. Any and all repairs required during the warranty period shall either be performed by the developer or their agents or shall be performed by the Agency with all costs for materials and labor reimbursed by the developer to the Agency.

2. *Working Conditions*

All work must comply with the Code of Federal Regulations – 29 (OHSA Standards).

3. *Work on City, County, and State Roads*

Prior to commencement of construction, the developer shall obtain all required licenses and/or permits for construction within City, County, or State road ROW. Encroachment permits and bonds are required for all work with in road ROW. 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".

4. *Water for Construction*

Water required for construction purposes shall be provided and paid for by the developer and shall be obtained in accordance with Agency policy.

5. *Irrigation Canal and Ditch Crossings*

The developer shall make all necessary arrangements with and obtain permission from canal and ditch owners prior to impacting with construction.

6. *Blasting*

Blasting will not be allowed except by special permission of the Agency Manager, and shall require all applicable National, State and Local permits.

C. Secondary Water System

1. *Backflow Prevention*

All development that is required to install a secondary water system shall connect the secondary water main to the Agency's secondary water system. If the Agency Manager deems it unpractical to connect to the Agency's secondary water system; the secondary water main shall be connected to the culinary water system until a connection can be made to the Agency's secondary water system. All secondary water mains that are to be connected to a culinary water main; shall be done using a Watts model 909 or equal reduced pressure zone (RPZ) type backflow preventer, installed above final grade. **In no case shall there be a non-district connection between the culinary water system and the secondary water system.**

2. *Secondary Water Construction Standards*
   The secondary water system construction standards are the same as the water construction standards with the following modifications.

3. *Secondary Water Line Identification*
   All secondary water lines shall be purple in color for identification purposes. Purple pipe shall only be utilized for construction of secondary water lines.

4. *Size of Secondary Water Main*s
   Secondary water system mains may be designed using less than 8 inch pipe. In no case shall the water line size be less than 2 inches.

5. *System looping*
   Unless required by the Agency Manager, secondary water mains do not require looping.

6. *Valve Boxes*
   All irrigation meter and valve boxes shall have a rectangular frame with recessed cover for automatic meter reading. Box cover shall be labeled **irrigation water**.

7. *Separation*
   A minimum separation of 5 feet shall be maintained between drinking water and secondary water lines.

8. *Service Lines*
   Location of secondary water service lines shall generally be 5 feet from the corner of the lot line. All services on the same side of the street as the secondary water line shall have only one meter per service line and shall be a minimum of 3/4 inches. Services on the opposite side of the street of the secondary water line shall have no more than two meters per service line and shall be a minimum of 11/2 inches.

9. *Disinfection*
   Unless required by the Agency Manager, secondary water lines will not require disinfection.